Tree Atlas of Namibia

Barbara Curtis
Coleen Mannheimer

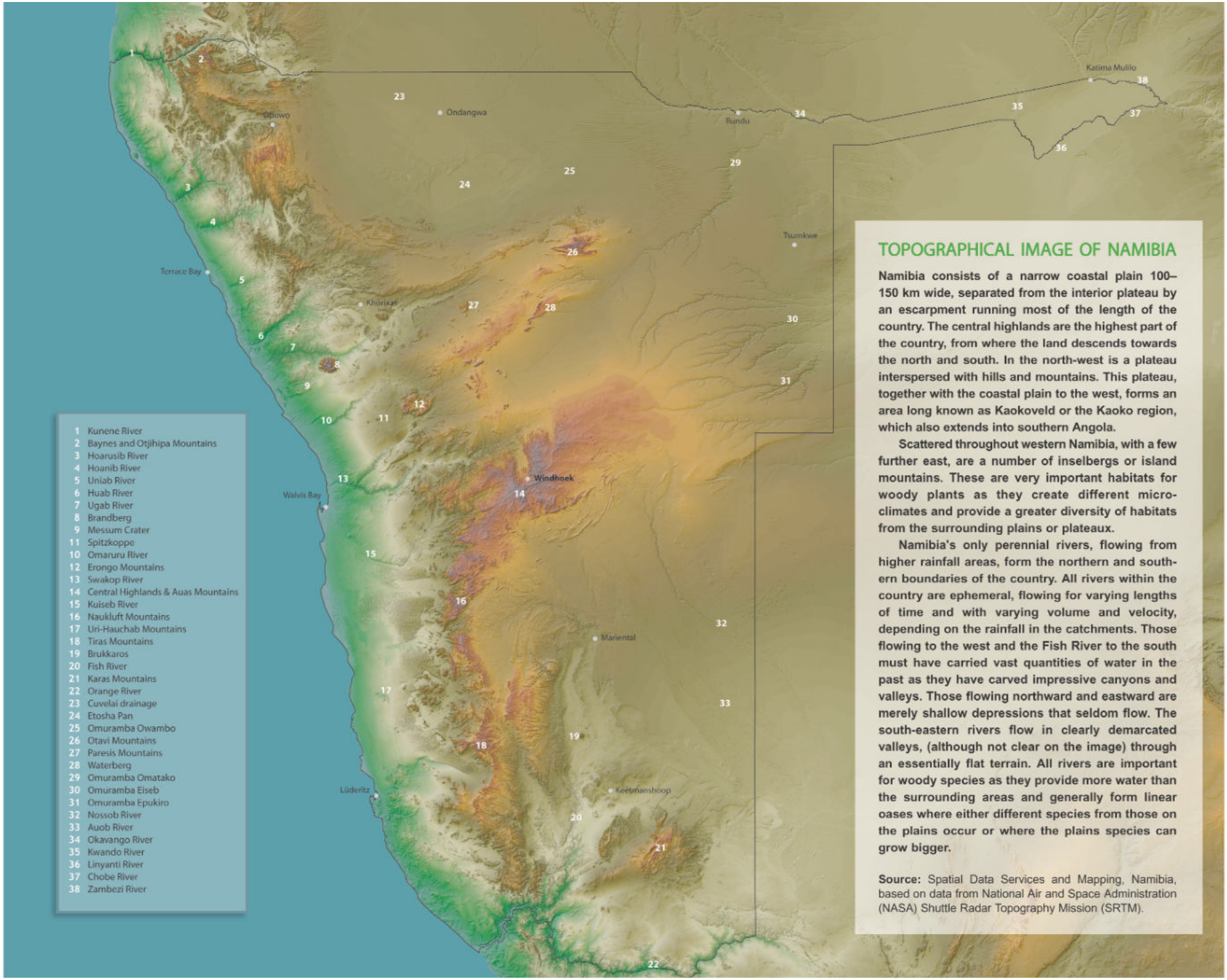
THIS ATLAS PRESENTS the distribution and estimated abundance of over 400 species of woody plants in Namibia. It is the culmination of six years of data collection by volunteers with a keen interest in trees and is one of two products of the Namibian Tree Atlas Project. Over 300 distribution maps show where the major species are found, while graphs depict their height and habitat, and when each species has leaves, flowers or fruit.

Although not intended as a field guide, this book gives a brief description of each species, highlighting the most distinguishing features, and illustrates most species with a line drawing of the leaves and flowers or fruit. Notes are included on general biology, uses and conservation concerns. The introduction summarises the Tree Atlas Project and highlights aspects of the ecology of woody species in Namibia. Naturalised alien species are also included.



NAMIBIAN LARGE WOODY PLANTS IN A NUTSHELL

- **408** indigenous large woody species
  (10% of all plants in Namibia)
  - **114** always trees
  - **21** generally trees, but sometimes shrubs
  - **62** may be trees or shrubs
  - **147** always shrubs
  - **43** generally shrubs, but sometimes trees
  - **5** dwarf trees
  - **16** scrambling or climbing shrubs
  - **30** endemic to Namibia
- **16** alien species



1 Kunene River
2 Baynes and Otjihipa Mountains
3 Hoarusib River
4 Hoanib River
5 Uniab River
6 Huab River
7 Ugab River
8 Brandberg
9 Messum Crater
11 Spitzkoppe
10 Omaruru River
12 Erongo Mountains
13 Swakop River
14 Central Highlands & Auas Mountains
15 Kuiseb River
16 Naukluft Mountains
17 Uri-Hauchab Mountains
18 Tiras Mountains
19 Brukkaros
20 Fish River
21 Karas Mountains
22 Orange River
23 Cuvelai drainage
24 Etosha Pan
25 Omuramba Owambo
26 Otavi Mountains
27 Paresis Mountains
28 Waterberg
29 Omuramba Omatako
30 Omuramba Eiseb
31 Omuramba Epukiro
32 Nossob River
33 Auob River
34 Okavango River
35 Kwando River
36 Linyanti River
37 Chobe River
38 Zambezi River

TOPOGRAPHICAL IMAGE OF NAMIBIA

Namibia consists of a narrow coastal plain 100–150 km wide, separated from the interior plateau by an escarpment running most of the length of the country. The central highlands are the highest part of the country, from where the land descends towards the north and south. In the north-west is a plateau interspersed with hills and mountains. This plateau, together with the coastal plain to the west, forms an area long known as Kaokoveld or the Kaoko region, which also extends into southern Angola.

Scattered throughout western Namibia, with a few further east, are a number of inselbergs or island mountains. These are very important habitats for woody plants as they create different micro-climates and provide a greater diversity of habitats from the surrounding plains or plateaux.

Namibia's only perennial rivers, flowing from higher rainfall areas, form the northern and southern boundaries of the country. All rivers within the country are ephemeral, flowing for varying lengths of time and with varying volume and velocity, depending on the rainfall in the catchments. Those flowing to the west and the Fish River to the south must have carried vast quantities of water in the past as they have carved impressive canyons and valleys. Those flowing northward and eastward are merely shallow depressions that seldom flow. The south-eastern rivers flow in clearly demarcated valleys, (although not clear on the image) through an essentially flat terrain. All rivers are important for woody species as they provide more water than the surrounding areas and generally form linear oases where either different species from those on the plains occur or where the plains species can grow bigger.

Source: Spatial Data Services and Mapping, Namibia, based on data from National Air and Space Administration (NASA) Shuttle Radar Topography Mission (SRTM).

Tree Atlas

of Namibia



A product of the
Namibian Tree Atlas Project

National Biodiversity Programme

Directorate of Environmental Affairs
Ministry of Environment and Tourism

First published in Namibia in 2005 by
The National Botanical Research Institute
Ministry of Agriculture, Water and Forestry
Private Bag 13184
Windhoek
Namibia
Tel: (+264) (0) (61) 2029111
Fax: (+264) (0) (61) 258153
E-mail: nbri@mweb.com.na
http://www.biodiversity.org.na

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ISBN 99916-68-06-3

Suggested citation:
Curtis, B. A & Mannheimer, C. A. 2005. *Tree Atlas of Namibia.* Windhoek: National Botanical Research Institute. 688pp.

Cover design: Barbara Curtis and Patricia Lynch-Blom

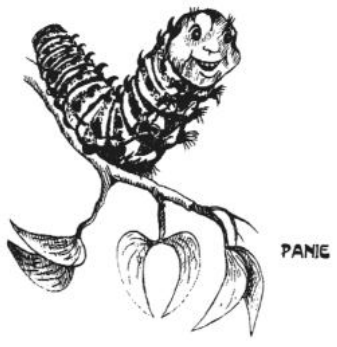
Illustrations: Blythe Loutit (all drawings, except those listed here), Antje Burke (*Zygophyllum prismatocarpum)*, Frances Crawford (*Bridelia tenuifolia, Erythrococca menyharthii, Grewia olukondae, G. sub-spathulata, Melianthus comosus, Lycium boscifolium, L. eenii, L. hirsutum, Opilia campestris, Psydrax livida, Rotheca myricoides, Vitex angolensis*), Coleen Mannheimer (*Acanthosicyos horridus, Adenia pechuelii, Azima tetracantha, Cissus nymphaeifolia, Combretum hereroense, Euphorbia damarana, Euphorbia gregaria, Euphorbia gummifera, Hyphaene petersiana* (tree), *Kigelia africana, Pachypodium lealii*, *Peltophorum africanum, Phoenix reclinata* (tree), *Rhus burchellii, Welwitschia mirabilis* (whole plant) and the project logo, Nicky Marais (Panie, the project mascot).
Illustrations for the glossary were done by Blythe Loutit and Coleen Mannheimer.

Maps and graphs: Liza Burmeister, Frances Crawford, Barbara Curtis, Selma el Obeid

Editing: Carole Roberts

Design, layout and supervision of printing: Patricia Lynch-Blom

Printed and bound by Kyodo Printing Co (S'pore) Pte Ltd



Tree Atlas of Namibia

BARBARA CURTIS

COLEEN MANNHEIMER

With illustrations by Blythe Loutit

National Botanical Research Institute
Ministry of Agriculture, Water and Forestry

FOREWORD

In an arid country such as Namibia, development and environment are inextricably linked. Certainly this is the case within the agricultural sector, and indeed, much of our economy and most of our people are directly dependent on our country's natural resource base. Woody plants are a vital component of this natural resource base – while their presence is essential for the maintenance of the diverse ecosystems in which they occur, they are responsible for the socio-economic well-being of a significant proportion of our people, through providing food, medicine, building material and a whole host of income-generating opportunities.

The Namibian Constitution explicitly promotes development through sustainable resource use, while National Development Plans and more recently Vision 2030, recognise that we have to manage our natural resources responsibly while seeking to stimulate economic growth and improved living conditions for all our citizens. In order for this to realise, development planning and decision-making need to be based on accurate, readily-accessible information. The Tree Atlas Project has made an important contribution to our knowledge of woody plants, and presents that information in this book in a simple manner that is available to both scientists and amateurs. It is thus a very valuable tool for the sustainable management of our land and its natural resources, providing indispensable baseline data that will facilitate future projects and environmental assessments.

The Tree Atlas Project was an excellent team effort between different government agencies, non-government organisations and Namibian citizens. The Project Team that worked tirelessly over several years to produce what you are holding in your hands, not only ensured that this information is of the highest scientific quality, but was instrumental in fostering a very constructive and productive collaboration between all tree-lovers. In a nutshell, the Tree Atlas of Namibia is a very good example of what 'smart partnerships' can deliver.

The Ministry of Agriculture, Water and Forestry is proud to be associated with the Tree Atlas of Namibia. Not only is an essential development tool now on the table, but the passion for trees instilled in many Namibian hearts through this project, will live on forever!





KAHIJORO SM KAHUURE
PERMANENT SECRETARY
Ministry of Agriculture, Water and Forestry

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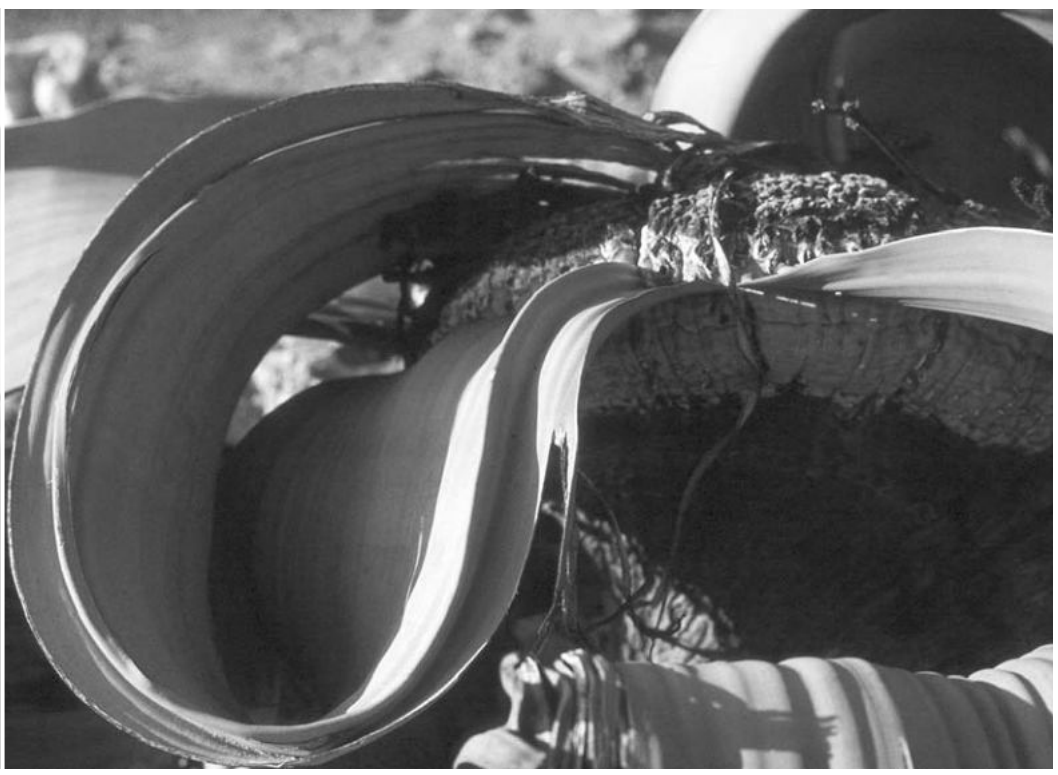
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PREFACE





OUR TREES AND SHRUBS serve a multitude of uses. They provide us with fuel and materials for building and crafting; some are a source of medicine or food, or hold special significance in our varied cultures; many feed our livestock and wildlife; and they all help to bind the soil, preventing erosion. Yet, despite their importance to us, a record of basic information on their distribution, abundance and general biology has been lacking.

The Tree Atlas Project (TAP) was initiated to help gather this information, record it, and make it available for the management and conservation of this important resource. The Project was launched on Arbour Day in October 1997 when it first invited the participation of interested volunteers – *atlassers* – to gather information and share their knowledge of trees and shrubs. Information was collected over six years – until December 2003 – and entered into a database housed at the National Botanical Research Institute. This book gives a synthesis and summary of the information in that database. It provides a 'snapshot' of which woody plants are found in Namibia, where they are found, and in what abundance during the time period of the project, as well as some biological and ecological characteristics of these plants.

INVOLVING THE PUBLIC

Apart from the primary aim of the TAP in mapping the distribution and abundance of trees and shrubs throughout Namibia, a secondary objective was to stimulate an awareness and interest in woody plants among Namibians by involving the public in the project. Involving the public would also help us tap years of accumulated traditional, yet unrecorded, knowledge on the plants and their uses.

Nothing of this scale had been carried out in Namibia before. We advertised the project widely and, for a country with a very small population, the response was most gratifying. A total of 594 people registered as atlassers, of which 216 contributed to the project by sending in at least one atlas sheet. Many went out of their way to get to areas for which there was little or no information, or to collect unusual and interesting specimens.

In the first two or three years regular workshops and talks were held around the country to inform the public about the project, to explain how to atlas and fill in the atlas sheets, and to assist atlassers in identifying woody plants. Keys suited to the Namibian taxa of the largest woody plant genera were produced. A newsletter, *Omusati*, was produced regularly, which kept atlassers informed on the progress and development of the project, updated them on the latest name changes, gave tips and advice on identifying trees and shrubs, and had interesting comments and observations from fellow atlassers. It also helped direct their activities towards areas or species needing attention.

For the first three years we spent much of our time getting volunteers started and encouraging them, as well as collecting data ourselves. In later years, efforts were concentrated on those volunteers who had been most active and enthusiastic. Poorly-covered areas were specifically targeted, and funds were made available to help atlassers cover their costs. We also intensified our own atlassing activity. As a result, the country was almost completely covered, with only a few areas needing more attention.

Many people have reported a new or increased interest in and awareness of trees since the launch of the project. Indigenous trees are frequently the subject of school projects. TAP workshops and lectures were always very well-attended, and we were approached by non-government and government organisations – including the Directorate of Forestry – and the Polytechnic and University of Namibia to hold tree identification workshops for staff and students. Since the inception of the project, members of the public seem far more aware of the NBRI, the National Herbarium and the National Botanic Gardens.

THE PRODUCTS

The primary product of the project is a database. It currently consists of 91,511 records of over 400 species of woody plants, on their distribution, abundance, habitat, size, growth form, flowering and fruiting, and some uses.

The information in the database is available to anyone with an interest in woody plants – be they students, researchers, land managers, farmers, foresters, horticulturists, conservationists or the interested public. The data are useful for a variety of applications. Foresters could supplement their information for planning and managing woody resources. Farmers could use the information for controlling bush encroachment, providing browse or opening up areas for irrigation. Horticulturists could use it for promoting indigenous plants suitable for gardening and commercial cultivation. Conservationists could use it to plan new parks and conservation areas, and manage the resources in these and existing conservation areas. The database is available via the internet on **http://www.biodiversity.org.na**

As with other atlas projects, such as the Southern African Bird Atlas, the Protea Atlas of South Africa and the South African Plant Invaders Atlas, the objective of the Tree Atlas Project was to provide a 'snapshot in time' of a changing landscape of, in this case, trees and shrubs. Rather than being a definitive study, it should be regarded as part of a monitoring exercise. If the database is to realise its true potential and value, the exercise should be repeated in the future.

Having said that, the database may also be regarded as a 'work in progress' as there are still areas and species not adequately covered, and more information is needed on flowering and fruiting times in different parts of the country. The database will be updated continuously and readers and atlassers are encouraged to continue contributing new information, which verify range extensions or interesting observations on annual cycle (Appendix 6 lists some areas and species in need of more attention). This information may be posted to the NBRI, Private Bag 13184, Windhoek.

This book, which provides a summary of this six-year collection of data, is the other major product of the Tree Atlas Project. We hope that it will prove a useful tool for planning and conservation, as well as provide baseline data for future comparisons, and that readers will enjoy the book and go out to look for areas in which they can add to the data provided.



BARBARA CURTIS



COLEEN MANNHEIMER

ACKNOWLEDGEMENTS





WE GRATEFULLY ACKNOWLEDGE the help and support of numerous individuals and organisations, without which this project and the resultant atlas would not have been possible.

The Tree Atlas Project (TAP), a project of the National Biodiversity Programme of the Directorate of Environmental Affairs in the Ministry of Environment and Tourism, was largely funded by the German Government through the Gesellschaft für Technische Zusammenarbeit (GTZ). It was conducted under the auspices of the National Botanical Research Institute (NBRI) of the Ministry of Agriculture, Water and Forestry, who provided an office and logistical support, as well as the continued support of its staff. Special thanks go to Gillian Maggs-Kölling, the Head of the NBRI, who made it possible.

The TAP was directed by a steering committee consisting of representatives of a number of stakeholders and chaired by Gillian Maggs-Kölling. She and committee members Phoebe Barnard (National Biodiversity Programme), Chris Brown (Namibia Nature Foundation; editor Southern African Bird Atlas), Moses Chakanga (Directorate of Forestry), Chris Hines (freelance botanist), Luise Hoffmann (member of public with keen botanical interest), Vincent Louw (Directorate of Forestry), John Mendelsohn (GIS, mapping and database specialist; contributing author of Southern African Bird Atlas) and Magda Robinson (Botanical Society of Namibia), are thanked for their time, personal interest and careful guidance.

A number of people assisted in the initial stages of the project – in its design, the drafting of the guidelines for atlassers and the development of the database. Specifically, we would like to thank Eleanor Chivell, Patricia Craven, Herta Kolberg, Renate Kubirske, Gillian Maggs-Kölling and Ben Strohbach of the NBRI; members of the Steering Committee; Tony Rebelo of the Protea Atlas Project, South Africa; Lesley Henderson of the South African Plant Invaders Atlas Project; Tony Palmer, Hannelie Snyman and Bernard de Winter of the National Botanical Institute, South Africa; Les Underhill of the Bird Atlas Project, University of Cape Town; Chris & Sue Brown, Jan Bührmann, Antje Burke, A Calitz, Nicholas Clarke, Renette Krommenhoek, Carole Roberts, Robin Wise and to everyone else who made helpful comments and suggestions. Celia Mendelsohn and Luise Hoffmann translated 'Guidelines to Atlassers' into Afrikaans and German respectively.

Alice Jarvis assisted in designing and setting-up the database, using the NBRI database as a guideline.

ATLASSERS

The Tree Atlas Project and this publication would not have been possible without the dedication and enthusiasm of all our volunteer atlassers. Many spent much of their spare time atlassing, collecting specimens and filling in atlas sheets for the project. The costs they incurred were largely covered by themselves. They are listed below in alphabetical order. One, two and three asterisks (*) next to names indicate contributions of 10–49, 50–99 and 100 or more atlas sheets, respectively. Heinrich Förtsch and Hermann Redecker deserve a special mention for faithfully providing sheets every month for five years; other atlassers who sent in monthly data when they were able to are also indicated by an obelisk (†).

Kobus Alberts*, Tobias Angula, Horst & Renate Austermühle*†, Bonifatius Awarab, Frik Badenhorst, Gernot Bahr*, Phoebe Barnard, JI Barnes*, Silke Bartsch*, Pieter Basson***†, Simone Bechtel, Hildegard Becker*, Nigel Berriman*, Conny Berry*, Mark Berry, FV Bester**, John Bester, Shirley Bethune*, Frank Bockmühl, Gerhardt Boois, Karin & Walter Böttger, Dave & Helen Boyer, D Brand, Erdmute Breiting, Peter Bridgeford*, Chris & Sue Brown***, Caroline Bührmann, Jan Bührmann*, Piet Burger*, Antje Burke**, Liza Burmeister, Cheetah Conservation Fund, Louise Clapham*, NV Clarke*, Marina Coetzee*, Gillian Cooper-Driver, Family Craven*, Barbara Curtis***, Henk Dauth, B Dawids*, Hermanus de Bruin, Vera de Cauwer, Colleen Deane, JW Debod, Hartwig Dedekind*, D & G Diekmann, LM du Plessis, Marc & Elinor Dürr*, Sylvia Düvel*†, Anka Eichhoff, Gisi Eimbeck, Ulli Eins, Erich Ellinger***, GPL Erasmus, Elke Erb, Etosha Aoba Lodge, Silvelyn Feddersen, Paulus Festus*, Ruth & Wilfried Feucht, Annegret Finke, U Fischer, Heinrich Förtsch**†, Hellmut Förtsch, Anna Fourie, Charles Francis, Jan Friede, Günther Friederich***†, Wilfried Friederich***, Udo & Anka Gärtner*, Klaus Gerstle, Patrick Graz, Marthie Greeff, Arne Gressmann, Mike Griffin, Ellen Gudde*, Theda Günther, Uwe Günther*, Volker Guthörl, Lynn Halstead, GN Hangara***, Sonja Hanke, Stephane Helary, Judith Hellwig, Joh Henschel, Renate Hilbert***†, Chris Hines**, Horst Hobohm*†, Helena Hoffman*, Jürgen Hoffmann*, Luise Hoffmann***, Maria Hoffmann, MC Hofmann, George Holl*, Gabriele Hoppe-Speer, Pieter Horn*, Dianne Hubbard, Mark & Laura Jago, Pieter Jansen***, Alice Jarvis & Tony Robertson, Dave Joubert, Marcelle Kähler, Inekelah Kambindji, Sandra Kehrberg***†, ES Klaassen*, Hentie Knouwds, Nicky Knox, Bertchen Kohrs, Herta Kolberg***, Holger & Claire Kolberg**, Hartmut Kölling**, Kurt Richard Kubirske, PHR Kujawa, Christel Landsrath, P Lane, B Larsen & M Hartwell, Sigrid Leger, Keith Leggett*, Joachim Lenssen, Dennis Liebenberg, Wayne Liebenberg, Christian Lindhorst, Sonja Loots, Roger Lowery, Sylke Lubbert, MWG Lukaschik, Gillian Maggs-Kölling, Suzan Mallet-Veale*, Coleen Mannheimer***, Nicky Marais, Fritz Maske, Ilvia McAdam, Pamela McGrath, Xavier Mercier *, Edna Meter, PH & I Meyer, Roy Miller*, Rüdiger Moisel, Christo & Lida Möller, Gerwalt Mosich, Christa Müller, Oscar Zambo Munanzi, Veikko Nampila, Julius Ngaujake, Karen Nott*, Monica Ochse, Okatamba Wildlife Research, Rosemary Orford, Birgit Ostermeier-Noctil, P Palme, participants of TAP excursions*, Walter Piepmeyer*, Bill Quinton, Birgit Rahn, David Raulstone, Hermann Redecker**†, Hannes Reinders, Peter Reiner, Hilke Riehmer*†, Carole Roberts*, Kevin Roberts, Wilhelm Roesener, Gesche Roxin**, Daniela Ruppel*, Mecki Rust*, Klaudia Schachtschneider*, Christa Schemmer*, B Schneider, Herbert & Ilme Schneider, Elisabeth Schober-Redecker, Arthur & Connie Scholz, Inge Scholz, Peter Schonecke, Johan Schoombee*, HG Schubert, Sonja Schubert, Brigitte Schünemann*†, Etta Schwarting**, Mary Seely*, Katy Sharpe*, Loide Shitaleni, Florence Siambongo, Charmaine Silver**†, Rob Simmons, Wilfried Slaney*, G Smith, H Sohrada, Carol Steenkamp, GJ Steenkamp, Jaco & Pamela Steenkamp, Marthinus Steyn, Judy Storm, Ben Strohbach*, Marianne Strohbach, Wessel Swanepoel***, Roger Swart, AD Symonds & SC Mayes, Jo Tagg & Vera Neuhaus**, Gudrun Theile, Naudé Theron*, R & C Thiessen, TU Tjikuzu, Heidi & Eberhard Tölken, Edith & Friedel Traupe, Rolf Trossbach, Marianne Uiras, University of Cologne*, Theo van der Merwe, JAJ van Eck**, B van Rooyen, Arjen van Zwieten, Bertus & Annabelle Venter, Wilferd Versfeld, JJ Viljoen, HJS von Bach, VE von Krosigk, FA von Solms*, Suzette von Wielligh, Joe Walter, David Ward, Viv Ward, Rensie Weimann, Louis Wessels***, Erwin Wiss, and Helmut zur Strassen***.

Many atlassers collected excellent specimens whilst atlassing, not only contributing to the project, but to the collection in the National Herbarium: Piet Basson, Jan Bührmann, Erich Ellinger, Günther Friederich, Wilfred Friederich, Luise Hoffmann, Piet Horn, Holger Kolberg, Gersche Roxin, Katy Sharpe, Wessel Swanepoel, Jo Tagg and Fanie von Solms deserve special mention. Our sincere thanks go to Silke Bartsch-Rügheimer, Davies Lutombi, Sonja Schubert, Marianne Uiras-Hochabes and Esmerialda Klaassen of the NBRI for assisting in identifying the thousands of plant specimens that the TAP generated.

Data collection was facilitated by the many farmers and lodges who provided access to their land, hospitality and information; Anglo-America allowed us to use their field camp in Kaokoveld. The Ministry of Environment and Tourism provided permits to atlassers for collecting plants and access to National Parks.

Over the years, the project was supported by numerous staff members, assisting with data capture and office administration: Edna Awaras, Nana Baloyi, Letitia Britz-Olivier, Liza Burmeister, Elizabeth Campbell, Petronella Claasen, Frances Crawford, Marietjie Gericke, Sonja Hanke, Heidi Jagdhuber, Sesilia Kauma, Catherine Keough, Bertchen Kohrs, Svenja Krauer, Joceline le Hanie, Mally Mott-Adams, Mary Müller, Natasha Quinn, Chrizelda Rühl, Klaudia Schachtschneider, Megan Schlange, Nicole Theile and Gudrun Theile. Special thanks go to Liza Burmeister and Frances Crawford for assisting in getting the book ready for publication.

The finances of the TAP were competently administered by the Namibia Nature Foundation. Special thanks go to Edla Kaveru.

Data from the TAP database provide the information on which the analyses were based for the production of this publication. Antje Burke, Berit Hachveld, Chris Hines, Ben Strohbach, Ernst van Jaarsveld, the Directorate of Forestry, and the Profile and Atlas Projects of the MET also generously shared their expertise and data from their research conducted during the time period of the TAP. FV (Bessie) Bester, Patricia Craven, Herta Kolberg, Sonja Loots and Ben Strohbach provided useful comments on distribution, and information on alien and invasive species, conservation status and ecology. John Ward assisted with geological terms in the glossary.

Conny Berry and Liza Burmeister produced some of the preliminary species accounts. Piet Basson, Chris Brown, Antje Burke, Nicholas Clarke, Frances Crawford, Lesley Crawford, Colleen Deane, Erich Ellinger, Günther Friederich, Wilfried Friederich, Jane Gold, Luise Hoffmann, Piet Horn, Herta Kolberg, John Mendelsohn, Christo & Lida Möller, Karen Nott, Mr & Mrs Hermann Redecker, Carole Roberts, Brigitte Schünemann and Ben Strohbach commented on drafts of the manuscript. Patricia Craven, Luise Hoffmann, Piet Horn, Herta Kolberg, Davies Lutombi and Marianne Uiras-Hochabes provided help with the common names.

The book was reviewed by FV (Bessie) Bester, Antje Burke, Luise Hoffmann, Piet Horn, Piet Jansen, Herta Kolberg, Hartmut Kölling, Gillian Maggs-Kölling, Ben Strohbach, Wessel Swanepoel and Jo Tagg.

John Mendelsohn and Selma el Obeid of RAISON assisted with the production of the publication, including accommodating Patricia, our designer, while she was in Windhoek. Frances Crawford and Luise Hoffmann assisted with proof-reading. Thanks very much to John and Viv Ward for providing transport in Cape Town.

Thanks to Antje Burke for providing two illustrations and to Shirley Bethune, Antje Burke, Liza Burmeister, Tony Cunningham, Erich Ellinger, Mrs U Fischer, Günther Friederich, Wilfried Friederich, Luise Hoffmann, Piet Horn, John Mendelsohn, NBRI, John Pallett, Peter Reiner, Kevin Roberts, Sonja Schubert, Carol Steenkamp, Wessel Swanepoel, Roger Swart, Peter Tarr, Braam van Wyk and Werner Voigts for allowing us to use their photos free of charge. A very big thank-you to Robert Müller for allowing us to use his photo for the cover. Sonja Schubert is gratefully acknowledged for scanning the slides and prints. PhotoBox kindly donated film.

A big thank you to all who gave moral support to the project, especially to the production of the final publication. Thanks to the families of atlassers for their patience. Very special thanks to Carole Roberts, whose input and support went far beyond the editorial services for which she was paid.

ABBREVIATIONS & SYMBOLS

General

°	degrees
'	minutes
AIWG	Alien Invasives Working Group
c.	*circa*; about
CITES	International Convention on Trade in Endangered Species
DoF	Directorate of Forestry
DRFN	Desert Research Foundation of Namibia
E	East
ed.	editor
eds	editors
in prep.	in preparation
IUCN	World Conservation Union
km²	square kilometre(s)
m	metre(s)
MET	Ministry of Environment and Tourism
mm	millimetre(s)
NBRI	National Botanical Research Institute
NDF	Namibian Defence Force
pers. comm.	personal communication
QDS	quarter-degree square
S	South
sp.	species (singular)
sp. nov.	*species novum*; new species
spp.	species (plural)
subsp.	subspecies
TAP	Tree Atlas Project
UNAM	University of Namibia
var.	variety

Languages

A	Afrikaans
E	English
G	German
Gc	Rumanyo, Rugciriku
H	Otjiherero
J	Jul'hoan
K	Khoekhoegowab (Nama/Damara)
Kx	Kxoe
L	Silozi
Nh	Naro
O	Oshiwambo
Od	Oshindonga
Ok	Oshikwanyama
Rk	Rukwangali
Rum	Rumanyo
T	Thimbukushu

Atlassers cited in text

AUS1	Austermühle, Horst & Renate
BAS1	Basson, Pieter
BEC1	Becker, Hildegard
BER1	Berry, Connie
BER2	Berriman, Nigel
BES1	Bester, FV
BET1	Bethune, Shirley
BRO1	Brown, Chris & Sue
BUR3	Burger, Piet
CRA1	Family Craven
CUR1	Curtis, Barbara
EIC1	Eichhoff, Anke
ELL1	Ellinger, EG
FOR1	Förtsch, Heinrich
FOU2	Fourie, Anna
FRI1	Friederich, Günther
FRI2	Friederich, Wilfried
GAR1	Gärtner, Udo & Anka
GRA1	Graz, Patrick
GRE3	Greef, Marthie
GUD1	Gudde, Ellen
HEL3	Helary, Stephane
HEN1	Henschel, Joh
HIL1	Hilbert, Renate
HIN1	Hines, Chris
HOB1	Hobohm, Horst
HOF1	Hoffmann, Luise
HOR2	Horn, Pieter
HUB1	Hubbard, Diane
KAH1	Kähler, Marcelle
KER1	Kehrberg, Sandra
KNO1	Knouwds, Hentie
KOL4	Kölling, Hartmut
MAN1	Mannheimer, Coleen
MIL1	Miller, Roy
NAM3	Nampila, Veikko
PIE1	Piepmeyer, Walter
PLE1	Du Plessis, LM
QUI2	Quinton, Bill
RED2	Redecker, Hermann
ROB2	Roberts, Kevin
ROX1	Roxin, Gesche
SCH16	Schünemann, Brigitte
SHA1	Sharpe, Katy
SIL1	Silver, Charmaine
SOL1	Von Solms, FA
STE6	Steenkamp, Carol
SWA3	Swanepoel, Wessel
TOL1	Tölken, Heidi & Eberhard
UIR1	Uiras, Marianne
WIS1	Wiss, Erwin

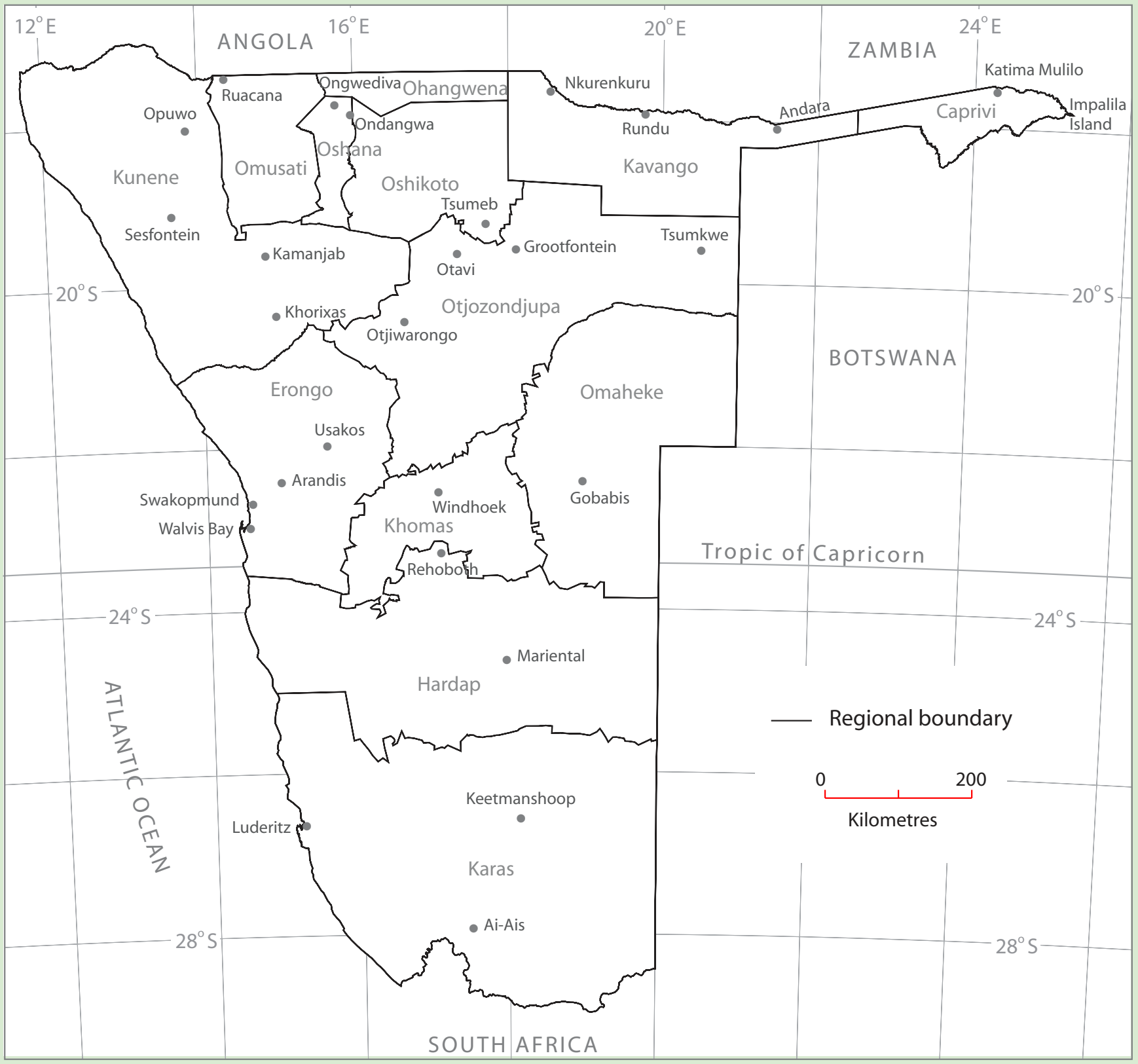


FIGURE 1: POLITICAL MAP OF NAMIBIA

Namibia is a large country of some 824,000 km² situated in the south-western corner of Africa. It stretches from 17° S to 29° S and 12° E to 21° E, with the Caprivi (one of 13 political regions) extending to 25° E along a narrow section, the Caprivi Strip. It is bordered by the Atlantic Ocean to the west, with the cold Benguela Current having a strong influence on the climate of most of the country. With the Tropic of Capricorn running roughly through the middle of the country, the climate is largely subtropical, with high summer temperatures and moderate winters. Many of these factors affect the distribution and ecology of plants.



INTRODUCTION

Assessing the TAP and its information

The information that the Tree Atlas Project accumulated on trees and shrubs so widely across the country was largely due to the enthusiastic and voluntary participation of amateurs. Reporting rates, however, differed from area to area, as well as from year to year. The information given in this book is a summary of the data and gives an indication of the broad trends and characteristics of our woody plants. To get a 'feel' for the data and assess any biases that might have arisen due to the nature of the project, we have outlined the background to the atlas – what data were collected, how and when, and how they were analysed – in the sections below.

WHICH SPECIES ARE INCLUDED?

The Tree Atlas Project was not only about trees, but included shrubs too. Appendix 1 gives a complete list of species covered by the TAP – some 400 plus species. In essence, every woody species, which usually grows to one metre in height or taller, was included. A few species listed in Craven (1999) were not included as their presence in Namibia and/or taxonomy is uncertain. Some species which are usually taller than one metre are not included because they are not sufficiently woody, such as *Gossypium* spp. (wild cotton). A few other species are not included since atlassers were not aware of them and did not record them. Some species usually shorter than one metre are included because the majority of the genus is taller, or because they have thick, swollen bases, such as many *Commiphora* spp. (corkwoods). Some of the more woody, thick-based climbers are also included. Information was collected only on those species growing wild, not those planted – including naturalised, alien species, although these tended to be overlooked by many atlassers. The desert areas of Namibia are home to over 500 species of dwarf shrubs, which are usually less than one metre high and are not well known; these species were not included in the TAP.

During the TAP thirteen species have been added to Namibia's list of woody species, or their previously uncertain presence has been confirmed (Appendix 1), with an additional four new species added during the production of the book. In addition to these the identities of at least three species have not yet been determined (E. van Jaarsveld pers. comm.), while three new species of *Commiphora* are presently being described (W. Swanepoel pers. comm.).

NAMIBIAN LARGE WOODY PLANTS IN A NUTSHELL

- **408** indigenous large woody species (10% of all plants in Namibia)
  - **114** always trees
  - **21** generally trees, but sometimes shrubs
  - **62** may be trees or shrubs
  - **147** always shrubs
  - **43** generally shrubs, but sometimes trees
  - **5** dwarf trees
  - **16** scrambling or climbing shrubs
  - **30** endemic to Namibia
- **16** alien species



GEOGRAPHICAL RESOLUTION

The data were collected by grid cell, using a grid based on a 15' x 15' or quarter-degree square. This is an area roughly 27 km x 27 km. There are 1254 squares in Namibia, of which only about 1140 have trees or shrubs.

DATA COLLECTION, STORAGE AND ANALYSIS

Atlassers recorded their observations for each quarter-degree square on a printed atlas sheet, with a new sheet per calendar month. Atlassers were urged to fill in as much or as little as they felt able to, following

THE QUARTER-DEGREE SQUARE

The reference system for describing biological specimens described by Edwards & Leistner (1971) was used. In this the lines of latitude and longitude on a map divide the country into large squares one degree south by one degree east (black blocks on figure 2). They are named according to the co-ordinates of their north-western corner – south first, then east (Windhoek, for example, is in degree-square 2217). These squares can be subdivided into sixteen quarter-degree (15') squares (grey blocks in figure 2), each with its own particular code. The code consists of four numbers followed by two letters, for example, 2217CA for Windhoek. The numbers are derived from the degrees south and east. Each degree-square is divided into four half-degree (30') squares and called A, B, C and D, deriving the first letter (C in the case of Windhoek). Each half-degree is sub-divided into a further four quarter-degree squares called A, B, C, D, deriving the second letter (A, in the case of Windhoek).

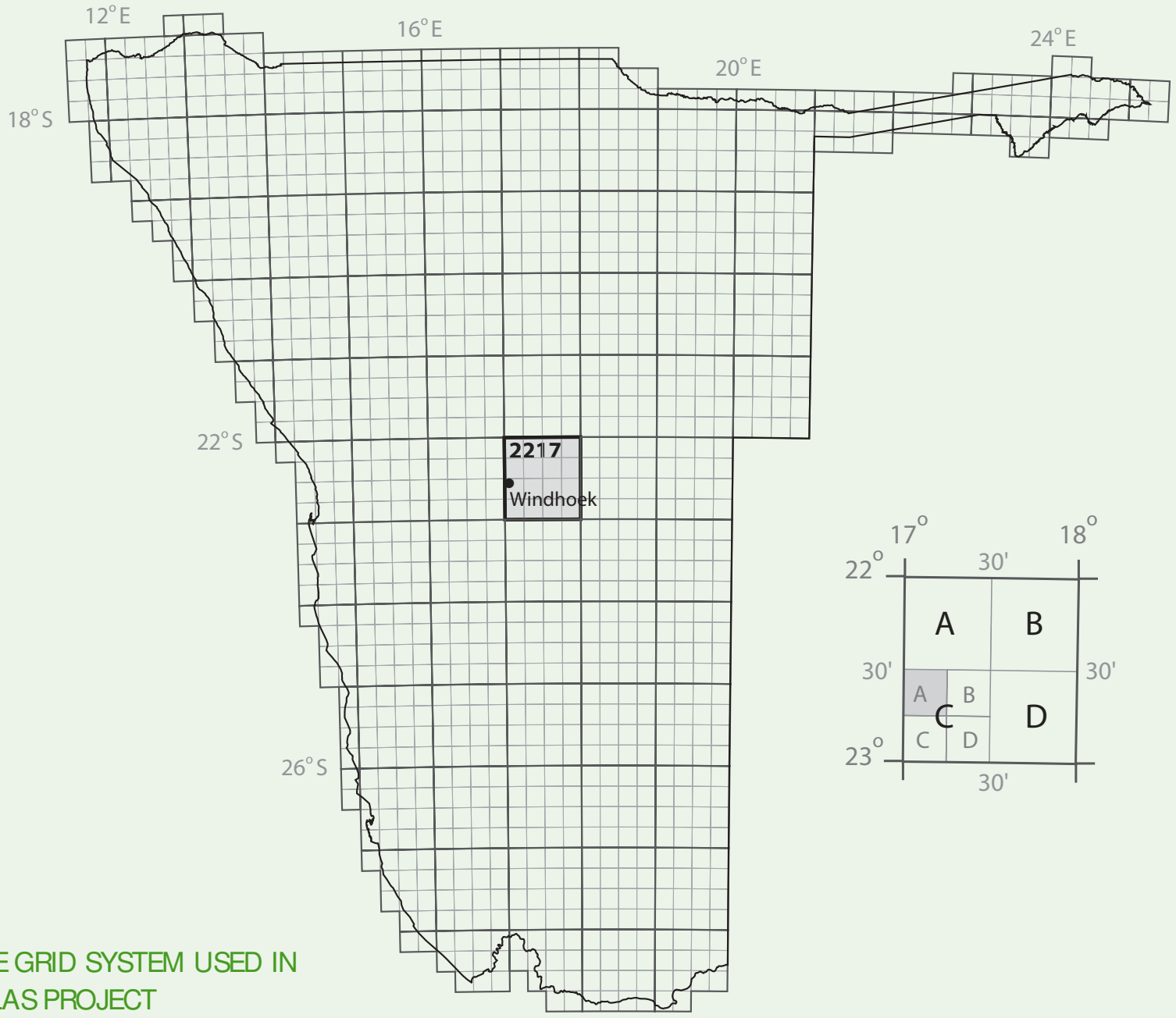


FIGURE 2: THE GRID SYSTEM USED IN THE TREE ATLAS PROJECT

the instruction manual, *Guidelines for Atlassers* (TAP 1997), which was available in English, Afrikaans and German. They were encouraged to collect specimens of any plants whose identity was uncertain and submit them to the NBRI where they were promptly identified by the National Herbarium staff. The National Collection has been increased, not only with specimens of new species for Namibia, but also with better specimens and specimens from new areas.

The amount of effort that went into each sheet varied considerably. Some were filled in from a moving vehicle, thus only easily identifiable species, and conspicuous flowers and fruit were recorded. Others were the result of an hour's to a day's walk around the area, with the atlasser checking each plant to be sure of the identification and to look for less obvious flowers and fruit. Some atlassers merely reported the presence of a species; others supplied information on abundance, growth form, height and habitat, and recorded the presence of fruit, flowers and leaves. This information has increased our knowledge of the abundance of many species, as well as our understanding of the annual cycles and other aspects of the biology of many species.

Data were entered regularly into the TAP database – a Microsoft Access database designed using the Specimen Database of the NBRI as a guideline. From this database preliminary distribution maps of species or number of taxa per quarter-degree square were produced, using ArcView. Species lists were produced for individual quarter-degree squares or areas, both at the request of atlassers working in certain areas and for the general public. Data for the atlas were analysed by running numerous queries which summarised and grouped the data. Various features were linked to others, such as height to habitat or abundance to different geographic areas, to see if there were associations. General comments were extracted for inclusion in the species write-ups that follow in this book.

NAMIBIAN TREE ATLAS

NAME/CODE CUR1 | REGION KUNENE | SHEET 1 OF 1

ADDRESS | NEAREST TOWN SESFONTEIN | FOR OFFICE USE

TEL FAX | VILLAGE/FARM ETENDEKA MOUNTAIN CAMP

DATE 25/10/97 (DD/MM/YY) | QUARTER-DEGREE SQUARE (SE) 1911 3D1

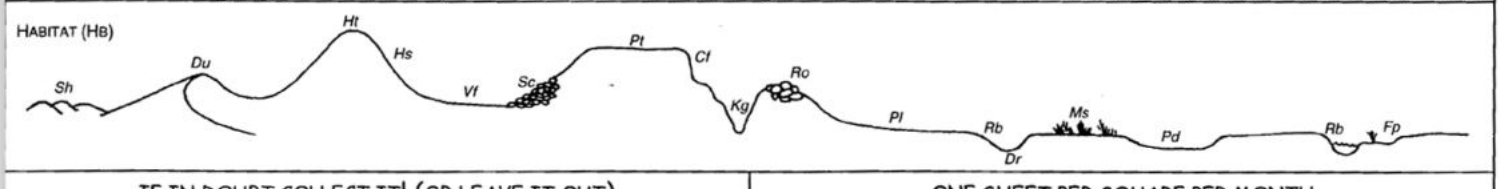
CO-ORDINATES 19°45'43" S 13°57'40" E

PRECISE LOCALITY DESCRIPTION OFF D3706 AREA BETWEEN CAMP & ROAD. CONCESSION AREA.

	SPECIES	Ab	Gf	Ht	Ac	Hb	COMMENTS	COLLECTION NUMBER
1	COLOPHOSPERMUM MOPANE	C	T	M,B	L,F	Dr	large trees follow water courses	
2	" "	A	S	L,M	L,F	Pl	heavily browsed by springbok → see notes	
3	TERMINALIA PRUNIOIDES	U	T	M,B	F	Dr	starting to flower	
4	" "	A	S	M	F	Pl	Several infected by a fungus	
5	PACHYPODIUM LEALI	C	T	L,M	L	Ht	Many broken by elephants	
6	EUPHORBIA DAMARANA	A	S	L,M	B	Pl	Several browsed by kudu	
7	EUPHORBIA VIROSA	C	S	M	B	Ht	Chewed by a rhino	
8	COMMIPHORA MULTIJUGA	C	T	M	B	Kg	A few broken by elephants	
9	COMMIPHORA SP.	U	S	L	L,F	Hs, Vf	Vf – browsed by springbok	CUR1/22
10	COMBRETUM IMBERBE	C	S	L	L	Rb	one with hornbills nest	
11	" "	C	T	M,B	L	Rb	Several have weaver nests	
12	?	C	S	M	L,F,S	V		CUR1/23
13								
14								

MOST ABUNDANT SPECIES COLOPHOSPERMUM MOPANE

HABITAT (HB)



CODES

ABUNDANCE (Ab)
R = rare
U = uncommon
C = common
A = abundant

GROWTH FORM (GF)
S = shrub
T = tree
C = climber/scrambler/strangler

HEIGHT (Ht)
L = <1 m
M = 1-3 m
B = 3-8 m
H = >8 m
V = various heights

ANNUAL CYCLE (Ac)
B = bare
L = leaves (old/new)
F = flowers
S = seeds/fruit

HABITAT (Hb)
Cf = cliff face
Dr = dry river/omuramba
Du = dune
Fp = floodplain
Ht = hilltop
Hs = hillslope
Kg = kloof/gorge/ravine/gulley
Ms = marsh/seepage
Pd = pan/depression/oshona
Pl = plain
Pt = plateau
Rb = riverbank
Ro = rocky outcrop
Sc = scree/tallus
Sh = sand hummock
Vf = valley floor
V = various habitats

IF IN DOUBT COLLECT IT! (OR LEAVE IT OUT) | ONE SHEET PER SQUARE PER MONTH

FIGURE 3: FRONT SIDE OF THE A4-SIZED TAP SHEET

This is an actual submission. Some of the terminology on the atlas data sheets could be modified for future similar projects.

TAP records were compared with data from plant specimens collected any time prior to 1997 housed in the National Herbarium of Namibia or the South African National Herbarium (Pretoria). This comparison helped determine which records were completely unlikely and should be discarded, which areas required more attention from the project and whether the TAP had extended the known range of species.

Data-capture errors that became apparent during the process of comparing TAP and herbarium records and at each step of the analysis process, as well as through spot-checks, have been rectified.

Atlas records

Atlassing efficiency

The database currently consists of 91,511 records on over 400 species of woody plants. The country was extremely well atlassed, both in terms of the number of squares visited (see Figure 4) and the percentage of expected species recorded per square (see Figure 5).

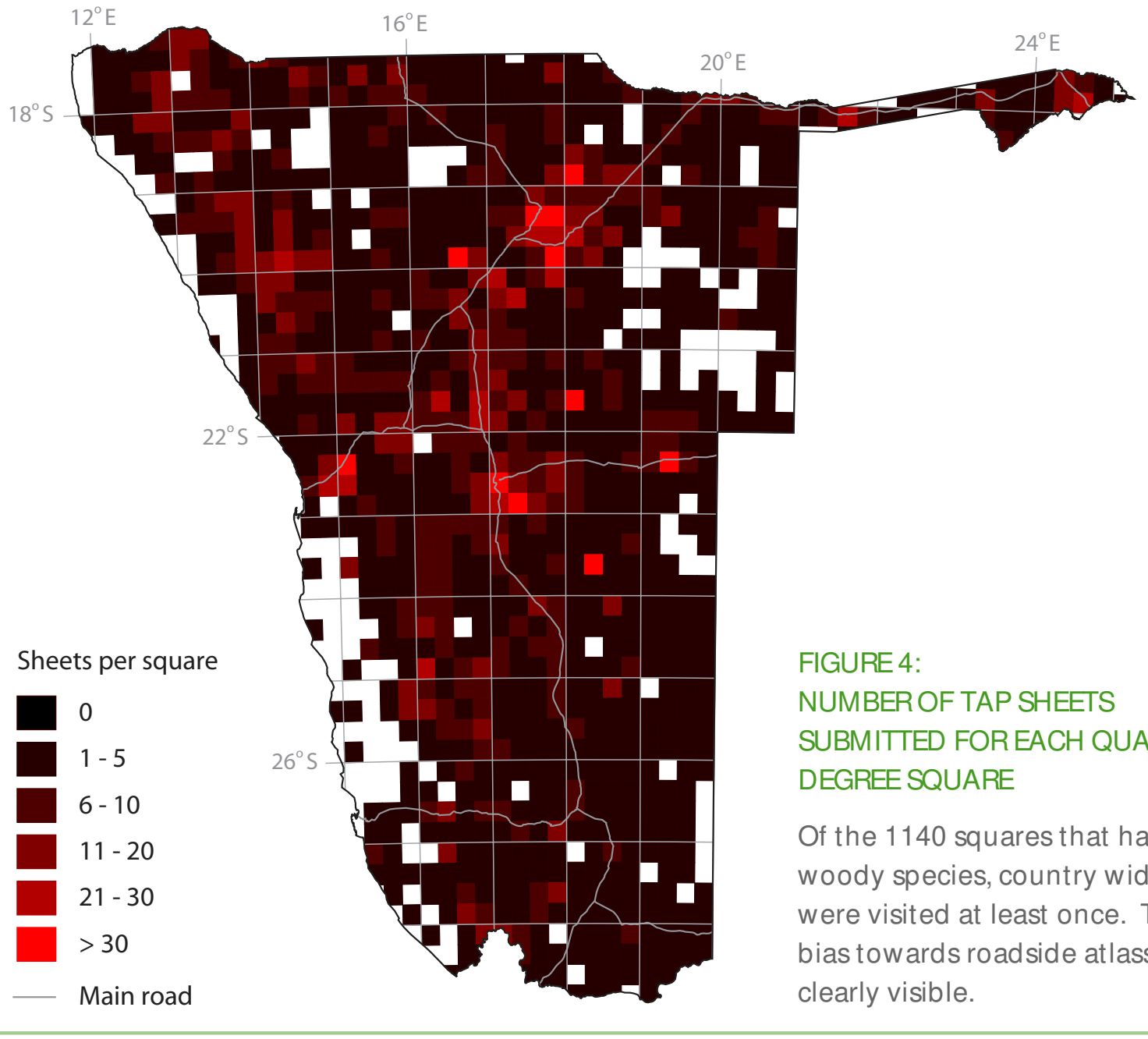


FIGURE 4:
NUMBER OF TAP SHEETS SUBMITTED FOR EACH QUARTER-DEGREE SQUARE

Of the 1140 squares that have woody species, country wide, 1064 were visited at least once. The bias towards roadside atlassing is clearly visible.

The majority of atlassing took place around Windhoek , where the project was housed and the majority of the 'few-sheet' atlassers live. The Otavi-Tsumeb-Grootfontein area also shows a high proportion of atlassing activity – especially in the early years (Figure 6) – where there were a number of very active atlassers. Apart from Windhoek (2217CA), the squares with more than 30 sheets were monitored by atlassers who sent in monthly observations for a number of seasons.

Approximately 6% of the grid squares expected to have trees or shrubs were not visited at all. These areas fell into a number of different categories:

- Coastal areas – either in the Skeleton Coast Park or the Sperrgebiet – which are not easily accessible to the general public, and have very little to no woody vegetation cover anyway
- Areas in the south that are accessible, but in which the diversity is so low, it was not deemed necessary to visit every square
- Areas in the north and north-east (Otjozondjupa Region) that are inaccessible due to the lack of roads, but where the vegetation is very uniform and the species present are likely to be the same as those in adjacent squares
- Areas in the north-west that are virtually inaccessible due to rough terrain and lack of roads

Atlassing efficiency (or coverage, as it was called in the newsletters) (see Figure 5) is calculated from the total number of taxa (species, subspecies and varieties) recorded per square expressed as a percentage of the expected number of taxa, estimated at the beginning of the project from herbarium records and previous studies. A total of 232 quarter-degree squares (almost 20% of the country) had more taxa than expected, with 614 (almost half of the country) having 75% of the expected number of species, or more, recorded. These well-atlassed squares are pretty evenly distributed among the squares that were not as well atlassed, giving a very good overall coverage or efficiency.

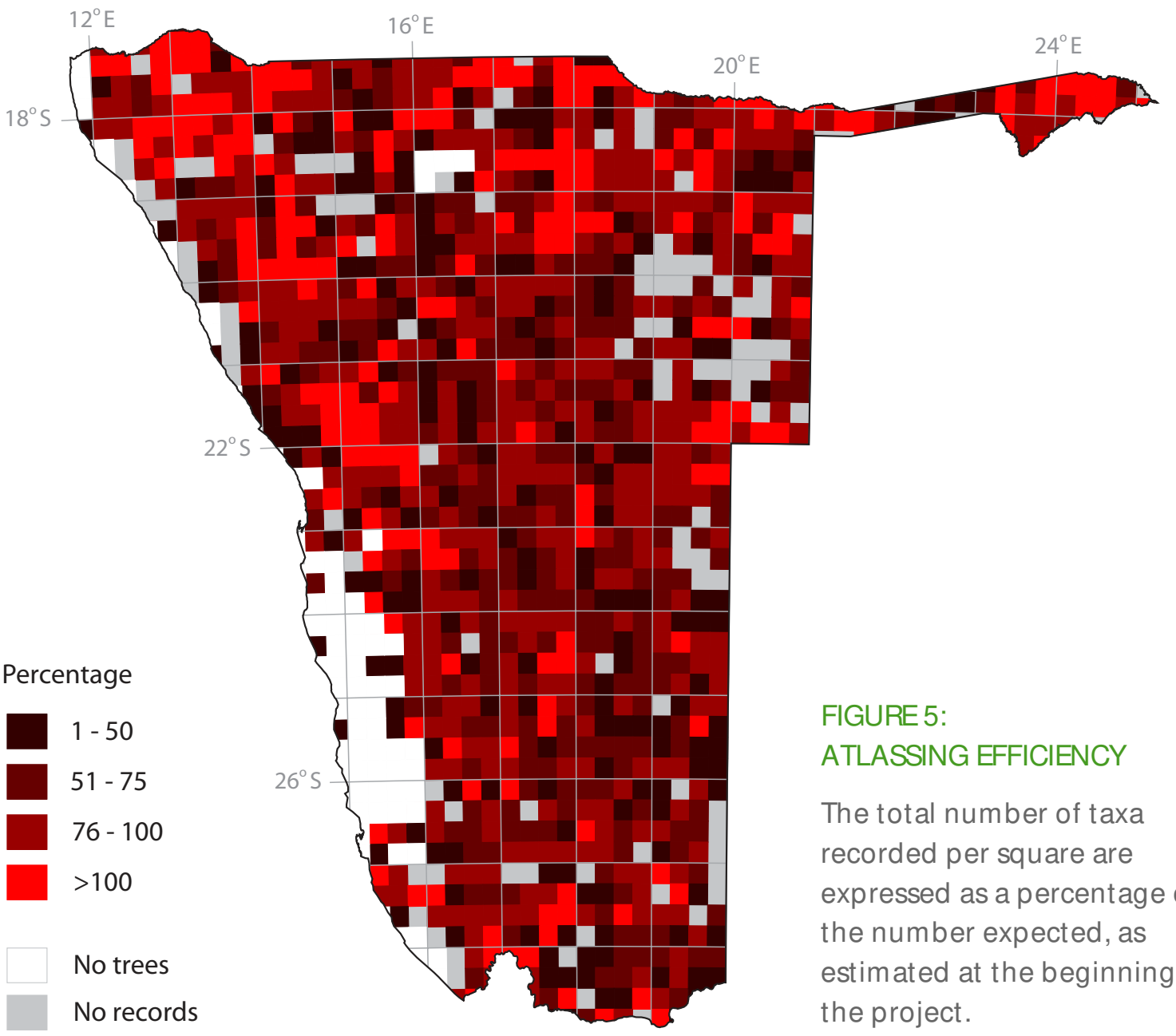


FIGURE 5:
ATLASSING EFFICIENCY

The total number of taxa recorded per square are expressed as a percentage of the number expected, as estimated at the beginning of the project.

Seasonality of atlassing

Figure 6 shows that the two seasons (July of one year to June of the next, i.e from winter, through summer to winter again) of greatest atlassing activity were 1998/99 and 1999/00. During March and April of 2000 good rains fell throughout the country, and since rain in the south is usually low and extremely variable,

FIGURE 6:
THE NUMBER OF ATLAS SHEETS SUBMITTED DURING EACH OF THE SIX SEASONS OF THE TREE ATLAS PROJECT

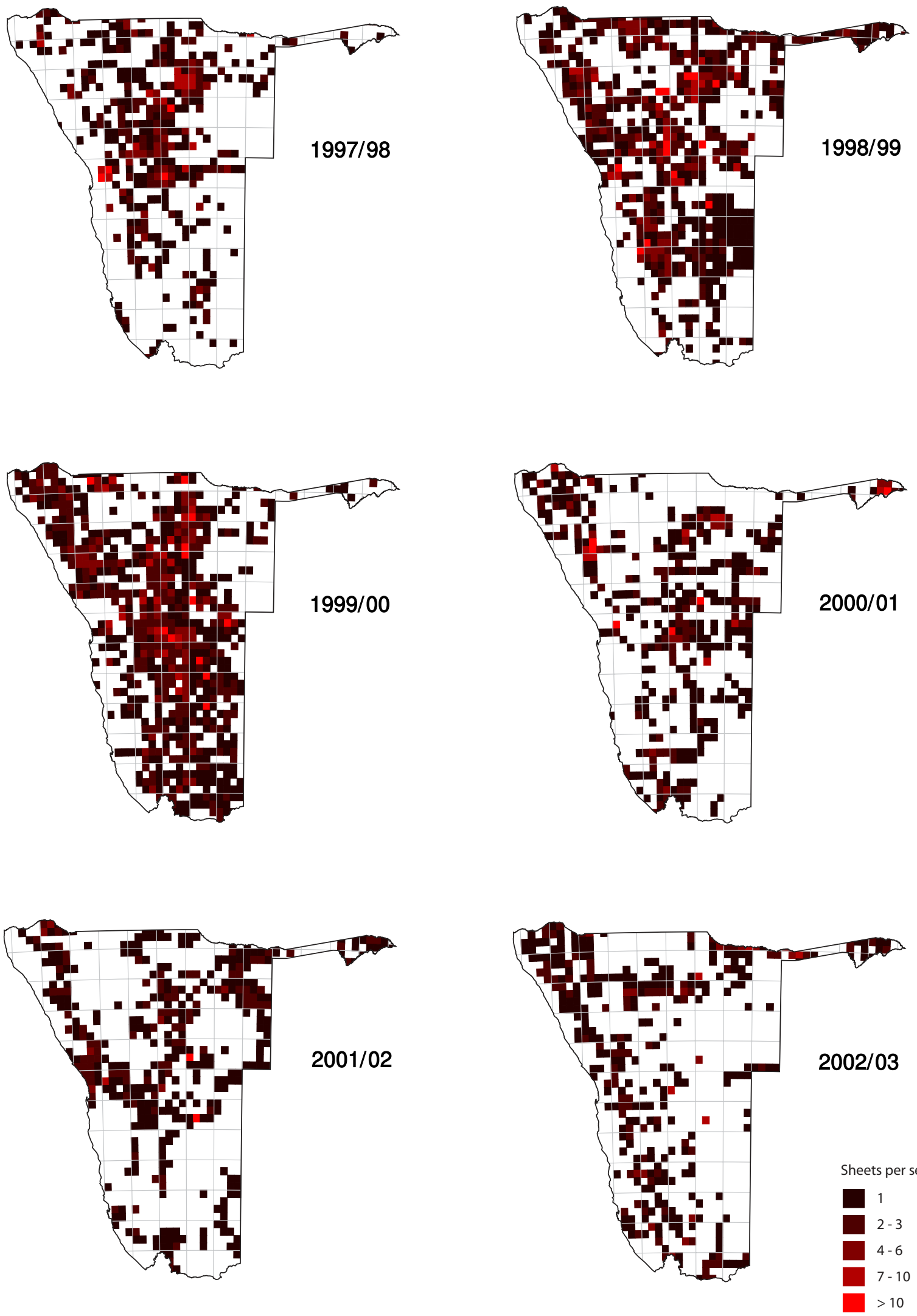
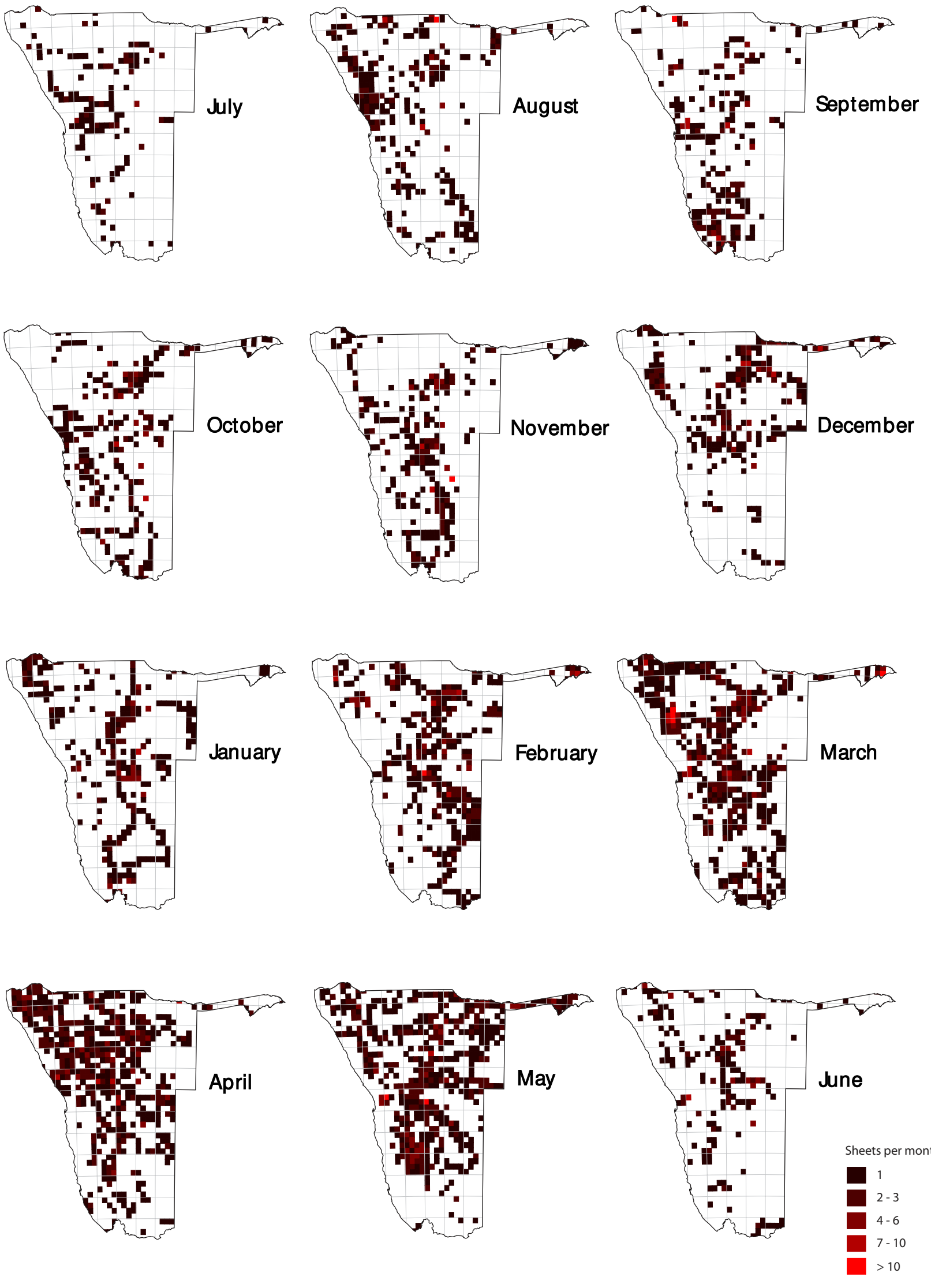


FIGURE 7:
THE CUMULATIVE NUMBER OF ATLAS SHEETS SUBMITTED FOR DIFFERENT MONTHS OF THE YEAR



this area was targeted after these rains. During the last three years, specific areas were targeted to fill in gaps, such as the 'bend of Botswana' in square 2120, which had remained unvisited until almost the end of the project.

Most atlassing took place during the months of March, April and May – the months when much of the country receives most of its rain, and immediately afterwards (Mendelsohn et al. 2002). Conversely, atlassers were least active during the winter months of June and July, and the data from this time are scanty. Most atlassing in the winter rainfall area (Sperrgebiet, south-west) was carried out in September.

Species distribution

The distribution of each species was simply determined from the records collected for each quarter-degree square. Where species were recorded in areas that appear way out of range, the record was omitted unless it was made by a very reliable atlasser or was supported by a specimen, in which case the atlasser code and specimen number are given in the species account. By comparing TAP records to data from herbarium specimens collected prior to 1997, the ranges of at least 60 species have been extended.

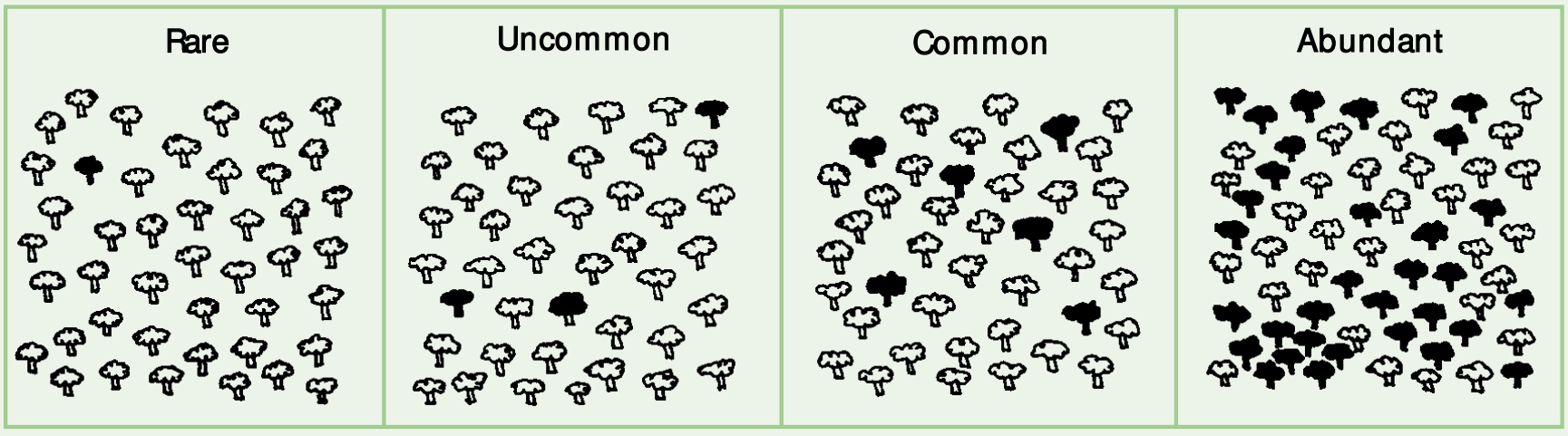
Some species were not observed in areas where they have been collected in the past, representing a reduction in their distribution range. The majority of these species were probably overlooked by atlassers, either because they are small, or easily confused with similar, better known species, or simply because they are unknown to atlassers because they are found in restricted and inaccessible places. Young plants also tended to be overlooked.

A good example of one species being confused with a better-known species is *Albizia antunesiana* (muto). *Albizia antunesiana* was not recorded by the TAP until the last year of the project, despite the fact that it is fairly widespread in Kavango Region, according to old herbarium records. It was only in September 2003, when an atlasser made a concerted effort to look out for it, that he noticed it in flower and realised that he had passed it often, thinking that it was *Burkea africana* (omutundungu). He then found other specimens where they had been collected previously, but all looked more like other species at a casual glance.

A species with a very restricted distribution that was not recorded during the TAP is *Trema orientalis* (pigeonwood). When the Botanical Society of Namibia made a special trip to the Erongo Mountains where the species had been collected previously, they found it, alive and healthy, but very elusive among large granite boulders.

However, a recorded reduction in distribution in some cases might not necessarily be due to observer error or bias. It might accurately reflect a true reduction in the distribution of a species and would justify further investigation. One such species is *Protea gaguedi* (African white protea), which has definitely undergone a range reduction due to habitat destruction and over-exploitation, and may be extinct in Namibia.

FIGURE 8: THE CONCEPT USED FOR ASSESSING ABUNDANCE OF A SPECIES WITHIN AN AREA



Abundance

Atlassers estimated abundance visually and assigned it to one of four categories (see Figure 8):

- Rare — if the atlasser had seen only one specimen in the quarter-degree square, in spite of spending some time looking
- Uncommon — more than one specimen seen, but not very many
- Common — quite a few specimens scattered between other species
- Abundant — many specimens

Some species were found to be common in some habitats, such as watercourses, but uncommon or absent in others. Such species were recorded as 'locally common'.

In the analysis, where a number of records of abundance exist for a species in one quarter-degree square, an average rating of abundance was calculated. This was done by assigning a numerical value to each of the categories above. The four categories above were summarised in three classes on the maps.

These data only give a rough indication of the abundance of a species because no-one covered entire squares comprehensively and because categorising abundance and the interpretation of the categories was somewhat subjective. There was also a danger of confusing abundance with conspicuousness. Some inconspicuous species might have been abundant, while other less abundant species appeared to be more abundant because they were more conspicuous.

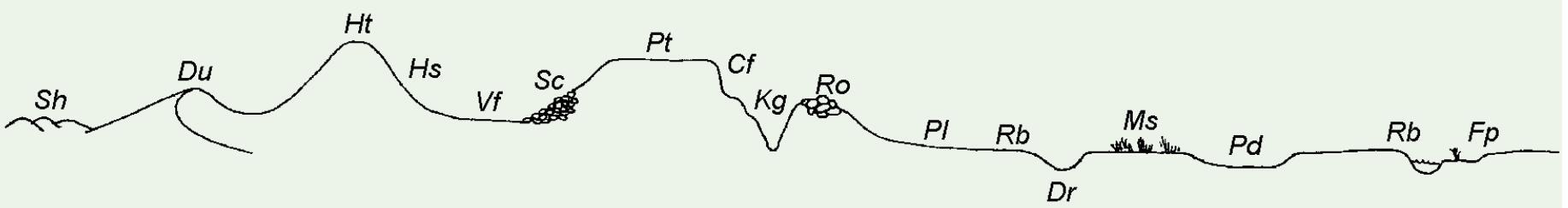
Habitat

Atlassers used codes to record the habitat in which the plant was growing (see Figure 9). This restricted the choice of habitats, but facilitated analysis by a computer query. Provision was made on the atlas sheets for describing other habitats not given in the list of codes and if the species was found in more than one habitat.

Similar habitats have been grouped together during the analysis in preparing the species accounts in this book. For example, river banks, river beds and floodplains were grouped as 'rivers', and dunes and sand hummocks as 'dunes'. Where a species occurred equally often in many habitats within the area under observation, the category 'various' could be chosen, but this proved to be of little value in the final analysis.

Some atlassers included information on substrates, which has been included in the species accounts.

FIGURE 9: THE HABITAT TYPES DEFINED TO GUIDE ATLASSERS



Cf	cliff face	Hs	hill slope	Rb	river/stream bank
Dr	dry/seasonal river/stream/omuramba	Kg	kloof/gorge/ravine/gulley	Ro	rocky outcrop
		Ms	marsh/swamp/wetland	Sc	scree/tallus
Du	dune	Pd	pan/depression/oshana	Sh	sand hummock
Fp	floodplain	Pl	plain	Vf	valley floor
Ht	hilltop	Pt	plateau		

Growth form and height

Species take on different growth forms and grow to different heights, depending on various conditions. The growth form was recorded as T = tree, S = shrub or S/T = those species with both shrub and tree forms in the area assessed. Height was divided into five classes and recorded using a code:

- L (low) shorter than 1 m
- M (medium) 1–3 m
- B (big) 3–8 m
- H (high) over 8 m
- V (various) when plants fell into most of the categories above

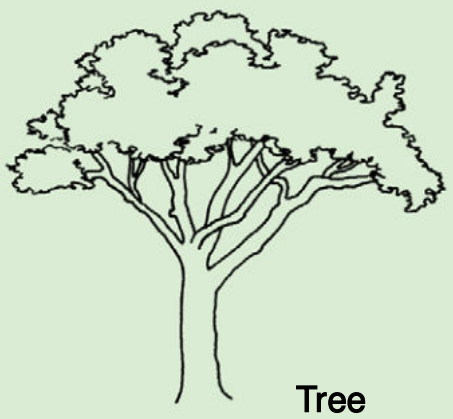
More than one category was recorded for stands of plants with mixed heights, for example, MB was used for trees that were both within the 1–3-m class (M) and the 3–8-m class (B).

In the analysis, heights were grouped according to the maximum height of the stand of plants under observation, for example, B, LMB and MB were all grouped under '3–8-m height class'. 'Various' was used for stands with a spread of individuals in all height classes; the number of records of 'various' was calculated from records of 'various' in the height column, as well as words like 'various' used in the comments column. A high 'various' value suggests a population with many young trees, as well as older ones.

DIFFERENTIATING THE TREES FROM THE SHRUBS

The growth form of woody plants varies. Some species always grow as trees while others are always shrubs. However, in Namibia, many species can have either growth form depending on factors such as moisture availability, substrate, animal damage, fire, overuse, etc. Not only do they take on different growth forms in different conditions, but trees and shrubs also have different uses. Thick stems can be used for building, making furniture or dugout canoes, while the wood of shrubs cannot be used for this but can be used for fence poles, for example; and trees are not as useful as shrubs for browse.

For the purposes of the TAP, a tree was regarded as a woody plant with one or several thick stems, usually branching well above the ground. Shrubs were considered to have many thin stems arising from and branching near the ground.



Tree



Shrub

Annual cycle

Atlassers recorded whether the plants had flowers (F), fruit or seeds (S) or leaves (L). In the analysis, an annual cycle diagram was constructed for each species giving a rating for the presence of each of these plant parts on a monthly basis. These ratings are based partly on the numbers of observations of each phenomenon (i.e. whether it had flowers, etc.), as well as the percentage these numbers were to the total number of recorded annual cycle observations. For example, for species X, there may have been 8 records of flowers in January and 15 in February, but the total number of annual cycle observations may have been 16 in January and 30 in February; thus, both months received equal rating.

Inconspicuous flowers and fruit (which would be mentioned under the description of the plant) may have been under-recorded by atlassers. Leaf production may be misrepresented as atlassers tended not to record plants without leaves because they were difficult to identify. Generally, far fewer observations were made in winter than in summer.

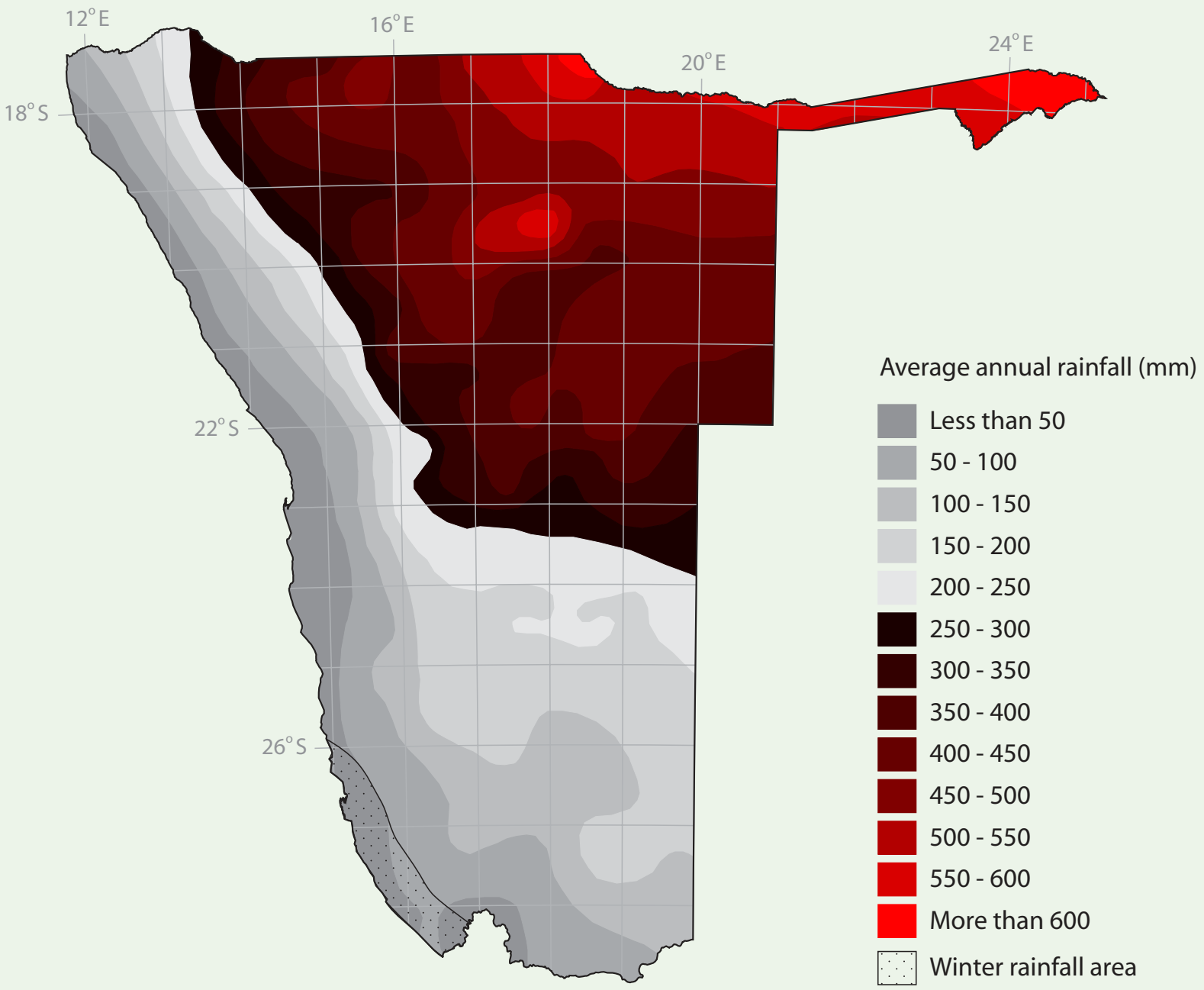


FIGURE 10: RAINFALL

Namibia is largely an arid country. Rainfall is lowest along the coast and just north of the southern boundary, gradually increasing in a north-easterly direction from an average of less than 50 mm per annum to around 600 mm. The number of woody species roughly follows this south-west-north-east trend (see Figure 12, page xx). The distribution of some species, such as *Pterocarpus angolensis* (kiaat), is limited by rainfall. Not only is the low rainfall limiting for plants, but also the extremely high rate of evaporation, the potential of which generally far exceeds rainfall, even in the wettest areas. Another important compounding factor in Namibia is the variability of the rainfall – when it falls and how much falls at a time. This varies tremendously from area to area and season to season, as well as within a season, a feature that is reflected in the variable annual cycle of most plants.

It rains in summer throughout most of Namibia, except in the extreme south-west where rain more commonly falls in the winter months. This could account for the unique species found in this area, such as *Aloe ramosissima* (boskokerboom), *Aloe pearsonii* (Pearson's aloe) and *Pachypodium namaquanum* (halfmens). The occurrence of fog is also thought to be an important factor in the south-west. Fog is a water source for many of the Namib Desert plants generally, including *Welwitschia mirabilis*. It occurs on more than 100 days a year along much of the coast and up to 50 days some 100 km inland.

Source: Adapted from Mendelsohn et al 2002

Characteristics of trees and shrubs in Namibia

Namibia is a predominantly arid to semi-arid country, with rainfall increasing from the south-west to the north-east (see Figure 10). This rainfall pattern largely determines the characteristics of the vegetation, which ranges from dry woodland in the north-east to desert in the west. In the context of the rest of Africa, Namibia falls within four of the eleven major biomes (see Figure 11) – all of which are arid to semi-arid, with none of the woodland and forest biomes found in Namibia.

The **Desert Biome** along the extremely arid west coast of southern Africa basically represents the Namib Desert, although it does not extend as far south as the actual Namib does, where it gives way to Succulent Karoo. Rainfall is extremely low and is greatly exceeded by evaporation. The sparse vegetation is

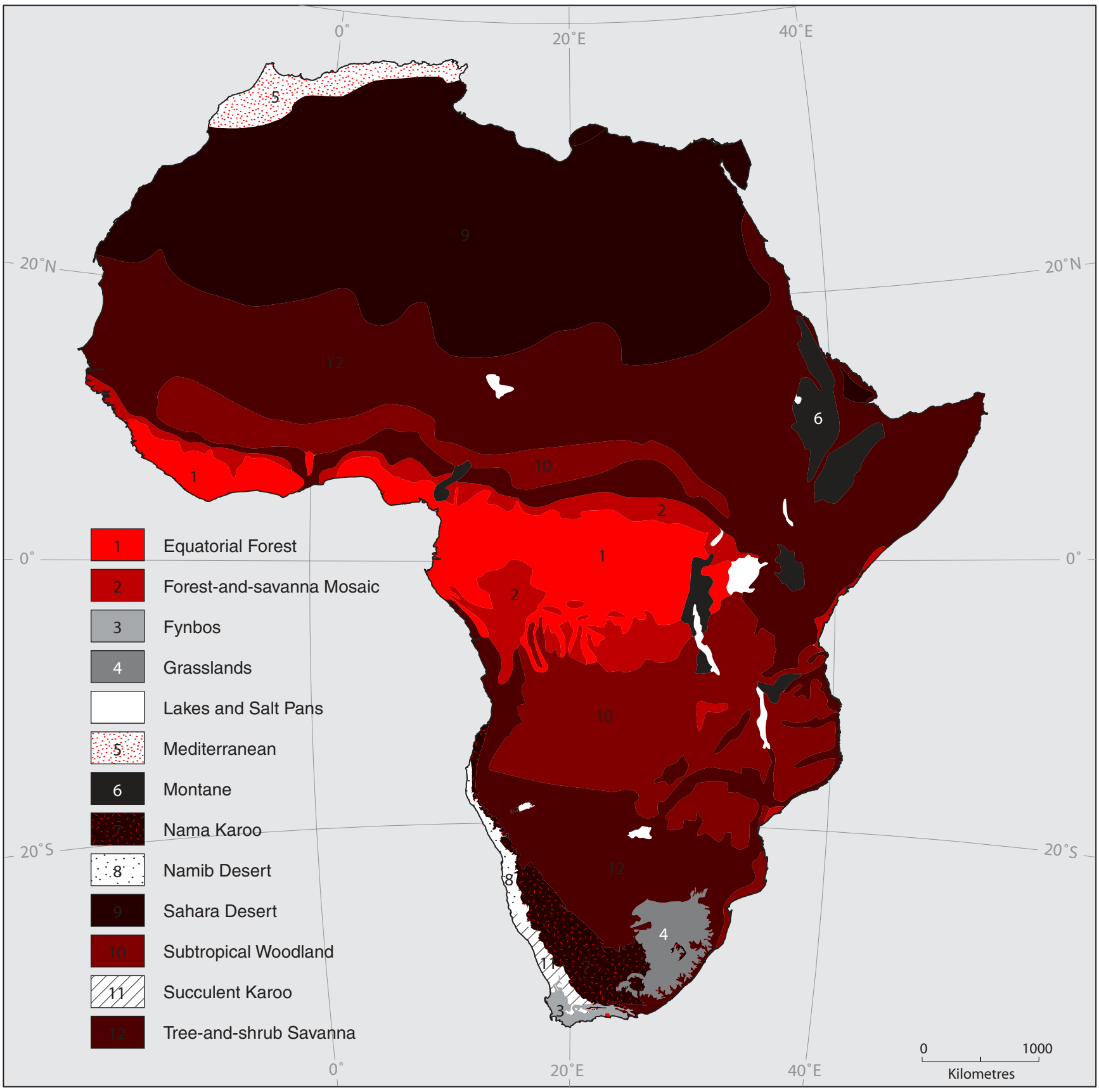


FIGURE 11: THE BIOMES OF AFRICA

Africa can be divided into eleven broad biomes, of which four occur in Namibia.

Source: Adapted from White (1983)

dominated by ephemeral grasses with a large area of shifting dunes that has almost no vegetation at all. Any large woody plants are largely confined to the ephemeral river courses. Dwarf shrubs and dwarf trees with swollen stems (pachycauls) occur on rocky outcrops or hills, or in dry washes.

The northern tip of the **Succulent Karoo Biome** extends into south-western Namibia, where rainfall is equally as low as the in the Desert Biome, but falls in winter. Fog plays an important role in the moisture regime of many plants. The vegetation is dominated by dwarf shrubs and succulents, many of which are endemic, either to Namibia or to the biome as a whole. The few large woody species that occur, are confined to rocky outcrops or watercourses.

Just to the east of these extremely dry areas, the **Nama Karoo Biome** extends from Angola in a narrow strip along the north-western escarpment and across the whole of the south. This biome is characterised by scattered low, dwarf shrubs, interspersed with grasslands. Here too, large woody plants are generally restricted to the ephemeral rivers or to rocky kloofs, with pachycauls on the hillslopes and rocky outcrops.

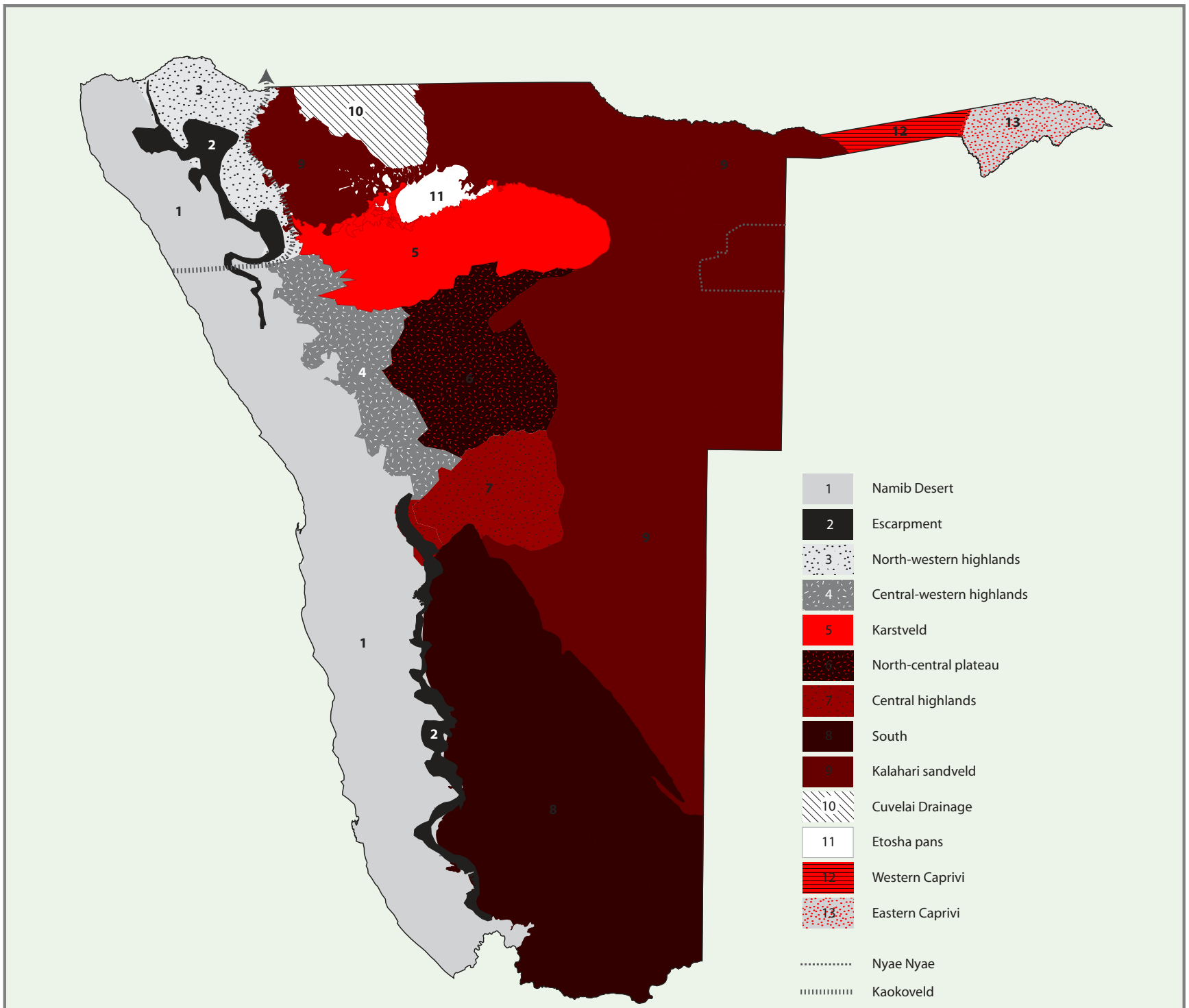


FIGURE 12: VEGETATION LANDSCAPES

The major landscapes which influence the distribution of woody species in Namibia, and to which reference is made in the text, with two specific areas (Nyae Nyae and Kaokoveld).

Source: adapted from Mendelsohn et al 2002

Yet further east, where annual rainfall increases to more than 150 mm, is the **Tree-and-shrub Savanna Biome**, which is predominantly shrubland interspersed with trees in the southern and central parts, and dry woodlands further north. The biome can be roughly divided into Acacia Savanna in the more arid southerly areas and Broad-leaved Savanna to the north and north-east. The few forest areas in Namibia are found in these higher rainfall areas of the north, mainly along the perennial rivers.

These broad biomes can be further subdivided into vegetation zones or vegetation types, based on the dominant species found in each. Currently there are two vegetation maps of Namibia (Giess 1998 and Mendelsohn et al. 2002), each with its own merits. These will not be discussed in this publication. Namibia has a number of different landscapes, however, each with its own combination of characteristic features and species of trees and shrubs. Many of the species accounts in this book refer to these landscapes, which are illustrated in Figure 12. Mendelsohn & El Obeid (in press) give a very good overview of woodlands and woody plant resources in Namibia.

DIVERSITY

Just over 400 large woody species occur in Namibia, which roughly constitutes 10% of the country's plant diversity. Generally, there is an increase in diversity of trees and shrubs from the arid coastal areas and the south-west towards the higher rainfall area in the north-east. Within this broad trend are pockets of higher diversity along the escarpment and on the mountains. The intensity of atlassing had a role to play in this apparent trend of species diversity – generally, the more time spent in an area, the higher the number of recorded species. Mountainous areas tend to have higher species diversity due to their characteristic availability of varied habitats, interception of rainwater and resultant creation of microclimates. Mountainous areas also tended to be more interesting for atlassers which means they may have put in more effort. Despite this bias, there are clearly four areas of highest diversity within Nambia, namely the Popa Falls/Andara area of the Okavango River, the eastern part of East Caprivi, the Otavi Mountains and surroundings, and the north-western escarpment and highlands of the Kaokoveld (see Figure 13). Other areas of relatively high diversity are found throughout the north, as well as in the central highlands and in other mountainous places. Areas are regarded as having high diversity if they have 100 or more woody taxa; moderately high diverstiy with around 75–100 taxa; and moderate diversity with 50–75 taxa per square.

The north-east

The highest diversity (over 130 taxa per square) was found along the eastern section of the Okavango River in the Andara/Popa Falls area. This is probably due to a combination of factors, such as a relatively high rainfall, nutrients introduced by the river, and the diversity of habitats that the area encompasses including riverine forest, floodplains, dunes, rocky outcrops and islands. There are also a number of protected areas here. Some of the more tropical species, such as *Ficus pygmaea* (pygmy fig), appear to have made their way downstream from further north. The high diversity recorded could also be due to intense atlassing activity here (see Figure 4, page 4). Species diversity along the river west of the Andara/Popa Falls area is only moderately high due to the lack of rocky habitats, as well as the apparent effect of deforestation over the years.

Eastern Caprivi has high rainfall and diverse habitats, including riverine forests and floodplains, as well as dry, deciduous woodlands on deep sand, mopane woodlands in old drainage lines and areas of old dunes and interdune valleys. Here too, there are many tropical species on the southern or western edge of their distributions, such as *Commiphora mossambicensis* (pepper-leaf corkwood), *Boscia angustifolia* (rough-leaved shepherds- tree) and *Euphorbia ingens* (giant euphorbia). The three areas with the highest diversity recorded – Salambala Conservancy, the area around Katima Mulilo and Impalila Island – were all intensively atlassed. The Katima Mulilo area supports an extra habitat, having rocky habitats along the Zambezi River. Impalila Island is unique in Namibia since it is the easternmost extremity of the country and is home to a number of species usually found further east, which are at the western edge of their

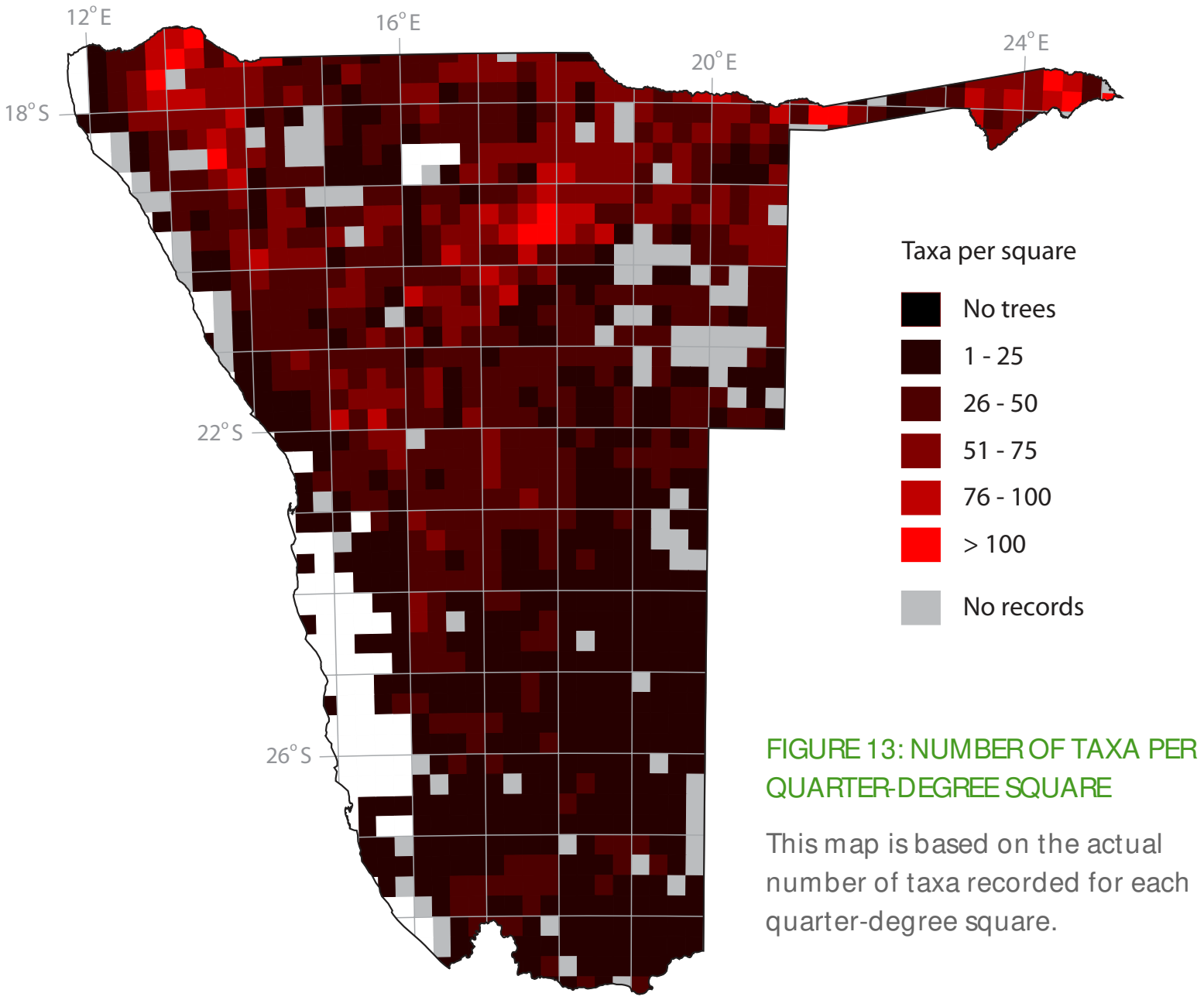


FIGURE 13: NUMBER OF TAXA PER QUARTER-DEGREE SQUARE

This map is based on the actual number of taxa recorded for each quarter-degree square.

distribution, such as *Mimusops zeyheri* (red milkwood), *Acacia schweinfurthii* (river scrambling-acacia) and *Commiphora karibensis* (angular-stem corkwood). It also has diverse habitats, including rocky river banks, sandy river banks, floodplains, dry deciduous woodlands on sand, and rocky outcrops. Some species occur here and then again, disjunctly, much further west in Namibia, for example, *Azanza garckeana* (monego), *Gyrocarpus americanus* (propeller tree), *Commiphora mollis* (velvet corkwood) and *Sterculia africana* (sterculia).

The Kwando River has a moderately high diversity, with a number of species that are present further east being absent from this area.

The Nyae Nyae pan area, further south, has moderate diversity, which is higher than the surrounding areas – possibly due to the seasonal accumulation of water in the pans.

The highlands

Although annual average rainfall in the highlands of the Kaokoveld is not as high as in the north-east, there are a number of mountains which intercept what rainfall there may be. Diversity is highest just south of the Kunene River where there is a number of different habitats, ranging from rocky and sandy river banks to floodplains, as well as rocky outcrops and many hills with kloofs and gulleys, and sandy plains, gravel plains and pans. The geology is also very varied. It is reported that local rainfall is often higher than the annual average for the area as a whole (Freyer, pers. comm.). See page 631.

Another area of high diversity is the mountains south of Opuwo, which form part of the north-western escarpment. This area has a diversity of habitats, as well as a productive aquifer to provide groundwater.

The Otavi Mountains area of the Karstveld has a high diversity due to factors such as high rainfall, the presence of an aquifer that stores groundwater and diverse habitats. There are relics from larger populations further south, such as *Olea europaea* (wild olive), as well as disjunct populations of species found further east in southern Africa, such as *Carissa bispinosa* (y-thorn carissa) and *Cassia abbreviata* (mululwe).

Areas of moderately high diversity include the Grootberg area along the north-western escarpment (1914CC) and the farm Huab and neighbouring farms (1914DD). These are mountainous areas with fairly high habitat diversity. Elements of the strictly desert-adapted species found west of the escarpment occur, as well as those more mesic species from east of the escarpment.

A number of isolated rocky mountains (inselbergs), such as Spitzkoppe (2115CC), the Erongos (2115DC) and the Waterberg (2017AD) fall into the moderately high diversity category. The Brandberg – Namibia's highest mountain – spans two squares (2114AB,BA). The number of species recorded for each square was less than 75 (thus it does not show up on the map), but the combined list for the area falls within the moderately high diversity category. All these inselbergs show higher diversity than the surrounding country.

Areas with moderate diversity include the central highlands around Windhoek, the Gamsberg – Namibia's third highest mountain – and the hills along the edge of the central escarpment. The lower woody diversity is probably partly due to the lower rainfall and partly to the cold winter temperatures and occurrence of frost. Diverse habitats and geology, with an aquifer providing permanent groundwater result in a higher species diversity in the Windhoek area than in adjacent areas. The intensity of atlassing around Windhoek has ensured that every woody species has been recorded. Some species, such as *Erythrina decora* (Namib coral-tree), *Steganotaenia araliacea* (carrot-tree) and *Obetia carruthersiana* (Baumnessel) have very restricted distributions and their presence may have been overlooked in squares that were not as well atlassed.

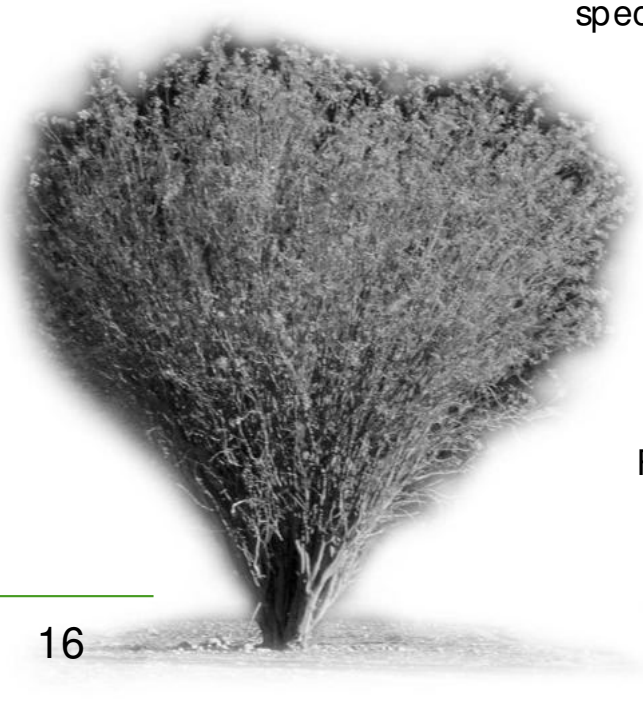
Another area of moderate diversity, higher than the surrounding area, is the Naukluft Mountains.

The south

The southern half of the country shows a low diversity of large woody species. The Succulent Karoo Biome, an important centre of diversity for succulent plants, cannot support large woody species, owing largely to the characteristic low rainfall and poor soils. Hilly areas show higher diversity than the surrounding areas, as do some of the larger rivers.

ENDEMISM

A plant is regarded as being endemic to an area if its total population occurs within that area. In general, endemism is not high among woody plants in Namibia, especially among the trees. As far as we know, only thirty species are endemic to Namibia (see Appendix 2) and further work in southern Angola may reveal that a number of our northern endemics occur there as well. At least twice this number of species of trees and shrubs is endemic to the Namib Desert or to the south-west arid belt, thus extending into southern Angola or the northern Cape. *Commiphora* is the only genus with many endemic species large enough to be classified as a tree or shrub and included in the atlas. *Salsola* has a number of endemics, but the genus consists mainly of dwarf shrubs and has thus not been included in the atlas. *Euphorbia* is another genus with many endemic species in general, but only two large enough to classify for the TAP, *E. damarana* (Damara euphorbia) and *E. venenata* (Karst candelabra-euphorbia). Other species, such as *Euphorbia eduardoi* and *E. gummifera*, extend into southern Angola and the northen Cape respectively.



Spatially, the endemics can be roughly divided into four groups (see Figure 14). The largest group, of ten species, occurs in the north- and central-

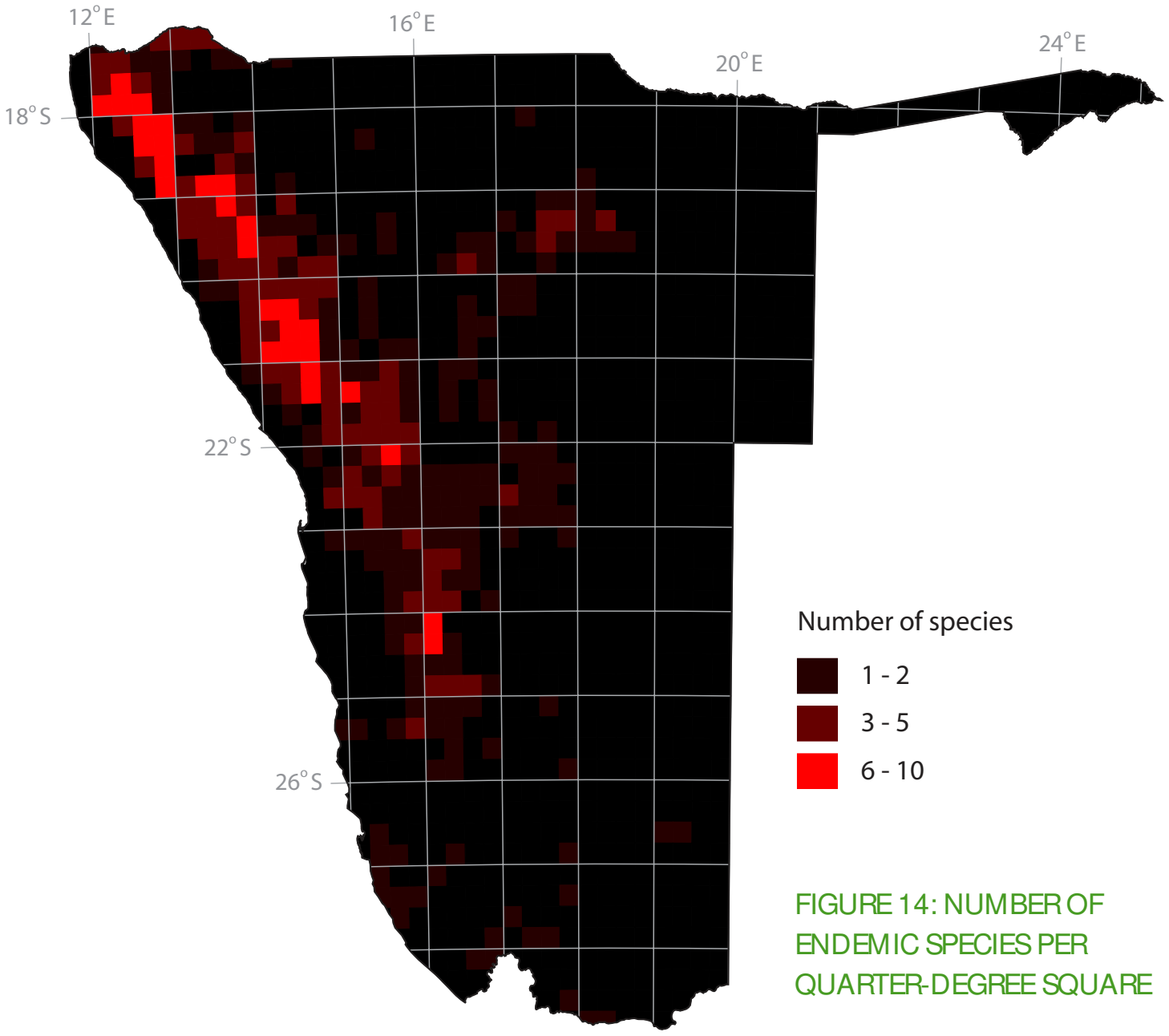


FIGURE 14: NUMBER OF ENDEMIC SPECIES PER QUARTER-DEGREE SQUARE

west, with species such as *Adenia pechuelii* (elephants-foot) and *Commiphora saxicola* (rock corkwood) extending from the Kunene River almost to the south-western escarpment. The others have more restricted distributions, with *Commiphora kraeuseliana* (feather-leaved corkwood) found mainly on the Brandberg and around the area north of the Ugab River, and *Sesamothamnus* sp. nov. found mostly just south of the Kunene River. The north-western escarpment and the central-western highlands have the highest numbers of endemic species per square.

The Brandberg is an area of high endemism in general, with eight woody endemics. The best-known and most striking in this area is the Brandberg acacia, *Acacia montis-usti*. *Euphorbia monteiri* subsp. *brandbergensis* is an endemic subspecies of a more widespread species that was not included in the TAP due to its small size, although subsp. *brandbergensis* is over 1 m high.

The second group, of five endemic species, occurs along the central- and south-western escarpment. *Commiphora dinteri* (Namib corkwood) and *Cyphostemma bainesii* (Baines kobus) are fairly widespread, while *Rhus volkii* (Naukluft rhus) and *Euclea asperrima* (mountain guarri) are restricted to the Naukluft area. *Caesalpinia pearsonii* (omuryandu) has a restricted distribution with a disjunct population, one section being in the Naukluft area and the other further north. The Naukluft Mountains have eight woody endemics, with species from the first and last groups as well as the five from group two.

The third group, of eight endemic species, occurs in the south, with species which have a far more restricted distribution than those in the north. *Ectadium latifolium* (broad-leaved ectadium) is a coastal species, falling within the Succulent Karoo Biome. Two smaller shrubs, *Lycium grandicalyx* and *Rhus problematodes* (Sperrgebiet karee) are found in the area bordering between the Succulent Karoo and Nama Karoo Biomes, while the others are found in the Nama Karoo. *Elephantorrhiza rangei* is only known

from Nauté Dam. There are a number of species such as *Commiphora capensis* (Namaqua corkwood) and *C. gracilifrondosa* (karee corkwood) that are endemic to the Richtersveld and the extreme south of Namibia. No square in this area has more than two woody endemic species.

The last group of endemics consists of species occurring in central Namibia, including the central highlands and the Karstveld. *Elephantorrhiza schinziana* (Otavi elephant-root), *Euphorbia venenata* (Karst candelabra-euphorbia) and *Heteromorpha papillosa* (Namibian wild-parsley tree) have restricted distributions; *Manuleopsis dinteri* and *Erythrina decora* (Namib coral-tree) have fairly widespread distributions; and *Cyphostemma juttae* (blue kobus) has a widely dispersed population. The Windhoek square (2217CA) has three endemics – *Heteromorpha papillosa*, which is rare on the Auas Mountains south of Windhoek; the widespread and common *Manuleopsis dinteri*, and seldom-seen *Erythrina decora*. The Otavi Mountains and eastern Karstveld have four endemics.

There are no endemic species in either the Okavango Basin or eastern Caprivi, and the Kalahari sandveld in general lacks endemics.

DISTRIBUTION TRENDS

Some species, such as *Acacia erioloba* (camel-thorn), *Acacia mellifera* (swarthaak) and *Boscia albitrunca* (witgat), have a very wide distribution over much of the country (see Appendix 3), which is largely due to their tolerance of a wide range of habitats and climatic conditions. Others have a very restricted distribution, generally due to specific habitat requirements. *Aloe pillansii* (giant quiver-tree) appears to be fog-dependent and is only found on fog-collecting slopes of mountains in the winter rainfall area. Species such as *Salix mucronata* (wild willow), *Syzygium* spp. and *Ficus capreifolia* (sandpaper fig) are restricted to the banks of perennial rivers.

There are a number of species with disjunct distributions, where one population may be separated from the next by vast distances, or the species may be present in small, scattered localities throughout the country. Sometimes habitat specificity explains the distribution. For instance, *Ficus cordata* (Herzfeige) is generally found near permanent water at springs or in rocky areas where rainwater collects and thus its distribution largely follows the distribution of its habitat, giving it a disjunct appearance due to the distances between these suitable spots. *Acacia nebrownii* (slapdoring) has a disjunct distribution which may be determined by its tolerance of calcrete and other poor-quality soils. Similarly, *Acacia kirkii* (floodplain acacia) only inhabits seasonally flooded pans and depressions, while *Gyrocarpus americanus* (propeller tree) occurs on dolomite found in the Otavi Mountains, just south of the Kunene River and on Impalila Island.

Other times the reason for the vastly separated populations is not so clear. *Euclea asperrima* (mountain guarri) occurs in the Waterberg and the Sperrgebiet, two very different areas from all aspects. There are a number of species, such as *Pterocarpus rotundifolius* (round-leaved teak), *P. lucens* (doringkiaat), *Boscia mossambicensis* (broad-leaved shepherds-tree) and *Combretum mossambicense* (knobbly combretum) that occur in the Caprivi and then again in the north-west, where rainfall and substrate are different. *Colophospermum mopane* is a well-known species with such a disjunct distribution, the reason for which remains a subject for speculation.

About 17% of the woody species found in Namibia have very restricted distributions here. Some are rare in a worldwide sense, and are generally endemic to Namibia or to the Namib Desert or the Succulent Karoo. There are also species or genera that are only found in one area of Namibia, but show a disjunct distribution when one looks at their distribution in the rest of Africa, or the world. The majority of species that are rare in Namibia are at the southern or western limit of their distribution here and are often widespread elsewhere, for example, *Excoecaria bussei* (pepper-seed), *Protea gaguedi* (African white protea), *Afzelia quanzensis* (mwanda), *Ptaeroxylon obliquum* (omumbungururu) and *Ormocarpum kirkii* (caterpillar-pod). There are also those rare species that are probably relicts of a different climate, existing in disjunct, isolated pockets in Namibia, with a much larger distribution elsewhere, for example, *Trema orientalis* (pigeonwood), *Dalbergia nitidula* (purple-wood flat-bean), *Ficus lutea* (giant-leaved fig) and *Senna singueana* (winter senna).

Other species, such as *Commiphora mollis* (velvet corkwood) and *Acacia senegal* (driehaakdoring), are fairly widespread in western Namibia, and also occur in South Africa and Zimbabwe. The genus *Moringa* is found in south-western Africa and also in north-eastern Africa, Arabia, India and Madagascar. *Sterculia africana* occurs in southern Africa and North Africa and southern Asia.

FACTORS THAT SHAPE OUR TREES AND SHRUBS

The aridity, highly variable rainfall and general lack of surface water are primarily responsible for shaping the characteristics of Namibia's woody vegetation (see Figures 13 and 14), but other important factors which help shape the various habitats available to plants – and the plants themselves – include factors such as topography, substrate and temperature.

Many of our plants show adaptations to arid conditions through their size and growth form. Generally, desert species are smaller than their counterparts elsewhere. Stems are often swollen and fibrous for storing moisture, as shown by many *Commiphora* species, *Adenia pechuelli* (elephants-foot) and *Cyphostemma* species. The leaves of desert plants are sometimes thick and succulent, as in *Aloe* or *Cyphostemma* species, or small and compound with small leaflets that can fold up during times of extreme moisture stress, such as *Acacia* species. In some species the leaves are mostly absent, as in *Euphorbia* species in which photosynthesis is largely taken over by the fleshy green stems.

The effect of increasing rainfall across the country can be seen not only on the number of species present (see Figure 13, page 15), but often on the abundance of that species, and on the overall size of the plants. Usually shrubby forms are found towards the drier west, and taller, tree forms of the same species are found in the north and east. For example, *Dichrostachys cinerea* (omutjete) is generally a shrub in the centre of Namibia, but a tree in the north-east. *Acacia reficiens* (rooihaak) is also a shrub in the dry west and a tree in its eastern distribution, often looking far more like the closely related *Acacia luederitzii* (Lüderitz acacia). This difference in growth form is also often noticeable in species growing in areas where water availability differs locally. For instance, individuals growing on the plains are usually smaller and more shrub-like than individuals of the same species growing along watercourses or in pans in the area. *Colophospermum mopane* (mopane), *Ziziphus mucronata* (buffalo-thorn) and *Terminalia prunioides* (Blutfruchtbaum) are three species in which this phenomenon is often observed.

Leaf size often increases with increasing availability of moisture. Thus, species in the east tend to have larger leaves in general than those in the west. Likewise members of a species can have much larger leaves in wet habitats than in dry ones.

Topography plays an important role in plant distribution because it shapes the habitats and micro-habitats available for trees and shrubs. Mountains not only intercept rainfall and create habitats with more available water with run-off collecting in rock crevices, kloofs and gulleys, but they also provide plants with shade and protection from wind, especially in kloofs and gulleys. Thus species such as *Ficus ilicina* (rock-splitting fig) that would not be found in less protected habitats occur here. Mountains provide a diversity of habitats, which are preferred by different species – some, such as *Acacia robynsiana* (hemelbesem), preferring the tops, while others prefer the lower slopes, or a particular aspect. Thus, hills and mountains generally have a higher diversity than the surrounding plains.

The nature of the substrate – determined by the geology and soils – available for plants to grow on can also be important. The geology of most of the country is extremely complex and largely rocky with a diversity of rock and soil types. Only the deep Kalahari sands in the north and east are geologically simple. The coastal plain from Lüderitz to Walvis Bay is covered by a vast sea of shifting

sand, which cannot support any woody vegetation. An important area with respect to distribution of trees and shrubs is the Karstveld, which stretches across northern central Namibia and north-westwards into Kaokoveld. This area comprises predominantly limestone and dolomite with very characteristic species, such as *Kirkia acuminata* (common kirkia), *Gyrocarpus americanus* (propeller tree) and *Spirostachys africana* (tamboti).

Soils in Namibia, in general, are structurally poor and deficient. Nutrient rich loamy soils are rare. In rocky areas the soils are very shallow with low nutrient content; the deep soils are largely sandy. Some species, such as *Acacia mellifera* (swarthaak), can be found on a wide range of soils. Others will only grow on specific substrates, for example, *Terminalia sericea* (silver cluster-leaf) and *Acacia fleckii* (sand-veld acacia) will only grow on sandy soils. Species like *Catophractes alexandri* (ghabbabos) and *Acacia nebrownii* (slapdoring) are often found on calcrete, while *Zygophyllum* and *Salsola* species are able to tolerate saline soils. The patchiness of the vegetation within an area clearly reflects the patchiness of the soils there.

SEASONAL VARIATIONS

An aspect of plant biology which is as variable as diversity and distribution is that of annual cycle (phenology) – that is, when plants produce leaves, flowers and fruit. Generally, this is affected by the climate, local weather and length of day. Woody species in Namibia seem to fall into various categories with respect to leaf production and flowering. Fruiting usually follows the same general pattern as flowering, although the length of time that fruit remains on a plant varies from species to species and, for a species, from one season to the next.

Leaf production

Species such as those belonging to the genera *Commiphora* (corkwoods) and *Sterculia* are clearly deciduous, always losing their leaves in winter and producing new leaves at the beginning of summer. For some, the cue to leaf production must be day length or temperature, since they produce new leaves at the same time every year, no matter when the rain starts, and often before the first rains. The same applies for leaf-fall at the end of summer. Other plants only produce new leaves after the first rains. Sometimes a second flush of leaves can be produced later in the summer if the main rains fall late. In the north-west, where rainfall is mostly in March or April, it is a common sight to have both old, autumn leaves and fresh green leaves on plants at the same time.

A number of species are evergreen, such as *Ficus* spp. (wild figs) and *Olea europaea* (wild olive). New leaves may be produced in the spring, but old leaves are never all lost at once and most individuals are never totally leafless.

The majority of Namibian species are not obviously deciduous or evergreen, but semi-deciduous to semi-evergreen. The timing of leaf-fall and the duration of the leaf canopy are largely dependent on rainfall. In good rain years these species may retain their leaves all year, sometimes shedding them in the spring just prior to producing new ones. In a bad rain year, they might all be bare by the onset of winter. The position of the individual tree also plays a role in how long leaves persist. Individuals growing in riverbeds and kloofs, or other habitats that retain water longer, may have leaves all year, whereas members of the same species growing in a more exposed or drier habitat may lose their leaves, for example, *Colophospermum mopane* (mopane) and *Ziziphus mucronata* (buffalo-thorn).

Species such as *Acacia mellifera* (swarthaak) are generally deciduous, but often there are individuals within any population that retain their leaves. It is usually these individuals – that are easily identified – that are recorded by atlassers, rather than the bare ones that may be in the majority.

Flowering and fruiting

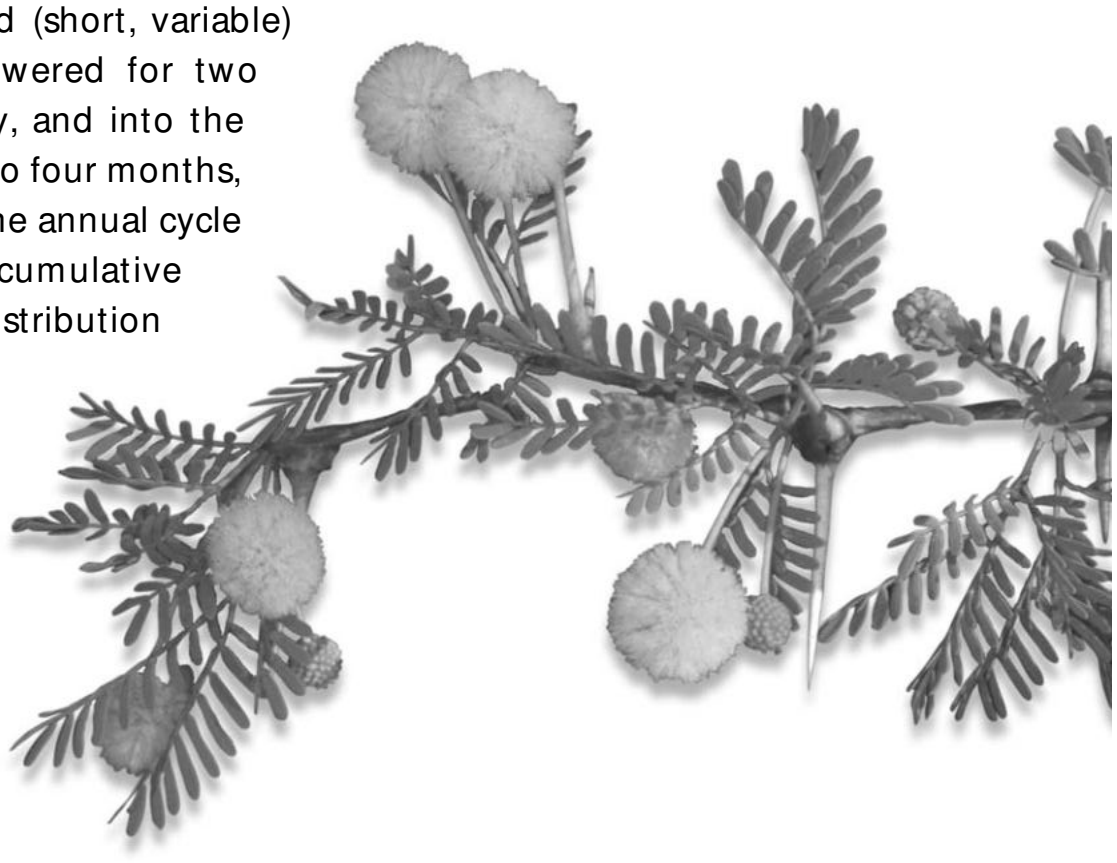
Like leaf production, flowering can be divided into rain-dependent species and those that are independent of rain. The rain-independent species generally flower early in summer or during late winter, before the rains. The flowering period of these plants is usually fairly short. The rain-dependent species usually only start flowering with the onset of rain. Some flower before the rains and again later in the season if rainfall is late or long-lasting. It seems that the drier the area, the more opportunistic the plants are with respect to their flowering. Thus, many Caprivi species flower at a fixed time, generally before the rains. This is probably because the start of the rain season is relatively predictable, ensuring that there will be sufficient moisture for the fruit to develop. Many desert species flower intermittently, depending on when the rains fall and how much falls. If rainfall is good, flowering is more prolific or lasts longer, and often there are two flowering peaks. If rainfall is low, flowering may be poor or not occur at all. Flowering can also be influenced by the amount of rain that fell in the previous season.

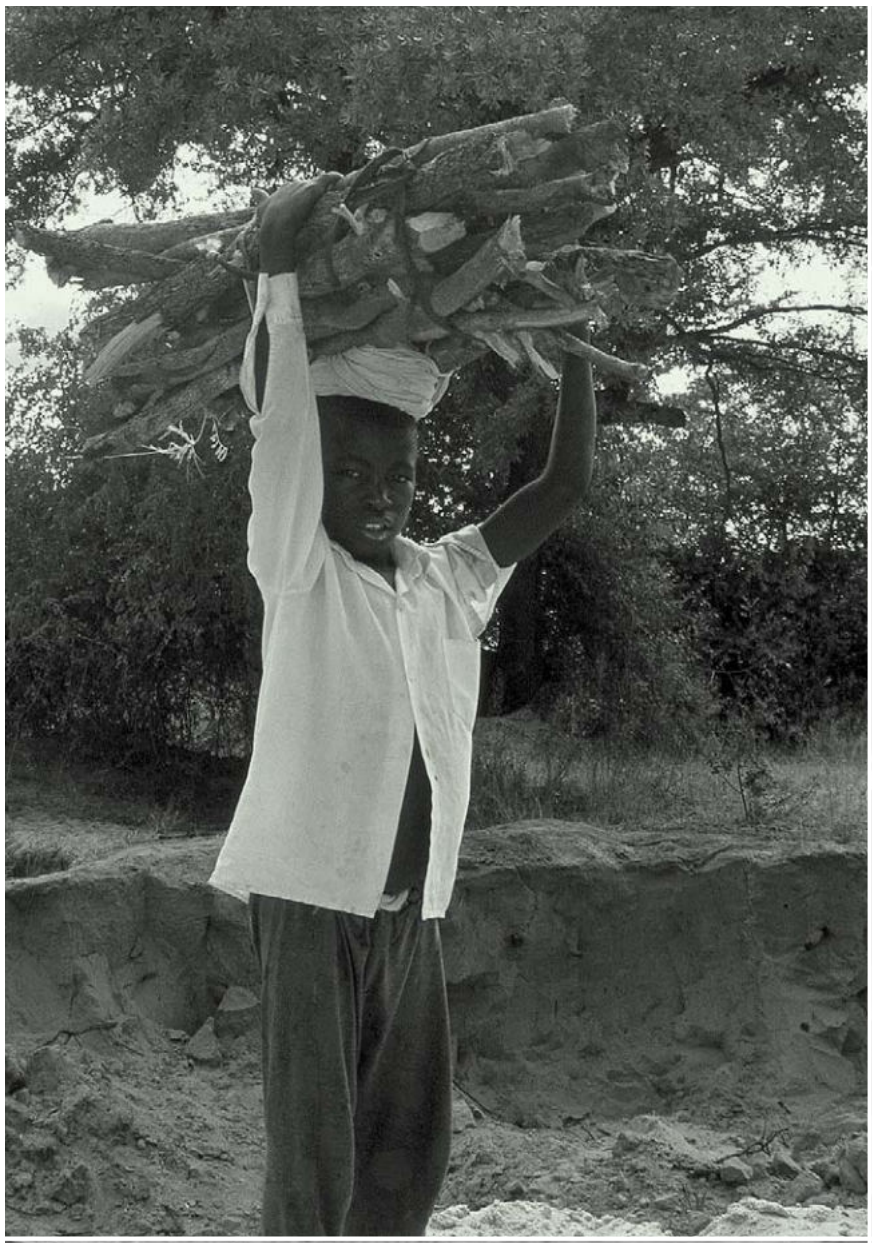
Monthly observations of the flowering patterns of the same individual plants over five years on two farms (Natalia, in 2118CA, by RED2 and Gomnab, in 2318CB, by FOR1) showed some interesting trends (TAP 2003). Plants could be roughly divided into three categories based on the length of flowering:

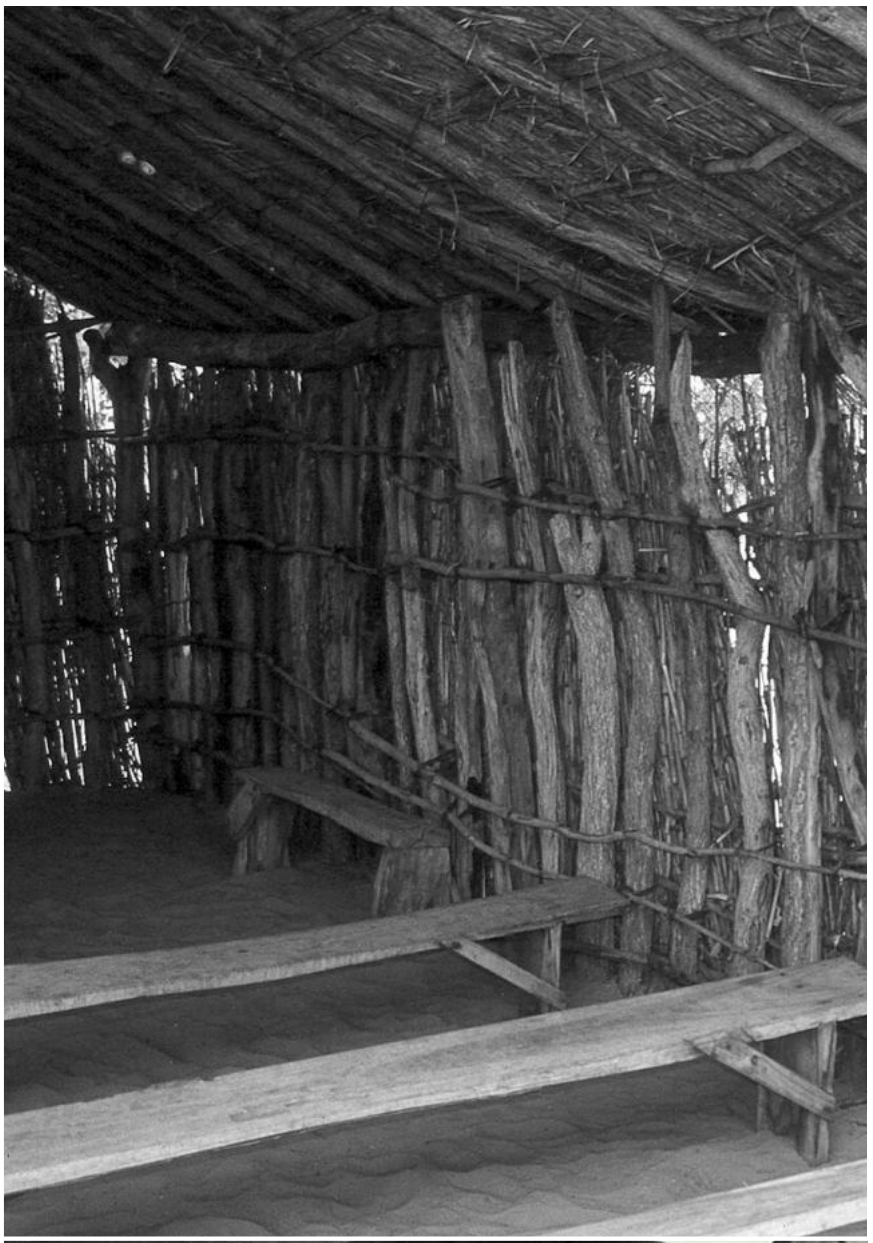
- The first category included those largely rain-independent species that flowered for a short, fixed period (1–3 months) the same time every year, such as *Acacia erioloba* (camel-thorn), *A. mellifera* (swarthaak), *Albizia anthelmintica* (worm-cure albizia) and *Boscia albitrunca* (witgat), which all flowered from August to October on both farms. The last three species had similar flowering patterns over the whole country, occasionally carrying on till late summer. Because of regional variations, *Acacia erioloba* had a flowering period of nine months over the whole country, but a short period in any given area, occasionally continuing on until later in the summer.
- The second category included those rain-dependent species that flowered for a short period, but flowering varied from year to year, or from one farm to the other, so that the total flowering period, as depicted in the annual cycle diagram for all years over the whole country, was long. *Ziziphus mucronata* is such an example. It only flowered for one month on Natalia, but generally three months on Gomnab. The time of flowering varied from August to March, or even June on Natalia. Looking at the country as a whole, the flowering period was generally November to March, though there were scattered records of flowers in almost every month.
- The third category includes rain-dependent species that generally flowered for a long period, and flowering time was variable from year to year and place to place. An example of this category is *Catophractes alexandri* (ghabbabos) which may flower for anything up to eight months in one season, at almost any time of the year. Two or even three flowering flushes in one year are not unusual.

Acacia karroo (soetdoring) fell into the second (short, variable) flowering category on Gomnab, where it flowered for two months every year from November to February, and into the third (long variable) category, flowering for one to four months, on Natalia, anytime from November to March. The annual cycle diagrams presented in this book show the cumulative flowering records for each species across its distribution area and for all the seasons during the TAP.

As with leaf production, it is not unusual for plants to have a second flush of flowers, especially in the north-west, and often one can find maturing fruit and new flowers or young fruit on the same plant in late summer. This is commonly seen on *Terminalia prunioides* (Blutfruchtbaum).











Regional patterns

An interesting avenue for further research would be the apparent regional differences in flowering and fruiting patterns, both between species and within species (see *Acacia erioloba*, page 138). At this stage, the data are too few to do more than speculate. A number of widespread species have a different flowering and fruiting time in Namibia to those same species in South Africa and Zimbabwe. An example is *Dombeya rotundifolia* (wild pear), which flowers from July to November in the east of the subcontinent and mostly April to June in Namibia, although some years it can carry on until December. This could be due to differing rainfall patterns in the two regions, but requires further research.

Appendix 3 gives a list of widespread species.

Conservation of woody resources in Namibia

Apart from being intrinsic elements of our landscapes and ecosystems, most of our trees and shrubs are of direct use to our rural and peri-urban communities in helping them to meet their basic needs. They provide low-cost construction materials, fuel-wood, food supplements, household utensils and traditional medicines, as well as being intrinsic in certain cultures. For some, the resources from these plants provide an important source of income through the sale of baskets, wood-carvings, fruits and the products thereof. These resources help provide a buffer against poverty. However, with population growth, the pressures on these relatively limited woody resources are increasing and there is a danger that these resources will be – and certainly, in some areas of the country, are already being – overexploited.

Recent work has found that natural woodlands have been reduced from 15% of Namibia's overall land area to about 9.8% over the last ten years (Watts 2003). Below, a brief overview of the main issues, as well as a number of concerns that were raised during the Tree Atlas Project, is given. There are few simple solutions to these problems, because they would involve addressing social problems, enforcement of legislation, education above all, and changing the attitudes of people to these valuable resources. Nevertheless, issues such as those of excessive and unsustainable fuel-wood consumption deserve urgent attention.

ISSUES AND CONCERNS

Consumptive uses

In Namibia, wood is harvested and consumed for a number of different purposes – for construction, fuel, and carving of furniture, utensils and ornaments. Much of this harvesting is done on a small scale, sometimes it is more extensive. The fruit and seed of many trees and shrubs are also harvested mainly for personal use, but harvesting for commercial purposes appears to be on the increase. Many woody species appear to be overexploited for these consumptive uses, but particularly for timber, fuel-wood and woodcarving.

Fuel

Fuel-wood is an essential and limited resource in Namibia. While harvesting for personal use in some areas appears to have little impact, increasing pressure around towns, such as Windhoek and Rosh Pinah, is apparently causing considerable loss of woody species, as well as loss of vegetation in general. In the south of the country where few woody species occur, the use of some species being harvested, such as *Aloe pillansii* (giant quiver-tree) and *A. dichotoma* (kokerboom), is posing a significant concern.

Harvesting fuel-wood for commercial purposes, including charcoal production, is controlled by permits issued by the Directorate of Forestry within the Ministry of Environment and Tourism. However, resource surveys, monitoring of harvesting activities and enforcement of regulations are not sufficiently regularly carried out, possibly due to staff shortages. Problems include over-harvesting and harvesting of non-target species.

One area that needs some attention is education of the general public regarding the use of 'braai' wood. The unthinking burning of unnecessarily large quantities of hardwood to cook relatively little

food is unsustainable in the long run, and the public should be made aware that their behaviour in this regard will affect future generations.

Timber and building materials

Timber is harvested by individuals for their own use or to sell. There appears to be some unsustainable takeoff. Commercial timber harvesting is controlled by the Directorate of Forestry but no Namibian timber is exported at present. Reforestation programmes using indigenous species should be considered.

Woodcarving

Woodcarving may be divided into two categories – that of utensils and tools for personal and community use, and that of curios, ornaments and furniture for commercial trade. There does appear to be an unsustainable takeoff of wood – largely for the informal commercial trade and particularly of large specimens. The social reasons behind this are complex, and we will not go into them here, beyond pointing out that once this resource is compromised the social problems will be greatly magnified.

Habitat destruction

In a country where woody resources are relatively limited, there seems to be little regard for conserving woody resources when preparing land for housing and other building developments, fields and agricultural projects, and roads, powerlines and other infrastructure. Existing mechanisms do not appear to be effectively regulating the clearance of woody vegetation in order to conserve large trees where possible, and to reduce unnecessary collateral damage to adjacent areas during construction work. As a result many areas are completely cleared, and little attempt is made to salvage any vegetation.

Excessive fires

Vast areas of north-eastern Namibia, specifically Caprivi and Kavango, burn every year. Some of the fires are started naturally by lightning, but many of the fires are set by people, mainly to clear land for fields and to stimulate the growth of fresh grass. With almost two-thirds of the area burning annually, the frequency of fire poses a serious threat to the woody vegetation. Frequent fires may compromise seed germination, seedling establishment and success, and the continued growth of the mature trees of some species, such as *Pterocarpus angolensis* (kiaat), *Burkea africana* (omutundungu) and *Ochna pulchra* (lekkerbreek). This issue urgently needs thorough investigation to ascertain what species are negatively affected, and to try and establish suitable burning regimes and/or mitigation measures in collaboration with local communities.

Impaired recruitment

Besides losses due to fire, certain species seem to show little to no signs of recruitment. Reduced recruitment in some areas may be caused by trampling or browsing of seedlings or the collection of seeds for fodder or other purposes. Research into the long-term effects of activities such as the extensive harvesting of *Acacia erioloba* pods outside Windhoek and elsewhere is needed.

Illegal collecting

A number of woody species, mostly pachycauls (species with swollen stems, often dwarf trees), are highly sought-after by specialist horticultural collectors. Some species are very valuable and the trade of such species involves large sums of money, especially overseas. Many of these plants are not cultivated, but collected from the wild and, although there is a permit system in place, much of it is done illegally by unscrupulous collectors putting many of these species at risk. The Ministry of Environment and Tourism is presently trying to raise public awareness in this regard. Training of roadblock personnel would also be useful.

Bush encroachment



Some woody species face competition from other, more resilient and more vigorous species, especially once their habitat has been disturbed by fire, construction, overgrazing, etc. The latter compete for resources – water in particular – and eventually exclude the original species from the area.

Cleared areas – such as a road verge, a field left fallow, the edge of a dam, or a burnt or otherwise disturbed area – are rapidly colonised by pioneer species. Pioneer species germinate and grow rapidly before other plants get a chance, often forming dense stands, sometimes to the extent of excluding other vegetation. In an undisturbed natural system, pioneer plants generally pave the way for other species which are less able to adapt to the often harsh conditions in newly cleared habitats. Once a canopy of shade has been formed by the pioneer or the soil has been stabilised, other plants start to take over from the pioneers and a gradual succession of plants ensues. In most man-disturbed situations this process of succession does not get a chance to develop.

Pioneer woody plants include species like *Mundulea sericea* (visgif), *Bauhinia petersiana* (koffiebeesklou), *Baphia massaiensis* (omulyambambi) and *Combretum elaeagnoides* (Caprivi combretum) which can often be found in dense stands along road verges. Under natural conditions, these plants would later give way to other species.

Pioneer species may also be invasive, but an invasive species does not necessarily need a disturbed area in order to dominate other vegetation. Both pioneer and invasive species may be indigenous or introduced (alien).

Bush encroachment is the invasion of woody species in areas that have always had either very low densities of trees and shrubs or have been devoid of them. Bush thickening refers to the state in areas in which woody species have always been present, but as a result of some change – usually man-induced – these species have increased in size and vigour. For example, on some farms where *Acacia mellifera* (swarthaak) has been 'controlled', *Dichrostachys cinerea* (omutjete) has taken over, changing the composition of the bush (BES1).

Bush encroachment is a serious problem throughout much of Namibia, especially in the commercial farming areas of the north-central areas. It results in an imbalance in the ratio of grasses to bush, a decrease in biodiversity and a decrease in carrying capacity, which in turn cause severe economic losses for Namibia (de Klerk 2004). It also negatively affects the efficiency of water use and groundwater, thereby contributing to the process of desertification. Bush thickening is regarded as a major threat to botanical diversity in Namibia and may even affect the diversity of mammals and other animals.

One school of thought is that the major cause of bush encroachment and thickening is over-utilisation of the grass layer (overgrazing) which results in higher water and nutrient infiltration into the subsoil, which in turn allows trees and bushes to dominate. Another is that rainfall and its variability play a greater role in determining vegetation composition than does grazing, and that savanna could be changed to grass-dominated land by favourable management and environmental conditions. Certainly both rainfall and grazing play a role, as do veld fires, a reduction in natural browsers (game) and past agricultural policies.

Appendix 4 lists the main invasive and pioneer species in Namibia. The most widespread encroaching species is *Acacia mellifera* subsp. *detinens* (swarthaak), closely followed by *Dichrostachys cinerea* (omutjete). Each vegetation zone has its own dominant encroacher (de Klerk 2004). The occurrence of the six chief encroachers is determined by rainfall, with *Acacia reficiens* (rooihaak) dominating the lowest rainfall areas (about 150 mm per annum) and *Terminalia prunioides* (Blutfruchtbaum) the highest.

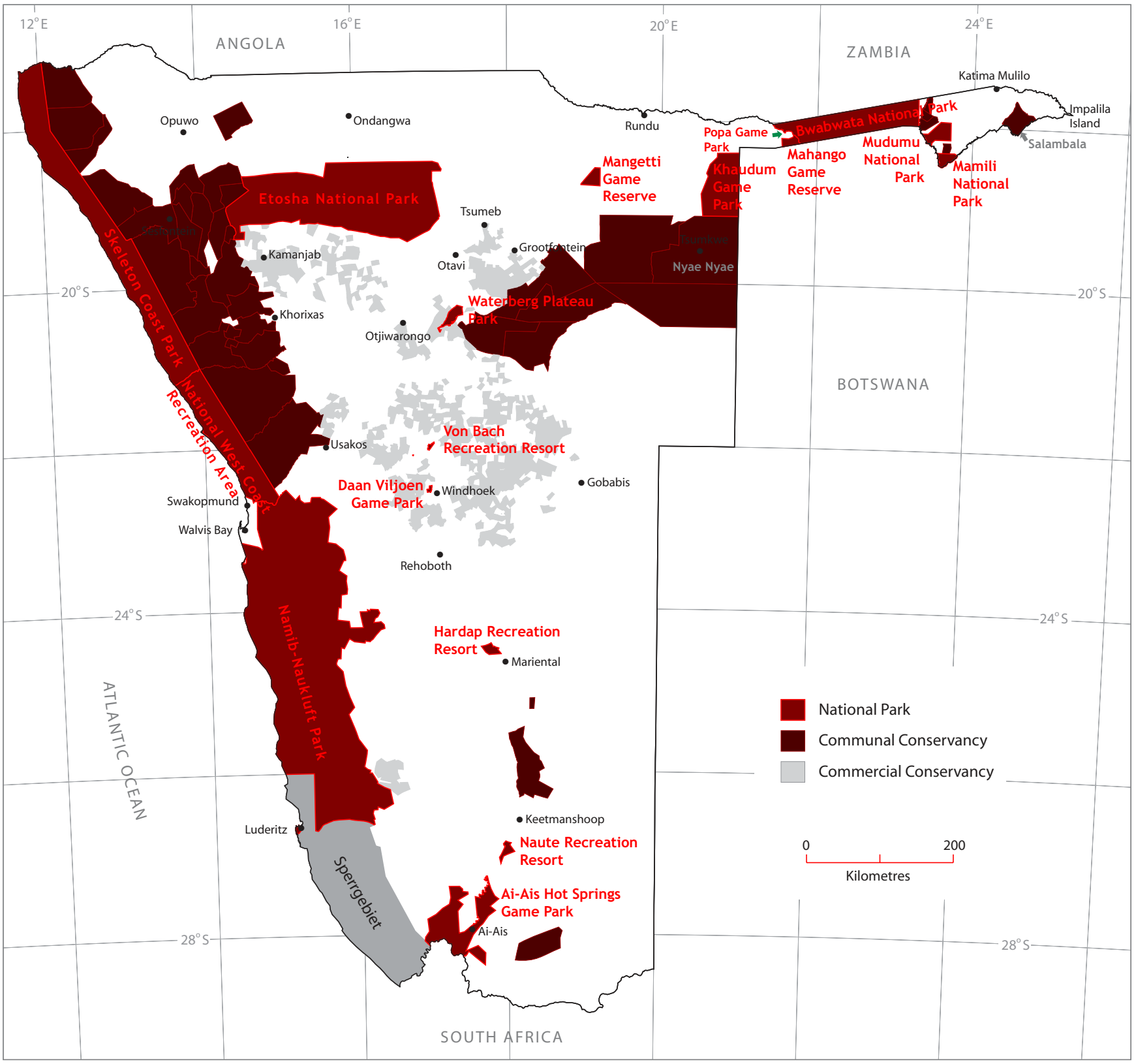


FIGURE 15: PROTECTED AREAS IN NAMIBIA

THE CONSERVATION AND PROTECTION OF TREES AND SHRUBS

Protected areas

Trees and shrubs are formally protected only within the national parks and game reserves of Namibia (see Figure 15). Much of the area under protection is in the arid parts of the extreme west, where there is little woody vegetation. In the areas where woody species are most diverse, there are only small protected areas. Conservancies have been established in some areas, such as eastern Caprivi, the Otavi, Erongo and Brandberg Mountains, and the Nyae Nyae area, to protect and manage the natural resources on a sustainable basis. In addition, community forests are becoming established in the north and north-east. The north-western highlands – another area of high woody species diversity – enjoys very little protection.

The depletion of our woody species in communal areas has been ascribed, in part, to the ownership of much of our woodland resources by Government – without ownership of these resources, individuals and communities are more inclined to over-utilise resources and not replant for the future. It has been

suggested that a more formal but collaborative system, whereby local communities manage forests according to a clear set of locally developed regulations, would promote sustainable use (Watts 2003).

Important tree areas

The most important areas for trees are the four areas with the highest diversity, namely the Andara/Popa Falls area of the Okavango River, the eastern Caprivi riverine woodlands and floodplains, including Impalila Island, the north-western escarpment and highlands, and the Otavi Mountains. Not only do these areas have the highest diversity of woody species, but they also have the highest numbers of protected species (Figure 16). In addition, they have many species that are rare or have restricted distributions in Namibia.

As well as having a high diversity of woody species, the highlands of the Kaokoveld are also home to ten Namibian endemics, with many additional species endemic to the greater Kaokoveld (which includes southern Angola). There are also different subspecies of more widespread taxa, such as *Acacia mellifera* subsp. *mellifera* (Kunene swarthaak) which is only found here in Namibia, as well as forms of more widespread species that look very different from their usual appearance, for example, *Acacia senegal* (driehaakdoring) and *Commiphora virgata* (omumbara). In addition, there are a number of Angolan species that have their southern distribution limit here, such as *Ceraria carrissoana* (*Angola ceraria*) and *Cussonia angolensis*. These two species have only been recorded in Namibia since the TAP, along with other new species for the country, namely *Hymenodictyon floribundum* (firebush), *Schrebera alata* (wing-leaved wooden pear), *Brachylaena huillensis* (laeveldvaalbos), *Pleurostylia capensis* (coffee pear), and a few as yet unidentified species. There are also a number of new species in the process of being described and published. Much of the mountainous area of the Kaokoveld is inaccessible, and has not been well explored botanically; they could well yield yet more Angolan species or even new species.

Many disjunct species are only found here and in the north-east, for example, *Pterocarpus rotundifolius* (round-leaved teak) and *P. lucens* (doringkiaat), as well as *Diplorhynchus condylocarpon* (horn-pod tree) and *Manilkara mochisia* (lowveld milkberry). Most of these species have a limited distribution within the Kaokoveld.

Neither the Okavango River nor the Caprivi has endemics, but a number of species are rare and have a limited distribution within Namibia, such as *Erythroxylum zambesiacum* (Zambezi coca-tree), *Oncoba spinosa* (munzenze) and *Croton longipedicellatus* (long-stalk croton).

In addition to having a high diversity of woody plants, the Otavi Mountain area is home to four endemic species, as well as housing a number of disjunct species which are rare in Namibia.

None of these four areas of high diversity is protected within the formal conservation network. The Otavi area falls within conservancies, while part of the eastern Caprivi floodplains fall within the Salambala Conservancy. The western edge of the north-western escarpment falls within three new conservancies.

Other areas with lower diversity, but with high numbers of protected species are the Brandberg, Grootberg and Erongo Mountains. The former is also home to eight endemic species. All fall within conservancies, but not national parks.

The only area with high endemism that falls within a formal conservation area is the Naukluft Mountains, which is in the Namib-Naukluft Park.

Protection of special species

Certain species are protected under national or international law (see Appendix 5). Namibian legislation protects a number of tree species under three Acts – the Forestry Ordinance No. 37 of 1952, the Forest Act No. 72 of 1968 and the Nature Conservation Ordinance No. 4 of 1975. However, there is insufficient enforcement of the regulations, and the wood from supposedly protected species such as camel-thorn (*Acacia erioloba*), is collected and sold as firewood. Most of the protected trees occur in the north (see Figure 16).

216 of the 400 woody species on the Tree Atlas's list of woody species (Appendix 1) have been assessed for red data status (Craven & Loots 2002, Loots 2005). Of these, 35 were found to be data deficient and 167 were "Low risk – least concern". No large woody plants have been classified as "critically endangered" or

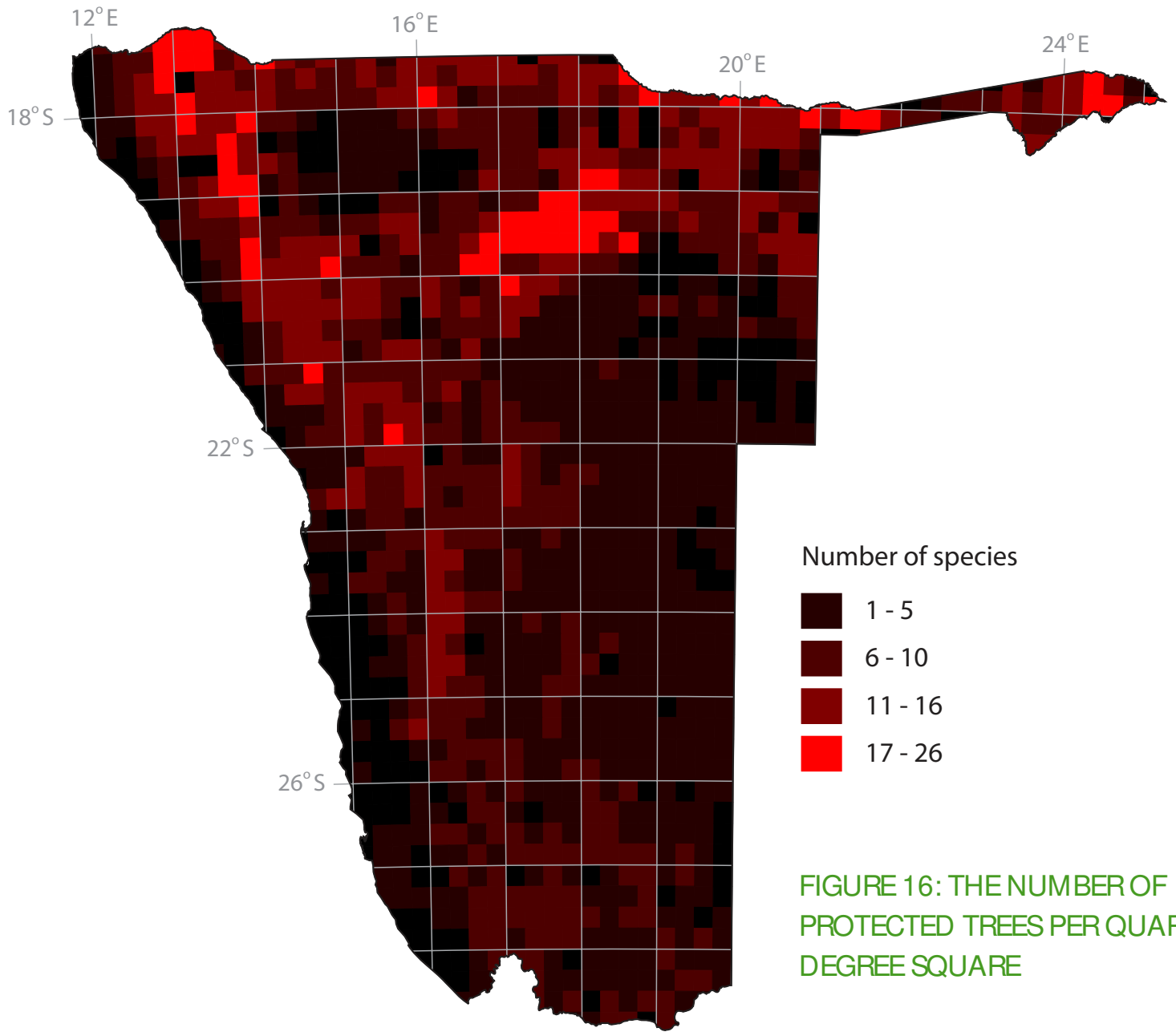


FIGURE 16: THE NUMBER OF PROTECTED TREES PER QUARTER-DEGREE SQUARE

"vulnerable". *Aloe pillansii* (giant quiver-tree) is classified as "endangered" and facing a very high risk of extinction in the wild. The others have been classified as being "Low risk – near threatened" (Appendix 6).

Some species threatened by international trade are also listed in CITES (International Convention on Trade in Endangered Species) Appendix I or II, which respectively prohibits and strictly regulates their legal trade internationally. *Aloe pillansii* (giant quiver-tree) and *Pachypodium namaquanum* (halfmens) are both in Appendix I, while a further 15 species are in Appendix II.

THE RED DATA LIST

The Red Data List is 'a catalogue of species whose future survival in nature hangs in the balance' (Golding 2002). The list is compiled by applying internationally accepted criteria according to the World Conservation Union's (IUCN's) recommendations of 2001. There are three categories of threatened species:

- critically endangered species are regarded as being on the brink of extinction in the wild
- endangered species are facing a very high risk of extinction in the wild
- vulnerable species are facing a high risk of extinction in the wild

Other categories include:

- near threatened species could become threatened in the near future
- species of least concern are usually widespread and abundant
- species for which the data are deficient and inadequate to assess

GUIDE TO SPECIES ACCOUNTS

The species accounts that follow in this atlas give a synthesis of the information on distribution and ecology collected during the Tree Atlas Project (TAP). Distribution maps of species that were found in four or more quarter-degree squares (see page 2 for more information on resolution), are given; those with less are mentioned in the text, but generally no map is included. Although there is a brief description of each of the plants this book covers, for a detailed description of trees and shrubs, and aids to their identification, refer to one of the recommended field guides (page 645).

The TAP, which ran from 1997–2003, was based on the voluntary participation of professional and amateur botanists. Some squares and months achieved better coverage than others. To assess whether a blank square on the distribution map of a widespread species is due to an absence of the species or to a lack of visits by atlassers, refer to the introductory maps showing the number of sheets submitted per square and the efficiency of atlassing (Figures 4 and 5, pages 4 and 5). In order to get an idea of how often a square was visited, and at what time of year, refer to the maps on pages 6 and 7 (Figures 6 and 7).

The map below is to help readers orientate themselves with regard to major towns. It is also on the inside back cover. See other maps in the introduction as well.

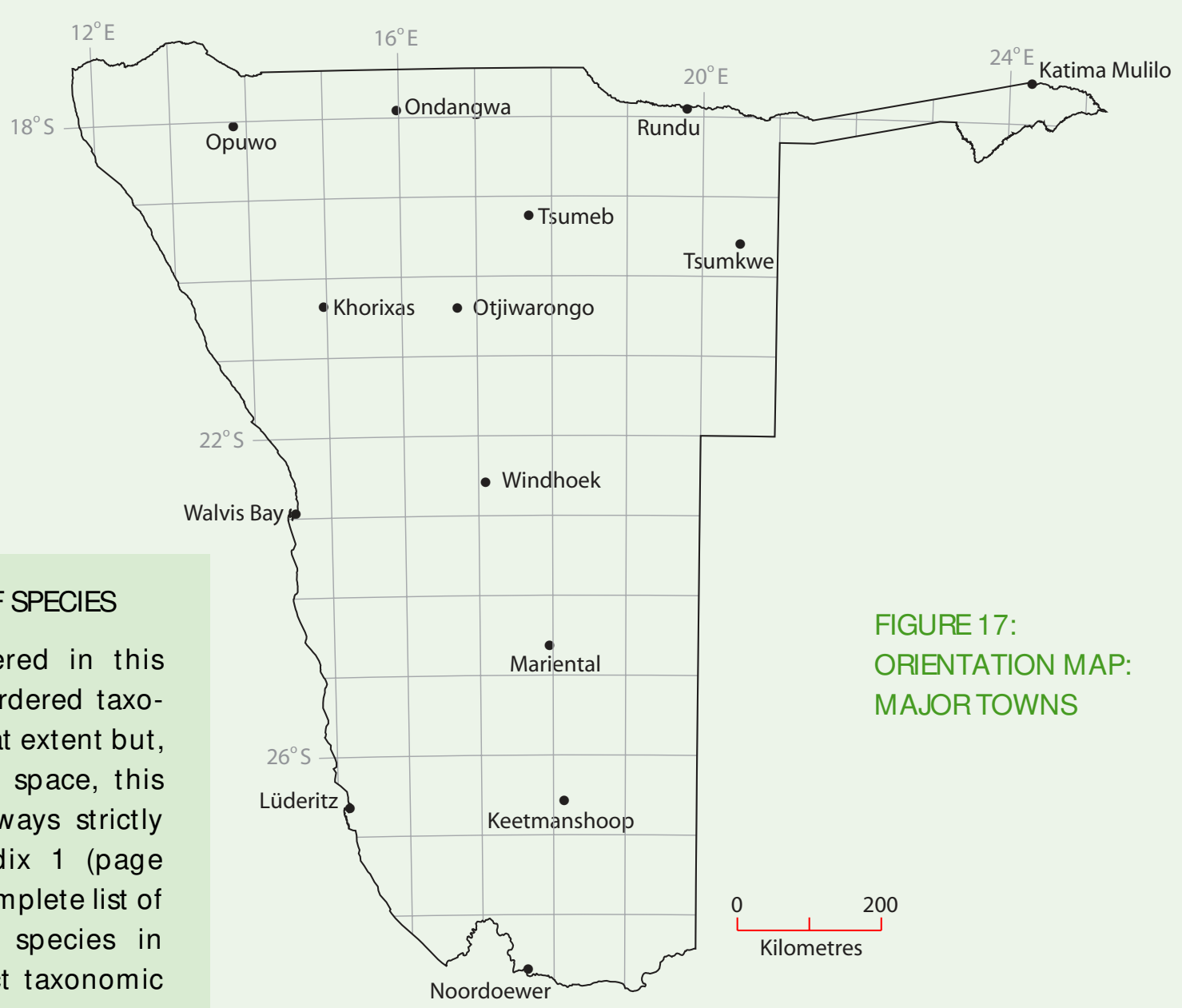


FIGURE 17: ORIENTATION MAP: MAJOR TOWNS

ARRANGEMENT OF SPECIES

The species covered in this atlas have been ordered taxonomically to a great extent but, to economise on space, this order was not always strictly followed. Appendix 1 (page 647) provides a complete list of all large woody species in Namibia, in correct taxonomic order, with subspecies and varieties if relevant, and with authorities.

1

5 ANACARDIACEAE

Rhus pyroides

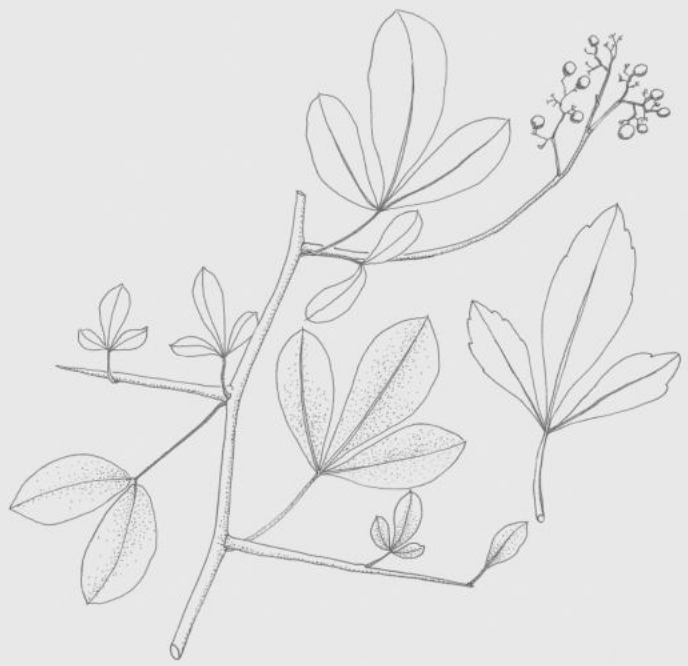
2 = Rhus dinteri

Fire-thorn Rhus

3 Common currant (E); gewonetaaibos (A)

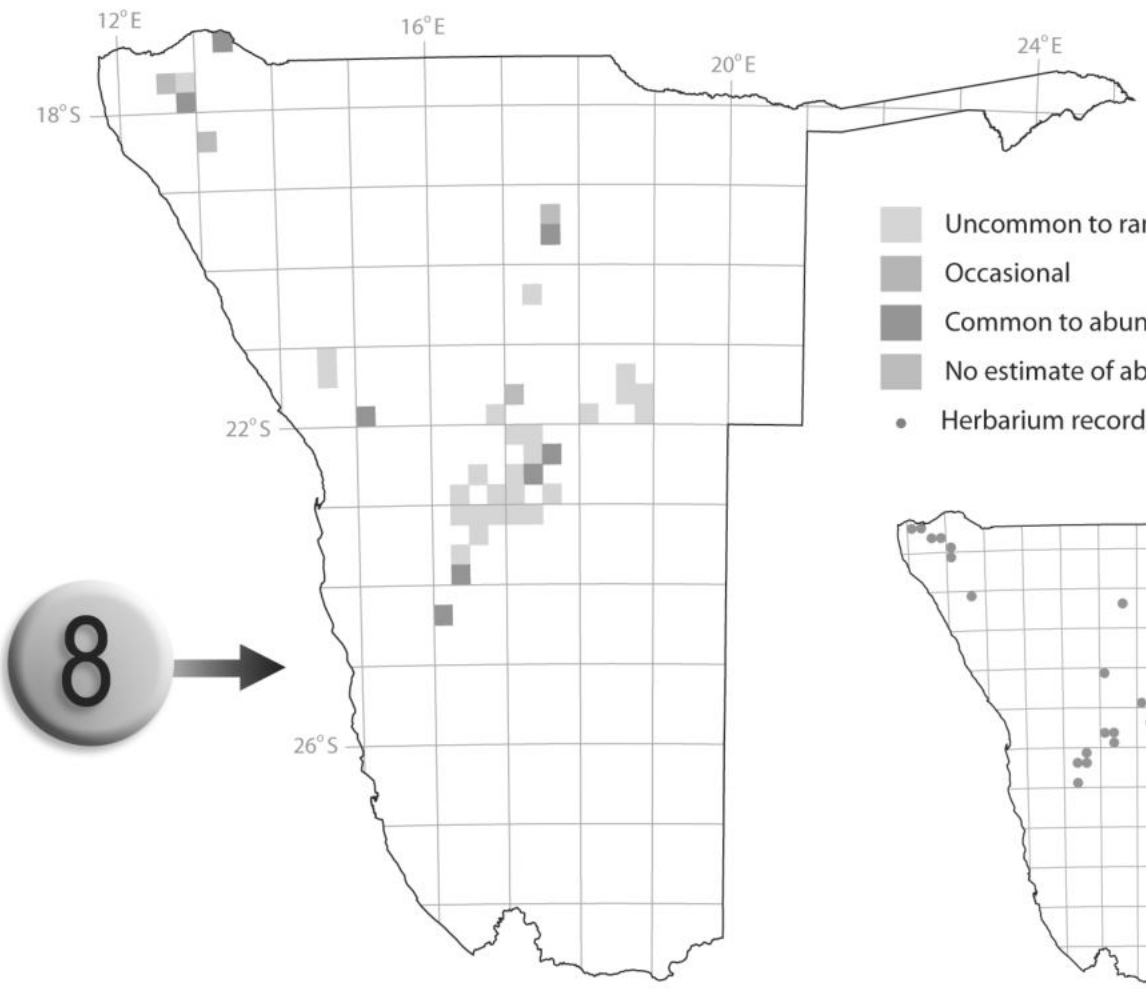
[61 records from 36 (3%) squares]

4



6 Evergreen, many-stemmed, dense shrub, **with or without spines**. LEAVES **both surfaces dark green with variable, white silky covering; margin entire**, slightly turned under; **apex with a fine, hair- like** tip; petiole with white, downy covering. FLOWERS tiny, star-like, greenish-yellow. FRUIT almost round, slightly flattened.

Flowers and fruit may be overlooked. There are two varieties in Namibia, *pyroides* and *dinteri*, but TAP records were seldom differentiated, thus the two have been treated together.



7

8

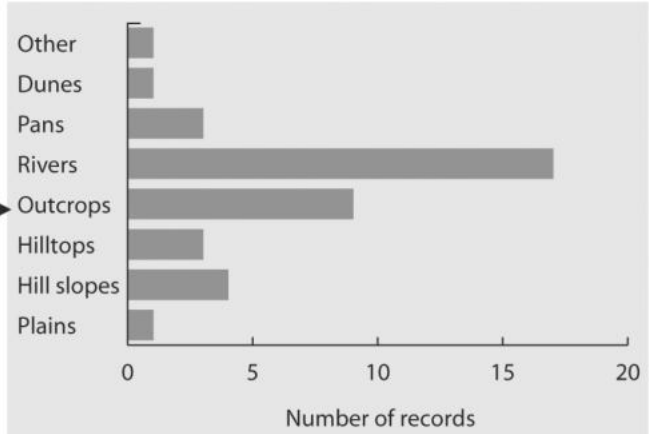
350

DISTRIBUTION & ABUNDANCE

Very disjunct, mainly in the central highlands, with a small population in the north-west and a few scattered, unconfirmed records elsewhere. There is a specimen from near Tsumeb in 1917BC (BAS1/101) which is a range extension. Atlassers recorded it from isolated localities along the Okavango River and in eastern Caprivi, but as these would be range extensions, and they were not accompanied by specimens, they have not been included. Uncommon to rare; sometimes locally common.

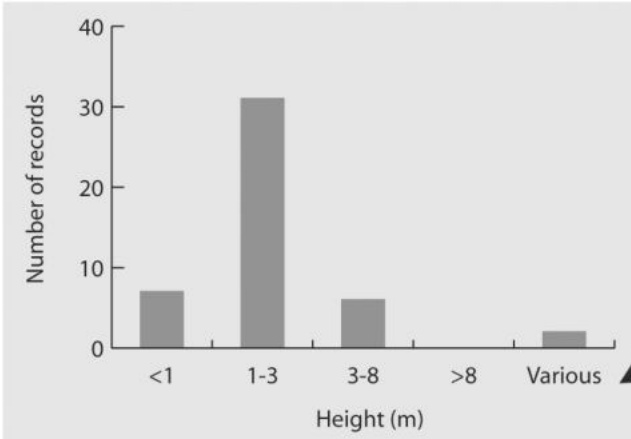
HABITAT

Mostly found along dry rivers, but also on rocky outcrops and hills.



GROWTH FORM

Generally a shrub in the 1–3-m height class, sometimes over 3 m.



ANNUAL CYCLE

Very few observations of flowers or fruit. FLOWERS October to May, peaking in March. FRUIT October to May. LEAVES recorded on every report, but observations few in winter.



GENERAL

Fruit edible. A scratch from the thorn burns for some time. The specific name, *pyroides*, means 'like a pear tree'.

CONSERVATION CONCERNS

None recorded.



1. Botanical name

Identifies exactly which plant is being described. See page 664 for an explanation of botanical names.

2. Synonym

Only well-known synonyms are given.

3. Common names

Few plants have only one common name, and sometimes one local name may refer to a number of different plants. Common names that are frequently used are listed, and the best known or most appropriate name has been elevated for each species. Where possible, names and spellings were checked by mother-tongue atlassers, but errors may have crept in, for which we apologise. See the list of abbreviations used for the different languages (page xx).

4. Number of records and squares

This indicates how well-atlassed and widespread each species is. Not every atlasser recorded aspects such as abundance, growth form, habitat or annual cycle, thus sample numbers for these aspects are always less than the total number of records. The number of squares in which a species is recorded is expressed as a percentage of the number of squares in the country that potentially contain large woody species (1140 squares).

5. Family

The plant family to which the species belongs is given in the header at the top of the page.

6. Description

This brief description summarises the plant's most important features; distinguishing characteristics are given in bold text. A note is made of how conspicuous or inconspicuous flowers and fruit are, as this affects annual cycle observations.

7. Subspecies and varieties

It is often difficult to distinguish between subspecies or varieties in the field. Most of the accounts are for the species as a whole, with comments on any differences found between subspecies. Often, a smaller map showing the distribution of the different subspecies or varieties has been drawn from herbarium records. In a few species, such as *Acacia mellifera*, for which it is relatively easy to distinguish between the subspecies, these have been mapped and discussed separately.

8. Distribution and abundance

The map shows the distribution of the species – with a rough indication of its abundance (see page 9) – per quarter-degree square (see page 2 for an explanation of quarter-degree square system). Records from the National Herbarium, prior to 1997, are shown as grey dots where the TAP record of distribution was less extensive than herbarium records. Squares in which the species occurred, but for which no abundance was recorded by atlassers are shaded in grey. The reader is referred to the orientation map on the inside back cover and other introductory maps in order to relate distribution to known localities in Namibia.

The legend is the same for all species, whether all shadings are present on the map or not.

The text summarises the information given on the map and draws attention to specific issues and observations. Records regarded as doubtful have either been omitted, or highlighted. Mention is made of where the previously recorded range as per herbarium specimens has been extended (the species may always have been there, just not documented before). Significant range extensions were generally only accepted if they were substantiated by a specimen, in which case the collector and specimen number have been included.

9. Habitat

The graph summarises habitats recorded by atlassers for the whole country, based on numbers of records. The most important habitats are mentioned in the text, with any regional

differences found. Substrates and vegetation types are also given, where these were recorded. No graphs are presented for species with few records.

10. Growth form and height

The text mentions whether the plants were predominantly trees or shrubs, and summarises the data on plant height for the whole country, noting any variations in these characteristics due to habitat or geography. The graph depicts the number of records of four height classes, using the height class of the tallest individuals for each record. 'Various' is used where there was a spread of individuals in all height classes, which generally depicts a healthy population of young and old individuals, indicating recruitment.

11. Annual cycle

A diagram showing the presence of flowers, fruit and leaves throughout the year is given. It follows the seasons, running from July of one year to June of the next. The diagram is based on the observations of atlassers, as well as records of flowers and fruit from the National Herbarium. The darkest shading shows maximum production, decreasing to white where very few to no records of each aspect were recorded per month. Months with no data are recorded as such. Where annual cycle data were few, what records there are have been mentioned in the text.

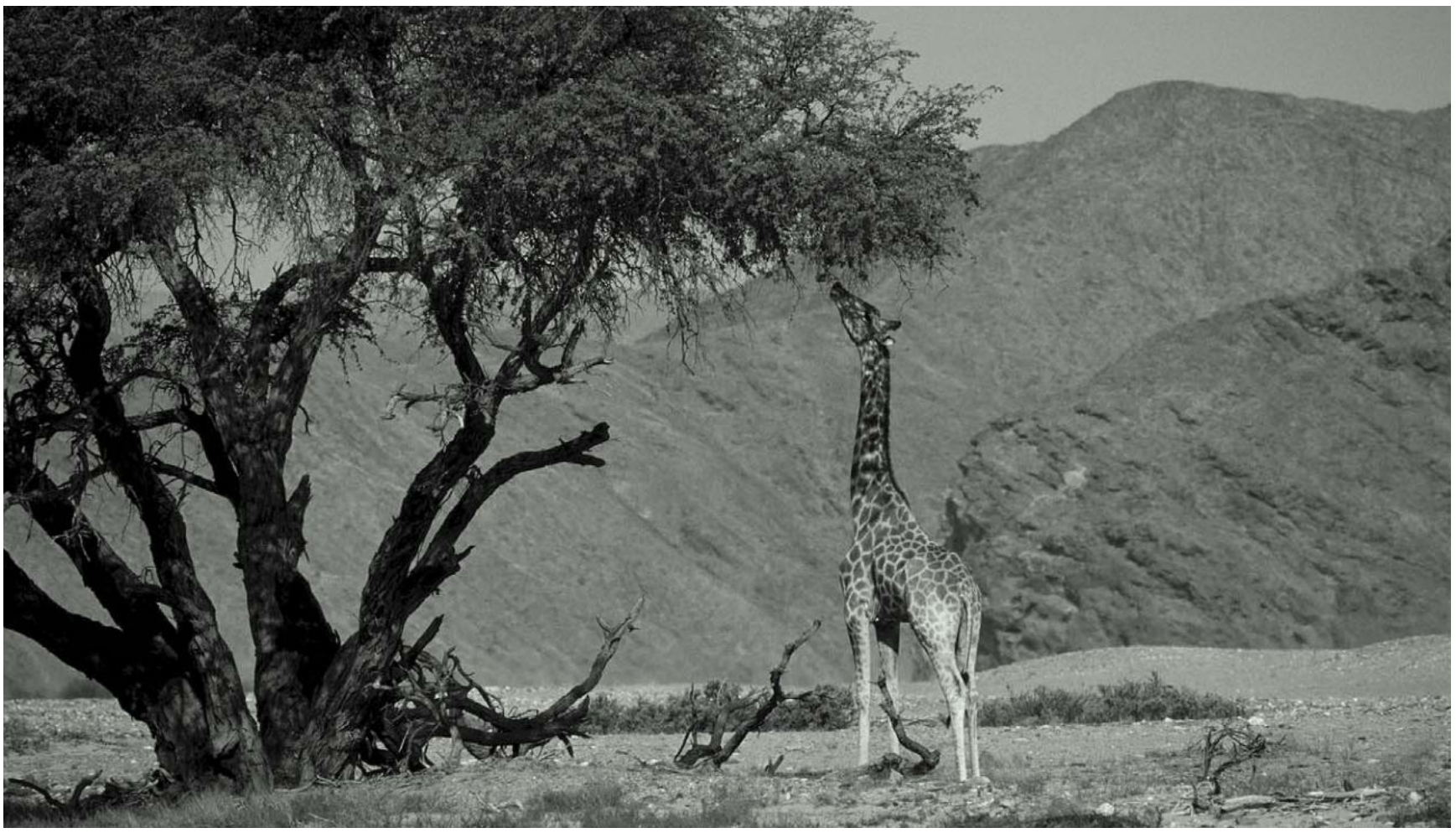
Additional information of interest recorded by the atlassers has been included. Some comments are of general pertinence, others refer to specific areas or specific times for which quarter-degree square (see page 2) or date references are given. Reference to the code of the atlasser who recorded specific information has also been given in many cases, e.g. HOF1; a list of atlasser codes used in the book is given in the list of abbreviations (page xiii).

12. General

General knowledge and interesting information reported by atlassers have been included in this section. As for information on annual cycle, this general information is often referenced.

13. Conservation concerns

The current conservation status of each species, as well as concerns raised by atlassers and those that have become apparent through the results of the TAP, are mentioned. The introduction (page 28) gives background on the terms used.



Welwitschia mirabilis

Welwitschia

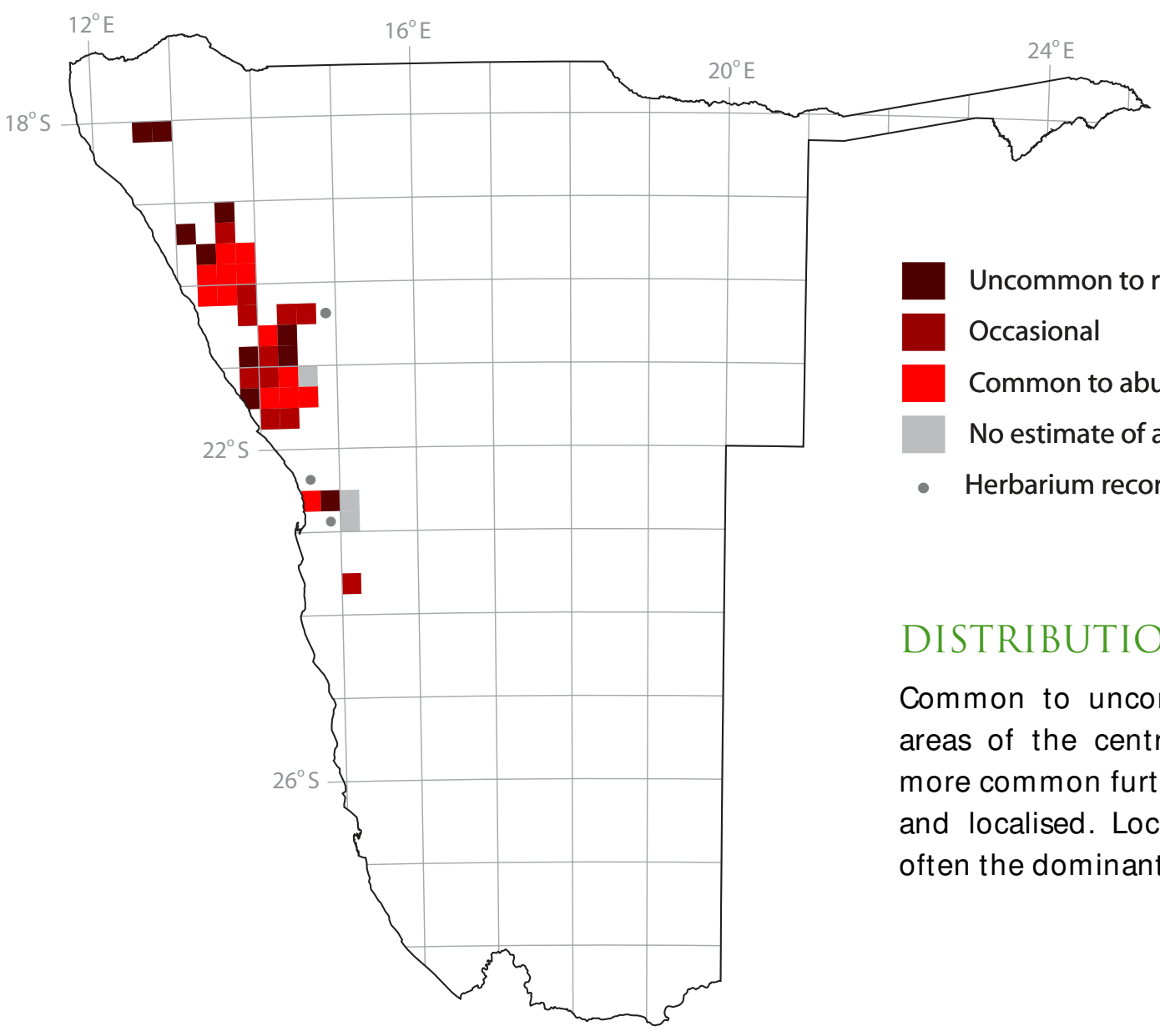
Tweeblaarkanniedood (A); onyanga (H); !kharos (K)

[107 records from 37 (3%) squares]



Short, stocky dwarf tree up to 2 m high and sometimes more than that in diameter, with a thickset, dark grey, rough, fissured trunk and an appearance often described as octopus-like. LEAVES only **two, growing continuously from either side of the trunk; without a petiole; thick, leathery**, yellow-green to dark-green; initially with parallel margins, later splitting, fraying and twisting, giving the impression that the plant has more than two leaves. INFLORESCENCE a **cone**; male (right) and female (left) cones on separate plants.

The cones are easily visible, but the seeds ('Fruit' in annual cycle diagram) are only noticeable if one approaches the plant.

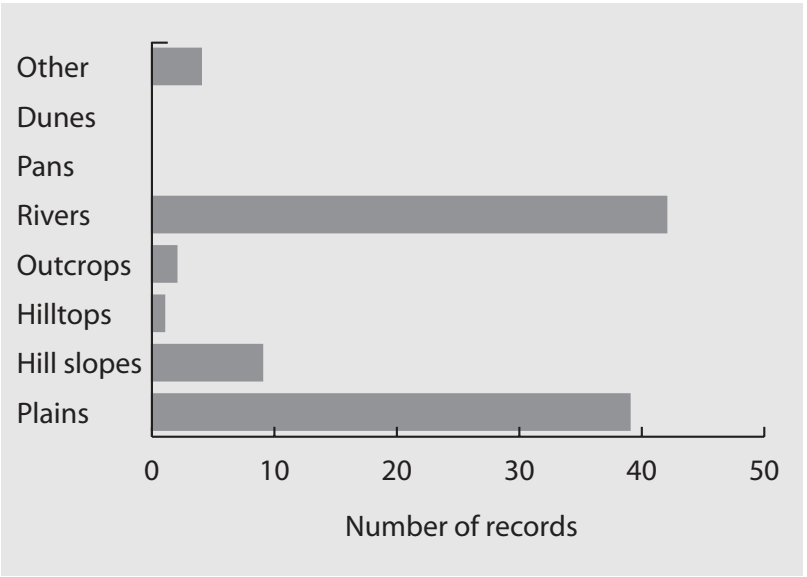


DISTRIBUTION & ABUNDANCE

Common to uncommon in small, disjunct areas of the central and northern Namib; more common further north. Often clumped and localised. Locally abundant in places; often the dominant woody species.

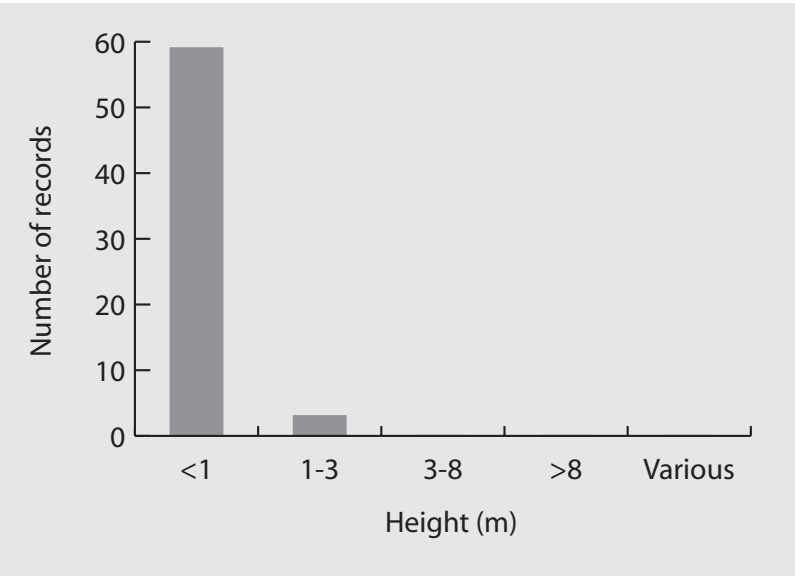
HABITAT

Mostly gravel plains and dry washes, sometimes on lower hill slopes and scree slopes. Always on gravel, stony or rocky ground.



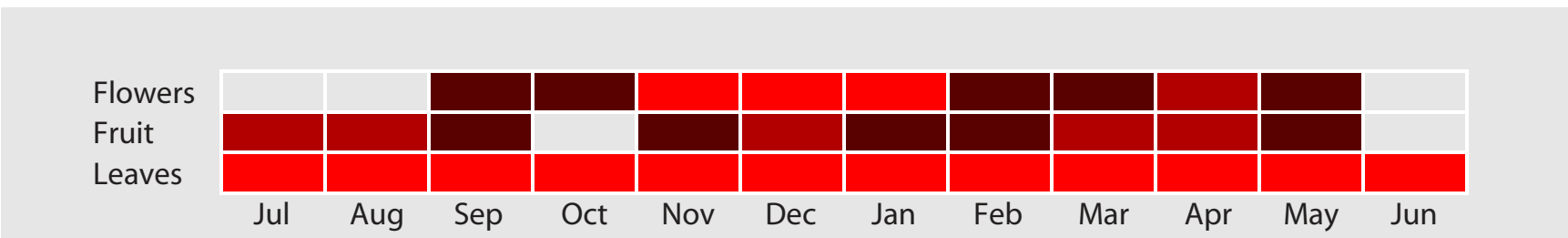
GROWTH FORM

Variously described as a tree or a shrub, the majority being less than 1 m high. Many small plants recorded around Wêreldsend (2013BB).



ANNUAL CYCLE

FLOWERS mainly November to April; young ones recorded in December. FRUIT December to August mostly. LEAVES evergreen.

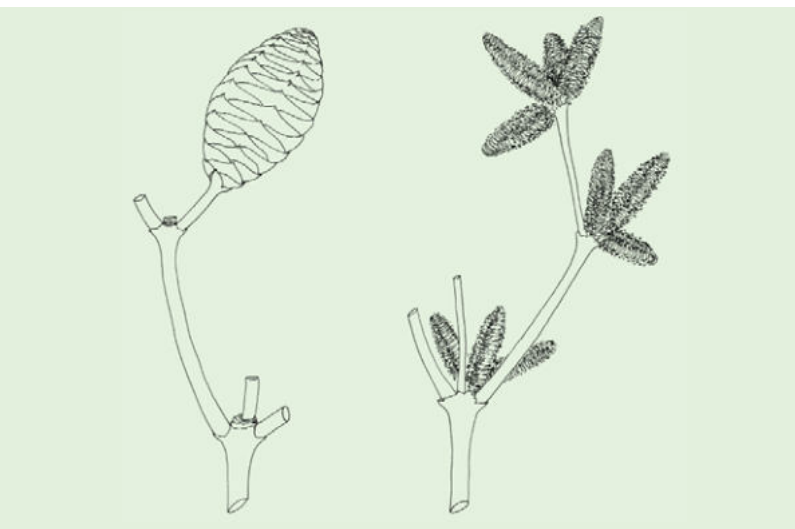


GENERAL

The leaves are eaten by zebra and rhino in times of severe drought, also browsed by domestic goats and donkeys; sometimes the leaves are cut off neatly, other times the flesh is eaten and the fibres are left as long stringy bits on the ends of the leaves. Plant-sucking bugs are always present. In certain areas, seeds are often fungus-infested, which may limit germination success. It was recorded that many leaves had been cut off by river action and many plants uprooted in the Numas Gorge of the Brandberg (GUD1, April 2000). Extensive research has been and continues to be done on this species.

CONSERVATION CONCERNS

Biologically unique, this species is of great economic importance as a tourist attraction. The plants in the Kuiseb River valley near Gobabeb (2315CA) are under serious threat from domestic animals. Endemic to Namibia and southern Angola; protected by the Nature Conservation Ordinance; listed as a CITES Appendix II plant.



Phoenix reclinata

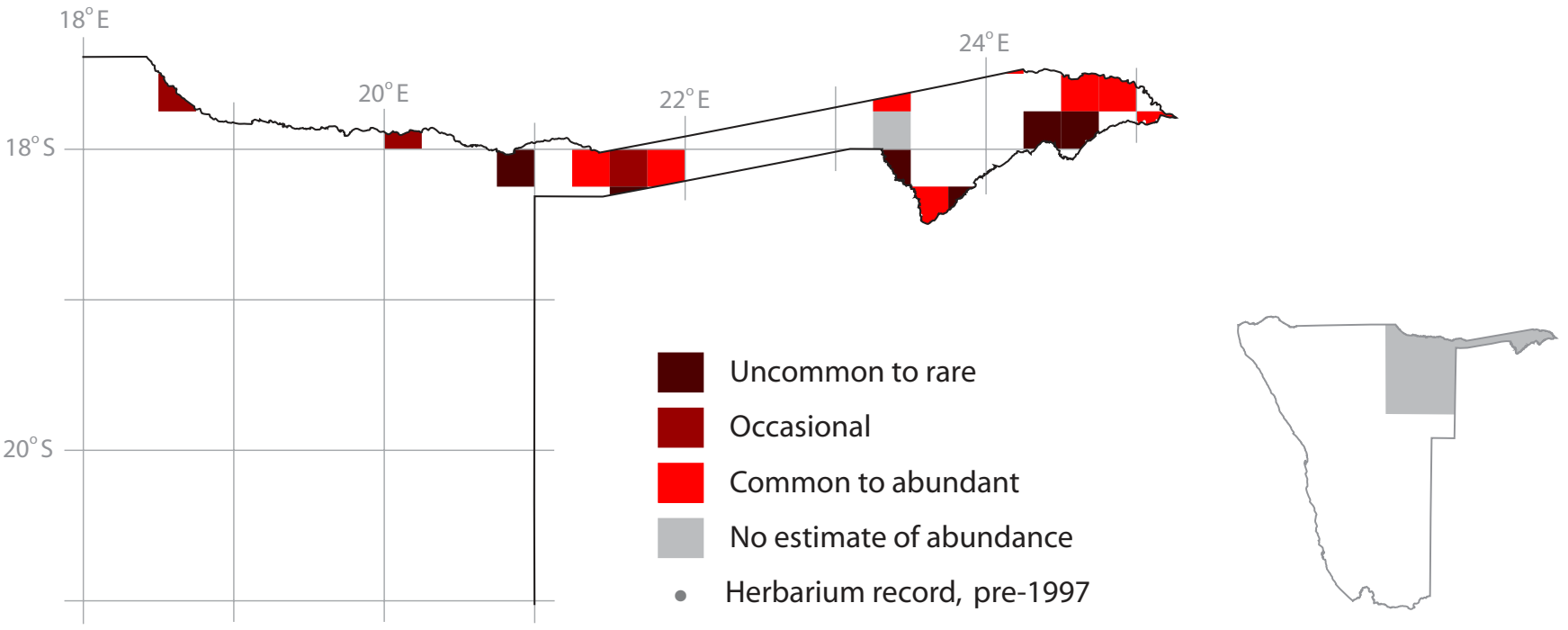
Wild Date Palm

Wildedadelpalm (A); jokarekare (J); sipupa (L); sikereva (Rk)

[36 records from 18 (2%) squares]

Single- or many-stemmed palm. LEAVES with **feather-like shape**, 3–4 m long, mostly clustered at the end of the stem. INFLORESCENCE a large spray; male and female flowers on separate plants. FRUIT ellipsoid, yellow-brown, up to 25 mm long, resembling a cultivated date, but smaller and less fleshy.



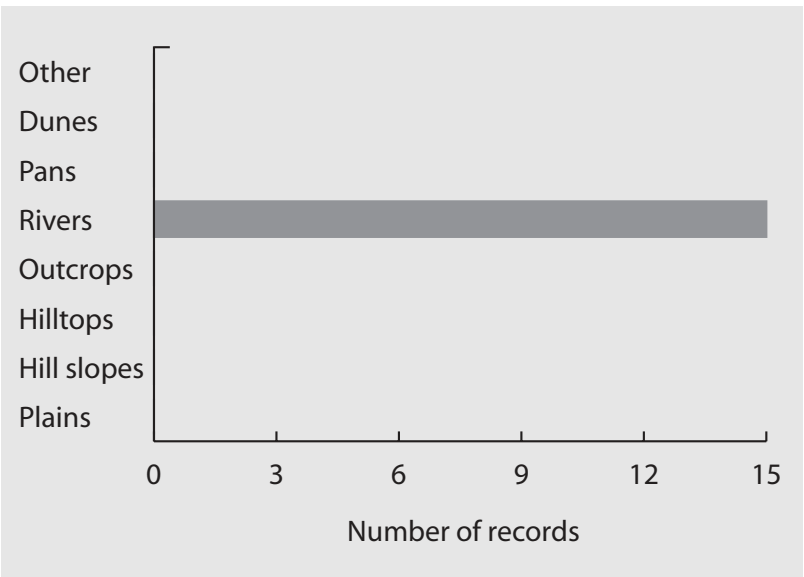


DISTRIBUTION & ABUNDANCE

Common along all the rivers in eastern Caprivi; uncommon to common to locally abundant along the eastern section of the Okavango River; uncommon along the western Okavango.

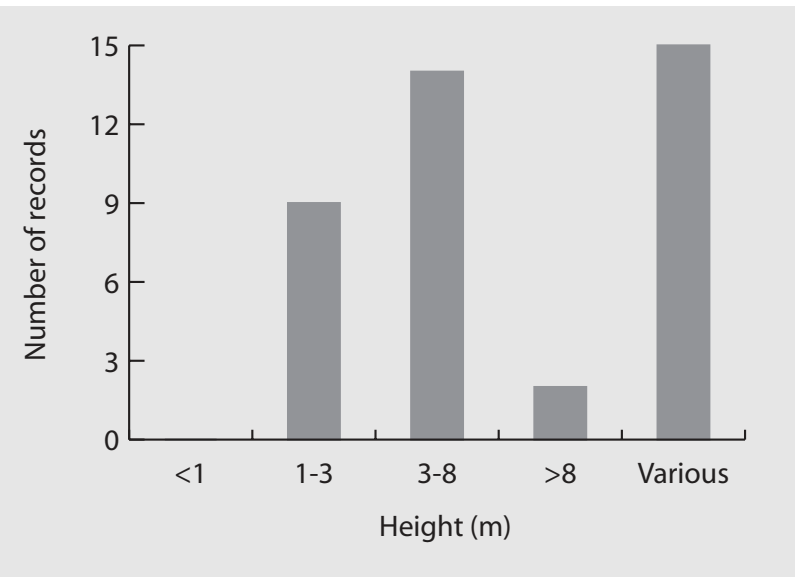
HABITAT

On river banks in areas of riverine forest, as well as on floodplains in eastern Caprivi.



GROWTH FORM

A tree of up to 8 m high, occasionally higher in eastern Caprivi; many young plants, especially along the Okavango.



ANNUAL CYCLE

FLOWERS a few records September and December. FRUIT some records November to March. LEAVES evergreen.

GENERAL

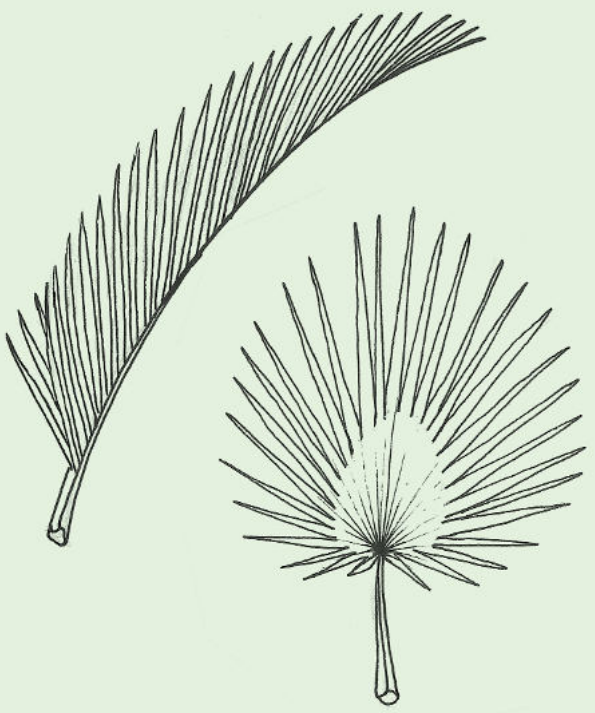
The fruit is edible. The leaves are used to weave baskets; an alcoholic beverage is made from the sap. As *P. reclinata* grows easily from seed, transplants easily and makes an attractive, evergreen garden plant, it has horticultural potential.

CONSERVATION CONCERNS

Threatened by habitat destruction along river banks, especially those of the Okavango River.

ARECACEAE (PALMAE) | PALM FAMILY

This is a large, ancient, mainly tropical family of very distinctive tall, slender, generally unbranched trees or shrubs. All have extremely large, leathery, fibrous leaves which are palmately or pinnately compound, with the leaflets folded along the midrib. As monocotyledons, they lack the secondary thickening found in the dicotyledons, thus their trunks are soft and fibrous inside. Flowers are generally small, unisexual, in large sprays, with male and female on separate plants. Fruits usually have a fleshy outer layer, enclosing one to many seeds. There are a number of economically important products, such as the coconut, (*Cocos nucifera*), date (*Phoenix dactylifera*), African oil palm (*Elaeis guineensis*) and raffia fibres (*Raphia* spp.).



Hyphaene petersiana

= Hyphaene benguellensis
= Hyphaene ventricosa

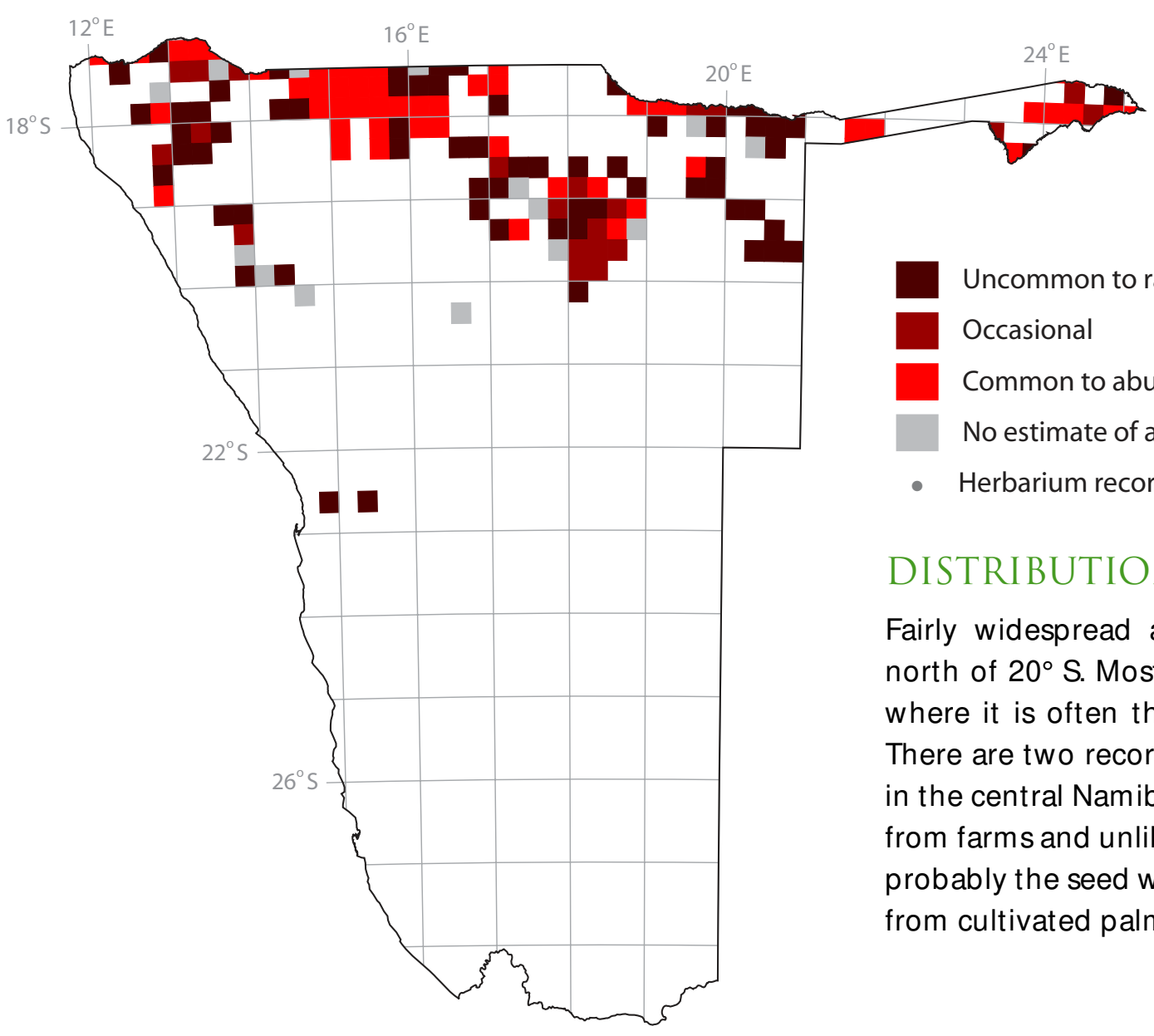
Makalani Palm

Omulunga (H,O); epokola (Ok); mbare (T)

[472 records from 163 (15%) squares]



Single- occasionally many-stemmed palm. STEM often slightly swollen in the middle or upper section. LEAVES large, **fan-shaped**; petiole up to 1 m long, armed with sharp, black thorns. INFLORESCENCE up to 1 m long; male and female flowers on separate plants. FRUIT **a spherical brown nut, c. 50 mm in diameter**; seed single, with exceptionally hard ivory-coloured layer known as 'vegetable ivory'.

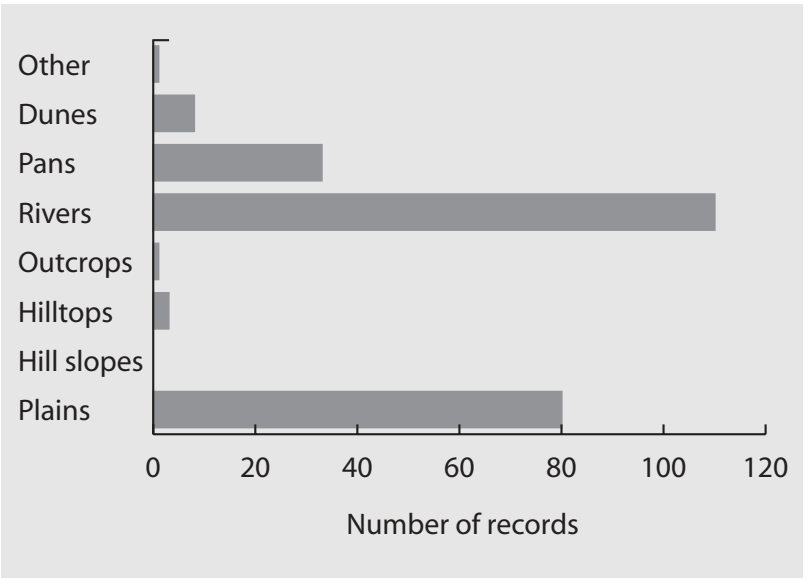


DISTRIBUTION & ABUNDANCE

Fairly widespread across northern Namibia, north of 20° S. Most abundant in the Cuvelai where it is often the dominant tree species. There are two records from the Swakop River in the central Namib Desert, which were away from farms and unlikely to have been planted; probably the seed was washed down the river from cultivated palms further upstream.

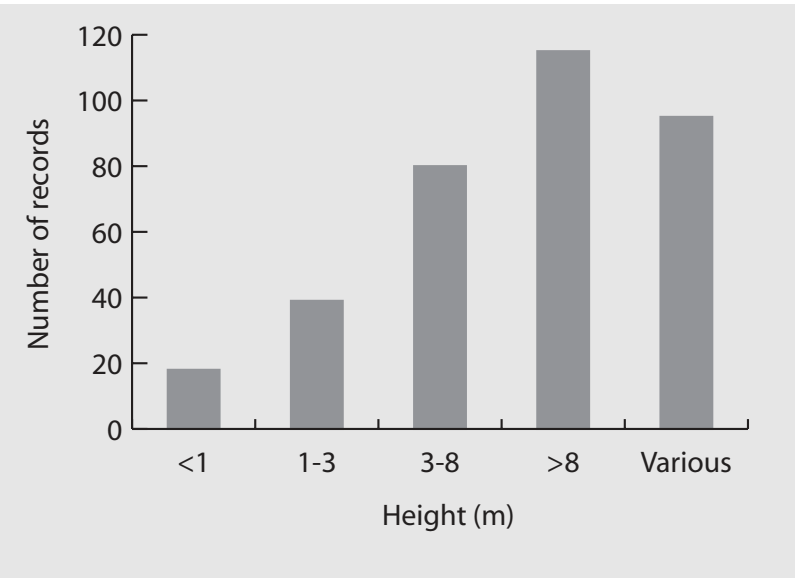
HABITAT

Various, but mostly on sandy plains. Associated with rivers and floodplains in the north-west and north-east, and pans and oshanas in the Cuvelai.



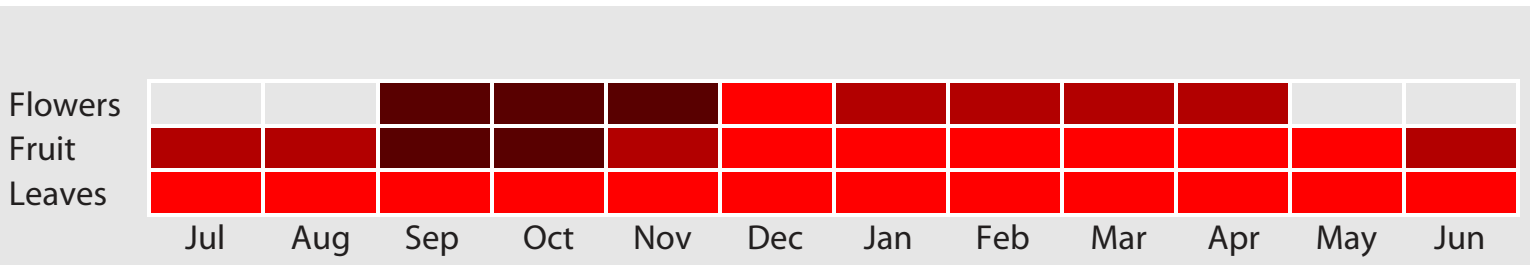
GROWTH FORM

Mostly a tree of 3 m to over 8 m high, but shrubby forms less than 3 m. Many young plants recorded.



ANNUAL CYCLE

FLOWERS September to April, but mostly December. FRUIT throughout the year, but mostly December to May. LEAVES evergreen.



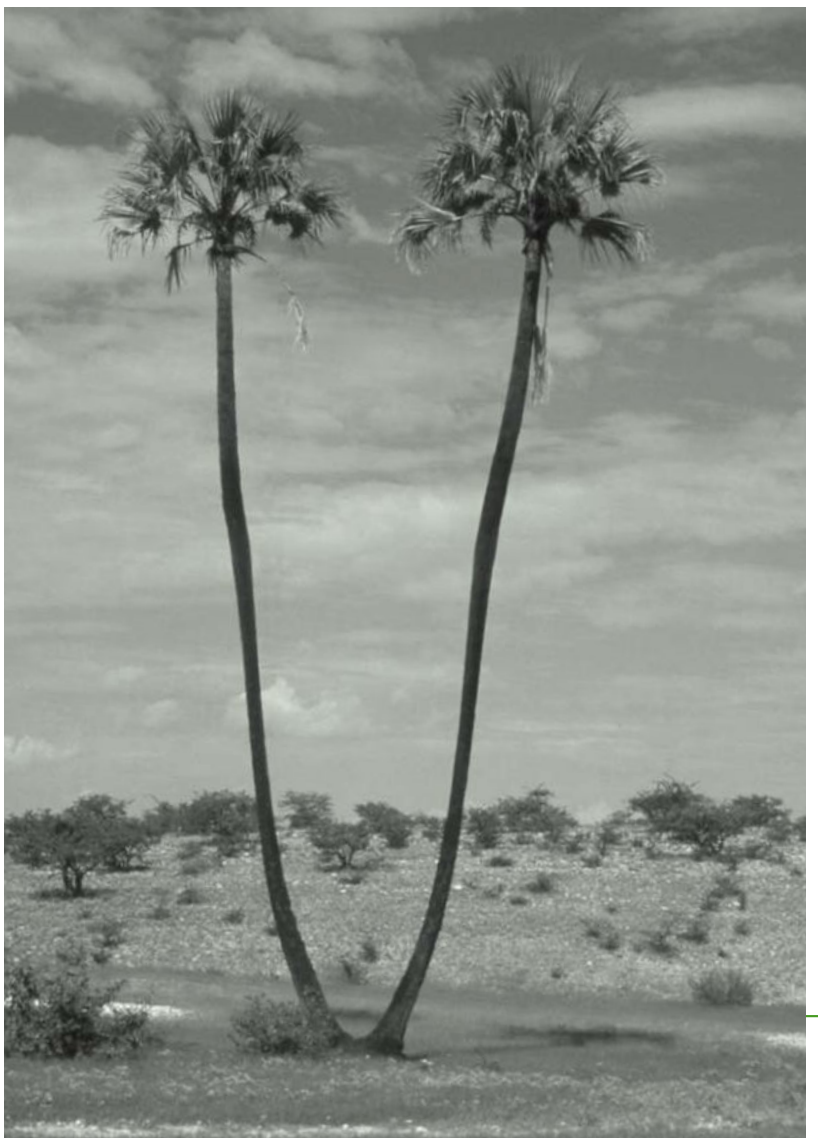
GENERAL

All parts of this species are used in a variety of ways, and only those uses recorded by atlassers have been listed here. The seeds are used extensively for carving souvenirs for the tourist industry. Elephants eat the fleshy layer of the fruit. People in the north tap the trees for sap from which they make an alcoholic beverage. The leaves are used for a variety of purposes; threads are stripped from the edges to use as dental floss.

CONSERVATION CONCERNS

Although heavily exploited, *H. petersiana* has good regenerative abilities and there are plenty of young plants around. Nevertheless, it should be monitored as extensive harvesting of nuts in some areas may have an effect on recruitment in the future.

Hyphaene petersiana, Kaokoveld, B. Curtis



Aloe dichotoma

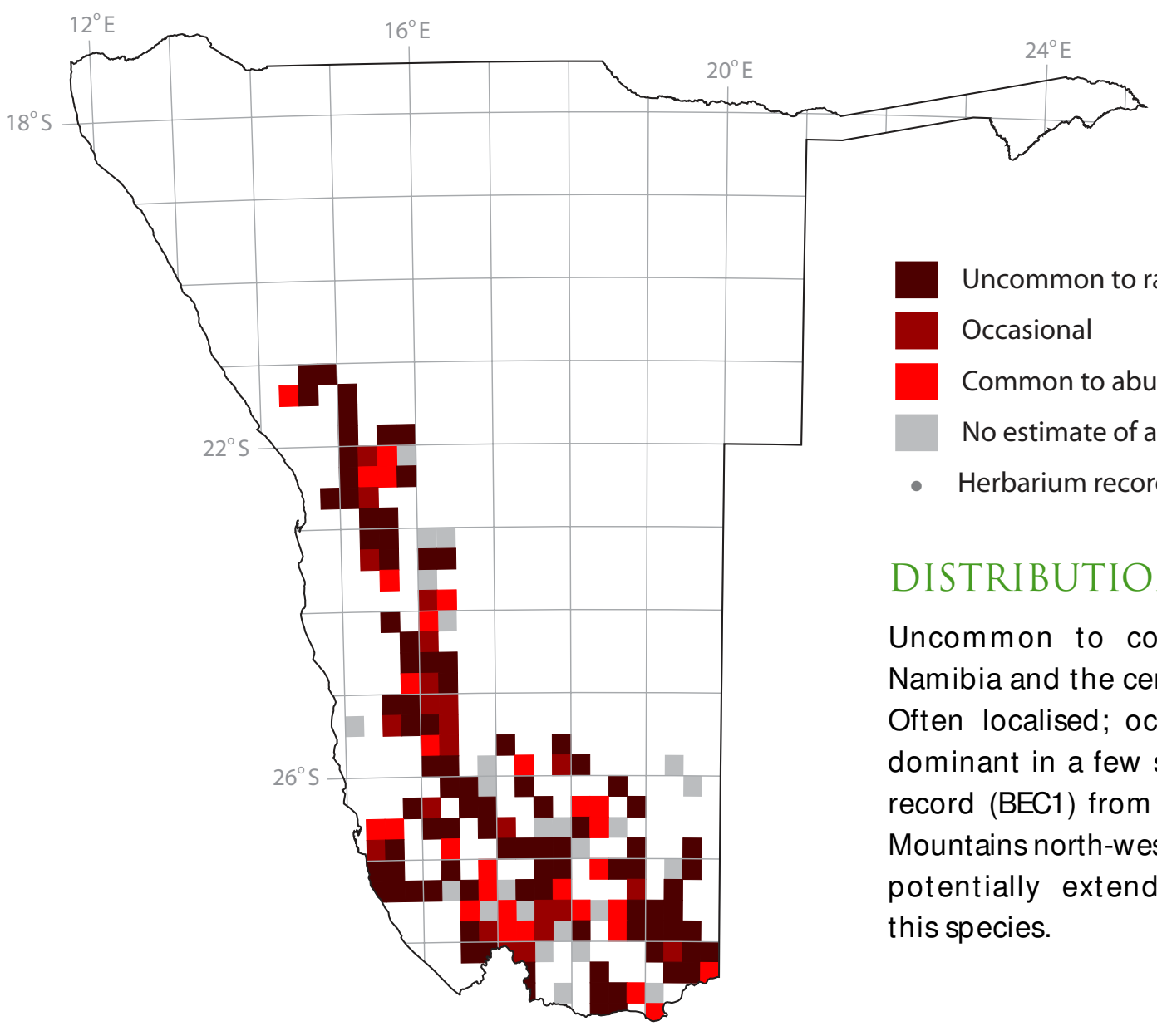
Kokerboom

Quiver tree (E); Köcherbaum (G); ||garas (K)

[397 records from 173 (16%) squares]



Single-stemmed tree, branching repeatedly into two to form a dense crown; usually sturdy. STEM succulent. BARK smooth and grey; older stem pale to deep yellow, rough, splitting and peeling in segments. LEAVES simple, succulent, in terminal rosettes; large, oblong, boat-shaped, grey-green to brown-green. FLOWERS tubular, bright yellow, on woody stalks carried above the leaf rosette.



DISTRIBUTION & ABUNDANCE

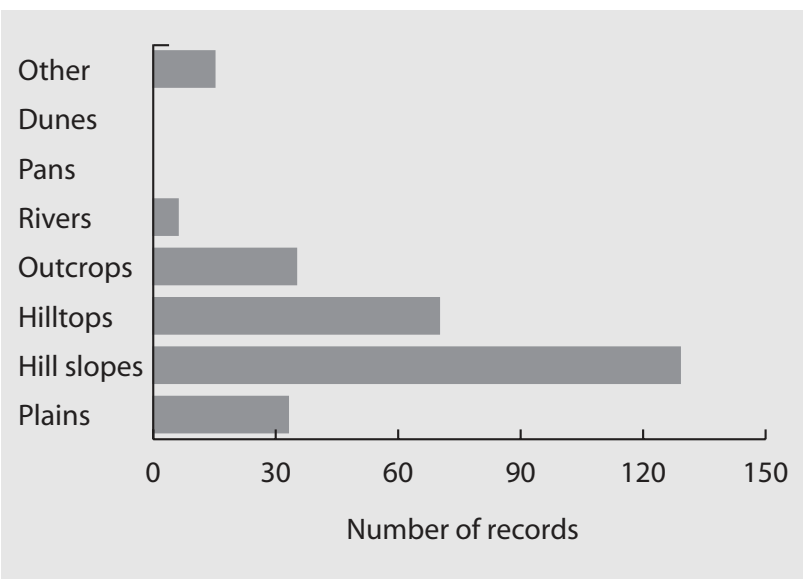
Uncommon to common across southern Namibia and the central-western escarpment. Often localised; occasionally abundant and dominant in a few squares in the south. One record (BEC1) from the slopes of the Paresis Mountains north-west of Otjiwarongo (2016AD), potentially extends the known range of this species.

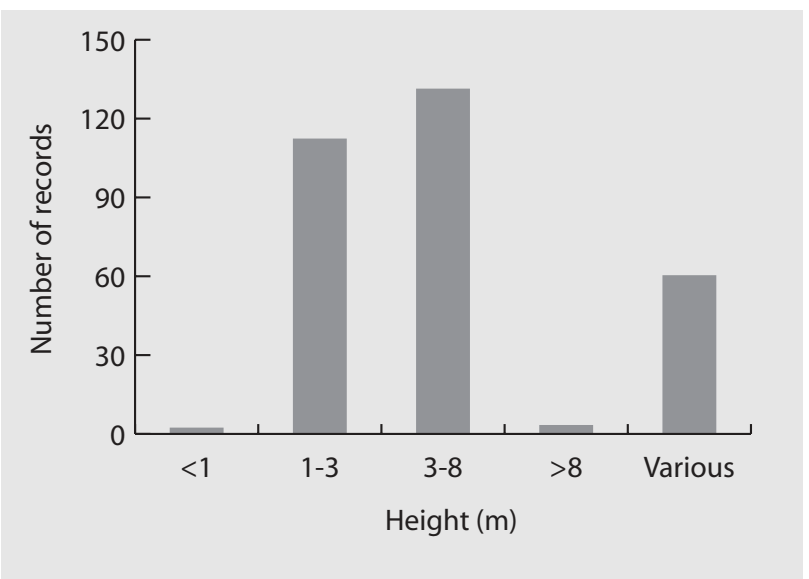
HABITAT

Rocky hillslopes and hilltops mainly, but also rocky outcrops and plains; sometimes on rocky outcrops in dunes, but never on sand.

GROWTH FORM

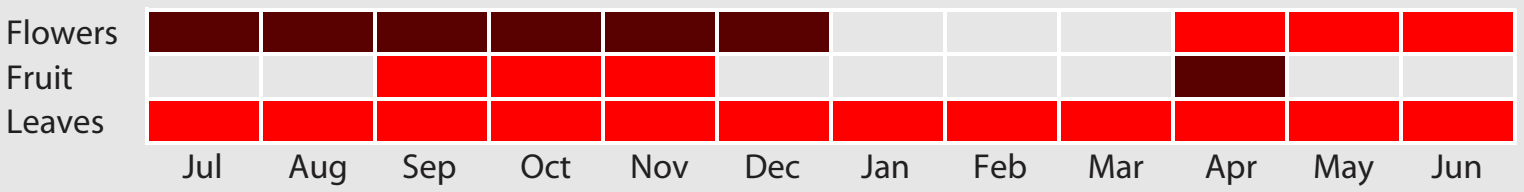
Always a tree; generally 1–3 m, often 3–8 m, rarely over 8 m high. One exceptional, 6 m tall individual was recorded from the Usakos area (2115DC) with a trunk circumference of 6.3 m, a diameter of 2.3 m at the base, and a crown diameter of about 7 m (FRI2).





ANNUAL CYCLE

FLOWERS mainly April to June, but occasional records up until December. FRUIT September to November. LEAVES are present all year.



GENERAL

Many dead and dying plants were noted in 2717DC and 2615BD, but lots of young were noted in 2615CB. These plants are sometimes susceptible to scale insect. Old branches are used as quivers for arrows. Sociable Weavers often make nests in the trees, and woodpeckers nest in the trunk. Sheep eat the dry leaves on the ground. This species is very popular with the horticultural trade.

CONSERVATION CONCERNS

The lack of young trees is a concern, as is the removal of mature plants for gardens. A recent study made on the health of the Namibian *Aloe dichotoma* population concluded that it might be susceptible to climate change (Foden 2002). Protected by the Nature Conservation Ordinance and listed as a CITES Appendix II species.

Aloe littoralis

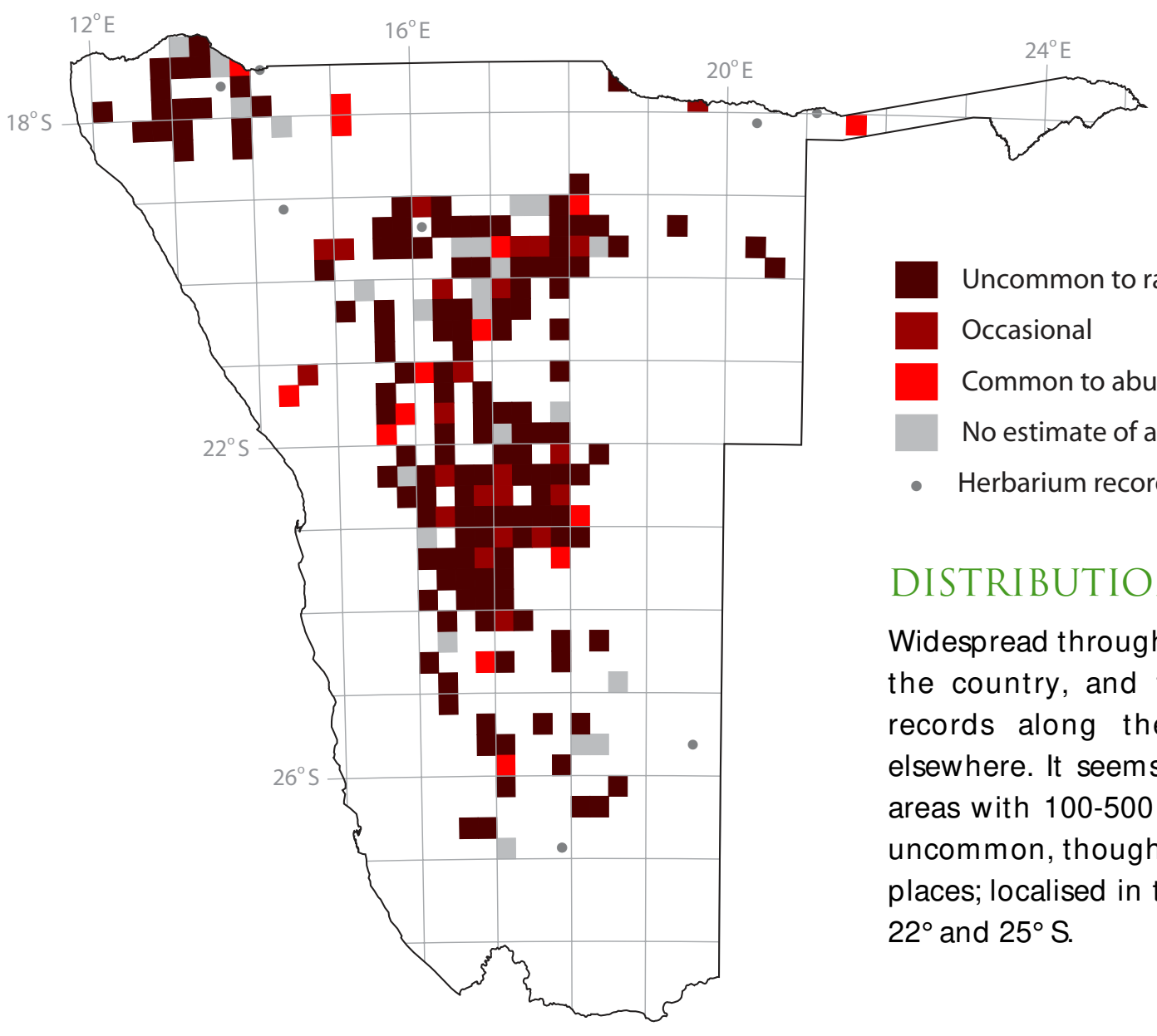
Windhoek Aloe

Bergaalwyn (A); otjindombo (H)

[483 records from 202 (19%) squares]



Single-stemmed. STEM **partly covered with old leaves and leaf remains.** LEAVES simple, succulent, in a large terminal rosette; lanceolate, broad at bases then tapering boat-like to a narrow tip, up to 0.7 m long and 30 mm thick; green to brown- green, **sometimes with small light blotches, especially when young**; margin with strong, brown teeth. INFLORESCENCE a branched, erect spray, up to 1.2 m long. FLOWERS **pale red to deep red with yellow tips**, tubular. FRUIT a capsule. SEEDS small, black, winged and papery.

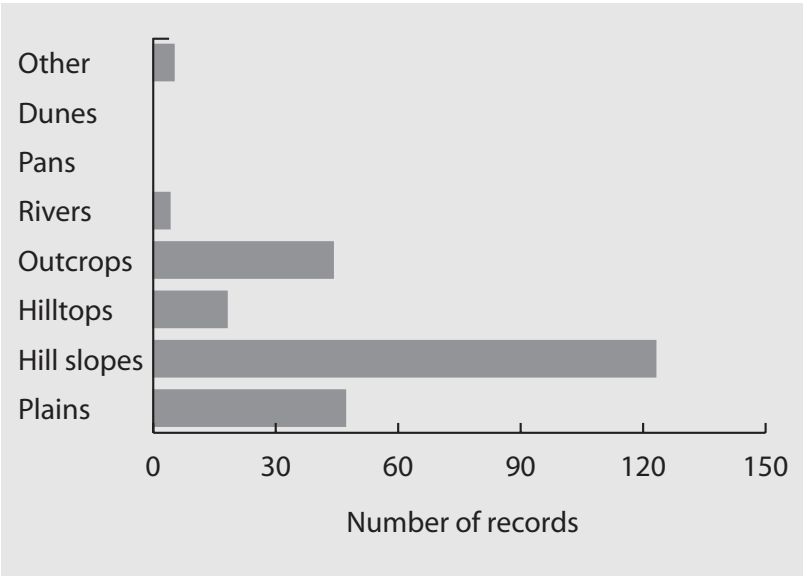


DISTRIBUTION & ABUNDANCE

Widespread throughout the central interior of the country, and the north-west; isolated records along the Okavango River and elsewhere. It seems to be confined to rocky areas with 100-500 mm of rainfall. Generally uncommon, though common to abundant in places; localised in the central areas between 22° and 25° S.

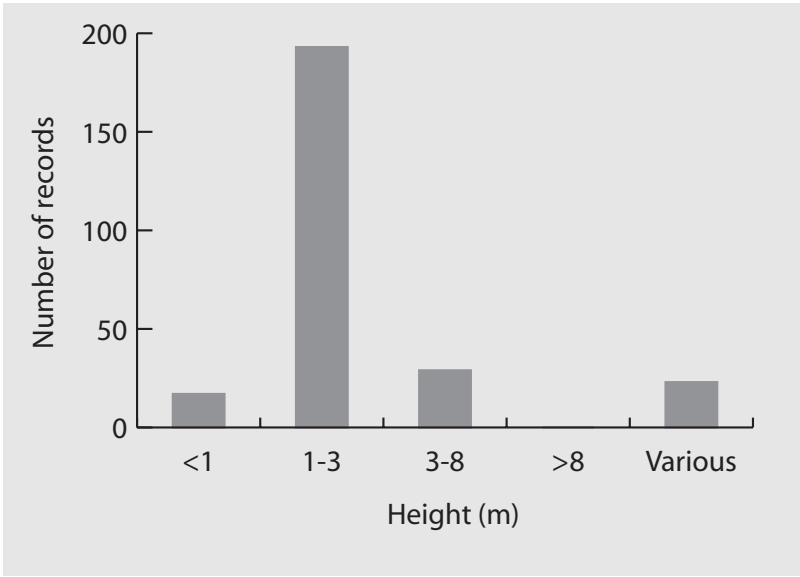
HABITAT

Found in a variety of habitats – most often on hillsides, but also on plains, rocky outcrops and hilltops. It was found on stony or rocky substrates, sometimes calcrete and only once on clay; never on sand.



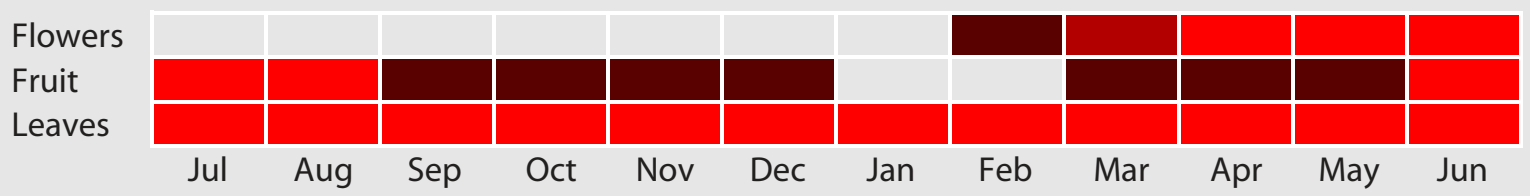
GROWTH FORM

Mostly a 'tree', 1–3 m high; occasionally 3–8 m high, north of 23° S.



ANNUAL CYCLE

FLOWERS sometimes appearing in February, but mainly April to June, with single records in October and November. FRUIT mostly June until August. LEAVES are present all year.



GENERAL

Often in localised, dense stands. Susceptible to white scale and gall formation; the flowers are sometimes infested with insects. Baboons do great damage to the plants in periods of drought. In the National Botanic Garden, Windhoek, dassies (rock hyrax) climb up the plants to eat the leaves and flowers, often damaging the growth points. Of horticultural potential as it is drought resistant and grows easily from seed. Whole plants can be transplanted. Also called mopane aloe (GAR1, 1918DA).

CONSERVATION CONCERNS

Potentially threatened by the pachycaul trade. Protected by the Nature Conservation Ordinance and listed in CITES Appendix II.

Flowering patterns *Continued overleaf*

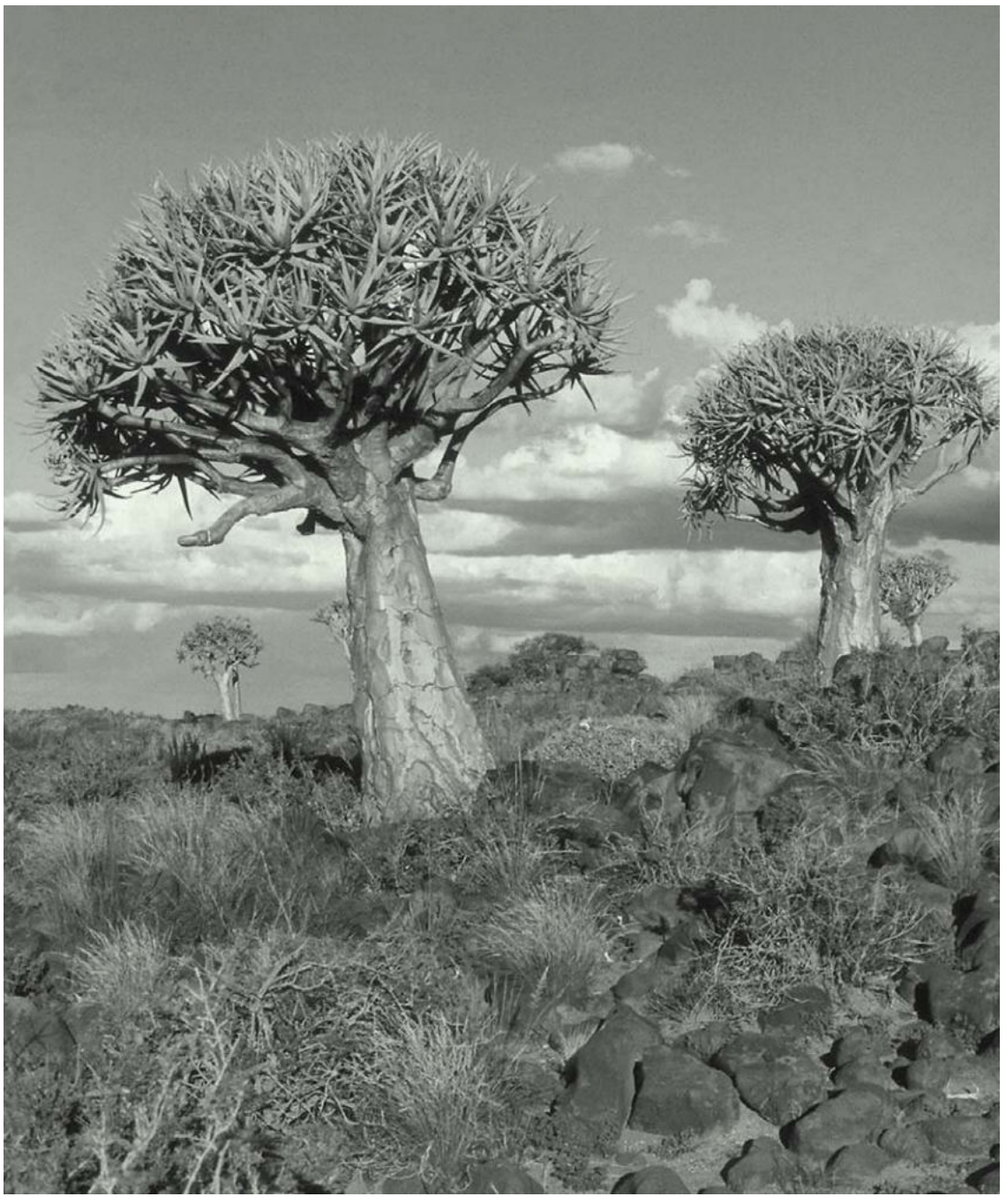
Flowering patterns of *Aloe littoralis*

Müller & le Roux's field guide to trees and shrubs of Namibia (Mannheimer & Curtis in prep.) says that flowering occurs in December/January in the south, March/April in the central parts and June/July in the north. Our flowering data were too few to really confirm or disprove this. There were no observations of any kind of *A. littoralis* in December/January in the south, but flowering was recorded for February/March. Flowering peaked in March in the central areas. In the north, there were no records at all for June, and only one record for July, for which flowering was noted. In the north-west most flowering was recorded for April/May.

ALOACEAE (ASPHODELACEAE) | ALOE FAMILY

The only representatives of this family in Namibia belong to the genus Aloe, which was formerly placed in the Liliaceae (lily family) and is widely represented. All aloes have rosettes of large succulent leaves, often with spiny margins. Most have very short stems since, as monocotyledons, they lack the secondary thickening needed to support large trunks. Despite this lack of secondary thickening, there are five tree or shrub-like species in Namibia, of which three have extremely restricted distributions.

Aloe dichotoma, B. Curtis



Aloe ramosissima, above.
Aloe pearsonii, below, E. Ellinger



Aloe pearsonii

Pearson's Aloe

[4 records from 2 squares]

Shrub with many unbranched stems arising from the ground; usually about 1 m tall, and about 0.5 m in diameter. LEAVES often flushed red-brown, decussate, curving downward and overlapping the leaf below; arising from near the ground; margin toothed.

Only recorded by TAP from two squares (2716DD and 2816BC) in the extreme south-west, but there are older herbarium records from an additional four squares. Common to locally abundant where they occur, but overall uncommon in any square. Generally crowded together on rocky hill slopes, hilltops and rocky outcrops. Evergreen with FLOWERS in December and January. FRUIT not recorded.

CONSERVATION CONCERNS

Threatened by succulent collectors, mining and low recruitment. Assessed as 'near threatened' according to the latest IUCN criteria (Loots 2005); protected by the Nature Conservation Ordinance; listed in CITES Appendix II.

Aloe pillansii

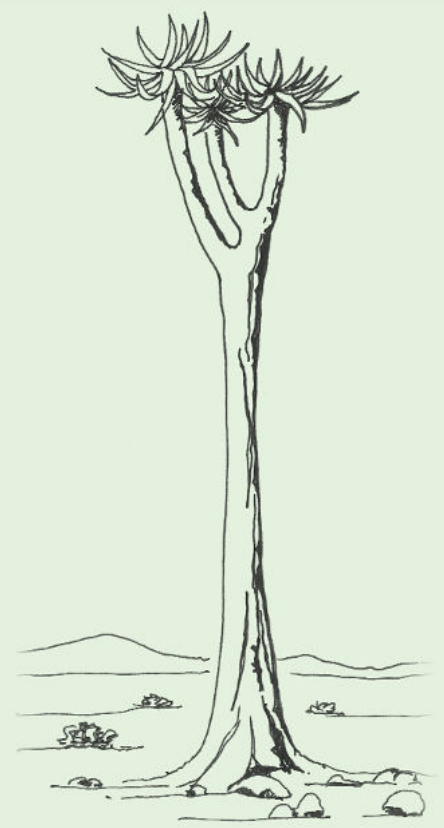
Giant Quiver-tree

Reusekokerboom (A)

[6 records from 1 square]

Tree with slender appearance. BARK pale grey to brown-yellow, rough, fragmenting into large pieces with smooth portions in between. LEAVES simple, succulent, in terminal rosettes; 500-600 mm long, encircling the stem; drooping with age. INFLORESCENCE much-branched, **hanging below the leaf rosette**. FLOWERS pale to bright yellow.

May be confused with *A. dichotoma*, especially when young.



Confined to one square just north of the Orange River (2716DD), with an earlier herbarium record from the adjacent square. Generally uncommon, but locally common on one farm. Found on rocky hill slopes and hilltops; occasionally on plains and sometimes scree slopes. Always a tree; usually 1-8 m high, once recorded >8 m high, but up to 15 m high according to herbarium records. Evergreen. FLOWERS and FRUIT recorded in September and November.

CONSERVATION CONCERNS

Threatened by collection for fuel wood and by mining activities. Assessed as 'endangered' according to the latest IUCN criteria (Loots 2005); protected by the Nature Conservation Ordinance; listed on CITES Appendix 1.

Aloe ramosissima

Boskokerboom

Maiden's quiver-tree (E);
nooienskokerboom (A)

[39 records from 13 (1%) squares]



Much-branched from near the base. STEM **normally very short**, succulent; longer-stemmed and less branched in more arid areas. LEAVES simple, succulent, in terminal rosettes; narrow, 150–200 mm long, brownish-green, margin with small teeth; base encircling the stem. INFLORESCENCE erect. FLOWERS bright yellow, tubular; conspicuous.

This species has recently been incorporated into *Aloe dichotoma* (Germishuizen & Meyer 2003), which it greatly resembles, but we have left it as a separate species since it has such a distinctive growth form and distribution.

See back cover for photo.

DISTRIBUTION & ABUNDANCE

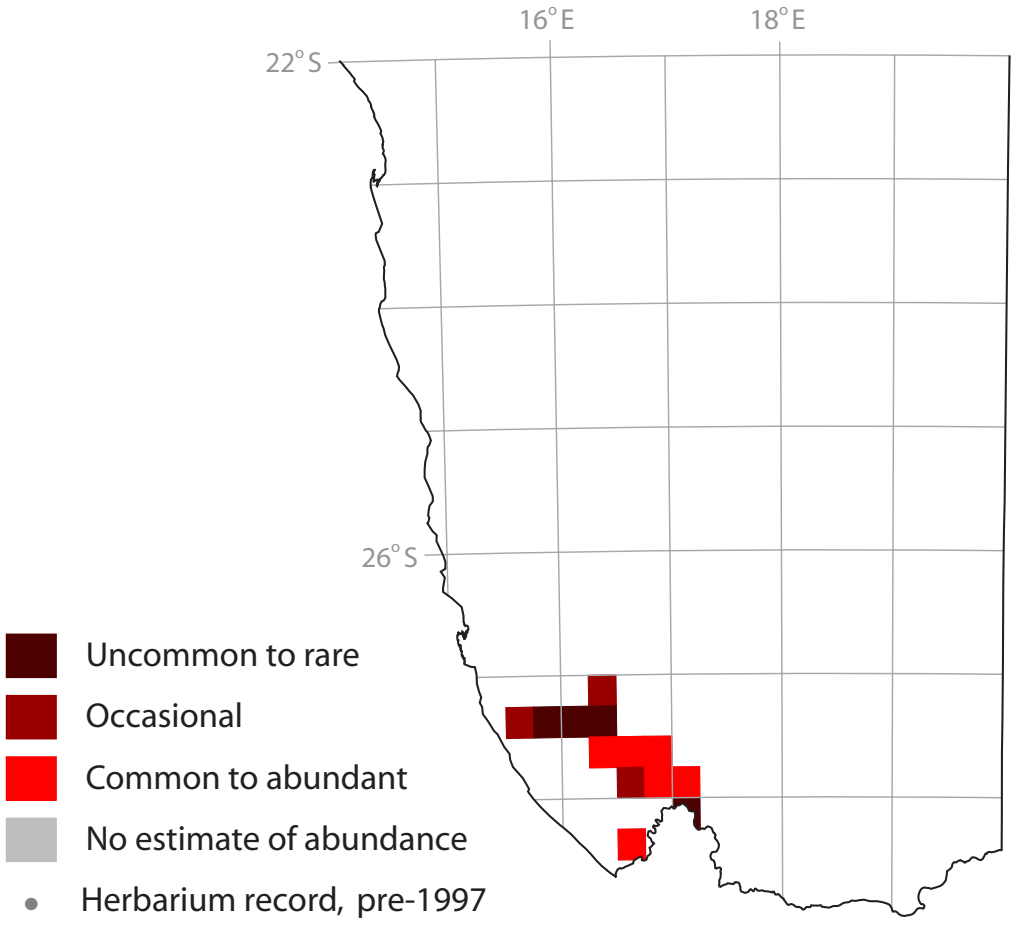
Widespread within its range in south-western Namibia. Uncommon in the west, common to locally abundant in the east; localised in some squares.

HABITAT

Rocky hill slopes, hilltops and rocky outcrops; a few on the plains or valley floor.

GROWTH FORM

A shrub or tree, usually in the 1–3-m height class.



ANNUAL CYCLE

FLOWERS September, from only one TAP record; March, June, July and September from herbarium records. FRUIT September and April. LEAVES evergreen.

GENERAL

Often damaged by baboons. Horticultural potential for dry gardens.

CONSERVATION CONCERNS

Threatened by the pachycaul trade and mining. Assessed as 'least concern' according to the latest IUCN criteria (Loots 2005); protected by the Nature Conservation Ordinance; listed on CITES Appendix II.

Morella serrata

= Myrica serrata

Lance-leaved Waxberry

[3 records from 2 squares]

Shrub or small tree. LEAVES simple, narrowly elliptic, **aromatic; yellowish-green with conspicuous golden glands below**. FLOWERS minute, without petals or sepals. FRUIT a spherical berry, *c.* 4–6 mm in diameter; navy-blue to black with a whitish, waxy coating when ripe.

Recorded as common on the river bank in the Popa Falls/Mahango Game Reserve area of the Okavango River (1821BA) and on the Kwando River (1723CB) by only two atlassers, suggesting that it was either confused with something else by other atlassers or it is only very locally common (22 sheets were submitted from eleven atlassers for 1821BA). Earlier herbarium records are from both of these squares plus one more in eastern Caprivi. A shrub or tree, mostly in the 1–3 m height class, but also over 3 m. FLOWERS recorded in December, January and July. FRUIT recorded in January, March, April and June.

Trema orientalis

Pigeonwood

[2 records]



Deciduous shrub or tree up to 4.5 m high. LEAVES simple, narrowly ovate, twice as long as broad; dark green and rough above; pale green with silver down below. FLOWERS small, green; petals absent. FRUIT a round, black berry.

Earlier herbarium records are from a locality in the north-west – near a spring in the Kapupa River on the south side of the Otjihipa Mountains (1712BC) – and from a number of localities in the Erongo Mountains, but most often from farm Ameib in 2115DC. Was found on Ameib by the Botanical Society, but no atlassers visited any of the other farms on which this species was previously recorded. Thus, it is possible that it still occurs on these farms.

A single specimen (SWA3/165) from the Omuvanda Mountains, just south of the Kunene River (1713AA) was brought in as the Tree Atlas was going to press.

Assessed as 'least concern' according to the latest IUCN criteria (Loots 2005).

In strict taxonomic order, these two families should come after Salicaceae.

Salix mucronata

Wild Willow

Wilgerboom (A); Kapweide (G); omurambandu (H); maandumuka (L)

Graceful shrub or tree with **drooping branches**. LEAVES simple, green above, grey-green to silvery below; margin entire to finely serrate. INFLORESCENCE an axillary spike; male and female flowers on separate plants. FLOWERS inconspicuous; female flowers green; male flowers with yellow stamens. SEED bears a **silky hair tuft** for wind dispersal.

There are two subspecies in Namibia, with distinctly different leaf sizes and shapes and different distributions.

S. mucronata subsp. *mucronata*

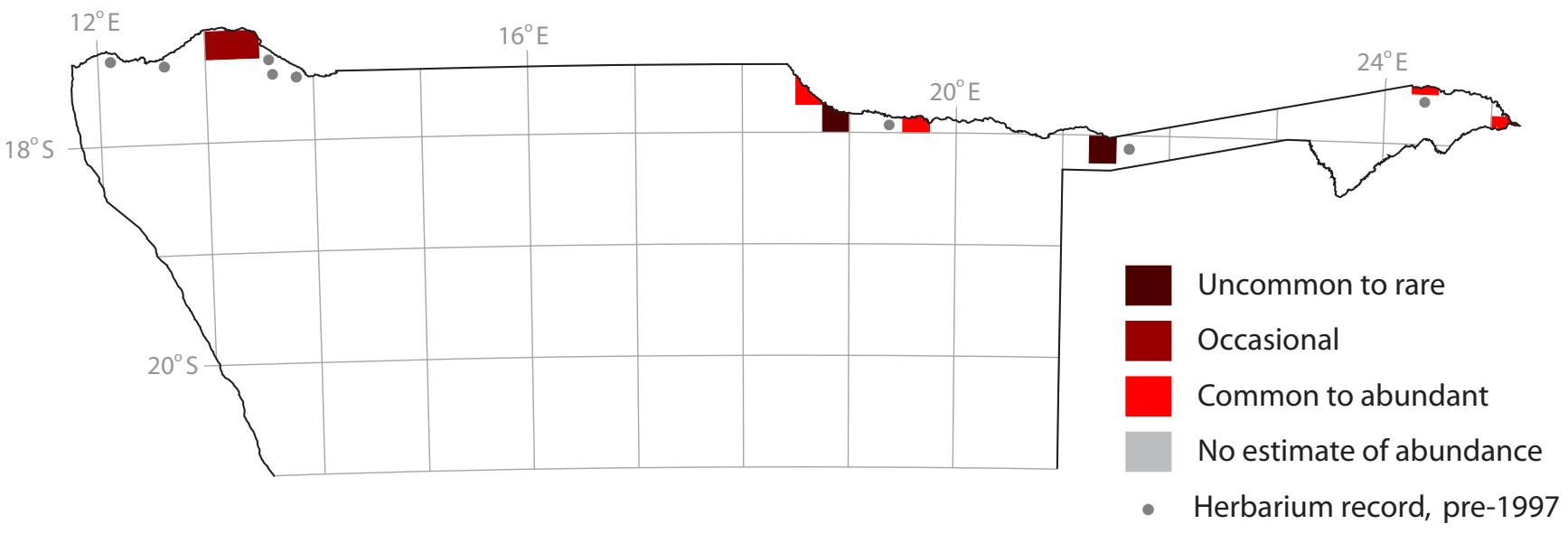
= Salix subserrata

Safsaf Willow

[13 records from 9 (<1%) squares]



Generally shorter than subsp. *capensis*; up to 4 m high. LEAVES narrowly ovate to broadly lanceolate to oblanceolate; **12–30 mm wide and 3–5 times longer than wide**, petiole often reddish.



In strict taxonomic order, this should come before Myricaceae and Celtidaceae.

DISTRIBUTION & ABUNDANCE

Occasional along the Kunene and Okavango rivers; locally common along the Zambezi River. Apparently absent from the Kwando-Linyanti system.

HABITAT

The banks and islands of perennial rivers.

GROWTH FORM

Mostly a tree in the 3–8-m height class, but higher on Impalila Island; sometimes a shrub of 1–3 m.

ANNUAL CYCLE

FLOWERS recorded in August, October, December, March, May and June. FRUIT recorded in March and September. LEAVES evergreen.

CONSERVATION CONCERNS

The lack of TAP records from the lower Kunene River could be as a result of the loss of this species or due to lack of recording, and is worth further investigation. The species could be adversely affected by further damming of the Kunene River. Protected by forestry legislation.

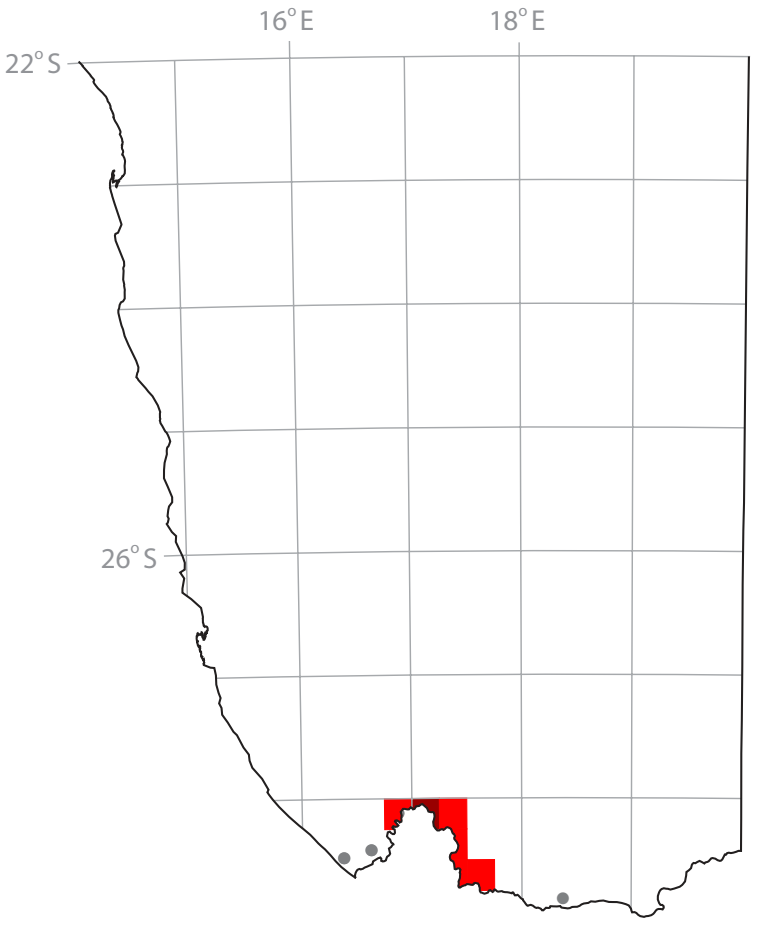
S. mucronata subsp. *capensis*

Small-leaved Willow

[21 records from 8 (<1%) squares]



Generally over 8 m high. LEAVES narrowly lanceolate, **less than 15 mm wide and more than five times longer than wide**.



DISTRIBUTION & ABUNDANCE

Abundant along the lower Orange River.

HABITAT

The banks and islands of perennial rivers.

GROWTH FORM

A tree of up to 8 m tall and over, often shrub-like.

ANNUAL CYCLE

FLOWERS September to February. FRUIT September to November. LEAVES evergreen.

CONSERVATION CONCERNS

Potentially threatened by the increase in wood collection along the river due to new commercial developments. Protected by forestry legislation.

MORACEAE | FIG AND MULBERRY FAMILY

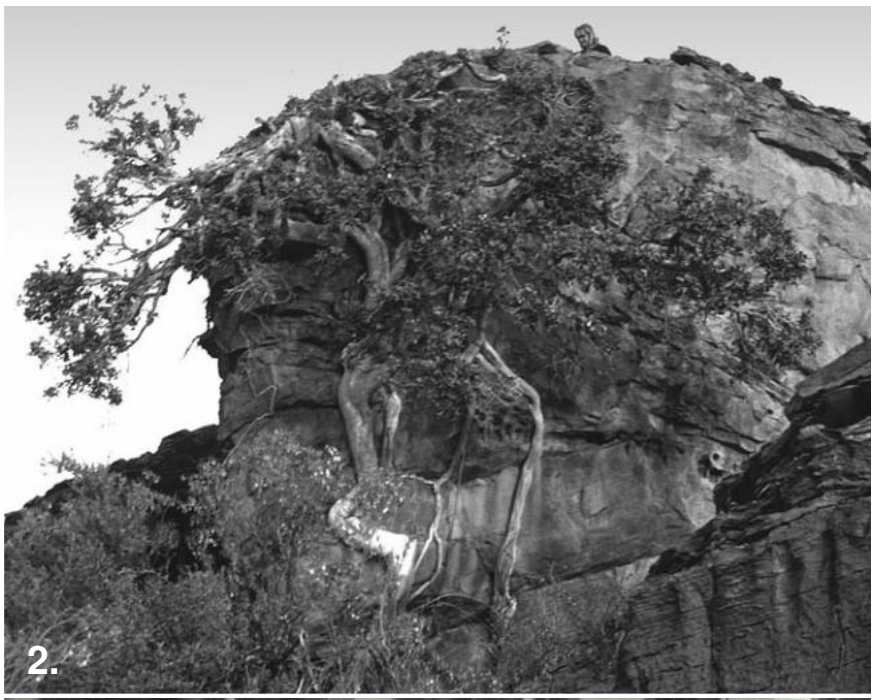
A widespread tropical and subtropical family of trees and shrubs characterised by milky latex and a conspicuous conical stipule that covers the apical bud (growing tip) and leaf buds. The flowers are tiny, lacking petals and sepals, generally unisexual, and usually clustered together on a fleshy receptacle. The fruit are mostly compound, fleshy berries. Well-known members are the mulberry (*Morus* spp.), fig (*Ficus* spp.) and rubber tree (*Ficus elastica*).

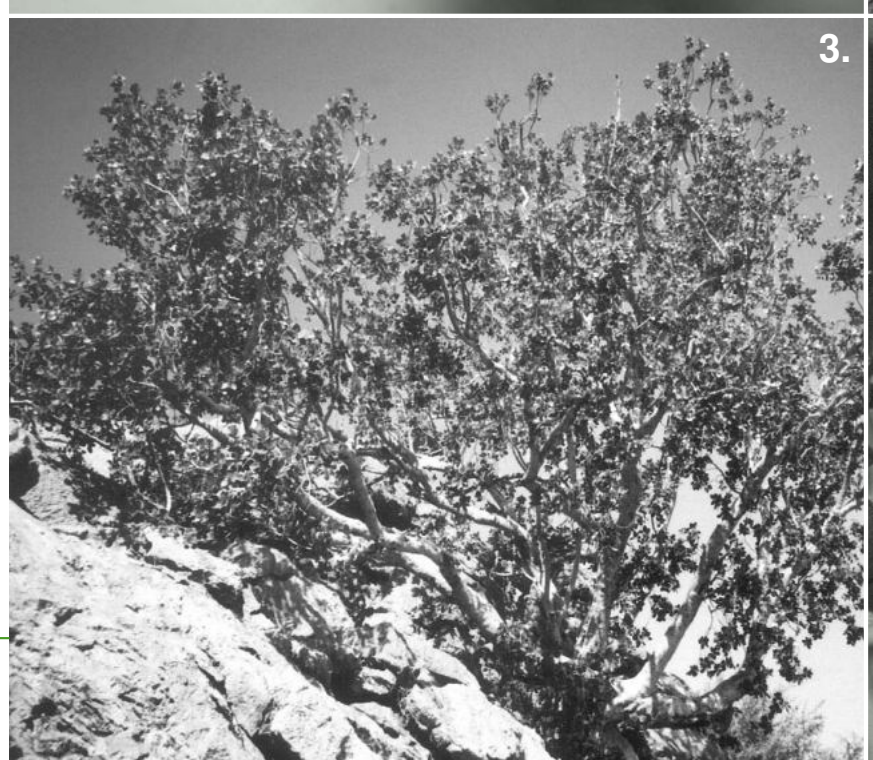
The genus *Ficus* (the only genus of this family in Namibia) is characterized by generally smooth, pale bark; simple, alternate, leathery or rubbery leaves, and a unique flower and fruit structure called a fig or syconium. Each fig is in fact an inflorescence of closely packed, minute flowers (florets) enclosed within the fleshy walls of the 'fig'.

Members of this genus have evolved a mutualistic relationship with a group of wasps known as 'fig wasps'. These tiny wasps, a few millimetres long, breed only within figs, while figs are entirely dependent on them for pollination. Young wasps feed on the fleshy tissue of the ovary in which they were laid. At maturity they chew their way into the fig cavity, where the wingless males mate with the females before chewing a hole through the fig wall so that the females can escape. The females collect pollen before leaving their natal figs, and then fly about in search of young receptive figs. They make their way into the fig through the narrow opening (ostiole) and lay their eggs on the ovules, depositing pollen on the stigmas as they do so. The florets that have styles longer than the ovipositor of the wasp are pollinated, but no egg is laid on the ovule and the floret can set seed. Each fig species is usually only pollinated by one species of wasps, which prevents hybridisation between fig species.

1. *F. sycomorus* figs, P. Reiner; 2. *F. ilicina*, E. Ellinger; 3. *F. glumosa*, L. Hoffmann; 4. *F. burkei*, P. Reiner









Ficus ingens

Red-leaved Fig

[2 records from 2 squares]

Deciduous spreading shrub or straggling tree. LEAVES ovate to oblong-ovate, 40–150 mm long; **young leaves coppery-red**. FIGS axillary on terminal branchlets, 10–13 mm in diameter, slightly hairy or smooth, dull red when ripe.

Recorded from two squares in the Otavi Mountains (1917B) and substantiated by specimens (HOF1/1081). Occasional tree in the 3–8 m height class, on dolomite hill slopes. Figs recorded in June only. Other records and earlier herbarium records from diverse parts of the country were not confirmed.

Ficus bubu

Sulphur-barked Fig

[2 records from 2 squares]

A tall tree with smooth, **creamy white to yellow bark**. LEAVES **very large** (up to 30 cm long), leathery, elliptic to sub-circular. FIGS 20 – 40 mm in diameter, yellowish brown, in clusters on short spurs on main branches.

Recently collected on the Omavanda Plateau (Baynes Mountains, 1713AA) (van Jaarsveld 17482) where it was growing along the cliff faces and in a riverbed. Also recorded from Otjihipa Mountain (1712BC)(SWA3). This is a new record for Namibia, with its nearest neighbour being in central Angola (Burrows 2003). A specimen collected by ROB2 (BC2034) from a narrow, rocky gorge between the Baynes and Otjihipa Mountains (1712BB) was identified as *F. lutea*, but could have been *F. bubu*. There is one old and dubious (Craven 1999) herbarium specimen of *F. lutea* from Kapupa Valley (1813DA).

Ficus verruculosa

Water Fig

[2 records from 2 squares]

Evergreen shrub or tree. LEAVES **elliptic** or oblong, thin, **parchment-like**; shiny green above, **paler and warty below** (hence the specific name); veins prominent. FIGS axillary, 6–10 mm in diameter, hairless; stalk up to 5 mm long.

Two TAP records from eastern Caprivi (1724DC and 1725CC). An uncommon to common shrub in the 1–3-m height class always growing in or near water. No figs recorded. Old herbarium records from February 1956 document *F. verruculosa* with figs in the Omuramba Omatako (1820AB).

Protected by forestry legislation.

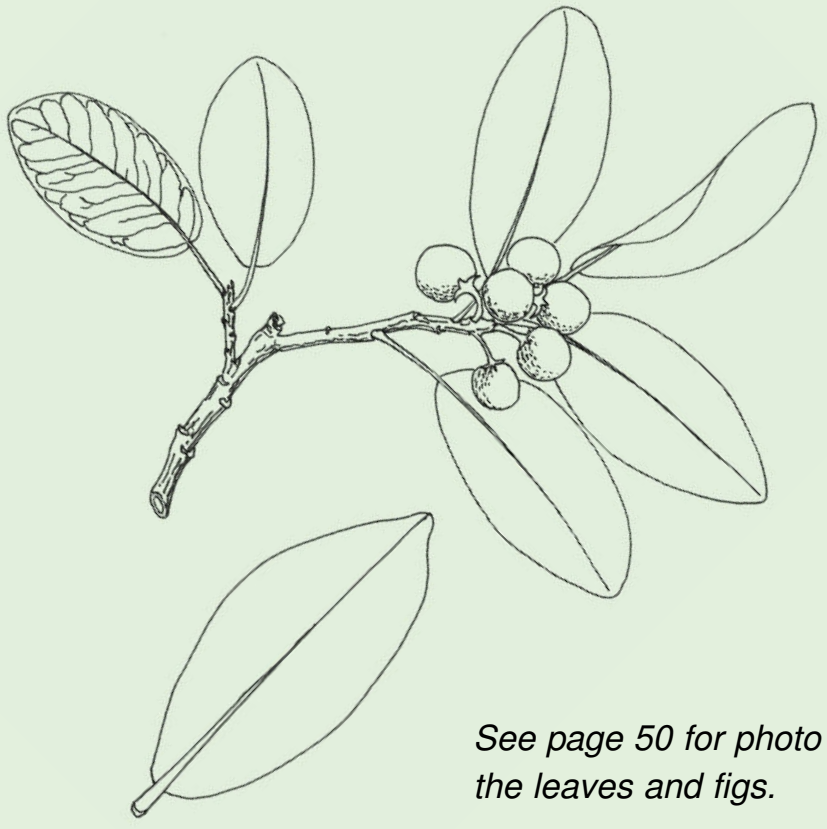
Ficus burkei

= Ficus thonningii

Strangler Fig

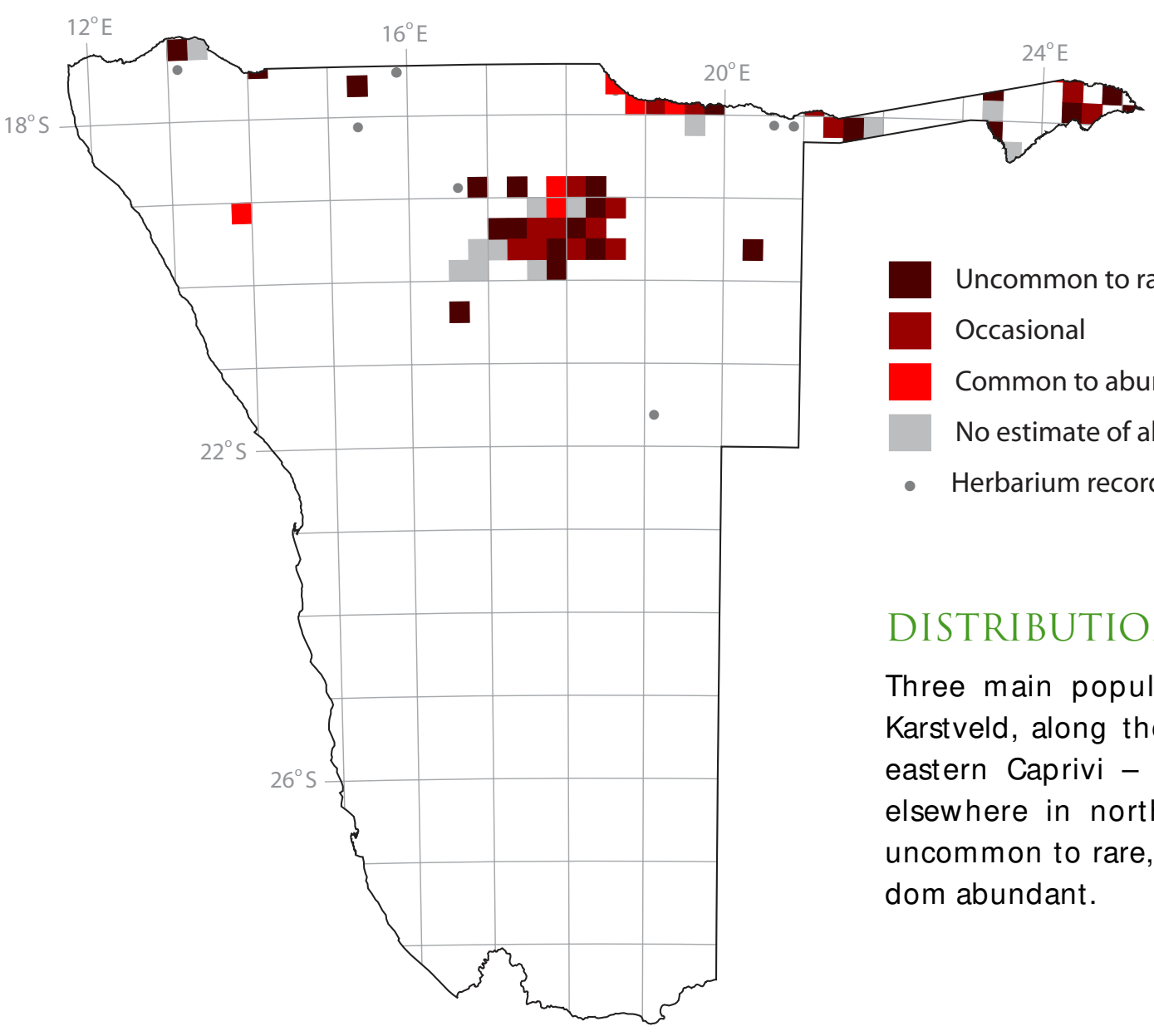
Wildevy (A); Würgefeige (G); omuhoro (H); omupuya (Od); mutata (R)

[208 records from 58 (5%) squares]



See page 50 for photo of the leaves and figs.

Evergreen or semi-deciduous tree with a dense canopy, 7–20 m high, trunk diameter up to 1 m, often with red aerial roots dangling from branches. BARK crumbly, white to grey; **young branchlets pale green with rust-red, downy covering**. LEAVES **oblong-elliptic**, 40–100 mm long; dull green to grey-green, veins prominent; **apex blunt to pointed; base blunt to broadly tapering**; petiole thick. FIGS solitary or paired in leaf axils on terminal branches, 8–12 mm in diameter, reddish when ripe, densely downy, sessile or almost so.



DISTRIBUTION & ABUNDANCE

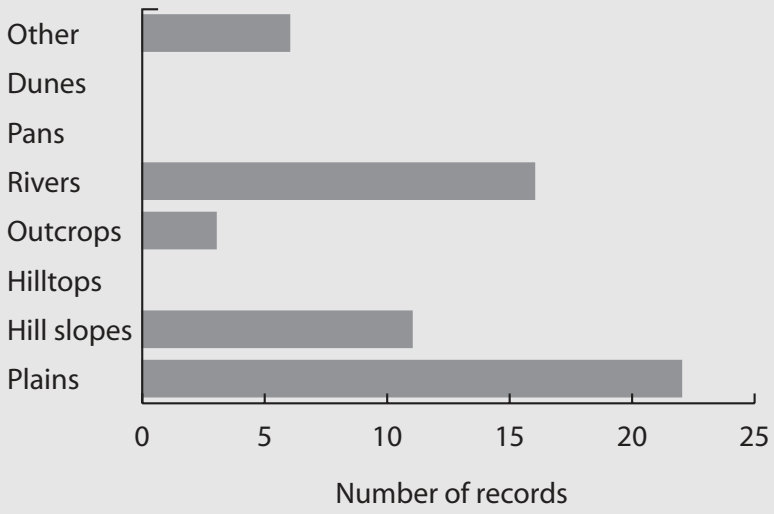
Three main populations – in the eastern Karstveld, along the Okavango River and in eastern Caprivi – with scattered localities elsewhere in northern Namibia. Generally uncommon to rare, sometimes common, seldom abundant.

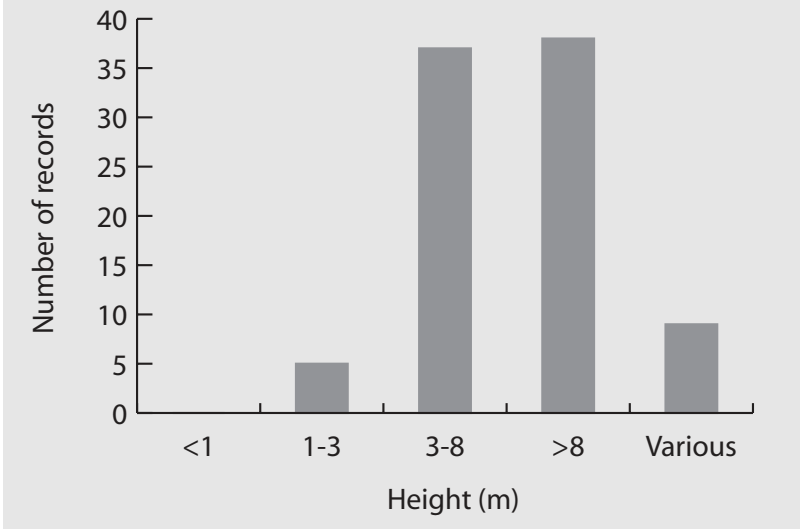
HABITAT

Various, but most often on plains and dolomite hill slopes in the Karstveld, and sandy or loamy river banks in the north-east. Sometimes found at springs.

GROWTH FORM

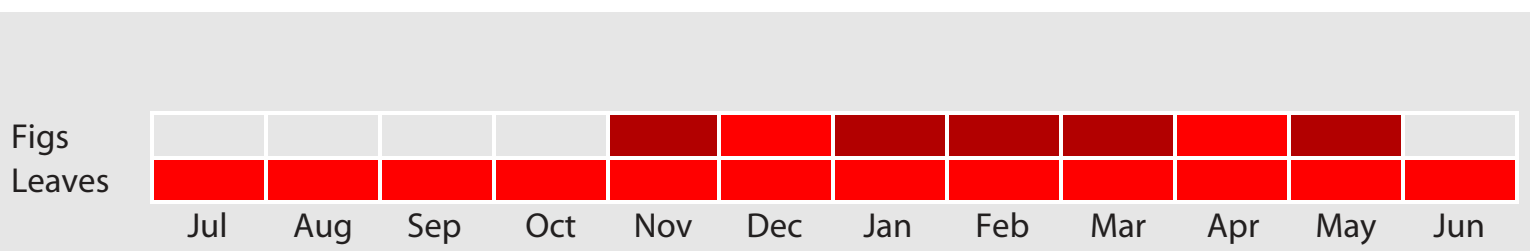
A tree up to 8 m high, or higher; sometimes a strangler.





ANNUAL CYCLE

FIGS mostly from November to May, with two peaks – December and April, but some found all year. LEAVES evergreen, with young leaves in October and November.



GENERAL

Strangler on various trees, including *Kigelia africana, Combretum imberbe* and *Faidherbia albida*. On maturing, their light grey bark often envelopes that of the host, giving the appearance of two canopies on one trunk – its own and that of the host. *Ficus burkei* is used as an indicator of groundwater. Its roots and bark are used medicinally and its fruit is edible, fresh, dried or prepared as an alcoholic beverage.

CONSERVATION CONCERNS

None recorded. Protected by forestry legislation.

THE FICUS THONNINGII COMPLEX

Previously a number of similar species was lumped together under this name. As the type specimen for *F. thonningiii* has been lost, and the original description was not very detailed, no-one can say for sure what it really is or what its distribution is. Experts now prefer to split it into its component species. There is still disagreement as to which species occurs in Namibia, with Burrows (2003) showing *F. petersii* and Germishuizen & Meyer (2003) and Coates Palgrave (2002) showing *F. burkei*. Most of our specimens fit the description of the latter species better, although we have recently found a specimen on top of the Baynes Mountains that could well be *F. petersii.*

Ficus capreifolia

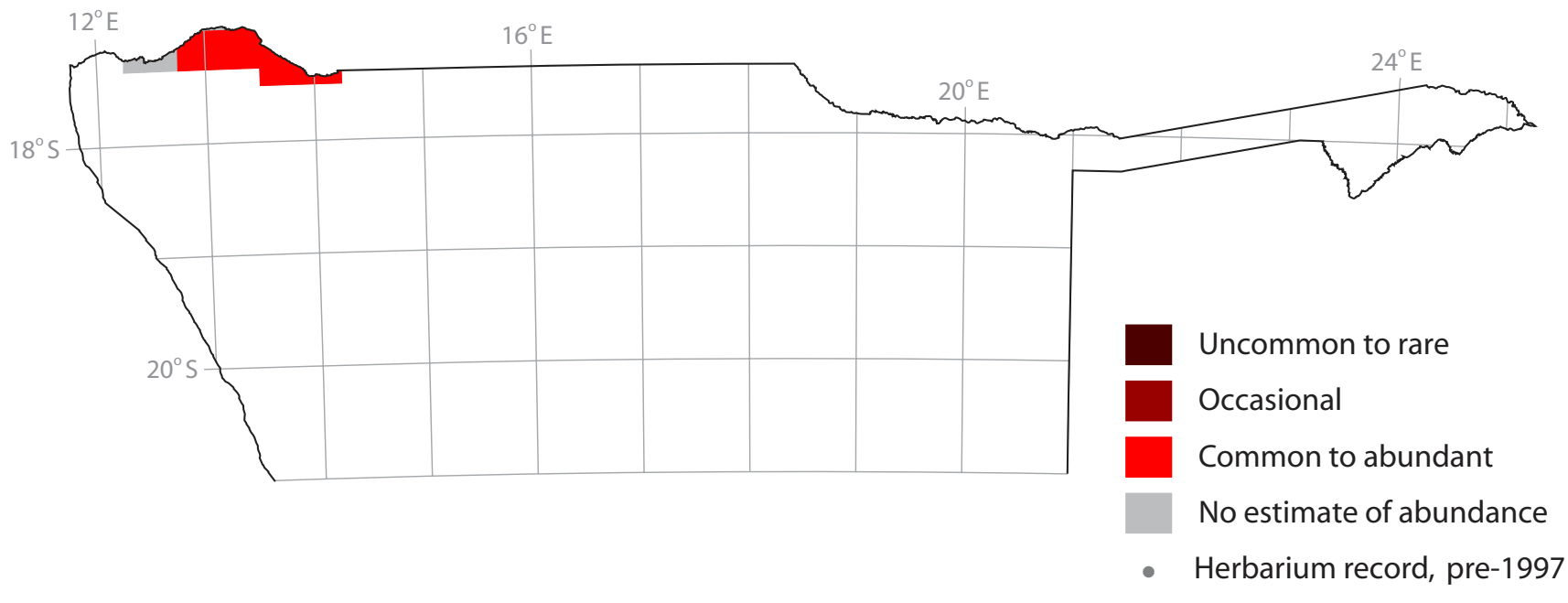
Sandpaper Fig

Skurweblaarvy (A); omuzuvakuvare (H); sikuluyi (L)

[32 records from 14 (1%) squares]



A large, dense shrub, often forming dense thickets along the river's edge. BARK greenish-grey with grey underbark; branches slender and whip-like; **young branchlets hairy and limp**. LEAVES **rough and sandpaper-like but hairless**; oblong-lanceolate to narrowly elliptic, both surfaces olive-green; **occasionally, margin slightly toothed near apex**; apex pointed or **trilobed**. FIGS axillary, **12–15 mm in diameter, stalk 15 mm long, surface rough**, red when ripe.

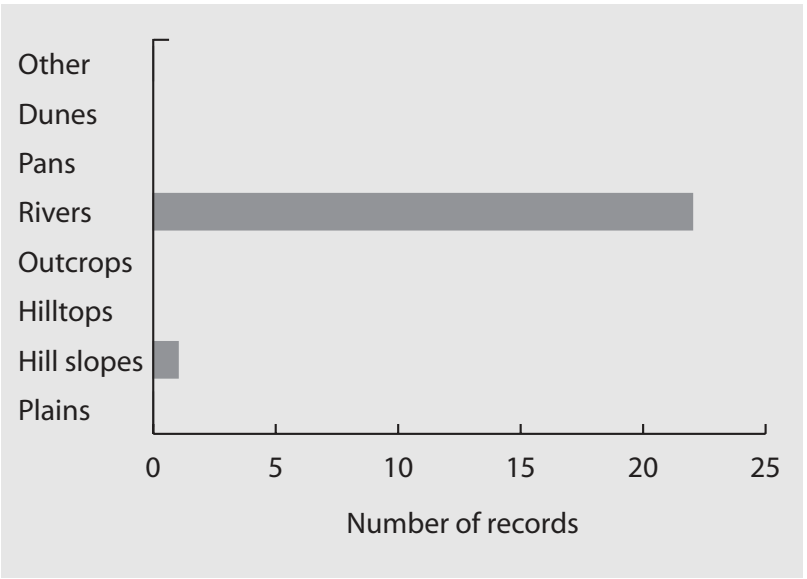


DISTRIBUTION & ABUNDANCE

Widespread and common to abundant along the Kunene River in the north-west.

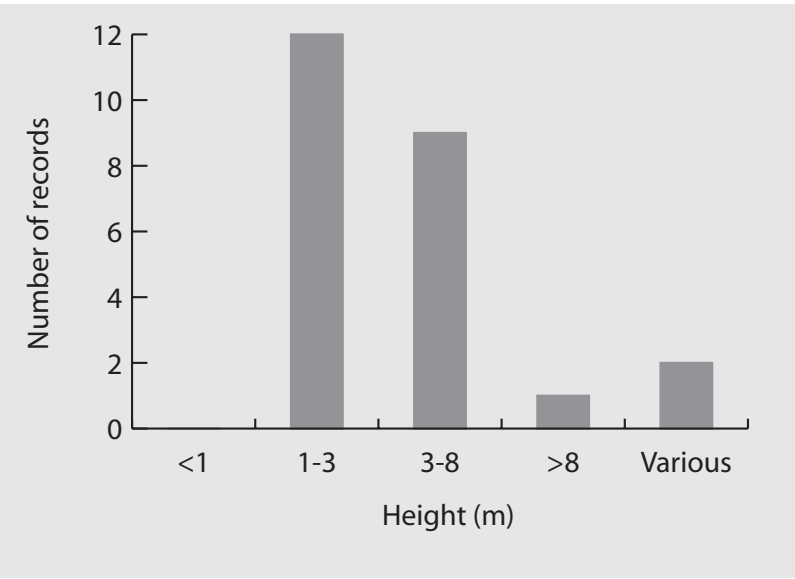
HABITAT

Always on the river bank, with its branches hanging in the water.



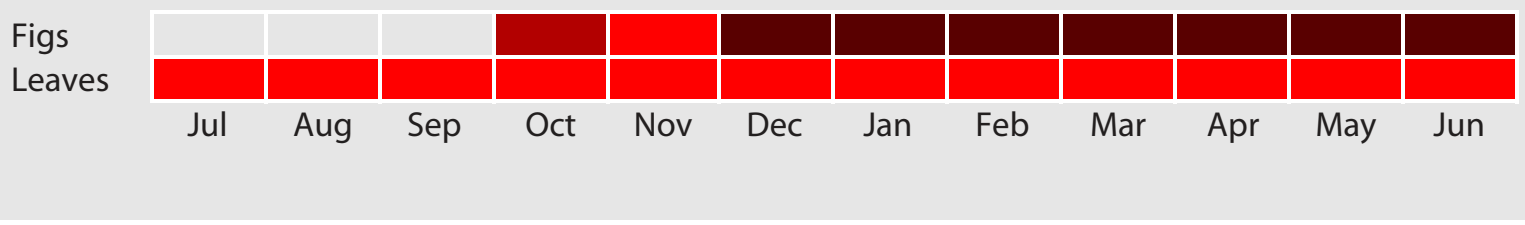
GROWTH FORM

Mostly a shrub up to 3 m high, sometimes up to 8 m; rarely a tree.



ANNUAL CYCLE

FIGS most of the year, but mainly in November. LEAVES evergreen.



GENERAL

Fruit edible.

CONSERVATION CONCERNS

None recorded.

Ficus fischeri

Poplar-leaved Fig

Wutata (T)

[1 record]

Tree, often a strangler; sometimes with aerial roots hanging from the branches. BARK **rough, grey**. LEAVES ovate to heart-shaped **with long petiole**. FIGS up to 15 mm in diameter; single or in pairs in leaf axils.

Only recorded by TAP from one locality on the Kwando River floodplain (1723CD). Recorded as common, but must either be very localised or easily mistaken for other species, as it was not recorded by eight other atlassers who visited that square. The record is, however, confirmed by a herbarium specimen (SOL1/CA1). Grows as a tree around 8 m high. FIGS recorded in March. There are three old herbarium records from the Caprivi Region: 'Common giant tree up to 20 m, typically a strangler on *Combretum imberbe*.'

Ficus cordata

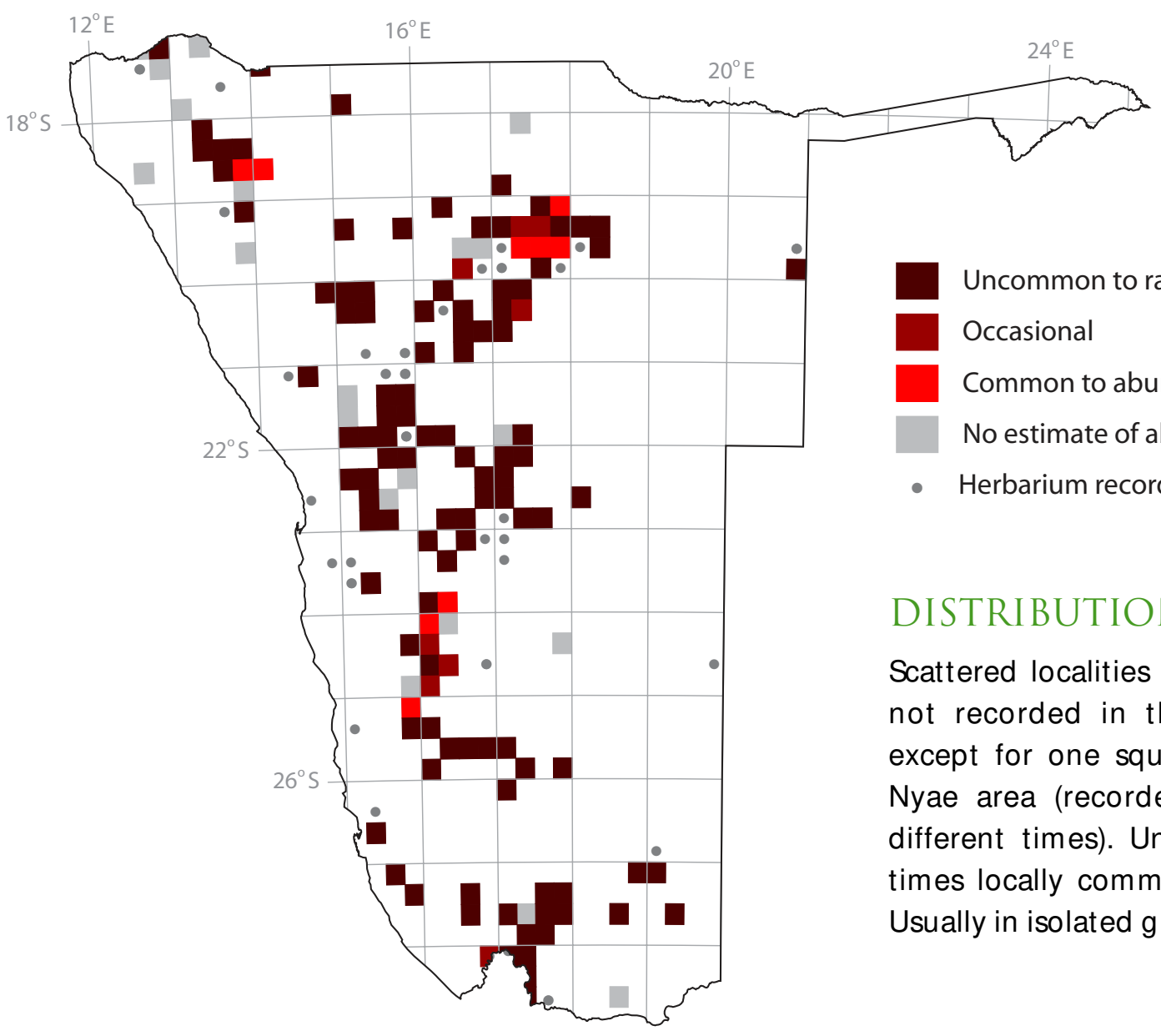
Herzfeige

Namaqua rock-fig (E); haartvy (A); omunkumbwa (H); |nomtabes (K)

[300 records from 143 (13%) squares]



Graceful tree, often drooping. BARK **pale grey** (often appearing almost white at a distance), smooth. LEAVES **heart-shaped**, 50–100 mm long; both surfaces dark green, hairless, veins prominent on both surfaces but yellow-green below; margin entire; **apex pointed**; base blunt to heart-shaped; **petiole slender, 12-30 mm long**, FIGS 6–8 mm in diameter, slightly downy to hairless, sessile, arranged in small axillary groups near the ends of branches, yellowy-green when ripe.

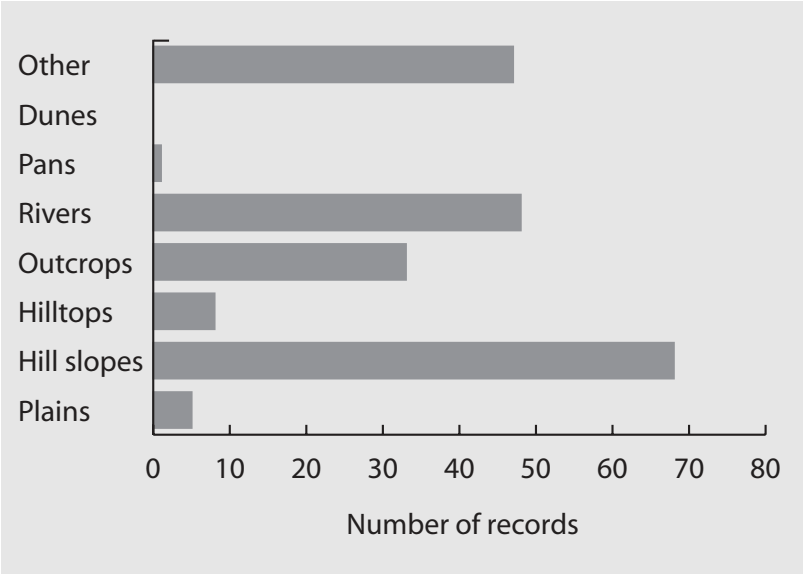


DISTRIBUTION & ABUNDANCE

Scattered localities throughout Namibia, but not recorded in the east and north-east, except for one square (1920D) in the Nyae Nyae area (recorded by three atlassers at different times). Uncommon to rare, sometimes locally common, but never abundant. Usually in isolated groups of a few individuals.

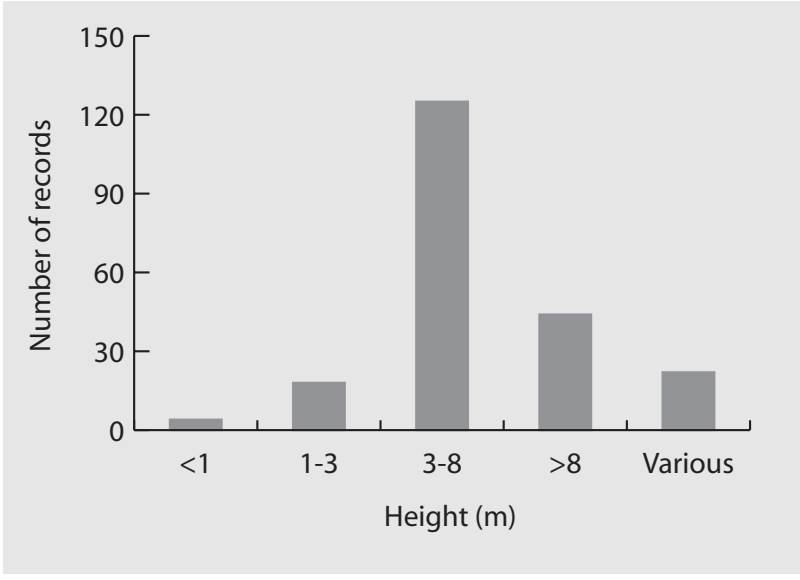
HABITAT

Various, but mostly hill slopes, along dry rivers, on rocky outcrops and in kloofs and gorges. Always on rock and often on very steep slopes, sometimes cliff faces. Very often associated with springs.



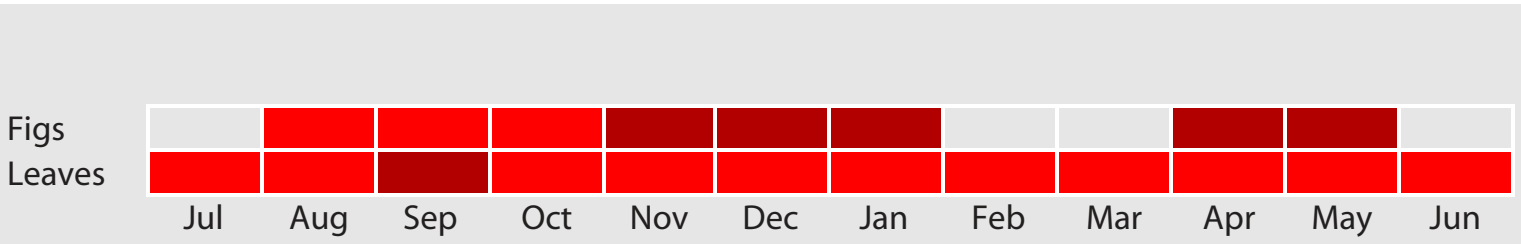
GROWTH FORM

A tree, generally up to 8 m high, but sometimes taller.



ANNUAL CYCLE

FIGS a few all year round, but mostly August to October, continuing till January, with a second, smaller peak in April or May. LEAVES evergreen, with some bare trees recorded in September; young leaves produced from August to November.



GENERAL

Birds and baboons eat the fruit; the leaves browsed by kudu. Various traditional uses.

CONSERVATION CONCERNS

None recorded. Protected by forestry legislation.

Ficus glumosa

Hairy Rock-fig

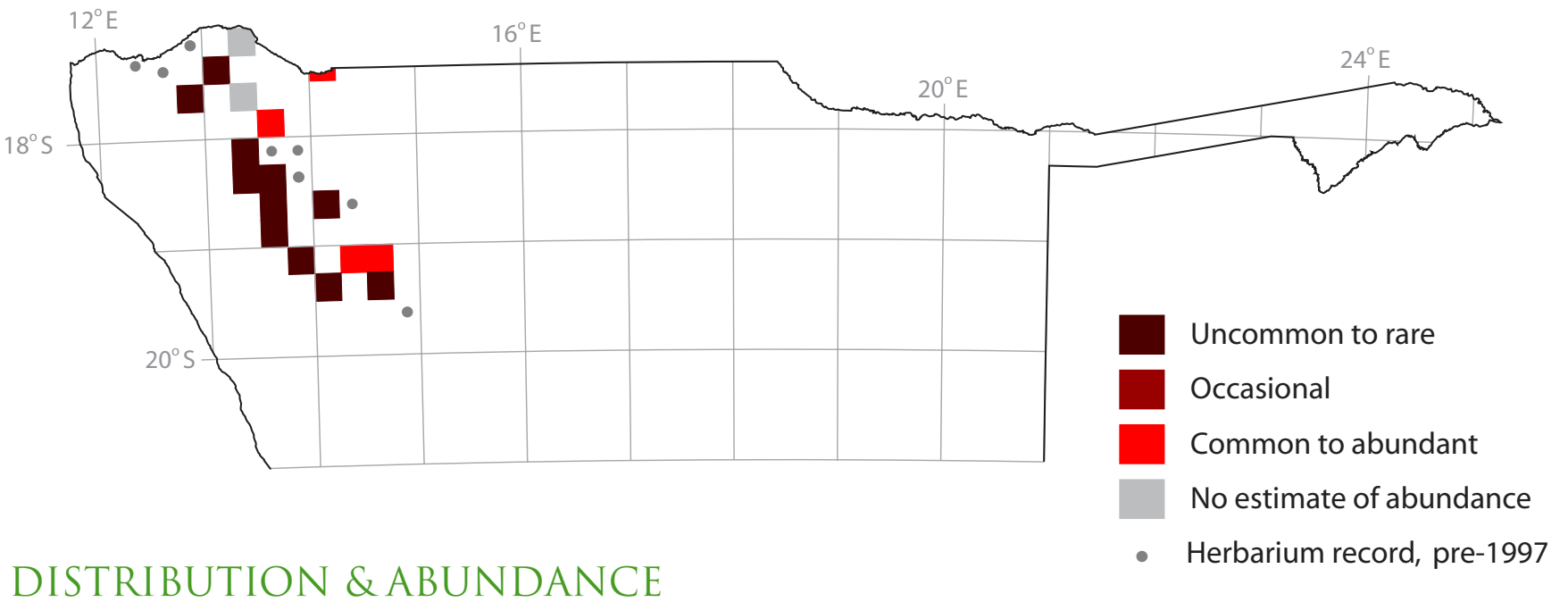
Steiffblattfeige (G); omuhoro (H); omukuyumba (Ok)

[16 records from 15 (1%) squares]



Shrub or tree, often a rock-splitter. BARK smooth, pale grey or cream. LEAVES simple, elliptic to circular, less than twice as long as broad; shiny, dark olive-green with **sparse white hairs, above**; brown-green with **dense white to brown hairs**, below; apex blunt; base blunt to slightly heart-shaped; petiole reddish, densely downy. FIGS **sessile** or on a stalk *c.* 2 mm long; 5–10 mm in diameter, sparsely downy to hairless, red when ripe.

See page 50 for photo.



DISTRIBUTION & ABUNDANCE

Uncommon in north-western Namibia.

HABITAT

Dry river courses, rocky outcrops and hill slopes. Always on rocks.

GROWTH FORM

A tree up to 8 m high.

ANNUAL CYCLE

FIGS have been recorded in April and June, with old figs in November. LEAVES evergreen.

CONSERVATION CONCERNS

This plant has either been overlooked along the western Kunene River, or has died out in that area. No young trees recorded.

Ficus pygmaea

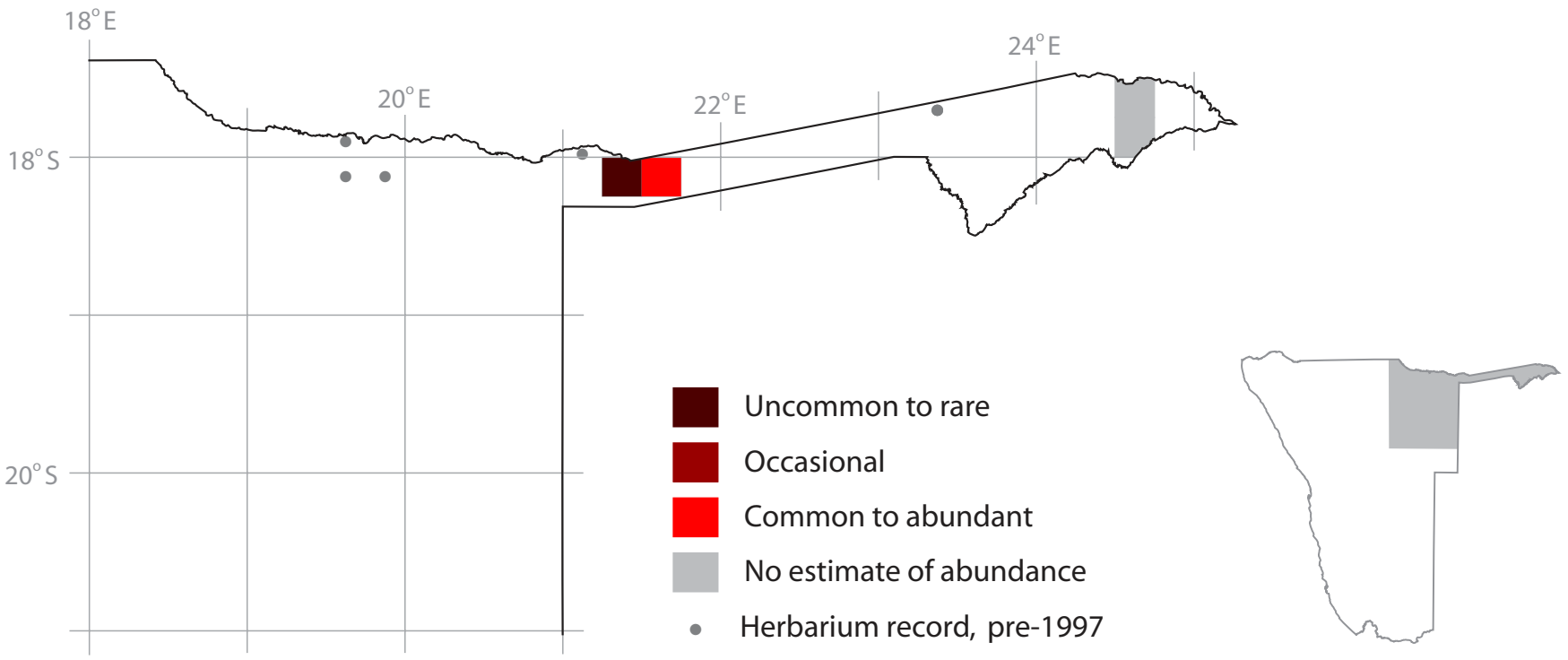
Pygmy Fig

Zwergfeige (G); kuzukuha (L); murivirivi (R)

[6 records from 4 (<0.5%) squares]



Multi-stemmed **shrub**. BARK of young branchlets brown to brown-black, with white hairs. LEAVES usually ovate-elliptic, but varies from ovate to narrowly lanceolate, 30–100 mm long; **rough; dark olive-green above; pale olive-green below; margin toothed to lobed**; petiole short with stiff, white hairs. FIGS single, axillary, stalked, 10–15 mm in diameter; covered with **coarse hairs**.



DISTRIBUTION & ABUNDANCE

Common in the Popa Falls area along the Okavango River; no abundance recorded in eastern Caprivi. There are earlier herbarium records from other localities, but most atlassers probably overlooked the plant since it is generally less than the requisite 1 m high.

HABITAT

Found on the banks of perennial rivers on sandy or rocky substrates.

GROWTH FORM

A shrub, up to 1 m high, or slightly taller.

ANNUAL CYCLE

FIGS March to May, October and December. LEAVES recorded in the five months in which observations were made.

GENERAL

Fruit edible.

CONSERVATION CONCERNS

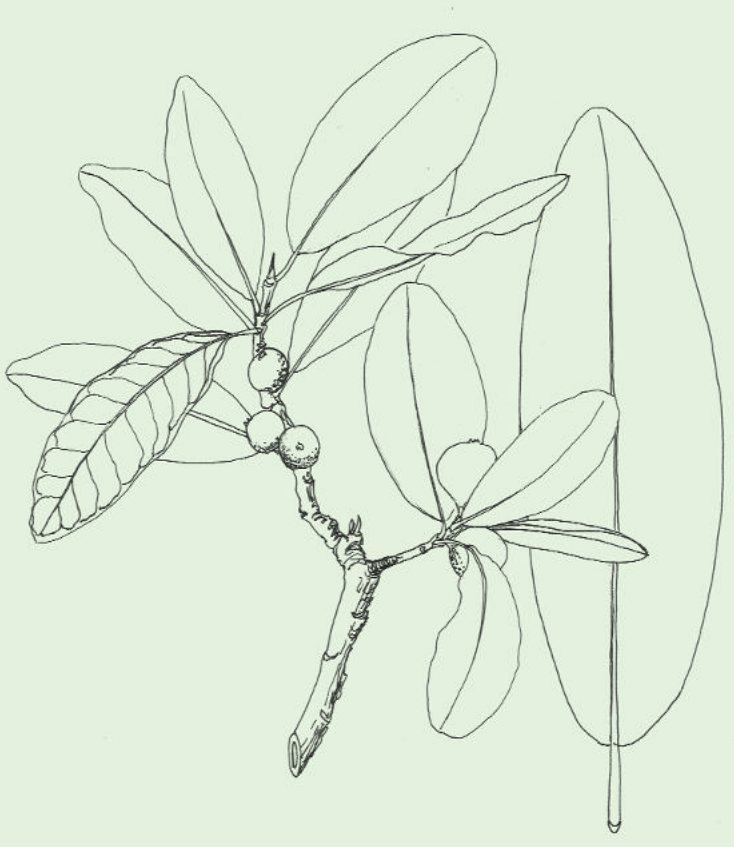
None recorded.

Ficus ilicina

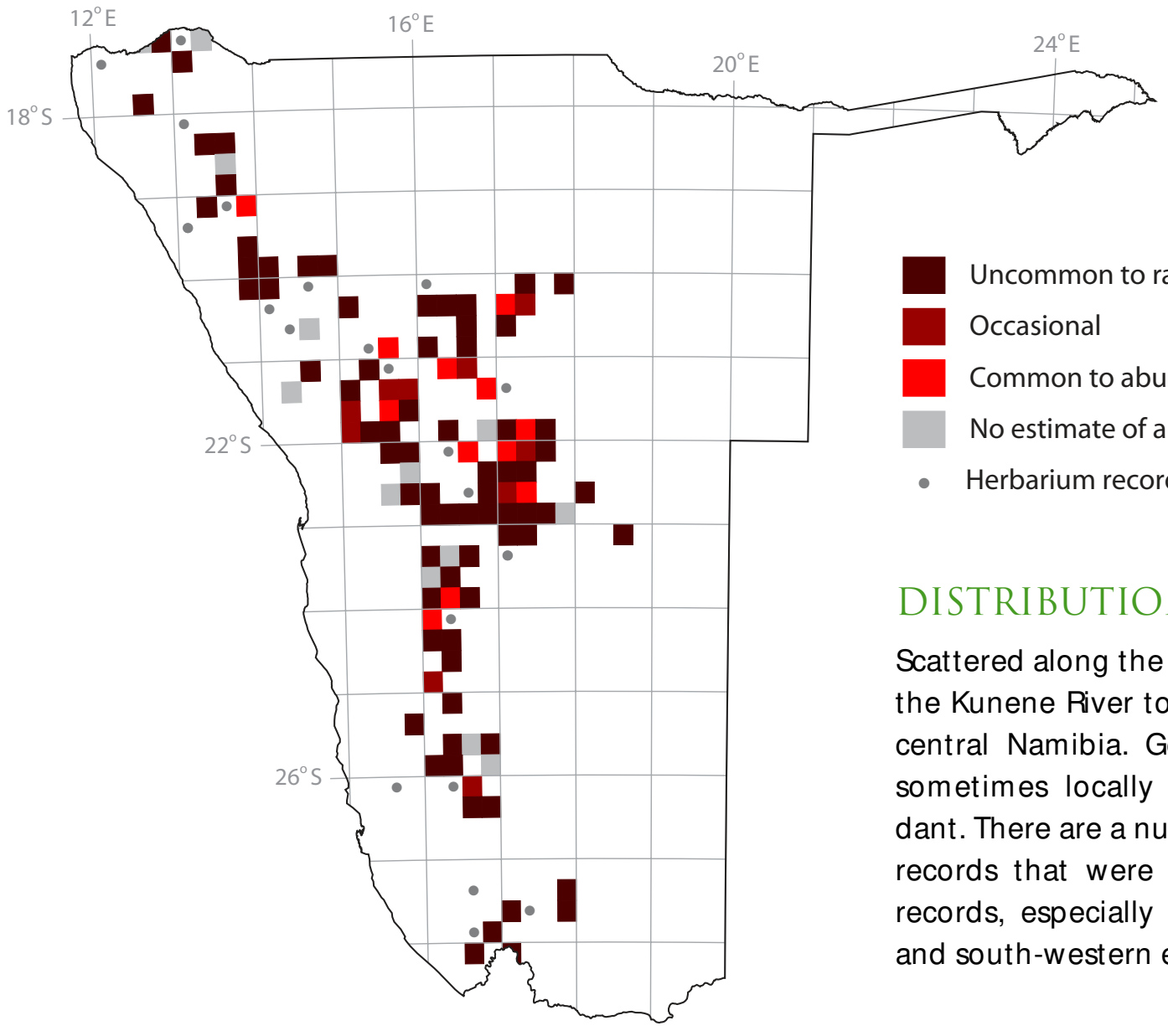
Rock-splitting Fig

Klimvy (A); Kletterfeige (G); omupendarwa (H)

[234 records from 108 (10%) squares]



Usually a rock-creeping shrub, **often a rock-splitter**, sometimes a single-stemmed tree up to 6 m high. BARK white to dark grey, smooth. LEAVES simple, **elliptic**, at least twice as long as broad; leathery, **shiny-green above; matt-green below**; petiole robust. FIGS sessile to stalked, single or in pairs, in axils on terminal branchlets; about 10mm in diameter, hairless to downy.

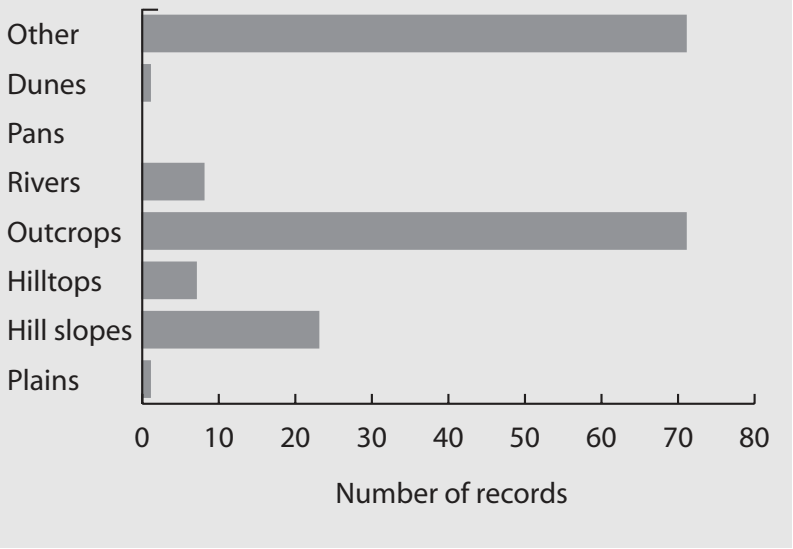


DISTRIBUTION & ABUNDANCE

Scattered along the western escarpment from the Kunene River to the Orange River, and in central Namibia. Generally uncommon, but sometimes locally common, seldom abundant. There are a number of earlier herbarium records that were not reconfirmed by TAP records, especially along the north-western and south-western escarpments.

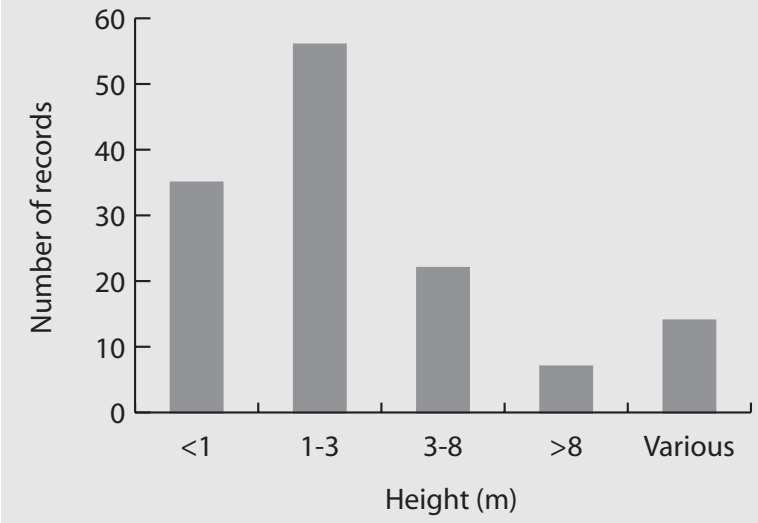
HABITAT

Rocky outcrops, cliff faces, hill slopes and kloofs. Always on rock.



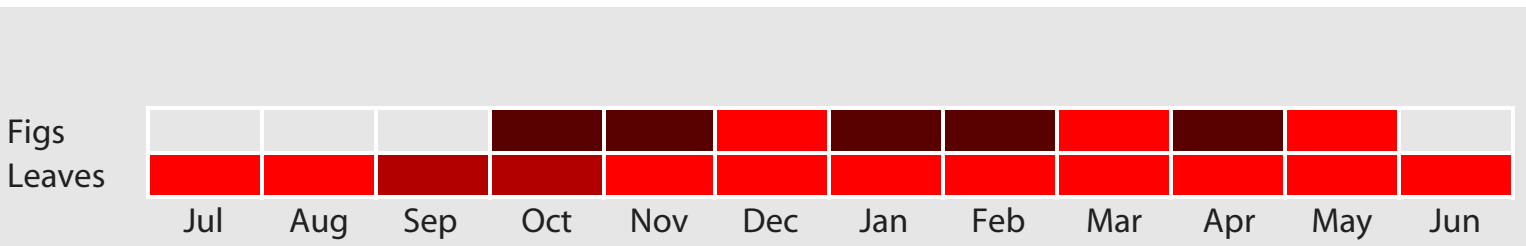
GROWTH FORM

Mostly a low scrambler over rocks, or a shrub up to 3 m high; sometimes a tree up to 8 m, rarely higher.



ANNUAL CYCLE

FIGS October to May. LEAVES evergreen, sometimes with a few bare individuals in September and October; young leaves produced in October.

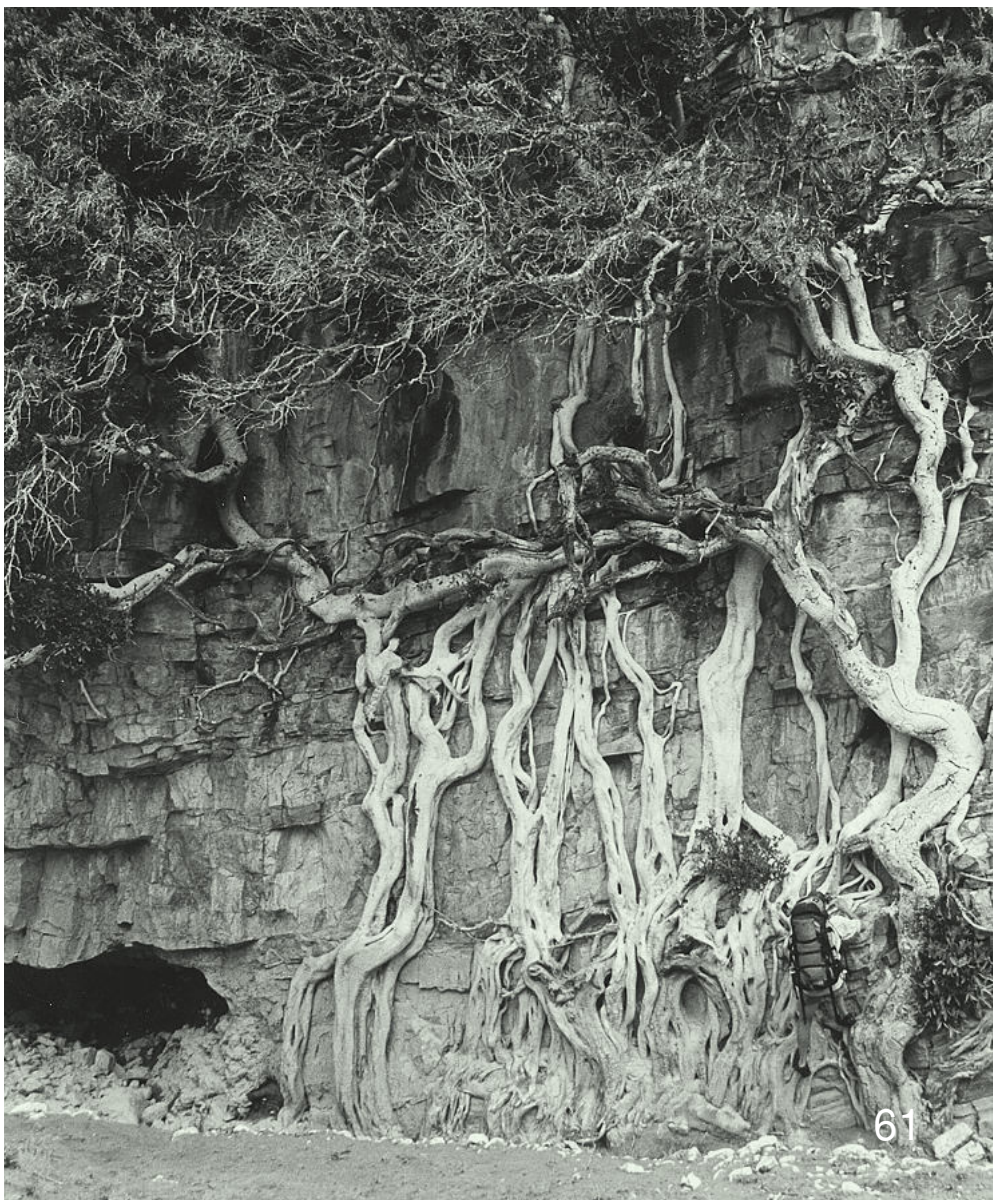


GENERAL

Fruit eaten by birds and people. Also known as ‘Raakvy’ (KNO1, 2217AC)

CONSERVATION CONCERNS

None recorded.



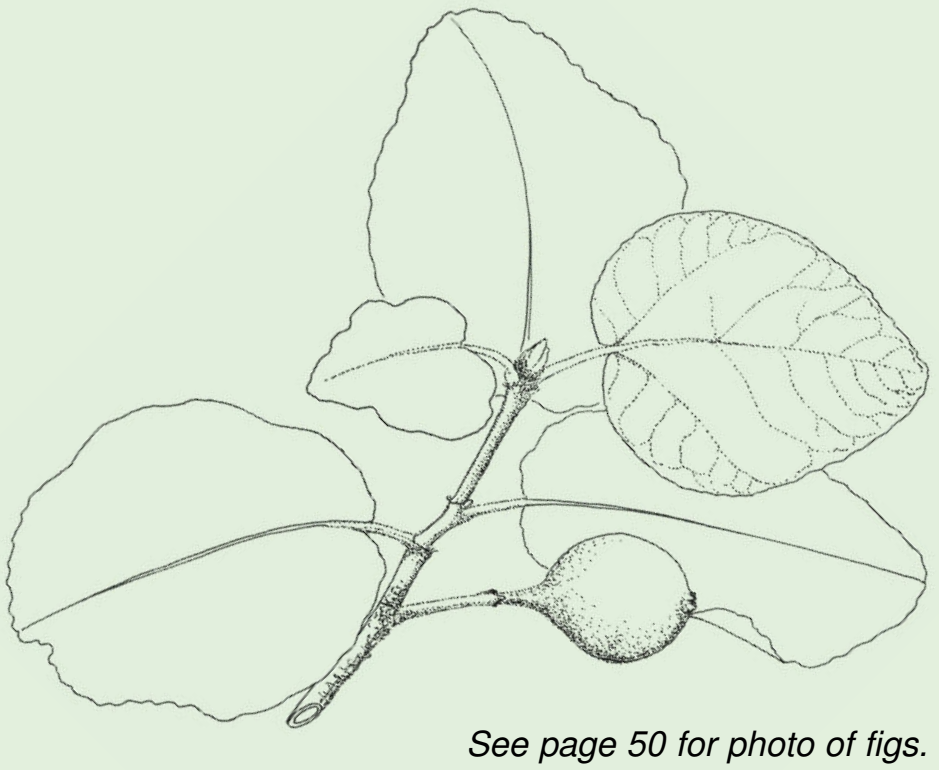
Ficus ilicina, Naukluft, L. Burmeister

Ficus sycomorus

Sycamore Fig

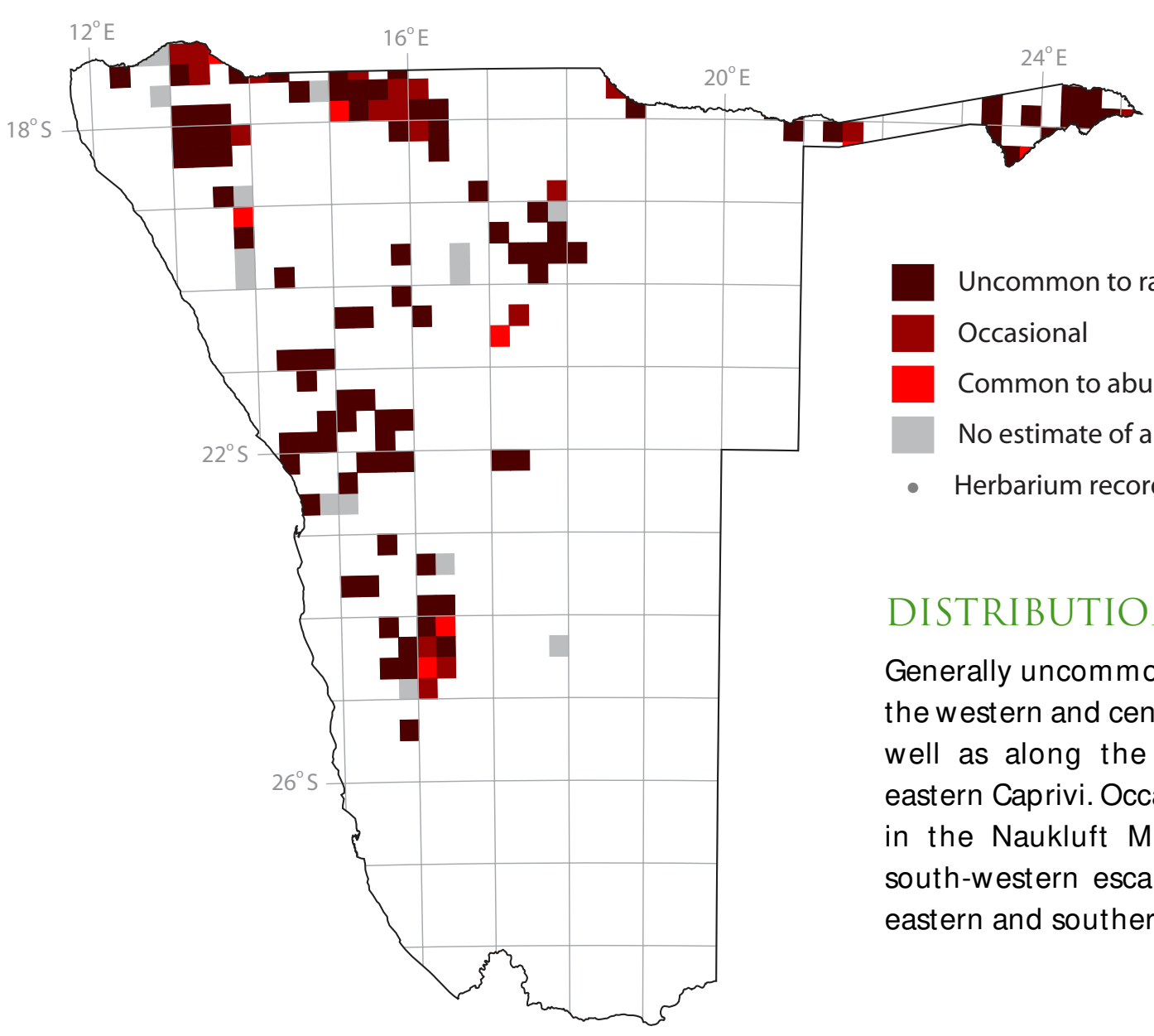
Geelstamvy (A); Waterbergfeige (G); muchaba (L); omukuyu (Ok)

[338 records from 142 (13%) squares]



See page 50 for photo of figs.

Large, semi-deciduous tree; trunk diameter up to 2 m and often buttressed; crown spreading. BARK variable, usually yellow, relatively smooth with rough, grey patches flaking off. LEAVES **round to broadly-elliptic**, 80 mm long; **stiff, rough**, leathery, dark green, **veins prominent**; base blunt to heart-shaped. FIGS in dense clusters on main stem and branches, or solitary in leaf axils; 15–30 mm in diameter; yellow with red, vertical streaks and white downy covering; stalk 20–30 mm long.



DISTRIBUTION & ABUNDANCE

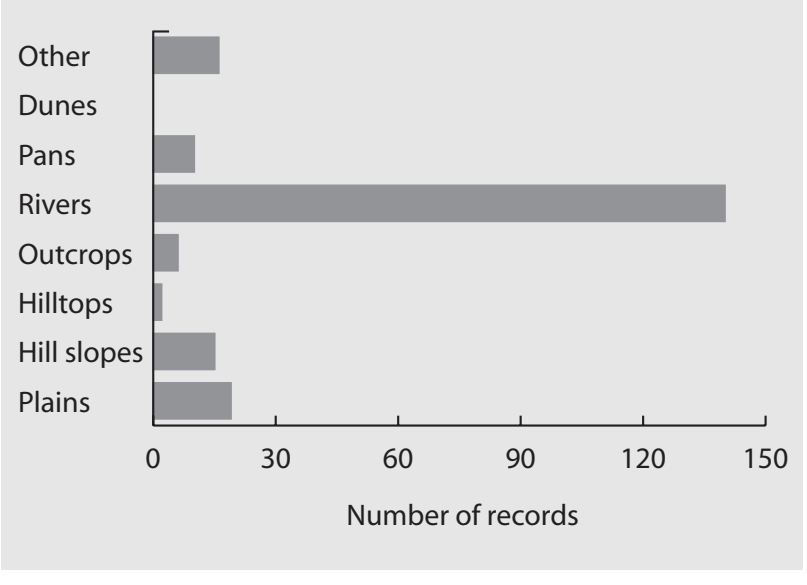
Generally uncommon in scattered localities in the western and central parts north of 25° S, as well as along the Okavango River and in eastern Caprivi. Occasional to locally common in the Naukluft Mountains and along the south-western escarpment. Absent from the eastern and southern areas of the country.

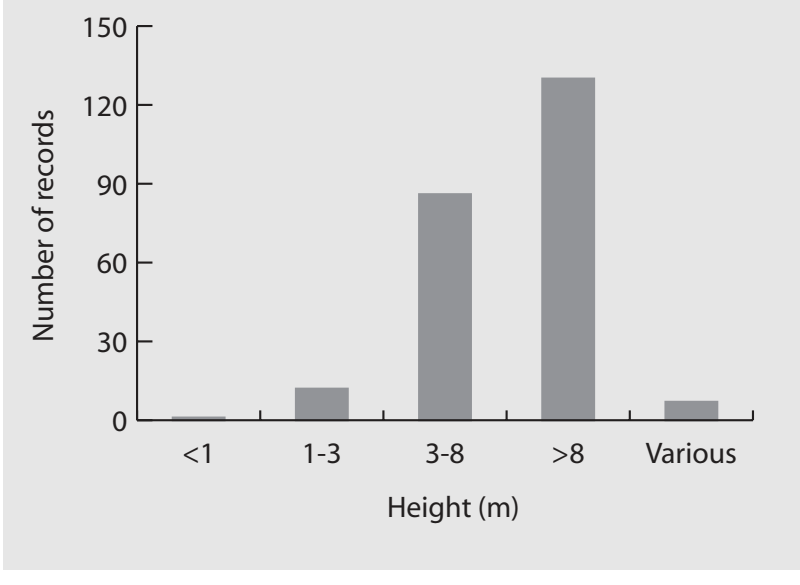
HABITAT

On plains and around pans or depressions in the central-north and north-east; along river banks and dry river courses, in kloofs, on hill slopes and often near springs in the north-west, and central and southern parts of their range.

GROWTH FORM

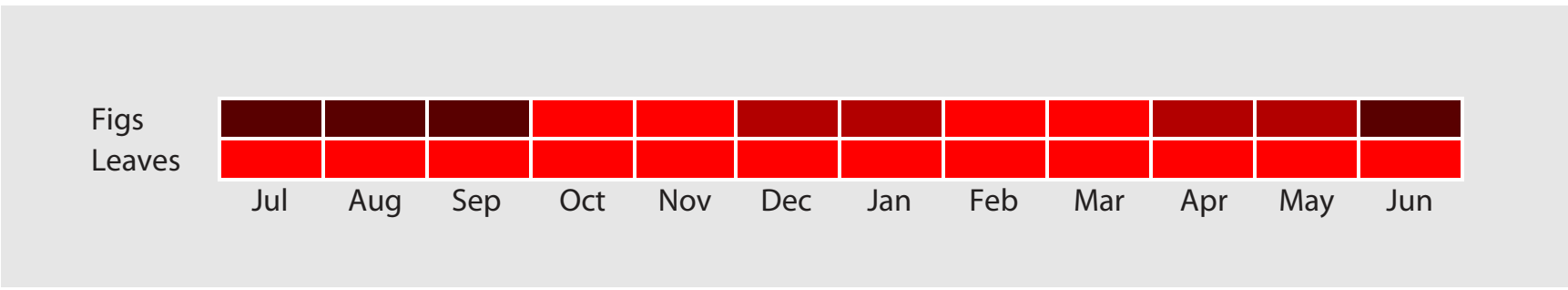
A large tree up to 8 m high or more. Few young ones recorded.





ANNUAL CYCLE

FIGS all year, with two peaks – October/November and February/March. LEAVES evergreen, with new leaves appearing in September, October, January and February.



GENERAL

The fruit are eaten by livestock, game, birds and insects, as well as by people. They can be dried for later use, or made into an alcoholic beverage. Various parts are used for medicinal purposes.

CONSERVATION CONCERNS

The trees have been affected in areas with excessive water abstraction which has caused springs to dry up. The apparent lack of young trees is also a concern. Local communities protect these trees for their fruit and shade. They are also protected by forestry legislation.



Butressed roots of *Ficus sycomorus*, Kaokoveld, B. Curtis

Obetia carruthersiana

Baumnessel

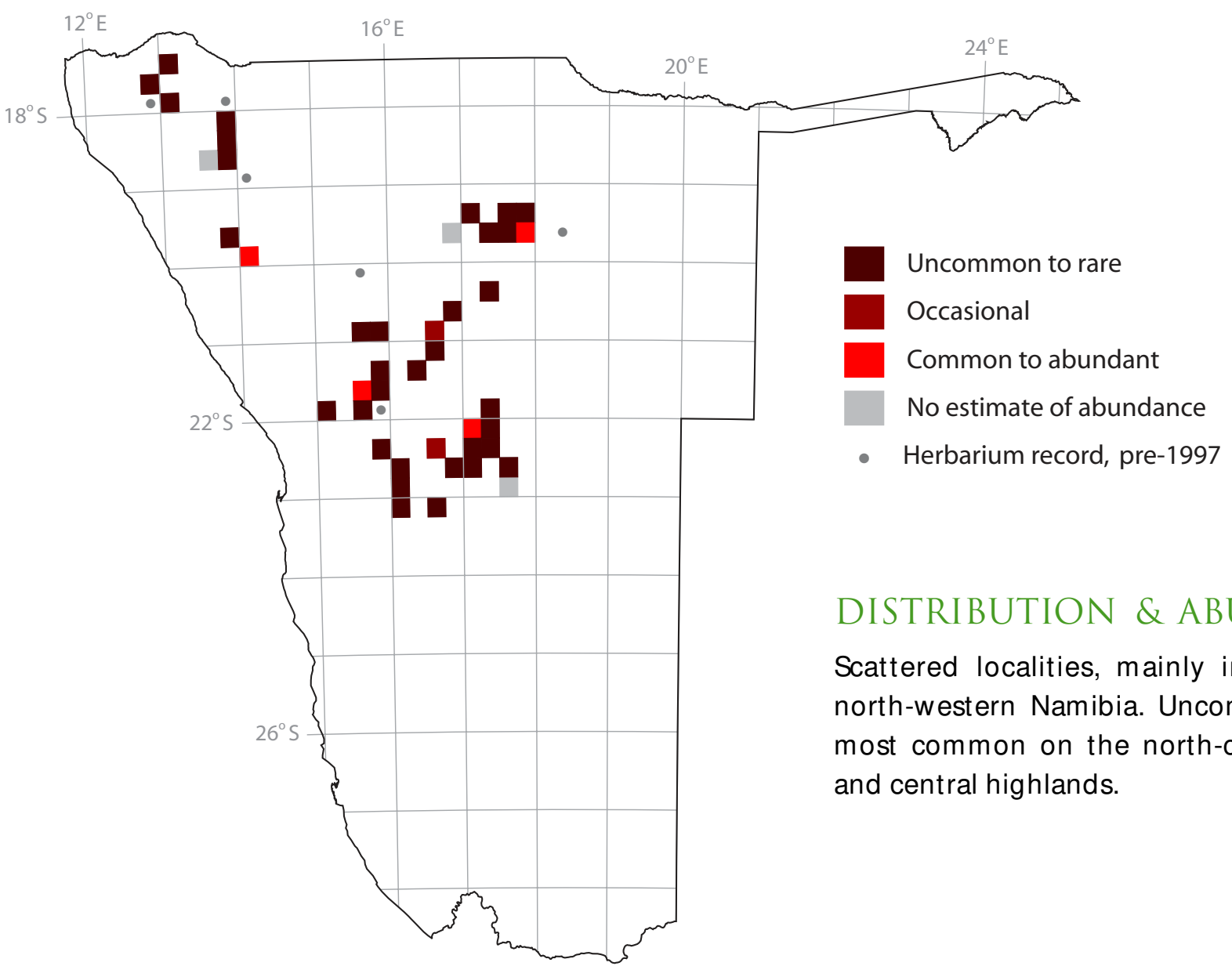
Angola nettle (E)

[93 records from 44 (4%) squares]



Deciduous, many-stemmed shrub with long, straight, swollen-based prickles and stinging hairs. LEAVES simple, heart-shaped, large (up to 200 mm long); both surfaces dark green, **prickly with stinging hairs; margin coarsely serrate**; petiole prickly. FLOWERS small and clustered in much-branched heads. FRUIT egg-shaped, enveloped in persistent calyx.

The stinging hairs on the leaves and stems cause an intensely painful burning sensation when touched and should be avoided. The plant is unmistakable, but flowers and fruit could be overlooked from a distance.

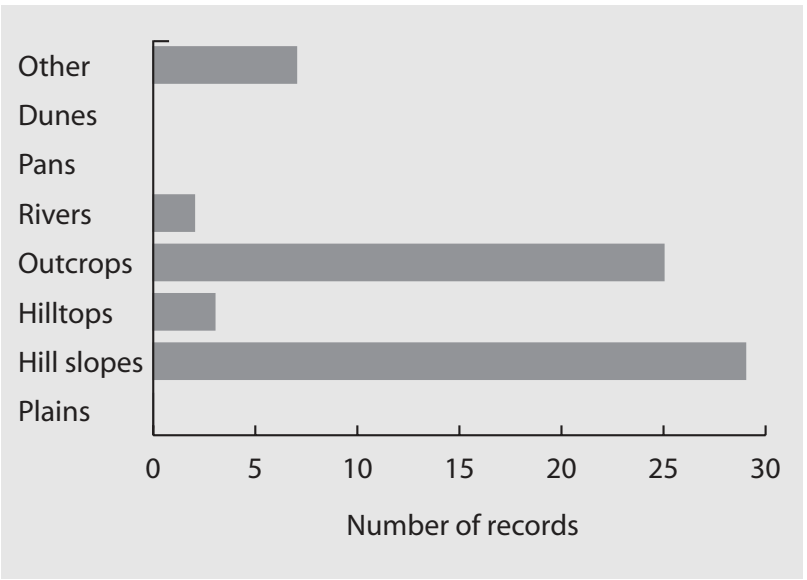


DISTRIBUTION & ABUNDANCE

Scattered localities, mainly in central and north-western Namibia. Uncommon to rare; most common on the north-central plateau and central highlands.

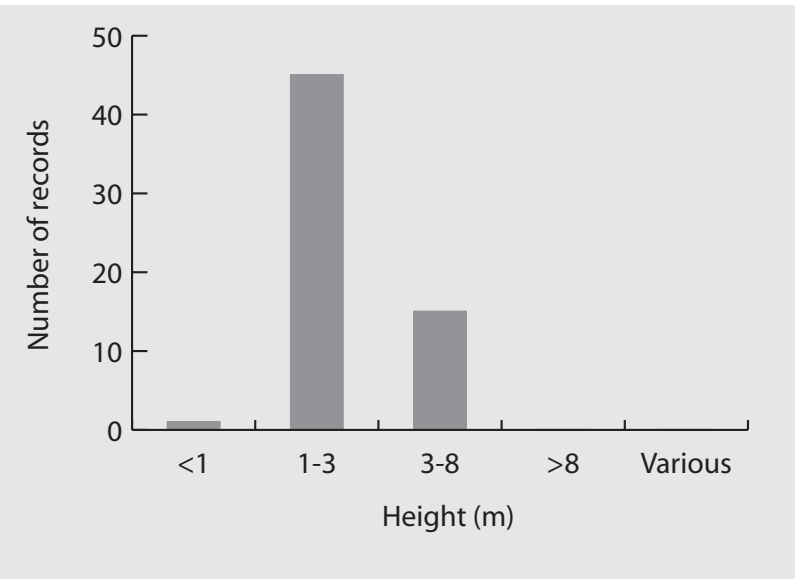
HABITAT

Mostly rocky hill slopes and rocky outcrops. Generally growing between rocks.



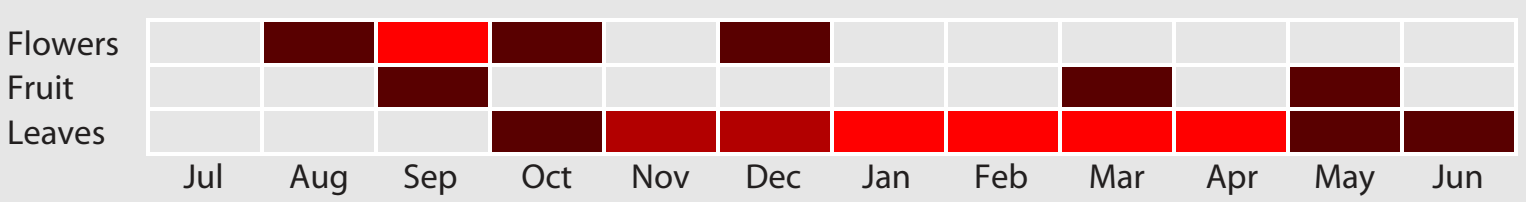
GROWTH FORM

Mostly a shrub (75% of observations), generally in the 1–3-m height class, but sometimes a tree over 3 m high (25%).



ANNUAL CYCLE

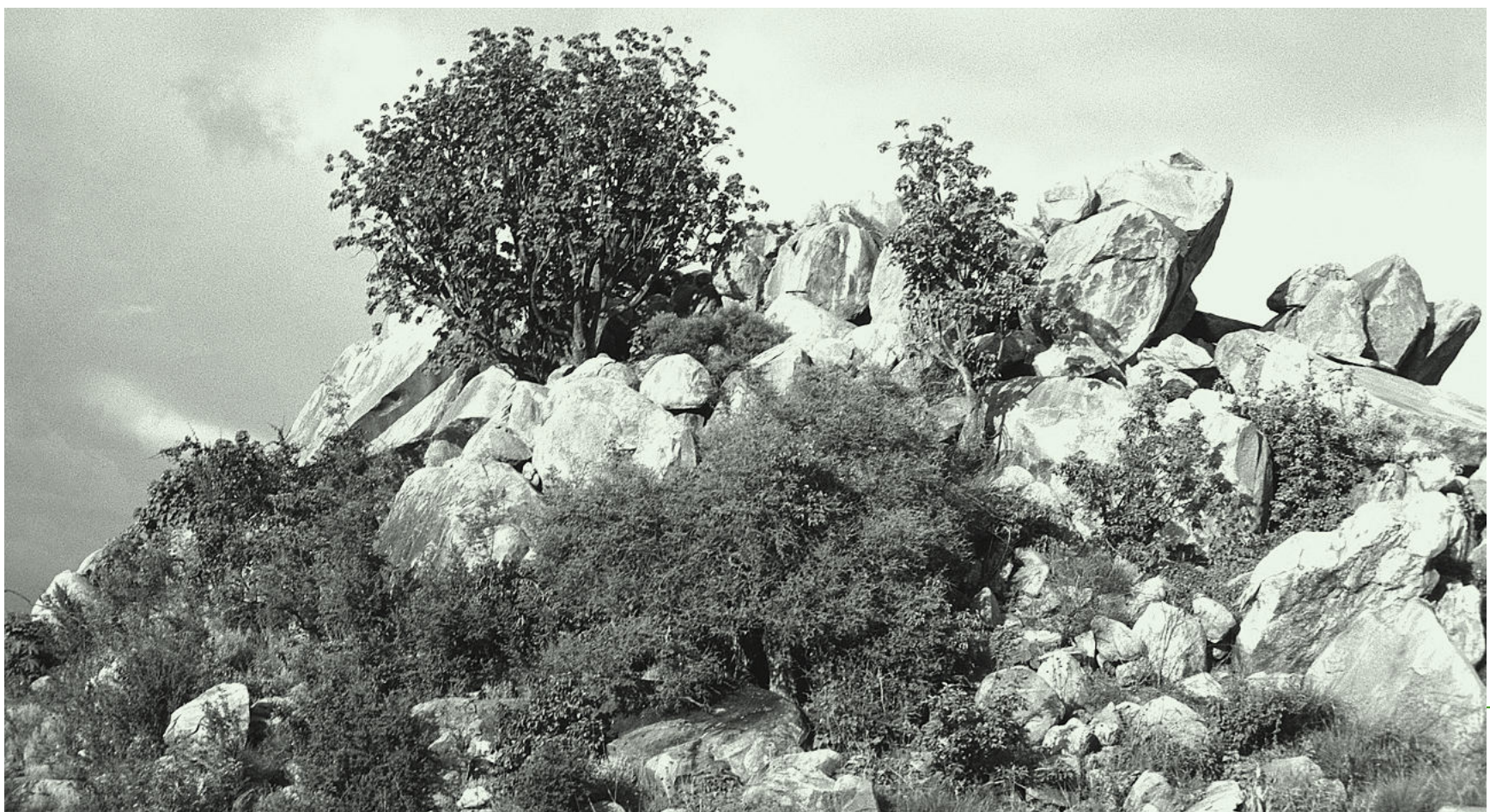
FLOWERS August to October, with two herbarium records in December. FRUIT single observations in March and May (TAP), and September (herbarium); also in October/November (HOF1, pers. comm.). LEAVES mainly November to April.



CONSERVATION CONCERNS

None recorded.

Obetia carruthersiana, B. Curtis



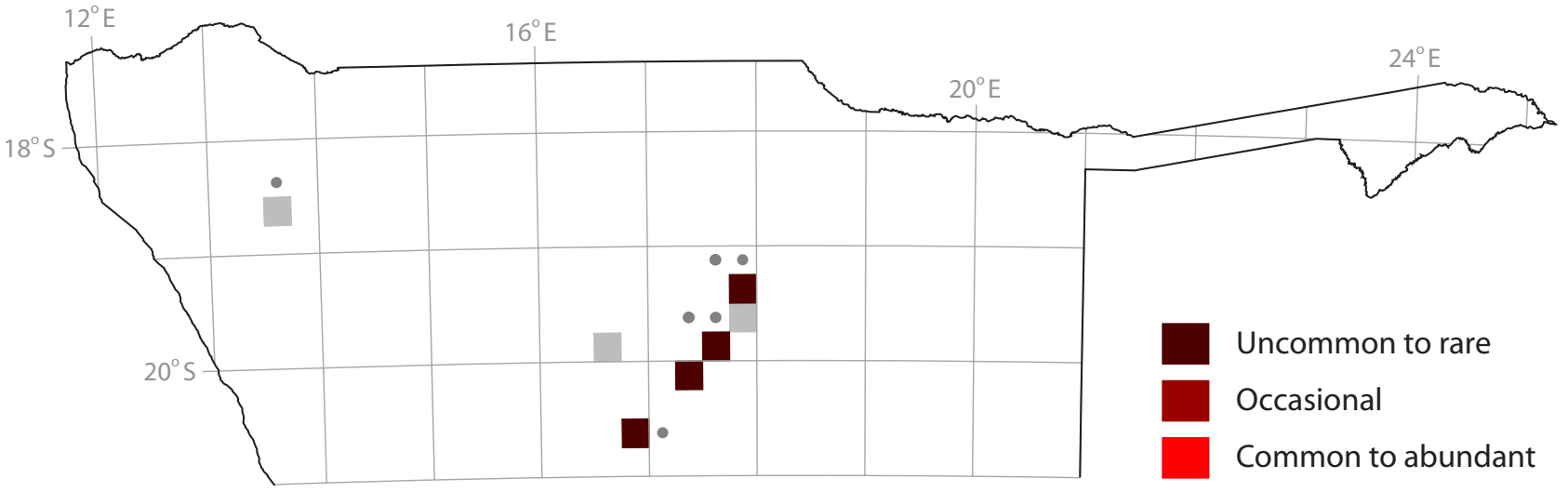
Pouzolzia mixta

Snuggle-leaf

Soap nettle (E); seepnetel (A); ondomo (H)

[14 records from 7 (<1%) squares]

Shrub. BARK **younger branchlets densely velvety** with short hairs. LEAVES simple, ovate, **soft-textured**; discolourous – **dark green** with sparse hairs **above**, and **densely silvery-felty below**; FRUIT a small nut **enveloped in papery, persistent flower parts**.



DISTRIBUTION & ABUNDANCE

Rare in the eastern Karstveld and near the Waterberg; one record from the north-western escarpment (CUR1/1548). This species was recently recorded on the Omavanda Plateau, Baynes Mountains (1713AA) (CUR1, identified by Braam van Wyk).

HABITAT

Rocky hill slopes and hilltops; generally on dolomite.

GROWTH FORM

Mainly a shrub less than 1 m high, but one record as a stand of shrubby trees over 3 m.

ANNUAL CYCLE

FLOWERS November, December, February and April. FRUIT February and April. LEAVES present December to April, bare in July, no other months recorded.

GENERAL

Root is used medicinally.

CONSERVATION CONCERNS

None recorded.

Protea gaguedi

African White Protea

Muririra (Rum)

[no TAP records]

Small, gnarled tree. BARK corky, flaking. LEAVES oblong or elliptic, light-green or bluish-green; base tapering; petiole absent. FLOWERS densely hairy, white or pink-tinged; bracts pale green with dense, silvery hairs, sometimes with rusty-brown margins.



No TAP records, despite two atlassers specifically looking for this species. Earlier herbarium specimens were collected from a number of squares along the Okavango River, the last of which was in the year 1985. This species is widely distributed in Africa. The specific name is based on the common name in Ethiopia. Extracts from the root are used for the relief of abdominal pains and for fainting. The plant is also used by men as an aphrodisiac.

CONSERVATION CONCERNS

This species could be extinct in Namibia due to habitat destruction and over-exploitation for traditional medicinal uses. One headman claims that the species still exists, but he was not prepared to say where. Assessed as 'data deficient' according to the latest IUCN criteria (Loots 2005).

Osyris lanceolata

= Osyris quadripartita

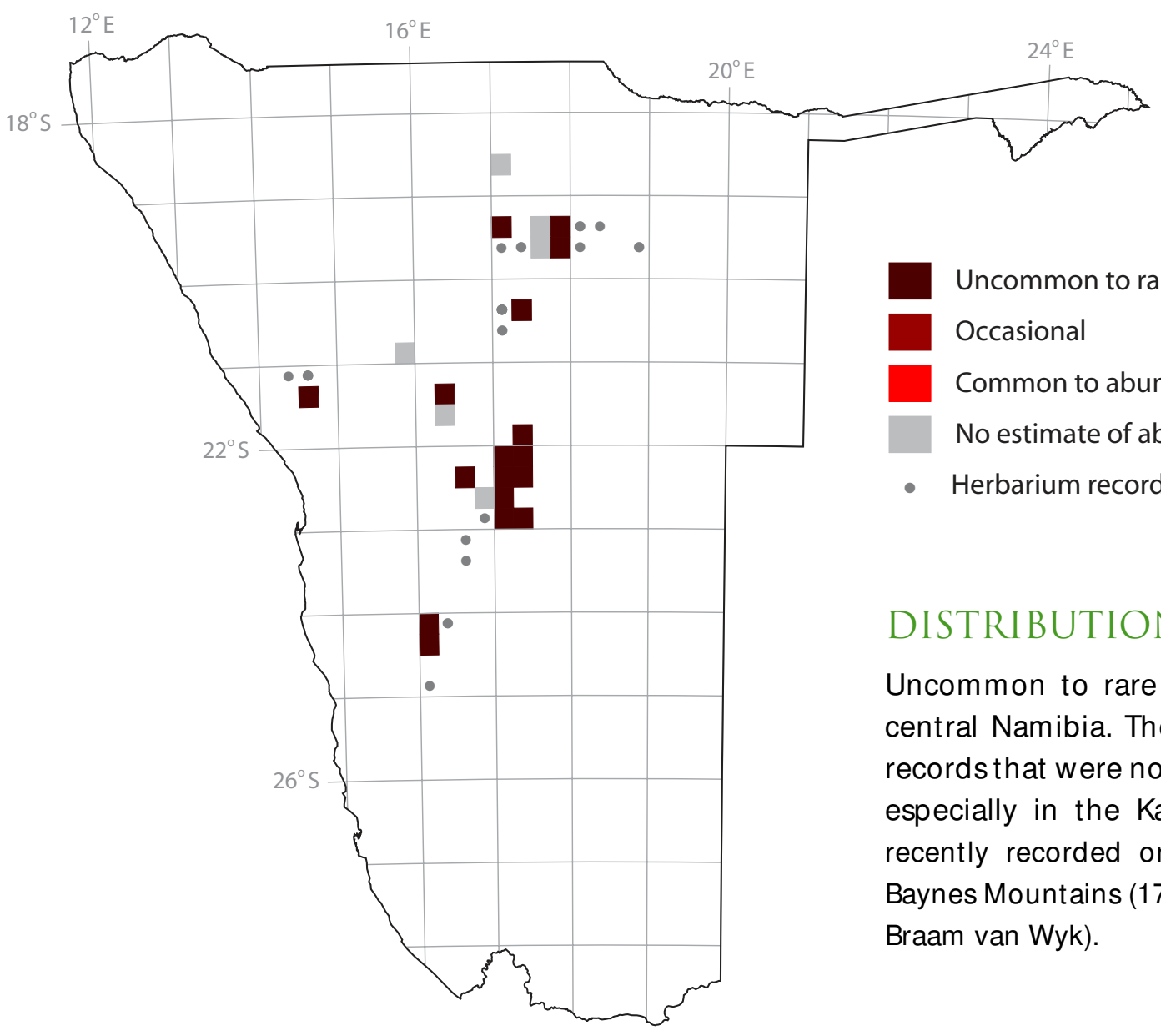
Bergbas

African sandalwood (E); ombahu, yozondu (H)

[38 records from 22 (2%) squares]



Evergreen, hardy shrub; occasionally a small tree, often over 4 m high; young branchlets angular. LEAVES simple, lanceolate to elliptic, **leathery to fleshy; bright grey-green or blue-green, with a dull, waxy coating; apex pointed, with sharp tip**. FLOWERS very small, yellow-green; **ovary inferior**. FRUIT a fleshy stone-fruit **crowned by a persistent calyx**; elliptic to almost spherical, red to dark purple when ripe.

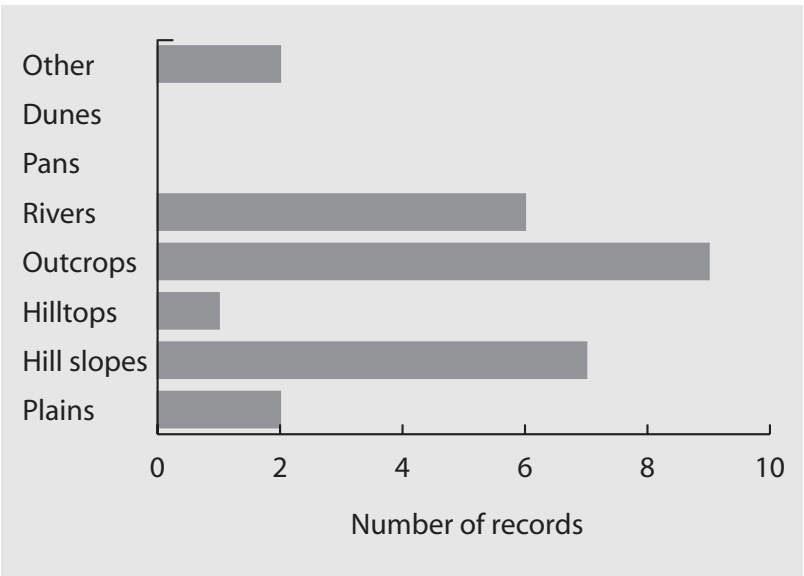


DISTRIBUTION & ABUNDANCE

Uncommon to rare in scattered localities in central Namibia. There are earlier herbarium records that were not reconfirmed by the TAP, especially in the Karstveld. This species was recently recorded on the Omavanda Plateau, Baynes Mountains (1713AA) (CUR1, identified by Braam van Wyk).

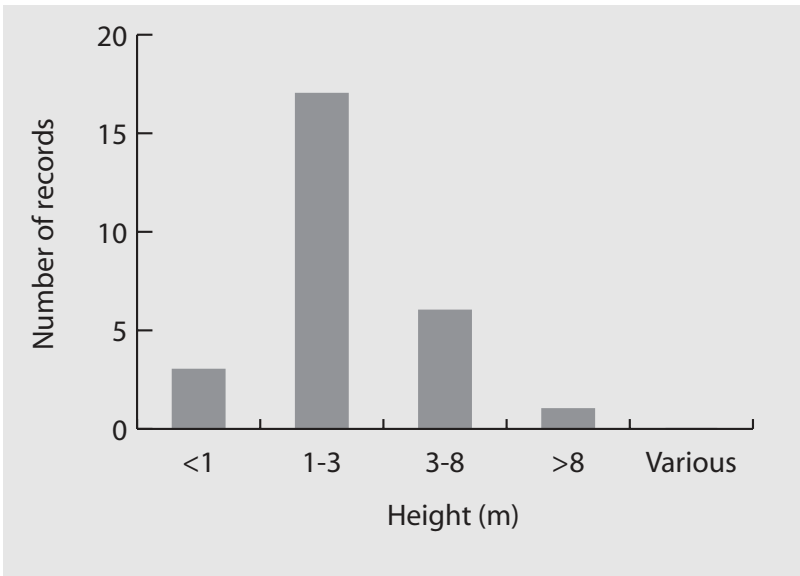
HABITAT

Various, but mostly found on rocky outcrops and hill slopes. Grows on rocky substrates, including calcrete, layered quartzite and mica schist.



GROWTH FORM

Mostly a shrub in the 1–3-m height class. Sometimes a tree of 3–8 m; once over 8 m.



ANNUAL CYCLE

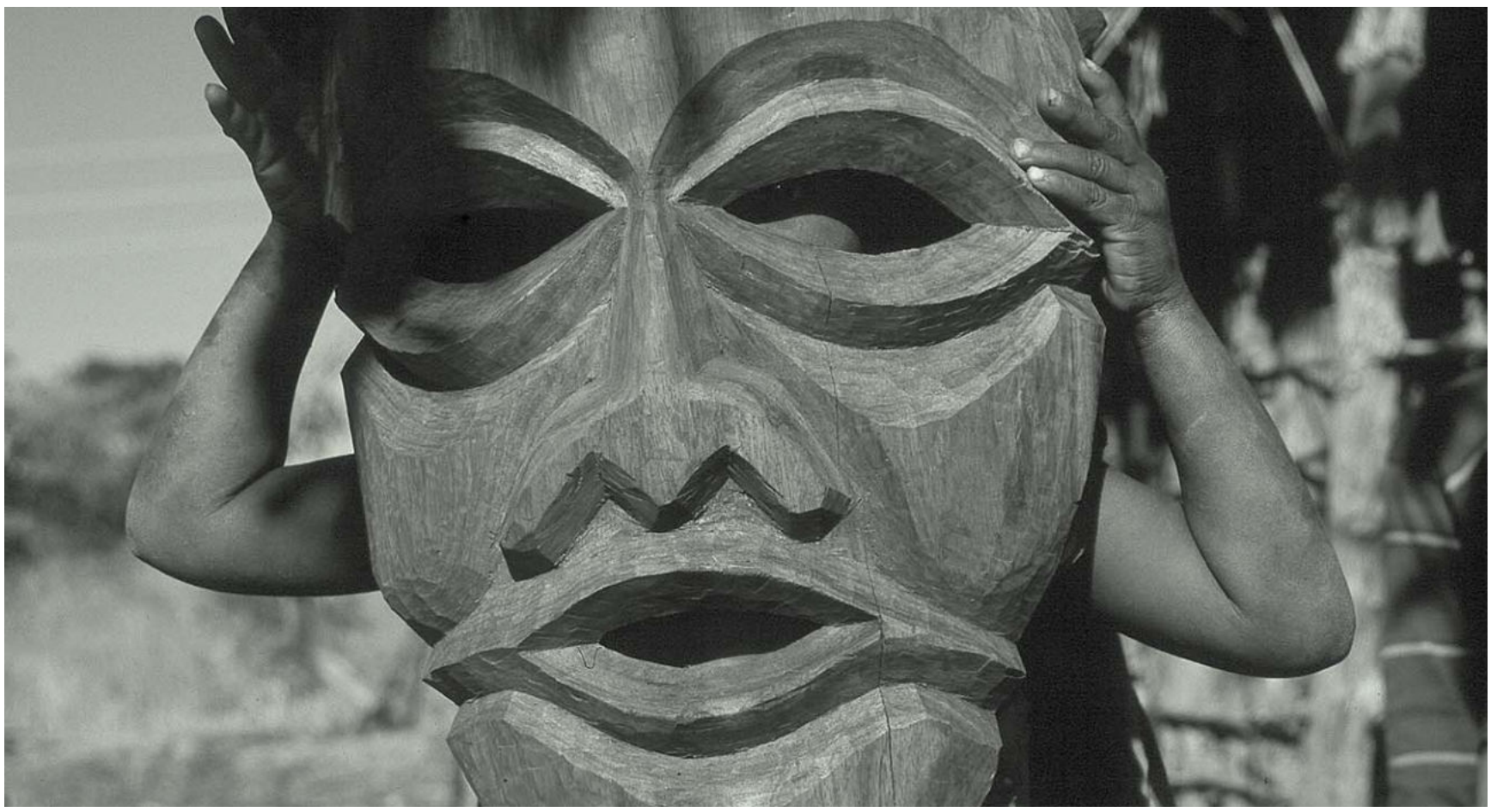
FLOWERS February and April, with single records in other months. FRUIT April and May, with single records in other months. LEAVES evergreen.

GENERAL

Often seems to grow in close association with other trees, so may be overlooked. Roots are used medicinally.

CONSERVATION CONCERNS: None recorded.

Kavango Mask, P. Reiner



Opilia campestris

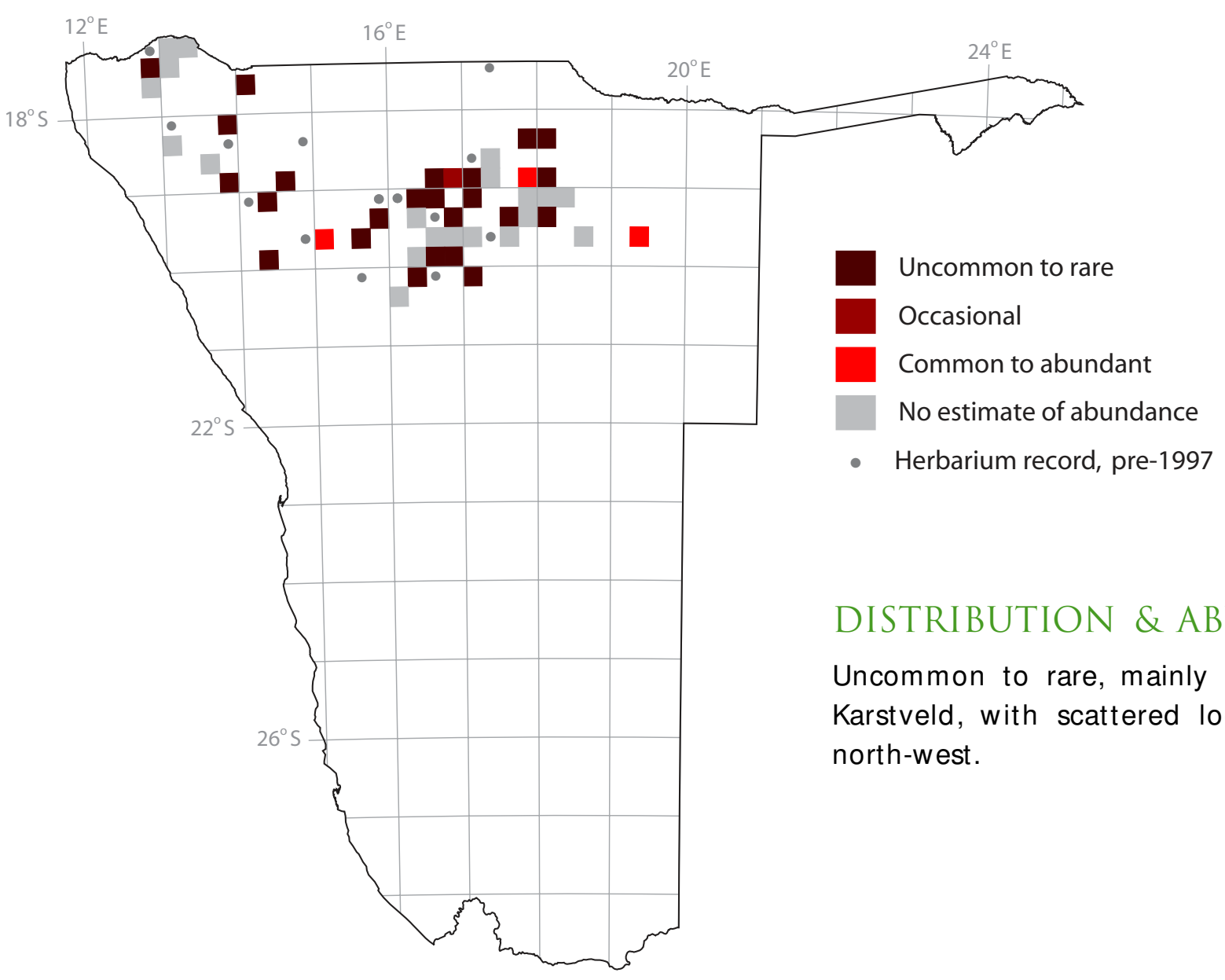
Lekkervreet

Omudize, omutwimise (H)

[123 records from 48 (4%) squares]



Sturdy, stiffly branched shrub. BARK younger branchlets **olive-green, with dense, short hairs**. LEAVES simple, small, alternate, in **two rows** (distichous); ovate to elliptic; **olive- to grey-green, with short hairs above and below**; drawn out into a petiole 1–3 mm long. INFLORESCENCE **catkin-like**. FLOWERS very small, sweet-smelling. FRUIT a hairy, elliptic stone-fruit; yellow-red when ripe.

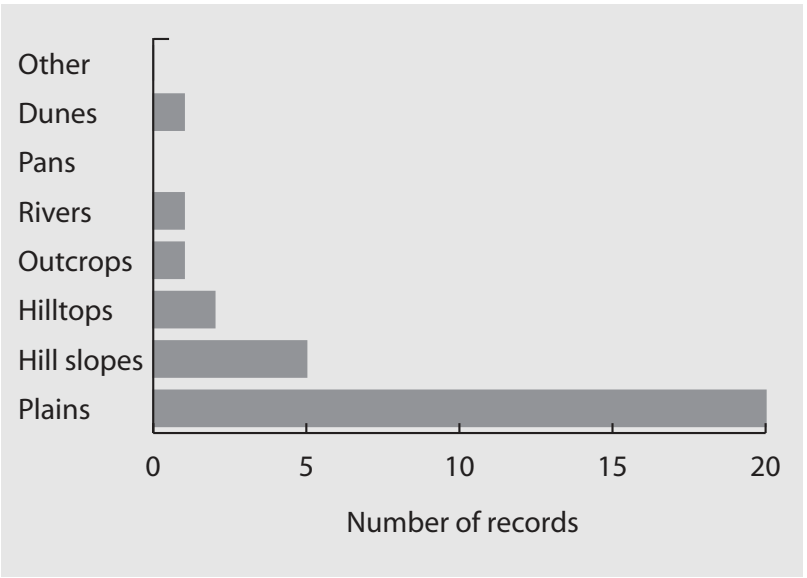


DISTRIBUTION & ABUNDANCE

Uncommon to rare, mainly in the eastern Karstveld, with scattered localities in the north-west.

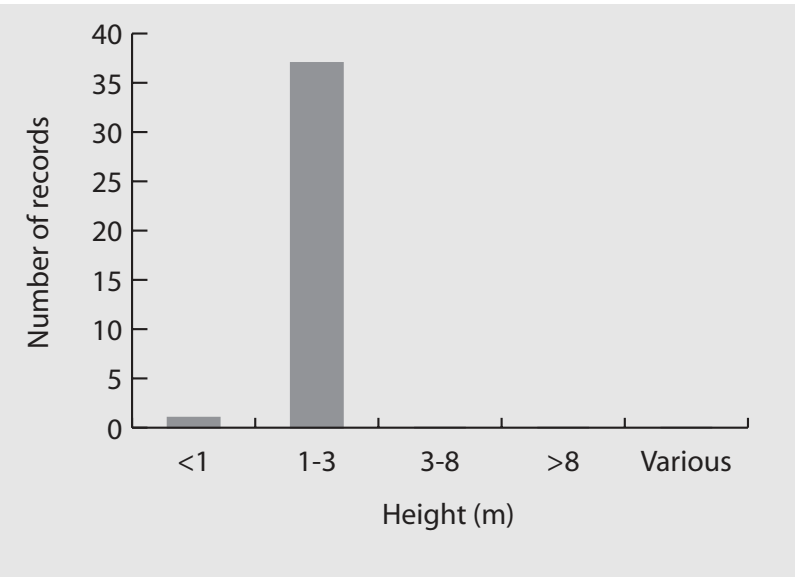
HABITAT

Mostly plains, usually in mixed woodland. Substrate often calcrete; sometimes clay, where it is more abundant.



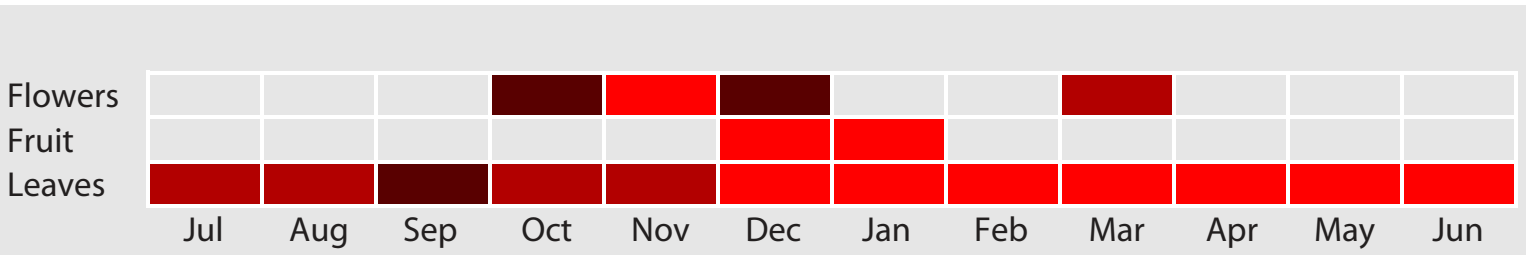
GROWTH FORM

Mostly a shrub in the 1–3-m height class.



ANNUAL CYCLE

FLOWERS mainly November, but with a second flush in March. FRUIT December and January. LEAVES semi-deciduous, with bare trees from July to September.



GENERAL

Heavily browsed by game and livestock.

CONSERVATION CONCERNS

None recorded.



Opilia campestris, L. Hoffmann

Ximenia americana

Blue Sourplum

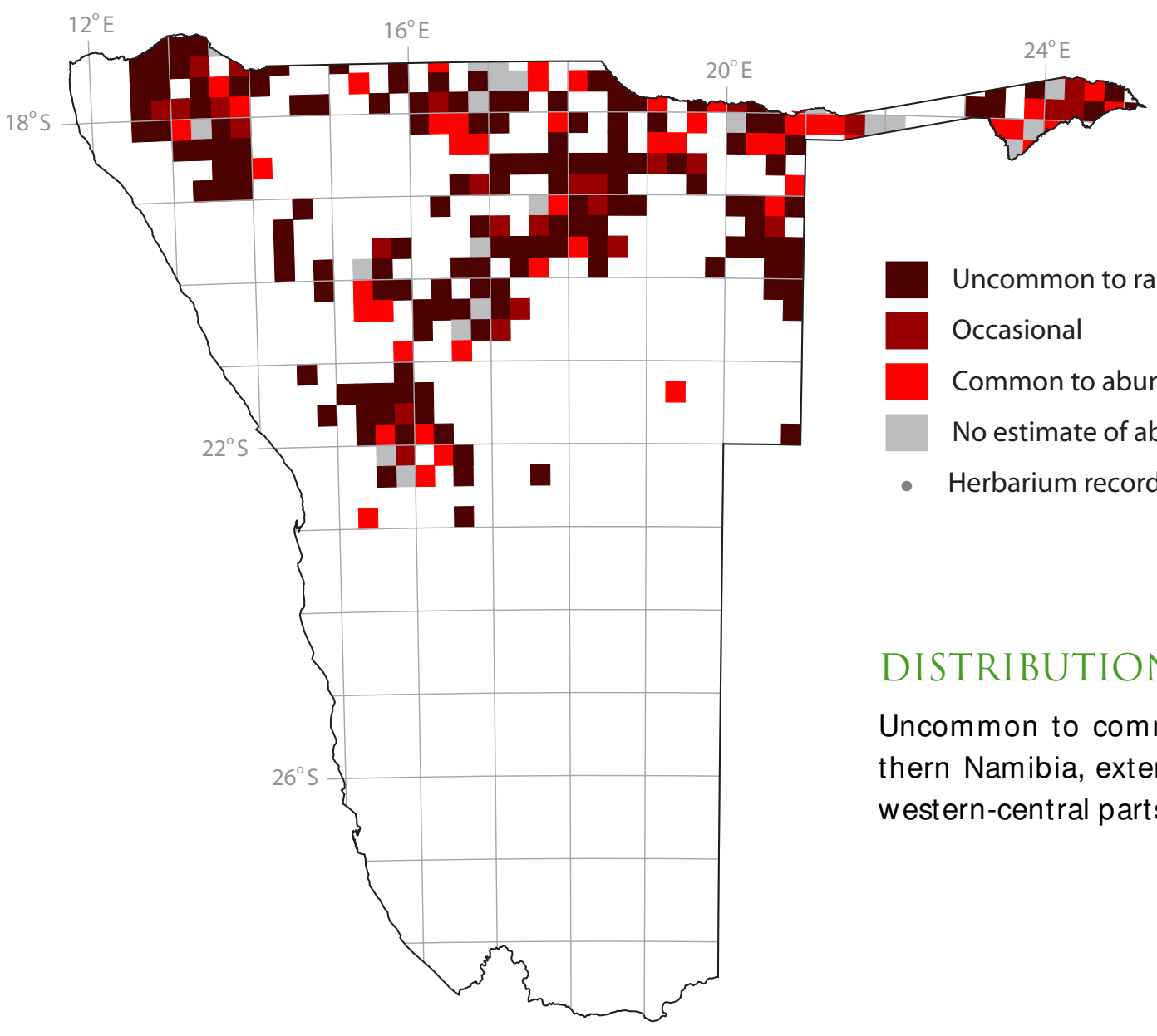
Blousuurpruim, geelpruim, kleinsuurpruim (A); omuninga (H); mungomba (L); omheke (O); kakukuru (R)

[602 records from 250 (23%) squares]



Usually a many-stemmed shrub with straight thorns, forming a thicket; occasionally a small tree. BARK **young branchlets blue-green**. LEAVES simple, semi-succulent, usually folded along the midrib; **both surfaces blue-green, hairless, with a dull, waxy coating**. FRUIT an ovoid, quite fleshy stone-fruit; **yellow to orange when ripe**. Flowers may be overlooked, fruit obvious.

There are two varieties in Namibia, of which the more common one, by far, is var. *microphylla*, which has smaller, bluer-green leaves than var. *americana*. Most atlassers were not aware that there are two varieties and thus no distinction has been made between them. Not all herbarium records have been correctly determined, thus no map is available for distribution of the varieties.

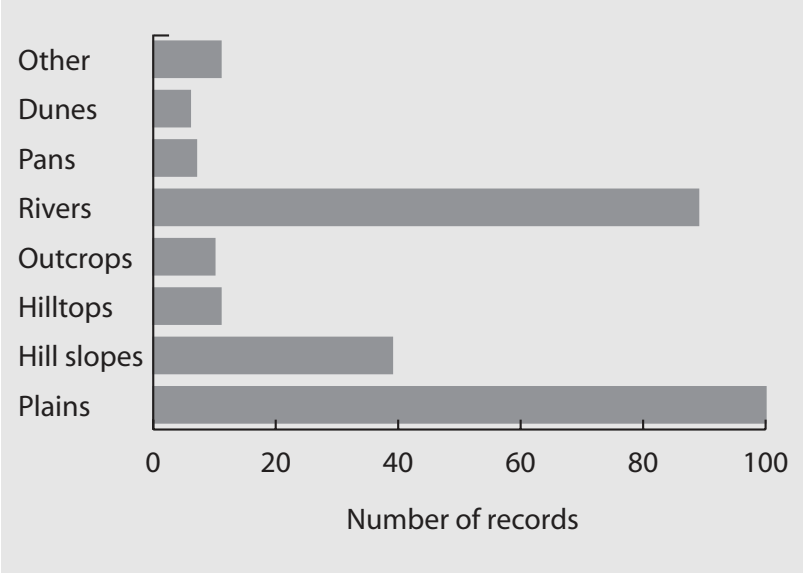


DISTRIBUTION & ABUNDANCE

Uncommon to common across most of northern Namibia, extending southwards to the western-central parts.

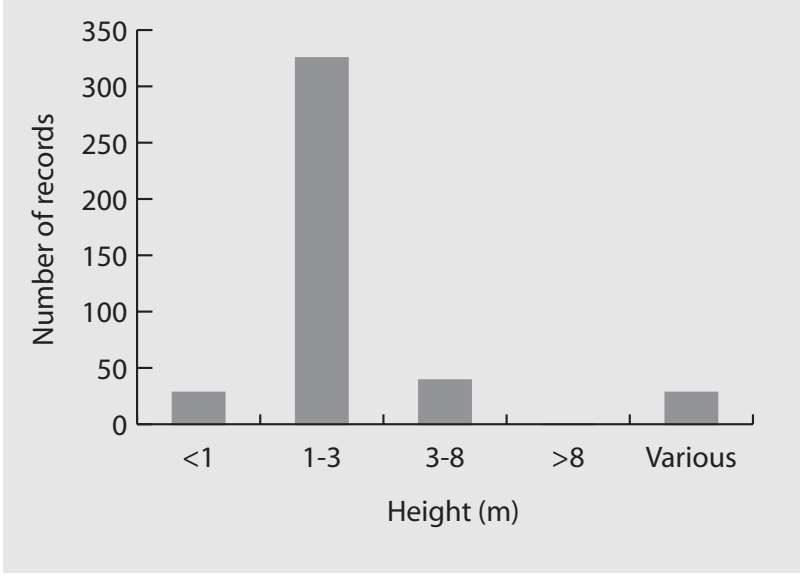
HABITAT

Various, but mainly plains in the Karstveld and north-east; hill slopes in the Karstveld and on the north-central plateau; along rivers in the central-west, north-west and north-east; and occasionally on pans in the north-east. Mostly on sand; sometimes on sand hummocks on floodplains.



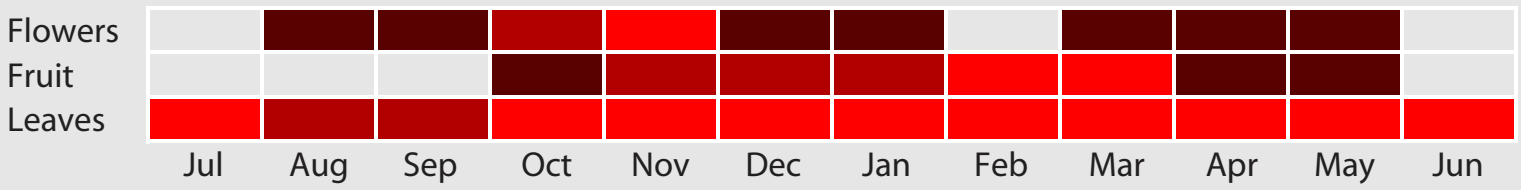
GROWTH FORM

Mostly a shrub (87% of records), generally in the 1–3-m height class, but sometimes taller. Occasionally a tree (11% of records) and sometimes climbing over a host plant (2%), which puts it into the 3–8-m class. It may form thickets in places.



ANNUAL CYCLE

FLOWERS most of the year, but never prolific; mostly October and November. FRUIT October to May. LEAVES essentially evergreen, with bare individuals in August and September.



GENERAL

A hemiparasite (depending on the roots of a host for moisture, but otherwise growing as a separate plant). The fruit of var. *microphylla* is eaten raw or brewed into an alcoholic beverage. The plant has medicinal properties and the seed oil is used cosmetically. Birds and tree squirrels eat the fruit; bees visit the flowers.

CONSERVATION CONCERNS

None recorded.

Ximenia americana var. *microphylla*, fruit and leaves, E. Ellinger



Ximenia caffra

Large Sourplum

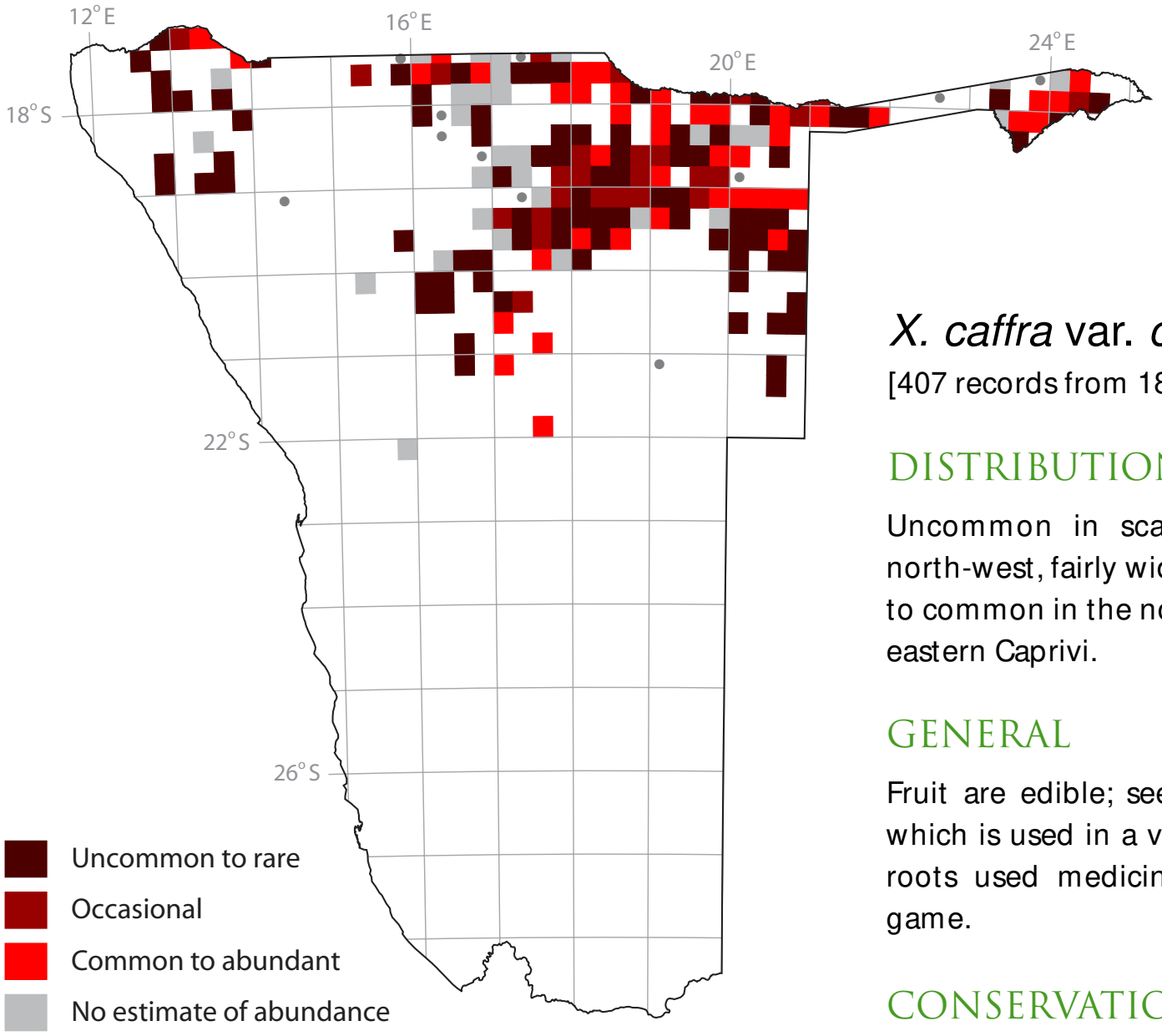
Groot suurpruim, rooipruim (A); omumbeke (H); ombyu (O); sipeke (Rk)



Semi-deciduous shrub or small tree with straight, brown thorns. LEAVES simple, longitudinally folded, dark green, somewhat leathery; apex blunt, often notched. FLOWERS fairly small, tubular. FRUIT an ovoid, somewhat fleshy stone-fruit; **pale yellow or orange-pink, becoming bright red** when ripe.

Flowers may be overlooked, fruit obvious.

There are two varieties in Namibia, with var. *caffra* far more common than var. *natalensis*. Any records not specifically designated, were assumed to be var. *caffra*. The two varieties are easily distinguished by the fact that the leaves and young branches of var. *caffra* are hairy, whereas those of var. *natalensis* are hairless to almost hairless.



X. caffra var. *caffra*

[407 records from 188 (18%) squares]

DISTRIBUTION & ABUNDANCE

Uncommon in scattered localities in the north-west, fairly widespread and uncommon to common in the north-east, and common in eastern Caprivi.

GENERAL

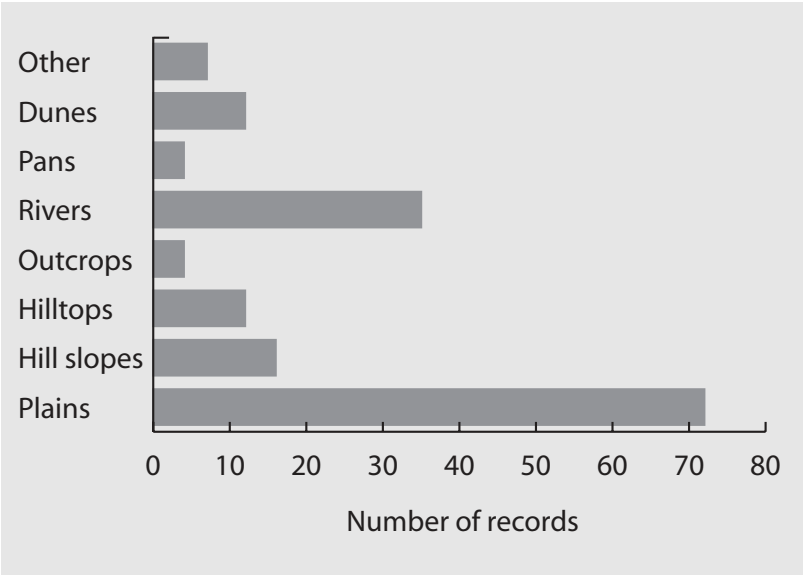
Fruit are edible; seeds contain a viscous oil which is used in a variety of ways; seeds and roots used medicinally; leaves browsed by game.

CONSERVATION CONCERNS

None recorded.

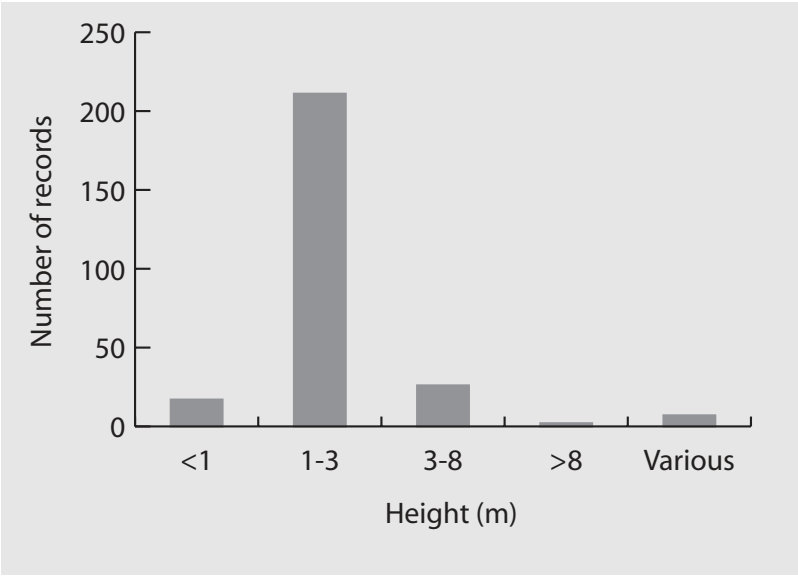
HABITAT

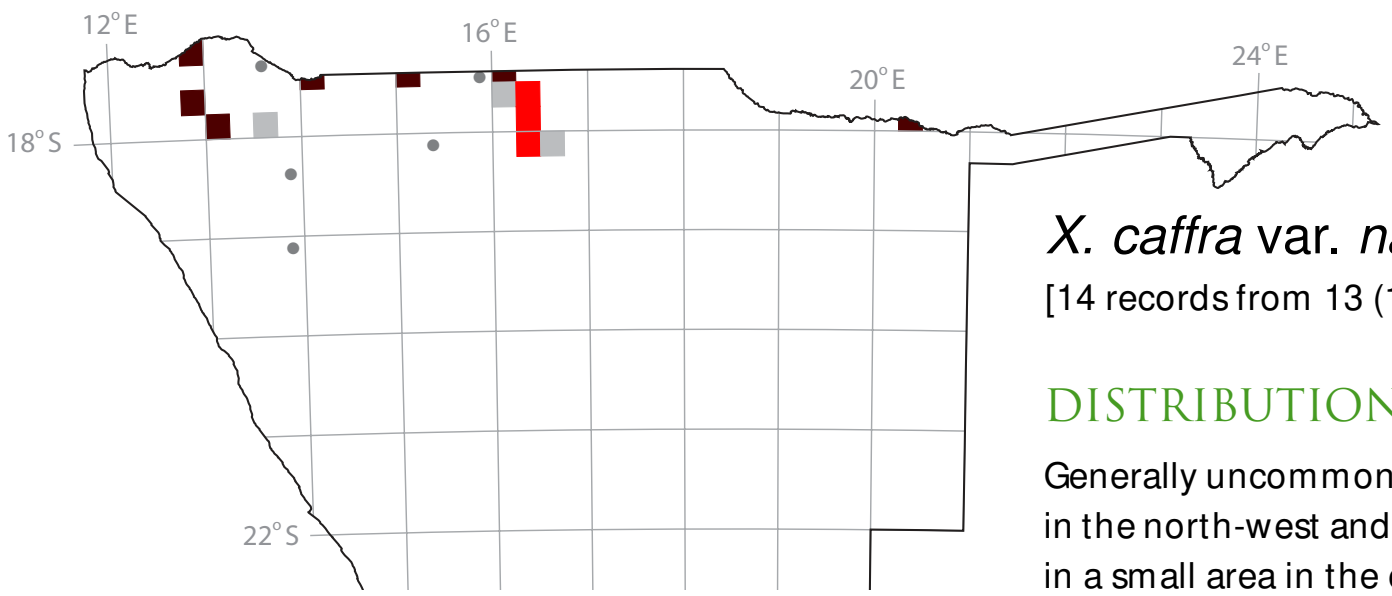
Found in various habitats, but mostly on plains, as well as along rivers and on dunes in the north-east, and hill slopes in the north-west; generally on sand or sandy loam.



GROWTH FORM

Usually a shrub (85% of records) in the 1–3-m height class, sometimes taller; occasionally a tree.





X. caffra var. *natalensis*

[14 records from 13 (1%) squares]

DISTRIBUTION & ABUNDANCE

Generally uncommon to rare in a few localities in the north-west and Cuvelai; locally common in a small area in the central-north.

HABITAT

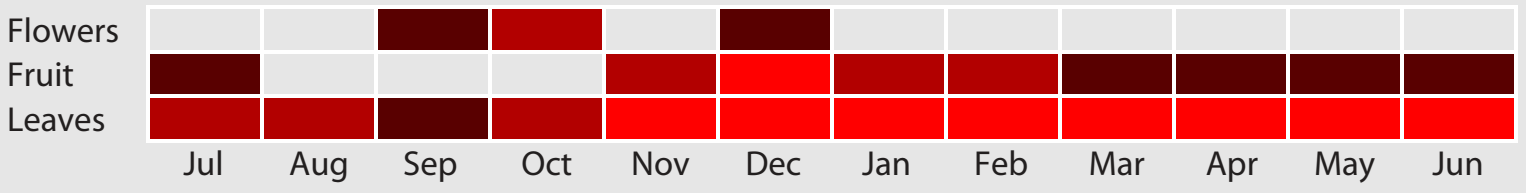
Mostly along dry river courses, sometimes on plains.

GROWTH FORM

Predominantly a shrub, but more often tree-like than var. *caffra*.

ANNUAL CYCLE

Records for both varieties amalgamated. FLOWERS mainly October, with single records most months. FRUIT mainly November to February but recorded up to July. LEAVES usually some, but with highest records of bare trees in September; leaf buds in August and September and young leaves October to December.



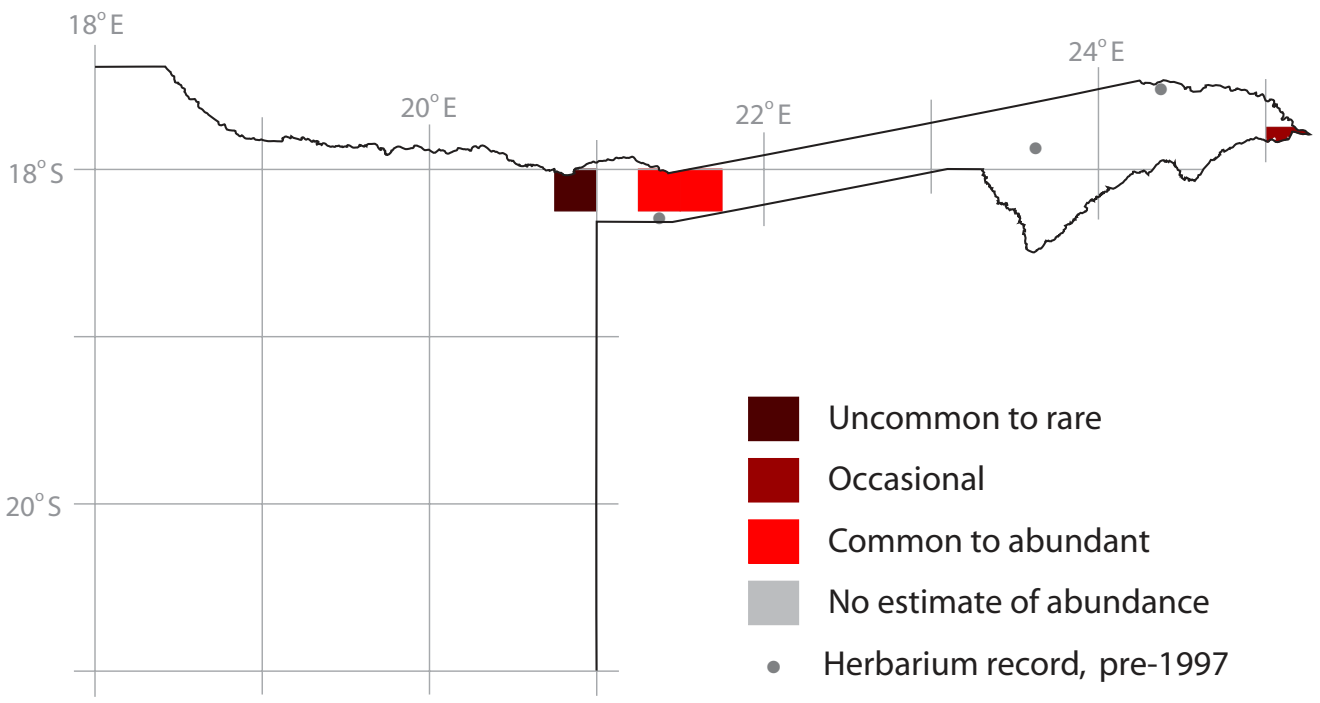
Olax dissitiflora

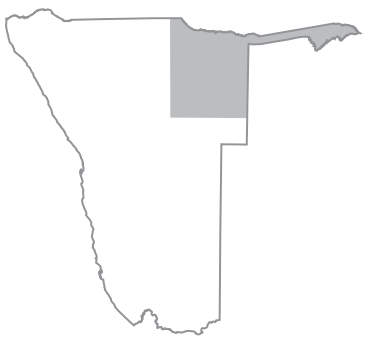
Mudowe

[9 records from 4 (<0.5%) squares]



Evergreen or semi-deciduous shrub or tree, with **lax and drooping branches**. Young branchlets bent zig-zag, dark green. LEAVES simple, alternate, **in two rows**, usually broadly lanceolate; **somewhat leathery, curved backwards, often folded along midrib**. FRUIT a fleshy, ovoid or round stone-fruit; orange to red when ripe; **enclosed in the fleshy, persistent calyx.**





DISTRIBUTION & ABUNDANCE

Uncommon to common along the eastern section of the Okavango River; uncommon on Impalila Island.

HABITAT

River banks and floodplains, as well as rocky outcrops or sandy slopes near rivers.

GROWTH FORM

Mostly a tree in the 3–8-m height class, sometimes shorter. There are some records of low shrubs near Popa Falls.

ANNUAL CYCLE

Observations made from March to May and October to December, only. FLOWERS October. FRUIT November and December. LEAVES present in all recorded months.

CONSERVATION CONCERNS

None recorded.

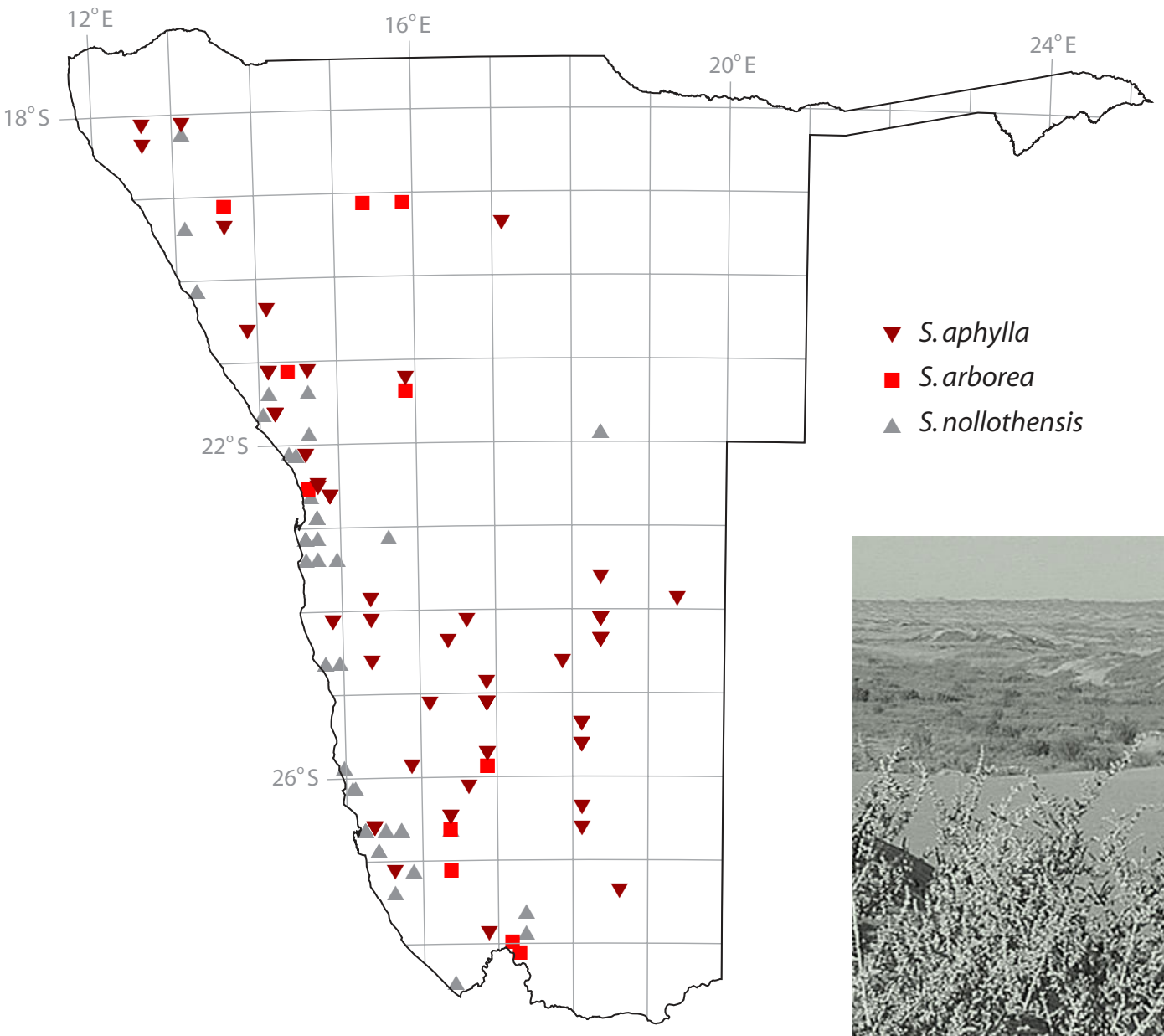
Salsola

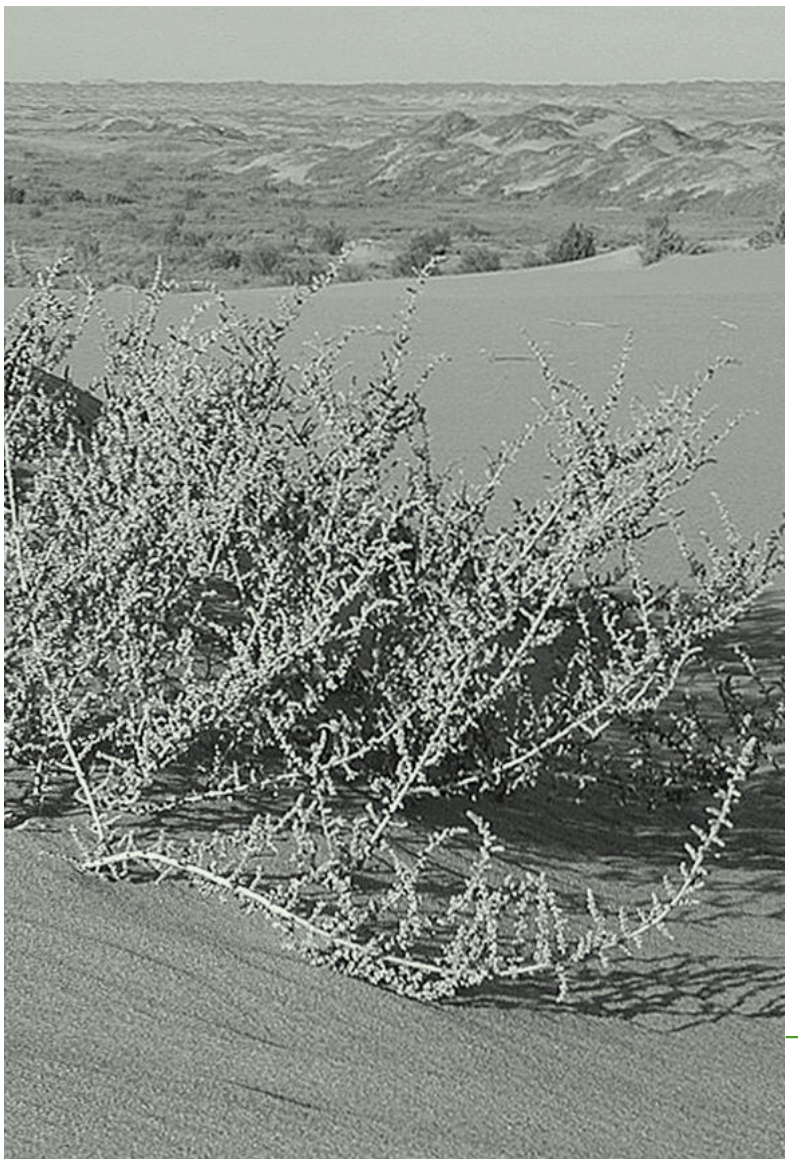
Gannabos

Saltbush (E); Brackbusch (G); #khoes (K)

A large genus with many species in Namibia, of which three, *S. aphylla*, *S. arborea* and *S. nollothensis*, are large enough to be included in the TAP. *Salsola arborea* is endemic to Namibia.

As this genus is tolerant of saline soils, it is very common in the south and along the coast, and provides important browse in areas where there is little else. Since the species are extremely difficult to tell apart, all were under-recorded by atlassers and the data collected were not considered reliable enough to include in this publication. Instead, a map of herbarium specimen data has been included to show distribution.





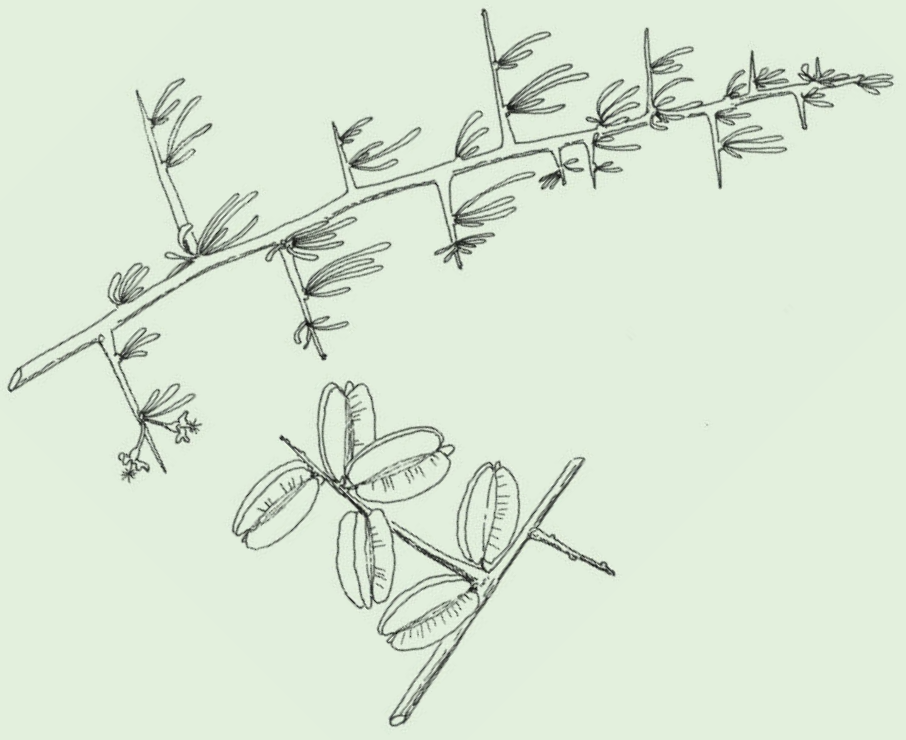
Salsola nollothensis, Sperrgebiet, A. Burke

Phaeoptilum spinosum

Brosdoring

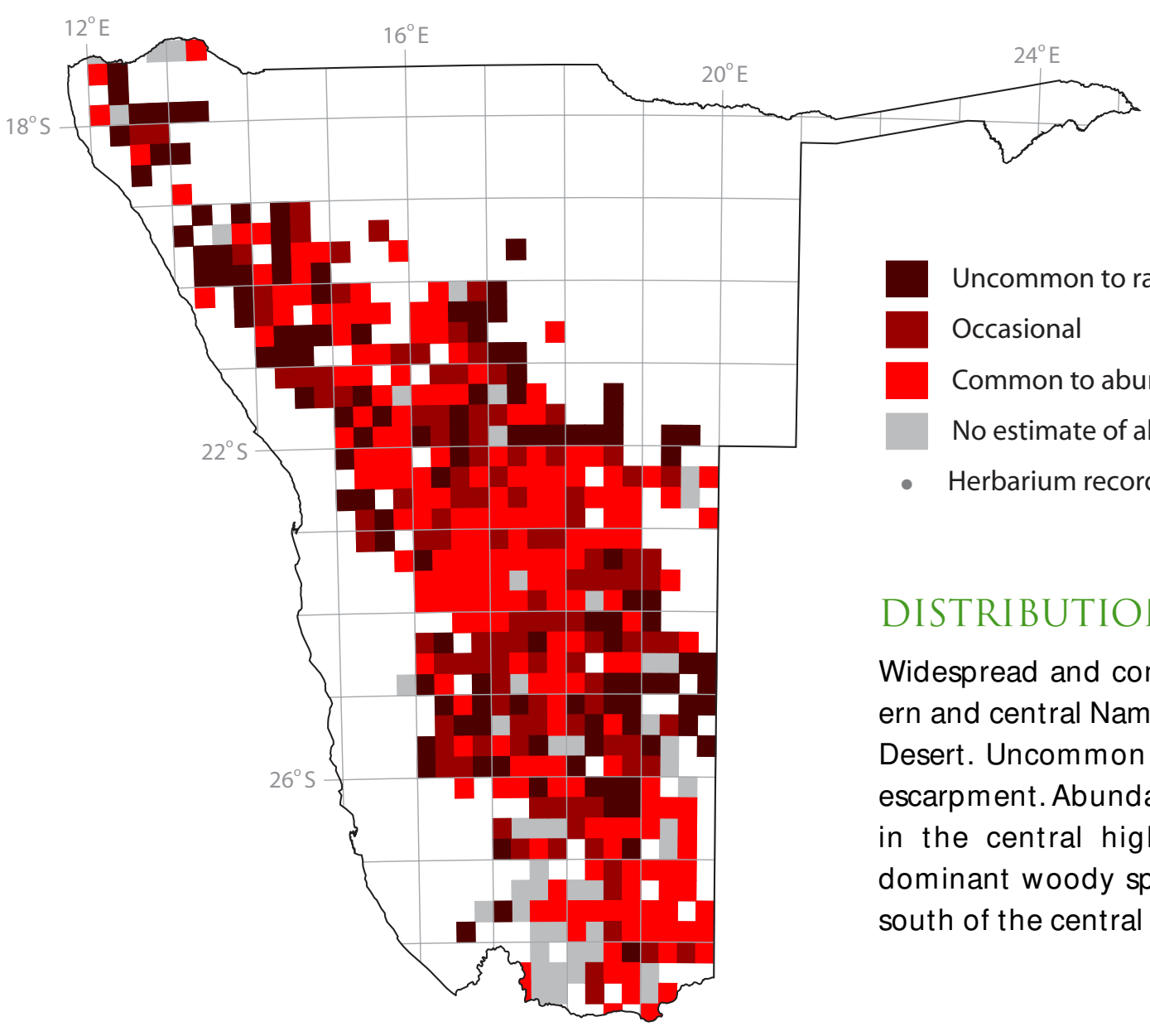
Brittle-thorn (E); wilde bougainvilla (A); Flügelfruchtstrauch (G): otjinanguruve (H); ||àri.s (K)

[1,415 records from 486 (45%) squares]



Many-stemmed, much-branched shrub, with **arching branches and spinescent twigs**. LEAVES simple, **narrow, elongate, spirally arranged or clustered on dwarf shoots**; dull grey-green, hairless; petiole very short. FLOWERS tubular; pale creamy yellow; usually clustered on dwarf shoots. FRUIT **papery, four-winged**, silvery to yellow to pink-red.

Most conspicuous when in fruit. Without flowers or fruit, it is very easy to confuse with *Lycium* spp.

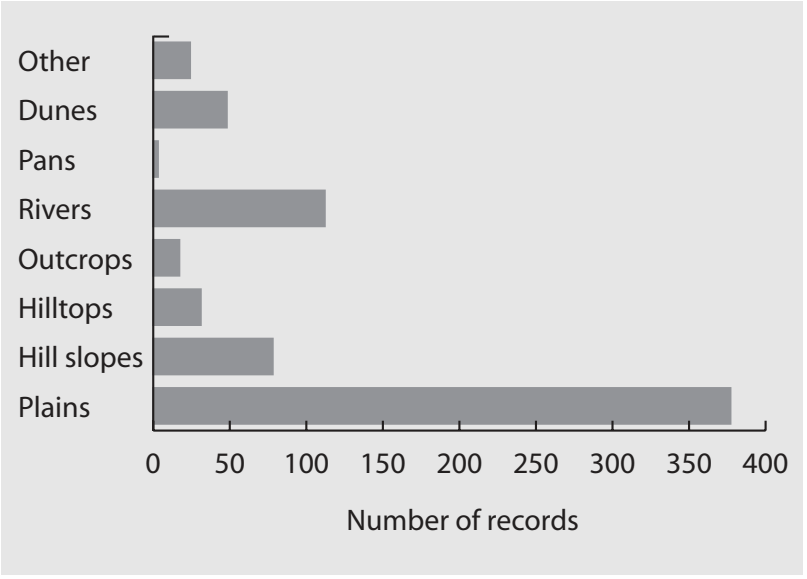


DISTRIBUTION & ABUNDANCE

Widespread and common throughout southern and central Namibia, excluding the Namib Desert. Uncommon along the north-western escarpment. Abundant in a number of squares in the central highlands, and one of the dominant woody species on the plateau just south of the central highlands.

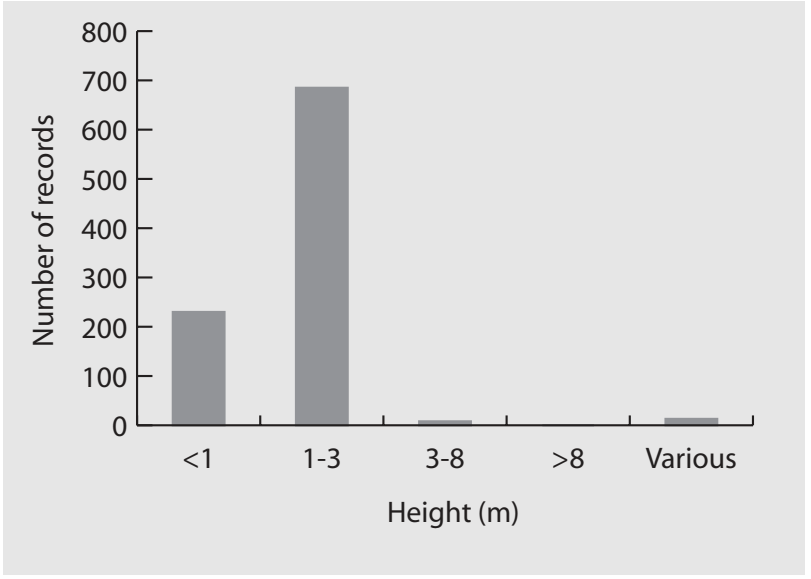
HABITAT

Various, but mainly on plains and along dry rivers. Also found on hills in the central highlands and in the south, and on dunes in the south-east. Substrates included sand, sandy loam, rock, stones, limestone and gravel.



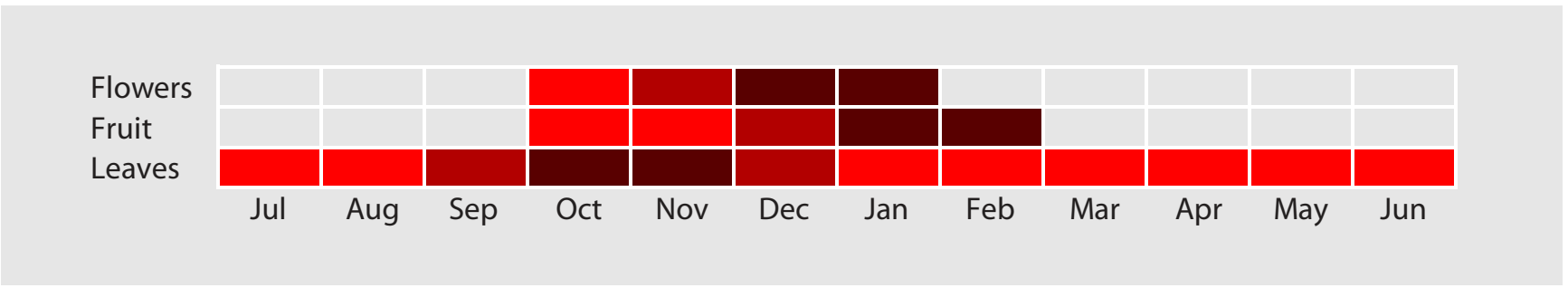
GROWTH FORM

Generally a shrub in the 1–3-m height class, but often less than 1 m; rarely over 3 m.



ANNUAL CYCLE

FLOWERS October to January, with old flowers recorded almost every month. FRUIT October to February. LEAVES present on some plants the whole year round; bare plants mostly recorded between September and December.



GENERAL

This shrub is browsed by eland and goats, and the flowers are visited by numerous insects. The plant thrives on road verges, and it has been noted (BES1) that it tends to increase where other species have been cleared, especially in the Okahandja district. It belongs to the Bougainvillea Family. Also recorded under the common name '!Tûses' (THE1, 2516AD).

CONSERVATION CONCERNS

None recorded.



Phaeoptilum spinosum, pods and flower buds, B. Curtis

Tetragonia schenckii

Kinkelbos

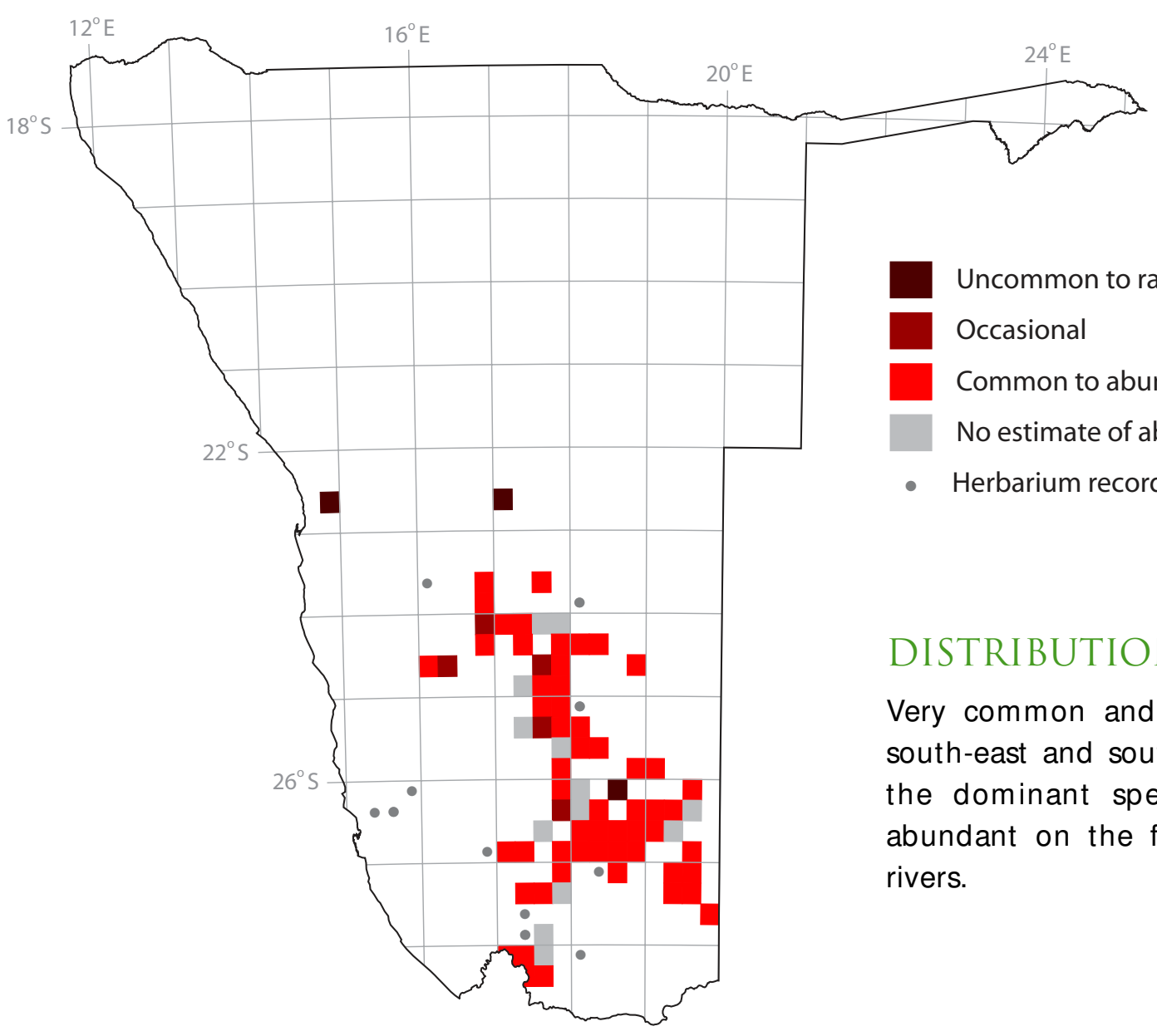
Süssbrackbusch (G); #khoes (K)

[117 records from 78 (7%) squares]



Untidy, much-branched shrub with lax branches, up to 1.6 m high. LEAVES simple, **blue-green, fleshy, with waxy bloom**, very variable in size. FLOWERS small, shortly tubular, pale yellow-green. FRUIT with **3–4 thin-textured wings or ribs**; yellow-green until ripe, then papery, matt or shiny, grey-brown.

Flowers and fruits in small clusters at tips of branches, obvious when present.

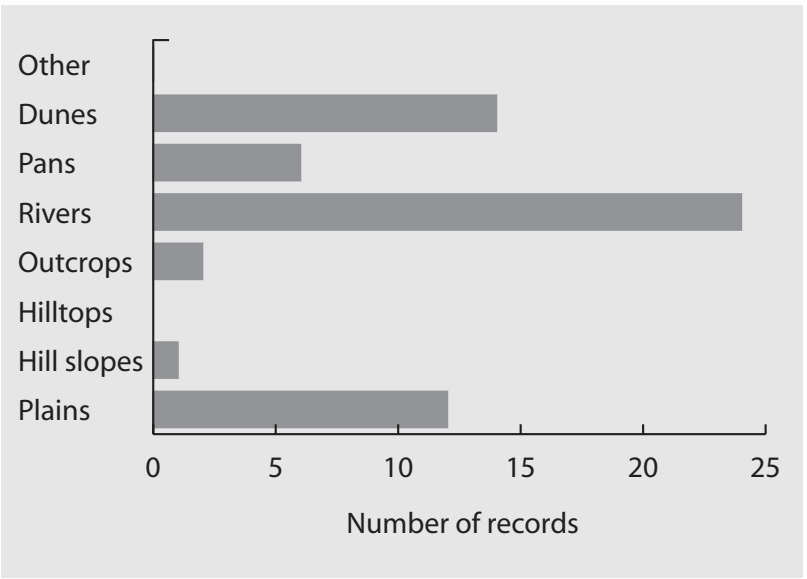


DISTRIBUTION & ABUNDANCE

Very common and widespread in areas of south-east and south-central Namibia, often the dominant species in the area. Most abundant on the floodplains of ephemeral rivers.

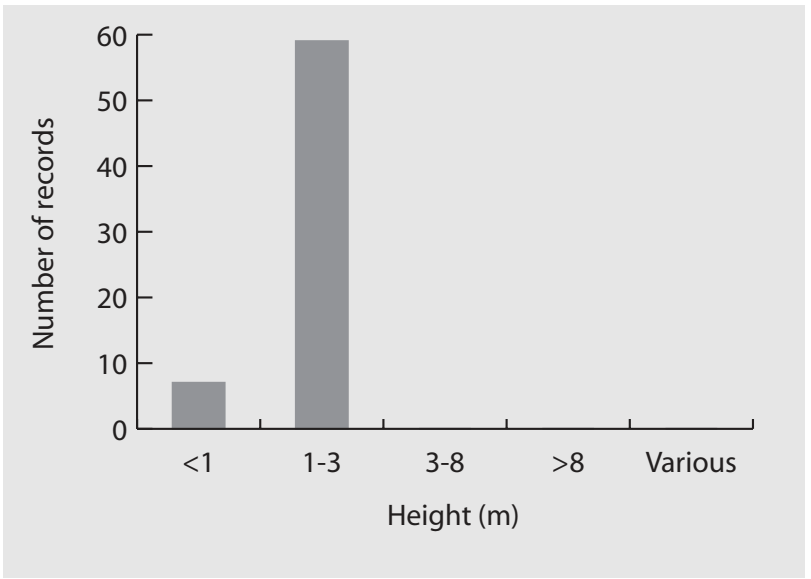
HABITAT

Mainly along dry water courses and on their floodplains, as well as in other seasonally inundated areas. Also on dunes and gravel plains near rivers. Prefers brackish soil.



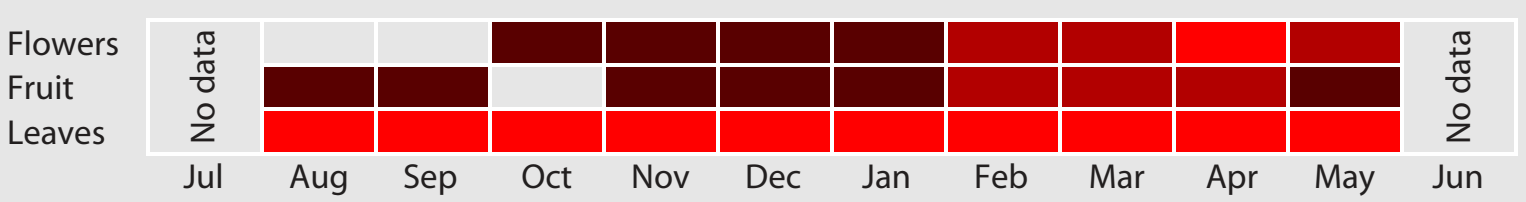
GROWTH FORM

A shrub, mainly in the 1–3-m height class.



ANNUAL CYCLE

FLOWERS mainly February to May. FRUIT mainly February to May, although old fruit can be found on some plants almost all year. LEAVES most of the year (there were no TAP records for this species in June and July).



GENERAL

According to the literature, the plant is poisonous and may cause stock loss among sheep. However, it is regarded by some as a good browse.

CONSERVATION CONCERNS

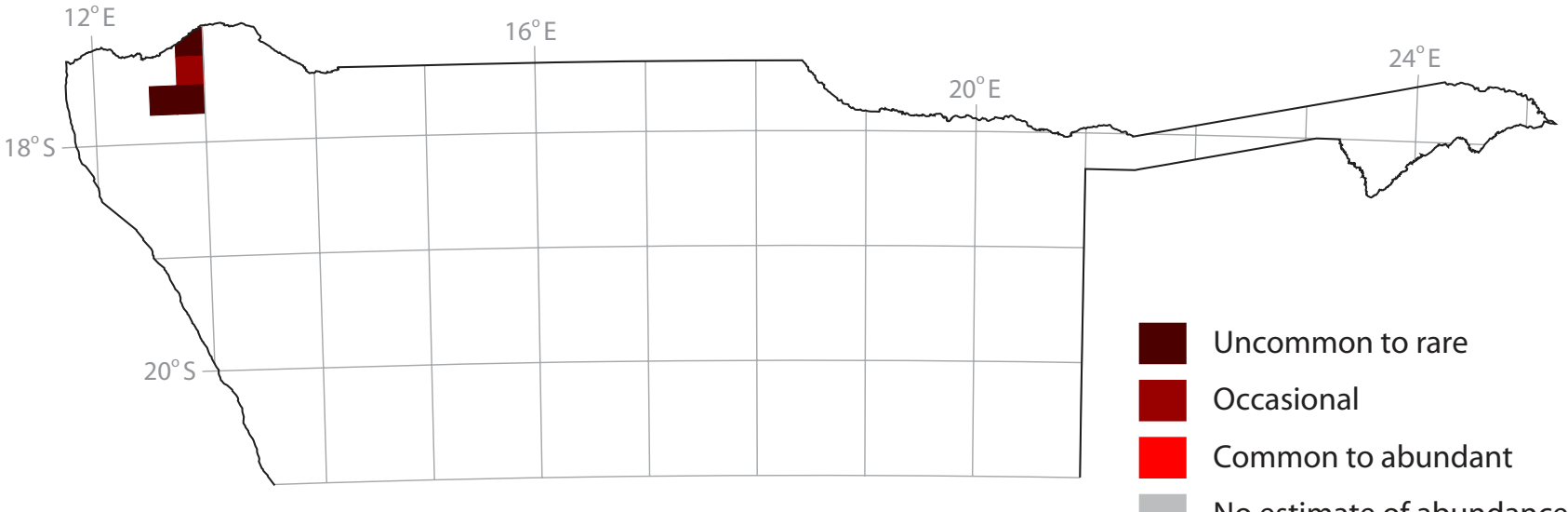
None recorded.

Ceraria carrissoana

Angola Ceraria

[4 records from (>0.5%) 3 squares]

A shrub or small tree with characteristic reddish-brown, waxy covering to the stems. LEAVES **ovate, succulent**, 10–20 mm long. FLOWERS very small, pink. FRUIT small, ovoid.



DISTRIBUTION & ABUNDANCE

Only recorded around the Baynes Mountains. Rare to occasional.

HABITAT

On steep, rocky hill slopes.

GROWTH FORM

Shrub or tree, about 2 m high.

ANNUAL CYCLE

FLOWERS in March; old flowers in December. FRUIT None recorded. LEAVES evergreen.

GENERAL

These are new records for the species in Namibia.

CONSERVATION CONCERNS

None recorded.



Ceraria carrissoana, leaves, B. Curtis

Ceraria fruticulosa

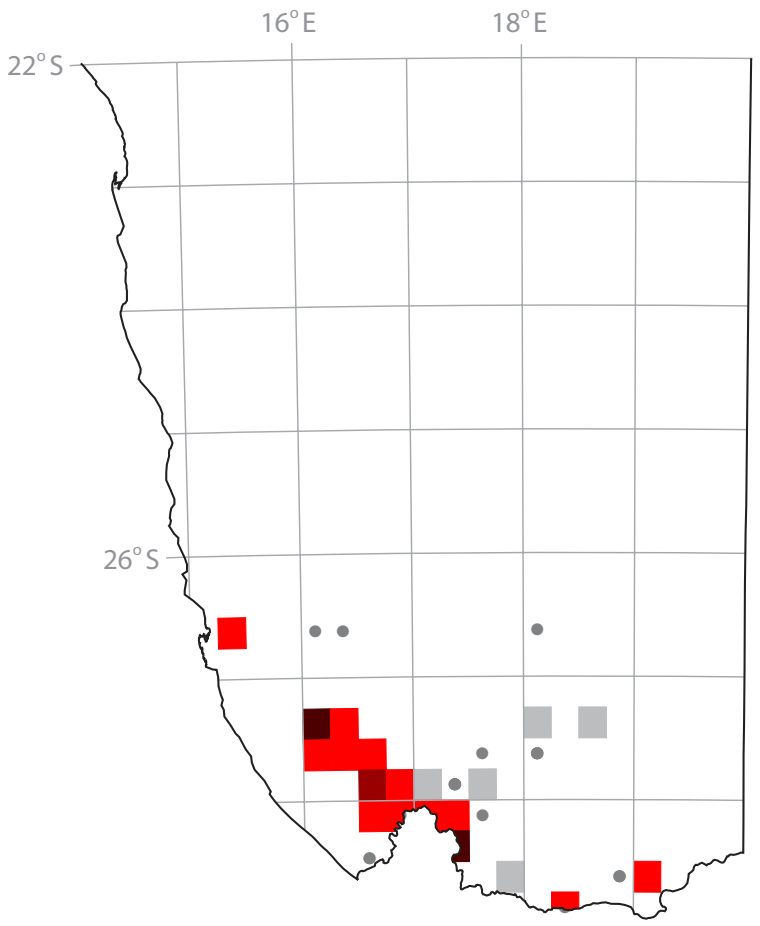
Slender Ceraria

[32 records from 19 (2%) squares]



Shrub. BARK **young branchlets flushed purplish-red** with a waxy appearance, **slender**. LEAVES simple, spirally arranged or clustered on dwarf shoots, sessile; **obovate to oblanceolate**, 10–15 x 4–7 mm, 2–2.5 times longer than broad, **thick and succulent; pale olive-green to blue-green**, hairless. FLOWERS small, bright pink, mainly on younger stems. FRUIT small and inconspicuous.

Should not be confused with *C. namaquensis* due to the chunky, creamy-white stems of *C. namaquensis* and the slender, purplish stems of *C. fruticulosa*.



DISTRIBUTION & ABUNDANCE

Common to uncommon and scattered over a small area of southern and south-western Namibia. In some areas (in 2818CD) it is the most abundant woody species. Past herbarium records show the plant to be more widespread than TAP records.

HABITAT

Mostly on rocky hill slopes and rocky outcrops.

GROWTH FORM

Always a shrub, usually <1 m high, but occasionally more than 1 m. Seems to be taller towards the west, but there are too few records to say this conclusively.

ANNUAL CYCLE

FLOWERS mainly March, sometimes other months. FRUIT no records. LEAVES evergreen.

CONSERVATION CONCERNS

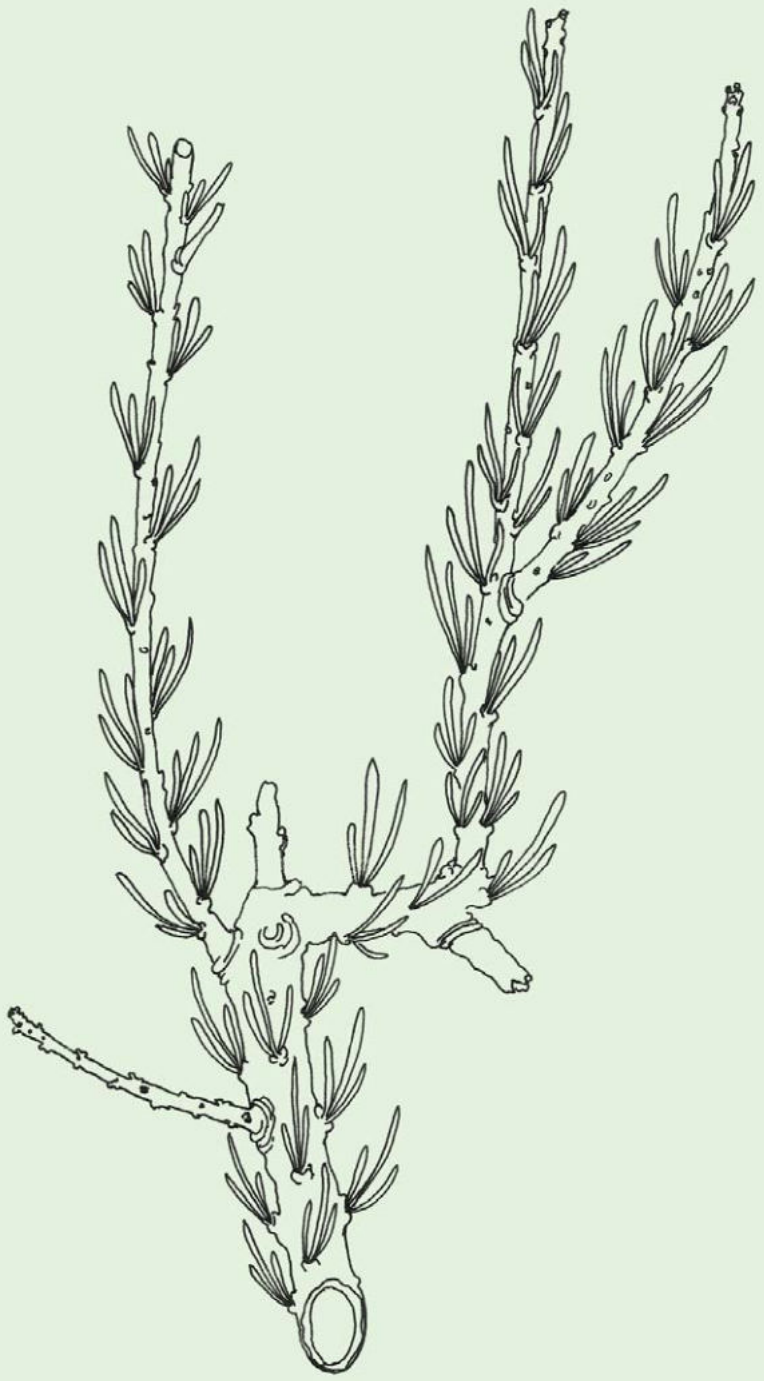
Unless this plant was misidentified by atlassers or it is very localised in some squares, there has been fairly extensive die-off of this species.

Ceraria longipedunculata

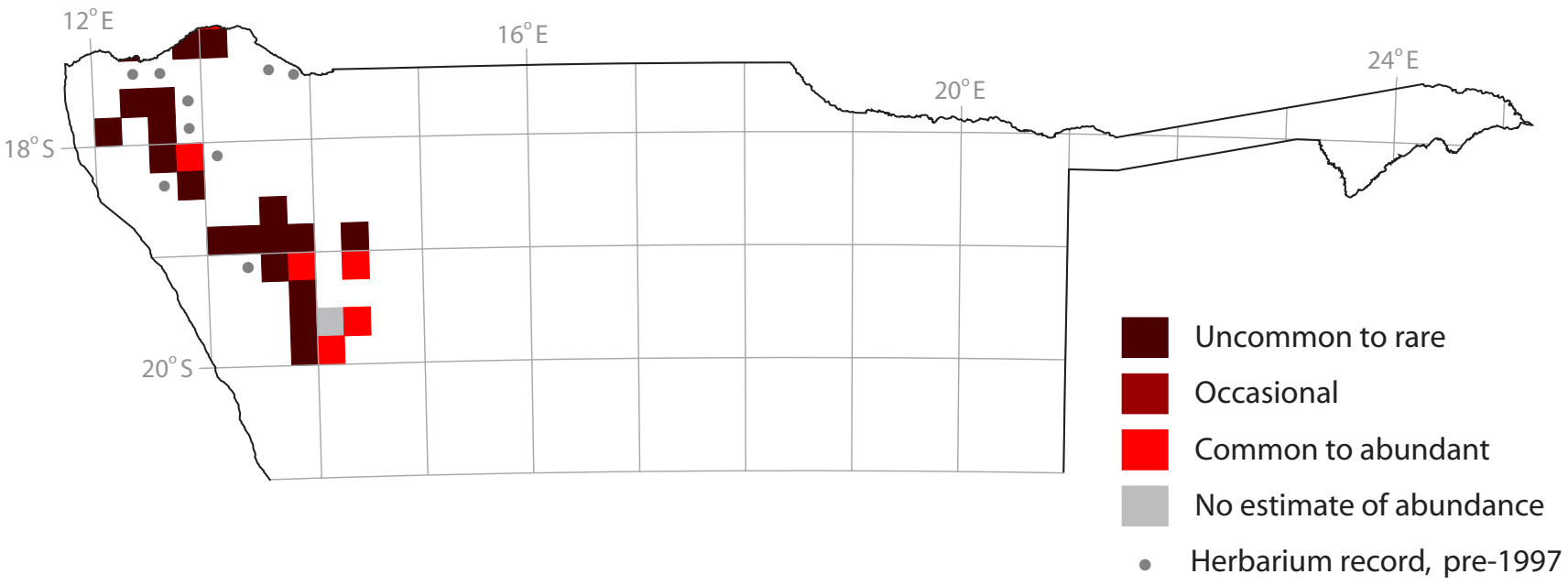
Kaoko Ceraria

Omumbondorowa (H)

[42 records from 27 (3%) squares]



Shrub or tree. BARK **young branchlets with a reddish to pale brown, waxy covering**. LEAVES simple, **spirally arranged or clustered on dwarf shoots, sessile; blade linear, cylindrical, succulent**, olive-green, hairless. FLOWERS small, pink, in sprays.

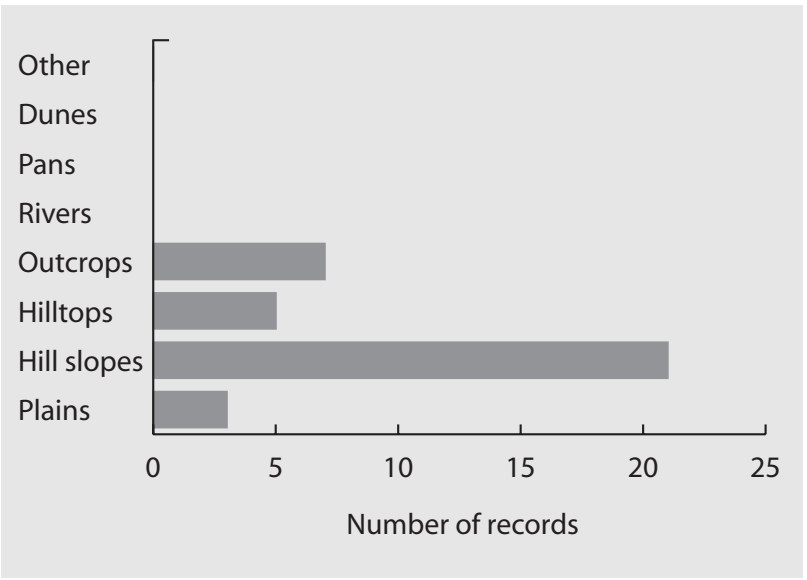


DISTRIBUTION & ABUNDANCE

Scattered localities in north-western Namibia. Uncommon to rare, occasionally common, once locally abundant (1913BB).

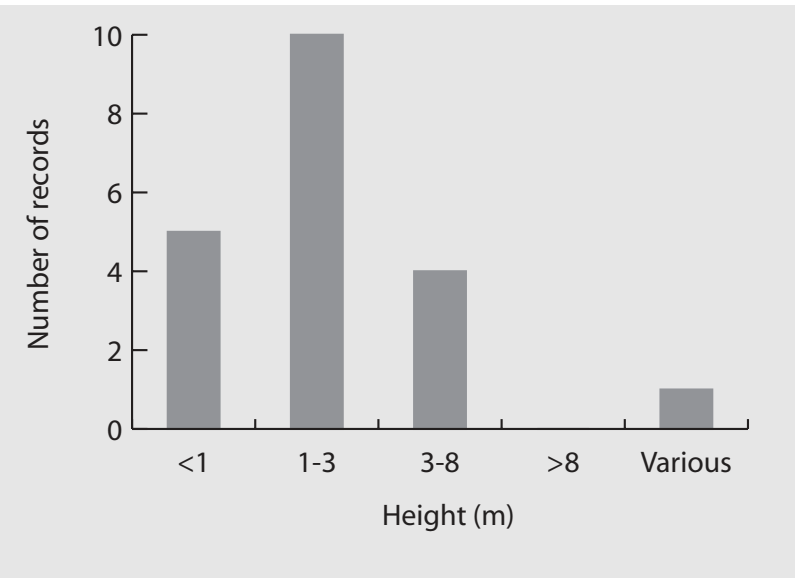
HABITAT

Mainly stony or rocky hill slopes, but also hilltops and rocky outcrops; once recorded in a wash/drainage (1913BB).



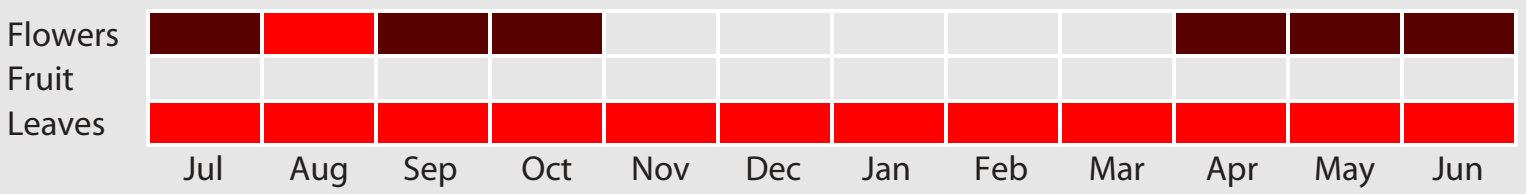
GROWTH FORM

Usually a shrub or tree up to 3 m high; sometimes a tree over 3 m.



ANNUAL CYCLE

FLOWERS mainly in August, occasionally April to October. FRUIT none recorded. LEAVES evergreen.

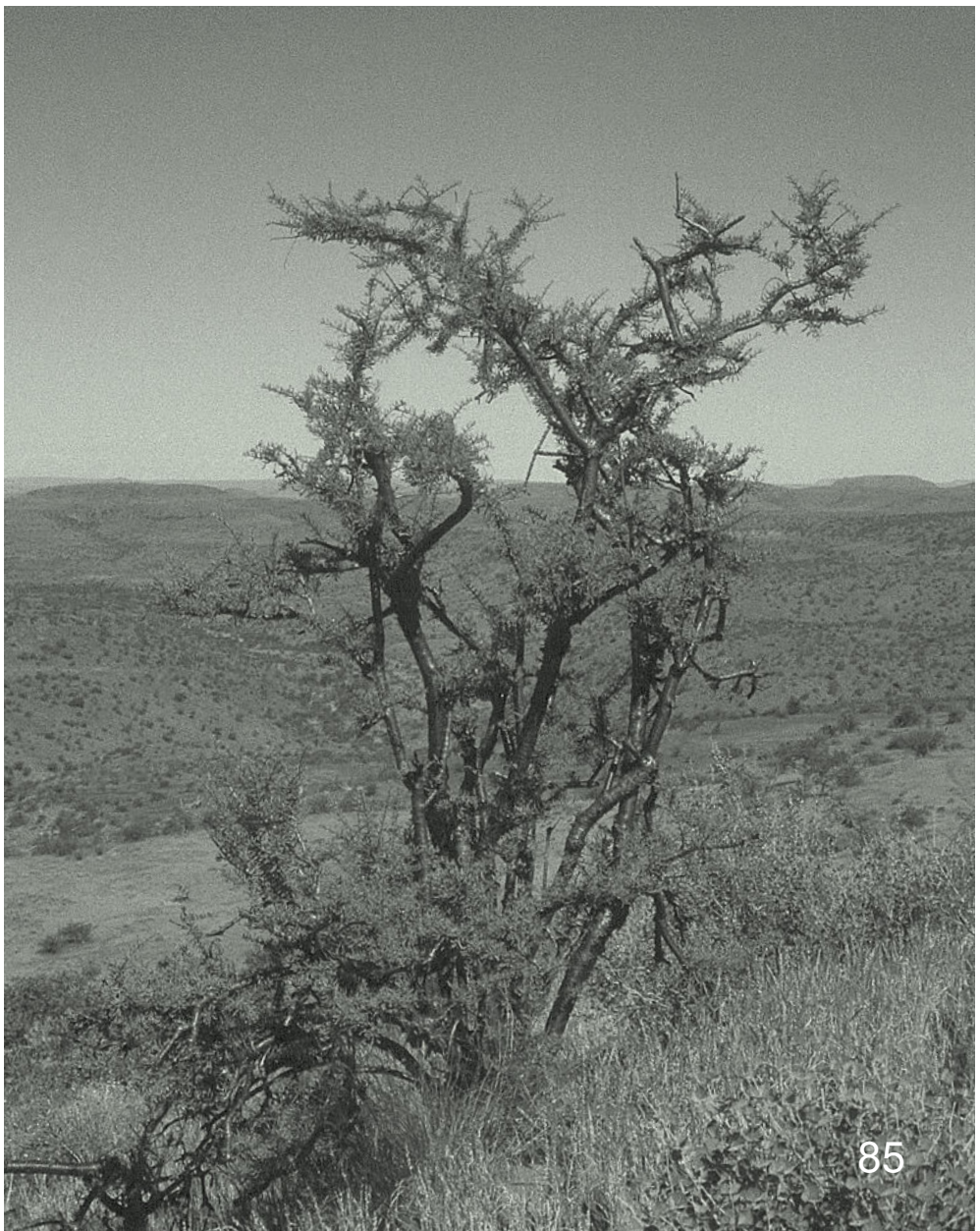


GENERAL

Of horticultural potential for dry gardens due to its attractive waxy stems and masses of small, pink flowers.

CONSERVATION CONCERNS

None recorded. Endemic to Namibia.



Ceraria longipedunculata, B. Curtis

Ceraria namaquensis

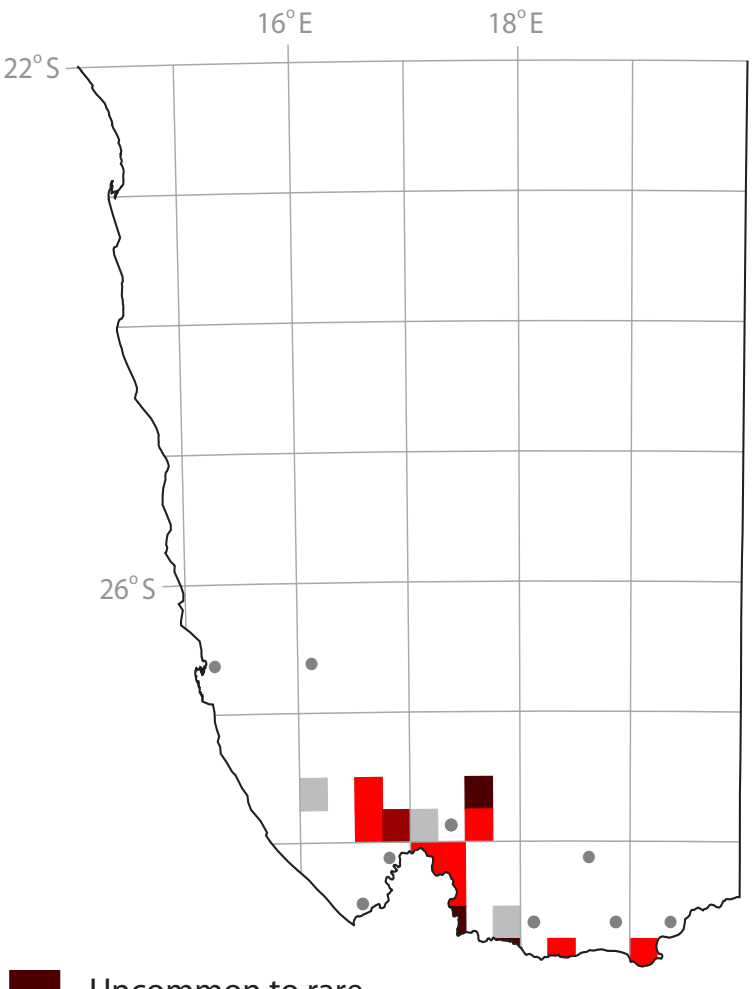
Wolftoon

Namaqua ceraria (E)

[30 records from 15 (1%) squares]



Shrub or small tree. BARK **creamy-white to silver-grey to brown**; older branches sturdy, **appearing out of proportion to the tiny leaves**. LEAVES simple, **clustered on dwarf shoots**; blade **linear to narrowly obovate, virtually cylindrical**, 3–4 x 1–1.5 mm; **succulent**, green, hairless. FLOWERS small, pale to deep pink. FRUIT very small and inconspicuous.



DISTRIBUTION & ABUNDANCE

Scattered over a small area of south-western Namibia. Generally common. Often localised. Earlier herbarium records were more widespread than TAP records.

HABITAT

Mostly on rocky hill slopes and rocky outcrops, including a granite outcrop in the Fish River Canyon. Twice recorded on a cliff and once in a dry riverbed.

GROWTH FORM

Always a shrub less than 3 m high.

ANNUAL CYCLE

FLOWERS mainly in November. FRUIT one herbarium record of old fruit in January. LEAVES evergreen.

GENERAL

Also called ‘spekboom’, but this name is confusing as many other, unrelated species are also known by this common name.

CONSERVATION CONCERNS

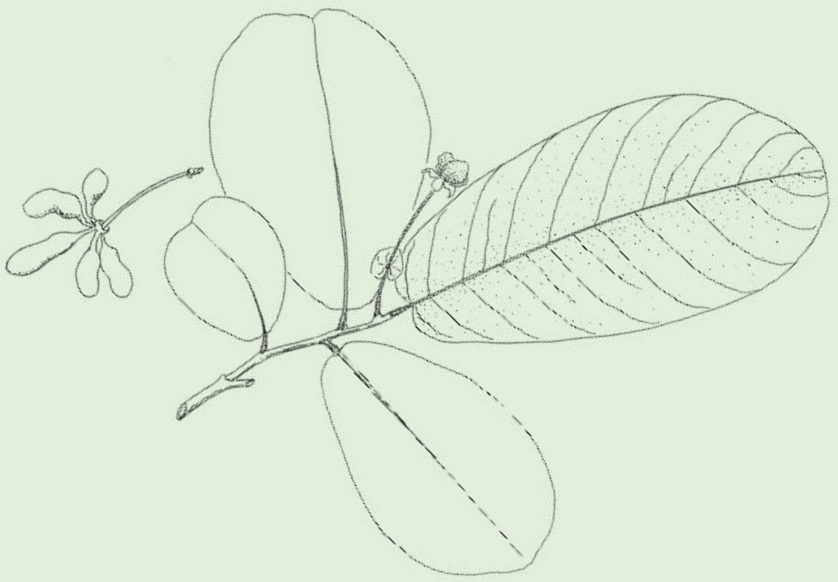
No threats recorded.

Friesodielsia obovata

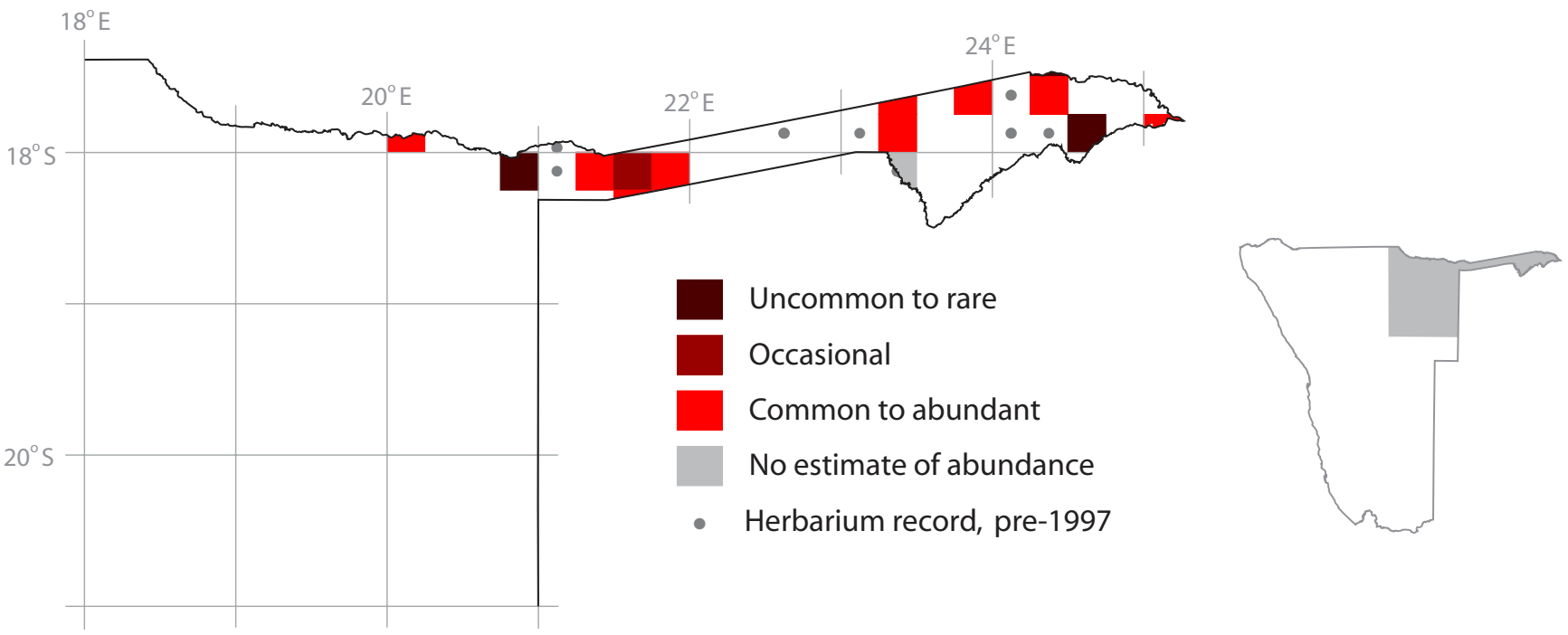
Mukondekonde

Dwaba-berry (E)

[31 records from 14 (1%) squares]



Straggling shrub or tree, with branches that often curl around other plants. BARK slightly sandpapery. LEAVES simple, thinly textured, **obovate to almost round**; dark green, almost hairless when mature; the terminal leaf with a slit in the tip. FLOWERS **solitary**, above the leaf axil or leaf-opposed; green-yellow; **bracts heart-shaped**, at base of flower stalks. FRUIT composed of **sausage-like** monocarps, each resembling a fat pod, **constricted between the seeds, red**. SEEDS black with a yellow, papery aril.



DISTRIBUTION & ABUNDANCE

Common to locally abundant in a few localities along the eastern stretches of the Okavango River and in the Caprivi Region.

HABITAT

Most often on river banks and floodplains, but also on dunes, marshes and plains.

GROWTH FORM

Mostly a shrub 1–3 m high, occasionally a tree over 3 m (15% of records).

ANNUAL CYCLE

No observations for June to September. FLOWERS February and March, old flowers in May. FRUIT February to May. LEAVES October to May with bare trees recorded in October.

GENERAL

Browsed by cattle. Fruit edible.

CONSERVATION CONCERNS

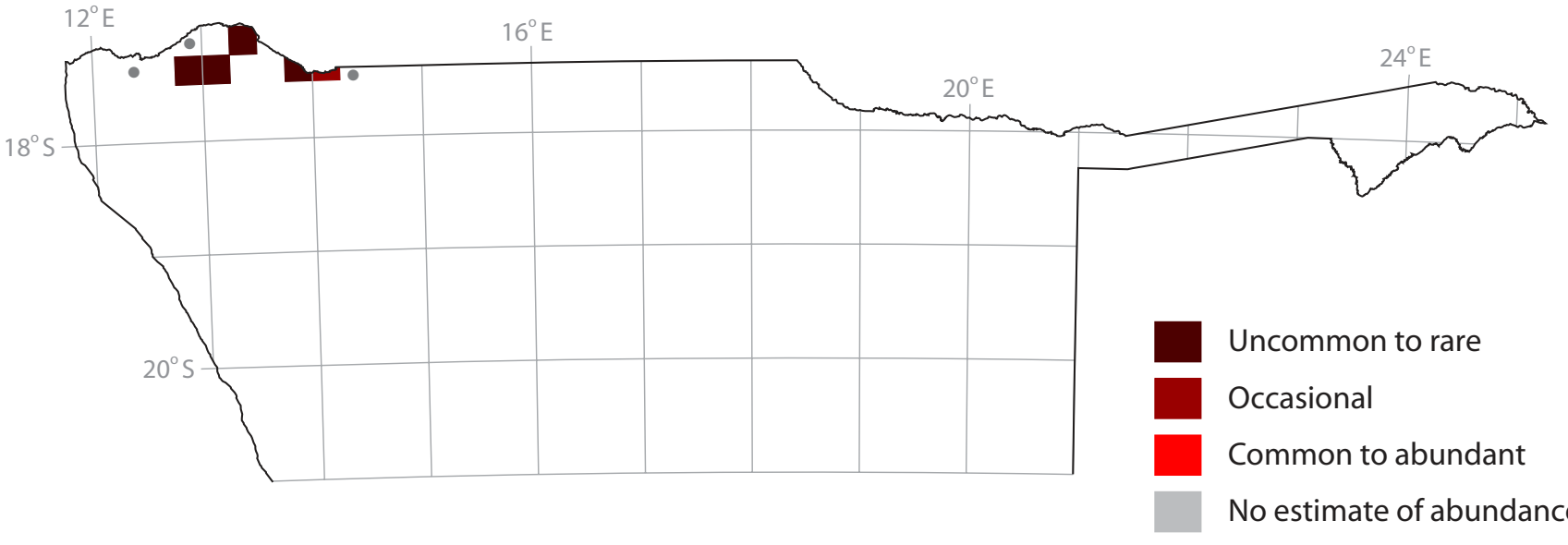
Heavily impacted by human activities and overgrazing. Only found in protected places such as fenced-off areas or in thick, thorny bush that cannot be penetrated by cattle.

Hexalobus monopetalus

Shakama Plum

[7 records from 5 squares]

Crooked tree, often **branching from low down**. Older branchlets with **persistent petiole bases** looking like short, hard stubs. LEAVES simple, thinly leathery, elongate-ovate to ovate-elliptic; **dark brown and hairy when in bud**; dark green, apex **often notched**. FLOWERS pale yellow; petals crinkly; **buds velvety red-brown**. FRUIT fat, lumpy, sausage-like berries; orange to red.



DISTRIBUTION & ABUNDANCE

Uncommon to rare in the north-west.

HABITAT

Rocky river banks.

GROWTH FORM

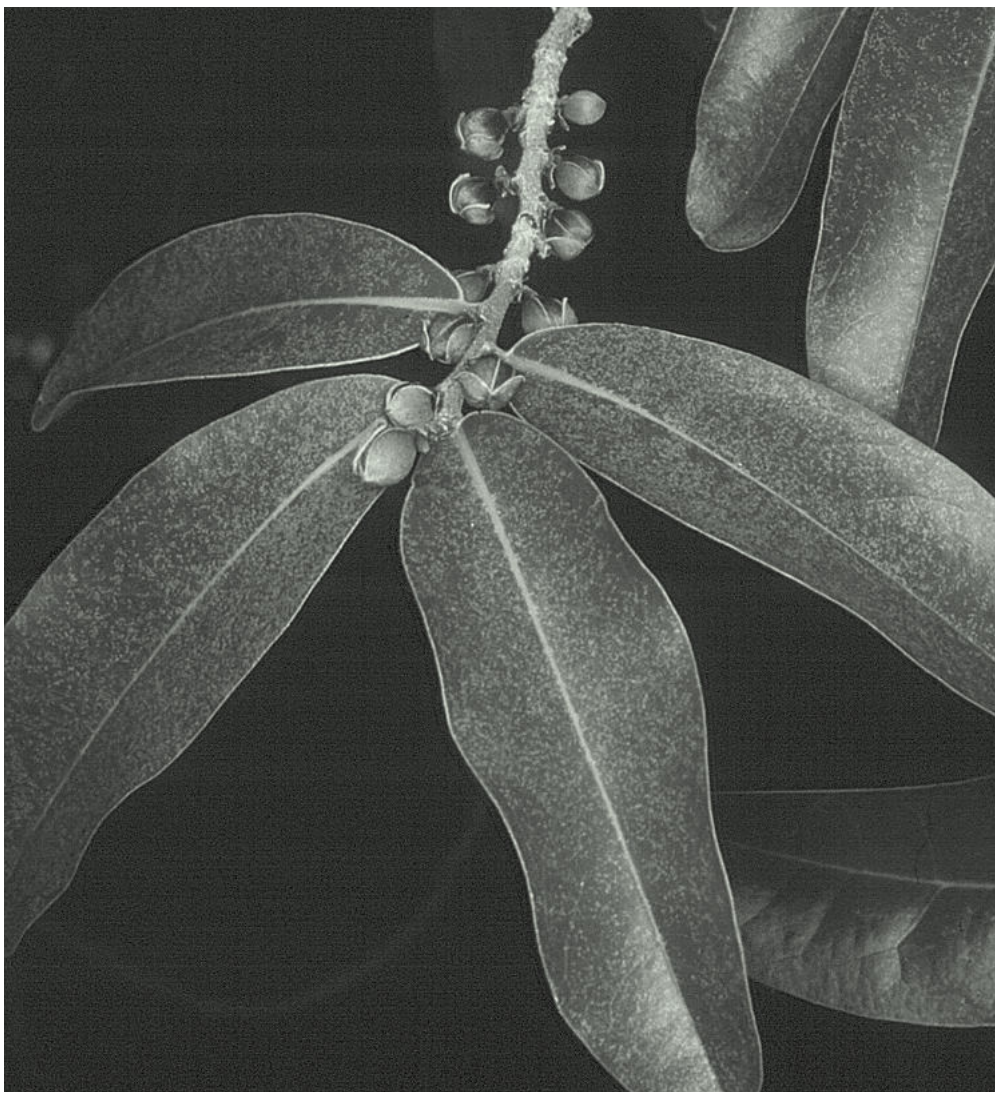
A tree, ranging from 1 m to over 8 m

ANNUAL CYCLE

Observations only in March, May and December. FLOWERS March. FRUIT March. LEAVES present at each observation.

CONSERVATION CONCERNS

None recorded.



Hexalobus monopetalus, leaves and buds, B. Curtis

Xylopia odoratissima

Kalahari Red-fingers

[2 records from 2 squares]

Tree with **reddish-brown branches, with conspicuous lenticels; young branches velvety**. LEAVES oblong to elliptic. FLOWERS dull green to dark yellow. FRUIT a red, sausage-like berry.

Recorded from the Okavango River near Andara (1721CC, 1821AB); two earlier herbarium records from the same area. Commonly a tree in the 3–8-m height class; uncommon as a shrub less than 1 m. Flowers recorded in March. Fruit in March.

Xylopia tomentosa

Bitter-wood

[1 record]

Tree having **reddish-brown branches with conspicuous lenticels; young branches densely hairy**. LEAVES oblong to elliptic with fringed margin. FLOWERS dull green to dark yellow. FRUIT a downy, red, sausage-like berry.

Recorded from the Okavango River near Andara (1721CC, 1821AB); two earlier herbarium records from the same area. Commonly a tree in the 3–8-m height class; uncommon as a shrub less than 1 m. Flowers recorded in March. Fruit in March.

Artabotrys brachypetalus

Purple Hook-berry

[1 record]

A woody climber, shrub or multi-stemmed, low-spreading tree, characterised by very **distinctive curling flower-stalks** that twine around stems of other plants.

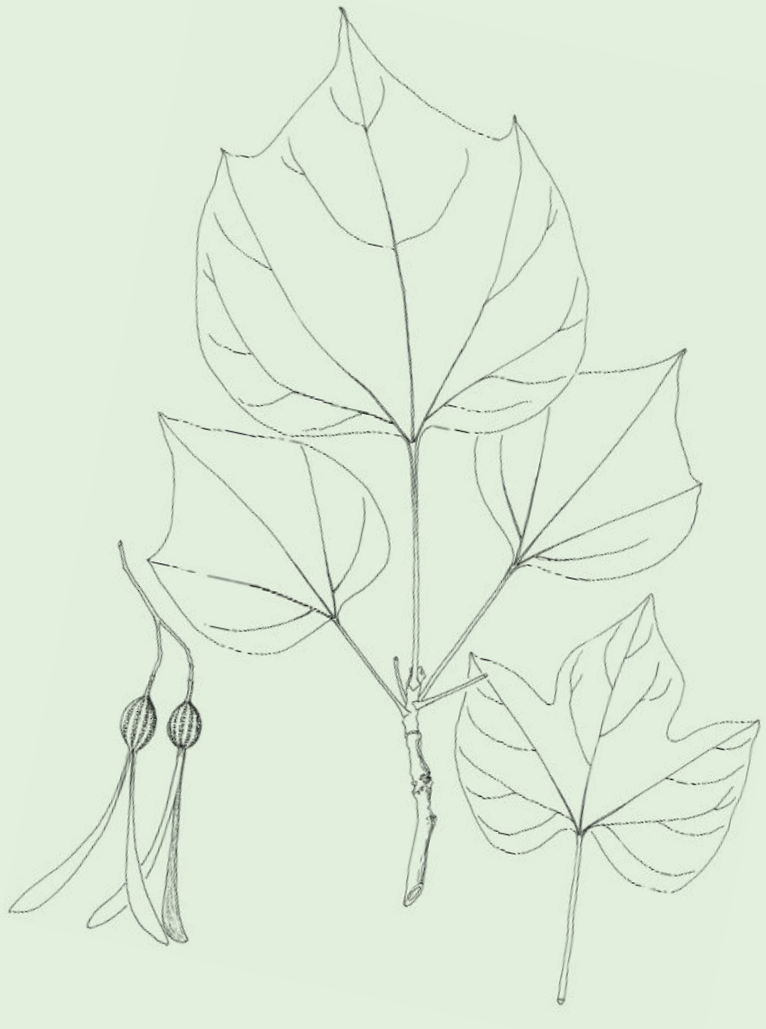
One record from Impalila Island, which is a new record for Namibia (CUR1/1401). An uncommon creeper with a woody stem, in the 1–3-m height class. Flowers in November.

Gyrocarpus americanus

Propeller Tree

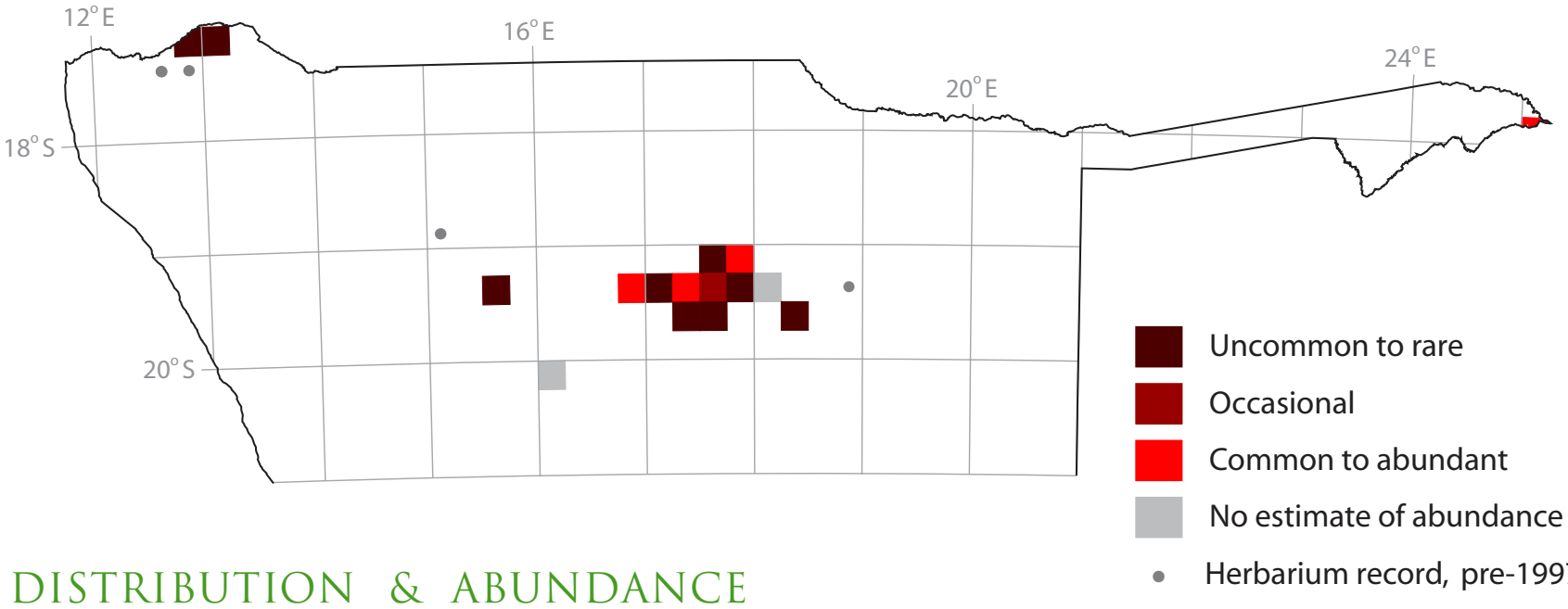
Helikopterboom; draaivrugboom (A); thindongowarodhi (T)

[39 records from 15 (1%) squares]



A tall, deciduous tree. BARK **pale grey, smooth, shiny, flaky**; young branchlets bright green and glossy, becoming grey-brown with grey-white lenticels. LEAVES simple, **clustered on ends of older branches**; **trilobed**, three conspicuous veins originate from the base; petiole 35–100 mm long, green, downy. FRUIT **a two-winged capsule**, propeller-like.

Subspecies *africanus* occurs in Namibia.



DISTRIBUTION & ABUNDANCE

Occasional to locally common in the eastern Karstveld, rare along the Kunene River and locally common on Impalila Island. A large stand was seen in 1916BD. There are a few earlier herbarium records from the north-west.

HABITAT

Found mainly on hill slopes, sometimes hilltops. Always on dolomite rock.

GROWTH FORM

A tree 3-8 m high, occasionally taller.

ANNUAL CYCLE

FLOWERS mostly March to May; flowering while losing their leaves. FRUIT mostly April to June. LEAVES October to February.

GENERAL

Leaves and roots used medicinally.

CONSERVATION CONCERNS

None recorded. Protected under forestry legislation.

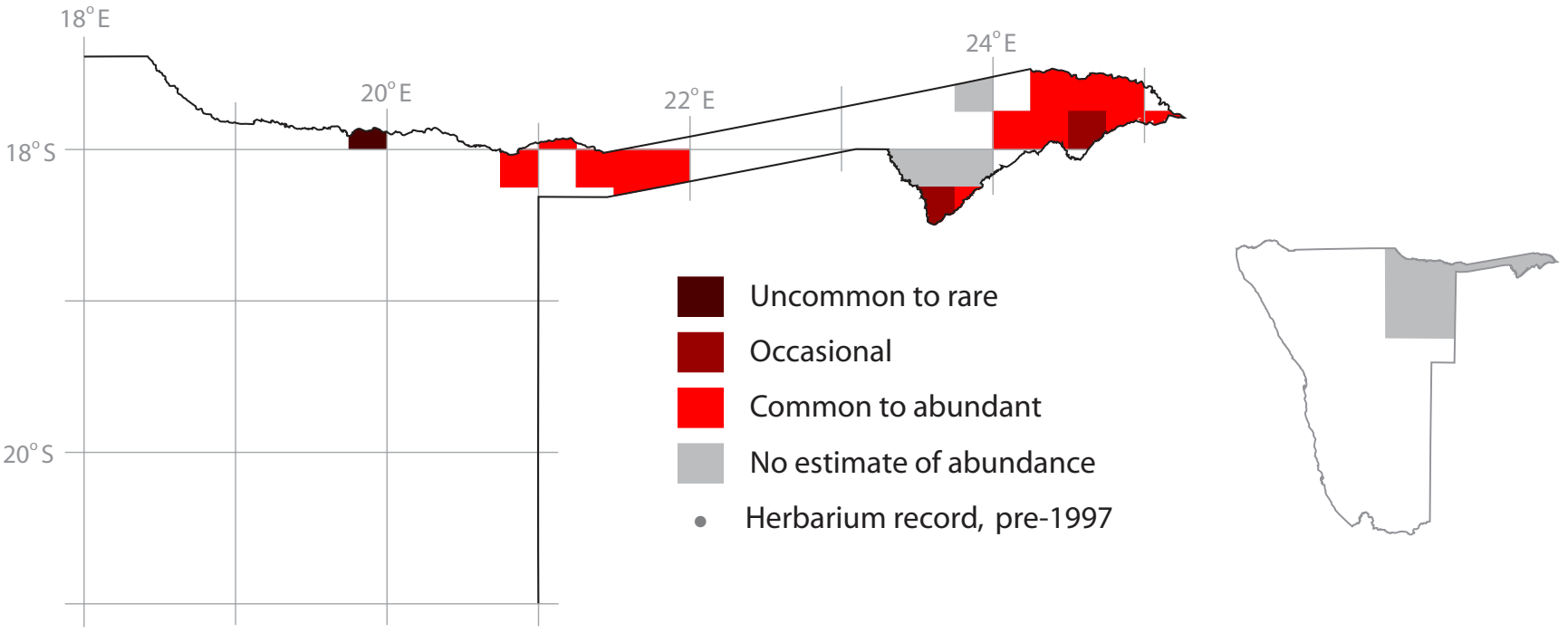
Capparis tomentosa

Woolly Caper-bush

Wollerige kapperbos (A); mudyangwe (T)

[57 records from 22 (2%) squares]

Scrambler or robust shrub, sometimes tree-like. BRANCHES with **a pair of sharp, velvety, hooked spines at every node** on older branches. LEAVES simple, oblong to broadly elliptic, grey-green; **densely downy below**; margin **fringed with hairs**; apex blunt, often shallowly notched or with hair-like tip. FLOWERS relatively large, yellowish-green, with numerous conspicuous white to pinkish stamens. FRUIT large, round, hanging on a **sturdy stalk**; yellow-orange to brownish and shiny when ripe, with the seeds embedded in the flesh, turning black and remaining on the plant a long time.



DISTRIBUTION & ABUNDANCE

Locally common in eastern Caprivi and along the Okavango River.

HABITAT

On sand hummocks or termite mounds on floodplains, along river banks and on plains.

GROWTH FORM

A shrub in the 1-3-m height class, sometimes over 3 m; often scrambling into other trees and sometimes completely covering the supporting tree. One record of a plant up to 10 m in *Piliostigma thonningii* (CUR1, 1724DC).

ANNUAL CYCLE

FLOWERS single records from July to October, with old flowers recorded in January and May. FRUIT September to May, but mostly February and May. LEAVES few records in winter because few atlassers were active in winter; bare plants recorded in May.

GENERAL

Tends to dominate overgrazed areas; browsed by game, but also reported to be poisonous, especially the roots. Believed to have many magical and medicinal properties.

CONSERVATION CONCERNS

None recorded.

Boscia albitrunca

Witgat

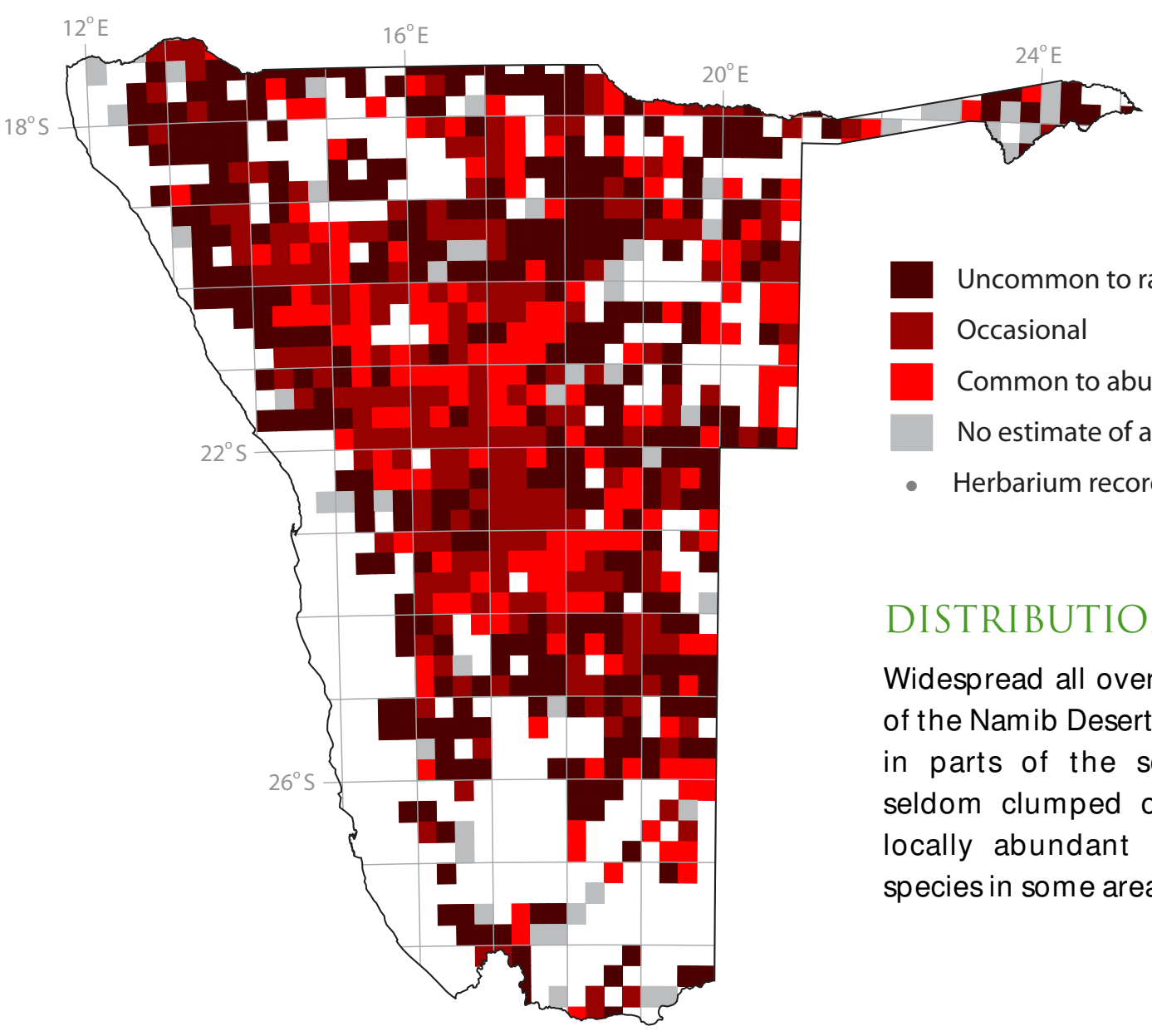
Shepherd's tree (E); Weissstamm (G); omutendereti (H); /hunib (K); omunghudi (O)

[2,844 records from 780 (73%) squares]



Usually a single-stemmed tree, with a neat, rounded crown; sometimes a low or prostrate shrub. BARK usually **pale, yellowish or almost white**, sometimes dark. LEAVES **oblong-elliptic, thick, leathery, brittle, slightly rough**; grey to dark green; apex blunt, often shallowly notched or with minute, hair-like tip; **petiole short**. FLOWERS small, green-yellow, in conspicuous masses. FRUIT round, with brittle, light brown shell.

Low-growing forms and small-leafed individuals may be confused with *B. foetida*, especially in the south. In the north-west, *B. albitrunca* may look like *Maerua schinzii* from a distance.



DISTRIBUTION & ABUNDANCE

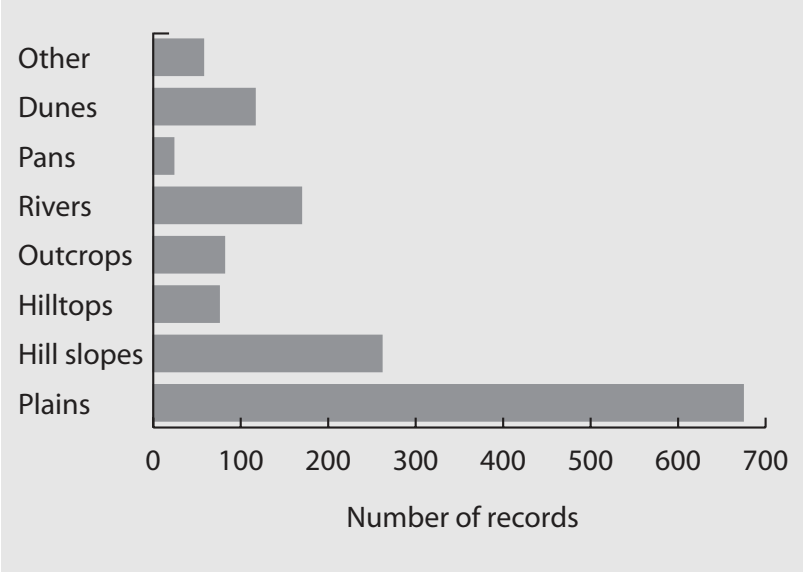
Widespread all over Namibia, except in areas of the Namib Desert where no trees grow, and in parts of the south. Usually scattered, seldom clumped or localised. Common to locally abundant and the dominant tree species in some areas in the central highlands.

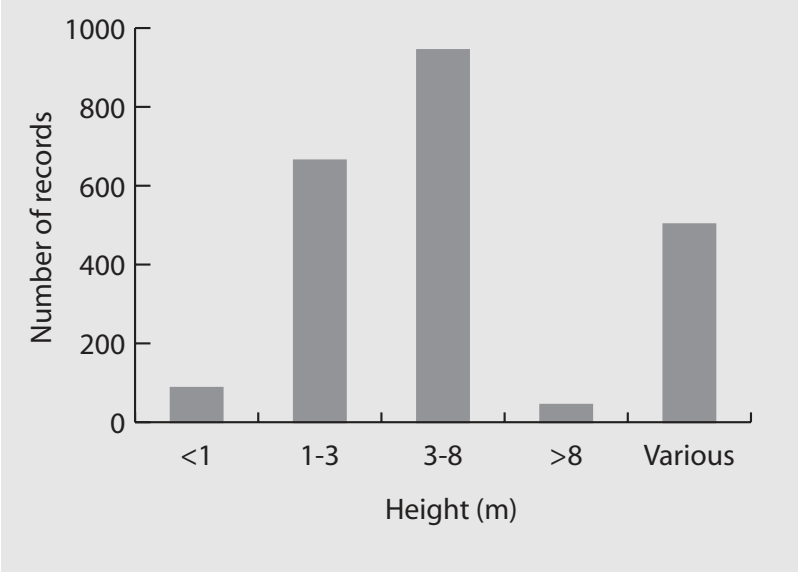
HABITAT

Found in all habitats, but most often on plains and hill slopes; sometimes abundant on river banks in the north-west and north-east. Grows on sandy or rocky substrates, including calcrete, schist, granite; often in association with termite mounds.

GROWTH FORM

Predominantly a tree of 1–8 m; less often a shrub under 3 m high. Trees over 8 m found in the north; some of over 20 m were reported from the Kunene River. In the south, *B. albitrunca* is more often a shrub and sometimes a rock-hugging creeper. Populations of variable height occur throughout the country.

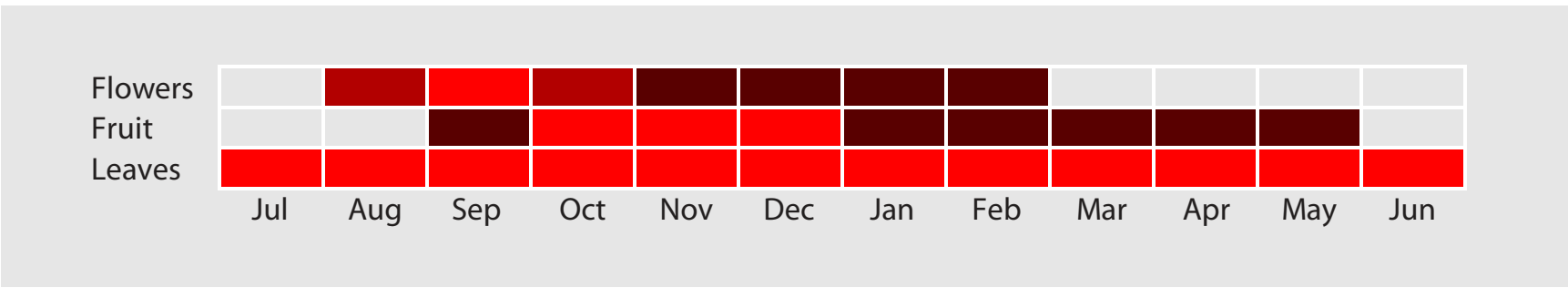




ANNUAL CYCLE

FLOWERS mainly August to October with a peak in September, but intermittently until February with single records at other times of the year. FRUIT peaks from October to December, but has been recorded all year. LEAVES evergreen.

Flowering and fruiting varied from season to season – in some seasons, such as 2002/03, it was very heavy, in other seasons there was very little. Flowering was very poor in 1997/98, with no flowering from August to October, but single records from December to February. In 2000, flowering continued until April.



GENERAL

Trees of up to 5 m high with 'a very strange growth form altogether – multi-stemmed and broom-like, with very long, slender, dark stems and no neat canopy' were reported from 2117AC (MAN1).

A frost-hardy and drought-tolerant plant. Seeds germinate easily, but are often reliant on 'nursery plants' such as *Euphorbia* spp., *Acacia* spp. and mopane to provide protection to the seedlings until they are established, as they are a favourite browse of livestock and game. Seedlings seldom transplant well. *Boscia albitrunca* coppices readily when chopped, and can continue to grow if the tree has fallen. Apart from being browsed by a variety of animals, the bark is also gnawed. The tree is sometimes totally defoliated by caterpillars and often susceptible to parasites such as *Viscum* and *Tapinanthus*. Birds such as White-browed Sparrow-weavers and Lappet-faced Vultures nest in the trees; one tree observed, had two leopards in it!

Continued on page 97.

Boscia foetida

Noeniebos

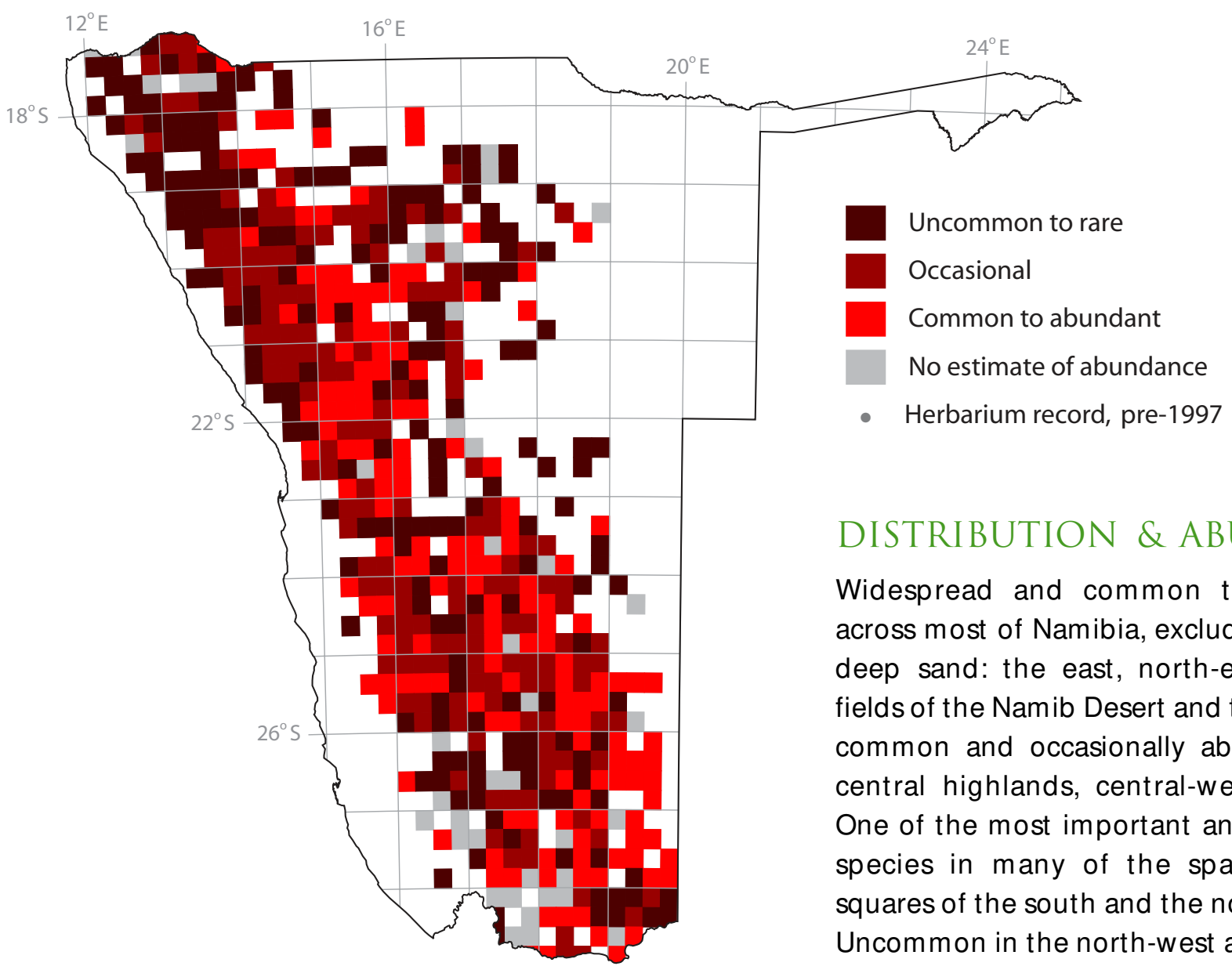
Smelly shepherds-bush (E); stinkbos (A); Nonibusch (G); omungundi (H); xaubes (K)

[1,817 records from 555 (52%) squares]



Shrub or tree. BARK **whitish with fissures exposing a rough, dark-coloured bark**; young branchlets **grey with plum-coloured underlayer**. LEAVES **small**, spirally arranged or clustered on dwarf shoots; oblong; both surfaces olive-green; petiole very short. FLOWERS small, green-yellow, with **characteristic unpleasant, foetid odour**. FRUIT round berry, 10 mm in diameter, hairy, yellow to pale brown when ripe.

Flowers and ripe fruit are fairly obvious. When not flowering or fruiting, it may easily be confused with *Maerua parvifolia* and shrubby forms of *B. albitrunca*. Only subspecies *foetida* occurs in Namibia

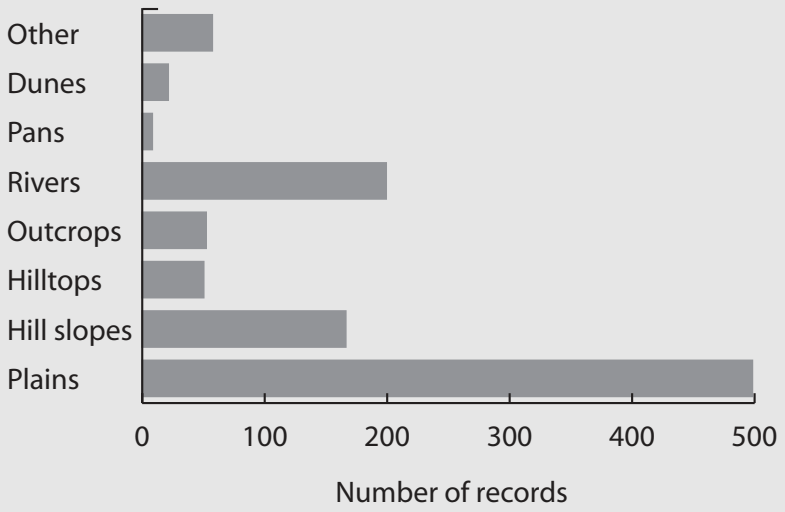


DISTRIBUTION & ABUNDANCE

Widespread and common to uncommon across most of Namibia, excluding areas with deep sand: the east, north-east and dune fields of the Namib Desert and the coast. Most common and occasionally abundant in the central highlands, central-west and south. One of the most important and conspicuous species in many of the sparsely wooded squares of the south and the northern Namib. Uncommon in the north-west and Karstveld.

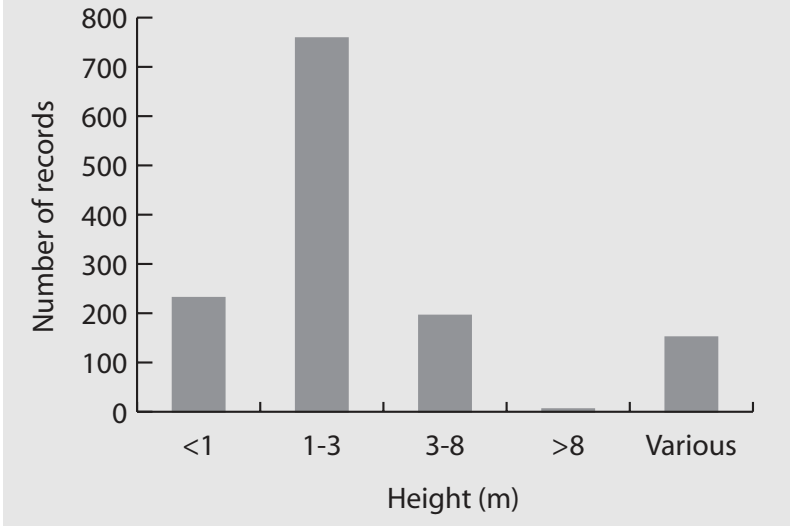
HABITAT

Found in various habitats, but mostly on plains, hill slopes and in dry rivers. Only found on stony, rocky or gravel substrates, never on sand unless there is underlying rock.



GROWTH FORM

Mostly a shrub (67% of records) up to 3 m high, but also a tree (33%) up to 3 m and sometimes over 3 m.



ANNUAL CYCLE

FLOWERS August to April, with a peak in September and October and a smaller peak in April; April flowering was recorded in three summers, especially in 2000, and most often in the north- and central-west. FRUIT recorded almost all year round, but mostly from October to March. LEAVES evergreen.



GENERAL

Leaves are browsed by game and livestock; sometimes the bark is also chewed by animals; Sociable Weavers use the flowers as nesting material and food. The fruit are sweet and eaten by birds and people. The leaves are chewed to relieve stomach-ache.

CONSERVATION CONCERNS

None recorded.

Boscia foetida, Kaokoveld, B. Curtis



Boscia microphylla

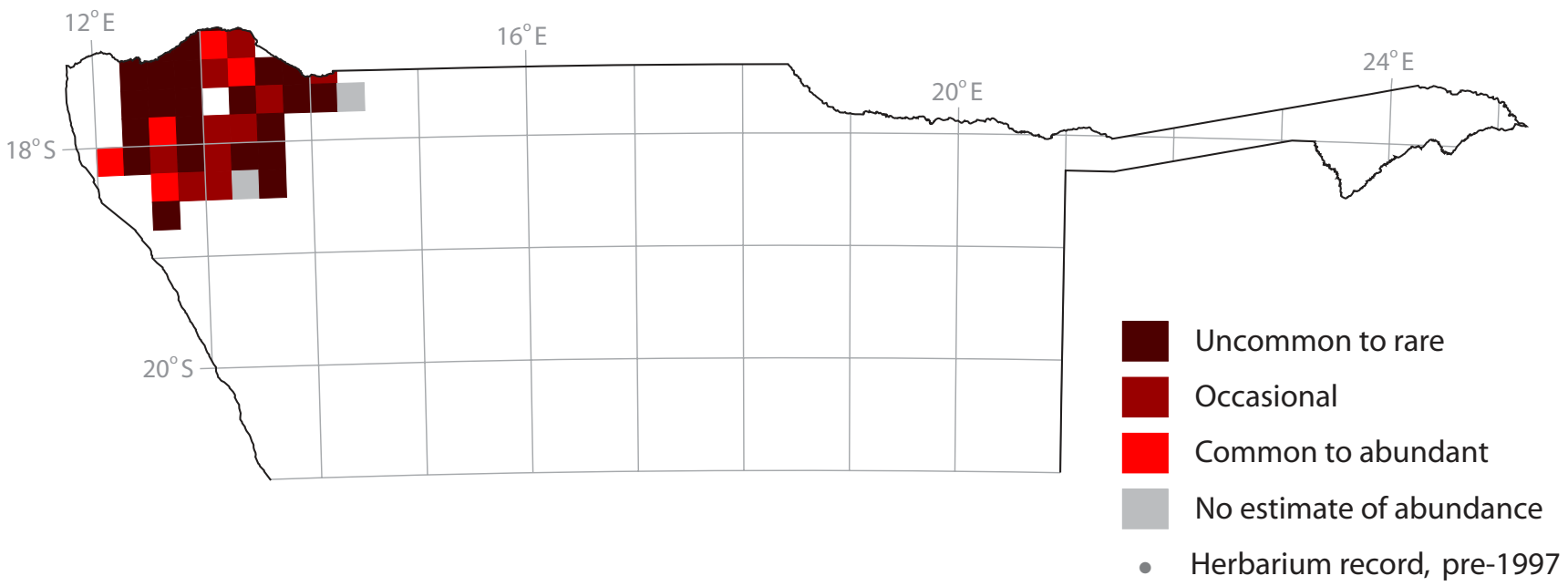
Slender-leaved Shepherds-tree

[76 records from 41 (4%) squares]



Evergreen to semi-deciduous tree. BARK **older branches smooth, red-brown** and hairless; **young branchlets downy and spiny**. LEAVES simple, spirally arranged or clustered on dwarf shoots; linear-lanceolate to oblong-lanceolate, very narrow; both surfaces **dull green and hairless**. INFLORESCENCE a small, elongate cluster, borne on dwarf shoots or terminally on lateral branches. FLOWERS green-yellow, small, petals absent. FRUIT spherical, <10 mm in diameter.

Can be confused with *B. foetida* or *Maerua parvifolia*.

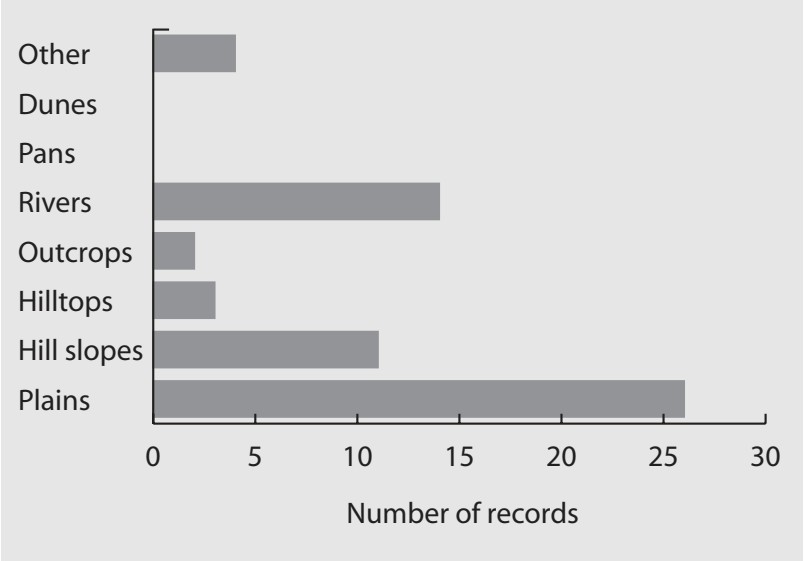


DISTRIBUTION & ABUNDANCE

Uncommon to occasional and fairly widespread in the extreme north-west. There were a number of older, herbarium records that were not confirmed by the TAP.

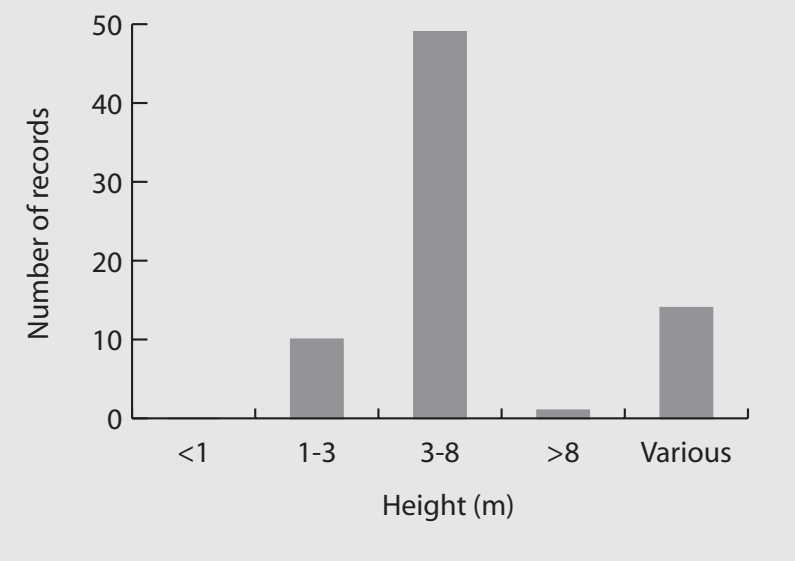
HABITAT

Various habitats, but mostly plains, hills and dry rivers. Grows on rock, gravel, sand and loamy sand.



GROWTH FORM

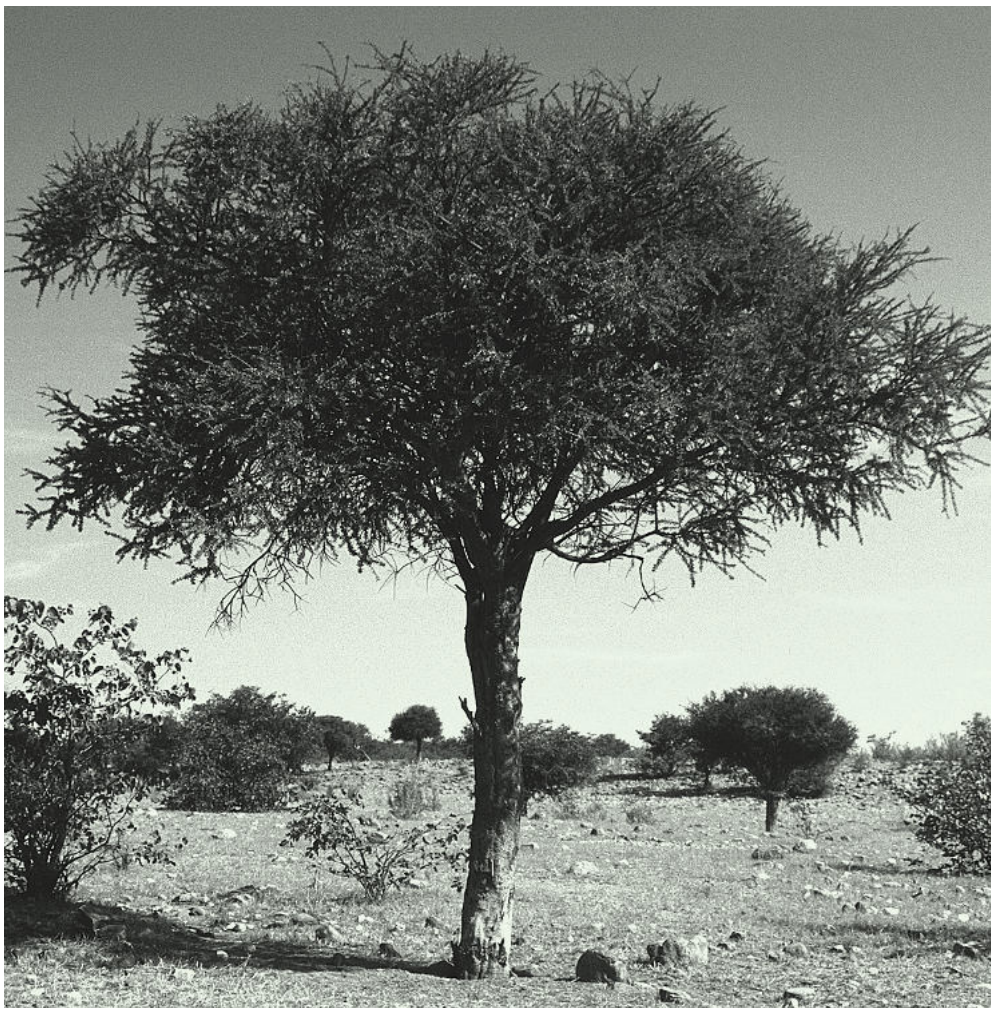
Always a tree, usually in the 3–8-m height class.



ANNUAL CYCLE

FLOWERS mostly July, September and October, with single records in January, April and June. FRUIT July and September. LEAVES most months.

CONSERVATION CONCERNS: None recorded.



Boscia microphylla, B. Curtis

Boscia albitrunca *Continued from page 93.*

People use *B. albitrunca* in a number of ways, of which a few are mentioned here. The roots are used to produce curdled milk ('oma-shikwa') and ground and used as a coffee substitute; the leaves are used for medicinal purposes; the fruit is edible and a good source of vitamins.

CONSERVATION CONCERNS

Although widespread and hardy, it is heavily utilised by people and animals. The difficulty that young plants have in becoming established is a concern, but fortunately there appears to be a healthy and widespread population of young plants. Protected by forestry legislation.

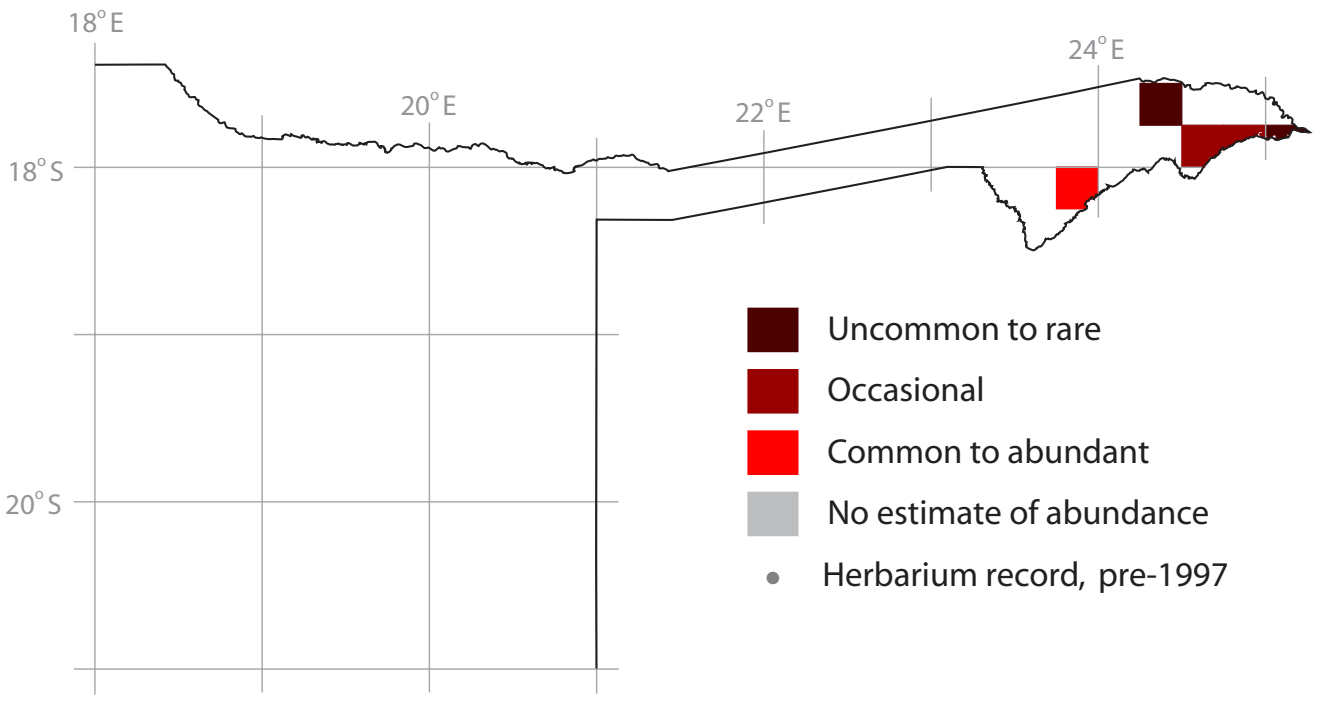
Boscia angustifolia

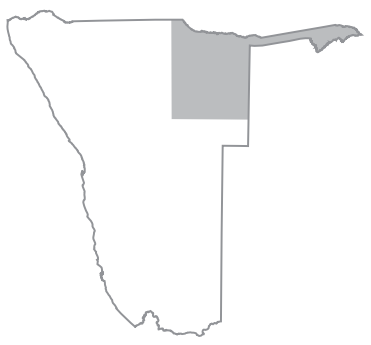
Rough-leaved Shepherds-tree

Skurweblaarwitgat (A)

[6 records from 4 (<0.5%) squares]

Shrub or small, evergreen tree. **Trunk often fluted, branches rigid**. LEAVES oblanceolate to elliptic, 20–70 mm long; leathery; **darkish green above**, finely hairy at first, becoming less so later; much paler below, grey-green or blueish-green, densely covered with fine hairs; veins distinct; apex broadly tapering to rounded, with **fine, sharp tip**; base tapering; petiole short. INFLORESCENCE a compact, crowded, axillary or terminal cluster. FLOWERS small, cream to yellow, petals absent; sweet-smelling. FRUIT spherical, *c.*10 mm in diameter; yellow to dark grey.





DISTRIBUTION & ABUNDANCE

Uncommon to common in scattered localities in eastern Caprivi. There was only one herbarium record prior to the TAP.

HABITAT

Plains, once recorded on a termite hill. Grows on heavy loam soils.

GROWTH FORM

A shrub of 1–3 m high, or a tree in the 3–8-m height class.

ANNUAL CYCLE

Observations were made in February, March, May and November, with the herbarium record in June. LEAVES were present in these months, but not FRUIT or FLOWERS.

CONSERVATION CONCERNS

None recorded. Assessed as 'Lower risk, near threatened' (Craven & Loots 2002).

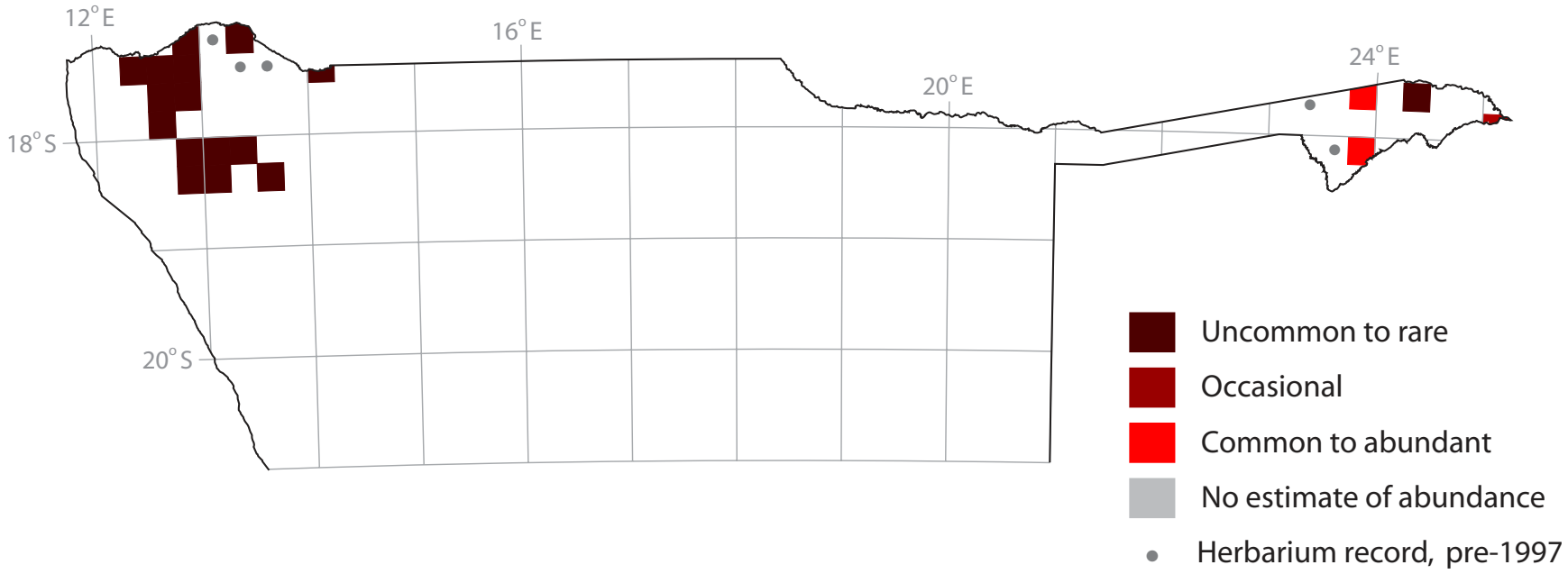
Boscia mossambicensis

Broad-leaved Shepherds-tree

[20 records from 20 (2%) squares]



Deciduous tree. BARK of **young branchlets yellow-green**. LEAVES simple, spirally arranged or clustered on dwarf shoots; **elliptic to broadly oblanceolate, up to three times longer than wide**; both surfaces **matt olive-green and hairless**, midrib prominent; apex often with a **spiny tip**. INFLORESCENCE an elongate cluster (raceme), up to 140 mm long. FLOWERS green-yellow, petals absent. FRUIT **spherical, up to 15 mm in diameter**.



DISTRIBUTION & ABUNDANCE

Disjunct, uncommon to rare, with most records from the north-west, and three from eastern Caprivi. There are earlier, herbarium records from both areas, as well range extensions south of the Kunene River that were not confirmed by specimens.

HABITAT

Plains, dry riverbeds and hill slopes.

GROWTH FORM

Mostly a tree up to 8 m high, with one record of trees taller than 8 m.

ANNUAL CYCLE

There were no TAP observations in the winter months. FLOWERS March, April and June. FRUIT October to April. LEAVES recorded all summer.

CONSERVATION CONCERNS

None recorded.

Boscia tomentosa

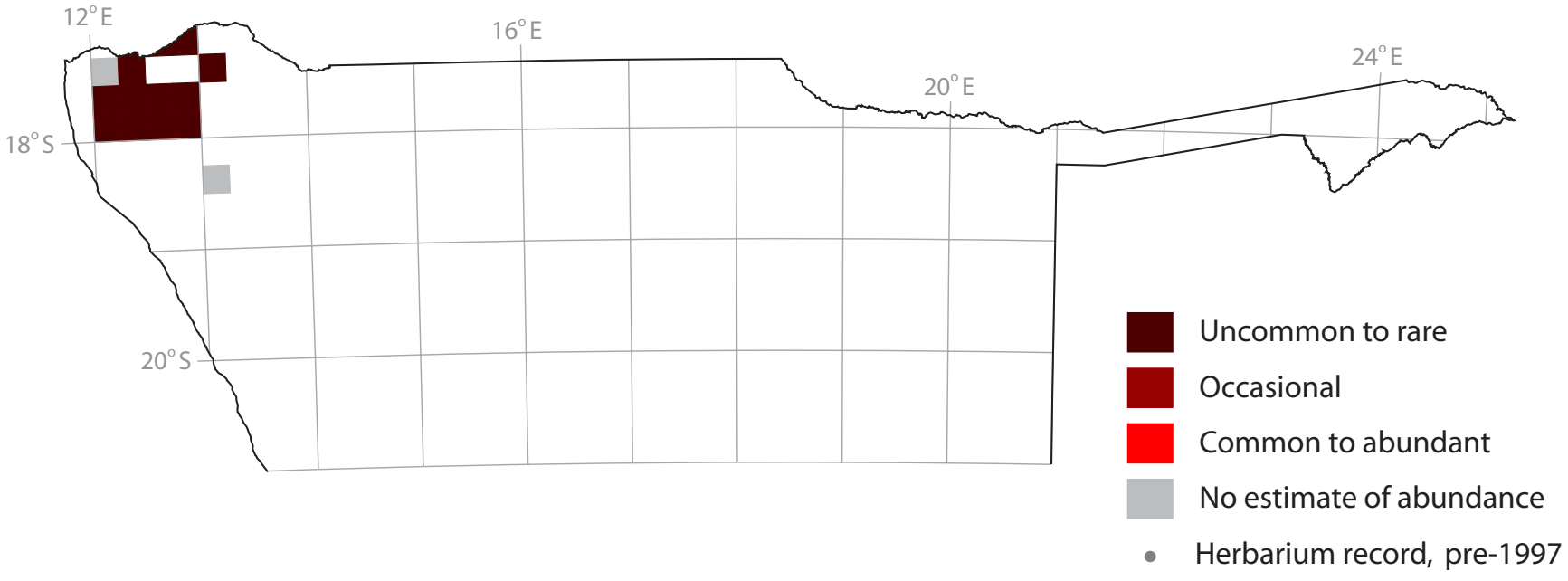
Hairy Shepherds-tree

[14 records from 12 (1%) squares]



Shrub or tree. BARK white, smooth; young branchlets yellow-green, **densely downy**. LEAVES simple, spirally arranged; **elliptic**, both surfaces yellow-green, with **white, downy covering visible with a hand-lens**; margin **fringed with hairs**; apex blunt to blunt and shallowly notched; base broadly tapering; petiole 5–9 mm long, downy. INFLORESCENCE **a terminal spray**, 50 mm long. FLOWERS small, green-yellow, petals absent. FRUIT spherical, almost hairless.

May have been mistakenly identified by atlassers as *Maerua schinzii*.



DISTRIBUTION & ABUNDANCE

Uncommon to rare in the extreme north-west.

HABITAT

Rocky hills and outcrops, sometimes plains; on stony or loam substrates.

GROWTH FORM

A tree, mostly in the 3–8-m height class, sometimes 1–3 m high.

ANNUAL CYCLE

FLOWERS January and April to July. FRUIT June and July. LEAVES presumably evergreen.

CONSERVATION CONCERNS

None recorded. Classified as 'Lower Risk, near threatened' (Craven & Loots 2002).

Maerua gilgii

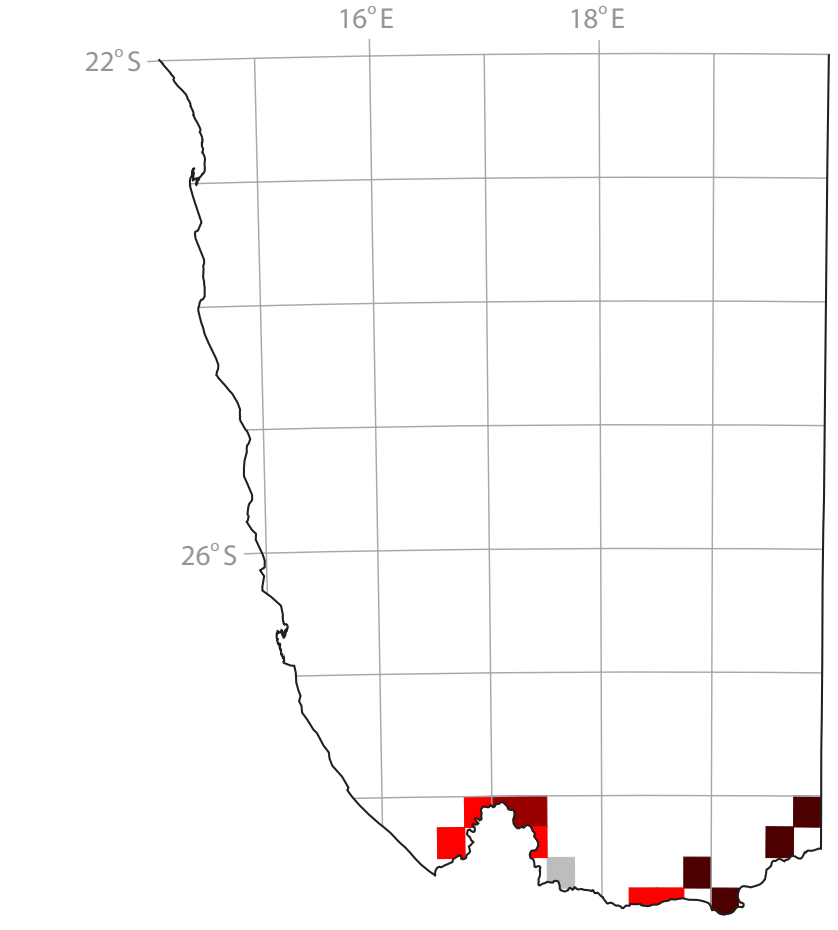
Rivierwitbos

River bush-cherry (E)

[21 records from 12 (1%) squares]



Dense, many-stemmed, evergreen shrub or small tree; **branches slender, often drooping**. BARK grey. LEAVES simple, spirally arranged; **oblong to elongate**, much longer than wide; both surfaces pale green; apex pointed with a fine hair-like tip. INFLORESCENCE a terminal or axillary spike. FLOWERS whitish-green to yellowish, petals absent; stamens very conspicuous. FRUIT spherical.



DISTRIBUTION & ABUNDANCE

Confined to the vicinity of the Orange River, where it is common.

HABITAT

On river banks and floodplains. Also occasionally in dry washes, hill slopes and on plains.

GROWTH FORM

A shrub or shrubby tree, generally up to 3 m high, but sometimes higher.

ANNUAL CYCLE

Observations were only made in five months. FLOWERS September to November, but mostly in October. FRUIT October to December, and May. LEAVES apparently evergreen.

CONSERVATION CONCERNS

Very restricted along Orange River – could be affected by increased human activity there.

Maerua juncea

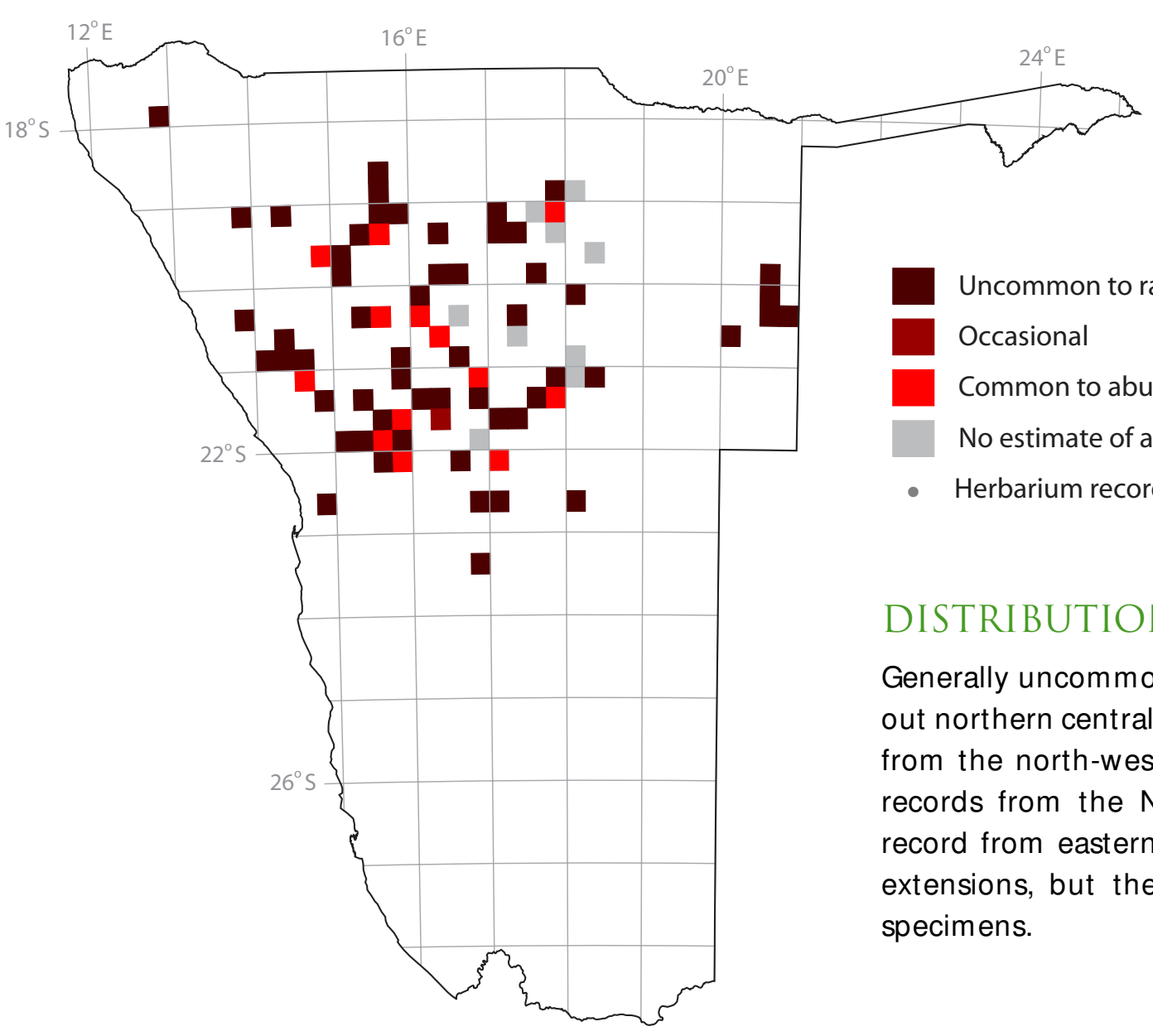
Slangeier

Schlangeneierbusch (G); orueti (H); /ao!uwub (K)

[138 records from 79 (7%) squares]



Dense, **many-stemmed, semi-deciduous shrub or scrambler; young branchlets fine**, green, longitudinally ribbed. LEAVES **simple or sometimes trifoliolate**, spirally arranged; shape very variable; **both surfaces dark green**. INFLORESCENCE a few-flowered terminal spike, or solitary flowers. FLOWERS with conspicuous, long, cream-coloured stamens giving a wide brush-like appearance. FRUIT **fat, irregularly sausage-shaped, many-seeded**, rough-skinned, brown when ripe.

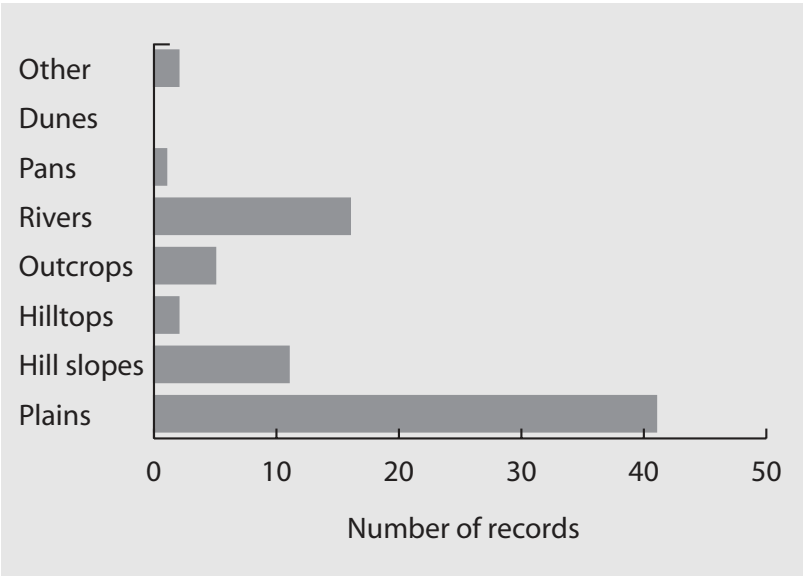


DISTRIBUTION & ABUNDANCE

Generally uncommon and scattered throughout northern central Namibia, with one record from the north-west. There are a number of records from the Nyae Nyae area and one record from eastern Caprivi which are range extensions, but they are not supported by specimens.

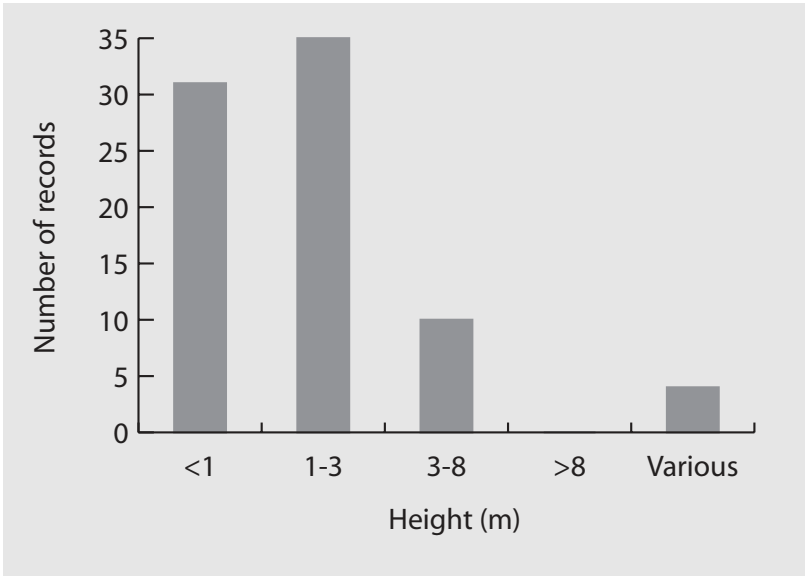
HABITAT

Mostly plains, also various other habitats, including a termite hill. Mostly on sand. Climbing into various different species.



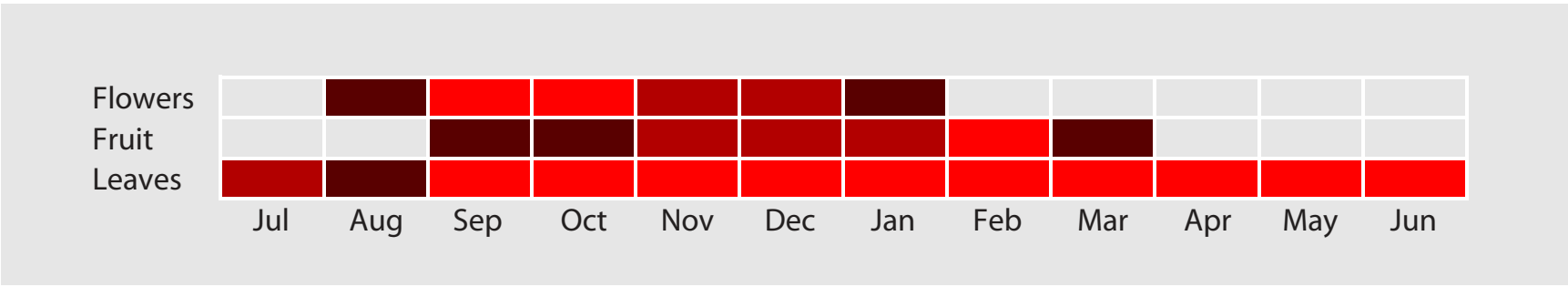
GROWTH FORM

Generally a climber, but sometimes a shrub in the 1–3-m category. As a climber it can reach over 3 m and can appear as a conspicuously lush, dark green clump on an otherwise bare tree. It sometimes completely covers the supporting plants, with branches hanging down.



ANNUAL CYCLE

FLOWERS August to January, mainly September and October. FRUIT mostly November to March, with a peak in February. LEAVES essentially evergreen.



GENERAL

Browsed by animals; sometimes infested with scale insects; the fruit are eaten by birds. Of horticultural potential as it grows easily from seed, has attractive flowers, does well in mica-schist and is frost-tolerant.

CONSERVATION CONCERNS

None recorded.



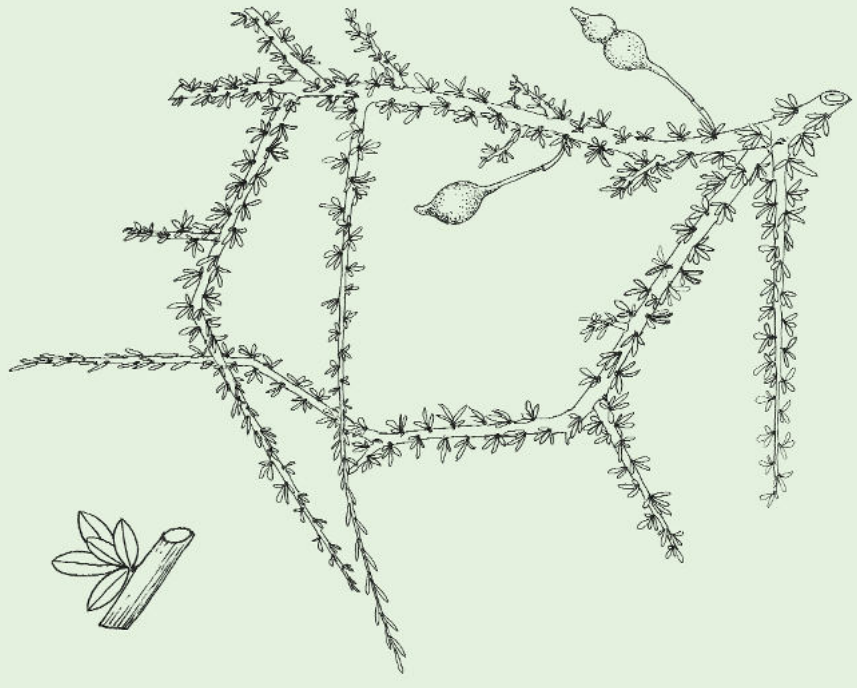
Maerua juncea flower, B. Curtis

Maerua parvifolia

Small-leaved Maerua

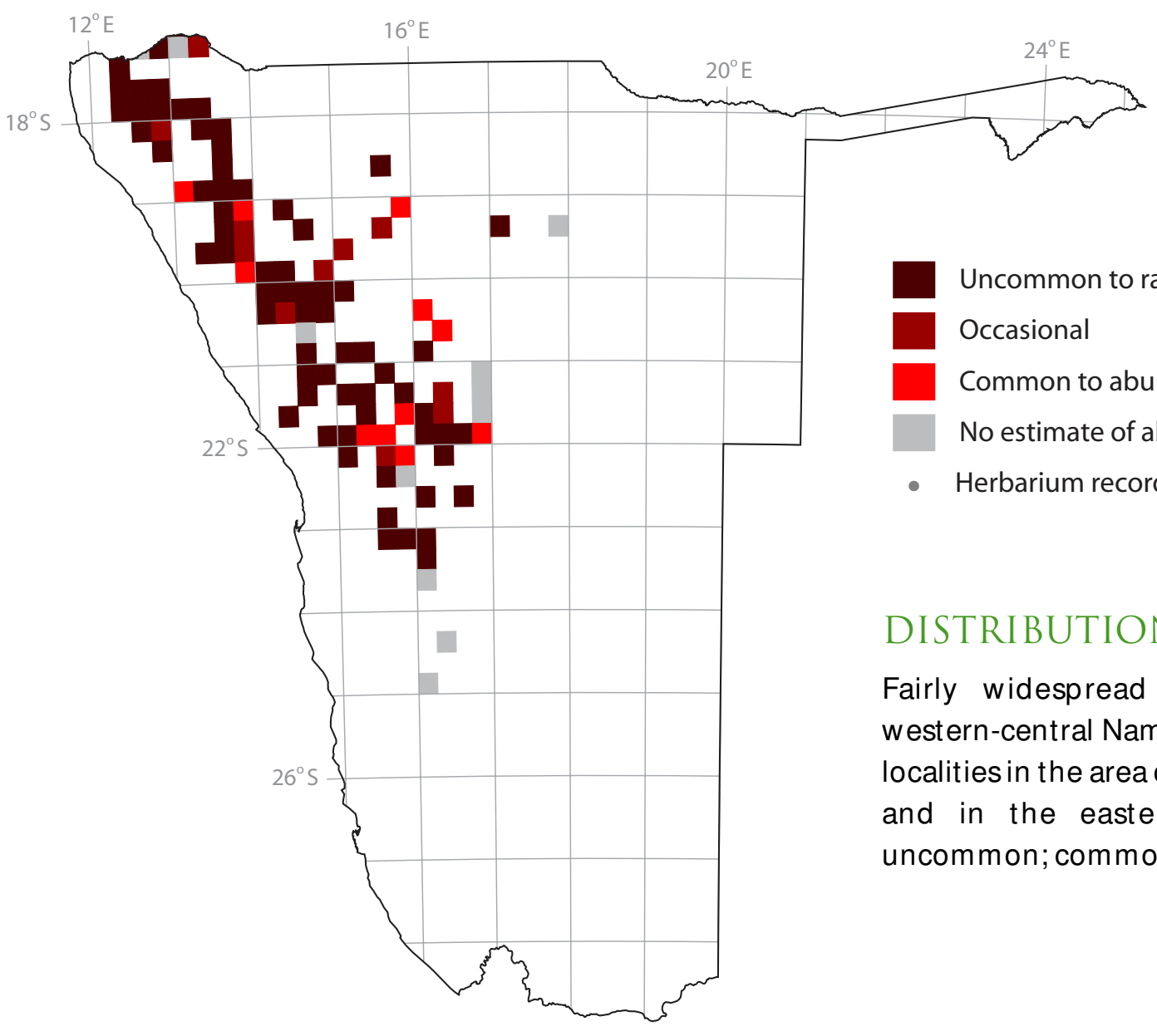
Otjinautoni (H); /ahaib (K)

[198 records from 103 (10%) squares]



Evergreen shrub or shrubby tree. BARK grey, fairly smooth; young branchlets grey-white. LEAVES simple, spirally arranged or clustered on lateral dwarf shoots; oblong-lanceolate to narrowly obovate, up to 10 mm long and 3 mm wide, thick and leathery; grey-green. FLOWERS solitary or paired on lateral dwarf shoots, pedicels up to 10 mm long; stamens numerous. FRUIT **irregularly cylindrical, constricted between seeds**.

This species is easily confused with *Boscia foetida* when not in flower or fruit and has probably been under-recorded.

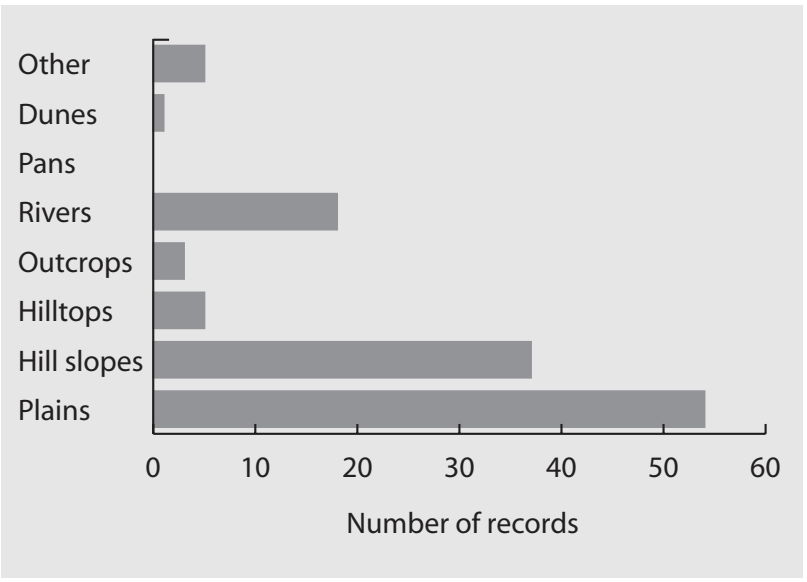


DISTRIBUTION & ABUNDANCE

Fairly widespread in north-western and western-central Namibia, with a few scattered localities in the area of the Naukluft Mountains and in the eastern Karstveld. Generally uncommon; common in some localities.

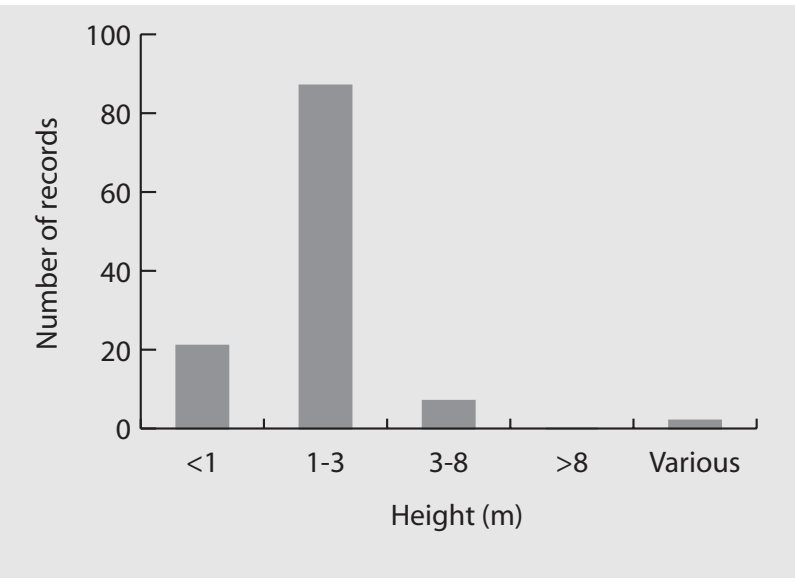
HABITAT

Various, but chiefly plains and hill slopes; along dry rivers in the west. Generally on gravel or rocky substrates, occasionally on sand.



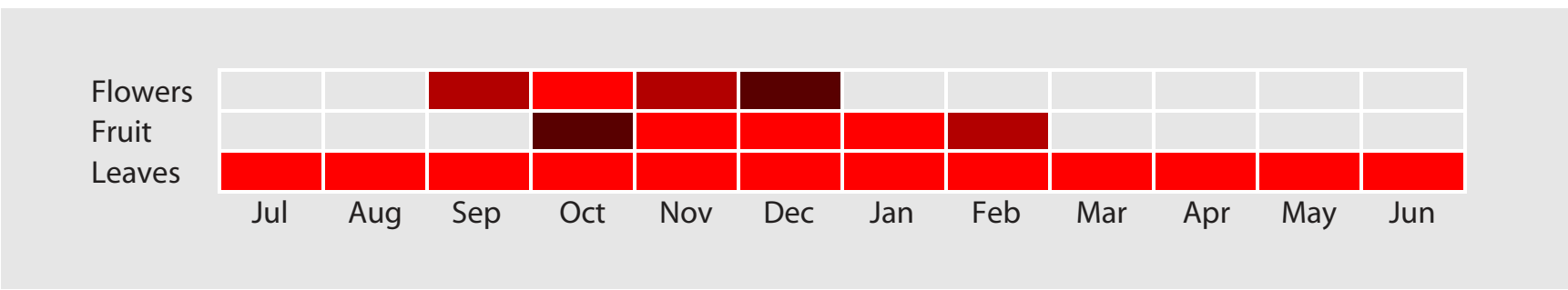
GROWTH FORM

Generally a shrub (65% of records), sometimes a tree (35%). Mostly in the 1–3-m height category.



ANNUAL CYCLE

FLOWERS September to December, with a peak in October; occasional flowers have been recorded almost every month. FRUIT October to February, but mostly from November to January. LEAVES evergreen.



GENERAL

Often browsed; sometimes infested with the parasite, *Tapinanthus* sp.

CONSERVATION CONCERNS

None recorded.



Maerua parvifolia, flowers, B. Curtis

Maerua schinzii

Lammerdrol

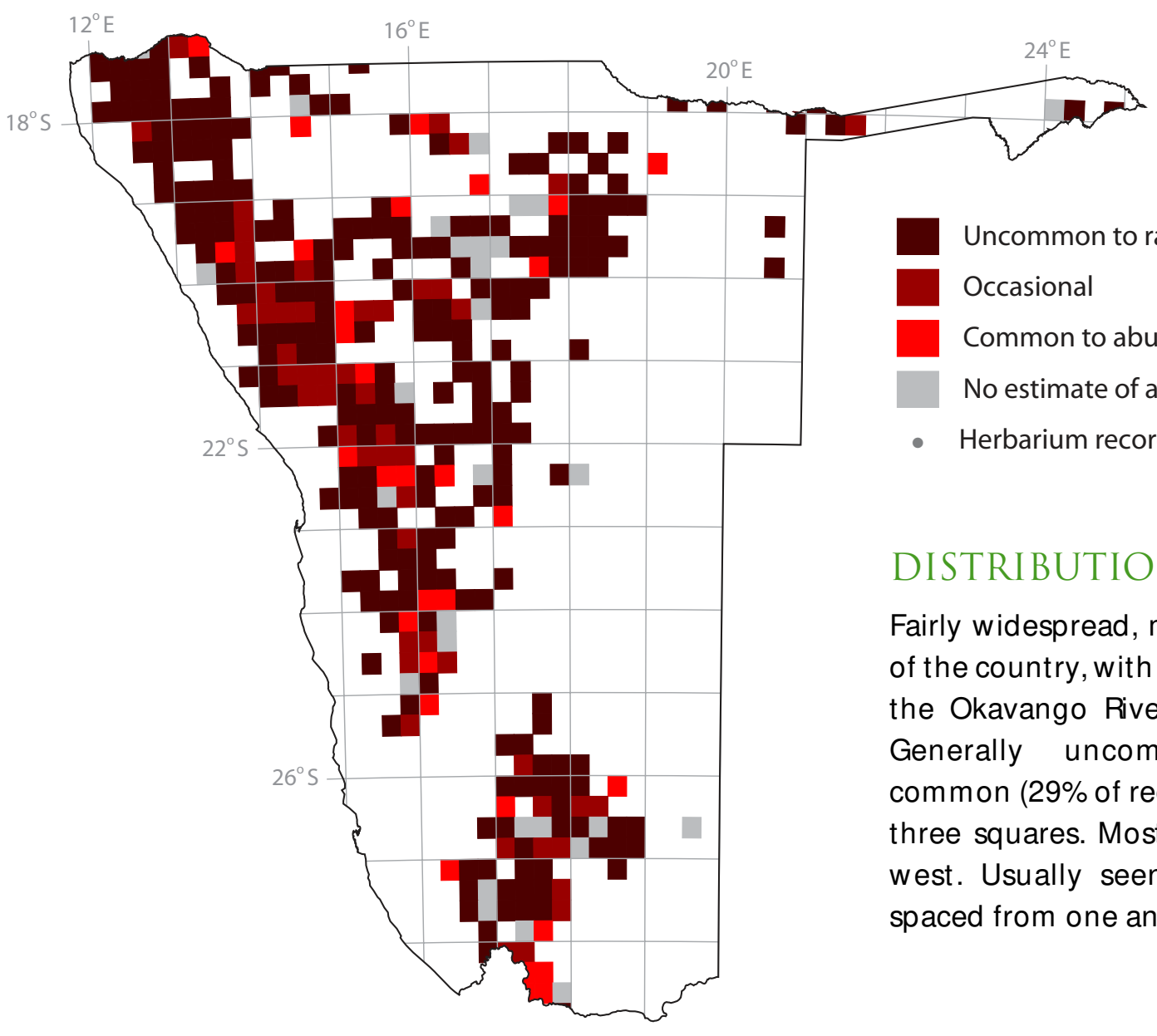
Ringwood tree (E); kringboom (A); Knotenfruchtbaum (G); omutengu (H); goradab (K)

[995 records from 360 (34%) squares]



Evergreen tree. BARK smooth, reddish-brown to almost black; **often one side of the trunk is darker, while the other side is paler grey and flushed dirty pink, often with horizontal 'wrinkles'**, hence the common name. LEAVES **elliptic to ovate or oblong, leathery, sometimes fine-sandpapery, other times velvety soft**; dull green to yellow-green; apex blunt, shallowly notched or with a hair-like tip; petiole up to 15 mm long. FRUIT **bean-like, constricted between seeds** to give a bead-like appearance.

Can very easily be confused with *M. angolensis*, and sometimes with *Boscia albitrunca*, especially in the north-west.



DISTRIBUTION & ABUNDANCE

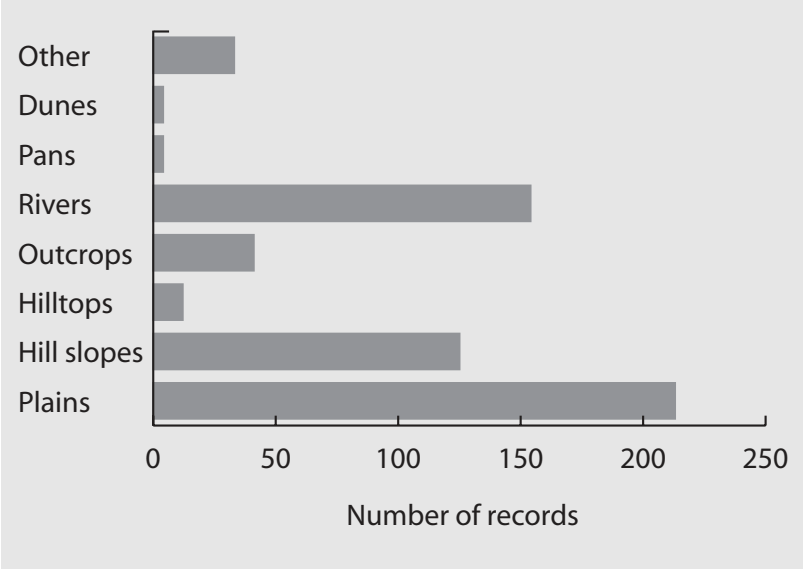
Fairly widespread, mainly in the western half of the country, with smaller populations along the Okavango River and in eastern Caprivi. Generally uncommon to occasionally common (29% of records); locally abundant in three squares. Most common in the central-west. Usually seen as single trees widely spaced from one another.

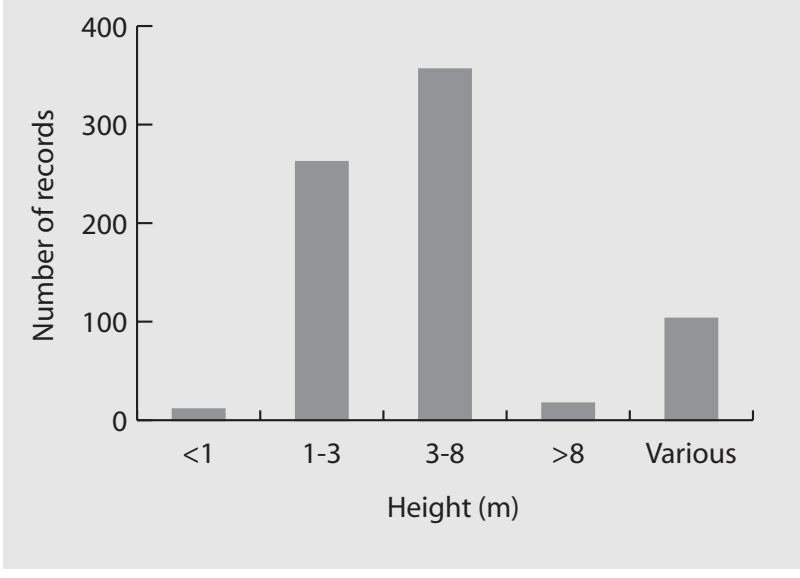
HABITAT

Various, but mainly plains, along dry rivers and on hill slopes. Also on rocky outcrops in the central-west and south. Grows on a variety of substrates.

GROWTH FORM

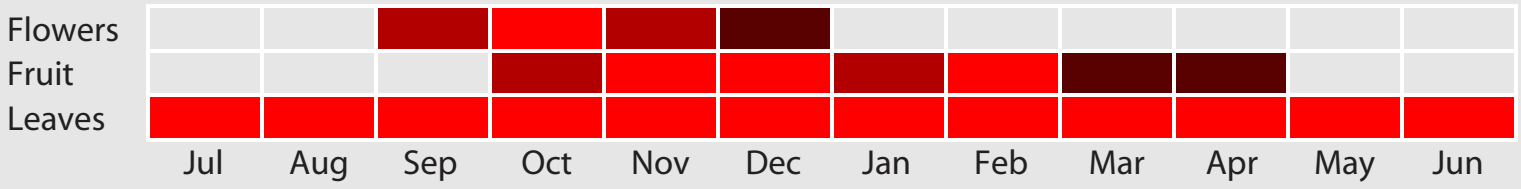
Usually a tree (90% or records) up to 8 m high, but occasionally higher. Mixed stands with individuals of all heights found in the central-west, north-west and south. In the north and north-west where these trees are heavily browsed they tend to have an open, flat canopy, whereas in Windhoek where they are not browsed, they have a rounded, more drooping canopy. The leaves of the western trees seem to be thicker, more leathery and rougher than those of the east and central parts, which are softer and more velvety. In the far north-west many individuals were observed that were over 2 m, but with a very slender, sapling like trunk and a very wispy canopy.





ANNUAL CYCLE

FLOWERS September to December, with a peak in October and occasional records most months. FRUIT some recorded every month, but mostly October to February. LEAVES evergreen, with young leaves produced from October to January; sometimes deciduous in the south.



GENERAL

Very nutritious and a favourite browse of game and livestock. Also eaten by ostrich. Caterpillars often defoliate trees. Young trees often need protection from a 'nursery plant' until they are large enough to withstand the browsing pressure. Mature trees generally have a browse line at giraffe height in Etosha National Park and Kaokoveld.

Various parts of the plant are used medicinally and ritually.

CONSERVATION CONCERNS

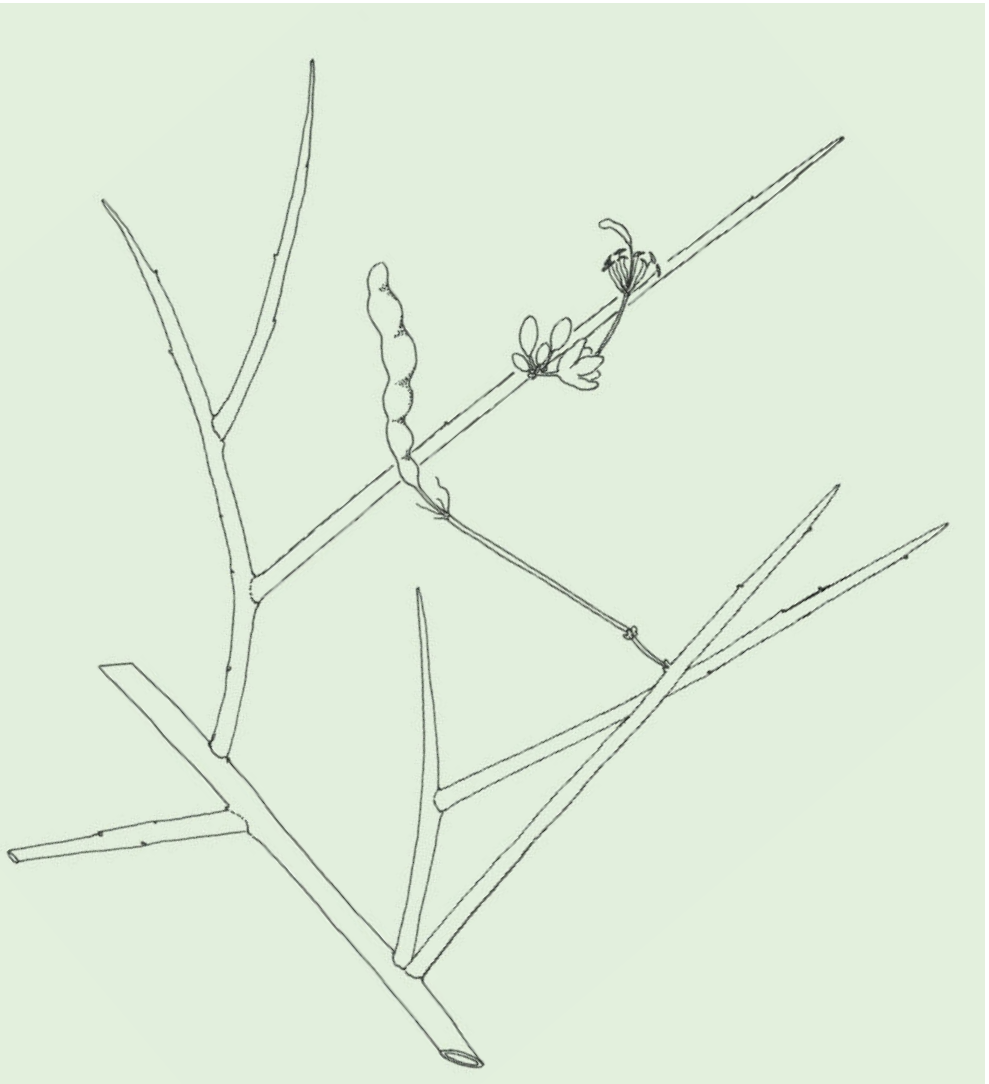
In the north-west, *M. schinzii* is being increasingly used for temporary shelters by young people who are not aware of the old tradition of leaving these trees standing. They are also being hammered by giraffes in the north-west. Protected by forestry legislation.

Cadaba aphylla

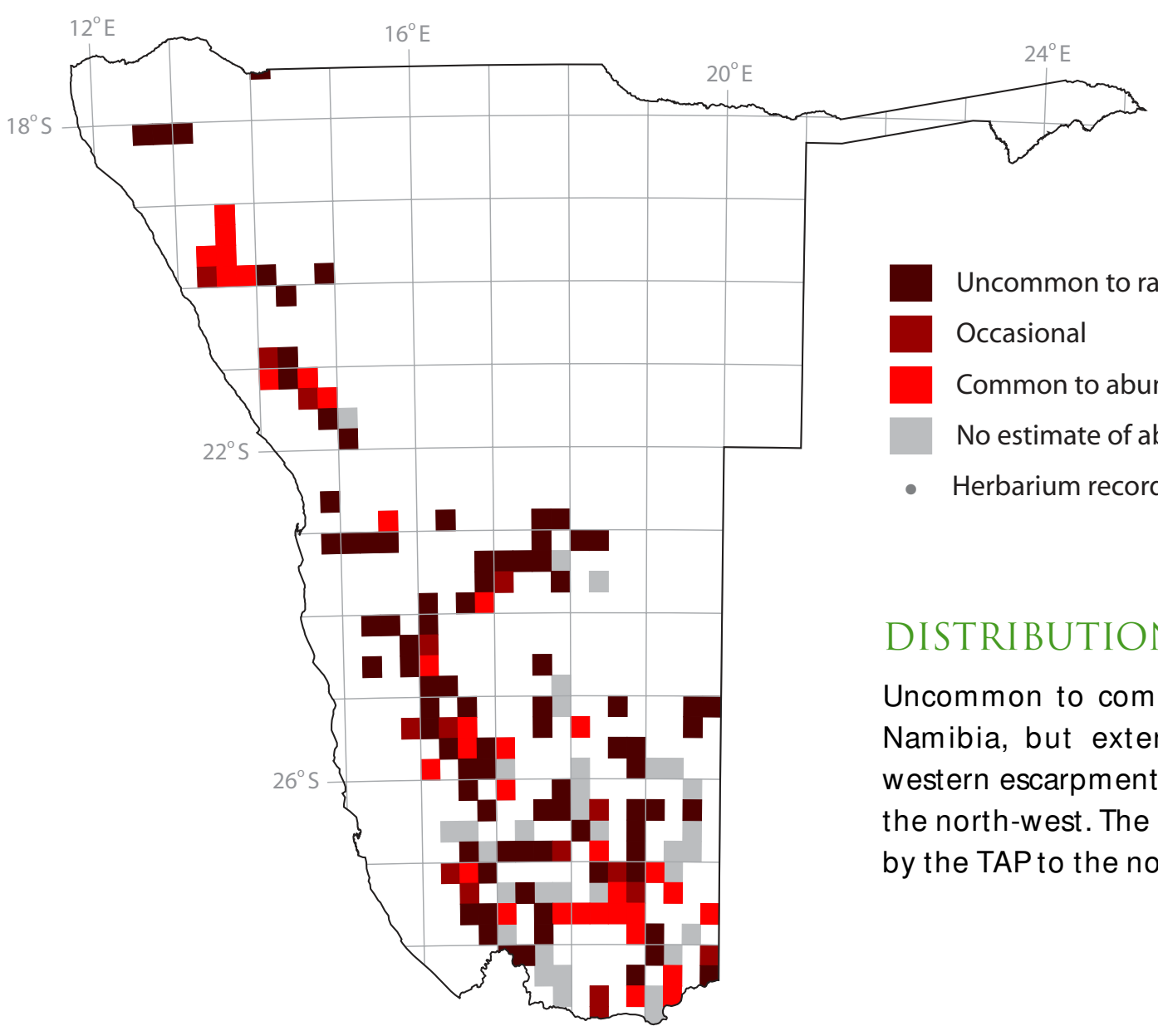
Swartstorm

Leafless wormbush (E); !tåss (K)

[280 records from 170 (16%) squares]



Dense **spiky shrub**, sometimes growing as a scrambler or strangler; branches hairless, pale to **dark blue-green** to purplish, **often leafless, twigs spinescent**. FLOWERS long; deep red-maroon, with a somewhat lacquered appearance. FRUIT fat, sausage-like, warty, may be sticky.

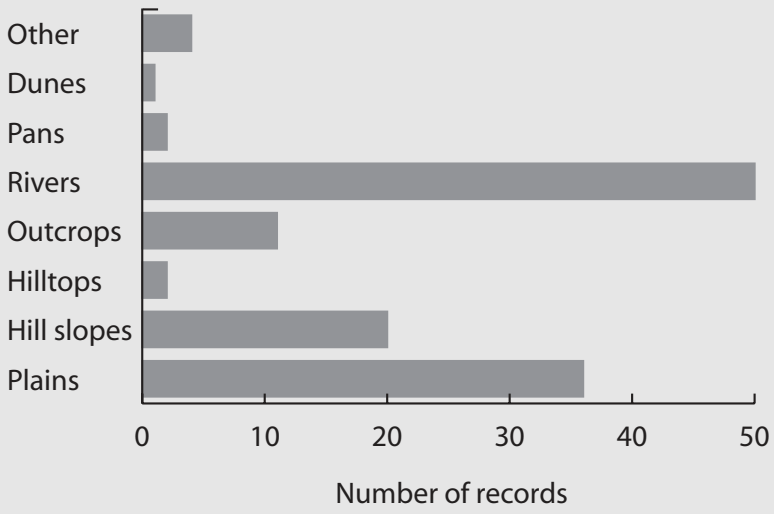


DISTRIBUTION & ABUNDANCE

Uncommon to common, mainly in southern Namibia, but extending along the north-western escarpment with isolated localities in the north-west. The range has been extended by the TAP to the north-west.

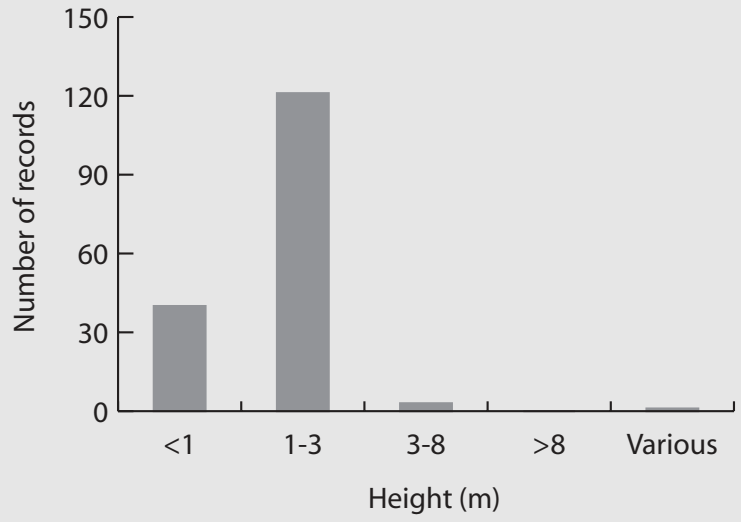
HABITAT

Along dry river courses, on plains and hill slopes. Mainly on gravel or stony substrates, occasionally sand.



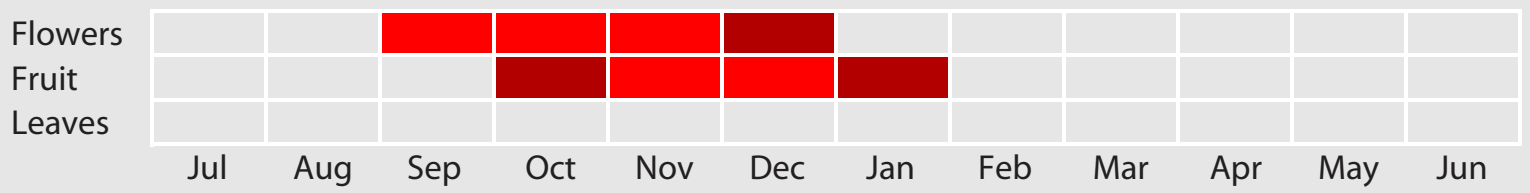
GROWTH FORM

A shrub of up to 3 m high, occasionally over 3 m; sometimes scrambling over other plants.



ANNUAL CYCLE

FLOWERS mainly from September to November. FRUIT present from October to January.



GENERAL

Browsed by livestock and game; roots used medicinally. The fruit looks like worms, hence the English common name.

CONSERVATION CONCERNS

None recorded.

CAPPARACEAE | CAPER FAMILY

A family represented in Namibia by numerous species in five genera, four of which include woody species. Leaves are generally simple and alternate. Flowers have conspicuous stamens, often with a brush- or pompom-like appearance. The family is characterised by having the ovary carried on a distinct stalk, called a gynophore, which is visible in fruiting specimens as a segment between the top of the fruit and the proper fruit stalk. Several species are very similar, and identification is difficult without flowers or fruit. The commercial caper comes from the flower buds of *Capparis* spp. Many Namibian species provide important browse for both wild and domestic animals.

Cadaba schroeppelii

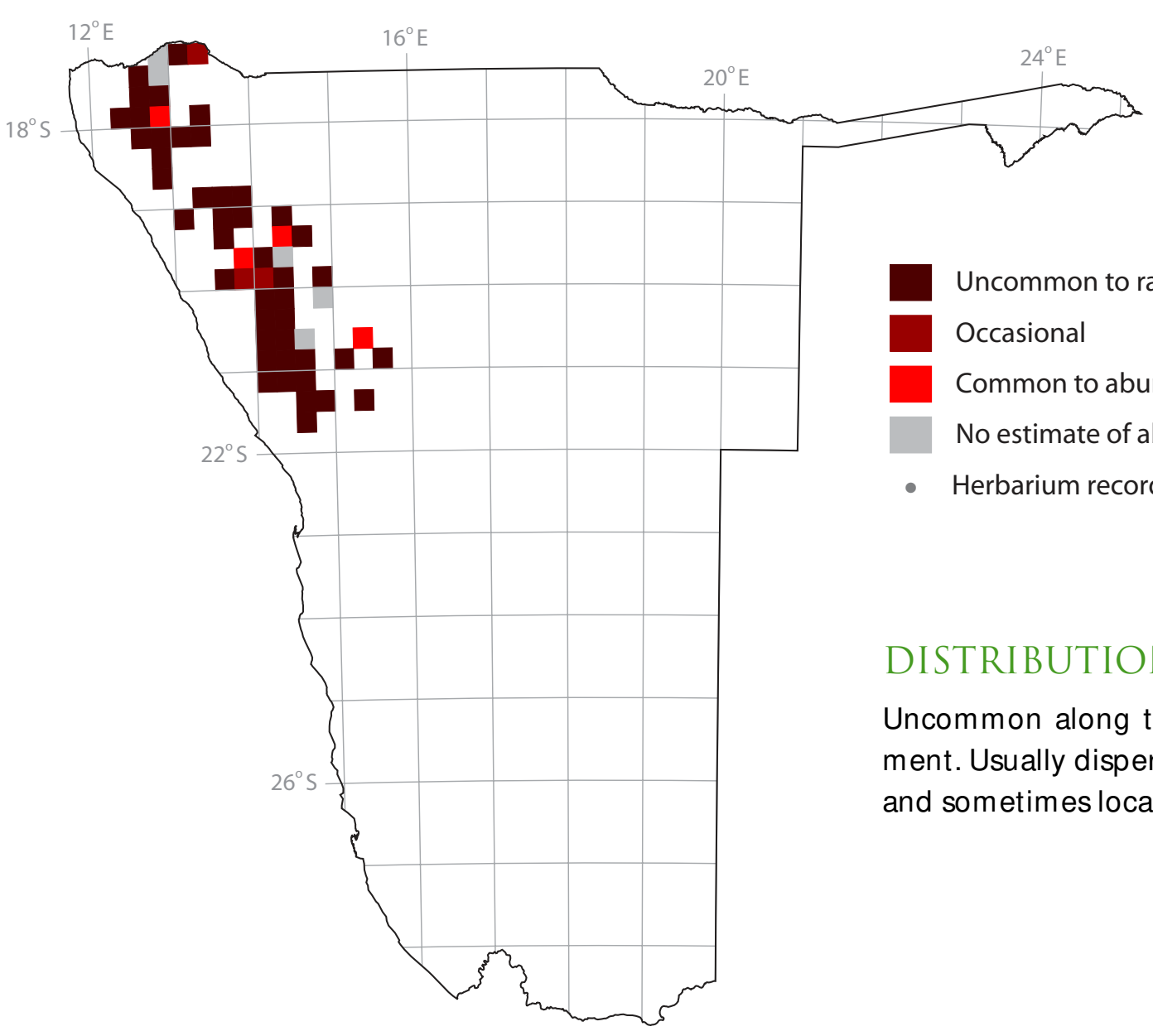
Silver-leaved Wormbush

||Gabi (K)

[103 records from 52 (5%) squares]



Evergreen shrub. BARK **black** to red brown; **young branchlets with silver-grey to white, scaly covering**. LEAVES simple, elliptic to obovate, 6–30 mm long; **both surfaces silver-grey to olive-green, scaly**. FLOWERS small, *c.* 10 mm in diameter; solitary in leaf axils; outer surface covered in scales. FRUIT cylindrical, up to 20 mm long; covered with dense grey scales; carried on a slender stalk.

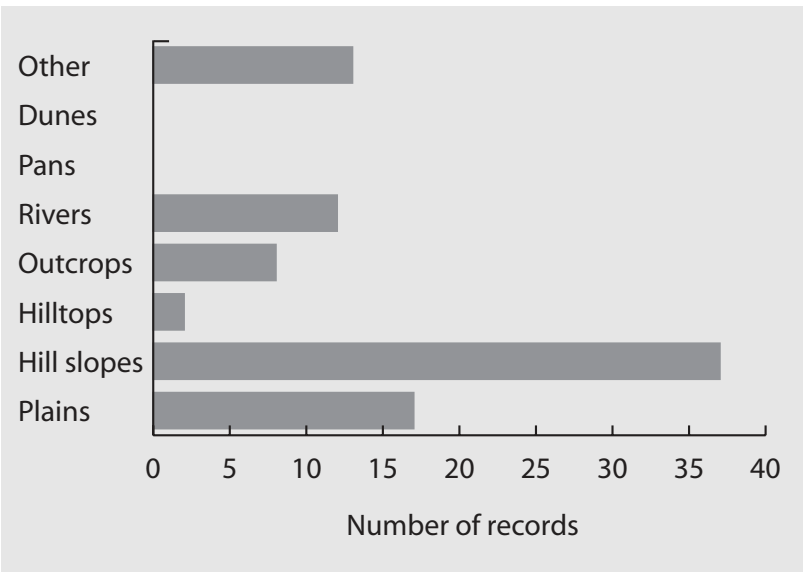


DISTRIBUTION & ABUNDANCE

Uncommon along the north-western escarpment. Usually dispersed, but may be clumped and sometimes locally common.

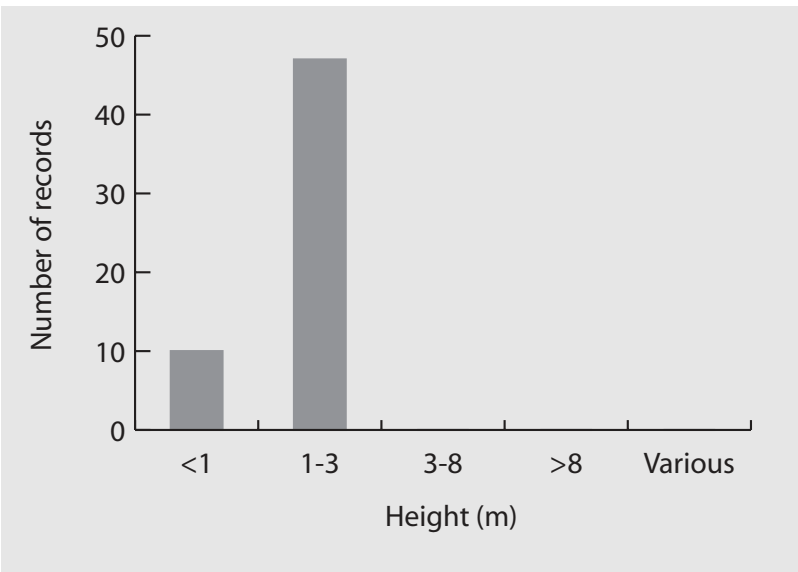
HABITAT

Various, but mostly hill slopes and valley floor. Always on stony or rocky ground.



GROWTH FORM

Generally a shrub in the 1–3-m height class; occasionally a tree or shrubby tree, but never more than 3 m high.



ANNUAL CYCLE

FLOWERS December, with old flowers recorded from February to August. FRUIT December. LEAVES evergreen.

GENERAL

They are often heavily browsed by various game species. The fruit looks like worms, hence the English common name. This species is of horticultural potential due to its attractive foliage and drought tolerance.

CONSERVATION CONCERNS

None recorded.

Cadaba schroeppelii, Kaokoveld, B. Curtis



Moringa ovalifolia

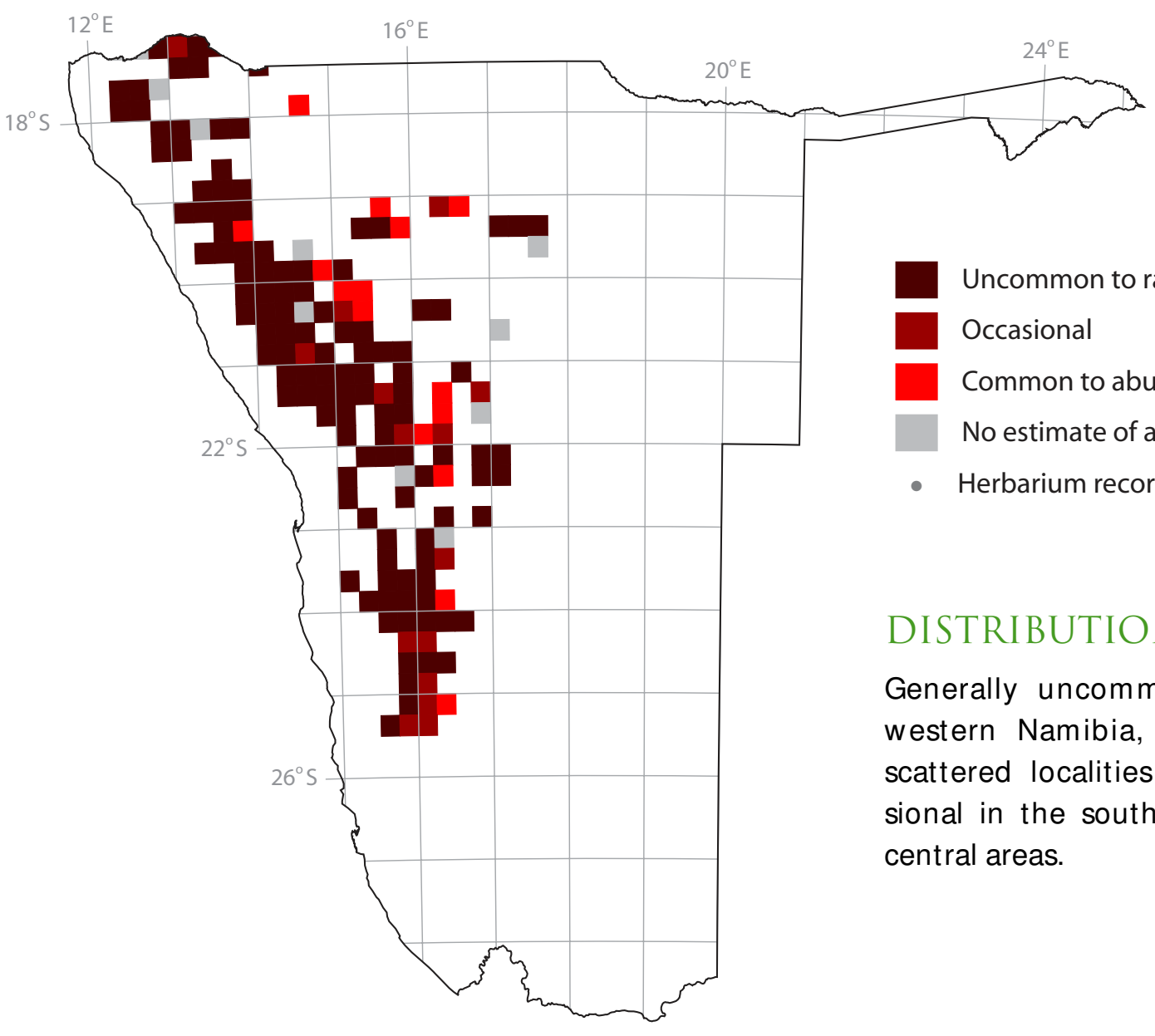
Sprokiesboom

Moringa, phantom tree (E); omutindi (H); //khaos (K); oluhongwe (O)

[377 records from 161 (15%) squares]



Deciduous tree with a thick, succulent trunk (up to 1 m in diameter) and feathery-looking canopy. BARK **smooth**, silver-grey to pale brown with a green tint; resinous. LEAVES **clustered near ends of branches**, twice-compound, *c.* 0.8 m long and 0.6 m broad, leaflets elliptic; petiole long. FLOWERS white, small, numerous, appearing with, before or after young leaves in a branched, axillary spray. FRUIT a long, **light grey-brown, pendulous pod, triangular in cross section, swollen over the seeds, splitting into three sections**. SEEDS with membranous wings.

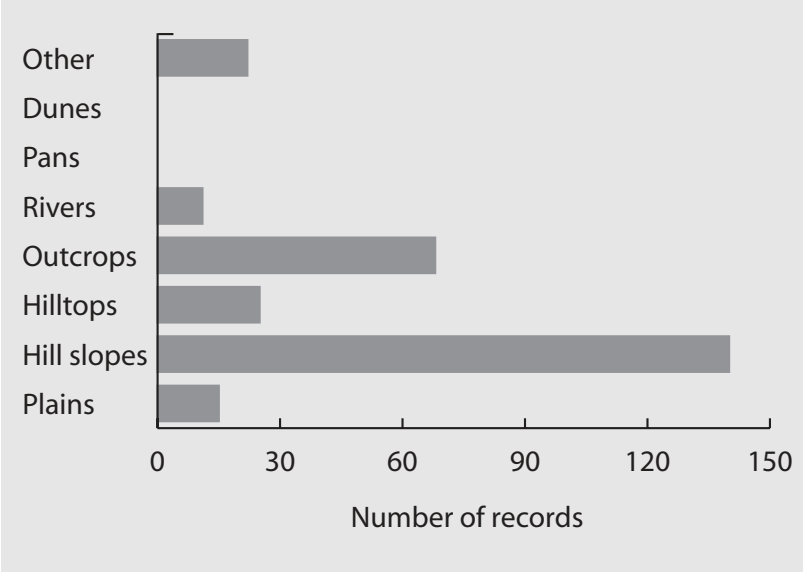


DISTRIBUTION & ABUNDANCE

Generally uncommon, but widespread in western Namibia, as far south as 26° S; scattered localities in the Karstveld. Occasional in the south, locally common in the central areas.

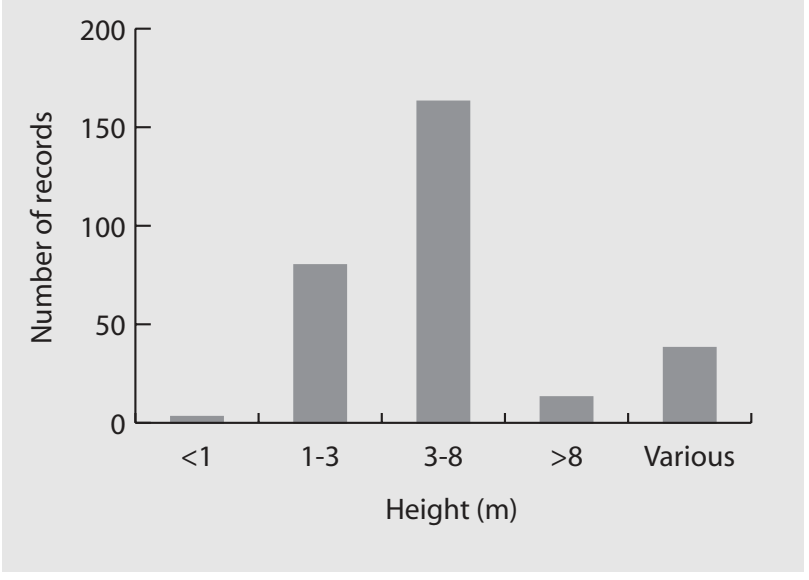
HABITAT

Various, but mainly hill slopes and rocky outcrops. There is a large population of old trees growing on a sandy plain in Etosha National Park (Sprokieswoud, 1915BA).



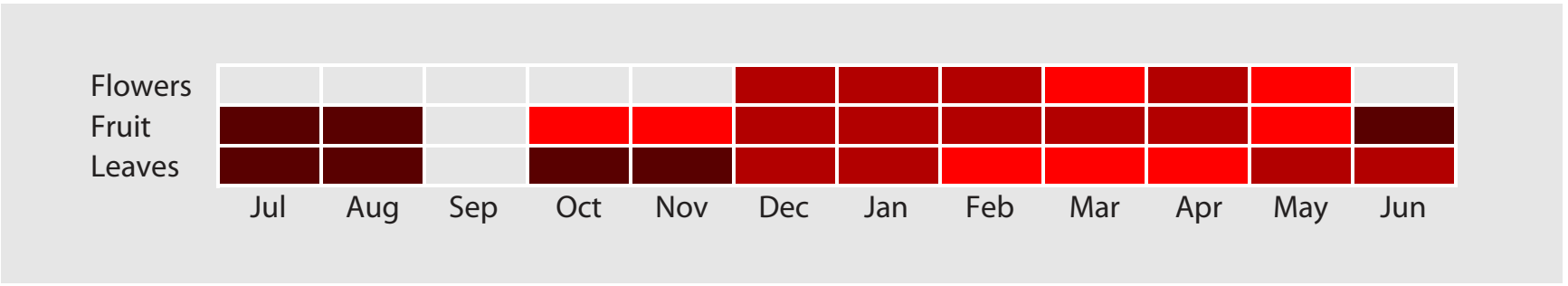
GROWTH FORM

A tree in the 3–8-m height class, with some young, shrubby forms recorded in places. A few, exceptionally large individuals were recorded in the Zebra Mountains (BET1, 1713BA) and in the Karstveld (HOF1).



ANNUAL CYCLE

FLOWERS December to May. FRUIT October to May, with occasional records in other months. It is interesting that peak recording of fruit is earlier than flowering, or five to seven months after the previous year's flowers. In gardens in Windhoek, flowers and fruit are often present together. LEAVES peak leafing from February to April, corresponding to late rainfall of the north-west.



GENERAL

The family is known for its high-quality, pharmacologically active seed oils and water-clarifying agents. Preliminary investigations have been done on *M. ovalifolia*, but nothing has been published to date. Fruit, leaves and roots are edible. Elephant, giraffe and springbok eat the fruit and leaves, while elephants and porcupine gouge the trunks for their moist, pulpy fibres which often results in grotesque shapes in these plants. These usually graceful trees grow easily from seed and have definite horticultural potential.

CONSERVATION CONCERNS

This plant is potentially threatened by the pachycaul trade. The Etosha population is being damaged by elephants to such an extent that a large part of it has been fenced-off for protection. Near-endemic to Namibia, extending into southern Angola. Protected by the Nature Conservation Ordinance.

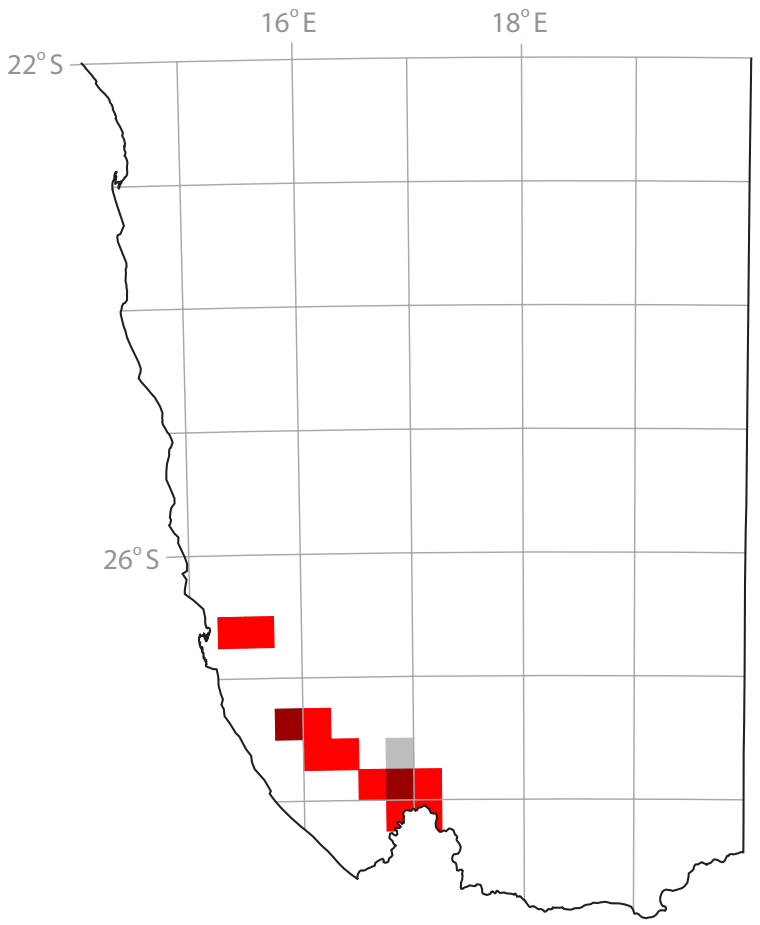
Tylecodon paniculatus

= Cotyledon paniculata

Southern Botterboom

[24 records from 12 (1%) squares]

Deciduous, succulent dwarf tree with thick, swollen trunk and short, thick branches. BARK smooth, olive-green to yellow-green, **peeling in papery, yellowish strips**. LEAVES simple, **succulent**, light bright green, elongate-ovate, up to 80 mm long. FLOWERS *c.* 20 mm long in a terminal spray, with **yellowish-red tube and yellowish lobes**; pendulous at first but drying erect.



Uncommon to rare
Occasional
Common to abundant
No estimate of abundance
• Herbarium record, pre-1997

DISTRIBUTION & ABUNDANCE

Locally common in a very small area in the south-west.

HABITAT

Mostly rocky hill slopes and outcrops.

GROWTH FORM

Variously described as a tree and a shrub, around 1 m high.

ANNUAL CYCLE

No observations between April and July. FLOWERS July to December. FRUIT August and September. LEAVES August to March.

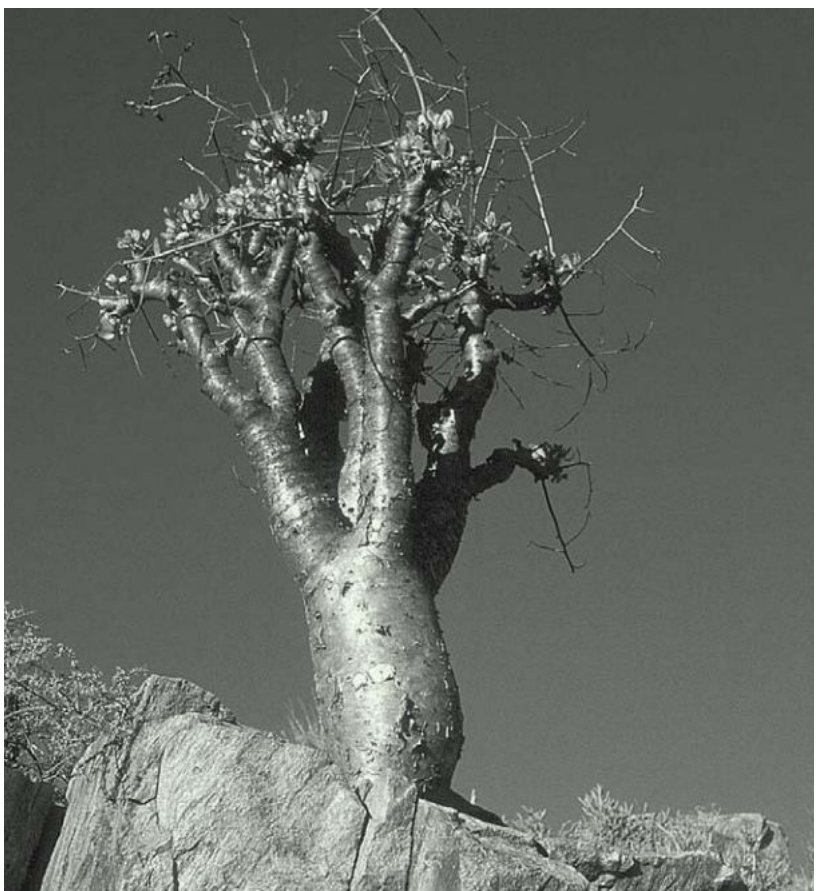
GENERAL

Has horticultural potential and is ideal for a dry garden. Roots easily from cuttings.

CONSERVATION CONCERNS

Could be threatened by the pachycaul trade. It is endemic to the south-western tip of Africa; it is more widespread further south.

Tylecodon paniculatus, B. Curtis

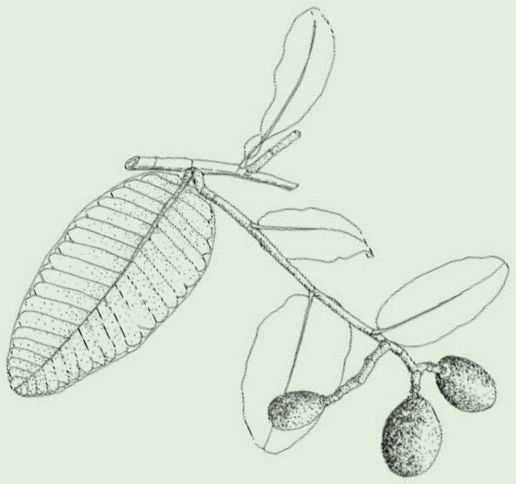


Parinari curatellifolia

Mobola-plum

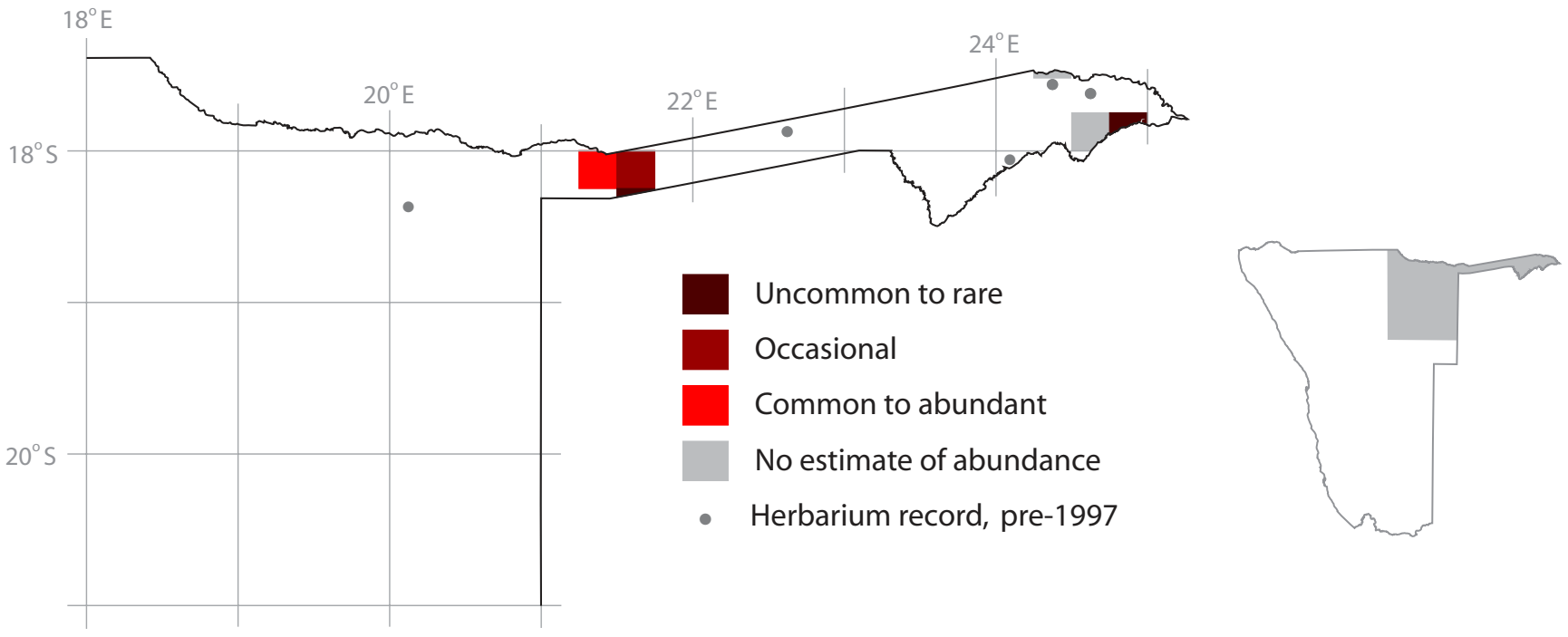
Grysappel (A)

[9 records from 5 squares]



Following strict taxonomic order, this species should follow *Montinia caryophyllacea*.

Large, evergreen tree with **spreading crown**, up to 20 m high. BARK dark grey, corky. LEAVES simple, alternate; elliptic to oblong, 50–110 mm long, dark green, shiny, hairless, **with prominent parallel secondary veins below** and with densely woolly covering; margin entire, occasionally undulate; apex blunt; base heart-shaped to blunt. FLOWERS small, white. FRUIT **ovoid to spherical**, c. 35 x 20 mm; **greyish to brownish, scaly skin; sweet, edible, yellowish mealy flesh**.



DISTRIBUTION & ABUNDANCE

Uncommon in eastern Caprivi; uncommon to common along the eastern stretches of the Okavango River.

HABITAT

Along river banks, in riverine forest.

GROWTH FORM

A tree of over 8 m tall.

ANNUAL CYCLE

FLOWERS only recorded in May. FRUIT September to May. LEAVES recorded in September and March to May.

GENERAL

The fruit is fragrant, sweet and edible, with a floury texture, and a high vitamin C content. The kernel is eaten as a nut and has a high oil content. Leaves are chewed to cure coughs.

CONSERVATION CONCERNS

Although the trees are highly valued for their shade and fruit, they are overexploited and easily damaged, and are usually only found in places where they are protected in some way.

Montinia caryophyllacea

Omutete

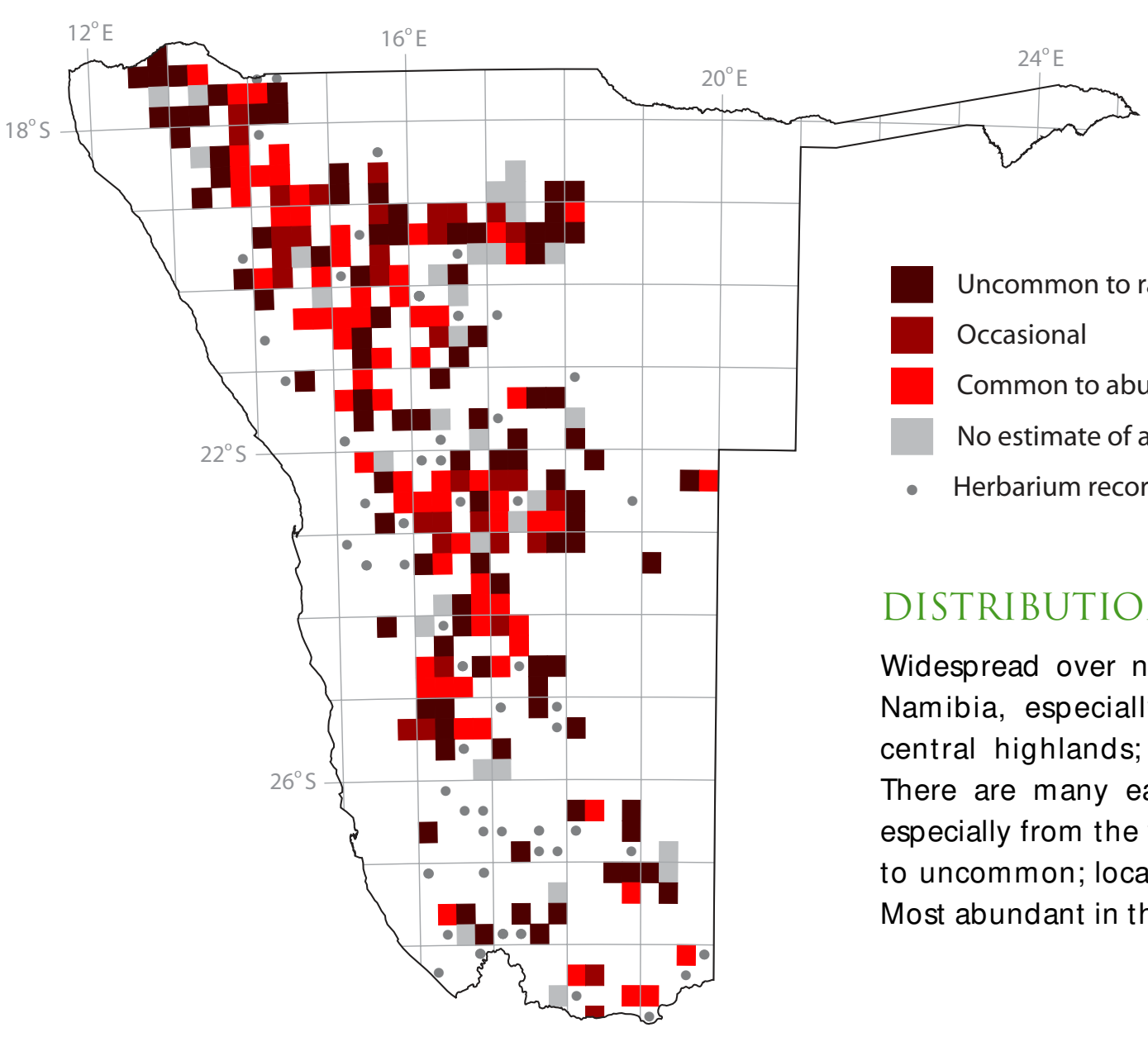
Wild clove-bush (E); peperbos, bergklapperbos (A); Pfeifenstrauch (G)

[393 records from 183 (17%) squares]



Following strict taxonomic order, this species would come before *Parinari curatellifolia*.

Semi-deciduous, **lax shrub**. LEAVES simple; linear-oblong to broadly lanceolate to elliptic, 15–70 mm long; **pale green, smooth, with a dull, waxy coating; margin entire**. INFLORESCENCE **male and female flowers on separate plants**. FLOWERS **small, waxy, white**; male flowers shallow, in small terminal sprays; female flowers solitary **with a large inferior ovary below the small, flat corolla**. FRUIT **a papery-woody, ovoid capsule**, 15–20 mm long, **splitting into two valves**. SEEDS **flat, with a membranous wing**.

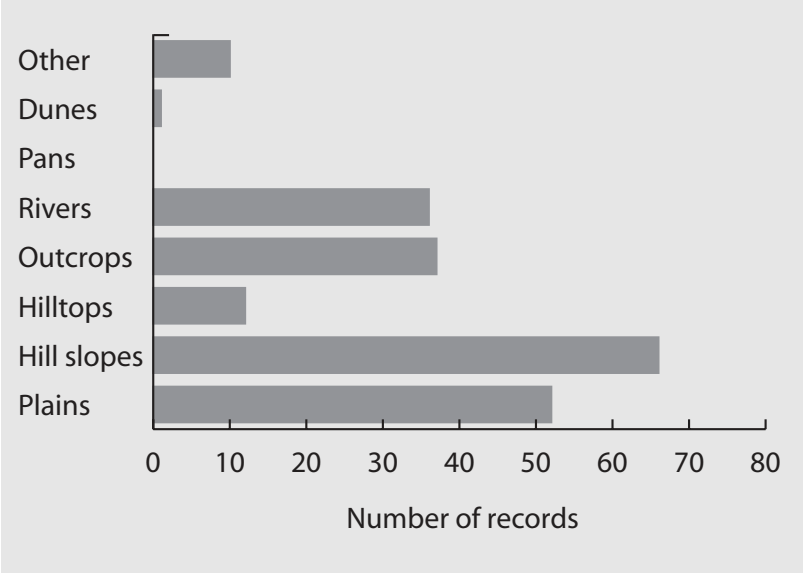


DISTRIBUTION & ABUNDANCE

Widespread over north-western and central Namibia, especially in the Karstveld and central highlands; scattered in the south. There are many earlier, herbarium records, especially from the west and south. Common to uncommon; locally common in the south. Most abundant in the central highlands.

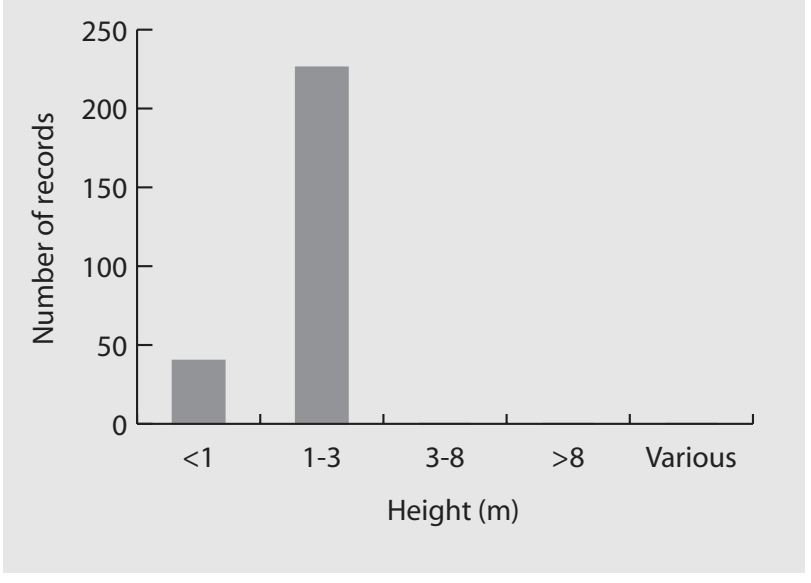
HABITAT

Various, but mainly hill slopes and rocky outcrops in the central highlands, plains in the Karstveld, and dry rivers in the south. It is found on a variety of substrates, including calcrete, gravel, granite and granitic soil, mica schist, dolomite, basalt and shale.



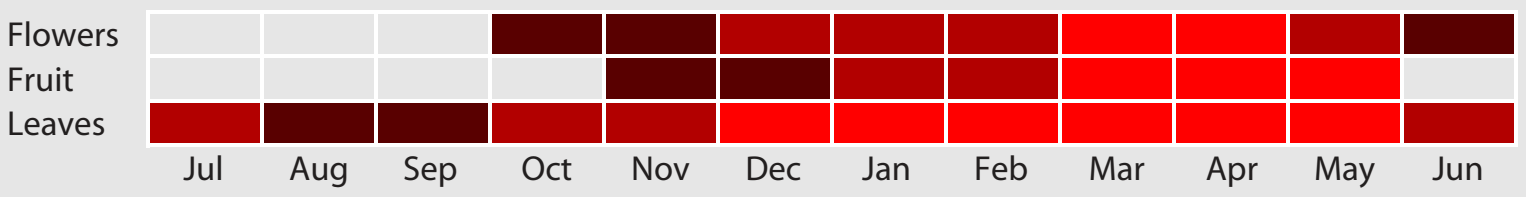
GROWTH FORM

A shrub in the 1–3-m height class.



ANNUAL CYCLE

FLOWERS October to June, but mostly March and April. FRUIT November to May, with some found all year round. LEAVES October to July, with young leaves in September and October.

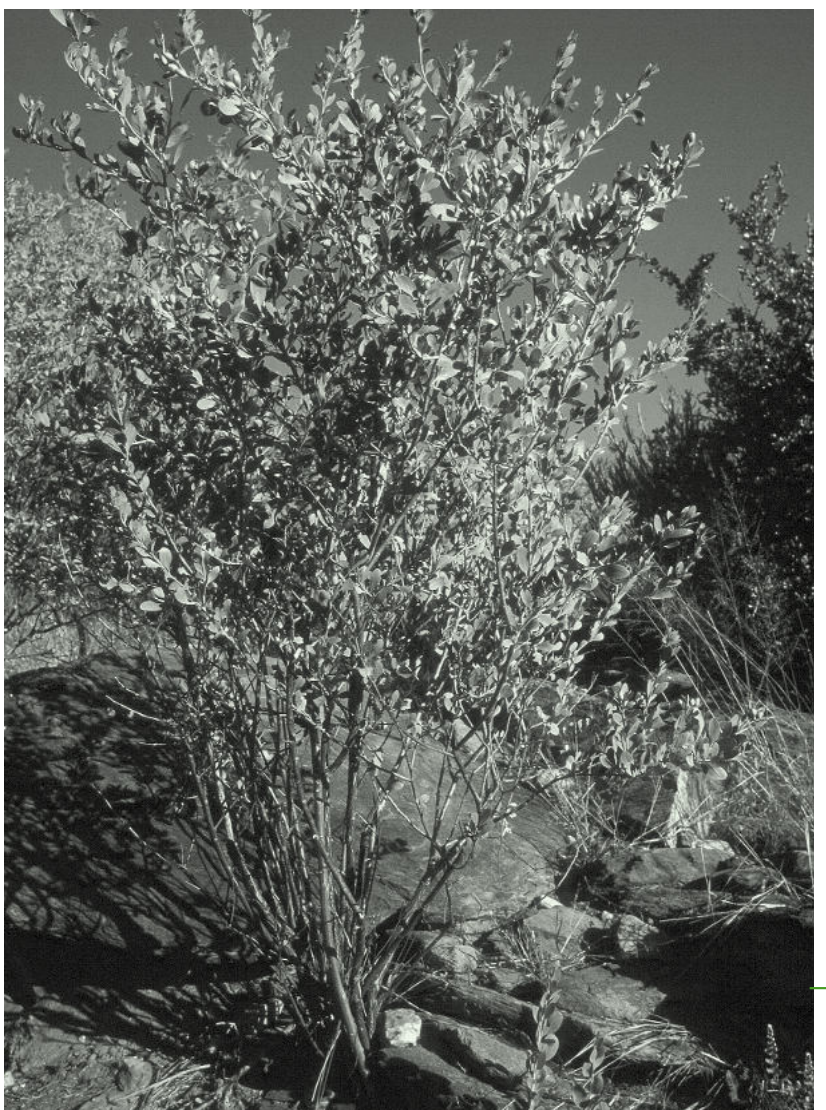


GENERAL

Heavily browsed by game and livestock; fruit eaten by koringkrieks (armoured ground cricket).

CONSERVATION CONCERNS

None recorded.



Montinia caryophyllacea,
L. Hoffmann

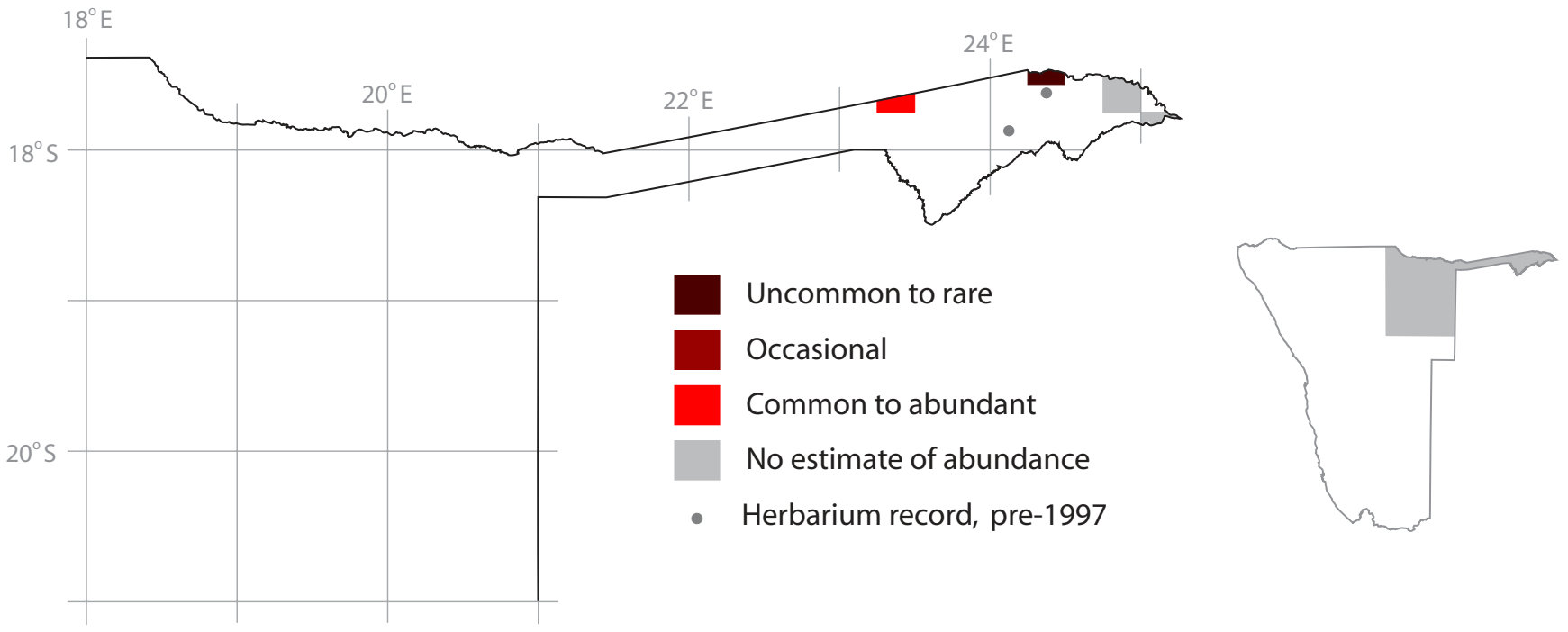
Rourea orientalis

= Byrsocarpus orientalis

Short-pod

[4 records from 4 squares]

Scrambling shrub or tree. BARK of young branchlets **brown-purple, with conspicuous lenticels**. LEAVES compound, up to 200 mm long; leaflets elliptic to oblong, up to 40 mm long; bright green above; paler below; **midrib often densely hairy**, especially below; apex **usually with a fine hair-like tip**. FLOWERS **conspicuous, up to 30 mm in diameter**, creamy-white, rarely tinged pink, **sweet lemon-scented**. FRUIT an oval capsule, *c.* 20 mm long, red-brown and splitting open when ripe. **SEEDS completely enclosed in a bright scarlet aril**.



DISTRIBUTION & ABUNDANCE

Common to uncommon in a few squares in eastern Caprivi.

HABITAT

River banks and floodplains.

GROWTH FORM

A shrub in the 1–3-m height class, a tree in the 3–8-m height class and a scrambler of over 8 m.

ANNUAL CYCLE

Observations only made in November and December. FLOWERS recorded in December. FRUIT in November and December. LEAVES only observed in November and December.

CONSERVATION CONCERNS

None recorded.

FABACEAE | (= LEGUMINOSAE) | PEA AND BEAN FAMILY

This is one of the largest and most important families in Namibia, with many very diverse woody and herbaceous species. The roots of most species have symbiotic relationships with nitrogen-fixing soil bacteria, thus these plants help to enrich the soil, while their pods are high in protein. By far the greatest diversity of trees occurs in this family, with all members being important for animal fodder, and many producing valuable timber and other products. The distinguishing characteristic of the family is the fruit, a pod, which is a dry, papery, leathery or woody capsule with a single row of seeds. Based on flower structure, the family may be clearly divided into three subfamilies. Some taxonomists regard the floral differences sufficient to separate the group into three distinct families. This school of thought uses the name Fabaceae to refer to the subfamily Papilionoideae only.

MIMOSOIDEAE | MIMOSA AND ACACIA SUBFAMILY

This subfamily (known as Mimosaceae to those proponents of three distinct families) is characterised by having many flowers in tight clusters. The petals are reduced or absent, and the stamens are long and numerous, giving the whole inflorescence the appearance of a small round ball or pompom, or an elongated spike or bottle-brush. The leaves are always bipinnate (twice-compound), and the leaflets are generally small. The largest and best-known genus is *Acacia*, which, in Namibia, always has thorns. The inflorescences are either compact balls or elongate spikes. With one exception (and one apparent exception) all species with a round inflorescence have straight thorns (sometimes with hooked thorns as well), and all those with an elongate inflorescence have hooked thorns. The genus *Albizia* is less well-known and sometimes erroneously mistaken for *Acacia*. These never have thorns, but in some species lateral branches may end in pointed spines. The flowers are always in half-spherical heads up to 50 mm in diameter, with extremely long and numerous stamens, giving the inflorescence a fluffy appearance.

CAESALPINIOIDEAE | BAUHINIA SUBFAMILY

The flowers of this subfamily (also known as Caesalpiniaceae) are the least uniform of the three subfamilies. They are generally irregular, having floral parts in fives, with the uppermost petal overlapped by the adjacent lateral petals (when present). There are usually ten or fewer stamens. Leaves may be compound or simple, and the plants are generally unarmed.

PAPILIONOIDEAE | PEA SUBFAMILY

The third subfamily (called Fabaceae by some authorities) has the typical pea flower, which is bilaterally symmetrical, with a large rear petal (standard), two smaller, stalked side petals (wing) and two fused, boat-shaped basal petals (keel). Here, too, leaves may be simple or compound.

Albizia anthelmintica

Worm-cure Albizia / Aru

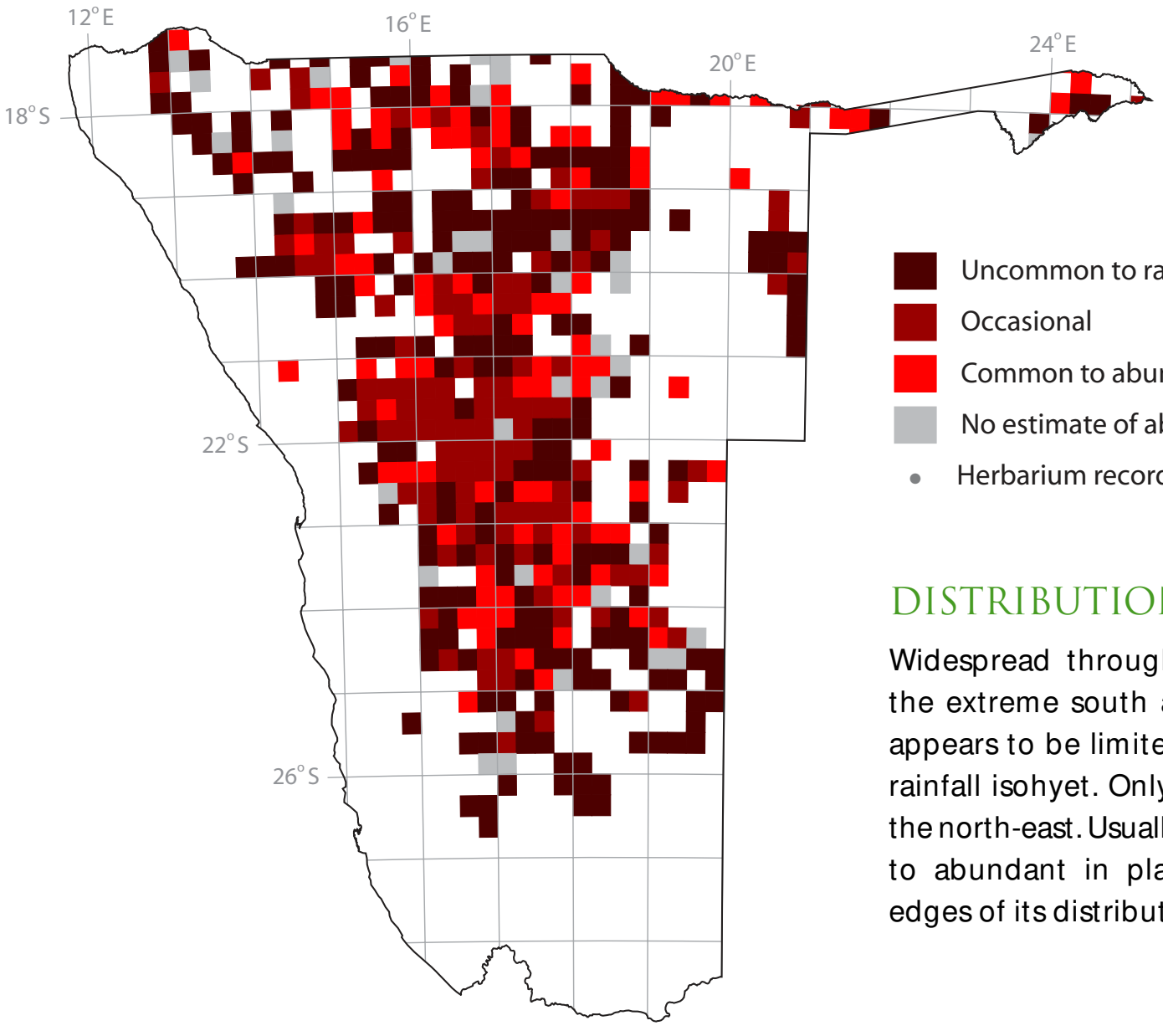
Aroe; oumaboom (A); Wurmrindenbaum (G); omuama (H, Ok); arub/s (K); mupopo (Mb); mukengutji (Rk)

[1,570 records from 478 (45%) squares]



A **tree** with **smooth, grey bark and a distinctive shape** rather like a Japanese drawing. LEAVES with few pinna and leaflet pairs; leaflets obovate, oblique, fairly small, **with a distinctly pointed tip; stipules are often hardened, but not into thorns**. FLOWERS **half-spherical heads, stamens long and numerous, petals small**. FRUIT a flattened, papery pod with pointed tips and a swelling above each seed.

Flowers and pods are conspicuous. The leaflets are similar to those of *Acacia mellifera*, but with a pointed apex.

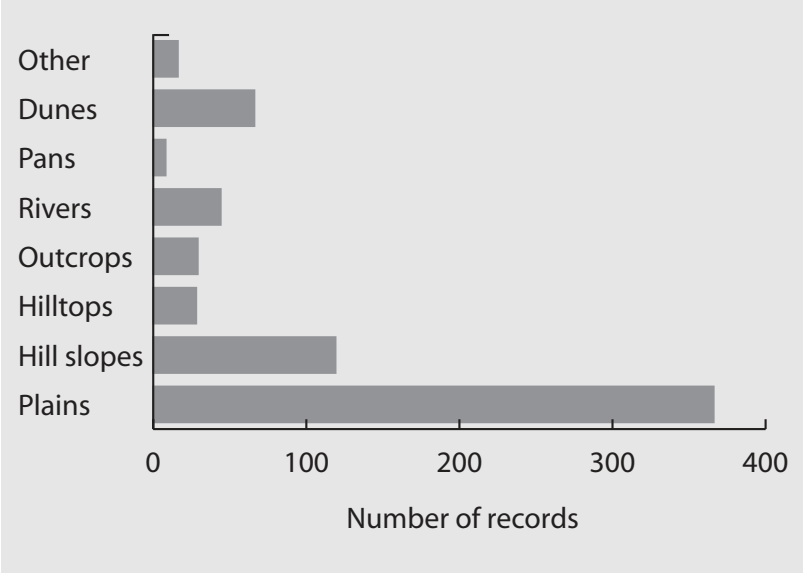


DISTRIBUTION & ABUNDANCE

Widespread throughout Namibia, except in the extreme south and the Namib Desert. It appears to be limited largely by the 150-mm rainfall isohyet. Only in scattered localities in the north-east. Usually occasional, but common to abundant in places; uncommon on the edges of its distribution.

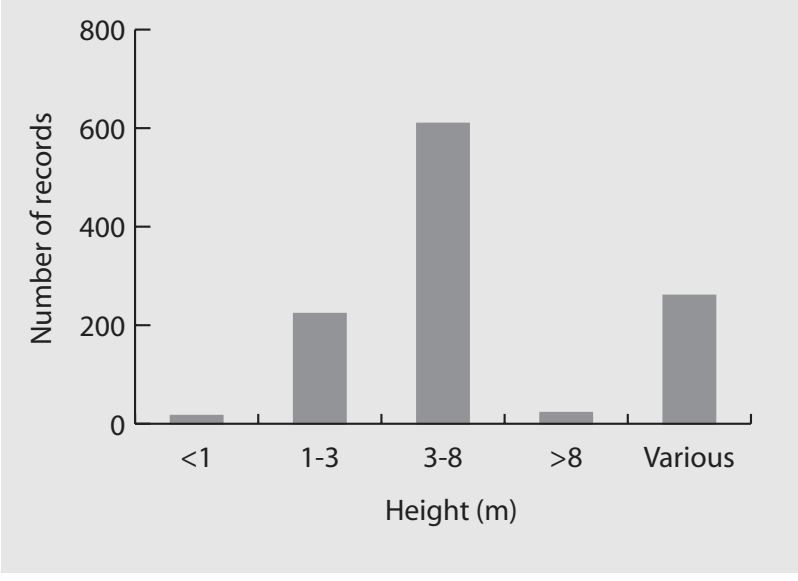
HABITAT

Mostly found on plains, but also hill slopes and occasionally other habitats, such as dry rivers in the central-west, and dunes and interdune valleys in the south and south-east. It grows on gravel or rock substrates mostly, sometimes calcrete, sandy clay or sand.



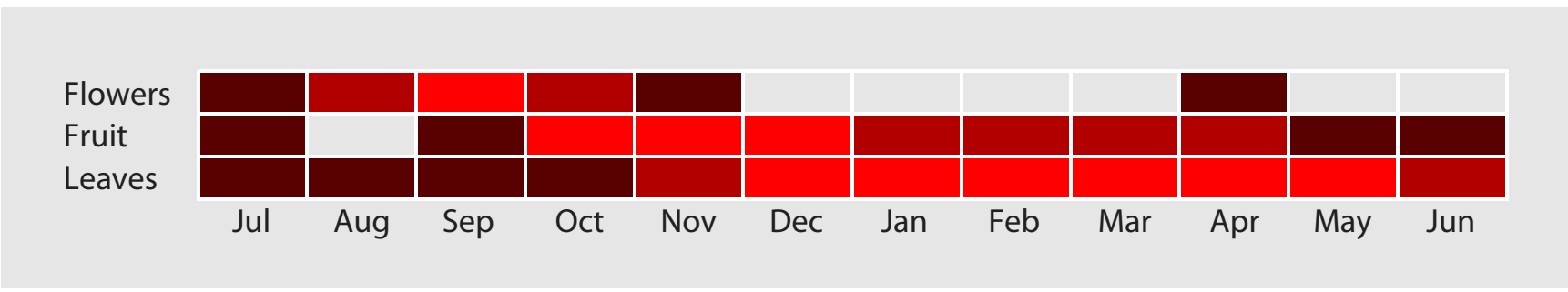
GROWTH FORM

Most often a tree 3–8 m high; occasionally over 8 m. Only 16% of records noted young trees; this could be because young trees are easily overlooked.



ANNUAL CYCLE

FLOWERS are recorded at least once in almost every month, but mainly August to October. In some years they start in June or last up until February (for example, February flowering was recorded for three years in the Karstveld), or have a second flowering in April. FRUIT mostly from October to April, with young fruit between September and November and ripe fruit in December and January. LEAVES deciduous, mostly December to May, but some leaves may be found on some individuals all year; young leaves September to November.



GENERAL

As the scientific and common names indicate, *A. anthelmintica* has properties that kill parasitic worms, such as tapeworm. The plant is browsed extensively by goats and game, especially young plants and new shoots; dassie and porcupine gnaw the trunk; elephant strip the bark and twigs; birds, such as the White-browed Sparrow-weaver and Red-billed Buffalo-weaver nest in them; sunbirds visit the flowers; and 'dikpens' (armoured ground crickets) and baboons eat the leaves.

Apart from using the roots and bark as a remedy for intestinal worms, small branches are also used as toothbrushes. The gum is good to eat. The tree has horticultural potential as garden or bonsai subject; it is attractive, tolerates frost and drought, and is able to grow in mica schist.

The plant is often infested with parasites such as *Tapinanthus*. Dead or dying trees were noted in a number of areas, which could be due to parasites or other causes. The Kavango population appears to be healthy, with no dead trees and many young ones, especially in somewhat protected areas (HOR2).

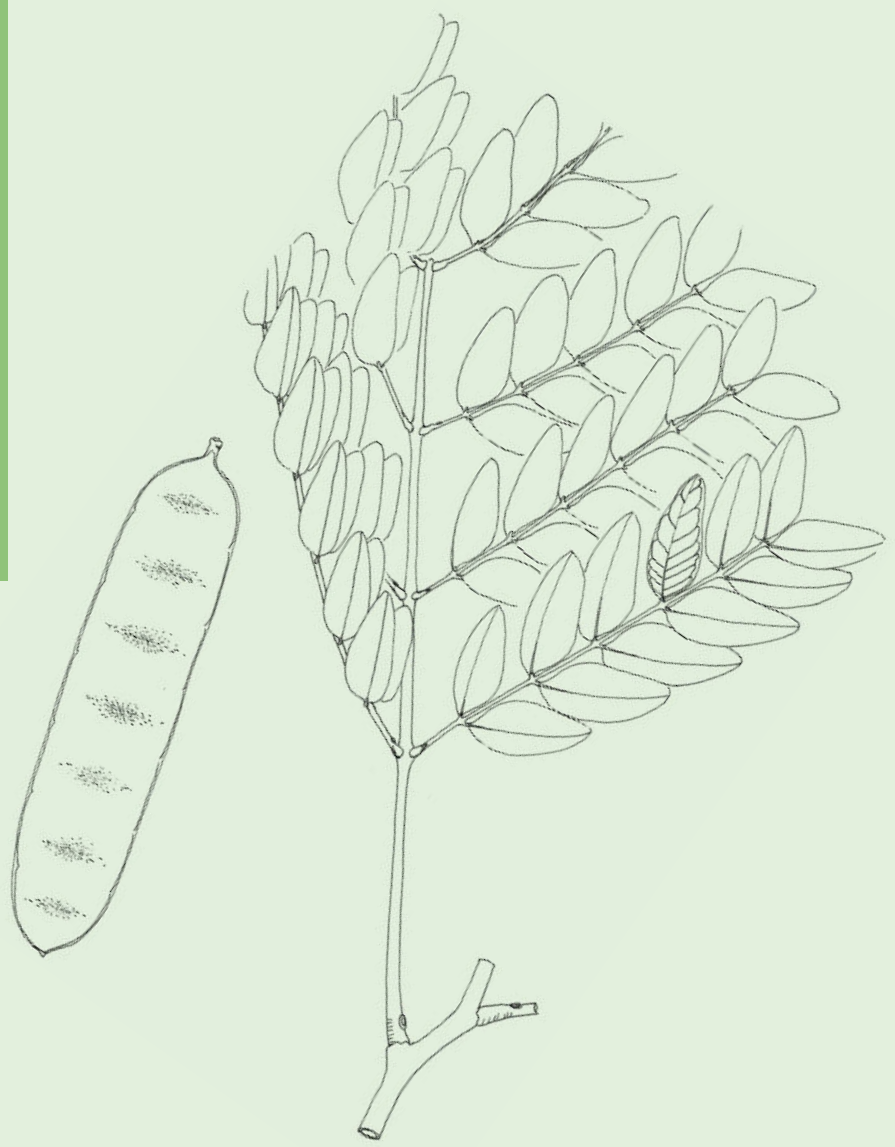
Continued on page 123

Albizia antunesiana

Muto

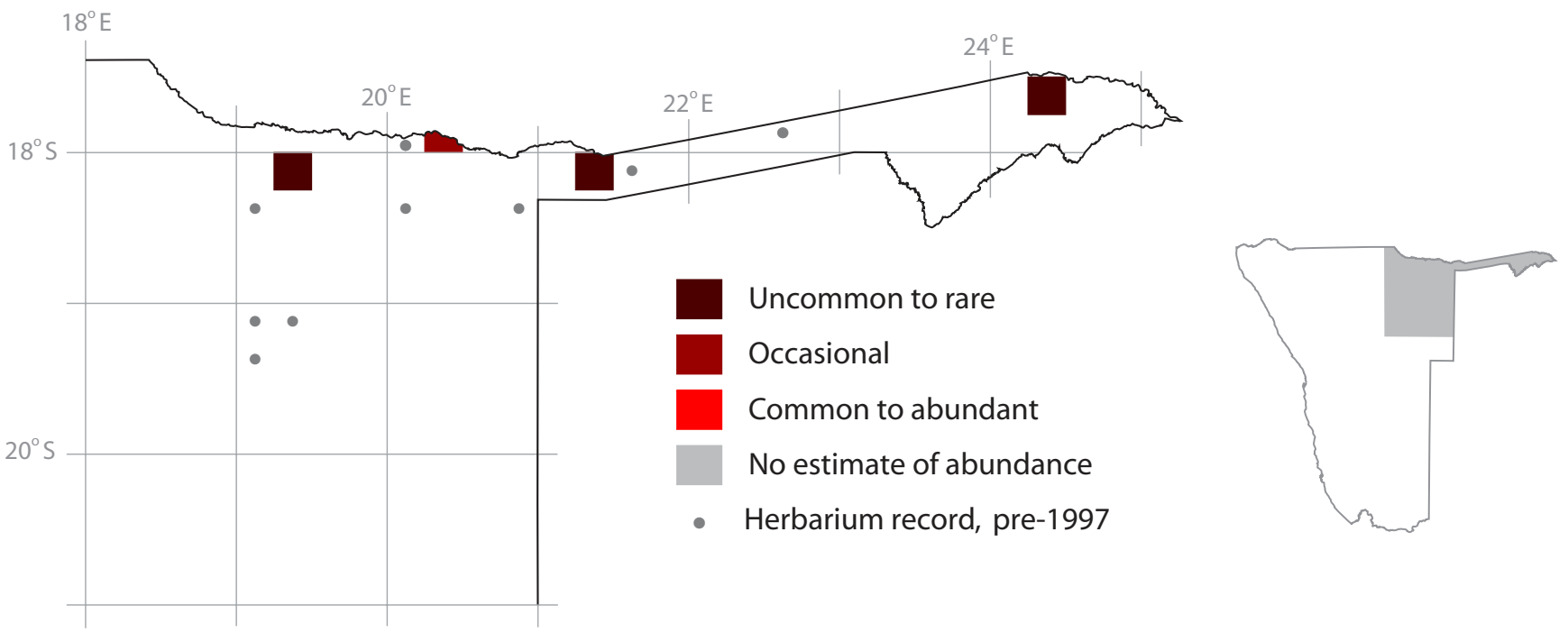
Purple-leaved albizia (E); goro-tco (Kx); mugha (L); muhurungu (Rk, Rum)

[6 records from 5 squares]



A small tree with a spreading, drooping crown. LEAVES twice compound; leaflets **large, opposite, oval to oblong with a blunt tip and an oblique midrib; distinctively pale below** with conspicuous veins; **young leaves** and the leaves on young trees **are often purple**, hence the common name. FLOWERS with conspicuous, yellow stamens and a rust-red calyx. FRUIT a pale brown pod, 110–160 x 25–40 mm, with constrictions between the seeds.

When not in flower, may be confused with *Burkea africana* and *Erythrophleum africanum* at a distance. Close up, the leaflets of *Albizia antunesiana* are opposite while those of the other two species are alternate. It also lacks the brown, velvety, new growth on branch tips which is characteristic of *Burkea africana*.



DISTRIBUTION & ABUNDANCE

Rare to occasional along the Okavango River; one record as an uncommon tree near Katima Mulilo. Earlier herbarium records are far more widespread along the Okavango River and Omuramba Omatako, but this species has definitely been overlooked due to its similarity with other species. It was only when specifically revisiting the localities of the earlier herbarium records that the present records along the Okavango River were noted – sometimes in places that had previously been atlased (HOR2). The record from Katima Mulilo was not substantiated by a specimen, either now or in the past, but is within the range given in other references (Coates Palgrave 2002) for this species.

A single specimen (SWA3/168) from the Omavanda Mountains, just south of the Kunene River (1713AA) was brought in as the Tree Atlas was going to press. This is the first record for the Kaokoveld, and represents a disjunct range extension.

HABITAT

Plains, dunes and floodplains.

GROWTH FORM

A tree in the 3-8-m height class, sometimes 1-3 m and once over 8 m high. According to hebarium records it may be up to 20 m high, and sometimes a shrub.

ANNUAL CYCLE

FLOWERS September and October. FRUIT September, October and May. LEAVES deciduous.

GENERAL

Roots used as a cold remedy.

CONSERVATION CONCERNS

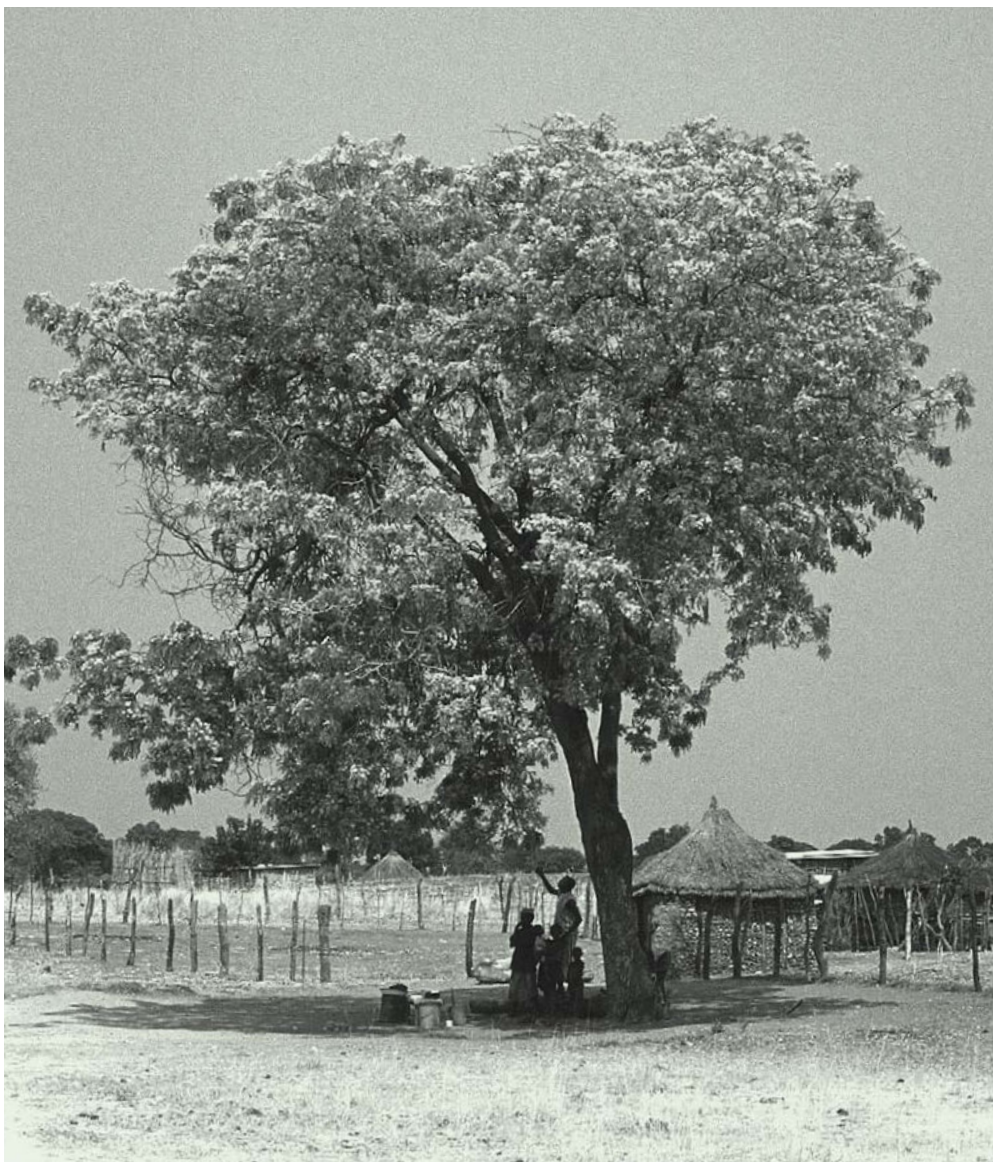
Affected by fire.

Albizia anthelmintica

Continued from page 121:

CONSERVATION CONCERNS

The low numbers of young trees recorded is a concern, as is the number of dead trees in some areas. It is protected by forestry legislation.



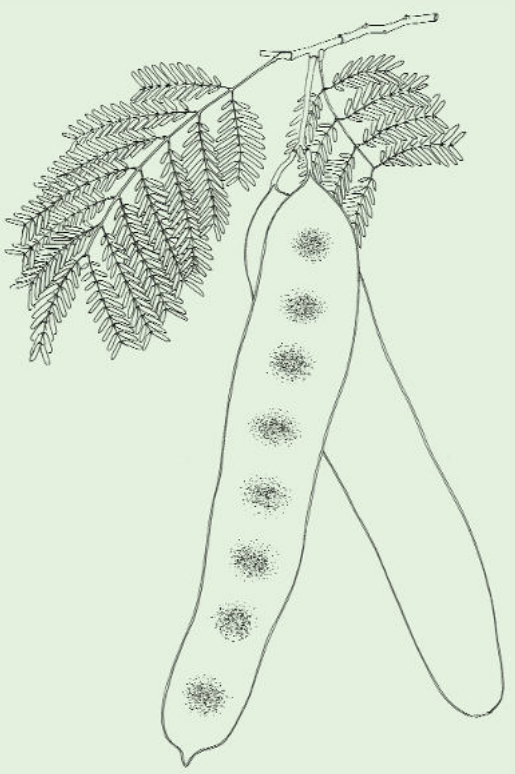
Albizia antunesiana, P. Horn

Albizia brevifolia

Ondongo

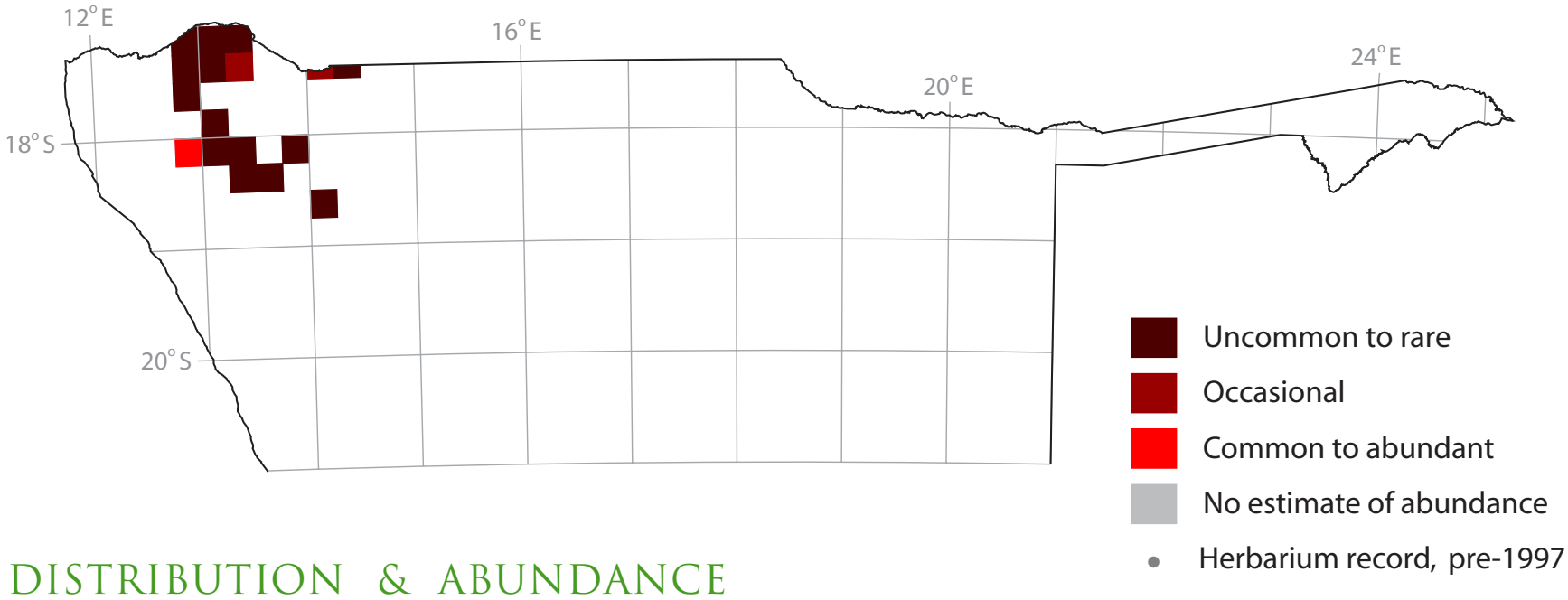
Mountain albizia (E); bergvalsdoring (A); omuryandjima (H); omumbala (O)

[27 records from 17 (2%) squares]



Generally shrub-like, **with a shapeless crown and lax branches**. BARK grey-black, smooth or shallowly fissured; **branchlets often spine-tipped**. LEAVES twice-compound with many small, **narrowly oblong**, blue-green leaflets, sparsely fringed with hairs. FLOWERS **half-spherical heads, stamens long and numerous, petals small**. FRUIT a straw-coloured **to reddish, papery, flattened pod**.

Flowers and pods are conspicuous. The tree has been confused with *Acacia* spp.



DISTRIBUTION & ABUNDANCE

North-western Namibia. Generally uncommon, sometimes locally common, never abundant.

HABITAT

Various habitats, but mostly hill slopes. Always on rocky substrates.

GROWTH FORM

Mostly a multi-stemmed tree 3–8 m high, sometimes over 8 m. Some shrubby forms up to 8 m. No young ones recorded.

ANNUAL CYCLE

Observations were only made in four months. FLOWERS from September to December. FRUIT in most months. LEAVES seemingly present all year from herbarium records, except possibly in July and August for which there are no records.

CONSERVATION CONCERNS

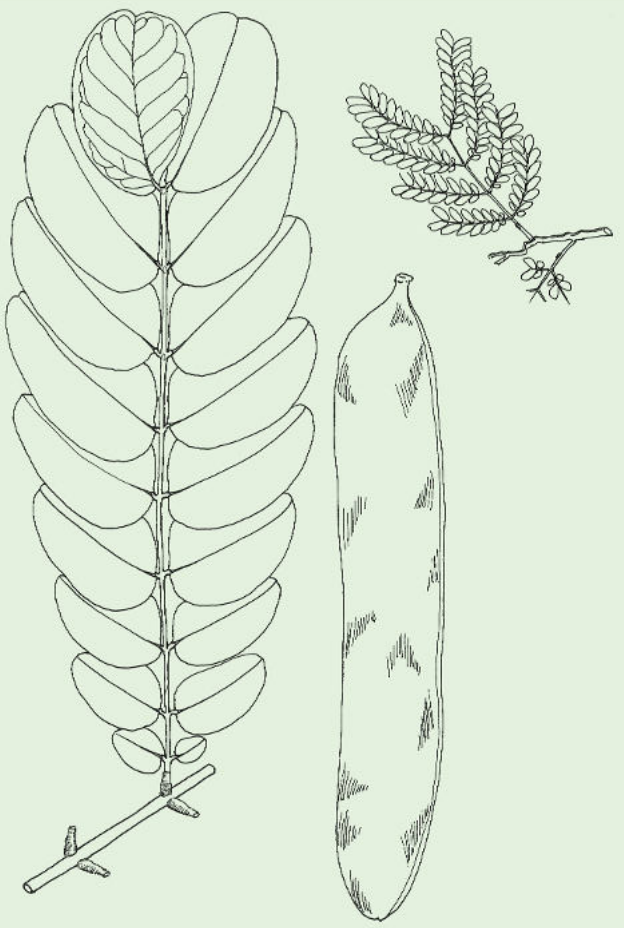
None recorded.

Albizia tanganyicensis

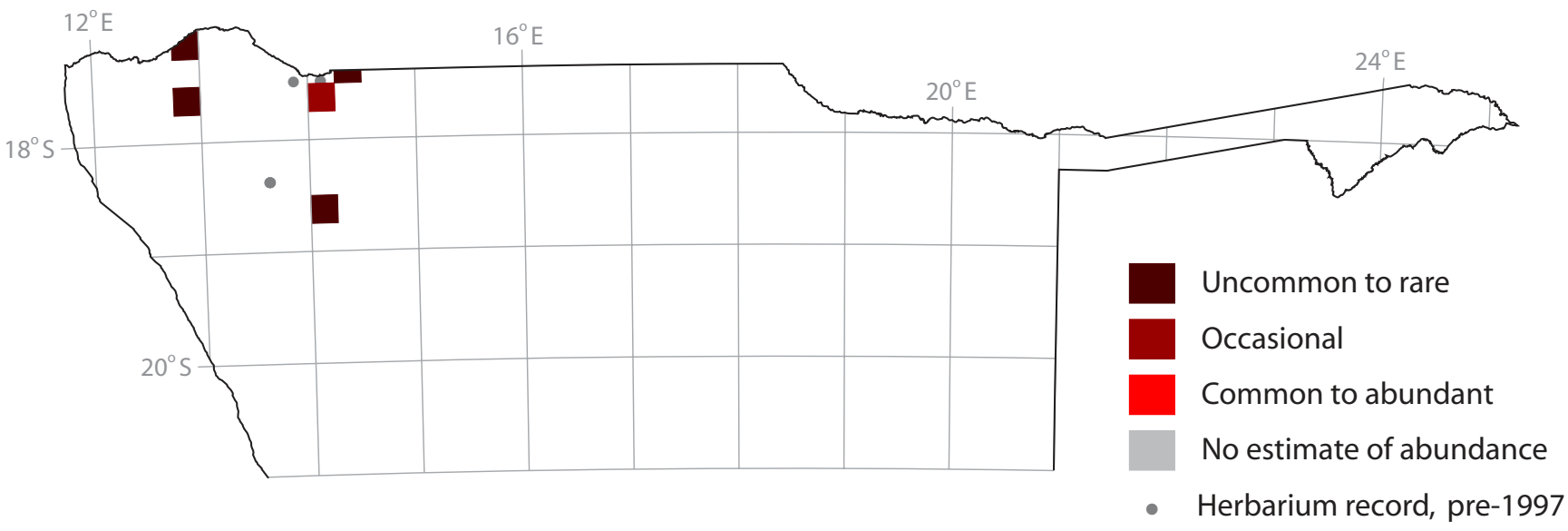
Omupepe

Paper-bark albizia (E)

[5 records from 5 squares]



A tree with a single, slender trunk. BARK **smooth, white to pale brown, flaking off in broad, reddish, papery sheets to expose a white underbark**. LEAVES large with fairly few large leaflets, which vary from red-brown to bright green to dull green; **tapering tip and asymmetric base**. FLOWERS **half-spherical heads, stamens long and numerous**, cream to white, petals small. FRUIT a pale brown and somewhat woody pod.



DISTRIBUTION & ABUNDANCE

Uncommon to rare in scattered localities in north-western Namibia.

HABITAT

Rocky hills and outcrops, usually near the top.

GROWTH FORM

A tree, 3–8 m or over 8 m in height. No young trees recorded.

ANNUAL CYCLE

These trees were only seen in summer, when they had leaves. The only flower records are on herbarium specimens collected in September 1968.

GENERAL

A very beautiful and striking tree, about which very little is known in Namibia. It would be worth investigating its horticultural potential.

CONSERVATION CONCERNS

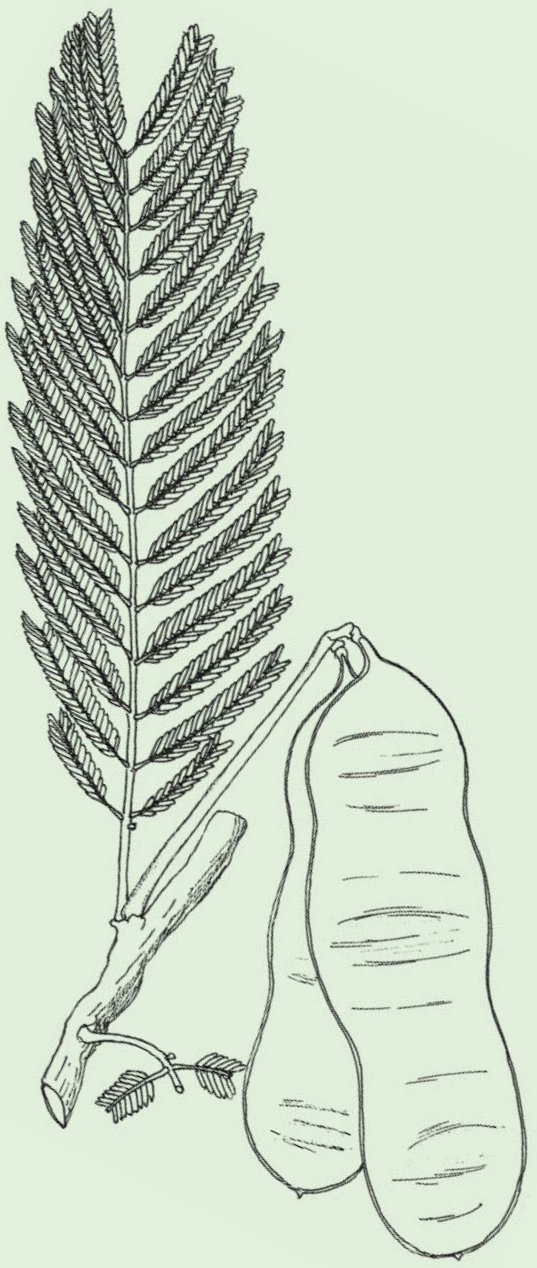
None recorded.

Albizia harveyi

Sickle-leaved Albizia

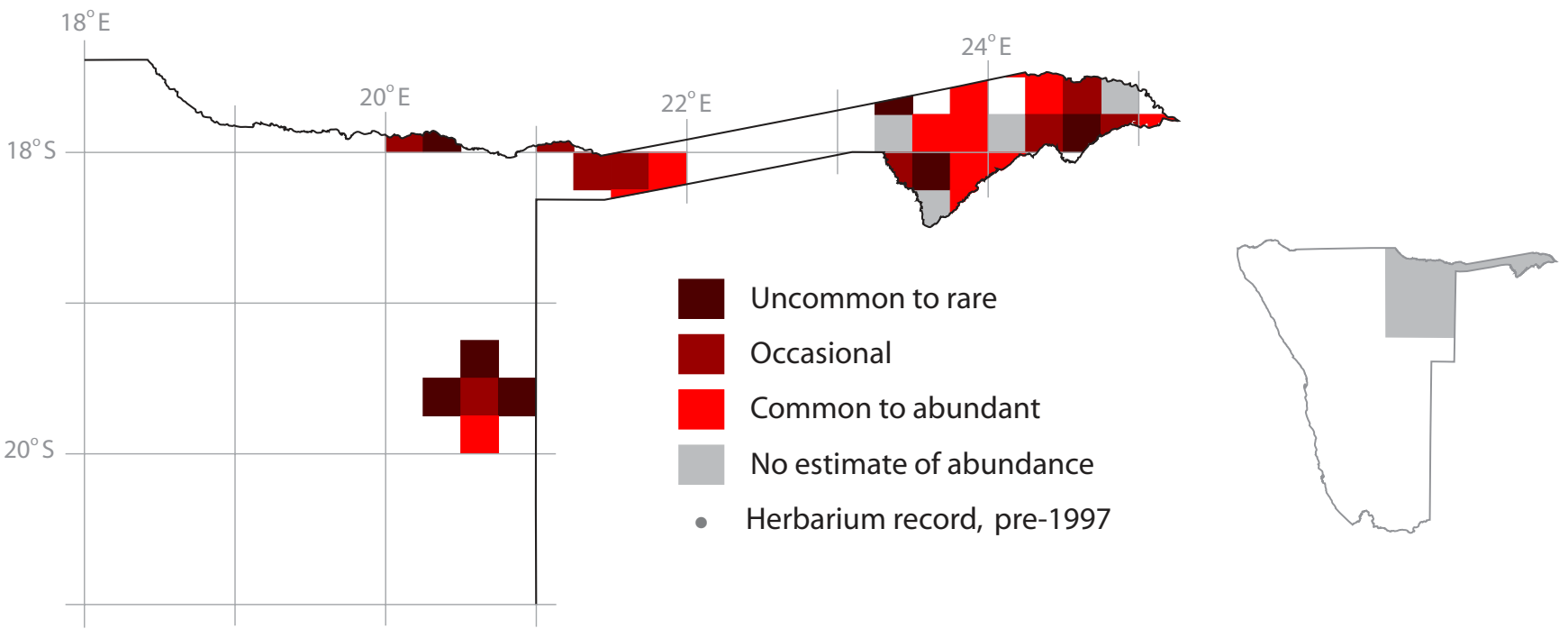
Bleekblaarboom (A); Sichelblattalbizia (G); masapo, sau (J)

[96 records from 33 (3%) squares]



A slender tree, with a rounded crown. BARK dark grey, rough, horizontally fissured. LEAVES with **numerous small, distinctly sickle-shaped leaflets, with a pointed apex**. FLOWERS white, with the smallest clusters of all Namibian *Albizia*. FRUIT a yellow-brown to brown pod, with a rounded apex; **slightly raised over the seeds**.

Flowers and fruit are conspicuous. It may be confused with *A. brevifolia*, but the distribution and habitat differ. May also be confused with various *Acacia* spp. from a distance and without flowers, but from close up it clearly lacks thorns.

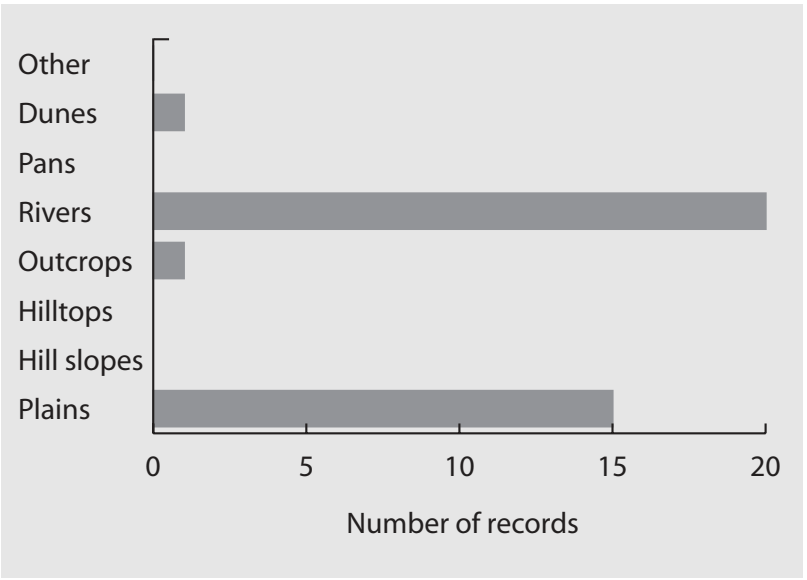


DISTRIBUTION & ABUNDANCE

Common to abundant and widespread in eastern Caprivi; occasional along the Okavango River; uncommon to occasional in the Nyae Nyae area.

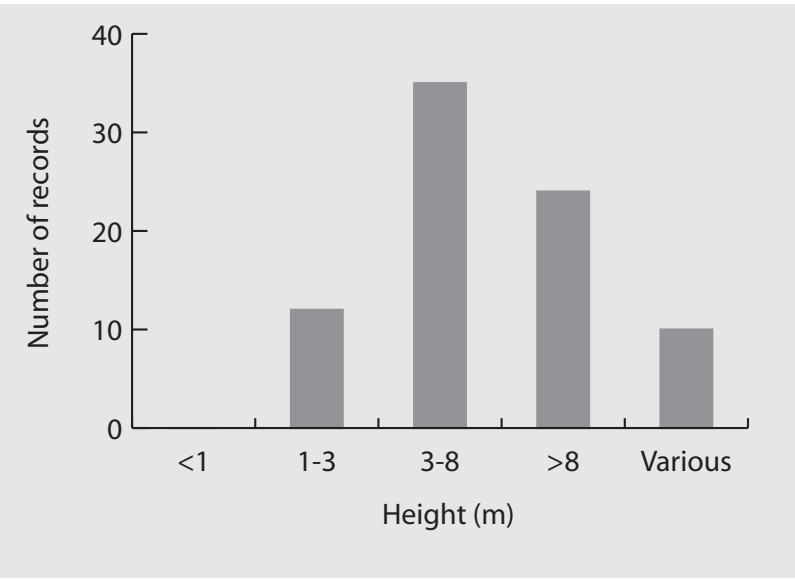
HABITAT

Found on plains, river banks and floodplains; only on plains in the Nyae Nyae area. Always on sand.



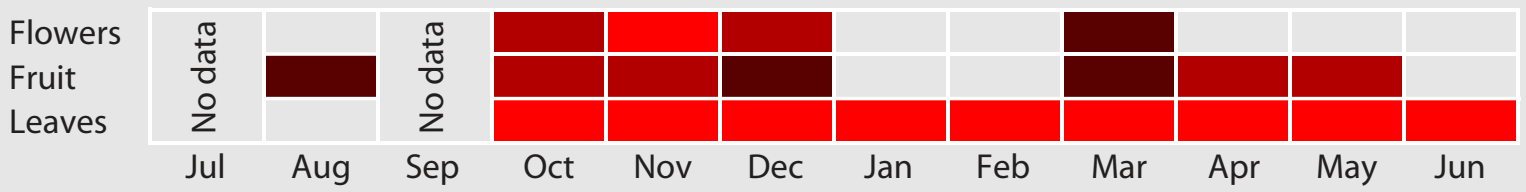
GROWTH FORM

A tree of 3–8 m high, sometimes taller than 8 m, with a few records of younger trees. No trees over 8 m were recorded from the Nyae Nyae area.



ANNUAL CYCLE

No observations in September. FLOWERS from October to December and again in March. FRUIT from October to December and March to May, with single records between May and October. LEAVES present most of the year, with young leaves in October.



CONSERVATION CONCERNS: None recorded.

Albizia harveyi, Katima Mulilo, B. Curtis



Albizia versicolor

Musese

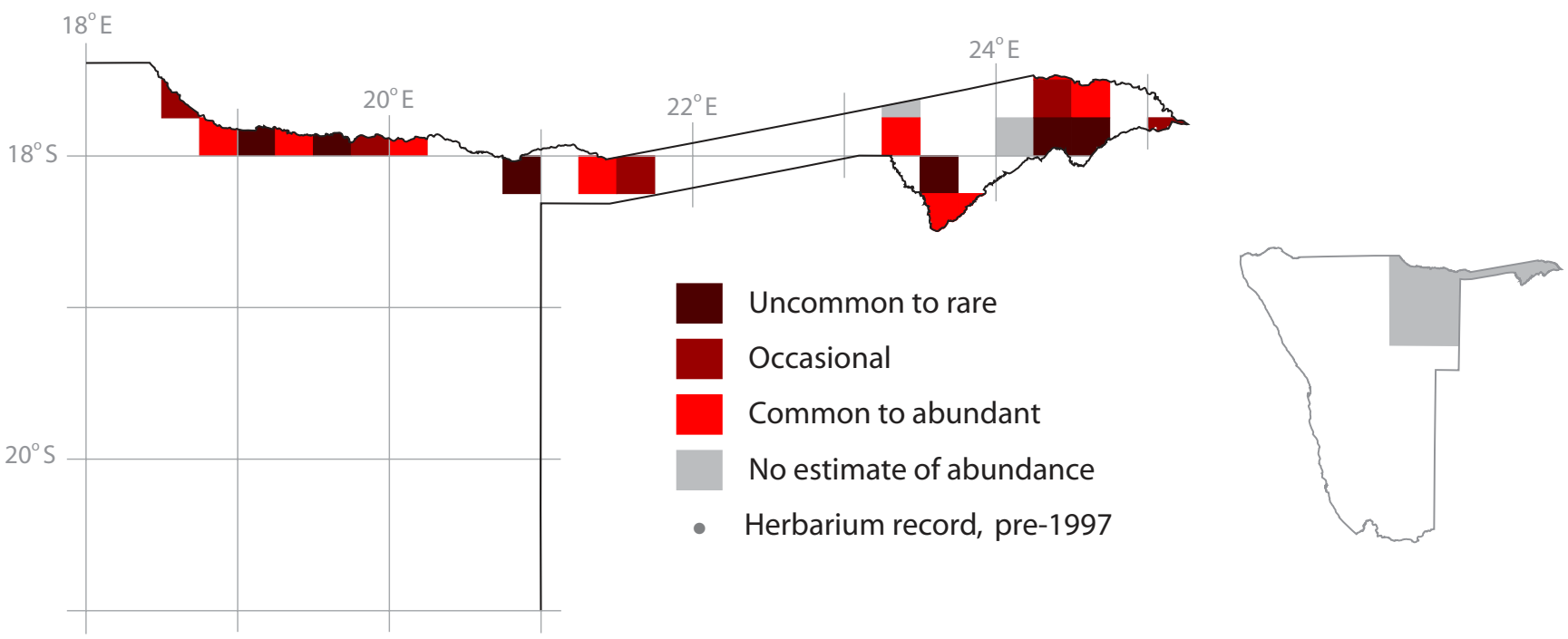
Large-leaved albizia, poison-pod albizia (E); mububa (L)

[55 records from 25 (2%) squares]



A beautiful, spreading tree. BARK rough, grey-brown; **branchlets yellow-brown**, downy. LEAVES the **largest** of all the Namibian *Albizia* spp., up to 300 x 200 mm, with 2–4 pinnae, each of which can be up to 180 mm long; leaflets (2–4 pairs) are alternately arranged, **broadly elliptic to almost square, downy**; undersurface of the **leaflet and the petiole with a rust-red, downy covering**. FLOWERS **half-spherical heads, stamens long and numerous**, cream to white, petals small. FRUIT a large, **reddish brown pod in huge clusters**.

The tree may be confused with *Sclerocarya birrea* from a distance, but the leaves of *S. birrea* have a terminal leaflet and are generally hairless.



DISTRIBUTION & ABUNDANCE

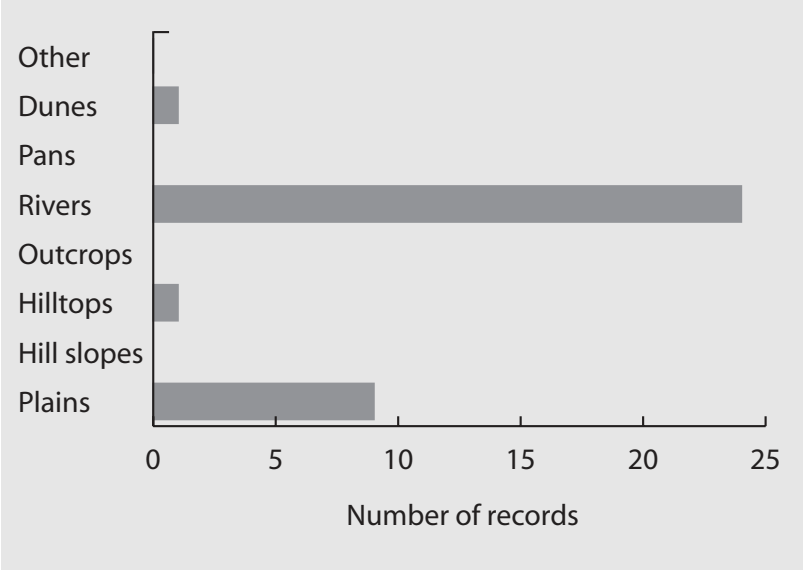
Fairly common in eastern Caprivi and all along the Okavango River. According to Coates Palgrave (2002) it occurs further west, and there was one uncertain TAP record which has not been mapped.

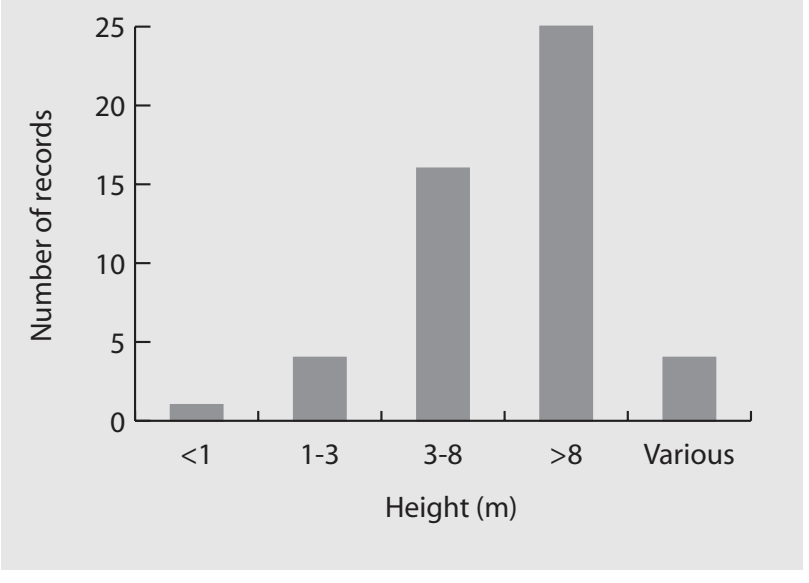
HABITAT

Mostly on river banks, but also floodplains and plains. Grows on sandy substrates.

GROWTH FORM

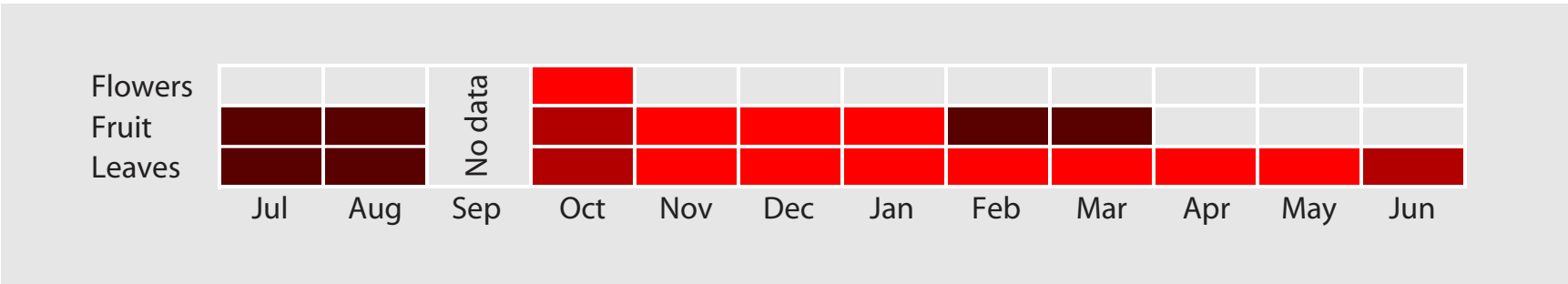
A tree of 8 m or taller; some young growth recorded.





ANNUAL CYCLE

No observations of this species were made in September. FLOWERS October and November. FRUIT July to March. LEAVES most of the year, with new leaves in October and December.



GENERAL

The pods are poisonous to stock; the bark and roots are used medicinally; the wood is used for furniture and implements. It is a beautiful shade tree with horticultural potential for frost-free areas, and has been successfully planted in Tsumkwe and at Ongwediva College. There is a village along the Okavango River named after this tree.

CONSERVATION CONCERNS

None recorded.



Albizia versicolor inflorescence and leaves, B. Curtis

Faidherbia albida

= Acacia albida

Anaboom

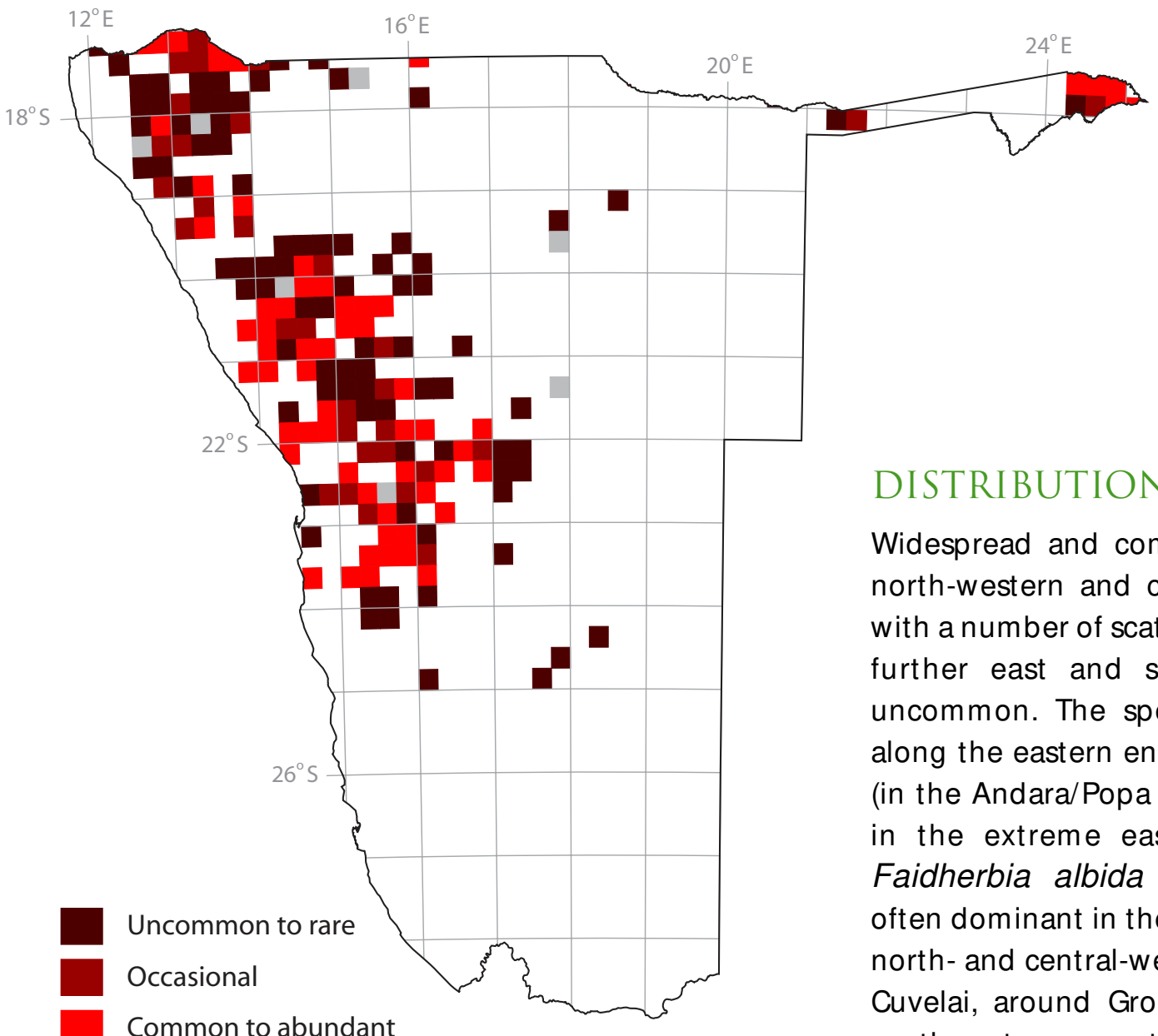
Winter-thorn, ana tree (E); Anabaum (G); omue (H); mbunga (L); anas (K)

[535 records from 190 (18%) squares]



A **tall, riverine** tree often found in **ephemeral rivers**. BARK grey and fissured; younger branches **white and smooth**. THORNS **straight, paired, short, held at a characteristic angle**. LEAVES produced in winter and dropped in the wet season. FLOWERS yellow, in spikes. FRUIT a **broad, woody pod, coiled, orange-red**.

Flowers and fruit are conspicuous. With its white branches, large, orange pods and 'reverse' annual cycle, it cannot be confused with any *Acacia* species.



DISTRIBUTION & ABUNDANCE

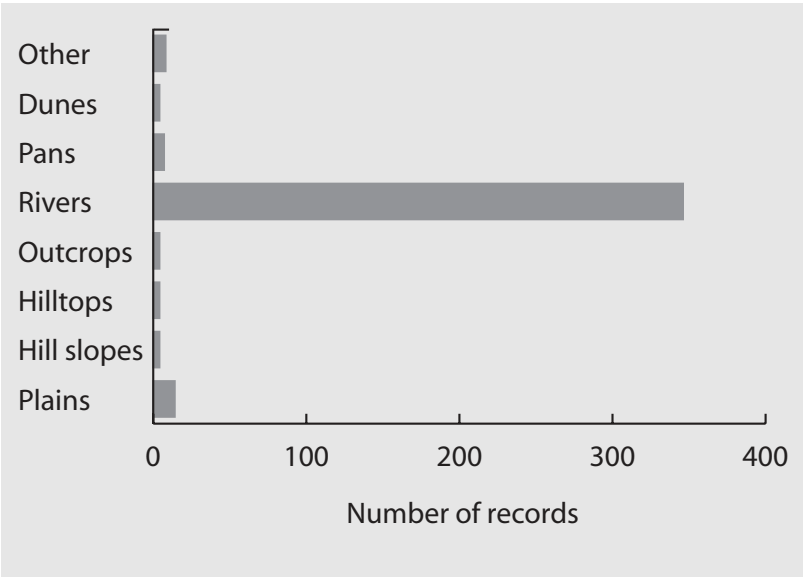
Widespread and common to uncommon in north-western and central-western Namibia, with a number of scattered records somewhat further east and south-east, where it is uncommon. The species is also occasional along the eastern end of the Okavango River (in the Andara/Popa Falls area) and common in the extreme eastern areas of Caprivi. *Faidherbia albida* is most abundant and often dominant in the ephemeral rivers of the north- and central-west. The records from the Cuvelai, around Grootfontein and from the south-east represent range extensions; only one record was, however, confirmed by a specimen (HIL/15 on Farm Hurisib in 1917BD).

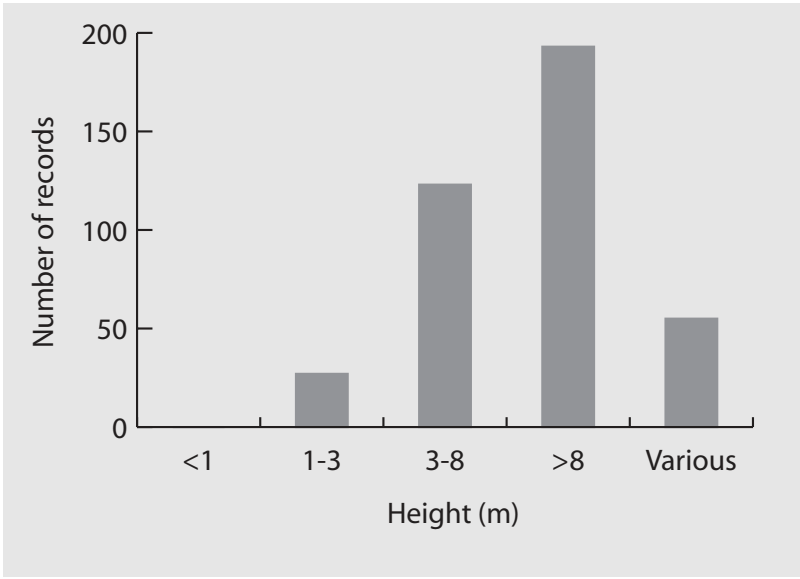
HABITAT

Generally growing in dry rivers and along the banks of perennial rivers, also on floodplains along the Okavango River and in eastern Caprivi. Individual trees are quite often found along road verges where water collects – presumably introduced there by cattle being herded from place to place.

GROWTH FORM

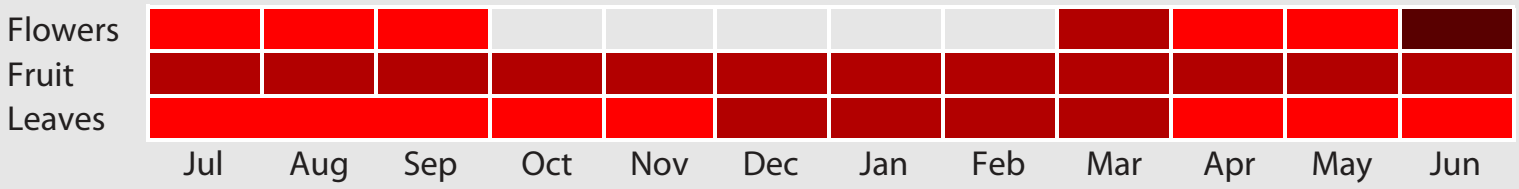
A tree over 8 m high, with a number of individuals 3–8 m high, but relatively few stands with trees of various heights were recorded.





ANNUAL CYCLE

FLOWERS mostly between March and September, with two flowering peaks, but the occasional flower can be found at any time of year. There was a marked flowering peak in April 2000 in the north-west, when this area had good late rains. FRUIT present all year round. LEAVES essentially evergreen, but with a substantial proportion of the leaves on every tree being shed in the summer, from December to March, and new leaves produced from July to September.



GENERAL

Livestock and game eat the leaves and pods. Bark is used medicinally and the seeds can be roasted and used as a coffee substitute. It was introduced into the Caprivi, Kavango and central northern regions as part of an agro-forestry project in the mid-1990s (HOR2). Although it strongly resembles *Acacia* spp. and was formerly a member of that genus, there are a number of taxonomic differences between *Faidherbia* and *Acacia*. The fact that it flowers and produces new leaves in winter is an important ecological difference.

CONSERVATION CONCERNS

The dams on the Swakop River appear to be having an adverse impact on these trees (BET1). Protected by forestry legislation.

Acacia arenaria

Omulyamenye

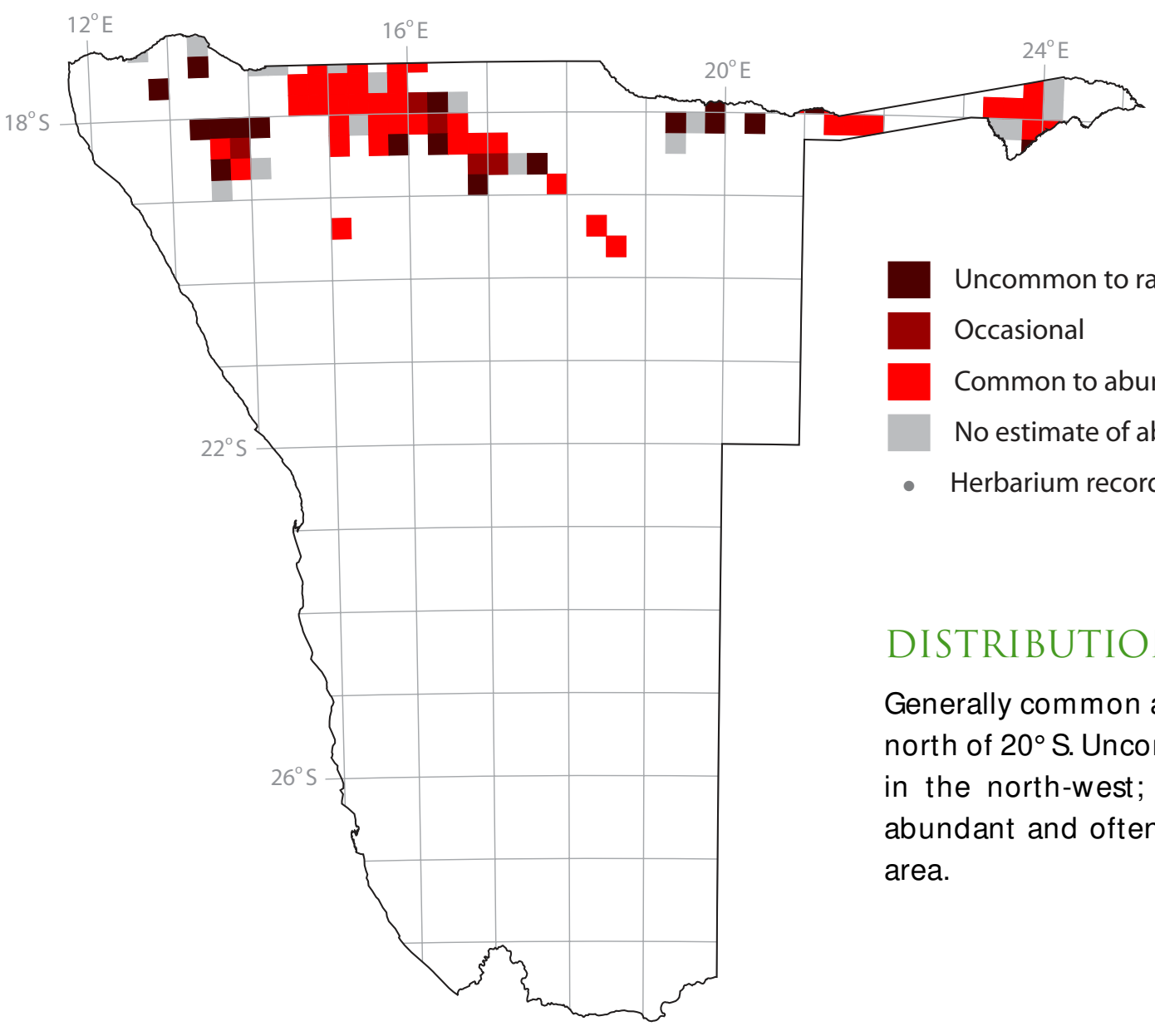
Sand acacia (E); sanddoring (A); muparapara (T)

[142 records from 82 (8%) squares]



A shrub or small, untidy, multi-stemmed tree. THORNS **straight, slender**, often reddish. LEAVES **long, narrow, feathery, tapering, with many small leaflets**. FLOWERS in round heads; white or pale pink. FRUIT **a long, slender, curved pod; pale to deep reddish-brown, thin valved, splitting open when ripe**.

Flowers and fruit are obvious. *Acacia arenaria* appears to have been confused with *A. hereroensis* in the north, where the latter does not occur. Its common and specific names refer to the sandy habitat it prefers.

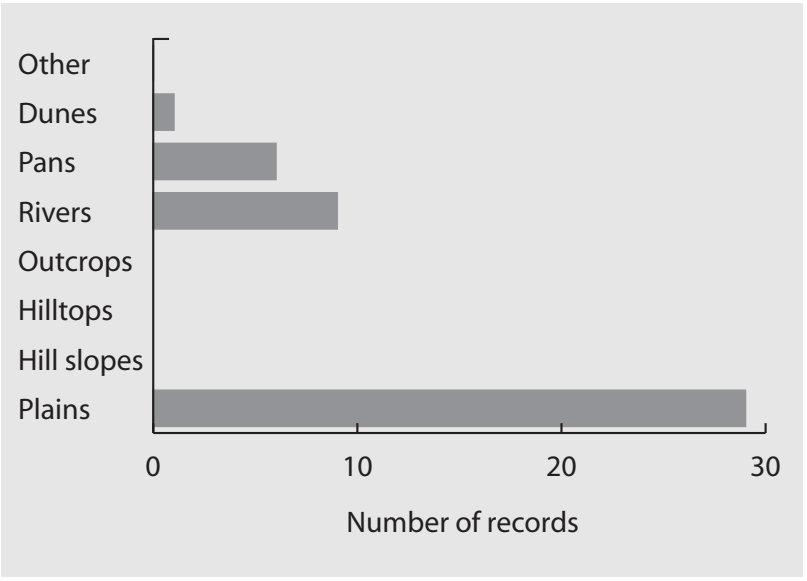


DISTRIBUTION & ABUNDANCE

Generally common across northern Namibia – north of 20° S. Uncommon and often localized in the north-west; widespread, common to abundant and often dominant in the Cuvelai area.

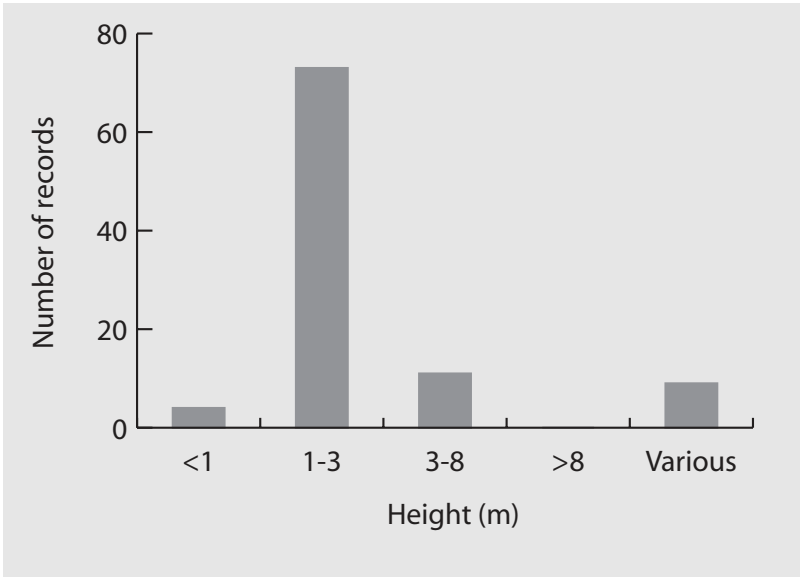
HABITAT

Mainly found on sandy plains, generally in woodland, sometimes within islands of trees on grassland, but also on floodplains and in pans or depressions, especially in the Cuvelai area. Found on rocky substrates, especially limestone, in the north-west and where it occurs south of 19° S.



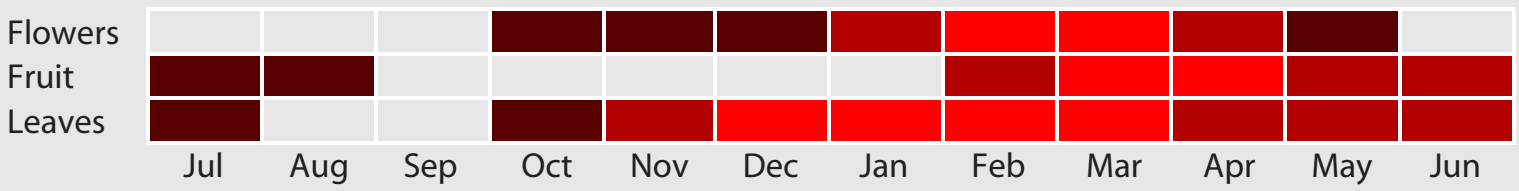
GROWTH FORM

Mainly a shrub in the 1–3-m height class; occasionally a shrub or tree in the 3–8-m height class, but never over 8 m. Generally gregarious; thicket-forming in places.



ANNUAL CYCLE

FLOWERS mainly January to April, with the highest peak in March. FRUIT peaks in March and April, but also found in February, May and June and isolated records between July and January. LEAVES almost year-round with young leaves in October and old leaves in July; the data are too few to get an accurate picture of how many plants have leaves in winter.



GENERAL

Used for construction. The roots are used medicinally and the bark fibres for other traditional purposes. Browsed by stock. This shrub is often found in disturbed areas, especially along road verges where water collects in the rainy season.

CONSERVATION CONCERNS

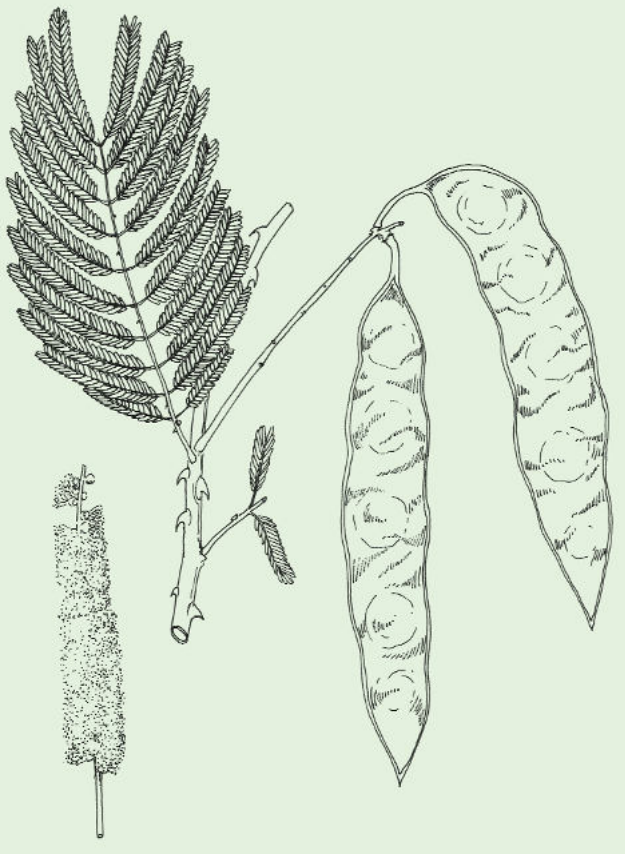
None recorded.

Acacia ataxacantha

Flame-thorn

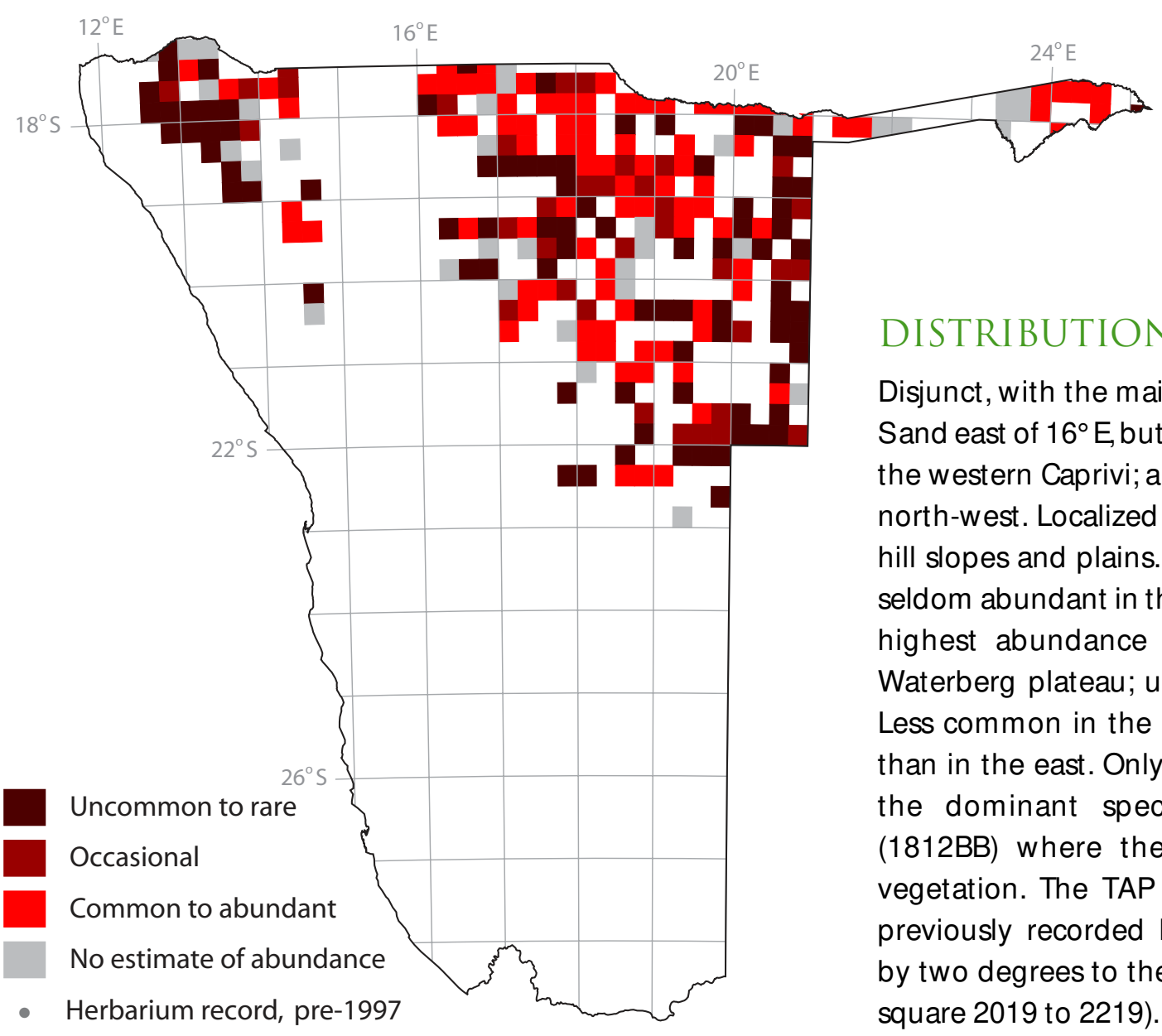
Rankroos, vlamdoring (A); Rosendornakazie (G); oruweyo (H); mukoro (Rk, Rum, T)

[482 records from 253 (24%) squares]



Scrambling shrub. THORNS large, hooked, **rose-like**; scattered irregularly along branches. LEAVES large, with **stalked, petiolar gland** and hooks on the rachis. FLOWERS in spikes towards tips of branches; cream. FRUIT a flat, **deep red to purplish-brown** pod, with pointed tips; brittle, dehiscent.

Flowers and pods conspicuous. In the extreme eastern Caprivi, this species may be confused with *Acacia schweinfurthii*.

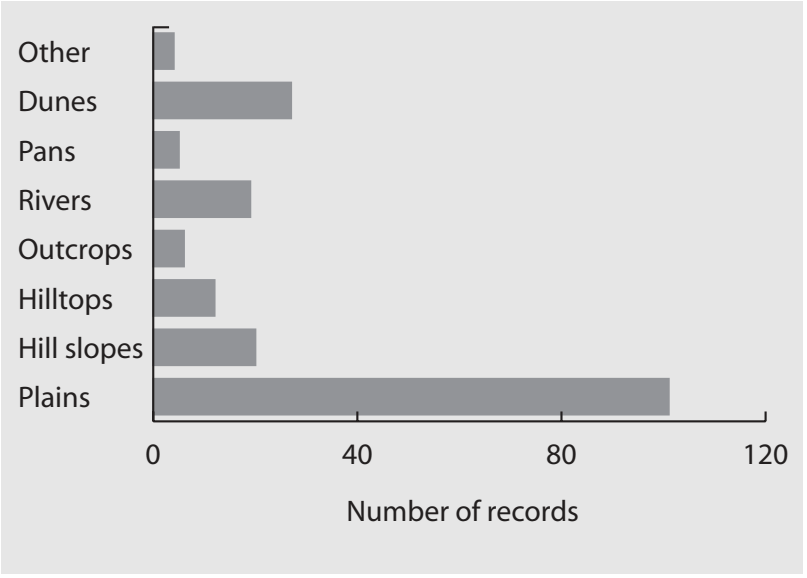


DISTRIBUTION & ABUNDANCE

Disjunct, with the main population north of 23° S and east of 16° E, but not recorded throughout the western Caprivi; a second population in the north-west. Localized in some areas, mainly on hill slopes and plains. Common to uncommon, seldom abundant in the eastern population; the highest abundance was recorded from the Waterberg plateau; uncommon in the Caprivi. Less common in the north-west and Karstveld than in the east. Only once recorded as one of the dominant species: in the north-west (1812BB) where there is very little woody vegetation. The TAP has extended the range previously recorded by herbarium specimens by two degrees to the south-east (from degree square 2019 to 2219).

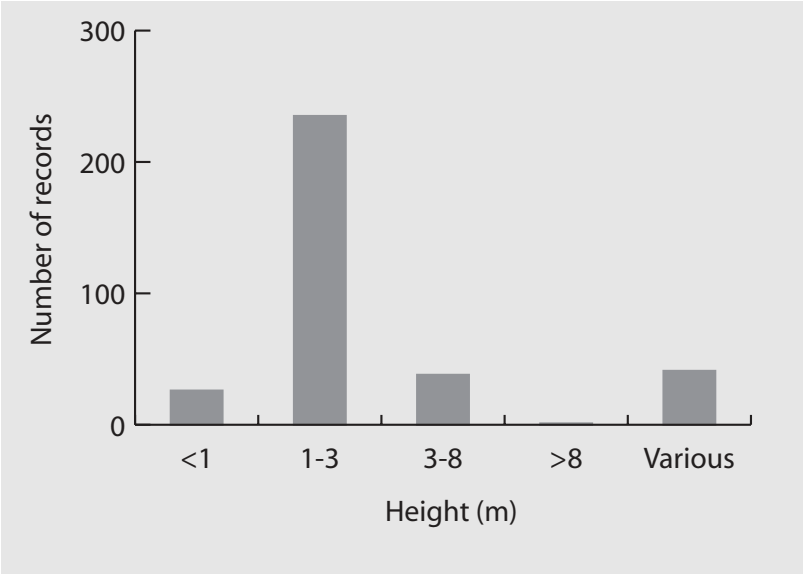
HABITAT

Various, but mostly on sandy plains in woodland; sometimes on gravel. In the north-west, it occurred predominantly on hill slopes and riverbanks, sometimes on rocky outcrops; in the north-east, on dunes and along river banks, as well as on plains.



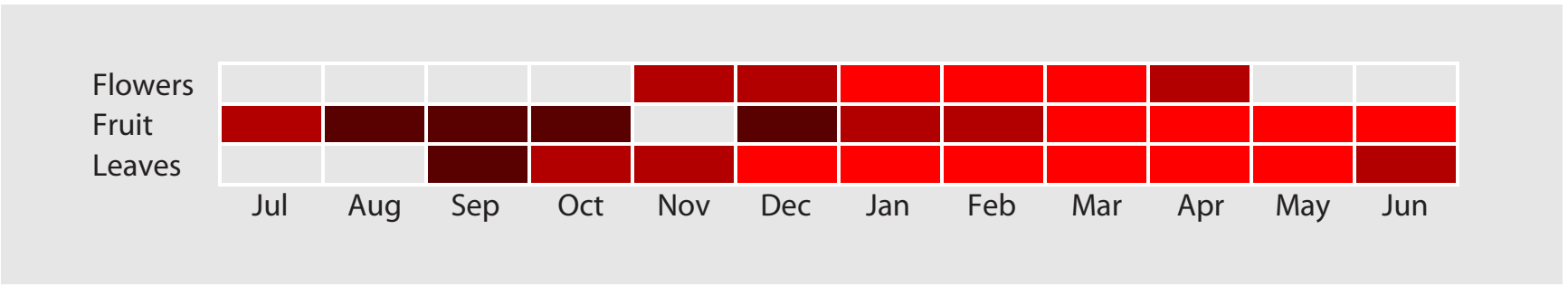
GROWTH FORM

Mostly a shrub up to 3 m high – seldom higher (10% of records) – sometimes climbing into or over other plants. Often forming dense thickets.



ANNUAL CYCLE

FLOWERS November to April, with the main peak in February; flowering only started in April in some years. FRUIT starting in December, but mostly March to June; old fruit present till October. LEAVES mainly December to May, with most trees bare in winter; new leaves in September and October, sometimes late November or December if rains were late.



GENERAL

Occasionally browsed. Roots used medicinally; otherwise traditionally used, for example, bows, arrows, spears. Resin is edible. 'Butterflies love it.' *Acacia ataxacantha* has horticultural potential as a hedge or barrier species. Also known as 'oroo' in Otjiherero (PIE1, 2017BB).

CONSERVATION CONCERNS

None recorded.



Acacia ataxacantha, B. Curtis

Acacia erioloba

= Acacia giraffae

Camel-thorn

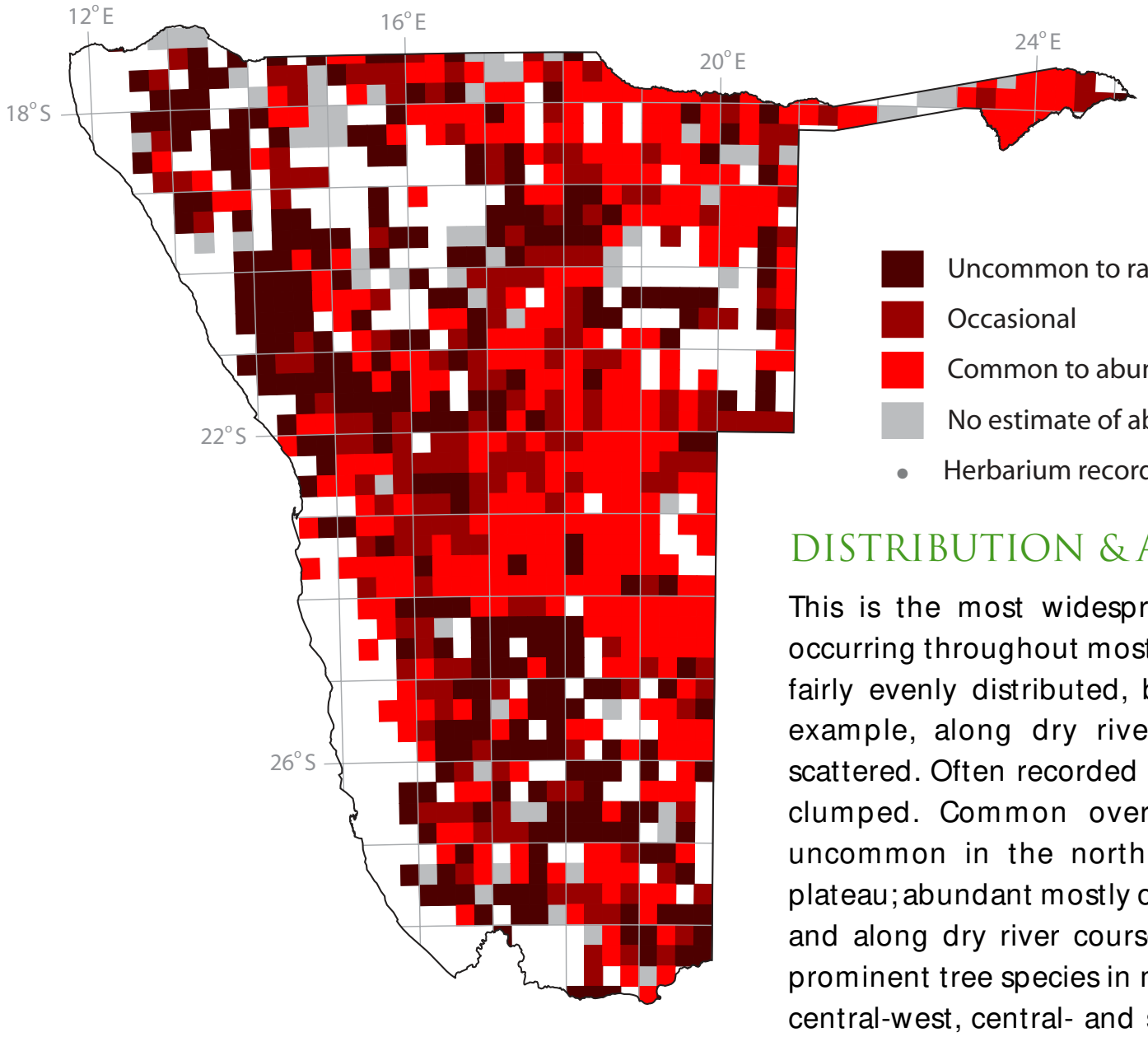
Kameeldoring (A); Kameldornbaum (G); omumbonde (H); ||ganab (K); muhoto (L); omuthiya (Od); omuonde (Ok); muntu (Rum)

[3,362 records from 889 (83%) squares]



A tree with a distinctive appearance when old; canopy spreading, sometimes in sections. TRUNK **gnarled and often misshapen**. BARK **dark grey and fissured**; young branchlets red-brown and **zig-zag**. THORNS paired, straight, white, sometimes **inflated at the base**. LEAVES with 2–5 pinna pairs and 8–15 leaflet pairs per pinna. FLOWERS **golden-yellow balls**. FRUIT a **woody, grey, velvety pod; often shaped like a human ear**.

Flowers and pods are conspicuous. Unmistakable as an adult, but may be confused with other straight-thorned *Acacia* species when young.



DISTRIBUTION & ABUNDANCE

This is the most widespread species in Namibia, occurring throughout most of the country. Generally fairly evenly distributed, but often localised – for example, along dry river courses – sometimes scattered. Often recorded as single trees, less often clumped. Common over most of the country; uncommon in the north-west and south-central plateau; abundant mostly on dunes in the south-east and along dry river courses. It is one of the most prominent tree species in many areas, especially the central-west, central- and south-east and along the Omuramba Omatako

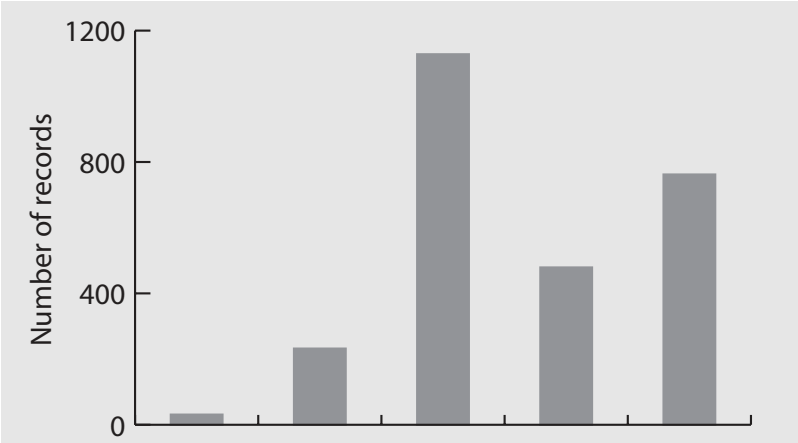
HABITAT

Occurs in a wide range of vegetation types, including woodland, riverine forest, thornbush and woodland savanna, shrubland, wooded and shrubby grassland and island thickets on termitaria. Found in almost all habitats, but most often on plains, along dry river courses, on sand hummocks and dunes; in the Cuvelai it is most abundant around pans; often on hill slopes in the central highlands. Mostly grows on sand, but also on clay, gravel and stony or rocky ground, including calcrete, granite koppies, sandstone, dolomite, quartzite and mica schist.



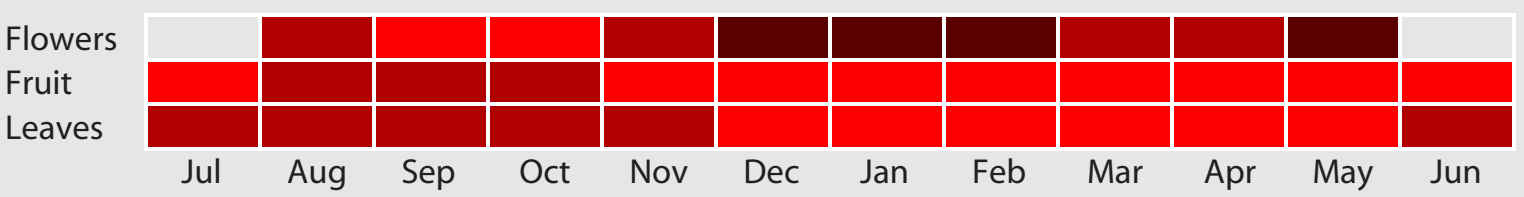
GROWTH FORM

Mainly trees (88% of records) which are 3–8 m high, but often over 8 m, especially along riverbeds and on floodplains. On rocky outcrops, *A. erioloba* grows mainly as shrubs of 1–3 m high. In the central and southern regions, often growing as stands of plants not exceeding 3 m in height; low thickets reported in 2018CD. Mixed stands of young, shrubby forms and taller trees ranging in height of up to 8 m or more were recorded in many areas, especially in the eastern half of the country where the species is most abundant. However, recruitment in general does not appear to be very good, judging by the low number of young plants in relation to mature ones.



ANNUAL CYCLE

FLOWERS August until May, with the main peak in September and a second, smaller peak in March/April; in some years the second peak was as early as January. There is a great deal of variability from year to year and area to area – see box below. FRUIT present all year; peaks in January, fewest in September/October; young fruit mostly October to December, ripe fruit January to July. There was great variability in the number of pods from month to month and area to area. LEAVES throughout the year, with slight drop in winter, especially August when there are many bare trees; new leaves appear from August to October.



GENERAL

Acacia erioloba has many uses. The wood is used for firewood, building material, fence poles, making implements; the seeds are used as a 'coffee bean'; various parts of the tree are used medicinally; and the tree provides generous shade. Birds recorded nesting in the tree include the Sociable Weaver, White-

browed Sparrow-weaver, Red-billed Buffalo-weaver, Tawny Eagle, various owls and others; the holes in the trunk and cavities under the bark are used by a wide range of small animals, including birds; fruit bats and monitor lizards have been recorded sheltering in these trees in Ongwediva. Both wild and domestic animals browse the leaves, flowers, young shoots and pods, which are highly nutritious. Pods are collected by farmers for fodder and as ingredients for licks. In some areas, the trees have been damaged by elephant or giraffe.

Although not regarded as an invasive species, *Acacia erioloba* was recorded encroaching along the road in 1918DA, and forming thickets in 2018CD. This species seems to be susceptible to parasites such as *Tapinanthus* and *Plicosepalus*. Along the Nossob, Olifants and Auob rivers it is being outcompeted by *Prosopis*. Large numbers of dead or dying trees were recorded, mainly from the central areas, which could be a result of drought.

There are various places in Namibia named after this tree in different languages, e.g. Omusati Region.

CONSERVATION CONCERNS

Although widespread and common, this species is very slow growing and does not regenerate rapidly. Often many young seedlings are found after good rains, such as in Sossusvlei (2415CB) in May 1998, but many of these seedlings do not survive long. Of concern is the number of pods that are collected and removed by people for their livestock in some areas, reducing the seeds available for germination and the replacement of lost individuals. Recruitment seems to be rather poor overall. *Acacia erioloba* is much sought after for firewood and is subject to over-exploitation. In places, such as the Camel-thorn Forest south of Rehoboth, it is being seriously threatened as a result of this. The camel-thorn is protected by forestry legislation.

Flowering patterns

There were some interesting regional flowering patterns of *Acacia erioloba*. Although flowering started in August throughout the country, it was most prolific in the north-east and around Grootfontein. In every region, flowering peaked in September/October. There were scattered records of flowering from February to May throughout the country, but the second peak was most noticeable in March/April in the south as well as the central- and north-west. The central Namib had a very broad flowering period. Although the data are too few to draw any firm conclusions – especially for the Cuvelai area, and the north- and south-west – it seems that flowering starts earliest in areas with the highest rainfall and highest spring temperatures, and continues later in the year in areas with a rainfall peak in March (see Mendelsohn *et al*. 2002, page 88).

Flowering period was recorded across the country as about nine months. However, the flowering period of individual trees was much shorter, generally only one or two months. On farms Gomnab (2318CB) and Natalia (2118CA), where five-years data were collected, *A. erioloba* had a short, fixed flowering period, from August to October, but always in September on both farms. On farm Quinta (2219AD), flowering also always occurred in September for three years. In Windhoek (2217CA), *A. erioloba* flowered mostly in September and October. Far longer flowering periods were recorded in the area of Rössing Mine than on most farms.

On other farms, flowering varied every year. The variablity in flowering was illustrated in October 1998 when flowering was over in most parts of the country, but only starting in squares 2115 and 2116. Response to rain was observed in degree square 2415 in May 1998 when flowers were noted on some trees after a shower on 26 March.

This second flowering seems to be unique to the drier parts of Namibia, as it does not occur in Zimbabwe (Timberlake *et al*. 1999) and does not appear to occur in South Africa (Smit 1999). It would be interesting to study the phenology of this plant further.

Acacia erioloba x *A. haematoxylon*

[12 records from 11 (1%) squares]

This is a hybrid between *Acacia erioloba* and *A. haematoxylon*, which looks more like the latter, but is not quite as grey and generally has broader pods. Since it can be confused with *A. haematoxylon*, it has probably been overlooked and is therefore under-recorded and has not been mapped.

It is common to uncommon in scattered localities in the south-east and southern Kalahari, with two records in the southern parts of the central highlands. It always grows in dunes, mostly as a tree of 1–8 m high.





Acacia erioloba x haematoxylon. Above: pod, C. Mannheimer. Below: tree, C. Mannheimer. Right: pods, B. Curtis

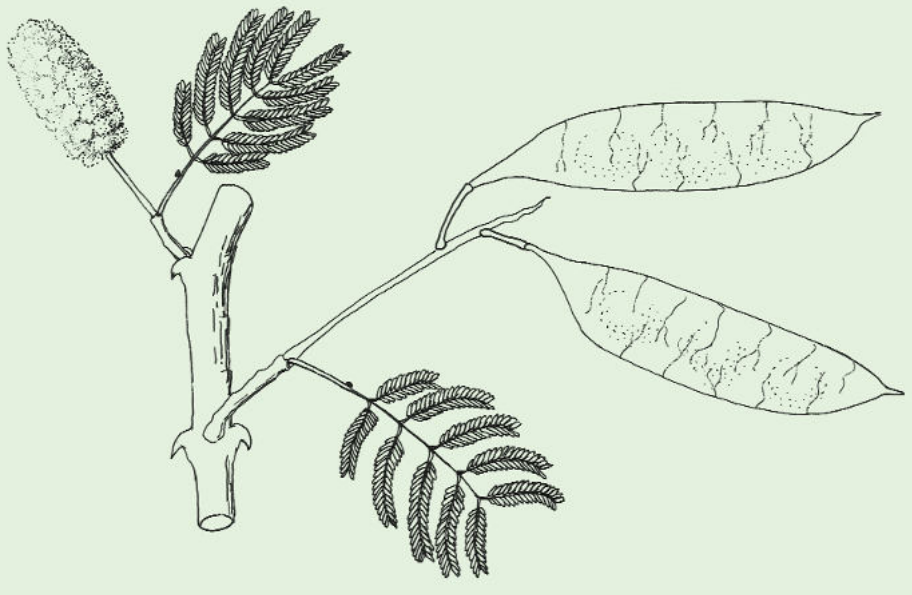


Acacia erubescens

Yellow-bark Acacia

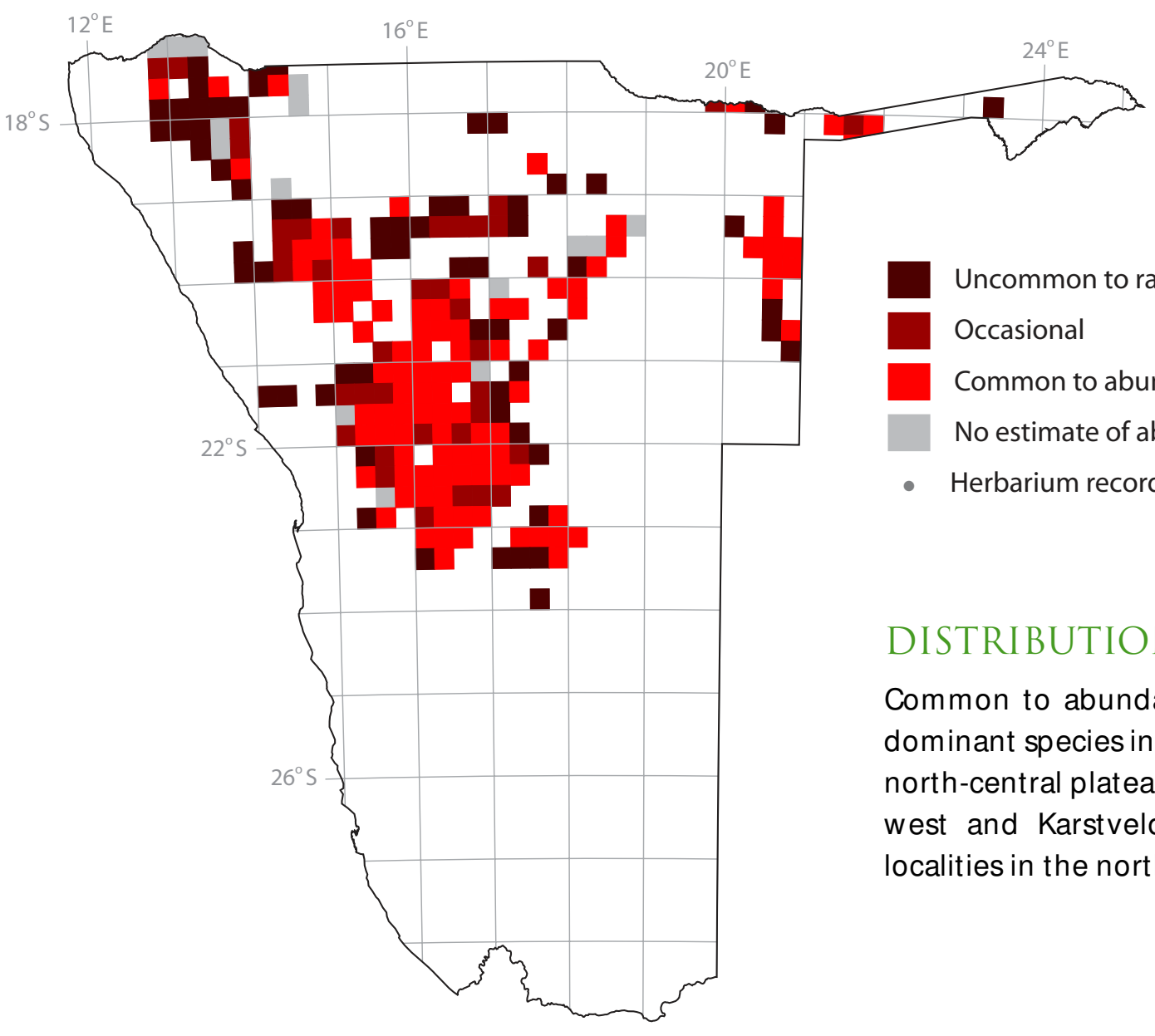
Withaak (A); Birkenrindenakazie (G); omungongomwi (H); dûs (K); murengambo (T)

[650 records from 221 (21%) squares]



A multi-stemmed tree or shrub. BARK **yellowish, papery, peeling**. THORNS hooked, **dark-tipped**. LEAVES **about as wide as long; leaflets widely spaced**, giving the tree an open, airy appearance; **long petioles with a columnar gland**. FLOWERS in **spikes**; creamy-white, **sometimes pink**. FRUIT a flat, leathery pod pointed at the tip.

Both flowers and pods are conspicuous. At a distance this species can be confused with *A. senegal*, or with *A. fleckii*.

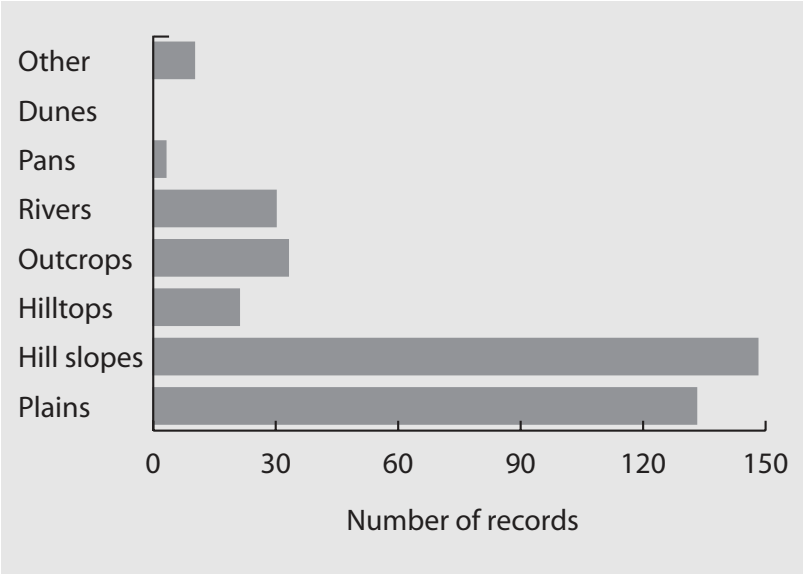


DISTRIBUTION & ABUNDANCE

Common to abundant and often one of the dominant species in the central highlands and north-central plateau; occasional in the north-west and Karstveld; common in scattered localities in the north-east.

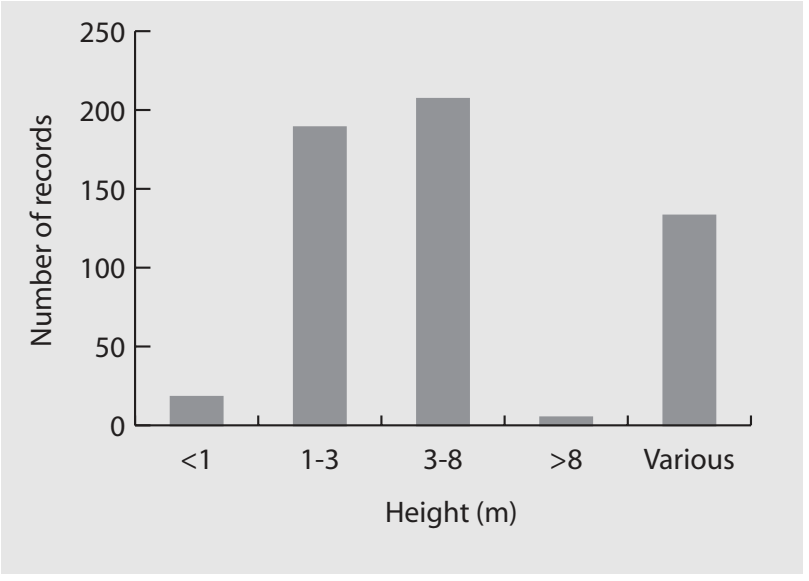
HABITAT

Various, but predominantly hill slopes and plains. Generally on rocky substrates including granite, mica schist, sometimes calcrete; seldom on sand.



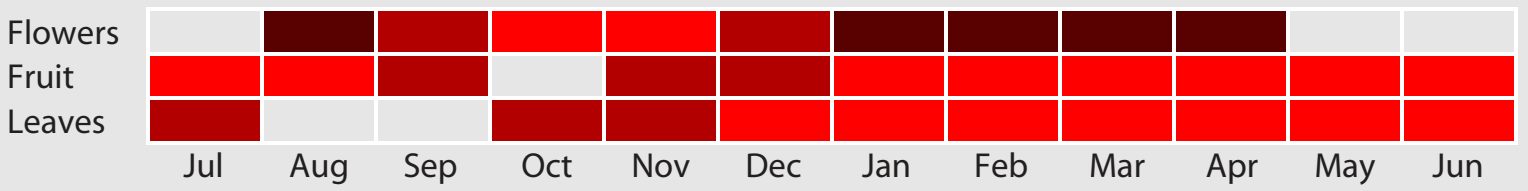
GROWTH FORM

A shrub up to 3 m high or a tree up to 8 m, seldom over 8 m; stands often ranging in height. Thicket-forming in places, for example, in square 2116DD.



ANNUAL CYCLE

FLOWERS start in August and peak in October/November. However, flowering was observed in February/March in 1998 in various places, and April in 2000 in the west. A number of atlassers recorded exceptional flowering in early 1998. FRUIT mostly January to April; young fruit from December to March, ripe fruit in July. LEAVES present from December until June or July, with most trees bare in winter; new leaves produced in October and November.



GENERAL

Acacia erubescens provides good firewood; in addition, the branches are used for making huts and kraal fences and the bark is used to make string. The gum is edible and very sweet. Bees are attracted to the flowers, and the honey reported to be good; moths also visit the flowers. This species is browsed by giraffe, kudu and elephant; Black Rhino were reported to browse the leaves in 2017AD (Waterberg).

This is an aggressive species and can proliferate to the detriment of other species; its encroachment is particularly bad in 2016AD. It is often parasitised by *Tapinanthus* spp. and sometimes defoliated by caterpillars; many plants have been killed by a fungal infection in 2016DD.
It is also known as Soetgom in some areas (PLE1, 1914DD).

CONSERVATION CONCERNS

None recorded.

Acacia fleckii

Sand-veld Acacia

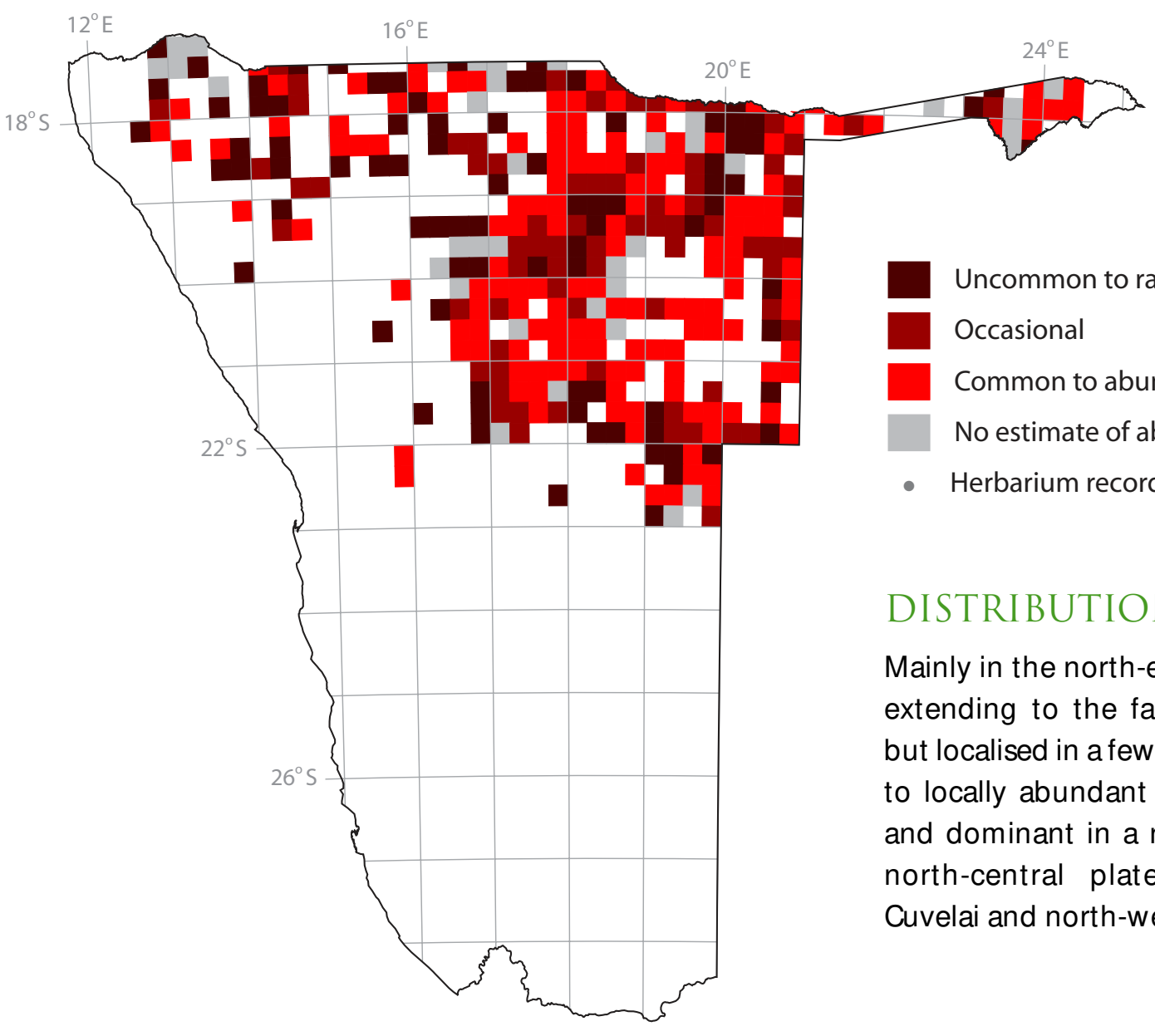
Bladdoring; geelhaak (A); Sandveldakazie (G); omutaurambuku (H); |ha (K); mungamba (Rk)

[1,009 records from 359 (34%) squares]



Usually a multi-stemmed tree or shrub. BARK **rough, peeling in yellowish or greyish papery layers**. THORNS hooked, **dark**, broad-based **with base extending down the stem**. LEAVES **longer than broad**, with extremely **small, closely-packed leaflets**; sometimes with **tiny hooks on the underside of the rachis; petiole less than 13 mm long**, with a **flattish, concave, oval gland**. FLOWERS in spikes, creamy-white. FRUIT a flattened and papery pod.

Flowers and pods are conspicuous. May be confused with *A. erubescens* or *A. senegal*.

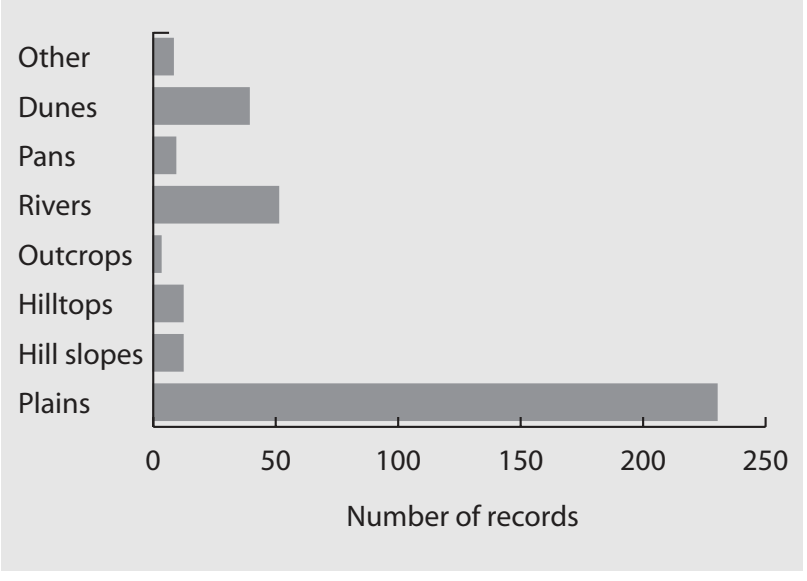


DISTRIBUTION & ABUNDANCE

Mainly in the north-eastern quarter of Namibia, extending to the far north-west. Widespread, but localised in a few places. Generally common to locally abundant in places; most abundant and dominant in a number of squares on the north-central plateau; uncommon in the Cuvelai and north-west.

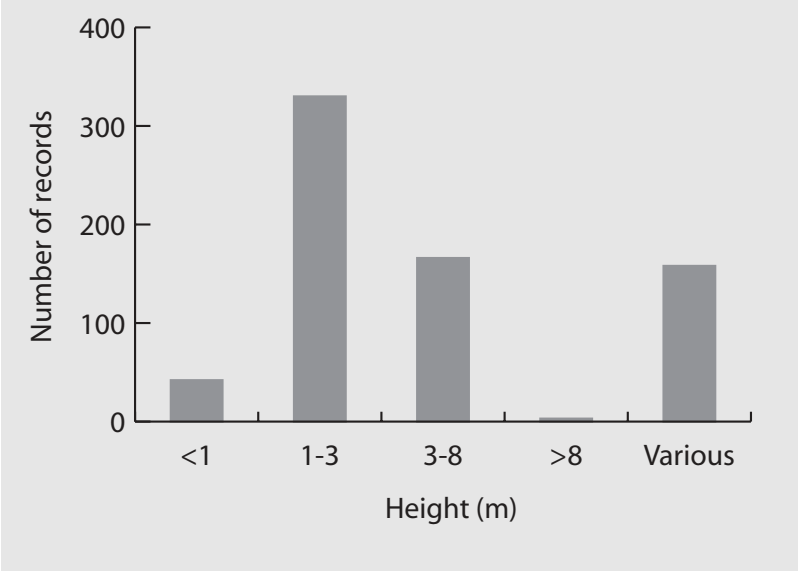
HABITAT

Mainly on plains; a few records in other habitats, such as dry rivers in the north-west, and on dunes and along river banks in the north-east. Predominantly found on sandy soils, sometimes on clay, seldom on calcrete.



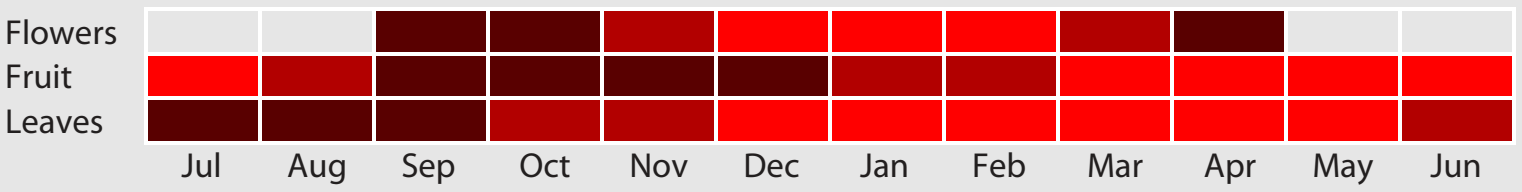
GROWTH FORM

Mostly a shrub up to 3 m high; sometimes a tree of up to 8 m. Only five records of trees over 8 m, generally on river banks; one tree in the Kaokoveld was over 10 m, with a single trunk. Stands ranging in height were recorded in many areas. Thicket-forming in some areas.



ANNUAL CYCLE

FLOWERS mostly November to May, peaking in January. In January/February 1998 flowering was good in degree-square 1916, but only a few seeds set, possibly due to the heat. FRUIT present all year, but mostly March to July; ripe fruit in April. LEAVES deciduous, with a few records of leaves all year round, but trees mostly bare in winter; young leaves from September to December, with most trees having leaves from January to June.



GENERAL

Browsed by elephant, rhino, various antelope, giraffe and goats. The roots are used medicinally (chest problems, coughing); traditionally, also used for producing cords and gates; wood harvested for charcoal production. The honey was reported as being good (HOB1), but Mr Geardes of Farm Kalidona (2118AC) says 'the gum is better' (CUR1).

Can be an aggressive encroacher and farmers eradicate it manually or chemically in some areas. Spreading due to overgrazing reported in 2118DD. Dead trees reported from 1917BD and 2017AA. Not a very frost-hardy species.

CONSERVATION CONCERNS

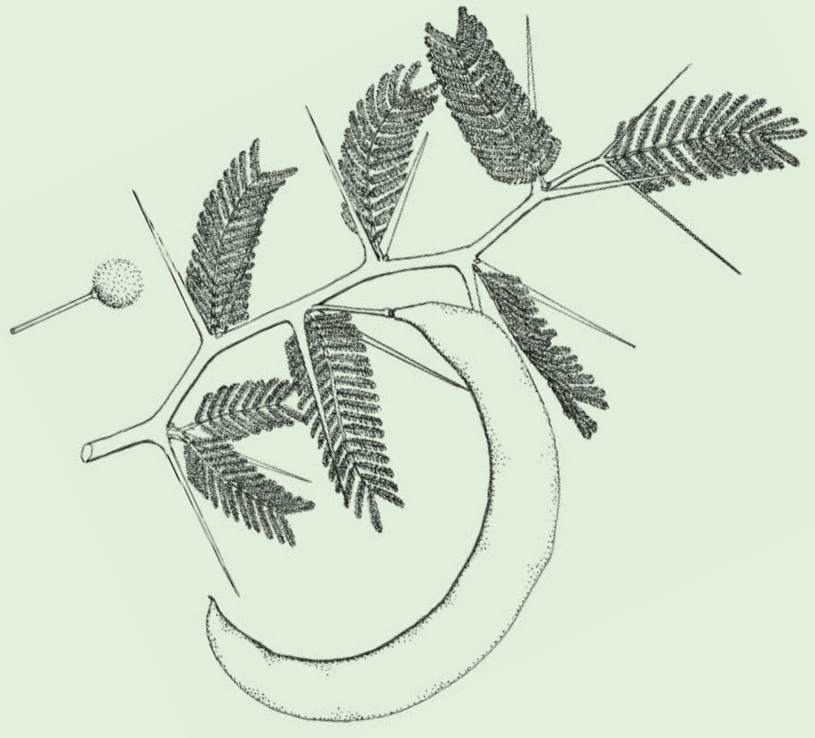
None recorded.

Acacia haematoxylon

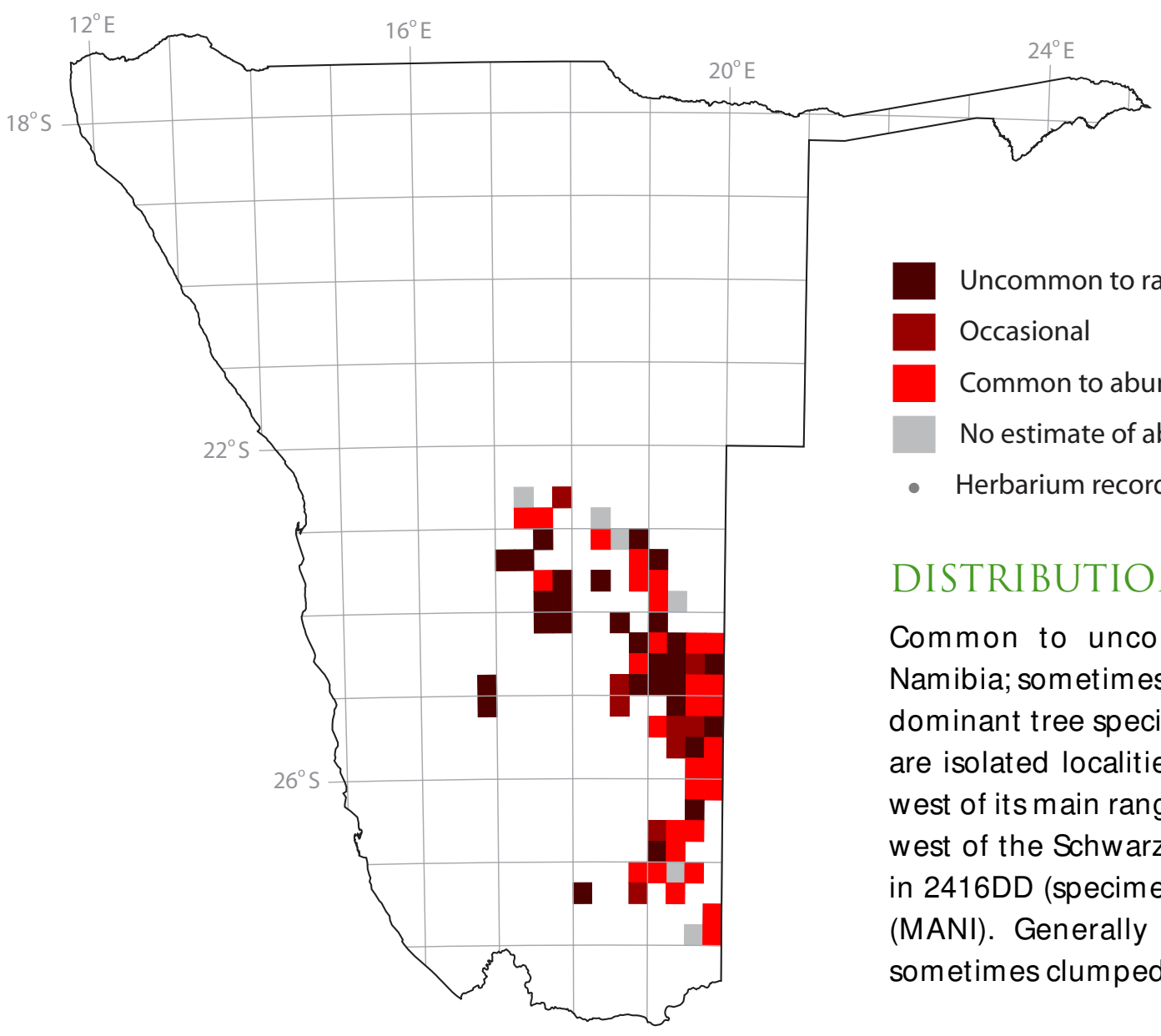
Vaalkameel

Grey camel-thorn (E);
!khas (K)

[164 records from 75 (7%) squares]



Shrub or small tree with **markedly grey appearance**. THORNS **extremely slender**, straight and white. LEAVES **grey; leaflets so tiny and close together that the leaves appear to be once-compound only**. FLOWERS in yellow balls. FRUIT a **woody, grey, velvety pod; narrow, cylindrical, sickle-shaped to spirally contorted**. Flowers and pods are obvious. Could be confused with *Tarchonanthus camphoratus*. This species cannot be confused with any other *Acacia*, but hybrids between it and *A. erioloba* have features midway between the two.

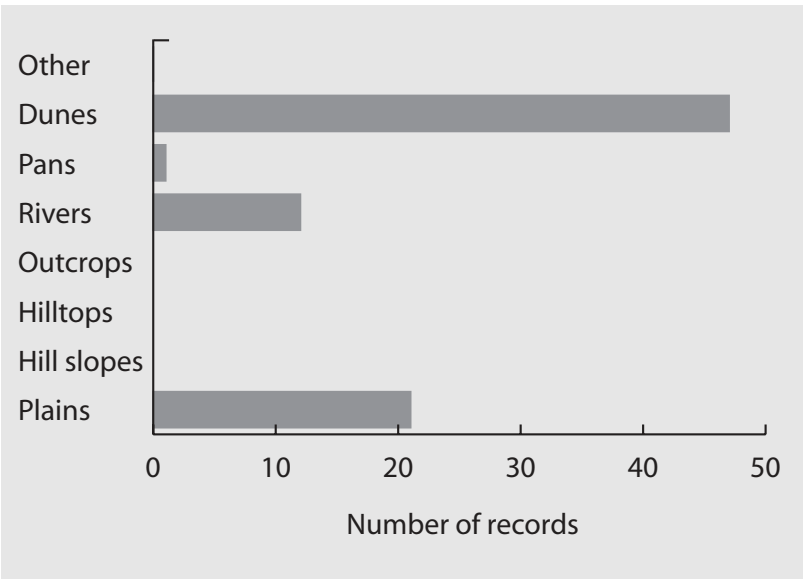


DISTRIBUTION & ABUNDANCE

Common to uncommon in south-eastern Namibia; sometimes abundant and one of the dominant tree species in many squares. There are isolated localities to the west and north-west of its main range, in an area of dunes just west of the Schwarzrand, south of Maltahöhe in 2416DD (specimen HOR2/158) and 2516BB (MANI). Generally evenly distributed, but sometimes clumped or localised.

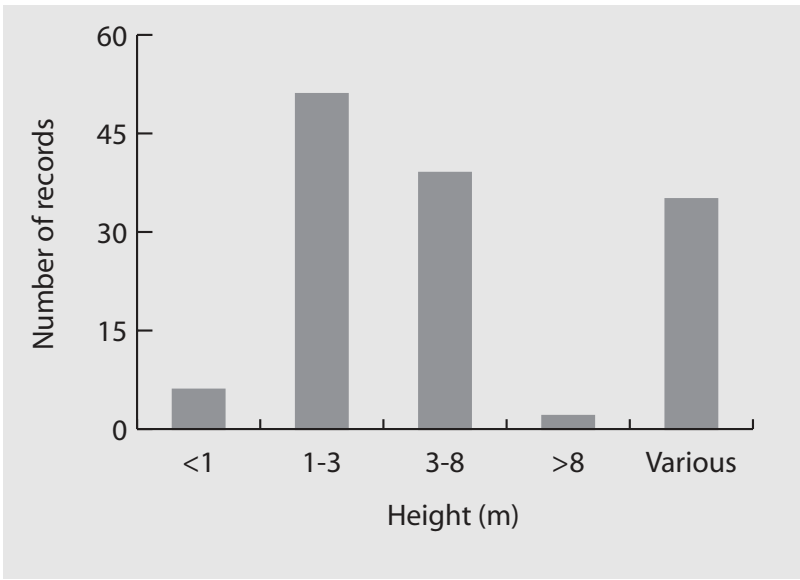
HABITAT

Mostly found on dunes and sand hummocks; also on sandy plains and interdune valleys; sometimes dry river courses, where it was generally rare. Substrate always sand or gravel. Individuals over 8 m were mostly recorded in dry riverbeds.



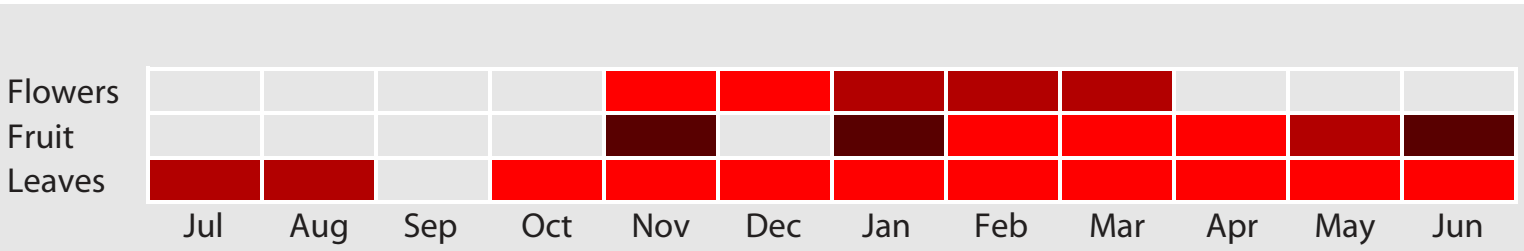
GROWTH FORM

Generally a tree from 1–8 m tall; occasionally over 8 m. Often a shrub or shrubby tree up to 8 m high. Forms thickets south-east of Windhoek. Mixed populations of various heights were often recorded.



ANNUAL CYCLE

FLOWERS November to March. FRUIT mostly February to May, with a few records in other months. LEAVES almost year-round, although many trees bare or with old leaves in September; new leaves produced in response to rain in 2318CB in October 2000 (FOR1).



GENERAL

Die-back and coppicing were noted in areas to the south-east of Windhoek. Fruit eaten by stock.

CONSERVATION CONCERNS

None recorded. Protected by forestry legislation.



Acacia haematoxylon, E. Ellinger

Acacia hebeclada

A shrub or small tree. **Young growth velvety**. THORNS **straight or slightly curved, especially near the tips; not hooked; hairy when young**. LEAVES **slightly to densely hairy**. FLOWERS pale yellow to creamy-white balls, near the ends of the branches. FRUIT **a characteristic thick, woody pod, with greyish hairs**.

Flowers and pods are conspicuous. In fruit, this species cannot be confused with any other. Without pods, it may be confused with *A. reficiens* or *A. luederitzii*. There are three subspecies, which are easily distinguished by their pods, but sometimes difficult to tell apart without pods. Thus, some of the records from the north may have been incorrectly assigned to subspecies. The subspecies are sufficiently different with sufficient numbers of observations for each to be treated separately. Records from the north were not assigned to subspecies have been omitted.

DISTRIBUTION

The species is widespread throughout most of Namibia. South of 19° S only subsp. *hebeclada* occurs. In the north-west, *A. hebeclada* is almost entirely represented by subsp. *tristis*. In the central-north, mainly subsp. *tristis* with some subsp. *hebeclada* is found. In Kavango, subsp. *tristis* and subsp. *hebeclada* occur, with subsp. *chobiensis* along the Okavango River. In Caprivi, mainly subsp. *hebeclada* with subsp. *chobiensis* on the floodplains.

A. hebeclada subsp. *hebeclada*

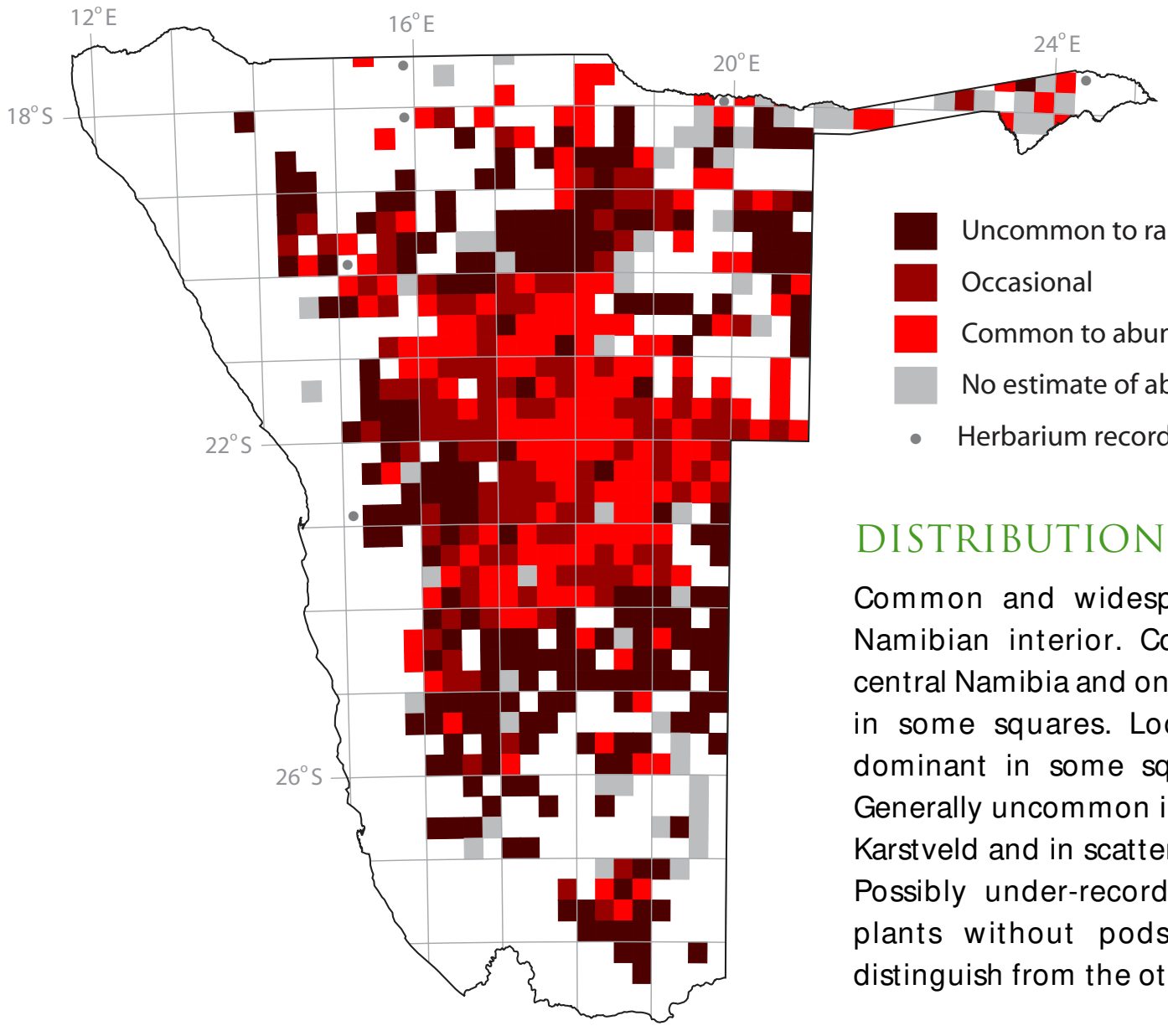
Candle-pod Acacia

Trassiebos (A); Kerzenakazie, Stehschotenakazie (G); otjimbuku (H); !geós (K)

[2,049 records from 580 (54%) squares]

Generally a spreading shrub with branches arising near the ground and curving upwards; sometimes a single-stemmed tree. FRUIT **an erect pod**, less than 25 mm wide.



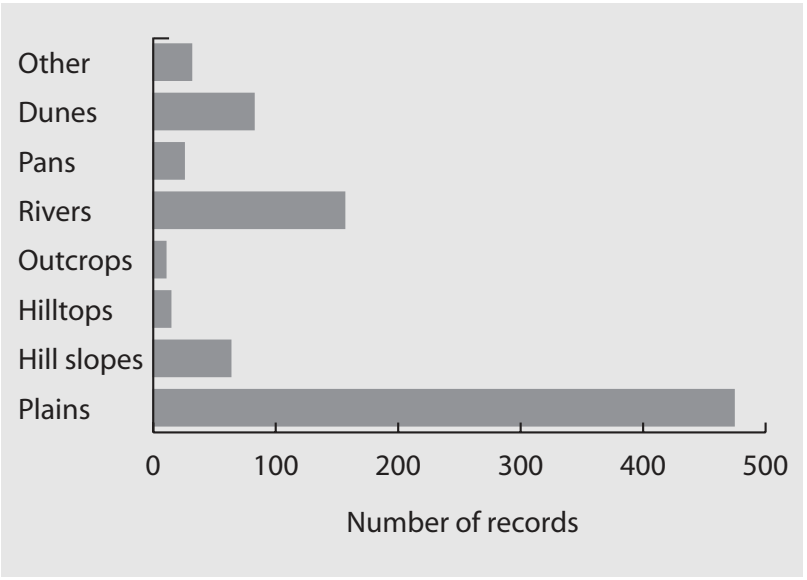


DISTRIBUTION & ABUNDANCE

Common and widespread over most of the Namibian interior. Common to abundant in central Namibia and one of the dominant species in some squares. Locally abundant or even dominant in some squares in the north-east. Generally uncommon in the north-west, Cuvelai, Karstveld and in scattered localities in the south. Possibly under-recorded in the north, where plants without pods are often difficult to distinguish from the other subspecies.

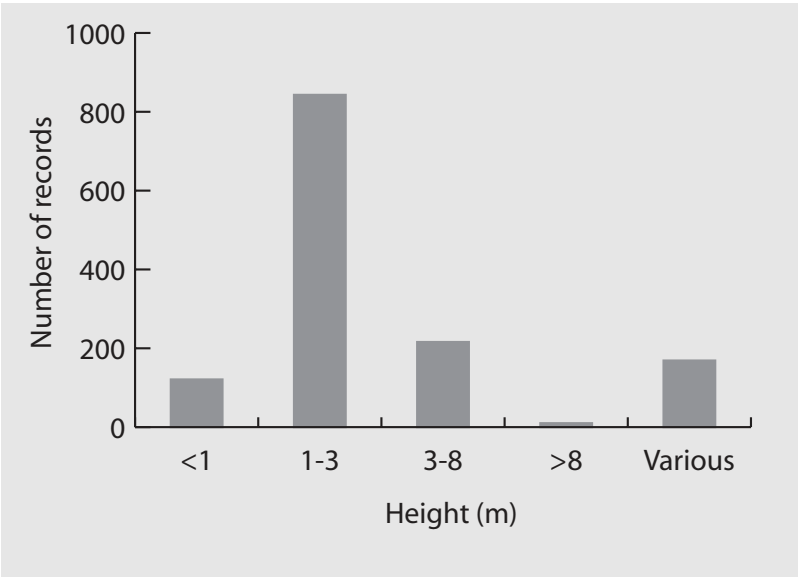
HABITAT

Predominantly found on plains, with some occurrence in dry rivers, hilly areas and on dunes; often around pans in the north-east. In the north, subsp. *hebeclada* is often found on calcrete, while in the central and southern interior it occurs on sandy substrates.



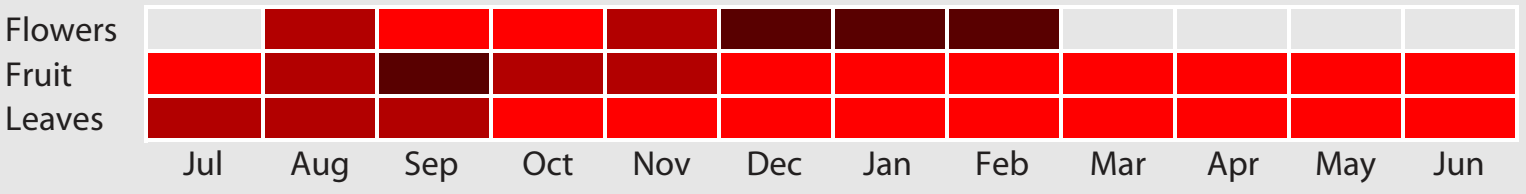
GROWTH FORM

Mostly a thicket-forming shrub up to 3 m high, occasionally a shrub or tree higher than 3 m; stands of mixed heights occur in the central highlands. Often forming low, spreading islands in the central-east and south.



ANNUAL CYCLE

FLOWERS mainly August to November, with the main peak in September, generally continuing through to February, but until May in some areas and some years. Have occasionally been recorded all year. A very small second flowering peak was recorded in the Kalahari, north-central areas and central highlands in 1998, 1999 and 2001; the central highlands had the longest flowering period with flowering continuing through March into May. FRUIT present all year, but generally by August and September they are all old pods; new pods start developing in October. LEAVES present on at least some individuals all year, but many trees are bare from June to September, when new leaves are produced.



GENERAL

May encroach in certain areas, and has a pronounced ability to coppice. In sandy areas, sand often accumulates around the plants, forming low islands. Occasionally infested with parasites (mistletoe).

Subsp. *hebeclada* is heavily browsed by domestic livestock and game, especially kudu; the pods are also eaten. Birds such as the White-browed Sparrow-weaver and Red-billed Buffalo-weaver nest in them.
The gum is edible. Roots are used by the Himba for stomach ailments (TJI1); they are also used medicinally for chest pains and coughing. This species supplies the material for a number of other traditional uses (necklaces, hairdressing), including construction (fence poles, hut building and tools).

CONSERVATION CONCERNS

None recorded.

Acacia hebeclada subsp *hebeclada*, L. Hoffmann



A. hebeclada subsp. *chobiensis*

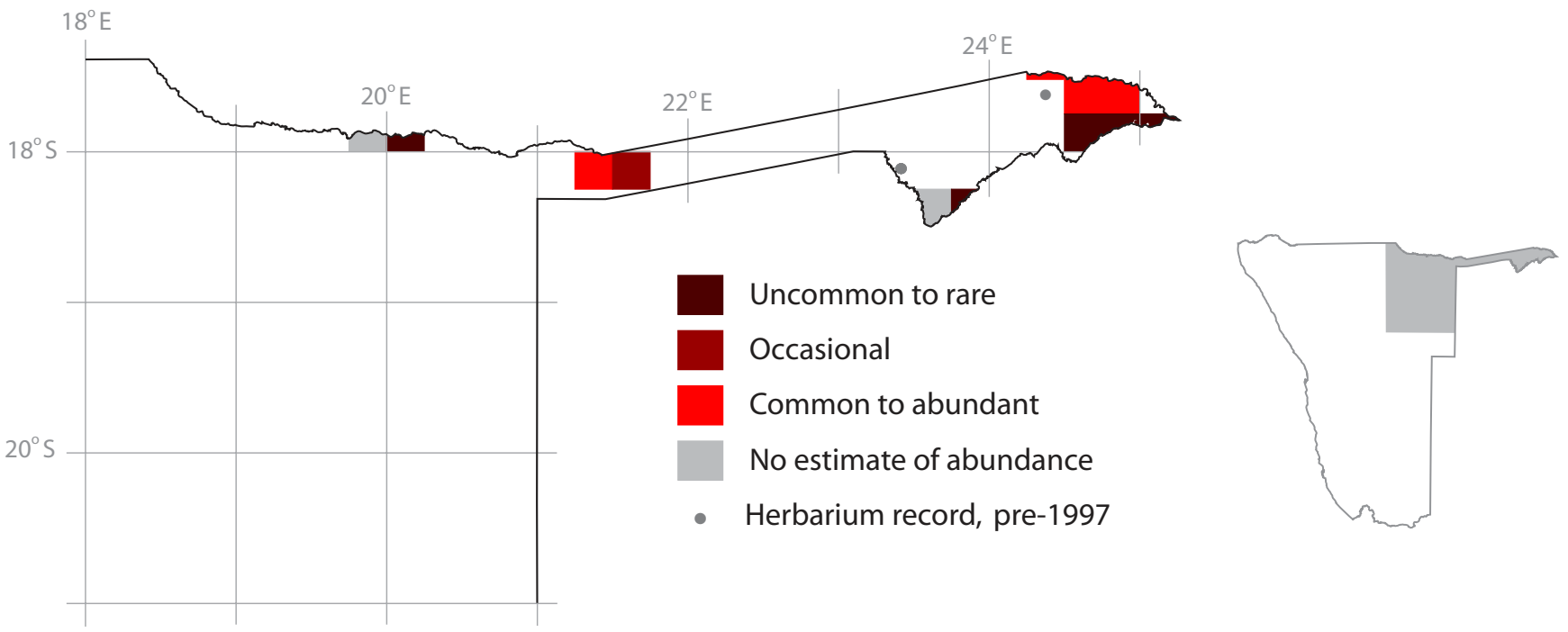
Chobe Candle-pod Acacia

Shiginda (Rum); thighondho (T)

[23 records from 12 (1%) squares]



Usually a large, spreading shrub. FRUIT **broader (>25 mm wide) and more robust pods**, distinguishes it from the other subspecies.



DISTRIBUTION & ABUNDANCE

Uncommon to common along the Okavango River and in the eastern Caprivi.

HABITAT

In sandy omurambas, and on river banks and floodplains.

GROWTH FORM

Mostly a shrub of 1–3 m high, rarely a tree of over 3 m.

ANNUAL CYCLE

Observations were only made in May, June, August, October and November. FLOWERS were recorded in August. FRUIT recorded from May to August, with old pods in November. LEAVES were present during most observations, but only in 33% of those in August.

GENERAL

Pods used for livestock fodder; also eaten by people in times of food scarcity.

CONSERVATION CONCERNS

Possibly threatened by habitat destruction.

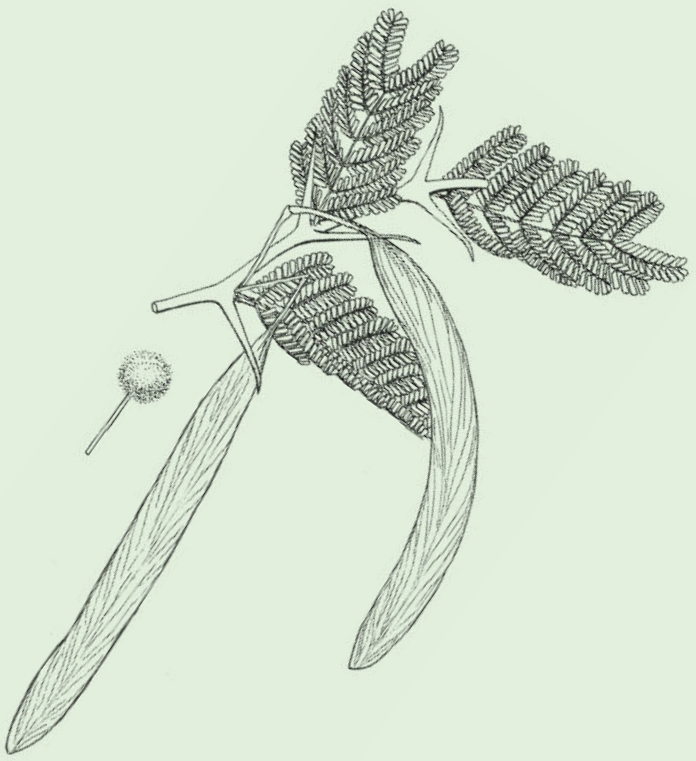
A.hebeclada subsp. *tristis*

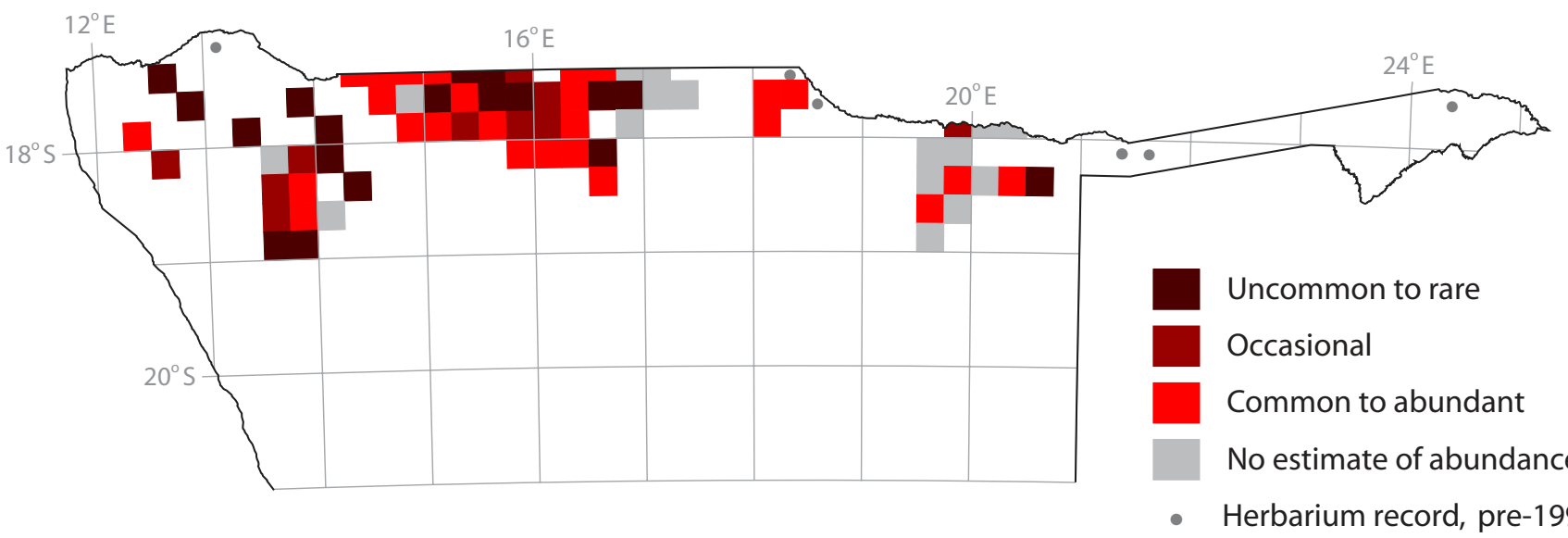
Weeping Candle-pod Acacia

Muisdoring (A); mangandjamba (H); omutokano (Ok)

[113 records from 69 (6%) squares]

Generally a small, single-stemmed tree with a rounded or flattened crown. FRUIT **hanging pods**.





DISTRIBUTION & ABUNDANCE

Common to locally abundant in the north, and dominant in a few squares in the Cuvelai; generally uncommon in the north-west. There were no TAP records from Caprivi, but some earlier herbarium records.

HABITAT

Chiefly in areas where water collects, such as pans, dry rivers and floodplains in mixed woodlands or wooded grasslands, sometimes in riverine forest; grows on sandy substrates.

GROWTH FORM

Mostly shrubs of up to 3 m, but also shrubs or trees in the 3–8-m height class. There were many stands with individuals of various heights.

ANNUAL CYCLE

There were no records of annual cycle from July to September. FLOWERS only reported in October and December. FRUIT some recorded in every month in which observations were made. LEAVES always recorded.

GENERAL

Browsed by rhino, black-faced impala, dik-dik, kudu and springbok. Leaves and roots used medicinally. Wood used for construction and making tools. Roots used traditionally for hairdressing. Gum edible.

CONSERVATION CONCERNS

None recorded.

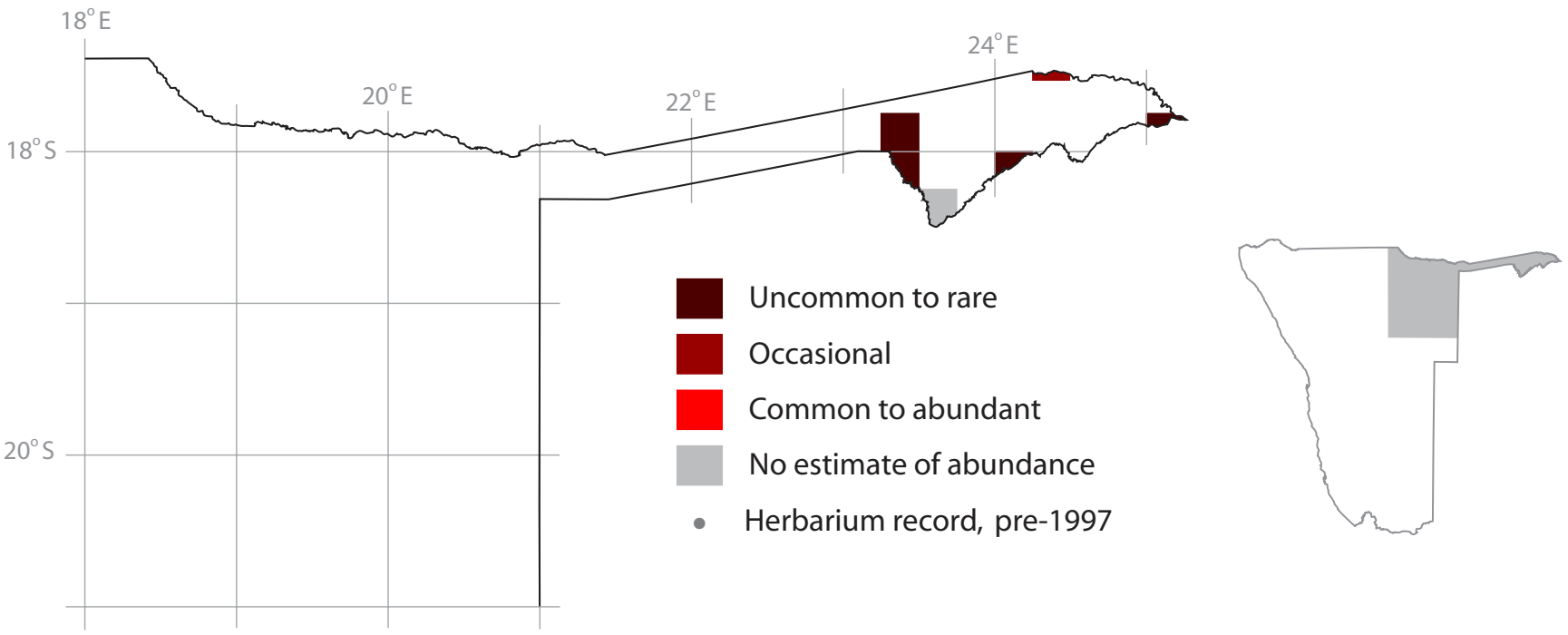
Acacia galpinii

Apiesdoring

Monkey-thorn (E); mukotokoto (L)

[12 records from 6 (<1%) squares]

A tall, deciduous, **riverine tree** with a rounded crown. BARK pale, flaking. THORNS hooked in pairs below the nodes. LEAVES large **with a small raised gland halfway up the petiole**. FLOWERS creamy-white in spikes; buds reddish-purple; **appearing before the new leaves**. FRUIT a broad, flat pod.
Flowers and fruit are conspicuous. When leafless, may be confused with *A. polyacantha* or *A. nigrescens*.



DISTRIBUTION, ABUNDANCE & HABITAT

Eastern Caprivi, only. Uncommon overall; occasional on river banks around Katima Mulilo; rare on the dunes at Susuwe (1723CD). Uncommon on river banks along the Kwando River, on Lupala Island (1823BC) and on Impalila Island. First recorded for Namibia by the TAP.

GROWTH FORM

A tree over 8 m tall.

ANNUAL CYCLE

Data too few for diagram. FLOWERS August and September. FRUIT October to January and in May. LEAVES August to May (there were no records for June and July).

GENERAL

This is a popular garden species in many places in Namibia, especially Windhoek.

CONSERVATION CONCERNS

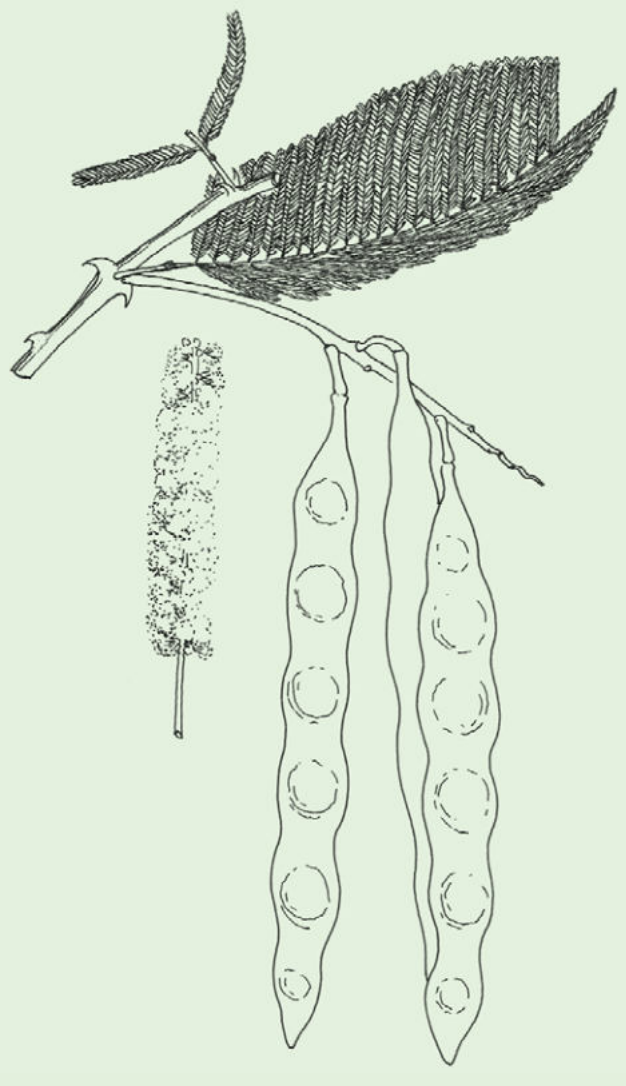
None recorded.

Acacia hereroensis

Bergdorn

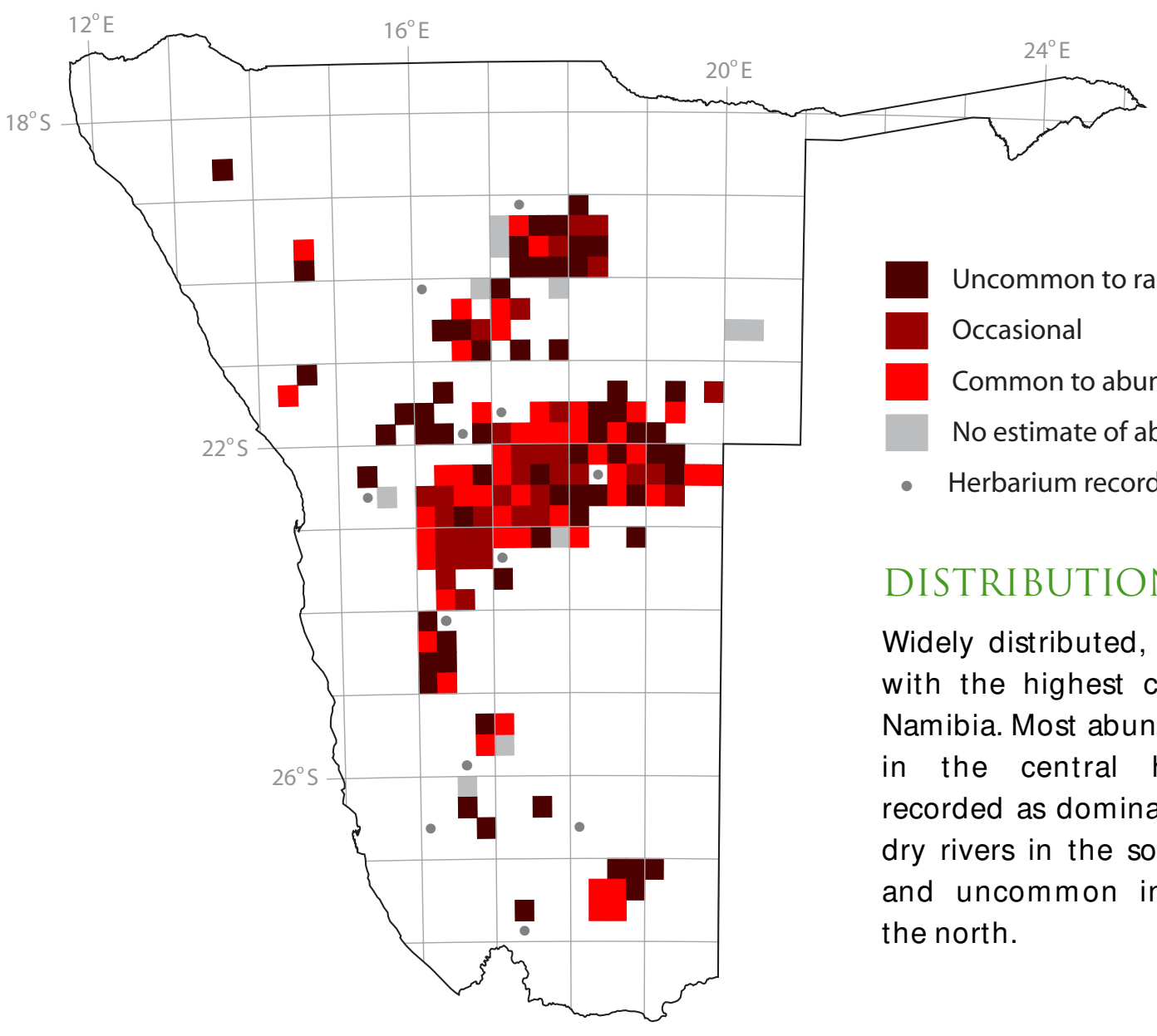
Mountain-thorn (E); oroo (H); #ninib (K)

[663 records from 157 (15%) squares]



A **wispy** tree or shrub with an open, airy canopy; occasionally a large tree with dark, fissured bark and a rounded canopy. THORNS **fine, hooked**; in pairs, single or sometimes absent, may appear scattered. LEAVES **long, narrow, with small, compact leaflets**. FLOWERS light yellow to creamy-white, in spikes on the ends of branches. FRUIT a reddish-brown pod; flattened and leathery.

Flowers and pods are conspicuous. May be confused at a glance with *A. arenaria*, but has hooked thorns, whereas *A. arenaria* has straight thorns. Has also been confused with *Albizia brevifolia*.

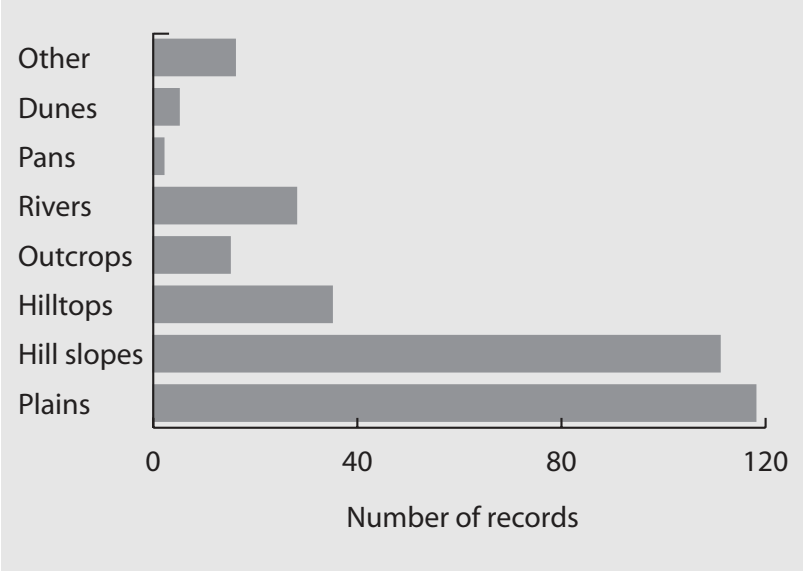


DISTRIBUTION & ABUNDANCE

Widely distributed, common to uncommon, with the highest concentrations in central Namibia. Most abundant and often dominant in the central highlands; occasionally recorded as dominant in the Kalahari and in dry rivers in the south. Otherwise scattered and uncommon in the south; absent in the north.

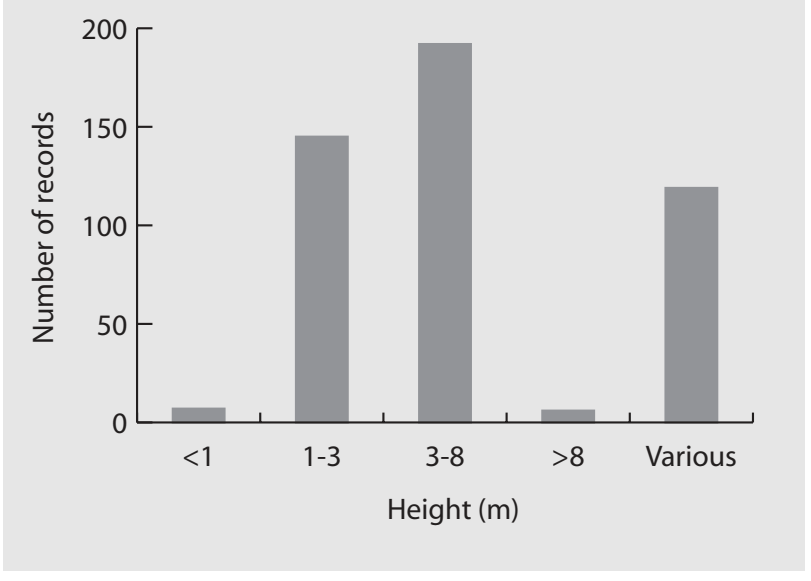
HABITAT

Various, but mostly on plains and hill slopes; on plains it was mainly recorded as uncommon whereas on hill slopes it was mainly common and the highest number of 'abundant' records was from hill slopes. Always on stony, rocky or gravel substrates.



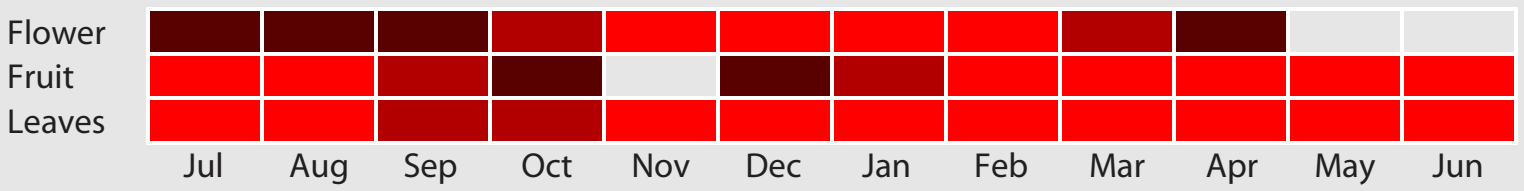
GROWTH FORM

Mostly a tree up to 8 m tall, seldom over 8 m; sometimes a shrub up to 3 m. Often stands of trees had heights ranging from less than 1 m up to 8 m. Those trees over 8 m were all north of 21° S, but in scattered localities.



ANNUAL CYCLE

FLOWERS some every month, with a peak in December and January, and buds recorded in October, November and March. FRUIT mostly February to August; young fruit from December to May and ripe fruit in May to July. LEAVES present most of the year; less in September and October and new growth starting in October.



GENERAL

Browsed by eland and kudu. Flowers attract butterflies. The roots are used medicinally. The trees are often infested by various parasitic species; in a few areas dead or dying trees were reported.

CONSERVATION CONCERNS

None recorded.



Acacia hereroensis, B. Curtis

Acacia karroo

Soetdoring

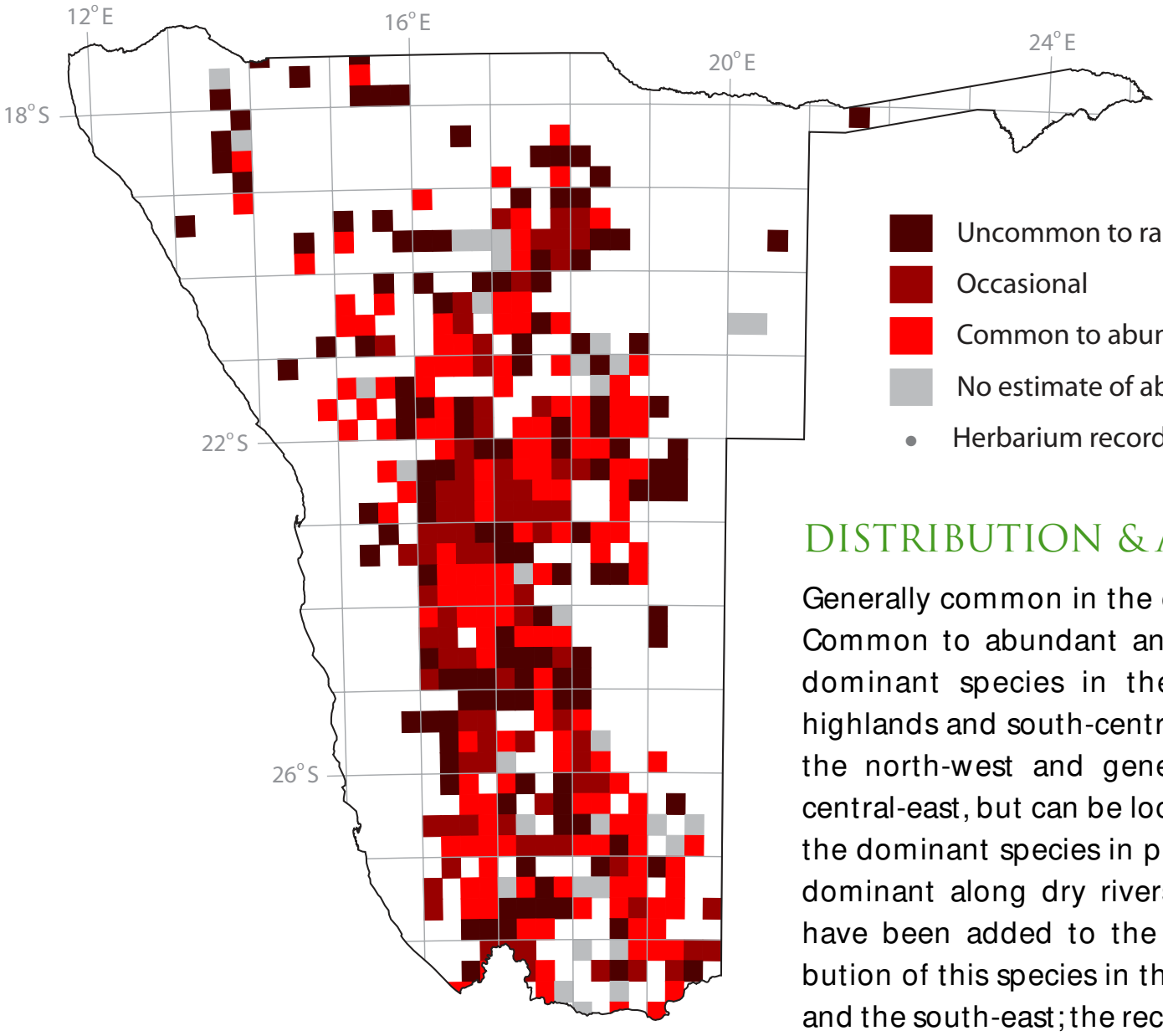
Sweet-thorn (E); Weissdorn, Süssdorn (G); ||khuus (K)

[1,369 records from 411 (38%) squares]



A fairly tall, erect tree. BARK **black, fissured; orange-red underbark** on young branches; exuding a sweet gum when injured. THORNS straight and white. LEAVES **glandular and shiny**. FLOWERS **in golden balls**. FRUIT a sickle-shaped, shiny, reddish-brown pod; clustered.

Flowers and fruit are conspicuous. Young plants may be mistaken for *A. nebrownii*, *A. erioloba* or *A. tortilis*.

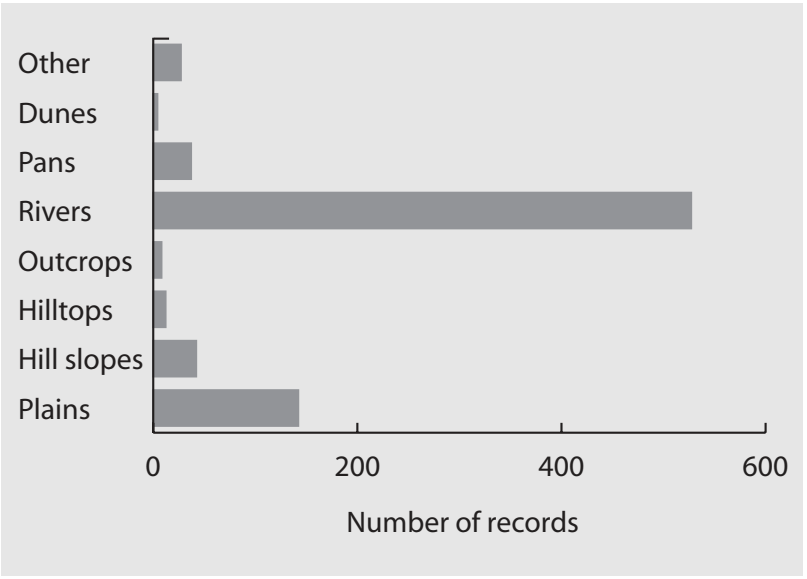


DISTRIBUTION & ABUNDANCE

Generally common in the central Namibian interior. Common to abundant and sometimes one of the dominant species in the Karstveld, the central highlands and south-central plateau. Uncommon in the north-west and generally uncommon in the central-east, but can be locally abundant and one of the dominant species in places. Often localised and dominant along dry rivers. A number of localities have been added to the previously known distribution of this species in the eastern Kunene Region and the south-east; the records from the Cuvelai and north-east are range extensions, but were not confirmed by specimens.

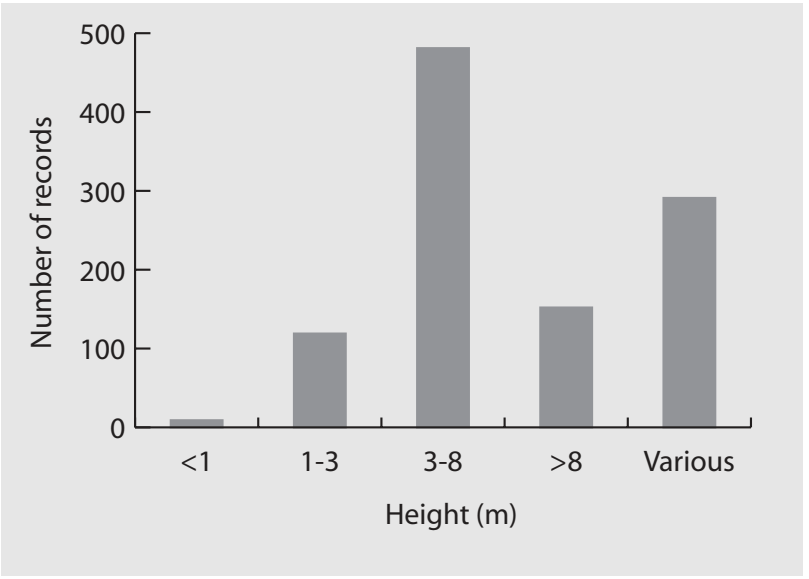
HABITAT

Mostly found on river banks and in dry riverbeds; occasionally on plains, and less often on pans (in the central-east) and floodplains. Substrates include silt, clay, sand and calcrete.



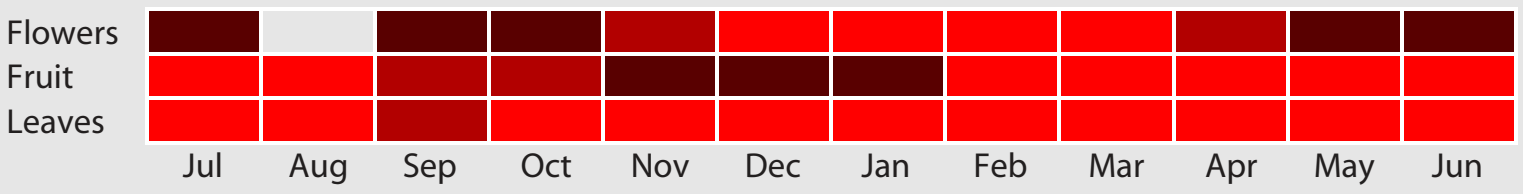
GROWTH FORM

Mostly a tree from 3–8 m high, but shrubby forms occur in all height categories. Trees higher than 8 m occur mainly along rivers in the Kalahari, central highlands and the south. Stands with mixed heights occur throughout the country.



ANNUAL CYCLE

FLOWERS November to April, with a peak in December and January, but with occasional flowering all year. Flowering appears to be responsive to rainfall. 'Flowering again after rain' was noted in January 1998 in 2316CD and in March 1999 in 2118CA. In April 1998 and 1999, flowers were only 'just starting' in 2217BD and 2515BB, respectively. FRUIT all year, but less often between September and January; young fruit recorded from October to April, and ripe fruit mainly from July to October. LEAVES essentially evergreen; occasional bare trees from May to November, and young leaves from August to January.



GENERAL

The bark of *A. karroo* is used medicinally and for tanning purposes. The resin is edible, even palatable. Weavers nest in the trees, and the flowers attract masses of bees, butterflies and other insects. In 2618DB black beetles bored holes 30–40 mm deep into the stems, which then exuded gum; eventually the trees died (FOU2). Often parasitised by mistletoe. Dead trees were noted in several areas. In other areas old trees have died and young ones are coming up (SCH16 in 2118CA). Encroaching in places (KOL4, 2116DA). In 1917DA, valleys that were open in the 1960s are now dense with *A. karroo* and *Ziziphus mucronata*.

CONSERVATION CONCERNS

None recorded.

Acacia kirkii

Floodplain Acacia

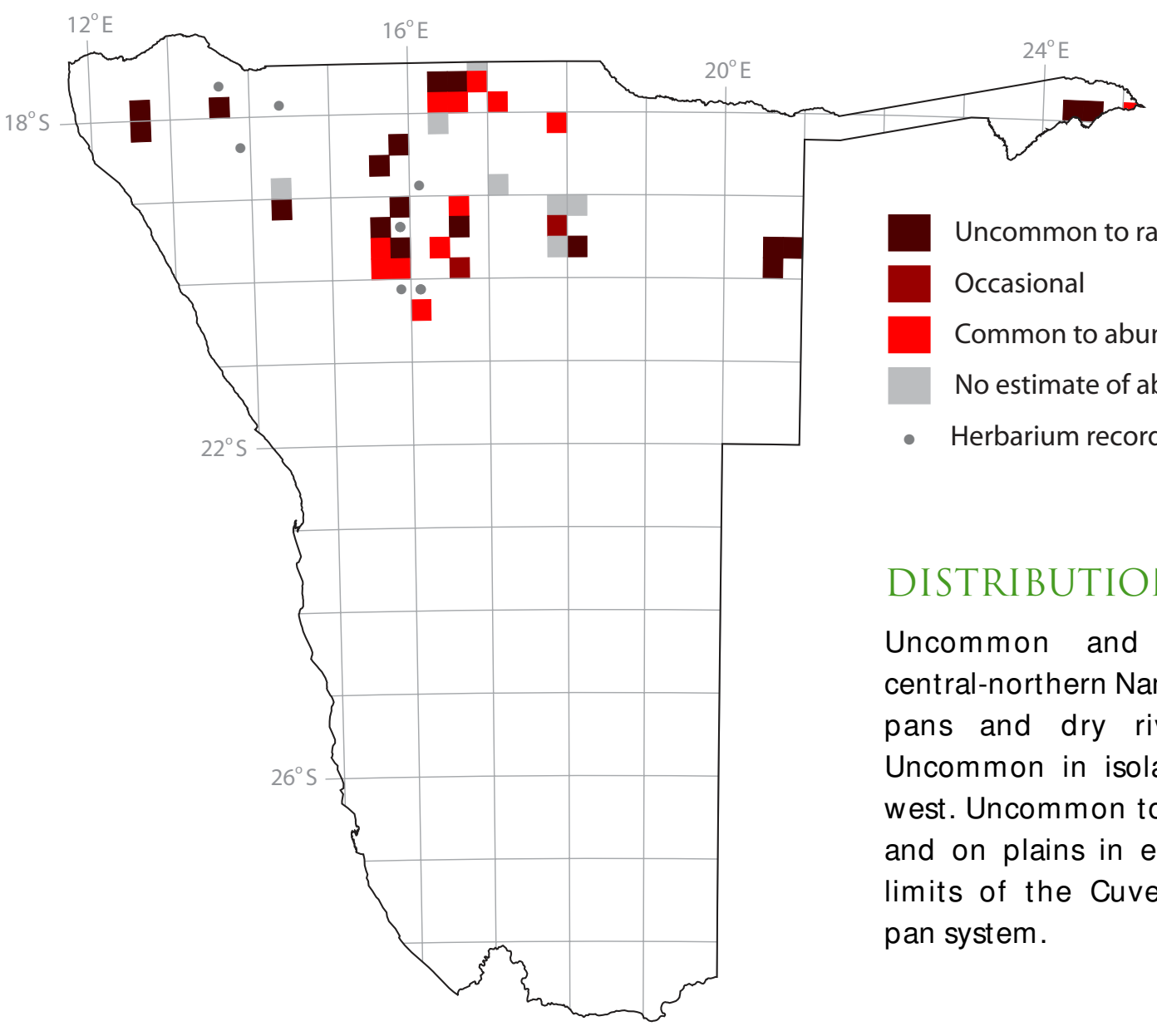
Buckelhülsenakazie (G);
orukumbuya (H); g!unkxarih (J)

[62 records from 39 (4%) squares]



A shub or medium-sized tree with **horizontal branches**. BARK **smooth, greenish-yellow, peeling**. THORNS straight and white. LEAVES clustered, medium-sized and feathery, with a short petiole. FLOWERS in creamy coloured balls. FRUIT a yellowish brown pod, with **characteristic swellings over the seeds**.

Flowers and ripe pods are conspicuous. Could be confused with *A. sieberiana*.

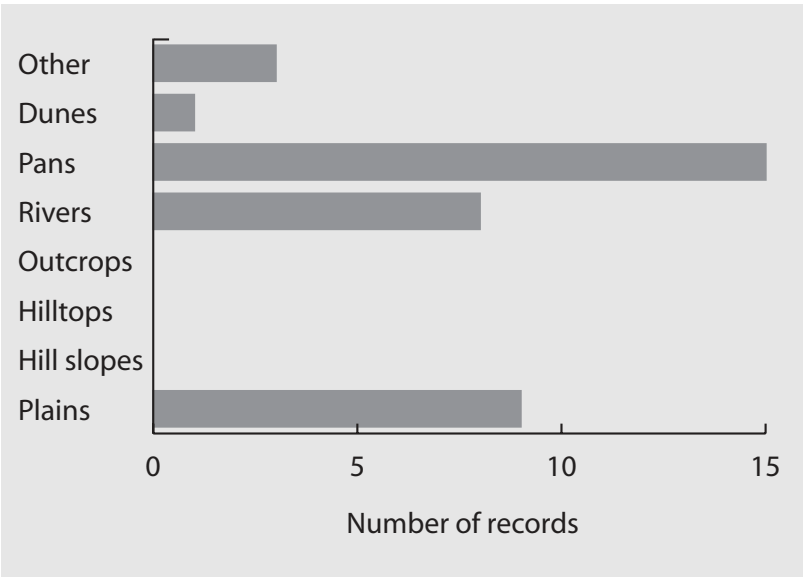


DISTRIBUTION & ABUNDANCE

Uncommon and scattered throughout central-northern Namibia. Locally abundant in pans and dry rivers in the Karstveld. Uncommon in isolated areas of the north-west. Uncommon to locally common in pans and on plains in eastern Caprivi, the outer limits of the Cuvelai and the Nyae Nyae pan system.

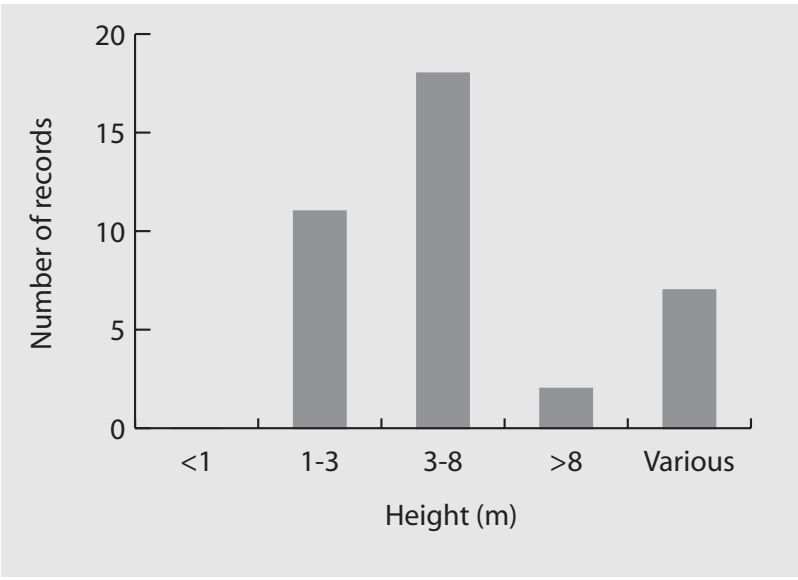
HABITAT

Mostly found in pans or depressions and on floodplains, but also on plains. Generally grows on clay.



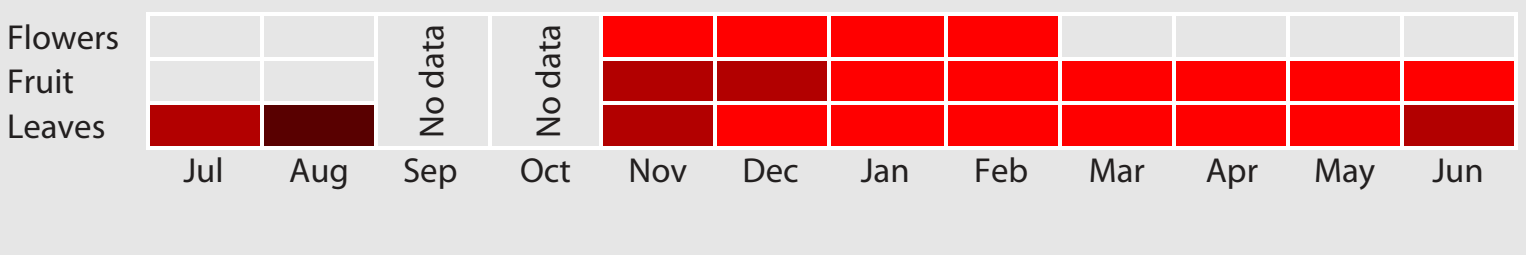
GROWTH FORM

Mostly a tree of 3–8 m, but also a shrub of 1–3 m. There were two records of individuals over 8 m, one in the Cuvelai and one on Impalila Island; none were less than 1 m.



ANNUAL CYCLE

There were no annual cycle records in September and October. FLOWERS November to February. FRUIT November to June. LEAVES recorded most months; bare trees were noted from June to August.



GENERAL

Browsed by giraffe, kudu, elephant and springbok.

CONSERVATION CONCERNS

One atlasser (STR1) noted that some populations in Etosha appear to be declining. There were also fewer records from the north-west than previously shown by earlier herbarium records.



Acacia kirkii, Ruacana road, B. Curtis

Acacia luederitzii

Kalahari Acacia

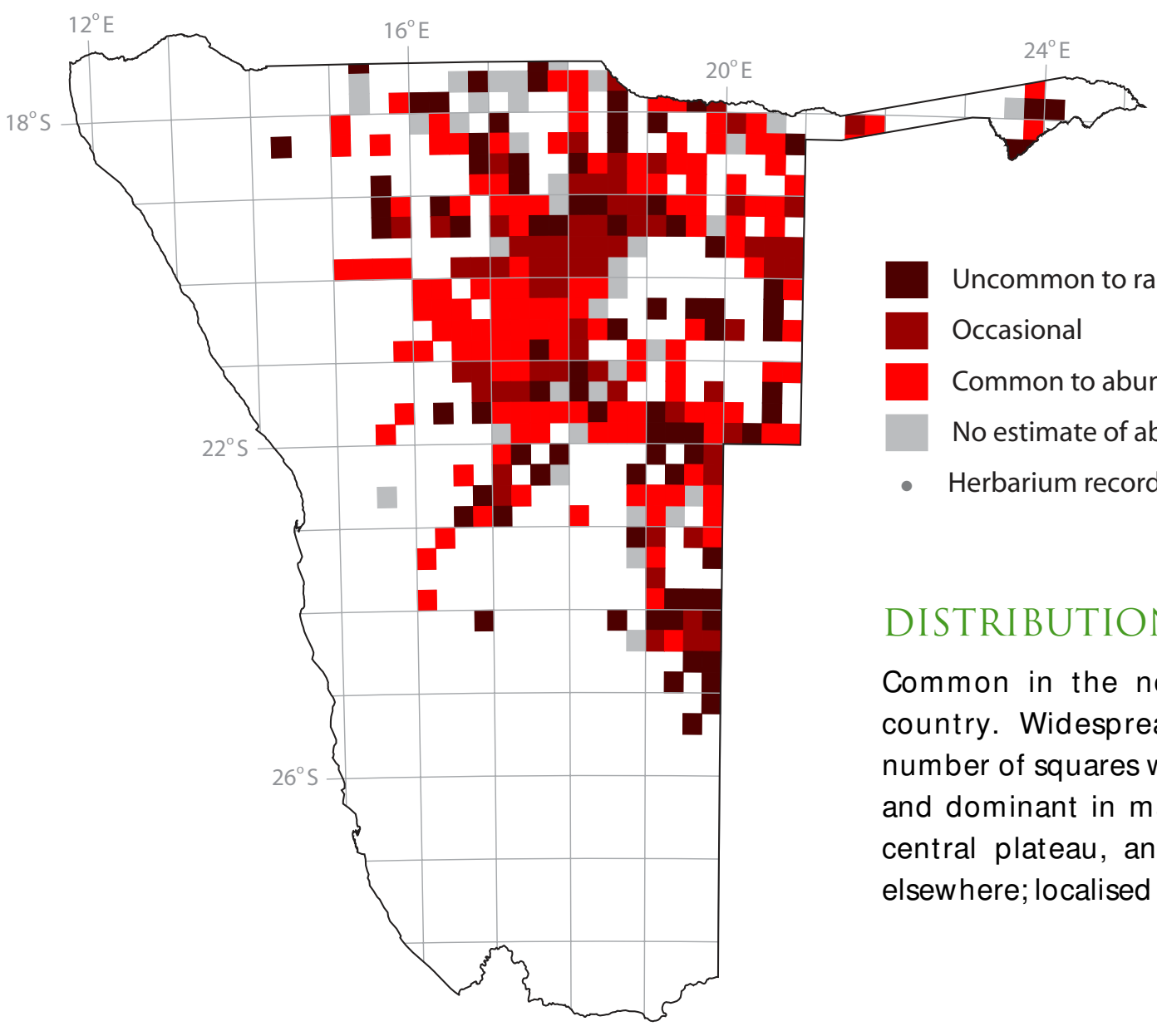
Baster-haak-en-steek (A); Lüderitzakazie (G); djoa (Kx); mumangondijamba (Rk)

[937 records from 326 (30%) squares]



A medium-sized tree with **a flattened** to rounded canopy. BARK **dark, fissured**; reddish on young trees. THORNS **hooked or straight**, in pairs. LEAVES **softly hairy, with 3–9 pinna pairs and 10–26 leaflet pairs**; leaflets small and **generally fringed with hairs**. FLOWERS creamy-white balls. FRUIT a flat, linear-oblong, reddish-brown pod; slightly pointed at the ends.

Pods and flowers are conspicuous. The tree is difficult to tell apart from *A. reficiens*. Many TAP records could have been misidentifications. Where possible, the data have been cleaned using size and distribution. Completely uncertain records have been deleted from the database. Farmers often do not distinguish between the two species, and simply refer to them both as 'basterkameel'.

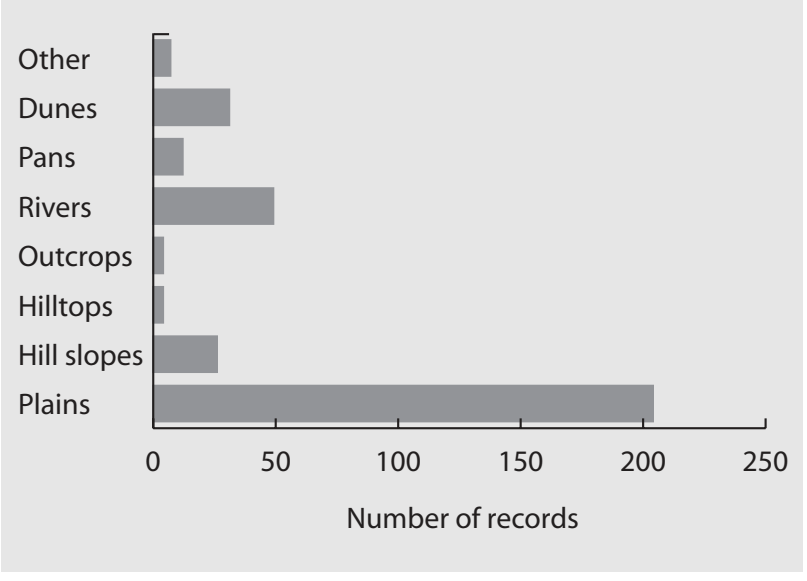


DISTRIBUTION & ABUNDANCE

Common in the north-eastern half of the country. Widespread, but absent from a number of squares within the area. Abundant and dominant in many places on the north-central plateau, and in scattered localities elsewhere; localised in some places.

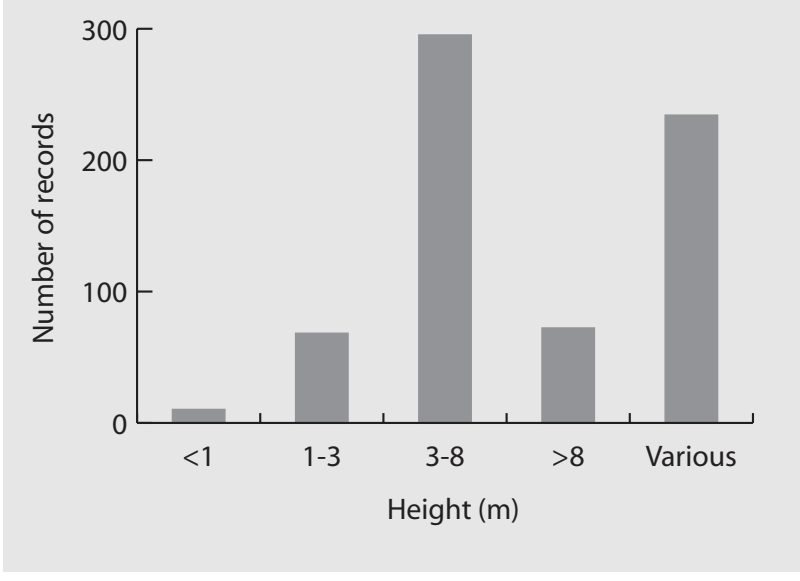
HABITAT

Most often found on sandy plains, sometimes on calcrete; often abundant in dry rivers. Also found on sand hummocks and sometimes hill slopes. On floodplains in the Cuvelai area.



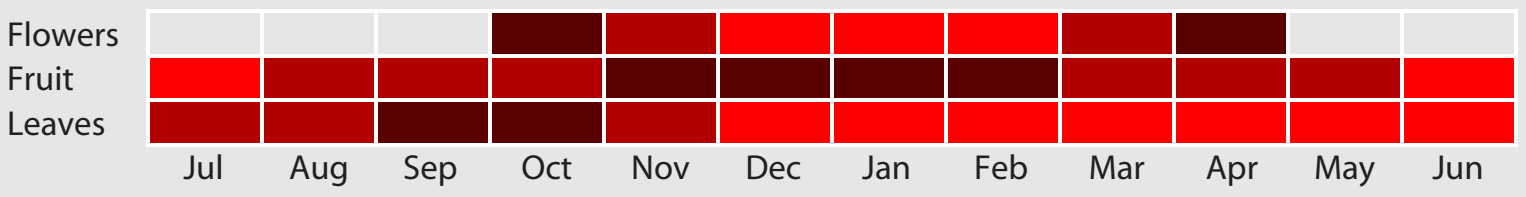
GROWTH FORM

Mostly a tree (70% of records) 3–8 m high (60% of trees), but sometimes over 8 m (13%). About 40% of the records consisted of healthy stands with trees of varying heights, mainly in the north-east and Kalahari.



ANNUAL CYCLE

FLOWERS never prolific, but present mainly between November and March. No flowering was recorded in some areas some years; in 2118DB, the 'first blossoms in three years' were produced in 2001 (TOL1). FRUIT present all year, but mostly March to October, with young fruit February to April and ripe fruit April and May. There were records of fruit apparently being affected by the heat in February 1998 in1916D when the trees 'flowered well but seeds did not form well because of the heat' (HOB1). LEAVES present all year, but with many plants bare in September and October; young leaves produced from September to November.



GENERAL

This tree is browsed, especially the young shoots. Flowers are eaten by springbok and giraffe; butterflies are attracted to the flowers. White-browed Sparrow-weavers nest in the trees.

The gum is edible, but not in common use; the fruit is also edible. Ash from this species is used to prevent infection of the naval in newborn babies. The wood and bark are used for construction (fencing poles); root bark and the root core are used for traditional purposes (arrow quivers, pestles). Bark fibres used for hut building and to make cords for jewellery.

In some areas it is encroaching; in a few areas trees are dying.

CONSERVATION CONCERNS

None recorded.

Acacia mellifera

A **V-shaped shrub** or small tree with a rounded canopy. BRANCHLETS **reddish-brown with white lenticels**. THORNS small, paired, recurved. LEAVES with **few, relatively large, rounded leaflets**. FLOWERS creamy-white. FRUIT a thin and papery pod with a pointed apex.

Flowers are conspicuous, pods may be overlooked when green. There are two subspecies in Namibia, which are characterised by their leaves and flowers.

A. mellifera subsp. *detinens*

Swarthaak

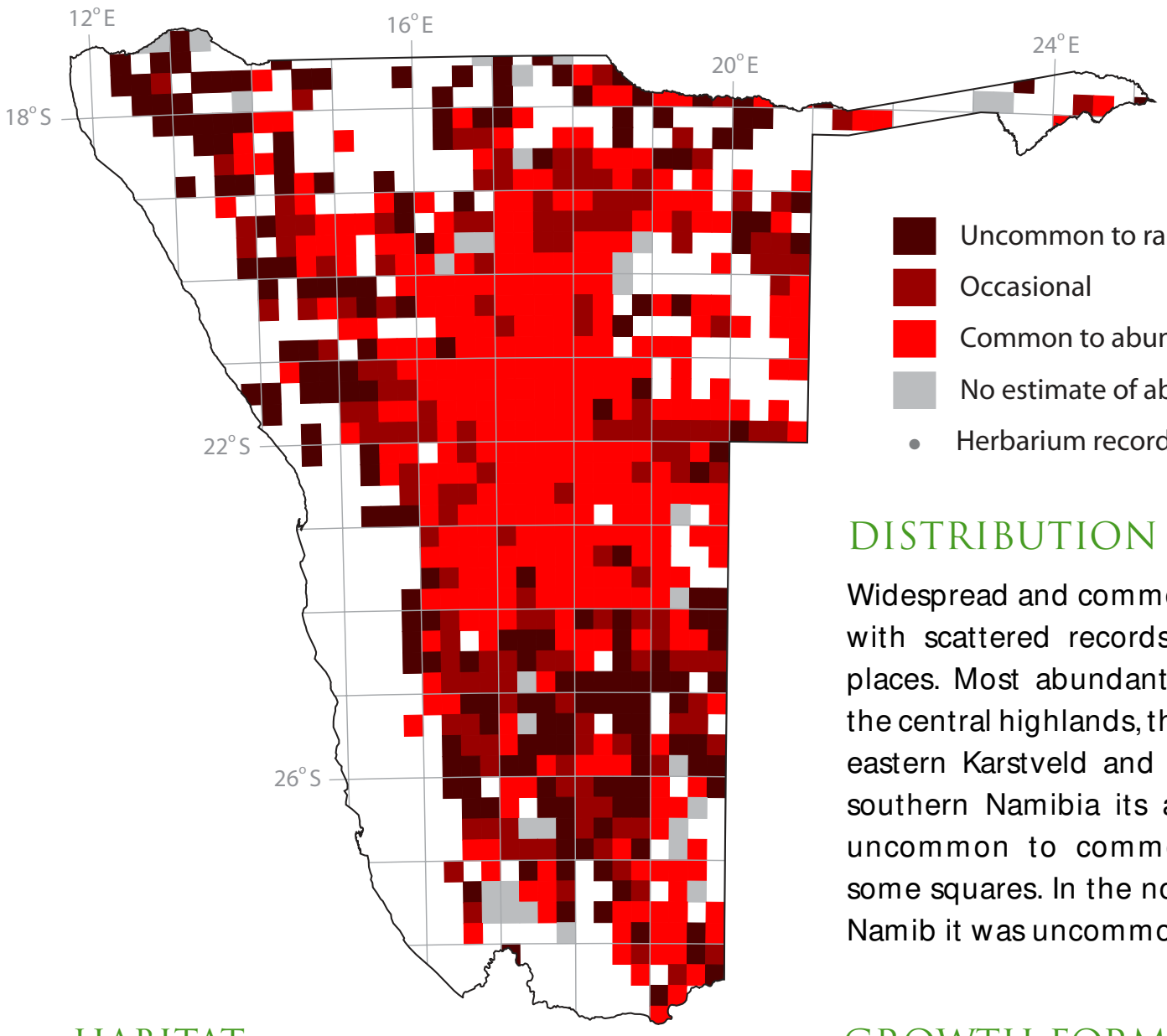
Black-thorn acacia (E); hakiesbos (A); omusaona (H); !noes (K); kankata (Rk, Rum)

[2,835 records from 751 (70%) squares]



THORNS **extremely sharp, very hooked, black**. LEAVES usually with 3–4 pinna pairs, each pinna with 1–2 leaflet pairs. FLOWERS appear to be in round balls (actually very reduced spikes).

From a distance may be confused with *A. senegal* due to its shape. Leaflets are similar to those of *Albizia anthelmintica*. This is by far the more common and widespread of the two subspecies.



DISTRIBUTION & ABUNDANCE

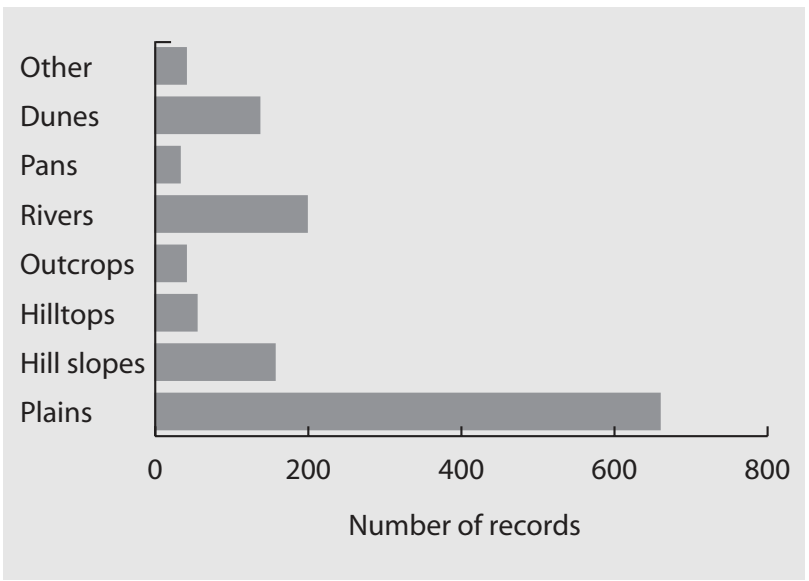
Widespread and common over most of Namibia, with scattered records in Caprivi; localised in places. Most abundant and often dominant in the central highlands, thornbush savanna, south-eastern Karstveld and parts of the Kalahari. In southern Namibia its abundance ranged from uncommon to common, being dominant in some squares. In the north-west and the central Namib it was uncommon.

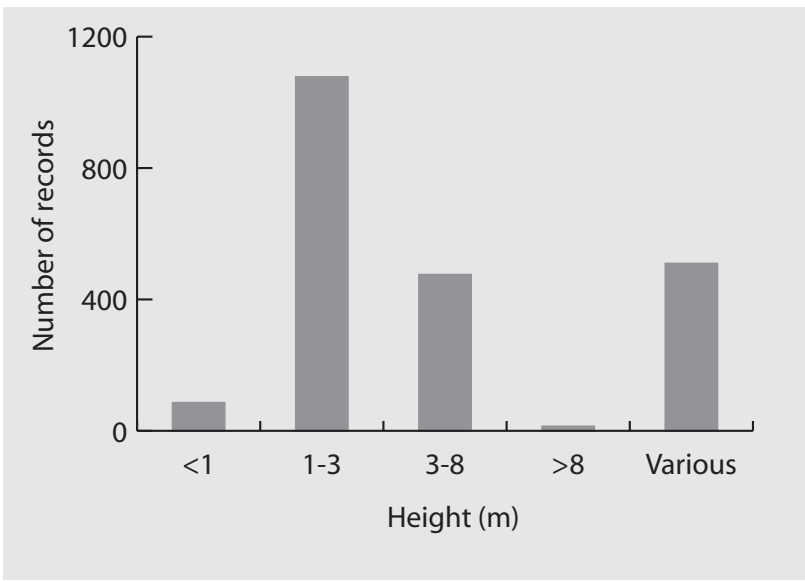
HABITAT

All habitat types, but most often on plains, where it ranged from uncommon to abundant, as it did on hill slopes. In dry rivers it was uncommon to common, whereas in dunes it was common to uncommon. Those recorded as being in a variety of habitats were common to abundant. Found on a variety of substrates including sand, calcrete, rocky, gravel and stony substrates and sometimes clay.

GROWTH FORM

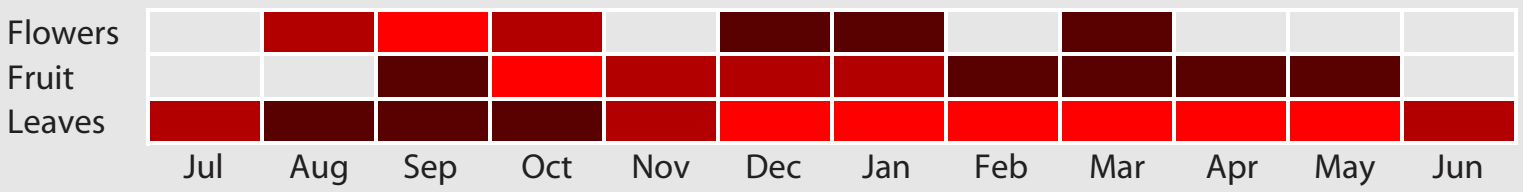
Mostly a shrub (60% of records) up to 3 m high (42% of records). Sometimes a tree (17%) or mixed stands of shrubs and trees up to 8 m (23%). The majority of those in the 3–8-m category were across the north of the country. Trees over 8 m were rare (2% of records), and found scattered throughout the country. Stands of mixed height classes found throughout the country, but predominantly in the north-east. The highest proportions of low (less than 1m high) populations were in the south-west and the Cuvelai. Thicket-forming in places.





ANNUAL CYCLE

FLOWERS mainly August to October, with a peak in September, extending until April some years, but much less profusely. There is a lot of seasonal and regional variability – see box below. FRUIT September to May, though found occasionally throughout the year; ripe fruit November to April. LEAVES were recorded on some individuals all year round; however, in winter most plants were bare, with young leaves being recorded from September to December; old leaves were recorded from March to October.



Flowering patterns

The variability between areas is shown by plants which 'bloomed particularly profusely' in 2217AC in 1997/98 (HUB1) and 'no flowers or seeds this season' in 2116DB for the same season (AUS1). Flowering intensity also varied from season to season. In 2000 when rains were very good throughout the country, a 'good flowering season' was noted for 2318CB (FOR1) and 'masses of flowers' in 2219AD (SIL1). In 1916D in August 1998 there were only occasional flowers due to lack of rain (HOB1) and in 1917BC they 'did not flower or bear fruit due to drought in 1998/9' (BAS1). Some years there were 'exceptionally many pods' (November 2000 from 2217DA (HOF1)) and other years there were few.

GENERAL

An aggressive, invasive species, that has encroached many overgrazed areas. In areas that have been treated with herbicide, it appears to be slow to invade again, and this has been attributed to competition with grass (BES1); in other areas it has been subject to extensive bush-clearing activies and harvesting for charcoal production. The fungus *Phoma glomerata* causes natural die-back in many areas, and is most effective in areas of heavy soils, due to moisture stress, causing die-back by as much as 80% over five years (BES1). Some farmers have tried to 'control it by using fungi, which has been successful in some areas' (PIE1). There were also several records of dead plants, mainly from the central parts of the country, but also from the south.

The leaves are commonly eaten by caterpillars; also browsed by dassies, giraffe, springbok, gemsbok, black-faced impala, elephant and rhino. Insects are attracted to its sweetly scented flowers and it is thought to be a good 'bee species' and is reported that the flowers produce good honey, more so in the omurambas than on the limestone (HOB1). Weavers and other birds nest in the trees.

The gum of this plant is edible and highly valued; it is usually harvested in winter. Pods may be eaten in times of food shortage. Dethorned branchlets are used for cleaning teeth; in the Herero culture the roots are used to curdle milk. Various plant parts are used medicinally. The wood is used for fence droppers and poles; branches are used for fencing gardens and cattle enclosures.

CONSERVATION CONCERNS

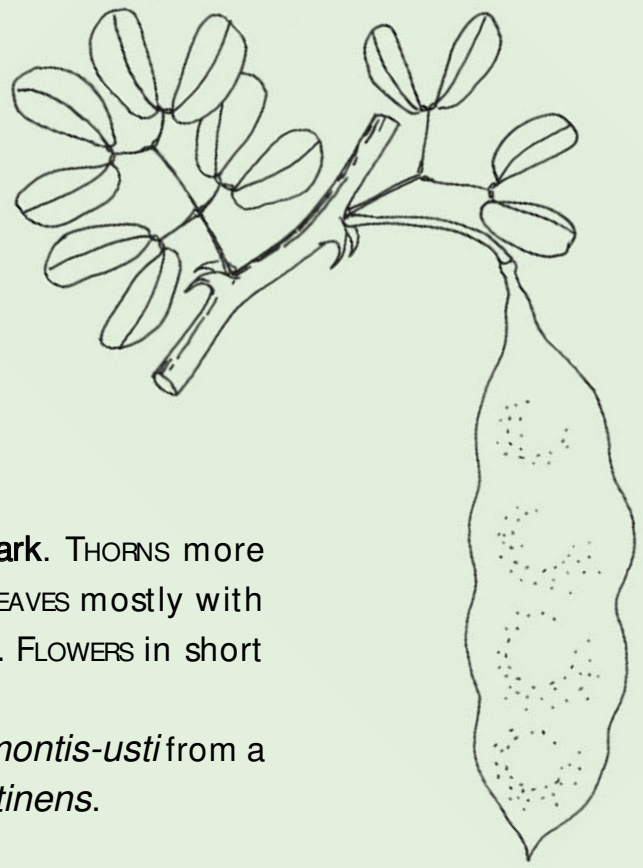
Of concern because of its effect on other species.

A. mellifera subsp. *mellifera*

Kunene Swarthaak

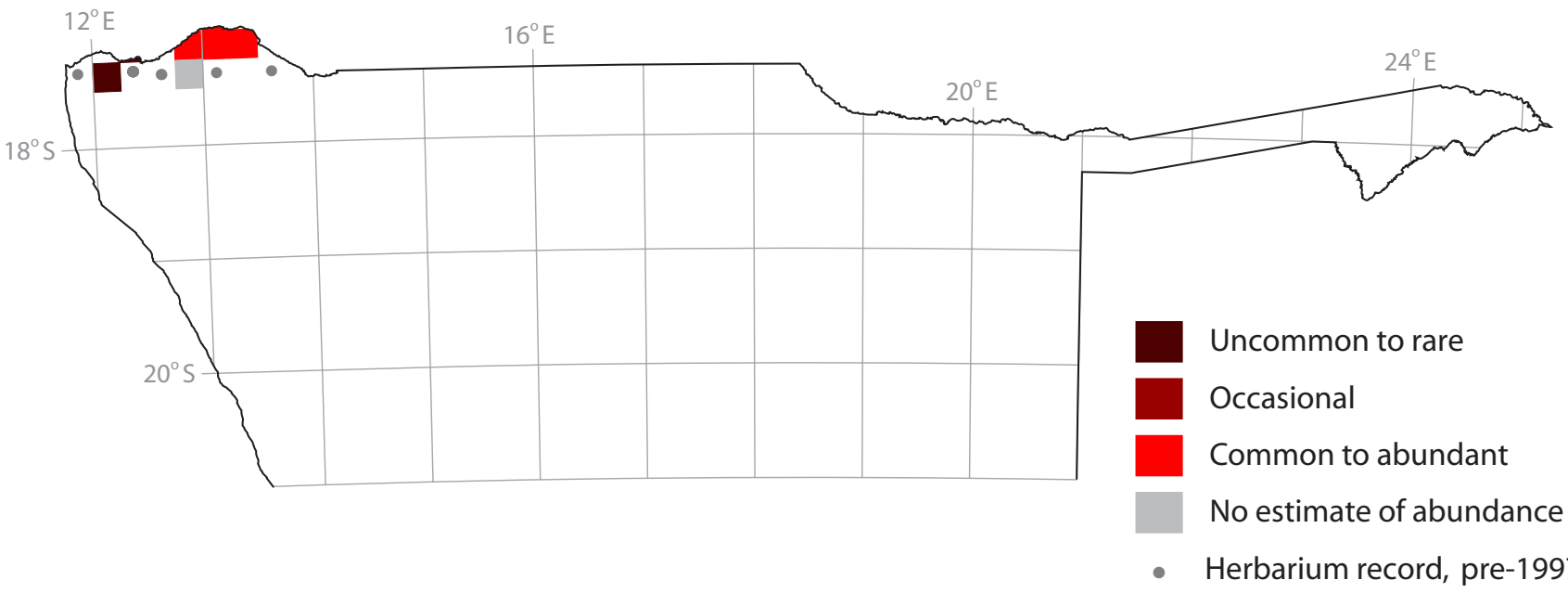
Omutukahere, omungondo (H)

[24 records from 11 (1%) squares]



Usually a **multi-stemmed shrub with very red, peeling bark**. THORNS more slender and less hooked than those of subsp. *detinens*. LEAVES mostly with two pinna pairs, each pinna with only a single leaflet pair. FLOWERS in short spikes.

This less-common subspecies superficially resembles *A. montis-usti* from a distance. It looks very different from *A. mellifera* subsp. *detinens*.



DISTRIBUTION, ABUNDANCE & HABITAT

Only found in the Kunene River valley and hills nearby. Mainly on rocky hill slopes, where it is abundant to common; abundant on the river banks.

GROWTH FORM

Mostly recorded as a tree 1–8 m tall.

ANNUAL CYCLE

Observations few. FLOWERS no TAP records, but herbarium records in July, September and October. FRUIT one TAP record in November. Herbarium records in June, July, October and November. LEAVES were recorded in all months that observations were made, except July; bare trees, also recorded in November.

GENERAL

It does not appear to be exploited for anything.

CONSERVATION CONCERNS

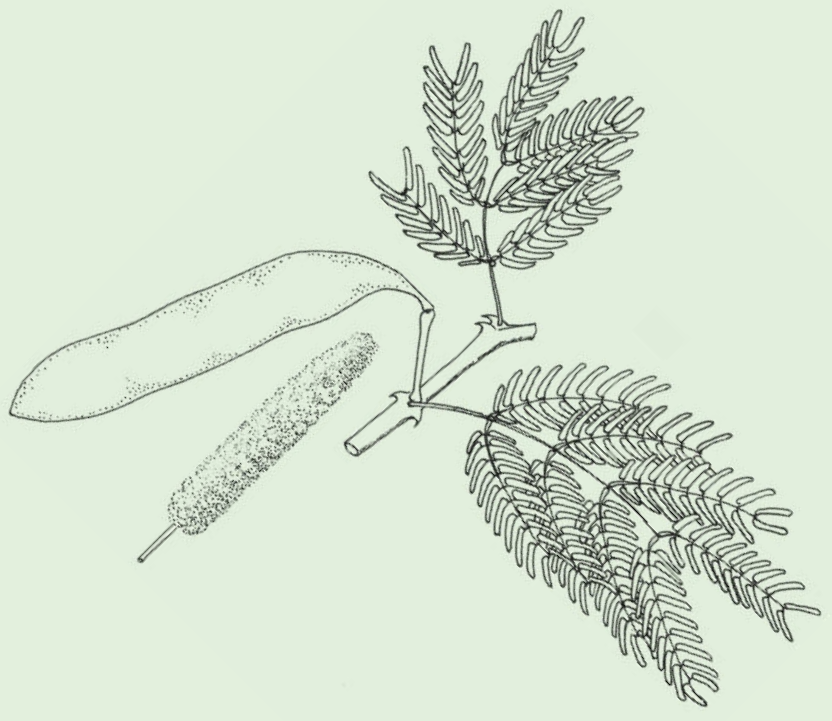
Although it has a very restricted range in Namibia, it is sufficiently common not to be endangered; however, a part of the population might be affected if the proposed Epupa Falls hydroelectric scheme goes ahead.

Acacia montis-usti

Brandberg Acacia

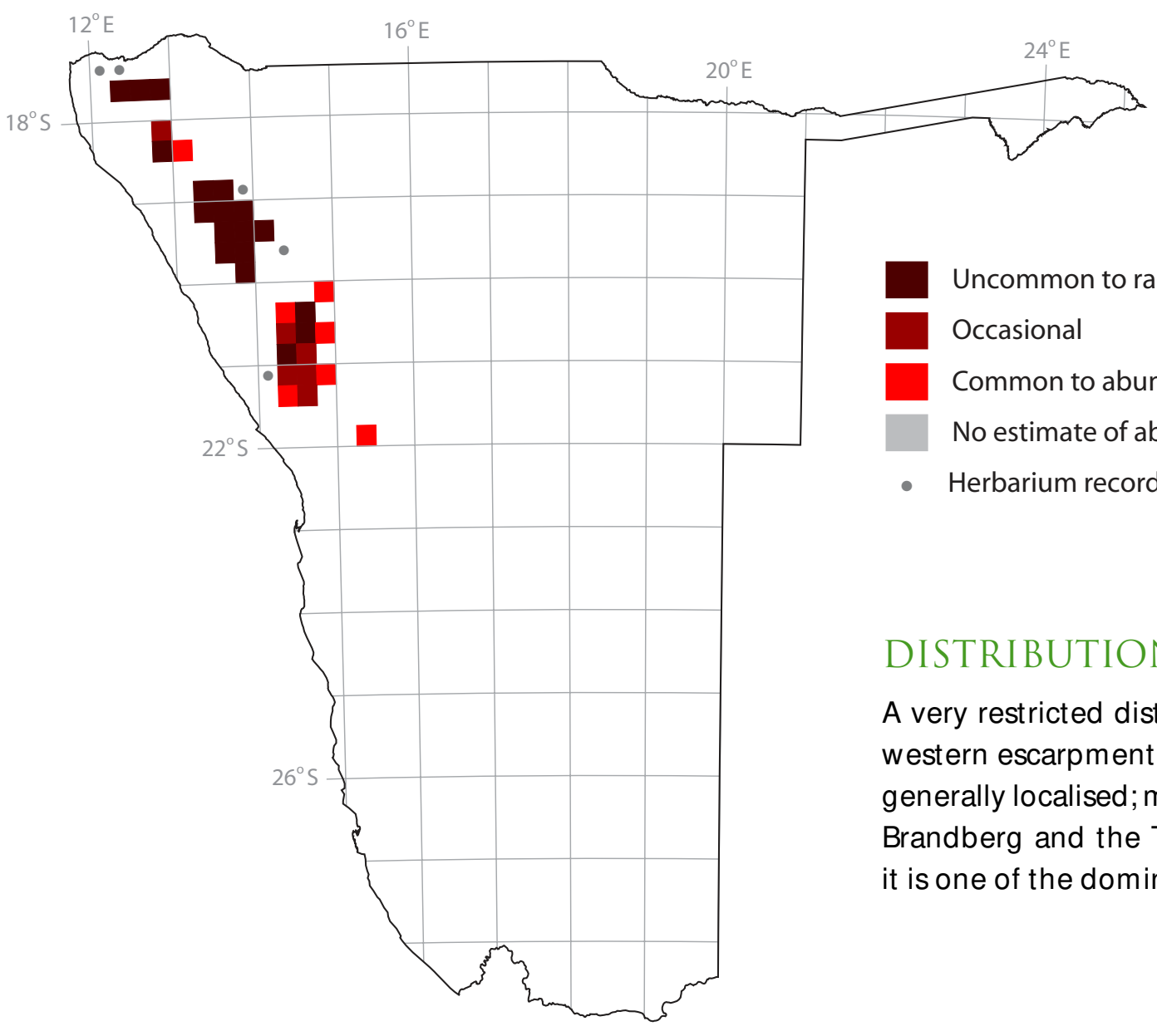
Nu-haib, aru, sai (K)

[72 records from 30 (3%) squares]



A **V-shaped shrub or tree** with a flat, spreading crown. **Numerous stems arise from near the ground** and branch higher up, resembling a **witch's broom**. BARK **red-brown to yellowish olive-green; flaking off in papery sheets**. THORNS paired, **slightly curved**, widely spaced. LEAVES medium-sized; petiole short with gland at base of first pinna pair. FLOWERS in cream-coloured to yellow spikes. FRUIT a thick, woody, brittle pod; dark brown.

In the extreme north-west, this plant may be confused with *A. mellifera* subsp. *mellifera* from a distance.

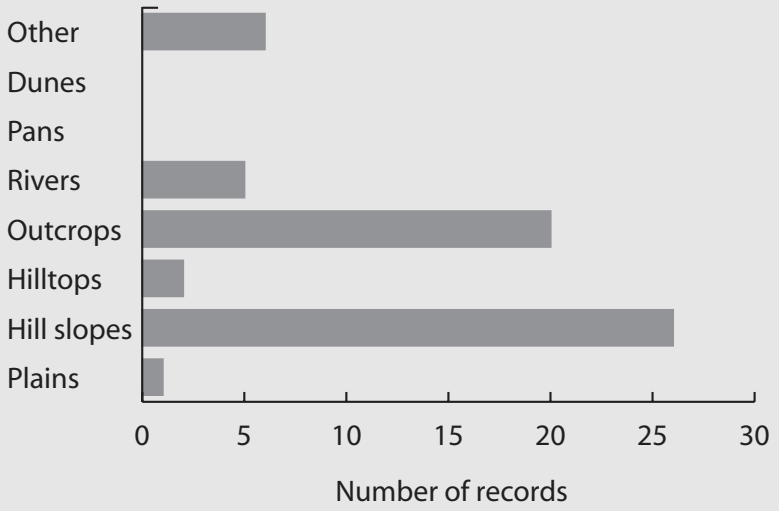


DISTRIBUTION & ABUNDANCE

A very restricted distribution along the north-western escarpment. Common to uncommon, generally localised; most abundant around the Brandberg and the Twyfelfontein area, where it is one of the dominant woody species.

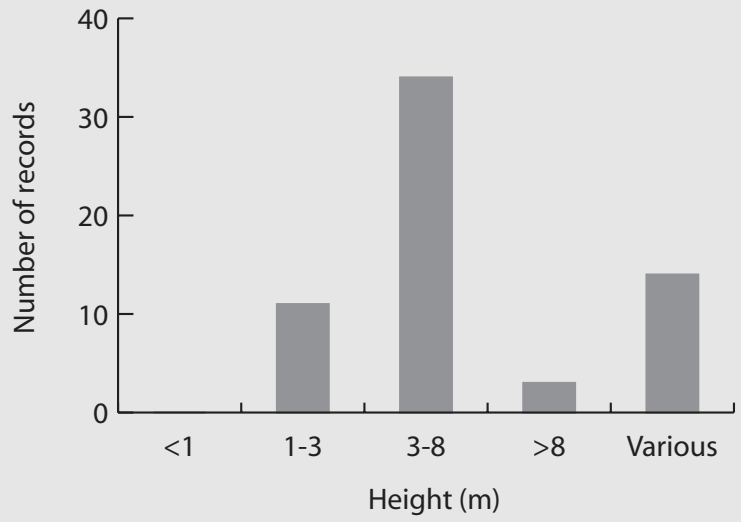
HABITAT

Mostly rocky hill slopes and rocky outcrops.



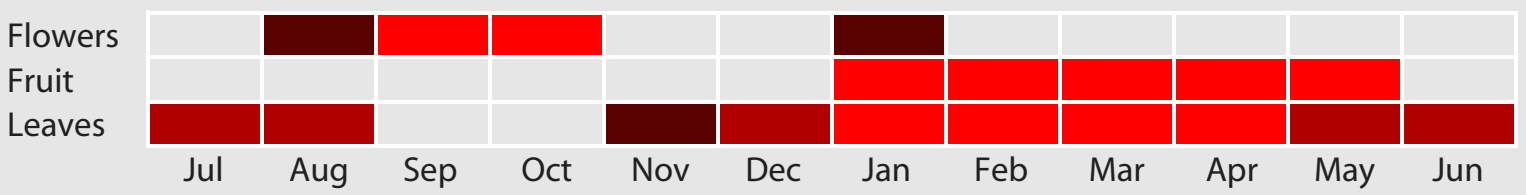
GROWTH FORM

Mostly a shrubby tree of 3–8 m.



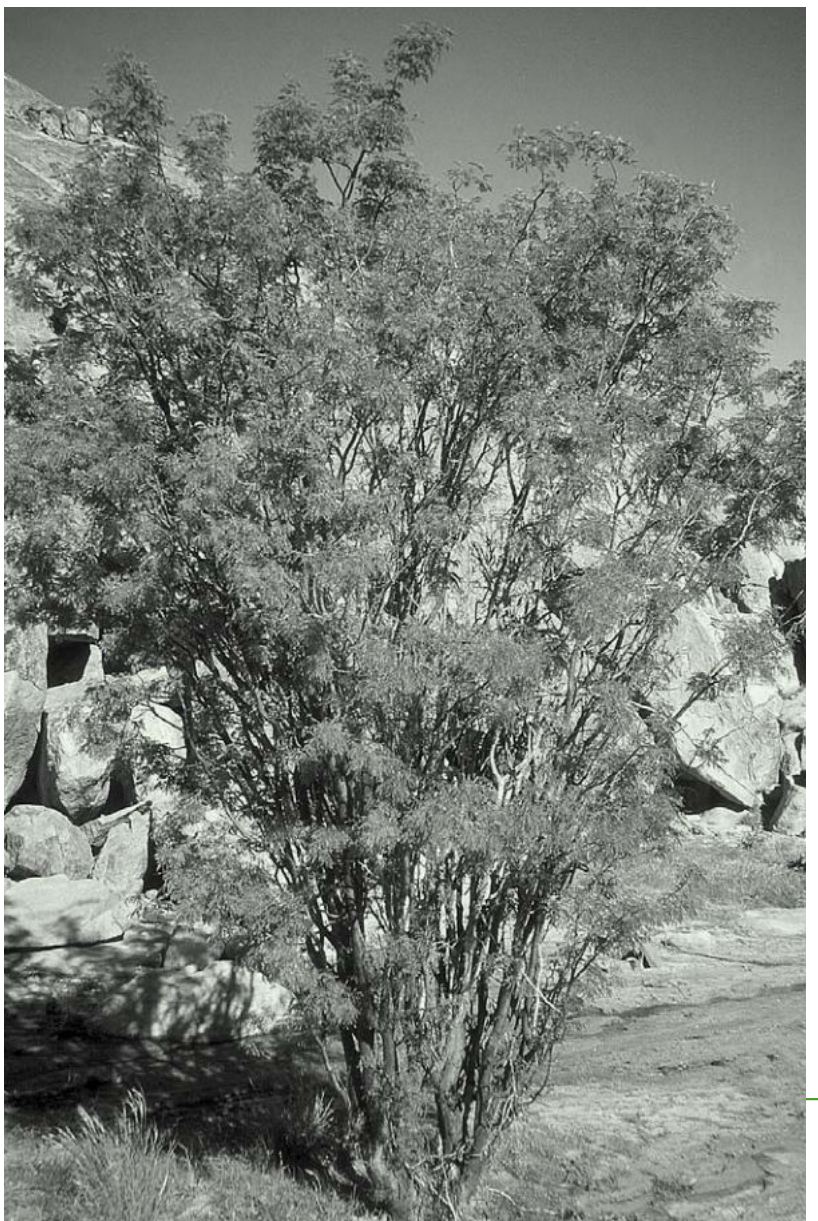
ANNUAL CYCLE

FLOWERS mainly September and October. Coates Palgrave (2002) indicates flowering in November and December, but this was not confirmed by herbarium or TAP records, despite eight observations of annual cycle during those two months. FRUIT January to May, with one record in October. LEAVES December to August, with leaf buds in November.



CONSERVATION CONCERNS

As an endemic with a very restricted range, it is worthy of conservation, but it does not appear to be threatened as its habitat is inaccessible and it is currently not exploited for anything. Protected by forestry legislation.



Acacia montis-usti, Brandberg, K. Roberts

Acacia nebrownii

Slapdoring

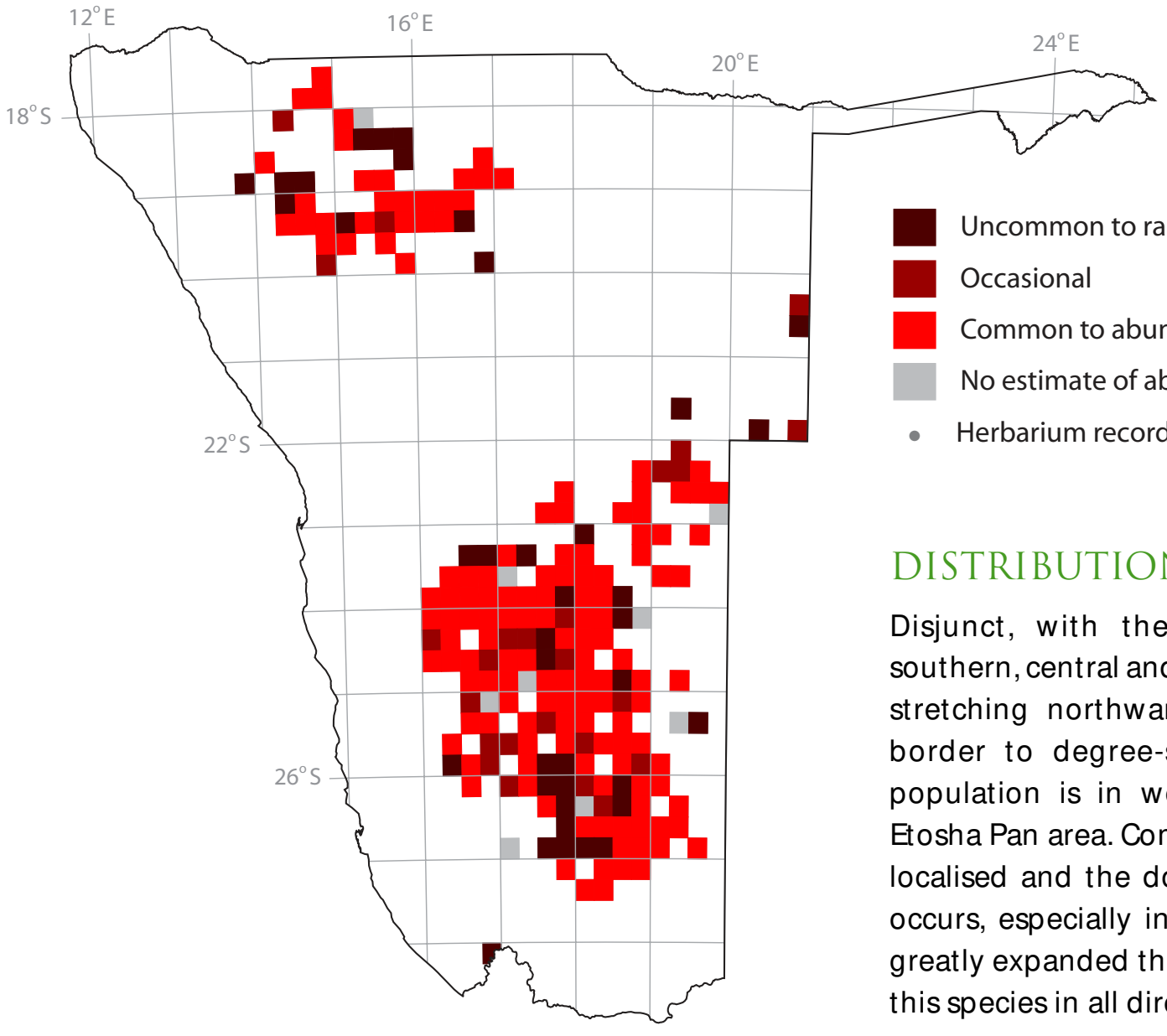
Water-thorn (E); soetdoringbos (in the south), waterdoring (A); Pfannenstrauch (G); orupunguya (H); /nubib (K)

[560 records from 216 (20%) squares]



A **straggly and untidy shrub** up to 3 m, often forming thickets. **Young shoots covered in sticky glands**. THORNS paired, slender, straight, white. LEAVES clustered at nodes, generally with **only one pinna pair; shiny green**. FLOWERS; **round, yellow balls**; FRUIT a **crescent-shaped pod, with numerous protruding black, sticky glands**.

The flowers are conspicuous; young pods can be overlooked. The **extremely glandular stems, leaves and pods** separate it from all the other Namibian *Acacia* spp., although at a distance it is sometimes mistaken for young plants of *A. karroo*.



DISTRIBUTION & ABUNDANCE

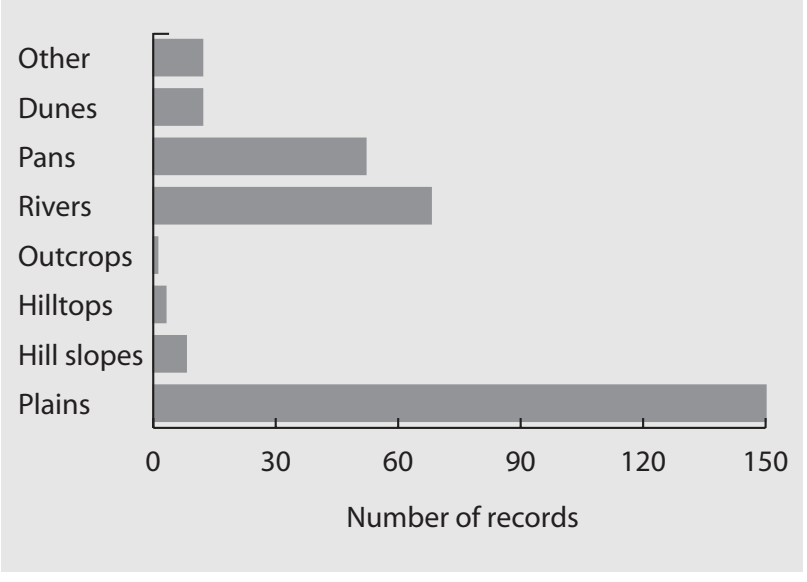
Disjunct, with the largest population in southern, central and central-eastern Namibia, stretching northwards along the Botswana border to degree-square 2020; the other population is in western Omusati and the Etosha Pan area. Common to abundant. Often localised and the dominant species where it occurs, especially in the south. The TAP has greatly expanded the recorded distribution of this species in all directions.

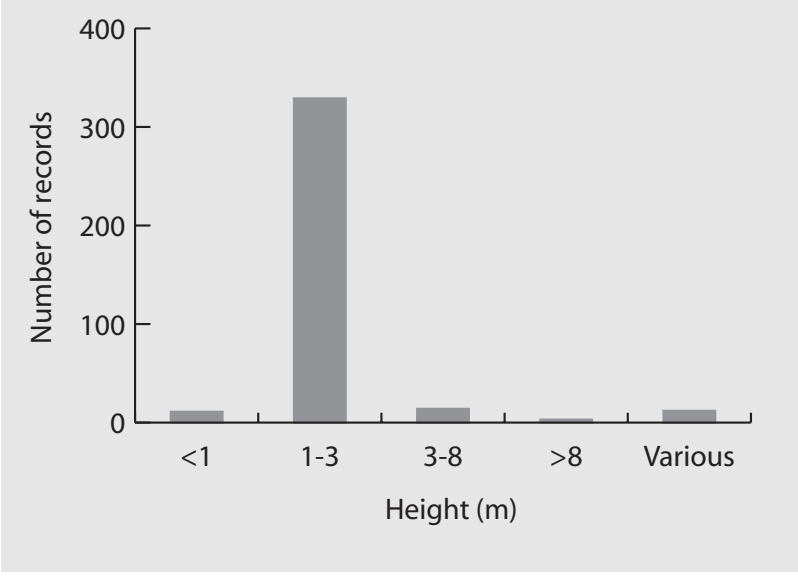
GROWTH FORM

Mostly a shrub up to 3 m high, very occasionally up to 8 m high. Often found in dense thickets.

HABITAT

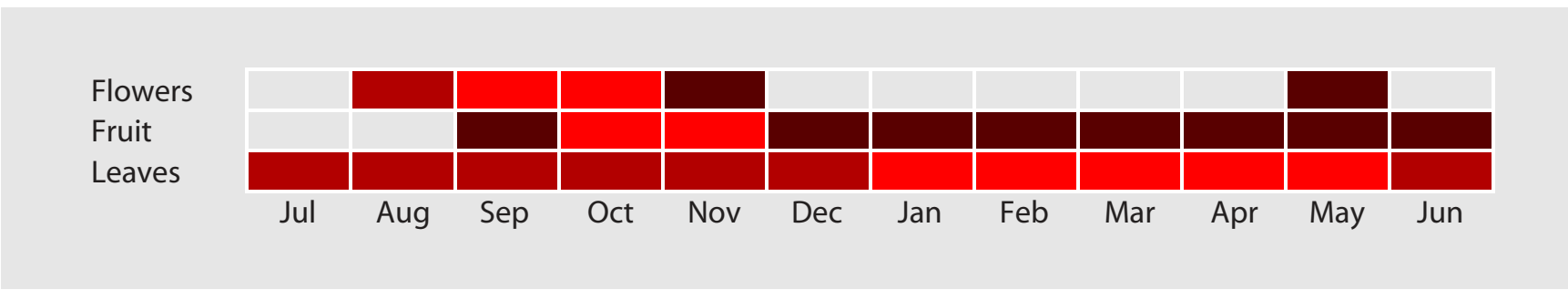
Mostly on plains, in pans or depressions and in dry rivers; it occurs sporadically in a wide range of other habitats, where it is usually rare to uncommon. Generally found on limestone, calcrete and sometimes clay; rarely on sand.





ANNUAL CYCLE

FLOWERS mainly August to October, with a few records until February and again in May (1998, 2000 and 2001), which presumably reflects a response to late rain. FRUIT probably under-recorded, but mainly October and November, with some records from September to June. LEAVES recorded on at least some individuals all year round, but bare plants recorded from May until December; new leaves mostly in September and October.



GENERAL

The sweetly scented flowers attract insects. Browsed by antelope, giraffe, elephant and rhinos; only moderately utilised by livestock. An encroaching species often found in dense stands in road reserves where water collects during the rainy season. Often parasitised by *Tapinanthus* spp.

CONSERVATION CONCERNS

None recorded.



Acacia nebrownii, pods, H. Kolberg

Acacia nigrescens

Knob-thorn

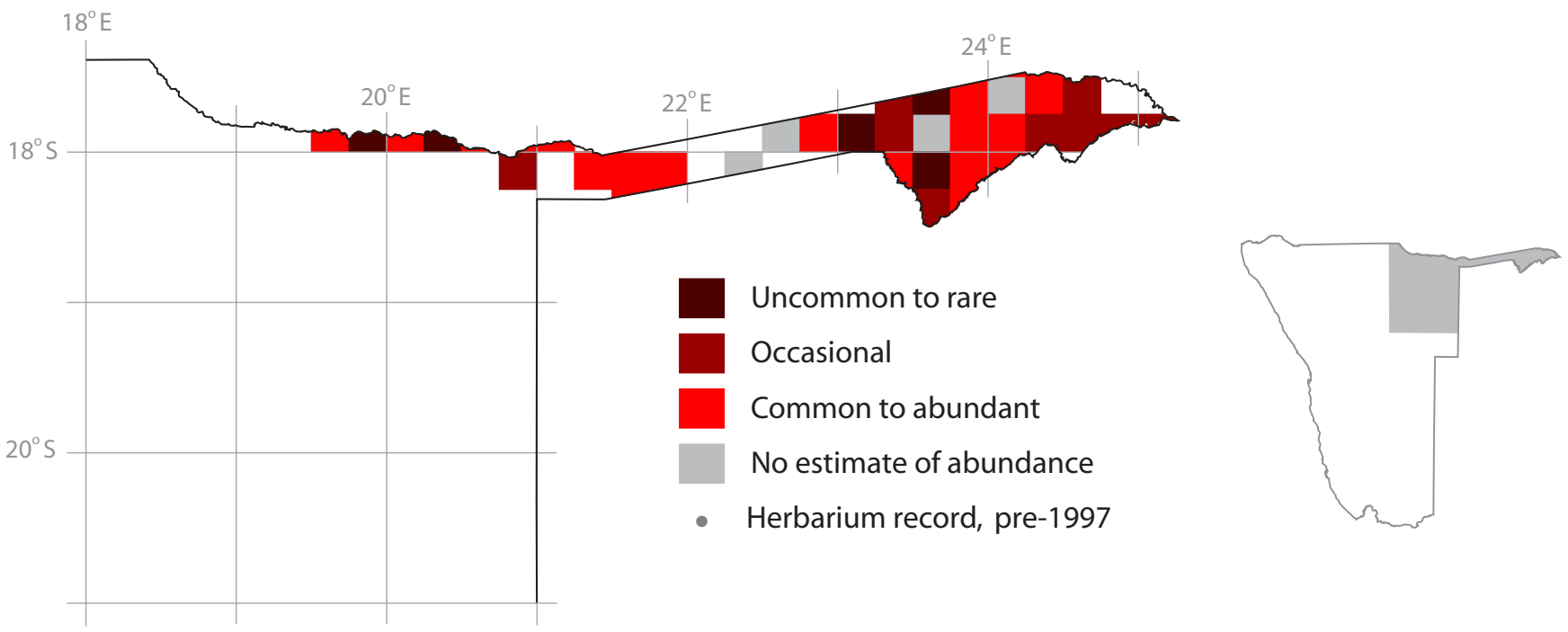
Knoppiesdoring (A); yi (J); mukotokoto (L); ngandu (Rk, Rum)

[123 records from 38 (4%) squares]



A tall tree with an **erect**, single trunk and spreading canopy. BARK **yellowish and papery or dark and longitudinally fissured**; often with hooked thorns on **raised knobs on trunk** and older branches, although not always present. THORNS paired, hooked. LEAVES with 2–3 pinna pairs, each with 1–2 pairs of **large, oval leaflets**. FLOWERS in spikes just before the leaves; white with reddish buds. FRUIT a straight, flat, narrow pod, with pointed tips.

When not in leaf it can be confused with *A. polyacantha* or *A. galpinii*.

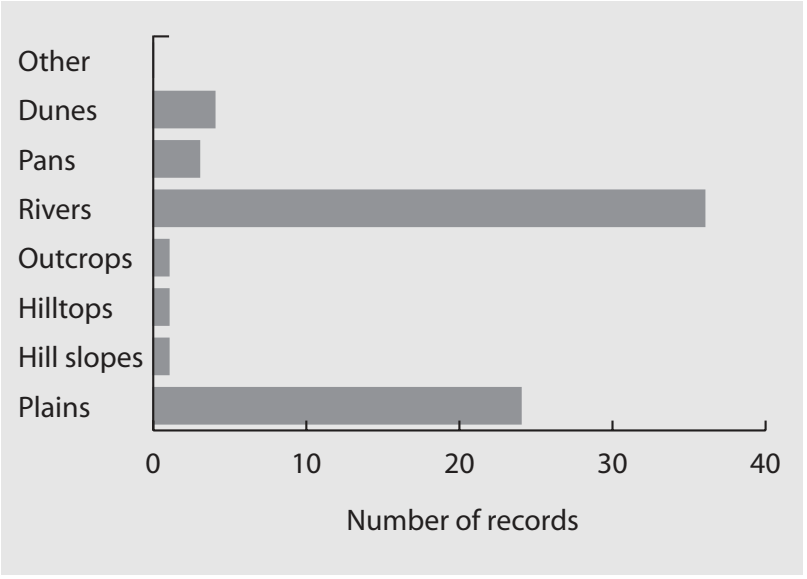


DISTRIBUTION & ABUNDANCE

Generally common and widespread in Caprivi and along the Okavango River.

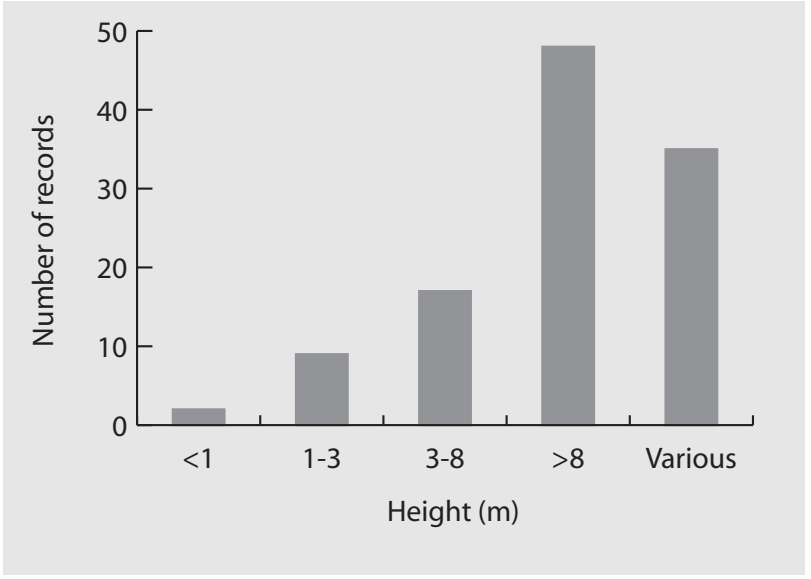
HABITAT

Always in woodlands or riverine forest. Mostly on sandy plains, where it is common to abundant; more often abundant on river banks; occasional on floodplains. Generally growing on sand, but often recorded on termite hills.



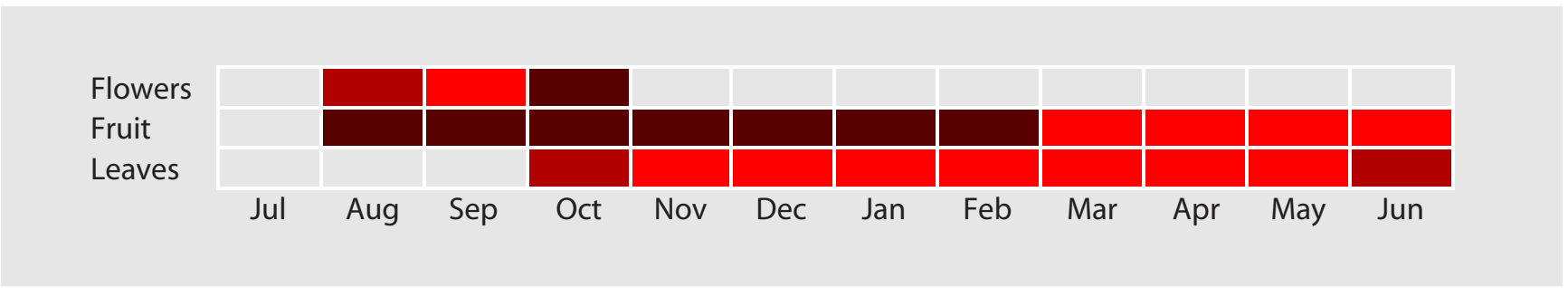
GROWTH FORM

Mostly a tree over 8 m high; many young plants recorded.



ANNUAL CYCLE

FLOWERS August to October, but mostly in September. FRUIT most often from March to June, but also noted on some trees from August to February. LEAVES mainly November to May, with new leaves recorded in October and February.



GENERAL

The wood of *A. nigrescens* is used for making furniture, fence poles and implements; the bark for making string. The tree is browsed by stock and game, including elephant. In many areas along the river it forms impenetrable stands, especially in protected areas. One individual grew up as a volunteer on Farm Chipururu (1918AD) where it was a tree, 5 m tall (KAH11998).

CONSERVATION CONCERNS

Threatened by clearing for homesteads and fields, especially along the Okavango River.



Acacia nigrescens, knobs on trunk, P. Tarr

Acacia nilotica

Lekkerruikpeul

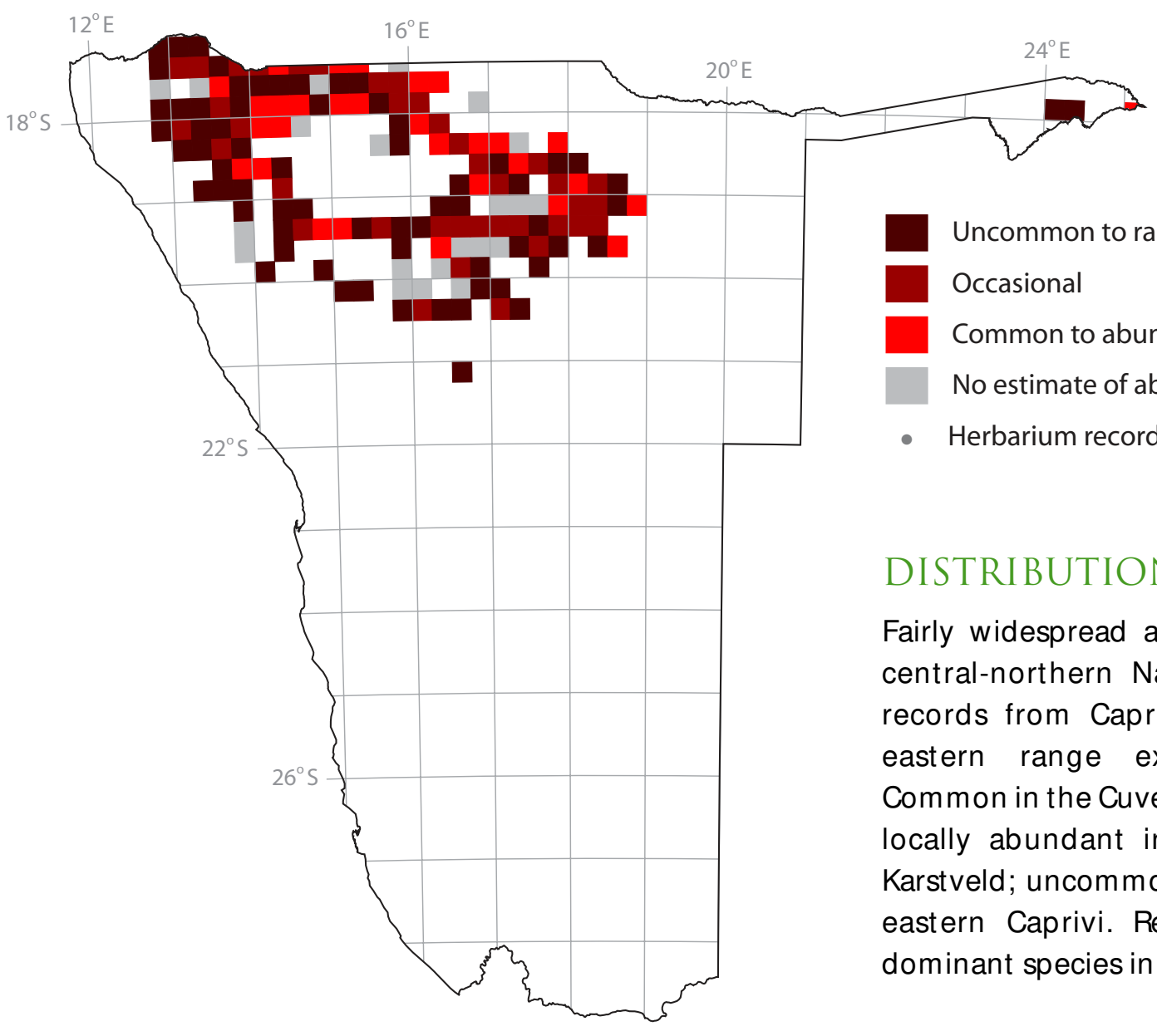
Scented-pod Acacia (E); olufu (H); omityuula (Ok)

[412 records from 156 (15%) squares]



A low, spreading shrub or small tree with a rounded crown. BARK dark, fissured; **cracking on young growth**. THORNS straight, sharp and needle-like; **swept backwards**. LEAVES medium-sized, with many small, **closely packed leaflets on a hairy rachis**. FLOWERS in yellow balls. FRUIT a long and straight pod with diagnostic **constrictions between seeds, resembling a string of beads; pleasantly and strongly scented**.

Flowers and pods are conspicuous. When not in pod it could be confused with *A. karroo*, but is distinguised by its closely packed leaflets and swept-back thorns.

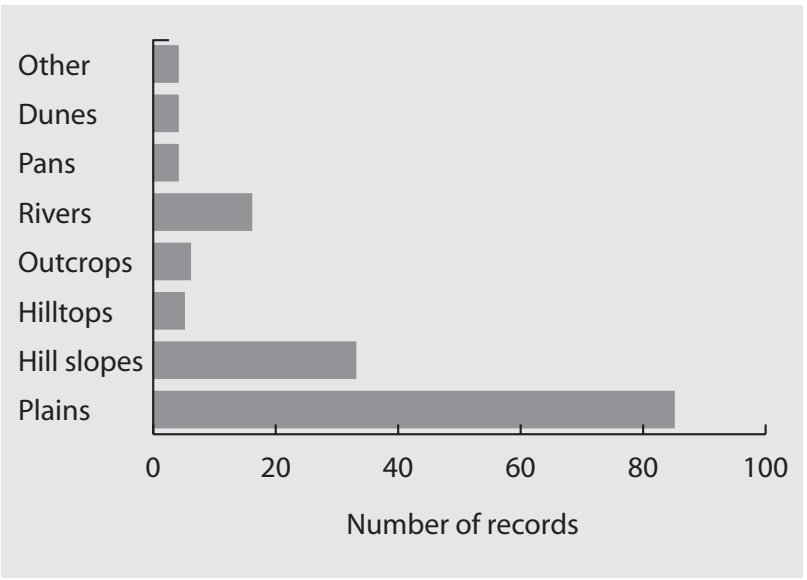


DISTRIBUTION & ABUNDANCE

Fairly widespread across north-western and central-northern Namibia; with three new records from Caprivi, which represent an eastern range extension for Namibia. Common in the Cuvelai and on Impalila Island; locally abundant in places in the eastern Karstveld; uncommon in the north-west and eastern Caprivi. Recorded as one of the dominant species in 1817D.

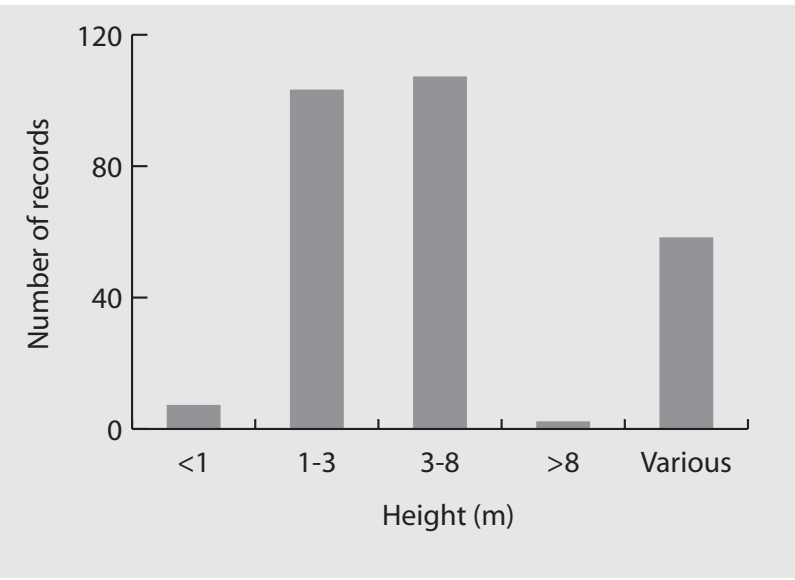
HABITAT

Found chiefly on plains and hill slopes, in mixed woodlands; along dry rivers in the north-west. Grows on sand and calcrete.



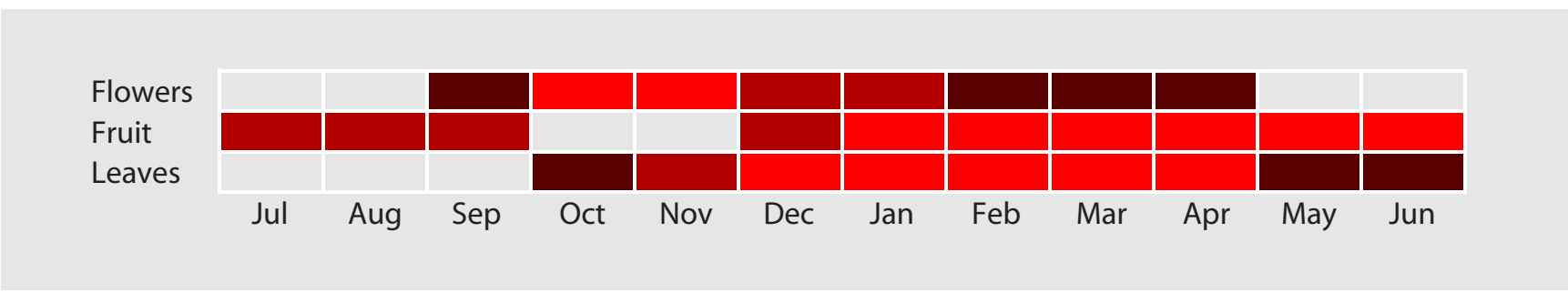
GROWTH FORM

Generally a tree up to 8 m tall; often shrubby, especially in the 1–3-m height category; seldom over 8 m tall.



ANNUAL CYCLE

FLOWERS peak in October and November, but may be found from September to April. FRUIT most months, but mostly from January to June. LEAVES generally November to April, with young leaves produced from October to December.



GENERAL

Heavily browsed by a number of animals, including various antelope species and rhino. Spines used traditionally, in sewing and basketry, and to remove splinters. These plants are frequently infested by parasites.

CONSERVATION CONCERNS

None recorded.



Acacia nilotica, Oshana Region, B. Curtis

Acacia reficiens

Rooihaak

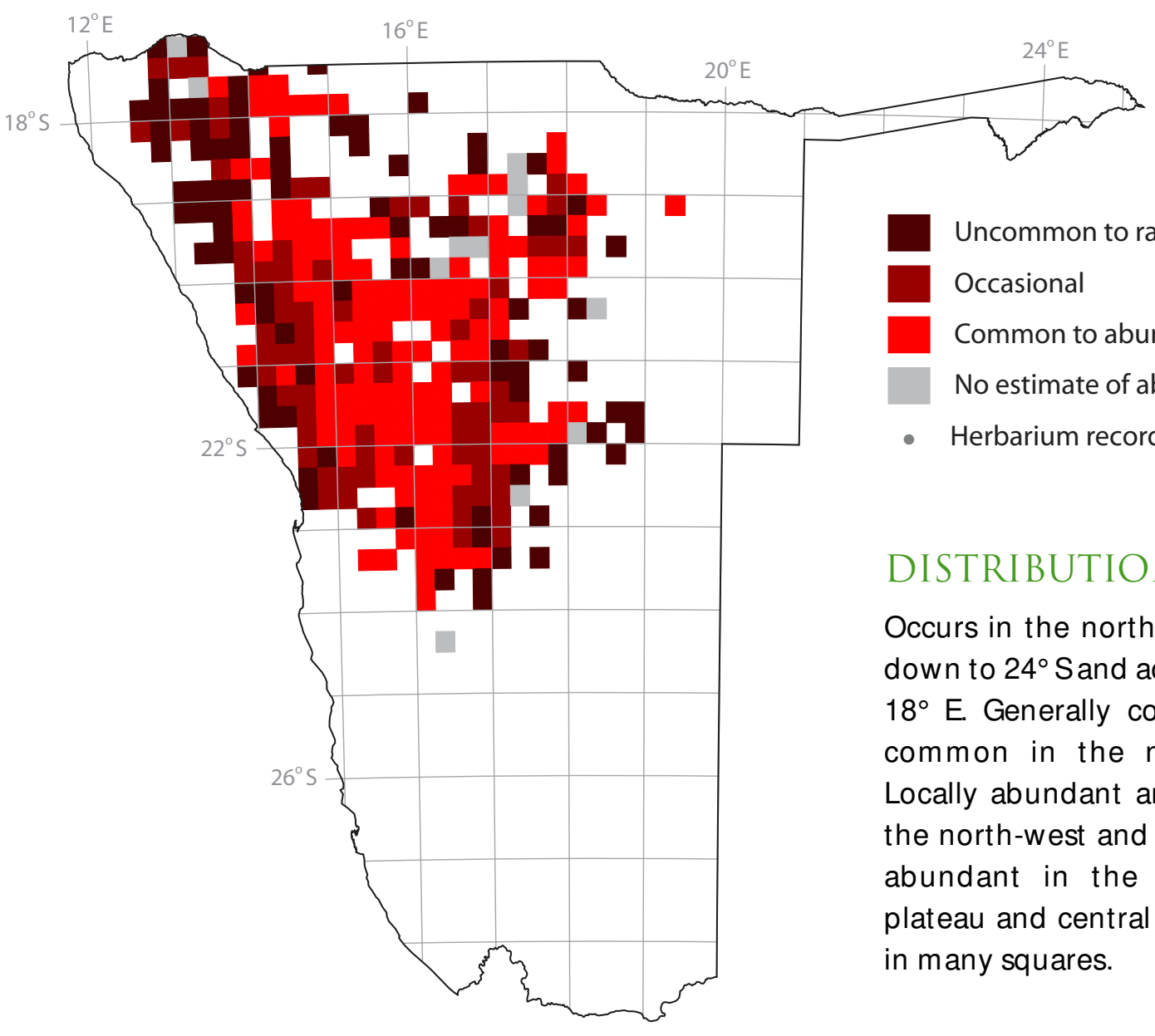
Red-thorn (E); Rotrindenakazie (G); Igu (J, Nh); !gûs (K)

[1,055 records from 316 (30%) squares]



Usually a V-shaped shrub. BARK **reddish**, especially in younger growth. THORNS **paired, either both hooked, both straight, or one hooked and the other straight**. LEAVES **with 1–4 pinna pairs and 5–11 leaflet pairs**, no hairs on margins. FLOWERS in creamy-white balls. FRUIT a flat, linear-oblong, reddish-brown pod; slightly pointed at the tips.

Flowers and pods are fairly conspicuous. The plant is very similar to *A. luederitzii*. May be distinguished by fewer pinna pairs, and leaflets that lack hairs along the margins (although there can be hairs on the midrib). More often a shrub than a tree, but often a tree where it overlaps with *A. luederitzii*. Many TAP records may have been misidentified. We have tried to clean the data where possible, based on growth form and distribution. Completely uncertain records have been deleted from the database. Farmers often do not distinguish between the two species, and simply refer to them as 'basterkameel'.

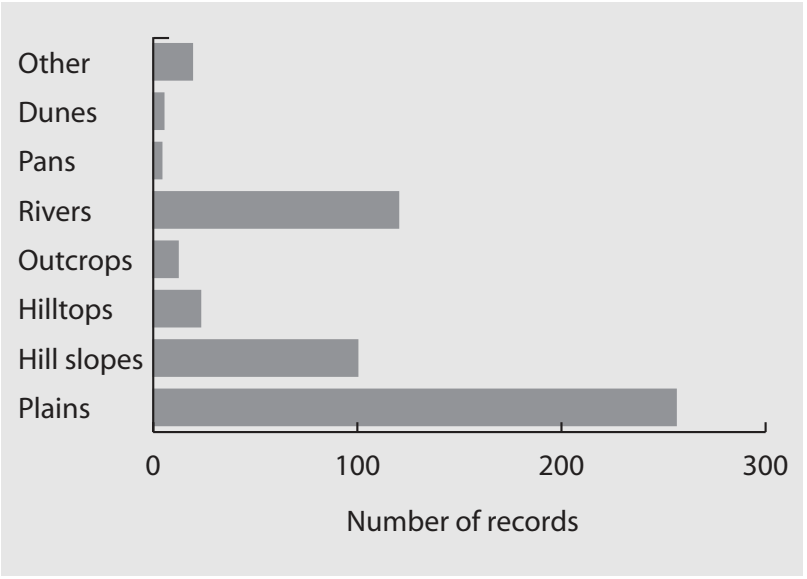


DISTRIBUTION & ABUNDANCE

Occurs in the north-western half of Namibia, down to 24° S and across as far east as roughly 18° E. Generally common. Common to uncommon in the north-west and Cuvelai. Locally abundant and dominant in places in the north-west and central-west. Common to abundant in the Karstveld, north-central plateau and central highlands, and dominant in many squares.

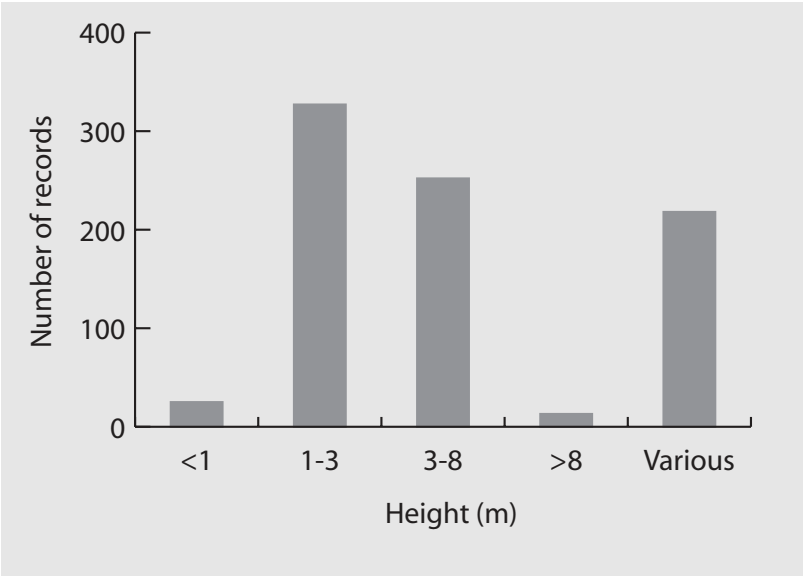
HABITAT

Found in various habitats, but predominantly on plains. Also found on hills and in dry rivers in the north-west; around pans and oshanas in the Cuvelai; along dry rivers in the central-west and on hills on the north-central plateau and the central highlands. Mostly growing on gravel or rocky/stony substrates, including granite and calcrete; seldom on sand.



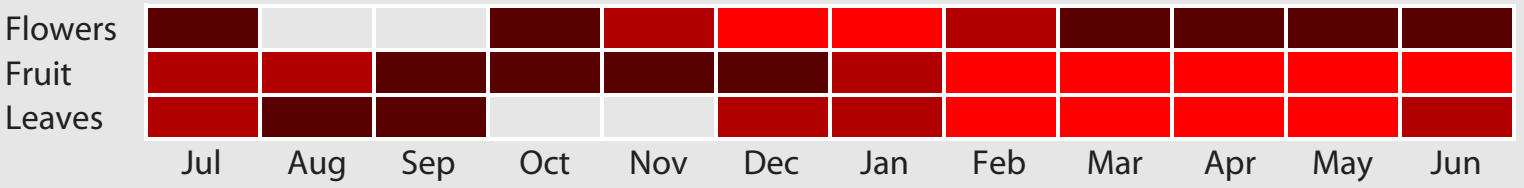
GROWTH FORM

About as often a shrub or shrubby tree as a tree. Most often from 1–3 m high, but frequently 3–8 m; seldom over 8 m. Stands of mixed heights found throughout the country.



ANNUAL CYCLE

FLOWERS mainly December and January, but a few records for most of the year. FRUIT on most trees from February to June, but some pods on some plants all year; young pods from November to March, with ripe pods mostly in July. LEAVES deciduous, with most trees bare from August to November; young leaves are produced from September to February.



GENERAL

Regarded as a very aggressive invader in many places, especially, but not necessarily, in disturbed areas. Fruits prolifically, and appears to have the ability to form a seed bank, unlike *A. mellifera*. Seeds germinate easily, and it has the ability to displace other species even without disturbance. Noted as having 'taken over' where *A. mellifera* and *Colophospermum mopane* have been controlled by felling and charcoal production. In the west, near Omaruru, dense thickets about 1.5 m high have been formed by this species. Die-backs of large specimens have been observed for some time. Harvested for charcoal production, producing good charcoal; subject to bush-clearing.

Leaves, flowers, bark and branches are browsed by a variety of animals, including springbok, giraffe, rhino and elephant. The gum is edible; the bark and roots are used medicinally.

CONSERVATION CONCERNS

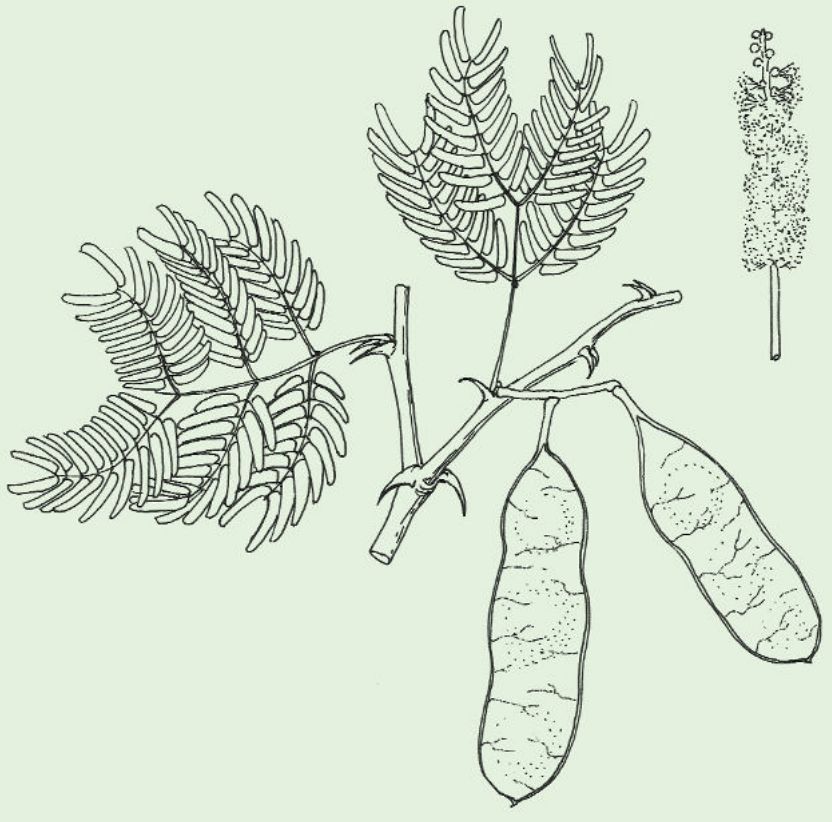
Of concern because of its effect on other species.

Acacia robynsiana

Hemelbesem

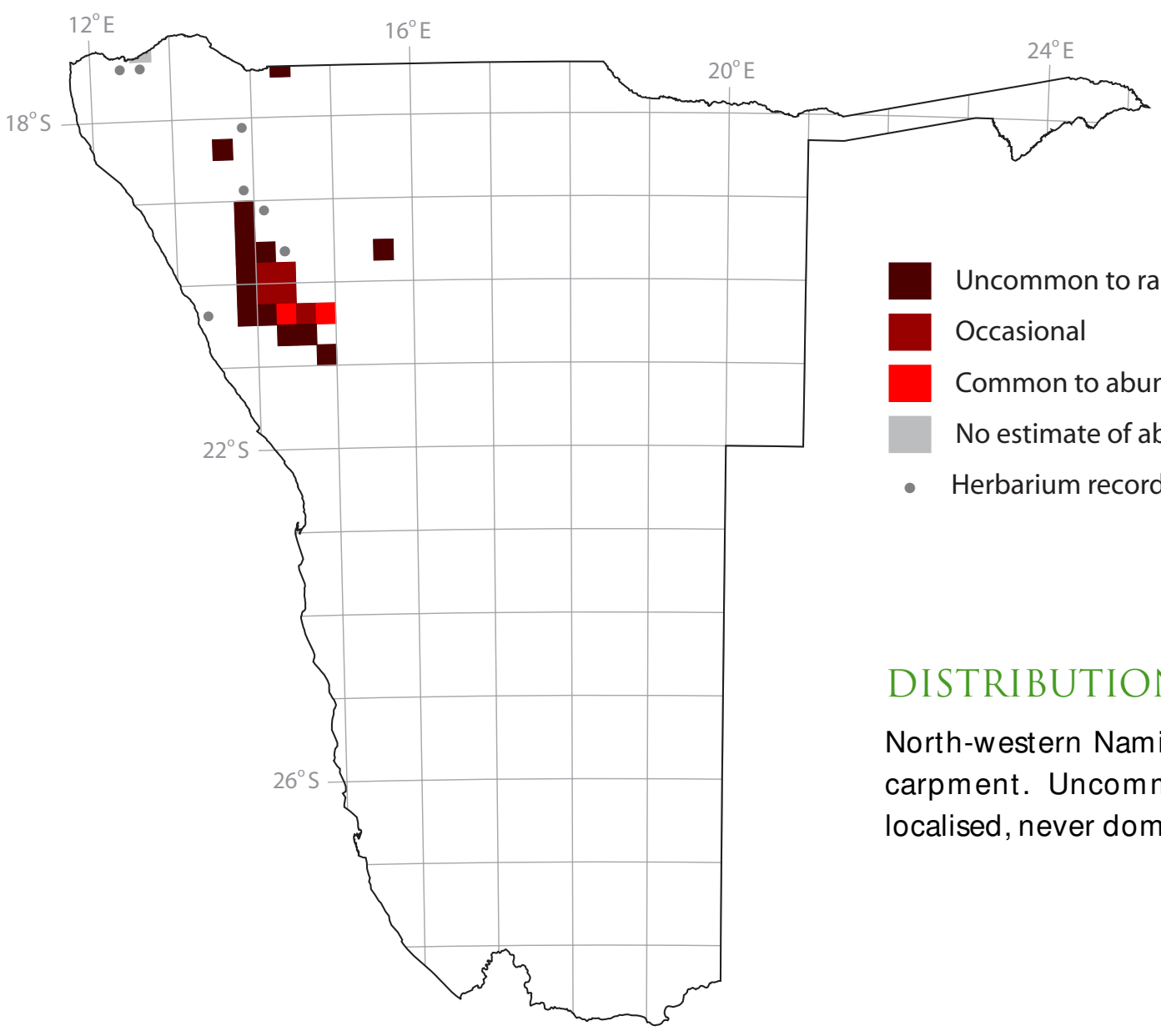
Whip-stick acacia (E); Antennenakazie (G); Inue (K)

[79 records from 22 (2%) squares]



An **untidy**, open shrub with **a few very long, slender, whip-like branches reaching to the sky**; generally, growing on rocky hilltops. THORNS small and hooked. LEAVES with **1–3 well-spaced pinna pairs and a gland at the junction of each pinna pair**. FLOWERS in pale yellow spikes. FRUIT a flattened pod, fairly straight, with thickened margin, yellowish-brown.

Flowers and pods are fairly conspicuous. Cannot easily be confused with other species.

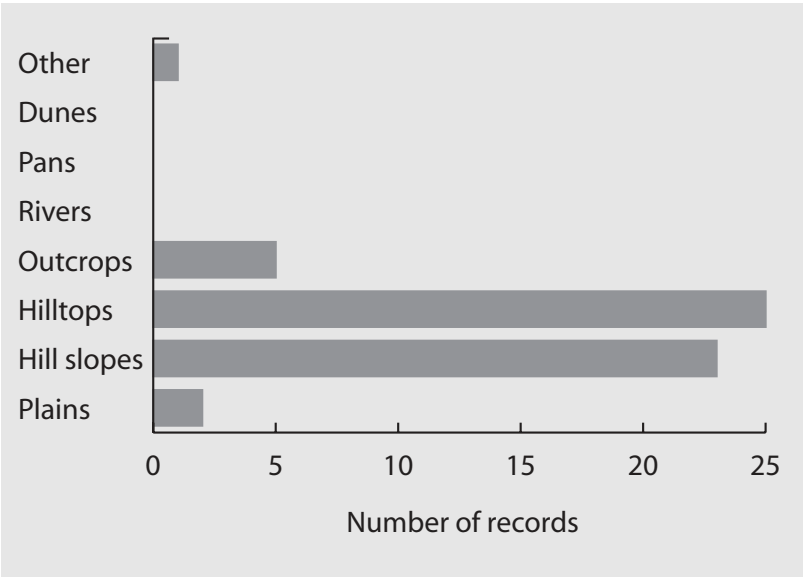


DISTRIBUTION & ABUNDANCE

North-western Namibia, mostly along the escarpment. Uncommon to common, often localised, never dominant.

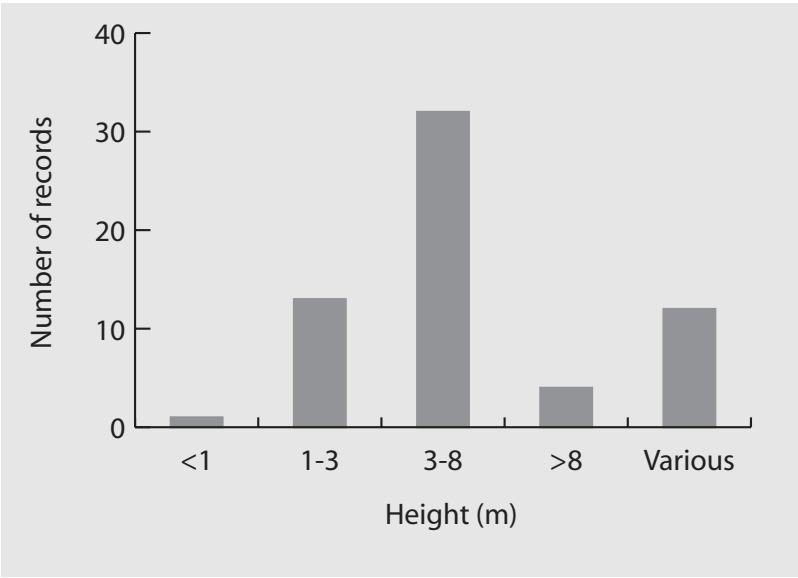
HABITAT

Mostly on rocky hilltops and hill slopes. Always on rock.



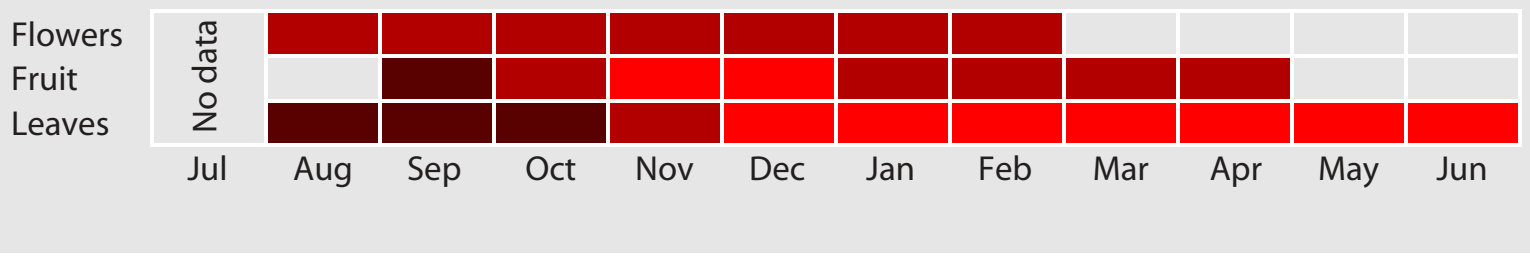
GROWTH FORM

A shrubby tree, mostly 3–8 m tall, occasionally over 8 m; often a shrub 1–3 m high.



ANNUAL CYCLE

FLOWERS August to February. FRUIT from September to April. LEAVES present on at least some trees from November until August, with young leaves in November and December.

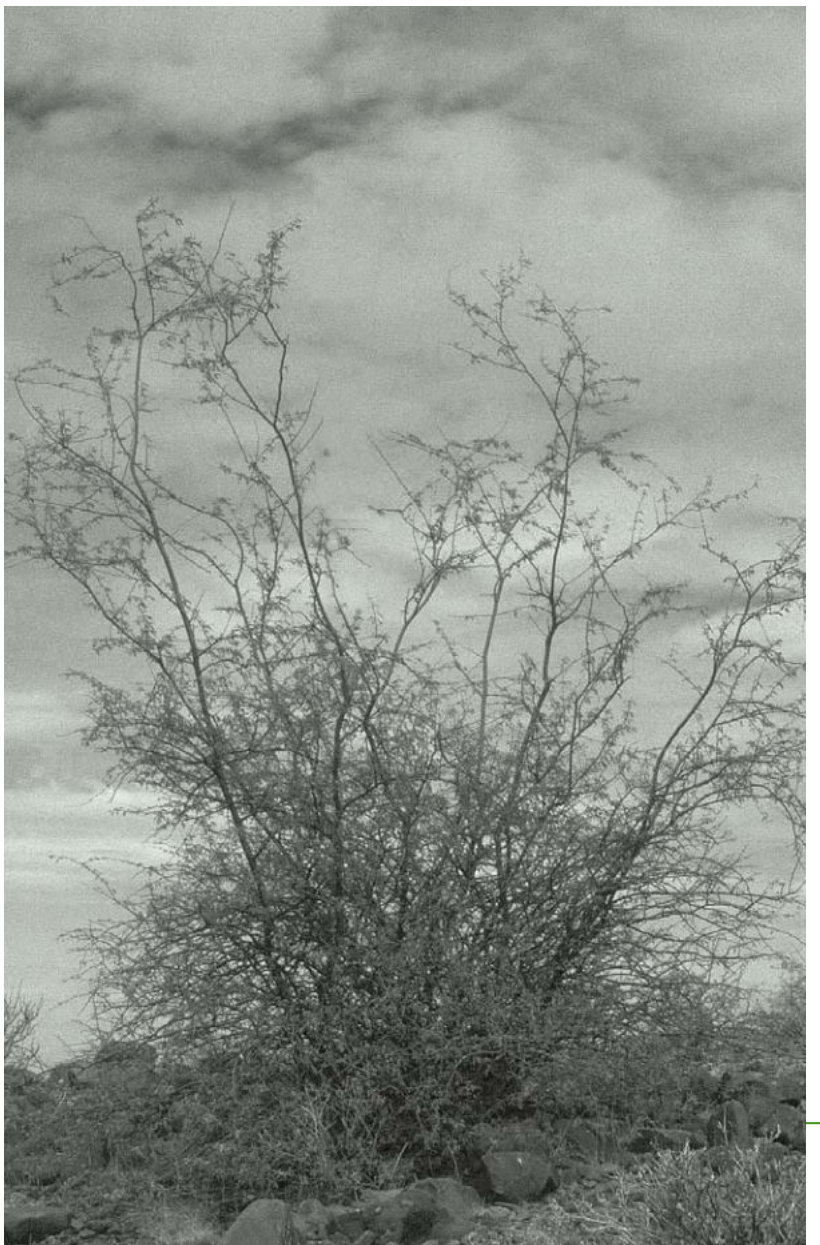


GENERAL

Cultivation of this species is untested, but it has potential as a feature plant in dry gardens. Has been used to provide masts for high frequency radios. The long branches are sometimes used to construct temporary shelters.

CONSERVATION CONCERNS

This species is endemic to the Namib Desert, but is not threatened as it inhabits inaccessible places and is not utilised much. Protected by forestry legislation.



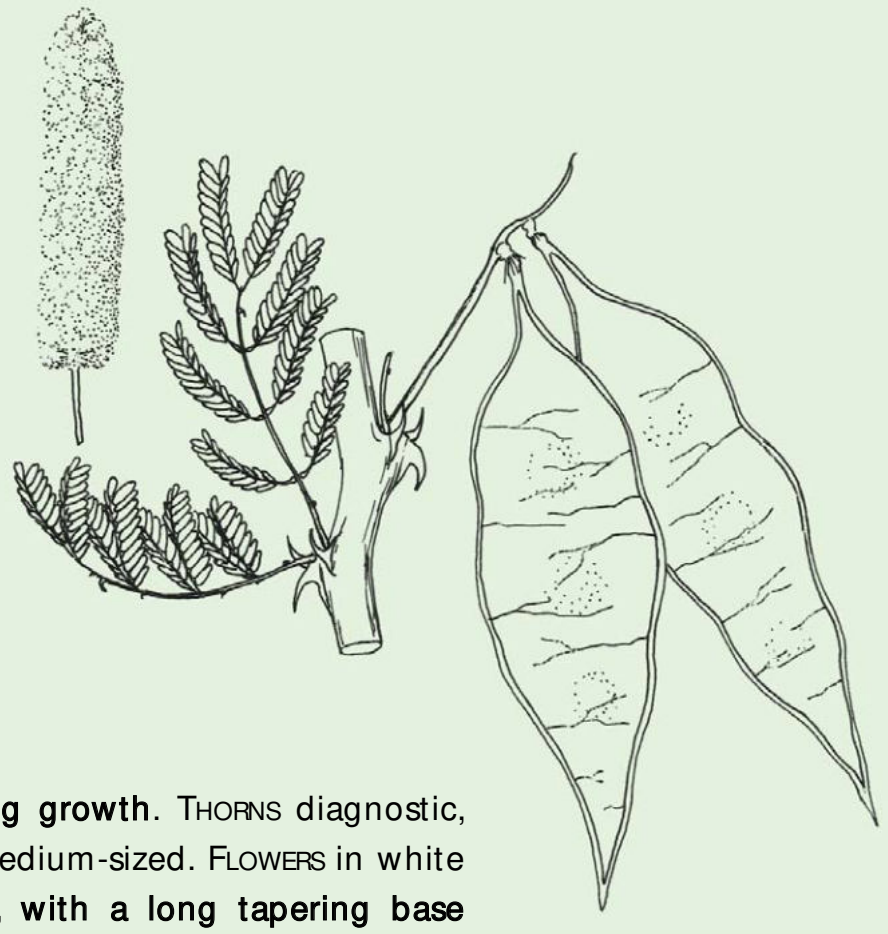
Acacia robynsiana, Kaokoveld, B. Curtis

Acacia senegal

Driehaakdoring

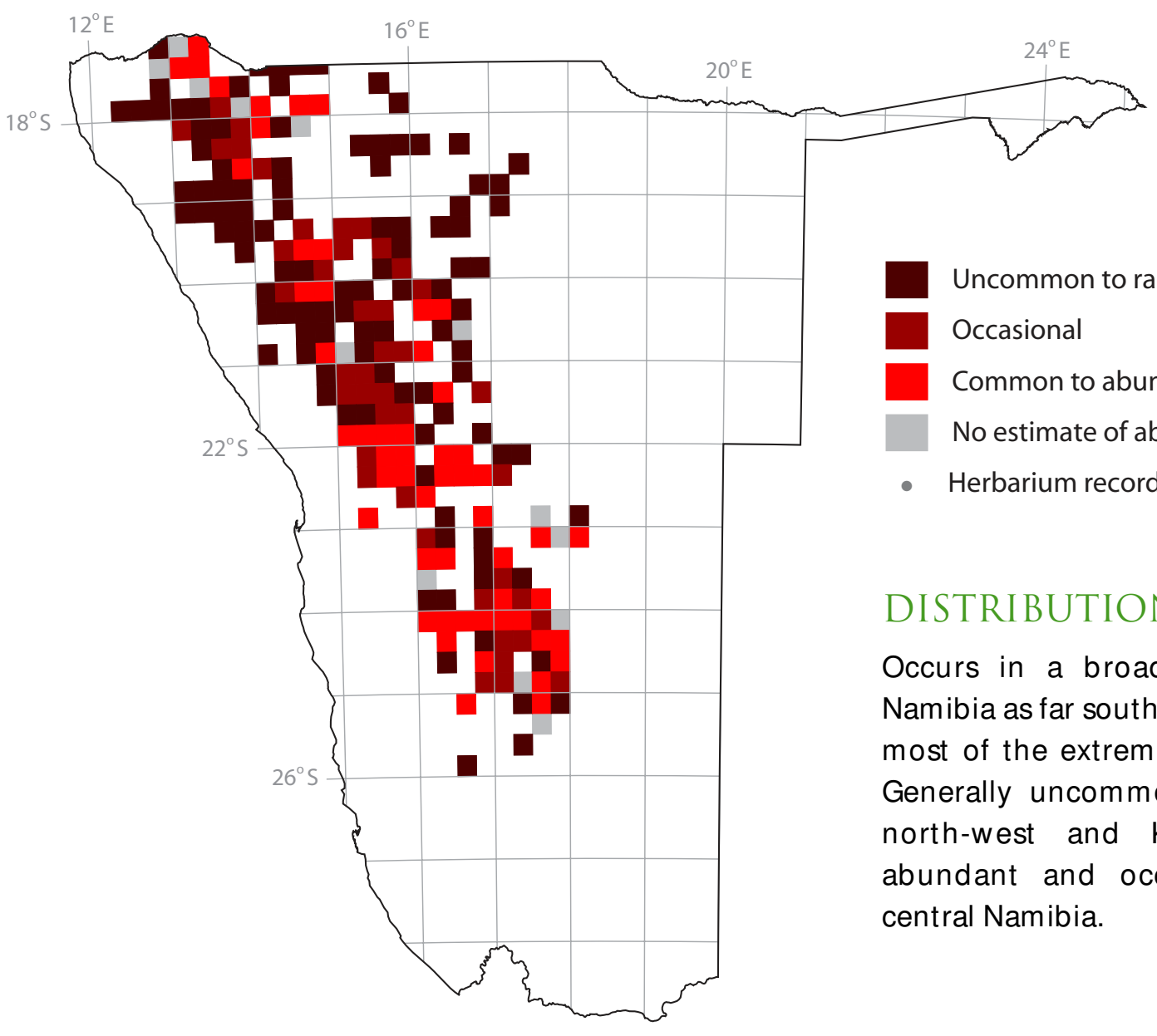
Three-hook acacia (E); Dreidornakazie (G); omuryangava (H); dus (K)

[449 records from 219 (20%) squares]



A V-shaped shrub. BARK **pale; greenish young growth**. THORNS diagnostic, **hooked and in threes** at each node. LEAVES medium-sized. FLOWERS in white spikes. FRUIT a straw-coloured, papery **pod, with a long tapering base and apex**.

May be confused with *A. erubescens* at a distance due to the shape and pale bark, but the thorns and pods distinguish the two species.

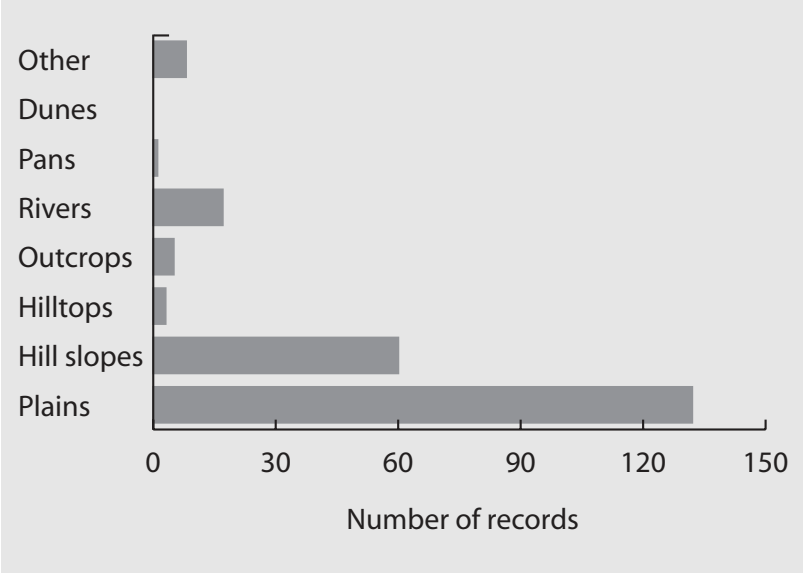


DISTRIBUTION & ABUNDANCE

Occurs in a broad band across western Namibia as far south as 26° S, but absent from most of the extreme western Namib Desert. Generally uncommon to occasional in the north-west and Karstveld; common to abundant and occasionally dominant in central Namibia.

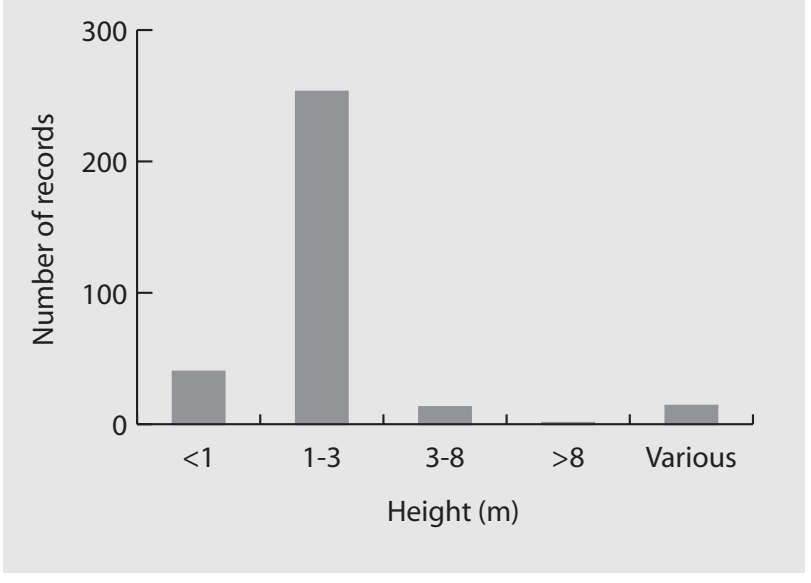
HABITAT

Mostly found on plains and hill slopes, also along river banks in the north-west. Grows on sand, gravel, stone and rocky substrates; occasionally on granite and calcrete.



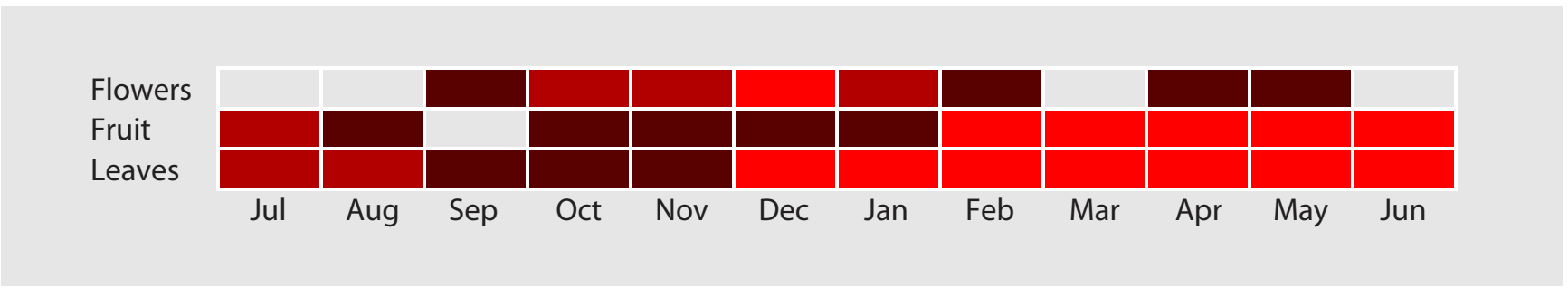
GROWTH FORM

Usually a shrub (77% of records), but also a tree (23%). Mostly in the 1–3-m height category, but occasionally higher.



ANNUAL CYCLE

FLOWERS found from September to May, but mostly from October to January, with a peak in December; it appears that there is a second flowering in April/May, possibly as a result of late rains. FRUIT whole year round, but mainly February to June, with ripe fruit recorded in July. LEAVES essentially deciduous, but may be found the whole year round; most bare trees were recorded from June to November, with young leaves from September.

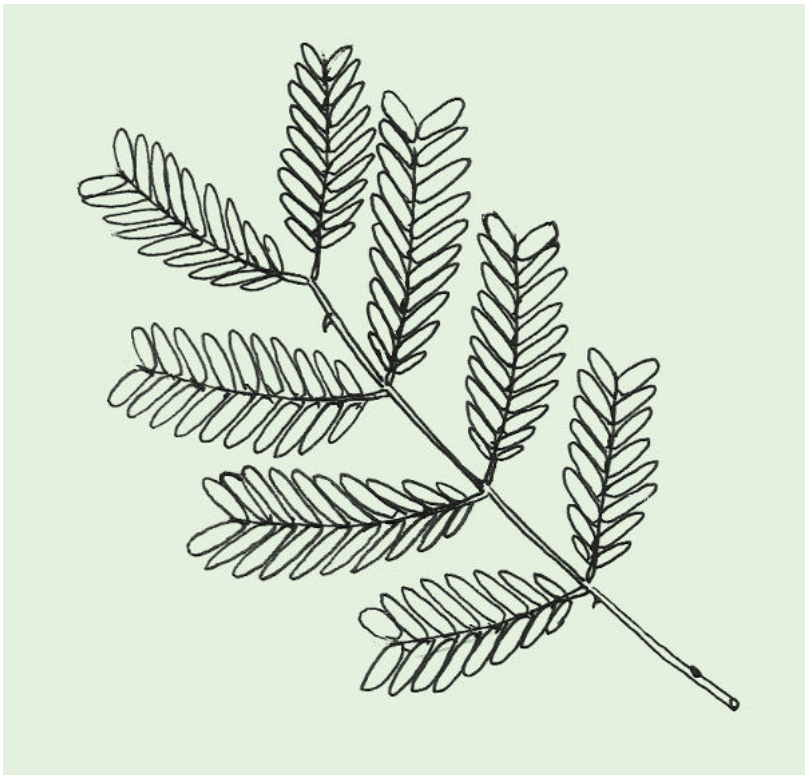


GENERAL

Leaves, flowers, bark and young branches are eaten by rhino, elephant, giraffe and springbok. This species produces a high quality, flavoured gum, which is harvested commercially in other countries. Branches are used for fencing stock enclosures. Sometimes the wood is used for making charcoal. May encroach where other bush has been cleared.

CONSERVATION CONCERNS

None recorded.

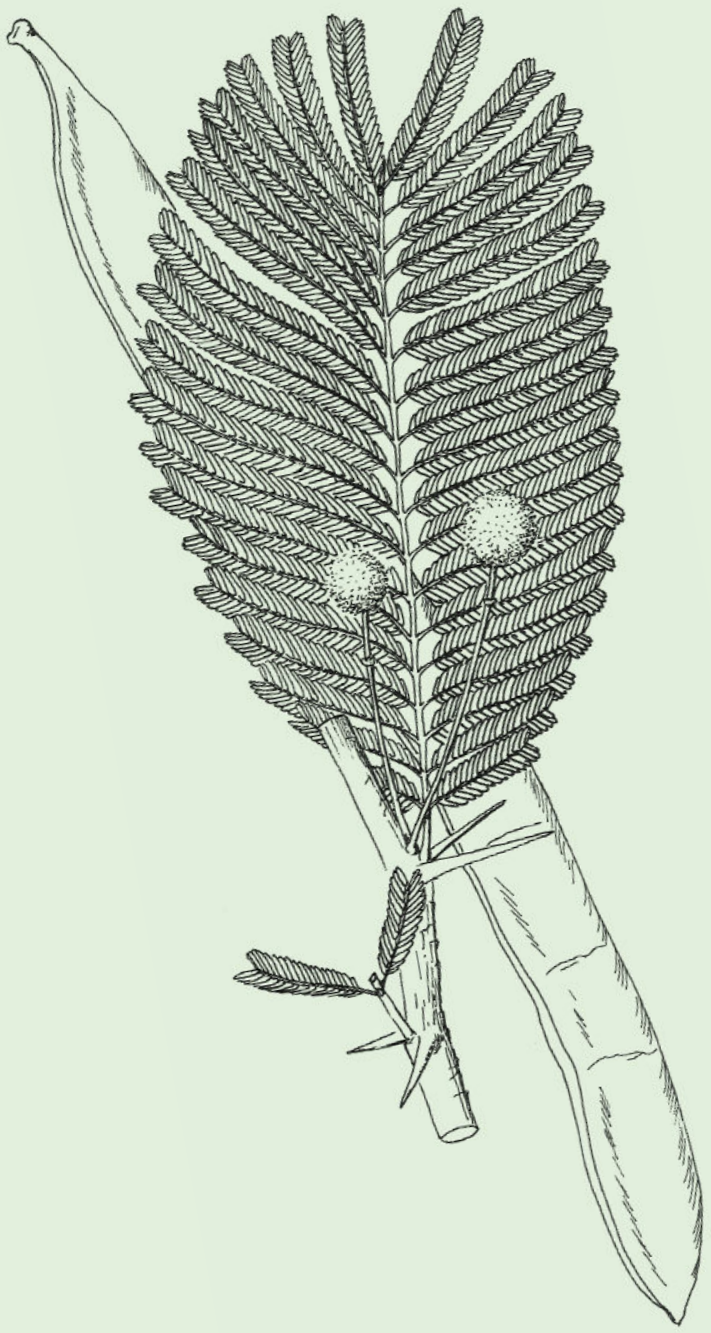


Acacia sieberiana

Paper-bark Acacia

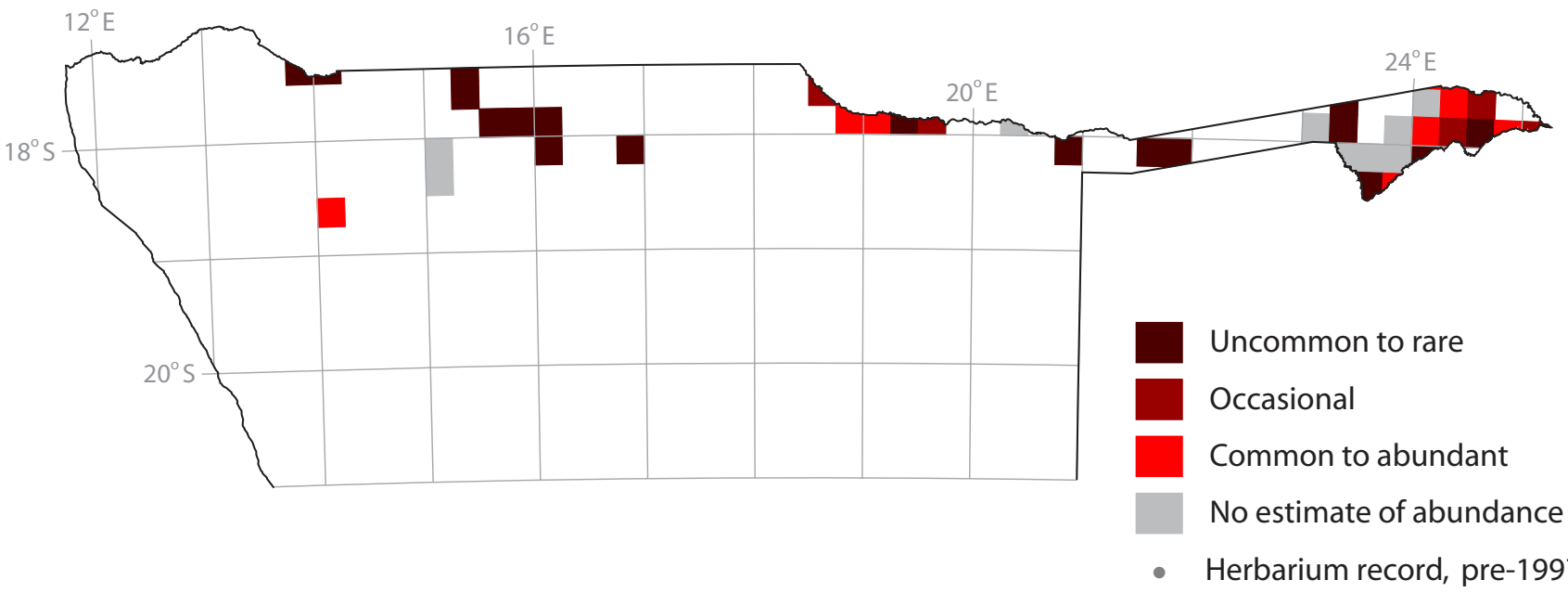
Omuyere, omuhengehenge (H); mutubatuba (L); muhengeva (Rk, Rum)

[85 records from 40 (4%) squares]



A medium-sized tree with grey to **yellow, peeling bark, dark foliage and flattened, spreading crown**. THORNS are **strong**, straight and white. LEAVES are **long and narrow with extremely small, closely packed leaflets**. FLOWERS in creamy balls. FRUIT a straight, **thick, reddish brown and woody pod**.

May be confused with some of the other single-stemmed, yellow, peeling-barked acacia species of the north, but is distinguished by its robust thorns, long, narrow leaves and thick, woody pods.

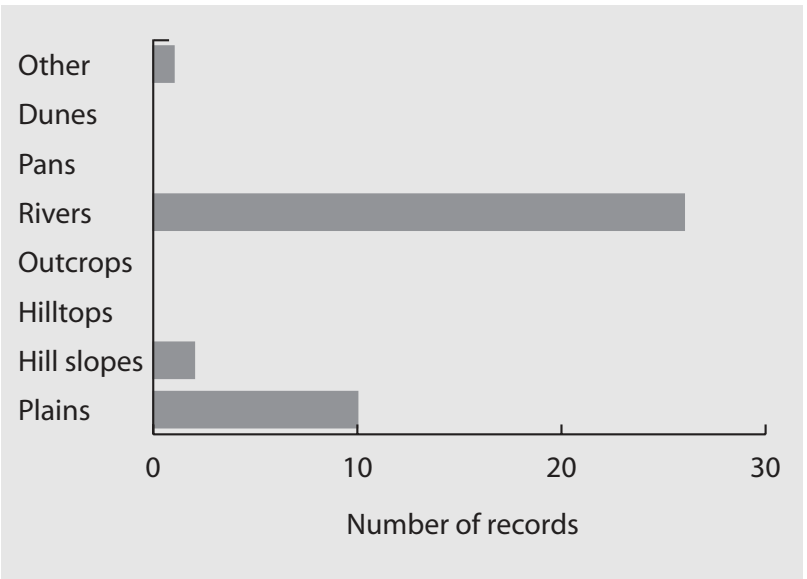


DISTRIBUTION & ABUNDANCE

A few isolated localities in the extreme north of Namibia, mainly in eastern Caprivi. Common in eastern Caprivi and along the Okavango River; uncommon in the Cuvelai and along the Kunene River. Often occurring as single individuals or small, isolated groups. A record from the south-west – from the western boundary of Etosha National Park (1814CA, BER2) – represents a range extension, as yet not confirmed with a specimen.

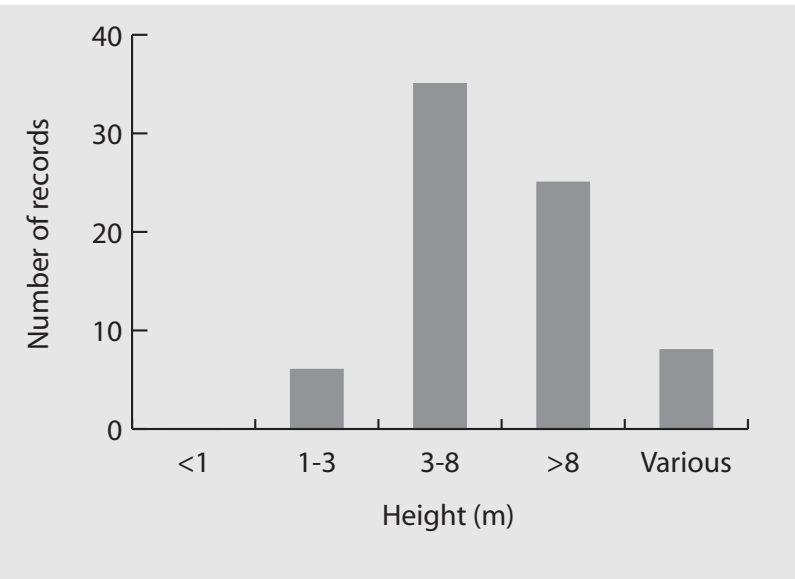
HABITAT

Mainly found on floodplains, but also on river banks and sandy plains.



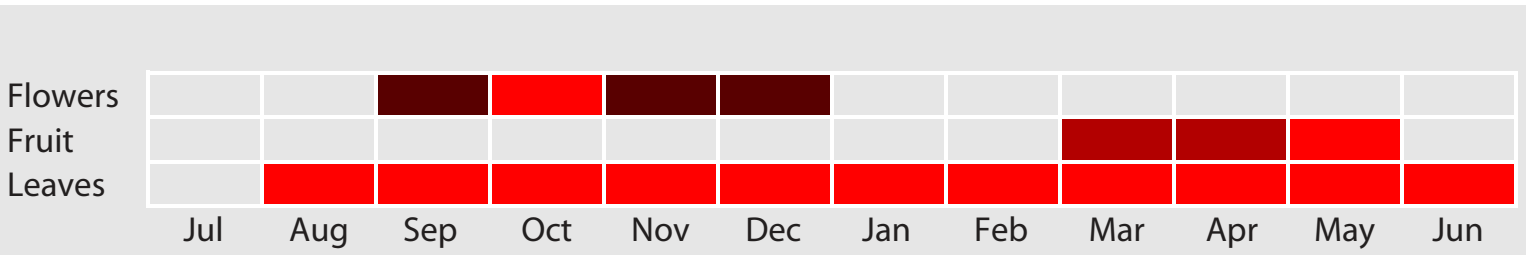
GROWTH FORM

Usually a tree of 3–8 m (58% of records), but often over 8 m (35%). Very few juveniles were recorded; those recorded were in eastern Caprivi.



ANNUAL CYCLE

FLOWERS from September to December, with one record in March. FRUIT single records in almost every month, with most records March to May. LEAVES seem to be present most months.



GENERAL

In 1714AC it was noted that trees were dying due to 'borer attack' (GRE3). Strong fibres produced from the bark are used to thread beads.

CONSERVATION CONCERNS

None recorded. Protected by forestry legislation.



Acacia sieberiana, Oshana Region, B. Curtis

Acacia tortilis

Umbrella-thorn

Haak-en-steek, krulpeul (A); Ringelhülsenakazie (G); orusu (H); /narab (K); kamutaka (O)

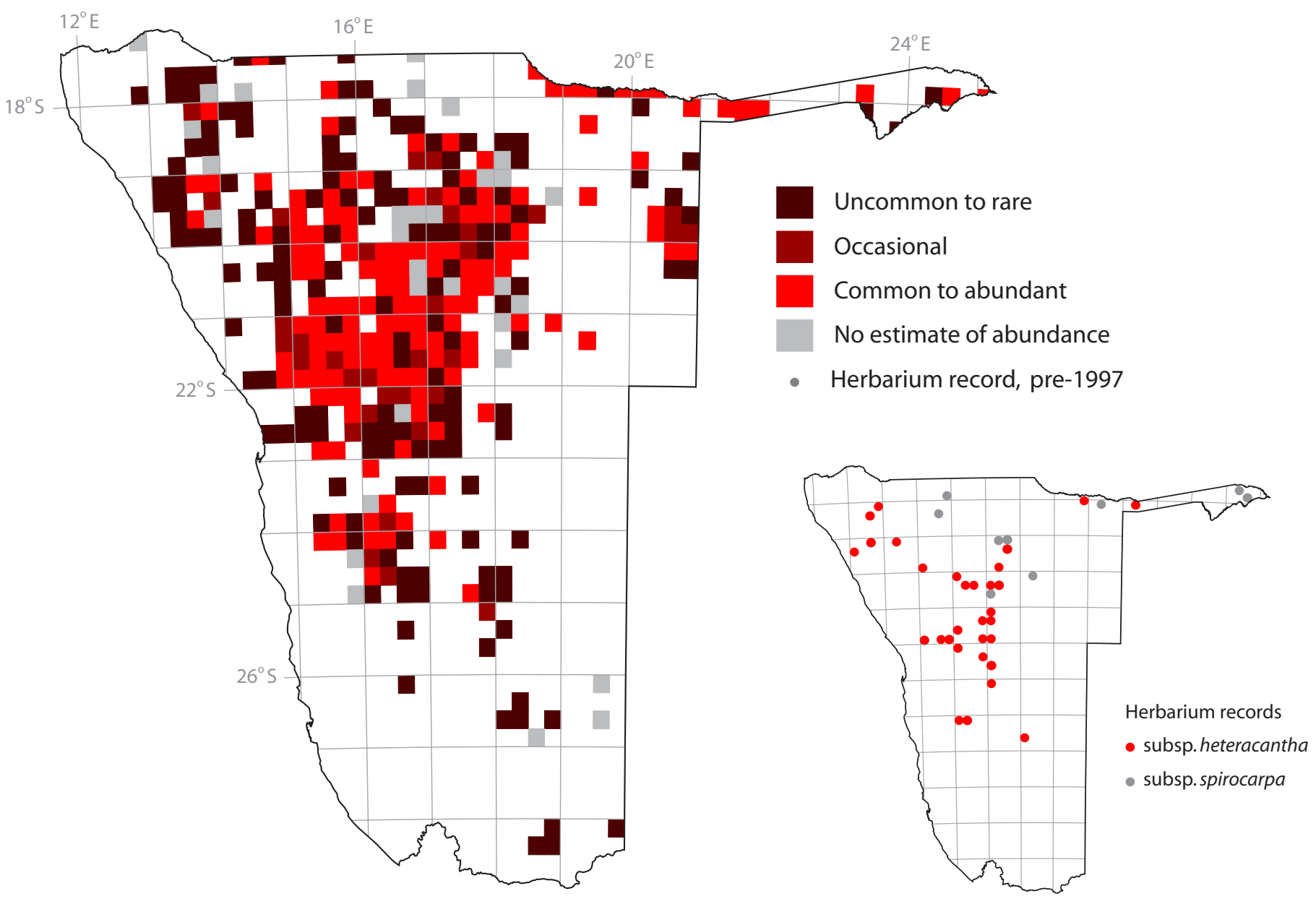
Generally a medium-sized tree with **spreading, flattened crown**. Two subspecies occur in Namibia, neither of which is the truly flattened 'umbrella thorn' of east Africa. BARK **dark, fissured**. THORNS paired, both straight or both hooked or one of each in a pair (in which case, the hooked one may be very inconspicuous). LEAVES **greyish, small, with very small leaflets**. FLOWERS in **small**, creamy-white balls. FRUIT a **twisted** pod.

The flowers are fairly conspicuous, the pods easily overlooked from a distance.

Acacia tortilis may be confused with *A. luederitzii* when not in pod. Young trees may resemble young *A. erioloba*, as they often only have straight thorns. This species has probably been under-recorded by the TAP, especially south of Mariental.

Since the subspecies can only be told apart by the pods, which are inconspicous at a distance and often not found, the majority of records could not be assigned to one or other subspecies. The most common subspecies is *heteracantha*, thus all records not specifically *spirocarpa* have been assigned to the former.

The combined distribution and abundance for both subspecies are shown below.



A. tortilis subsp. *heteracantha*

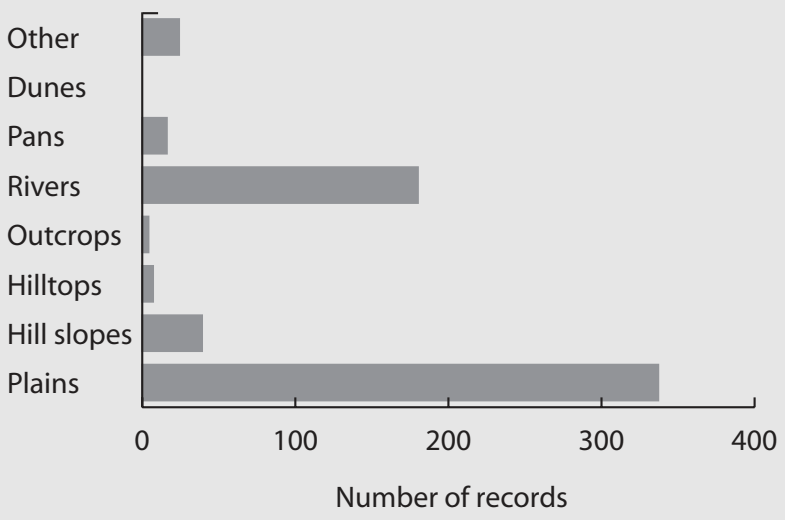
[1,102 records from 353 (33%) squares]

CROWN more rounded than that of subsp. *spirocarpa*. FRUIT pods are hairless or almost so, without glands and generally tightly coiled.



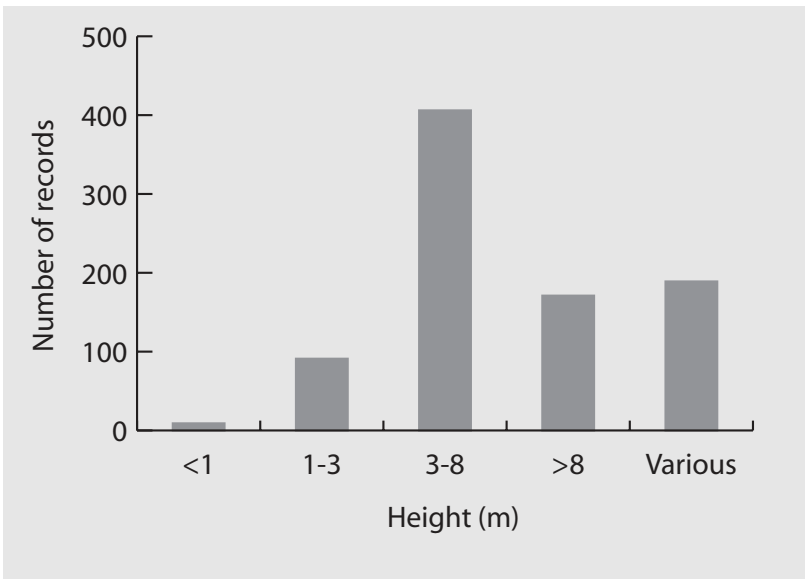
HABITAT

Most commonly found on plains and along rivers; also around pans in the central-west. Substrates range from sand to dolomite hill slopes to calcrete.



GROWTH FORM

Usually a tree 3–8 m high (62% of records), but about 23% of the trees were taller than 8 m. About 24% of the stands recorded had trees of variable heights. Tall trees occurred throughout the range, with most in the Karstveld and north-central areas.



DISTRIBUTION & ABUNDANCE

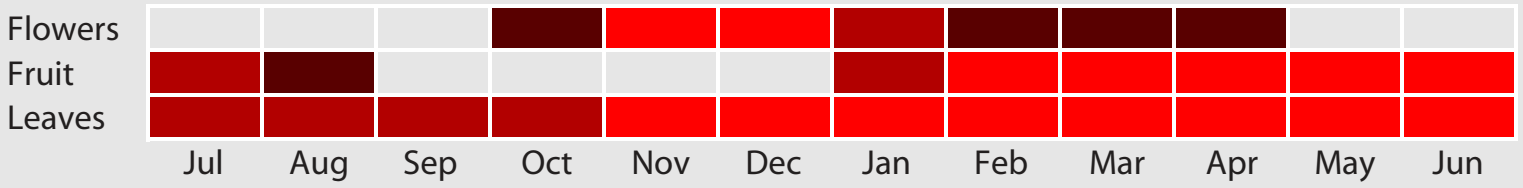
Common to uncommon, mostly in the central interior, extending to the north-west; scattered records from the north-east and south-east. Locally abundant and dominant in a few places. Most abundant and widespread on the north-central plateau. The records for the Nyae Nyae area and the south-east are range extensions.

GENERAL

Apart from providing good shade, this tree has a number of other uses. Its wood is used for fuel and construction, the branches for cattle fences, the bark to produce rope for housing and the roots to produce quivers. It produces an edible gum of medium quality. This tree is browsed by goats, antelope and rhino; and the pods, which are highly nutritious, are eaten by giraffe and antelope, and used for livestock fodder. The trees are occasionally infested by parasites (for example, *Tapinanthus* spp.). Also known as nuisance bush (SCH16, 2015C).

ANNUAL CYCLE (Both subspecies combined)

FLOWERS start in November and last until April, peaking in November and December. FRUIT present most of the year, but most common from January to June. LEAVES found all year round, but many trees bare between July and October; new leaves produced from August/September.



CONSERVATION CONCERNS

None recorded.

A. tortilis subsp. *spirocarpa*

[55 records from 32 (3%) squares]

CROWN generally somewhat flattened. FRUIT pods have a conspicuous, densely woolly covering with numerous dark red glands. They are generally less tightly curled.



DISTRIBUTION & ABUNDANCE

Found chiefly in the eastern Karstveld, with isolated records elsewhere in northern Namibia. Generally common, sometimes uncommon to rare.

HABITAT

Only found on plains.

GROWTH FORM

Usually a tree of 3–8 m (52% of tree records), but often over 8 m (40%). No stands of trees of various heights were recorded.

ANNUAL CYCLE

Combined with subsp. *heteracantha*.

CONSERVATION CONCERNS

None recorded.

Acacia polyacantha

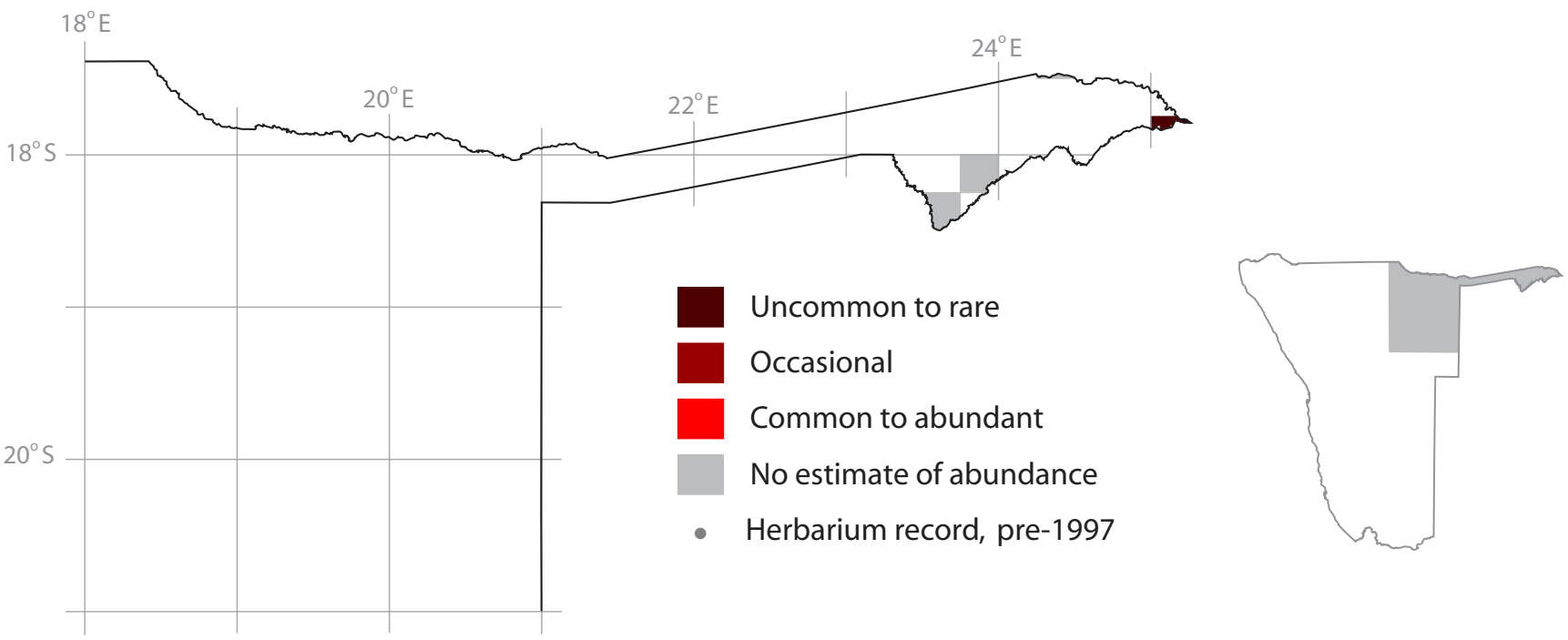
= Acacia campylacantha

Mukoka

White-stemmed acacia (E); witdoring (A); ngowe (L)

[5 records from 4 squares]

A very tall, erect tree with a layered crown. BARK **pale, flaky**. THORNS hooked, often on knobs on stems and older branches. LEAVES large, with many very small, pale green leaflets; **a large, flattened, oblong gland** at base of petiole. FLOWERS in creamy spikes. FRUIT a straight, flat pod, tapering at both ends.
Can be confused with *A. galpinii* or with *A. sieberiana* from a distance.



DISTRIBUTION & ABUNDANCE

Uncommon to rare in eastern Caprivi. Prior to the TAP there was only one herbarium specimen, thus the range of this species has been extended.

HABITAT

Found on river banks and on an island in a floodplain.

GROWTH FORM

A tree over 8 m tall.

ANNUAL CYCLE

Observations were made once each in April, May and November. FLOWERS recorded in November. FRUIT recorded in November and May. The single herbarium record had flowers and fruit in October. LEAVES present during each month recorded.

CONSERVATION CONCERNS

None recorded. Rare in Namibia.

Acacia polyacantha, B. Curtis



Acacia robusta

River-thorn

Ankle-thorn, splendid acacia (E); enkeldoring (A)

[1 record]

A medium-sized, single-stemmed tree **with thickened branches and robust young twigs**. THORNS paired, **short, straight, stout**. LEAVES **dark green** and practically evergreen; **hairy petioles and rachis**; large leaflets. FLOWERS in light yellow to cream balls. FRUIT a **thin, curved, woody pod**.

Only recorded from Impalila Island (1725CC) where it was a tree ranging in height from 1 m to 10 m tall. Common on river banks. In November it had leaves and fruit. Herbarium specimens had flowers and fruit in January.

Acacia schweinfurthii

River Scrambling-acacia

Rivierrankdoring (A)

[3 records from 2 square]

A **scrambling shrub**, often entangled with other plants and forming an impenetrable thicket. STEM **pale, with dark, longitudinal bands**. THORNS hooked and **scattered along stems**. LEAVES large, with **a large, squat petiolar gland**, and **distinctive swelling at the base of the petiole**. FLOWERS creamy-white, in balls. FRUIT a large, oblong, leathery pod, with smooth domes over the seeds.

May be confused with *A. ataxacantha*. This is the only Namibian species of acacia with **curved thorns and flowers in balls**.

Recorded from riverine forests on Impalila Island (1725CC), where it is occasional as a scrambling shrub ranging from 1–4 m tall and from 1724CA. It had flowers and old fruit from the previous season in November and new fruit in April. This species was added to the Namibian species list by the TAP.



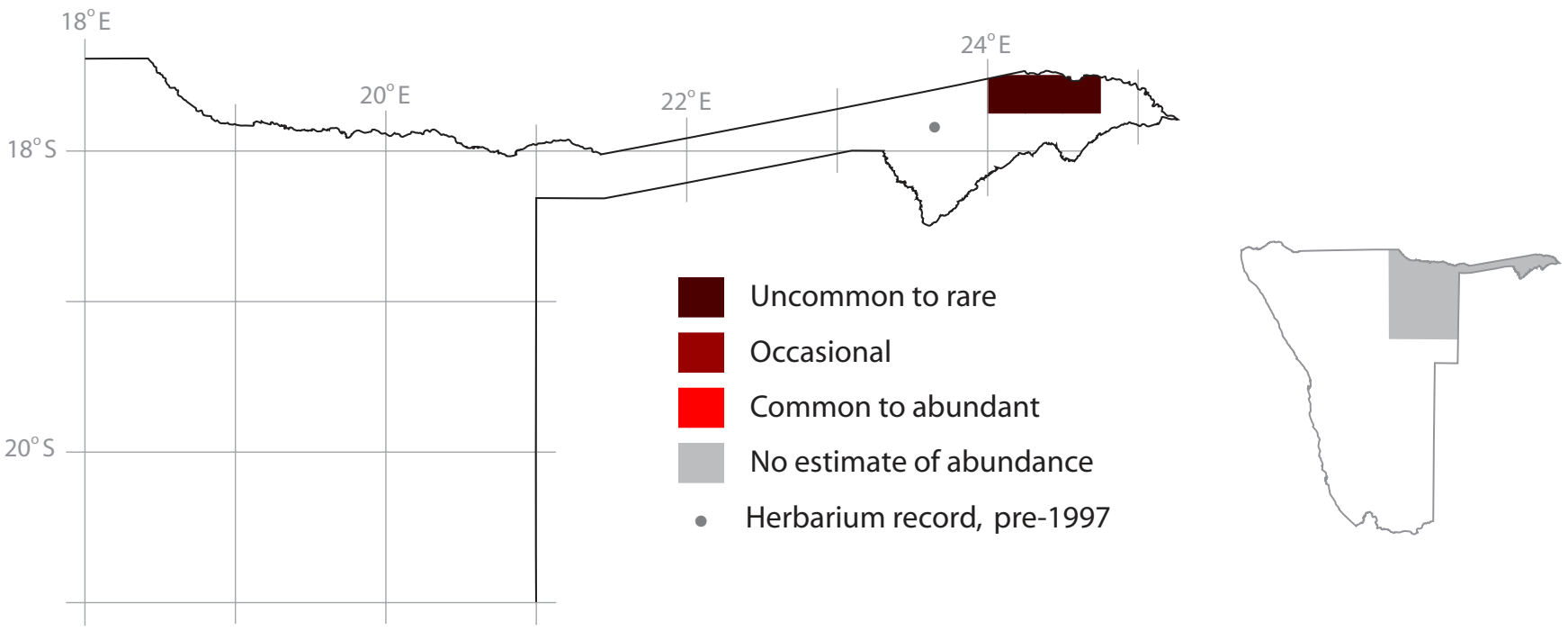
Amblygonocarpus andongensis

Munyenye

Scotsman's rattle (E); munye (T)

[5 records from 3 squares]

A medium to large tree with spreading crown. BARK black, fissured. FRUIT a pod, up to 170 x 30 mm; straight or almost so with **four distinct, blunt angles; dark brown, woody, shiny, indehiscent**.



DISTRIBUTION & ABUNDANCE

Uncommon in three squares in extreme eastern Caprivi.

HABITAT

Floodplains and sandy plains.

GROWTH FORM

Tree over 8 m high.

ANNUAL CYCLE

No flower records. FRUIT recorded in December, February and May. LEAVES recorded December to May.

CONSERVATION CONCERNS

None recorded.



Amblygonocarpus andongensis, inflorescence, C. Hines

Mimosa pigra

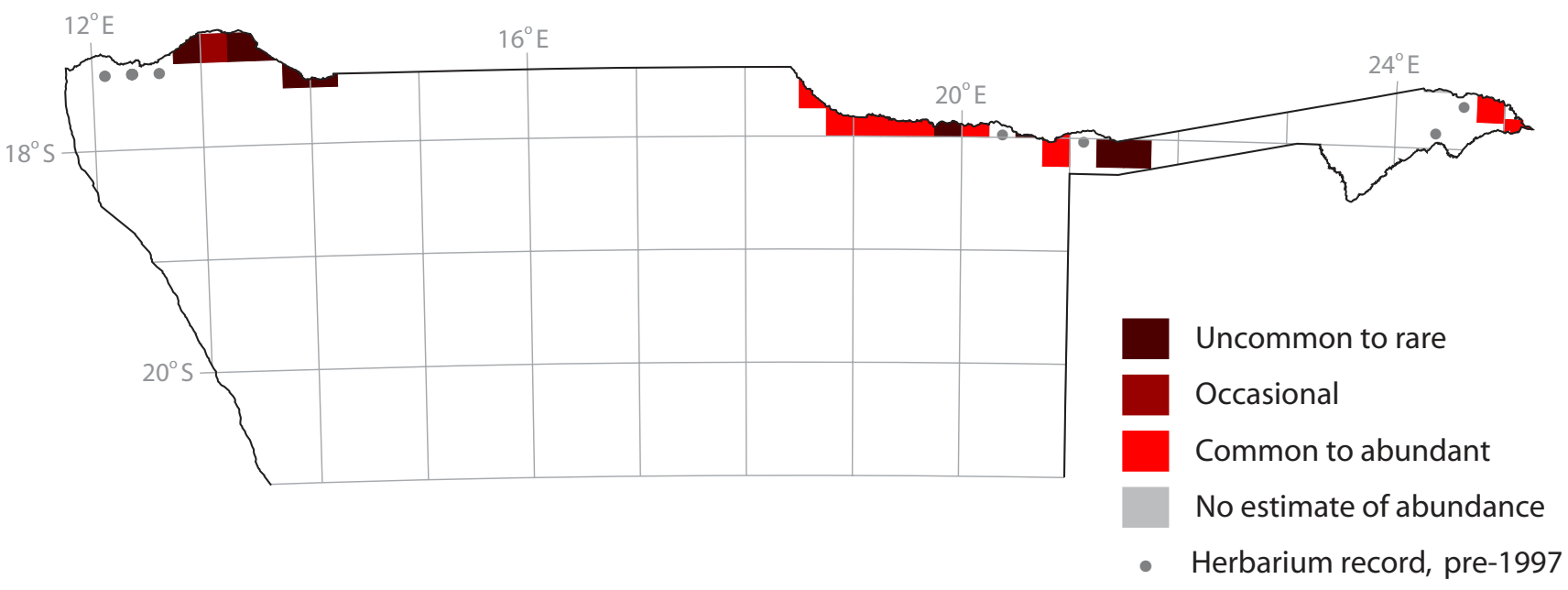
Nambara-nambara

River mimosa (E); omutahoni (H); murombe (T)

[26 records from 21 (2%) squares]



Evergreen shrub, **often scrambling,** up to 3 m high. BRANCHLETS with **scattered thorns**. LEAVES with many small leaflets, **petiole and rachis with rust-brown, bristly covering; pale yellow to reddish spines between each pinna pair**. FLOWERS **pink to purple in round heads**. FRUIT a 30–70 mm, straight or slightly curved, dark-brown pod; **bristly, with sharply pointed tip; valves break up transversely into segments leaving a seam network with the thickened margin remaining on the plant**.



DISTRIBUTION & ABUNDANCE

Widespread and common along the northern perennial rivers. Previously recorded further downstream on the Kunene River than at present.

HABITAT

Found on river banks and floodplains, in riverine forest or in the open. Often half submerged.

GROWTH FORM

A shrub, generally in the 1–3-m height class, occasionally over 3 m; sometimes scrambling over other plants.

ANNUAL CYCLE

FLOWERS October to June, mostly December (including herbarium records). FRUIT all year, mainly December. LEAVES only recorded by the TAP from November to May.

GENERAL

Forming thickets along river banks. Leaves used medicinally.

CONSERVATION CONCERNS

Some people maintain that *Mimosa pigra* is alien to southern Africa, but there does not seem to be any certainty on this issue; it is not recorded as an alien in Germishuizen & Meyer (2003).



Right: *Mimosa pigra* leaves, pods and inflorescence, P. Reiner

Below: Okavango River, P. Reiner



Dichrostachys cinerea

Omutjete

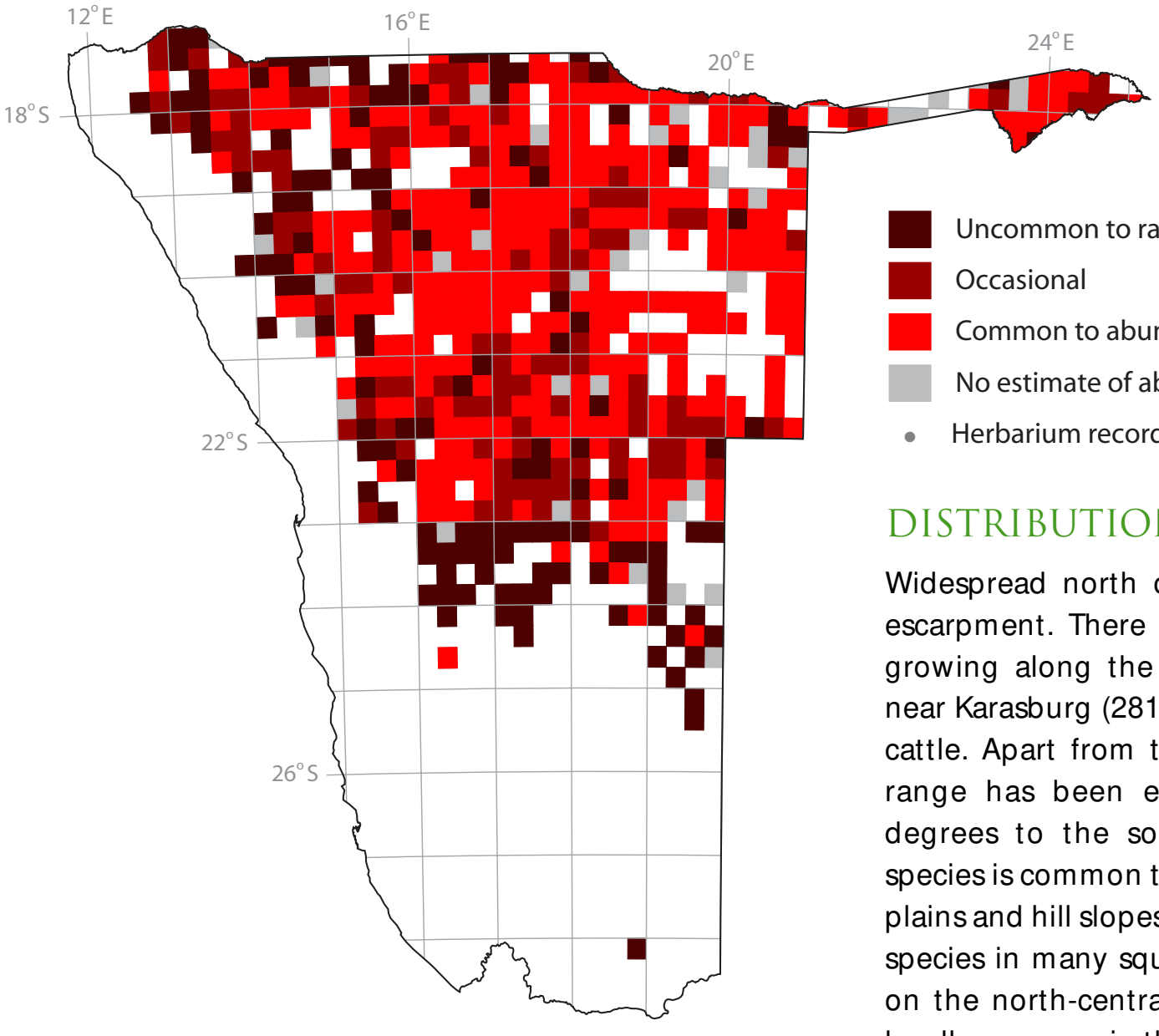
Kalahari Christmas tree, sickle-bush (E); papwielbos, sekelbos (A); Farbkätzchenstrauch (G); |goes (K); mishale (L); ongete (O); mwege (Rk)

[2,189 records from 592 (55%) squares]



A deciduous shrub or small tree, with sturdy, **spinescent, lateral branches up to 40 mm long**, with sharp, dark brown tip. LEAVES with very small leaflets. INFLORESCENCE a **hanging cluster of two types** of flowers: sterile, **pink basal flowers** and bisexual, **yellow apical flowers**. FRUIT a pod, hanging in **clusters**, dark brown, **sickle-shaped to contorted**, indehiscent.

The spines, bicoloured flowers and clustered pods make this species unmistakable. Subspecies *africana*, with two varieties, occurs in Namibia. Each variety has very obscure distinguishing characteristics making them difficult to tell apart and so they have not been differentiated by the TAP.

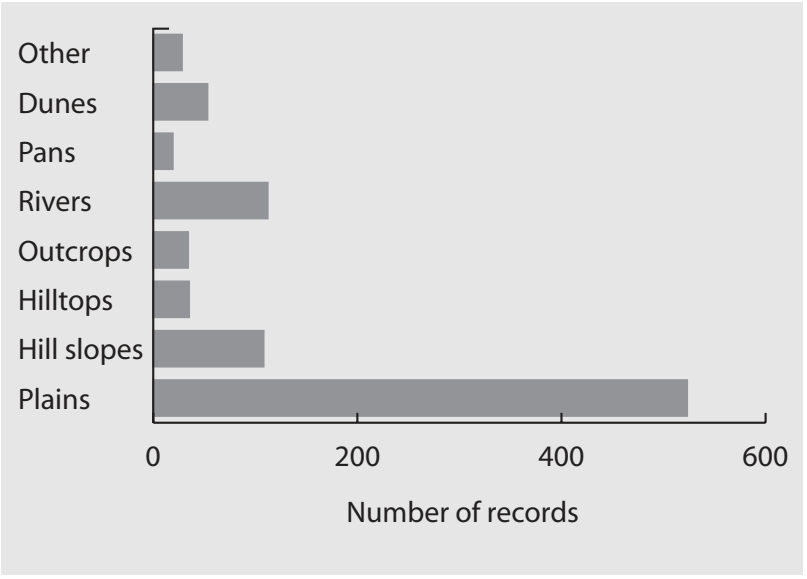


DISTRIBUTION & ABUNDANCE

Widespread north of 25° S and east of the escarpment. There is one record of a plant growing along the railway line at Wolplaas near Karasburg (2818BB), probably seeded by cattle. Apart from that record, the recorded range has been extended by nearly two degrees to the south-east. Generally, this species is common to abundant, especially on plains and hill slopes; it is one of the dominant species in many squares and most abundant on the north-central plateau. Uncommon to locally common in the north-west.

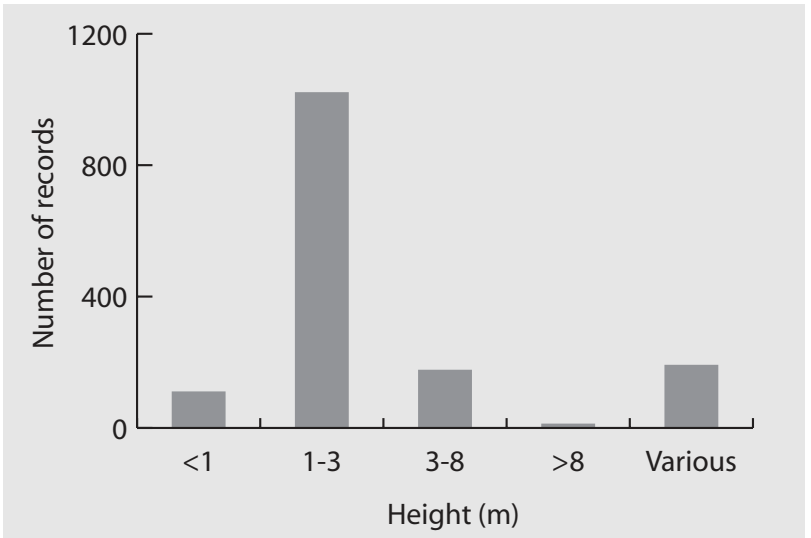
HABITAT

Found in a wide variety of habitats, although most often on plains. Along dry river courses in the north-west, north-east and south; hill slopes in the Karstveld, north-central plateau and central highlands; dunes in the north-east and south-east. Generally on sandy or calcareous substrates, but also stony/rocky substrates, sandy loam or clay.



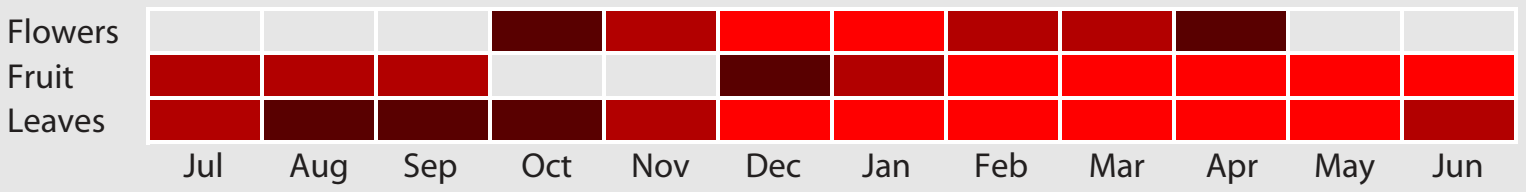
GROWTH FORM

Mostly a shrub up to 3 m high, occasionally over 3 m. In the north-east, sometimes a tree up to 8 m high, seldom over 8 m.



ANNUAL CYCLE

FLOWERS start in October and last until April, with a peak in December and January. Plants may flower more than once in a flowering season. FRUIT a few may be found all year, peak production from February to June; young fruit were recorded between December and May, and old fruit from July to December. LEAVES some all year, but mostly between December and May; young leaves in October and November.



GENERAL

An aggressively invasive species, dominating large areas and forming impenetrable thickets. Under normal thorn-tree savanna conditions it will not necessarily displace other species, even when present in high numbers. It invades disturbed areas, especially where mechanical clearing has taken place. It has been found that this species is far less likely to invade areas treated with herbicides; this has been attributed to a lack of nursery plants to protect it when it is young. It is often damaged by frost.

Good browse for livestock and game, including antelope, giraffe and rhino. The pods have a high protein content, and are used as livestock fodder. It makes excellent firewood. Traditionally a preferred wood for making digging sticks, also used for archery bows, knobkierries; the leaves and roots used medicinally. There were reports of it causing severe blood-poisoning caused by stepping onto the thorns.

CONSERVATION CONCERNS

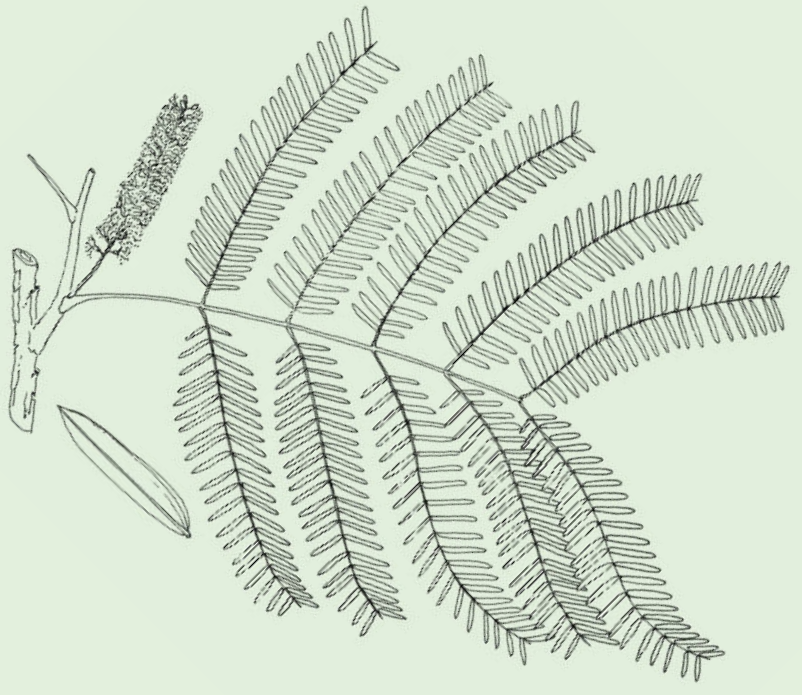
Of concern because of its effect on other species.

Elephantorrhiza elephantina

Omundjoze

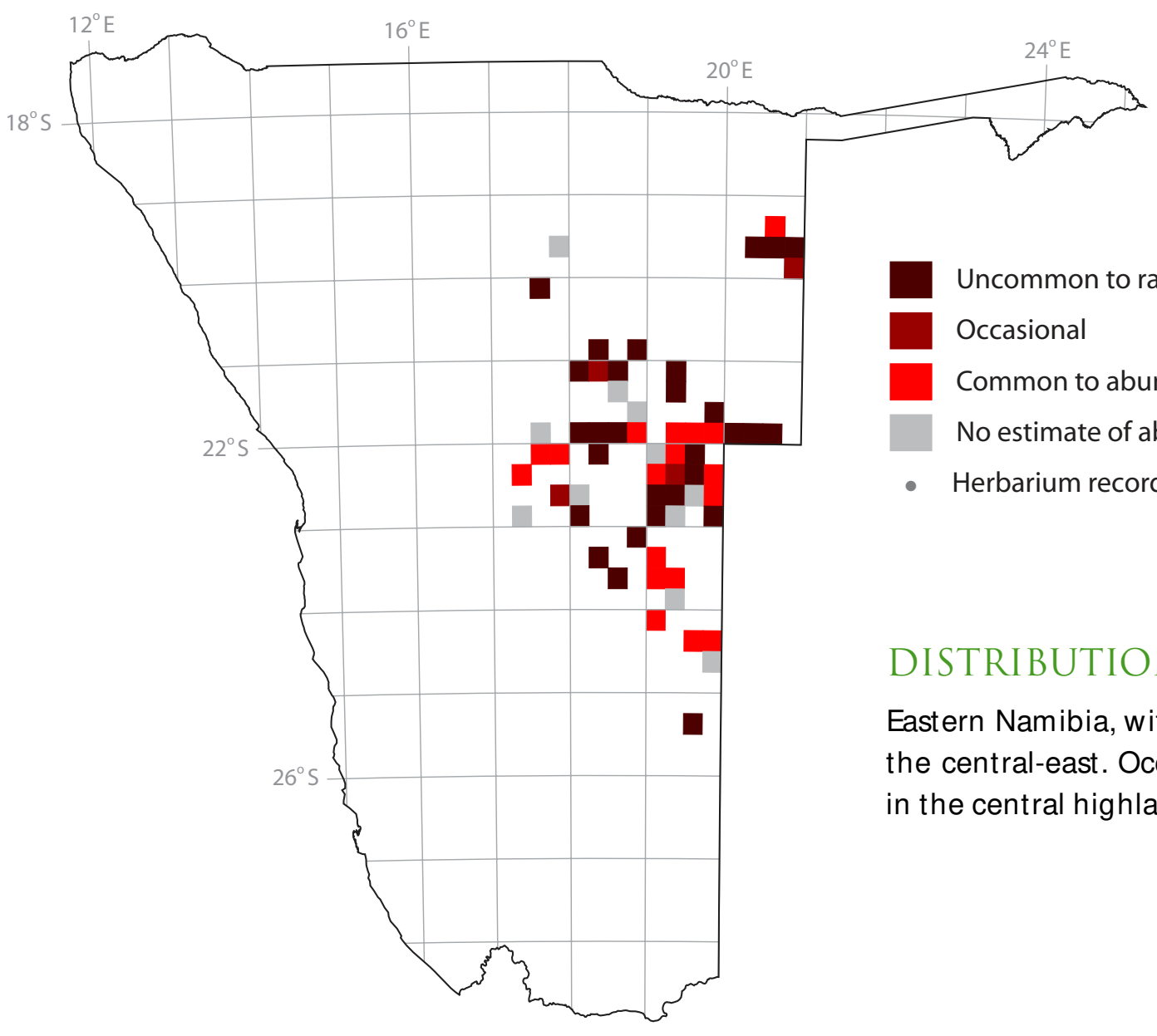
Elandsboontjie (A); Gerbwurzel (G); n/oan (J); #nunib (K)

[98 records from 62 (6%) squares]



A deciduous suffrutex with **soft, unbranched**, reddish-brown annual stems. Generally **300–500 mm high**, although sometimes up to 1 m. LEAVES 200–300 mm long, with 5–13 pinna pairs and 14–45 leaflet pairs. INFLORESCENCE an axillary spike of **bright yellow flowers**, up to 50 mm long. FRUIT a long and narrow pod; straight or slightly curved, dark-brown to red-brown; **prominent transverse veins** and swellings above the seeds.

Flowers and ripe pods are conspicuous. The plant may be confused with any of the other *Elephantorrhiza* species.

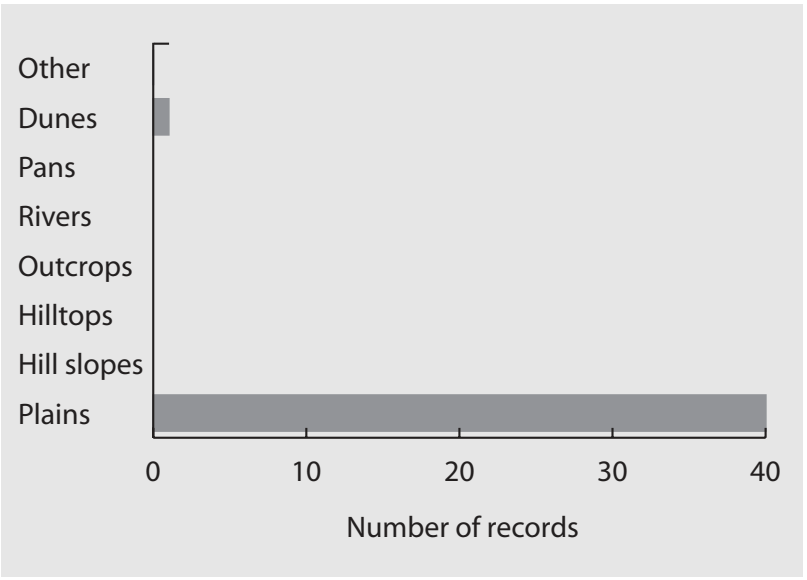


DISTRIBUTION & ABUNDANCE

Eastern Namibia, with the main population in the central-east. Occasional. Locally common in the central highlands and south-east.

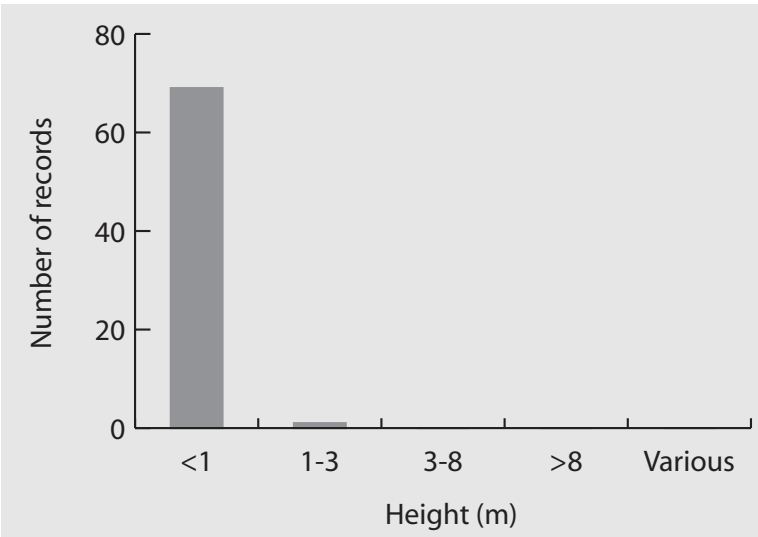
HABITAT

Found on sandy plains, generally in woodlands.



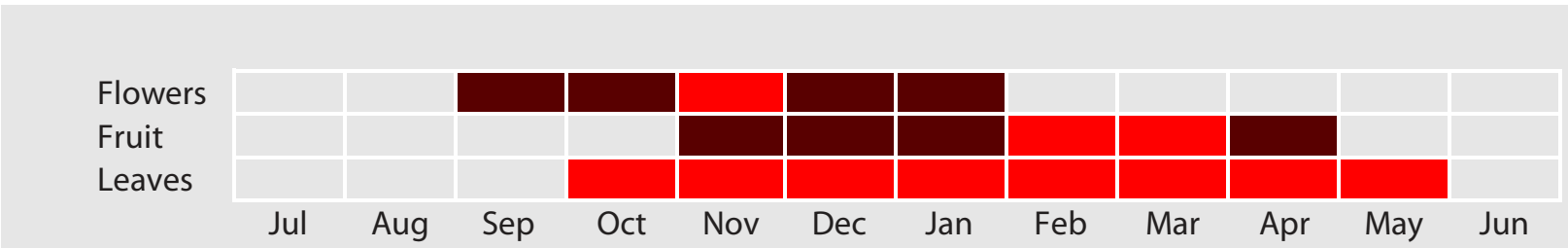
GROWTH FORM

Always a shrub less than 1 m high.



ANNUAL CYCLE

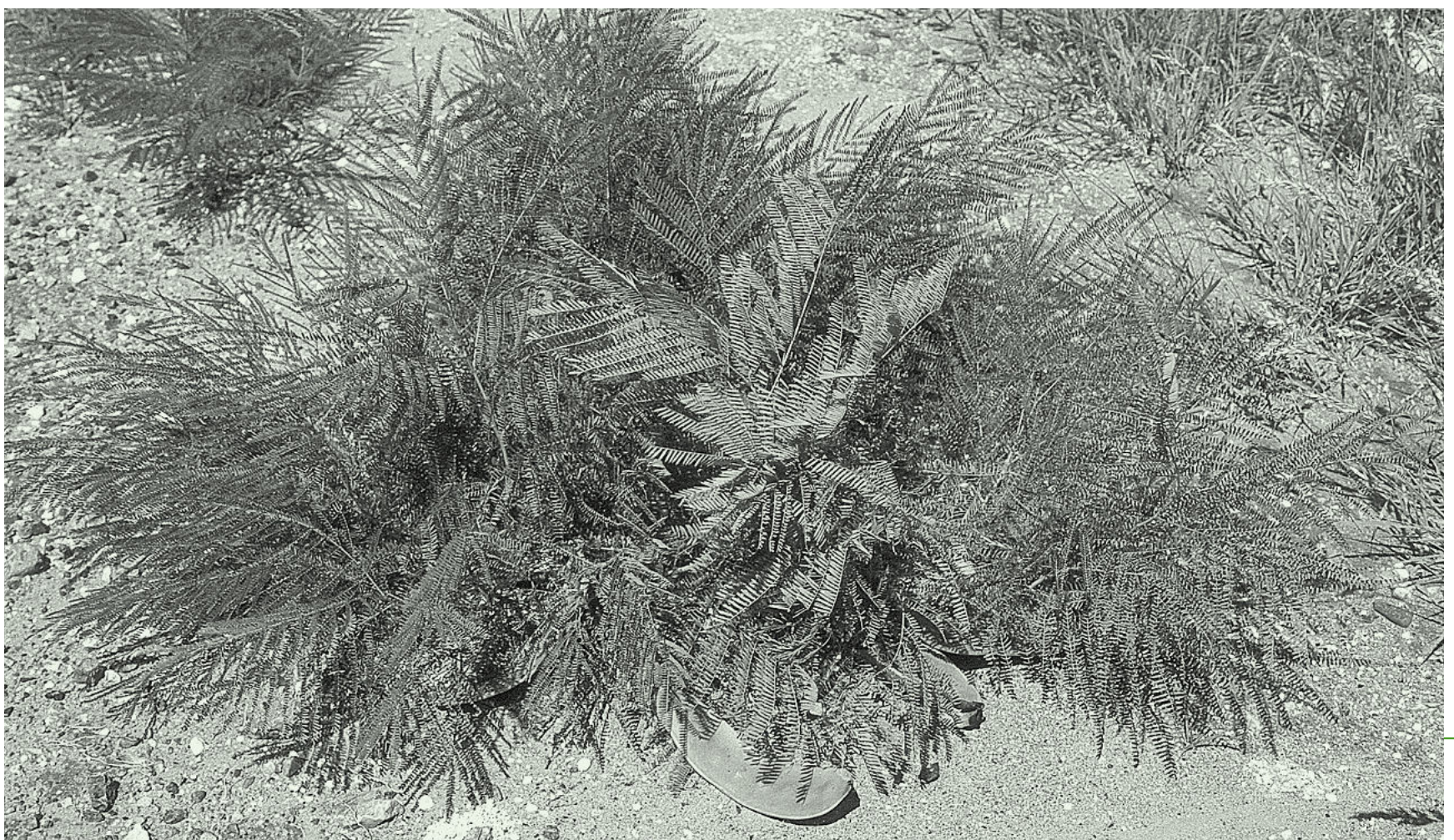
FLOWERS mostly November, but individual records from September to January. FRUIT mainly February and March. LEAVES October to May.



GENERAL: The pods are eaten by people and animals.

CONSERVATION CONCERNS: None recorded.

Elephantorrhiza elephantina, whole plant (pod in foreground), W. Geiss/NBRI



Elephantorrhiza goetzei

Narrow-pod Elephant-root

Basterbasboontjie (A)

[4 records from 3 squares]

Deciduous shrub. BARK red-brown to purplish. FLOWERS cream-coloured, sometimes tinged with pink or purple, appearing before or together with the leaves.

Recorded from two squares in eastern Caprivi and one from the Mahango Game Reserve (1821BC). Uncommon to common shrub of 1–3 m high; less often a tree over 3 m. Fruit recorded in November. There is one additional herbarium record from just south of Katima Mulilo.



Elephantorrhiza goetzei, inflorescence, C. Hines

Elephantorrhiza rangei

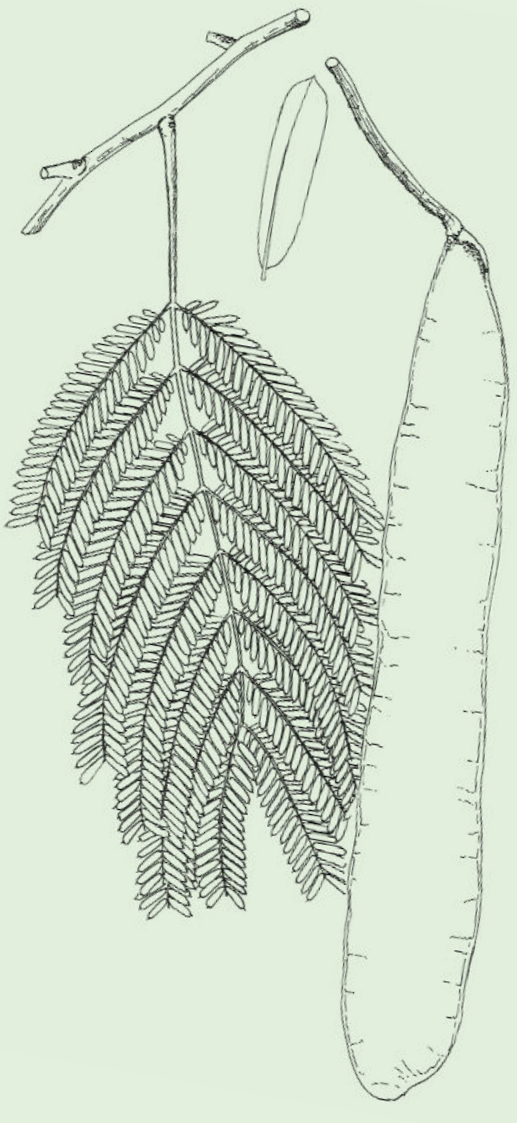
[no TAP records]

This endemic is known only from the type specimen collected in the year 1908 from the dunes at Naute Dam (2617DD) and not recorded by the TAP. Classified as 'Data Deficient' (Craven & Loots 2005).

Elephantorrhiza schinziana

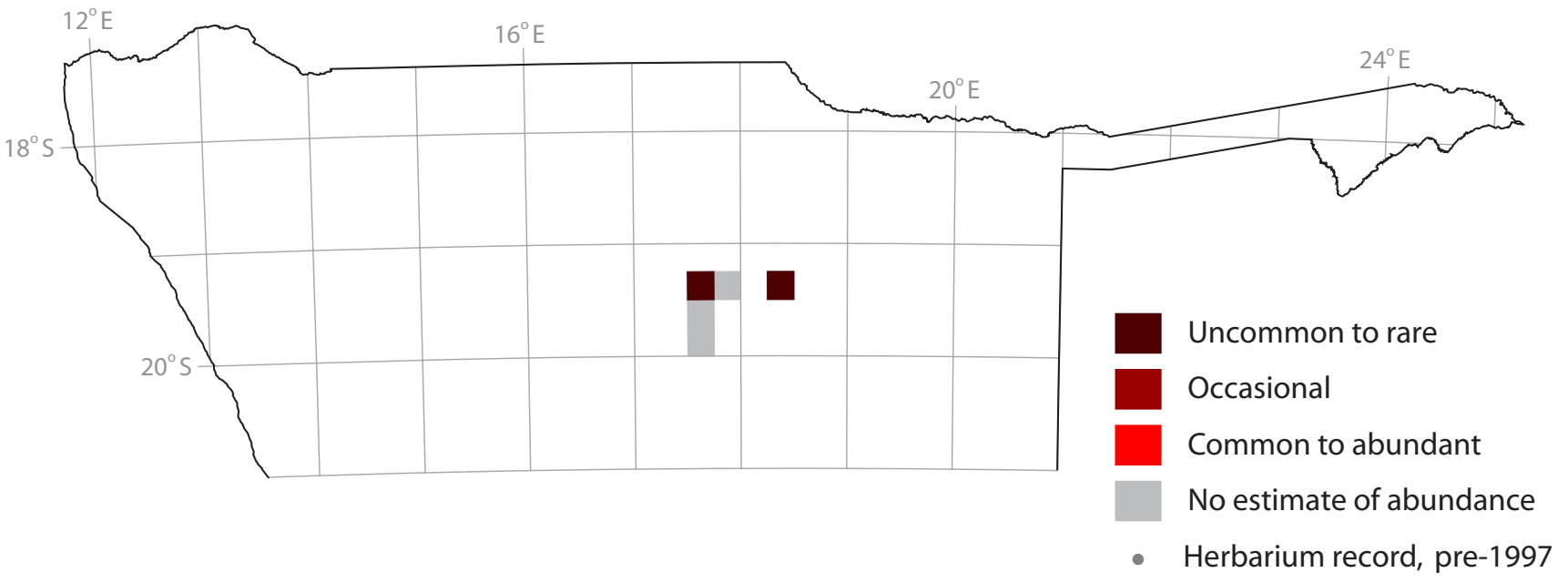
Otavi Elephant-root

[12 records from 5 (<1%) squares]



A deciduous shrub or small tree, 2–5 m high. BARK smooth, grey. LEAVES with 2–12 pinna pairs and 20–30 leaflet pairs. INFLORESCENCE an axillary spike 70–120 mm long, with yellow flowers. FRUIT a flattened, straight or somewhat curved pod; dark brown to red-brown.

May be confused with *E. suffruticosa*, where the two overlap, but lacks the strongly displaced midrib on the leaflet of that species. Pods and flowers are conspicuous.



DISTRIBUTION & ABUNDANCE

Confined to the Otavi Mountains. Uncommon to rare.

HABITAT

Grows on dolomite hill slopes and rocky outcrops

GROWTH FORM

A shrub or tree less than 8 m high.

ANNUAL CYCLE

FLOWERS November. FRUIT January and February. LEAVES recorded from November to March; bare in August; there are no records for the other months.

CONSERVATION CONCERNS

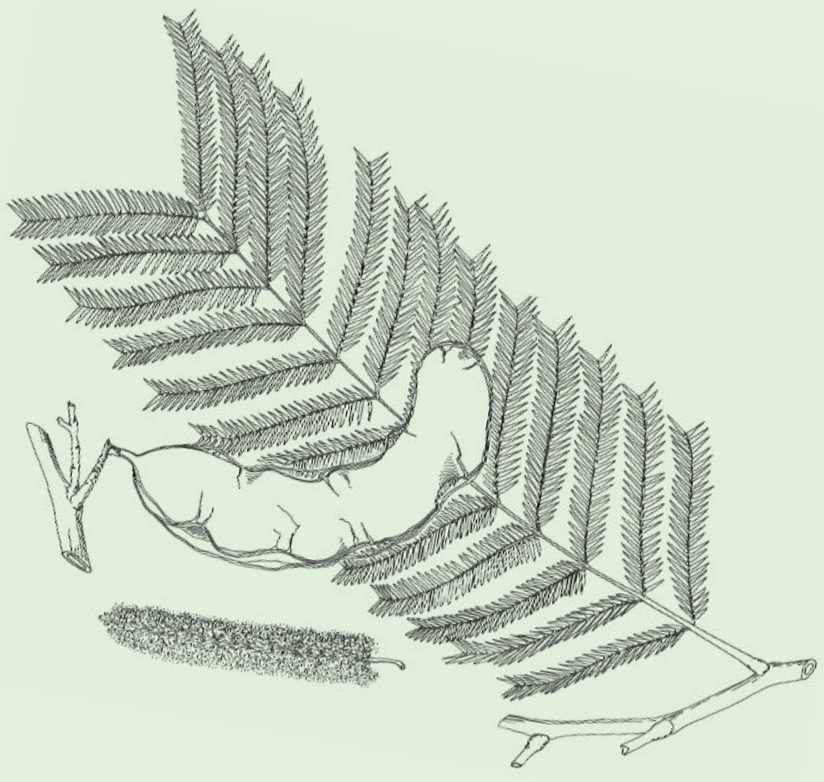
Endemic and rare with restricted distribution. Worthy of conservation.

Elephantorrhiza suffruticosa

Looiwortel

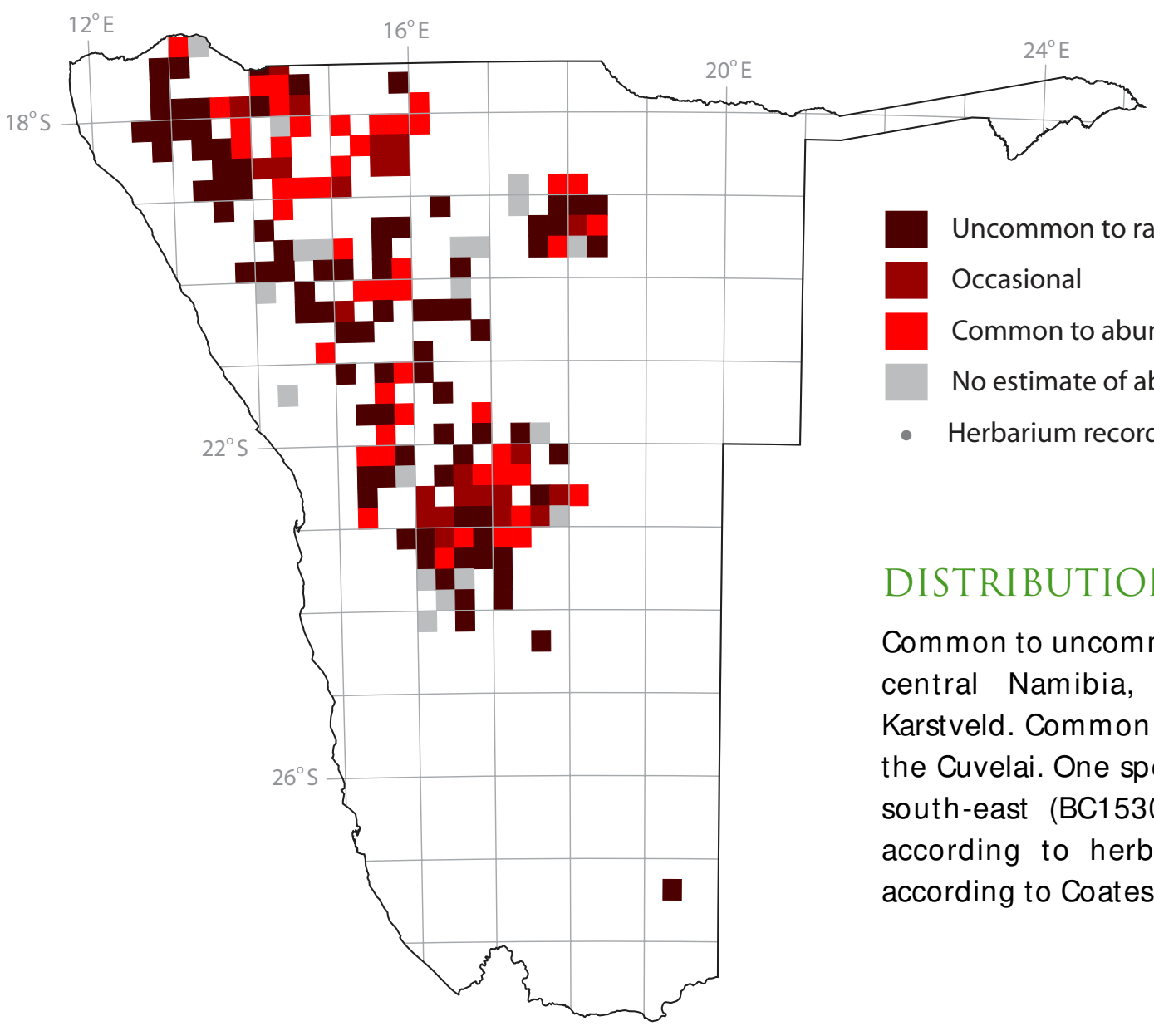
Skew-leaved Elephant-root (E); omundjoze, otjite (H); mparara (Rum)

[356 records from 180 (17%) squares]



A deciduous shrub or many-stemmed tree. BARK grey-brown to **red-brown**. LEAVES 160–250 mm long, with 12–25 pinna pairs and 20–45 leaflet pairs; **leaflets markedly asymmetric with midrib almost along one margin**. INFLORESCENCE an axillary spike 5–15 mm long, **with golden-yellow flowers** appearing before the leaves. FRUIT a pod up to 10 mm thick; oblong, dark brown to red-brown, with persistent, thickened margins.

Can be confused with other *Elephantorrhiza* species. Flowers and pods are conspicuous.

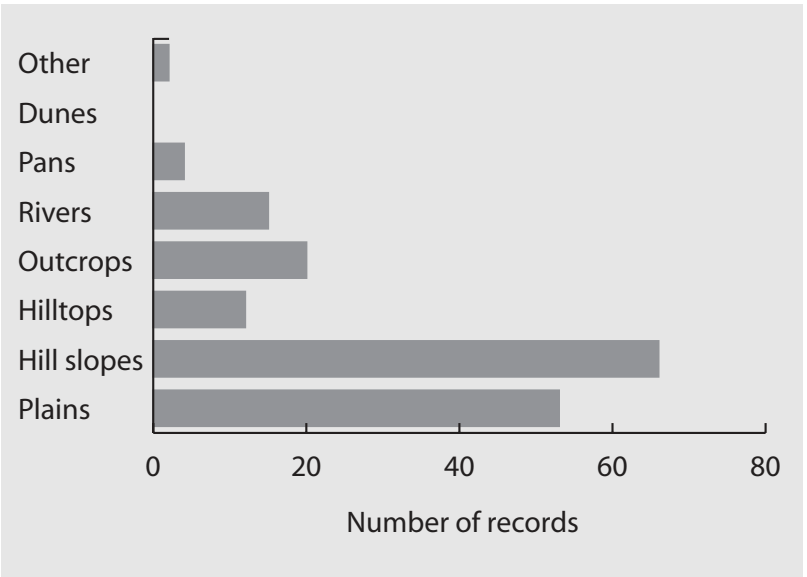


DISTRIBUTION & ABUNDANCE

Common to uncommon in north-western and central Namibia, including the eastern Karstveld. Common to abundant in places in the Cuvelai. One specimen from the extreme south-east (BC1530) is a range extension according to herbarium records, but not according to Coates Palgrave (2002).

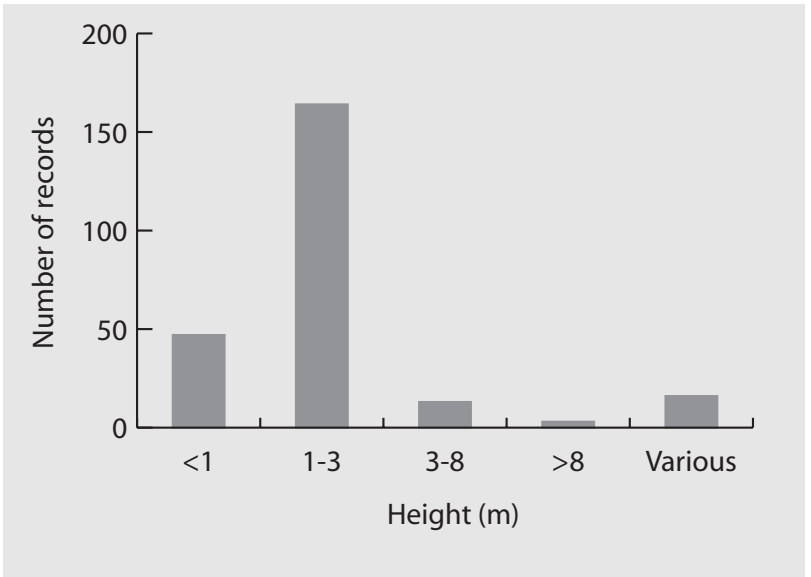
HABITAT

Various habitats, but mostly hill slopes and plains; along rivers in the north-west; on rocky outcrops in the south. Found on rocky or stony substrates.



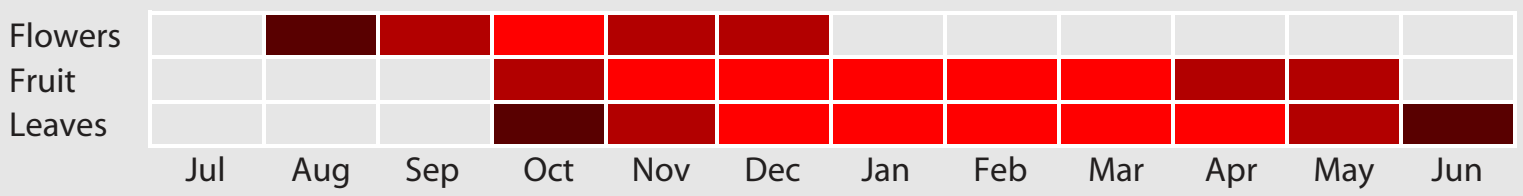
GROWTH FORM

Generally a shrub up to 3 m high, occasionally a tree up to 8 m.



ANNUAL CYCLE

FLOWERS August to December, with a peak in October, and isolated records in other months. FRUIT October to May, with occasional records of old fruit in other months. LEAVES Mainly November to May, with young leaves in October and November.



GENERAL

Eaten by baboons and dassies; often defoliated by insects. Seems to grow in disturbed areas in 1920DD. Of horticultural potential due to its brilliant yellow flowers, soft foliage and lack of thorns.

CONSERVATION CONCERNS

None recorded.



Elephantorrhiza suffruticosa, inflorescence, B. Curtis

Entada arenaria

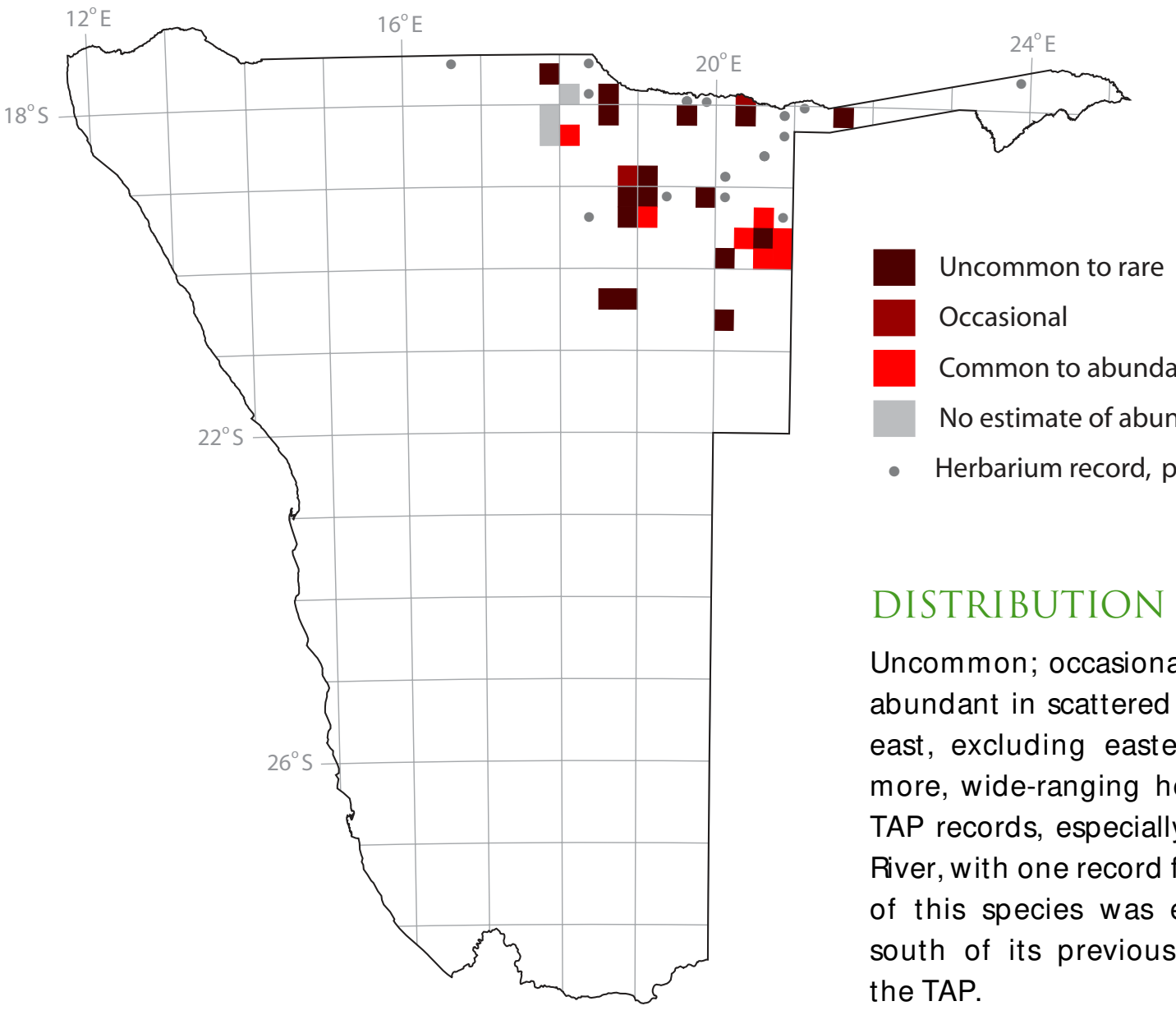
Mukambakamba

Sand entada (E): n/oan (J); /'E (Kx); ohelelanhenya (Ok)

[33 records from 27 (3%) squares]

A **suffrutex** with annual stems. LEAVES with **large, oblong, very asymmetric leaflets**; one side of the base rounded to cordate, the other **wedge-shaped; apex indented**. FLOWERS pale yellowish-white, in spikes. FRUIT a **long, broad pod**; straight, curved or sickle-shaped, leathery; **the walls splitting across into one-seeded segments and the thickened outer margins remaining on the plant**.

Pods and flowers are conspicuous. May be confused with young *Albizia antunesiana*, but the leaflets of the latter are far more ovate, with a more tapering tip.



DISTRIBUTION & ABUNDANCE

Uncommon; occasionally locally common to abundant in scattered localities in the north-east, excluding eastern Caprivi. There are more, wide-ranging herbarium records than TAP records, especially along the Okavango River, with one record from Caprivi. The range of this species was extended one degree south of its previously recorded range by the TAP.

HABITAT

Deep, sandy plains and dunes in woodland.

GROWTH FORM

Shrub (suffrutex) less than 1m high.

ANNUAL CYCLE

Few records; no observations from June to November. FLOWERS December. FRUIT January to May. LEAVES reported December to May.

GENERAL

The seeds of this plant are used ornamentally; root fibres are used ornamentally or for making nets for carrying goods. Various parts of the plant are used medicinally.

CONSERVATION CONCERNS

The lack of reporting of this species in areas in which it has previously been recorded could be a result of a die-out of the species in that area. However, it is more likely due to the fact that it was overlooked, being generally less than one metre in height and seldom common.

Entada arenaria, leaf and pod, C. Mannheimer

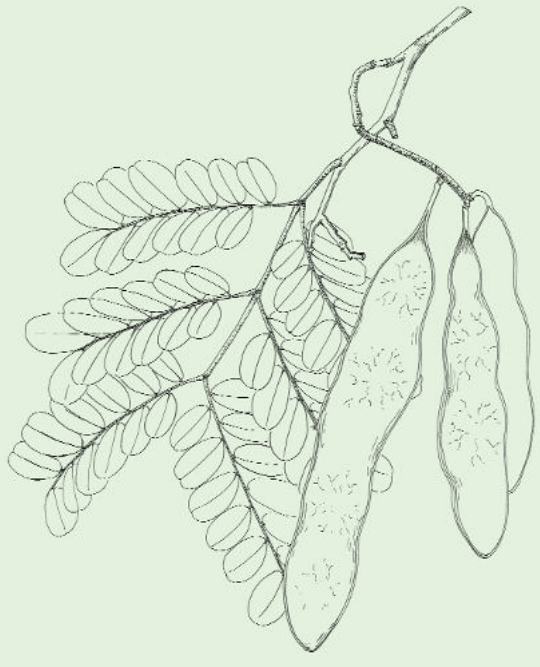


Erythrophleum africanum

Mupako

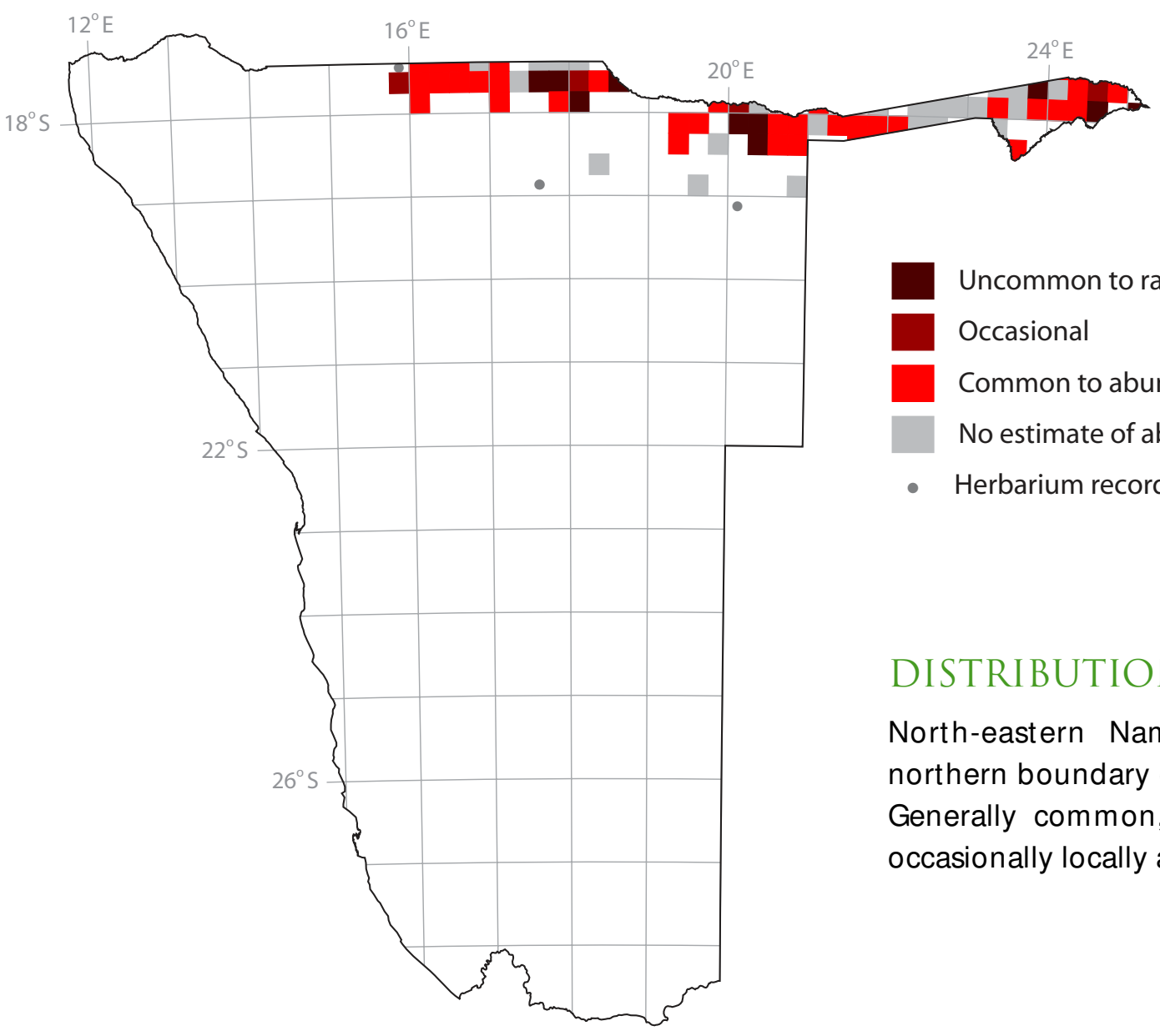
Ordeal tree (E); ambokiaat (A); qarati (Kx); mubako (L)

[110 records from 73 (7%) squares]



Medium to large deciduous tree. LEAVES bipinnately compound; **2–4 pinna pairs with round glands on rachis at base**; 8–14 alternate, green leaflets with **apex shallowly notched to blunt to broadly tapering**. FLOWERS in dense spikes, 35–100 mm long; small, fragrant, yellow-green or cream flowers. FRUIT a straight, flat, brown, leathery pod, **splitting along both sides**.

Flowers and ripe pods are conspicuous; green pods may be overlooked. This species may be confused with *Burkea africana*, but has green leaflets that are smaller than the grey-green leaflets of the latter, and that are green rather than grey-green. It lacks the velvety brown covering on young branches and new growth which is characteristic of *Burkea africana*.

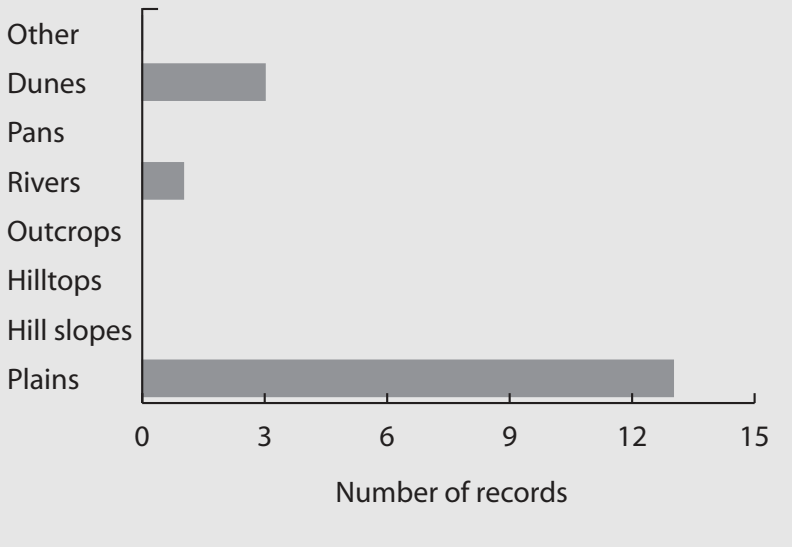


DISTRIBUTION & ABUNDANCE

North-eastern Namibia and the extreme northern boundary of Namibia as far as 16° E. Generally common, sometimes uncommon, occasionally locally abundant.

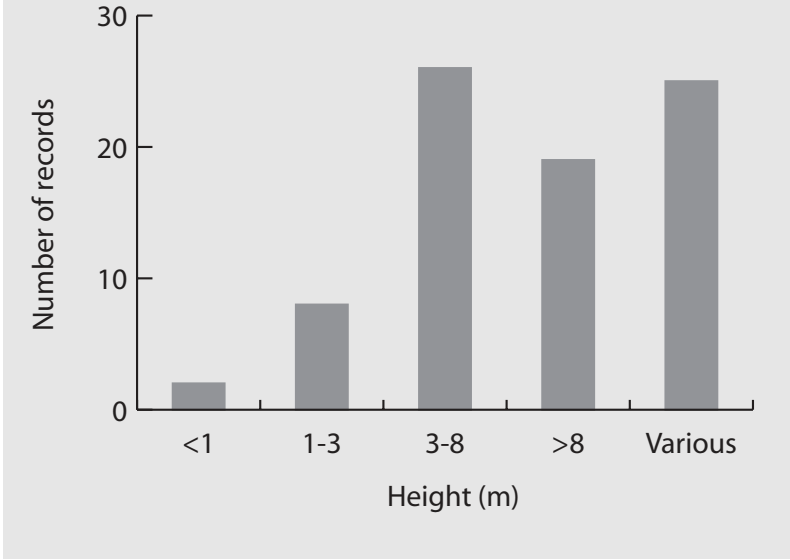
HABITAT

Plains and low dunes, as well as floodplains, in riverine forest and mixed woodlands.



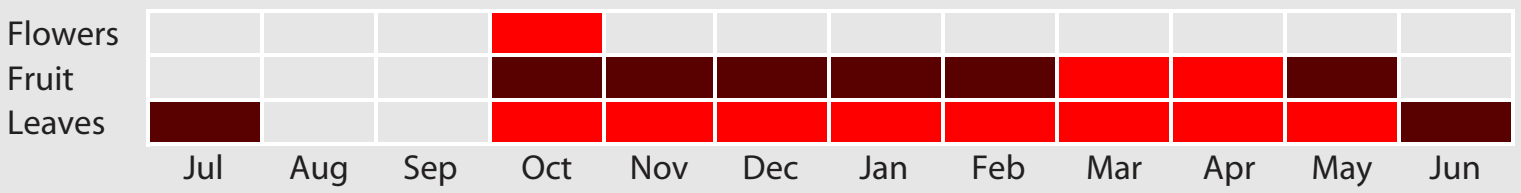
GROWTH FORM

A tree of over 8 m in height, with a lot of young growth of various heights in most localities.



ANNUAL CYCLE

Few data for June to September. FLOWERS one record in October. FRUIT present from October to May, but mostly in March and April. LEAVES October to May, with young leaves October and November.

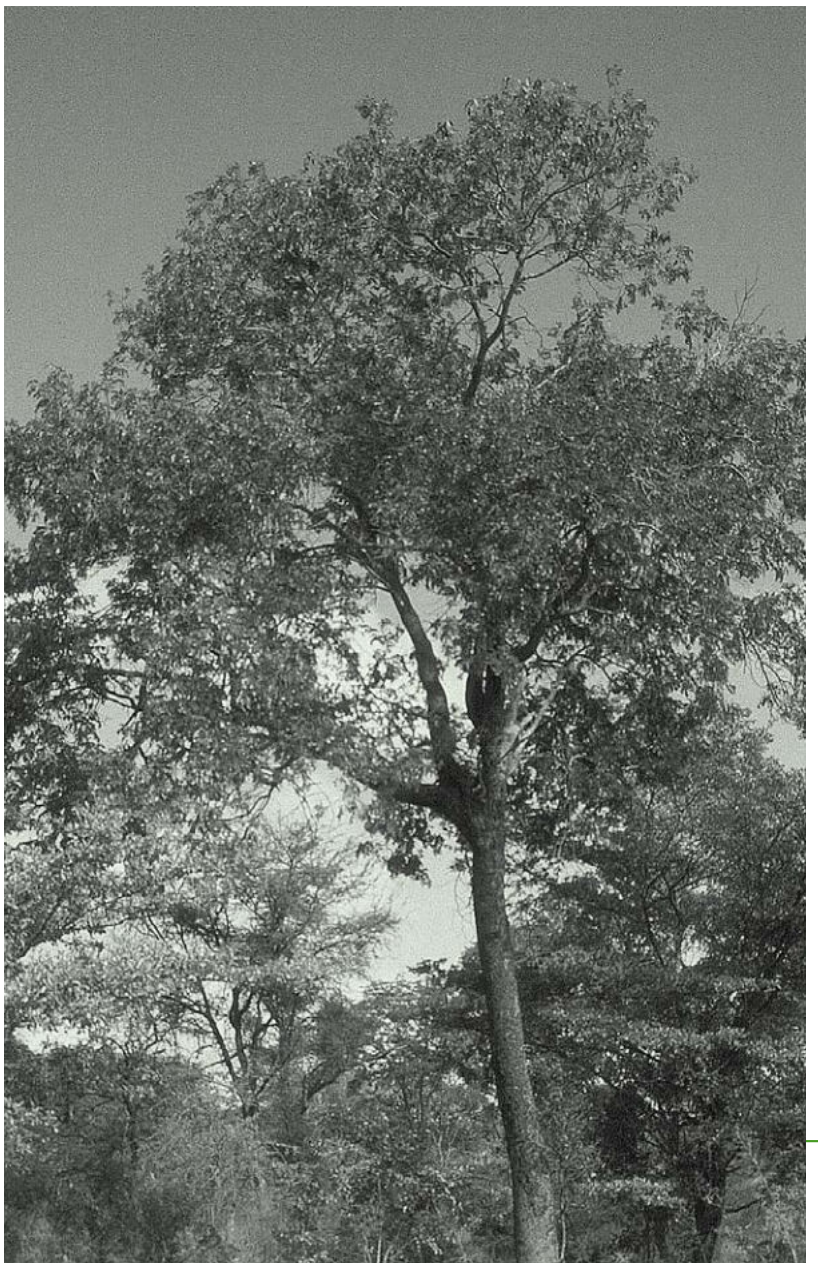


GENERAL

The wood is used to make furniture. The bark, roots and leaves are poisonous according to some literature; other sources report that the leaves are used medicinally.

CONSERVATION CONCERNS

None recorded.



Erythrophleum africanum, tree, B. Curtis

Burkea africana

Omutundungu/Burkea

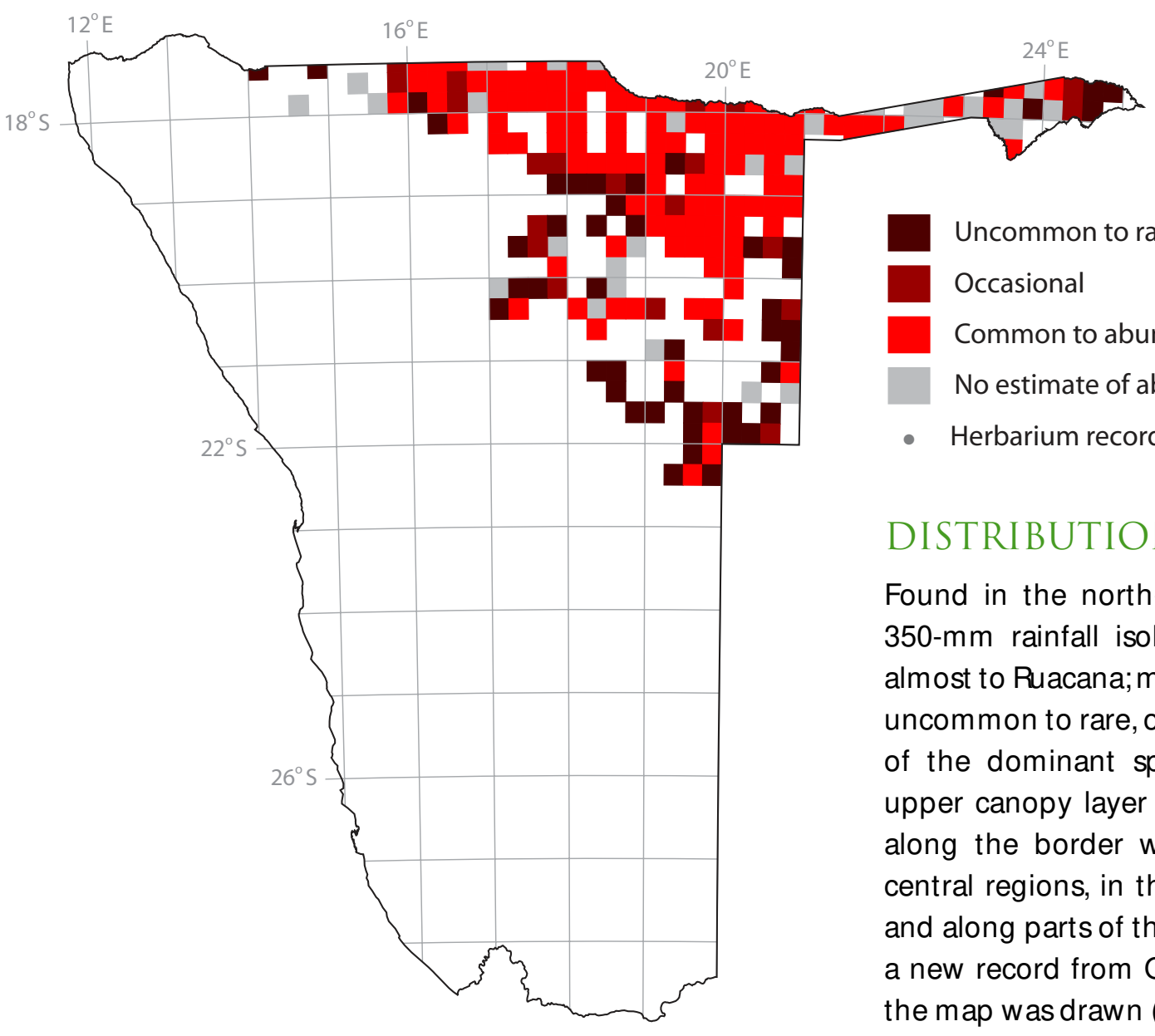
Sandsering, wildesering (A); musheshe (L); muhehe (T)

[490 records from 218 (20%) squares]



Deciduous tree with rounded to flattened crown. BARK grey, rough, longitudinally grooved; **young branchlets and growth points with a rust-brown, woolly-velvety covering**. LEAVES twice compound, clustered at young growth points; leaflet elliptic to obovate, **blue-green above, grey-green below with prominent mid-rib**; base asymmetric. INFLORESCENCE a hanging spike, occasionally branched, especially at young growth point. FLOWERS small, whitish; may appear before the leaves. FRUIT thin, pale brown, flattened, oblong-elliptic pods; in clusters.

May be confused with *Erythrophleum africanum* or *Albizia antunesiana* when not in flower. Both lack the velvety, brown covering characteristic of *B. africana* growth points.

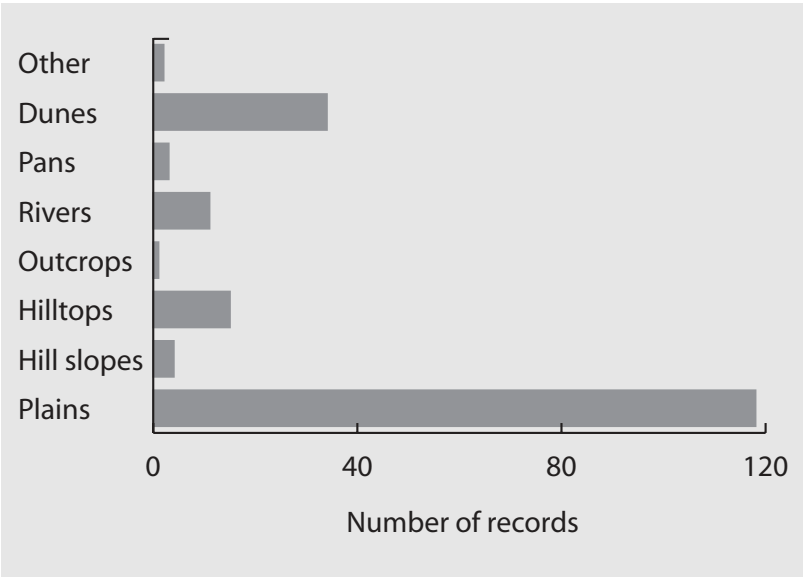


DISTRIBUTION & ABUNDANCE

Found in the north-east, roughly east of the 350-mm rainfall isohyet, but extending west almost to Ruacana; mostly common, sometimes uncommon to rare, occasionally abundant. One of the dominant species – especially in the upper canopy layer – in a number of squares along the border with Angola in the north-central regions, in the Omatako drainage area and along parts of the Okavango River. There is a new record from Omavanda (1713 AA) since the map was drawn (BC 2247).

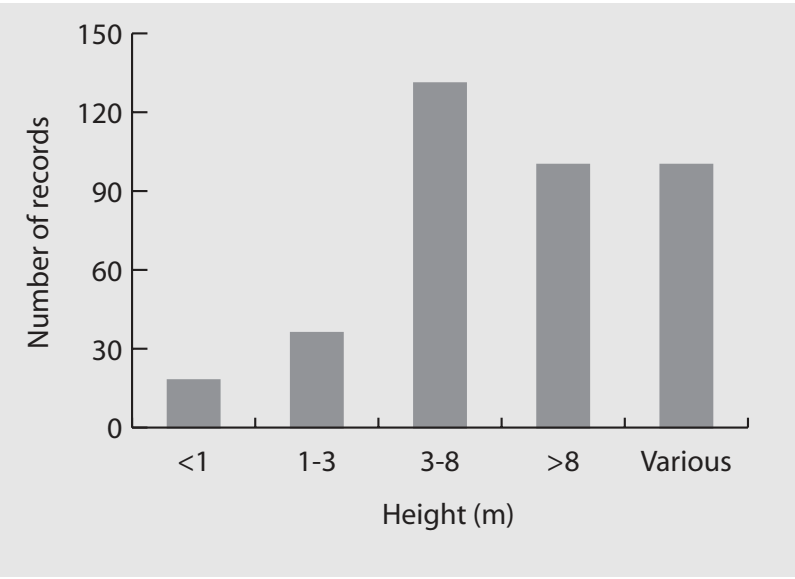
HABITAT

Most often on plains, also on dunes in the north-east. Always on sandy substrates.



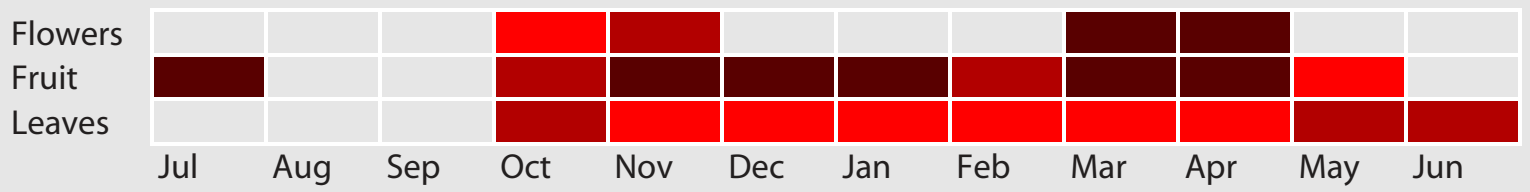
GROWTH FORM

A tree 3–8 m high and higher. Trees over 8 m found mainly in the Cuvelai and central-east.



ANNUAL CYCLE

FLOWERS in spring and autumn, with most in October. FRUIT found occasionally most of the year round, but most often in May. LEAVES November to April, with new leaves mostly in October.



GENERAL

This species is browsed by game, including springbok, zebra and eland; it is host to edible caterpillars of the family Saturniidae during the rainy season. The wood has numerous uses, including fuel, the construction of kraal fences and 'sitting places'; the stumps are used as stools, as well as mortars and pestles for grinding mahango. The resin is edible but inferior; crushed bark is used to enhance the colour of beer; the sap, bark and roots are used medicinally. Ash from charred roots is used ritualistically by Ju|'hoansi hunters. Also known as omukongo (H) (PIE1, 2017BB).

The tree is difficult to cultivate, with poor germination and poor survival of seedlings. Dead or dying trees were noted in occasional squares, but regeneration was noted after fire in 1820BC. Young trees and coppice growth were noted in several squares, particularly in the degree-square 1919, but overall recruitment was not high, or not noted.

CONSERVATION CONCERNS

Excessive fire may be compromising recruitment by destroying seeds. Overharvesting for timber may also be of concern in future. Protected by forestry legislation.

Colophospermum mopane

Mopane / Omusati

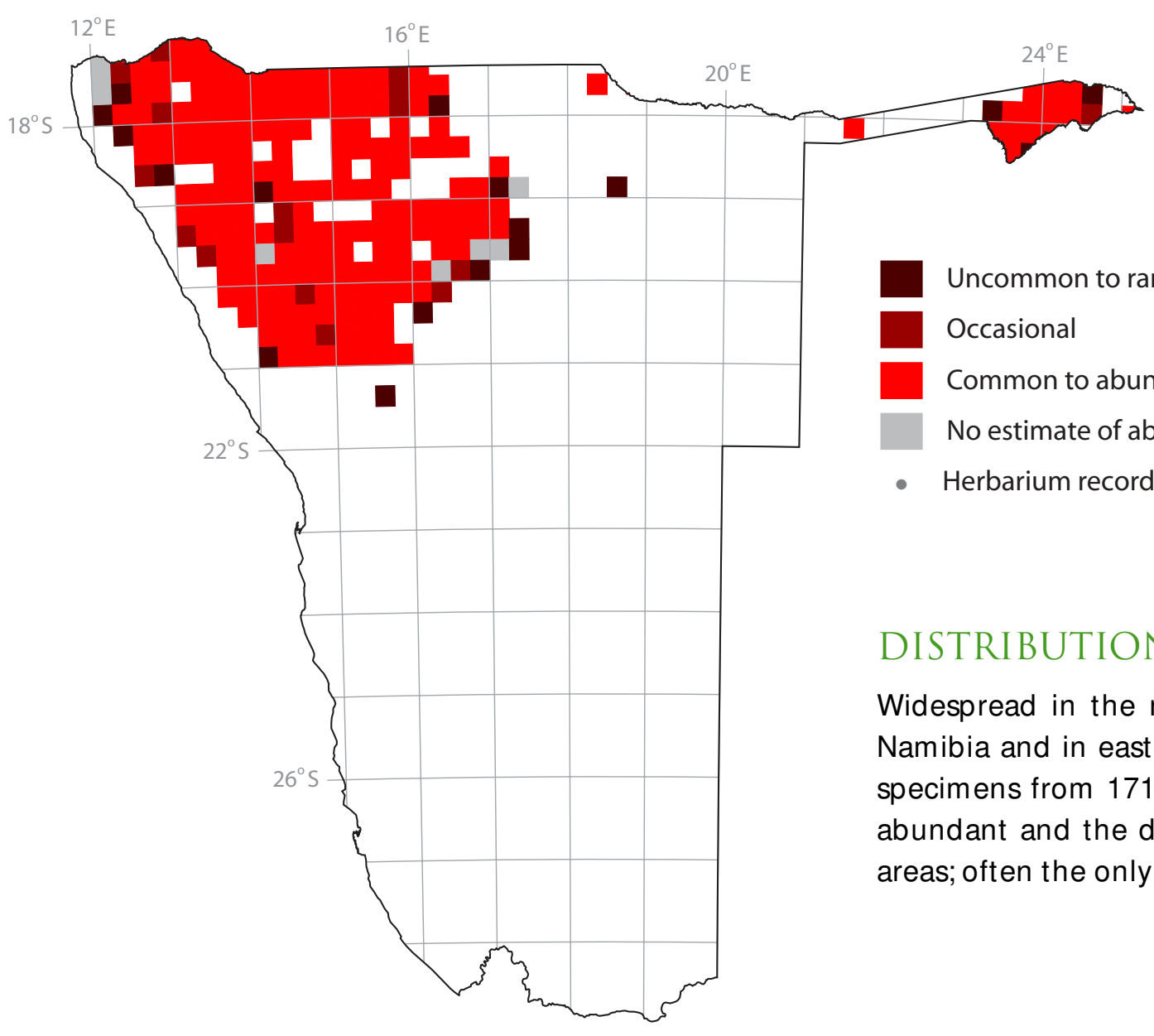
Mopani (A, L); omutati (H); ||gais (J, K); tsaurahais (K); pana (Kx); mupanyi (T)

[1,056 records from 236 (22%) squares]



A semi-deciduous shrub or tree. LEAVES bifoliolate, with two sessile **leaflets** resembling **the wings of a butterfly, smelling of turpentine** when crushed. FLOWERS small, green-yellow, with 20–25 stamens hanging down. FRUIT a flattened, **kidney-shaped**, leathery, smallish, pale brown pod.

Flowers and green pods easily overlooked. Mopane may only be confused with *Guibourtia coleosperma* by someone who does not know either species.



DISTRIBUTION & ABUNDANCE

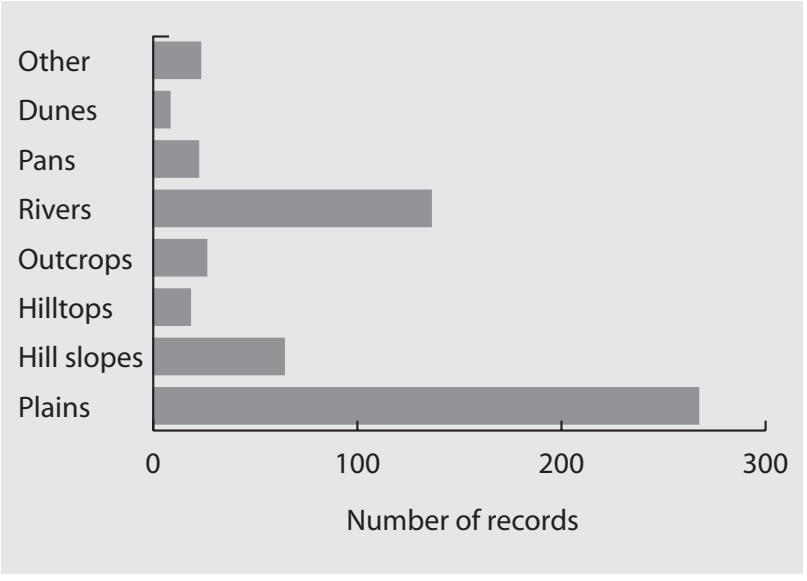
Widespread in the north-western quarter of Namibia and in eastern Caprivi, with isolated specimens from 1718CB and 1818DC. Mostly abundant and the dominant species in large areas; often the only woody species.

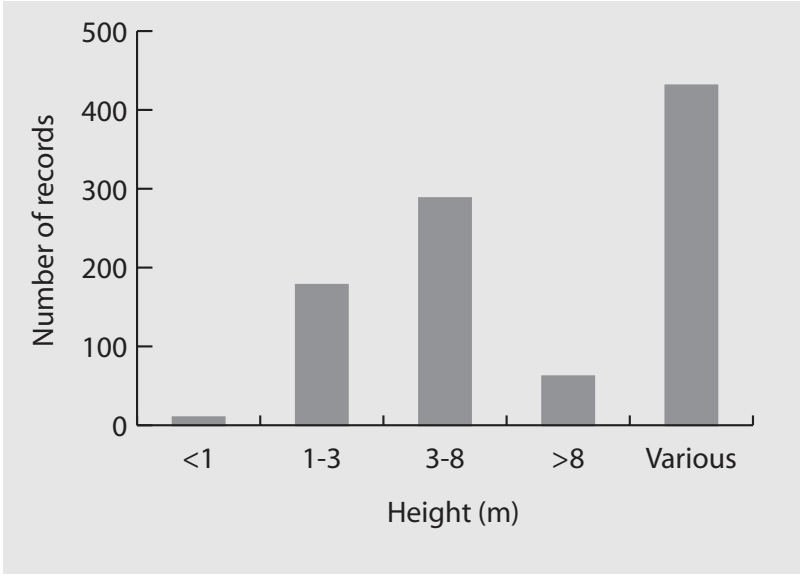
HABITAT

Found in almost all habitats, but most abundant on plains. Also found along dry river courses. Generally on sandy substrates, but also on rock, gravel and calcrete.

GROWTH FORM

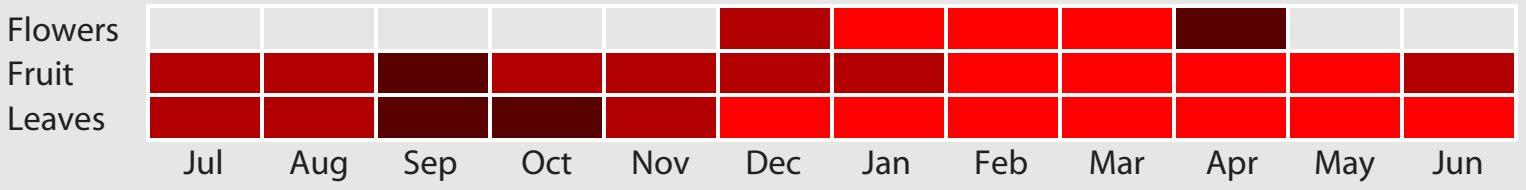
About 60% of records were trees and 40% shrubs; often shrubby trees. Generally up to 8 m high, but sometimes taller, and often in mixed stands of all height classes. Along the Kunene River, and in places in the Cuvelai and in the Kamanjab area, there are trees higher than 8 m, as well as in eastern Caprivi. In the drier west, trees growing along water courses, or following the flow of an underground aquifer are noticeably taller and more tree-like than those on the plains and hill slopes. The chopping of live wood has turned many single-stemmed trees into multi-stemmed shrubs.





ANNUAL CYCLE

FLOWERS mainly December to March, with occasional flowers produced at other times. Flowering was variable from year to year, with the summer of 1998/99 having the longest flowering period overall – from November until March. It is also variable from region to region – in January in the Caprivi, in December and January in the Karstveld, and January to March in the north-west. FRUIT may be found all year, but most often February to May. LEAVES found on most trees between November and June; with most trees bare from July to October; young leaves are produced October and November.



GENERAL

Mopane is the only large woody species in many areas and is heavily utilised for fuel, construction and other purposes. It has the ability to coppice (regrow) from the chopped stump, but in some areas it is being utilised to the point where there is only short, shrubby growth. Mopane may be an encroaching species in some squares and is subject to bush-clearing and harvesting for charcoal.

Both wild and domestic animals browse the leaves. It is an important food for mopane worms, the larvae of the emperor moths, *Imbrasia belina*, which are in turn an important food in local diets. The roots of mopane are harvested for the ornamental trade. Various parts used medicinally; also used for good luck charms. In Himba culture it is believed to be sacred, and used in rituals.

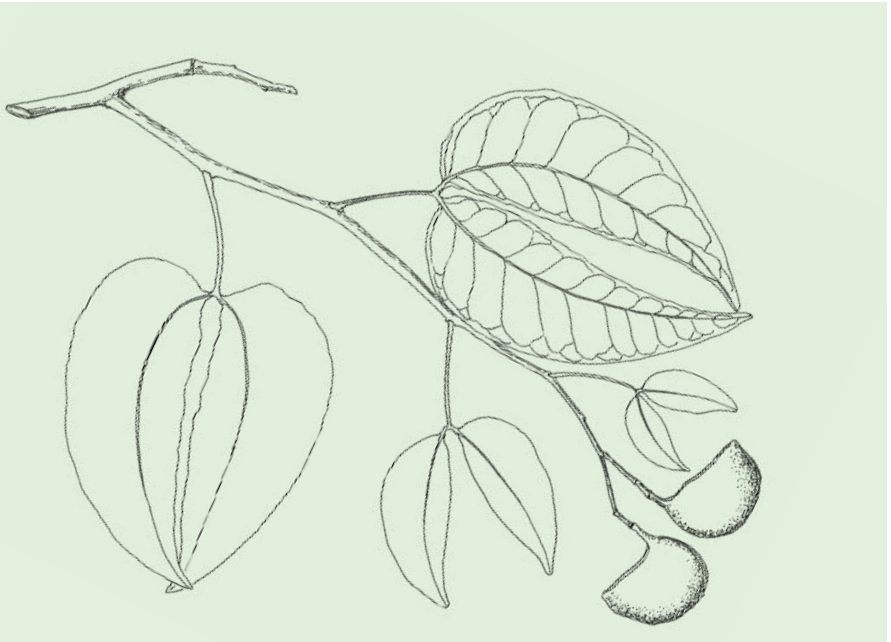
Continued on page 205

Guibourtia coleosperma

Ushivi

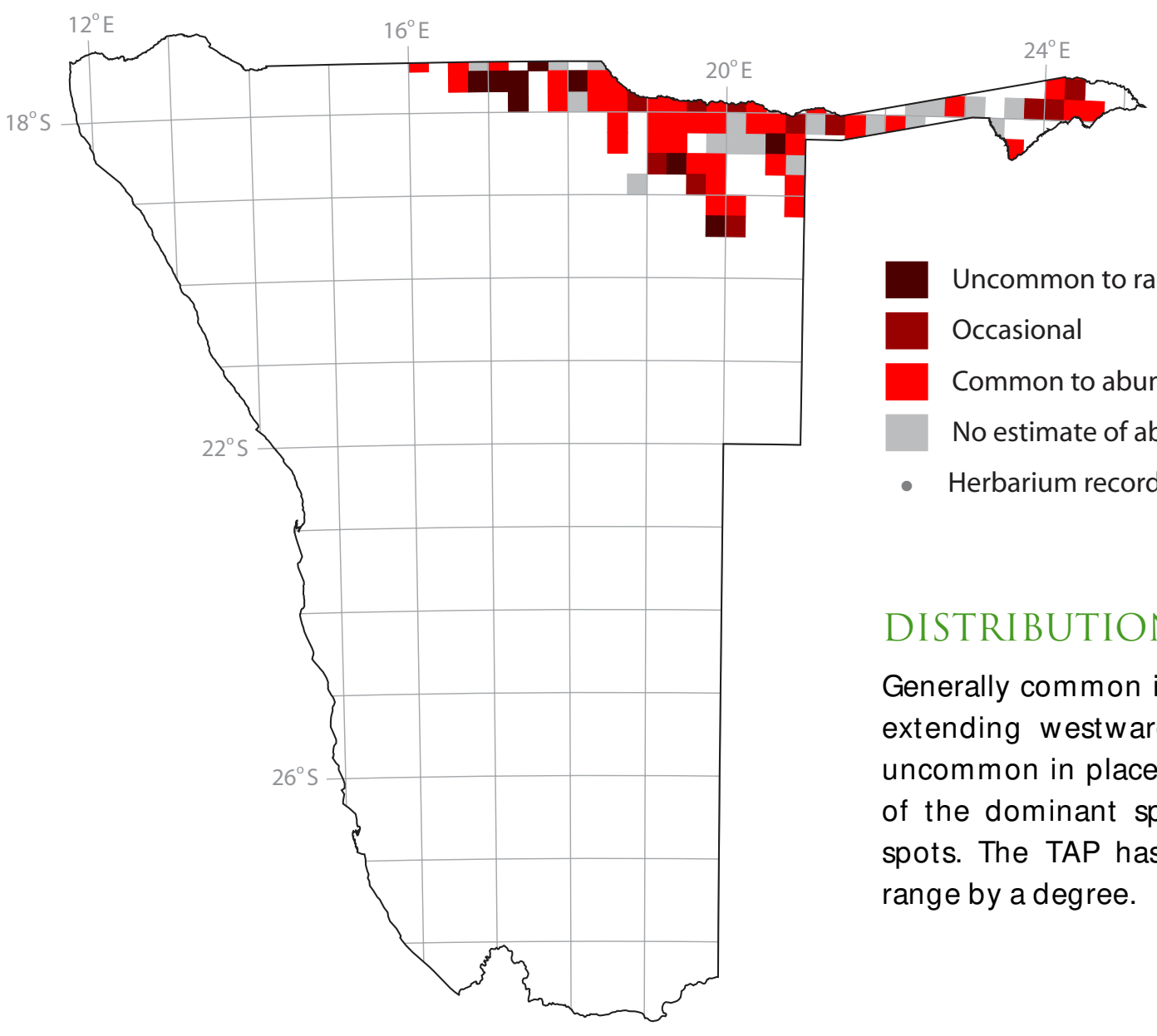
Baster mopanie (A); muzauli (L); omusii (O); ghushi (T)

[160 records from 82 (8%) squares]



Tall tree with spreading crown and **drooping branches**. BARK reddish to yellow-brown; **smooth, often with rough, black patches** peeling off in small fragments. LEAVES **butterfly-shaped; shiny green above**, with dull, waxy coating, hairless; **veins forming definite network**. FLOWERS small, cream-coloured to white, star-shaped, in terminal or axillary sprays. FRUIT a pod, 20–30 mm long, oval, brown to dark brown; thickly woody. SEEDS solitary, *c.* 10 mm long, **red-brown with conspicuous red aril**.

Fruit is conspicuous. Flowers conspicuous when in profusion, may be overlooked from a distance when only a few. Can only be confused with *Colophospermum mopane* if neither of the species is well known to the observer.

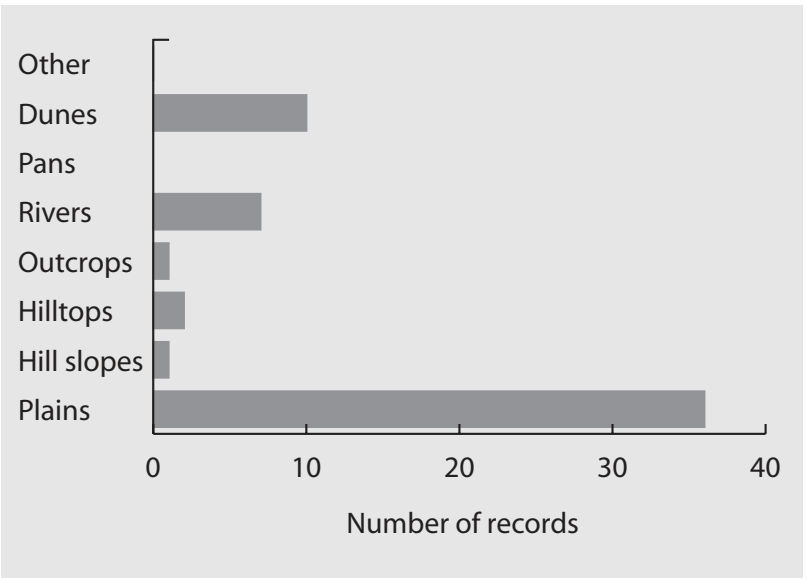


DISTRIBUTION & ABUNDANCE

Generally common in north-eastern Namibia, extending westwards to 16° E; sometimes uncommon in places, seldom abundant. One of the dominant species in a few localised spots. The TAP has extended its westward range by a degree.

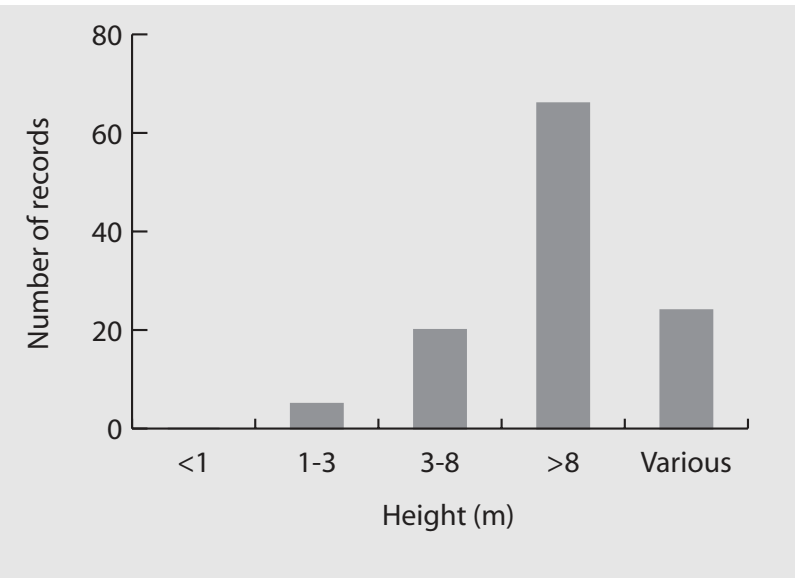
HABITAT

Grows on sandy plains, along rivers and occasionally on dunes or sand hummocks. Usually found in mixed or riverine woodlands.



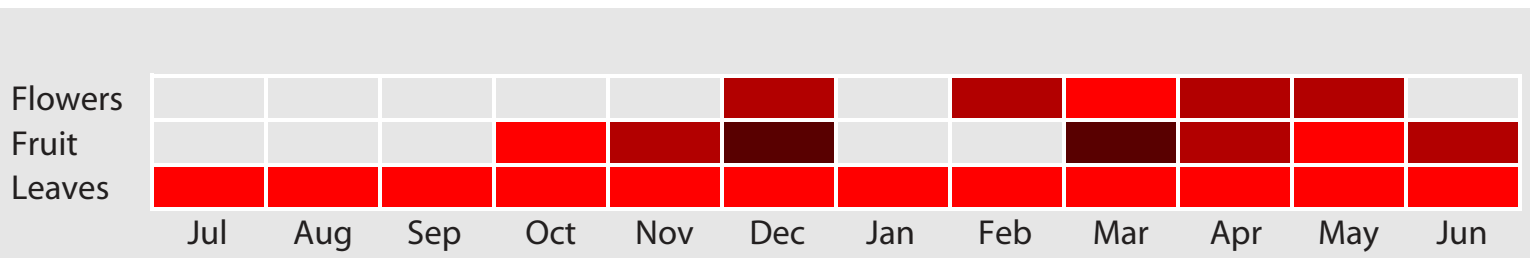
GROWTH FORM

Always a tree, with about 28% of records to 8 m high and 72% taller than 8 m. About 25% of observations had young and old trees of all heights.



ANNUAL CYCLE

FLOWERS December to May, but mostly March; there were no TAP records of flowers before December, but fruit records peaked before December. FRUIT most records in October and May. LEAVES evergreen.



GENERAL

The seeds are edible, but also used ornamentally; the seed oil is used for cooking, as well as cosmetics. The wood is used for watos (dug-out canoes), construction timber and carved utensils. Various parts are used medicinally. *Guibourtia coleosperma* has horticultural potential for frost-free areas, as it is a very attractive, evergreen shade tree with striking fruit, and white, star-like flowers that show up against the dark, glossy foliage.

CONSERVATION CONCERNS

None recorded. Protected by forestry legislation.

Colophospermum mopane *Continued from page 203:*

CONSERVATION CONCERNS

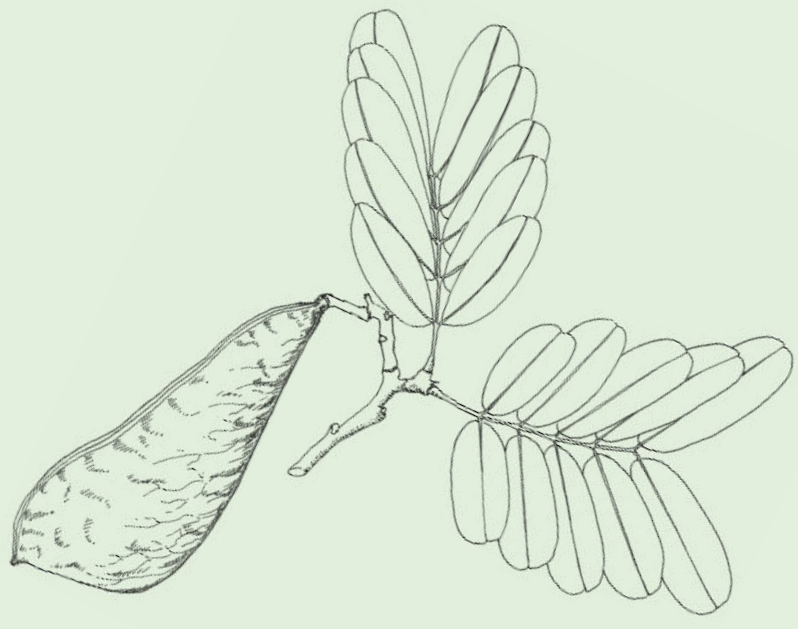
Although widespread and able to regenerate, this species is still of concern as the rate of exploitation may be greater than the rate at which it can recover. Overgrazing can seriously reduce the production of young plants. Protected by forestry legislation.

Baikiaea plurijuga

Zambezi Teak

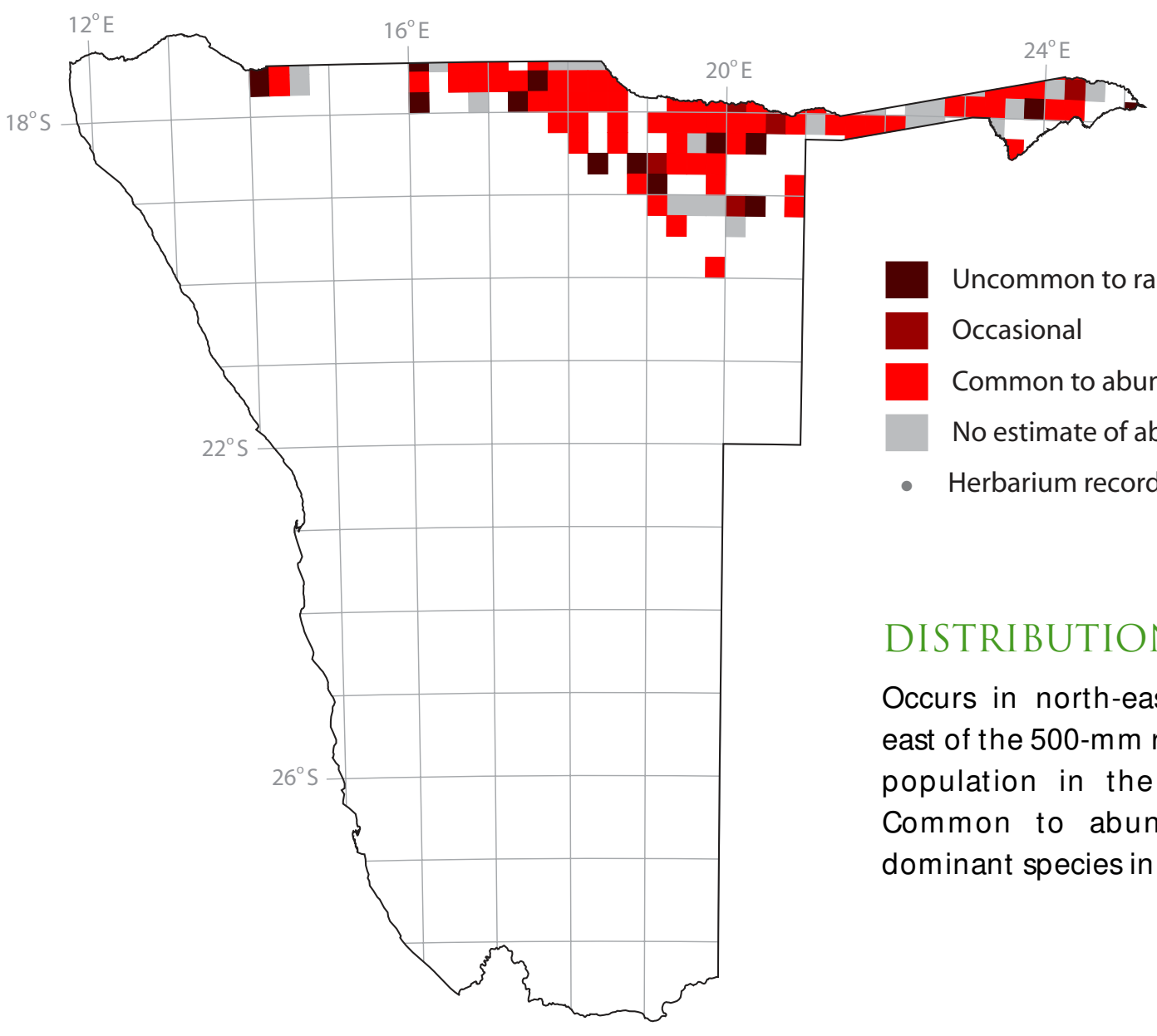
Mukusi (L); omupapa (O); uhahe (Rk, Rum); mukutji (T)

[182 records from 108 (10%) squares]



Deciduous tree with dense, spreading crown, up to 20 m high. BARK grey to dark brown, sometimes flaking off in longitudinal strips LEAVES compound, up to 140 mm long, with 4–6 leaflet pairs; leaflets opposite, leathery, oblong to narrowly elliptic; dark green above, pale green below, both surfaces downy; apex slightly indented with a short bristle. FLOWERS 20–30 mm long, **petals pink to mauve, crinkly**; buds with golden-brown, downy hairs. FRUIT a pod, up to 150 mm; **apex broader than the base, flattened, woody, covered with rust-brown, densely woolly hairs**, turning golden-brown when ripe.

Flowers and pods are conspicuous and distinctive; without them the species may be confused with a number of others.

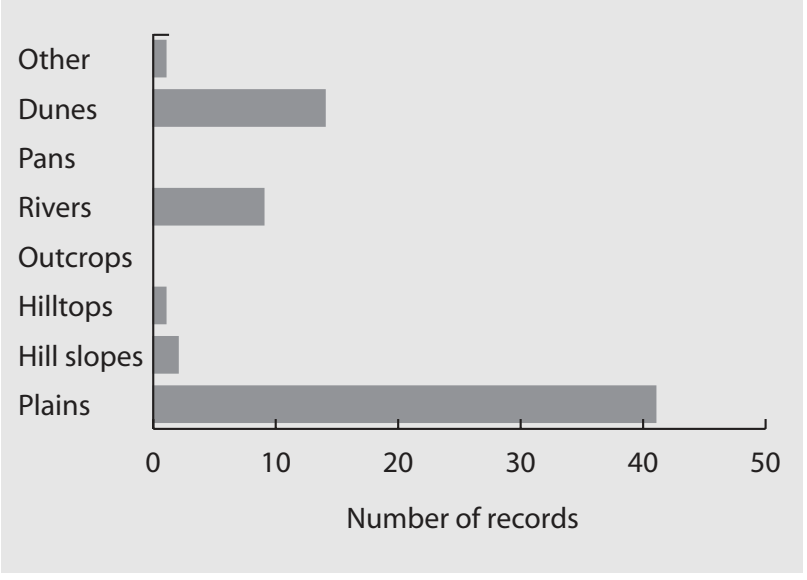


DISTRIBUTION & ABUNDANCE

Occurs in north-eastern Namibia, generally east of the 500-mm rainfall isoyet, with a small population in the area around Ruacana. Common to abundant and one of the dominant species in a number of squares.

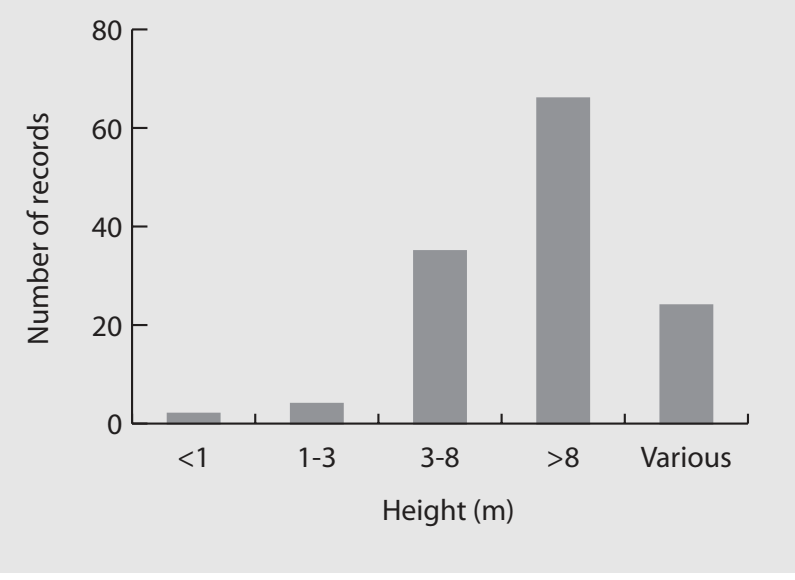
HABITAT

Mostly on plains, also dunes and in dry riverbeds. Always on sand.



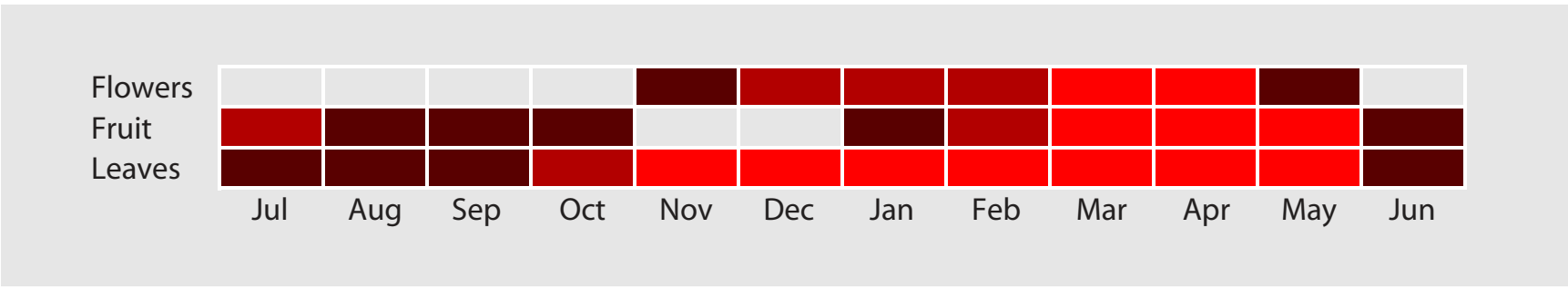
GROWTH FORM

Mostly a tree of over 8 m, but many individuals in the 3–8-m category. A number of saplings under 3 m high and many shrubby forms due to frequent fire were recorded, especially in the Kavango Region.



ANNUAL CYCLE

FLOWERS November to May, with a peak in March and April. FRUIT January to October, with a peak from March to May. LEAVES some all year round, mainly November to May; new leaves in October (few observations June to December).



GENERAL

The wood is used for a variety of purposes including furniture, tools (hoes, axes) and carvings. Seeds used for ornamental crafts. The sap is used for eye ointment and for upset stomachs. Other parts of the plant are also used medicinally. This lovely shade tree with its beautiful flowers has horticultural potential in frost-free areas.

CONSERVATION CONCERNS

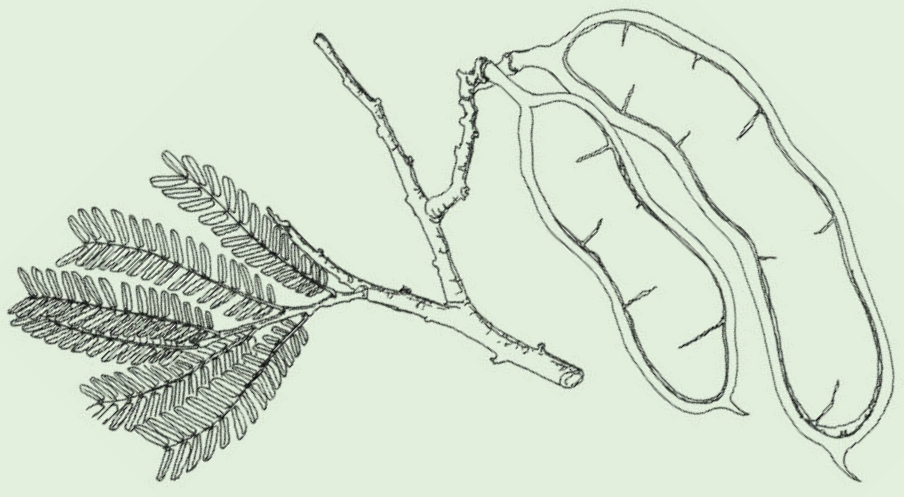
Threatened by over-exploitation for timber, fencing and hut construction, as well as by clearing for homesteads and fields. Protected by forestry legislation. The population is declining and the tree classified as 'near threatened' according to the latest IUCN criteria (Loots 2005).

Schotia afra

Karoo Schotia

Karooboerboon (A)

[14 records from 9 (<1%) squares]

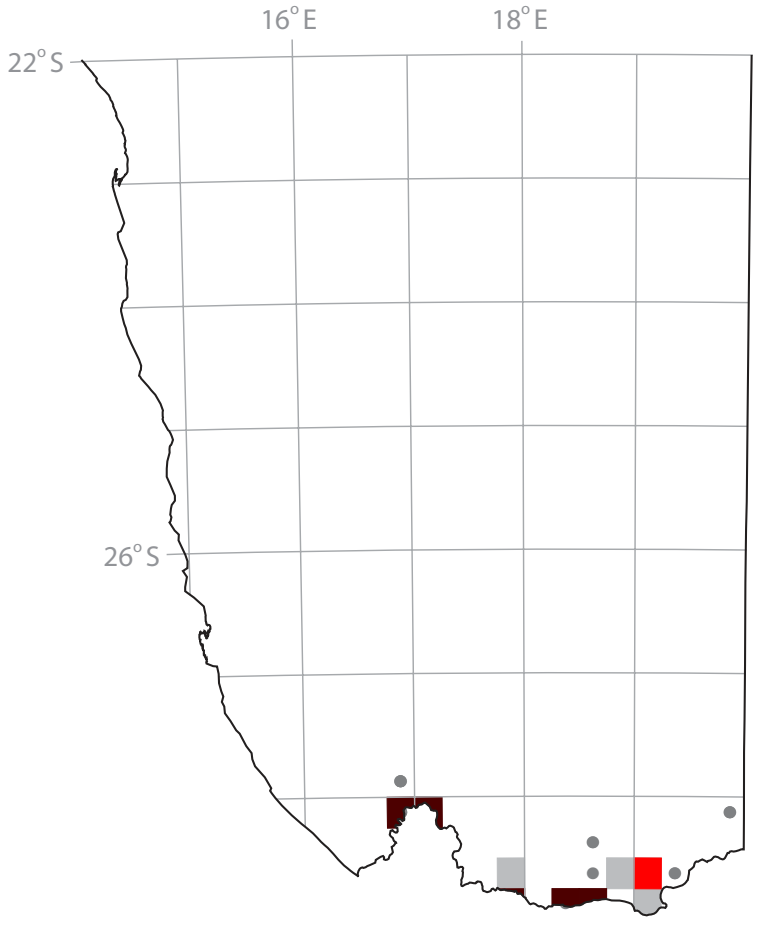


Sturdy shrub or small tree with a gnarled trunk and rigid branchlets. LEAVES compound, with small, narrow leaflets. FLOWERS **bright red, with stamens protruding beyond the petals**; up to 18 mm long; in clusters on the ends of branches. FRUIT a somewhat sickle-shaped, **flattened, woody pod, with a pointed apex and thickened margins which are persistent; splits along the lateral walls when ripe**.

Flowers and fruit are conspicuous.

DISTRIBUTION & ABUNDANCE

Generally uncommon along the northern bank of the Orange River. It was locally common in 2819CA and the dominant woody species in kloofs in 2817AA. There are a few earlier herbarium records which were not reconfirmed by the TAP.



HABITAT

Mostly found along dry water courses among rocky hills, on gravel or stony substrates.

GROWTH FORM

Generally a tree in the 3–8-m category; twice recorded as over 8 m. Sometimes a shrub of less than 3 m.

ANNUAL CYCLE

Observations were made August to November, and in February and March. FLOWERS September to November. FRUIT August, February to May. LEAVES apparently evergreen.

GENERAL

The seeds of this plant are edible. The flowers attract many insects. This plant has horticultural potential due to its drought-tolerance, lack of thorns and striking clusters of deep crimson flowers.

CONSERVATION CONCERNS

No threats reported. This plant is rare in Namibia, and protected by forestry legislation.

Afzelia quanzensis

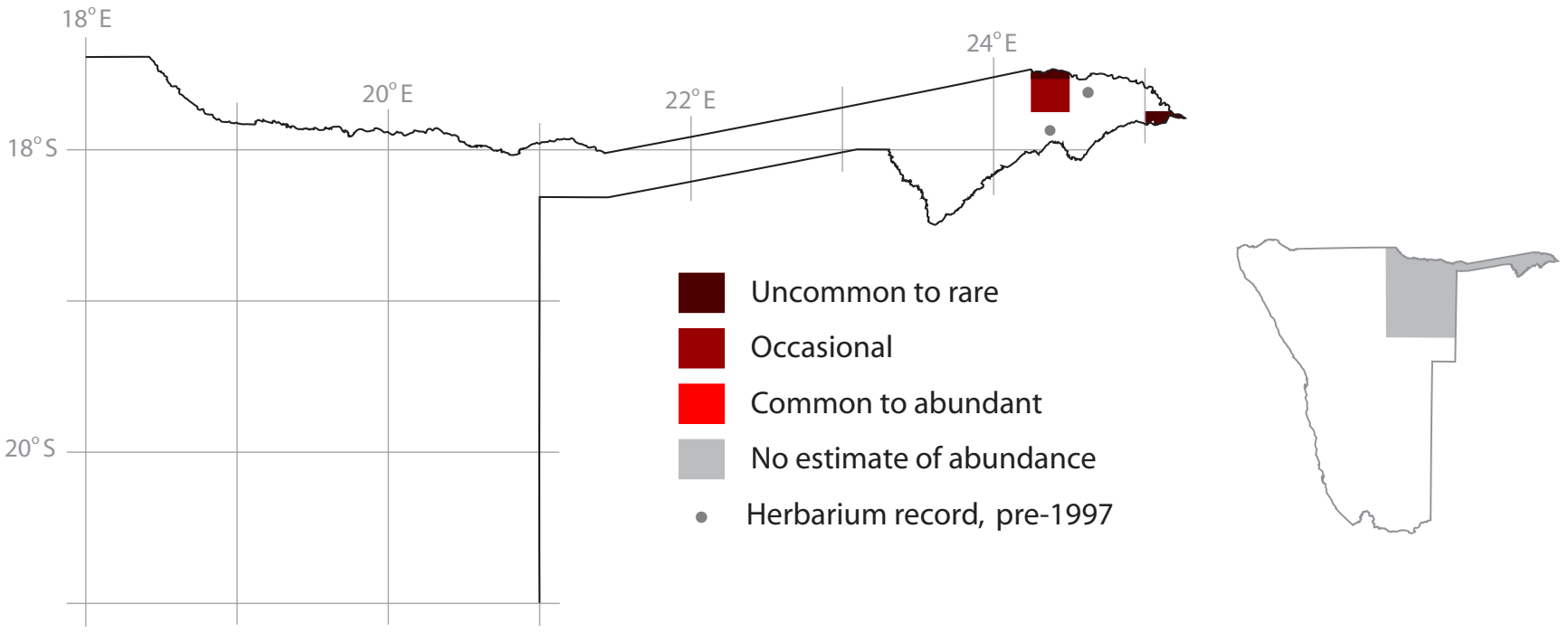
Mwanda

Pod mahogany (E); peulmahonie (A)

[7 records from 4 squares]

Tall deciduous tree with a large spreading crown. BARK purplish-grey to pale brown, **smooth or flaking in thick, round discs**. LEAVES compound, up to 400 mm long; leaflets large, elliptic, **glossy with prominent veins; dark green above**, lighter green below. FLOWERS with a single, **relatively large, conspicuous, orange-red petal**. FRUIT a large, woody pod, obliquely-oblong, flattened; splitting into two thick, woody valves. SEEDS **black with an orange to red cup-shaped aril**.

The leaves are similar to those of *Julbernardia*.



DISTRIBUTION & ABUNDANCE

Uncommon in Caprivi, from Katima Mulilo south to the Chobe River and east to Impalila Island.

HABITAT

Floodplains and river banks.

GROWTH FORM

Always a tree, usually over 8 m; 1–3 m high in 1724CC.

ANNUAL CYCLE

FLOWERS in November. FRUIT February, March, May and November. LEAVES were recorded in February, March and November; old leaves in May. No leaves recorded in July.

CONSERVATION CONCERNS

None recorded. Rare in Namibia.

Afzelia quanzensis, Katimo Mulilo, B. Curtis



Adenolobus garipensis

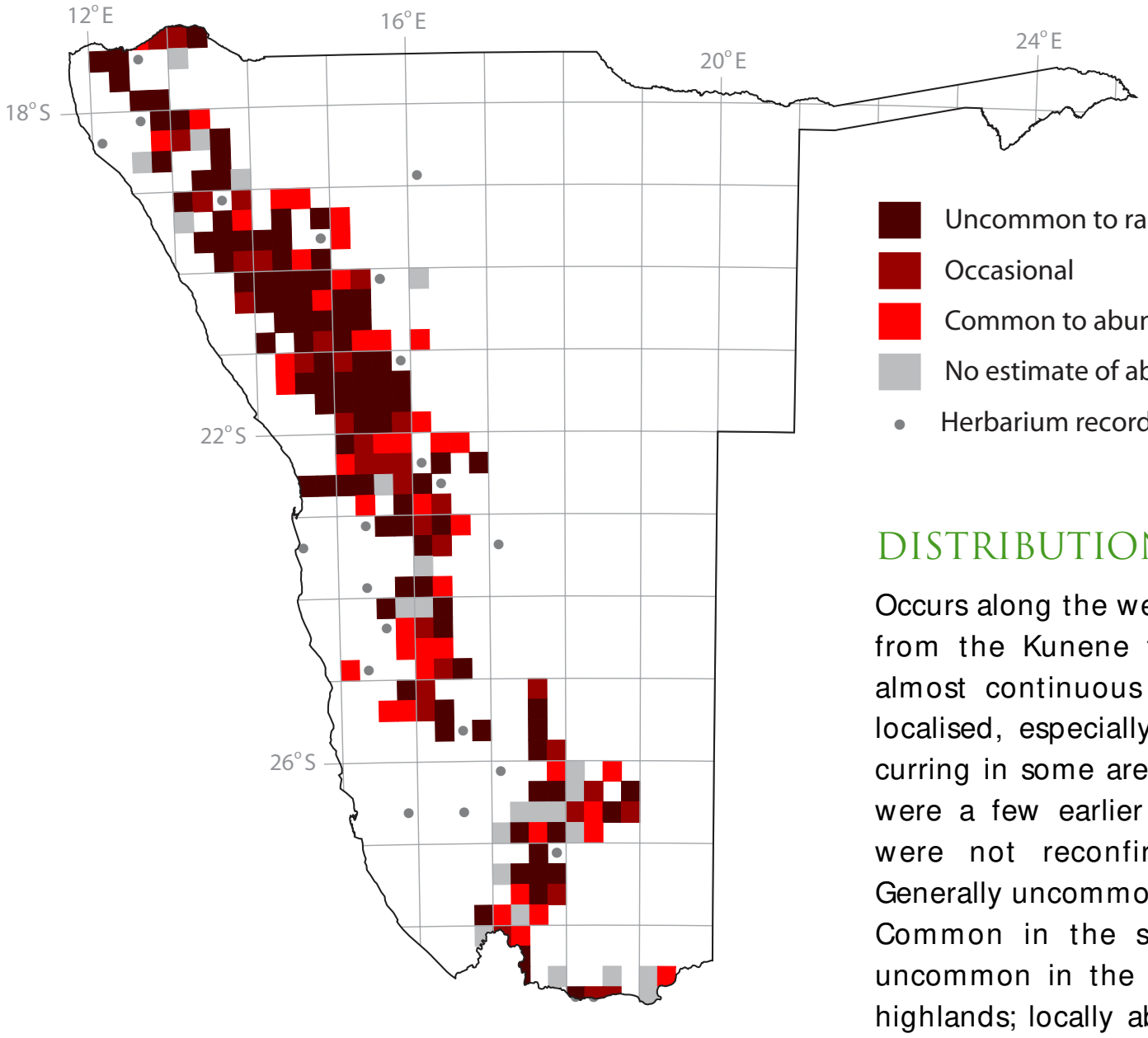
Omukandakanda

Butterfly-leaf (E); bloubeesklou (A); |hantu (K)

[470 records from 207 (19%) squares]



Evergreen shrub or small tree, with slender green branches. BARK smooth, pale grey. LEAVES **bilobed**, fairly small, **blue-green**. FLOWERS a tight tube with stamens protruding; **yellow to red with conspicuous red to maroon veins**. FRUIT a small, pale brown-green pod; occasionally covered with short glands appearing as dark-brown flecks, or else smooth, shiny and pale brown.
Flowers and ripe pods are conpicuous; young pods could be overlooked. Cannot really be confused with anything else.

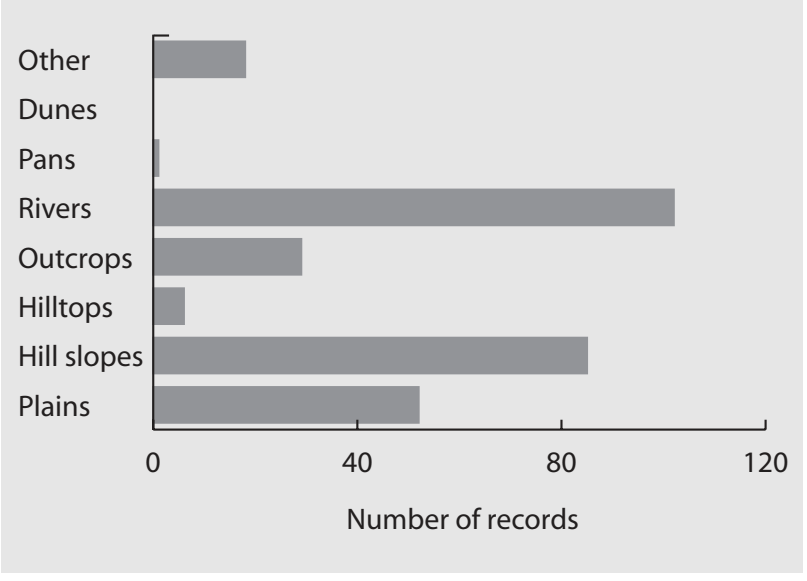


DISTRIBUTION & ABUNDANCE

Occurs along the western side of the country from the Kunene to Orange Rivers in an almost continuous line. Plants were often localised, especially in the north-west, occurring in some areas, but not others. There were a few earlier herbarium records that were not reconfirmed during the TAP. Generally uncommon to common; often rare. Common in the south-west; common to uncommon in the central-west and central highlands; locally abundant in places in the central- and north-west.

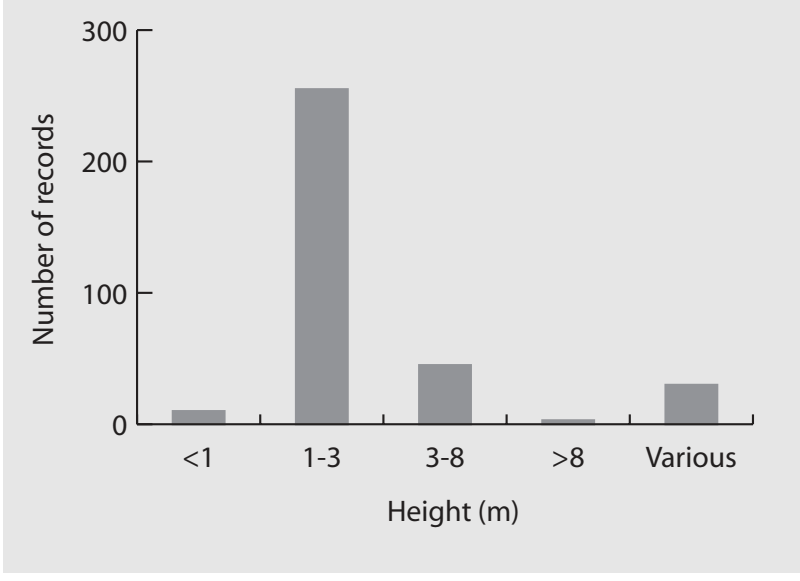
HABITAT

Found in most habitats, but most often in dry rivers and on hill slopes; on plains in the central-west and south. This plant prefers rocky habitats, but also occurs on gravel and sand.



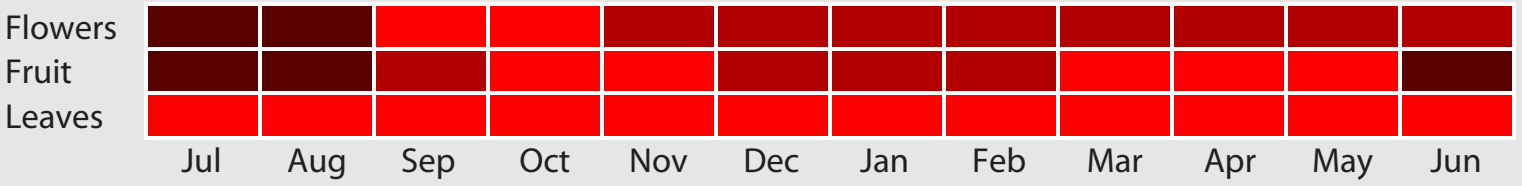
GROWTH FORM

Mostly a shrub of 1–3 m high, occasionally up to 8 m. Very rarely a tree, and then more often in dry rivers and on plains.



ANNUAL CYCLE

FLOWERS occur sporadically all year round, with a peak in September and October. FRUIT are also present every month, but most often from March to May and in October and November; ripe seeds were recorded in July. LEAVES may be found every month, with a few bare individuals recorded every month except from February to April, and new leaves occasionally throughout the year; vigorous new leaf growth was recorded in January 1998.



GENERAL

Heavily browsed by most ungulates, both wild and domestic. Also known as koedoebos (SOS1, 2416CD)

CONSERVATION CONCERNS

None recorded.

Bauhinia petersiana

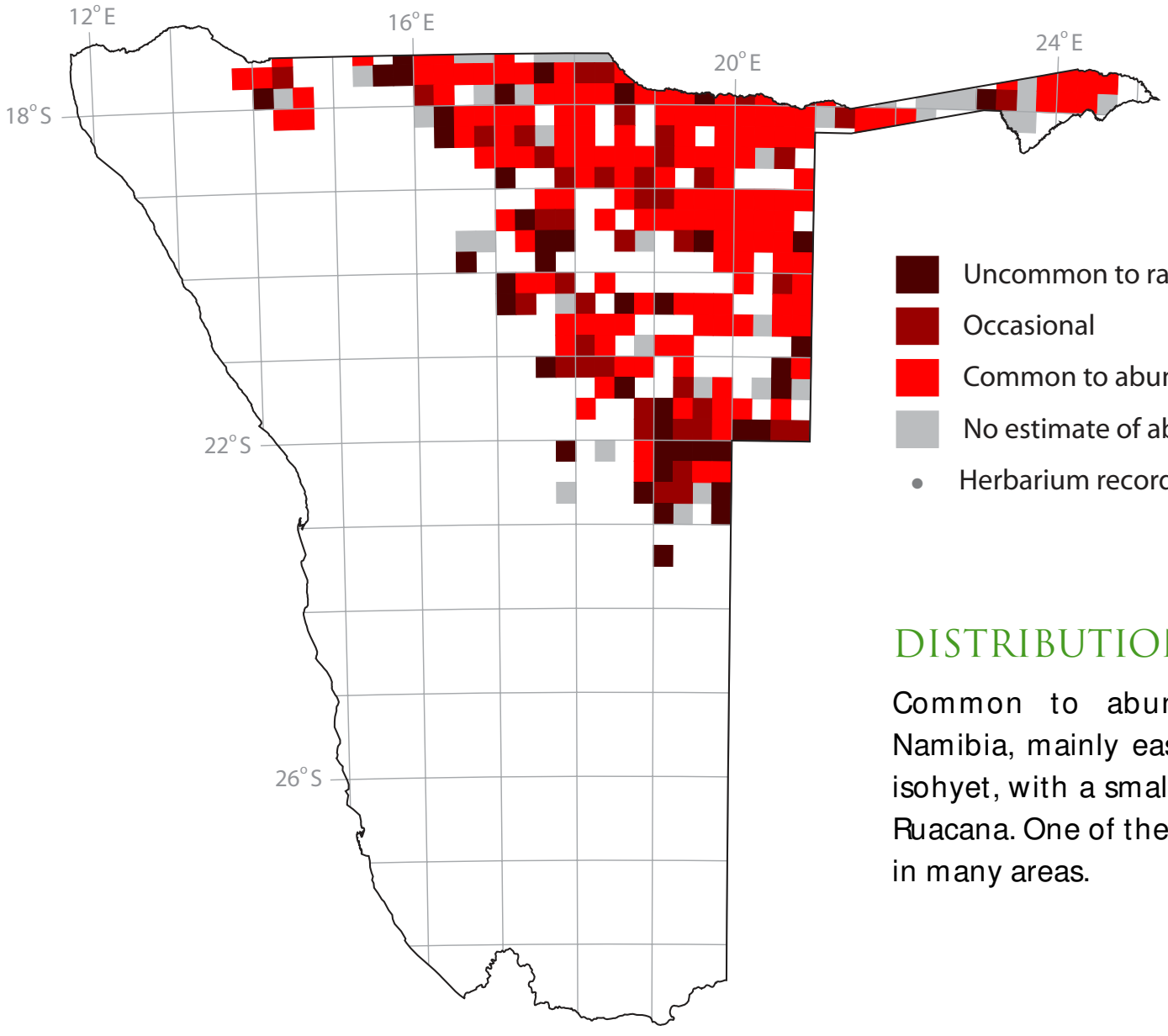
Koffiebeesklou

White bauhinia (E); omukatjipera (H); Iganib (K); omutwanghuta (Ok); muhusi (Rk); muntjuti (Rum); mupondo (L)

[665 records from 279 (26%) squares]



Semi-deciduous shrub often climbing into or over other plants. BRANCHES coil around other plants and some have hooks or spurs to anchor themselves. LEAVES **bilobed**, broader than long, 25–50 x 30–50 mm; leaf tip divided **up to two-thirds of leaf length**. FLOWERS **usually white**, may be pink; **petals *c.* 60 mm long, margin wavy**. FRUIT a pod, *c.* 150 x 25 mm, dark brown to black, flattened, woody, pointed at both ends; splitting along seams with sides curling up like a cork-screw.

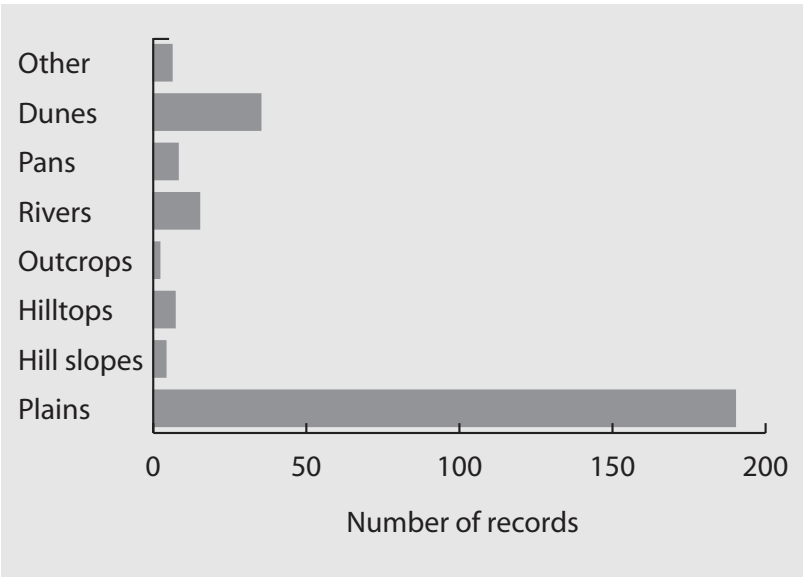


DISTRIBUTION & ABUNDANCE

Common to abundant in north-eastern Namibia, mainly east of the 350-mm rainfall isohyet, with a small population just south of Ruacana. One of the dominant woody species in many areas.

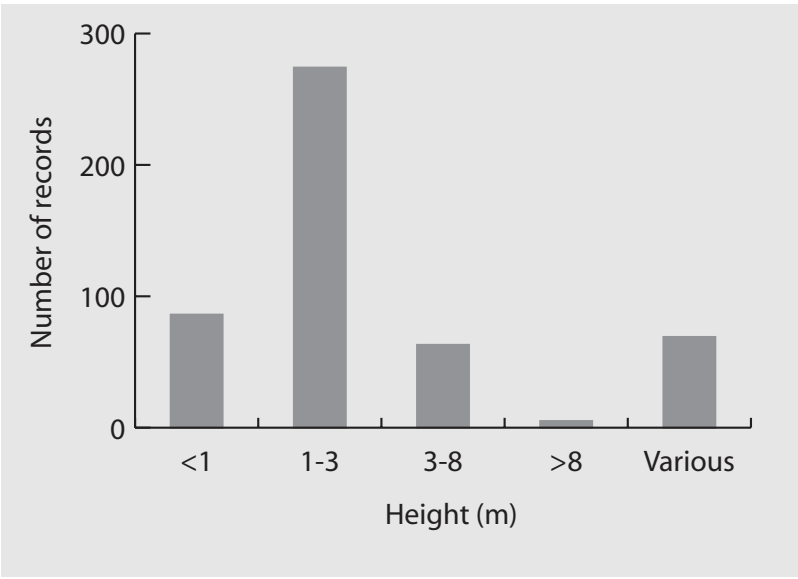
HABITAT

Mostly on plains in deep, sandy soils, but also on small dunes; sometimes in dry rivers or pans.



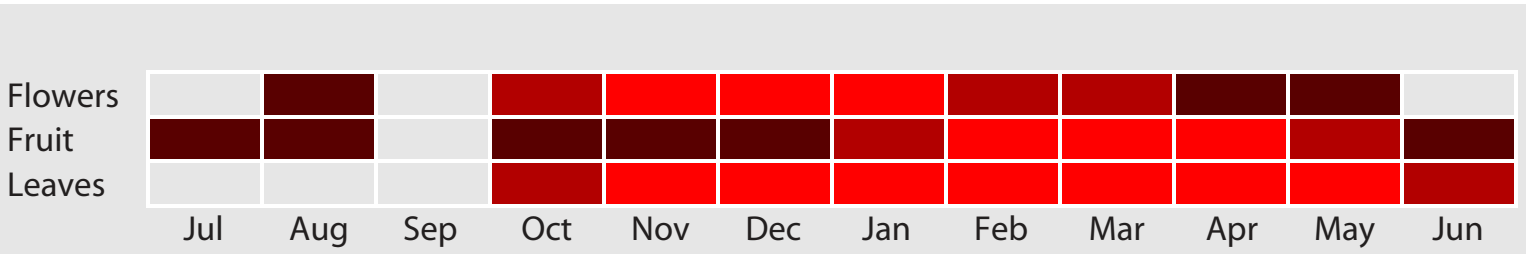
GROWTH FORM

Usually a shrub in the 1–3-m height class, sometimes over 3 m. May be thicket-forming in places.



ANNUAL CYCLE

FLOWERS mainly October to March, with sporadic flowering in other months. FRUIT most of the year, but mainly January to May. LEAVES October to June; young leaves recorded intermittently throughout the year.



GENERAL

Easily colonises disturbed areas. It is heavily browsed by game, including eland, and livestock; warthog dig out the roots. The seeds are roasted and ground as a coffee-substitute; when food is scarce, the roots are roasted and the bark is eaten; children suck out the flowers' nectar. The leaves and seeds are used medicinally. *Bauhinia petersiana,* with its attractive flowers, has horticultural potential for frost-free areas.

CONSERVATION CONCERNS

None recorded.



Bauhinia petersiana, flowers, C. Hines

Bauhinia urbaniana

Mupondopondo

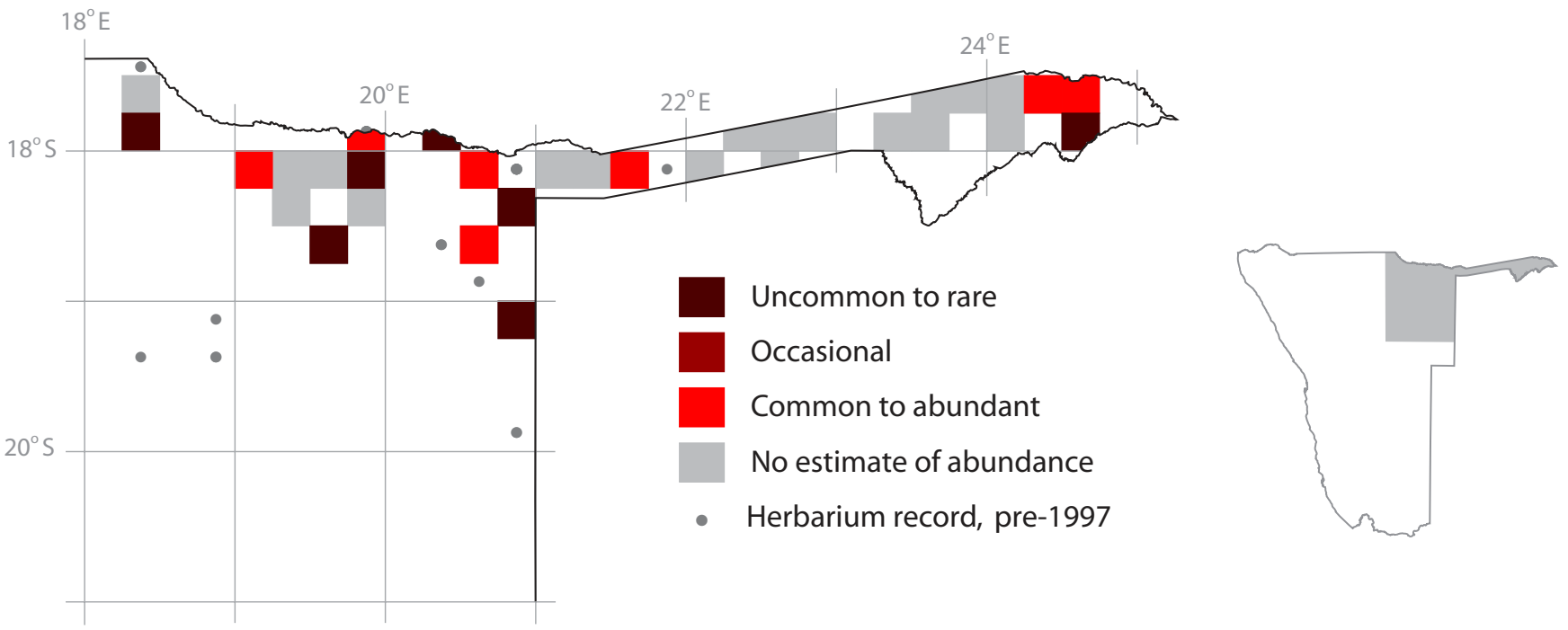
Pink bauhinia (E); sandbeesklou (A); pe (Kx)

[32 records from 32 (3%) squares]



Semi-deciduous shrub. LEAVES bilobed, often broader than long; divided **to approximately two-thirds of the leaf length**; dark green above. FLOWERS **usually pink**, may be white to mauve; petals up to 20 mm long; **buds with dense, rusty-brown hairs**. FRUIT a dark brown to black pod; flattened, woody, pointed at both ends; splitting along seams with valves curling up like a cork-screw.

Flowers and pods are conspicuous. Impossible to tell apart from *B. petersiana* without flowers, and since this species is less common, it has probably often been recorded as the latter.



DISTRIBUTION & ABUNDANCE

Common to uncommon in north-eastern Namibia, east of the 500-mm rainfall isohyet. Past herbarium records from the eastern Karstveld were not confirmed by the TAP.

HABITAT

Plains; occasionally floodplains and dry rivers. Always on sand.

GROWTH FORM

A shrub up to 3 m high, occasionally scrambling.

ANNUAL CYCLE

No observations were made June to November, except for August. FLOWERS were recorded from February until October. FRUIT were found from January to May. LEAVES were recorded from December to May; two records of bare trees in August.

CONSERVATION CONCERNS

None recorded.

Haematoxylum dinteri

Blutholzbusch

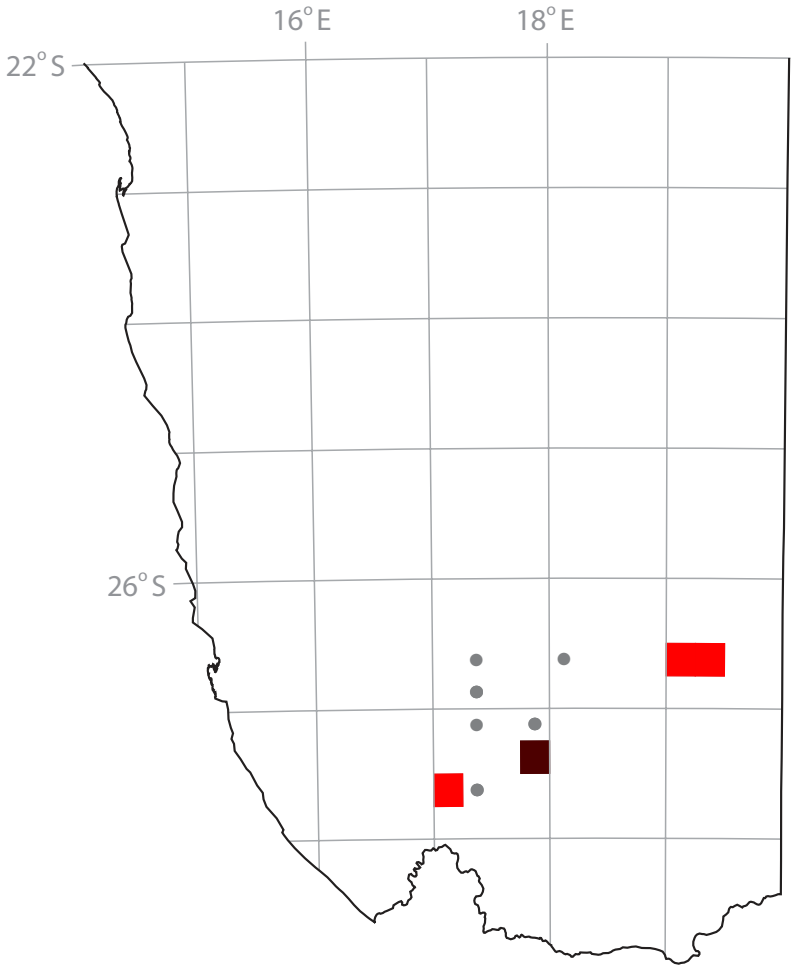
Bloodwood (E)

[5 records from 4 (<1%) squares]

Sturdy shrub, with **spine-tipped branchlets**. BARK **grey-brown to black**, smooth. LEAVES compound with 1–3 leaflet pairs; **small, reddish ovate to awl-shaped stipules** at the insertion of the leaflets; leaflet 4–8 mm long, grey-green, with conspicuous lateral veins; apex usually shallowly notched. FLOWERS in few-flowered sprays; yellow, 10 mm long, glandular. FRUIT 25–35 mm long, obliquely-oblong, compressed, reddish-brown to purplish, membranous, glandular, splitting along the valves.

DISTRIBUTION & ABUNDANCE

Locally abundant shrub less than 1 m high around pans in 2619CA & CB; locally common shrub up to and just over 1 m on a rocky outcrop in 2717CA. There are earlier herbarium records from the Fish River and other dry water courses of the south, as well as the mountains near the Fish River.



Uncommon to rare
Occasional
Common to abundant
No estimate of abundance
Herbarium record, pre-1997

HABITAT

Pans and rocky outcrops. Herbarium records are from hill slopes, dry riverbeds, plains and valleys.

GROWTH FORM

A shrub up to and just over 1 m high.

ANNUAL CYCLE

TAP records only in January and March; results combined with herbarium records. FLOWERS recorded in September, October and March to May. FRUIT recorded in October, January, March and May. LEAVES apparently deciduous.

GENERAL

The leaves and pods are browsed by various game species. Flowering is dependent on rain.

CONSERVATION CONCERNS

Probably overlooked by atlassers due to its small size and restricted distribution. Endemic to Namibia.

Piliostigma thonningii

= Bauhinia thonningii

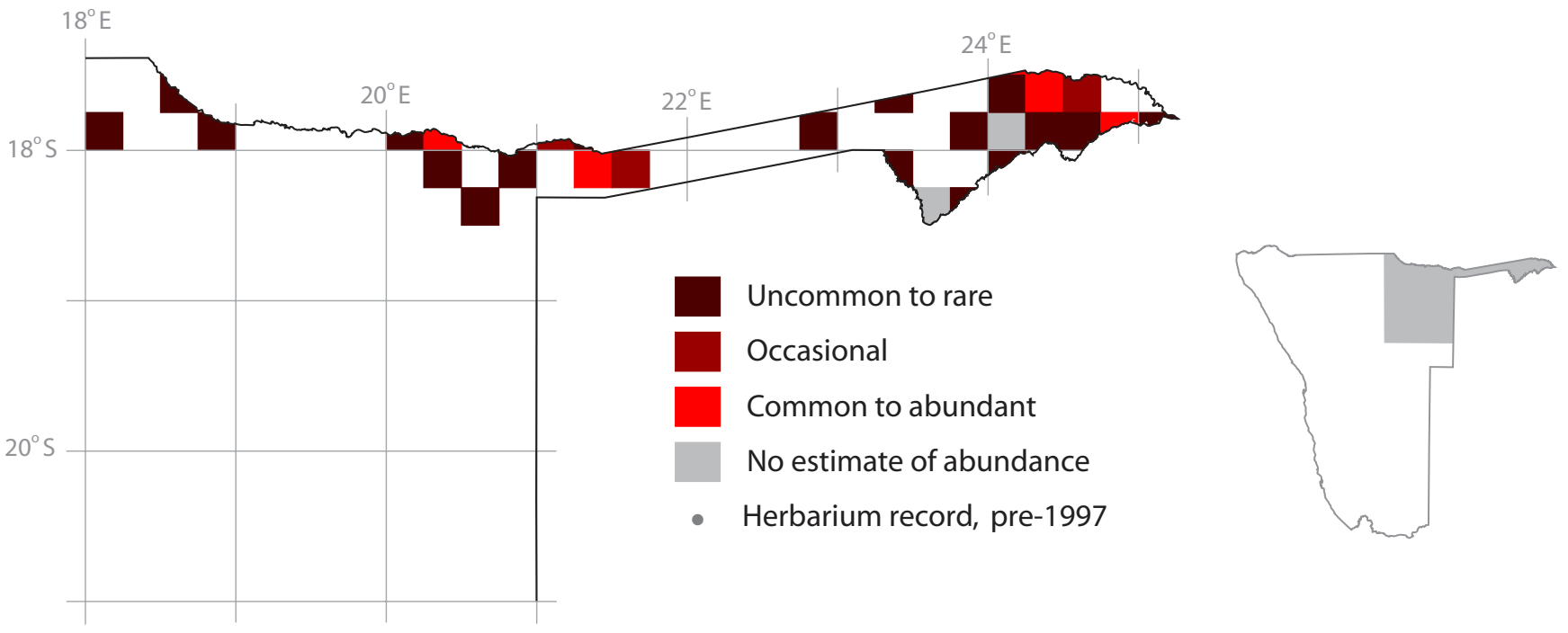
Mupapama

Monkeybread (E); kameelspoor (A); omutuutuu (O); du|dhu (Kx); mubaba (L)

[71 records from 29 (3%) squares]



Semi-deciduous tree with spreading crown, up to 9 m tall. BRANCHLETS with **red-brown, densely woolly covering when young**. LEAVES simple, bilobed, large, **leathery**; shiny, dark green above; **rust-brown** to dull green with downy covering below, veins prominent and densely branched; **apex deeply incised for at least one-third of the length** with a **sharp point between the lobes**; lobes blunt to pointed; base heart-shaped. FLOWERS, male and female flowers on separate plants; small, white to pink buds and calyces with dark brown, velvety hairs. FRUIT a, large, flattened, woody pod; oblong to somewhat kidney-shaped; **margin thickened with rust-coloured, downy covering; not splitting open when ripe**.

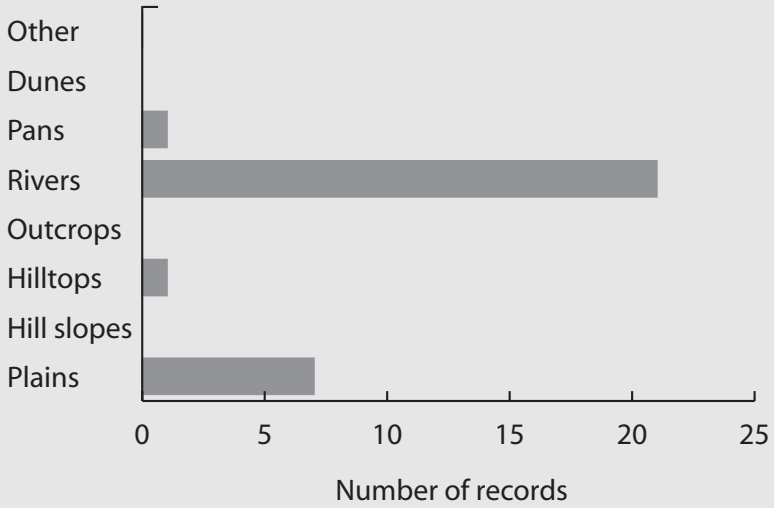


DISTRIBUTION & ABUNDANCE

Common to uncommon in eastern Caprivi; common in the Popa Falls area; uncommon further west along the Okavango River. One atlasser (HOR2) suggested that this species had been under-reported in Kavango, where he had seen them all the way from Divundu and Popa Falls up to Mashare. Mupapama, the common local name, is also the name of a village near to Mashare and Takwasa, named after the trees growing there (1720CD).

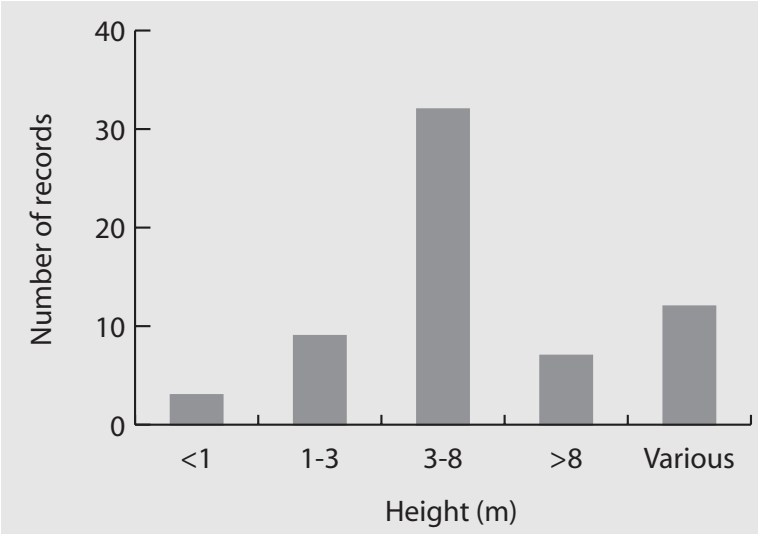
HABITAT

Mostly floodplains and river banks, as well as sandy plains.



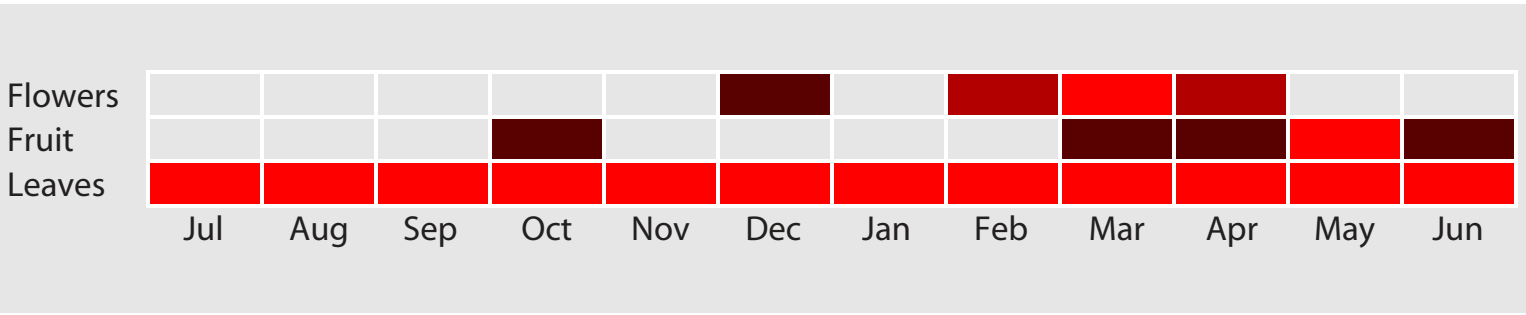
GROWTH FORM

Mostly a tree (75% of records) up to 8 m tall, but sometimes taller. A number of smaller, shrub-like forms also seen.



ANNUAL CYCLE

FLOWERS February to April, with occasional records in December. FRUIT March to June, with occasional records in October. LEAVES present when observations made, few observations made in the winter months.



GENERAL

The pods are highly nutritious and eaten by game and livestock, as well as by people in times of famine; the leaves, bark and young shoots are also eaten. All parts of the tree are used medicinally. Sometimes used for fuel wood. A good shade tree, used as live fences around fields, and of horticultural potential for frost-free areas.

CONSERVATION CONCERNS

Appears to be impacted by fire and/or human activities.

Piliostigma thonningii, C. Mannheimer



Dialium engleranum

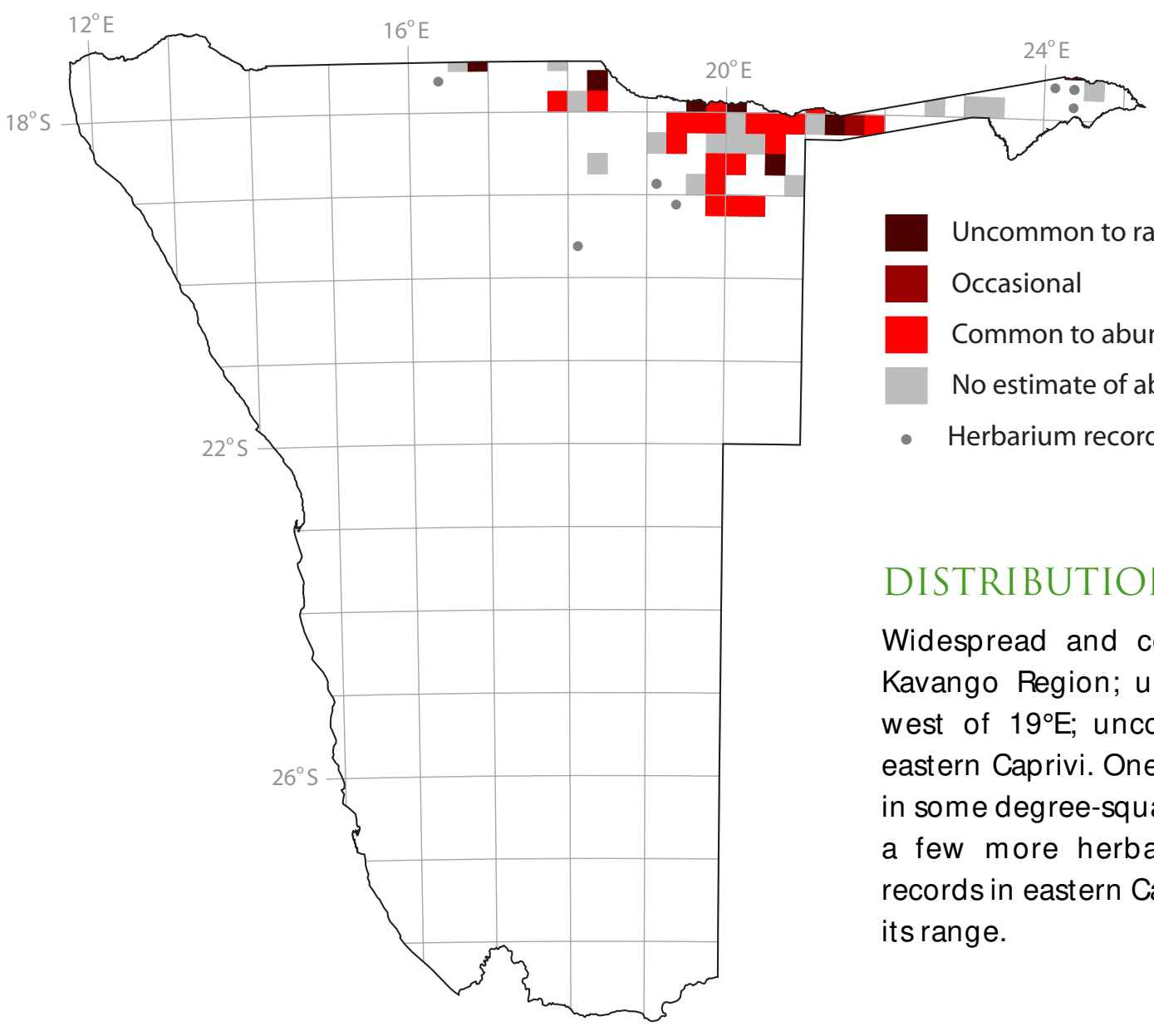
Nonsimba

Kalahari podberry (E); muhanane (H); djau (K); ghut(h)imba (Rum, T)

[55 records from 43 (4%) squares]



Deciduous tree. BARK smooth to rough, pale to dark grey, peeling off in irregular fragments to expose dark brown underbark. LEAVES compound, up to 160 mm long; leaflets oblong-elliptic, leathery, dark green and shiny above, **pale green, downy below**; veins prominent. FLOWERS small, creamy-white, in loose, terminal sprays. FRUIT ovoid, *c.* 25 x 17 mm; velvety, dark brown, not splitting open. SEEDS salmon-brown to reddish-brown, with one to two seeds embedded in orange-red flesh.

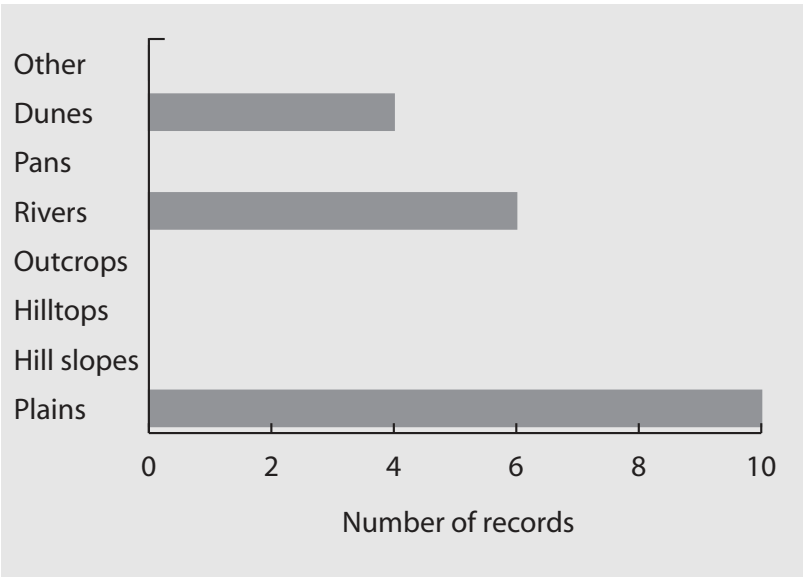


DISTRIBUTION & ABUNDANCE

Widespread and common in most of the Kavango Region; uncommon and scattered west of 19°E; uncommon and localised in eastern Caprivi. One of the dominant species in some degree-squares in Kavango. There are a few more herbarium records than TAP records in eastern Caprivi and on the edges of its range.

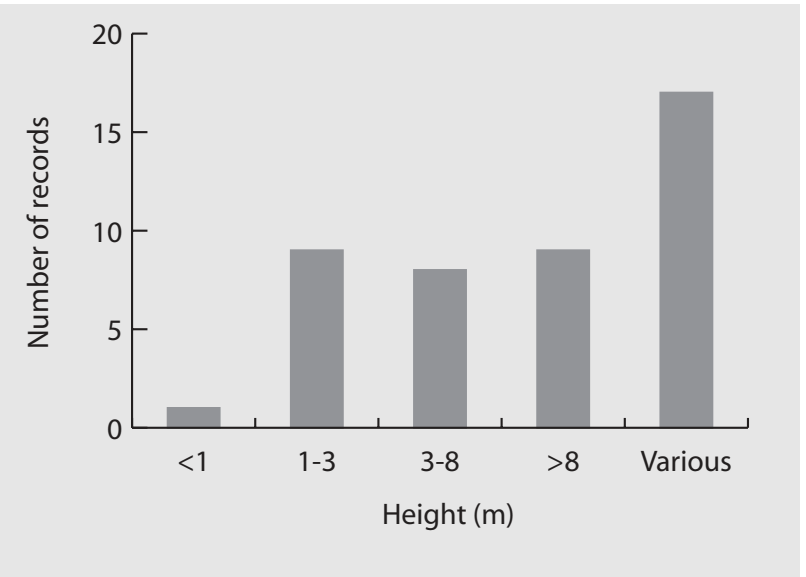
HABITAT

Most often on plains; also dunes, riverbanks and in dry riverbeds. Always on sandy substrates.



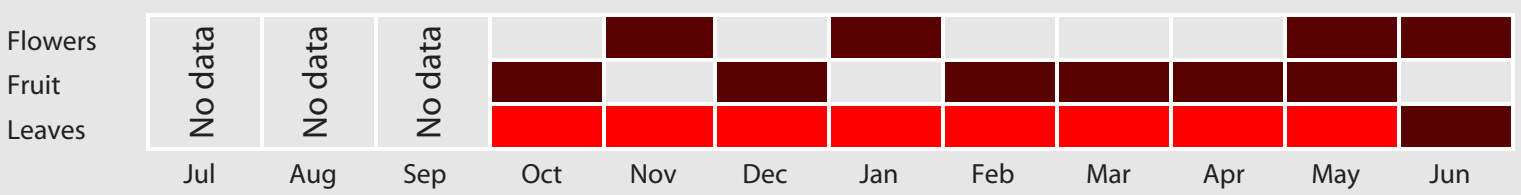
GROWTH FORM

Mostly a tree (63% of records) up to 8 m or more; also a shrub in the 1–3-m height class. Most stands have a mix of height classes.



ANNUAL CYCLE

FLOWERS single records in January, May, June and November. FRUIT single records most months from October to May. LEAVES found every month that there were observations; young leaves recorded in October.



GENERAL

In areas where there are frequent veld fires, the plants occur mainly as shrubs of 1–3 m high.
The wood is used for timber, knife handles and sheaths. The leaves, bark and roots are used medicinally. The fruit is eaten fresh or used to produce an unfermented beverage, or to flavour milk; fresh seeds are eaten raw, while dried seeds can be stored for later use. Seeds are also used to make necklaces.

CONSERVATION CONCERNS

None recorded.



Dialium engleranum, L. Hoffmann

Cassia abbreviata

Mululwe

Long-tail cassia (E); sjambokpeul (A); omutangaruru (H); omutundungu (O)

[2 records from 2 squares]

Shrub or small tree with large yellow flowers and very long, cylindrical pods.



Opposite page: *Cassia abbreviata*, NBRI/R. Britz

A rare tree in the 1–3-m height class in Kaudum Game Park (1820BD), and an uncommon tree of 20 m from Impalila Island (1725CC). Found on plains. Fruit recorded in August and November; old leaves in August. There are isolated, earlier herbarium records from the north-west, Grootfontein area and the Okavango River; flowers were recorded in November and fruit in March.

Senna singueana

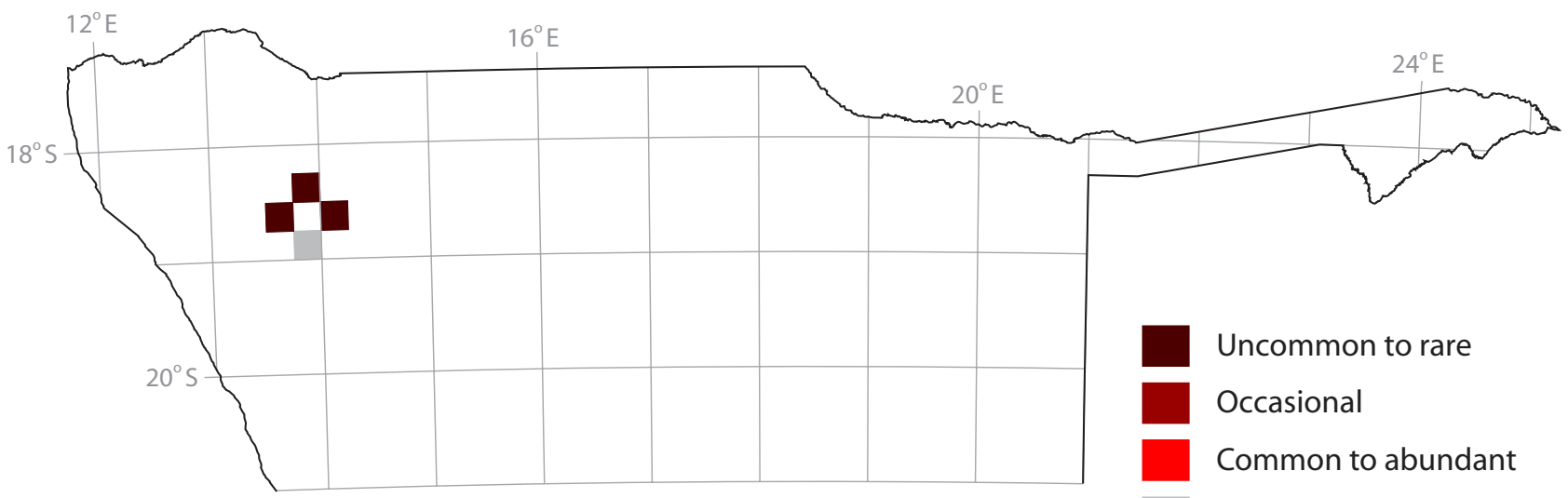
= Cassia singueana

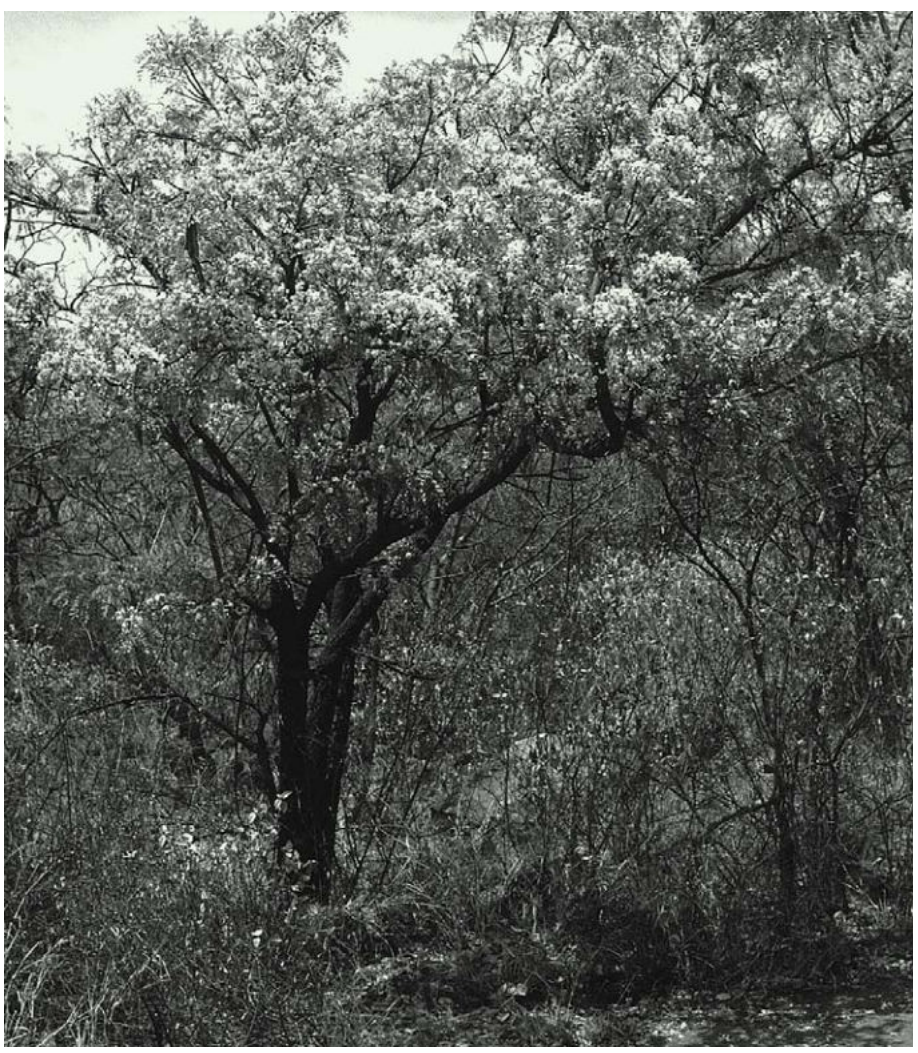
Winter Senna

Kleefpeul (A)

[6 records from 4 squares]

A small tree. LEAVES compound with 4–10 leaflet pairs; leaflets oval, 25–50 mm long, bright green; **conspicuous glands between each leaflet pair**. FLOWERS **deep yellow in large, loose sprays**. FRUIT a narrow, cylindric pod, 150–250 mm long; somewhat constricted between the seeds; yellow when ripe, finely velvety to hairless.





DISTRIBUTION & ABUNDANCE

Uncommon to rare in the north-west, along the escarpment.

HABITAT

Rocky hill slopes.

GROWTH FORM

A tree, mostly up to 3 m, occasionally taller.

ANNUAL CYCLE

Observations only made in March and April. FLOWERS April, also June (herbarium record). FRUIT not recorded. LEAVES both March and April.

CONSERVATION CONCERNS

None recorded. Rare in Namibia.

Parkinsonia africana

Green-hair Tree

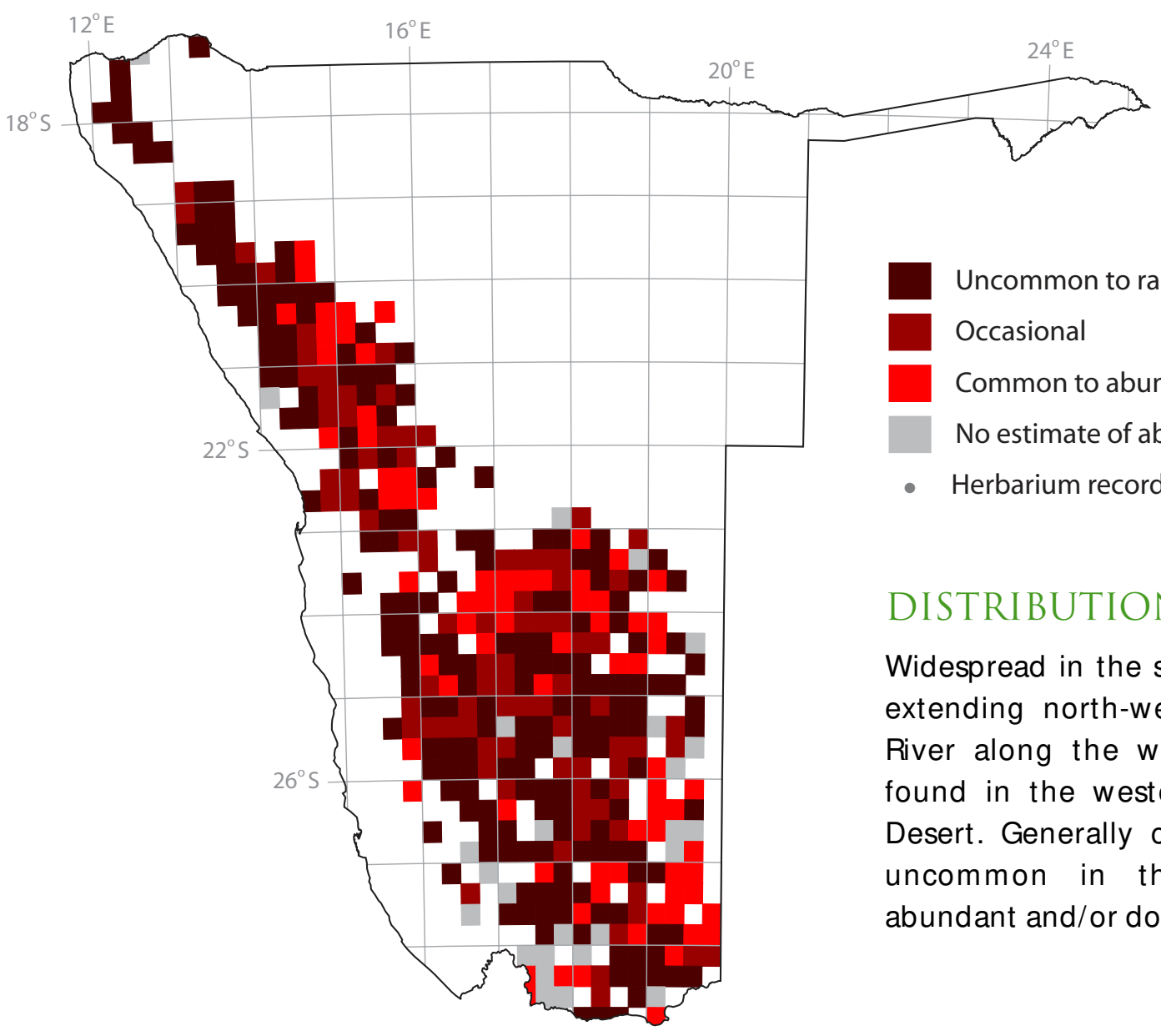
Lemoendoring (A);
Langnadelstrauch (G); !khas (K)

[1,214 records from 386 (36%) squares]



Usually a thin-stemmed, scraggly shrub. BARK smooth, pale brown to **yellow-green**. THORNS **straight, yellow-green to pale brown**. LEAVES compound; **leaflets pale yellow-green, tiny or absent**; rachis appearing as a long, green thread. FLOWERS yellow, up to 15 mm in diameter. FRUIT a slender pod, straight to slightly sickle-shaped, somewhat constricted between seeds and flattened; usually not splitting open.

Flowers and fruit are conspicuous.

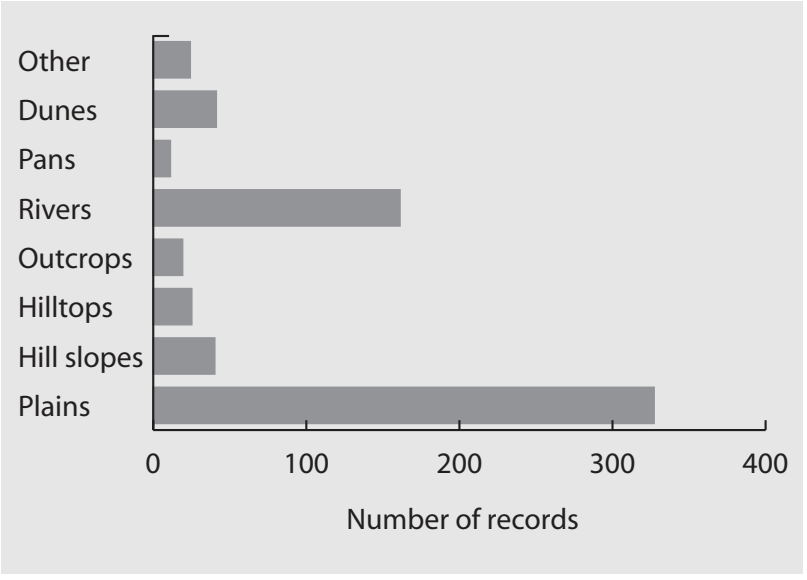


DISTRIBUTION & ABUNDANCE

Widespread in the southern half of Namibia, extending north-westwards to the Kunene River along the western escarpment; not found in the western parts of the Namib Desert. Generally common to uncommon; uncommon in the north-west. Locally abundant and/or dominant in a few squares.

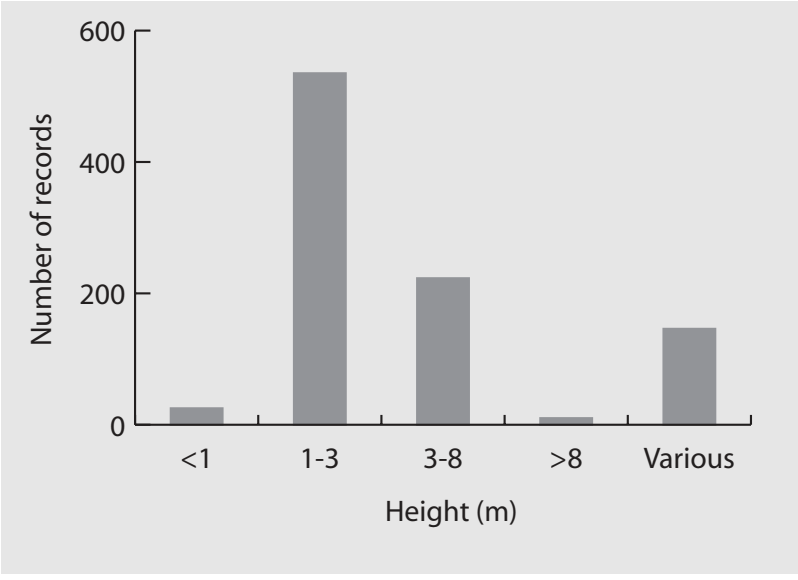
HABITAT

Various, but most frequently on plains; also along dry rivers, especially in the north-west and central-west. On hills in the south and central-west; on dunes in the south-east. Found on sand, gravel and limestone substrates.



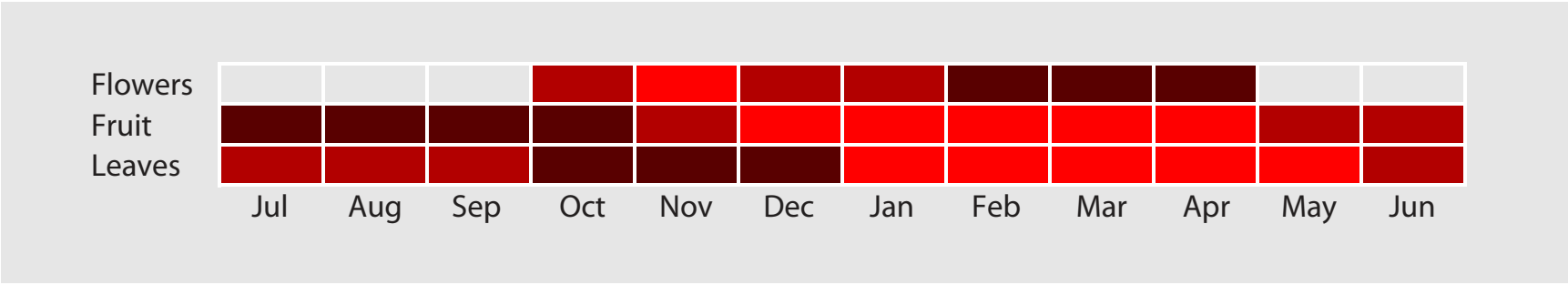
GROWTH FORM

Generally a shrub with 25% of records multi-stemmed trees. Mostly 1–3 m high with about 30% of records up to 8 m high.



ANNUAL CYCLE

FLOWERS October to April, peaking in November. FRUIT all year round, but most abundant between December and April. LEAVES generally deciduous, although leaves were observed all year round; most bare trees recorded from October to December, when new leaves were also recorded.



GENERAL

Heavily browsed by game such as kudu and oryx, which also nibble the bark; Red-billed Queleas use the leaves to build nests; White-browed Sparrow-weavers nest in the branches. The leaves, terminal shoots and bark are used medicinally. Often infested by parasites such as *Tapinanthus* spp.

CONSERVATION CONCERNS

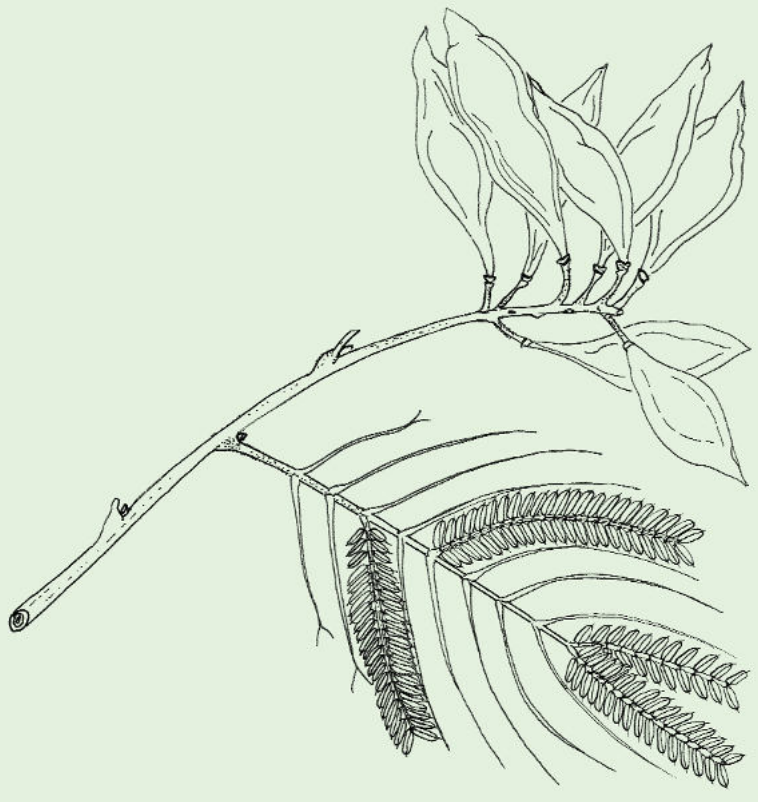
None recorded. Protected by forestry legislation.

Peltophorum africanum

Muparara

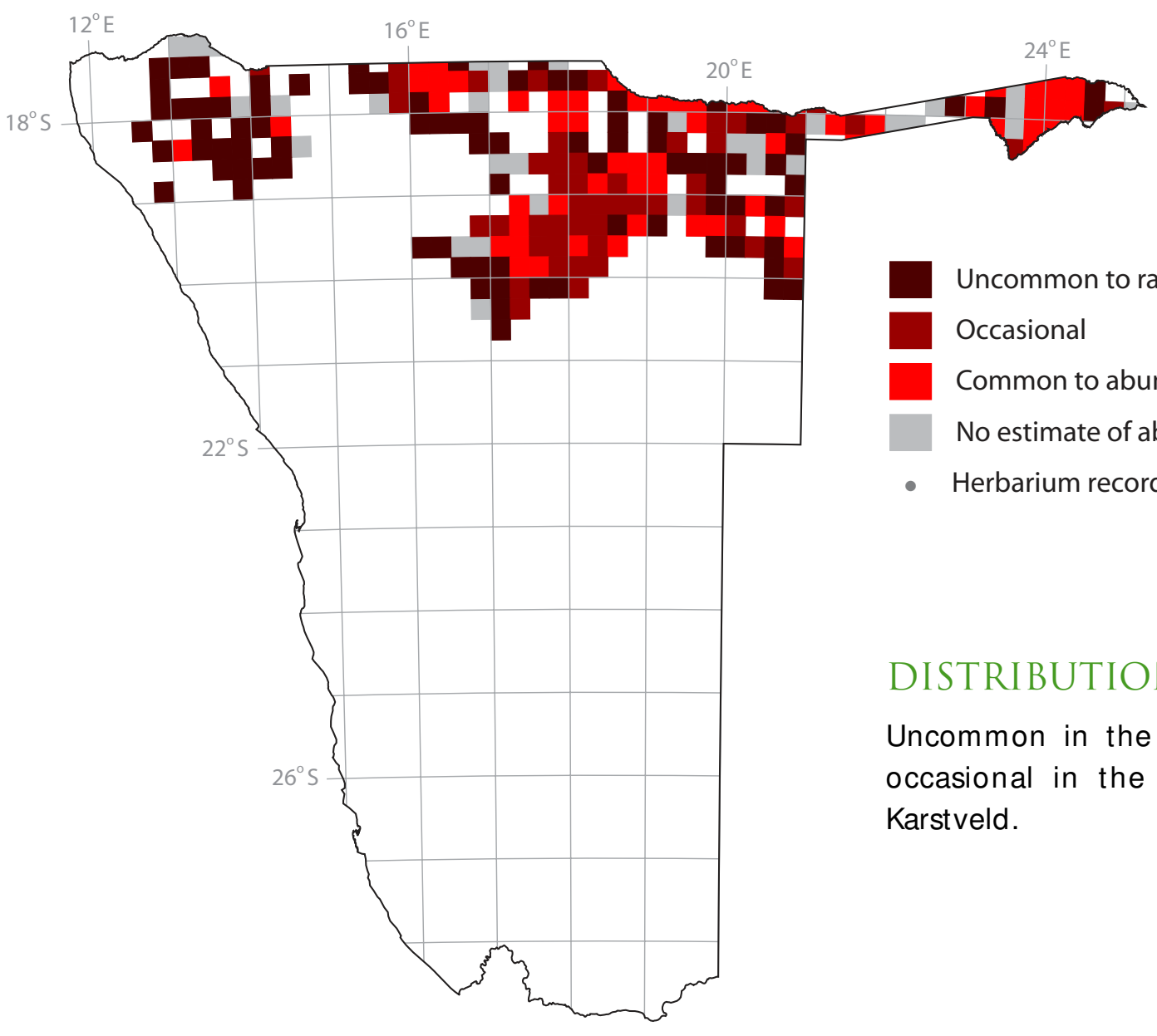
Huilboom, dopperkiaat (A); omuparara (H); munjele (L); omupalala (O)

[778 records from 229 (21%) squares]



Shrub, or tree, with a spreading crown. LEAVES bipinnately compound, large; fairly small leaflets, spirally arranged or densely clustered on young shoots; dull green above, with long, soft hairs; pale grey-green below with downy covering. FLOWERS **yellow, showy, in axillary or terminal sprays**. FRUIT a flat, brown, winged, ovoid pod with **both ends pointed**; not splitting open.

Flowers and fruit are conspicuous. May be mistaken for an *Albizia* when not in flower or fruit.

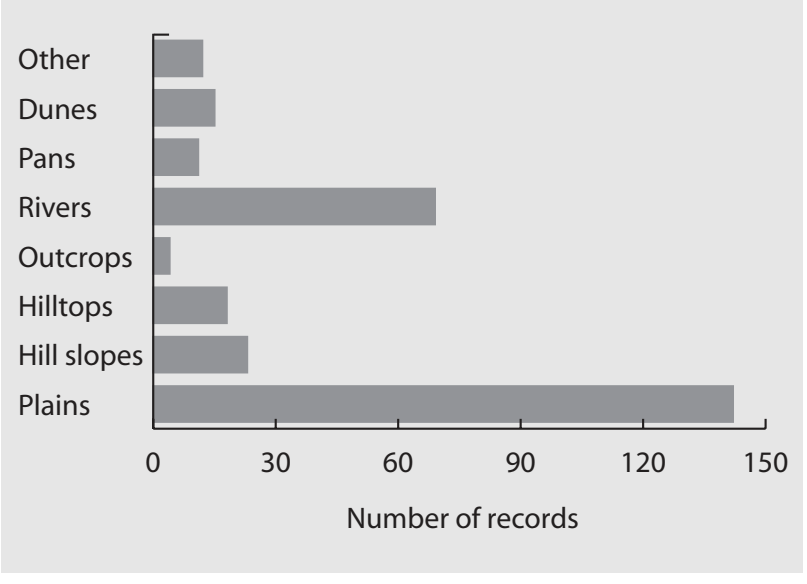


DISTRIBUTION & ABUNDANCE

Uncommon in the north-west; common to occasional in the north-east; common in Karstveld.

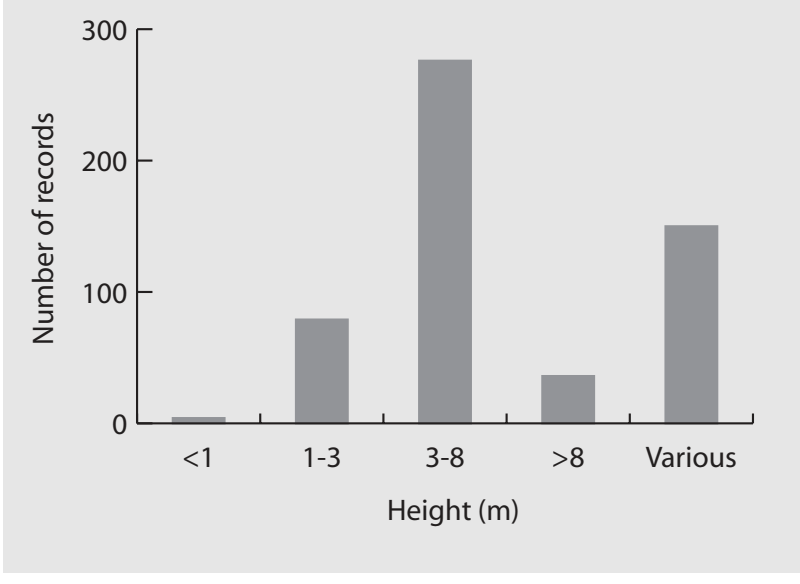
HABITAT

In various habitats, but mostly on sandy plains. Along rivers in the north-west and north-east; on dolomite hill slopes in the Karstveld; on dunes and in pans in the north-east; hilltops in the north-central areas. Occasionally on calcrete, loam or clay substrates.



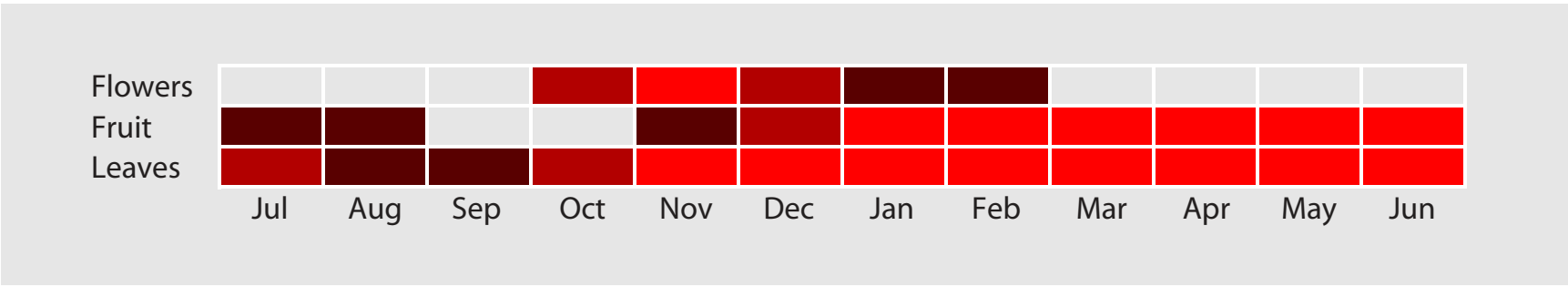
GROWTH FORM

Mostly a tree (80% of records), sometimes a shrub (20%). Generally up to 8 m, but sometimes taller (10%). About half of the records of trees over 8 m were in the area of the Waterberg, on plateaux, cliff faces and valley floors; those in the north-west found on river banks.



ANNUAL CYCLE

FLOWERS October to February, with single records in other months. FRUIT mainly December to June. LEAVES recorded throughout the year, but trees often bare in winter; young leaves mainly in October.



GENERAL

The wood is used to construct kraal entrances and fences, also for butter-churns, mortars and tool handles. The bark, wood, rotten heartwood, fruit and roots are used medicinally, although the roots are reported to be used to poison people. Crushed parts of the plant are also used to produce an insect repellent for domestic stock. Rotten heartwood is also used for cosmetic purposes.

Black rhino feed on the plants in the Waterberg; the flowers attract bees. Is used extensively in gardens because of its lovely flowers; fairly frost-resistant.

CONSERVATION CONCERNS

None recorded. Protected by forestry legislation.

Peltophorum africanum flowers, B. Curtis

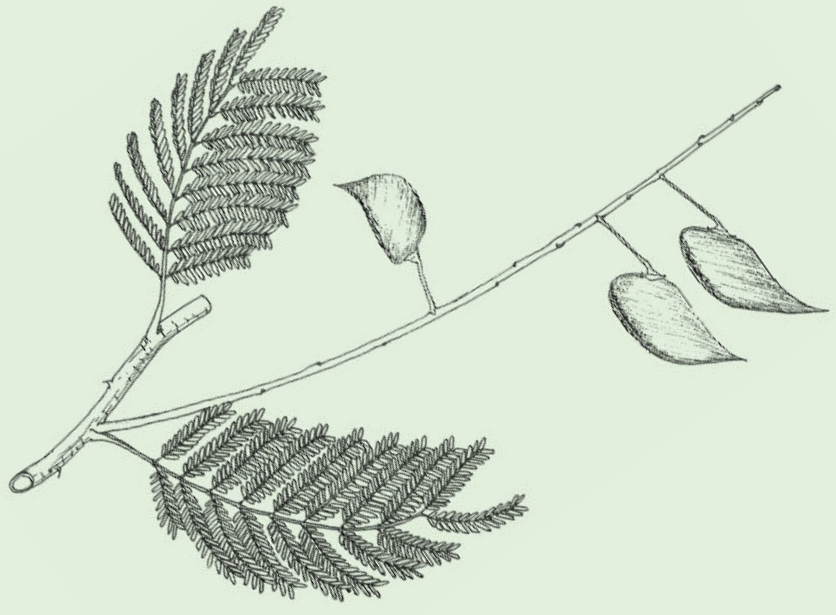


Caesalpinia rubra

Purple Caesalpinia

Auauroi (K)

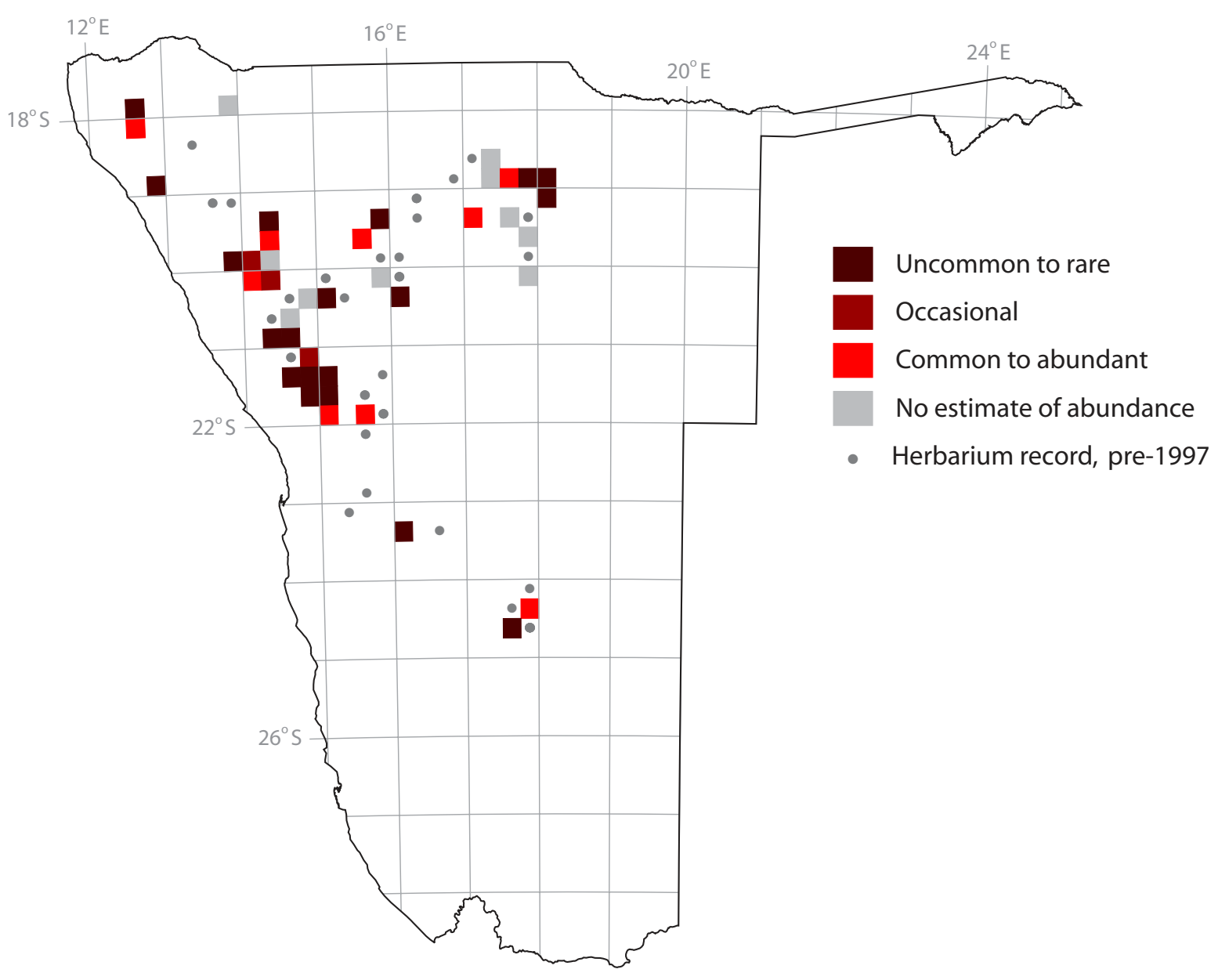
[68 records from 41 (4%) squares]



Semi-deciduous shrub. BRANCHLETS **red-brown to plum-coloured**. THORNS slightly curved, evenly distributed along stem, **slender, thin**. LEAVES twice compound, 45–60 mm long with many small oblong to obovate leaflets, dark green, glandular. FLOWERS **reddish-purple**, up to 15 mm long in terminal sprays. FRUIT inflated and sharply pointed, **beak-like**; brown to red, hairless, splitting open, mostly with two seeds.

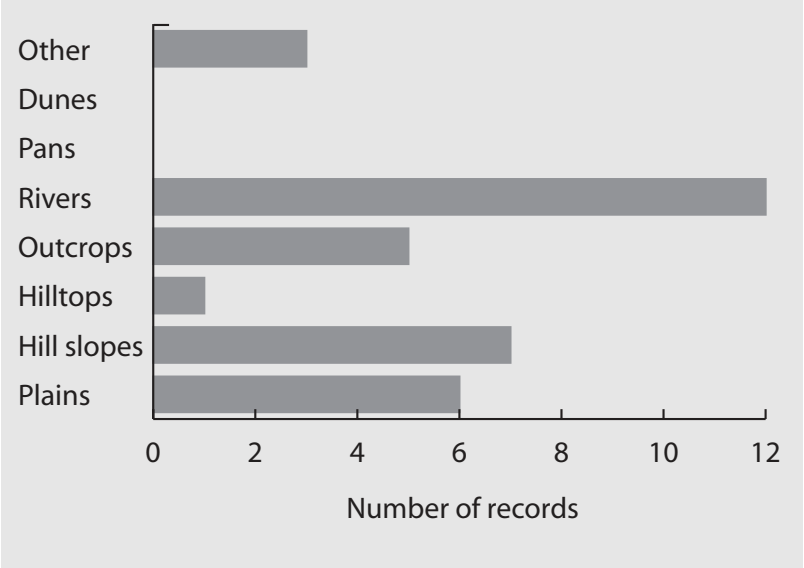
DISTRIBUTION & ABUNDANCE

Uncommon to sometimes locally common in scattered localities, mainly along the north-western escarpment and in the Karstveld, but also from a small area in square 2417BD. There are many localities from which it was previously collected, but not recorded by the TAP.



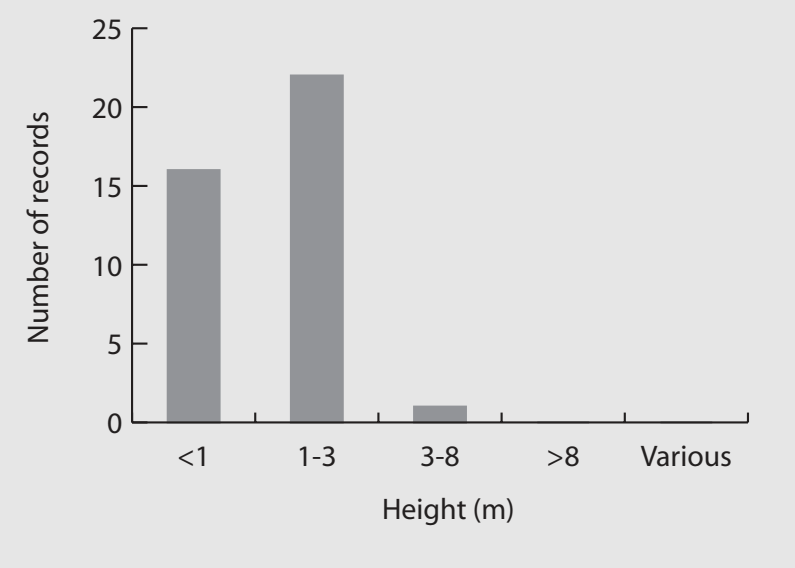
HABITAT

Various, but mainly along dry river courses. Found on rocky substrates.



GROWTH FORM

A shrub in the 1–3-m height class, occasionally higher.



ANNUAL CYCLE

FLOWERS noted in December and from February to May; rain-dependent. FRUIT March to May. LEAVES recorded during all months, bare plants in June and December.

GENERAL

Browsed by small stock and game; of horticultural potential due to its attractive flowers, drought resistance and cold tolerance.

CONSERVATION CONCERNS

None recorded.

Caesalpinia pearsonii

Omuryandu

[1 record]

A shrub around 1 m high. LEAVES trifoliate. FLOWERS yellow. FRUIT a **strongly sickle-shaped to almost circular** pod; compressed, reddish-brown, downy, **covered with curved thorns up to 6 mm long**.



Endemic to the escarpment of Namibia; occurring on stony, sandy soils. Only one, uncertain TAP record from Mirabib (2315AD) in the central Namib. Earlier herbarium records from six widely scattered squares; only one specimen of 1 m, all the rest <1m high.

Caesalpinia merxmuellerana

Orange-river Caesalpinia

[1 record]

A shrub. LEAVES with 1–7 leaflet pairs. FLOWERS red. FRUIT a crooked-pear-shaped pod.

Endemic to the mountains north of the Orange River in the extreme south of Namibia. Only one TAP record from 2717CA (specimen CUR1/1521). A rare shrub in the 1–3-m height class. Earlier herbarium records exist for this square, as well as 2717CB & CC. A shrub up to 2 m high, sometimes 4 m high. Very common and in dense stands on black, calcrete terraces along dry river banks, where it is the dominant woody shrub.

Swartzia madagascariensis

= Bobgunnia madagascariensis

Mutengura

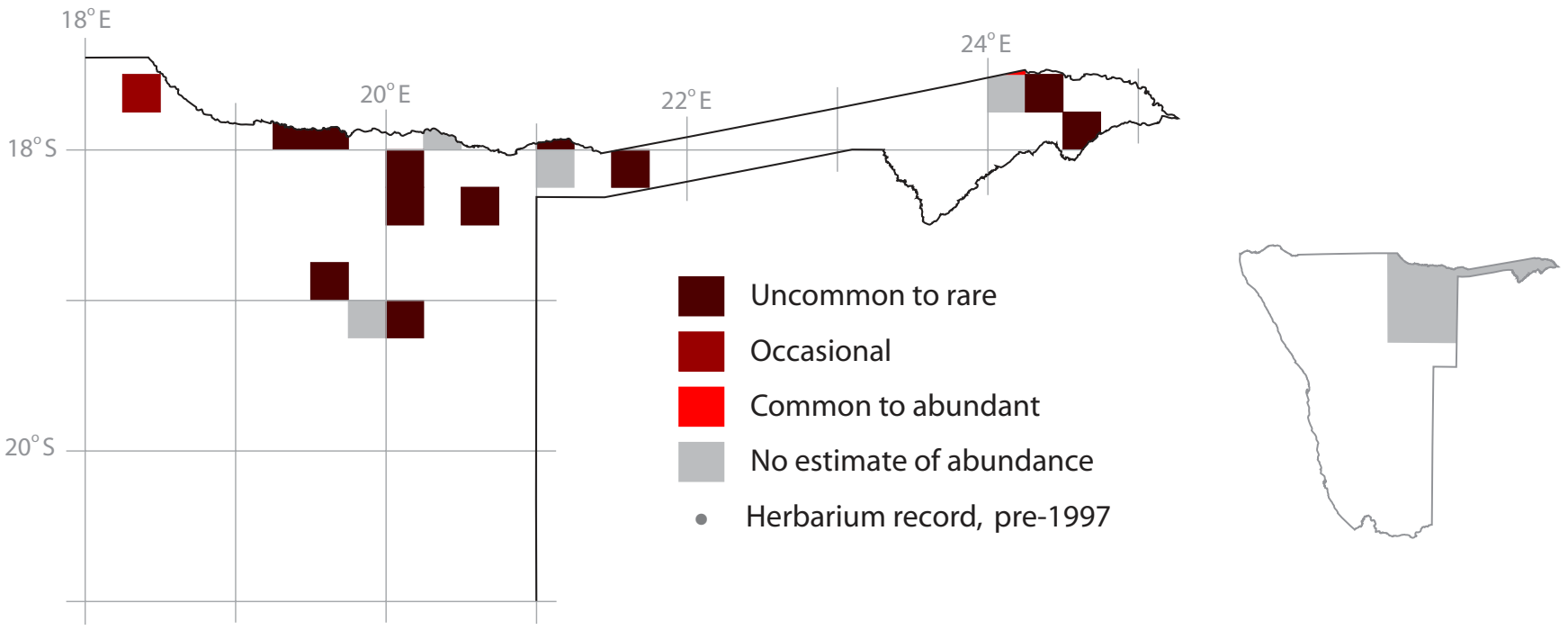
Snake-bean (E); mushakashela (L); omumonga (O); motjeketjek (Rk)

[21 records from 18 (2%) squares]

A small, deciduous tree, **often with a gnarled trunk**. BARK **rough, fissured, powdery; flakes off easily**. LEAVES compound with 3–11 alternate leaflets; **petiolule short and thick**; leaflets elliptic, dark green and hairless above, paler green and **densely woolly below; apex blunt and shallowly notched**. FLOWERS **up to 20 mm long; a single, conspicuous, crinkled, white petal with grey edging; numerous orange-yellow stamens protruding**. FRUIT a **cylindrical, crooked pod, up to 300 mm long; slender, woody**, dark brown; not splitting open.

Cannot really be confused with other species, especially when in flower or pod, both of which are conspicuous.





DISTRIBUTION & ABUNDANCE

Uncommon in scattered localities in the Kavango and Caprivi regions.

HABITAT

Sandy valleys or floodplains.

GROWTH FORM

A shrub in the 1–3-m height class or a tree in the 3–8-m height class.

ANNUAL CYCLE

FLOWERS recorded in September and October. FRUIT recorded in August, October, December, and from February to May. LEAVES October to June, with young leaves in October.

GENERAL

Pods eaten by cattle. Seeds reportedly poisonous and used as arrow poison. Fruit used medicinally.

CONSERVATION CONCERN

None recorded. Rare in Namibia.

Wood carvings, P. Reiner



Baphia massaiensis

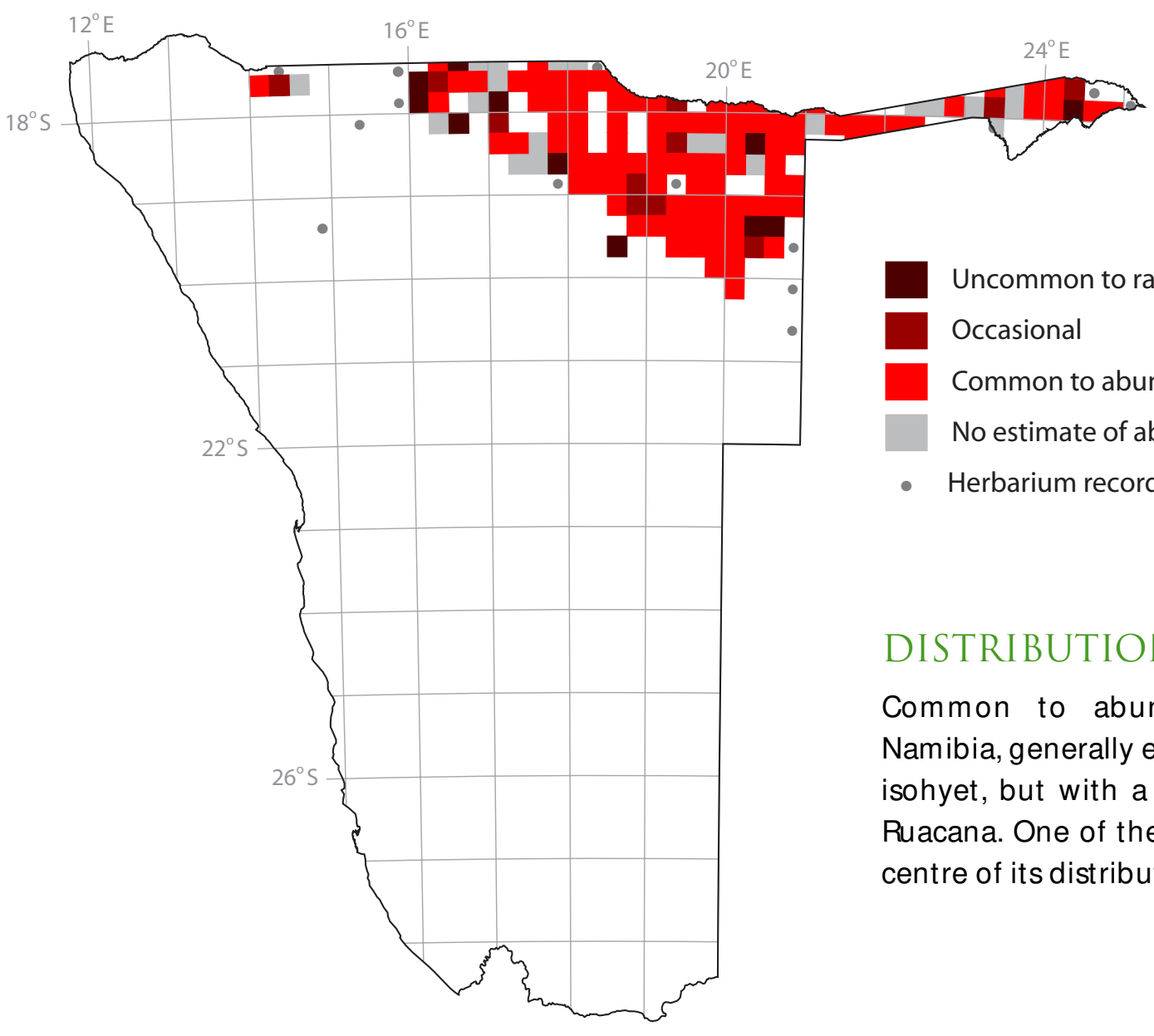
Omulyambambi

Sand camwood (E); isunde (L); ofufwe (Ok); mbun(d)je (Rk, Rum)

[298 records from 145 (14%) squares]



Shrub. BARK dark brown to reddish-black. LEAVES simple, alternate, **usually obovate**, but often with tapering tips; dull green above and pale green below; **folded inwards along midrib, lateral veins prominent**. FLOWERS sweetly scented; **white** to pale rose with a **central, golden-yellow spot**; petals crinkly. FRUIT a flattened pod with long, drawn out apex; woody, reddish-brown to dark shiny brown; splitting open when ripe and leaving two twisted valves.
Flowers and pods are conspicuous.

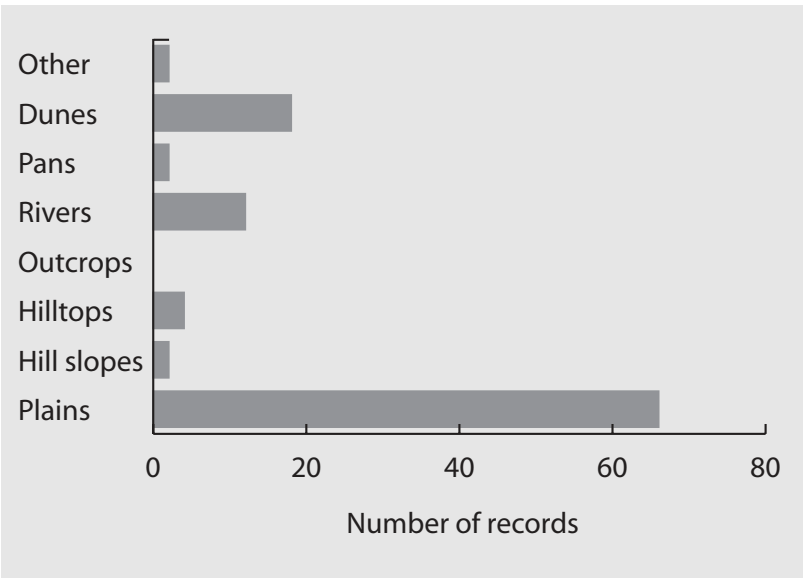


DISTRIBUTION & ABUNDANCE

Common to abundant in north-eastern Namibia, generally east of the 500-mm rainfall isohyet, but with a small population around Ruacana. One of the dominant species in the centre of its distribution.

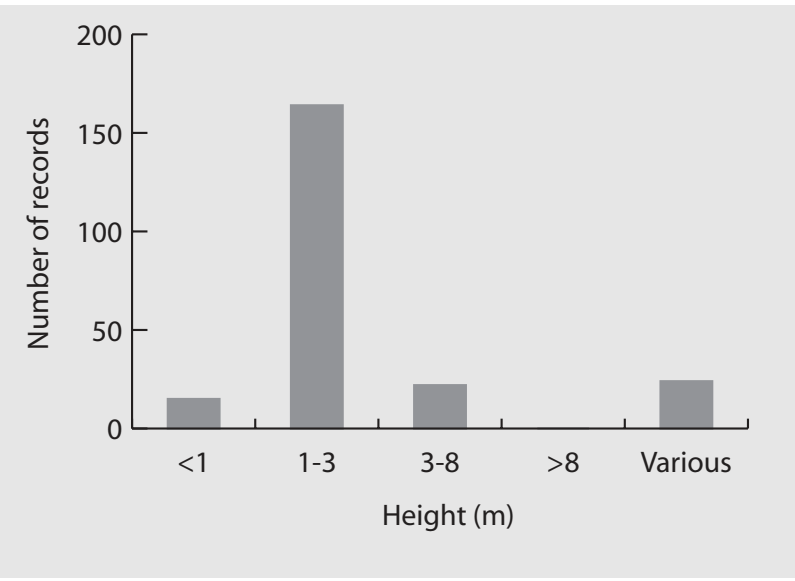
HABITAT

Predominantly found on plains, but also on dunes and occasionally in other habitats. Always on sand.



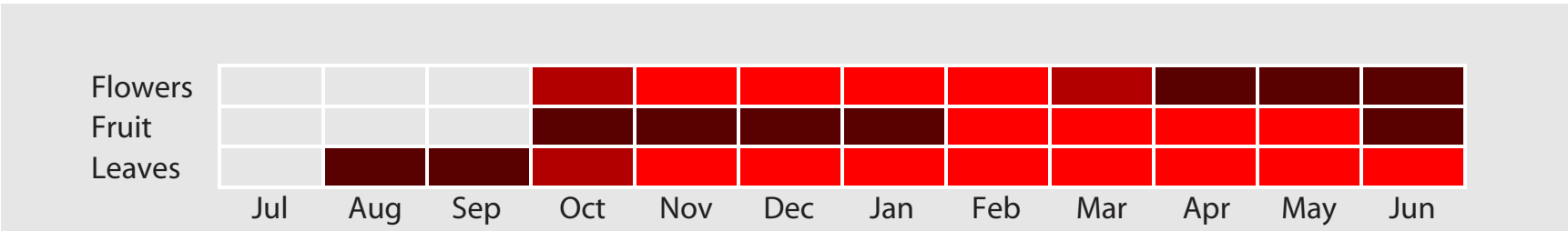
GROWTH FORM

Generally a shrub up to 3 m tall, occasionally over 3 m. Sometimes thicket-forming.



ANNUAL CYCLE

FLOWERS October to March, with occasional records until June. FRUIT mostly February to May, with a few records earlier and later. LEAVES mainly October till June, with young leaves from August to October.



GENERAL

Common along road verges and other disturbed areas. The fruit and leaves are eaten by game and livestock. It has various medicinal and traditional uses. *Baphia massaiensis* has horticultural potential for frost-free areas due to its attractive flowers.

CONSERVATION CONCERNS: None recorded.

Baphia massaiensis, flowers, B. Curtis



Mundulea sericea

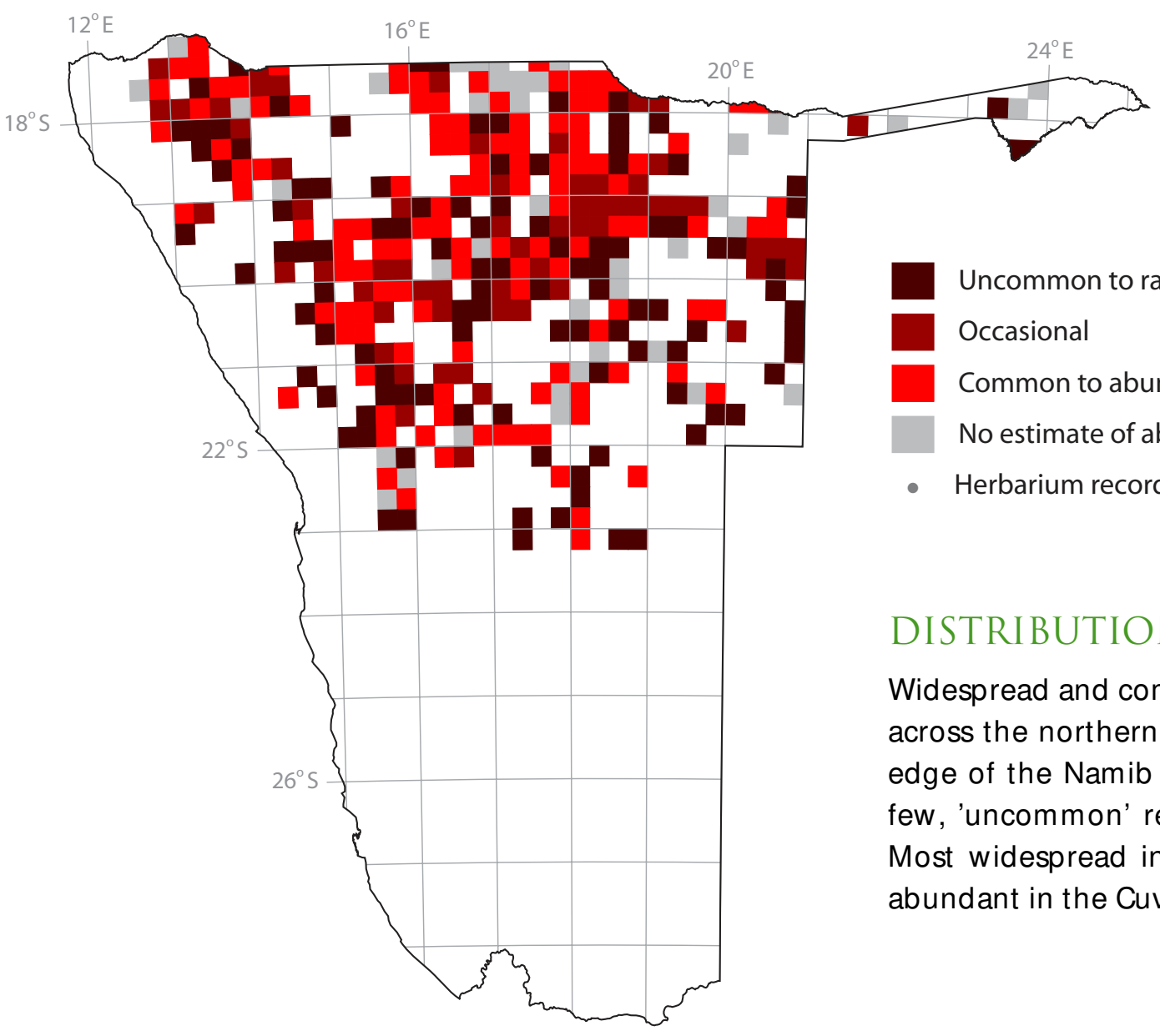
Visgif

Silverbush (E); visboontjie, kurkbos, mangaanbos (A); Fischgift (G); omukeka (H); !gaeb (K) omumbaganyana (O); mbungururu (Rk, Rum, = star)

[795 records from 332 (31%) squares]



Shrub or small tree. BARK beige-grey, **corky, deeply vertically grooved** with strips flaking off; branchlets with silky, silver covering when young. LEAVES twice compound; leaflet lanceolate to elliptic, 15–30 mm long; **shiny, dark green above; dull green below, with dense, silvery down**. FLOWERS **violet to mauve**, 10–20 mm long, hanging like a bunch of grapes. FRUIT clustered, **flattened, papery pods, with thickened margins and yellow-brown silky covering**.



DISTRIBUTION & ABUNDANCE

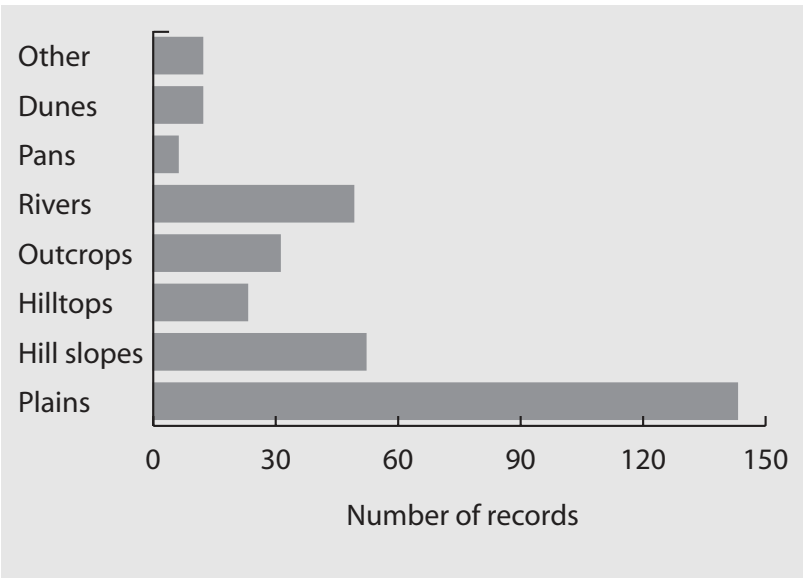
Widespread and common to locally abundant across the northern half of Namibia from the edge of the Namib to the Okavango River; a few, 'uncommon' records in eastern Caprivi. Most widespread in the Karstveld, but most abundant in the Cuvelai.

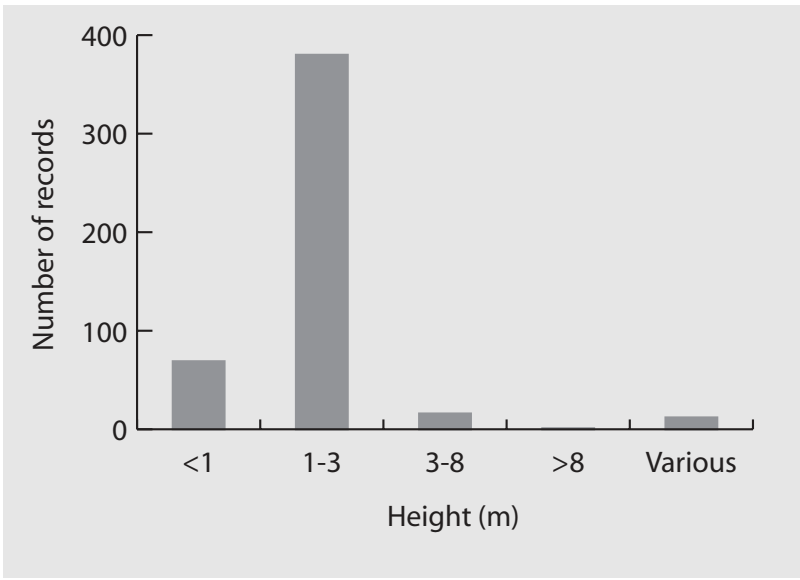
HABITAT

Various, but mostly plains. Along dry river courses in the north-west; hills and rocky outcrops on the north-central plateau; dunes and pans in the north-east. Usually on sand, but also calcrete and other rocky substrates.

GROWTH FORM

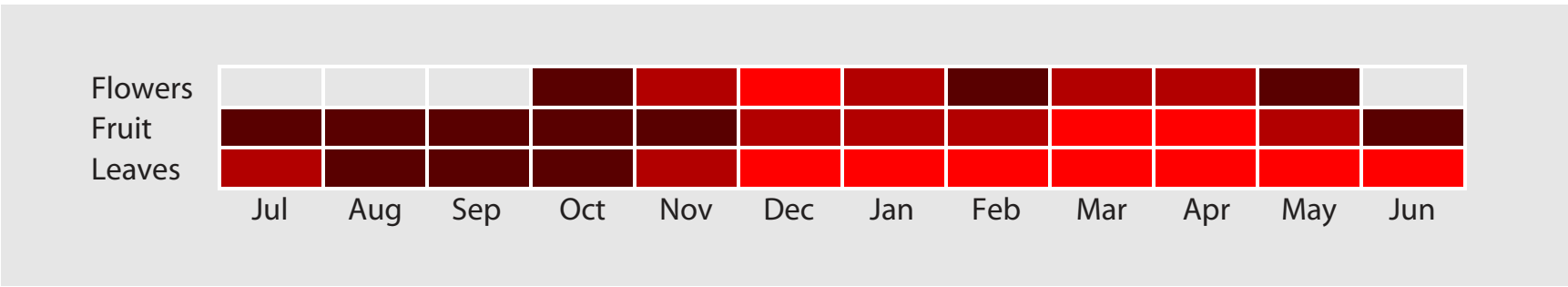
Generally a shrub (96% of records) up to 3 m high, with one record over 3 m.





ANNUAL CYCLE

FLOWERS a rain-dependent species that may flower twice in one season, any time from October to May. FRUIT present all year, but mostly December to May. LEAVES mainly November to July, with young leaves recorded any time of year, but mostly October.



GENERAL

Colonises disturbed areas such as road verges and areas cleared of other bush. Crushed bark and roots used to poison fish, hence the common name; seeds are not as poisonous as the bark; leaves are browsed by game and livestock, but poisonous to insects. *Mundulea sericea* is of horticultural potential as it is drought-resistant, fairly frost-hardy, and has attractive leaves, flowers and autumn colours.

CONSERVATION CONCERNS

None recorded.



Mundulea sericea flowers and leaves, B. Curtis

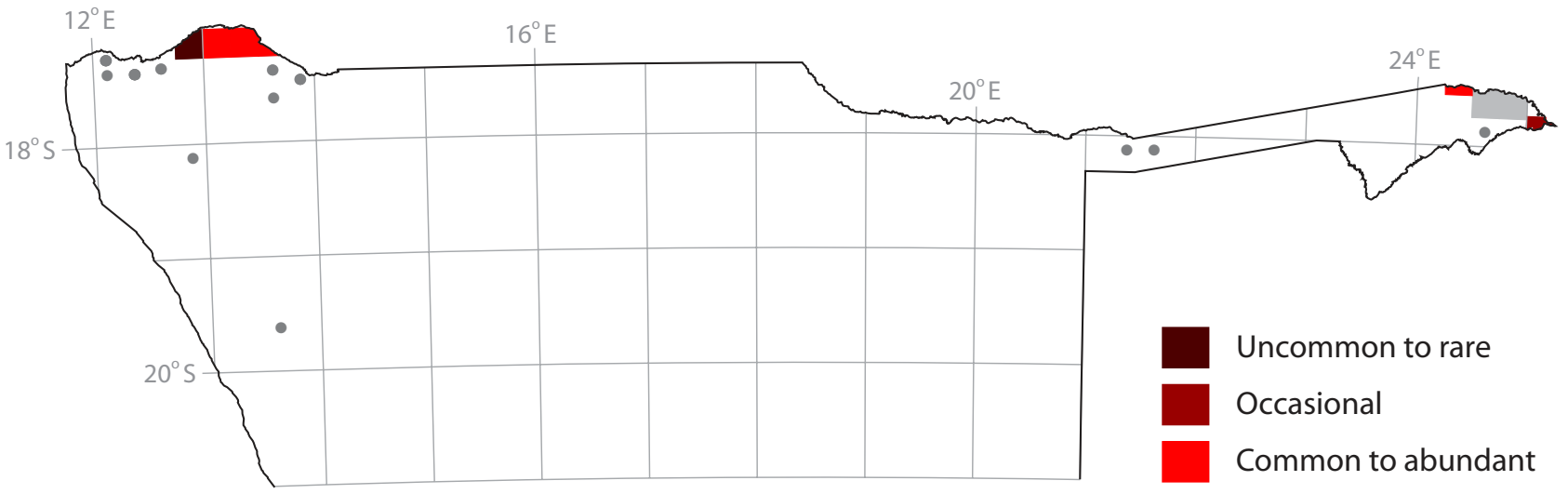
Sesbania sesban

River-bean

Rivierboontjie (A); malonga (L); ombudje (O)

[11 records from 8 (<1%) squares]

A shrub or short-lived tree, with slender trunk. LEAVES twice compound, spirally arranged, with **6–27 leaflet pairs**; leaflets sessile, oblong, 5–26 mm long. FLOWERS **yellow, sometimes with a greenish tinge**. FRUIT a long and narrow, straight to slightly curved pod, sometimes slightly twisted; straw-coloured to red-brown. SEEDS rattle inside the pods when the wind blows.



DISTRIBUTION & ABUNDANCE

Common along the Kunene and Zambezi rivers only. The records from the Zambezi River are a range extension to earlier herbarium records; there are, however, more herbarium records from the lower Kunene than were recorded by the TAP.

HABITAT

River banks and floodplains.

GROWTH FORM

A tree (60% of records) or shrub (40%) in the 1–3-m height class; occasionally over 3 m high.

ANNUAL CYCLE

FLOWERS & FRUIT intermittent records throughout the year. LEAVES probably deciduous; too few observations.

GENERAL

Leaves and young branches are browsed by livestock and game. Worldwide, the species is in demand because the leaves are considered a good feed supplement for ruminants. It is planted to increase soil fertility.

CONSERVATION CONCERNS

None recorded.

The genus *Sesbania* has eight semi-woody species in Namibia, of which three are over 1 m high. Only *S. sesban* has been included here as the other two are very softly woody and not very tree-like at all, and were not recorded by atlassers.

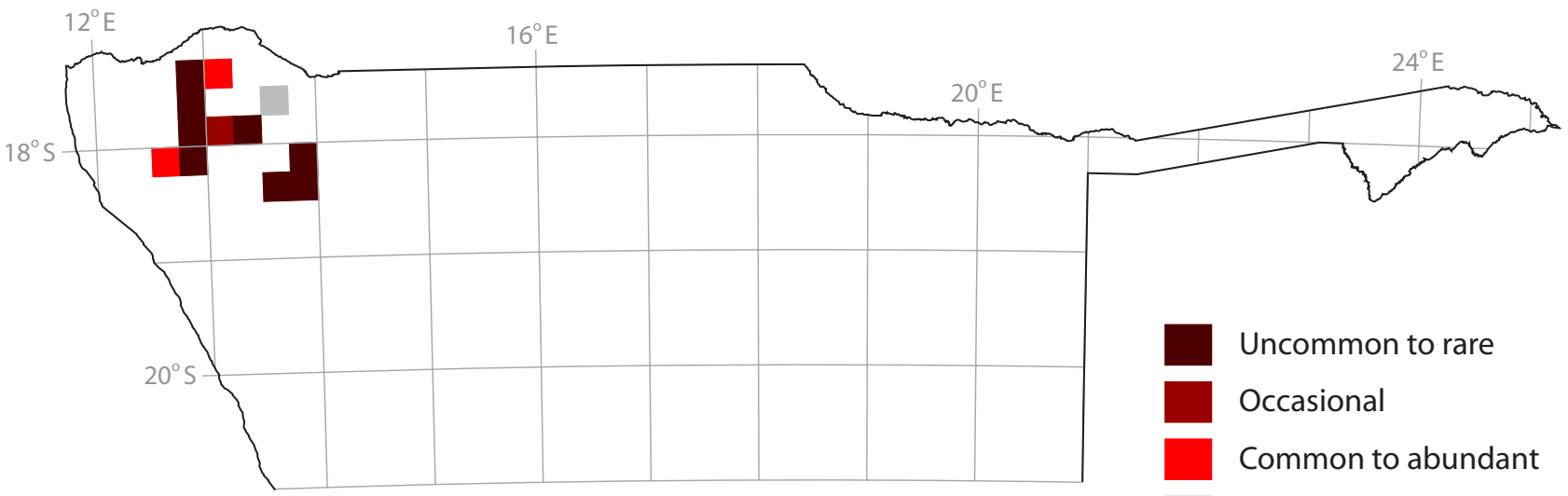
Ormocarpum kirkii

Caterpillar-pod

Krulrusperboontjie (A); omuyoramazenge (H)

[16 records from 12 (1%) squares]

Deciduous shrub or small tree **with a narrow crown**. TRUNK slender, with few branches. BARK **brown, rough and scaly**. LEAVES compound, with 7–13 leaflet pairs; leaflets elliptic to oblong, 4–11 mm long; dark green above, pale green below; apex sharp-tipped; base rounded; margin entire, rolled under. FLOWERS **conspicuous, deep pink, with deep mauve centre and conspicuous veins**. FRUIT **a small, tightly curled, hairy pod, almost concealed by the dry petals**.



DISTRIBUTION & ABUNDANCE

Uncommon in the north-western highlands and north-western escarpment. Locally common in a few places.

HABITAT

Various, but mostly along dry rivers. Always on rocky or stony substrates.

GROWTH FORM

Generally a shrub in the 1–3-m height class, but occasionally a tree over 3 m high.

ANNUAL CYCLE

Only recorded in four months. FLOWERS March, April, August and December. FRUIT in March, April and August. LEAVES recorded in March and April, not recorded in August.

GENERAL

Attractive, of horticultural potential for frost-free areas.

CONSERVATION CONCERNS

None recorded.

Ormocarpum kirkii, B. Curtis



Dalbergia martinii

Zambezi Flat-bean

[no TAP records]

A straggling shrub up to 3 m high or a climber with well-developed stem tendrils. BARK dark chocolate-brown; unarmed. LEAVES with 5–8 altermate leaflets which are elliptic to obovate.

One earlier herbarium specimen from eastern Caprivi; it was not recorded by the TAP.

Dalbergia nitidula

Purplewood Flat-bean

[2 records from 2 squares]

A slender shrub or small, straggling tree with grey-brown or reddish bark, flaking to expose a rusty underbark; unarmed. LEAVES compound, with grey-green oval leaflets.

A rare tree in the 3–8-m height class on a river bank in 1712DB, and an uncommon shrub in the 1–8-m height classes on a hill slope in 1813DA. With leaves in January. Previously found in one square in the north-west (1713AC). Recently found on the Omavanda Plateau, Baynes Mountains (1713AA) as an occasional tree of 2–4 m high, with leaves in July and January (SWA, CUR1, Braam van Wyk, pers. comm).

Wood Carver with his carvings, B. Curtis



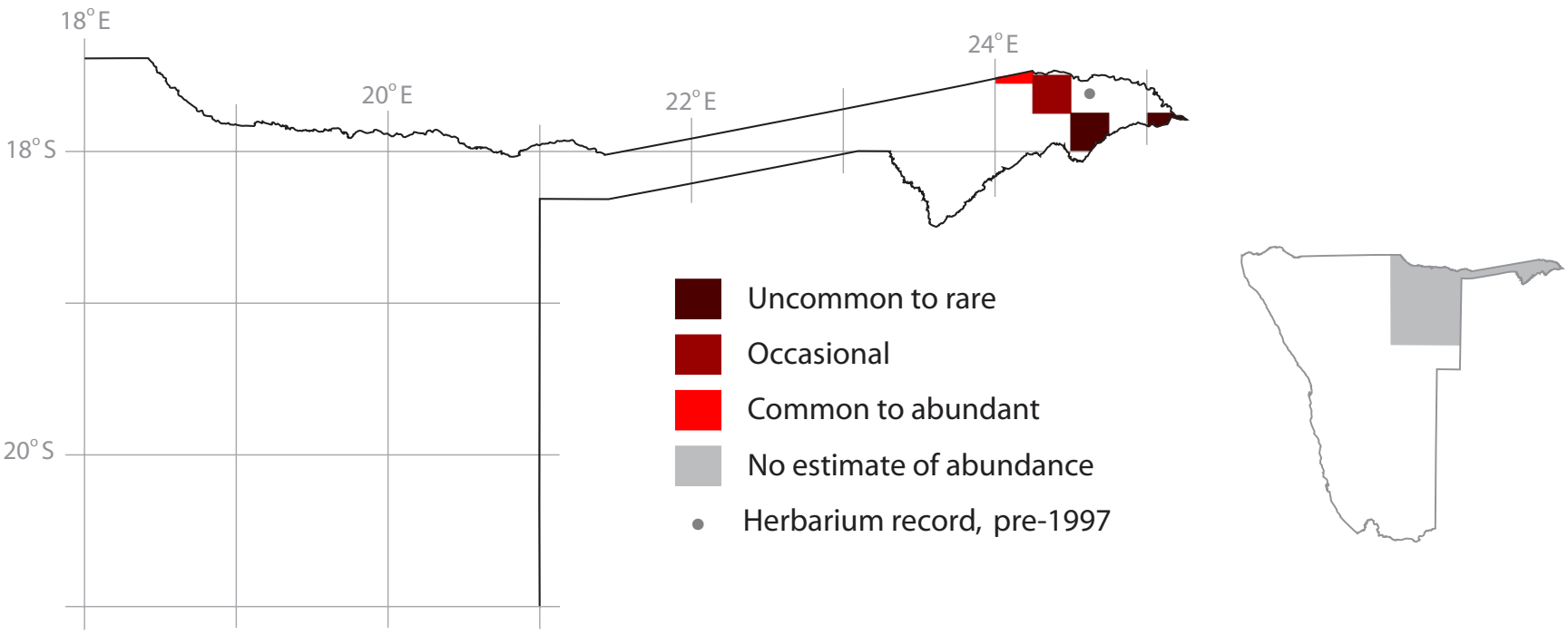
Delbergia melanoxylon

Zebra-wood

Sebrahout (A)

[7 records from 4 squares]

Deciduous shrub, with **characteristic, spinescent lateral branches**. BARK smooth, grey, sometimes peels in strips. LEAVES compound, **spirally arranged or clustered** on spinescent shoots; 7–13 almost sessile leaflets, oval; dark green and shiny above, paler green and matt below; **apex rounded to notched**; base broadly tapering. FLOWERS **clustered on spines**; small, white or pale pink, sweetly scented and appearing with new leaves. FRUIT a **flattened, papery pod**, up to 50 x 13 mm; pale brown to black when mature, usually borne in dense clusters.



DISTRIBUTION & ABUNDANCE

Uncommon to common in the extreme eastern Caprivi.

HABITAT

On plains and river banks.

GROWTH FORM

Mostly a shrub of less than 3 m high; occasionally a tree of over 8 m.

ANNUAL CYCLE

Records only for March, April and November. FLOWERS not recorded. FRUIT recorded in November. LEAVES recorded in every observation month

CONSERVATION CONCERNS

None recorded.

Pterocarpus angolensis

Kiaat / Mukwa

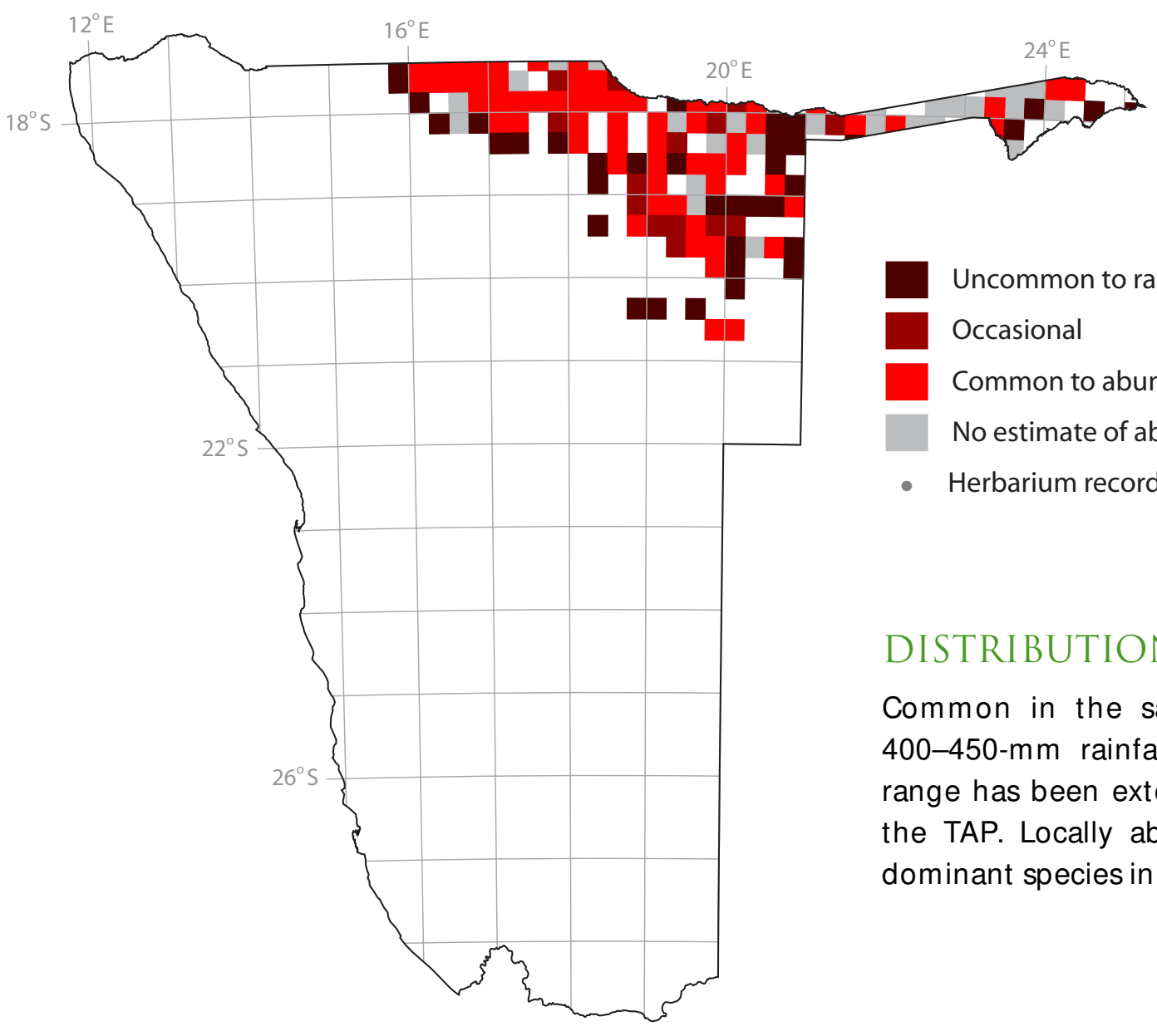
Dolf (A, G); omu(h)uva (H, O); mulombe (L); uguva (Rk, Rum); ghughuwa (T)

[257 records from 142 (14%) squares]



A large tree, up to 20 m high with an open, **umbrella-shaped canopy**. TRUNK **single, straight**. BARK dark, rough, longitudinally fissured. LEAVES compound, 300 mm long, with up to 20 pairs of bristle-tipped, shiny, dark green leaflets. FLOWERS **yellow**, sweetly scented; appearing in spring before the leaves; **hanging in sprays up to 200 mm long**. FRUIT **a distinctive pod, with a central, round seed case, covered in long, stiff bristles and surrounded by a flat, papery wing**.

Flowers and fruit are conspicuous. The tree is fairly distinctive with its tall, erect trunk and umbrella-shaped canopy.

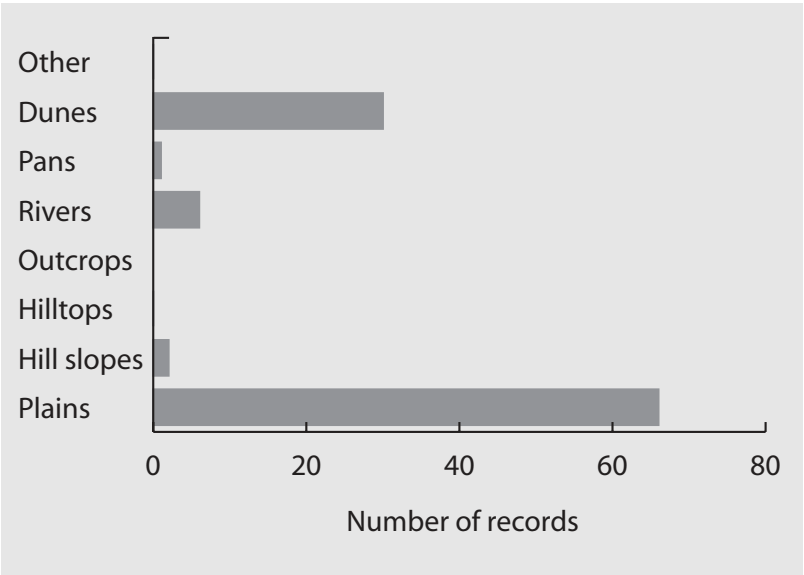


DISTRIBUTION & ABUNDANCE

Common in the sandy areas east of the 400–450-mm rainfall isohyet. The southern range has been extended by one degree by the TAP. Locally abundant and one of the dominant species in places.

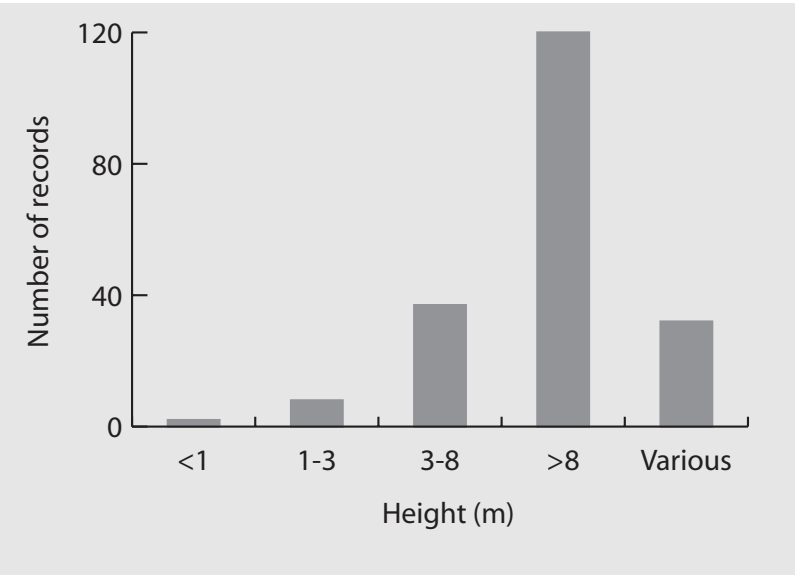
HABITAT

Mostly sandy plains and dunes in mixed woodlands.



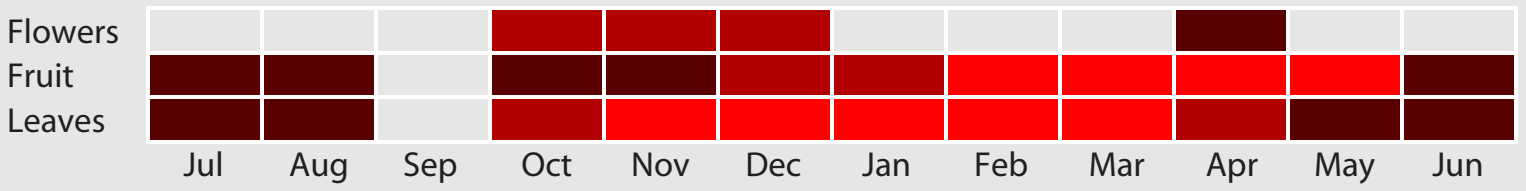
GROWTH FORM

A tree of over 8 m high. About 20% of records reported young trees, mostly in areas west of Tsumkwe.



ANNUAL CYCLE

FLOWERS October to December, with a second flush in April; never many records. FRUIT December to May mainly, but present all year round. LEAVES October to April.



GENERAL

Heavily utilised for a variety of purposes, but mostly as timber on a commercial basis, and for wood-carving. It also has ceremonial and medicinal uses. *Pterocarpus angolensis* can withstand fire, dying back to the woody rootstock and coppicing next season. Seeds need fire to germinate and total protection from fire results in decrease in recruitment. It is a light-demanding species, remaining as a suffrutex for many years if growing in shade (GRA1).

CONSERVATION CONCERNS

Needs strict monitoring due to the apparent increase in demand for wood-carving, especially of large pieces. The low percentage of young trees is a concern, but it could be that atlassers did not always note the presence of young trees. Recruitment is possibly being affected by excessive burning regimes. Protected by forestry legislation. Assessed as 'near threatened' according to the latest IUCN criteria (Loots 2005).

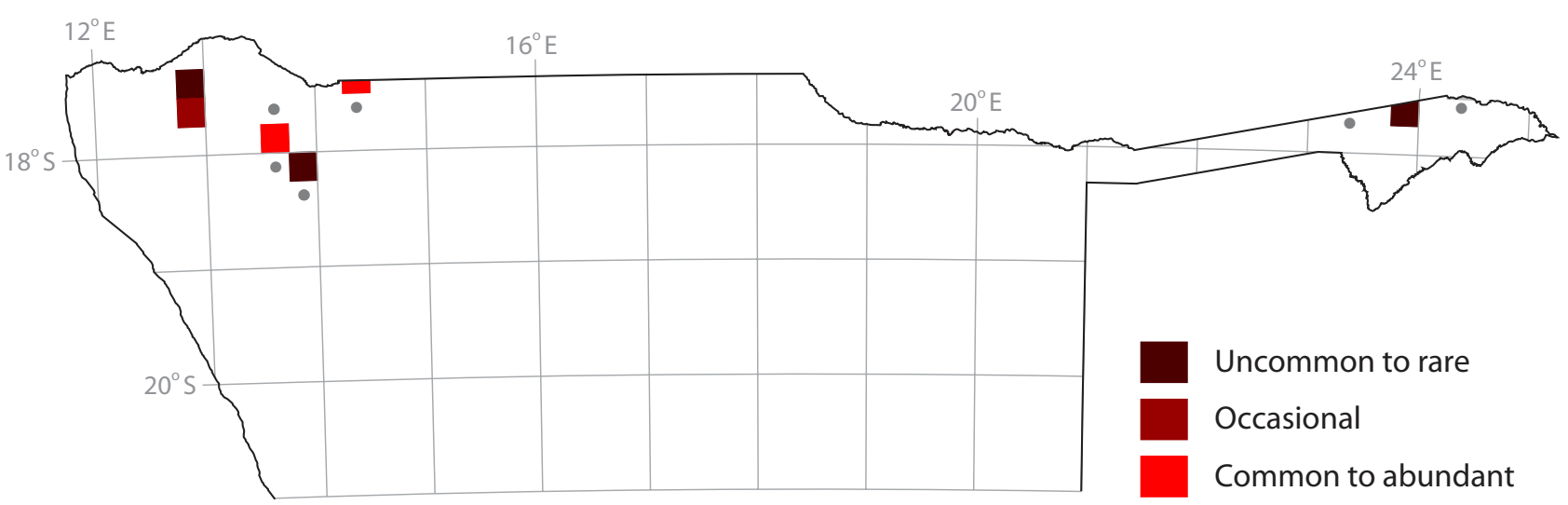
Pterocarpus lucens

Doringkiaat

Thorny teak, bloodwood (E); mwangula (L)

[8 records from 7 (<1%) squares]

Tree, up to 10 m high. BARK smooth, **grey-green, sometimes flaking in thin scales to expose a pale brown underbark**. BRANCHLETS **straight, spiny**. LEAVES compound, **drooping**, with 1–3 small leaflet pairs; leaflets oblong to ovate; dark green and shiny above, downy below; **margin wavy**. FLOWERS yellow, in long, soft, drooping sprays; appearing before or together with new leaves. FRUIT a small, oval to elliptic, flattened pod; **central part thickened, hard, reddish-brown, hairless, with pale brown, membranous wing**.



DISTRIBUTION & ABUNDANCE

Occasional in the far north-west; uncommon in eastern Caprivi. Common in Ruacana town. There were more, earlier herbarium records than TAP records in both areas.

HABITAT

Various habitats in the north-west; on gravel or stony substrates. On sandy plains in eastern Caprivi.

GROWTH FORM

A tree, mostly in the 3–8-m height class; also shorter in the north-west.

ANNUAL CYCLE

FLOWERS no records. FRUIT occasional records from November to May (including herbarium records). LEAVES March to May (the only months of TAP observations).

GENERAL

The South African common name 'bloodwood', alludes to the fact that red-brown sap is exuded when the tree is cut.

CONSERVATION CONCERNS

None recorded.

Pterocarpus rotundifolius

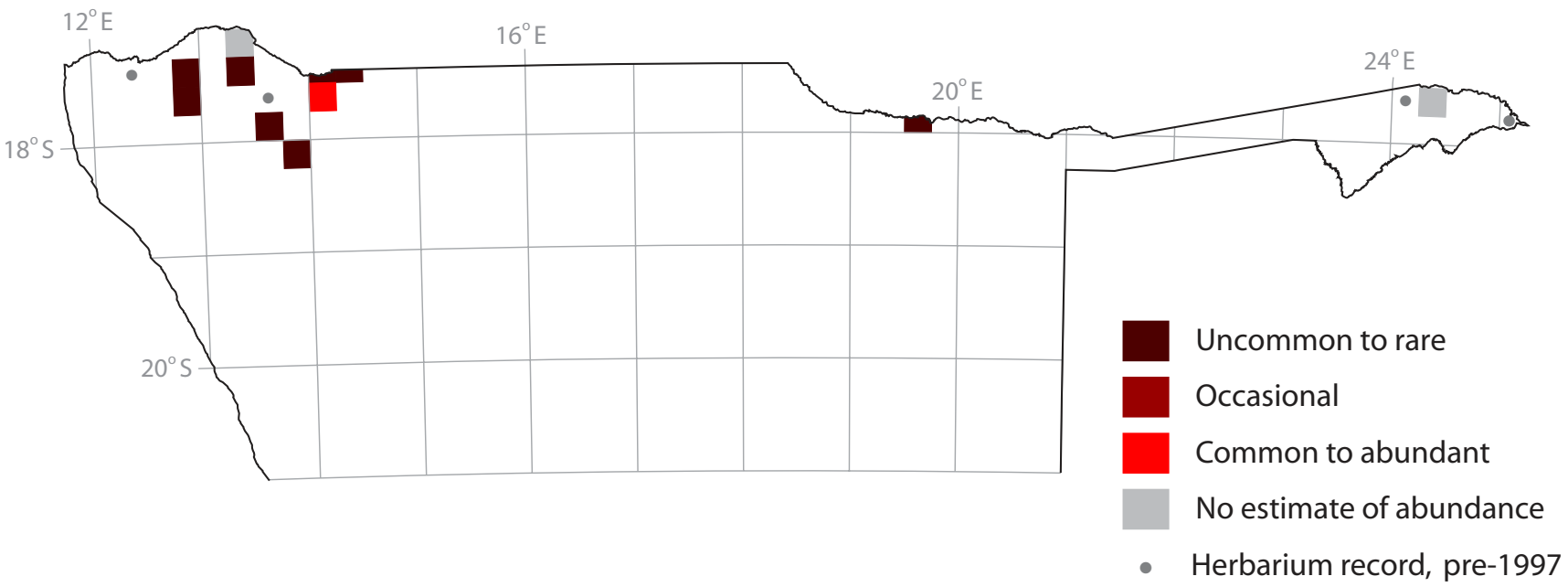
Round-leaved Teak

Dopperkiaat (A)

[14 records from 11 (1%) squares]

A deciduous tree. BARK **dark grey to brown, longitudinally fissured**. LEAVES compound, up to 250 mm long, with 1–3 leaflet pairs; leaflets elliptic to **almost round** with **very conspicuous veins; dark green and shiny above, paler green below**; margin **wavy; apex rounded, notched**. FLOWERS **brilliant yellow with crinkled petals**, sweet scented, in long sprays. FRUIT a small, flattened, hanging pod; **elliptic to almost round; heavily veined, dark brown centre with light brown wing**.

There are two subspecies in Namibia, *polyanthus* and *rotundifolius*, but they have been grouped together since neither is well represented in Namibia; they are very similar and most atlassers did not know the differences between them.



DISTRIBUTION & ABUNDANCE

Generally uncommon in the far north-west, with only one recent record from eastern Caprivi. Both subspecies have been collected from the north-west, but only subsp. *polyanthus* from eastern Caprivi, near Katima Mulilo and Impalila Island in 1959.

HABITAT

Mostly plains and hill slopes, occasionally hilltops. Generally on gravel, or rocky or stony substrates; sometimes on sandy soil.

GROWTH FORM

A tree, generally in the 3–8-m height class, but variable.

ANNUAL CYCLE

Only recorded in December, March and April. FLOWERS January. FRUIT December, March and April. LEAVES December, March, April.

GENERAL

This plant's attractive flowers give it horticultural potential for frost-free areas.

CONSERVATION CONCERNS

None recorded.

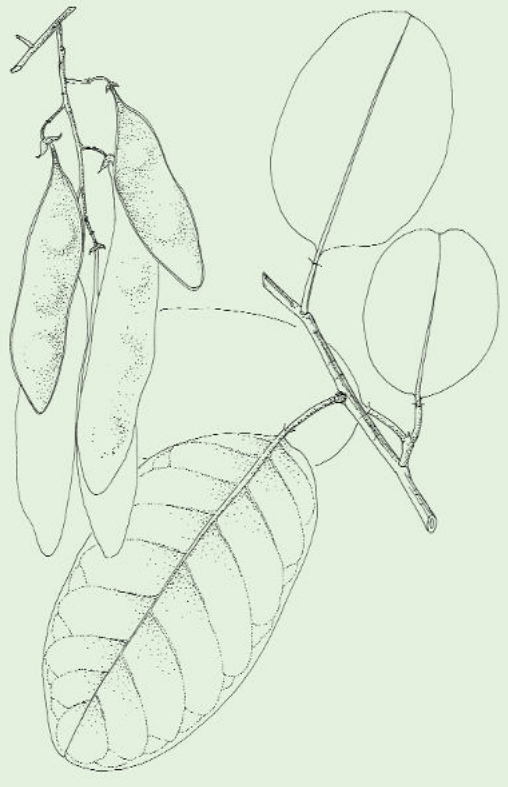
Philenoptera nelsii

= Lonchocarpus nelsii

Kalahari Omupanda

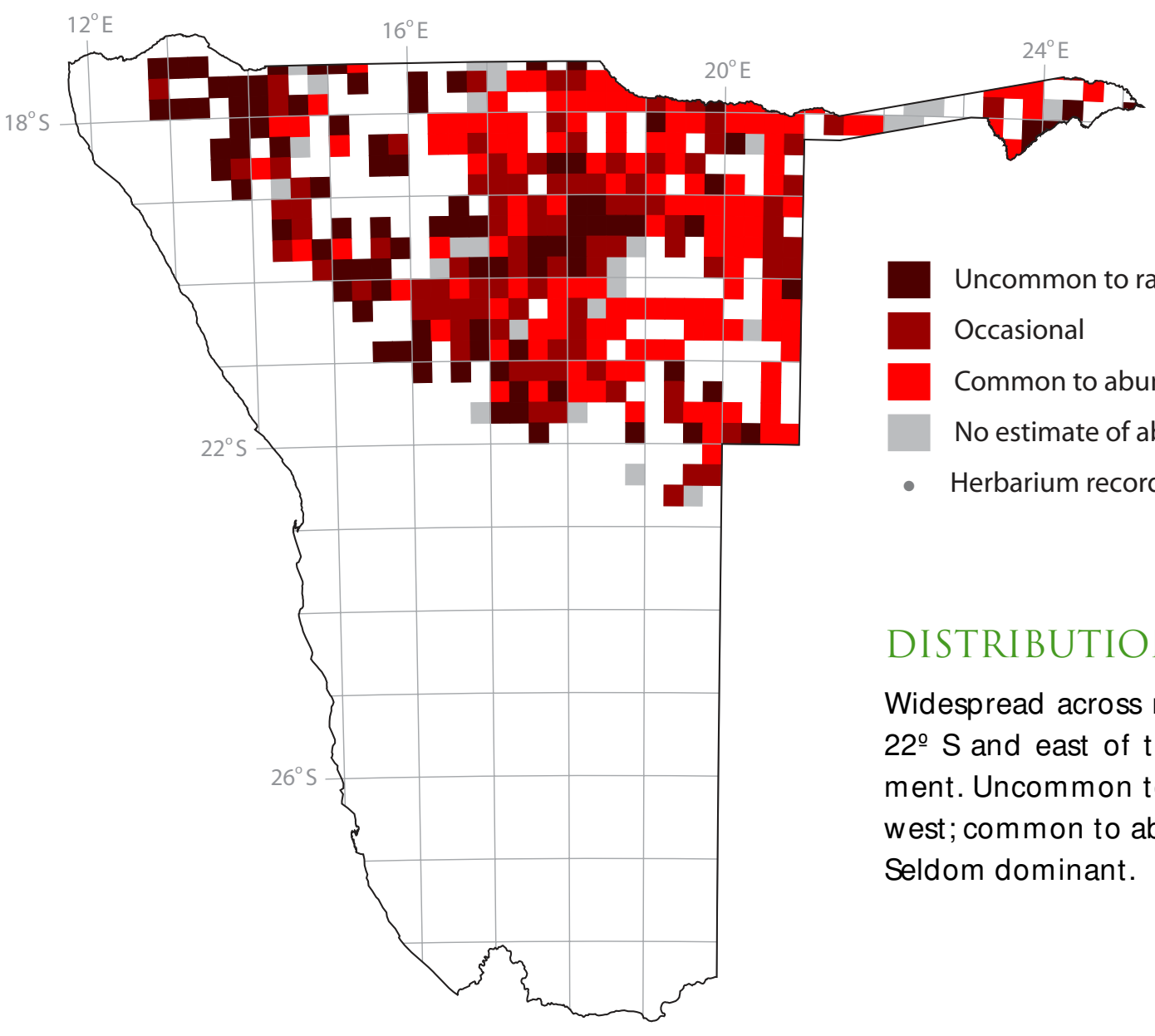
Kalahari apple-leaf (E); appelblaar (A); Apfelblattbaum (G); mukololo (L); mupanda (Rk, Rum); mukorokoro (T)

[1,120 records from 353 (33%) squares]



A small tree. BARK yellowish-grey. LEAVES **apparently simple**, large, dark green, **leathery and puckered**. FLOWERS white to **purple**, in densely-branched sprays. FRUIT a flattened pod.

Flowers and pods are conspicuous. Young, hairy leaves may be confused with those of *Combretum molle*, while mature leaves resemble those of *C. zeyheri*. Both species of *Combretum* have opposite leaves and lack stipules, which are initially present in *Philenoptera*.

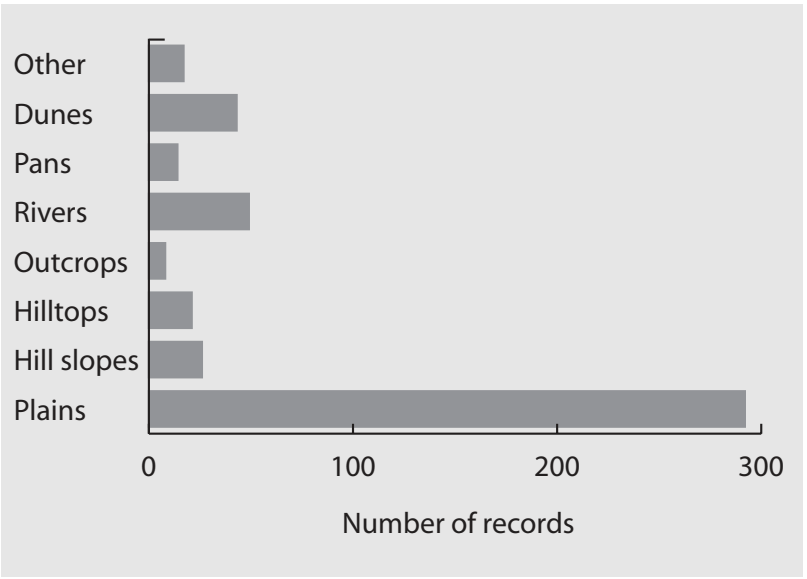


DISTRIBUTION & ABUNDANCE

Widespread across most of Namibia north of 22º S and east of the north-western escarpment. Uncommon to occasional in the north-west; common to abundant in the north-east. Seldom dominant.

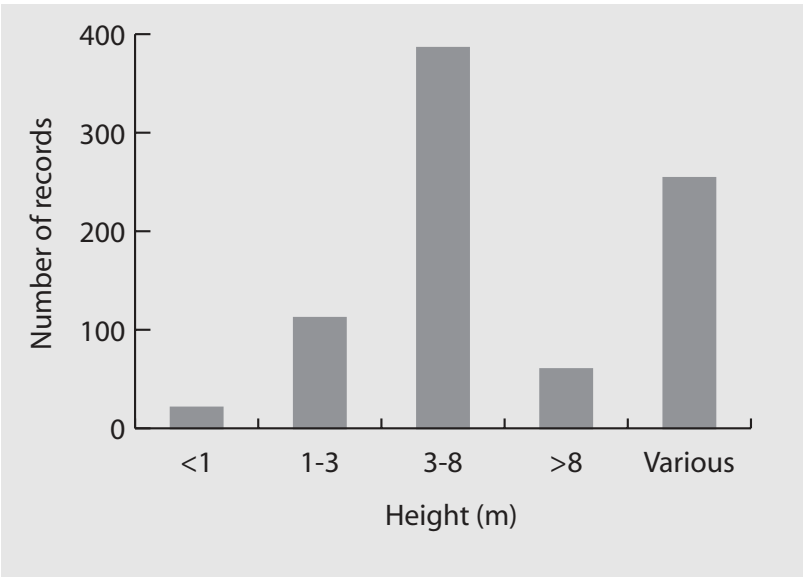
HABITAT

Various habitats, but most often on plains. Also along rivers in the north-east and north-west; on hills on the north-central plateau; on dunes and around pans in the north-east. Generally on deep sand; occasionally on calcrete or dolomite.



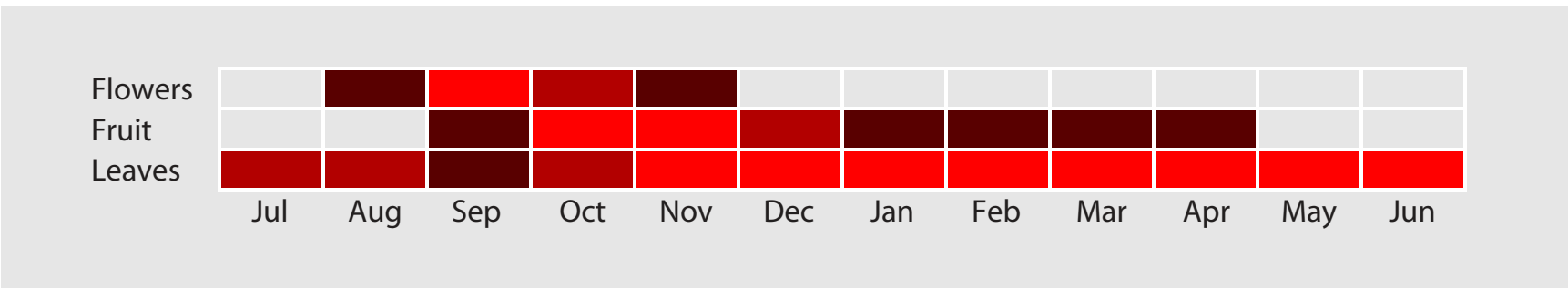
GROWTH FORM

Mostly a tree in the 3–8-m height class, but sometimes taller (10% of records), particularly on the north-central plateau; younger plants more shrub-like. There were many stands of plants of mixed heights in the east and on the north-central plateau.



ANNUAL CYCLE

FLOWERS August to November. FRUIT September to April. LEAVES semi-deciduous, with bare trees from July to October and new leaves from September to November.



GENERAL

The wood is very tough and flexible, and does not break or shatter easily. It has been used in the past for making ox-wagon wheels and bearings for agricultural implements. It is still used by farmers for chain guides and to replace oak bearings in modern implements. Particularly used where slow-moving bearings are needed, and friction would soon wear out metal bearings.

The leaves are eaten by giraffe and cattle; flowers are eaten by guinea fowl and dik-dik and attract insects including honey- and bumble-bees. In Kaokoveld, the outer, scaly bark of branches is used to promote curdling in milk; spoons are carved from the wood. Susceptible to parasites such as *Plicosepalus* spp., which appear to have killed some specimens. This plant is regarded as an indicator of fertile soil in the north.

With its neat shape and attractive flowers, *Philenoptera nelsii* is of horticultural potential.

CONSERVATION CONCERNS

None recorded. Protected by forestry legislation.

Philenoptera violacea

= Lonchocarpus capassa

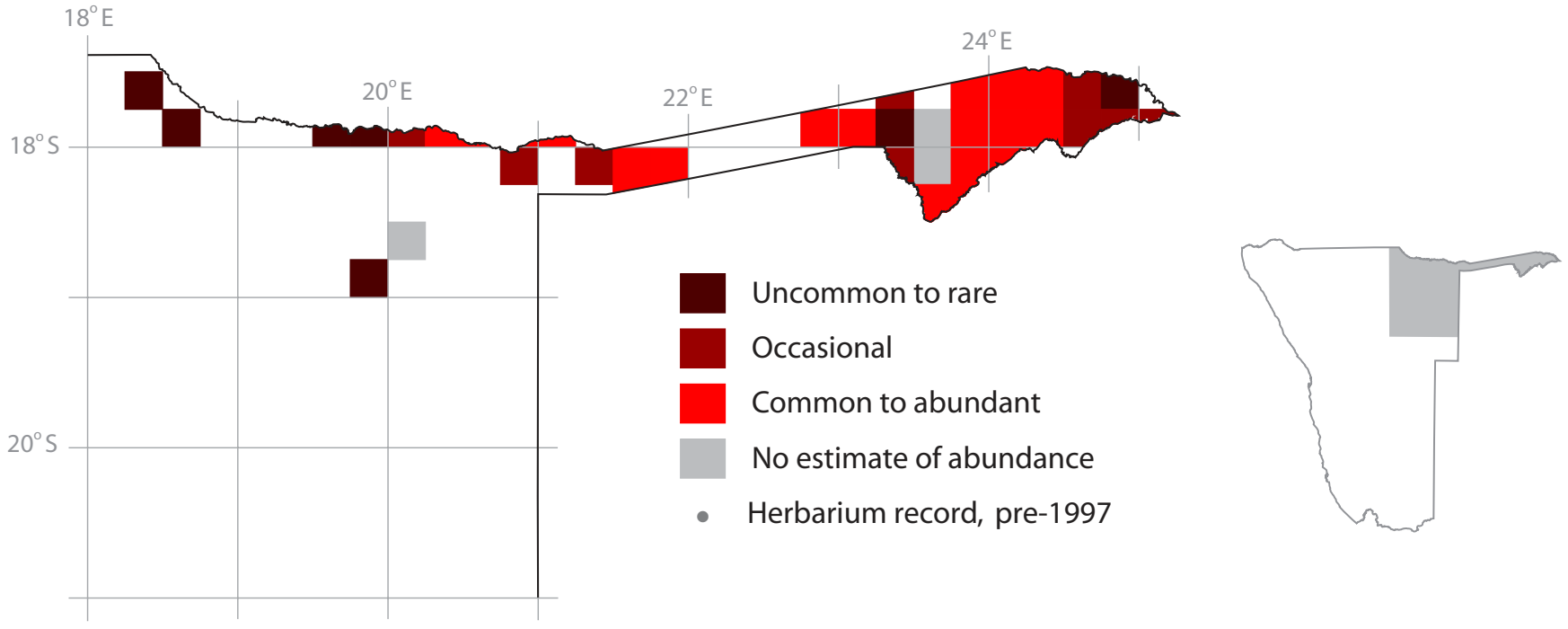
Northern Omupanda

Rain tree (E); appelblaar (A); Apfelblattbaum (G); mukololo (L); mukorokoro (T)

[127 records from 41 (4%) squares]



Semi-deciduous tree, with an open, rounded crown. LEAVES with **one large, terminal leaflet and 1–2 smaller lateral leaflet pairs**; leathery, **somewhat concave and shiny, dull green above**. FLOWERS in long mauve to violet sprays. FRUIT **a flattened, non-splitting, hanging pod, tapering at both ends**.

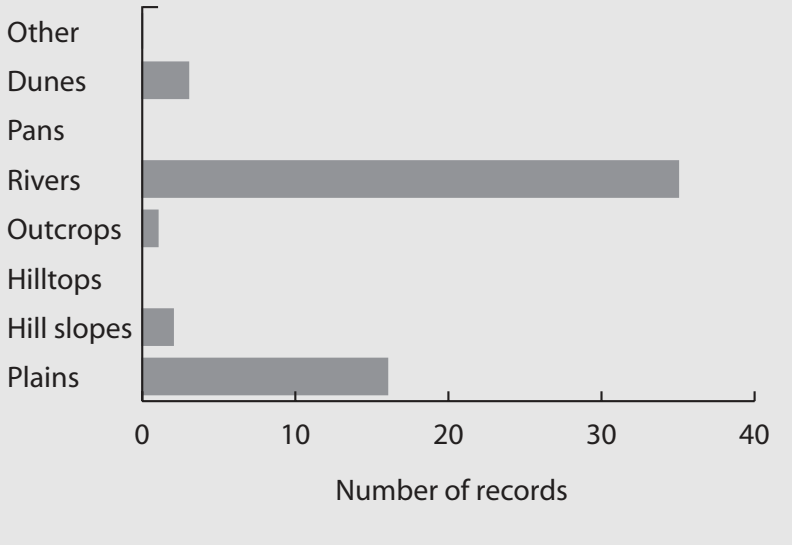


DISTRIBUTION & ABUNDANCE

Common to abundant along the Okavango River and in eastern Caprivi on the floodplains and in the mopane woodlands. Uncommon along the Omuramba Omatako. Possibly under-reported in western Caprivi.

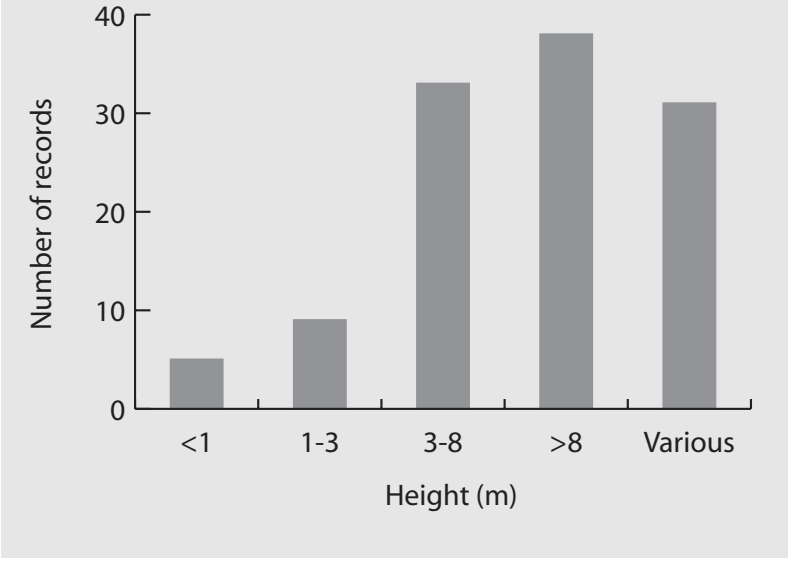
HABITAT

Along river banks and on floodplains, as well as on sandy plains and dunes.



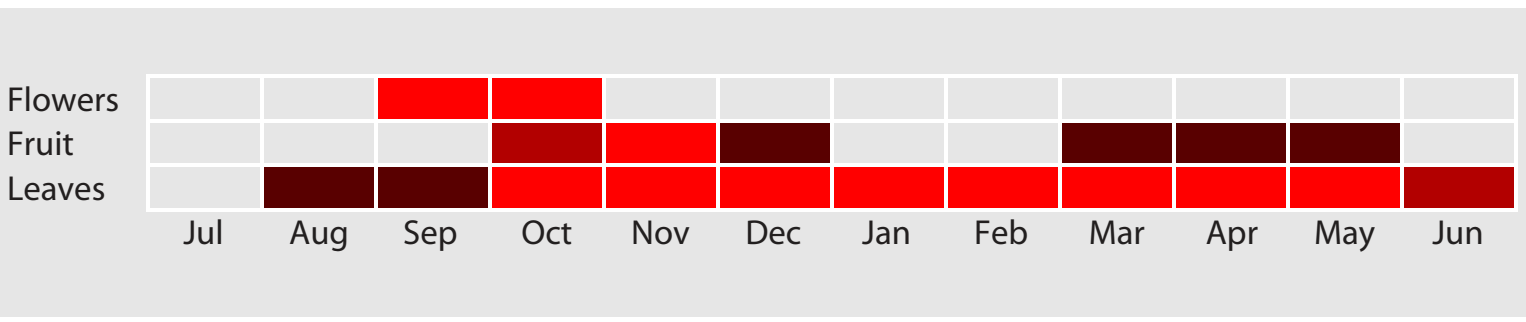
GROWTH FORM

A tree from 3–8 m and taller; about 30% of records with various heights.



ANNUAL CYCLE

FLOWERS September and October. FRUIT mainly October to December, with some records in the autumn months; the fruit hang in clusters, and persist on the tree for a long time. LEAVES October to June, with young leaves in August and September.



GENERAL

The fruit and leaves are eaten by game and livestock; the leaves, in fact, being used for livestock fodder. Wood is used for fence poles and watos; the roots medicinally. This plant is of horticultural potential for large gardens in low-frost, sandy areas.

Named 'rain tree' in South Africa due to the bugs it supports that suck out the sap, extract the sugars and excrete almost pure water, which falls to the ground like raindrops.

CONSERVATION CONCERNS

None recorded. Protected by forestry legislation.



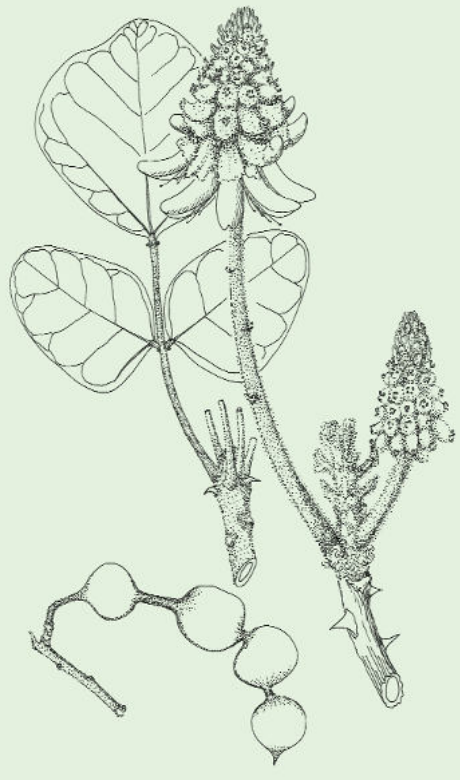
Philenoptera violacea, C. Mannheimer

Erythrina decora

Namib Coral-tree

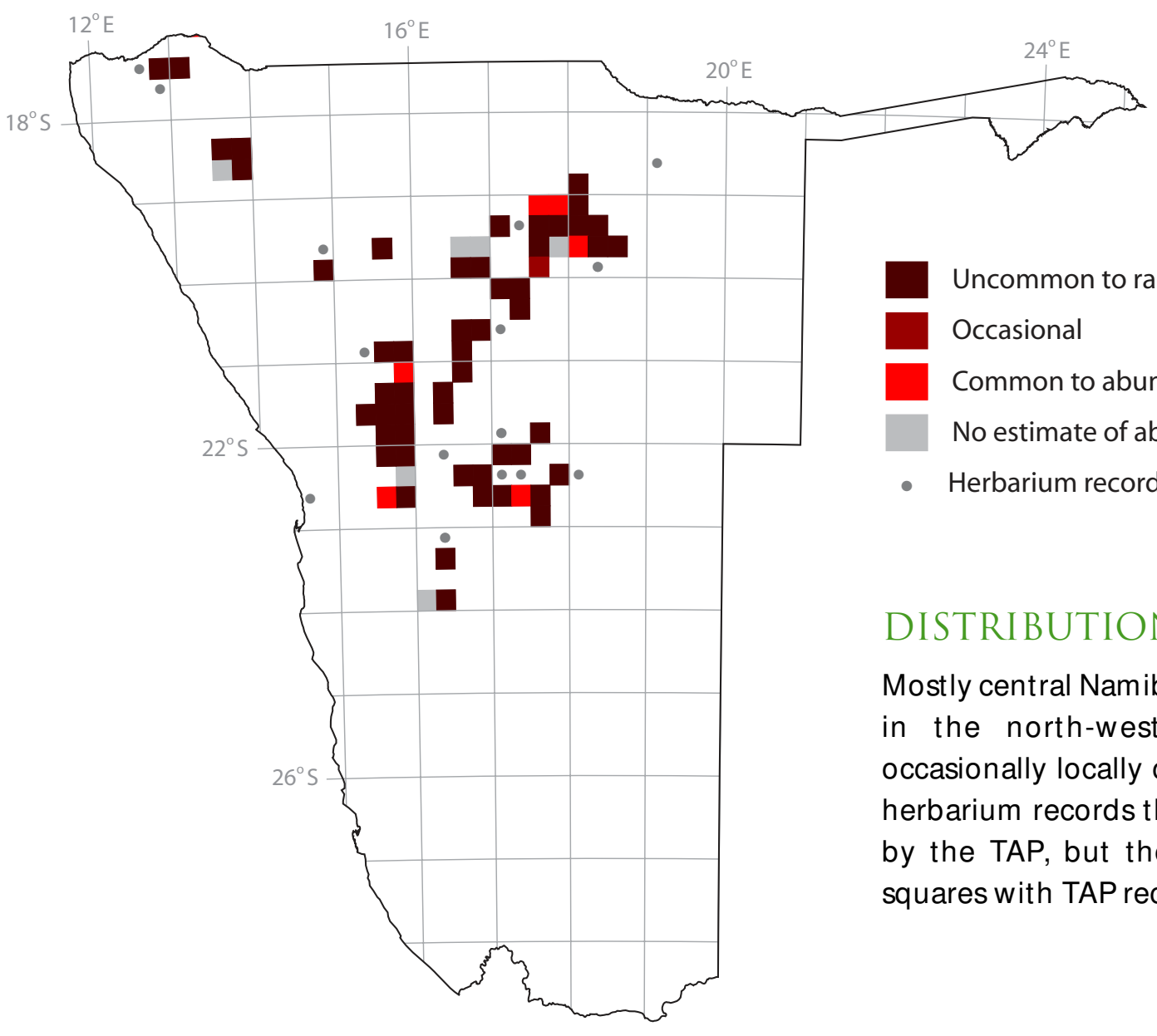
Suidweskoraalboom (A); Korallenbaum (G); omuninga (H); oninga (= fruit, H)

[158 records from 66 (6%) squares]



Deciduous shrub, or small to very large tree. BARK grey, **corky**. BRANCHLETS with **woolly covering** and **scattered thorns**. LEAVES **trifoliolate; terminal leaflet rhombic and larger than lateral leaflets, often broader than long; petiole, rachis and midrib armed with thorns**. INFLORESCENCE a stiff spray of bright red flowers, appearing before the leaves. FRUIT a **woody pod, conspicuously constricted between the seeds.** SEEDS **red with a black spot at point of attachment**.

Cannot be confused with other plants. Flowers and fruit are conspicuous.

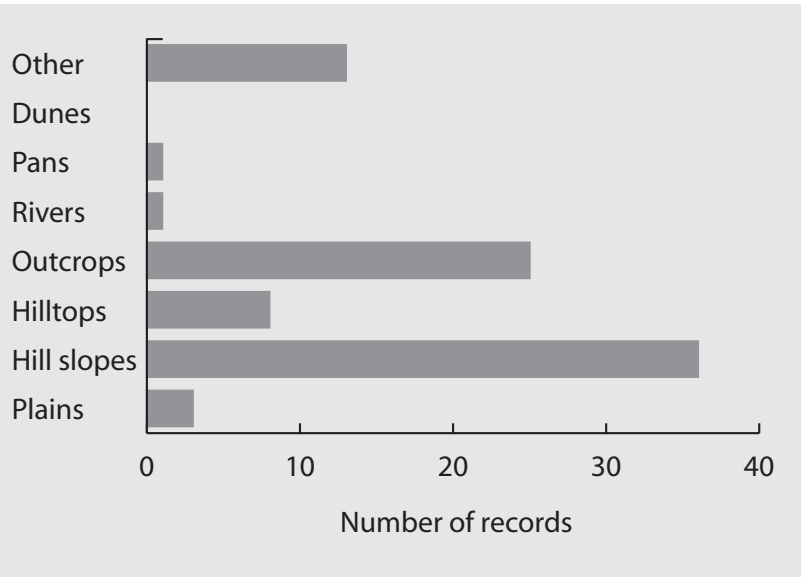


DISTRIBUTION & ABUNDANCE

Mostly central Namibia, with isolated localities in the north-west. Uncommon to rare, occasionally locally common. There are a few herbarium records that were not reconfirmed by the TAP, but these were always next to squares with TAP records.

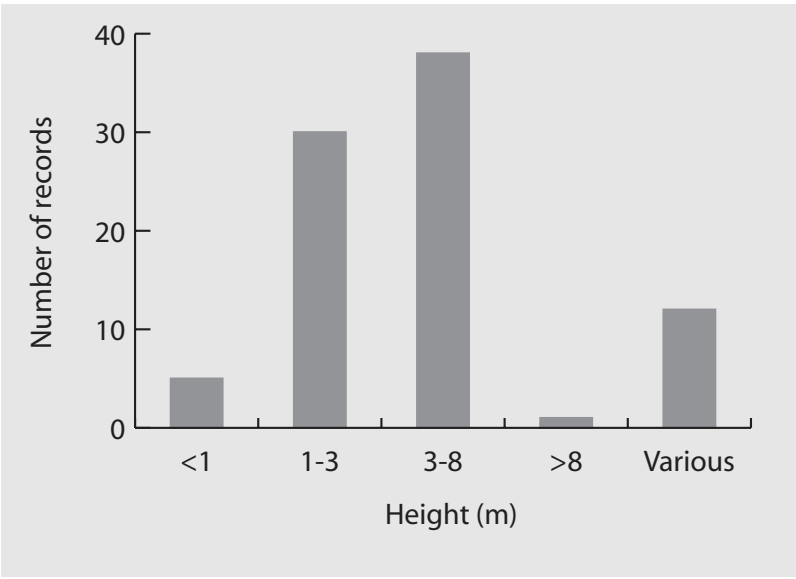
HABITAT

Mainly rocky outcrops and hill slopes, but also kloofs and gorges, especially in the central highlands.



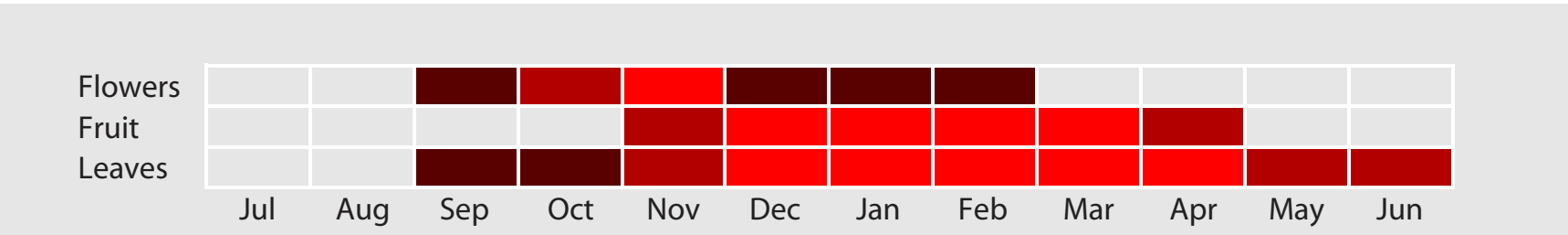
GROWTH FORM

A tree up to 8 m tall.



ANNUAL CYCLE

FLOWERS September to February, with a peak in November. FRUIT November to April. LEAVES November to June, with new leaves produced in September and October.

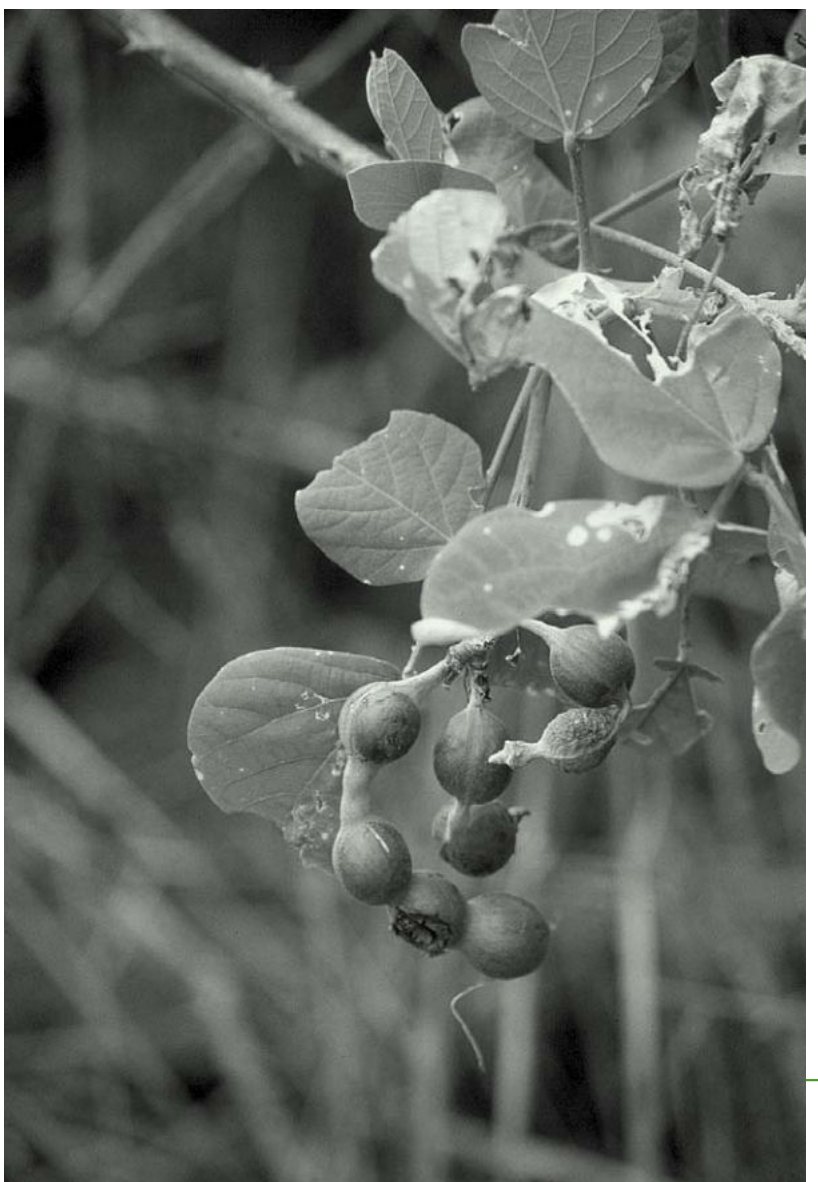


GENERAL

Used medicinally. Although frost-sensitive, of definite horticultural potential due to the attractive flowers, fruit and seed.

CONSERVATION CONCERNS

Endemic to Namibia, and very uncommon throughout its range, therefore worthy of protection. Very few young trees recorded. Protected by Forestry legislation.



Erythrina decora, E. Ellinger

Xeroderris stuhlmannii

Wingbean

[3 records from 3 squares]

A deciduous tree with a spreading crown, exuding a red sap when cut. LEAVES compound, leaflets oblong to ovate, folded upwards along the midrib, covered with fine hairs when young; margin wavy and slightly rolled under; petiolule of terminal leaflet jointed. FLOWERS small, greenish-white; densely covered with cream to rusty velvety hairs on the calyx and stalk. FRUIT a flat pod, **swollen in the centre over the seeds, with a membranous wing all around**.

A rare tree of up to 20 m high on the plains on Impalila Island (1725CC); a common tree of over 8 m on the plains near the floodplain in 1724AD. A rare tree of 8 m on the golfcourse of Katima Mulilo. Young leaves and fruit recorded in November. Leaves, flowers and fruit recorded in October. There are also two earlier herbarium records from Katima Mulilo and the square to the south of it.

Erythroxylum zambesiacum

Zambezi Coca-tree

[3 records from 2 squares]

A shrub or small tree from the Zambezi Valley in Zimbabwe and Zambia. LEAVES simple, small, obovate to oblong, thinly textured, pale green, **with base running into petiole**; stipules triangular, fused, persistent. FLOWERS small, white, inconspicuous. FRUIT small, red, ellipsoid.

Three records from the Salambala Conservancy (1724DA & DC) in eastern Caprivi. A common tree of 5 m tall, but also a shrub 1-3 m high, on sandy plains. Flowers and fruit recorded in March. These are new records for Namibia (specimens CUR1/722 & 734).

Neoluederitzia sericeocarpa, flower, C. Mannheimer



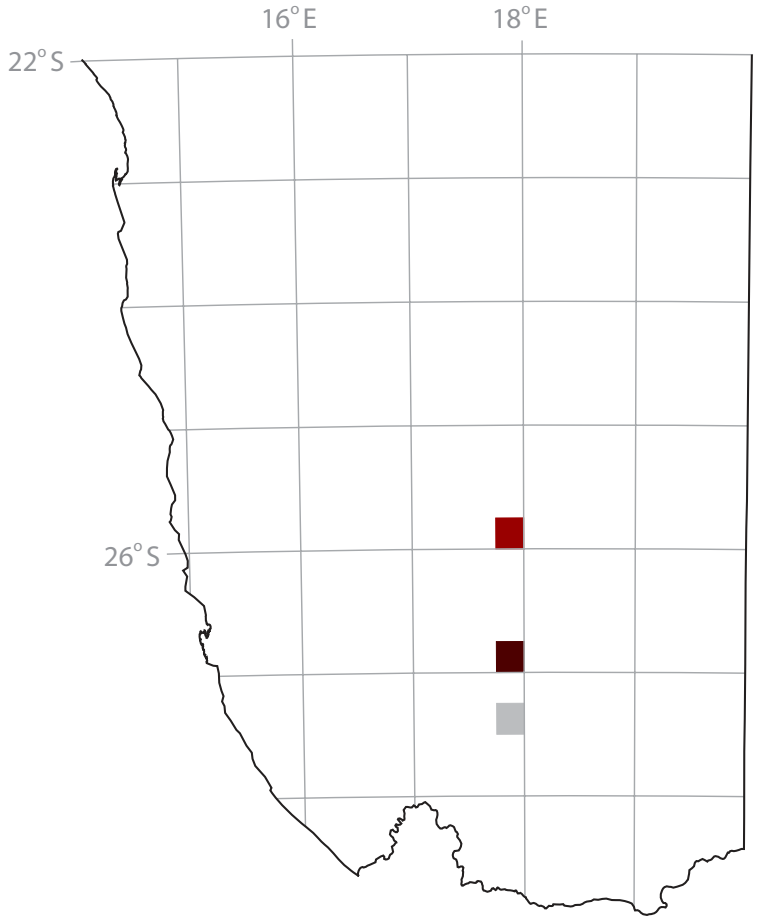
Neoluederitzia sericeocarpa

Silk-seed Bush

[5 records from 3 (<0.5%) squares]



Semi-deciduous shrub, up to 3.5 m high and equally wide. Young, lateral branches look like sturdy, straight spines. BARK red-brown with white lenticels; young branchlets cream-coloured. LEAVES compound, borne on cushions, up to 40 mm long; leaflets elliptic to obovate, up to14 mm long and 6 mm wide, **grey-green, silky**. FLOWERS solitary or clustered on axils; very pale yellow, with prominent anthers, *c.* 25 mm in diameter. FRUIT a capsule, densely covered with stiff, khaki hairs.



DISTRIBUTION & ABUNDANCE

Occasional in three scattered localities along or near to the Fish River.

HABITAT

Found on rocky outcrops, along dry watercourses and on hill slopes.

GROWTH FORM

Shrub, mostly in the 1-3-m height class.

ANNUAL CYCLE

FLOWERS and FRUIT recorded in September and November. LEAVES recorded in September, October and April.

GENERAL

Leaves and flowers browsed by goats.

CONSERVATION CONCERNS

This is an endemic species with a very restricted distribution and thus worthy of conservation.

Zygophyllum prismatocarpum

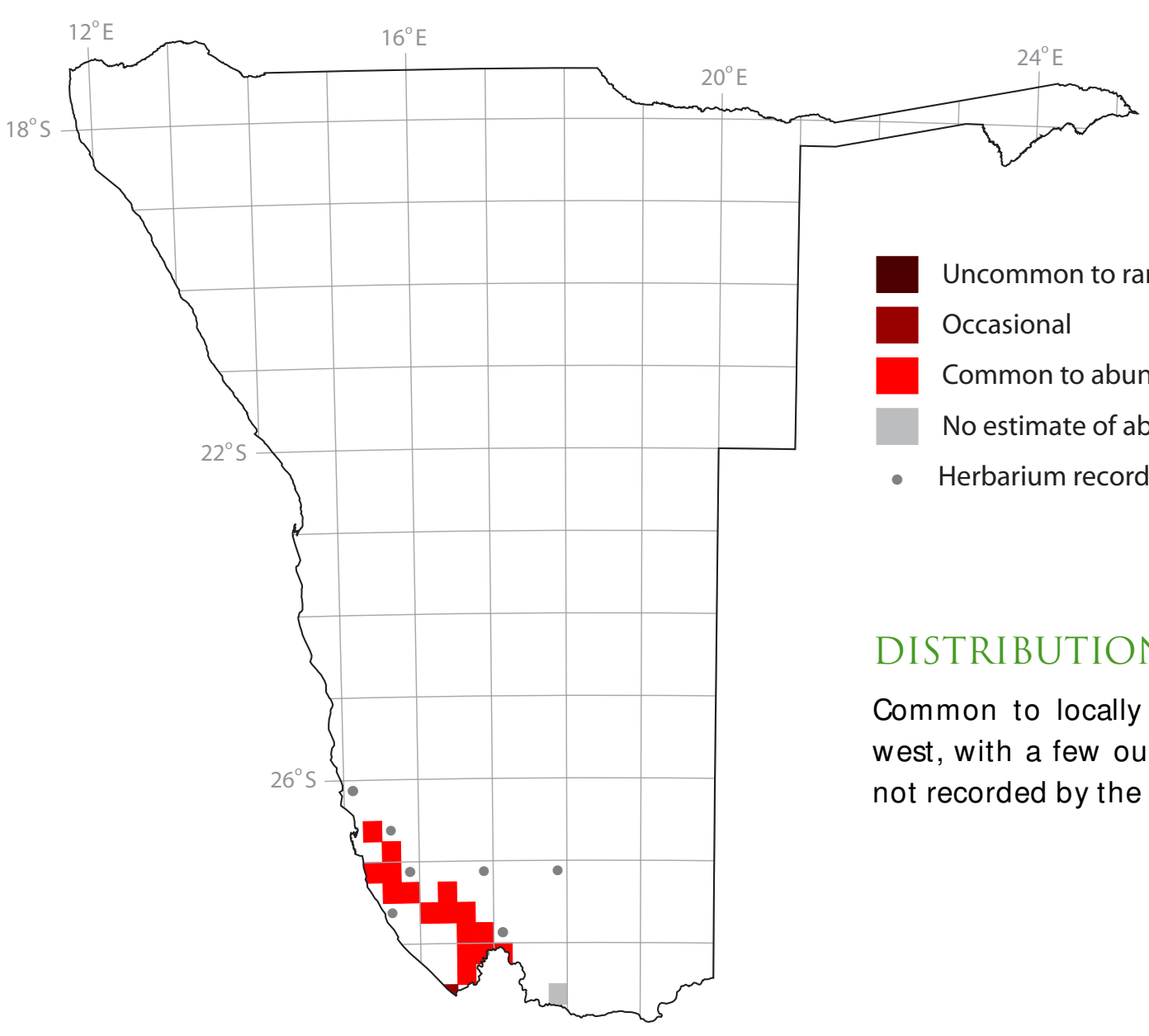
Langlootspekboom

Tall zygophyllum

[40 records from 18 (1.7%) squares]



Semi-deciduous shrub. Branched at the base with several **long, erect to drooping branches protruding from the top**. LEAVES **simple, opposite, sessile, almost round**, 16–30 mm long; **dull green with a leathery texture**. FLOWERS white, **in dense erect sprays, often towards tips of branches**, up to 10 mm in diameter. FRUIT a fleshy five-winged capsule, up to 6 x 12 mm; **breaking into longitudinal sections when dry**.

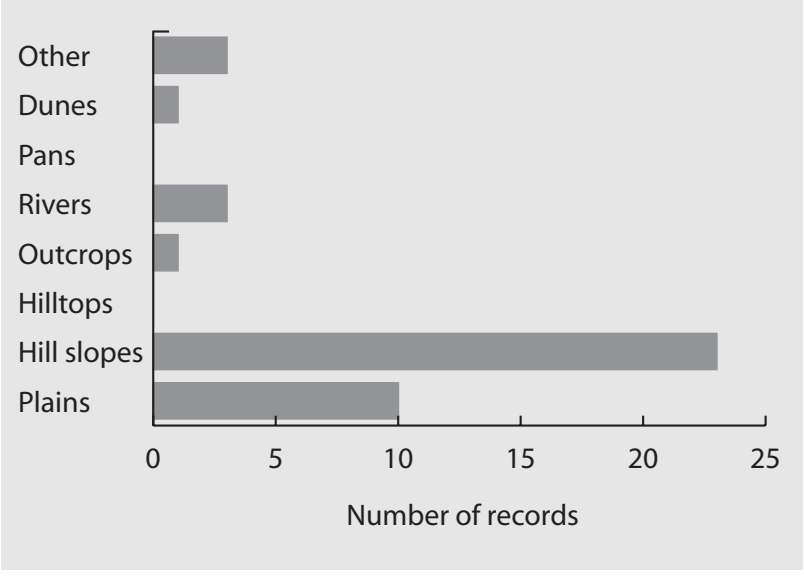


DISTRIBUTION & ABUNDANCE

Common to locally abundant in the south-west, with a few outlying herbarium records not recorded by the TAP.

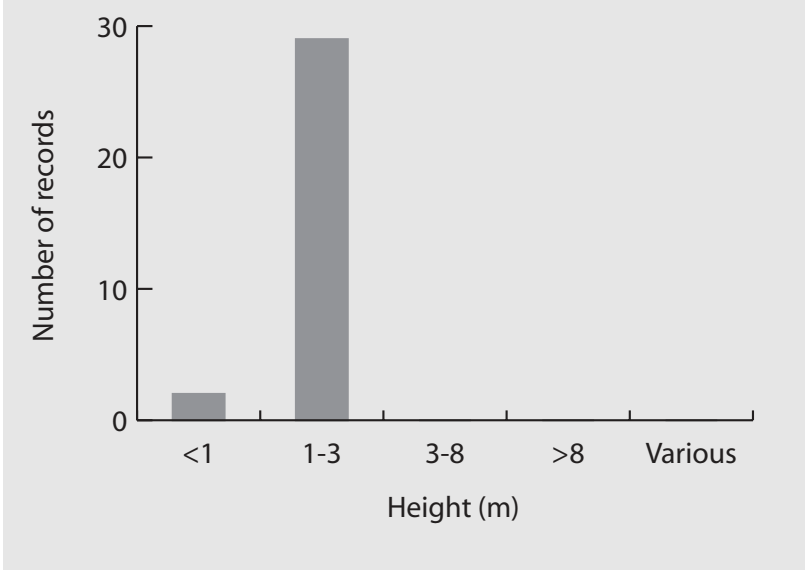
HABITAT

Mainly found on rocky hill slopes and gravel plains; occasionally along drainage lines.



GROWTH FORM

A shrub in the 1–3-m height class.



ANNUAL CYCLE

No TAP observations in the winter months. FLOWERS August to October. FRUIT September to November. LEAVES present in all months of observation.

CONSERVATION CONCERNS

None recorded.

Zygophyllum prismatocarpum, leaves and capsules, C. Mannheimer



Sisyndite spartea

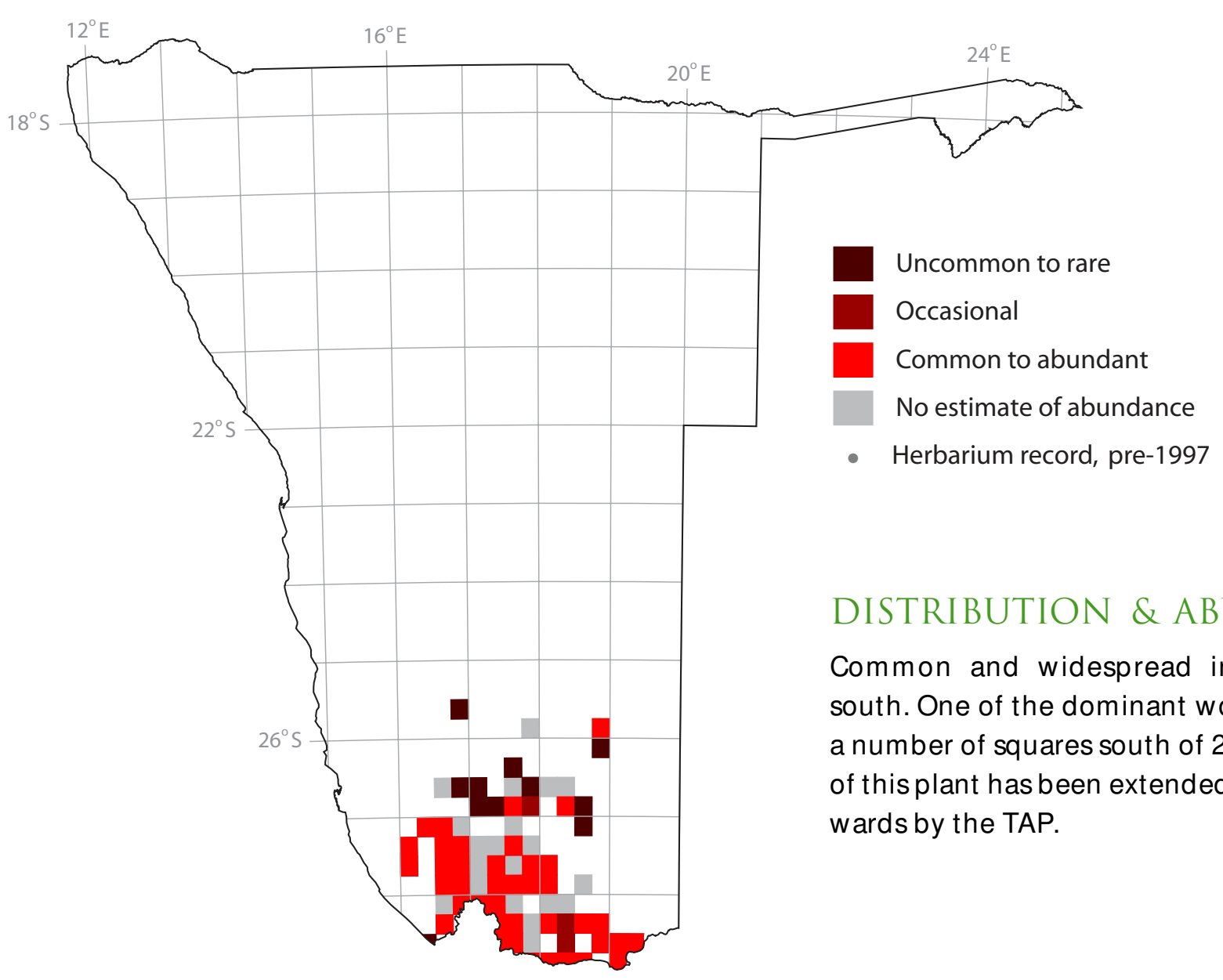
Desert Broom

Besembos, woestynbesem (A)

[173 records from 74 (7%) squares]



Many-stemmed, lax, **often untidy shrub**. BARK **young branchlets green, hairless**. LEAVES small and inconspicuous, evenly compound, spirally arranged; 1–5 sessile leaflet pairs; leaflets obovate, **hairless**; apex blunt, base tapering. FLOWERS solitary, bright yellow, *c.* 45 mm in diameter. FRUIT a yellow capsule with bristly covering.

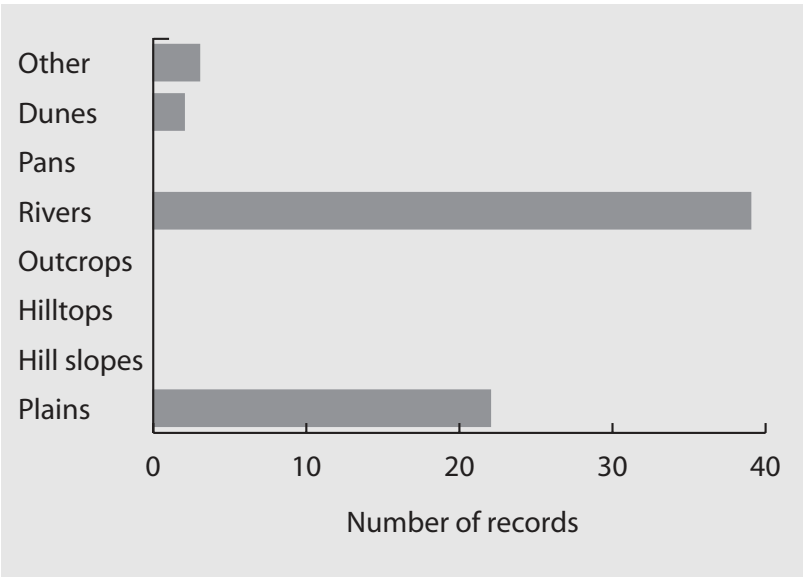


DISTRIBUTION & ABUNDANCE

Common and widespread in the central-south. One of the dominant woody species in a number of squares south of 28° S. The range of this plant has been extended slightly northwards by the TAP.

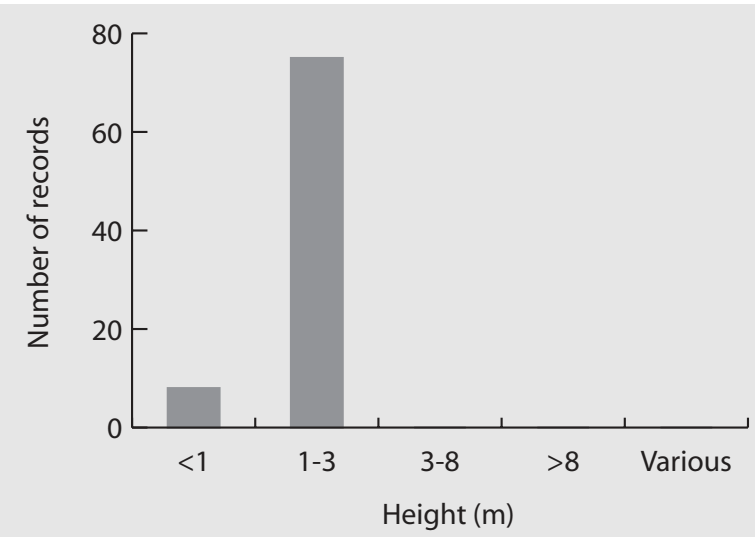
HABITAT

Mostly along dry rivers, but also on gravel plains and sometimes in kloofs; occasionally found on sandy plains or dunes; often along road verges.



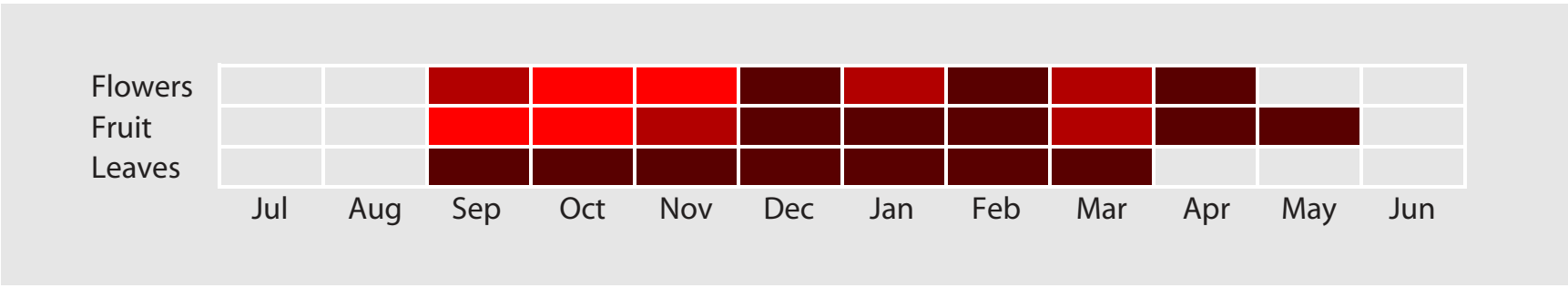
GROWTH FORM

A shrub in the 1–3-m height class.



ANNUAL CYCLE

FLOWERS variable from September to April, or sometimes later. FRUIT September to May. LEAVES September to March.



GENERAL

Roots used medicinally. With its attractive flowers and fruit, this plant has horticultural potential.

CONSERVATION CONCERNS

None recorded.



Sisyndite spartea, flowers and fruit, C. Mannheimer

Balanites angolensis

= Balanites welwitschii

Omutungambara

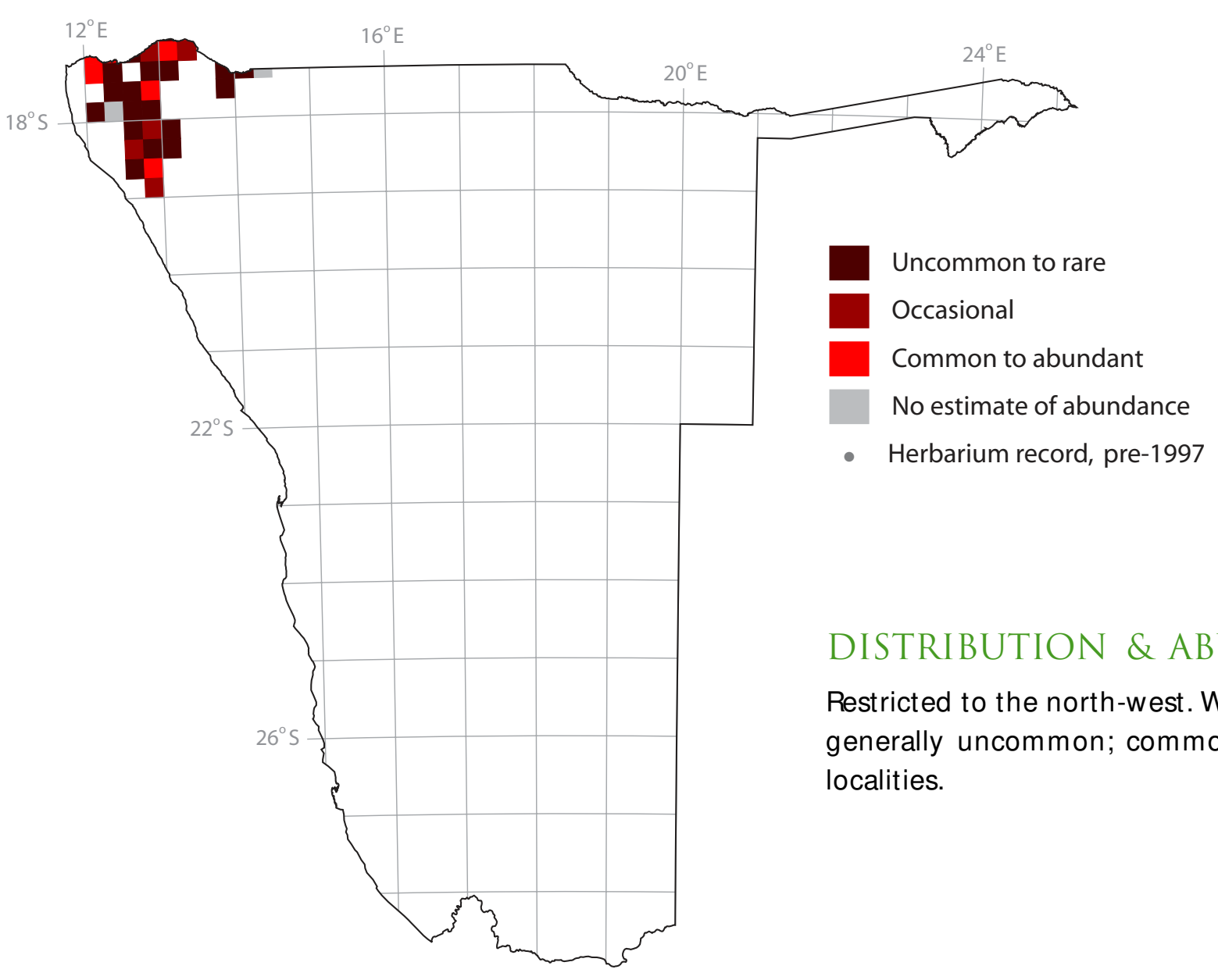
Angolan green-thorn (E)

[74 records from 33 (3%) squares]



Semi-deciduous tree or shrub. BARK rough, vertically grooved; **young branchlets green to yellow-green, densely downy**. THORNS **straight, slender, green to yellow**; up to 90 mm long. LEAVES bifoliolate; asymmetric leaflets, ovate to oblanceolate, 12–17 mm long; leathery, yellow-green, with short sparse down; apex pointed; base tapering. FLOWERS small, pale green to whitish, in small axillary clusters. FRUIT **ovoid, orange when ripe**, *c.* 30 mm long.

Only one subspecies, *welwitschii*, found in Namibia.

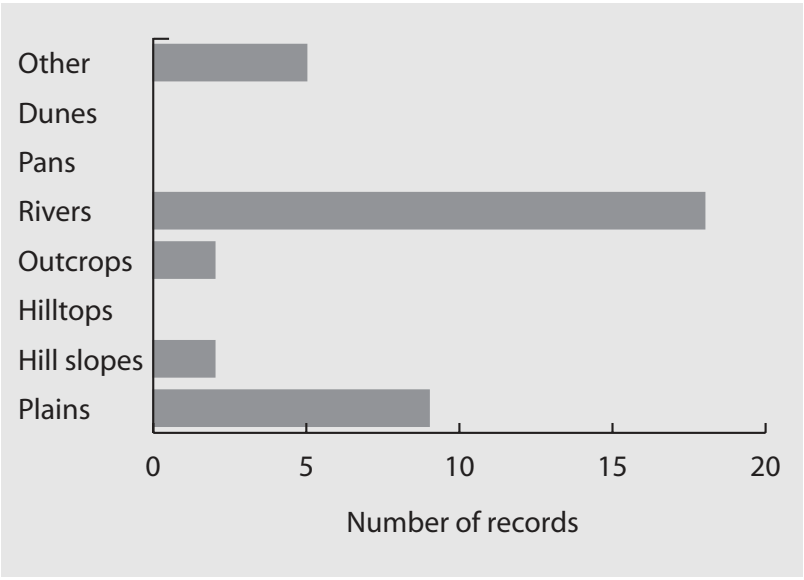


DISTRIBUTION & ABUNDANCE

Restricted to the north-west. Widespread, but generally uncommon; common in scattered localities.

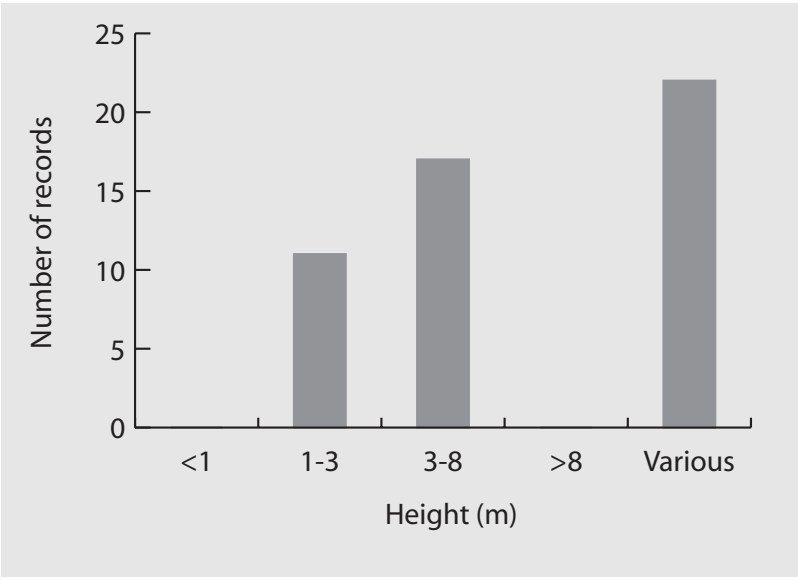
HABITAT

Mainly found along dry river courses.



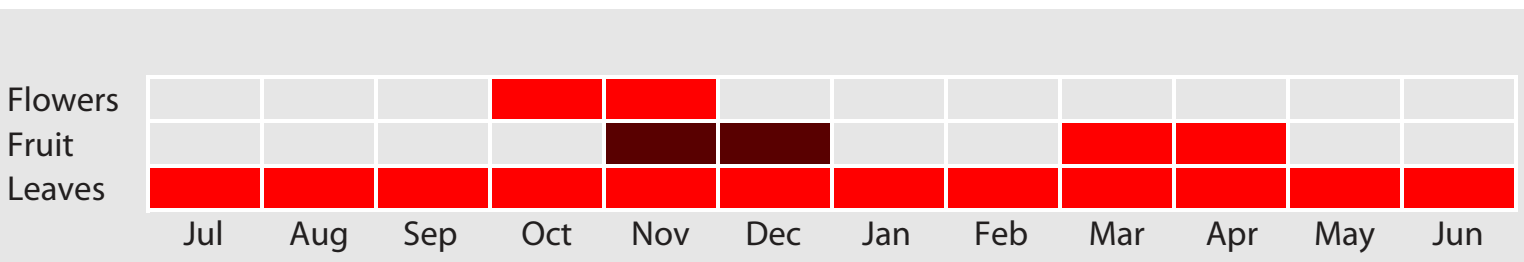
GROWTH FORM

Trees (60% of records) or shrubs, mainly in the 3–8-m height category. Many stands had plants of mixed heights.



ANNUAL CYCLE

FLOWERS October and November. FRUIT some records in November and December, most from March to April. LEAVES recorded all year.



GENERAL

Does not appear to be well-utilised. Although the fruit are said to be edible, they are quite bitter and usually show little evidence of harvesting by humans or animals. Roots are used medicinally.

CONSERVATION CONCERNS: None recorded.

Balanites angolensis subsp. *welwitschii*, fruit, B. Curtis

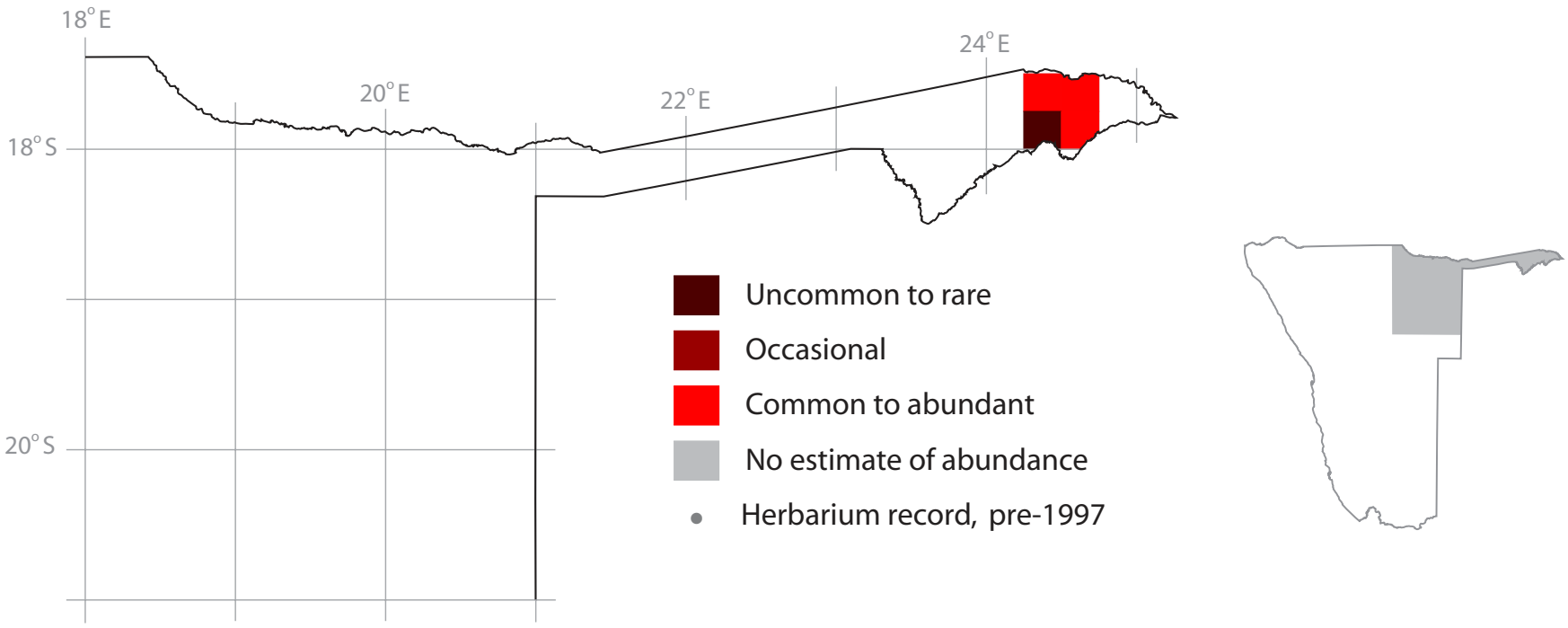


Balanites aegyptiaca

Single Green-thorn

[9 records from 4 squares]

An evergreen shrub or small tree with stiff grey-green branches armed with **stout, simple spines**. BARK dark, cracked. LEAVES **bifoliolate**; leaflets elliptic-obovate, slightly asymmetric, bright green, **leathery**. FLOWERS small and inconspicuous, greenish-white. FRUIT elongated, up to 50 mm long; **yellowish-red when ripe**.



DISTRIBUTION & ABUNDANCE

Common to uncommon in a few places in eastern Caprivi.

HABITAT

Found on sandy plains.

GROWTH FORM

A shrub in the 1–3-m height class or a tree 3–8 m high.

ANNUAL CYCLE

Observations only made in November, February and March. FLOWERS None recorded. FRUIT February. LEAVES present in all months of observation.

CONSERVATION CONCERNS

None recorded.

Balanites maughamii | Green-thorn

A tall, deciduous tree which develops a deeply fluted trunk with age. Spines unequally forked. Leaves bifoliolate, velvety hairy, grey-green.

There were no TAP records, but there was one specimen collected from eastern Caprivi during the time of the TAP, which is a new record for Namibia.

Zanthoxylum ovatifoliolatum

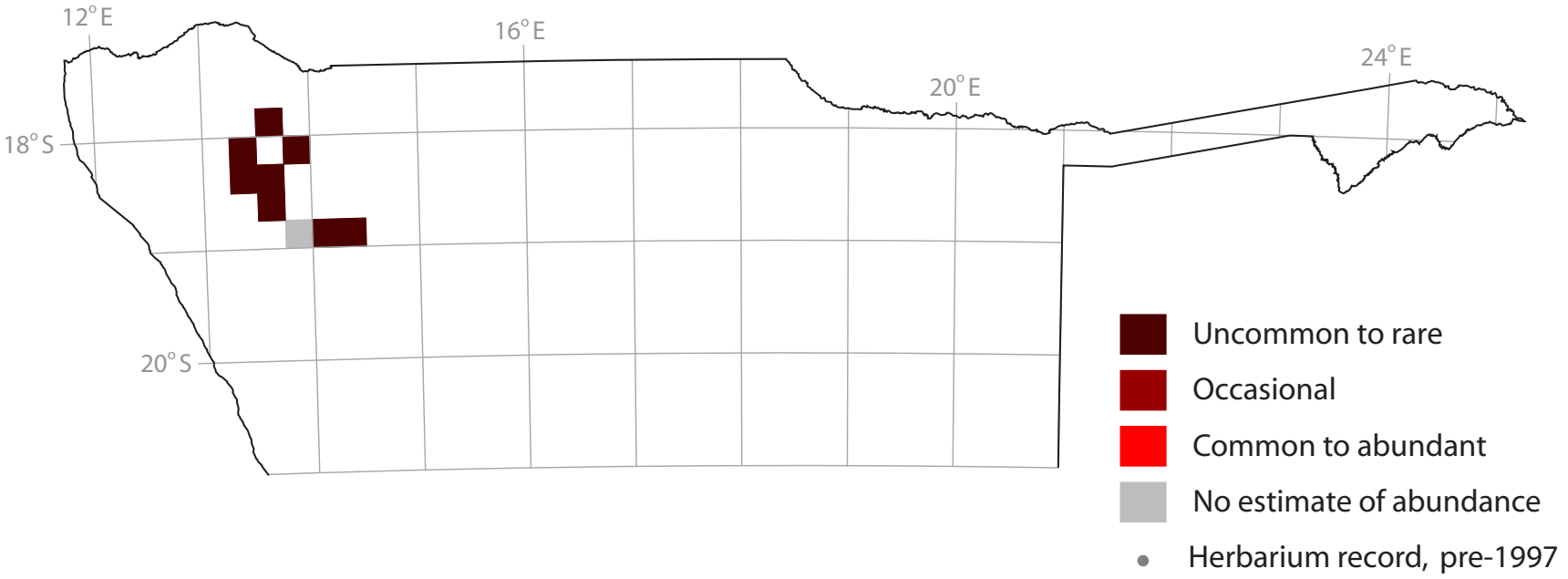
Nokoma

Kaoko knobwood (E);
owamboperdepram (A)

[11 records from 9 (<1%) squares]



Deciduous shrub or tree. THORNS **paired, curved, sharp; scattered on branches and sometimes on petiole, rachis and midrib of leaflets**. LEAVES unevenly compound, with a citrus-like scent when crushed; leaflets sessile, ovate to broadly lanceolate; **margin finely scalloped**. FLOWERS small, green-yellow, unisexual. FRUIT a dark brown, densely glandular capsule, 5–6 mm in diameter; splitting into two valves when ripe.



DISTRIBUTION & ABUNDANCE

Uncommon to rare in the north-west.

HABITAT

Various, including dry river courses, hills and rocky outcrops.

GROWTH FORM

A shrub 1–3 m high, or a tree in the 1–3-m and 3–8-m height classes.

ANNUAL CYCLE

Only observed in March, April and June. FLOWERS June. FRUIT March, April and June. LEAVES March and April.

CONSERVATION CONCERNS

None recorded.

Citropsis daweana

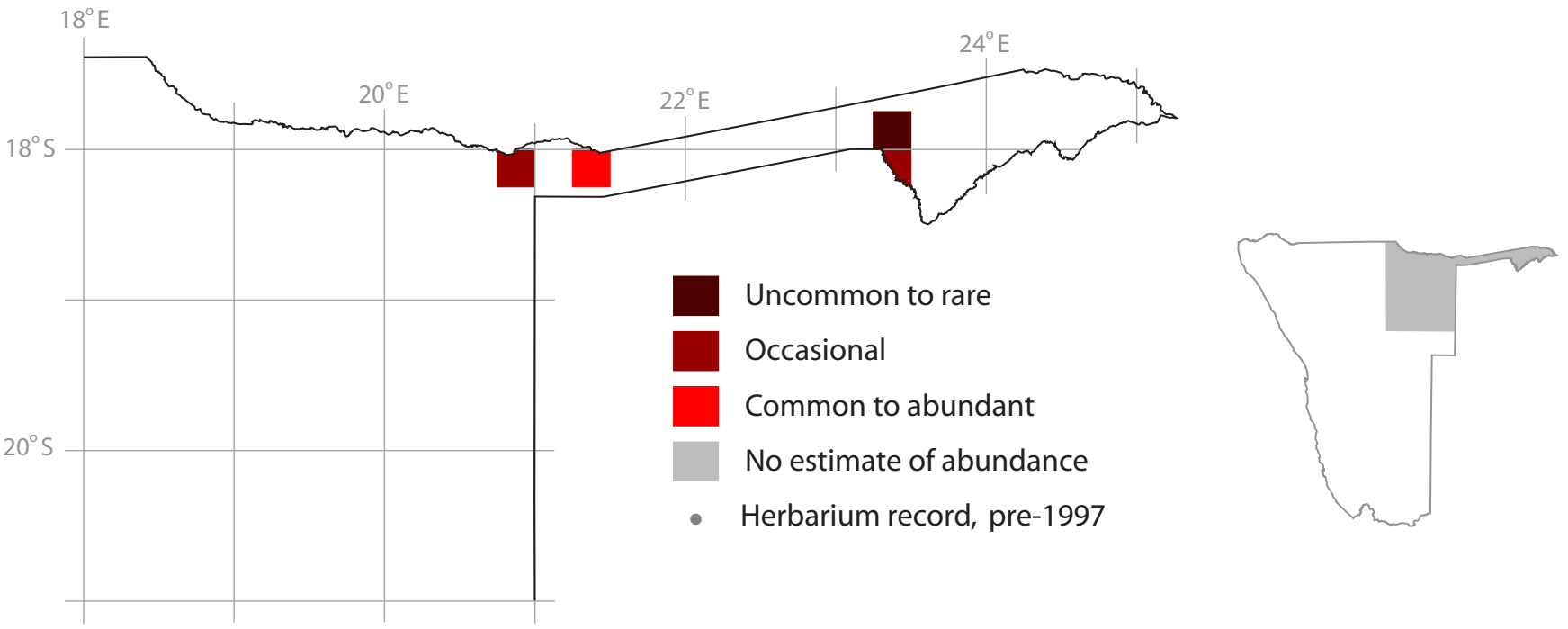
Wild Citrus

Wildesitroen (A); nzani (L); mukiki (Rk, Rum)

[7 records from 4 squares]



Shrub or small tree. THORNS **solitary, axillary, rigid, green, slender**; 10–30 mm long. LEAVES unevenly compound, 60–130 mm long, **with a citrus-like scent** when crushed; **rachis distinctly winged**; leaflets narrowly elliptic to elliptic-ovate, olive-green with fine, grey hairs; **margin scalloped**. FLOWERS white to pale yellow; petals up to 6 mm long. FRUIT a round berry, up to 15 mm in diameter, resembling a miniature orange with a tough skin; red-brown when ripe. SEEDS resembling pips of an orange, but dark brown.



DISTRIBUTION & ABUNDANCE

Restricted to two small areas along the Okavango and Kwando rivers. Common to uncommon.

HABITAT

Mainly found on river banks; also on dunes.

GROWTH FORM

A shrubby tree, mostly 3–4 m high. Sometimes growing in thickets of 5-6 m in diameter.

ANNUAL CYCLE

Only observed in March, April and October. FLOWERS October and December. FRUIT April and October. LEAVES recorded all months of observations.

GENERAL

Leaves and flowers heavily attacked by insects.

CONSERVATION CONCERNS

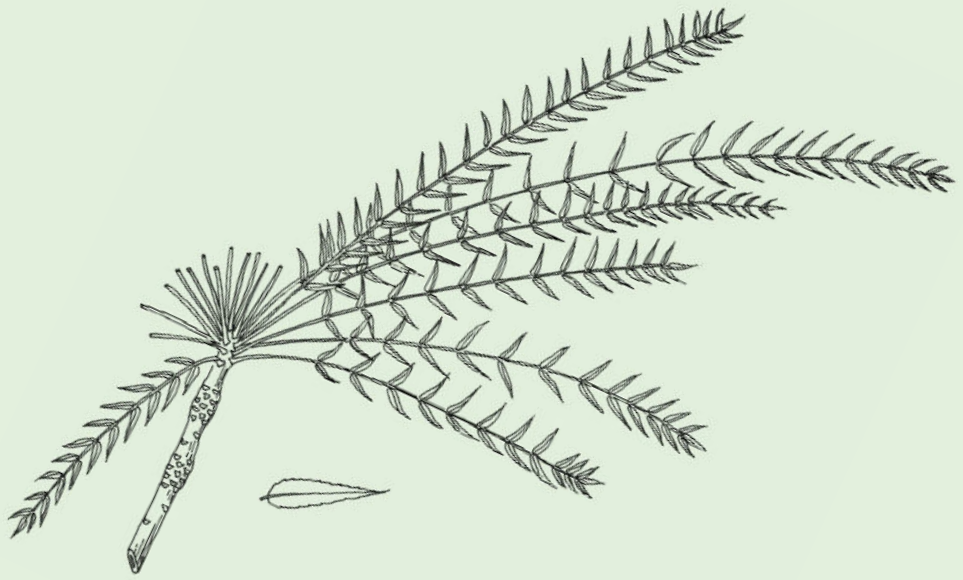
Rare in Namibia, but more widespread in Zimbabwe and northwards. Population has apparently not changed in recent years.

Kirkia dewinteri

Kaoko Kirkia

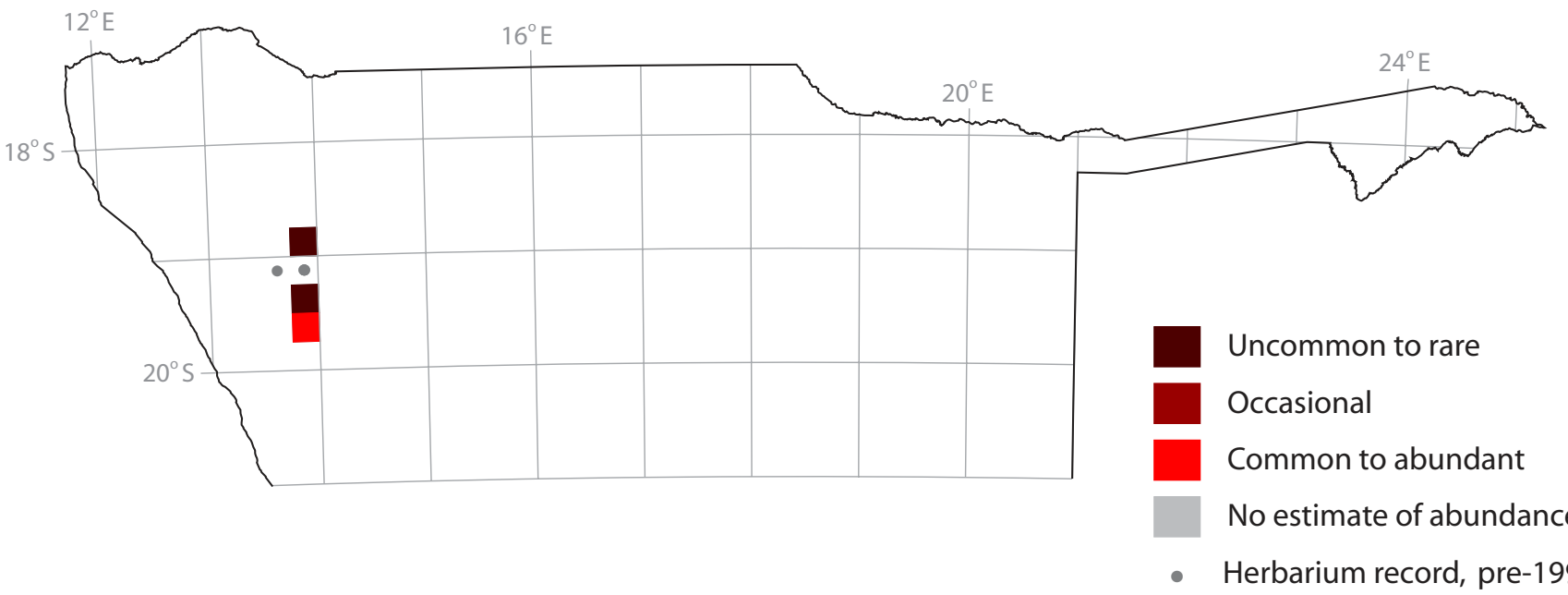
Kaokosering(e) (A, G)

[4 records from 3 squares]



Deciduous tree. BARK **yellow with scattered small, black dots**. LEAVES unevenly compound, spirally arranged, 100–300 mm long; leaflets lanceolate, **up to 15 x 3 mm**, glandular, grey-green; margin toothed; **apex bristle-like; base asymmetrically tapering**. FLOWERS small, white, in a lax spray. FRUIT a small, hard, capsule; **splitting into eight valves when ripe**.

This plant may be confused with *K. acuminata*, but has much finer leaflets and the bark has black dots.



DISTRIBUTION & ABUNDANCE

Locally common in a very small area of rocky mountains on the north-western escarpment. There are earlier herbarium records from two additional squares, between the TAP records.

HABITAT

On a hilltop, a hill slope and in a kloof.

GROWTH FORM

Trees in the 3–8-m height class; the northern-most stand had young, shrubby forms less than 3 m in height, as well.

ANNUAL CYCLE

Observations made in August, December, January and April. No FLOWERS or FRUIT recorded by TAP. LEAVES in April; bare in August; young leaves in January.

CONCERVATION CONCERNS

Endemic and very restricted. Protected by forestry legislation and classified as ‘rare‘ according to the IUCN criteria (Loots 2005).

Kirkia acuminata

Common Kirkia

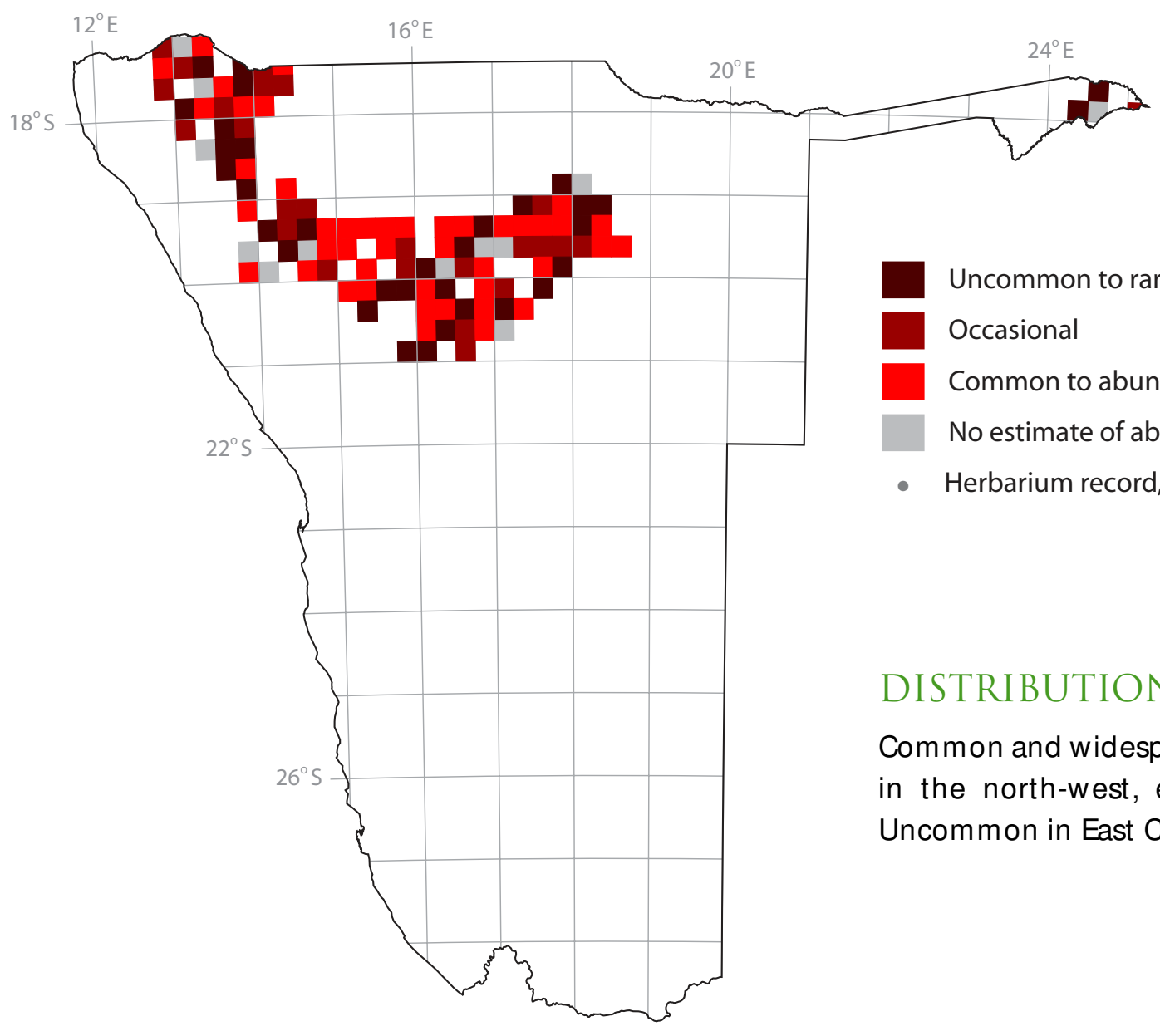
Bergsering, witsering (A); Bergseringe (G); !gurueb (K); mulembalemba (L); omulemba (Ok)

[325 records from 117 (11%) squares]



Deciduous tree with spreading crown. BARK **pale grey, crumbly, grooved; dark grey to charcoal underbark**. LEAVES compound, **clustered on tips of branchlets**, up to 400 mm long; leaflet with **very short petiolules**; lanceolate to narrowly ovate, **longitudinally folded**, shiny green to dark green; **margin toothed; apex pointed**. FLOWERS small, greenish to cream-coloured in long sprays. FRUIT a somewhat **four-sided, woody capsule, with sharp ridges in the corners**, splitting into four valves when ripe; *c.* 15 x 8 mm.

This tree may be confused with *Commiphora crenato-serrata* from a distance, but can be distinguished by the darker, crumbly bark and very short petiolules, as well as the fruit.

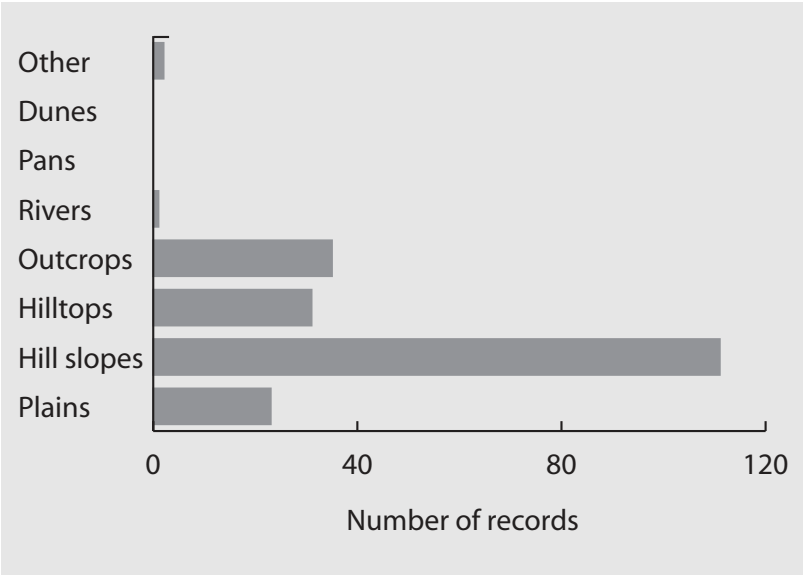


DISTRIBUTION & ABUNDANCE

Common and widespread in the Karstveld and in the north-west, east of the escarpment. Uncommon in East Caprivi.

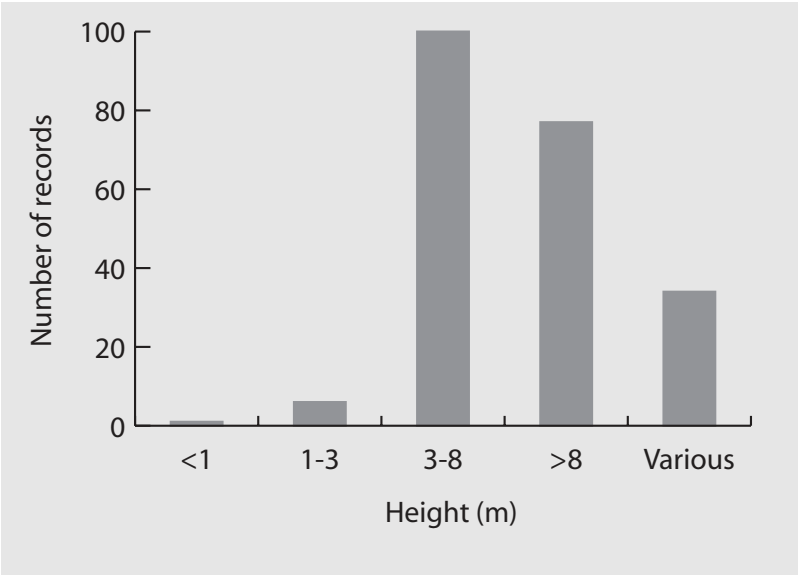
HABITAT

Found on hill slopes and rocky outcrops, predominantly on dolomite.



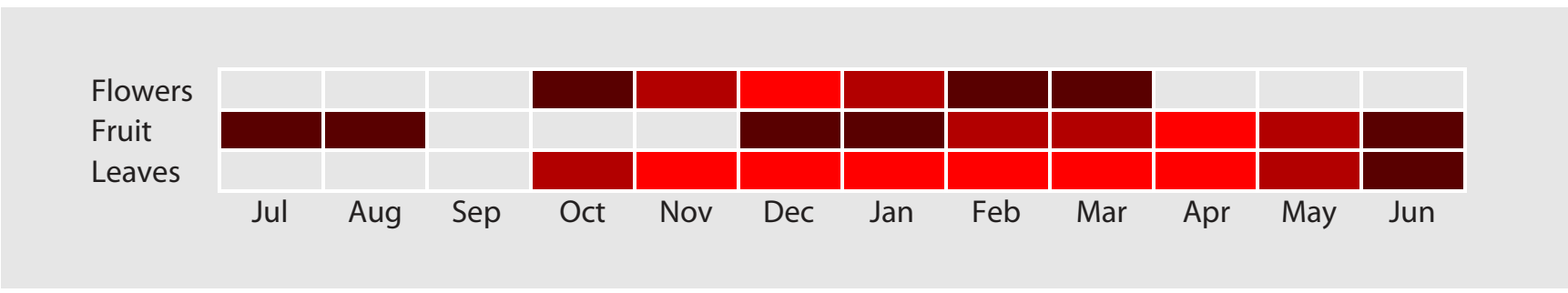
GROWTH FORM

A tree up to 8 m high and over. Very few young ones recorded.



ANNUAL CYCLE

FLOWERS October to March, with a peak in December. FRUIT December to August, with a peak in April. LEAVES mainly from October to May, with young leaves September to November.

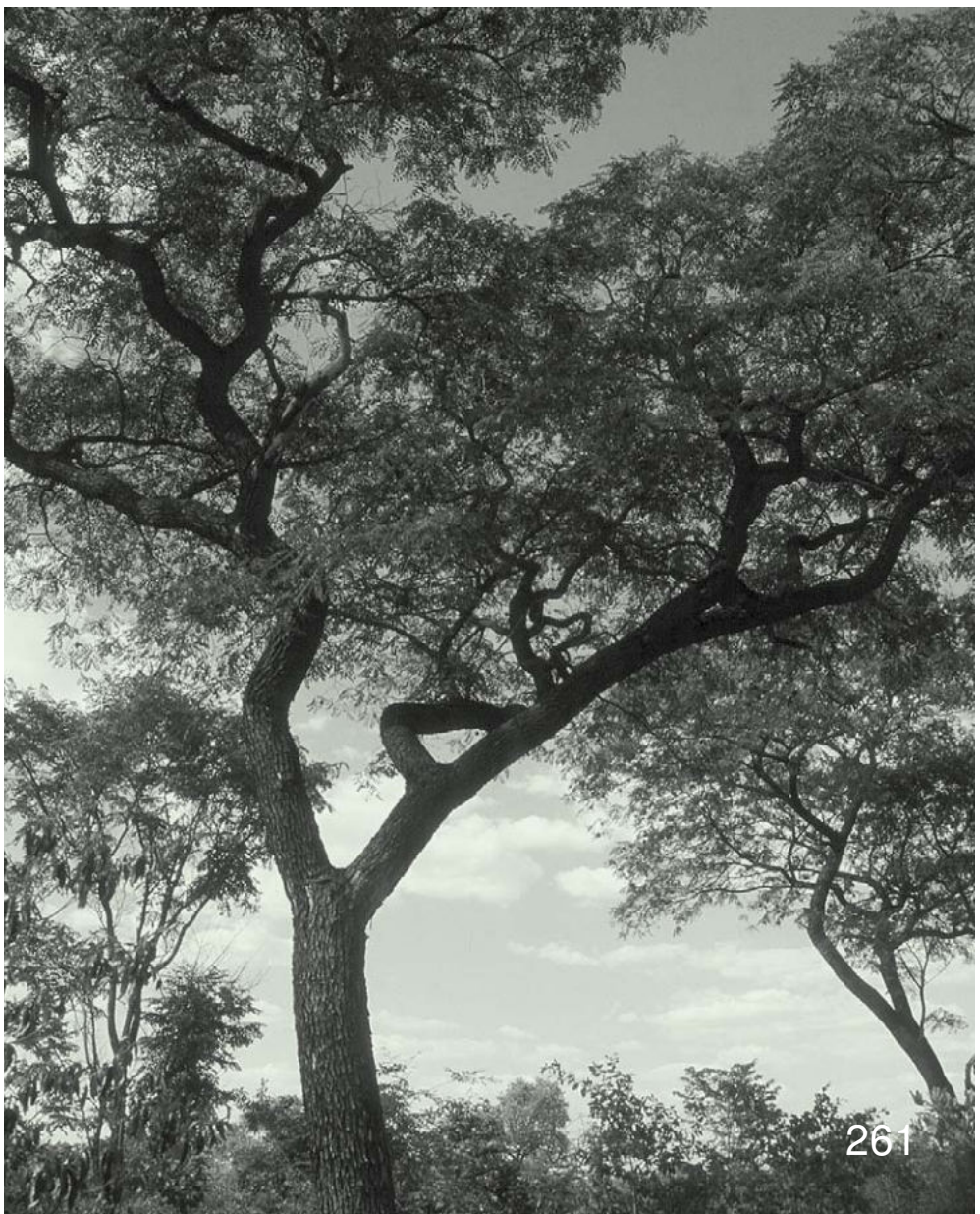


GENERAL

Browsed by giraffe; monkeys eat the fruit. Does well as a garden tree in frost-free areas or in very sheltered spots elsewhere.

CONSERVATION CONCERNS

None recorded.



Kirkia acuminata, northwest plateau, B. Curtis

BURSERACEAE | MYRRH FAMILY

A family characterised by having aromatic resin, the most well-known being frankincense from *Boswellia* and myrrh from *Commiphora abyssinica* and *C. myrrha*. In southern Africa this family is represented by the genus *Commiphora*, comprising 26 species in Namibia, many of which are endemic or near-endemic to Namibia. This is a very distinctive genus of deciduous shrubs and small to medium-sized trees, some of which have large, swollen bases and may be regarded as dwarf trees. The bark is characteristically smooth, often shiny and translucent, sometimes peeling off in papery strips or pieces. The wood is soft and corky, hence the English name, corkwood. All species exude an aromatic liquid or gummy resin, hence the genus name which is derived from *commi*, meaning 'gum', and *phoros*, meaning 'bearing'. The German name, Balsambaum, alludes to this characteristic.

The flowers are very small and rather inconspicuous, mostly with sexes on separate plants, appearing before the leaves. The fruit is a small ovoid or round berry, thinly fleshy, splitting into two when ripe. The single, relatively large stone is generally partially covered by a thin, fleshy, orange, yellow or red pseudaril with lobes of variable length, depending on the species.

The aromatic resin of many species, such as *C. multijuga*, is used locally for a variety of purposes. The wood is increasingly being used for carving for the tourist industry, which is a serious concern as these species are slow-growing. The plants are also often badly damaged by elephants. Most species will grow easily from truncheons, however, and are used as hedges or live fences. This characteristic is alluded to in the Afrikaans name, kanniedood. Most species are of horticultural potential for dry gardens because of their appealing shapes and flaking bark. Some of the thick-based species are potentially threatened by the pachycaul trade.

There is a lot of variability within some species, and it is thought that there may be a number of new species in the Kaokoveld and at least one along the Orange River (SWA3). A new species has been described recently and is due for publication soon (Swanepoel, in press, Steyn 2003). It is similar to *C. namaensis*, being a shrub of up to 3 m high with many intertwined, sturdy branches. The bark is smooth, grey and non-peeling. The simple leaves differ from those of *C. namaensis* by being larger and more obovate or elliptic. The pseudaril has much shorter lobes than that of *C. namaensis*. This plant occurs mainly in the degree blocks 1913 and 2014, and would have been recorded by atlassers as *C. namaensis* or 'unidentified'.



Commiphora sp. nov., W. Swanepoel



Commiphora viminea

Onangwi

Zebra-bark corkwood (E);
Zebramyrrhe (G)

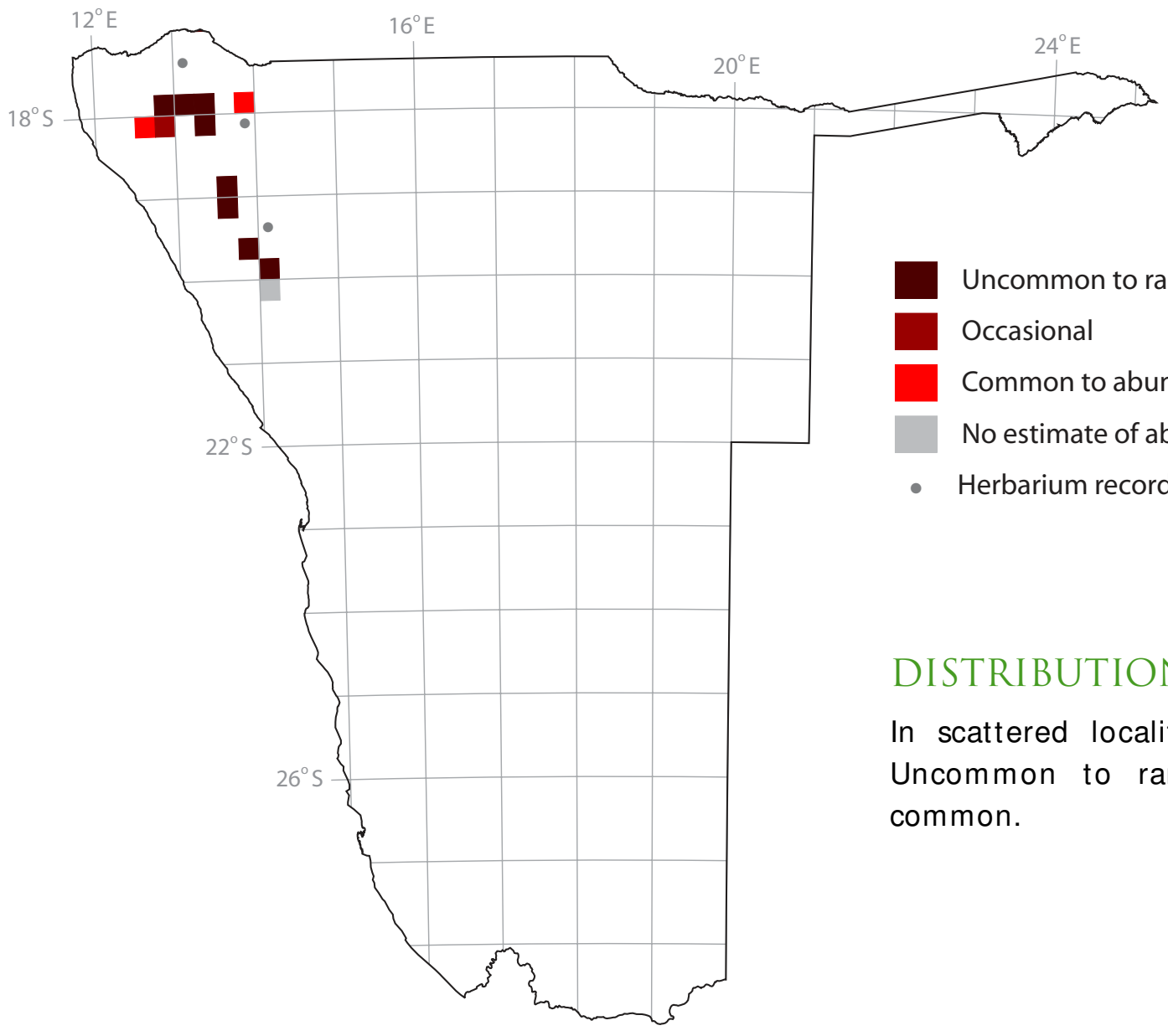
[14 records from 12 (1%) squares]



Deciduous shrub or single-stemmed tree. BARK **grey to green-yellow with large, warty, black bands of lenticels giving a zebra-striped appearance; peeling off in yellowish, papery horizontal strips.** BRANCHLETS initially **pale green to red-brown becoming purple, generally spine-tipped**. LEAVES **mostly simple**, occasionally trifoliolate, **narrowly obovate or elliptic; both surfaces blue-green** with dense glandular hairs; margin finely toothed. FLOWERS small, cream-coloured, unisexual. FRUIT a berry, ovoid, *c.* 10 x 6 mm, with a pointed tip; red-brown.

Can be mistaken for *C. pyracanthoides* or *C. glandulosa*. This species was formerly incorrectly identified as *C. merkeri* in southern Africa.

Many specimens in Namibia do not resemble the description above, but have been classed as *C. viminea* for want of any better identification. SWA3 is of the opinion that these are another new species, which he is busy describing.



DISTRIBUTION & ABUNDANCE

In scattered localities in the north-west. Uncommon to rare; occasionally locally common.

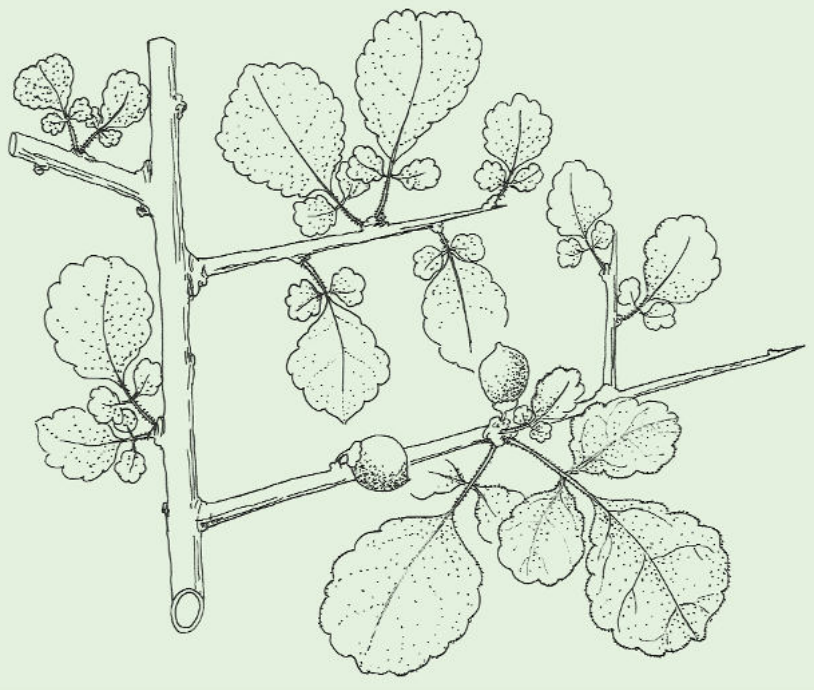
Continued on page 277

Commiphora africana

Hairy Corkwood

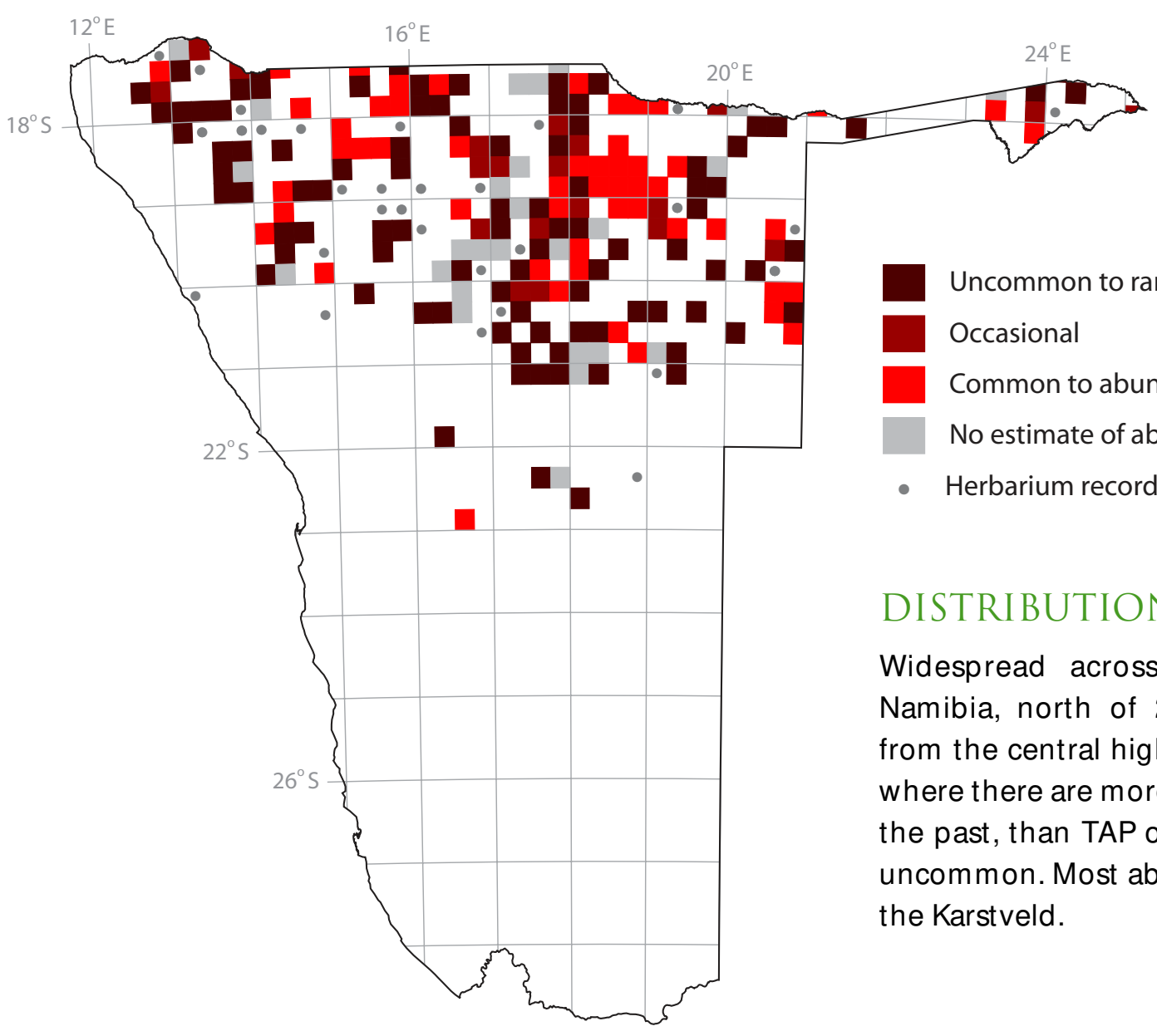
Poison-grub commiphora (E); omukuya (H); /hus (K); mutjimatji (T)

[333 records from 212 (20%) squares]



Generally, a many-stemmed shrub; **spine-tipped**. BARK dark-grey to green, flaking off in papery strips to expose a green underbark. LEAVES **trifoliolate**, fairly small; both surfaces olive-green, **with long, soft hairs or densely woolly**; veins prominent below; **margin scalloped**. FLOWERS small and inconspicuous, easily overlooked.

Could be confused with some of the other species with green underbark, such as *C. angolensis*, if the leaves and spines are not closely examined.

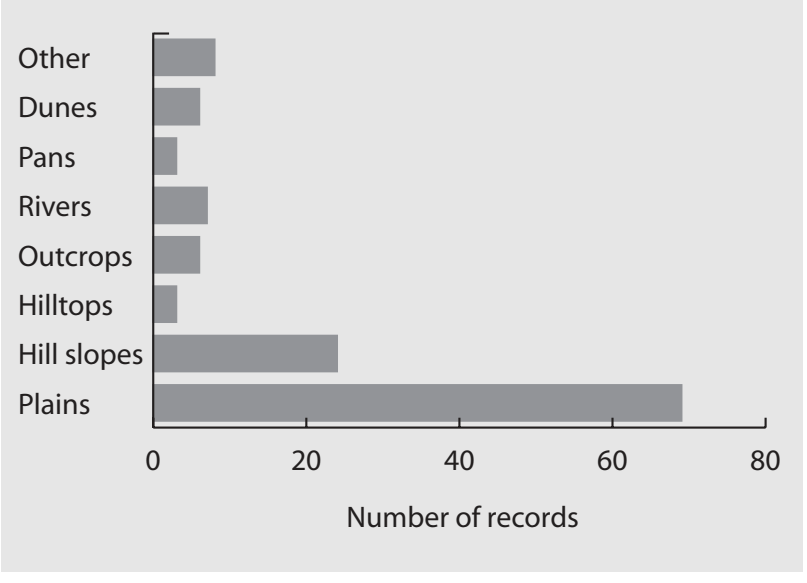


DISTRIBUTION & ABUNDANCE

Widespread across the northern half of Namibia, north of 21° S; scattered records from the central highlands and Gobabis area, where there are more herbarium records from the past, than TAP observations. Common to uncommon. Most abundant just north-east of the Karstveld.

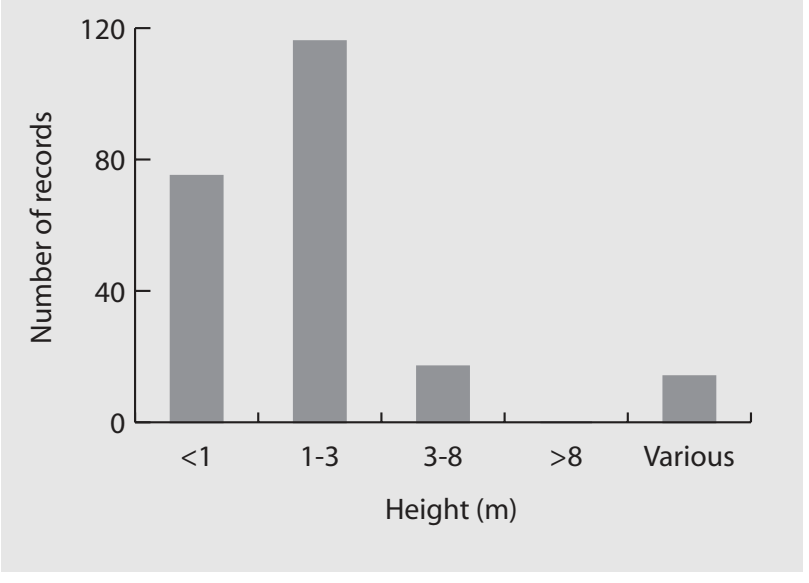
HABITAT

Predominantly on plains, also hill slopes in the north-west, with occasional records in other habitats. Mainly found on sand, but also calcrete, dolomite and other stony or rocky habitats.



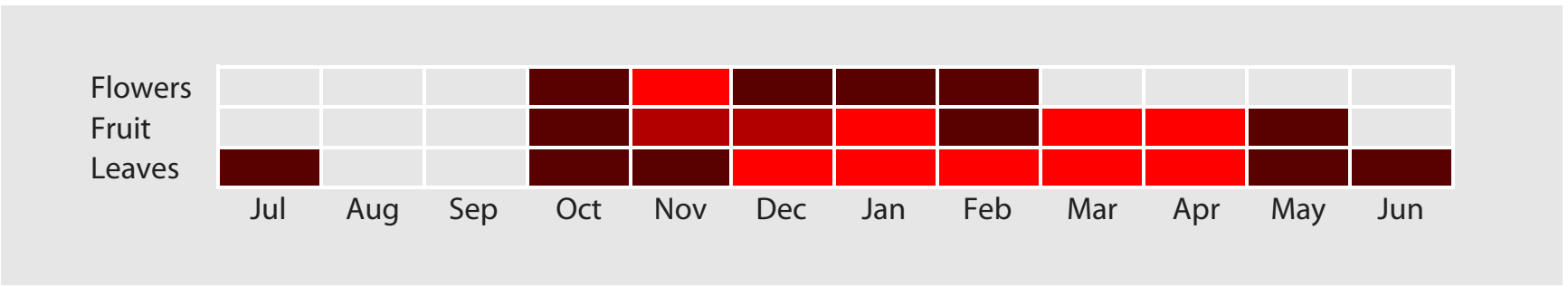
GROWTH FORM

Mostly a shrub in the 1–3-m height class; occasionally a tree taller than 3 m.



ANNUAL CYCLE

FLOWERS mostly November, with scattered records from October to February. FRUIT mostly from November to April, with the most records in March. LEAVES mainly from December to April, with young leaves October to December.

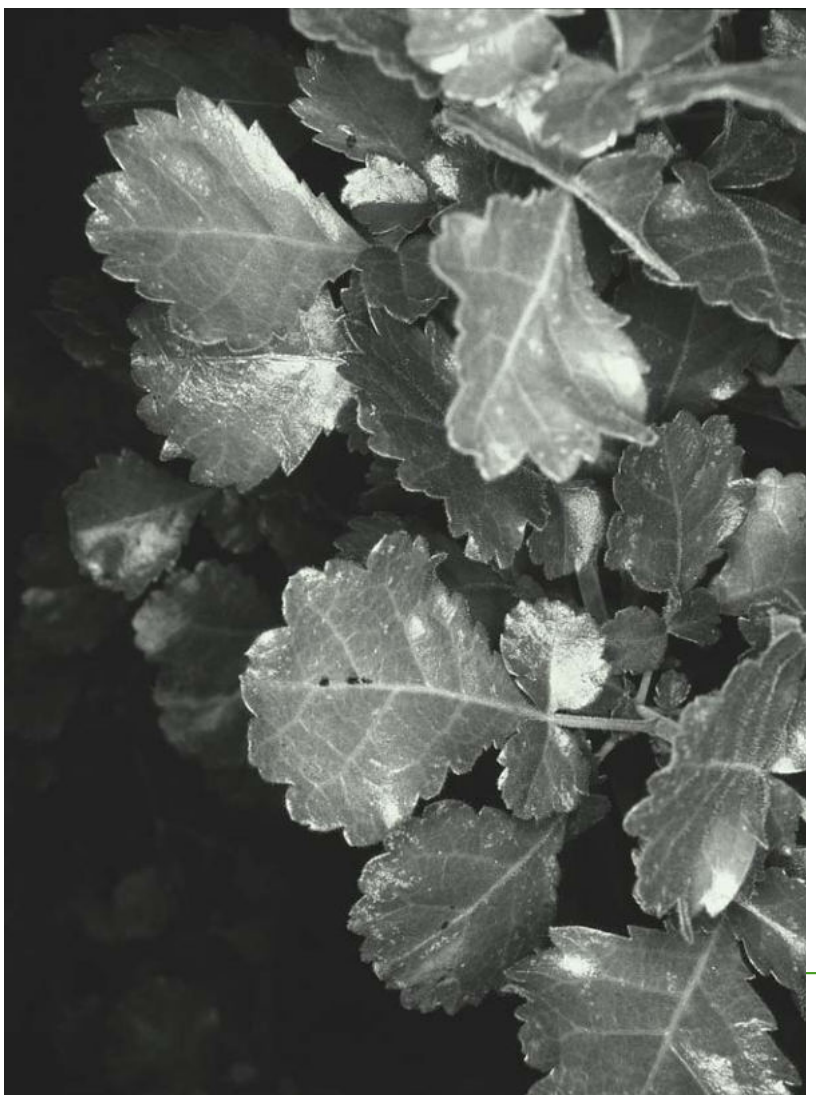


GENERAL

Browsed by herbivores and defoliated by caterpillars; also host to the larvae of an insect whose pupal cases contain a toxin used to dress arrowheads. The resin, as well as the raw, young roots, are edible. Cups and buckets are carved from the wood. *Commiphora africana* is easily grown as a hedge or 'live fence' by planting truncheons. It was recorded that female plants grow faster than males (NAM3).

CONSERVATION CONCERNS

None recorded.



Commiphora africana, leaves, B. Curtis

Commiphora anacardiifolia

Omutenge

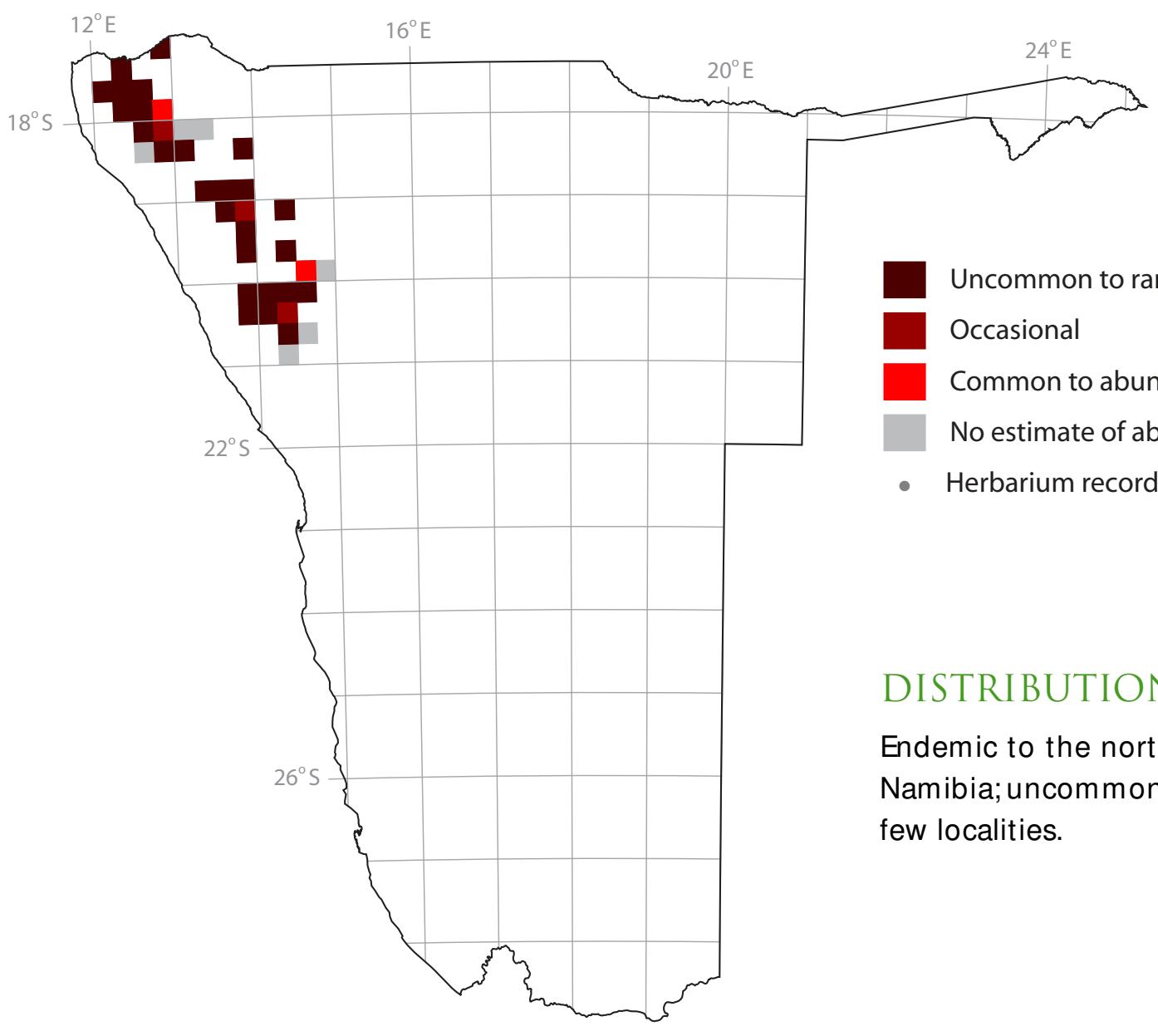
Large-leaved commiphora (E);
//khaos (K); ehoho (O)

[71 records from 38 (4%) squares]



Single-stemmed, erect tree. BARK **yellow-brown, flaking off in large, papery strips**. LEAVES **large, simple**, spirally arranged or clustered, narrowly to broadly elliptic to obovate; **both surfaces olive-green although slightly paler below, leathery and rough**. FLOWERS inconspicuous. FRUIT pseudaril yellow to orange; cup-shaped with four very short lobes.

May be confused with large-leaved *C. glaucescens* in the north.

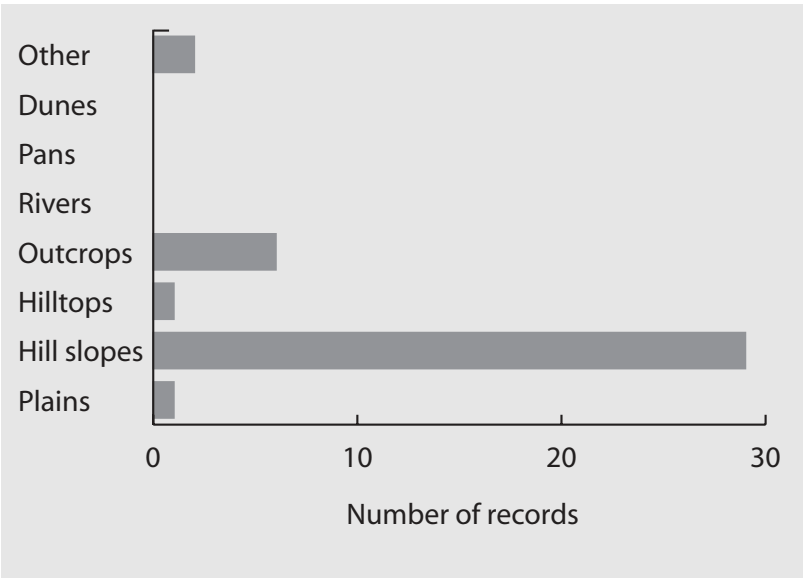


DISTRIBUTION & ABUNDANCE

Endemic to the north-western escarpment of Namibia; uncommon to rare, but common in a few localities.

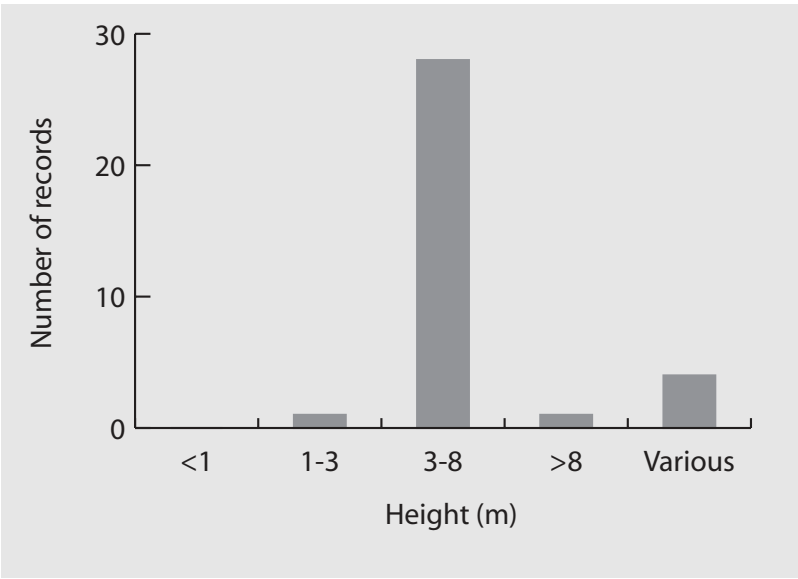
HABITAT

Found on hill slopes and rocky outcrops growing on a variety of rocks, including schist and dolomite.



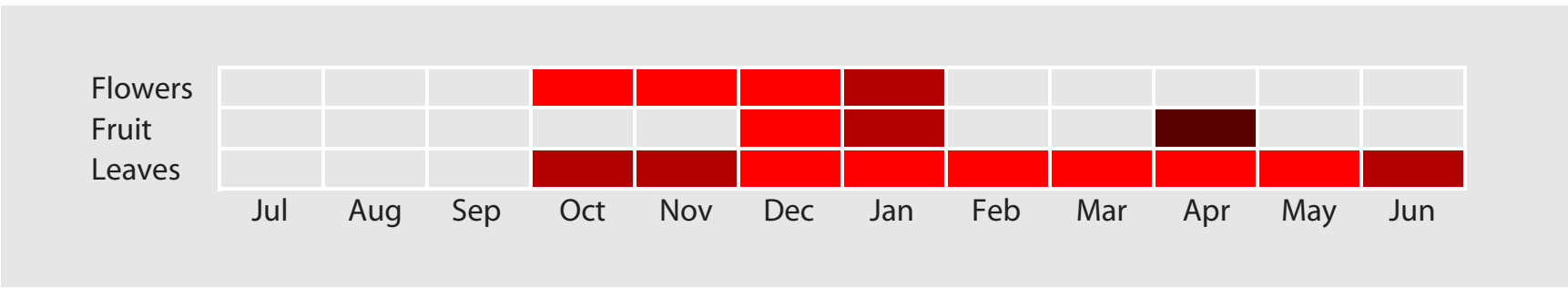
GROWTH FORM

Always a tree, mostly 3–8 m high.



ANNUAL CYCLE

FLOWERS October to January. FRUIT December and January, with one herbarium specimen in April. LEAVES present mainly from December to May, with young leaves in October and November.



GENERAL

Possibly of horticultural potential.

CONSERVATION CONCERNS

None recorded. Endemic to the north-western escarpment of Namibia.



Commiphora anacardiifolia, showing peeling bark, A. Cunningham

Commiphora angolensis

Sand Corkwood

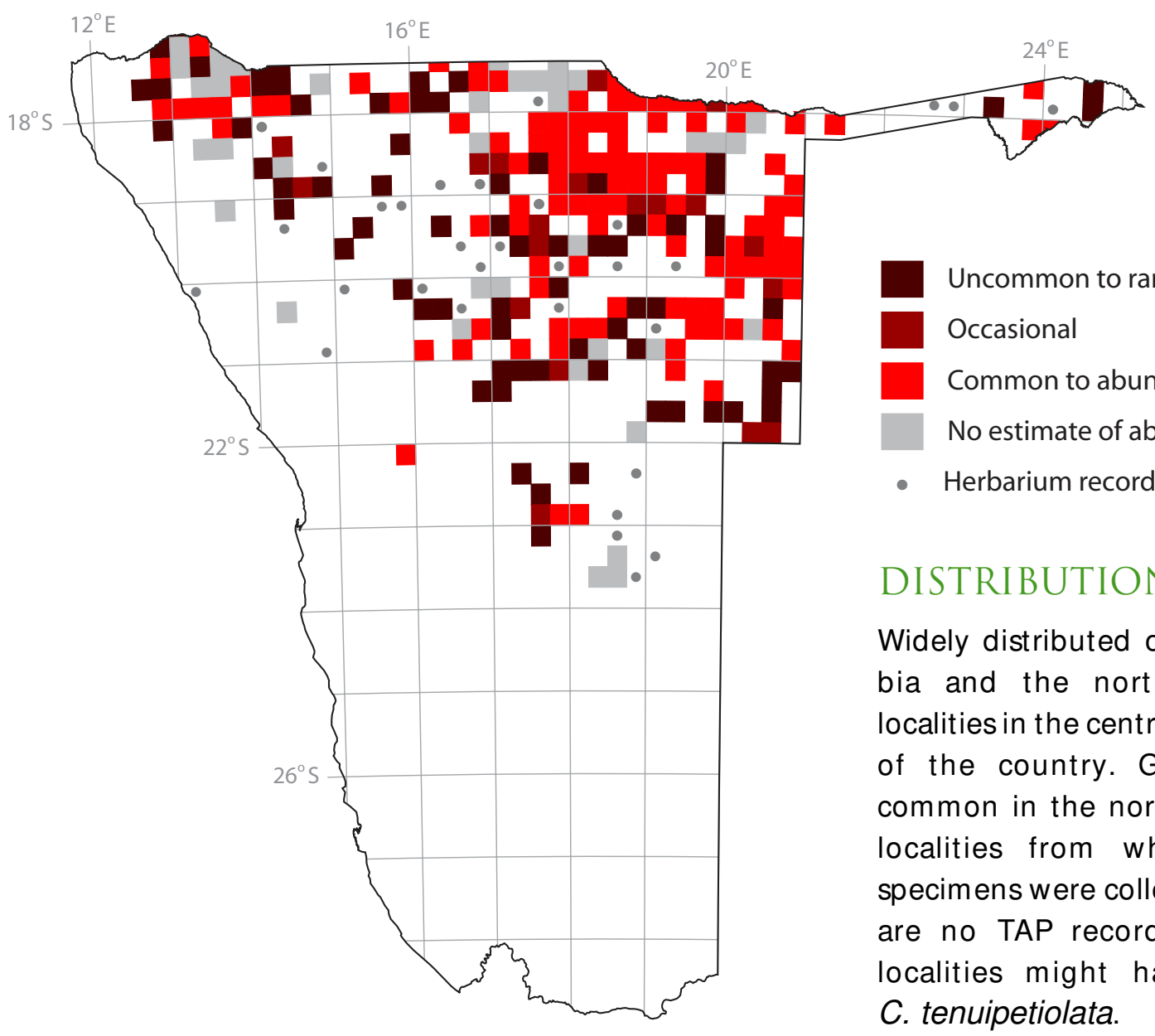
Sandkanniedood (A); /iinas (K); oshiwowo (Od); mughogho (Rk)

[391 records from 262 (24%) squares]



Generally a shrub. BARK **yellow-green to grey to dark grey to chestnut-brown with brown markings; flaking off in grey-white to yellow, papery strips to expose the green underbark**. BRANCHLETS **with soft hairs when young, blunt-tipped**. LEAVES usually trifoliolate, occasionally imparipinnate with 2–4 lateral pinna pairs; **both surfaces olive-green, with long, soft hairs**.

Easily confused with *C. tenuipetiolata*, but *C. angolensis* is generally a shrub, while *C. tenuipetiolata* is generally a tree. *Commiphora tenuipetiolata* also lacks soft hairs on the branchlets.

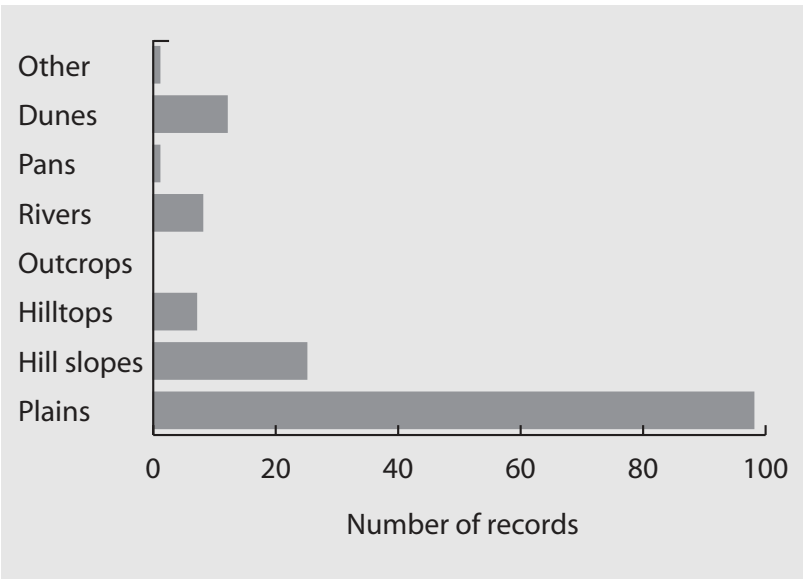


DISTRIBUTION & ABUNDANCE

Widely distributed over north-eastern Namibia and the north-west, with scattered localities in the central-north and central parts of the country. Generally common; uncommon in the north-west. There are many localities from which earlier herbarium specimens were collected but for which there are no TAP records; the plants in these localities might have been recorded as *C. tenuipetiolata*.

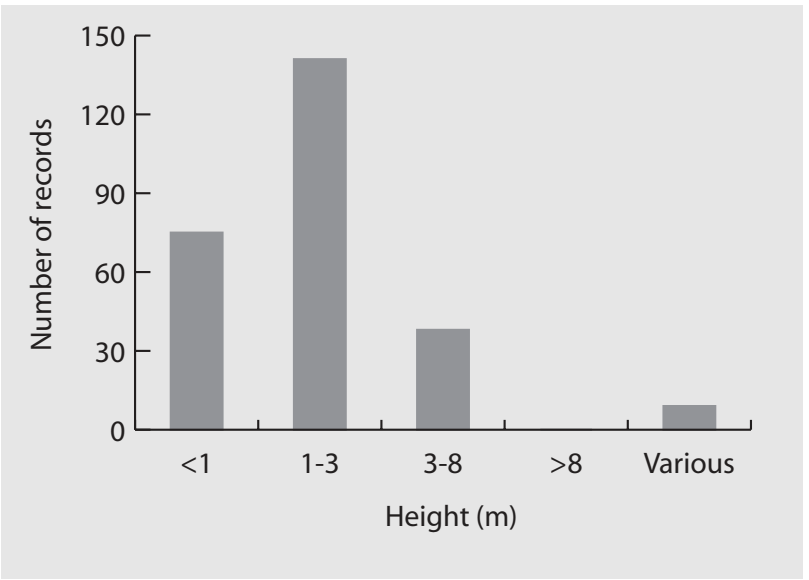
HABITAT

Mainly found on plains, also hillsides; on dunes and along rivers in the north-east, with isolated records from other habitats. Generally growing on sand, occasionally stony soil.



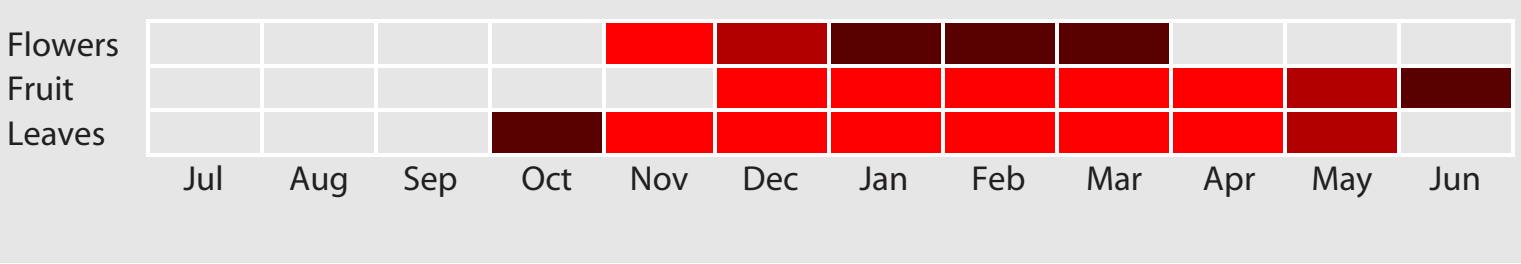
GROWTH FORM

Mostly a shrub up to 3 m high, sometimes a tree up to 8 m. Very often thicket-forming.



ANNUAL CYCLE

FLOWERS mainly in November, but may be found sporadically up until March. FRUIT present from December to May. LEAVES present from November to May, with young leaves in October.



GENERAL

Easy to grow as a 'live fence' from truncheons, and is one of five royal sacred trees planted in kraals. The roots contain a refreshing, sweet fluid, they are chewed and the fibres are spat out; roots are also boiled in water, which is then used to treat high blood pressure (BOC1). The wood is used for firewood and to carve utensils, such as cups and buckets. *Commiphora angolensis* hosts the larvae of beetles belonging to the genus *Diamphidia*, whose pupal cases contain a toxin used to produce arrow poison.

CONSERVATION CONCERNS

None recorded.

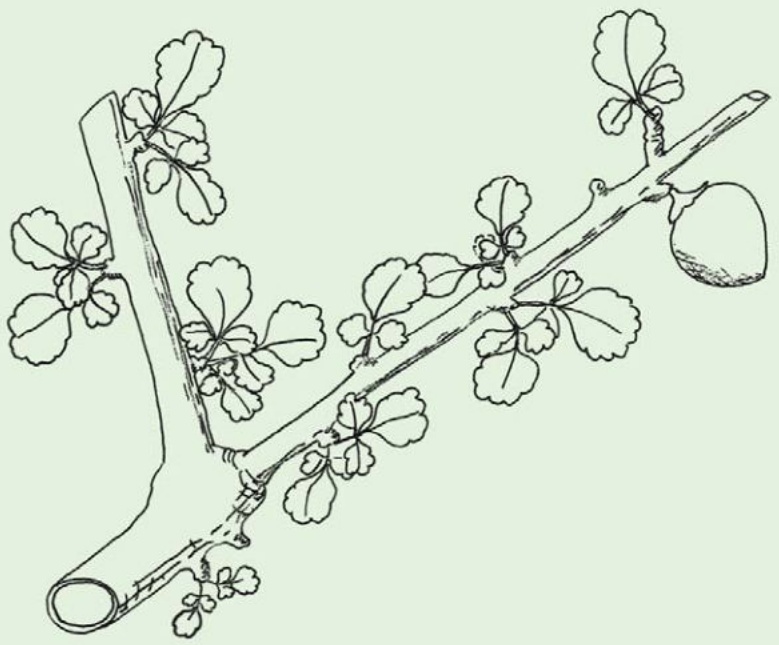
Commiphora angolensis, seed with pseudaril, B. Curtis



Commiphora capensis

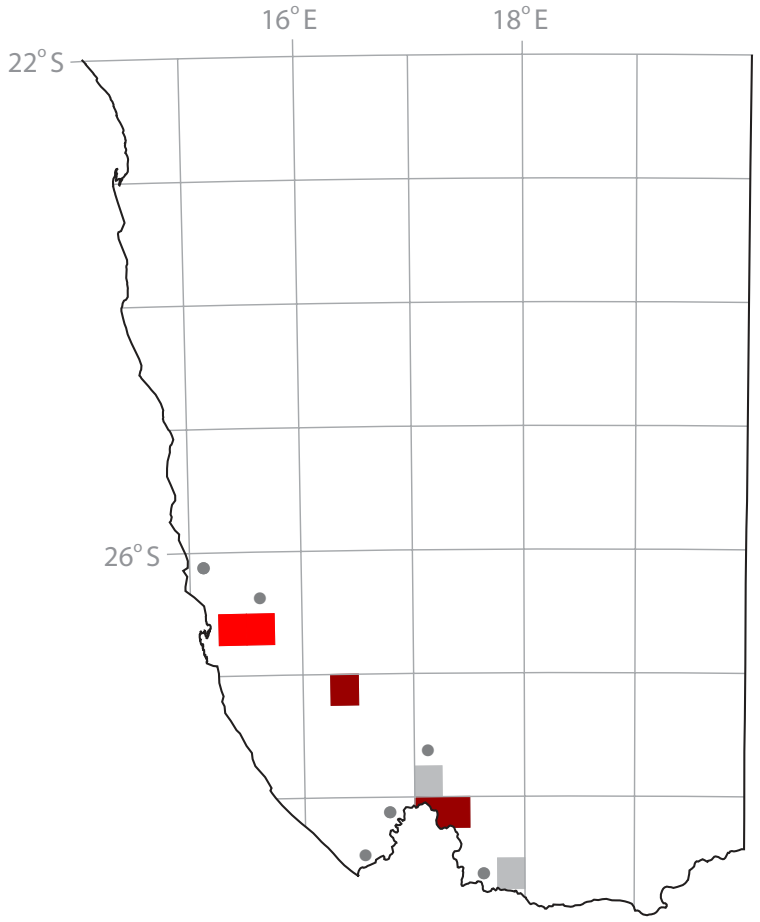
Namaqua Corkwood

[10 records from 7 (<1%) squares]



Thick-stemmed shrub with a single, fat base, branching near the ground into many stout branches. BARK **smooth, dark grey to grey to off-white**. BRANCHLETS not spine-tipped. LEAVES trifoliolate, **heart-shaped to almost circular** or obovate; **both surfaces dark green, hairless**. FLOWERS small and inconspicuous. FRUIT a small, round berry; pseudaril absent.

This species strongly resembles *C. dinteri*, but the two can be separated on distribution.



DISTRIBUTION & ABUNDANCE

Restricted to the winter-rainfall area of Namibia, and just over the border into South Africa. Generally common in two very small populations, one just north of the Orange River, the other in the Lüderitz area; sometimes locally abundant; the dominant species in 2615CB. There is a new record from a locality between the Orange River and Lüderitz. Old herbarium records show a greater range than has been recorded by TAP.

HABITAT

Found on rocky outcrops and rocky or stony hill slopes.

GROWTH FORM

A shrub less than 3 m tall.

ANNUAL CYCLE

Observations were made in March, May, September and October only. FLOWERS only recorded in October. FRUIT were recorded in all four months. LEAVES were recorded by TAP and the herbarium in all months observed.

GENERAL

Possibly has specialised horticultural potential as bonsai or pachycaul.

CONSERVATION CONCERNS

The lack of records from previously recorded squares could indicate insufficient atlasing or a die-back of the species. In the Lüderitz area, none of the three squares from which the species was previously recorded was atlased. Along the Orange River all of the three previous squares were atlased, but not exactly the same localities. This near-endemic could be threatened by illegal removal for the pachycaul trade.

Commiphora cervifolia

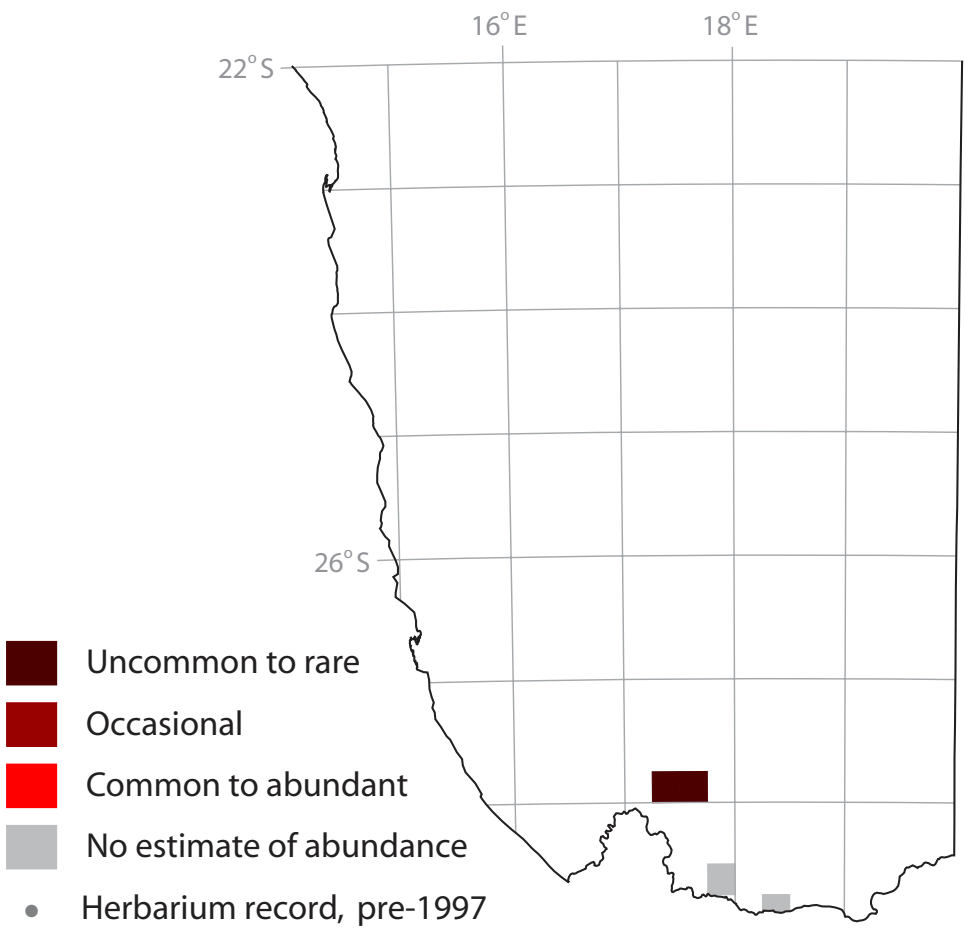
Antler-leaved Corkwood

Spoegboom (A)

[4 records from 4 (<0.5%) squares]



Thick-stemmed shrub (or dwarf tree) with a single, fat base, branching near the ground into many stout branches. BARK grey-green to yellow-brown with dark flecks, **not flaking**. LEAVES trifoliolate; **irregularly lobed like stag antlers**, sometimes three-lobed; base runs into petiole. FLOWERS small, yellow. FRUIT ellipsoid, up to 10 mm in diameter; pseudaril absent.



DISTRIBUTION & ABUNDANCE

Uncommon and endemic to a very small area just north of the Orange River, with more records south of the river.

HABITAT

Rocky outcrops and hill slopes.

GROWTH FORM

Shrub, recorded as less than 1 m and 1–3 m high.

ANNUAL CYCLE

FLOWERS September. FRUIT no records. LEAVES deciduous.

Continued on page 275.

Commiphora crenato-serrata

Damara Corkwood

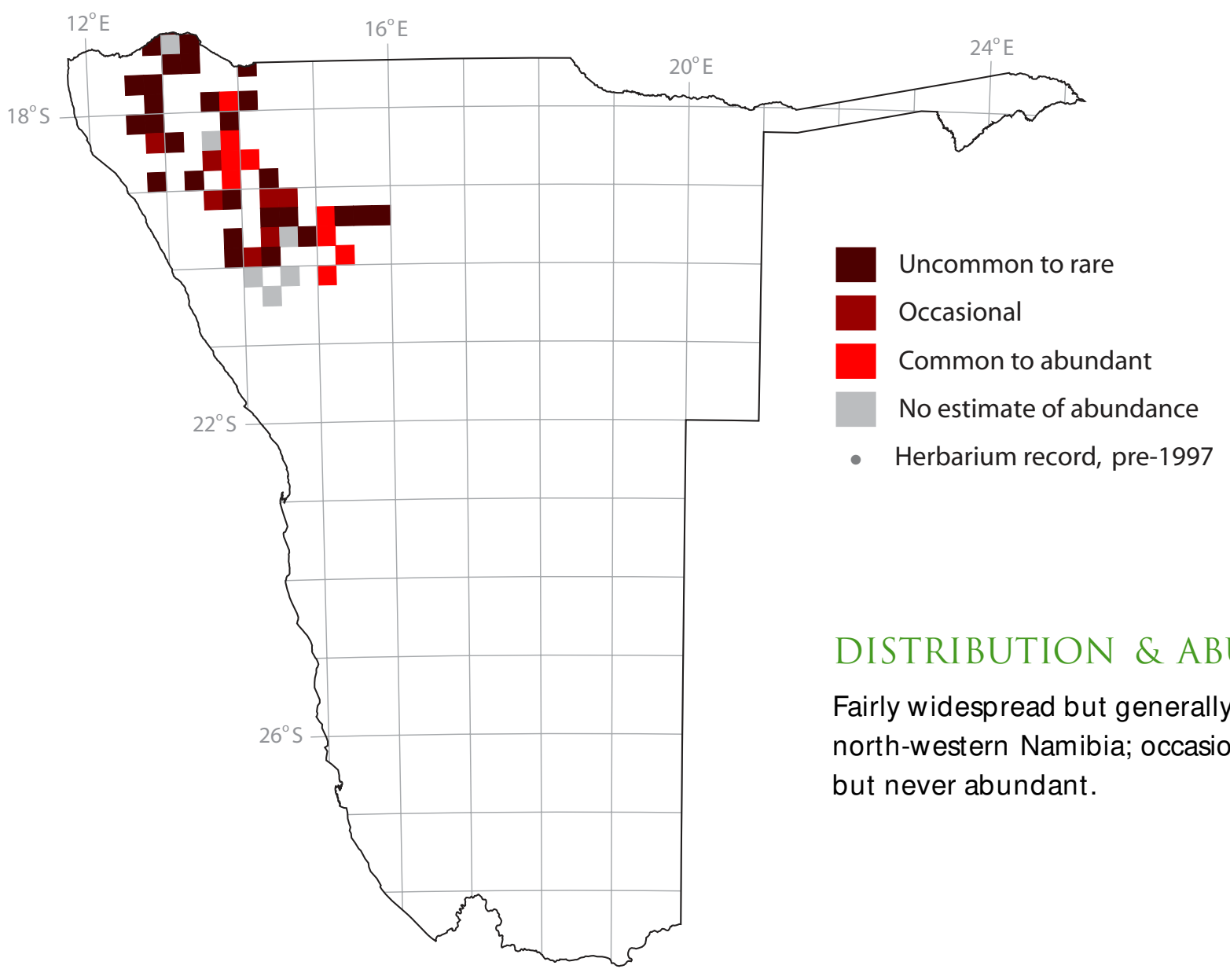
Omuhanga (H); sukurikanneb (K)

[80 records from 51 (5%) squares]



Slender, erect tree. BARK **pale grey to pale brown**, smooth, **not flaky; may be distinctively pitted**. LEAVES compound, **spirally arranged at ends of branches, 100–290 mm long, drooping; petiolule 5–20 mm long; leaflet narrowly lanceolate, toothed.** FLOWERS small and inconspicuous. FRUIT ovoid berries with pointed tips, in long bunches.

Commiphora crenato-serrata may be confused with *Kirkia acuminata*, but the former has lighter bark and distinct petiolules, and exudes an aromatic resin when damaged; fruit different.

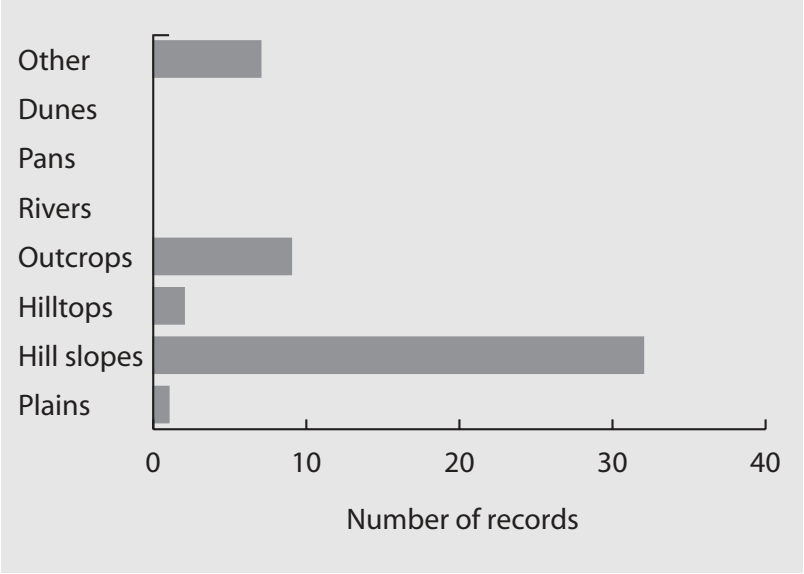


DISTRIBUTION & ABUNDANCE

Fairly widespread but generally uncommon in north-western Namibia; occasionally common, but never abundant.

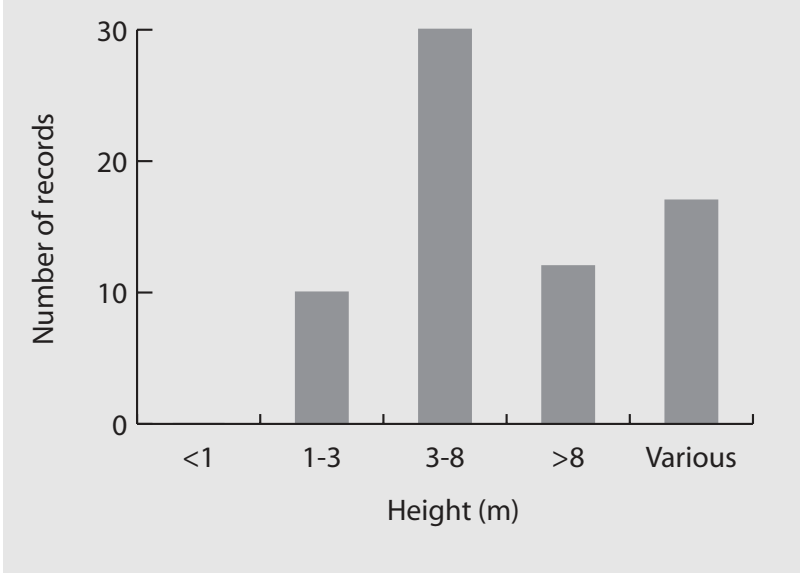
HABITAT

Mostly found on rocky hill slopes and rocky outcrops, generally associated with dolomite and granite.



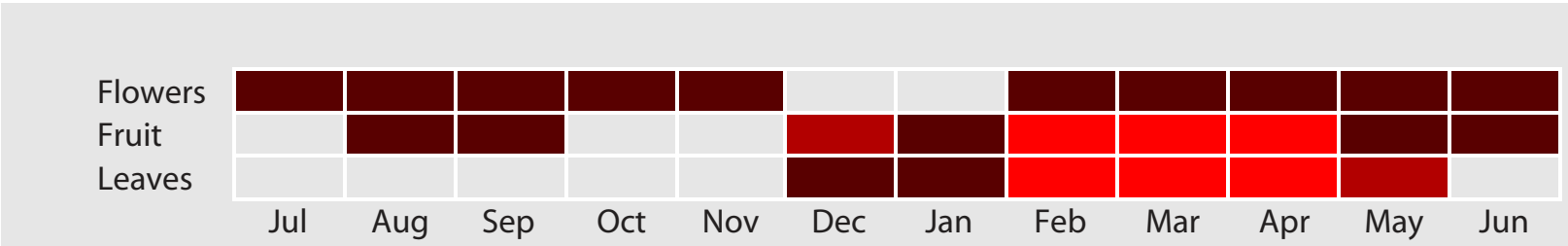
GROWTH FORM

A tree up to 8 m high, occasionally over 8 m.



ANNUAL CYCLE

FLOWERS one record of flowering almost every month of the year. FRUIT mainly February to April, with individual records most months. LEAVES mostly from February until April, with young leaves produced in December and January, sometimes as early as September.

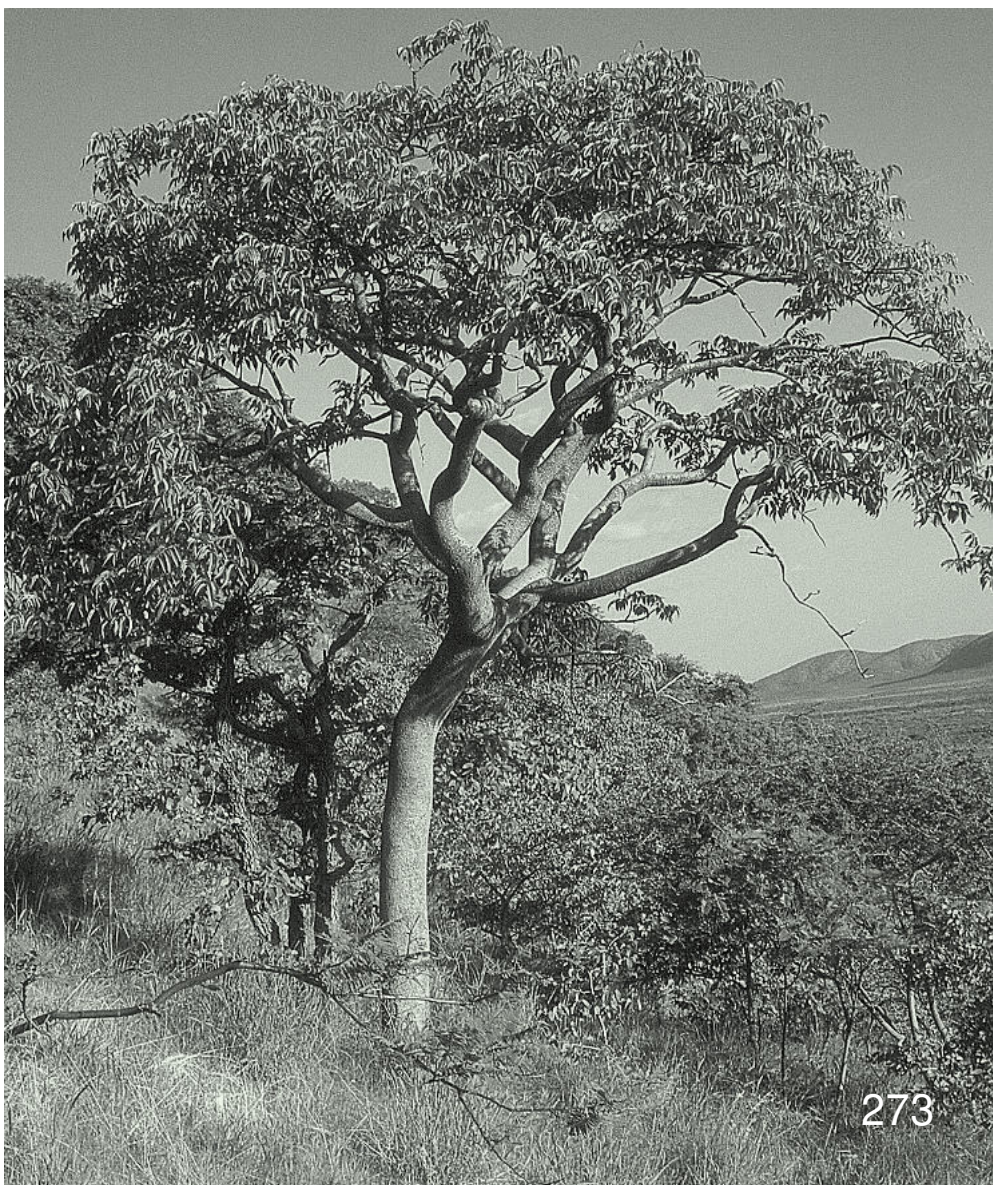


GENERAL

Of horticultural potential.

CONSERVATION CONCERNS

None recorded. Near-endemic to the Kunene Region.



Commiphora crenato-serrata, B. Curtis

Commiphora dinteri

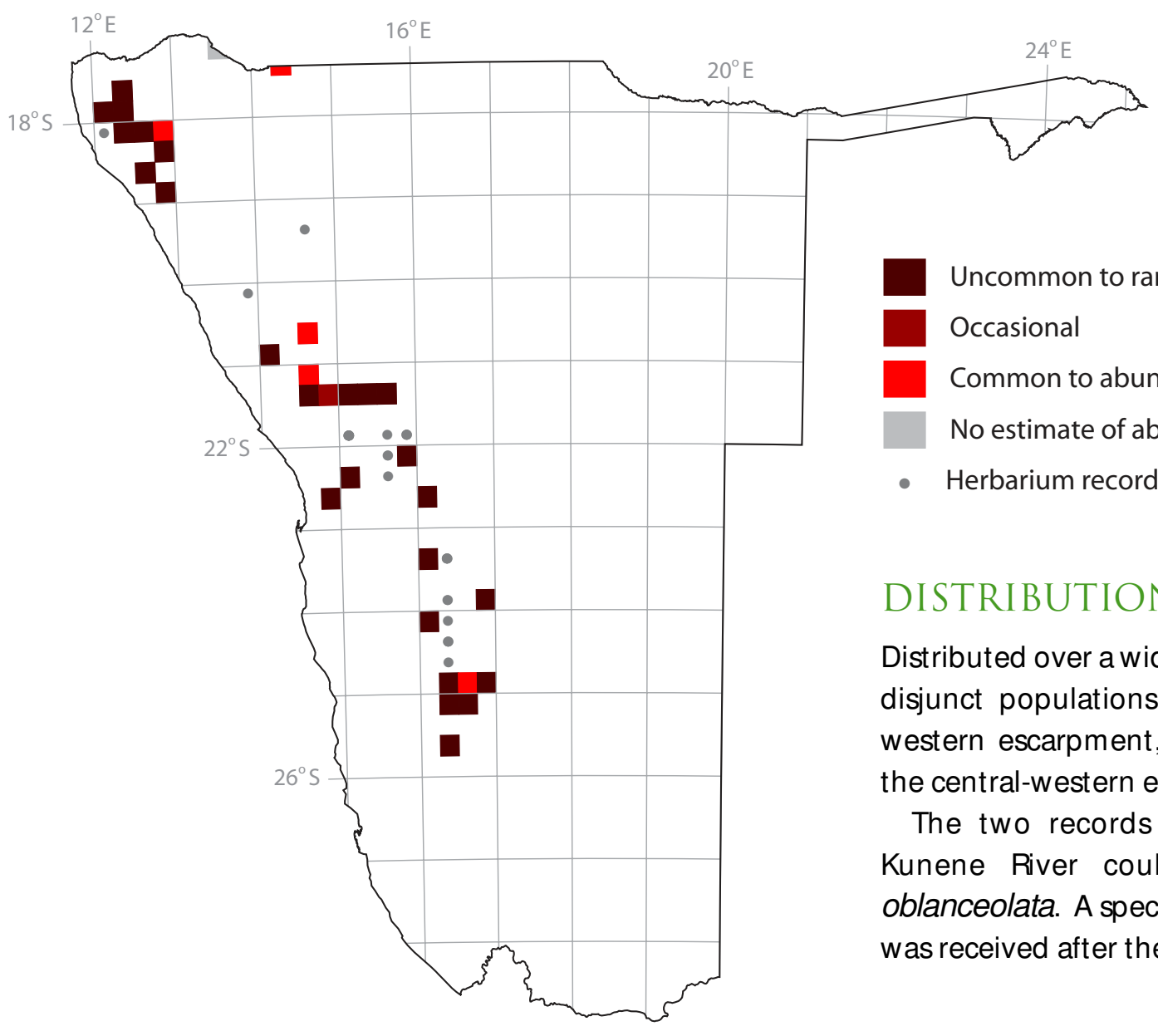
Namib Corkwood

[38 records from 34 (3%) squares]



Shrub with **swollen stem, branching near the ground**. BARK **grey to grey-brown, smooth to wrinkled with black flecks**. LEAVES usually **trifoliolate**, 8–30 mm long; **leaflet obovate** to broadly elliptic; both surfaces olive-green, hairless; **margin scalloped or deeply toothed**. FLOWERS small and inconspicuous. FRUIT with red pseudaril; four-lobed with two lobes shorter than the other two.

This plant strongly resembles *C. capensis*, but the leaves may be larger than those of *C. capensis*. The main difference is in the pseudaril, which is absent in *C. capensis*. They are also separated by distribution.



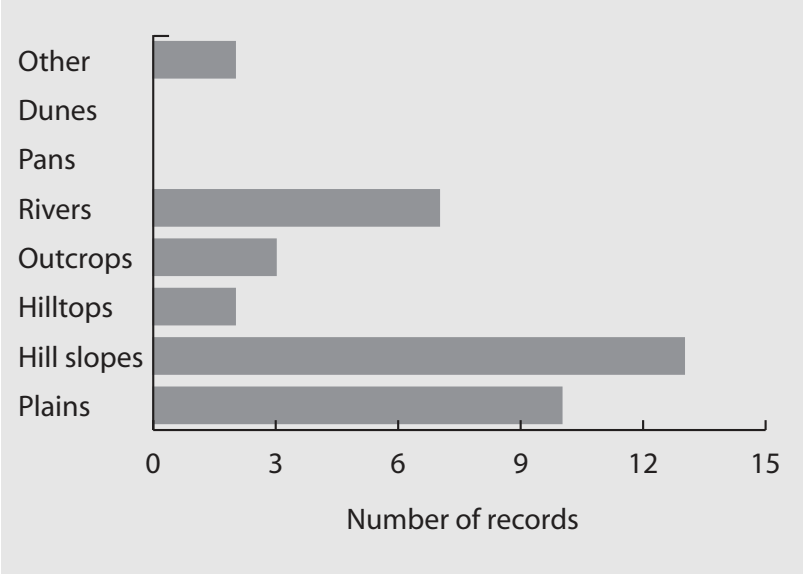
DISTRIBUTION & ABUNDANCE

Distributed over a wide range in two apparently disjunct populations, one west of the north-western escarpment, the other roughly along the central-western escarpment.

The two records from just south of the Kunene River could be misidentified *C. oblanceolata*. A specimen from 1712AA (SWA3) was received after the map was drawn.

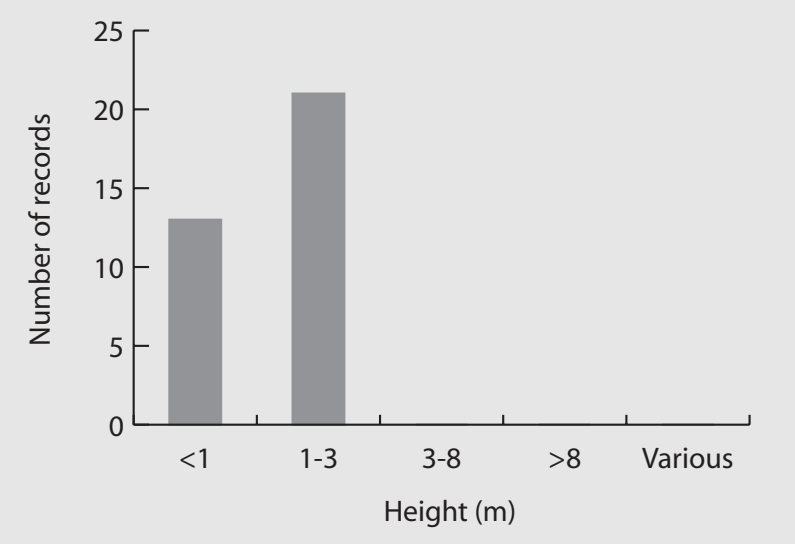
HABITAT

Mostly on rocky hill slopes, often very steep ones; also gravel plains and along dry water courses.



GROWTH FORM

Described by atlassers as a shrub or tree. About 37% of records less than 1 m high; 63% over 1 m, but less than 3m.



ANNUAL CYCLE

FLOWERS mostly recorded in October and November, but also in February (Naukluft, 2416AA); there were also records of plants starting to flower in April 2003 (2115AC, SWA3). There were no herbarium records of flowering. FRUIT no TAP records, but there were herbarium records from September to May, with most in April. LEAVES present from January to May or July, with young leaves in November and December.

GENERAL

Possible specialised horticultural potential as bonsai or pachycaul.

CONSERVATION CONCERNS

Endemic. Potentially threatened by pachycaul trade. The lack of TAP records from some of the earlier herbarium specimen sites could be a result of die-off of the species, or atlassers either not having visited the sites or having misidentified the plants. These sites should be investigated further.

Commiphora cervifolia *Continued from page 271:*

GENERAL

Exudes a sweet, aromatic resin when touched. The fruit are eaten by game and small stock. Possible specialised horticultural potential as bonsai or pachycaul.

CONSERVATION CONCERNS

This endemic species is rare in Namibia and unique in the world. It is not protected, nor has it been assessed as a 'Red Data' species. Although the population appears to be stable, due to its small numbers it deserves more attention and protection. Unless the issue of fuel provision is addressed in the far south, increasing numbers of migrant labourers working on large-scale irrigation schemes along the Orange River could result in this species being harvested for fuel in future. Potentially threatened by the illegal pachycaul trade. Assessed as 'near threatened' (Craven & Loots 2002).

Commiphora discolor

Omurere

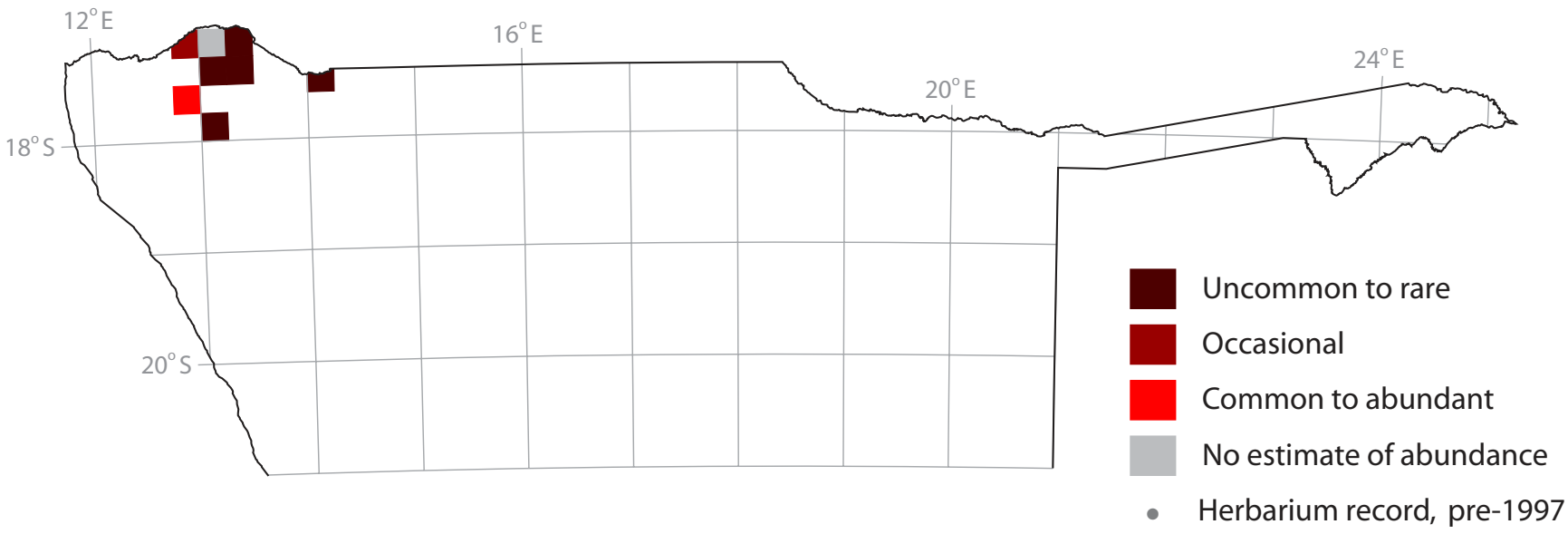
Kaoko corkwood (E)

[11 records from 9 (<1%) squares]



Deciduous tree. BARK yellow-white to golden yellow, **peeling off horizontally around the trunk** in characteristic long, stringy strips. LEAVES usually simple, clustered on older branches; broadly elliptic, up to 60 mm; **both surfaces shiny dark green**; **margin scalloped to toothed**. FLOWERS small and inconspicuous. FRUIT almost round, up to 9 mm in diameter; pseudaril four-lobed (or three-lobed); all lobes of equal length, totally covering the seed.

Flowers inconspicuous, fruit may be overlooked from a distance. The plant cannot be mistaken.



DISTRIBUTION & ABUNDANCE

Uncommon to rare in a small area just south of the Kunene River; sometimes locally common.

HABITAT

Found on rocky hill slopes and rocky outcrops.

GROWTH FORM

A tree up to 8 m high.

ANNUAL CYCLE

FLOWERS recorded once in March (out of seven observations in March). FRUIT one record in March and one in November (only one record between July and December). LEAVES in summer only.

GENERAL

Various articles are carved from the wood. Has horticultural potential for dry gardens.

CONSERVATION CONCERNS

Not recorded. The species, however, is generally rare and very localised in Namibia. Possibly endemic to the greater Kaokoveld, inlcuding southern Angola.

Commiphora edulis

Rough-leaved Corkwood

[3 records from 3 squares]



Shrub or small tree. BARK **light grey, flaking in small yellowish papery pieces**. LEAVES compound; leaflets narrowly elliptic to narrowly ovate, rough. FRUIT large for a *Commiphora* sp.; pseudaril red, cup-like with four short lobes covering one-third of seed; flesh is apricot-coloured when ripe.

All three TAP records from eastern Caprivi (1724CA, CD and DC). There are also earlier herbarium records from two squares along the Okavango River (1718). Uncommon shrub in the 1–3-m height class, or tree in the 3–8-m height class. Flowers recorded in November; fruit recorded in December and March and April.

Commiphora viminea *Continued from page 263:*

HABITAT

Found on hill slopes, along dry watercourses and on plains.

GROWTH FORM

Mostly a shrub up to 3 m high; sometimes a tree of 3 m, once taller than 3 m.

ANNUAL CYCLE

FLOWERS recorded in December and January. FRUIT in November, February and March. LEAVES November to May.

CONSERVATION CONCERNS

None recorded. Rare in Namibia.

Commiphora giessii

/Aoab

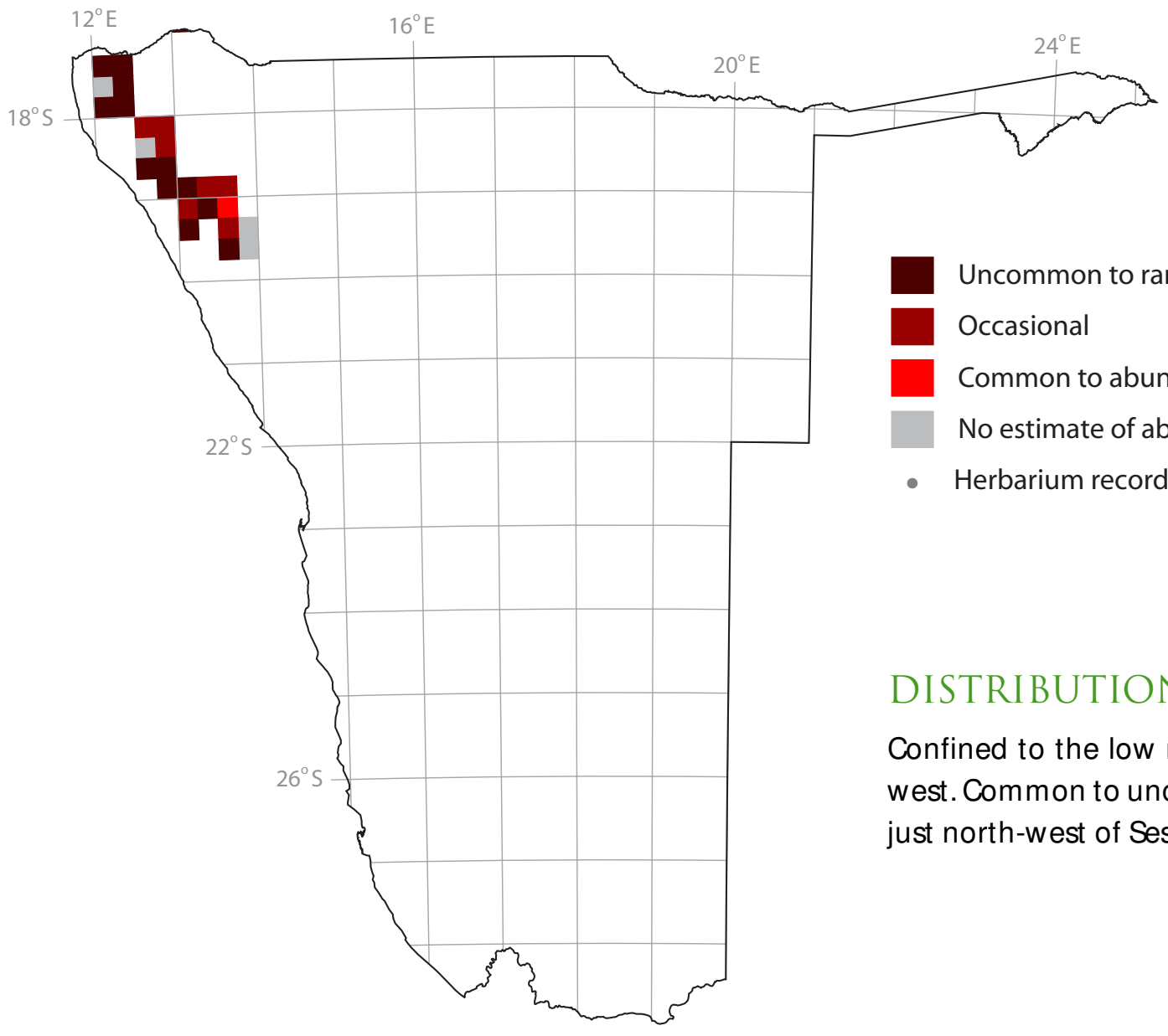
Red-stemmed corkwood (E); /nas (K)

[60 records from 25 (2%) squares]



Many-stemmed shrub, with crown generally wider than the plant is tall. BARK **smooth, red-brown, usually not flaky**. BRANCHES **lax, lanky, slender, red-brown**. LEAVES **trifoliolate**, 10–70 mm; leaflets sessile, **elliptic to narrowly obovate**; both surfaces pale green, hairless; **margin entire**.

It may be confused with *C. virgata*, but the red-brown bark of *C. giessii* is generally not flaky.

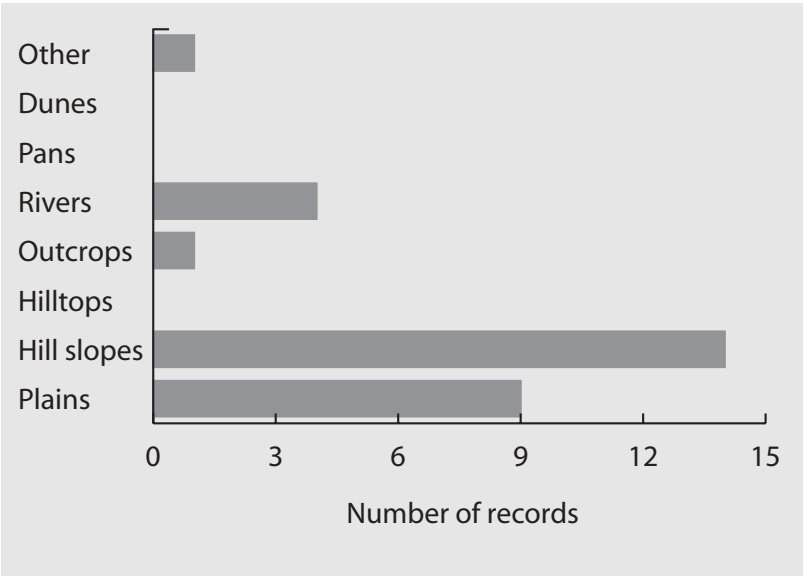


DISTRIBUTION & ABUNDANCE

Confined to the low rainfall areas of the north-west. Common to uncommon; locally abundant just north-west of Sesfontein (1913B).

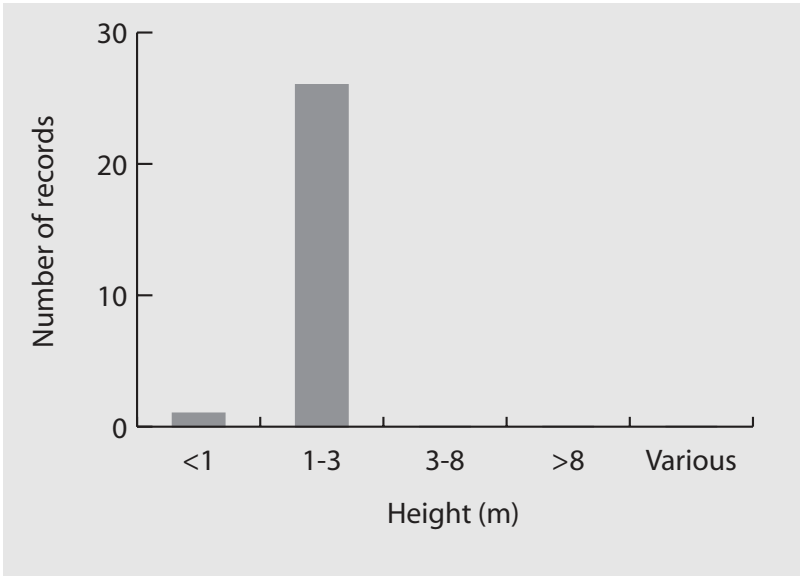
HABITAT

Mostly on hill slopes, but also on plains and sometimes along dry watercourses. Always on stony or rocky substrates.



GROWTH FORM

A shrub up to 3 m high.



ANNUAL CYCLE

FLOWERS in December (herbarium records). FRUIT in June, July and December. LEAVES mainly from January to March, with new leaves in December.

GENERAL

This plant is of horticultural potential, especially for dry gardens.

CONSERVATION CONCERNS

None recorded. *Commiphora giessii* is endemic and has a small population, and is therefore worthy of conservation.



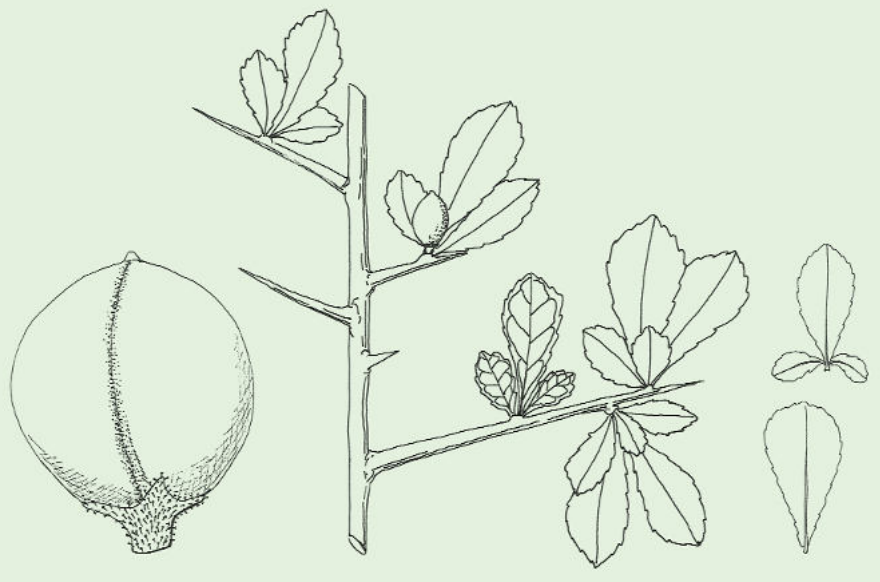
Commiphora giessii, A. Cunningham

Commiphora glandulosa

Omukange

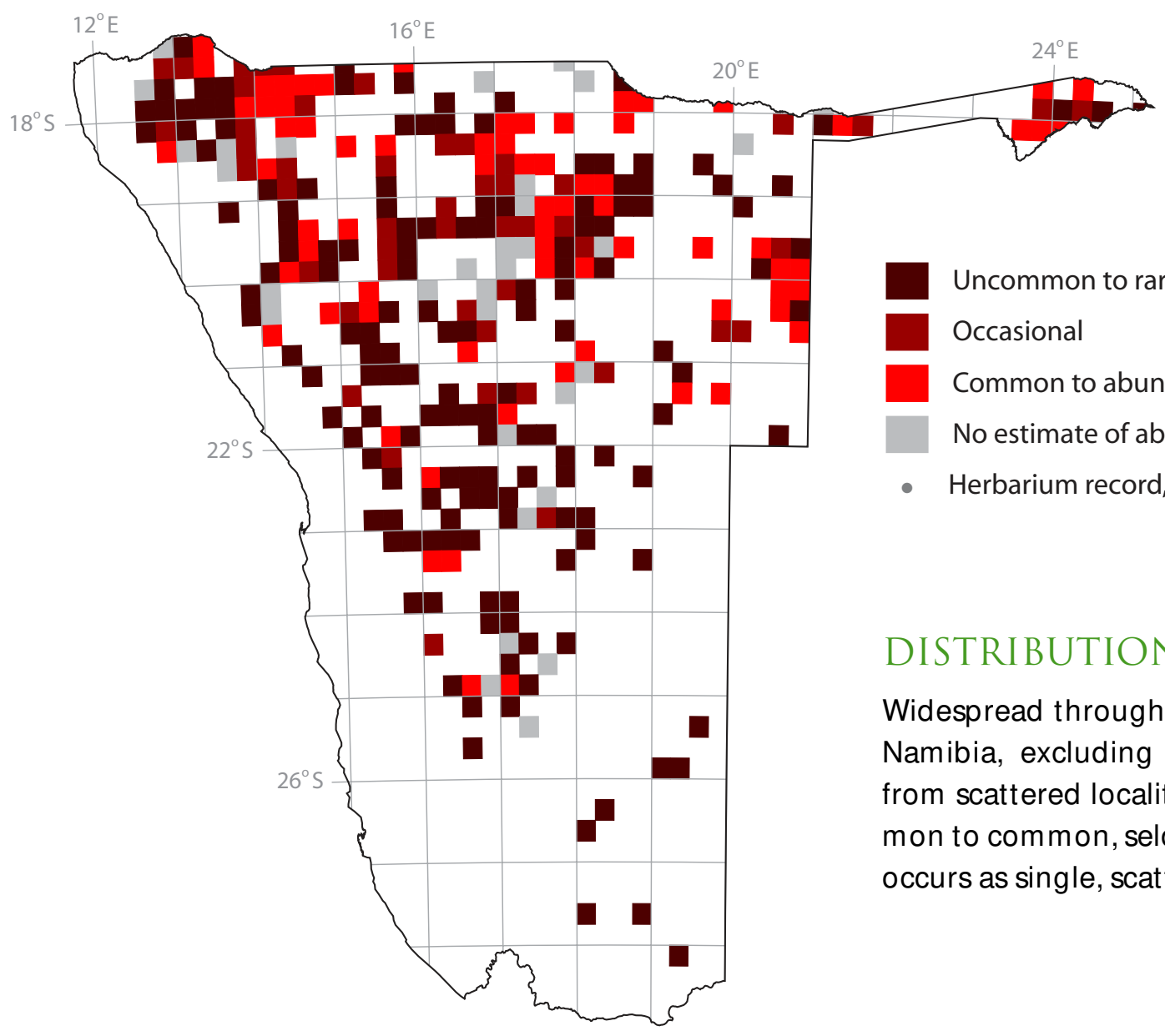
Tall common corkwood (E);
Druesenbalsambaum (G)

[576 records from 314 (29%) squares]



Generally a **single-stemmed tree**, occasionally a shrub. BARK **peeling off in yellow, papery strips to expose green underbark**. BRANCHLETS **spine-tipped**. LEAVES usually **simple**, sometimes trifoliolate, spirally arranged or terminally clustered; obovate, 8–30 mm long; **both surfaces shiny green**; long glandular hairs at base; margin mostly scalloped to toothed; petiole short, with dense glandular hairs. FLOWERS small, **bisexual; calyx with small to large, glandular hairs**. FRUIT almost round, up to 14 mm in diameter; stalk absent or very short; pseudaril red, four-lobed, almost enveloping the entire seed.

Very similar to *C. pyracanthoides*, but *C. glandulosa* is generally a tree while *C. pyracanthoides* is a shrub. The glandular hairs on the calyx, which are very difficult to see without magnification, further distinguish *C. glandulosa*.

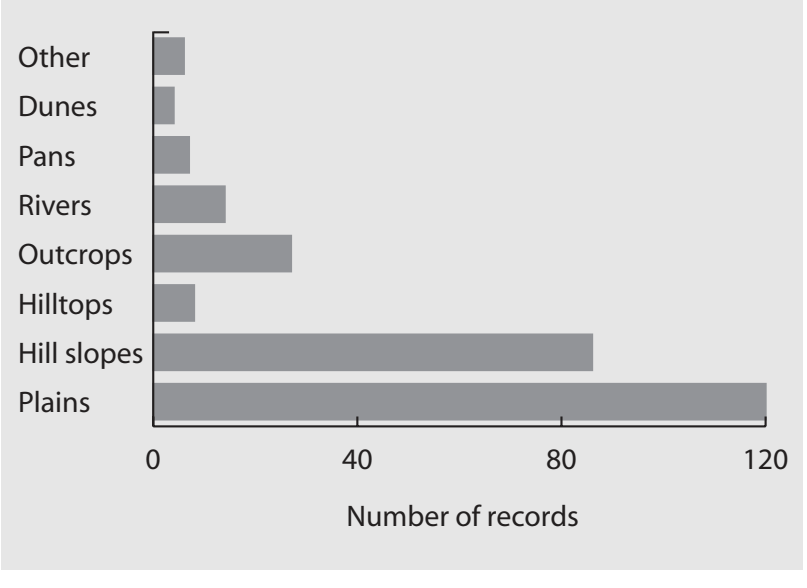


DISTRIBUTION & ABUNDANCE

Widespread throughout northern and central Namibia, excluding the Namib Desert, and from scattered localities in the south. Uncommon to common, seldom abundant. Generally occurs as single, scattered trees.

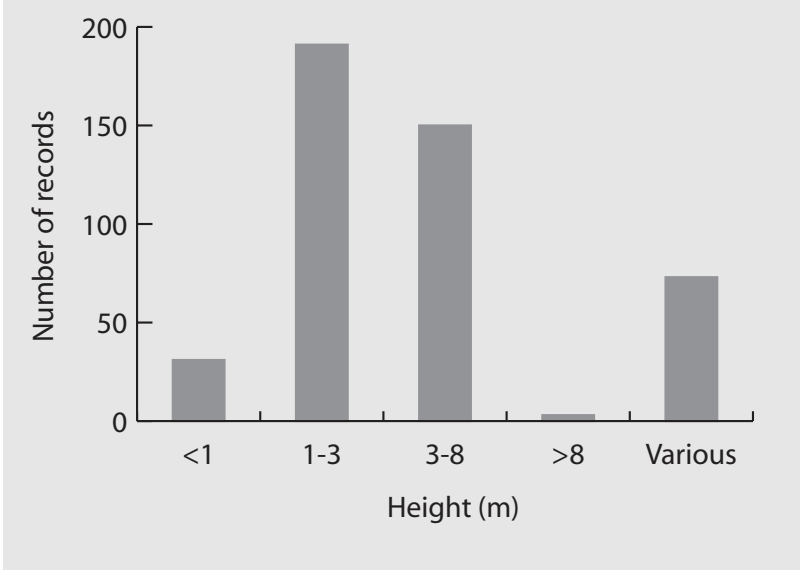
HABITAT

Various, mainly plains; also found on hill slopes and rocky outcrops.



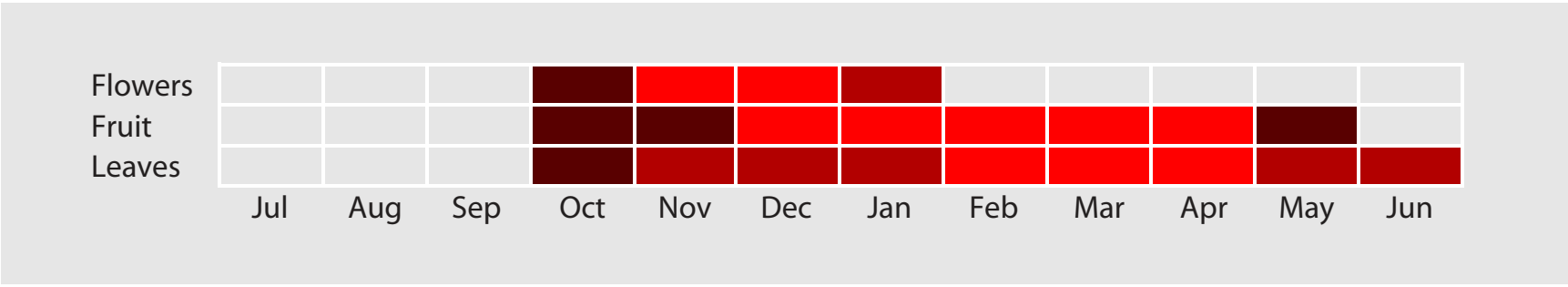
GROWTH FORM

Mostly a tree (70% of all records) in the 3–8-m height class (37% of all records; 53% of tree records), but often a shrub of up to 3 m.



ANNUAL CYCLE

FLOWERS have been recorded from September until April, but most flowering occurs in November and December. FRUIT may be found from October to June, but are present mostly from December to April. LEAVES variable, depending on rainfall; new leaves can be produced anytime from October to February, but mostly in December, and most trees have leaves between February and April.

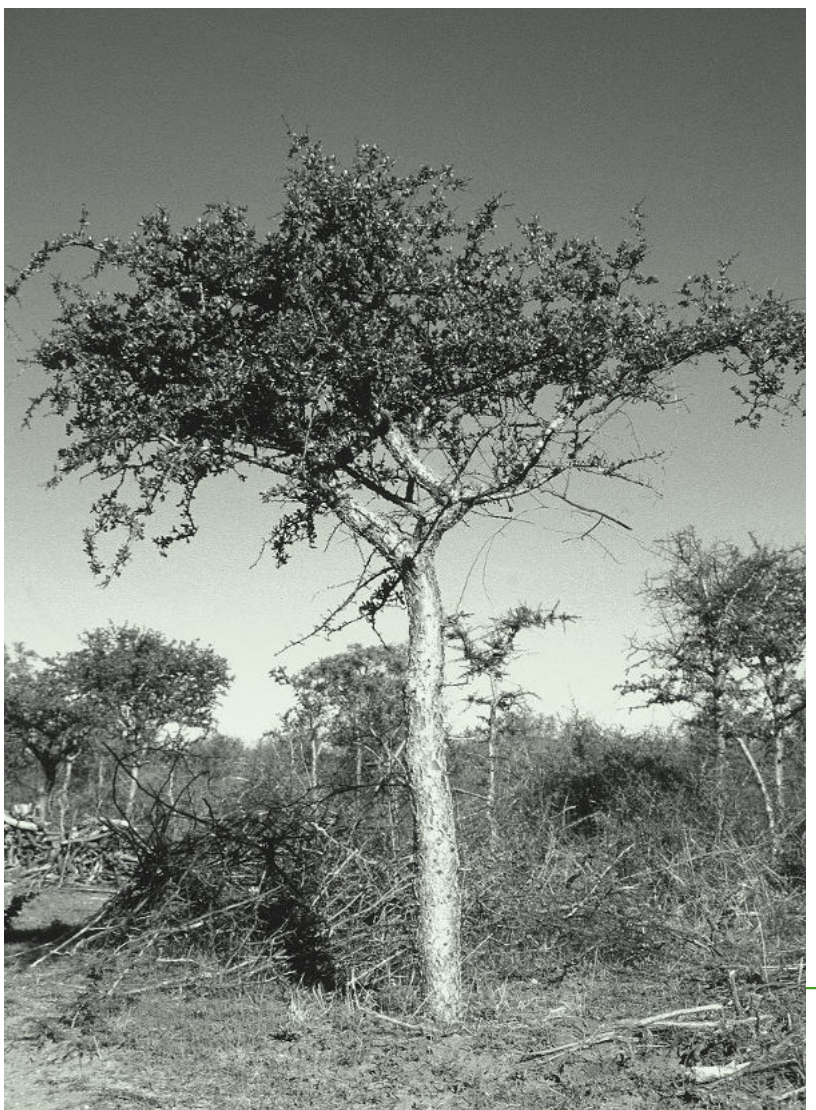


GENERAL

The leaves are browsed; birds eat the fruit. The roots are chewed for their sweet sap. The resin, often exuded from the stems, is said to be poisonous (compare with *C. pyracanthoides*), but is soaked, cooked and used as a substitute for washing powder. The soft wood is used for carving various items such as ornaments and stools. Grows easily from cuttings and truncheons, which are planted for hedges.

CONSERVATION CONCERNS

None recorded.



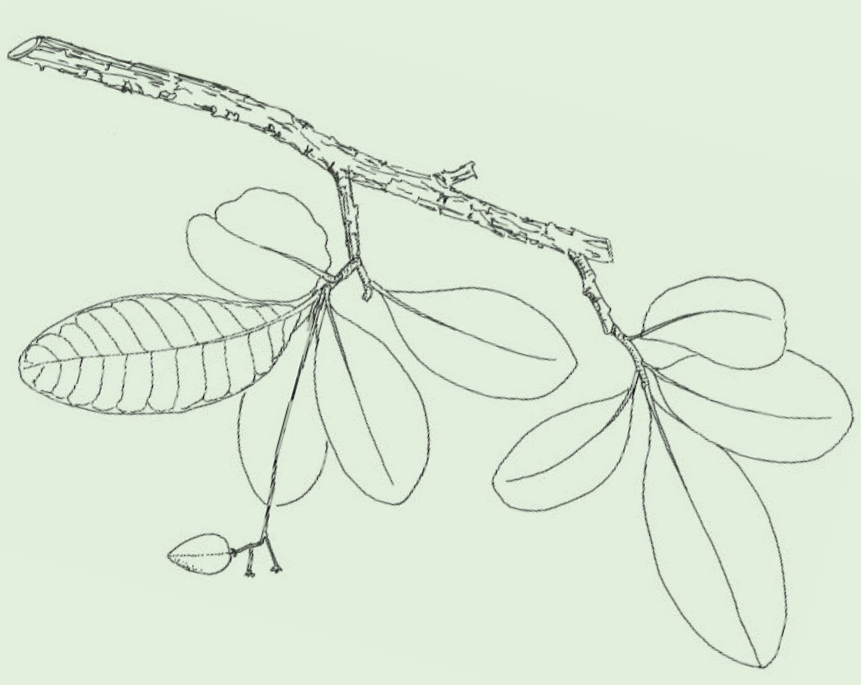
Commiphora glandulosa, B. Curtis

Commiphora glaucescens

Tsaura

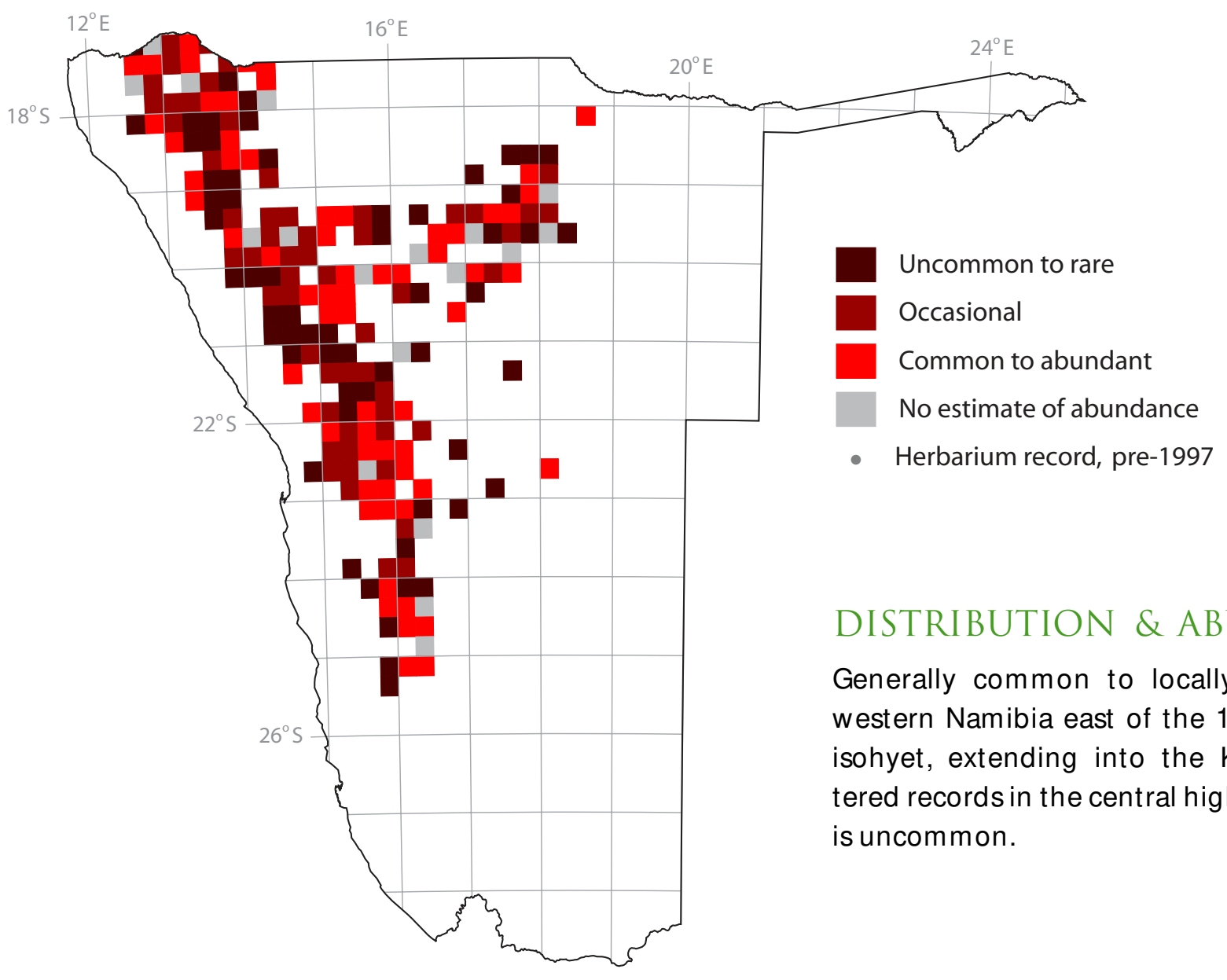
Blue-leaved corkwood (E);
Bloublaarkanniedood (A);
omutungi (H)

[529 records from 198 (19%) squares]



Deciduous **tree, 2–8 m tall**. BARK golden-brown to **red-brown or copper-coloured; peeling off in papery strips or in round flakes**. LEAVES **simple, broadly elliptic** to obovate, 15–100 mm long; **blue-green; margin undulate**. FLOWERS small, cream-coloured to pink-tinted on long stalks. FRUIT a berry, ellipsoid, up to 12 x 8 mm; pseudaril red.

Large-leafed specimens in the far north-west may be mistaken for *C. anacardiifolia*.

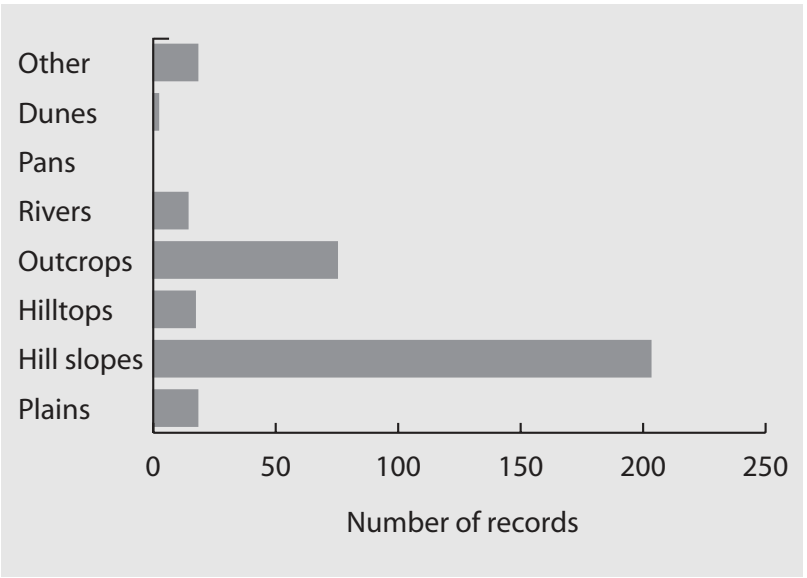


DISTRIBUTION & ABUNDANCE

Generally common to locally abundant in western Namibia east of the 100-mm rainfall isohyet, extending into the Karstveld; scattered records in the central highlands where it is uncommon.

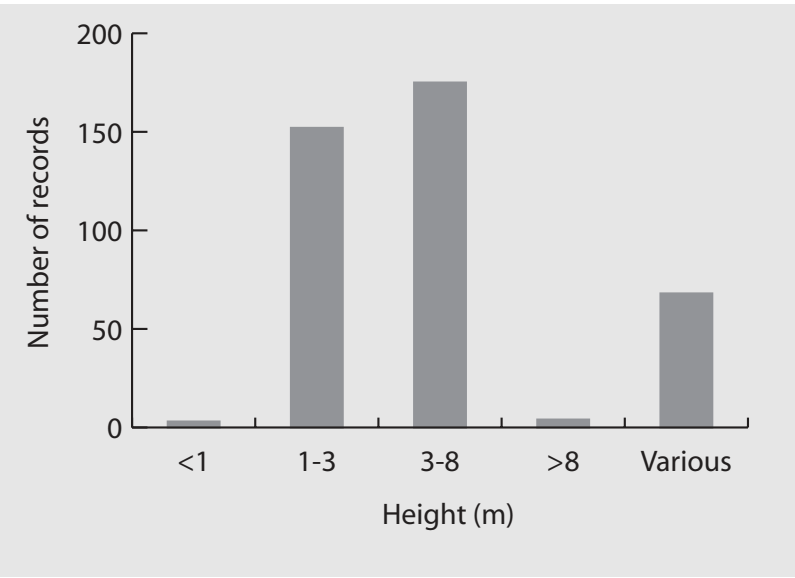
HABITAT

Various habitats, but mainly hill slopes and rocky outcrops; also along dry watercourses in the central-west.



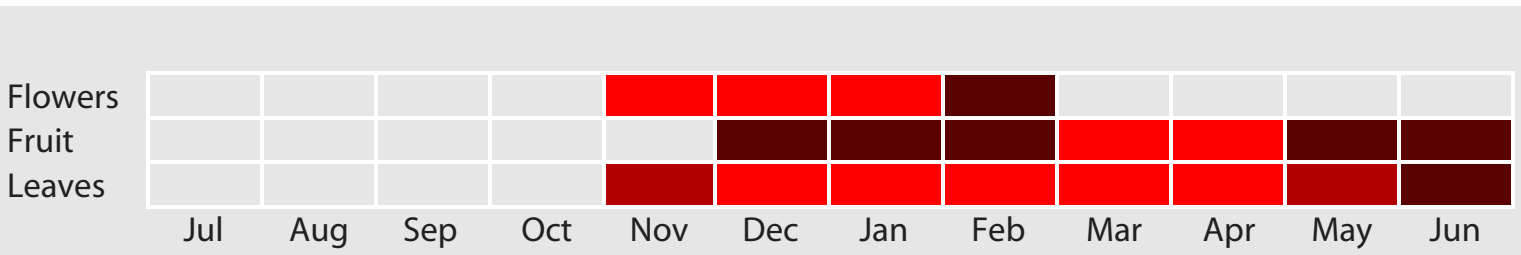
GROWTH FORM

Generally a tree (87% of records) of up to 8 m high; occasionally a shrub.



ANNUAL CYCLE

FLOWERS November to January, mostly. FRUIT December to June, with a peak in March and April. LEAVES mostly December to April, with new leaves in November.

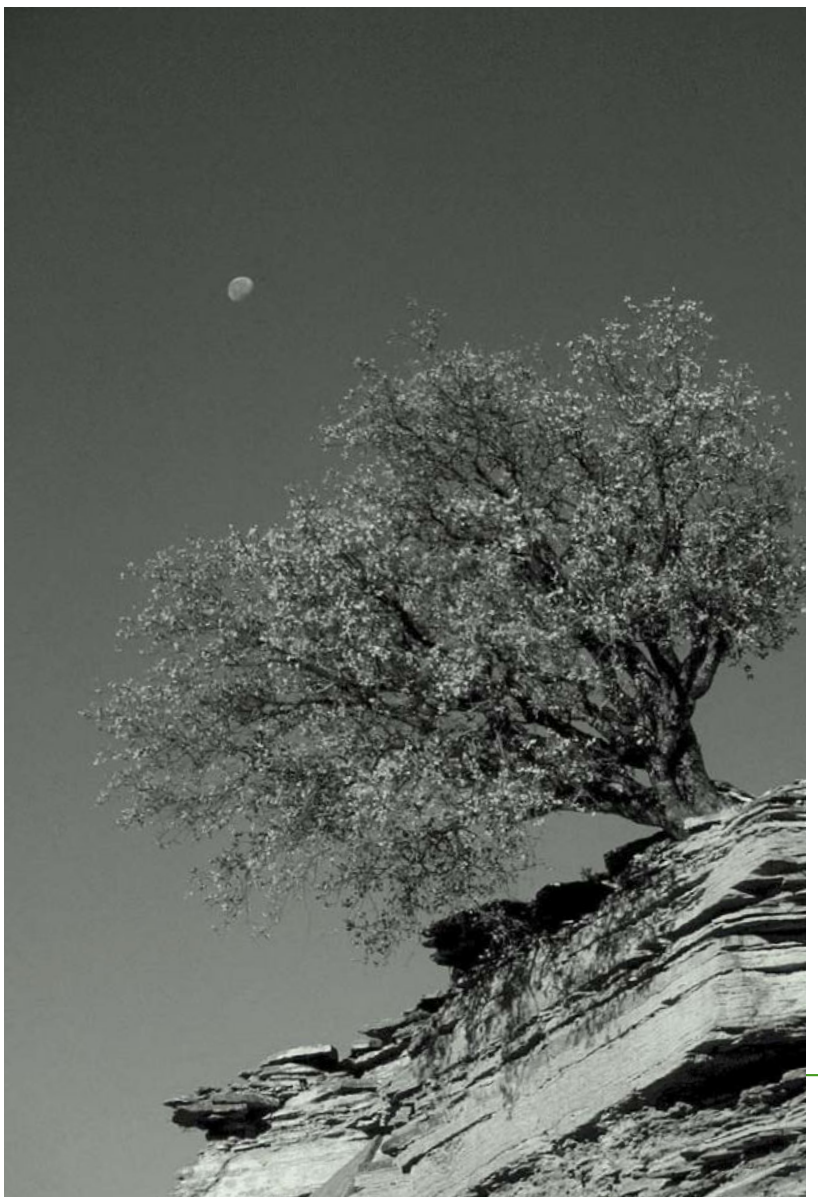


GENERAL

The foliage and branches are eaten by cattle. Branches are cut to obtain water if none else is available; various items carved from the wood.

CONSERVATION CONCERNS

None recorded.



Commiphora glaucescens, R. Swart

Commiphora gracilifrondosa

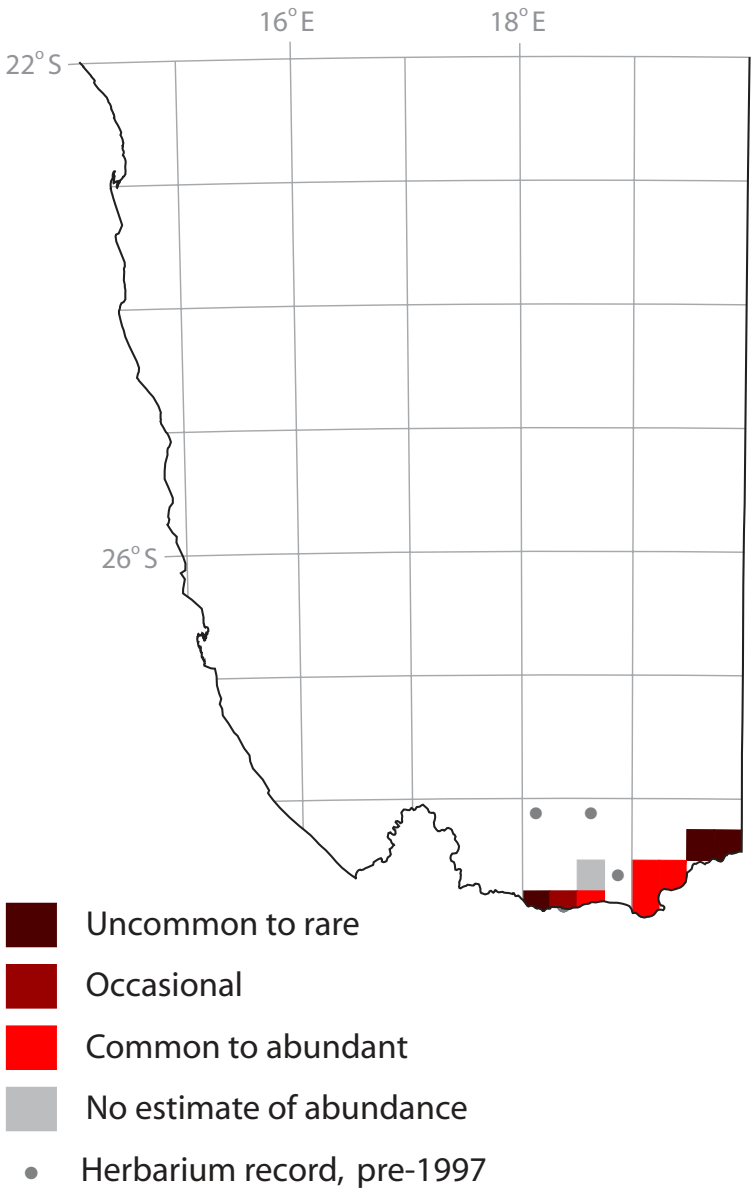
Karee Corkwood

Kareekanniedood/Suikerkan (A)

[11 records from 9 (<1%) squares]



Thick, swollen-stemmed shrub, branching near the ground, with stems appearing succulent. BARK **grey to yellow-brown with dark flecks**, not flaky. BRANCHLETS not spine-tipped. LEAVES **trifoliolate**, up to 60 mm long; **leaflets linear, terminal leaflet often irregularly lobed**. FLOWERS small and inconspicuous. FRUIT almost round; pseudaril with two long arms and 1 or 2 shorter lobes.



DISTRIBUTION & ABUNDANCE

Locally common in a small area immediately north of the Orange River, east of 18° E.

HABITAT

Found on rocky outcrops and hill slopes. Sometimes recorded on sandy soil or gravel among boulders, or on the banks of streams.

GROWTH FORM

A shrub in the 1–3-m height class; sometimes smaller. A few herbarium collectors referred to it as a ‘many-stemmed tree‘.

ANNUAL CYCLE

FLOWERS mainly in October, with herbarium records in September and May. FRUIT mainly in October, with single records from February to May. LEAVES October to March.

GENERAL

Possible specialised horticultural potential as bonsai or pachycaul.

CONSERVATION CONCERNS

A species endemic to the Orange River, with a very restricted distribution, though common where it occurs and not appearing to be threatened. The two herbarium records unconfirmed by the TAP could be indicative of a decline in the population or that the species may have been overlooked; one of the squares in which it was previously recorded was not well-atlased, the other was moderately atlased. As for *C. cervifolia*, the threat of firewood shortages in its area of distribution and increasing numbers of people in the area is a concern. Could potentially be threatened by the pachycaul trade. Assessed as 'near-threatened' (Craven & Loots 2002).

Commiphora karibensis

Angular-stem Corkwood

[2 records from 1 square]

Very similar to *C. mollis*, but with deeply fluted trunk.

Both TAP records from Impalila Island. Uncommon as a shrub in the 1–3-m height class; locally common as a tree, 3–8 m high, on the river bank. No flowers or fruit recorded. Previously, not recorded in Namibia.

Commiphora kraeuseliana, leaves and fruit, S. Bethune

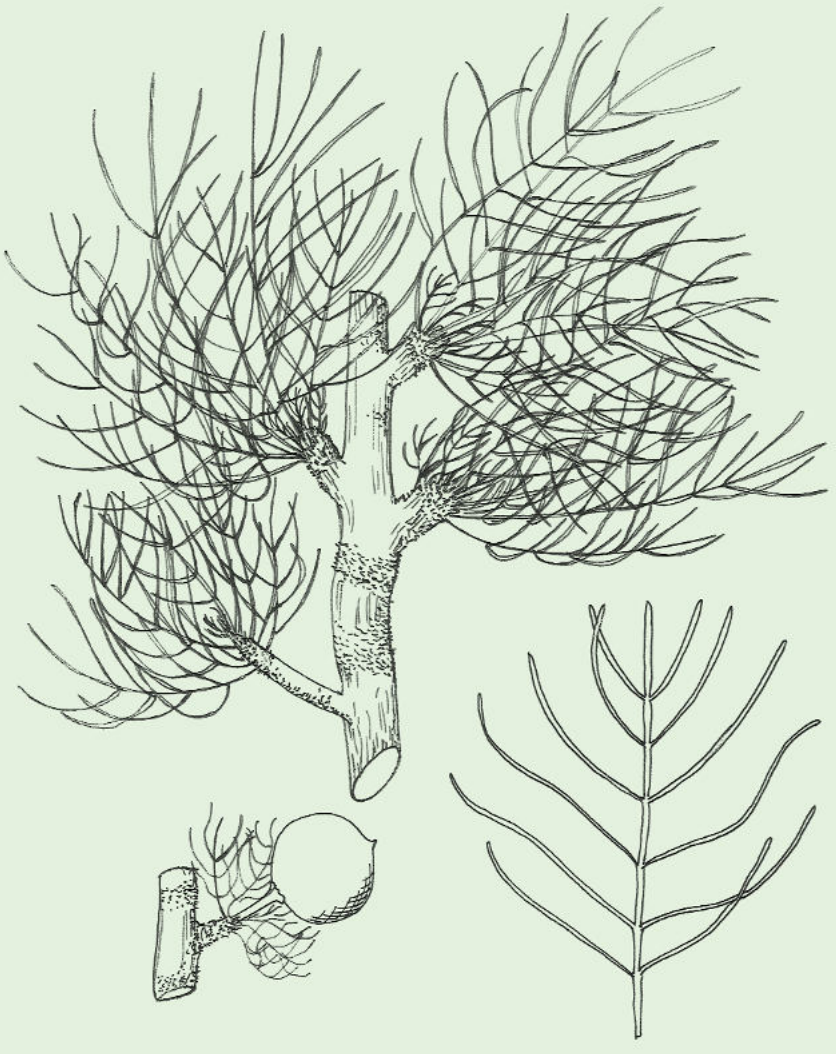


Commiphora kraeuseliana

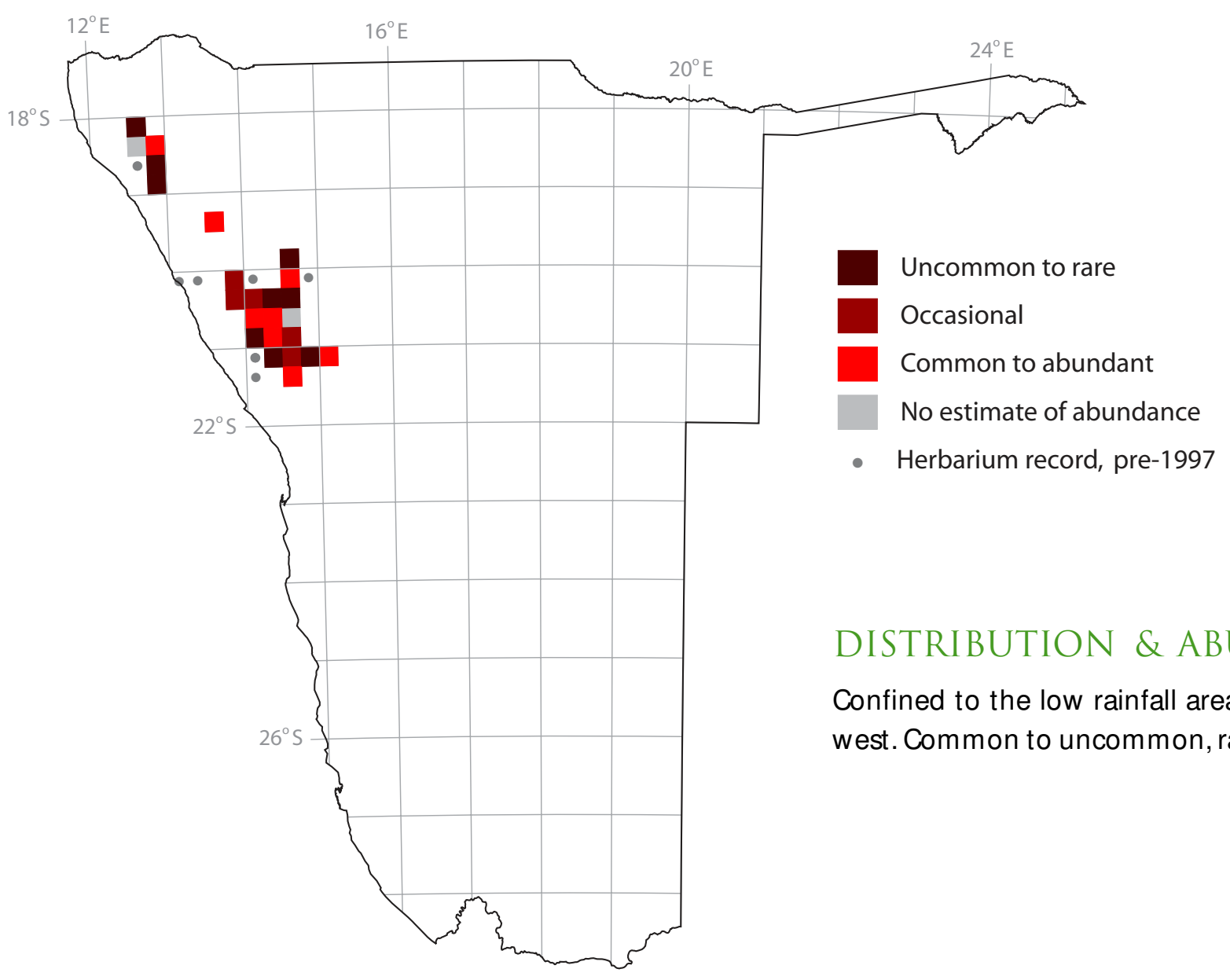
Feather-leaved Corkwood

[51 records from 24 (2%) squares]

Shrub with short, swollen stem branching close to ground-level. BARK **grey-brown to yellowish, peeling off in papery strips at the base**. BRANCHLETS relatively short, stout, plum-coloured, with a dull, waxy coating. LEAVES **imparipinnately compound; leaflet linear to thread-like, dark green**. FLOWERS small and inconspicuous. FRUIT the largest of all the *Commiphora*, **up to 20 mm in diameter; pseudaril absent**.



See page 285 for photo of the leaves and fruit.

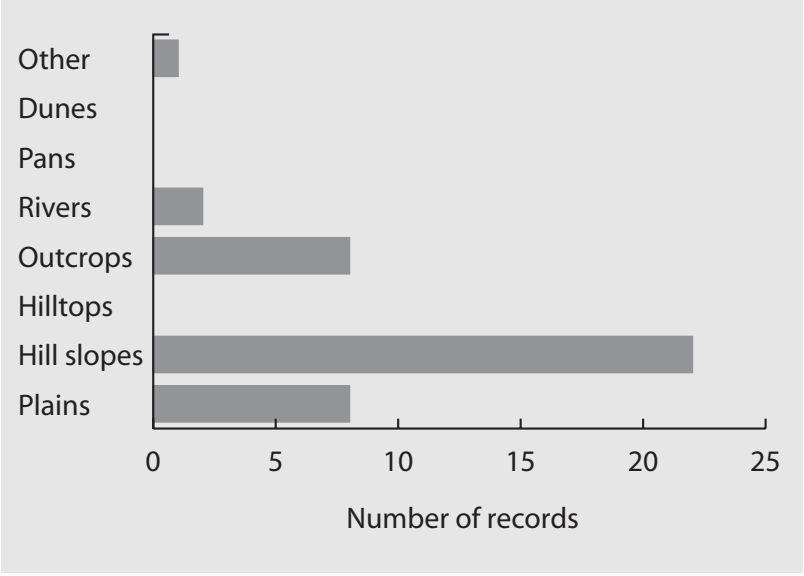


DISTRIBUTION & ABUNDANCE

Confined to the low rainfall areas of the north-west. Common to uncommon, rarely abundant.

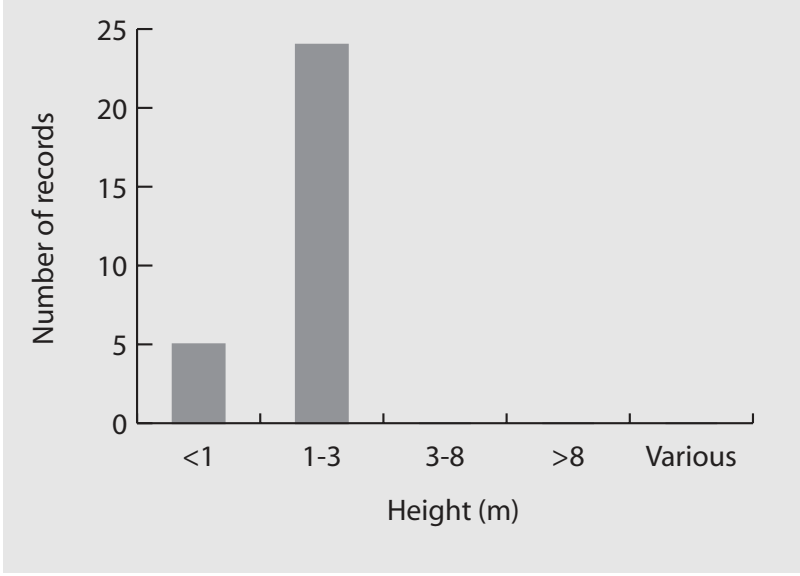
HABITAT

Mainly on rocky hill slopes and rocky outcrops; occasionally on plains, in ravines and on river banks.



GROWTH FORM

Always a shrub, generally less than 2 m tall.



ANNUAL CYCLE

FLOWERS March to May, but mainly April. FRUIT March to May, but mainly April; one herbarium record in April and three in December. LEAVES from December to April, turning yellow in May.

GENERAL

Small ones were recorded germinating in the Brandberg parking area (near the White Lady on the north-eastern side of the mountain; 2114BA) in March 2002. Has horticultural potential as a pachycaul and bonsai subject.

CONSERVATION CONCERNS

Potentially threatened by illegal removal for pachycaul trade. Endemic to Namibia.

Commiphora kraeuseliana, K. Roberts



Commiphora mollis

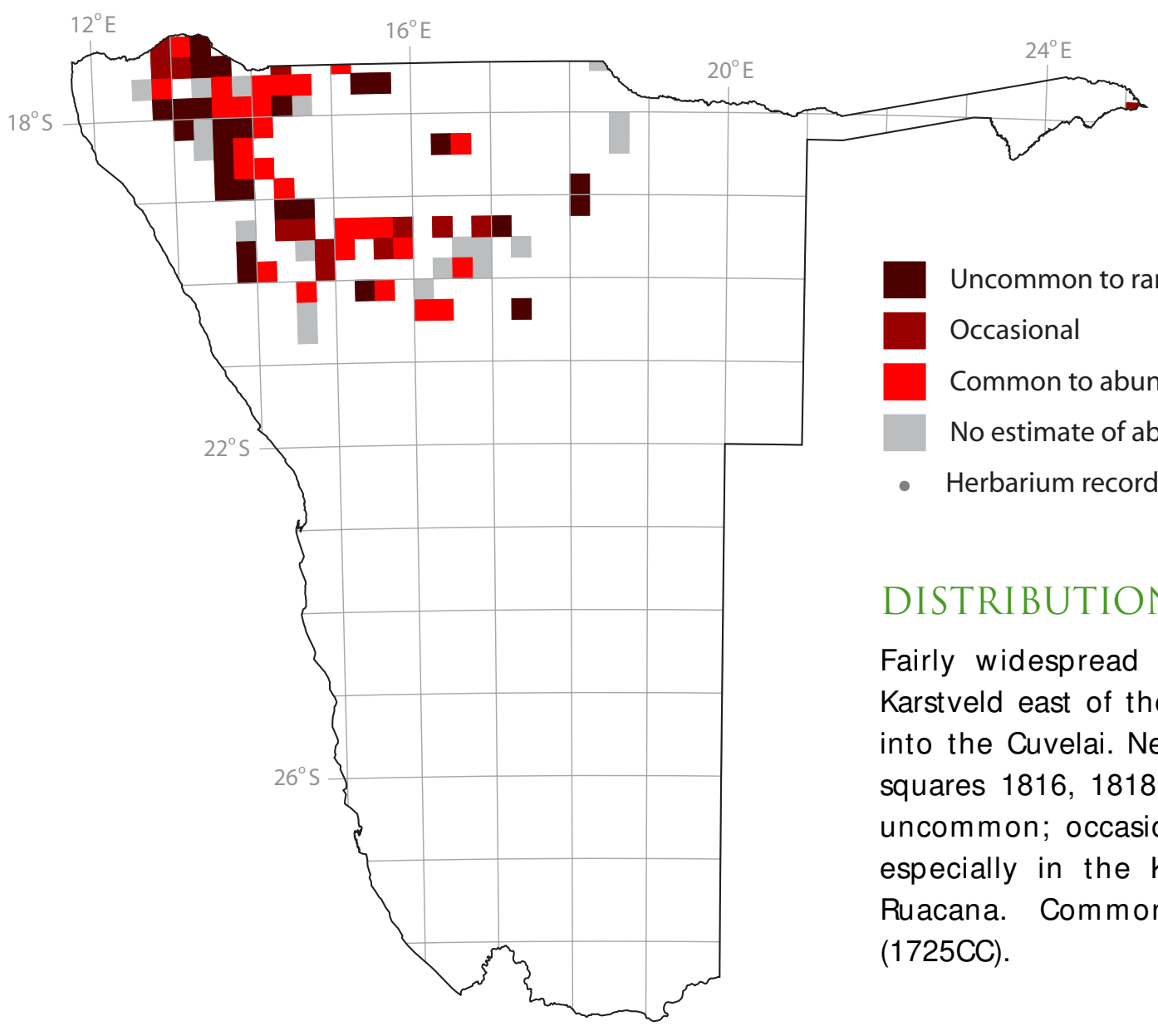
Velvet Corkwood

Fluweelkanniedood (A);
Haarige Myrrhe (G); omurenda (H);
dau-areb (K)

[138 records from 86 (8%) squares]



Tree with **round, spreading crown**, up to 8 m high; stem base sometimes **fluted in mature trees**. BARK **smooth, brown to grey-brown, peeling off in small rectangular blocks**; often irregularly fissured with knobbly thickenings. LEAVES compound, medium-sized; leaflets oblong-elliptic, grey to green, **with a finely woolly covering**. FLOWERS small, cream-coloured to slightly pink. FRUIT almost round, up to 15 mm in diameter, red, densely downy; pseudaril red, four-lobed, almost covering entire seed.

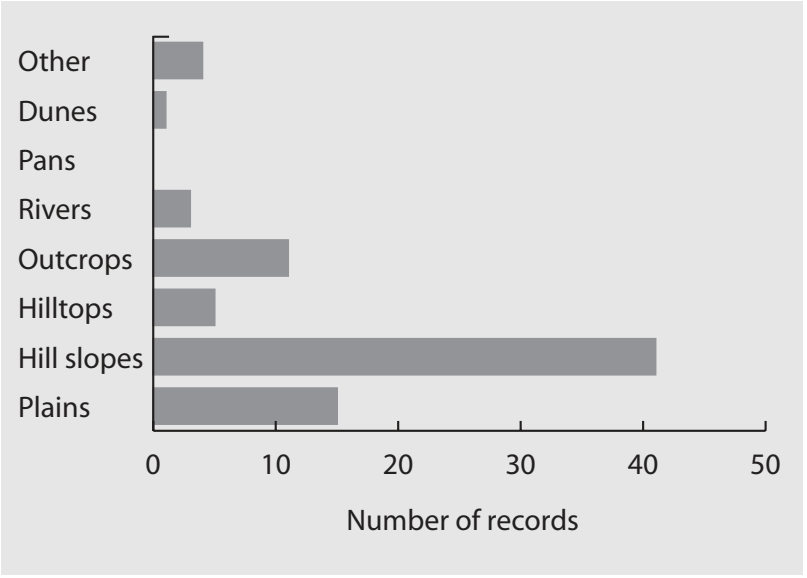


DISTRIBUTION & ABUNDANCE

Fairly widespread in the north-west and Karstveld east of the escarpment, extending into the Cuvelai. New records from degree-squares 1816, 1818 and 1918. Common to uncommon; occasionally locally abundant, especially in the Karstveld and south of Ruacana. Common on Impalila Island (1725CC).

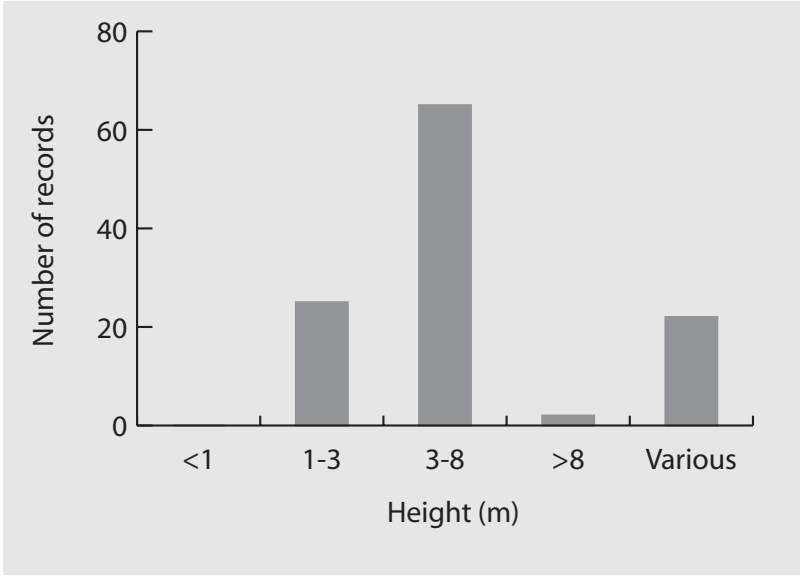
HABITAT

Mainly found on hill slopes and plains; also on rocky outcrops in the north-west. Usually growing on stony or rocky ground, but also in deep sand. One large specimen was found near a seasonally inundated area in the central-north (1715CB).



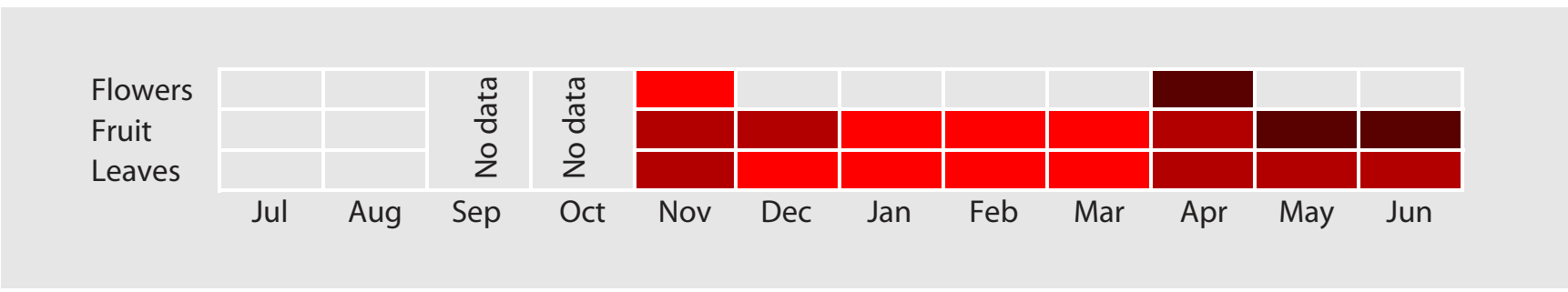
GROWTH FORM

A tree up to 8 m high; rarely over 8 m, but often less than 3 m.



ANNUAL CYCLE

There were no observations in September and October. FLOWERS November, with one herbarium record in April; apparently rain dependent. FRUIT mainly November to April, but may be found until June. LEAVES mainly December to March, with new leaves produced in November and some trees still with leaves until the end of June.



GENERAL

The leaves and young shoots are browsed by game and livestock. The wood is used for making household articles. The plant has horticultural potential and can easily be grown from truncheons; locally, it is used as 'live fencing'. Also called 'visboom' (PLE1, 1914D).

Oshindongo names include 'omukanga' for the tree, 'ewongua/egonga' for the unripe fruit and 'akamene' for the ripe seed (MAN1, CUR1, HOF1, specimen WIND72369)



CONSERVATION CONCERNS

None recorded.

Commiphora oblanceolata

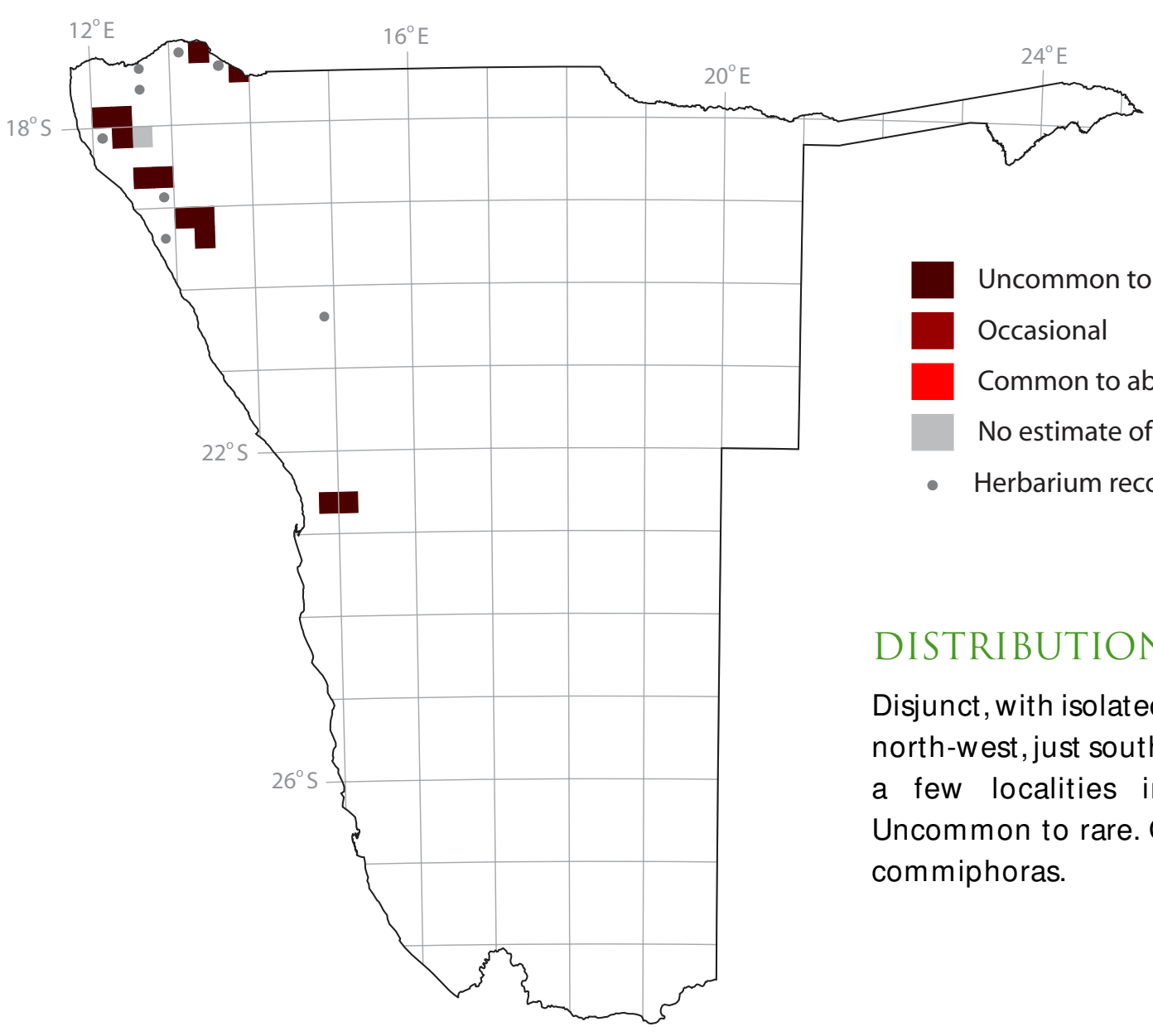
Swakopmund Corkwood

Swakopmundkanniedood (A)

[20 records from 13 (1%) squares]



A **densely branched shrub, generally with a swollen base**. BARK **pale grey to dark grey, smooth**, not flaky. LEAVES trifoliolate; leaflets almost sessile, **narrowly oblanceolate**; margin generally irregularly toothed. FLOWERS small and inconspicuous. FRUIT *c.* 9 x 8 mm; pseudaril with two long arms and 1 or 2 short lobes.



DISTRIBUTION & ABUNDANCE

Disjunct, with isolated localities in the extreme north-west, just south of the Kunene River and a few localities in the central Namib. Uncommon to rare. One of the most-western commiphoras.

HABITAT

Found on rocky hill slopes or gravel plains.

GROWTH FORM

A shrub, generally up to 2 m, but once recorded as over 3 m.

ANNUAL CYCLE

FLOWERS February and March. FRUIT March, April and July, with old fruit in February. LEAVES deciduous.

GENERAL

Possible specialised horticultural potential as bonsai or pachycaul.

CONSERVATION CONCERNS

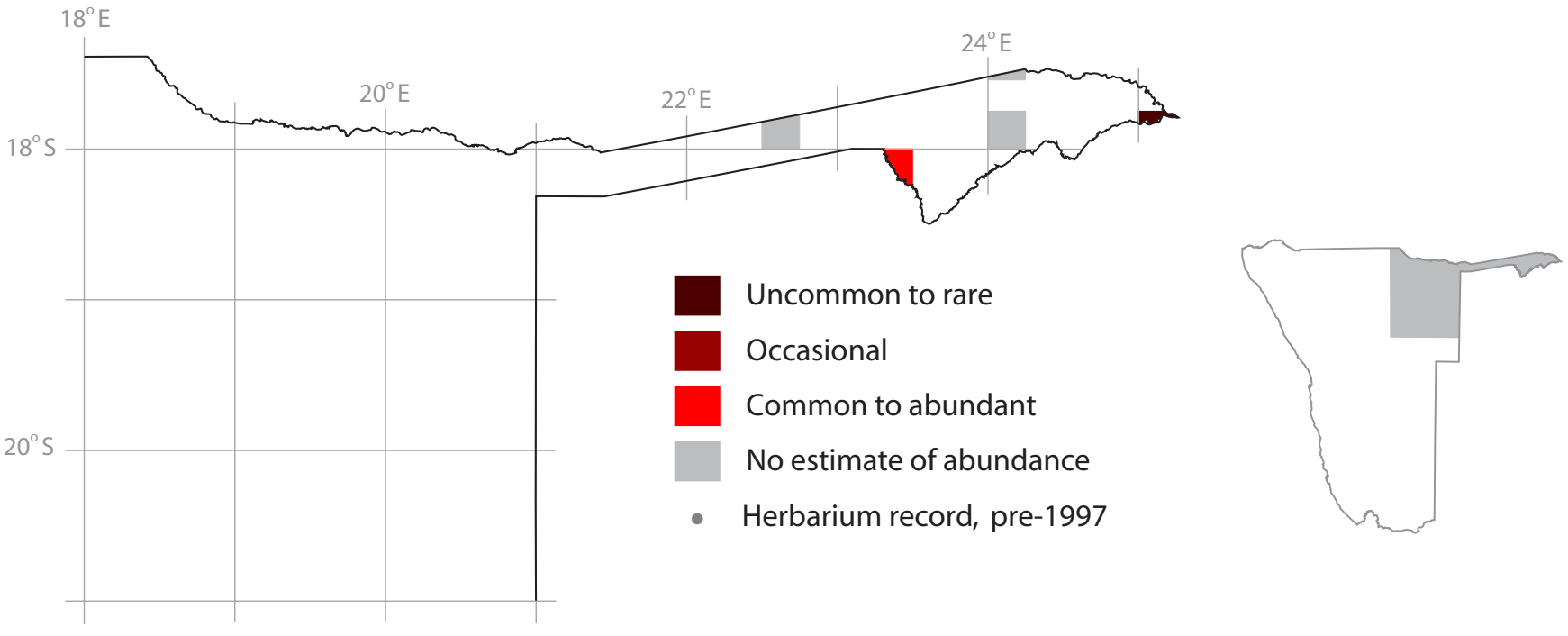
A near-endemic, potentially threatened by illegal collecting for the pachycaul trade. Assessed 'near-threatened' (Craven & Loots 2002).

Commiphora mossambicensis

Pepper-leaf Corkwood

[5 records from 5 (<0.5%) squares]

Tree up to 10 m high. BARK **grey, smooth, sometimes peeling**. LEAVES **trifoliolate**, with **long petiole**; leaflet large, **broadly ovate to almost circular, drooping; bright, fresh green, shiny**, with golden glandular hairs. FLOWERS small and inconspicuous. FRUIT with pseudaril with four lobes, two much shorter than the others.



DISTRIBUTION & ABUNDANCE

Generally uncommon in Caprivi; locally abundant at Lianshulu Lodge (1823AB). The range in Namibia has tentatively been extended westwards from Impalila to western Caprivi, but specimens are required to confirm this.

Continued on page 303.

Commiphora multijuga

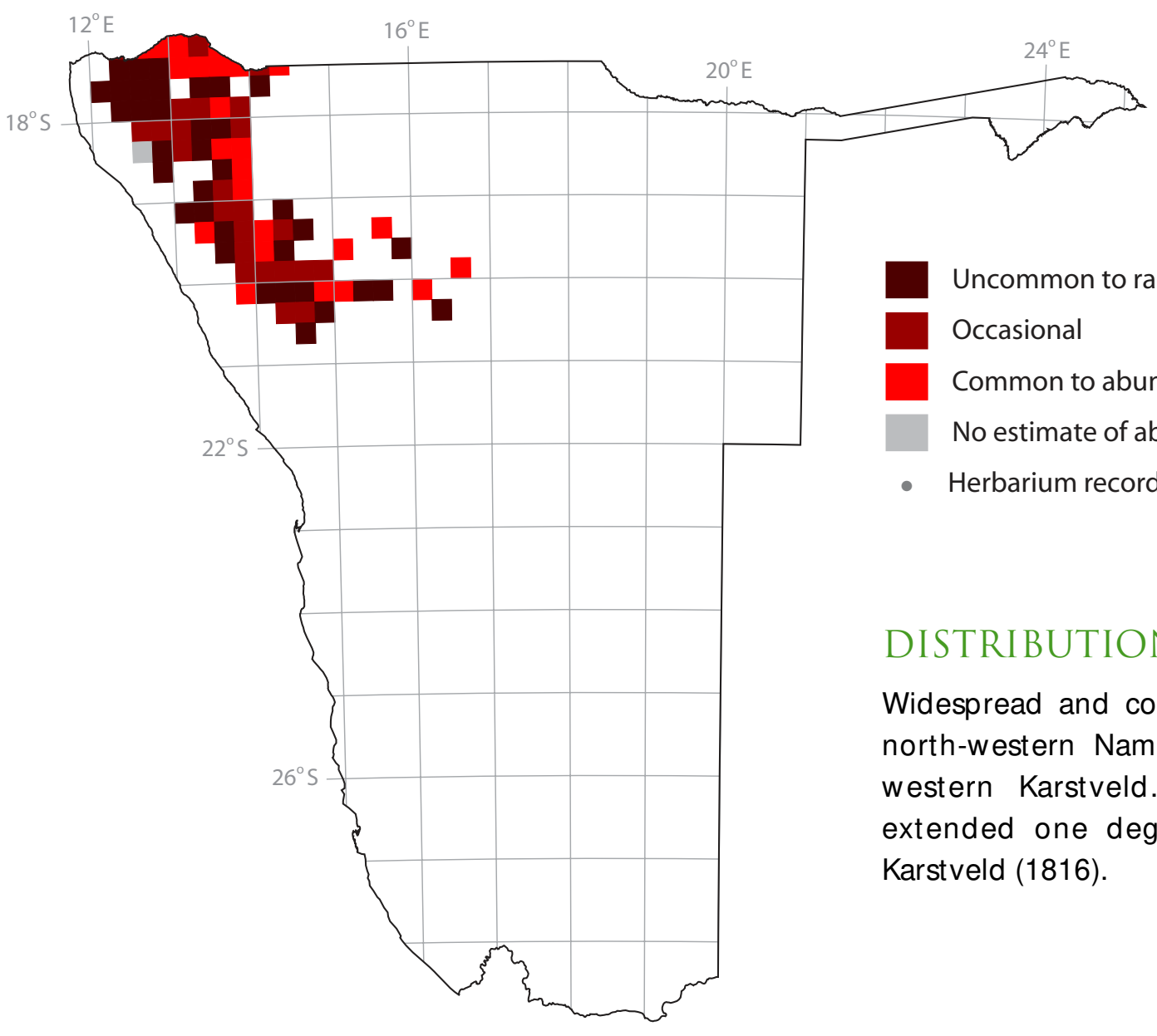
Omuzumba

Purple-stem commiphora (E);
Jochblättriger Balsambaum (G);
tsans (K)

[263 records from 87 (8%) squares]



Tree, usually single-stemmed. BARK **smooth, red-grey to purple-grey or dark brown**, not flaky; bark of old stems dark, occasionally splitting longitudinally. LEAVES compound, spirally arranged, 60–250 mm long; **petiolule 10–15 mm long, slender; leaflet delicate, drooping**, irregularly elliptic to **diamond-shaped**, 12–25 mm long; both surfaces dark green. FLOWERS cream-coloured to yellow, with petals noticeably curled outward. FRUIT ovoid to practically round, *c.* 15 mm in diameter; pseudaril red, four-lobed, practically reaching the tip of the seed.

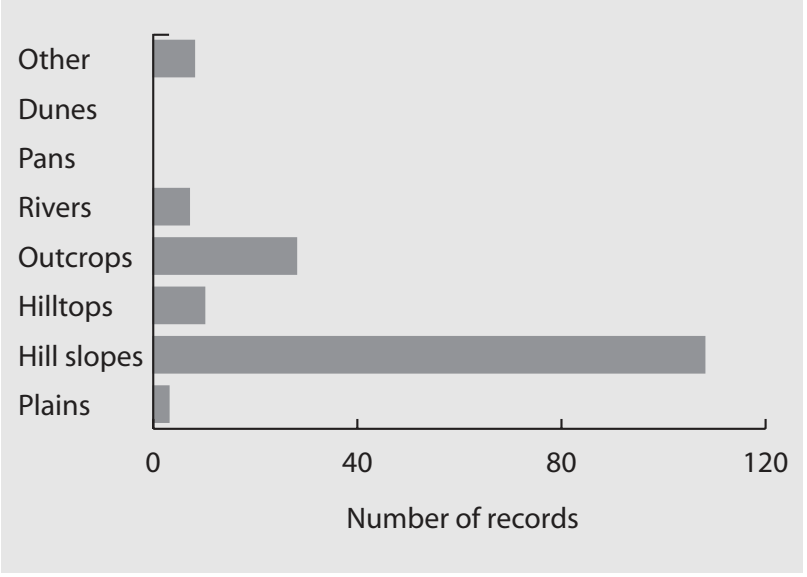


DISTRIBUTION & ABUNDANCE

Widespread and common to uncommon in north-western Namibia, extending into the western Karstveld. The range has been extended one degree to the east in the Karstveld (1816).

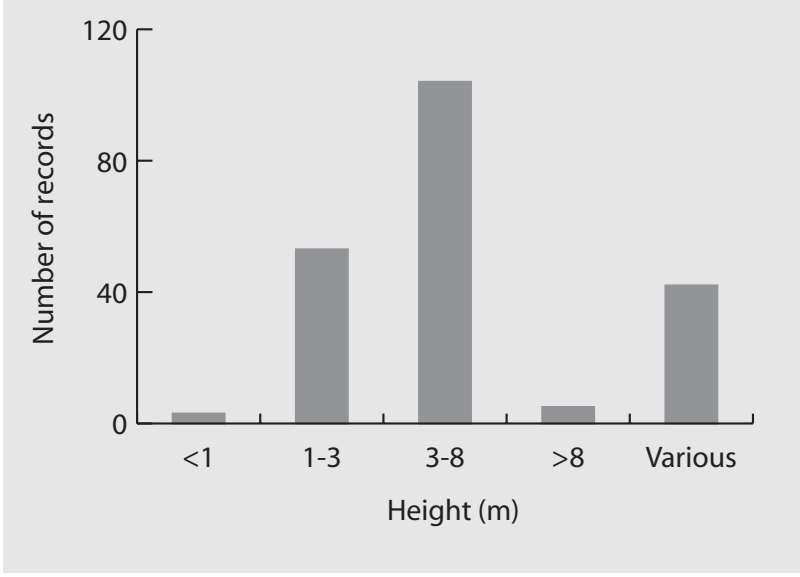
HABITAT

Found on hill slopes and rocky outcrops, growing on various rock types.



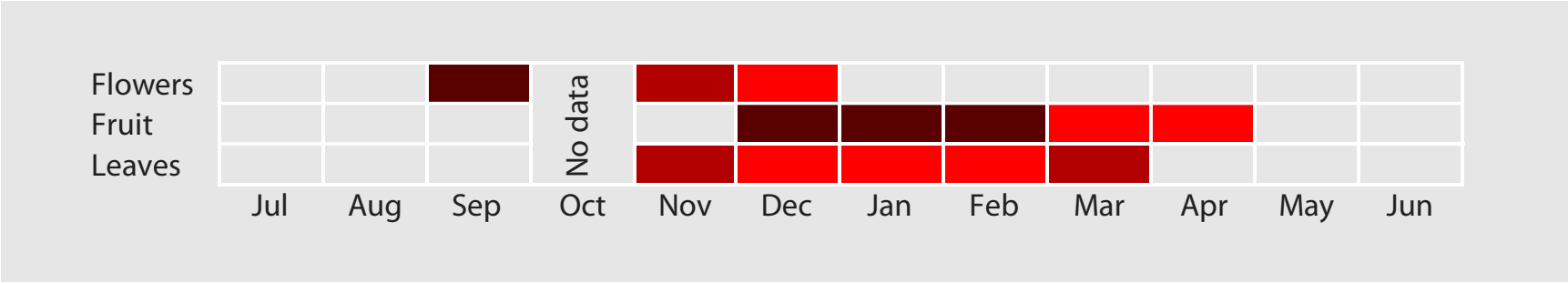
GROWTH FORM

A tree up to 8 m high, seldom taller.



ANNUAL CYCLE

No observations in October. FLOWERS mostly December, with records in September and November. FRUIT December to April, but mostly in March and April. LEAVES December until March, with new leaves in November.

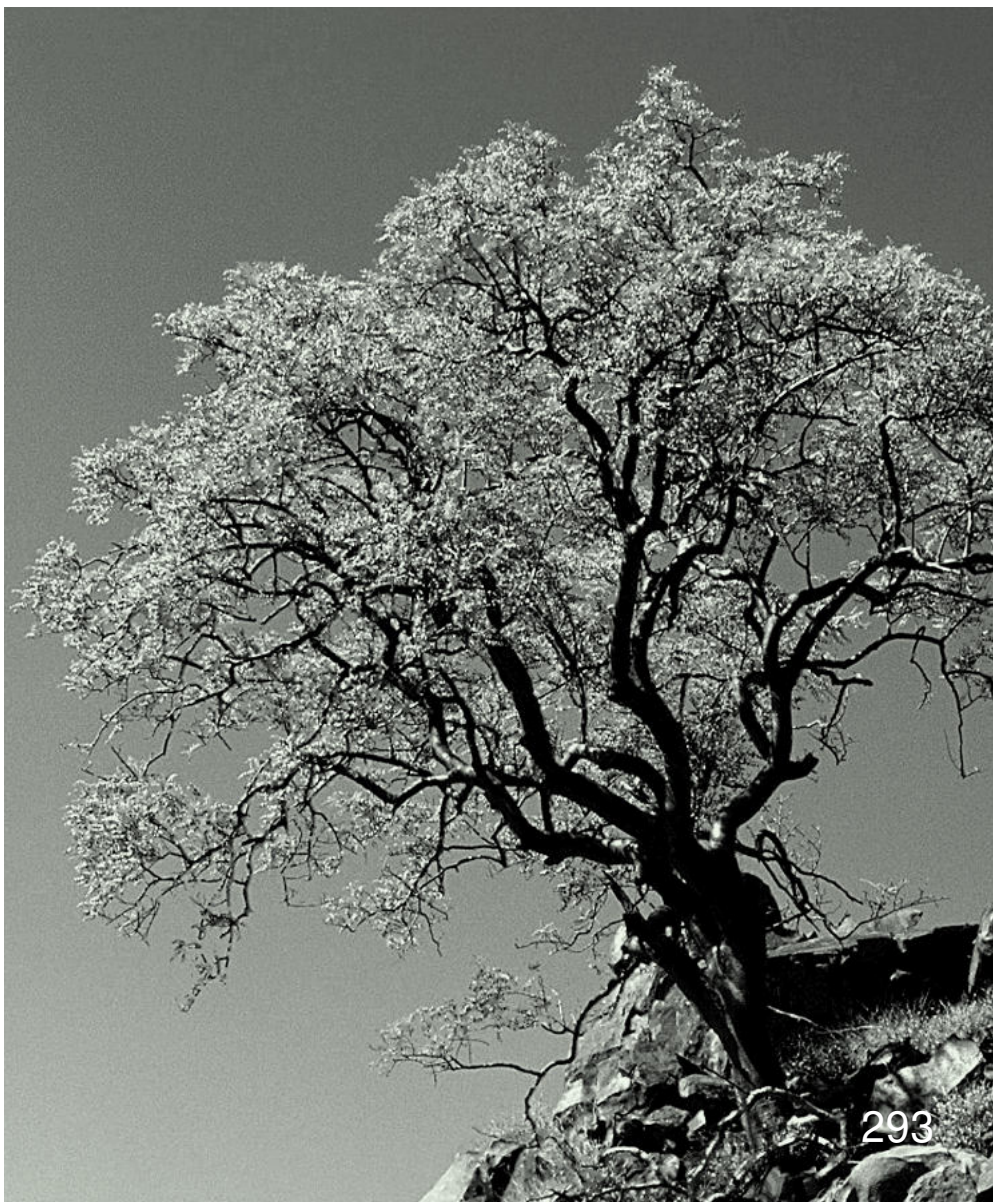


GENERAL

Leaves browsed by small livestock. Strongly aromatic. Himba and Herero women mix the aromatic gum with fat for cosmetic purposes; the sticky, colourless resin can cause blinding; twigs have a pleasant taste and are used to clean teeth. An extremely attractive tree with contrasting bark and delicate leaves, of definite horticultural potential for frost-free areas.

CONSERVATION CONCERNS

Although this species is well used, it does not appear to be threatened. It is heavily damaged in many areas, possibly by animals such as elephant or baboon.

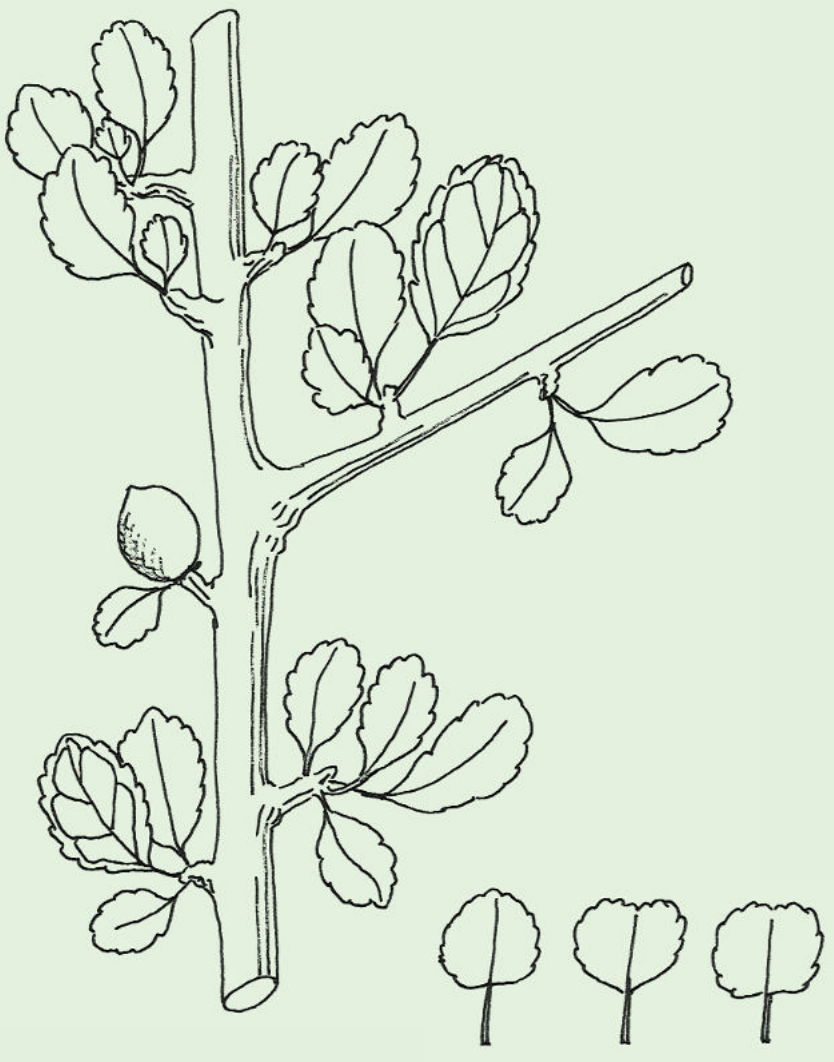


Commiphora multijuga. B. Curtis

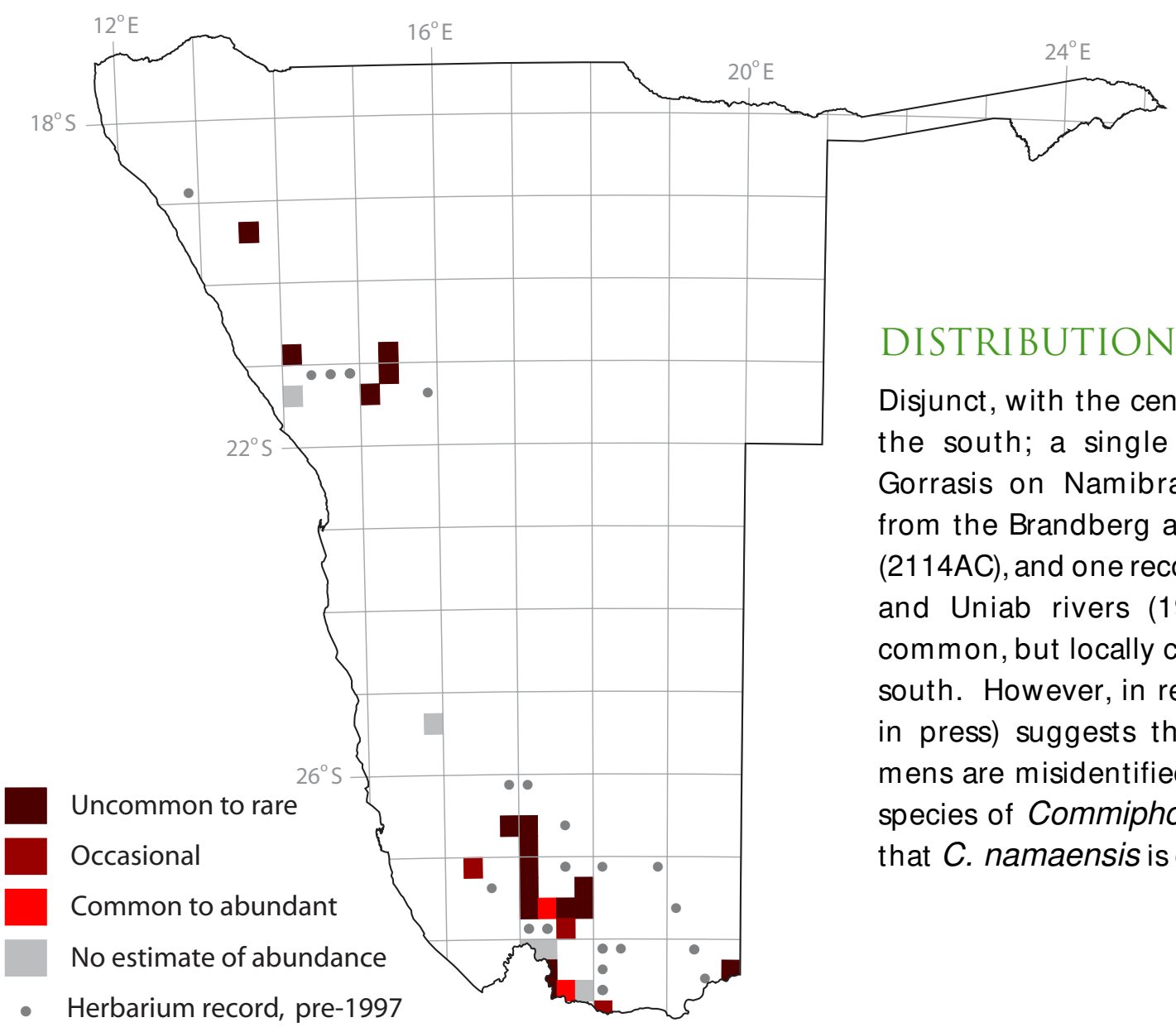
Commiphora namaensis

Nama Corkwood

[35 records from 27 (3%) squares]



Shrub, with **thick, swollen stem branching near the ground** into slender branches; usually less than 1 m high. BARK pale to dark **grey, not flaky**. BRANCHLETS not spine-tipped. LEAVES **usually simple, circular to slightly oblong, 5–15 x 4–12 mm; both surfaces olive-green, hairless; margin scalloped to coarsely toothed**. FLOWERS small and inconspicuous. FRUIT pseudaril with two lobes.

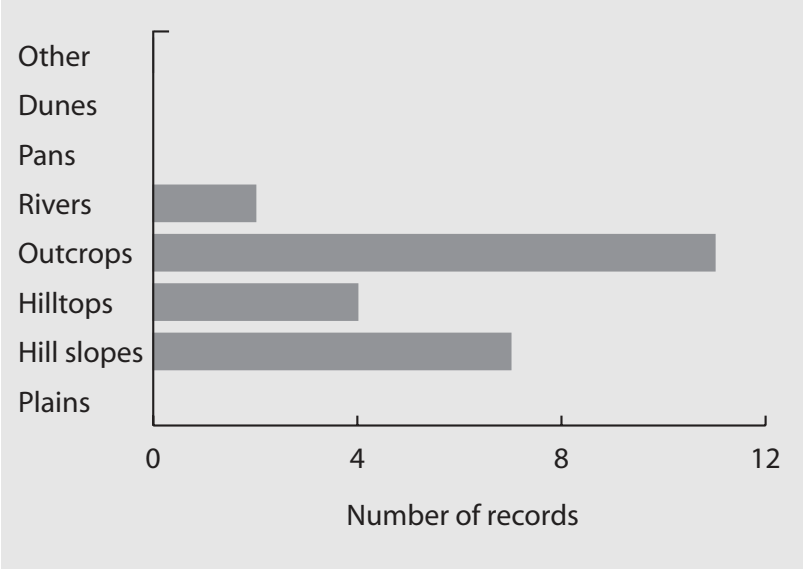


DISTRIBUTION & ABUNDANCE

Disjunct, with the centre of its distribution in the south; a single specimen from Farm Gorrasis on Namibrand (2515BD), records from the Brandberg and Messum Crater area (2114AC), and one record between the Hoanib and Uniab rivers (1913BC). Generally uncommon, but locally common in places in the south. However, in recent work (Swanepoel, in press) suggests that the northern specimens are misidentified *C. dinteri* or the new species of *Commiphora* (see page 262), and that *C. namaensis* is confined to the south.

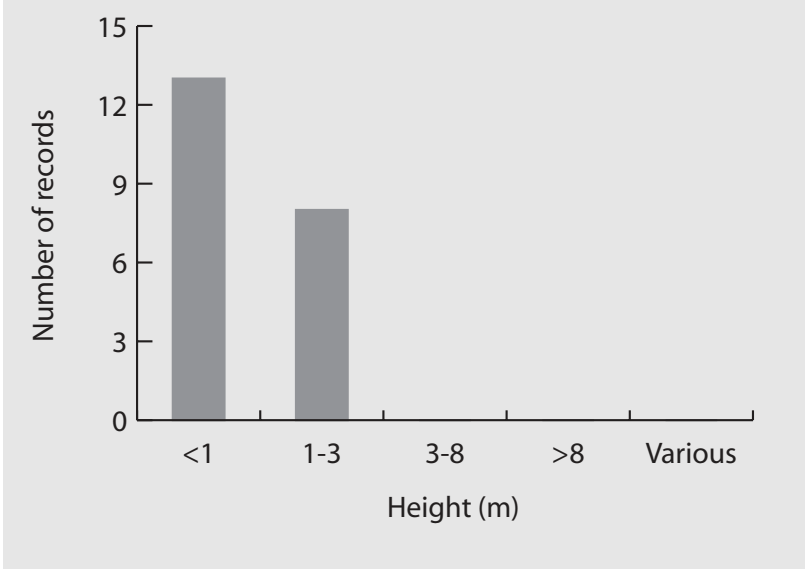
HABITAT

Mostly found on rocky outcrops and hill slopes, but also along dry river courses.



GROWTH FORM

Generally recorded as a shrub of less than 1 m, but occasionally up to 3 m in the south.



ANNUAL CYCLE

FLOWERS in October and November. FRUIT from February to May, but mostly in May. LEAVES present on some individuals for most of the year.

GENERAL

Caterpillars sometimes defoliate this species. Of horticultural potential as a pachycaul or bonsai subject.

CONSERVATION CONCERNS

The decrease in range as compared with earlier herbarium specimens could be of concern, but the species is very localised, and could have been overlooked. Potentially threatened by illegal collecting for the pachycaul trade. Near-endemic.

Commiphora namaensis, near the Orange River, C. Mannheimer

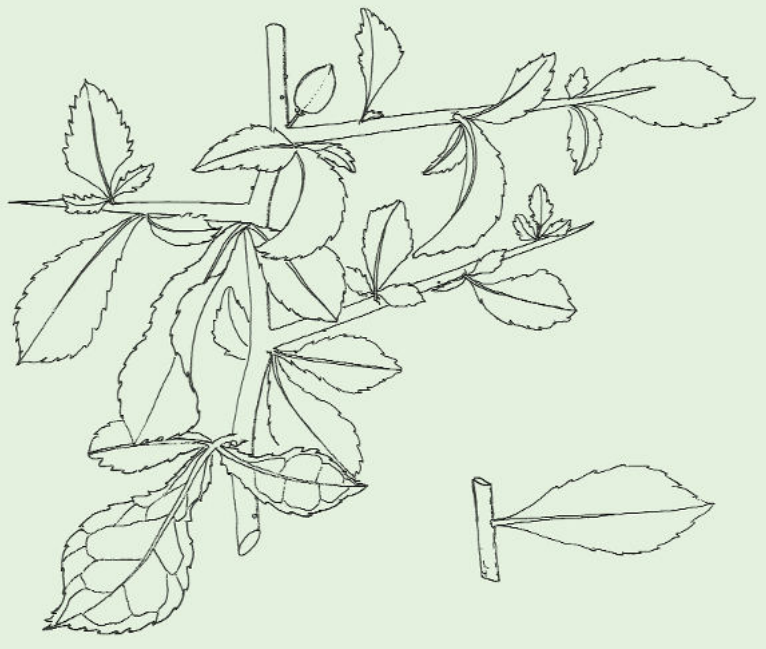


Commiphora pyracanthoides

Firethorn Corkwood

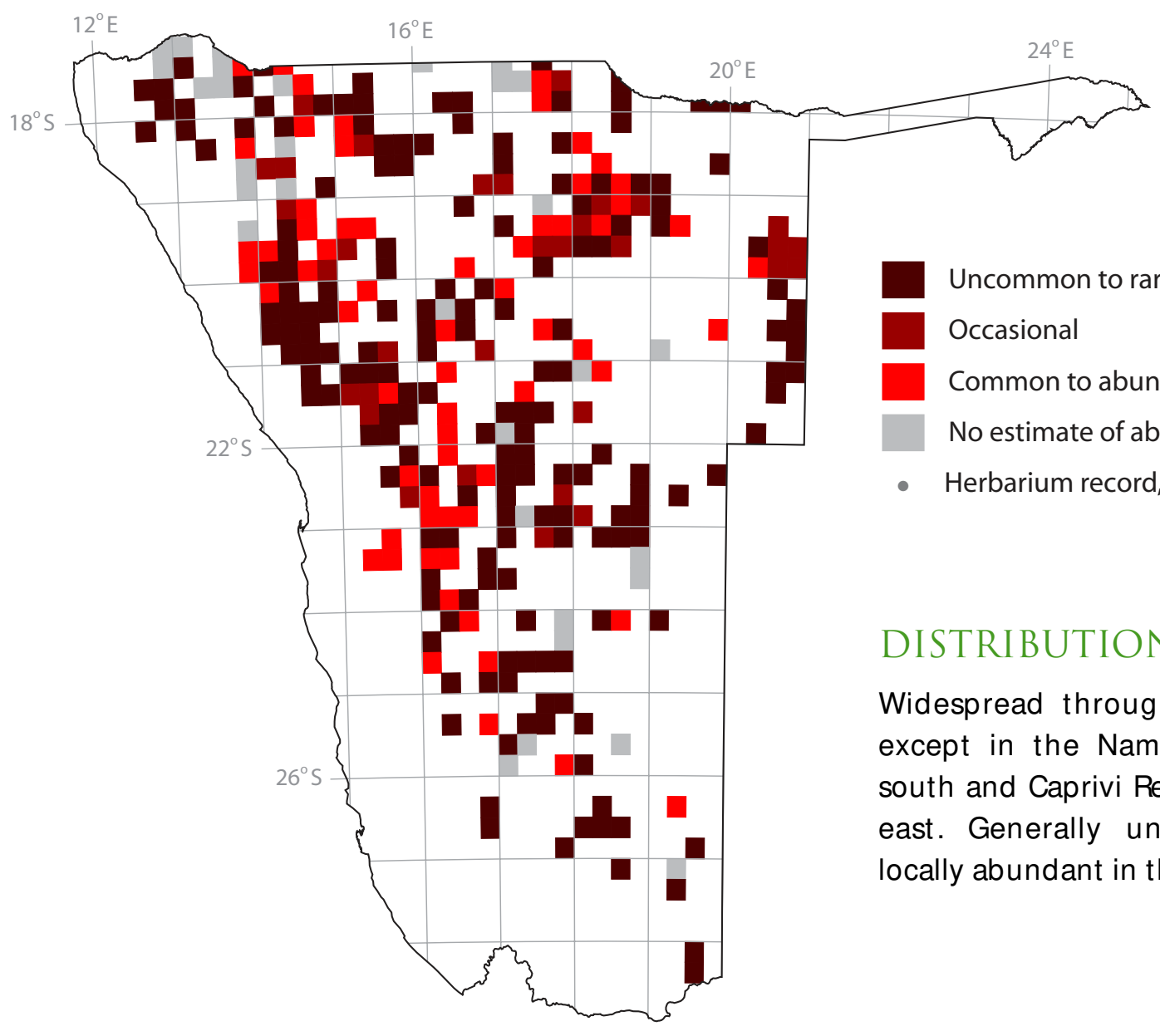
Small common corkwood (E);
Feuerdorn (G); /iinîb (K)

[543 records from 309 (29%) squares]



Spiny, many-stemmed shrub, occasionally a tree. BARK peeling off in yellowish, papery strips to expose a green underbark. LEAVES **simple** or trifoliolate, generally clustered, obovate to elliptic; **both surfaces shiny green** with long, glandular hairs, especially concentrated at base; **margin mostly toothed;** petiole very short. FLOWERS small, pink to pale red, on dwarf-shoots. FRUIT ovoid to round, up to 18 mm in diameter; pseudaril red, four-lobed with lobes covering the entire seed.

Very difficult to distinguish from *C. glandulosa* without looking for the absence of glandular hairs on the calyx. *Commiphora pyracanthoides* is generally a shrub, and this criterion was used to separate the two species in most cases.

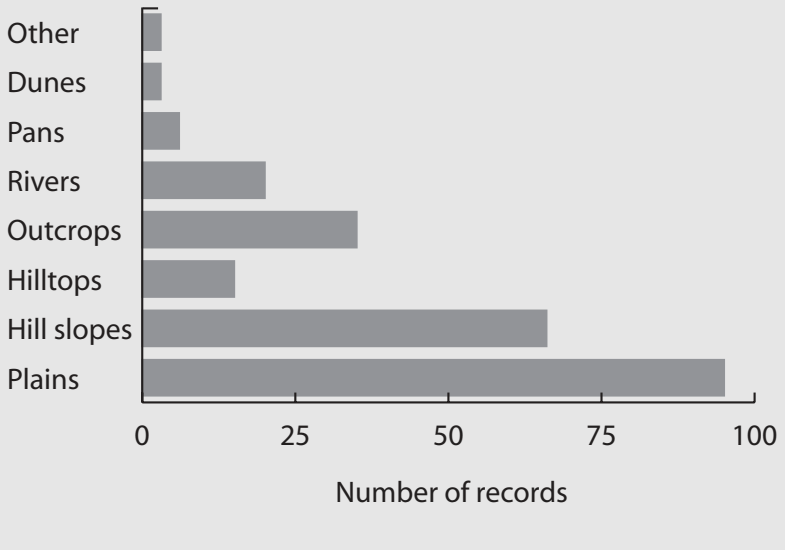


DISTRIBUTION & ABUNDANCE

Widespread throughout most of Namibia, except in the Namib Desert, the extreme south and Caprivi Region. Intermittent in the east. Generally uncommon to common; locally abundant in the Karstveld,

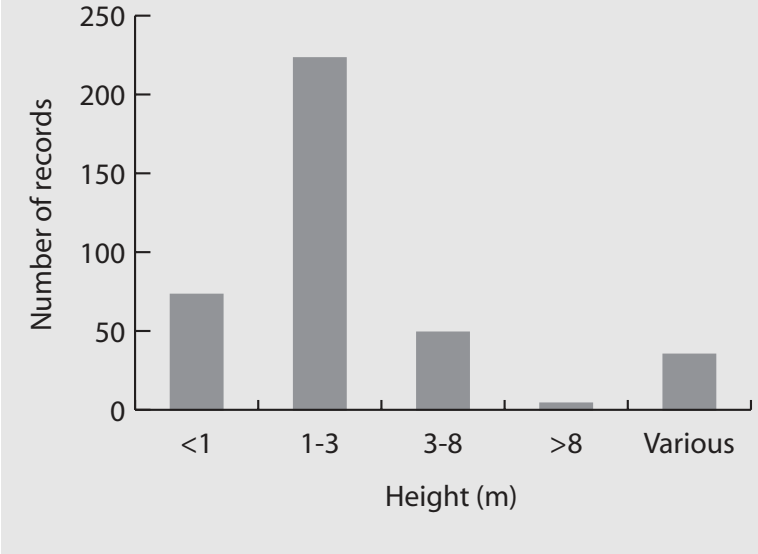
HABITAT

Found in various habitats, but mainly on plains, hill slopes and rocky outcrops. Grows on sand, calcrete and stony or rocky ground.



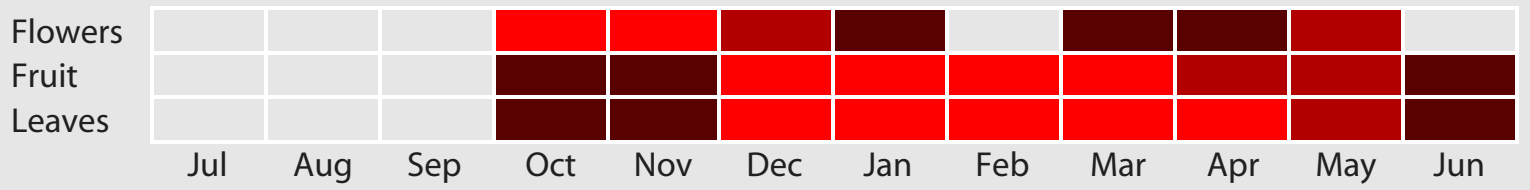
GROWTH FORM

Generally a shrub in the 1–3-m height class, sometimes over 3 m, often growing under other plants; occasionally a tree up to 8 m high.



ANNUAL CYCLE

This is a rain-dependent species. FLOWERS mostly in October and November, with a smaller peak in May and intermittent records almost all year. FRUIT mainly December to March. LEAVES December to May, with young leaves in October and November.



GENERAL

The leaves are browsed. The fruit are inedible. The roots have a thirst-quenching sap. An extract from the bark is used to straighten hair and treat gall diseases in calves; the resin is edible (compare with *C. glandulosa*), but is also used as soap. The wood is used to start fires by rubbing sticks together; finely crushed wood is used as snuff. This plant is used to build ‘living fences‘. Called ‘Botterboom‘ and ‘Pendoring‘ on some farms, but both these names more often refer to completely different species.

CONSERVATION CONCERNS

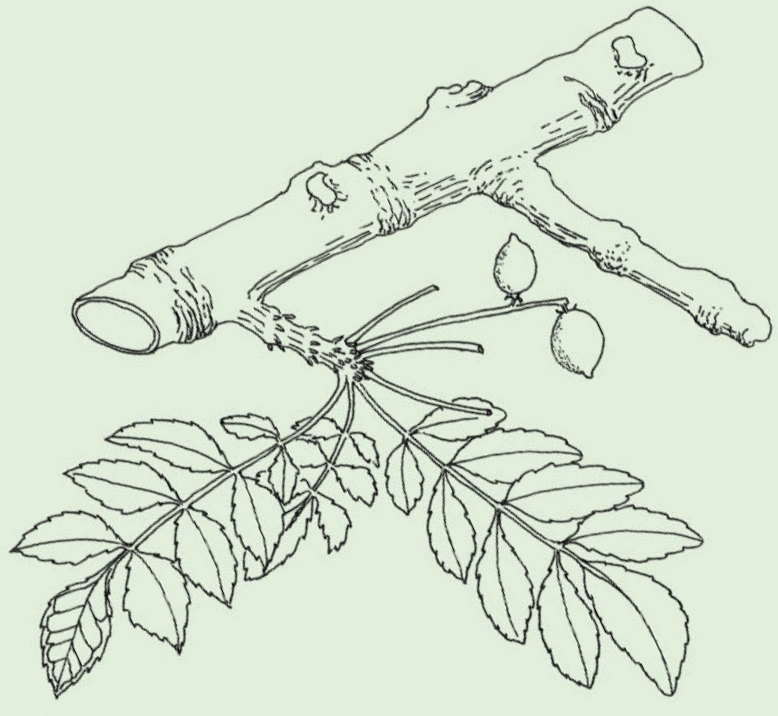
None recorded.

Commiphora saxicola

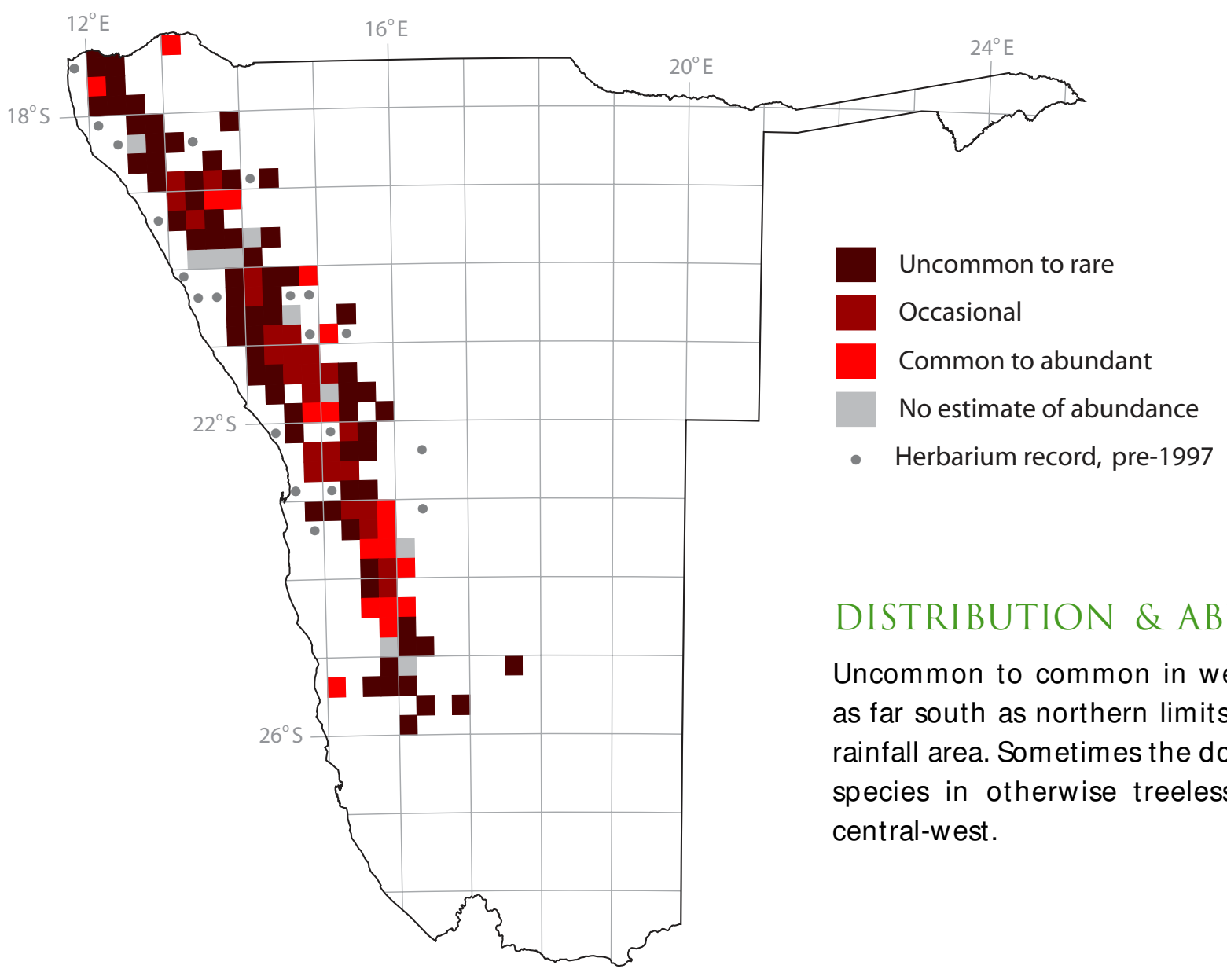
Rock Corkwood

Felsenmyrrhe (G); //gai (K)

[338 records from 125 (12%) squares]



Low-growing shrub with short, swollen stem, or a small, single-stemmed tree. BARK **grey, finely speckled, smooth, not flaky**. LEAVES compound, spirally arranged or clustered on dwarf shoots, 25–160 mm long; leaflet elliptic, **practically circular**; both surfaces dark green to yellow-green **with a dull, waxy coating above**, veins prominent below; **often folded upward along the midrib**; margin **deeply toothed**; apex blunt to shallowly notched to pointed. FLOWERS small, pale green to cream-coloured, appearing before the leaves. FRUIT ovoid, up to 10 mm in diameter, with pointed apex.



DISTRIBUTION & ABUNDANCE

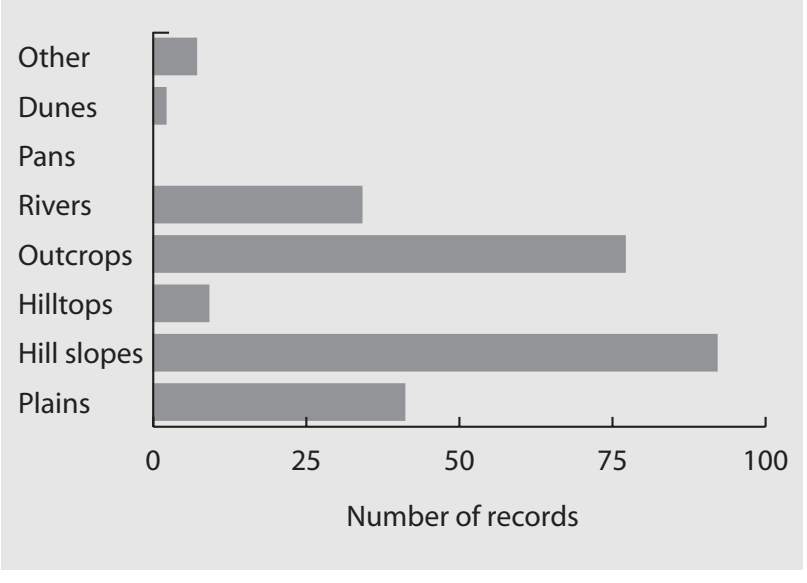
Uncommon to common in western Namibia as far south as northern limits of the winter-rainfall area. Sometimes the dominant woody species in otherwise treeless areas in the central-west.

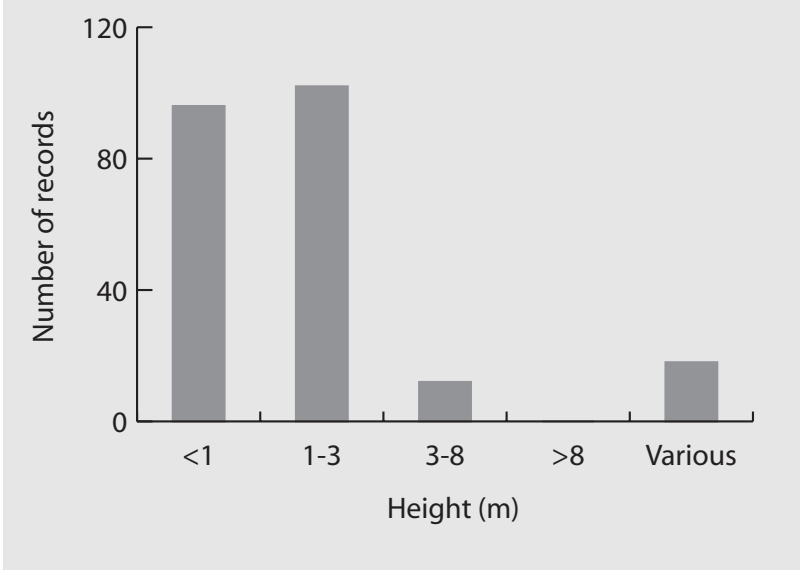
HABITAT

Various, but mainly on rocky outcrops, hill slopes, plains and along dry watercourses. Generally growing on rock, sometimes gravel.

GROWTH FORM

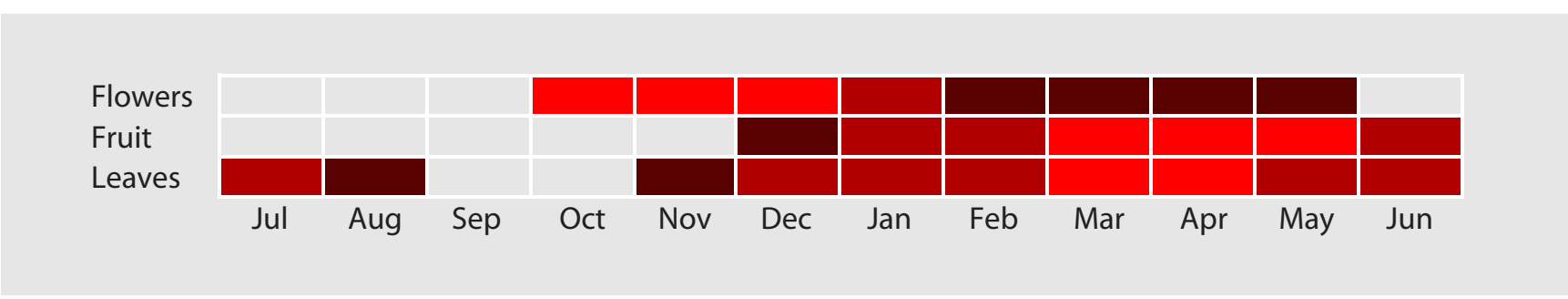
Generally, a fat-stemmed shrub less than 1 m high, but sometimes taller than 1 m. In the north, and occasionally in the central-west, it can become a single-stemmed tree of up to 8 m tall.





ANNUAL CYCLE

FLOWERS mainly October to December, but have been recorded up till May. FRUIT most often recorded in April, but present from December to June. LEAVES March and April, mainly; individuals with leaves can be seen at almost any time depending on the rainfall the area has received.

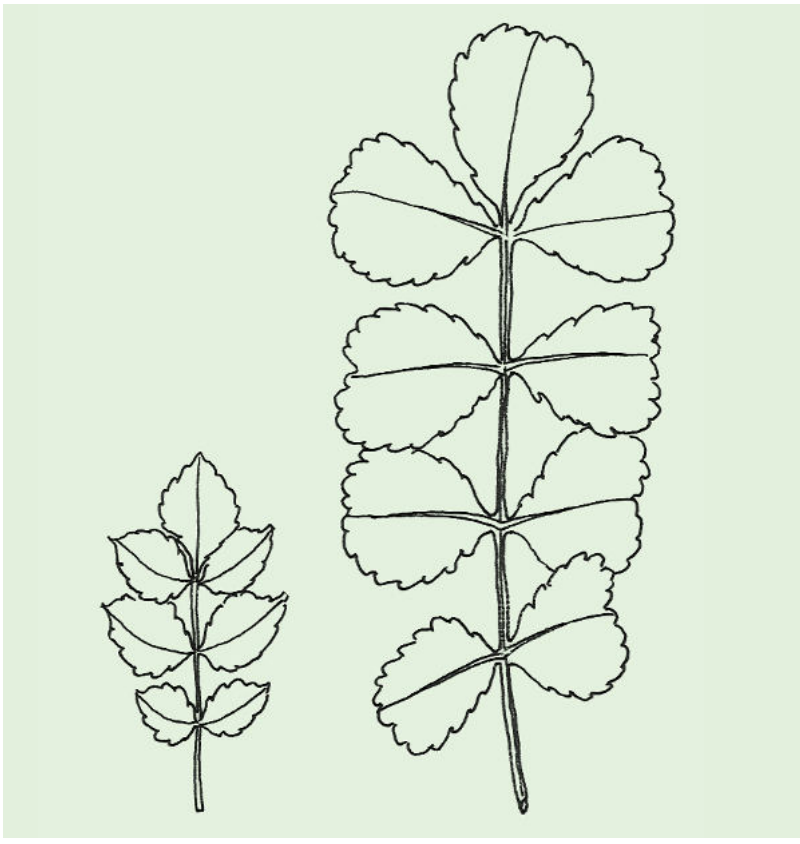


GENERAL

Rain-dependent species; sometimes defoliated by caterpillars. Of horticultural potential as pachycaul and bonsai subject.

CONSERVATION CONCERNS

Illegal removal for pachycaul trade as a collectors item. Endemic to Namibia.



Commiphora tenuipetiolata

Satin-bark Corkwood

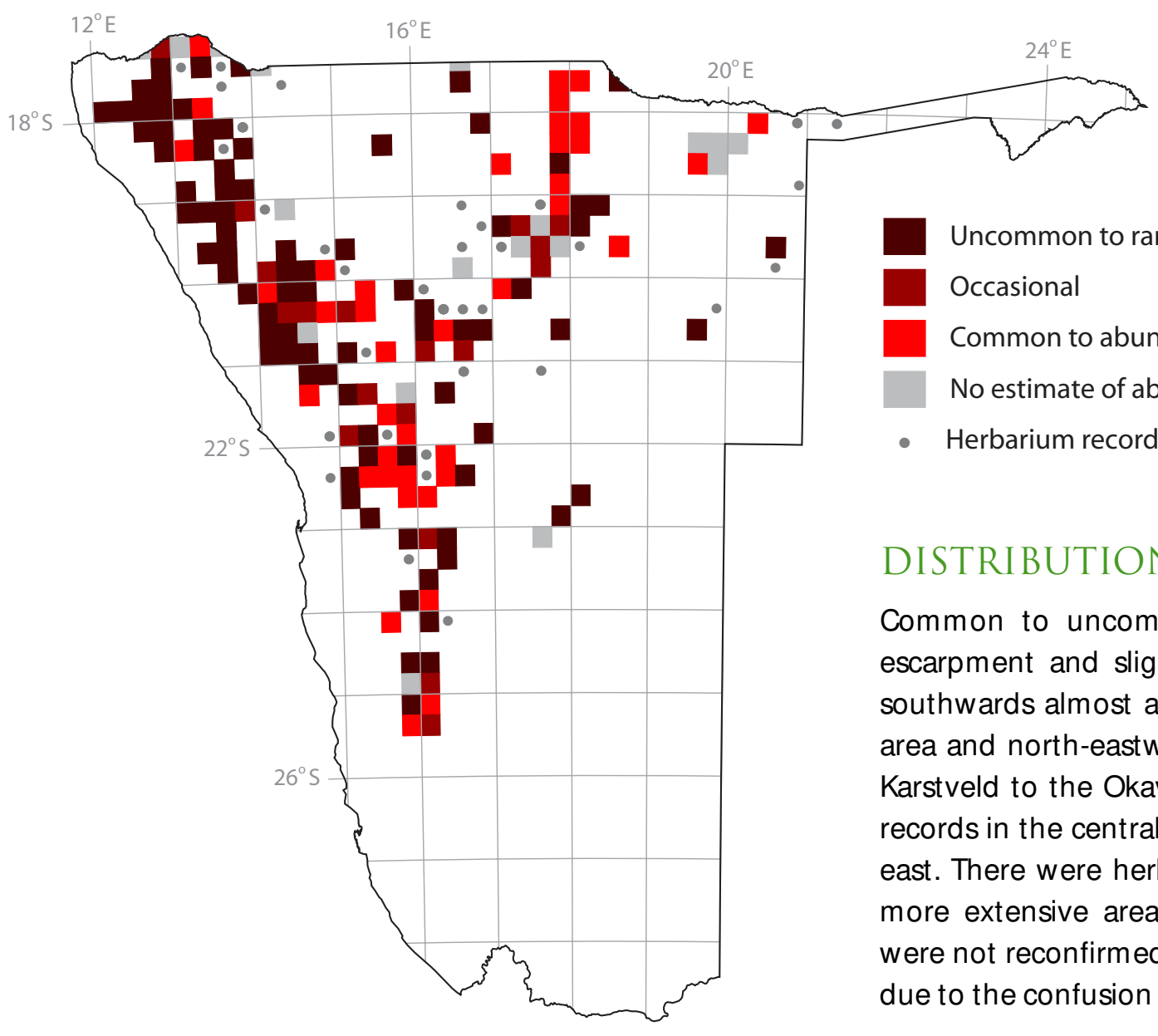
Witstamkanniedood (A); /uri/huus (K)

[274 records from 165 (15%) squares]



Single-stemmed tree, occasionally a shrub. BARK grey to white to **yellowish, peeling off in white, papery strips to expose a blue-green underbark**. LEAVES pinnately compound or trifoliolate, 25–55 mm long; **petiole long, slender**; leaflet obovate to elliptic; both surfaces grey-green or yellow-green to blue-green, **hairless to downy** (trees with downy leaves usually confined to the northern regions of Namibia while those with hairless leaves occur exclusively in the south); margin entire or toothed near the tip. FLOWERS small, pale green. FRUIT almost round, up to 15 mm in diameter; pseudaril bilobed, covering between one-third and three-quarters of the seed.

Can be confused with *C. angolensis*, which is generally a low shrub with hairs on the young branchlets, whereas *C. tenuipetiolata* is generally a tree with hairless young branches.

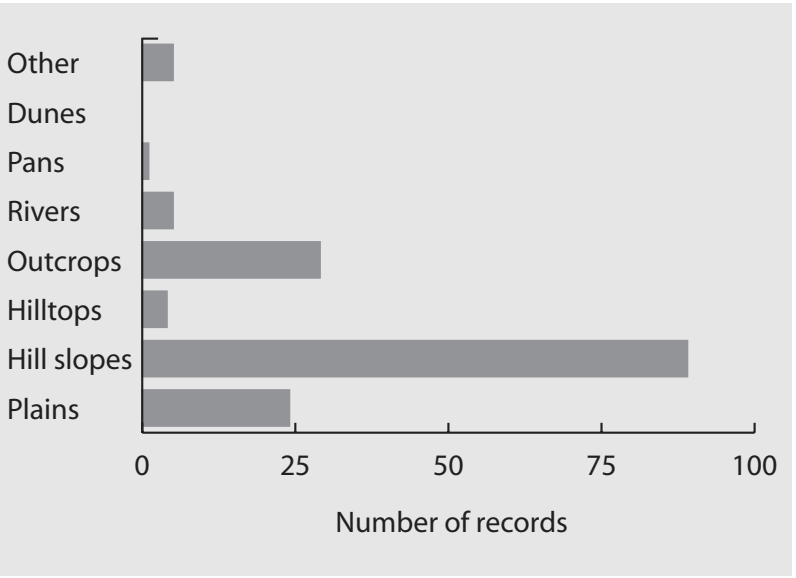


DISTRIBUTION & ABUNDANCE

Common to uncommon along the western escarpment and slightly east of it, extending southwards almost as far as the winter-rainfall area and north-eastwards through the eastern Karstveld to the Okavango River, with isolated records in the central highlands and the north-east. There were herbarium specimens from a more extensive area in the north-east which were not reconfirmed by the TAP; this could be due to the confusion with *C. angolensis*.

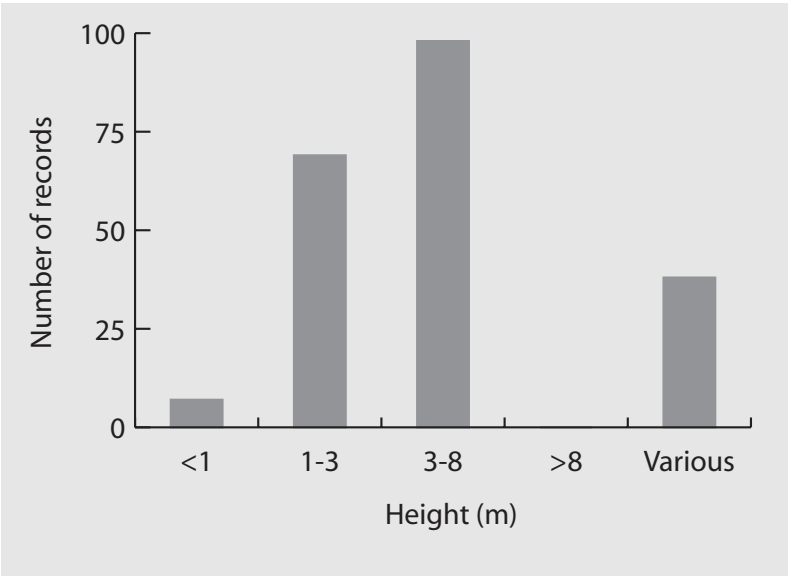
HABITAT

Mostly found on hill sides, though also on plains and rocky outcrops; sometimes on steep slopes. Grows on both rocky and sandy substrates.



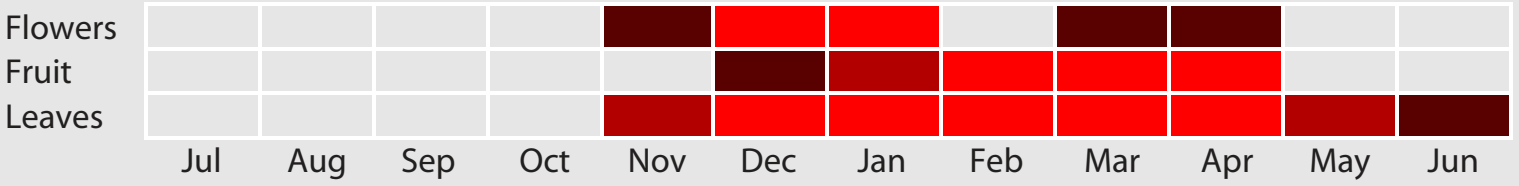
GROWTH FORM

Usually a tree up to 8 m high, but often a shrub up to 3 m. On Farm Oros (2017AA) there are many trees with very contorted, multiple stems.



ANNUAL CYCLE

FLOWERS mostly in December and January, but also sometimes in March and April. FRUIT peaked in March, but could be found from December to April. LEAVES mainly from December to May, with young leaves mostly in November and December.

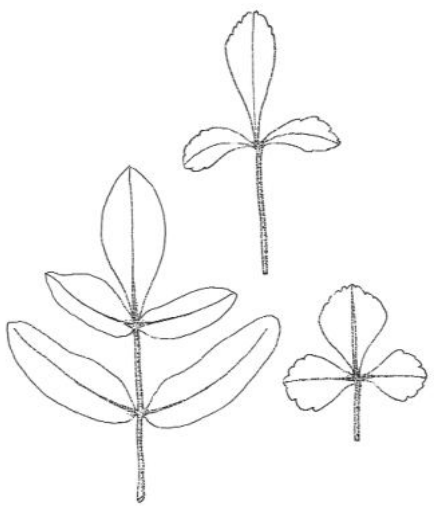


GENERAL

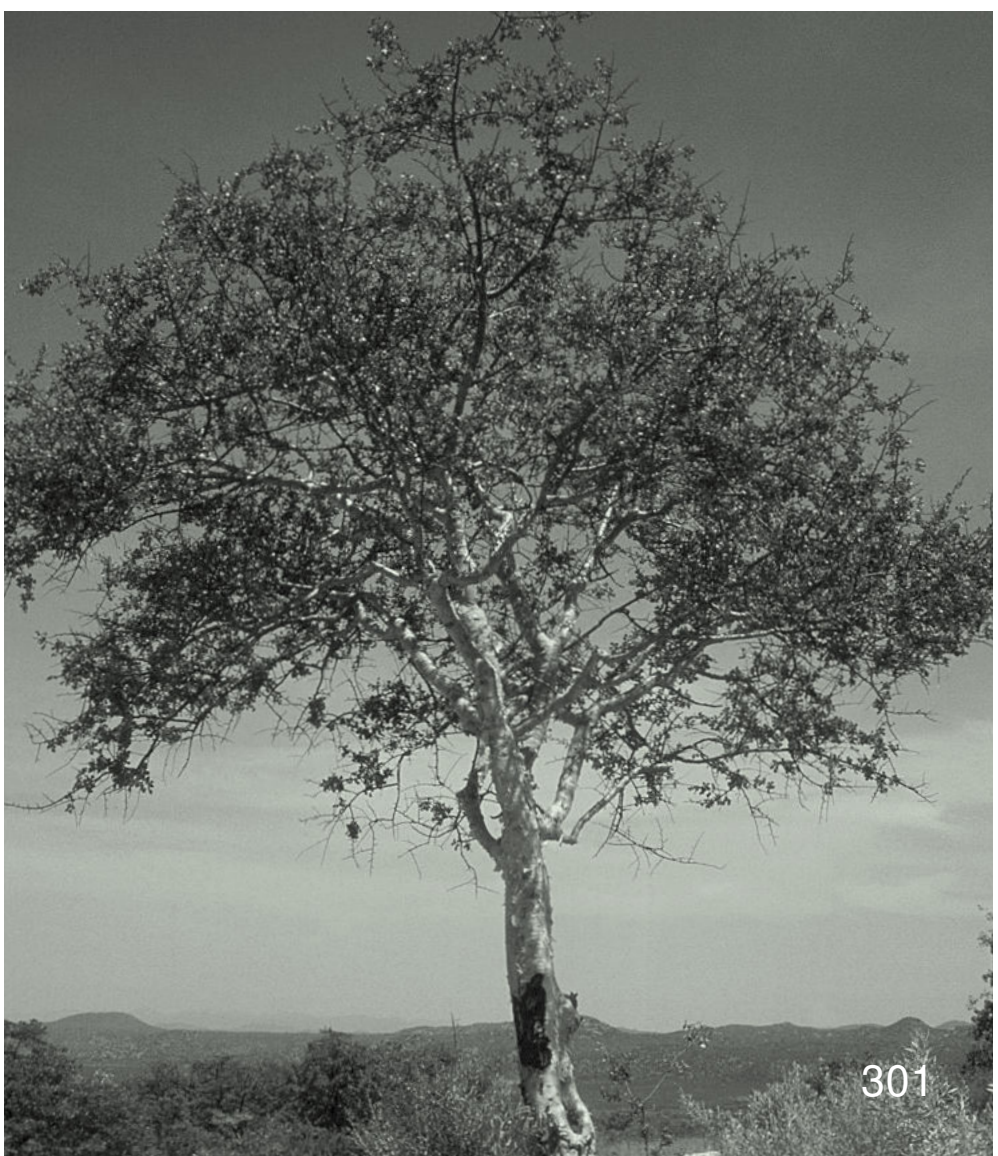
Of horticultural potential.

CONSERVATION CONCERNS

None recorded.



Commiphora tenuipetiolata, just south of Kunene River. B. Curtis

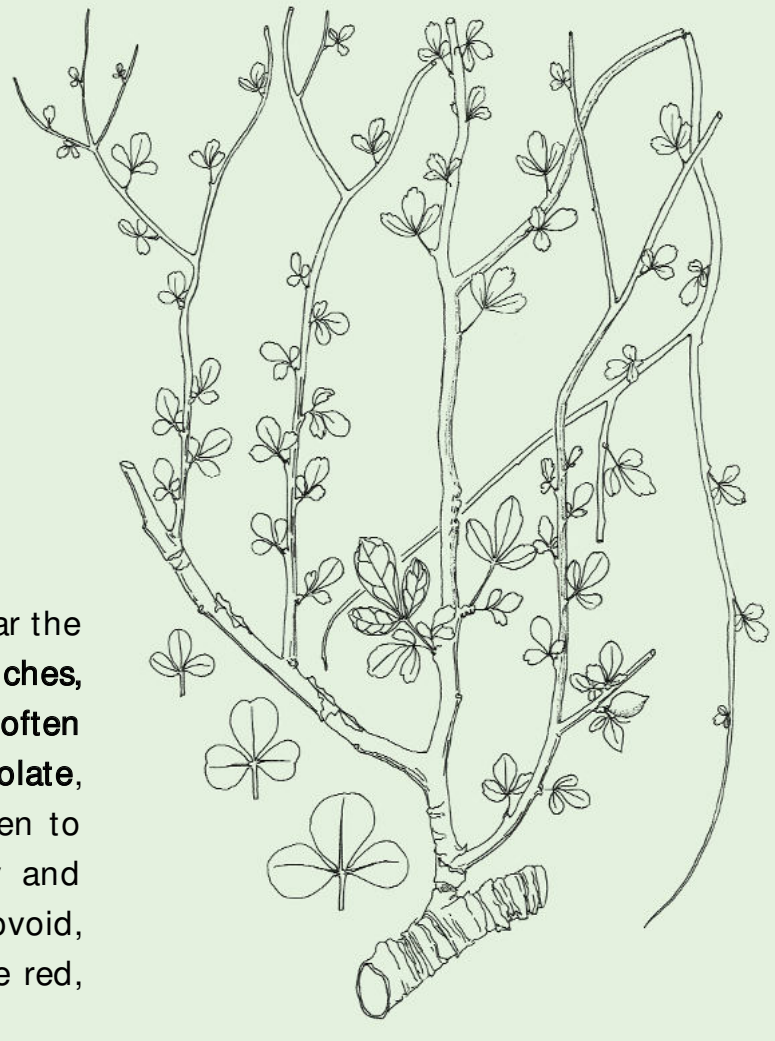


Commiphora virgata

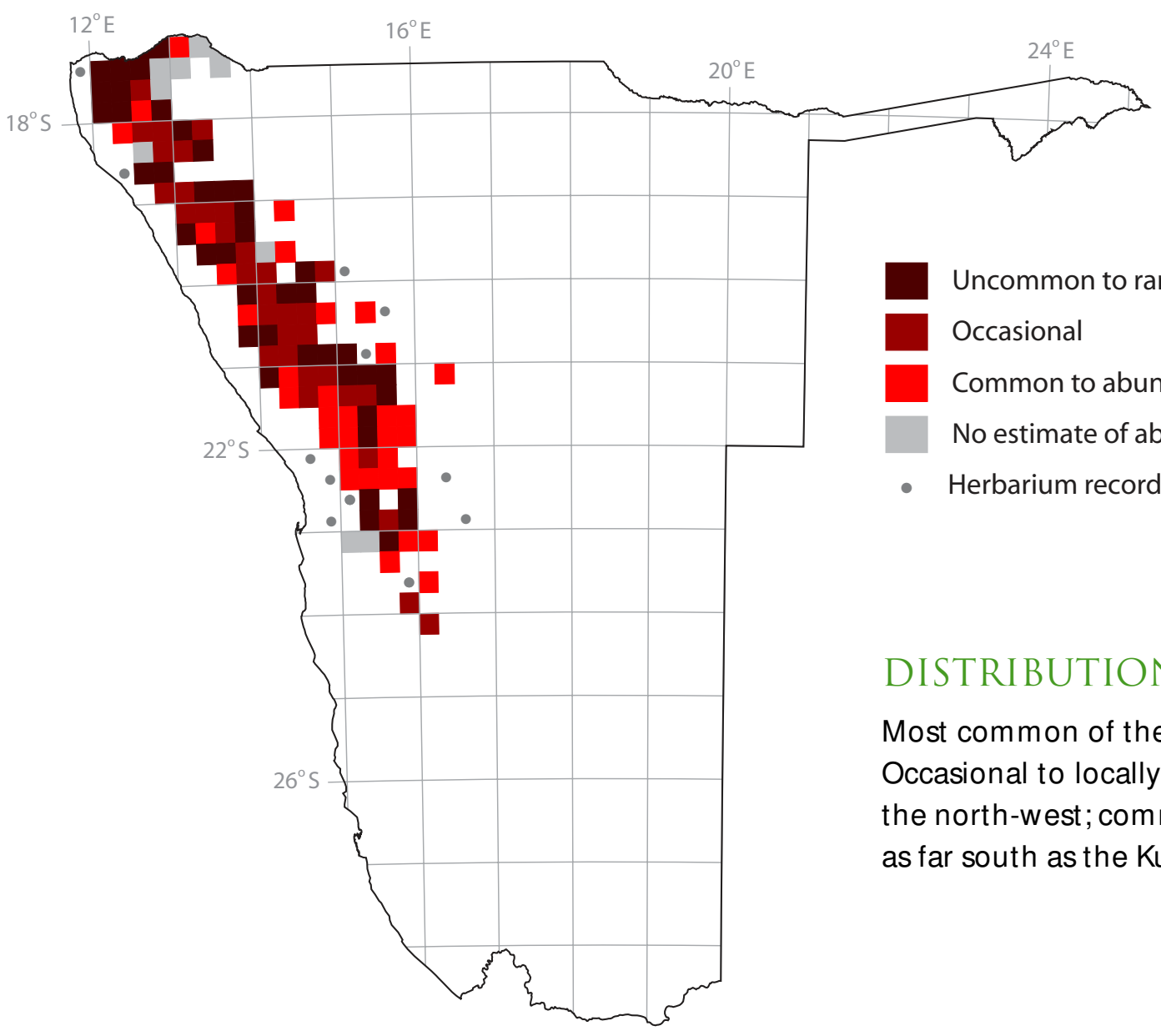
Omumbara

Slender corkwood (E);
slapkanniedood (A); soba (K)

[271 records from 120 (11%) squares]



Much-branched shrub or a shrubby tree branching near the ground. BARK **yellow-white to silvery on main branches, peeling off in papery strips**. BRANCHLETS **slender and often drooping, older branchlets red-brown**. LEAVES **trifoliolate**, leaflet usually obovate, small; both surfaces dark green to green-yellow, **hairless; margin entire**; petiole lanky and slender. FLOWERS small, greenish to green-yellow. FRUIT ovoid, up to 10 mm in diameter, red; pseudaril white to pale red, four-lobed with lobes almost covering entire seed.

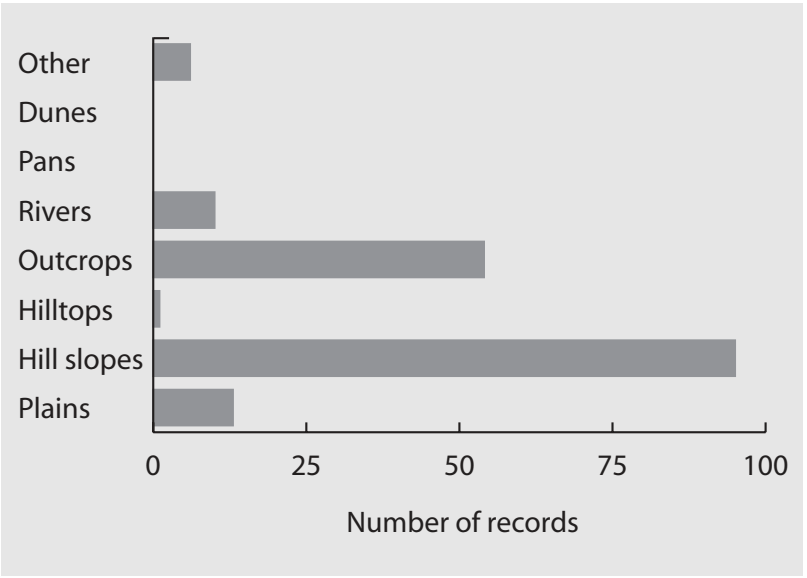


DISTRIBUTION & ABUNDANCE

Most common of the small *Commiphora* spp. Occasional to locally common or abundant in the north-west; common in the central Namib as far south as the Kuiseb River.

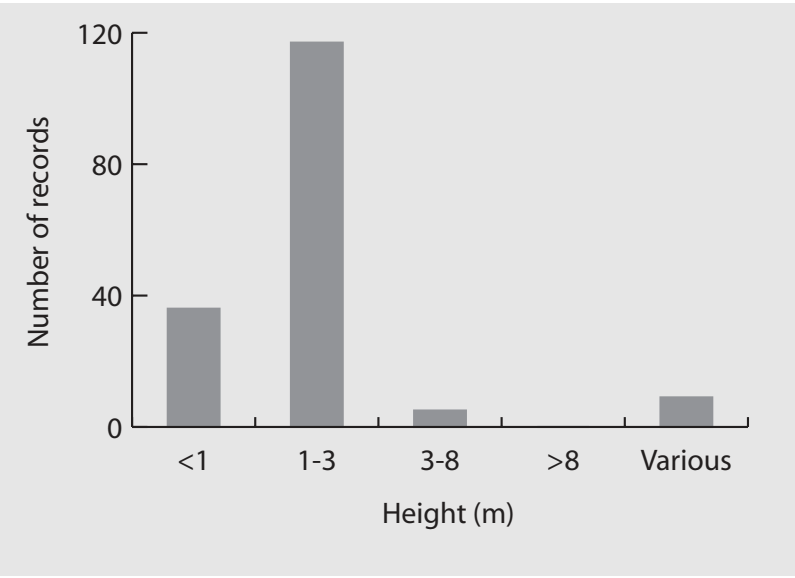
HABITAT

Found mainly on hill slopes and rocky outcrops, on stony, rocky or gravel substrates.



GROWTH FORM

Usually a shrub of less than 3 m high; just south of the Kunene River it is often a tree of over 3 m.



ANNUAL CYCLE

FLOWERS mostly in December, with occasional records in other months. FRUIT most often recorded in April, but present from October to May. LEAVES present on most plants from February to April, with new leaves produced in November and December.



GENERAL

A pachycaul collector's item, and of horticultural potential as such, and as a bonsai subject.

CONSERVATION CONCERNS

Potentially threatened by pachycaul collectors. Endemic.

Commiphora mossambicensis *Continued from page 291:*

HABITAT

Found on river banks.

GROWTH FORM

Mostly recorded as a shrub in the 1–3-m height class. A tree of 6 m on Impalila Island. A 'really scruffy, clambering shrub' at Lian-shulu Bush Lodge (1823AB, SHA1).

ANNUAL CYCLE

Data only recorded in May, August and November. FLOWERS and FRUIT only recorded in August. LEAVES recorded in May and November, with young leaves in August.

CONSERVATION CONCERNS

None recorded.

Commiphora wildii

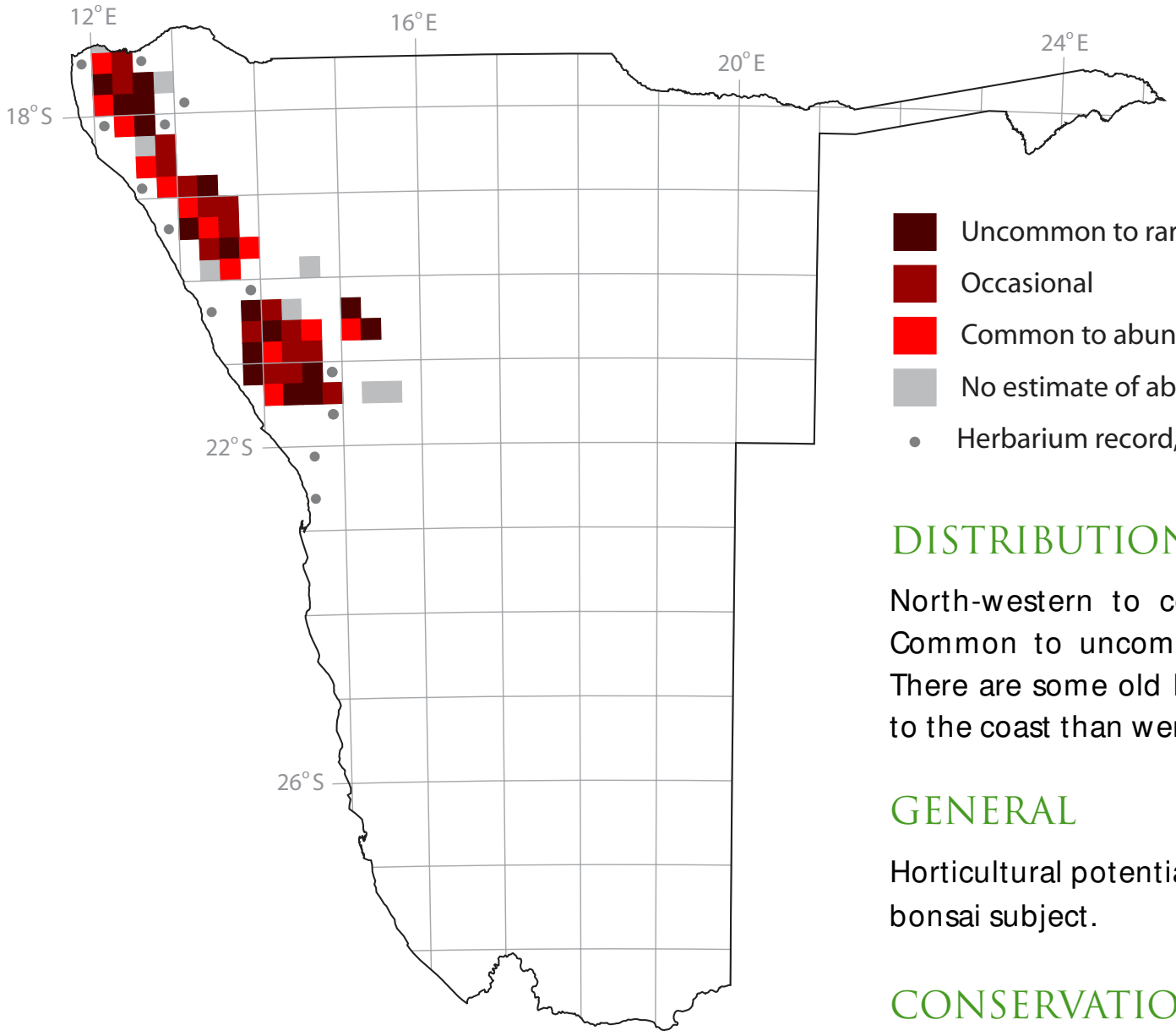
Omumbiri

Oak-leaved Commiphora (E)
Herare (K); oshiziwowo (Od)

[147 records from 56 (5%) squares]



Deciduous shrub, with **thick, swollen stem branching near the ground**; generally growing almost prostrate over rocks, occasionally erect; crown diameter of up to 5 m. BARK **grey-brown, shiny, mostly smooth**; occasionally peeling off in papery strips. LEAVES **resembling oak leaves** with leaf base **continuing down rachis and petiole so that these appear winged**. FRUIT with yellow to orange pseudaril, four-lobed with lobes covering a quarter of the seed.



DISTRIBUTION & ABUNDANCE

North-western to central-western Namibia. Common to uncommon, seldom abundant. There are some old herbarium records closer to the coast than were recorded by the TAP.

GENERAL

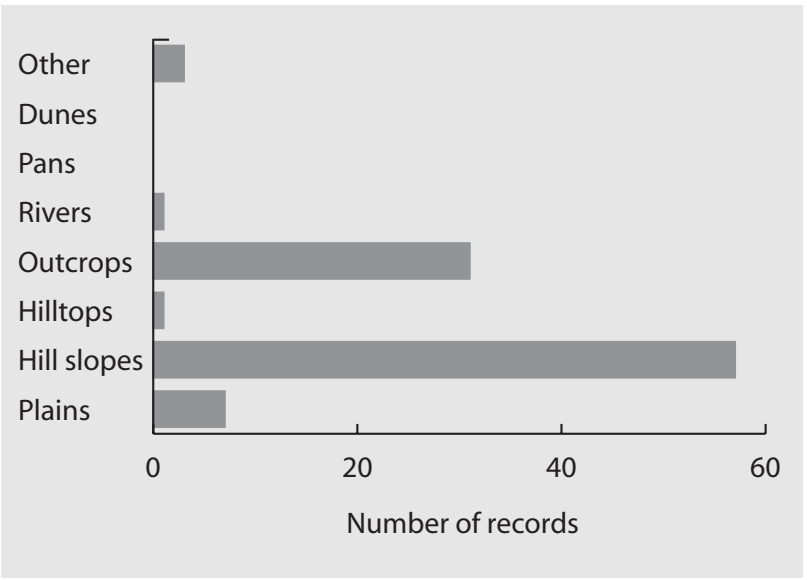
Horticultural potential as pachycaul and bonsai subject.

CONSERVATION CONCERNS

None recorded. Endemic to Namibia.

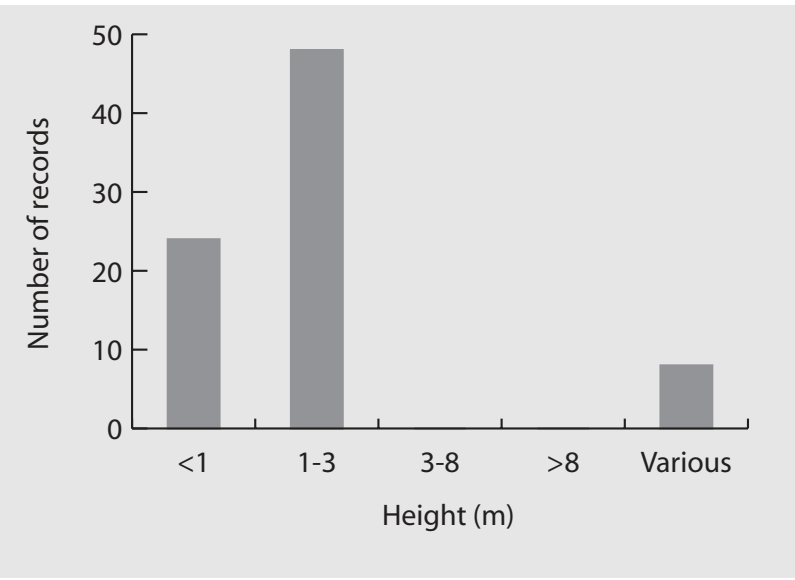
HABITAT

Found on rocky or stony hill slopes and rocky outcrops, including granite; sometimes on plains and in other habitats.



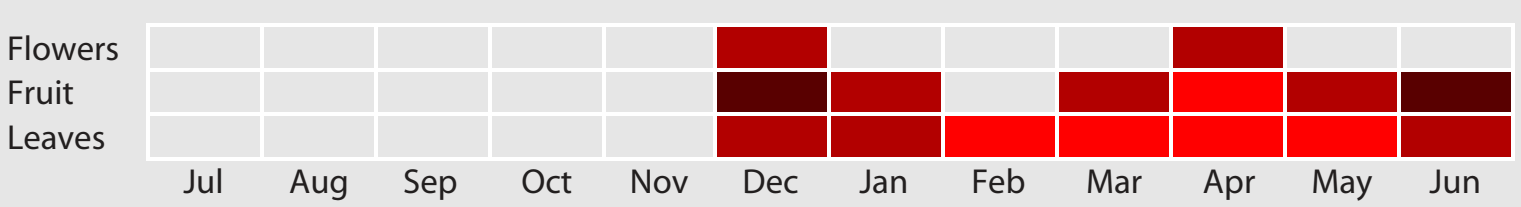
GROWTH FORM

A shrub, generally less than 3 m high.



ANNUAL CYCLE

FLOWERS recorded in December and April. FRUIT recorded from December to June, but mostly in April; fresh seeds found on one individual near the Brandberg in September (ELL1). LEAVES from December to June, with young leaves in December.



Commiphora wildii, less common, erect growth form, E. Ellinger



Ptaeroxylon obliquum

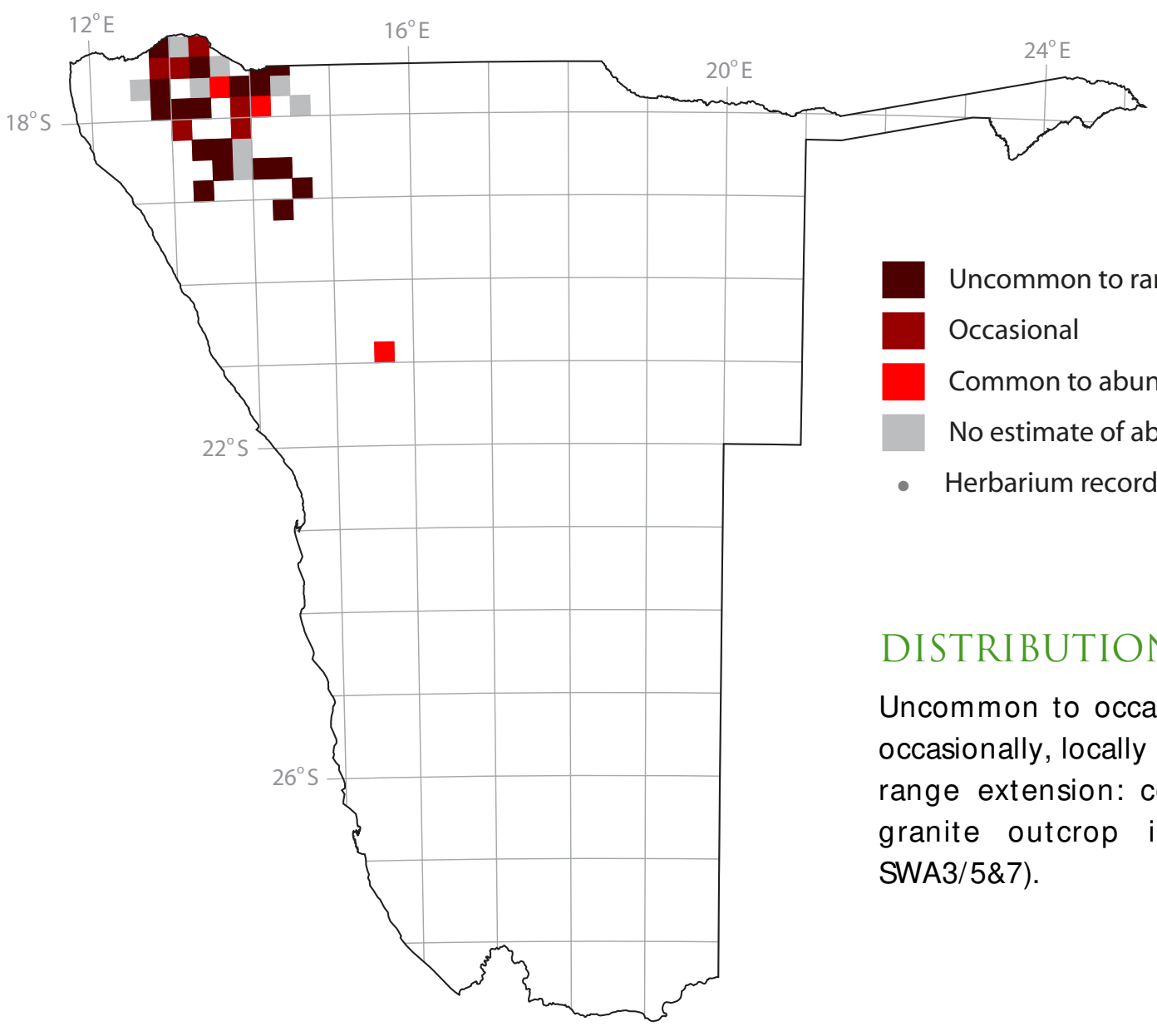
Omumbungururu

Sneezewood (E)

[57 records from 36 (3%) squares]



Slender, low-branching tree. BARK dark, fissured. LEAVES compound, bright green, **rachis slightly winged; leaflet obliquely elliptic to oblanceolate, with lower half much smaller than upper half; base characteristically obliquely wedge-shaped**. FLOWERS tiny, pale yellow. FRUIT a characteristically veined, oblong capsule.

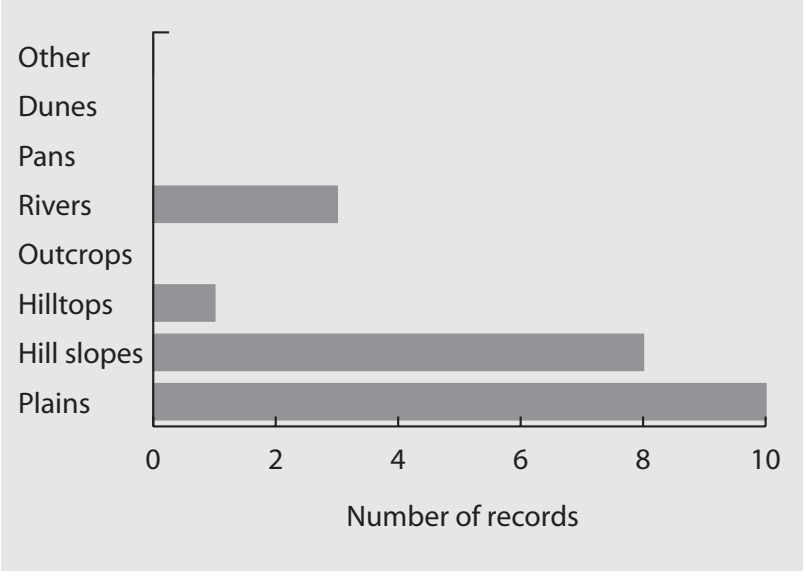


DISTRIBUTION & ABUNDANCE

Uncommon to occasional in the north-west; occasionally, locally common. There is a new range extension: common on an isolated granite outcrop in 2015DC (specimens SWA3/5&7).

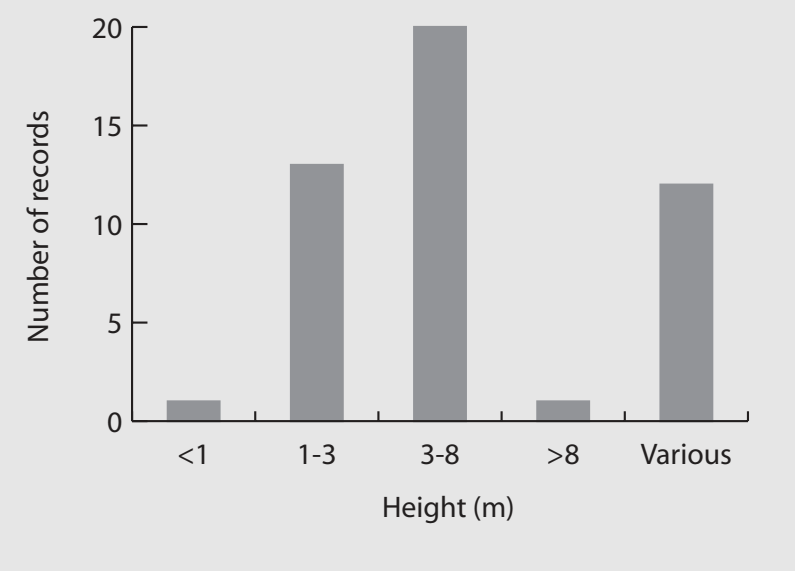
HABITAT

Chiefly found on plains and hill slopes in woodland areas. Grows on gravel, stony or sandy substrates.



GROWTH FORM

A tree, mostly in the 3–8-m height class, with shrubby forms 1–3 m high.



ANNUAL CYCLE

Observations mainly March and April, a few in May and January, one each in August and November. FLOWERS March. FRUIT May and June. LEAVES apparently evergreen (only one observation between June and October).

GENERAL

Leaves browsed by livestock and game; sharply aromatic when bruised. Wood used to make knobkerries and walking sticks; coals used in the ovens of the Himba ironsmiths, but not for indoor fires as the smoke irritates the throat. Young twigs and branches used medicinally; wood used as an insect repellent. Regarded as a good luck charm. Elsewhere in southern Africa, *P. obliquum* occurs in areas with much higher rainfall, including the mist belt in montane forests.

CONSERVATION CONCERNS

None recorded.

Turraea zambesica

Zambezi Honeysuckle-tree

[3 records from 3 squares]

A shrub or slender tree occuring in riverine woodlands and thickets. LEAVES elliptic. FLOWERS small, creamy-white. FRUIT a thinly woody capsule.

Three TAP records from far eastern Caprivi (1724AD, DB and DC). Previously recorded (herbarium) from two additional squares. A rare tree in the 3–8-m height class found on a river bank, floodplain and sandy plain. Flowers recorded in November; old flowers in July.

Nymania capensis

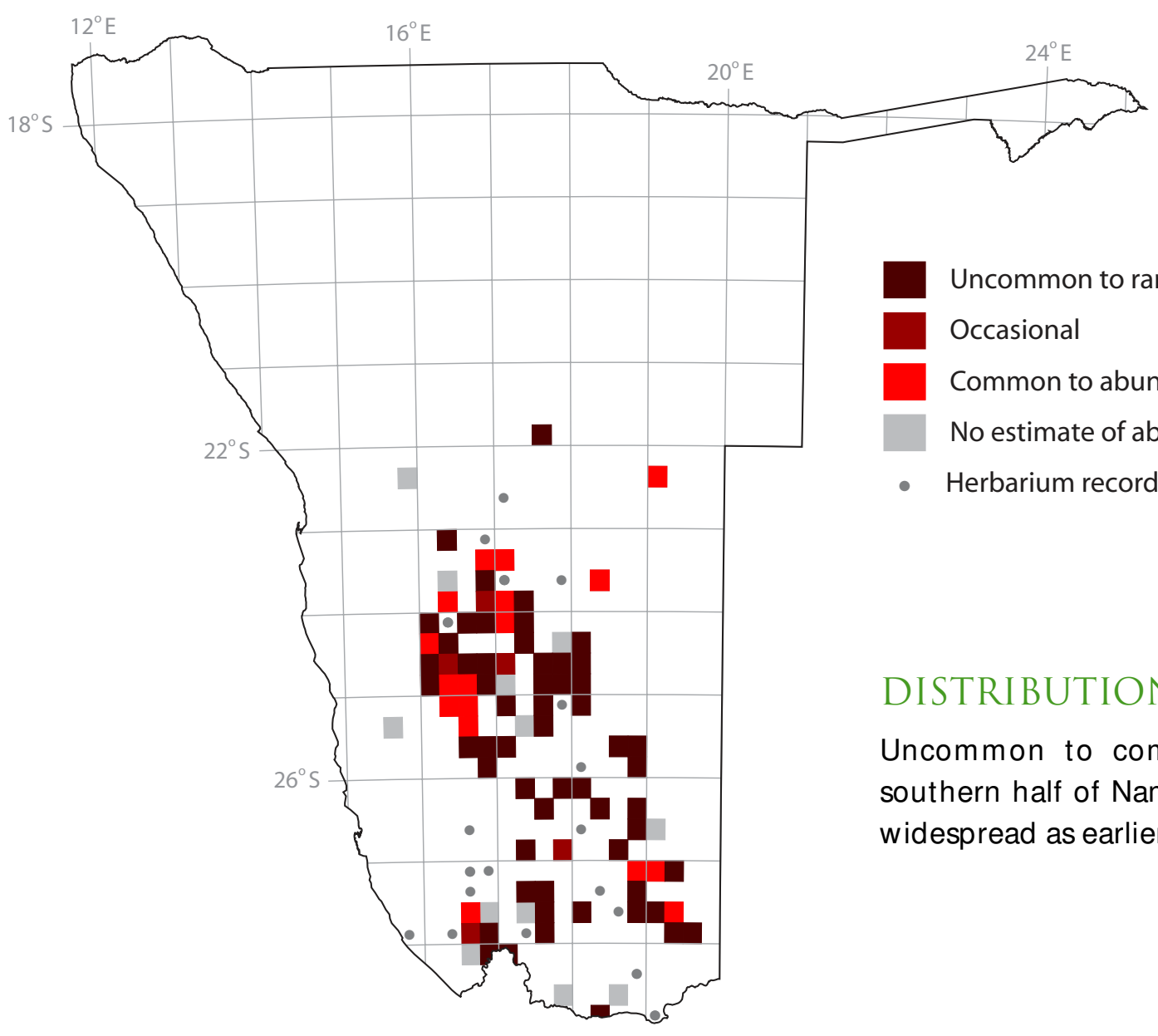
Klapperbos

Chinese-lanterns (E); !gaebe (K)

[113 records from 91 (9%) squares]



Stiff shrub. BARK white to pale grey. LEAVES simple, almost sessile; **linear-oblong**, small, olive-green. FLOWERS solitary, **tubular, pink to scarlet-red**. FRUIT **an inflated capsule; balloon-like, thin, papery, four-lobed; red when ripe**.

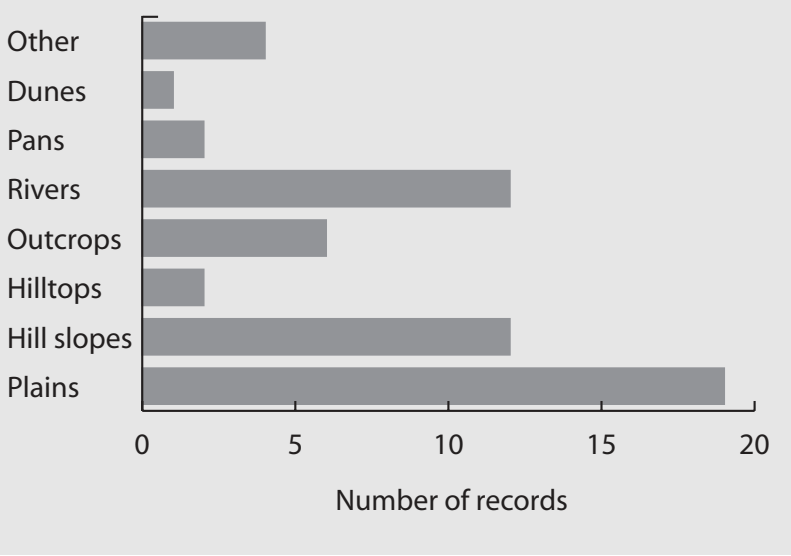


DISTRIBUTION & ABUNDANCE

Uncommon to common in places in the southern half of Namibia. TAP records not as widespread as earlier herbarium records.

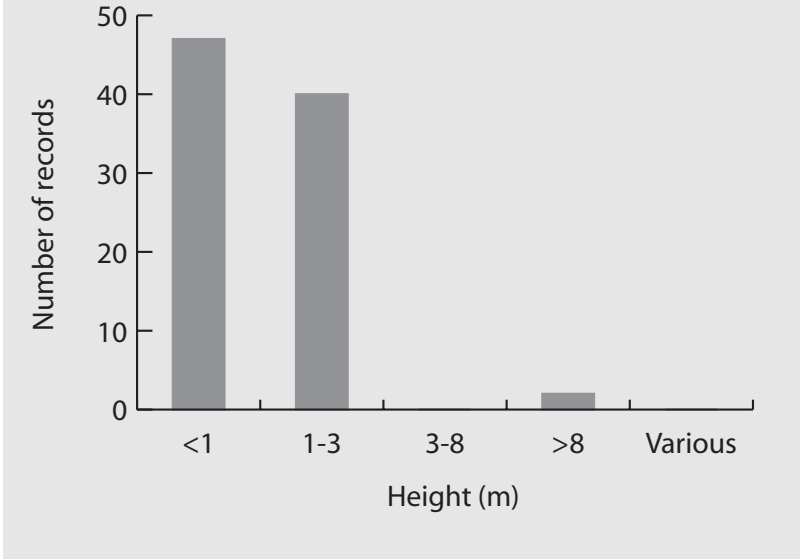
HABITAT

Various habitats, but mainly on plains, hill slopes and along dry rivers. Grows on rocky, stony, gravelly or sandy substrates. Also found high in the mountains.



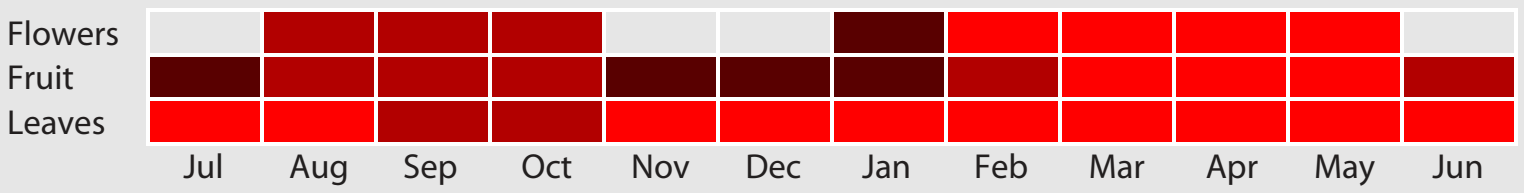
GROWTH FORM

A shrub in the 1–3-m height class; often less than 1 m.



ANNUAL CYCLE

FLOWERS single records every month, but mostly in two waves – the first and smaller one in spring and the second, major one in late summer; they appear to be rainfall-dependent. FRUIT all year, but in two waves similar to flowering. LEAVES evergreen to semi-deciduous.



GENERAL

The bark is sometimes stripped by animals; the leaves and fruit provide nutritious fodder. The leaves and roots are used medicinally; the roots are also used to curdle milk. *Nymania capensis* has good horticultural potential for Windhoek gardens as it can withstand drought and very cold winters.

CONSERVATION CONCERNS

Not recorded. This plant was either overlooked by atlassers or the population has declined.



Nymania capensis, E. Ellinger

Trichilia emetica

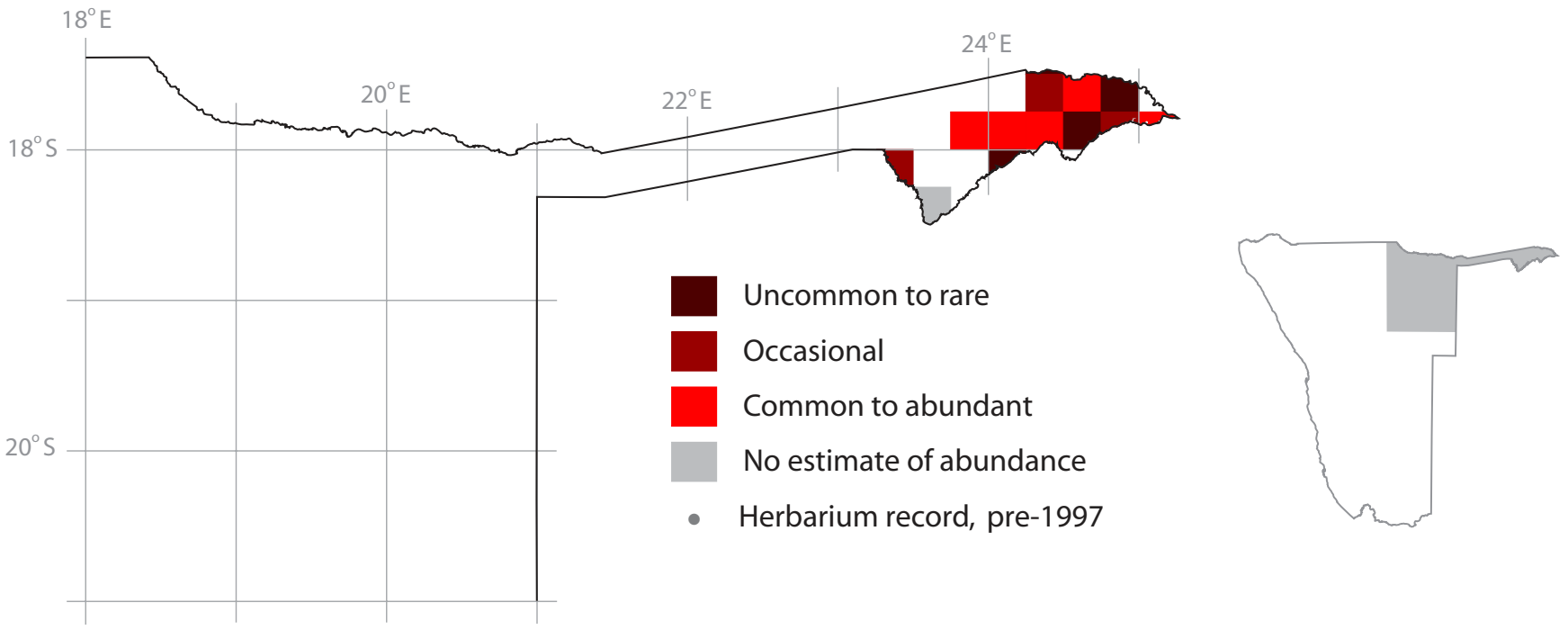
Musikili

Natal mahogany (E);
rooiessenhout (A)

[28 records from 14 (1%) squares]

A large, **evergreen tree with a spreading, rounded crown often reaching the ground**. BARK dark; smooth or rough. LEAVES compound, up to 500 mm long; leaflets elliptic, **dark, glossy green above; pale greenish-brown with dense, short, curly hairs below**. FLOWERS small, tubular, creamy-green, in dense clusters. FRUIT a round, creamy-green-brown capsule, downy, up to 30 mm in diameter; splitting into two or three valves; **with a distinctly thickened neck** connecting the base to the stalk. SEED **black, almost totally covered by a scarlet aril**.

Flowers and fruit are conspicuous.

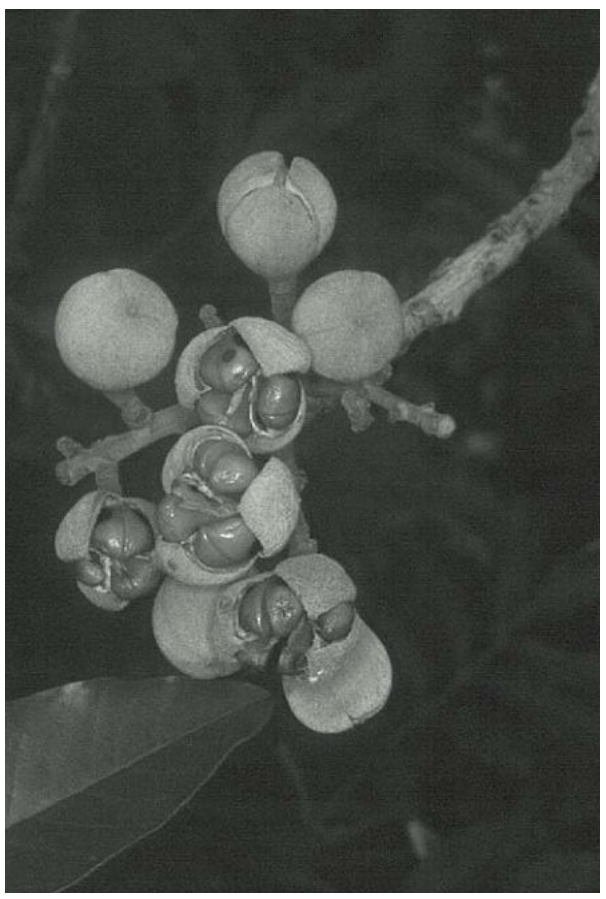


DISTRIBUTION & ABUNDANCE

Fairly widespread in eastern Caprivi. Common to uncommon.

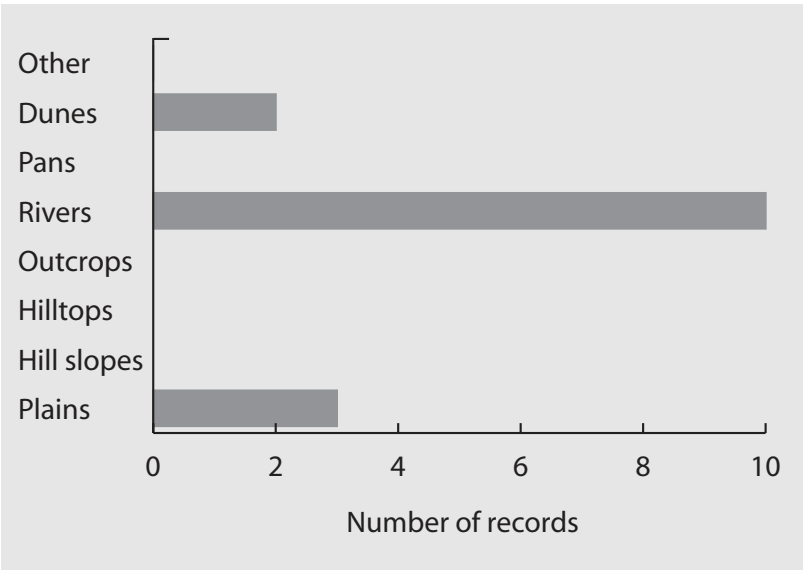
Trichilia emetica, Left: leaves. Right: fruit.
Opposite: tree. All B. Curtis





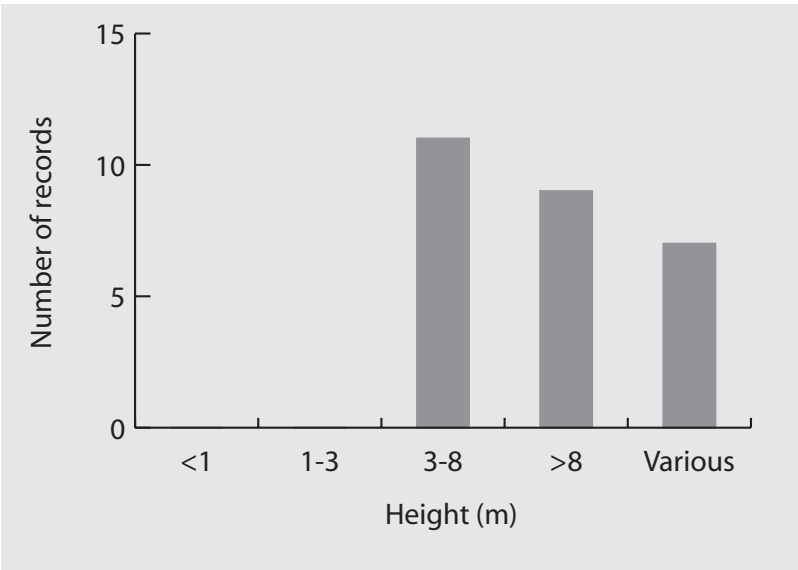
HABITAT

Mostly sand hummocks on floodplains; also on river banks and sandy plains.



GROWTH FORM

A tree up to 8 m and more in height. Young plants noted in some squares.



ANNUAL CYCLE

No observations were made from June to August, one each in September and October. FLOWERS only recorded in November and December. FRUIT September to April. LEAVES Evergreen, with young leaves in November.

GENERAL

A beautiful, shady tree, often planted at homesteads and around other buildings in both Caprivi and along the Okavango River.

CONSERVATION CONCERNS

None recorded.

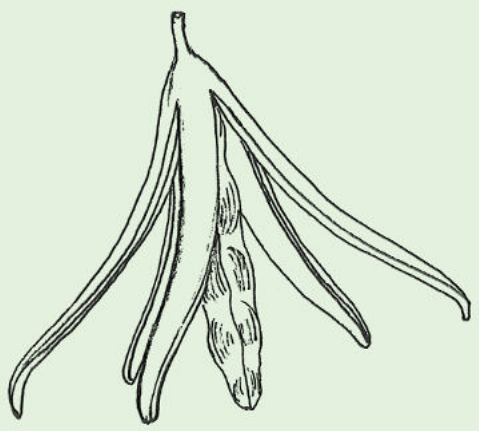


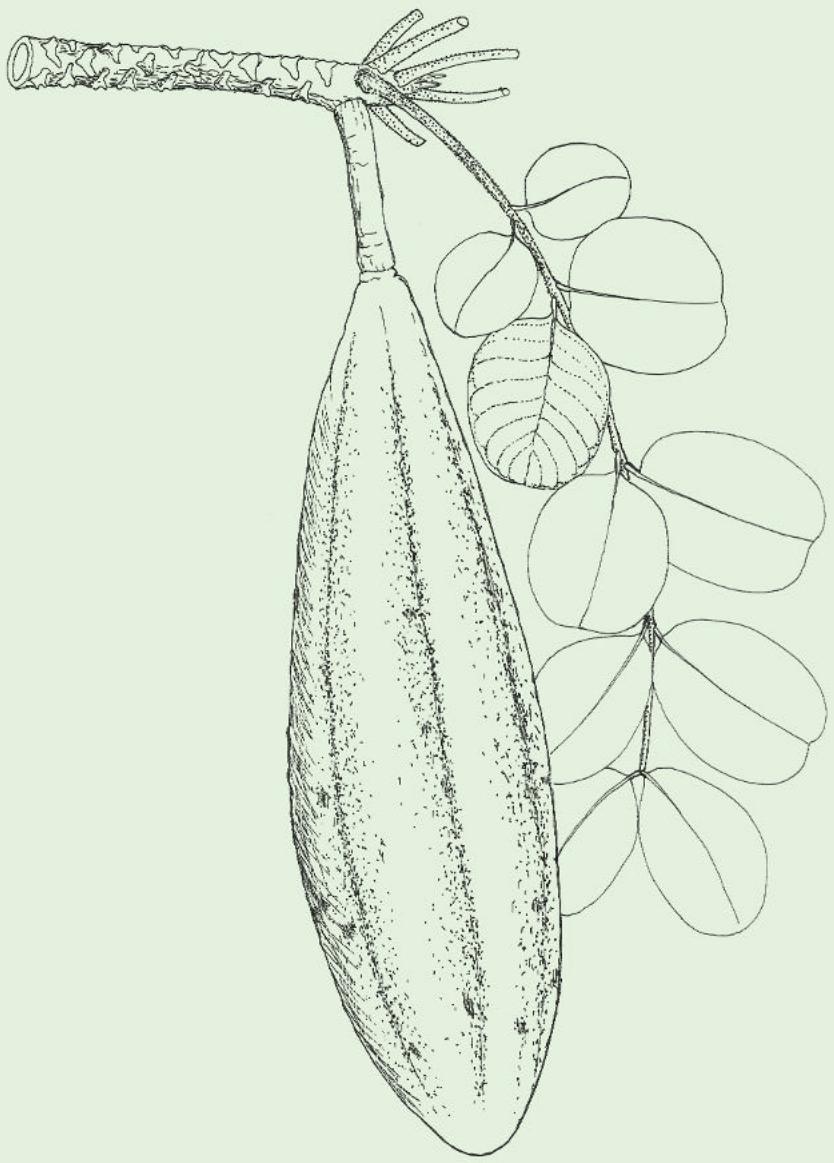
Entandrophragma spicatum

Owambo Wooden-banana

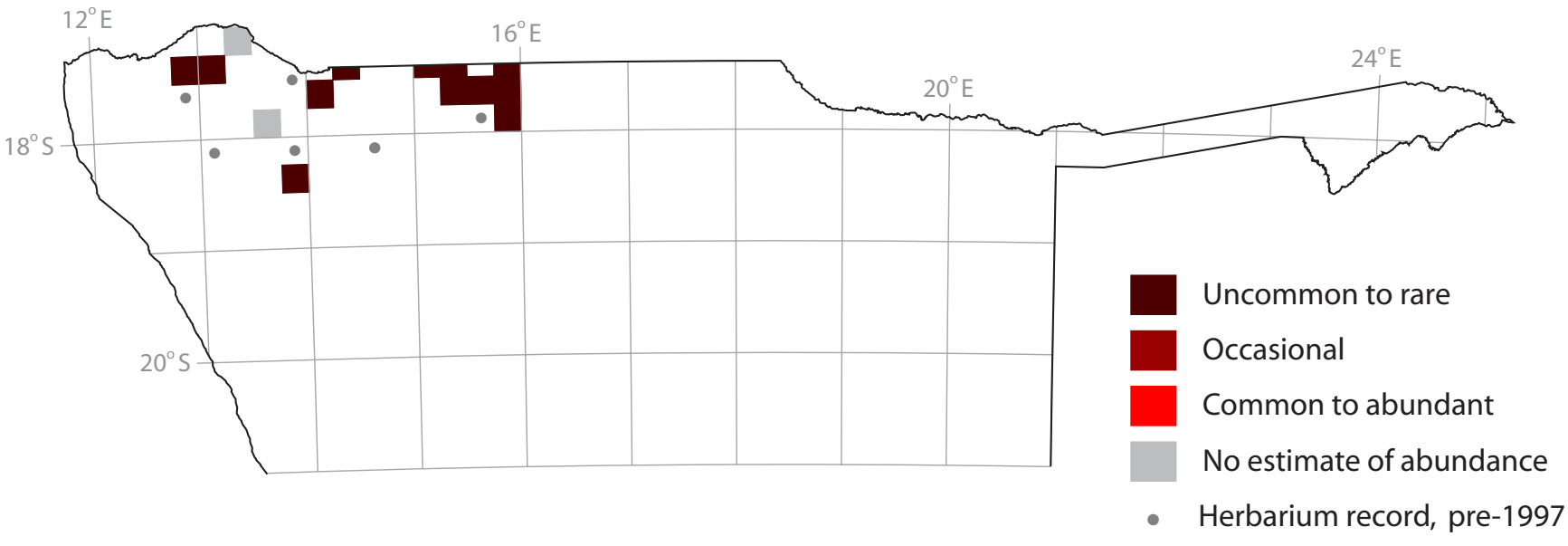
Owambo-mahonie (A); omataku (O); ndetaku (=fruit, Ok)

[17 records from 14 (1%) squares]





Deciduous tree with spreading canopy. BARK grey, **peeling off in large pieces** to expose a yellowish underbark. LEAVES compound, **up to 160 mm long; leaflet circular to elliptic with blunt apex and base**. FRUIT a cylindrical woody capsule, splitting open to reveal a central woody column to which the seeds are attached and **resembling a peeled banana**.



DISTRIBUTION & ABUNDANCE

Uncommon to rare in north-western Namibia, but extending as far east as 16° E. Earlier herbarium records indicate that it should occur slightly further south-westwards than was recorded by the TAP.

HABITAT

Found on plains, hill slopes and rocky outcrops, on both sandy and rocky substrates.

GROWTH FORM

A tree up to 8 m high and over. There is an exceptionally large tree (over 20 m high) 20 km west of Engela in the north (1715BD).

ANNUAL CYCLE

Observations for seven months only. FLOWERS never recorded or collected. FRUIT single records in February, March, May, June, August and November. LEAVES recorded most months, could be deciduous.

GENERAL

Seeds are considered poisonous, and never eaten, although a cosmetic oil is extracted from them. Small stems are used as toothbrushes, and the pod stalk is used to make snuff. An attractive species of horticultural potential for frost-free areas.

CONSERVATION CONCERNS

This is a large and conspicuous species, but it occurs in very low numbers, therefore it is possible that the previously sampled trees are still there. If they have disappeared, then this species would be of conservation concern. Protected by Forestry legislation.



Entandrophragma spicatum, Oshana Region, B. Curtis

Entandrophragma caudatum

Caprivi Wooden-banana

Bergmahonie (A); mubana, mupumena (L)

[2 records in 2 squares]

A tall tree with **spreading canopy**. BARK **extremely rough**; flaking in **woody discs**. LEAVES compound, up to 300 mm long, hanging; leaflet ovate to lanceolate with **narrowly pointed apex and asymmetric base**. FRUIT a woody, cylindrical capsule; splitting open to reveal a **central woody column to which the seeds are attached, and resembling a peeled banana**.

Rare in the Caprivi, from which there were two TAP records (1724CB, 1725CC) and one previously collected herbarium specimen. Uncommon tree up to 25 m tall on the mainland; common tree up to 30 m tall on a rocky outcrop on Impalila Island. Old fruit recorded in November.

Securidaca longepedunculata

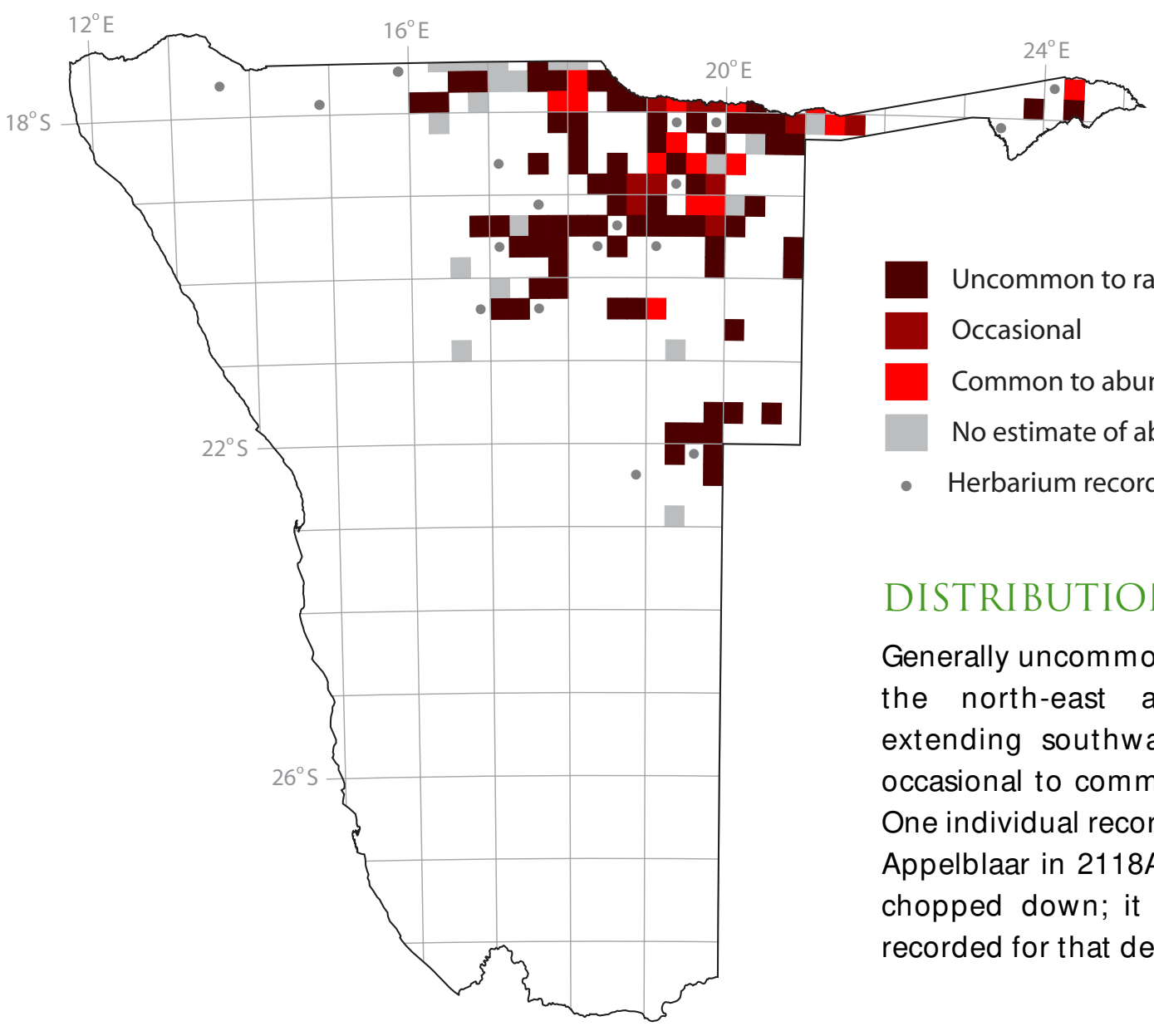
Violet-tree

Krinkhout (A); omudiku (O); mungombe (Rk); muviyu (Rum)

[226 records from 117 (11%) squares]



Slender, deciduous tree. BARK **smooth, pale grey with horizontal markings.** BRANCHLETS **spine-tipped.** LEAVES simple, elliptic to oblanceolate; both surfaces dark green and finely downy. FLOWERS **pink to deep purple with crinkled petals, up to 10 mm long, sweet-smelling, on long slender stalks** in small clusters, appearing with the young leaves. FRUIT **a nut, initially purple-green but straw-coloured when ripe; one-seeded, with wing along one side, broad, up to 40 x 15 mm.**

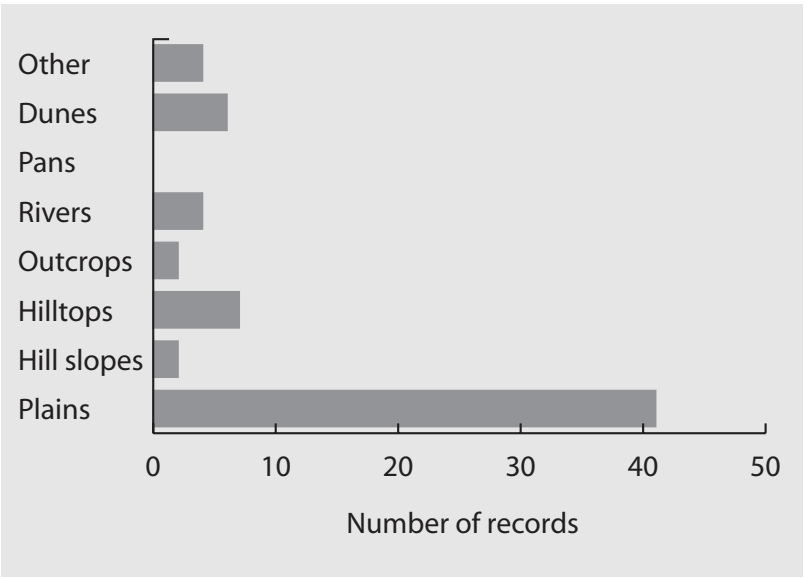


DISTRIBUTION & ABUNDANCE

Generally uncommon in scattered localities in the north-east and eastern Karstveld, extending southwards to the central-east; occasional to common in places in Kavango. One individual recorded in flower on the farm Appelblaar in 2118AB (EIC1), which was later chopped down; it was the only individual recorded for that degree block.

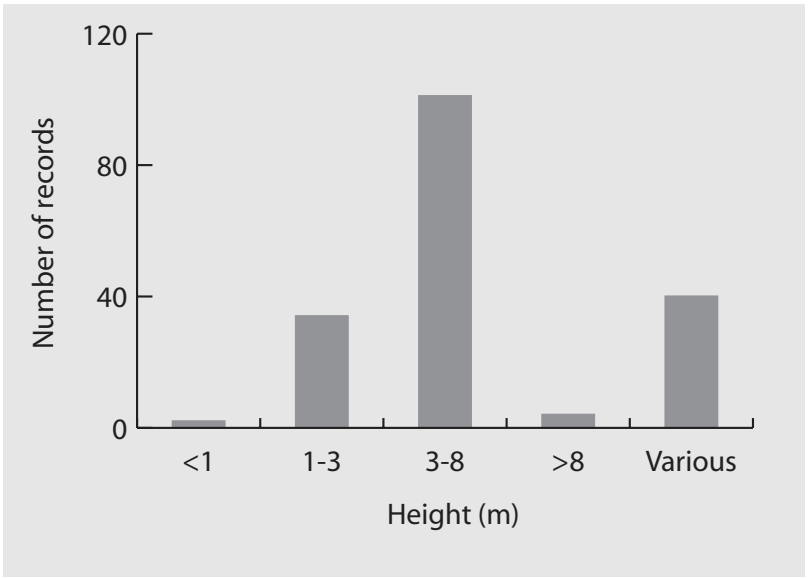
HABITAT

Various habitats, but mostly on sandy plains; also along rivers and on dunes in the north-east. Generally growing on deep sand or sandy loam; one record from crevices in granite hills. It seems to like the vicinity of dolomite rocks (HOF1).



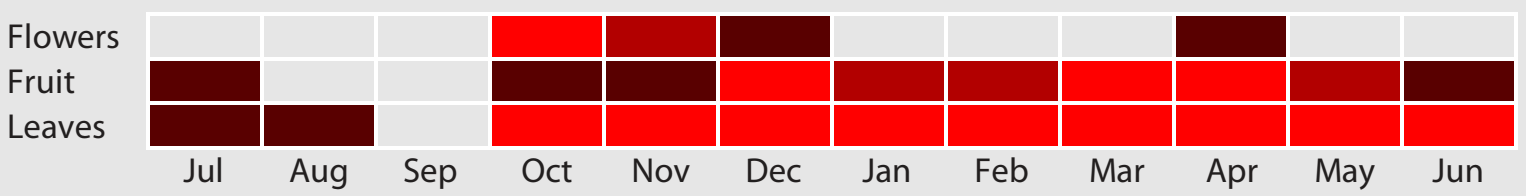
GROWTH FORM

A tree in the 3–8-m height class, rarely taller, but often less than 3 m; occasional records of young trees.



ANNUAL CYCLE

FLOWERS October to December, with occasional records in April in some years. FRUIT mainly December to May, with two peaks. LEAVES mainly October to June, with young leaves in October.

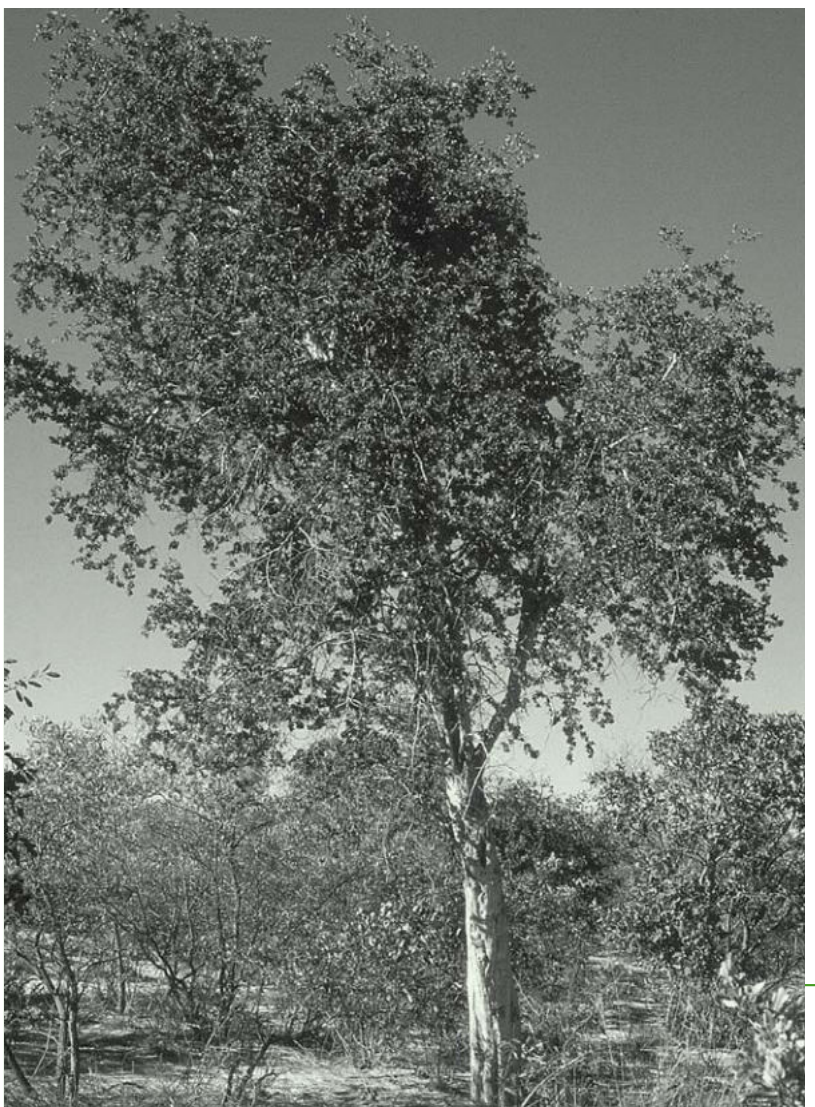


GENERAL

Browsed by game. The leaves and roots used medicinally; the bark, seeds and roots are used as soap; the bark fibres are woven into rope and other materials. Some parts of the plant are toxic. Although it would make a good garden tree, it is apparently not easy to cultivate, and must be protected against frost. The specific name, *longepedunculata*, refers to the long flower stalks.

CONSERVATION CONCERNS

None recorded.



Securidaca longepedunculata, C. Mannheimer

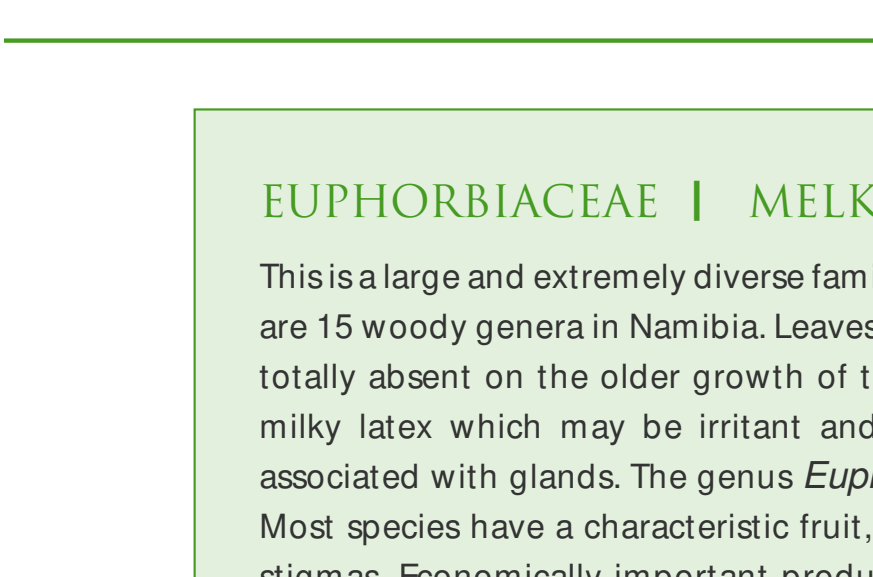
EUPHORBIACEAE | MELKBOS (MILKBUSH) FAMILY

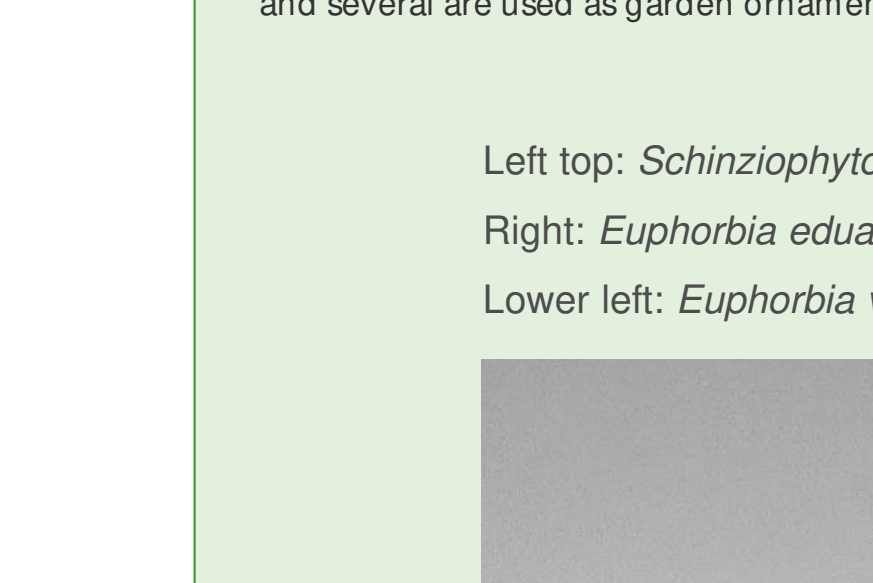
This is a large and extremely diverse family of over 5000 species of herbs, shrubs and trees, of which there are 15 woody genera in Namibia. Leaves are usually alternate, simple or palmately compound and often totally absent on the older growth of the succulent forms. Many, but by no means all, species exude milky latex which may be irritant and/or toxic. Flowers sometimes lack a perianth, and are often associated with glands. The genus *Euphorbia* has a highly specialised inflorescence called a cyathium. Most species have a characteristic fruit, which is usually three or six-lobed, and crowned by persistent stigmas. Economically important products of this family include cassava (*Manihot esculenta*), rubber (*Hevea brasiliensis*) and castor oil (*Ricinus communis*). Many species are succulent-collectors' items and several are used as garden ornamentals, for example, poinsettia (*Euphorbia pulcherrima*).

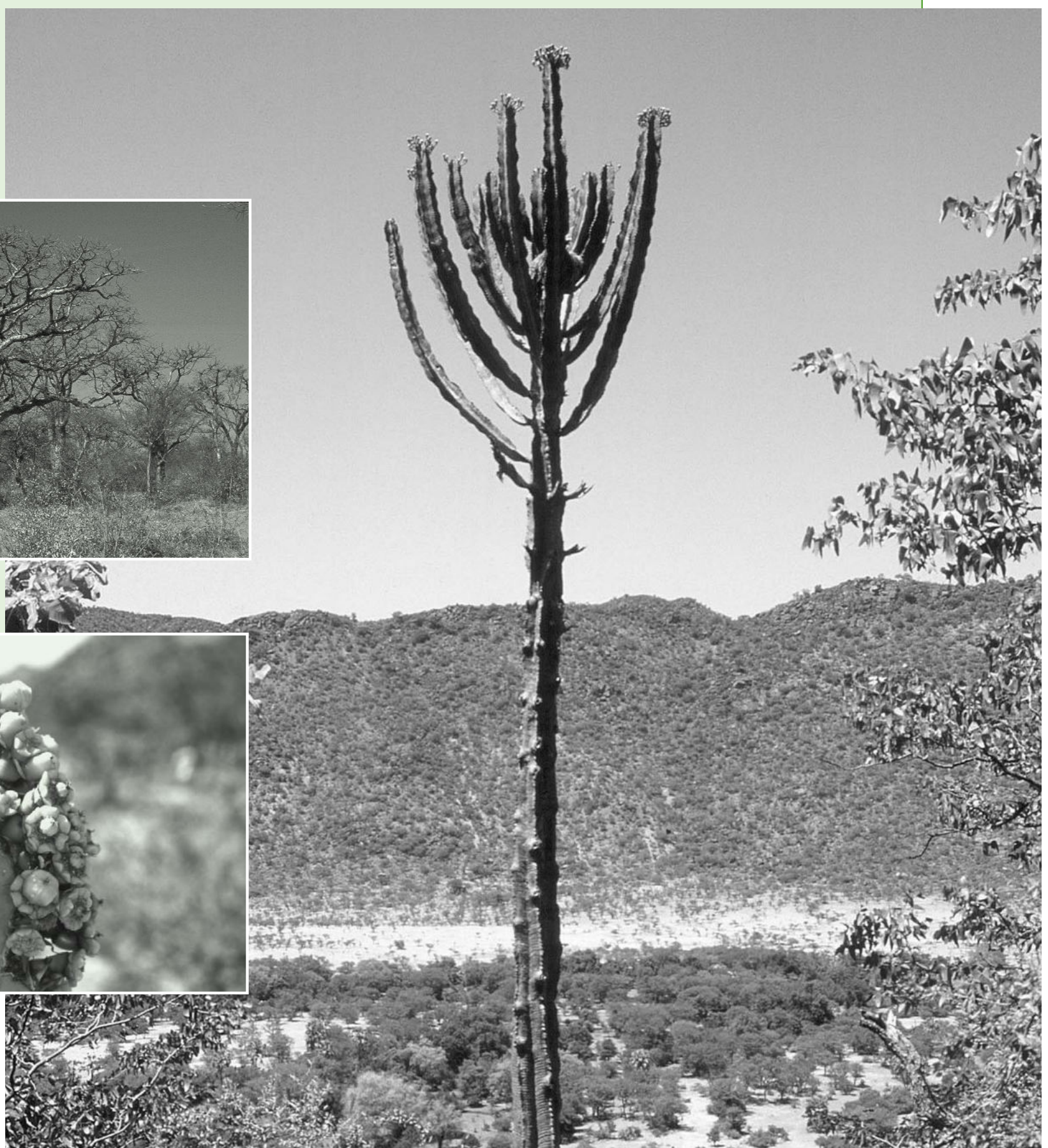
Left top: *Schinziophyton rautanenii*, P. Reiner

Right: *Euphorbia eduardoi*, Kaokoveld, B. Curtis

Lower left: *Euphorbia virosa*, cyathia and fruit, B. Curtis







Phyllanthus reticulatus

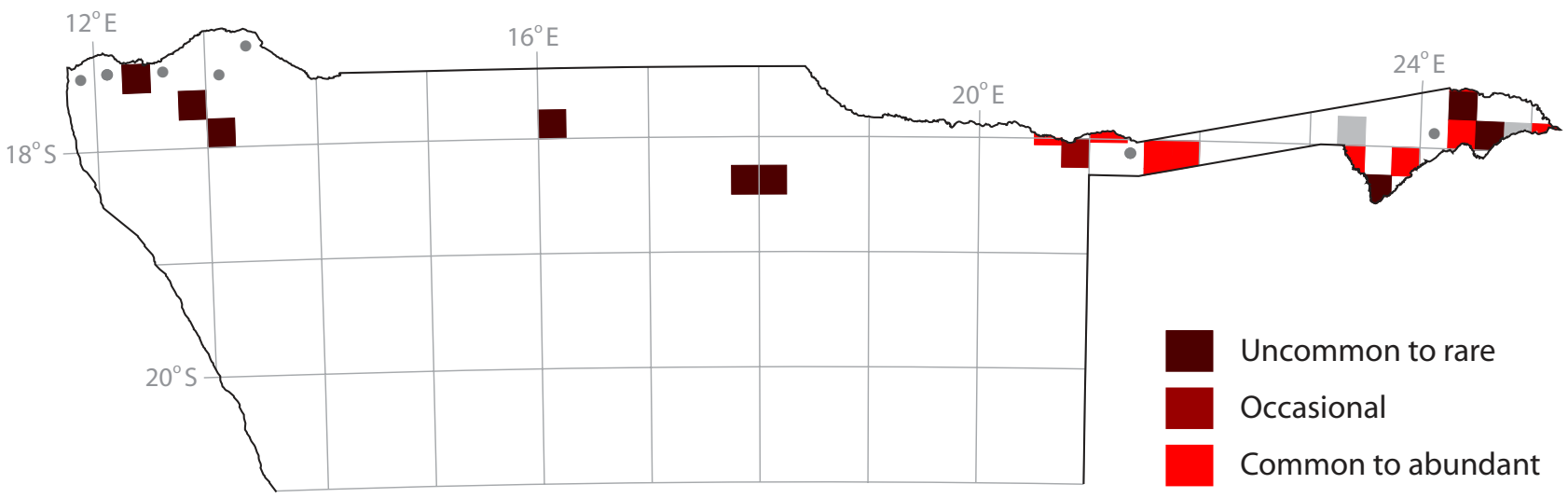
Potato-bush

Aartappelbos (A); okahonukondu (H); chizeze (L)

[28 records from 22 (2%) squares]

Evergreen shrub or small twiggy tree. BARK grey to brown, smooth; branchlets drooping. LEAVES simple, alternate, ovate to oblong; **conspicuous red net-veins** below. FLOWERS axillary, small, yellowish-green or reddish; male and female flowers respectively grouped together; appearing before or together with the leaves. FRUIT a small capsule; **black and splitting open when ripe**.

May be confused with *Flueggea virosa*, but the fruit of *P. reticulatus* is black and the leaves are smaller, while the leaves of *F. virosa* are larger and the fruit is white.



DISTRIBUTION & ABUNDANCE

Uncommon in the north-west and just north-east of the Karstveld; common along the Okavango River; uncommon to common to abundant in eastern Caprivi. The records in the central-north are range extensions according to earlier herbarium specimens, but the plant was possibly overlooked by atlassers along the lower Kunene River.

HABITAT

Mainly found on river banks, but also on sandy plains or sand hummocks.

GROWTH FORM

Generally a shrub 1–3 m high; occasionally a tree of over 3 m in eastern Caprivi.

ANNUAL CYCLE

No observations from June to September. FLOWERS single records from February to June, and August, October and December. FRUIT single records from March to June, in August and from October to December. LEAVES recorded for every month of observation.

GENERAL

The flowers have a smell of potatoes, hence the common name. The leaves are browsed by game and livestock. The fruit and roots are toxic; however, the roots are used medicinally.

CONSERVATION CONCERNS

None recorded. The lack of TAP observations along the Kunene River is probably due to a lack of atlasing, rather than the loss of this species there.

Pseudolachnostylis maprouneifolia

Kudu-berry

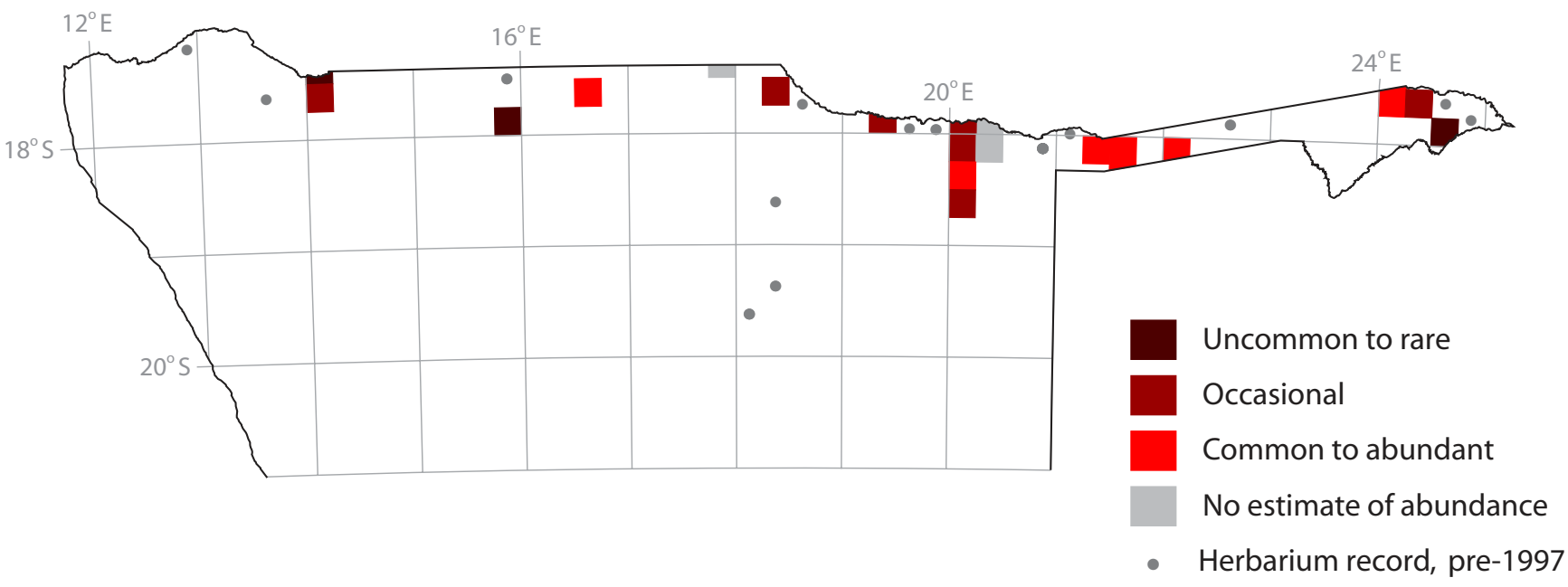
Mubu, mukunyu (L)

[24 records from 24 (2%) squares]



Deciduous tree with spreading crown. LEAVES simple, alternate, **held horizontally**, ovate to elliptic; dark green above, olive-green below, **margin turned under; base blunt to heart-shaped; petiole short and downy**. FLOWERS small, yellow-green; male and female flowers on separate plants. FRUIT **an almost-round capsule**, ***c.* 20 mm in diameter**; divided into three to six faint vertical segments, yellow when ripe.

There are two varieties in Namibia, *glabra* and *dekindtii*, but no TAP records distinguished between the two.

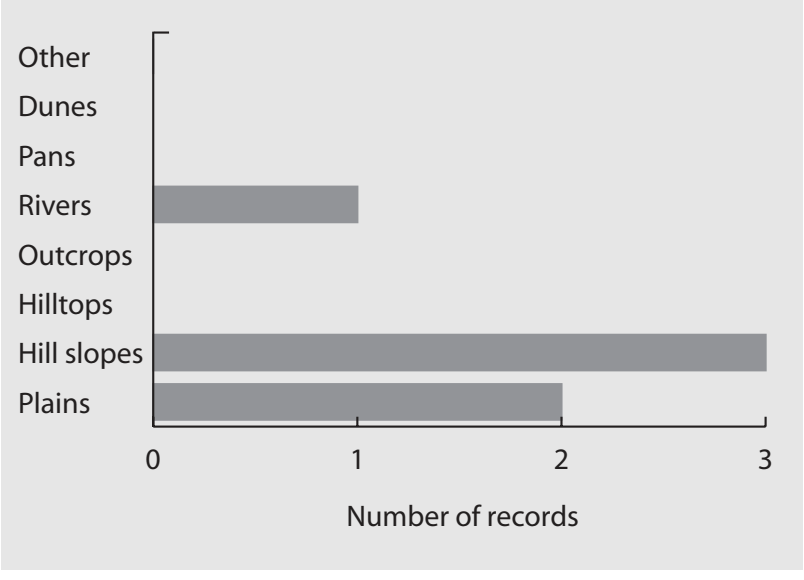


DISTRIBUTION & ABUNDANCE

Scattered localities across extreme northern Namibia. Common along the eastern stretches of the Okavango River and in a disturbed area in the central-north (1716DA); uncommon elsewhere.

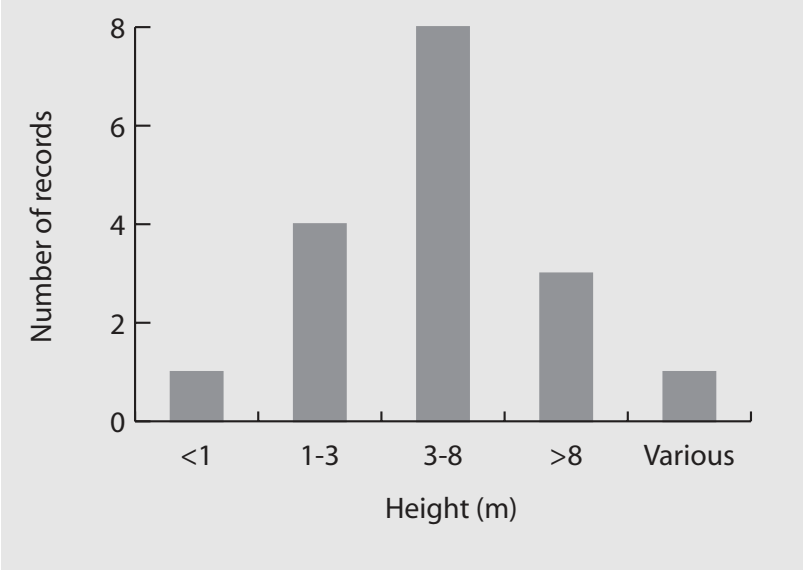
HABITAT

Found mainly on sandy plains, but also on rocky hill slopes in the north-west.



GROWTH FORM

A tree, generally up to 8 m high, but occasionally higher (17% of records).



ANNUAL CYCLE

There was only one observation between July and November. FLOWERS none recorded. FRUIT March to December. LEAVES recorded December to June and not in August.

GENERAL

The roots are used medicinally; the fruit is used to produce an alcoholic beverage.

CONSERVATION CONCERNS

Either this species was overlooked by atlassers because it is so uncommon, or its range has been reduced. Needs further investigation.

Margaritaria discoidea

Peacock-berry

[3 records from 3 squares]

Semi-deciduous shrub or small tree with spreading crown. TRUNK straight, buttressed. BARK brown, rough, flaking irregularly to expose red-brown underbark. LEAVES simple, ovate to obovate; bright green, papery. FLOWERS inconspicuous, yellowish-green. FRUIT a three-lobed capsule, yellow.

Three records from eastern Caprivi. A rare shrub in the 1–3-m height class in Salambala Conservancy (1724DC) and on Impalila Island (1725CC), and an uncommon tree in the 3–8-m height class at Lianshulu (1823AD). The last record is a range extension (CUR1, specimen 1250). Flowers recorded in October. Three earlier herbarium records (1724AD, CC and DA) report it as a tree 3–5 m high, with fruit in December and February.

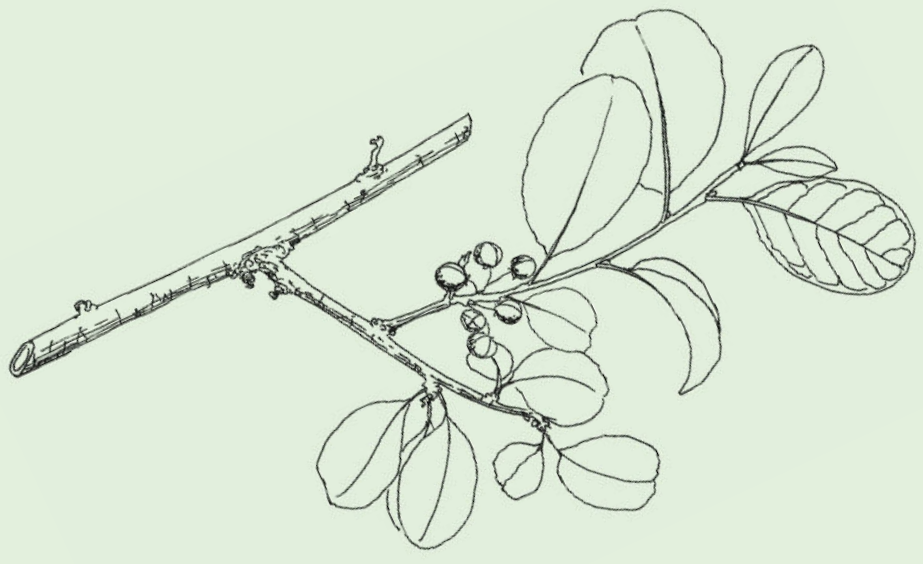
Flueggea virosa

= Securinega virosa

Mururuturu

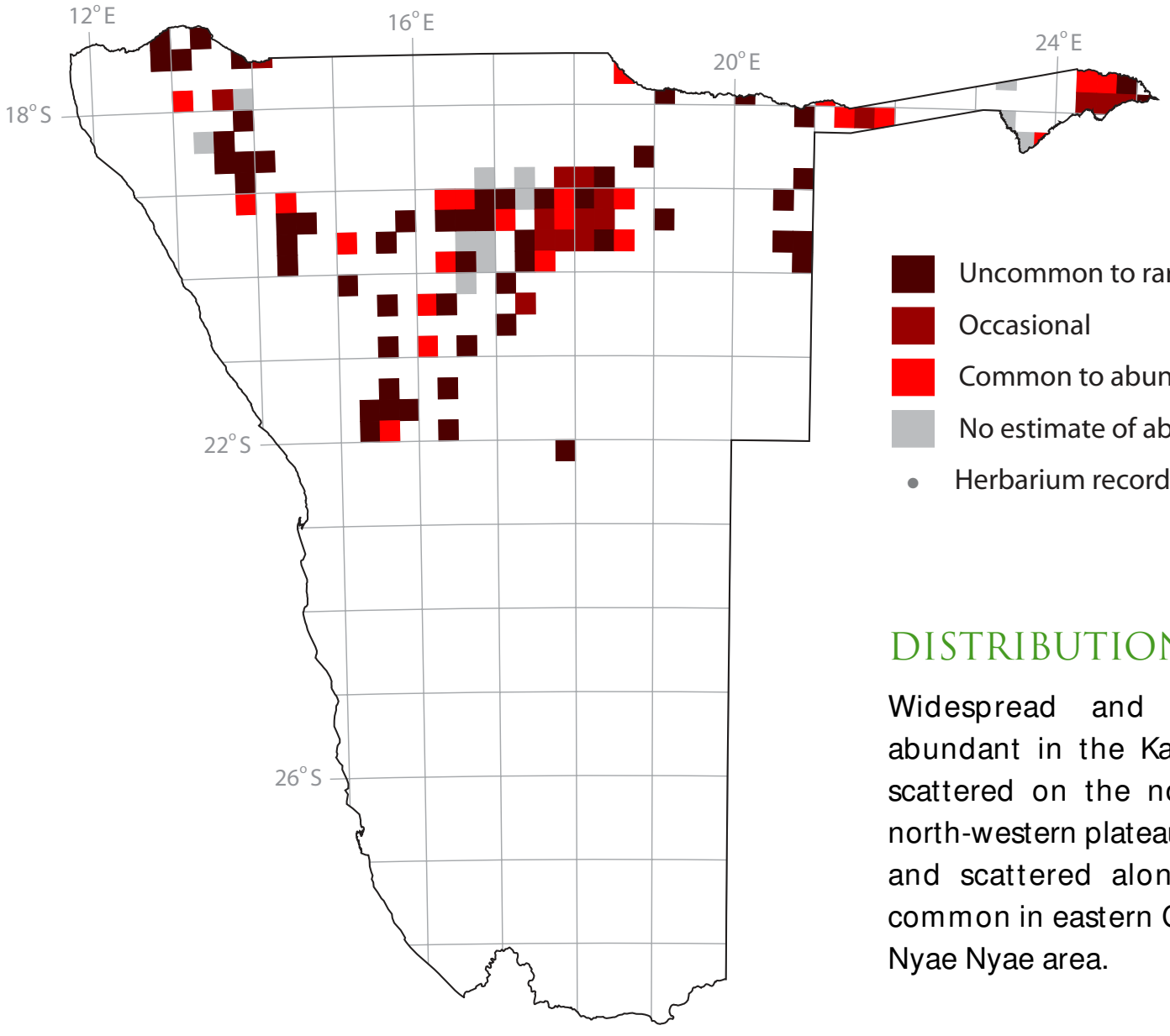
White-berry bush (E); witbessiebos (A); !urigune (K); katoma (L)

[236 records from 109 (10%) squares]



Semi-deciduous, densely branched shrub. LEAVES simple, alternate, **elliptic to obovate to circular, thin-textured**, 15–60 mm long; both surfaces bright green, hairless. FLOWERS small, in axillary clusters, cream to greenish; male and female flowers on separate plants. FRUIT a **small, round, fleshy berry, white** when ripe.

Flowers may be overlooked at a distance, but clusters of fruit are more obvious. The plant may be confused with other members of the family.

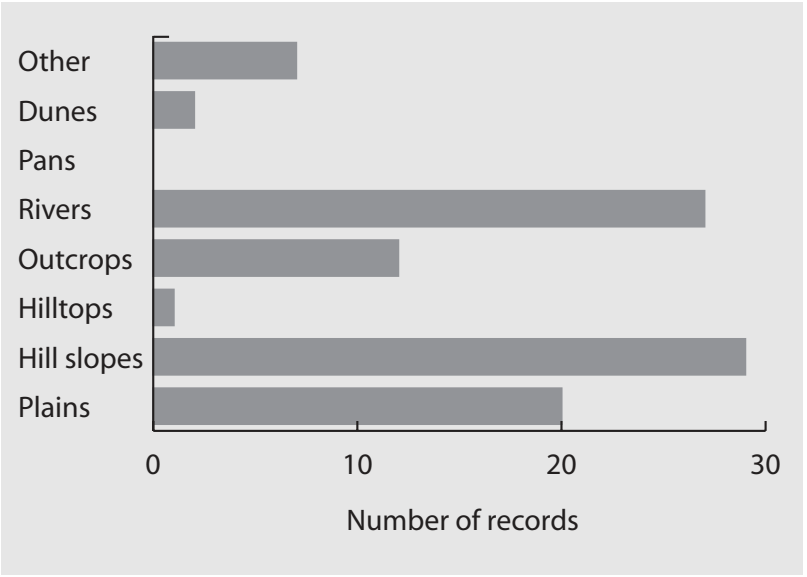


DISTRIBUTION & ABUNDANCE

Widespread and occasional to locally abundant in the Karstveld; uncommon and scattered on the north-central plateau and north-western plateau; common to uncommon and scattered along the Okavango River; common in eastern Caprivi; uncommon in the Nyae Nyae area.

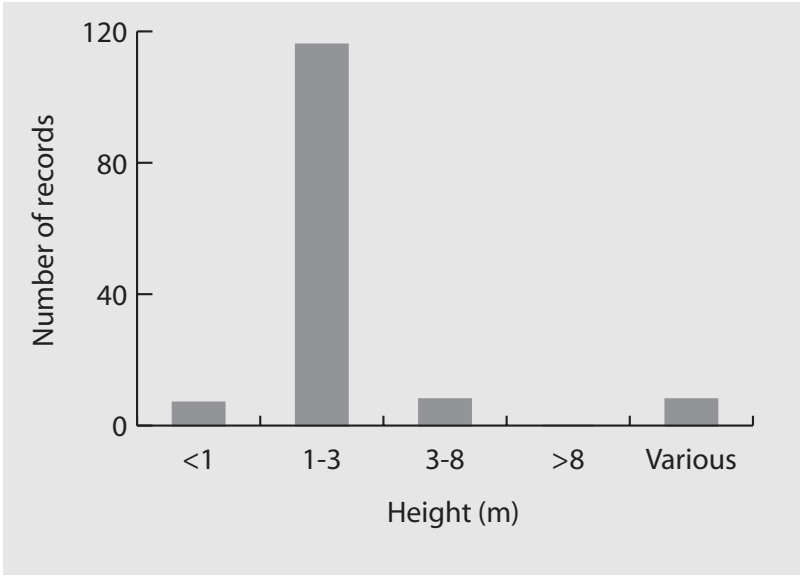
HABITAT

Found in various habitats, but mainly on hill slopes on the north-central plateau and in the Karstveld, as well as on plains in the latter; along river banks in the north-east; and along dry watercourses in the north-west. Generally on stony or rocky substrates, but also on sand or loam in the north-east.



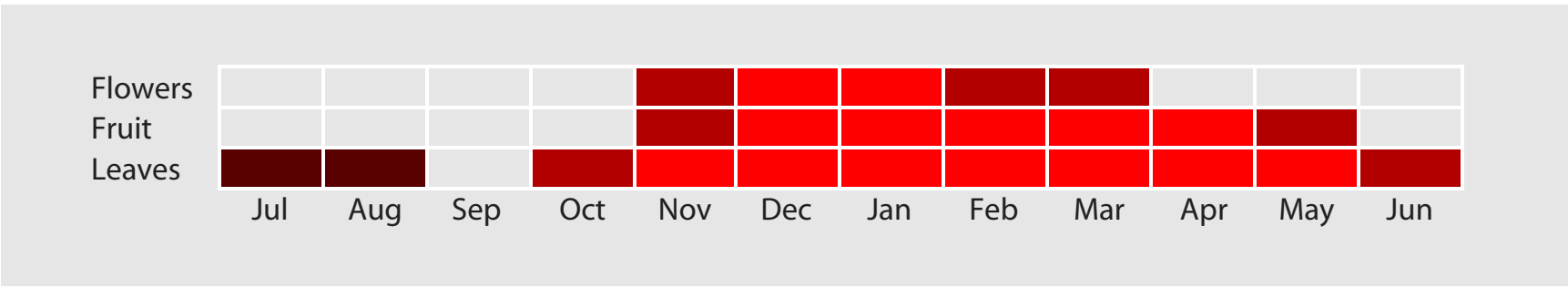
GROWTH FORM

A shrub up to 3 m high, sometimes over 3 m.



ANNUAL CYCLE

FLOWERS November to March, with a peak in December. FRUIT November to May, with the main peak in March. LEAVES mostly October to June, with new leaves from October to December.



GENERAL

Various parts of the plant are used for traditional purposes. *Flueggea virosa* makes an attractive garden shrub, but loses its leaves in winter in Windhoek.

CONSERVATION CONCERNS

None recorded.

Antidesma rufescens

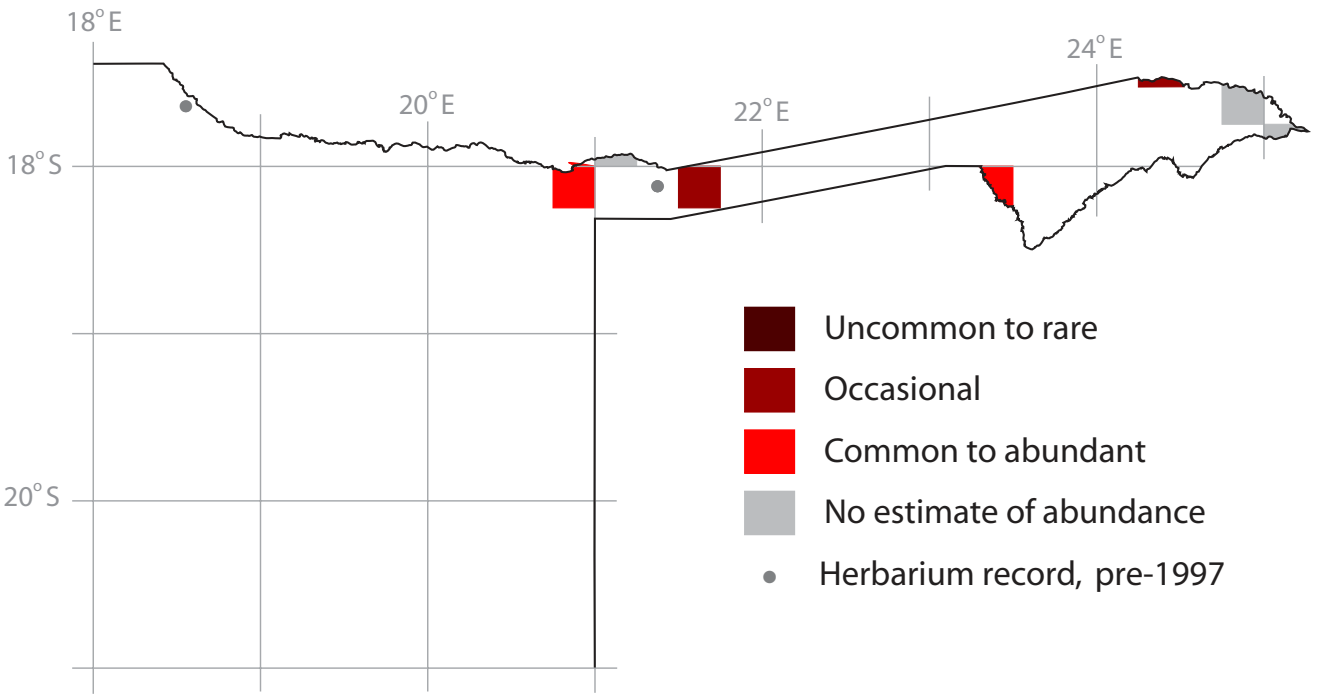
Mukoso

Water tassel-berry (E)

[7 records from 7 (<1%) squares]

Shrub or tree. BARK pale grey, soft; **young branchlets green to rust-brown, densely woolly**. LEAVES simple, elliptic to obovate, up to100 mm long and 50 mm wide; **leathery, hairless, shiny; dark green above; pale green below**. INFLORESCENCE an elongate cluster. FLOWERS small, with an unpleasant foetid scent; male and female flowers on separate plants. FRUIT berry-like, pendulous; initially green-white when young but gradually becoming red or black-purple when ripe.

Virtually identical to *A. venosum*, but lacks the hairy under-surface of the leaf.



DISTRIBUTION & ABUNDANCE

Common along the eastern stretches of the Okavango River; uncommon to common in eastern Caprivi.

HABITAT

Along the banks of perennial rivers.

GROWTH FORM

A shrub or tree, mostly in the 1–3-m height class, but sometimes over 3 m high.

ANNUAL CYCLE

FLOWERS and FRUIT October, November and April. LEAVES semi-deciduous.

CONSERVATION CONCERNS

None recorded.

Antidesma venosum

Murombe

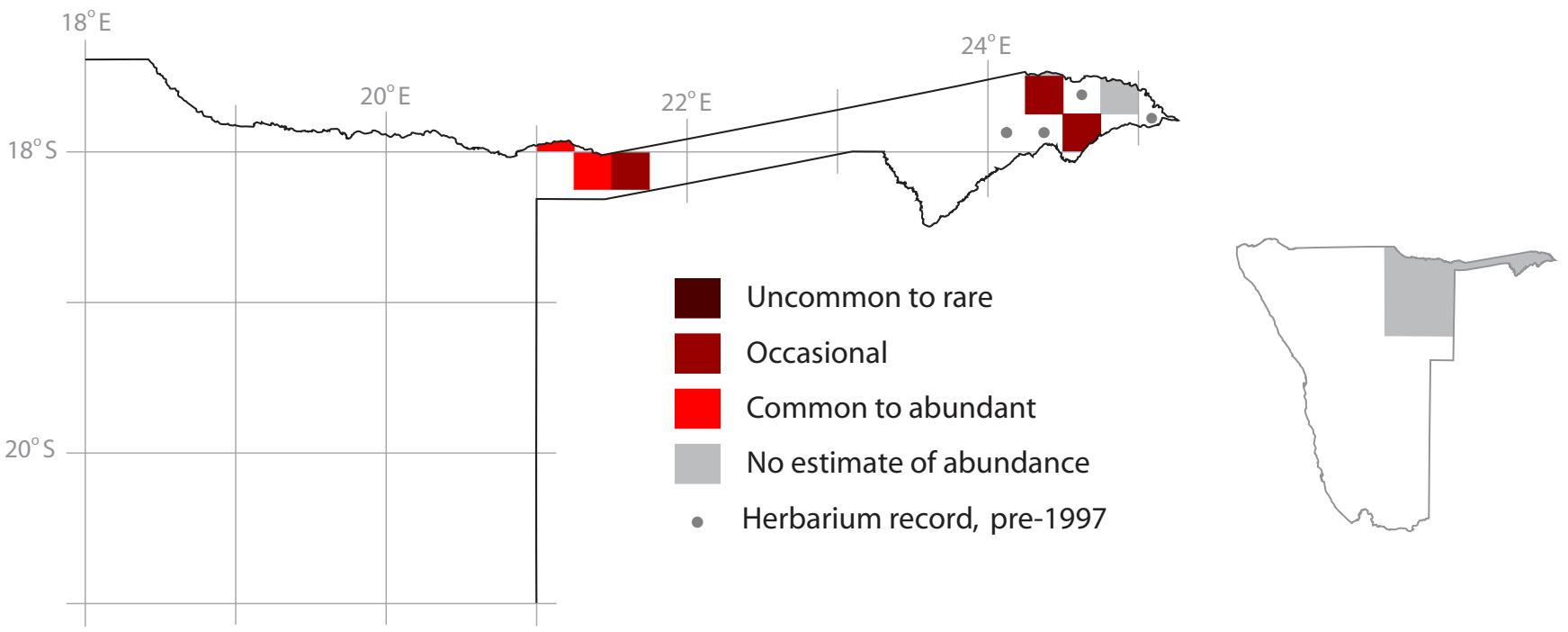
Tassel-berry (E); musole (L); runkwanana (K)

[10 records from 7 (<1%) squares]



Semi-deciduous. YOUNG BRANCHLETS **green to rust-brown, densely woolly**. LEAVES simple, elliptic to obovate, up to100 mm long; **leathery; shiny, dark green and hairless above; pale green to pale brown and densely woolly below**. FLOWERS small, with foetid scent; FRUIT berry-like, pendulous; initially green-white becoming red or black-purple when ripe.

Very similar to *A. rufescens*, but is densely hairy on the underside of the leaves.



DISTRIBUTION & ABUNDANCE

Found on the Caprivi floodplains and along the eastern stretches of the Okavango River. Generally uncommon, sometimes locally common or abundant.

HABITAT

Found on the banks and floodplains of perennial rivers.

GROWTH FORM

Mostly a shrub in the 1–3 m-height class, but sometimes a tree of over 3 m (5–6 m, according to herbarium records).

ANNUAL CYCLE

Observations made from December to March, only. FLOWERS in November, December and February. FRUIT in November and December and from March to May. LEAVES recorded every month of observations.

GENERAL

Often grows in the shade of larger woody species. The fruit is edible.

CONSERVATION CONCERNS

None recorded.

Bridelia cathartica

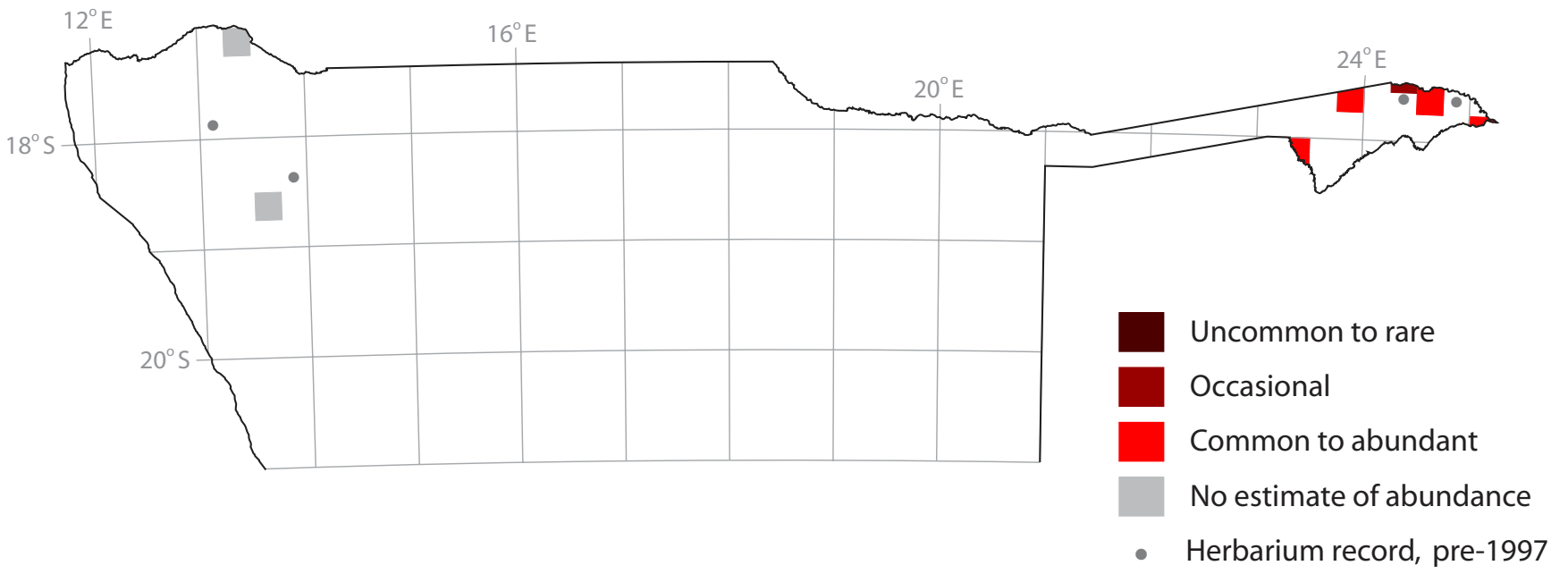
Muningunga

Mountain blue-sweetberry (E)

[12 records from 7 (<1%) squares]

Shrub or small tree. BARK brown to grey, smooth or fissured; **young branchlets brown, slender, drooping zig-zag**. LEAVES simple, alternate, lanceolate or ovate to oblong; dark green and shiny above, paler green below; **lateral veins looping before reaching the margin**. FLOWERS small, greenish, in axillary clusters. FRUIT small, fleshy, wine-red, becoming black when ripe.

May be confused with *Phyllanthus reticulatus* or other species of *Bridelia*.



DISTRIBUTION & ABUNDANCE

Occasional in scattered localities in eastern Caprivi; abundance in the north-west unknown.

HABITAT

On river banks in eastern Caprivi. No habit recorded for Kaoko.

GROWTH FORM

Mostly a shrub in the 1–3-m height class.

ANNUAL CYCLE

There were only four months of TAP observations in which flowers, fruit and leaves were recorded: March, April, May and November; these records have been combined with herbarium records. FLOWERS have been seen in November and from February to May. FRUIT was only recorded in May. LEAVES were observed in March, April, May and November.

CONSERVATION CONCERNS

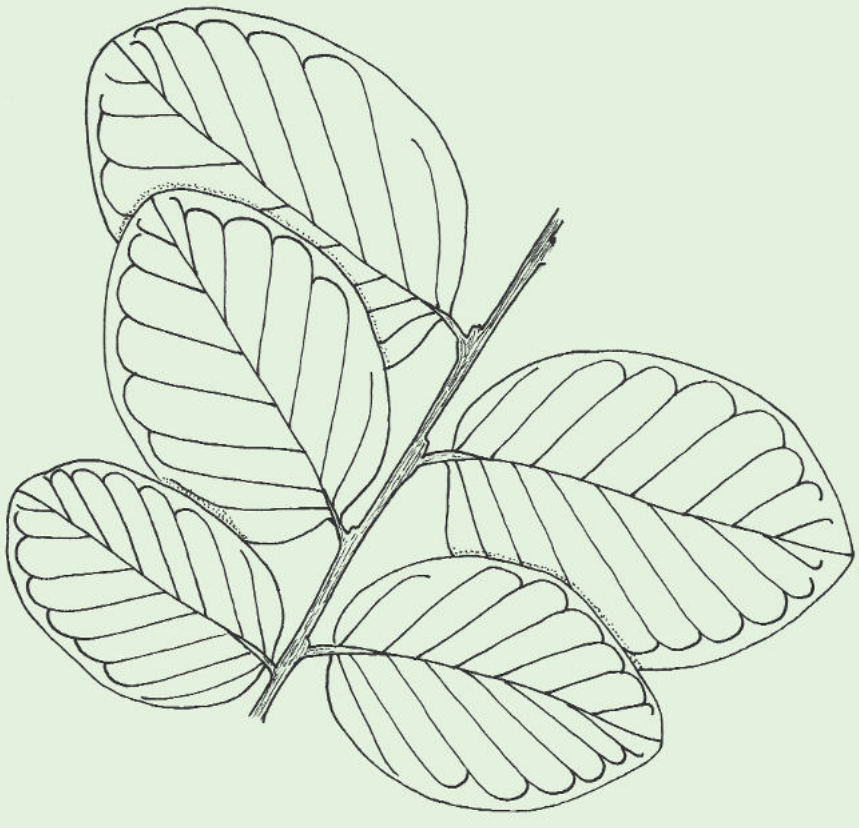
None recorded.

Bridelia tenuifolia

Tender Sweetberry

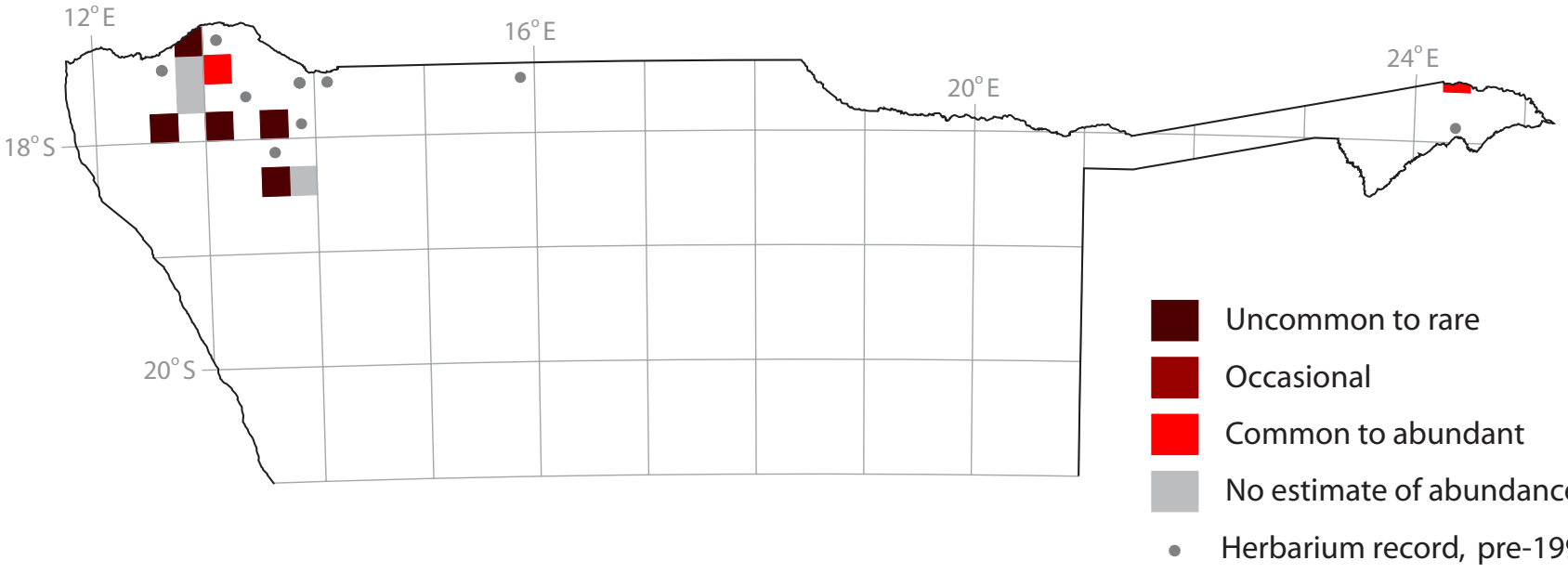
Sagtesoetbessie (A)

[12 records from 9 (<1%) squares]



Shrub or small tree. BARK dark grey, rough. LEAVES simple, alternate, elliptic to obovate to ovate, up to 110 mm long; **sparsely downy to hairless above, downy below**; margin entire, sometimes undulate. FLOWERS small, axillary, yellow-green, clustered or solitary. FRUIT a a small berry, black when ripe.

May be confused with other species of *Bridelia*.



DISTRIBUTION & ABUNDANCE

Uncommon to locally common in the extreme north-west.

HABITAT

Found on river banks and rocky outcrops.

GROWTH FORM

Mostly a tree 1–3 m high, but sometimes a shrub; once a tree 3–8 m high.

ANNUAL CYCLE

FLOWERS recorded from January to June and in November. FRUIT recorded from March to July. LEAVES evergreen.

CONSERVATION CONCERNS

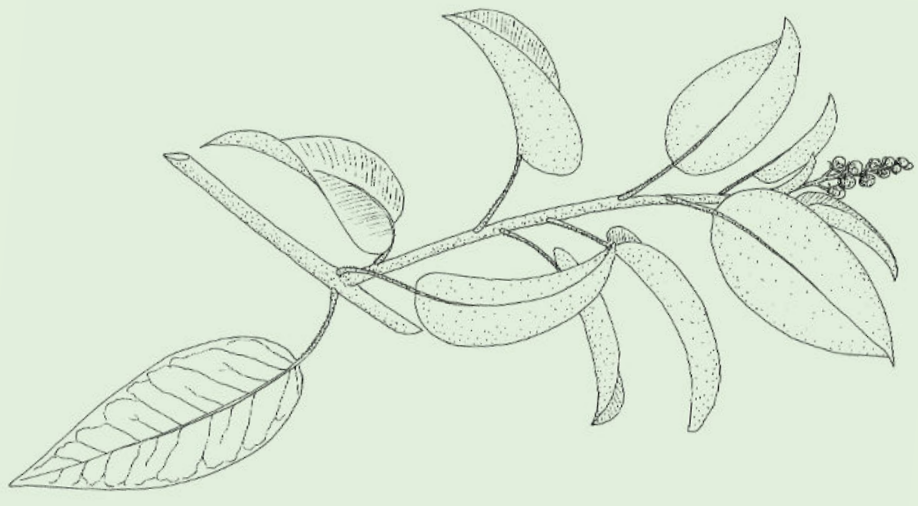
Either this species has been overlooked by atlassers, or its range has decreased, and thus it is of conservation concern and should be investigated further.

Croton gratissimus

Laventelbos / Mbango

Lavender croton (E);
omumbango (H, O); apupuueb (K);
mukewa (L); mwango (T)

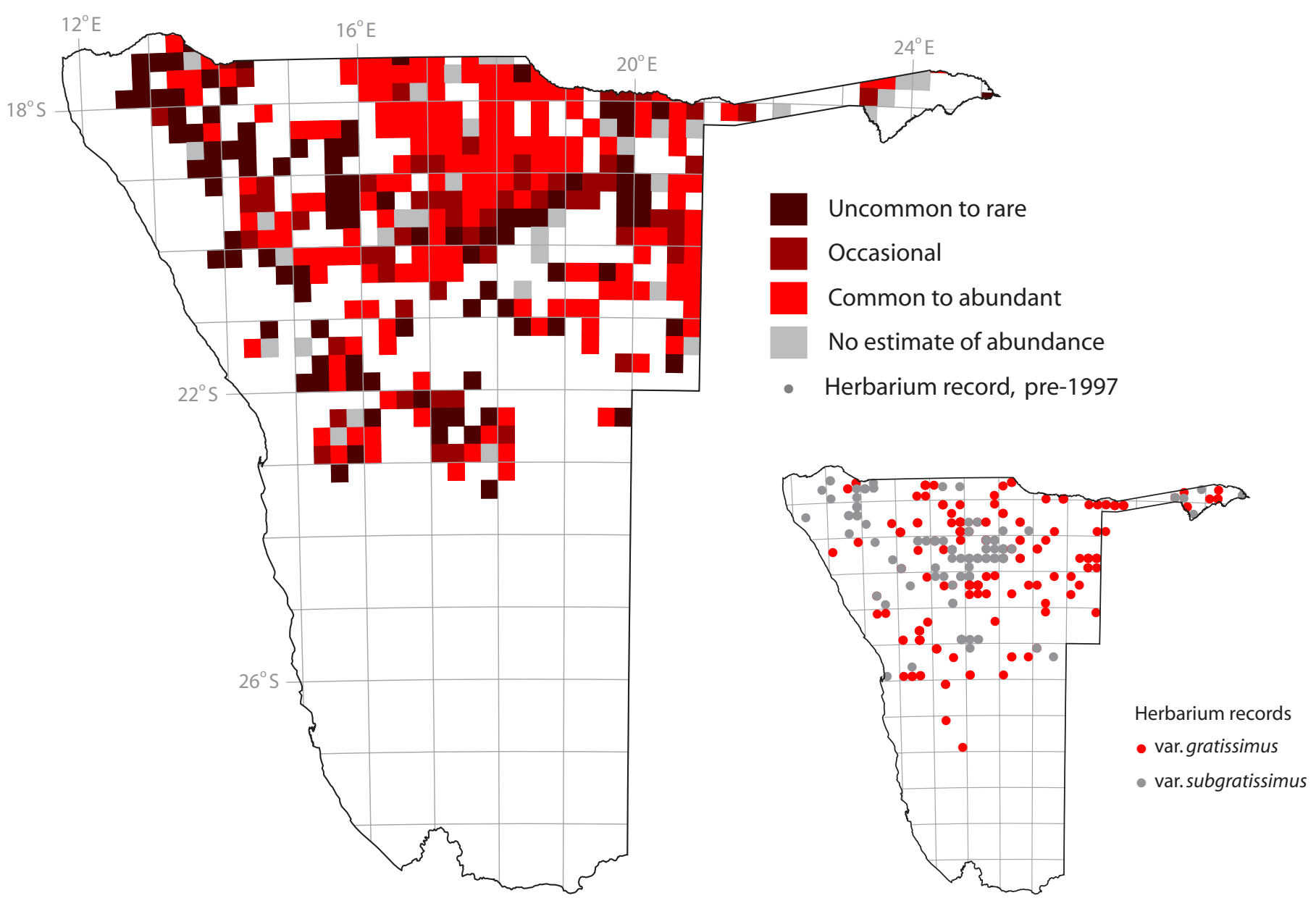
[968 records from 349 (33%) squares]



Lax shrub or tree. BARK rough, grey-brown to black; **young branchlets with a dense covering of silvery hairs and rust-brown scales**. LEAVES simple, elliptic to elliptic-lanceolate, up to 100 mm long; dark green above; **silvery with scattered red-brown scales below; petiole 6–25 mm long**. FLOWERS yellow. FRUIT a rough, three-lobed yellowish capsule.

This plant may be confused with *C. menyharthii*, which has a far shorter petiole.

There are two varieties of *C. gratissimus* in Namibia. They are easily distinguished by the presence of rough, stellate hairs on the upper surface of the leaf of var. *subgratissimus* that are absent in var. *gratissimus*. However, few atlassers were aware of this distinction and it is not possible to tell the variety from a moving vehicle. Thus, for the purposes of the TAP, the two varieties have been analysed together.

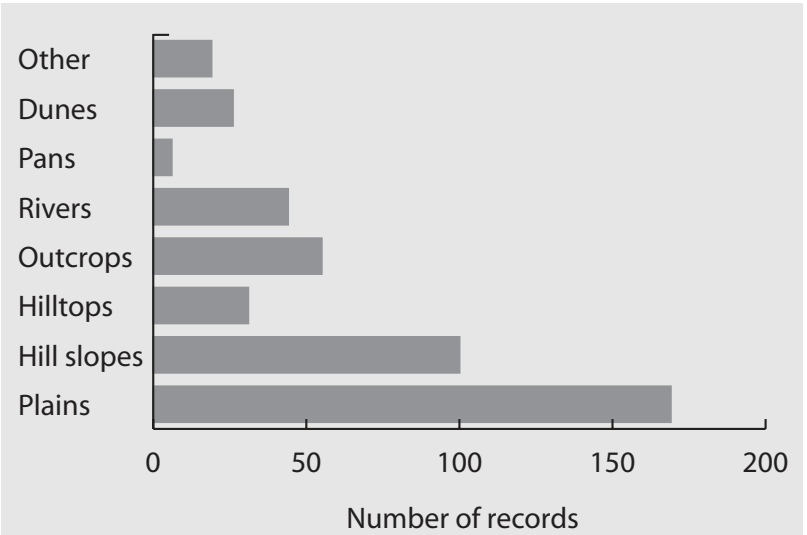


DISTRIBUTION & ABUNDANCE

Widespread and generally common over northern Namibia north of 23° S, except in the Namib Desert and western Caprivi. Common to abundant and dominant in places in the Cuvelai, Karstveld, and the north-east; less common in the west. Variety *gratissimus* is the more common and widespread, occurring over the whole range. Variety *subgratissimus* extends over most of the range, except the north-east apart from eastern Caprivi where it does occur; it is more common in the north-west than variety *gratissimus*.

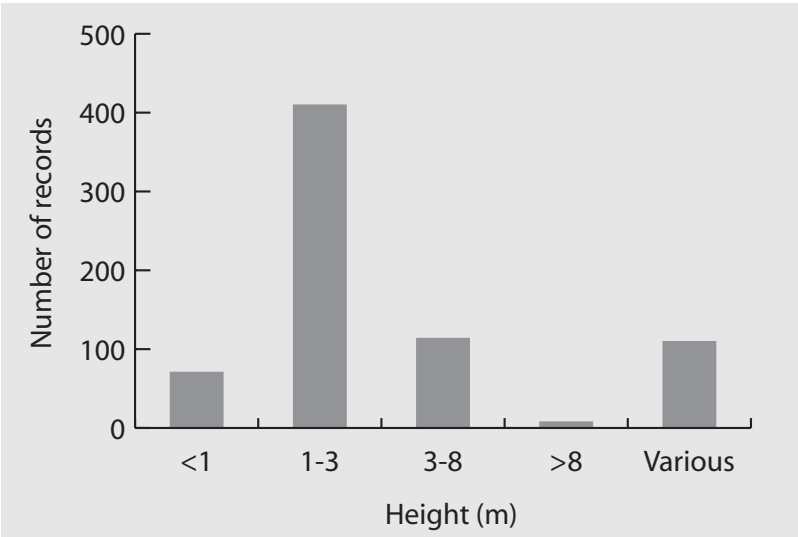
HABITAT

Found in a variety of habitats, mostly on plains, hill slopes and rocky outcrops. It is also found along dry rivers in the north-west, and on dunes in the north-east and central-east. Grows on sand, rock and calcrete.



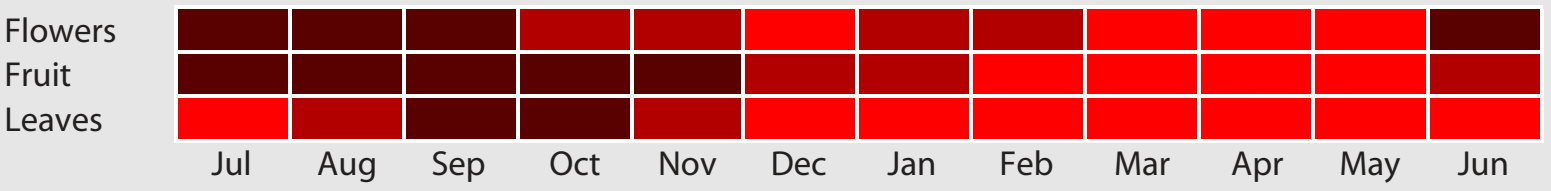
GROWTH FORM

Mostly a shrub, sometimes a tree, up to 3 m high; less often up to 8 m high.



ANNUAL CYCLE

FLOWERS there are two distinct peaks, the first in December, and the second, larger peak in April, although flowering may start in September. FRUIT present all year, but most abundant from February to May. LEAVES can be found on some individuals all year, but the highest number of bare trees is from August to October; new leaves produced from August to December.



GENERAL

The leaves are browsed by cattle, goats and game. Crushed leaves are used as perfume by young San women; boiled leaves can be used as soap. Various parts of the plant are used medicinally. The shrub tends to become numerous in cleared areas. The specific name, *gratissimus*, means 'most pleasant'. Other, unconfirmed names submitted by atlassers include 'oshibango' and 'oshitupaheke' (both Oshiwambo, MAN1) and N?aq'ara (Ju|'hoan, STE6).

CONSERVATION CONCERNS

None recorded.

Croton megalobotrys

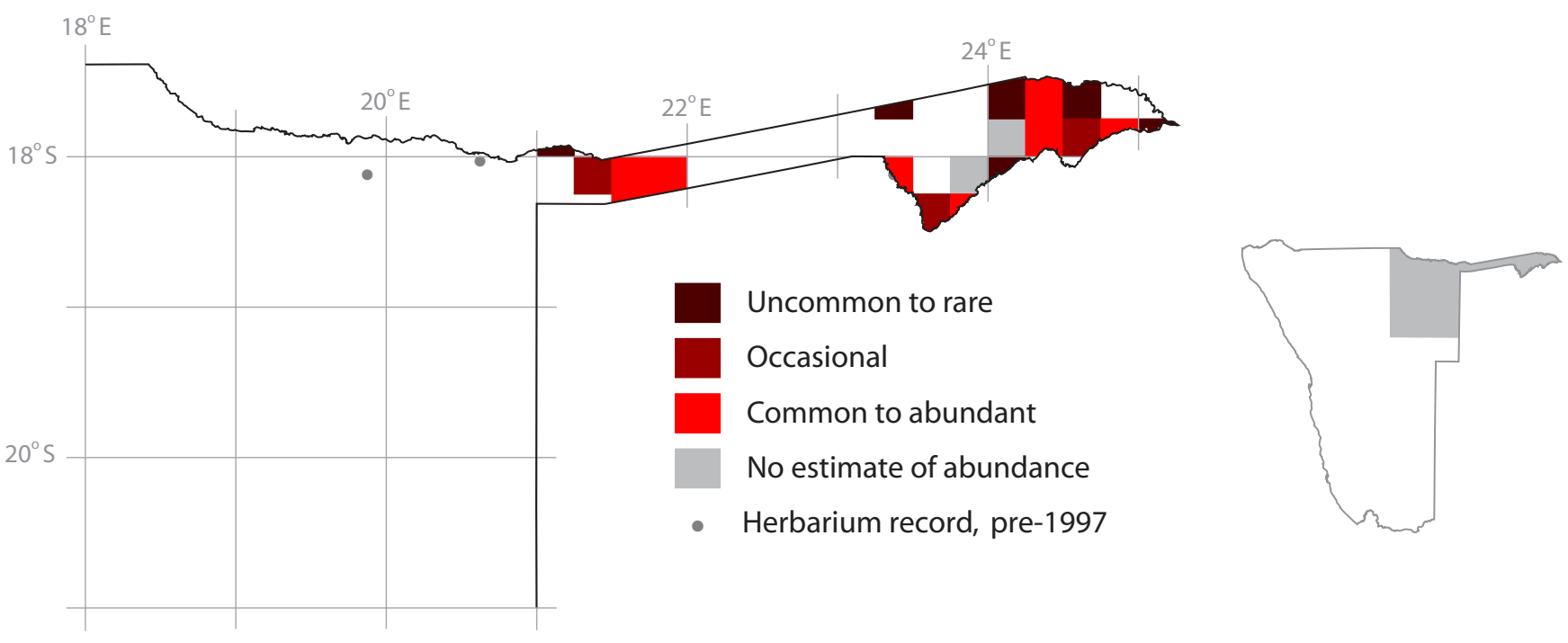
Murongo

(Large) fever-berry (E); mununkila, mutwatwa (L)

[48 records from 20 (2%) squares]



Shrub or tree. BARK grey-brown with a yellowish tint; **young branchlets densely downy**. LEAVES simple, ovate to elliptic-lanceolate, **conspicuously tapering from a broad base towards apex**, up to 150 mm long; **prominently five-veined from the base; margin irregularly and coarsely toothed; petiole 25–60 mm long**, with dense woolly covering and **two small knob-like glands near tip**. FLOWERS small, yellow-green, in an 80–100-mm-long spike. FRUIT a softly hairy or smooth, three-chambered, woody capsule, **20–35 mm in diameter**; bright green at first, becoming orange to golden-brown when ripe.

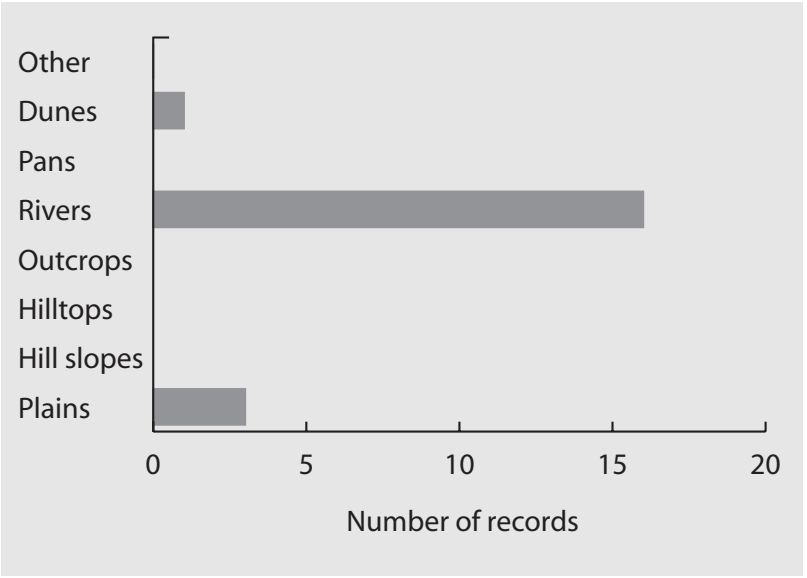


DISTRIBUTION & ABUNDANCE

Common to uncommon along the eastern stretches of the Okavango River and in eastern Caprivi. Locally abundant on floodplains.

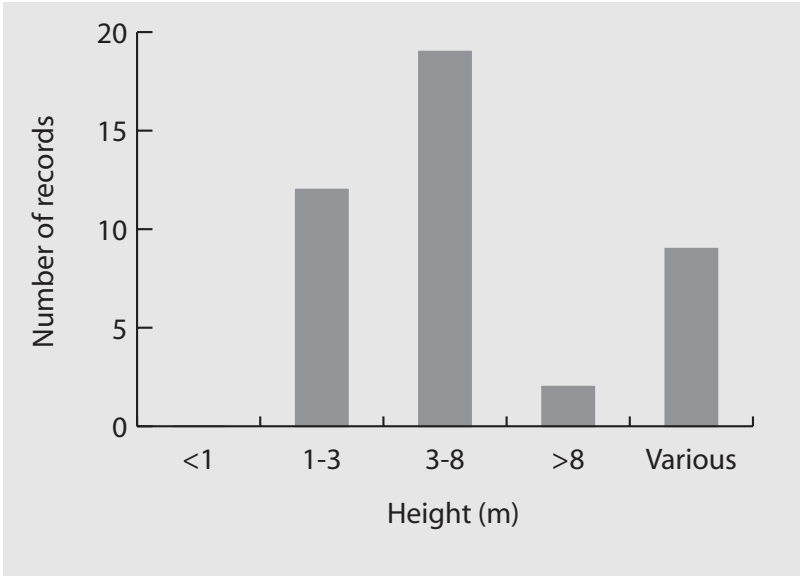
HABITAT

Mainly found on floodplains and along river banks.



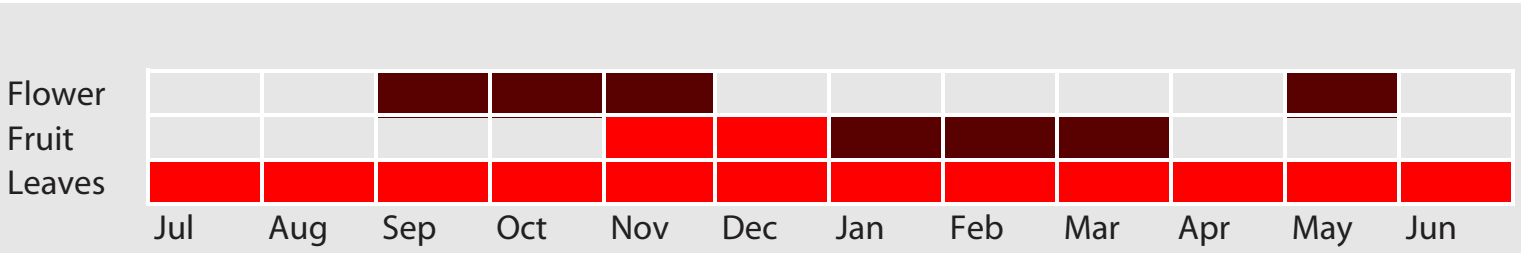
GROWTH FORM

A tree or shrub up to 8 m high, occasionally over 8 m.



ANNUAL CYCLE

FLOWERS one record per month in September, October, November and May. FRUIT mostly in November and December, but can be found till March. LEAVES evergreen.



GENERAL

Eaten by elephants. The bark is poisonous, but various parts of the plant are used medicinally. May be thicket-forming away from the river.

CONSERVATION CONCERNS

None recorded.



Croton megalobotrys, Kwando River, C. Mannheimer

Croton menyharthii

Rough-leaved Croton

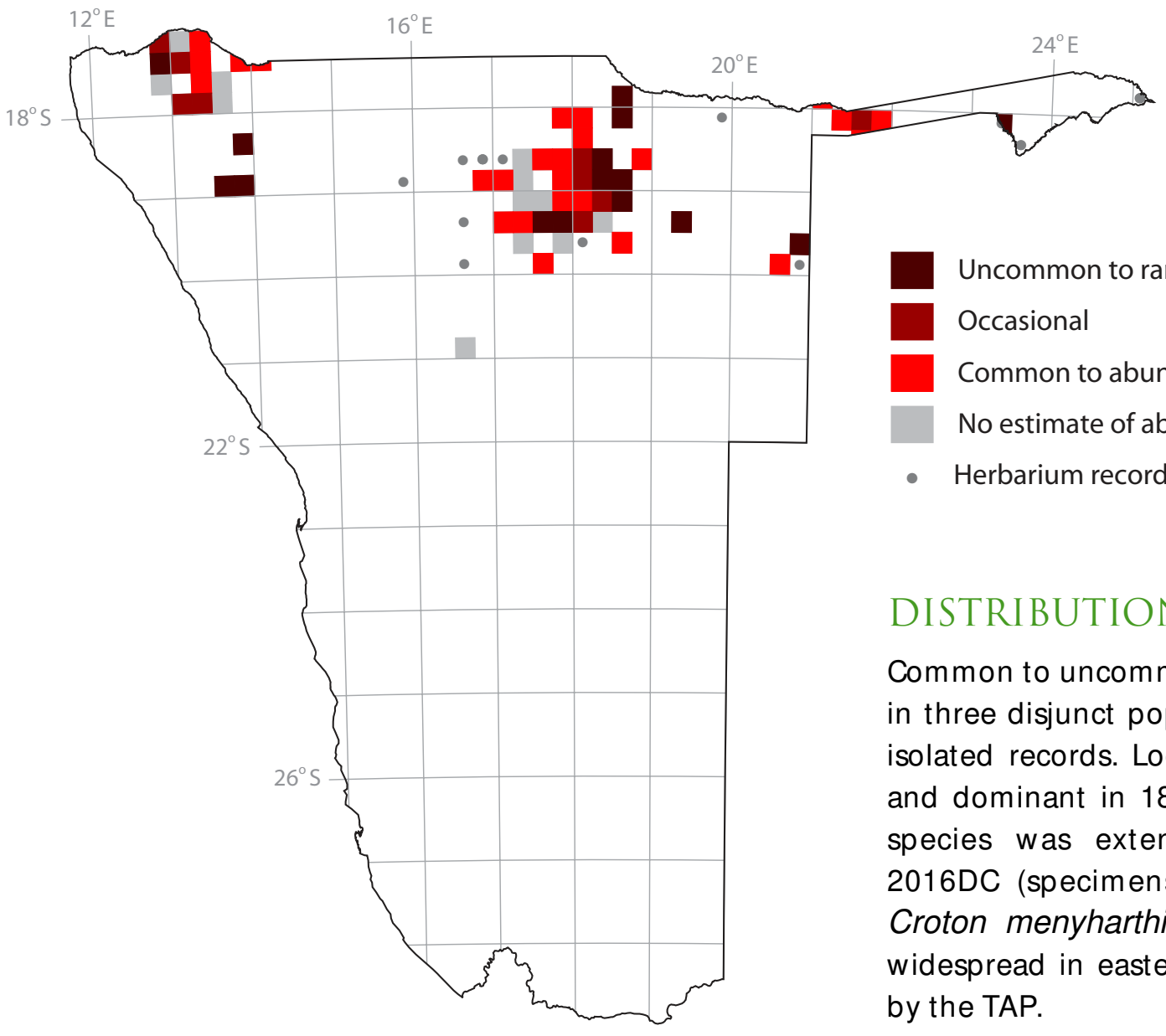
Mwango (T)

[117 records from 64 (6%) squares]



Semi-deciduous shrub. BARK rough, grey-brown; young branchlets silvery. LEAVES simple, ovate to virtually elliptic, up to 70 mm long; scattered rough hairs above and **dense silver-yellow scales below**; apex blunt, often shallowly notched; base heart-shaped to blunt; **petiole 2–5 mm long**. FLOWERS yellowish. FRUIT a three-chambered capsule, up to 8 mm in diameter and splitting open when ripe.

Can be confused with *C. gratissimus*, but *C. menyharthii* is generally a much smaller plant with a more yellowish appearance. Leaves of *C. menyharthii* have shorter petioles.

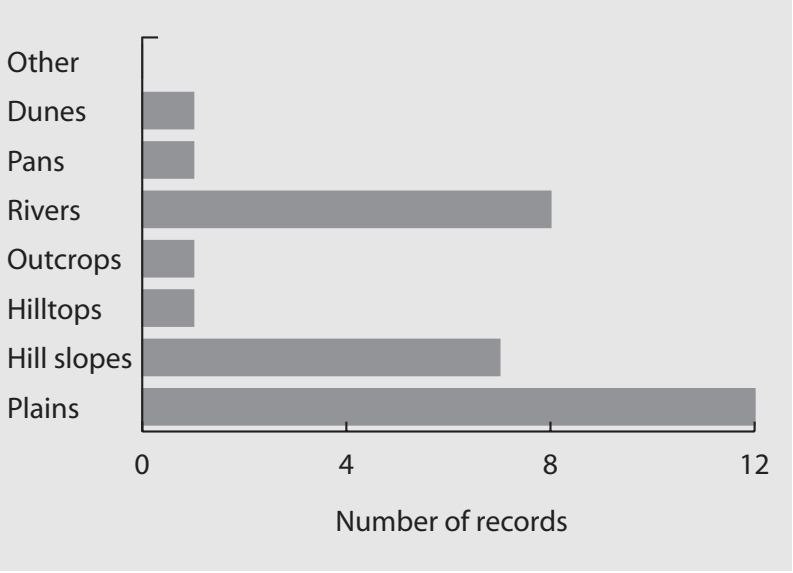


DISTRIBUTION & ABUNDANCE

Common to uncommon north of 21° S mainly in three disjunct populations, but with other isolated records. Locally abundant in places and dominant in 1817DB. The range of this species was extended in degree-square 2016DC (specimens LH577 & 578, HOF1). *Croton menyharthii* is thought to be more widespread in eastern Caprivi than reported by the TAP.

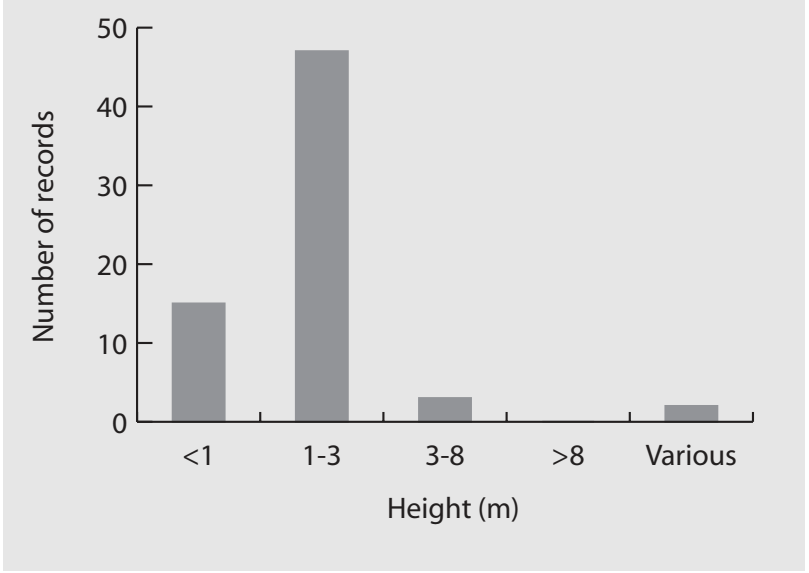
HABITAT

Found in a variety of habitats, but mostly in mixed woodlands, and on plains and hill slopes. Also along dry river courses in the north-west. Grows on sand, loam or stony substrates.



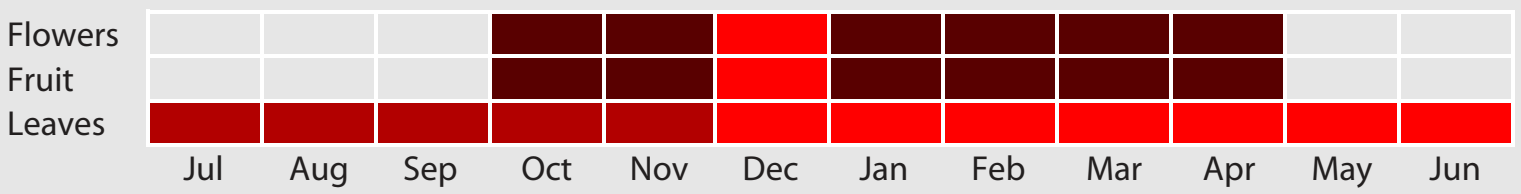
GROWTH FORM

Mainly a shrub in the 1–3-m height class, occasionally a tree.



ANNUAL CYCLE

FLOWERS and FRUIT recorded sporadically October to April, but mostly in December. LEAVES may be found on some individuals all year, but mostly from December till June.

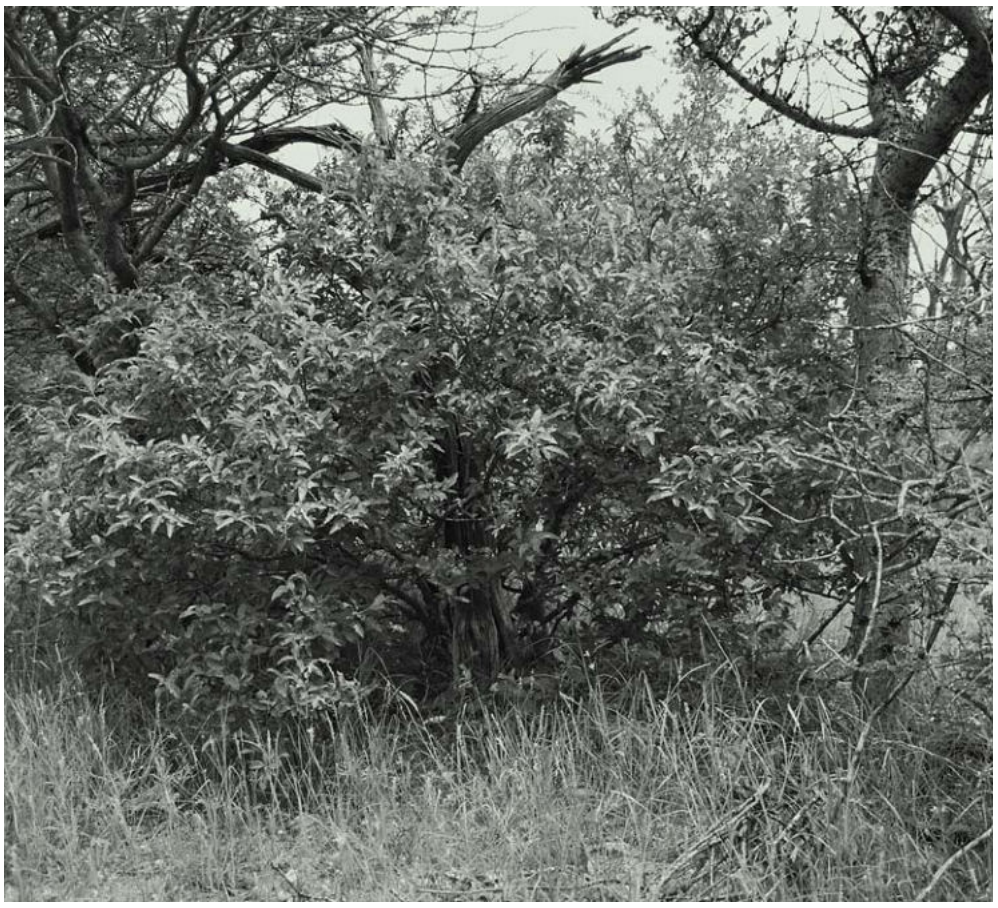


GENERAL

A rain-dependent species.

CONSERVATION CONCERNS

None recorded. The lack of records from the Okavango River and eastern Caprivi could be due to the species having been overlooked or misidentified by atlassers, but is a concern if the species no longer occurs in those localities.



Croton menyharthii, G. Friederich

Croton leuconeurus

Barotse Croton

[2 records from 2 squares]

Shrub or tree, with drooping branches and **hairy young branchlets**. LEAVES simple, elliptic-ovate, **usually with soft covering of white hairs below**. INFLORESCENCE a terminal catkin, up to 200 mm long. FRUIT a rough, three-lobed, yellowish capsule. This is a species from north of the Zambezi River.

There were two TAP records; uncommon shrubby trees 3–4 m high on the floodplains of the Okavango River (1721BB) and common shrub up to 3.5 m or tree up to 5 m on Impalila Island (1725CC). There is one old herbarium record from the Zambezi River (1724AD). Flowers and fruit were recorded early November and February.

Croton longipedicellatus

Long-stalk Croton

[1 record]

A scrambling shrub or small tree. LEAVES ovate to elliptic, thinly textured, **hairy, with two glands** next to the petiole on the undersurface, **petiole long, with a bend at the base**. FLOWERS yellow or greenish-cream. FRUIT small, almost round, three-lobed. This is a species found in the Zambezi Valley.

There was only one TAP collection (SHA1/L115) from Lianshulu Lodge (1823AB) on the Kwando River, where it was recorded as a common shrub in the 1–3-m height class on the river banks, and with fruit in April. This is a new record for Namibia.

Croton pseudopulchellus

Small Lavender-croton

[1 record]

Spindly shrub. LEAVES **small, lanceolate**; aromatic when crushed; below, **densely covered with silvery scales and dotted with red-brown scales**. FLOWERS small, yellow. FRUIT a small, three-lobed capsule. This species is known from south-western Zimbabwe.

There was one TAP specimen (CUR1/1237) collected from the woodland east of the Kwando River. It was locally common as a shrub of around 1 m high, with flowers in late October. There is one earlier herbarium record from the Okavango River.

Erythrococca menyharthii

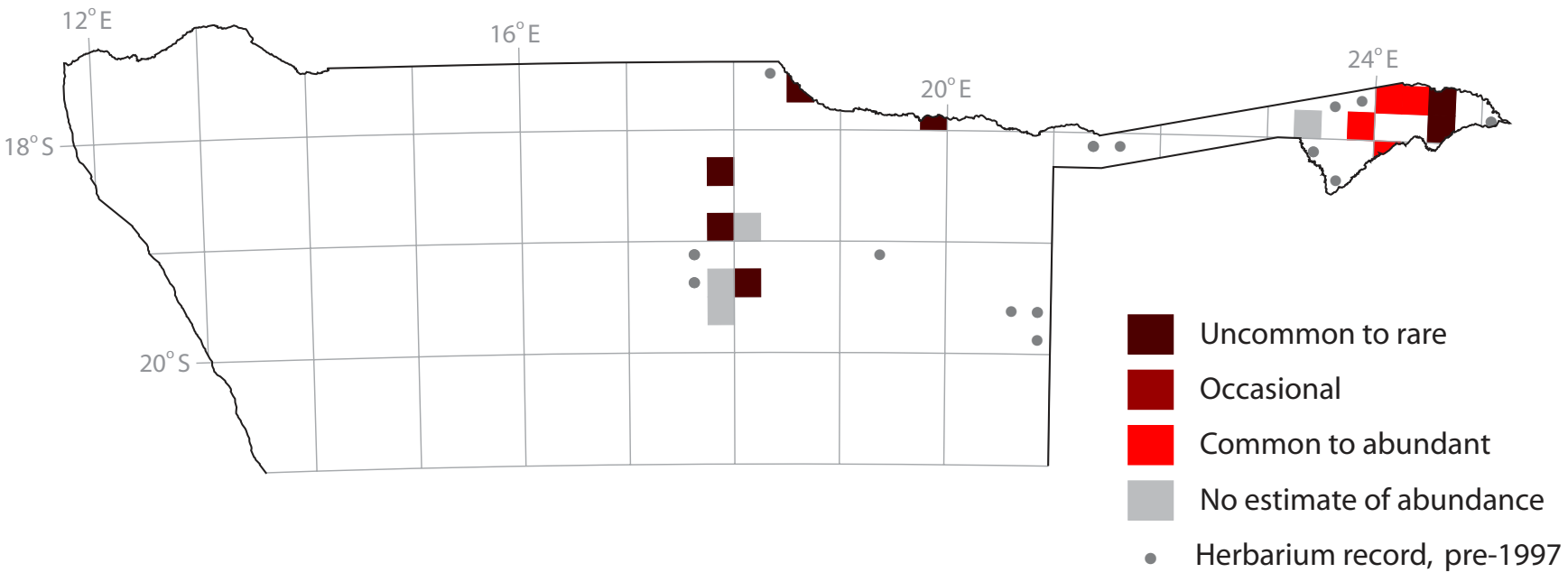
Dipoko

Northern red-berry (E)

[25 records from 16 (1%) squares]

Spindly shrub, generally fairly small. BARK pale grey, smooth, **with rough scaly buds**, tends to flake when old. LEAVES simple, elliptic to ovate-lanceolate, downy; margin toothed or entire. INFLORESCENCE **an axillary umbel**. FRUIT a **three-chambered capsule, red**; splitting open when ripe.

This plant may be overlooked unless it is in fruit, when it is very conspicuous.



DISTRIBUTION & ABUNDANCE

Restricted to north-eastern Namibia. Uncommon in the eastern Karstveld and along the Okavango River; common in eastern Caprivi. There are earlier herbarium records from the Andara-Popa Falls and the Nyae Nyae areas, which were not confirmed by the TAP.

HABITAT

Found on plains and river banks in the north-east, and on dolomite hill slopes in the Karstveld. Grows on sand or stone.

GROWTH FORM

A shrub in the 1–3-m height class.

ANNUAL CYCLE

No observations were made from May to September. FLOWERS recorded from October to March. FRUIT recorded from December to May. LEAVES were present in all months for which there were observations (October to April).

GENERAL

The leaves of this plant are cooked and eaten as a vegetable, or added to dishes to spice them up.

CONSERVATION CONCERNS

The population could be declining, but it is more likely that this species was overlooked.

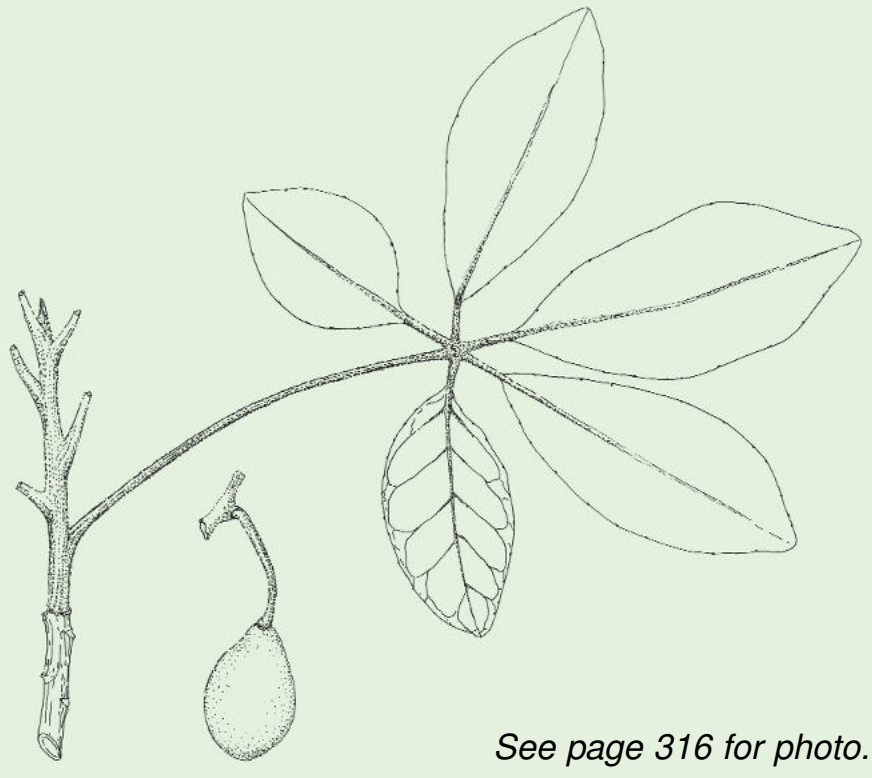
Schinziophyton rautanenii

= Ricinodendron rautanenii

Manketti

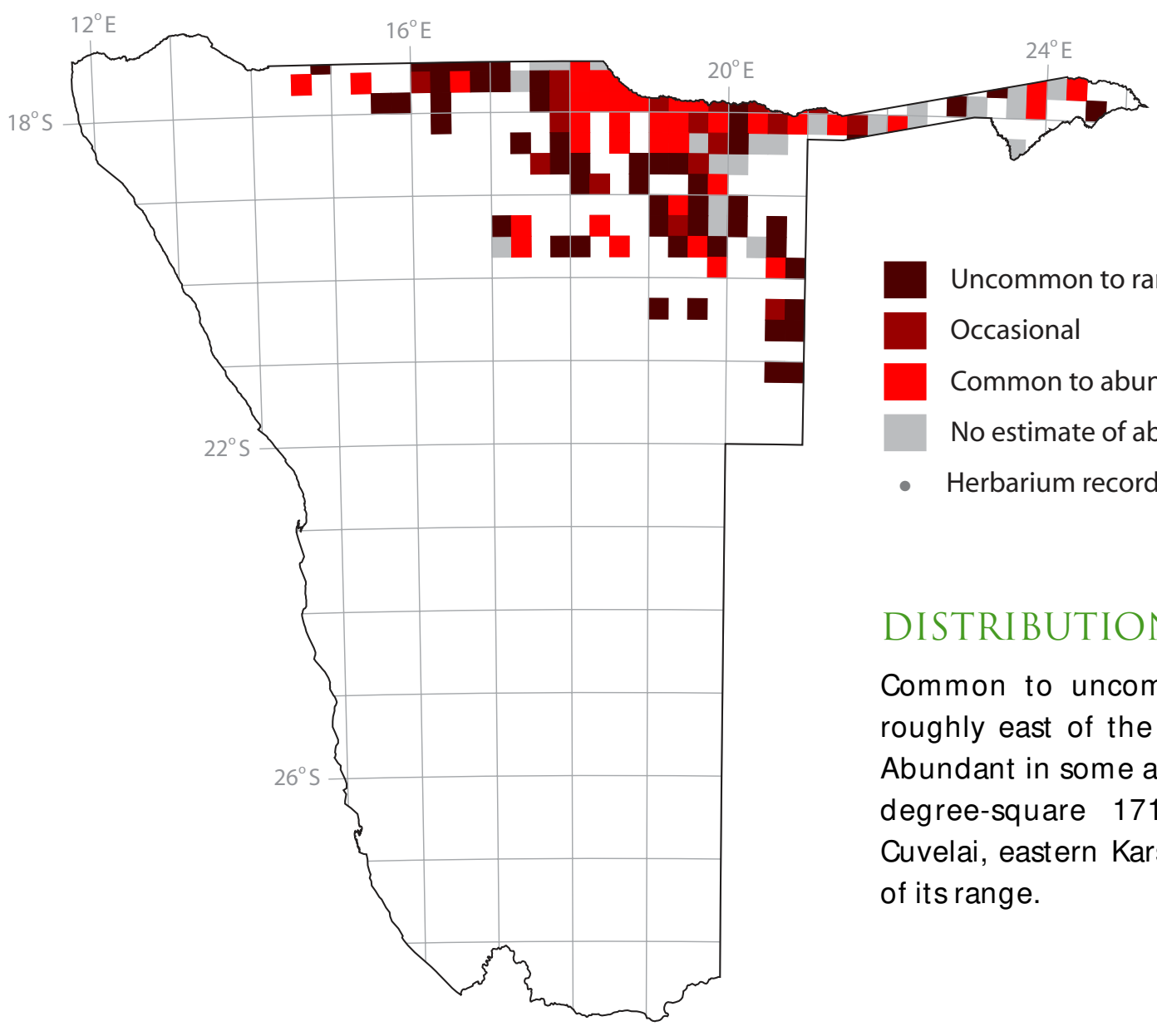
Ongete, omungete (H); mungongo (L); onkete, omunkete (Od); omangette (Ok); ugongo, ngongo (= fruit; Rk, Rum, T)

[250 records from 133 (12%) squares]



See page 316 for photo.

Large, deciduous tree with **rounded, spreading crown**. BARK smooth, **yellowish to yellow-grey**, with pieces peeling off to expose a yellowish underbark. LEAVES **5–7-palmately compound**; leaflets elliptic to obovate; dark green above, with dense, rust-brown hairs; pale yellow-green below, with brown-white, finely woolly covering. FLOWERS yellow, in terminal spray; male and female flowers on separate plants. FRUIT oval, **brownish when dry,** SEEDS **nutlike**, enclosed in hard shell.

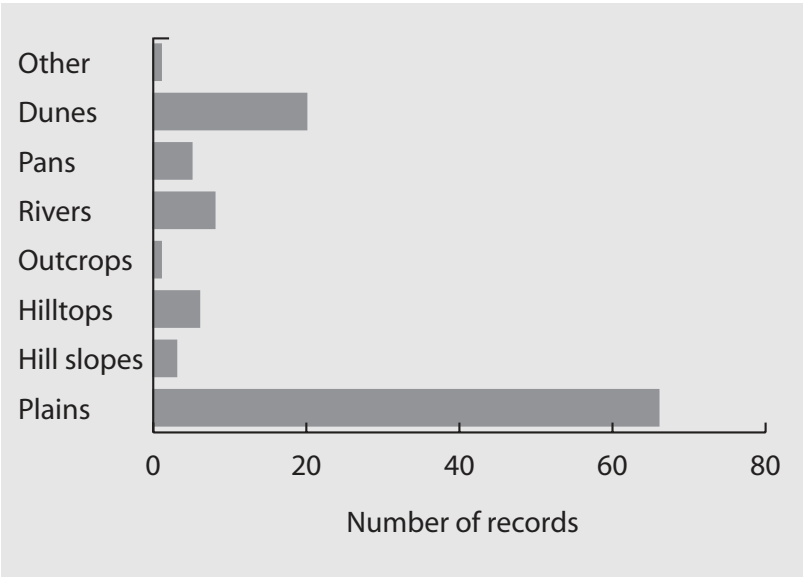


DISTRIBUTION & ABUNDANCE

Common to uncommon in the north-east, roughly east of the 400-mm rainfall isohyet. Abundant in some areas and dominant in the degree-square 1718; uncommon in the Cuvelai, eastern Karstveld and southern part of its range.

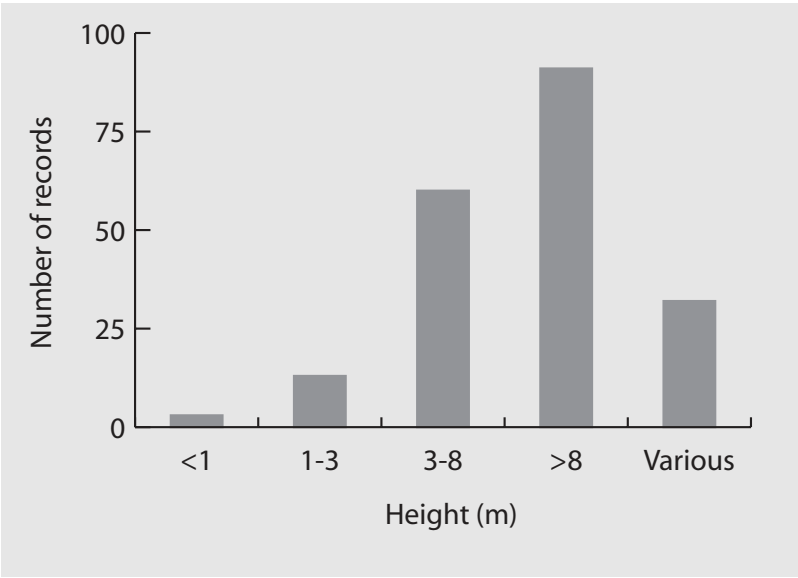
HABITAT

Found in various habitats, but most often on plains and dunes. Grows on sandy or sandy loam substrates in mixed woodland, riverine forest and shrubbed woodland. Found on floodplain islands in eastern Caprivi.



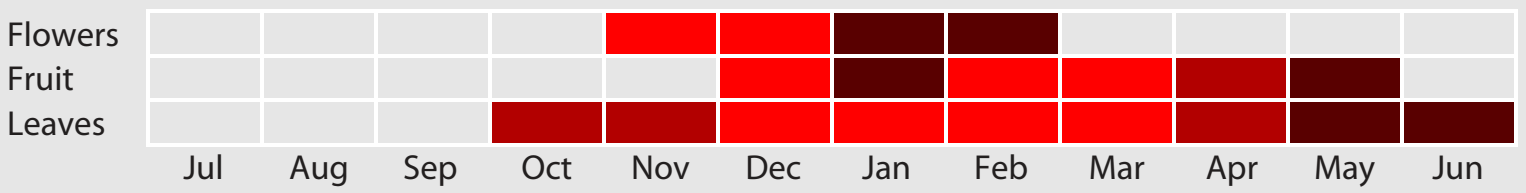
GROWTH FORM

A tree generally over 8 m high, with only a few young plants noted.



ANNUAL CYCLE

FLOWERS November to February. FRUIT December to May. LEAVES mainly October to April, with young leaves in October and November.



GENERAL

Numerous uses have been documented in the literature for this species. The manketti is a valuable shade tree that has the ability to coppice easily. It yields a light and durable timber, which is used to make hunting bows, spoons, drums and marketable items for the tourism trade. The branchlets are used as fire-sticks.

The fruit is used in a number of different ways and is stored for later use when food is scarce. The kernel is eaten raw or roasted; it is also stamped and mixed with ochre for body application. The carbohydrate-rich flesh of the fruit, is made into a delicious jelly or puree when crushed; the fermented fruit are distilled to make a potent spirit called 'kashipembe'. The seed contains an edible oil that is extracted and used for cooking. The manketti is also used medicinally, but has been reported to be dangerous. The commercial potential of this species as an indigenous fruit-tree is being investigated.

CONSERVATION CONCERNS

The increased use of this tree for wood-carving might be of concern, although its immense value as a food resource will probably prevent it from being harvested to any large extent for that purpose. Young trees were probably under-reported as they are usually protected locally. The trees are greatly damaged by veld fires. Protected by forestry legislation.

Spirostachys africana

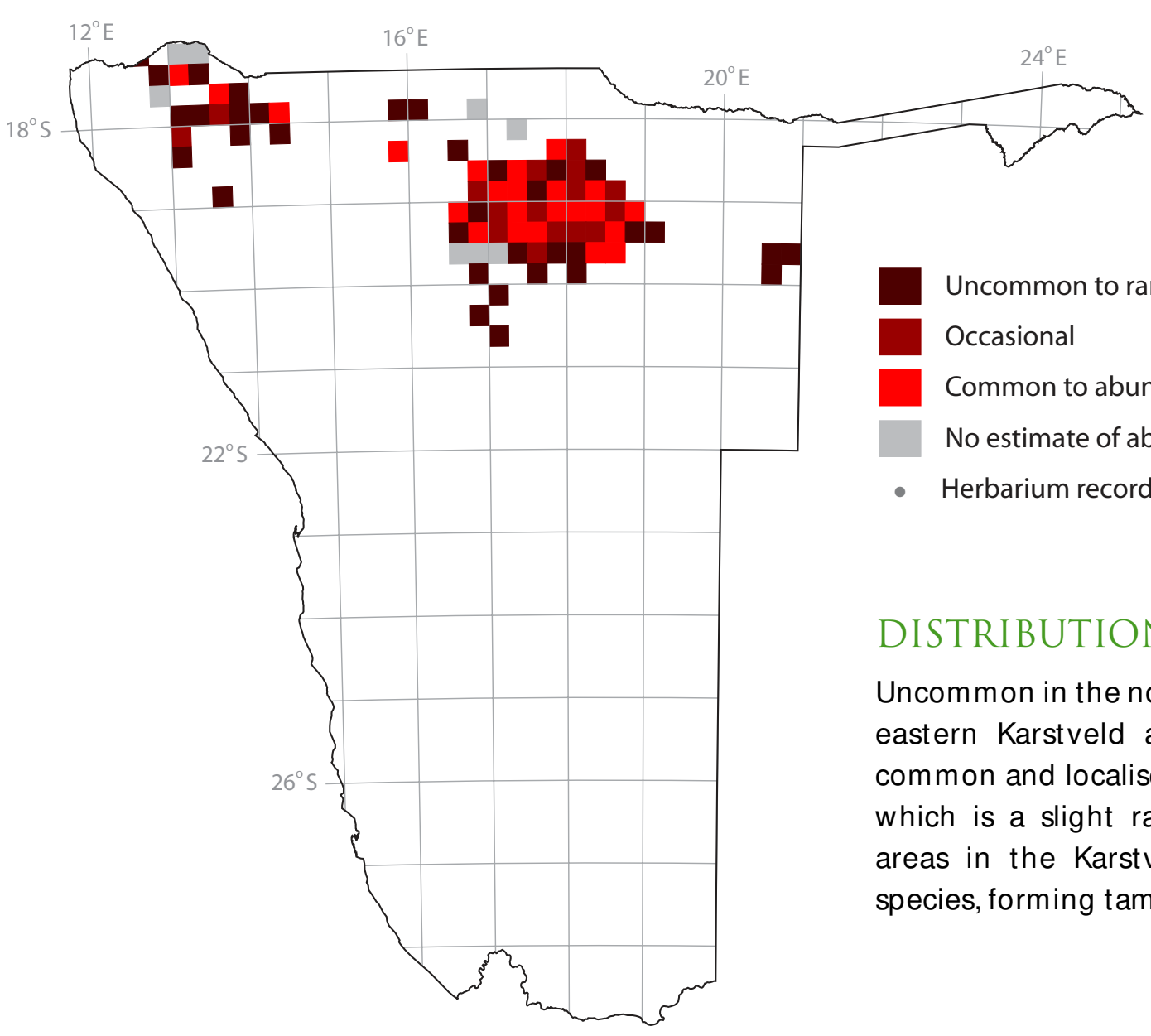
Tamboti

Tambotie (A); Tambuti (G); omuhongo (O); muhongo (Rk, Ruk)

[254 records from 83 (8%) squares]



Erect tree with spreading crown, and **milky latex**. BARK grey to dark grey, **longitudinally fissured to form small, rectangular blocks; young branches drooping**. LEAVES simple, ovate to elliptic; **margin crenate**. INFLORESCENCE an axillary spike, densely covered with brown bracts. FRUIT a three-lobed, three-seeded, yellow-brown capsule, about 10 mm in diameter.



DISTRIBUTION & ABUNDANCE

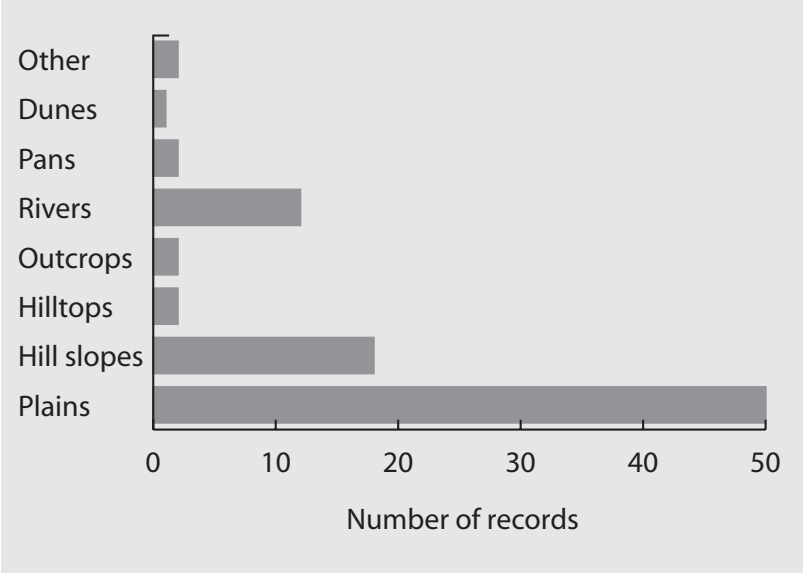
Uncommon in the north-west; common in the eastern Karstveld and just east of it; uncommon and localised in the Nyae Nyae area, which is a slight range extension. In some areas in the Karstveld it is the dominant species, forming tamboti woodlands.

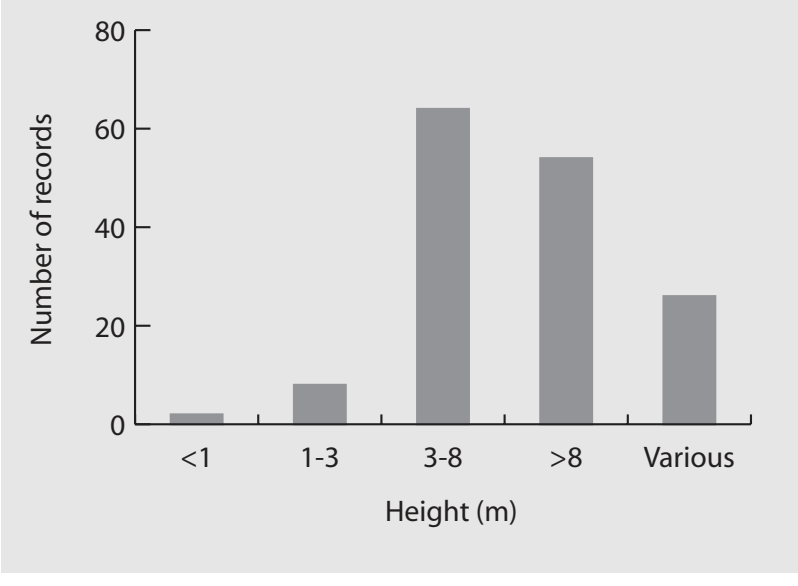
HABITAT

Mainly found on plains in the north-east and Karstveld, as well as on hill slopes in the Karstveld; occurs along dry river courses in the north-west. Grows on sand, calcrete, dolomite or other rocky substrates.

GROWTH FORM

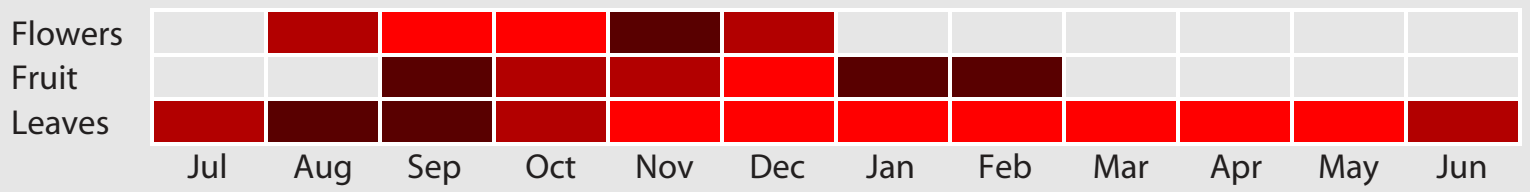
A tree in the 3–8-m height class or taller. Young trees recorded in degree squares 1817 and 1917.





ANNUAL CYCLE

FLOWERS August to December. FRUIT September to February, peaking in December. LEAVES mainly October to June, with young leaves in November and December.



GENERAL

Graceful tree of horticultural potential. The wood is hard, termite resistant and used for fencing, furniture and house construction, as well as for smaller items such as decorative walking sticks and beads. The wood should not be used as firewood because the smoke is irritant and may cause nausea or taint the food cooked over the coals. The wood is nevertheless sometimes burnt to obtain the aromatic smoke; and torches are made from the branches. The stems and bark are used to produce fish-poison and poison for application to arrowheads; the leaves and latex are used medicinally, although this is said to be dangerous. Powdered wood is used by Herero women as perfume.

The leaves, shoots and twigs are browsed by giraffe, kudu and dik-dik; tree squirrels eat the bark, new leaves, pollen and seeds and nest in holes in the tree-trunk. The seeds are known as 'jumping beans'; they are often infested with the larvae of a moth, which move, causing the seed to 'jump about'.

CONSERVATION CONCERNS

About 5% of the big trees in 1918AD have died. Formerly, tamboti was used to make props for the mine in Tsumeb and, although there is no documented evidence, may have been over-utilised in the area west of Otavi. Protected by forestry legislation.

Excoecaria bussei

Pepper-seed

Pawnbroker

[1 record]

Shrub to medium-sized tree. LEAVES elliptic-obovate, dark, glossy green. FLOWERS small, greenish-yellow. FRUIT a distinctive three-lobed capsule, *c.* 45 mm in diameter.

One TAP record and specimen from the Andara area (1821AB). An uncommon tree 5 m high, with fruit in March. There is one other herbarium specimen, from 1724CA.



Excoecaria bussei, fruit, B. Curtis

Maprounea africana

Lumwamwa

Magic-nut, redskin (E); rooitakkie (A)

[no TAP records]



Deciduous tree. BARK pale brown, rough, corky, deeply fissured to expose a pinkish underbark; young branchlets brittle, limp and plum-coloured. LEAVES simple, ovate. FLOWERS yellow. FRUIT a triangular capsule; red when ripe.

Although not recorded during the TAP, there are four, earlier, herbarium records from one square in western Caprivi (1722DC).

Euphorbia espinosa

Peeling-bark Woody-euphorbia

[no TAP records]

Shrub or small tree, often twiggy, with succulent stems. BARK olive-green, with yellow, papery peel. LEAVES oblong to elliptic. FLOWERS greenish-yellow. FRUIT a small, blue-green, three-lobed capsule.

There were no TAP records, but earlier herbarium records came from the Okavango River or nearby (1719CD, 1821AB, BA and 1918CA). Listed on CITES Appendix II.

Euphorbia matabelensis

Sivaradi

Three-forked euphorbia (E)

[3 records from 3 squares]

A shrub or small tree with spine-tipped branches. LEAVES small, in clusters. FLOWERS greenish-yellow, in dense heads. FRUIT a small, three-lobed capsule.

This plant was recorded from the Hartmann's Valley in the north-west (1712AA, AC) and 1718CB as an uncommon shrub up to and just over 1 m. Earlier herbarium records come from the north-west (1712CB and 1813CC) and eastern Caprivi (1723CB, DB and 1714AD). Listed on CITES Appendix II.

Euphorbia venenata

Karst Candelabra-euphorbia

Karst-kandelabra Euphorbie (G)

[6 records from 4 squares]

Many-stemmed, spiny, succulent grey-green shrub with milky latex. BRANCHES simple, sometimes branched near tip; **six-angled**, deeply furrowed, **sharply constricted at intervals, segments broadest at base**. THORNS straight, paired, about 5 mm long. INFLORESCENCE three yellow cyathia borne together. FRUIT a three-angled capsule, about 5 mm in diameter.

An extremely uncommon species from a few scattered localities in central-northern Namibia. Recorded as a shrub of less than 3 m, growing chiefly on plains, but also on hill slopes. Flowers recorded in September and December. Fruit in September. There are only four herbarium specimens of *E. venenata* (1814CA, 1915BD, 1917BA and CC).

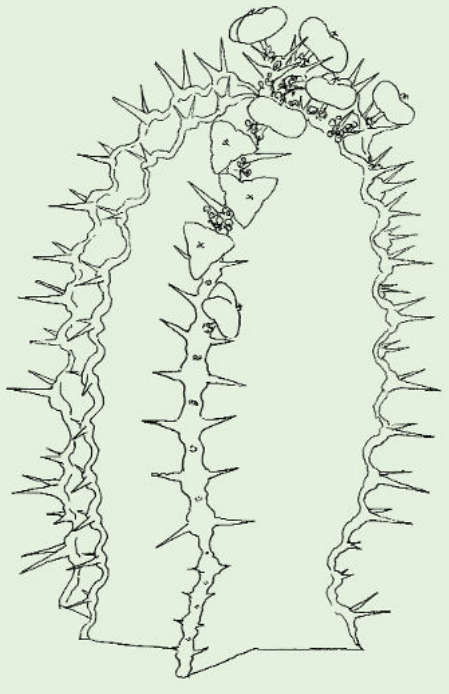
CONSERVATION CONCERNS

Euphorbia venenata is endemic to Namibia. It is listed as a CITES Appendix II species and has been assessed as 'data-deficient' according to the latest IUCN criteria (Loots 2005).

Euphorbia avasmontana

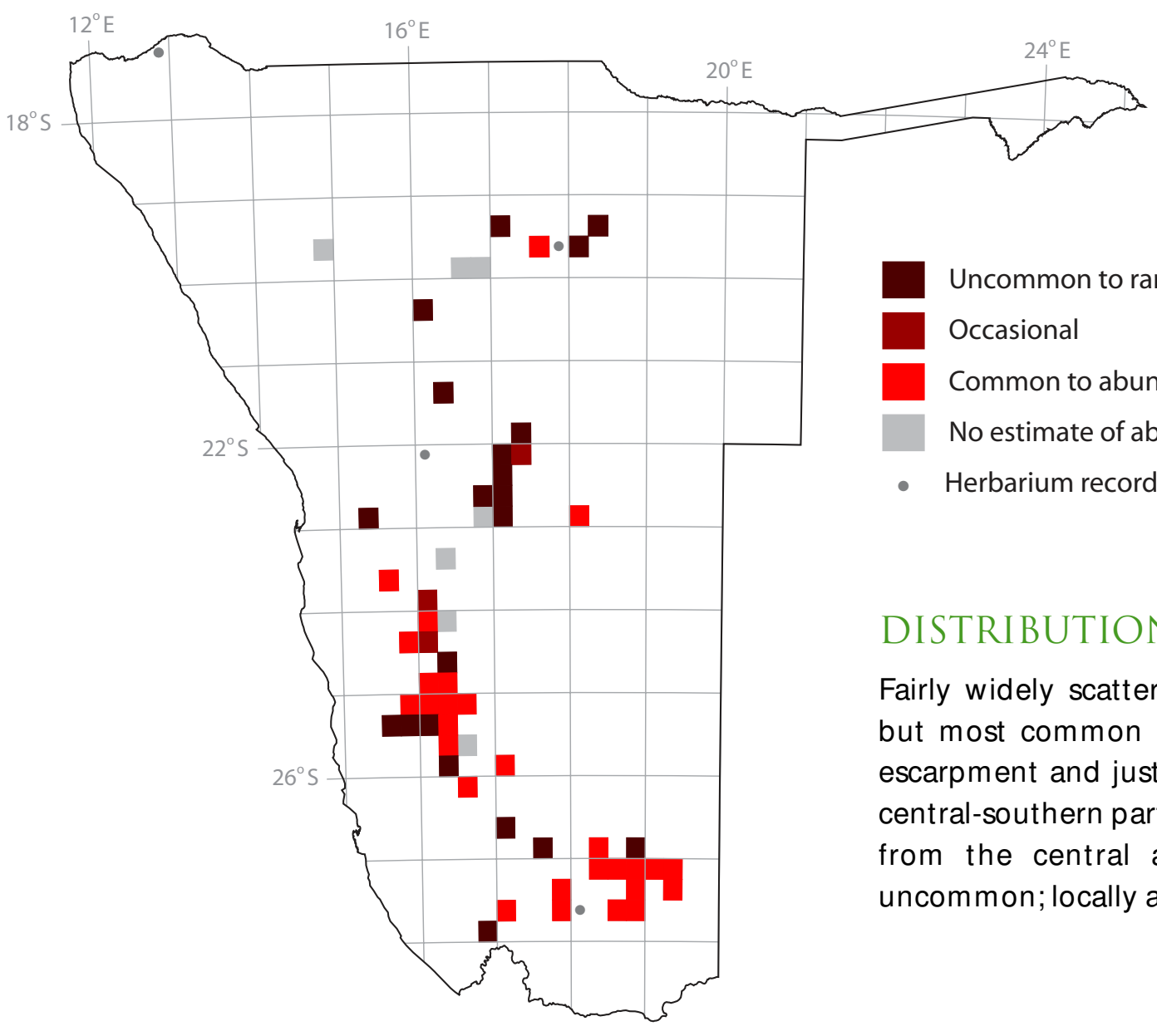
Slender Candelabra-euphorbia

[98 records from 59 (6%) squares]



Many-stemmed, spiny, cactus-like succulent, with milky latex. STEMS **rarely branched, with shallow furrows**, irregularly constricted at variable intervals. THORNS straight, paired, 10–20 mm long. INFLORESCENCE 2–3 small, yellow cyathia borne between spine-pairs, leaving **2–3 small scars** when they fall. FRUIT **a distinctly three-angled capsule**.

May easily be confused with *E. virosa* and other large euphorbias, and are therefore probably under-recorded. The differences lie in the number of scars left by the cyathia when they fall, the shape of the capsule, and the shape and branching of the stem.

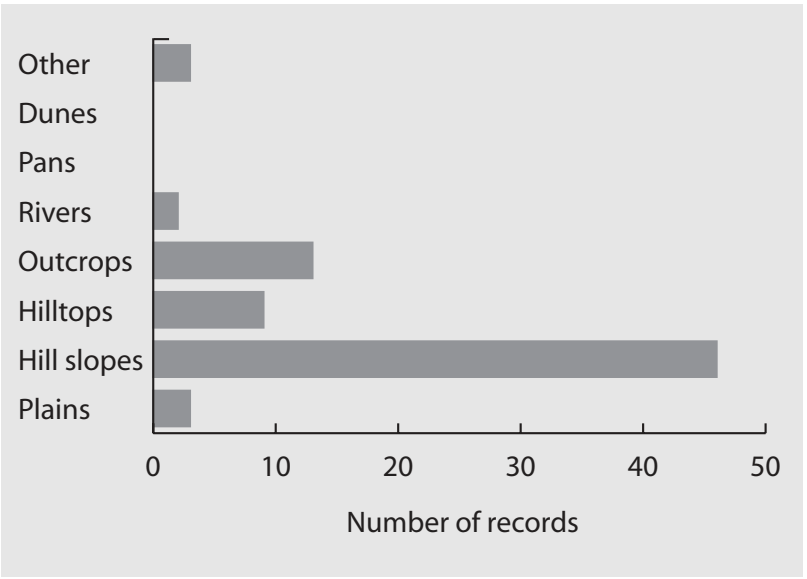


DISTRIBUTION & ABUNDANCE

Fairly widely scattered throughout Namibia, but most common along the south-western escarpment and just east of it, as well as the central-southern parts; there are a few records from the central areas too. Common to uncommon; locally abundant in places.

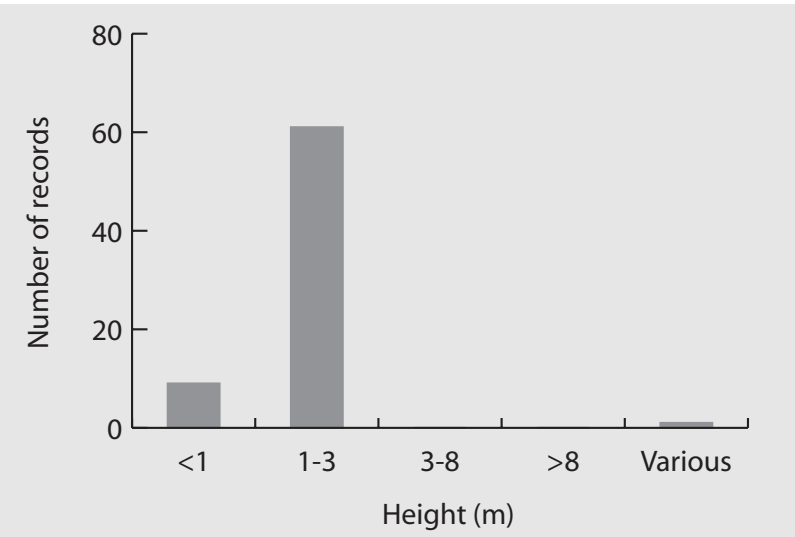
HABITAT

Common to locally abundant on hill slopes; uncommon on rocky outcrops; occasionally found on hilltops and in other habitats.



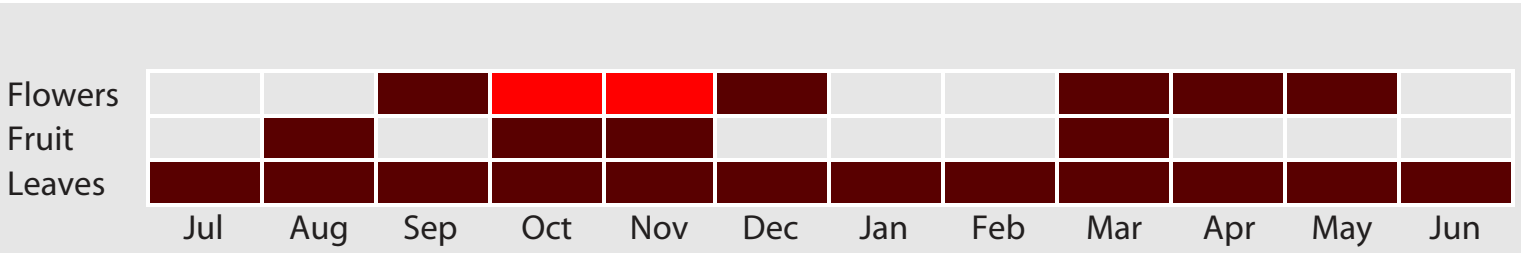
GROWTH FORM

A shrub less than 3 m high.



ANNUAL CYCLE

FLOWERS mostly October and November, but other months as well. FRUIT individual records in August, October, November and March. LEAVES only present on young growth; reported most months.

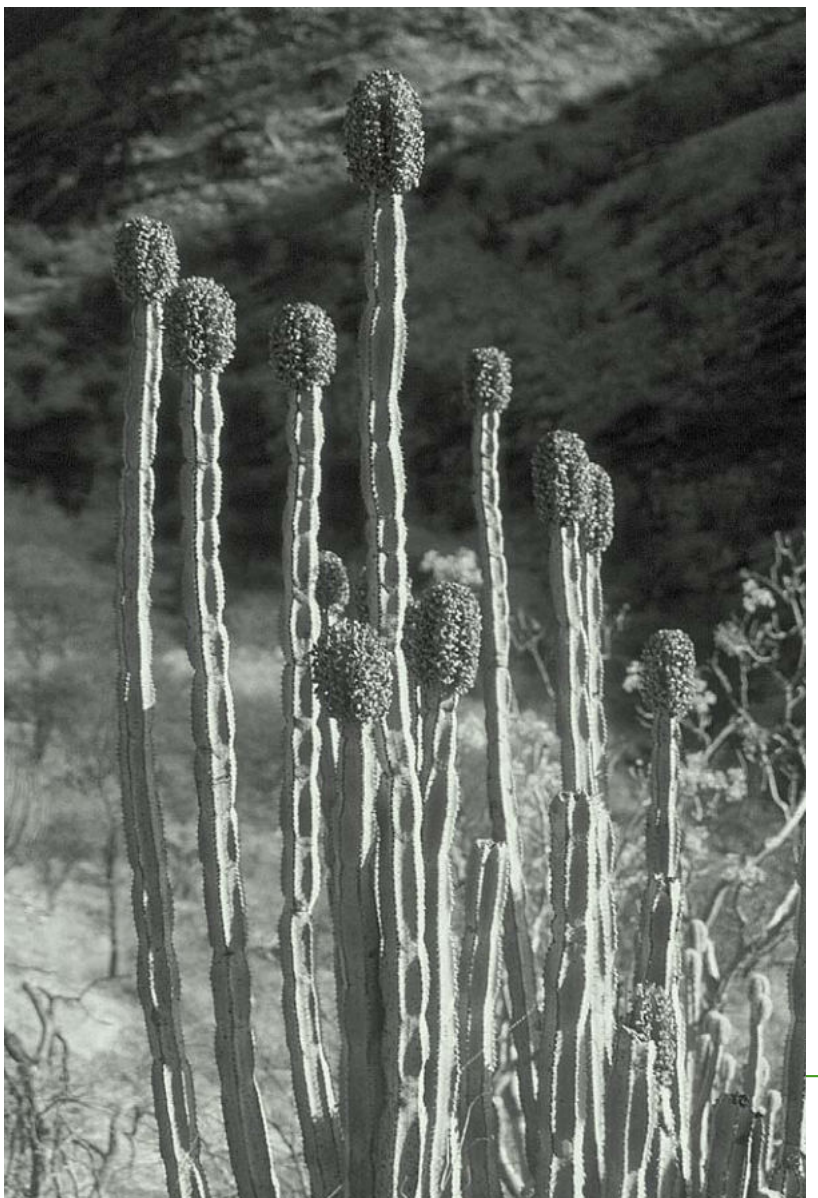


GENERAL

Sometimes used as a structural element in water-efficient, landscaped gardens. Latex is an extreme irritant to the skin and eyes.

CONSERVATION CONCERNS

This species is listed in CITES Appendix II.



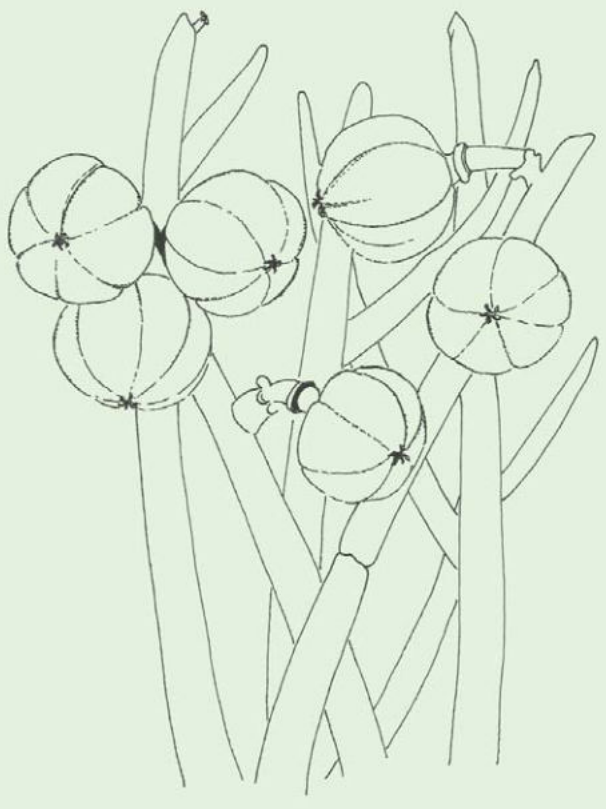
Euphorbia avasmontana, B. Curtis

Euphorbia damarana

Damara Euphorbia

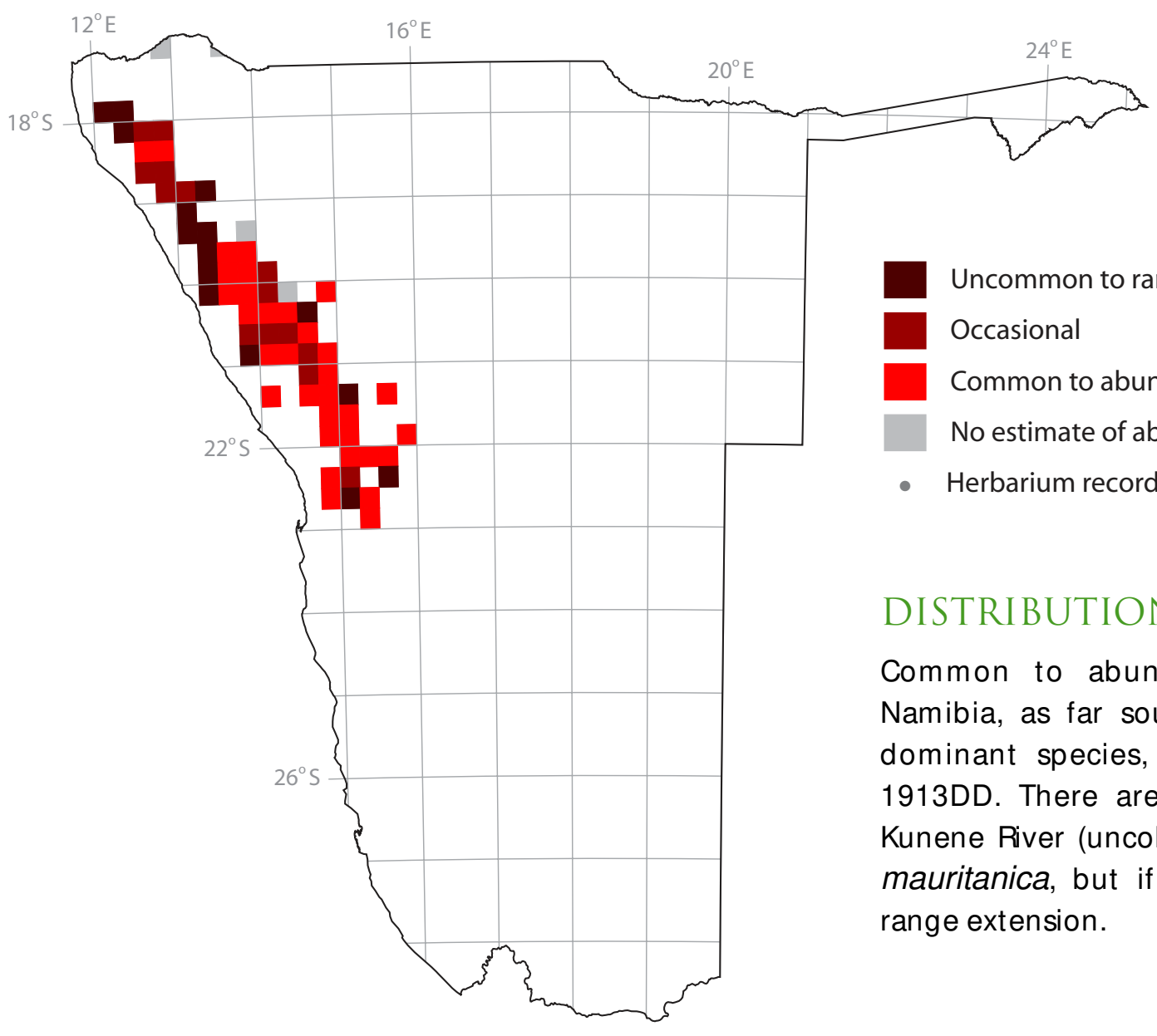
Damaramelkbos (A); kuib (K)

[224 records from 70 (7%) squares]



Yellow-green to blue-green shrub with milky latex. STEMS many, seldom-branched, spineless, succulent. FLOWERS small. FRUIT **a rounded capsule** up to 22 mm in diameter, **usually on an erect stalk**.

May be confused with a number of other spineless, succulent shrubs, especially *E. gregaria*, which it closely resembles, but which only occurs in the south.

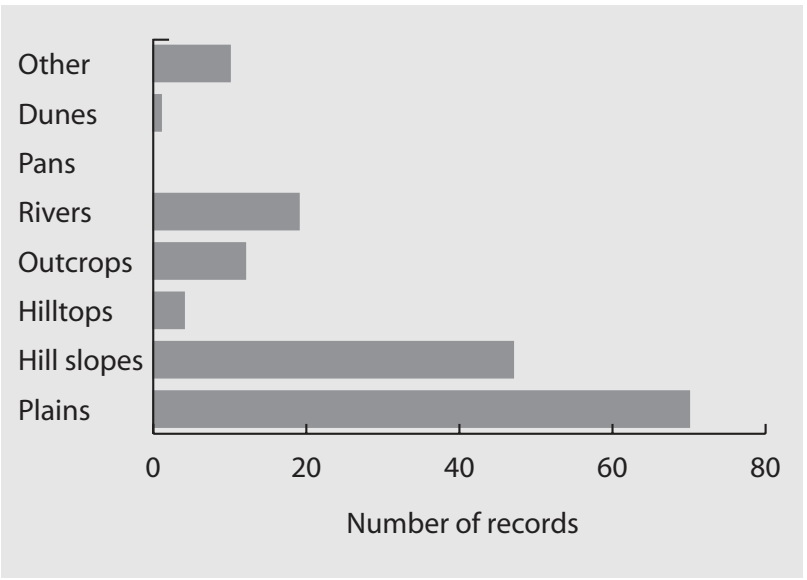


DISTRIBUTION & ABUNDANCE

Common to abundant in north-western Namibia, as far south as 23° S; often the dominant species, for example in square 1913DD. There are two records from the Kunene River (uncollected) that could be *E. mauritanica*, but if not would represent a range extension.

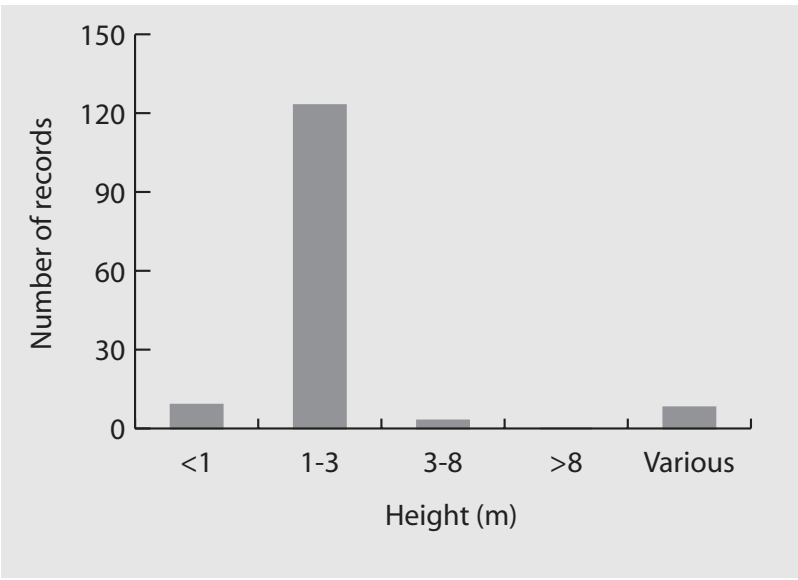
HABITAT

Found in various habitats, but mainly on rocky or gravel plains and lower hill slopes; also along dry river courses in the north-west.



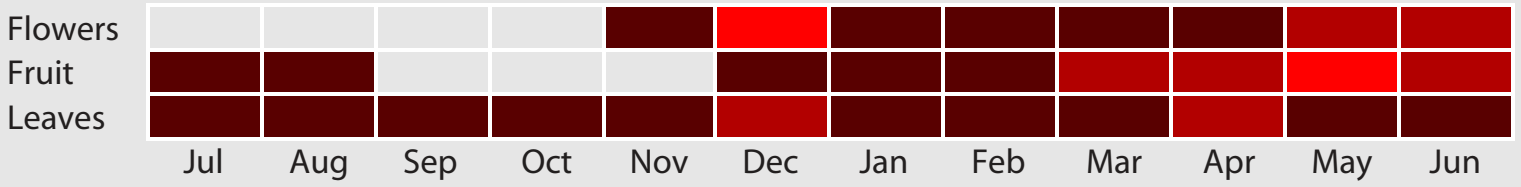
GROWTH FORM

A shrub up to 3 m high.



ANNUAL CYCLE

FLOWERS November to June, with the main peak in December and a second in May/June. FRUIT recorded in most months, but mainly March to June. LEAVES although essentially a leafless species, it does produce a few small leaves throughout the year, most often in December and April (after rain).



GENERAL

A characteristic species of the central to northern Namib Desert. Browsed by black rhino and kudu; springbok and oryx have also been observed browsing the plant. Ground squirrels climb into the bushes to eat the fruit. The milky latex is toxic to humans and highly irritating to the skin, mucous membranes and eyes. After good rains, hundreds of scattered seedlings appear, but few survive.

CONSERVATION CONCERNS

Endemic; listed in CITES Appendix II.



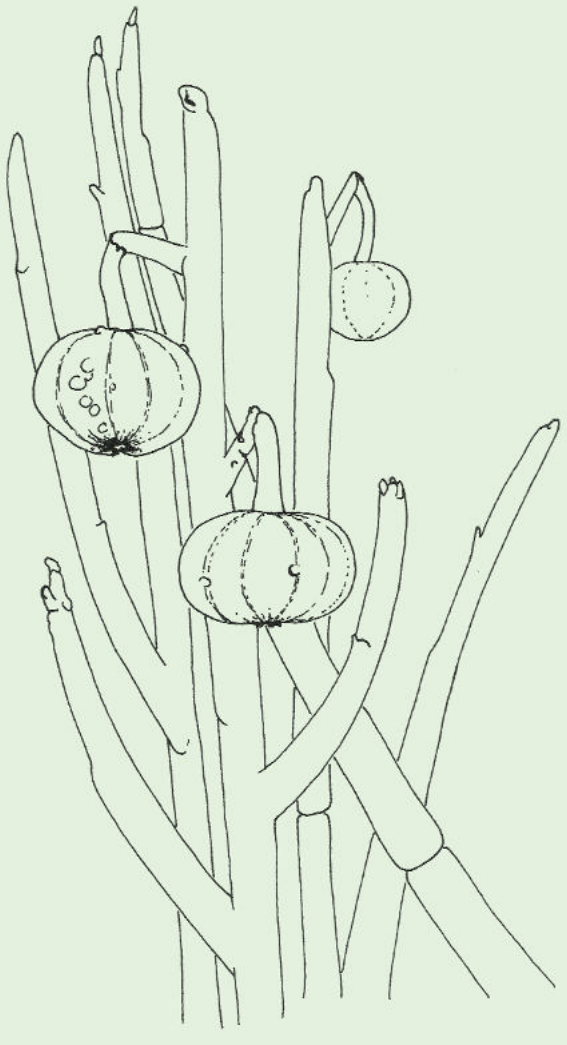
Euphorbia damarana, B. Curtis

Euphorbia gregaria

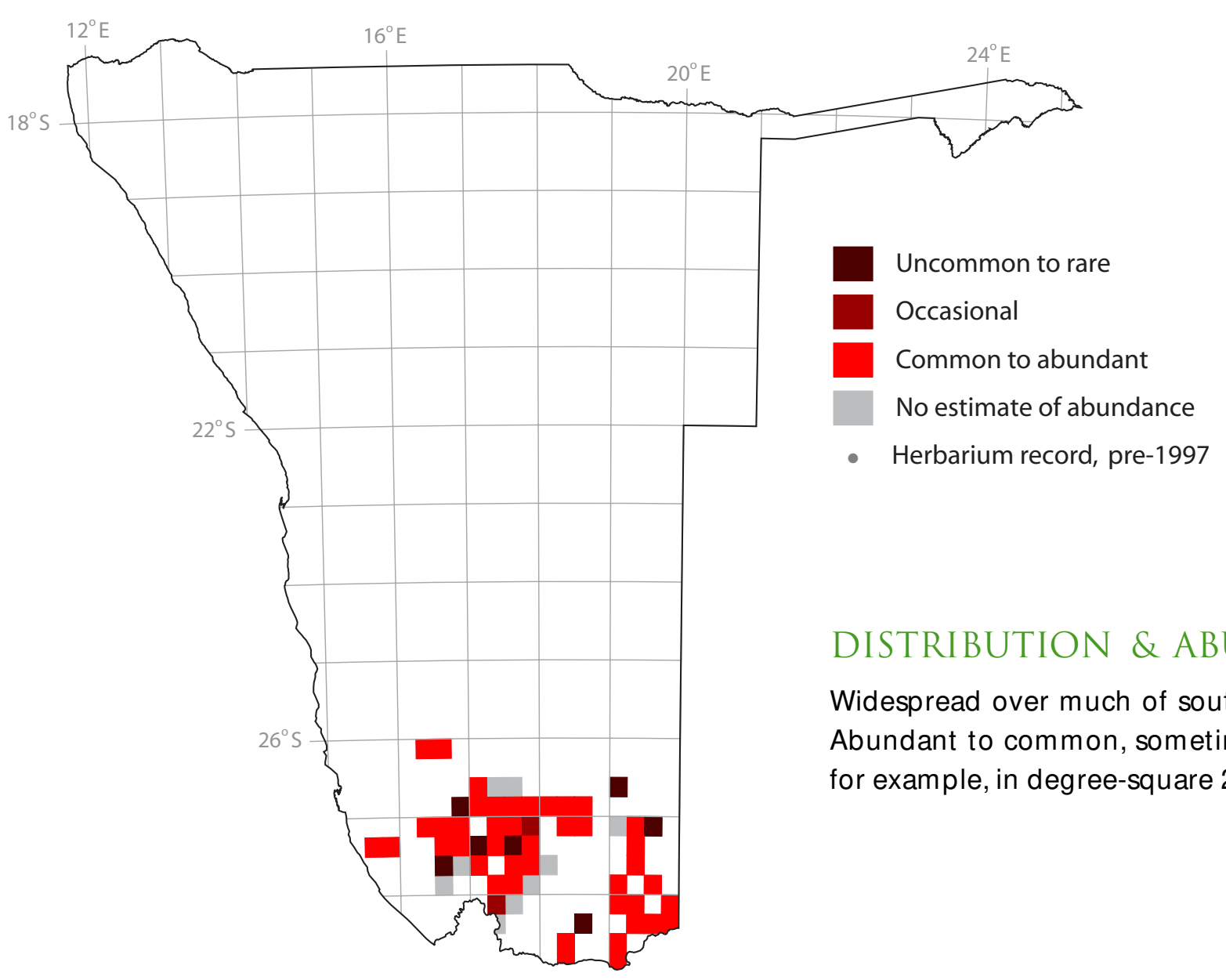
Karas Euphorbia

Beseneuphorbie,
Namibmilchbusch (G)

[103 records from 61 (6%) squares]



Many-stemmed, spineless, succulent shrub. MAIN STEM reduced and barely visible above ground level. BRANCHES many, round in cross-section; green-yellow to blue-green or grey-green. LEAVES only on new growth, rudimentary; falling early to leave inconspicuous scars. FRUIT **a rounded capsule on a recurved stalk**, up to 16 mm in diameter.

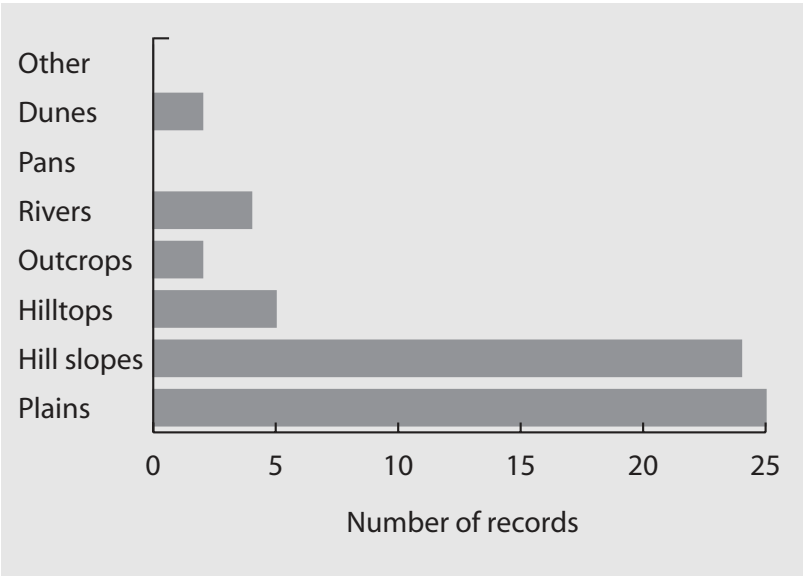


DISTRIBUTION & ABUNDANCE

Widespread over much of southern Namibia. Abundant to common, sometimes dominant, for example, in degree-square 2717.

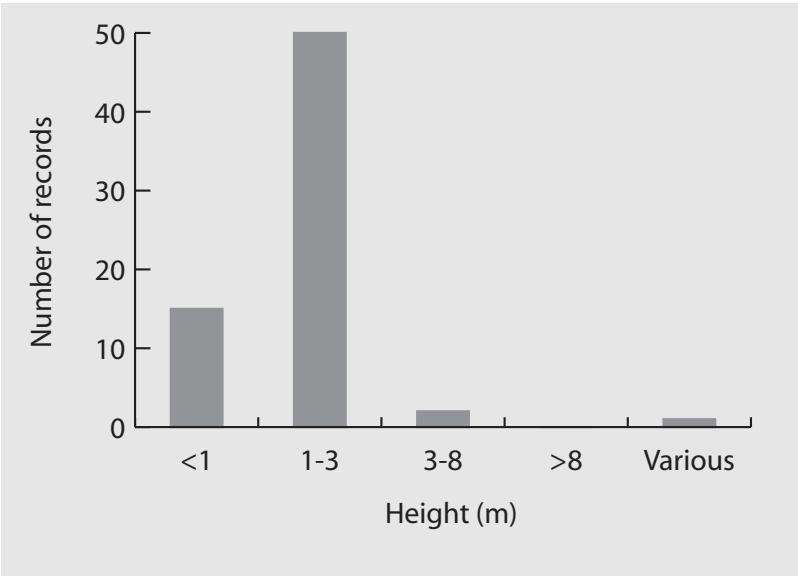
HABITAT

Predominantly found on hill slopes and plains, on sandy, gravel or rocky substrates.



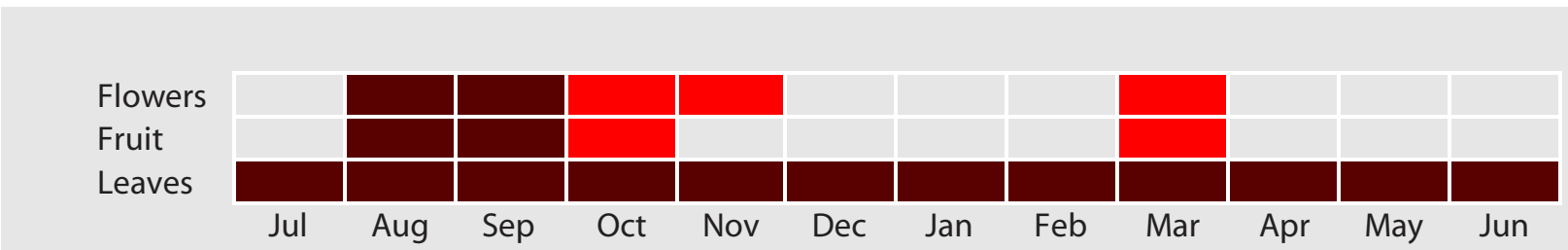
GROWTH FORM

A shrub, mostly in the 1–3-m height class, but occasionally over 3 m.



ANNUAL CYCLE

FLOWERS seen at various times in the year, but mainly from August to November and in March. FRUIT has a similar timing to the flowers. LEAVES often leafless, but may produce small, inconspicuous leaves erratically at almost any time of year.



GENERAL

The latex is irritant, especially to the eyes and mucous membranes.

CONSERVATION CONCERNS

Endemic to southern Namibia and the Richtersveld. Listed on CITES Appendix II.

Euphorbia gregaria, B. Curtis

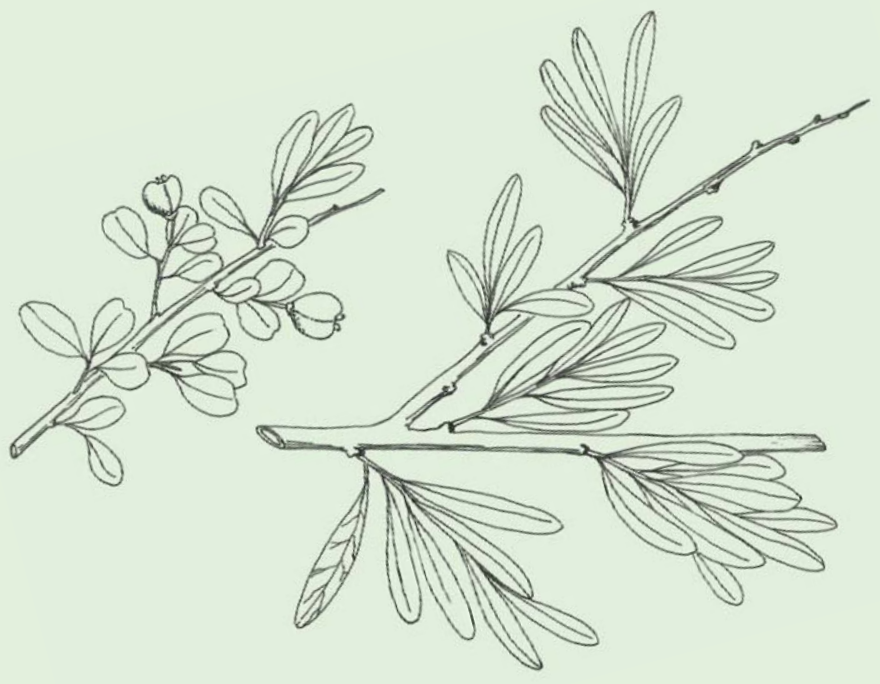


Euphorbia guerichiana

Paper-bark Euphorbia

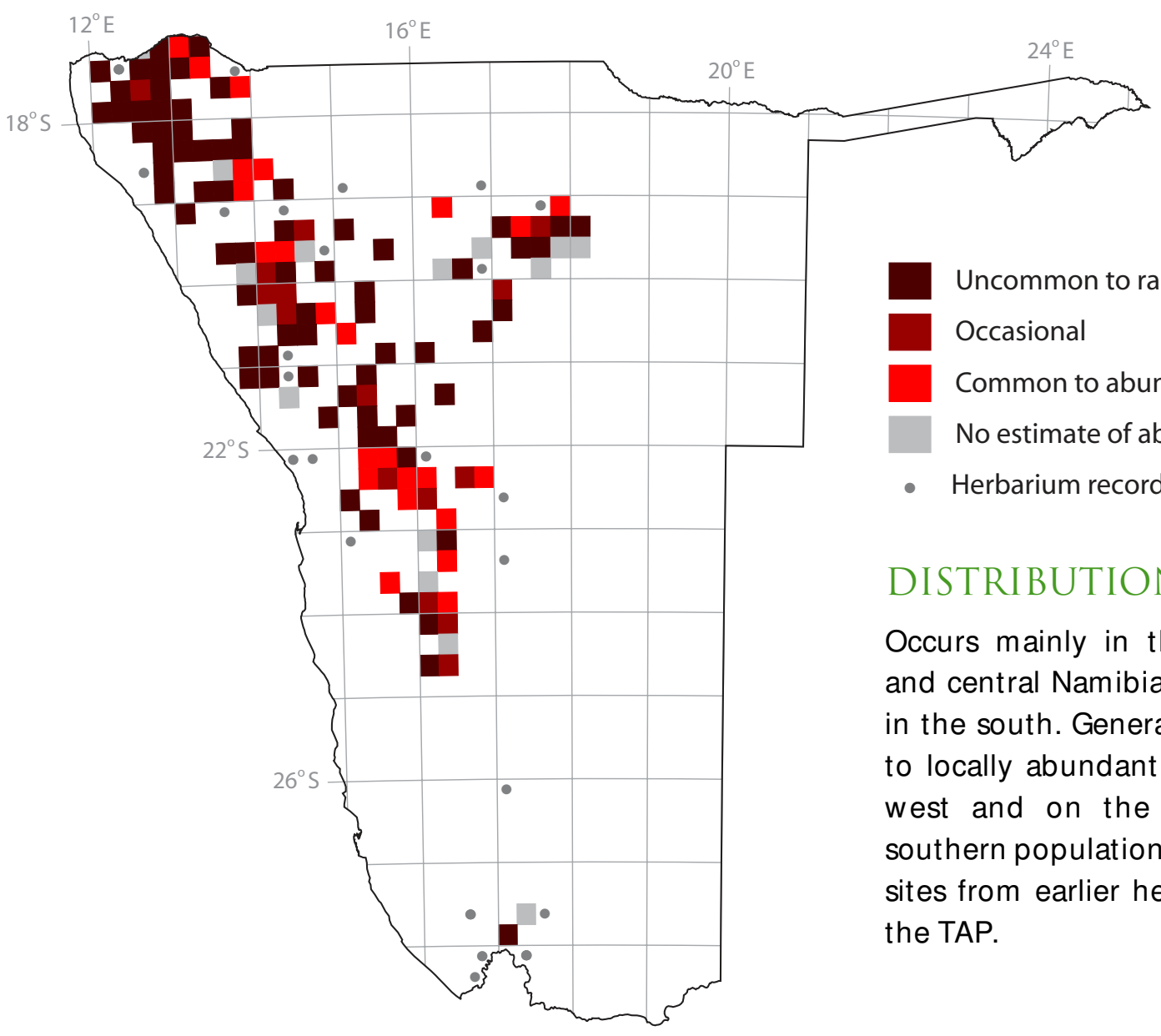
Papierbasmelkbos (A);
omupondororwa (H)

[224 records from 131 (12%) squares]



Deciduous shrub or tree with milky latex. BARK **smooth, waxy, dark brown to yellow, peeling**; young branchlets slender, plum-coloured. LEAVES simple, extremely variable in shape. FLOWERS yellow, small; **solitary cyathia** on dwarf-shoots. FRUIT a smooth, **three-lobed capsule**, up to 6 mm in diameter.

Flowers and fruit may be overlooked if atlasing from a vehicle. May be mistaken for a commiphora when not in flower or fruit.

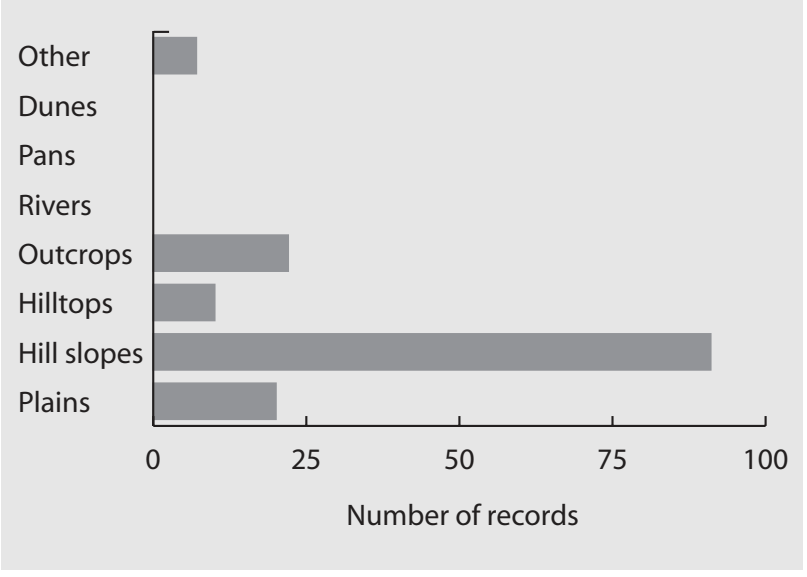


DISTRIBUTION & ABUNDANCE

Occurs mainly in the north-west, Karstveld and central Namibia, with a small population in the south. Generally uncommon; common to locally abundant in places in the central-west and on the central highlands. The southern population is reported from far more sites from earlier herbarium records than by the TAP.

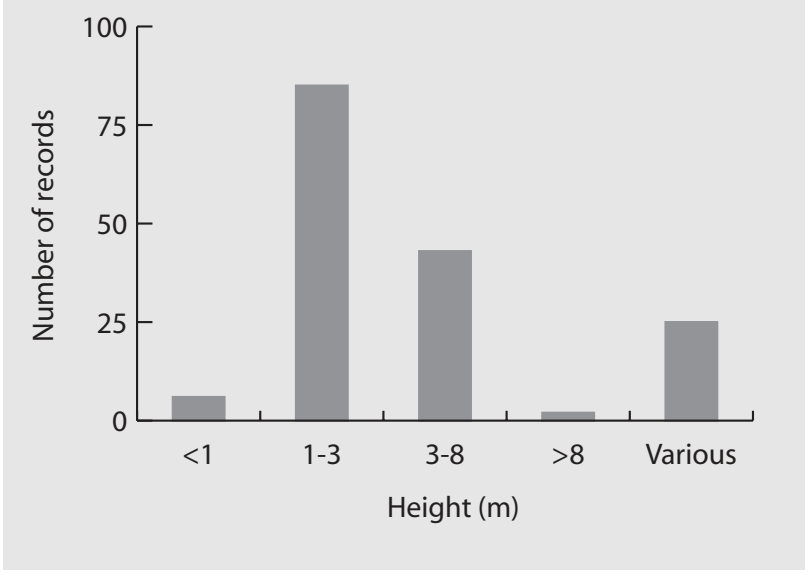
HABITAT

Most often found on hillsides, plains and rocky outcrops. Grows on rocky/stony substrates, as well as sand and sandy loam.



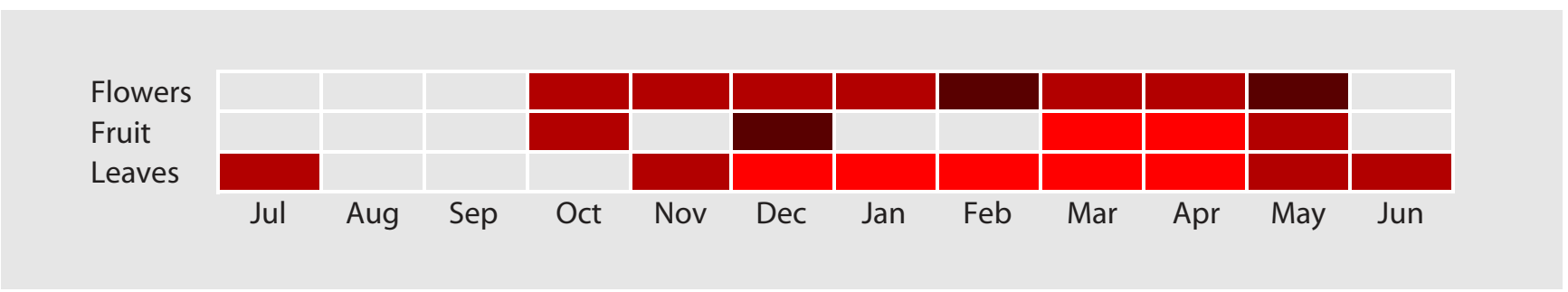
GROWTH FORM

A shrub up to 3 m high or tree (63% of records) 1–8 m high. Generally more tree-like in the north and shrub-like in the south; leaves generally longer and more slender in the north, and small and fleshy in the south.



ANNUAL CYCLE

FLOWERS October to May, but seldom many recorded. FRUIT mainly March and April, but also May and October. LEAVES November to July, with young leaves produced from November to January.

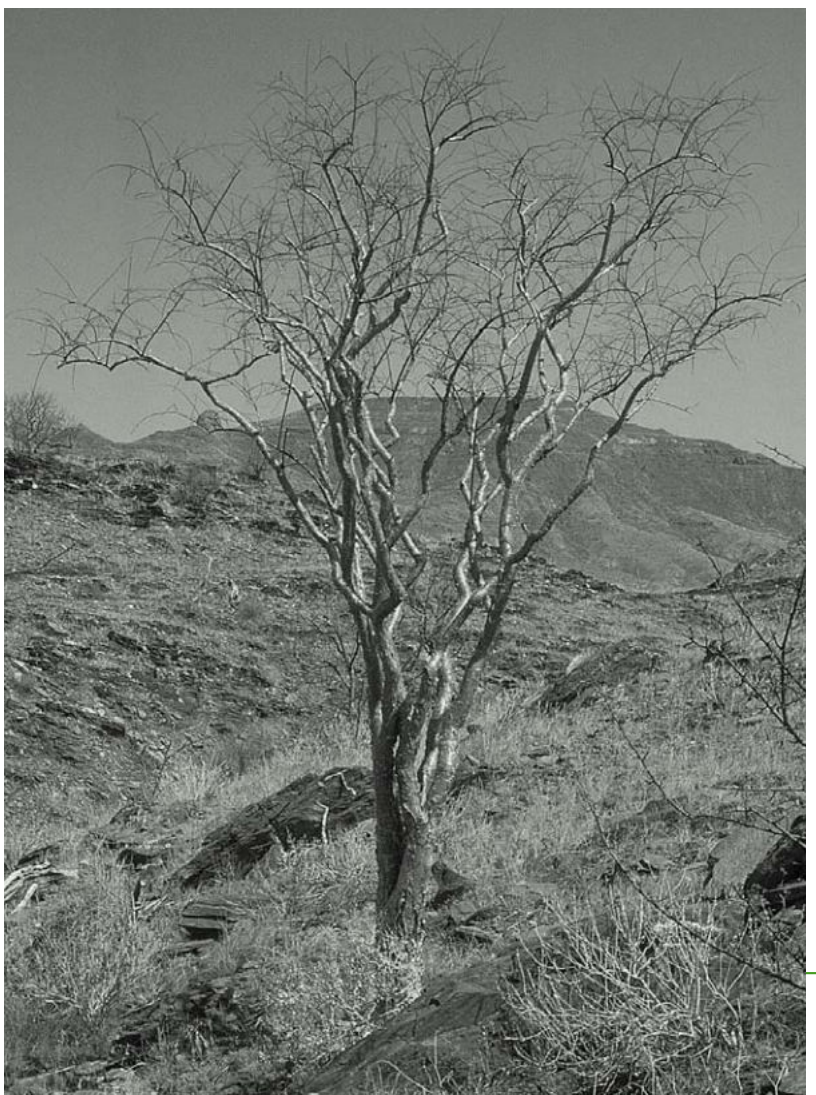


GENERAL

Heavily browsed in places; also damaged by elephants. Possible horticultural potential for dry gardens due to attractive bark.

CONSERVATION CONCERNS

Listed as a CITES Appendix II species.



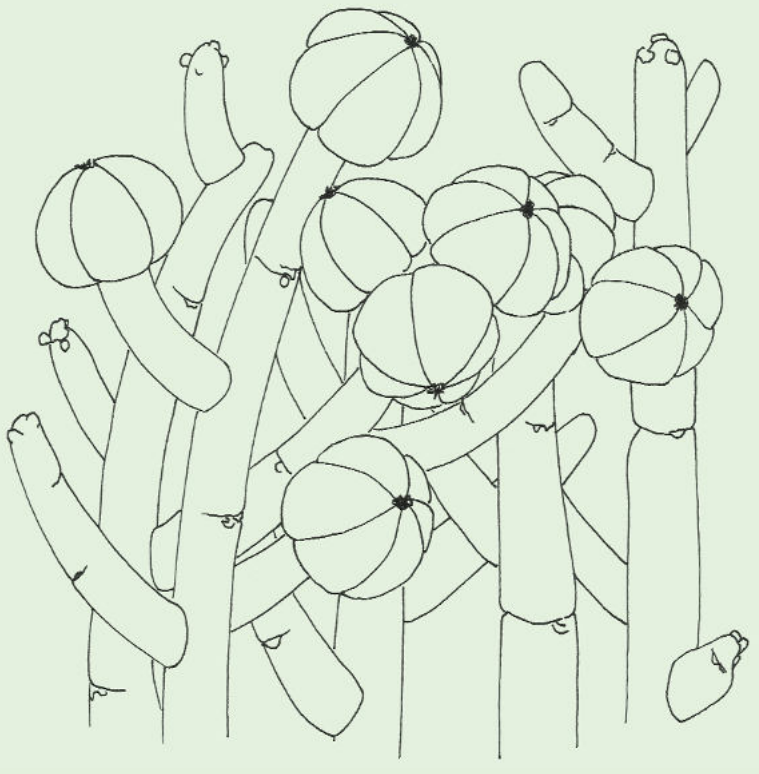
Euphorbia guerichiana, Kaokoveld, B. Curtis

Euphorbia gummifera

Southern Namib Euphorbia

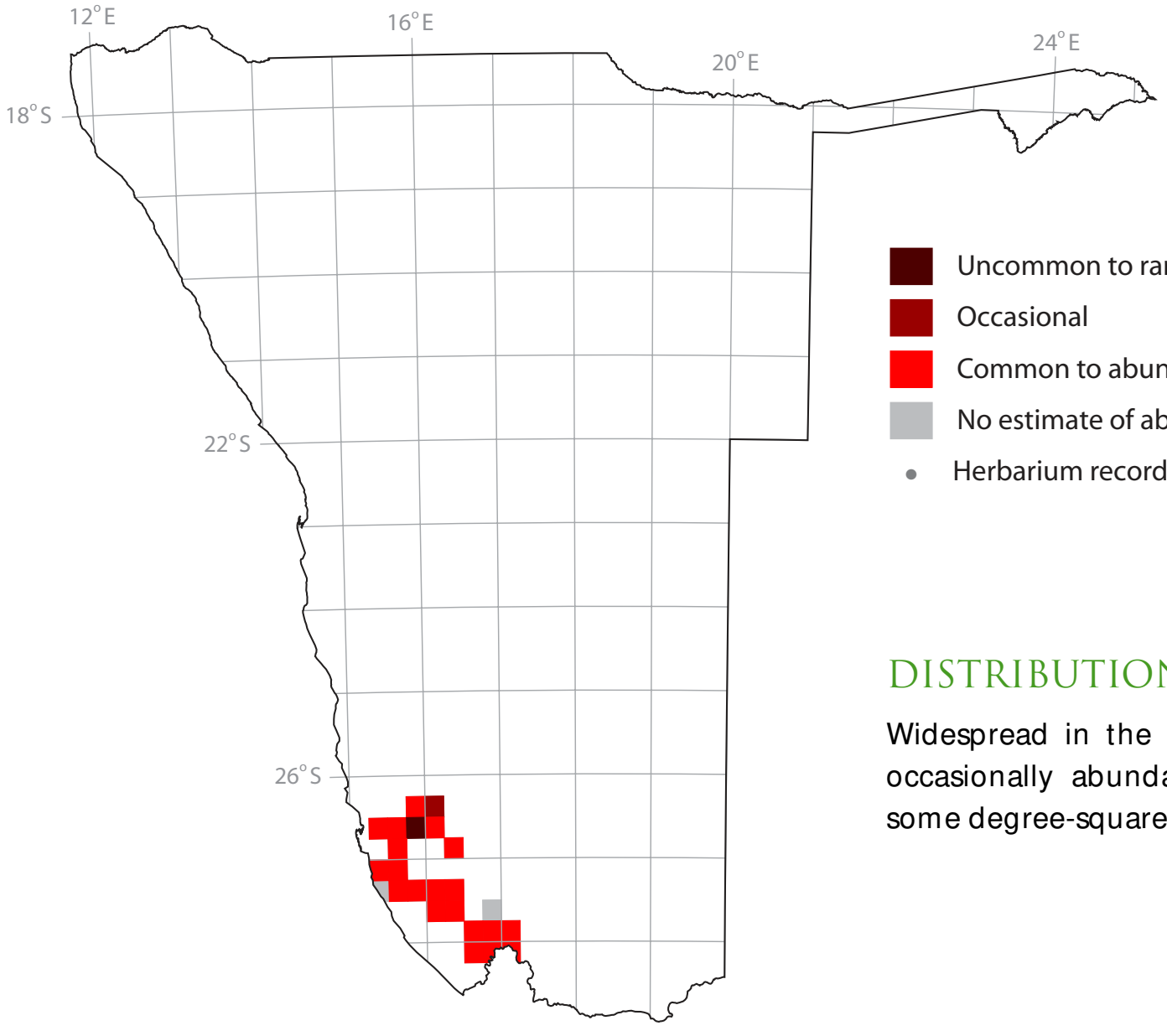
Gomnoors (A)

[49 records from 24 (2%) squares]



Many-stemmed, low, succulent shrub. MAIN STEM reduced and barely visible above ground level. BRANCHES many; rebranched, round in cross-section, dull green. LEAVES only on new growth, rudimentary, falling early. FRUIT **a rounded and almost sessile capsule, bright pink becoming brown when dry**, up to 12 mm in diameter.

Can be confused with *E. gregaria*, but *E. gummifera* has a pink capsule with an extremely short stalk and a more westerly distribution.

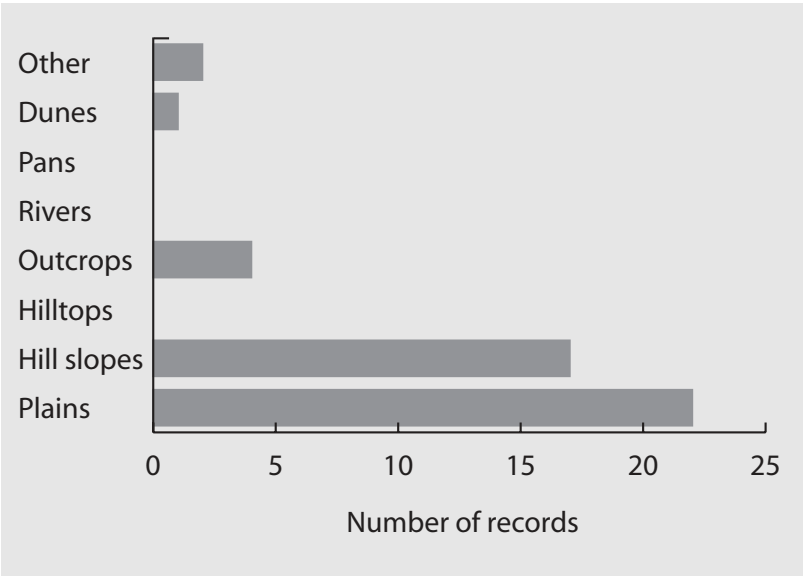


DISTRIBUTION & ABUNDANCE

Widespread in the south-west. Common to occasionally abundant; locally dominant in some degree-squares.

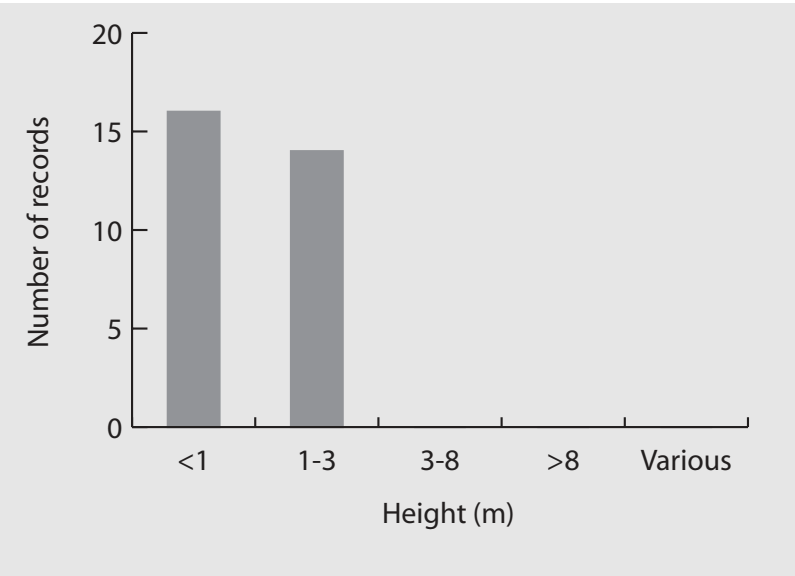
HABITAT

Chiefly found on plains and hill slopes, growing on sandy or rocky substrates.



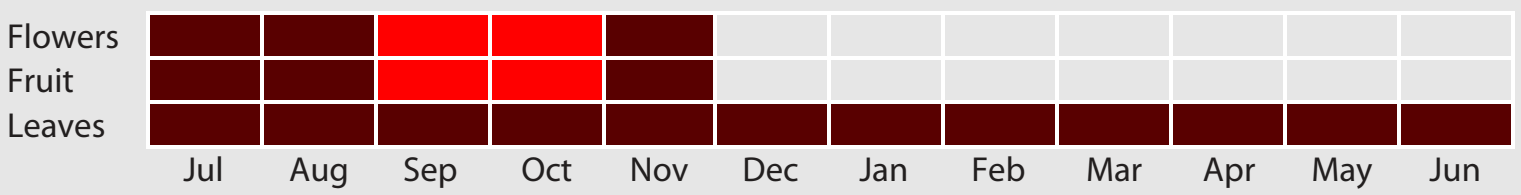
GROWTH FORM

A shrub, mostly less than 1 m high, or in the 1–3-m height class.



ANNUAL CYCLE

FLOWERS and FRUIT July to November, but mostly September and October. LEAVES generally leafless, but with a few small leaves at any time of year.



GENERAL: The latex is an irritant.

CONSERVATION CONCERNS: Endemic to the southern Namib; listed in CITES Appendix II.

Euphorbia gummifera, C. Mannheimer



Euphorbia virosa

Candelabra Euphorbia

Gifboom (A);
Kandelaberwolfsmilch (G); eyao (H);
||khaos (K); oshilalanamwadi (O)

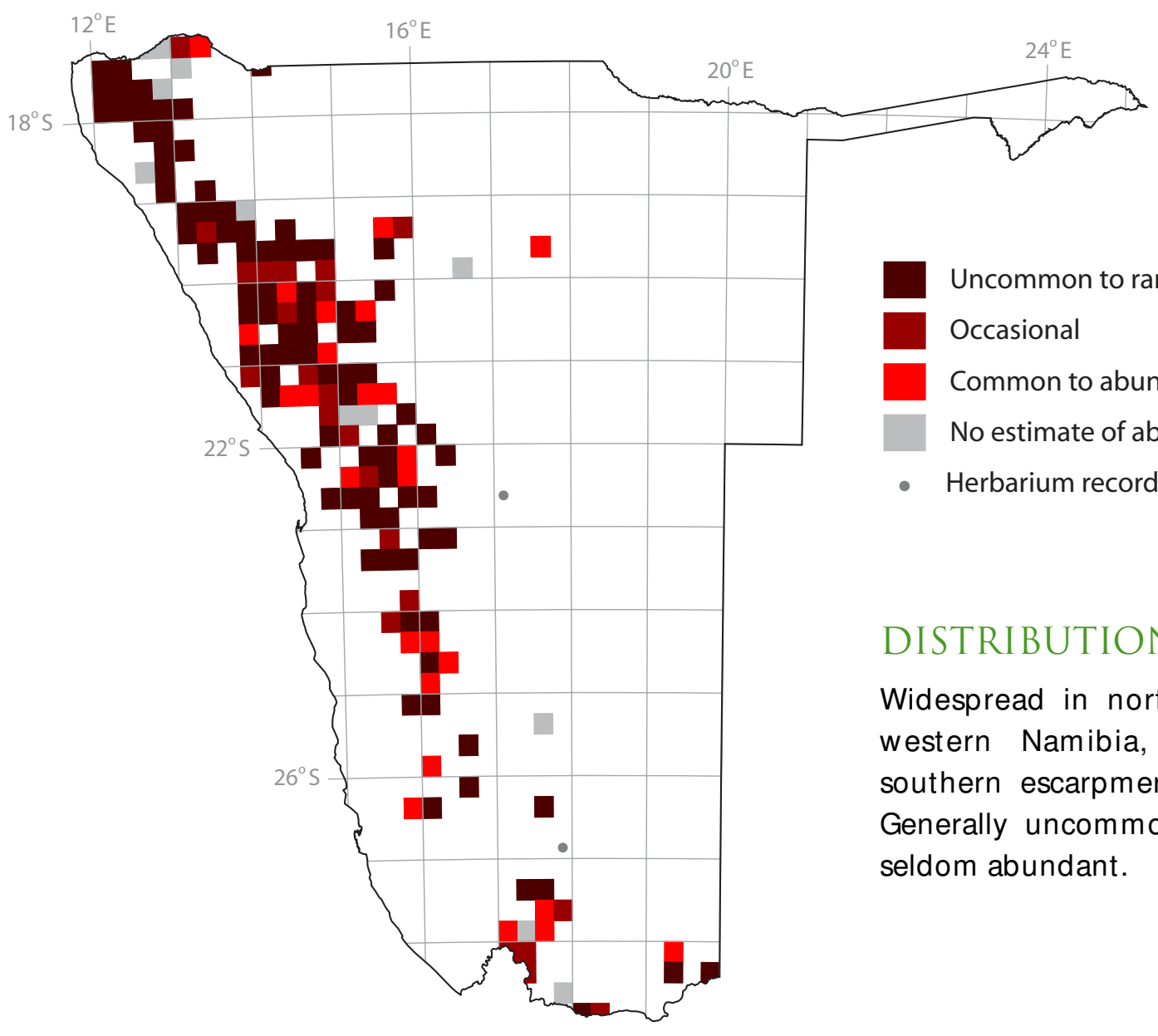
[349 records from 150 (14%) squares]



See page 316 for photo of flowers and fruit.

Many-stemmed, spiny, succulent, grey-green shrub with milky latex; often broader than tall. BRANCHES unbranched or laxly branched in upper portions; **lower stem spirally contorted, branches 5–8-angled with deep furrows; constricted at intervals to form symmetrical segments widest near middle**. THORNS straight, paired, rigid, 11–13 mm long. INFLORESCENCE a yellow cyathium, up to 18 mm in diameter; **borne singly between the thorns of each spine-pair, falling to leave one scar**. FRUIT a vaguely three-angled to rounded capsule; up to 18 mm across, smaller when dry; maroon-purple, drying to light brown.

Similar to *E. avasmontana*, which has much smaller flowers, in cyathia clustered in threes.

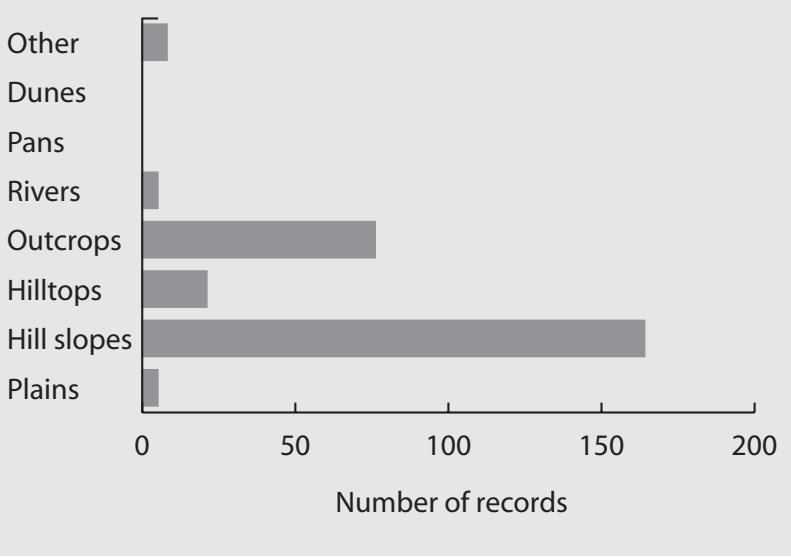


DISTRIBUTION & ABUNDANCE

Widespread in north-western and central-western Namibia, extending along the southern escarpment to the Orange River. Generally uncommon, sometimes common, seldom abundant.

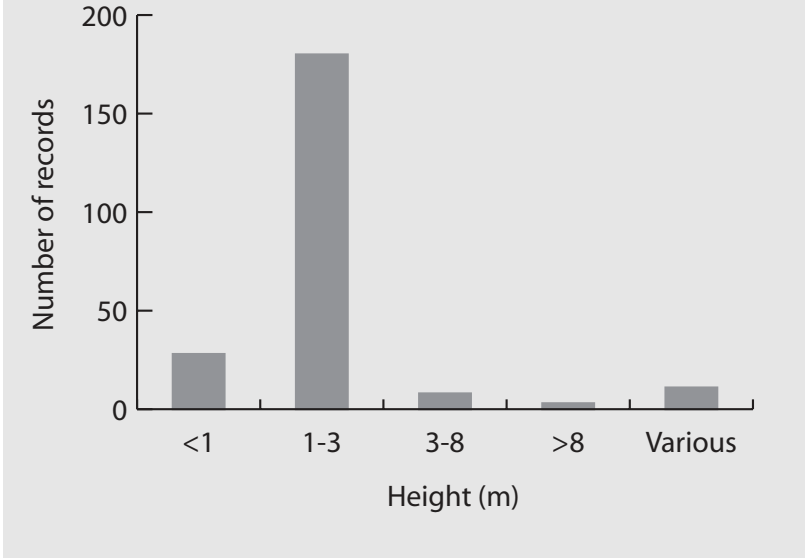
HABITAT

Predominantly found on rocky hill slopes, but also rocky outcrops in the north-west and central-west; sometimes on hilltops in the north-west.



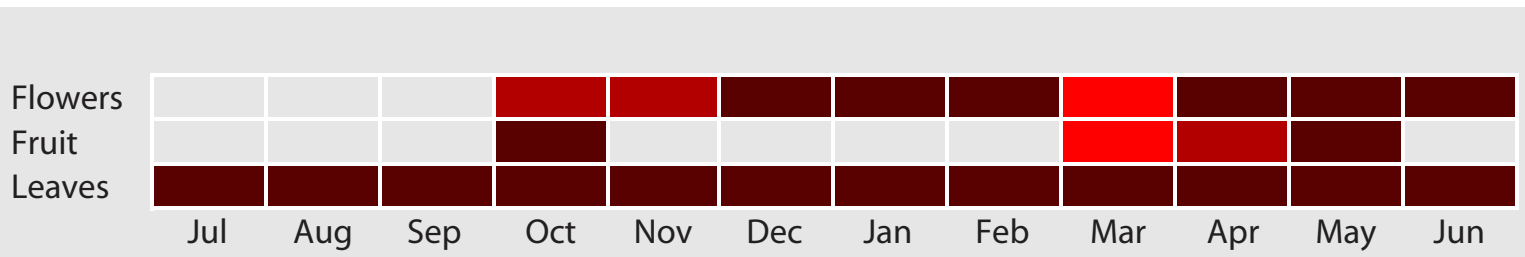
GROWTH FORM

A stem-succulent shrub, generally less than 3 m high; occasionally taller.



ANNUAL CYCLE

FLOWERS October to June, but mostly in March. FRUIT generally March, but other months too. LEAVES tiny leaves at the ends of branches can be found on some individuals most of the year.

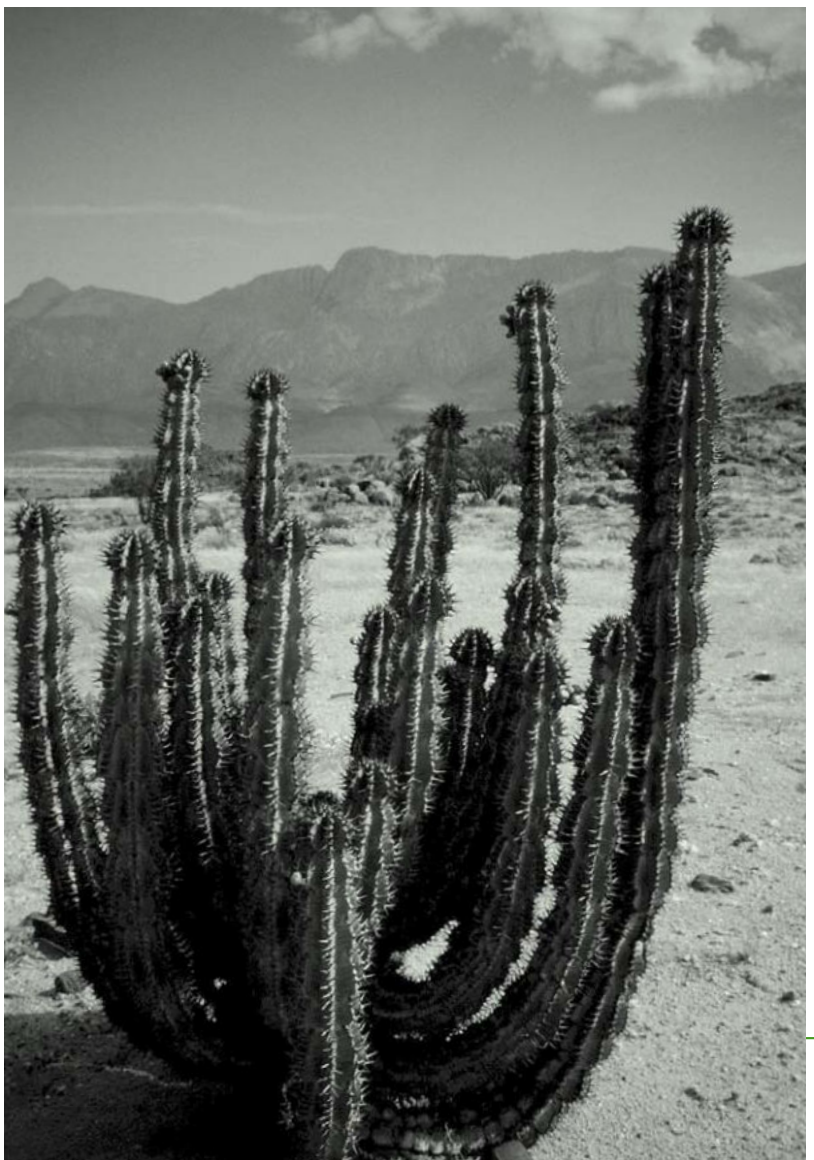


GENERAL

The latex is extremely irritant. Poisonous to most animals, but black rhino browse on these plants.

CONSERVATION CONCERNS

None recorded, but listed as a CITES Appendix II species.



Euphorbia virosa, Brandberg, S. Bethune

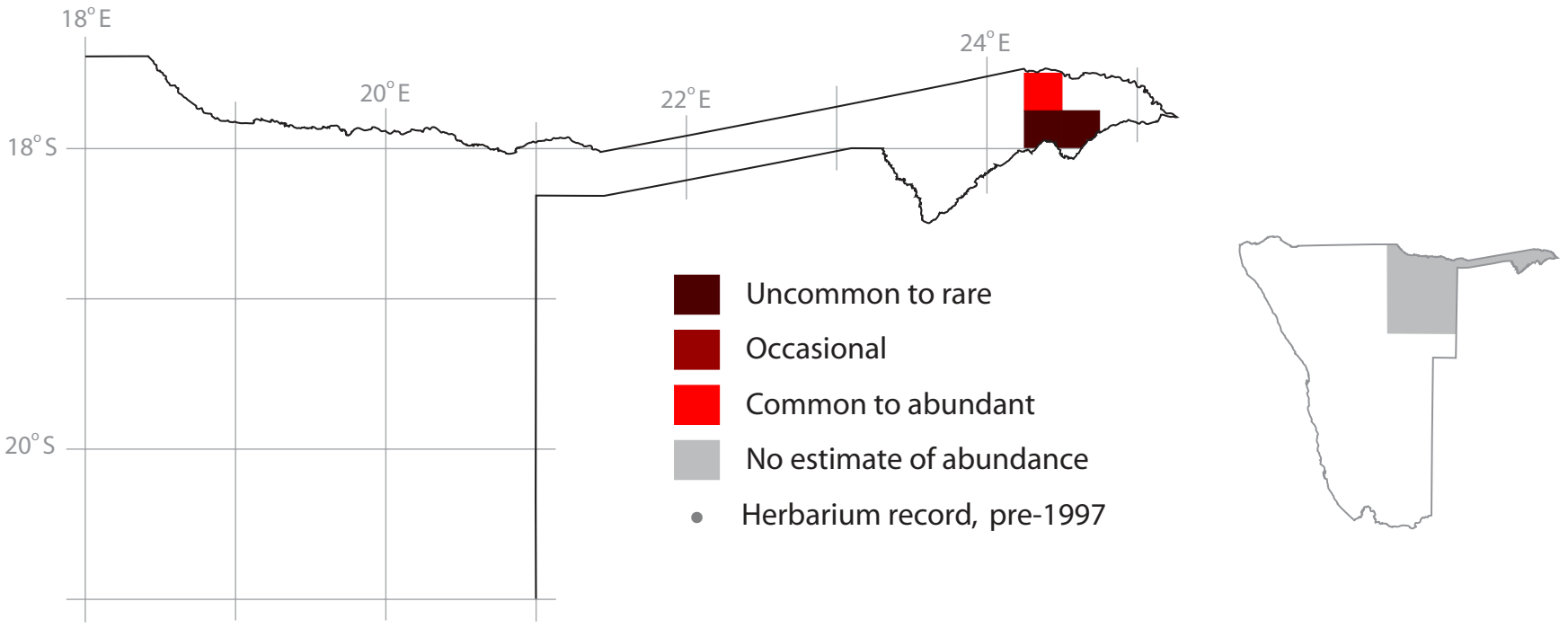
Euphorbia ingens

Giant Euphorbia

Gewone naboom (A); lianduandu (L)

[10 records from 3 squares]

Single-stemmed, succulent, spiny, **candelabra-like tree with dense crown**. BRANCHES 4–5-angled. FRUIT a slightly three-angled capsule up to 10 mm in diameter.



DISTRIBUTION & ABUNDANCE

Very localised in eastern Caprivi. Generally uncommon to locally common in places.

HABITAT

Found on sandy plains and floodplains.

GROWTH FORM

A tree over 8 m tall.

GENERAL

The latex is an irritant.

ANNUAL CYCLE

Only recorded in February and March, when neither FLOWERS nor FRUIT were recorded. Leafless.

CONSERVATION CONCERNS

Listed as a CITES Appendix II species.

Euphorbia ingens, C. Hines

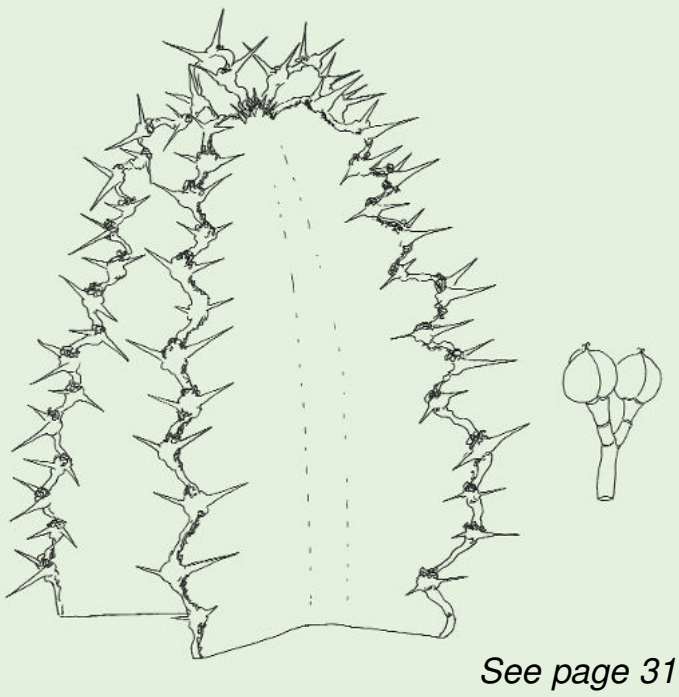


Euphorbia eduardoi

Kaoko Tree-euphorbia

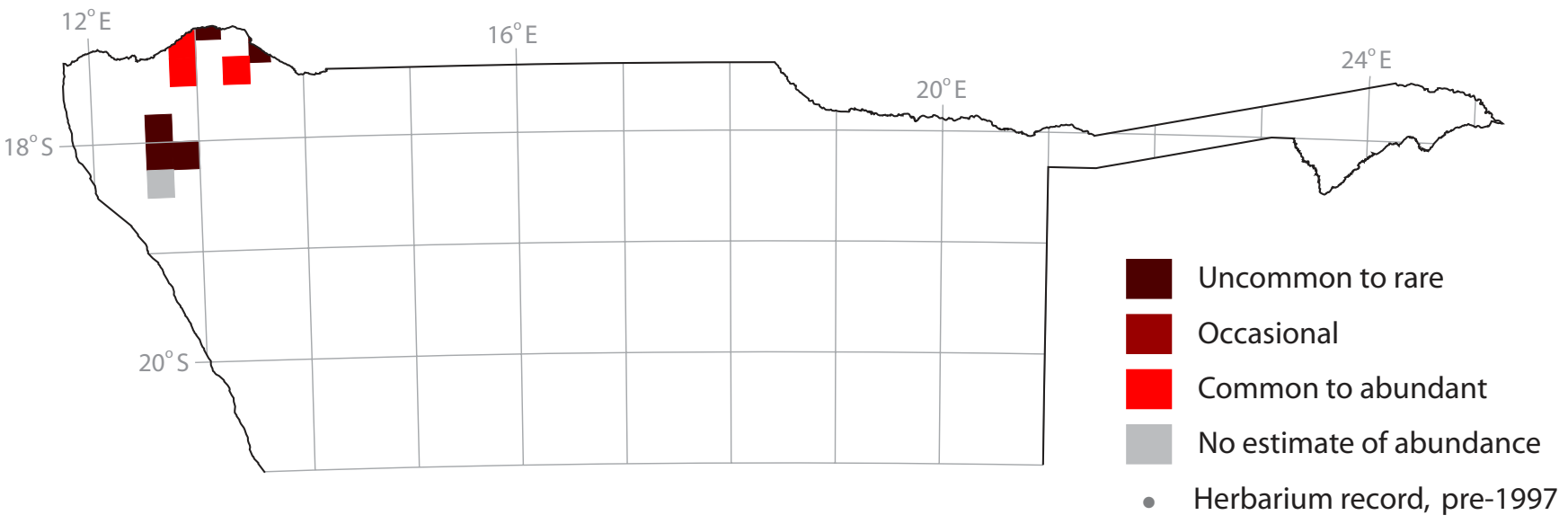
Baumeuphorbie (G)

[11 records from 9 (<1%) squares]



See page 316 for photo.

Single-stemmed, **succulent, spiny, candelabra-like tree with milky latex, branching high above the ground**. BRANCHES 5–6-angled. INFLORESCENCE yellow, in groups of three cyathia between spine-pairs. FRUIT a three-chambered capsule, 18 mm in diameter.



DISTRIBUTION & ABUNDANCE

Very restricted distribution in a few localities in the far north-west, but generally common where they do occur.

HABITAT

Found on rocky hill slopes, hilltops and outcrops; often on steep slopes.

GROWTH FORM

A slender tree, generally up to 8 m high; few to no young ones recorded.

ANNUAL CYCLE

There is virtually no information on the annual cycle. FLOWERS and FRUIT have been recorded in March.

GENERAL

The latex is irritant.

CONSERVATION CONCERNS

Euphorbia eduardoi is a near-endemic with a very restricted range, but not threatened because of its inaccessible habitat. The lack of young plants is a concern. Listed as a CITES Appendix II species.

Sclerocarya birrea

Marula / Omungongo

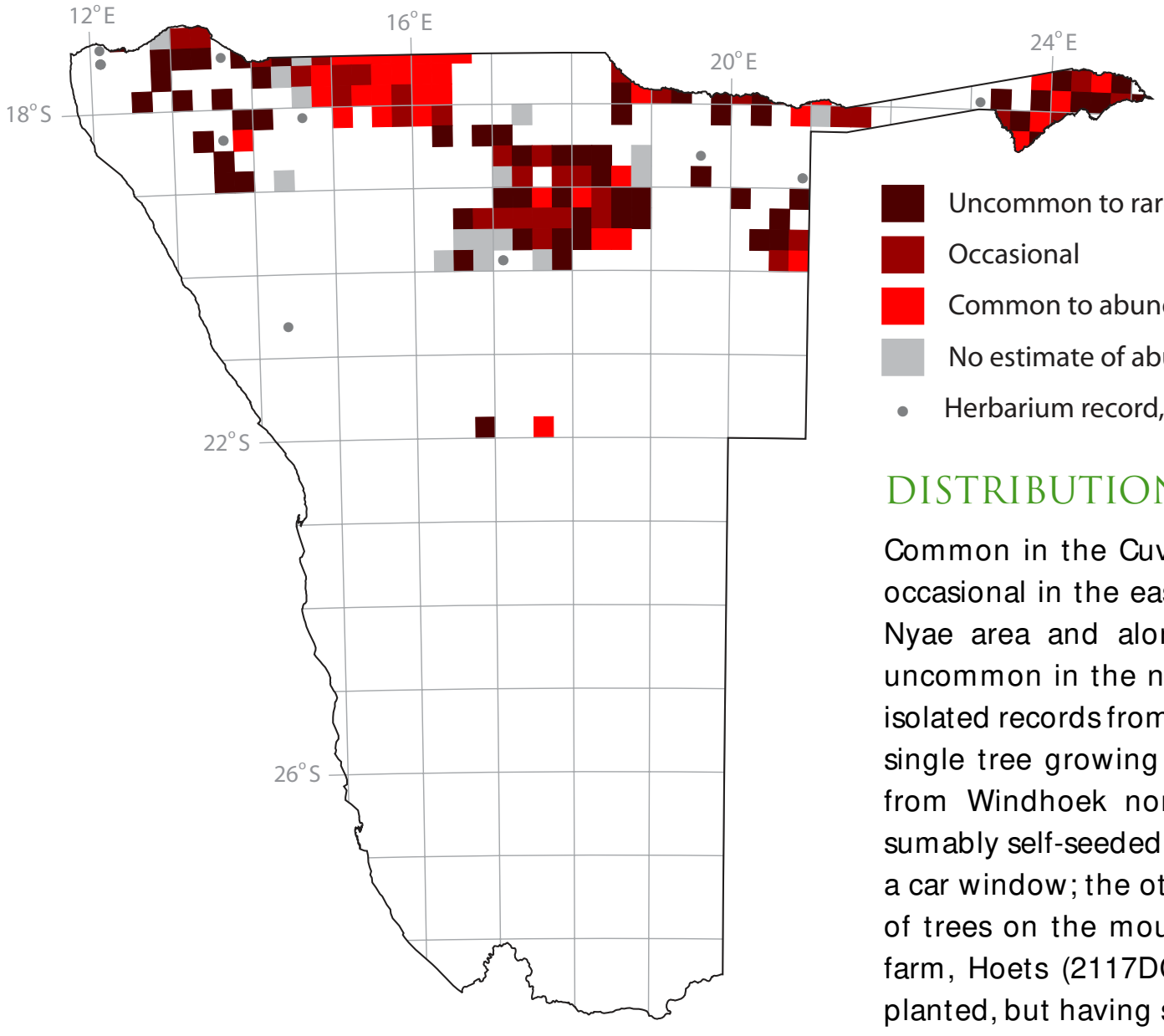
Maroela (A); malula (L); goarus (K); omugongo (Od); uwongo (Rk)

[492 records from 153 (14%) squares]



Large deciduous tree with dense, spreading crown. BARK yellowish to grey, **covered with irregular, flat, dark grey scales; young branchlets with conspicuous leaf-scars**. LEAVES compound, up to 300 mm long; **leaflet margin entire or coarsely toothed (especially in young plants); characteristic tip**. FLOWERS with red sepals and yellow petals; male and female flowers on separate plants. FRUIT almost round, tough-skinned, up to 40 mm in diameter; pale creamy yellow when ripe.

There are possibly two subspecies of the marula present in Namibia. The most widespread is subsp. *caffra*; it is uncertain whether subsp. *birrea* occurs in Namibia.

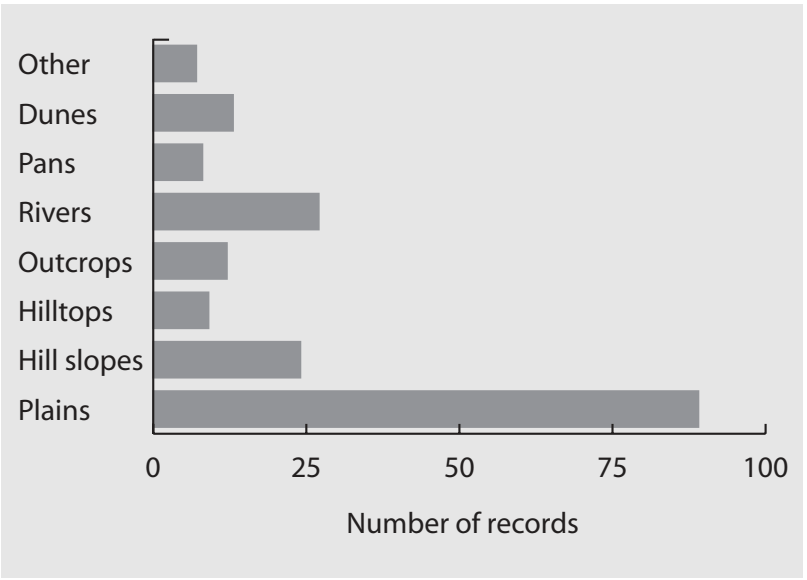


DISTRIBUTION & ABUNDANCE

Common in the Cuvelai and eastern Caprivi; occasional in the eastern Karstveld, the Nyae Nyae area and along the Okavango River; uncommon in the north-west. There are two isolated records from central Namibia: one is a single tree growing next to the B2 highway from Windhoek northwards (2116DD), presumably self-seeded from a pip thrown out of a car window; the other consists of a number of trees on the mountain slopes of the NDF farm, Hoets (2117DC), presumably originally planted, but having since self-propagated.

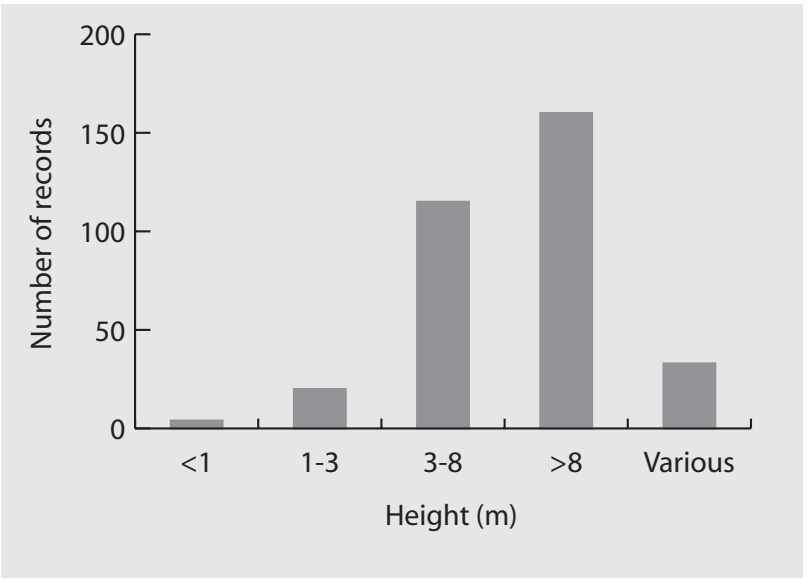
HABITAT

Found in various, but mainly on plains. Also found on hill slopes in the Karstveld and north-west; along rivers in the north-east and north-west; on dunes and around pans in the Cuvelai. Generally grow on a sandy substrate, but sometimes on gravel, stony ground or dolomite.



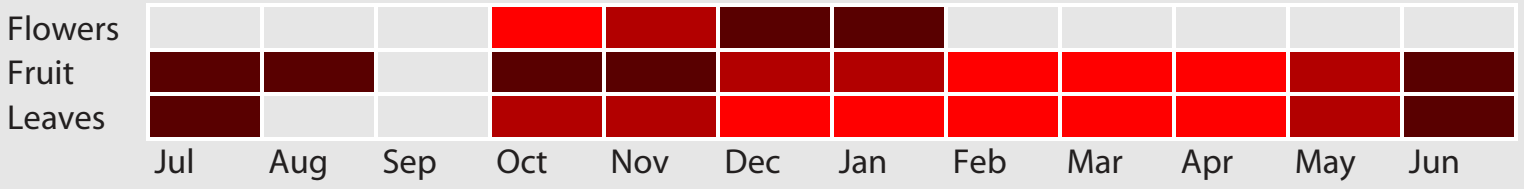
GROWTH FORM

A tree of over 8 m high. Young trees probably overlooked as the leaves are different from the leaves on older trees; in Kavango many young trees may be observed near mature trees, presumably dispersed by people eating the fruit and dropping the seed.



ANNUAL CYCLE

FLOWERS October to January, with individual records until July. FRUIT October to August. LEAVES mainly October to May, with young leaves October to December.



GENERAL

The marula is a very important fruit and shade tree, utilised by people and animals. The fruit flesh, which is nutritious and high in vitamin C, is eaten fresh; the juice is drunk unfermented as a beverage, or is fermented to make wine which may be further distilled to make brandy. The kernel is edible. Oil expressed from the kernel is protein-rich; it is eaten with porridge and also used for cooking, as well as for dressing hides and leather. The oil and fruit are also exploited commercially for use in cosmetics and for the production of alcoholic beverages. The fruit can be used as an insecticide. The wood is used for carvings and the branchlets for fire-sticks. The leaves and bark are used medicinally. Elephants eat the bark and fruit.

CONSERVATION CONCERNS

Protected locally by the communities that use them and by forestry legislation.

Lannea discolor

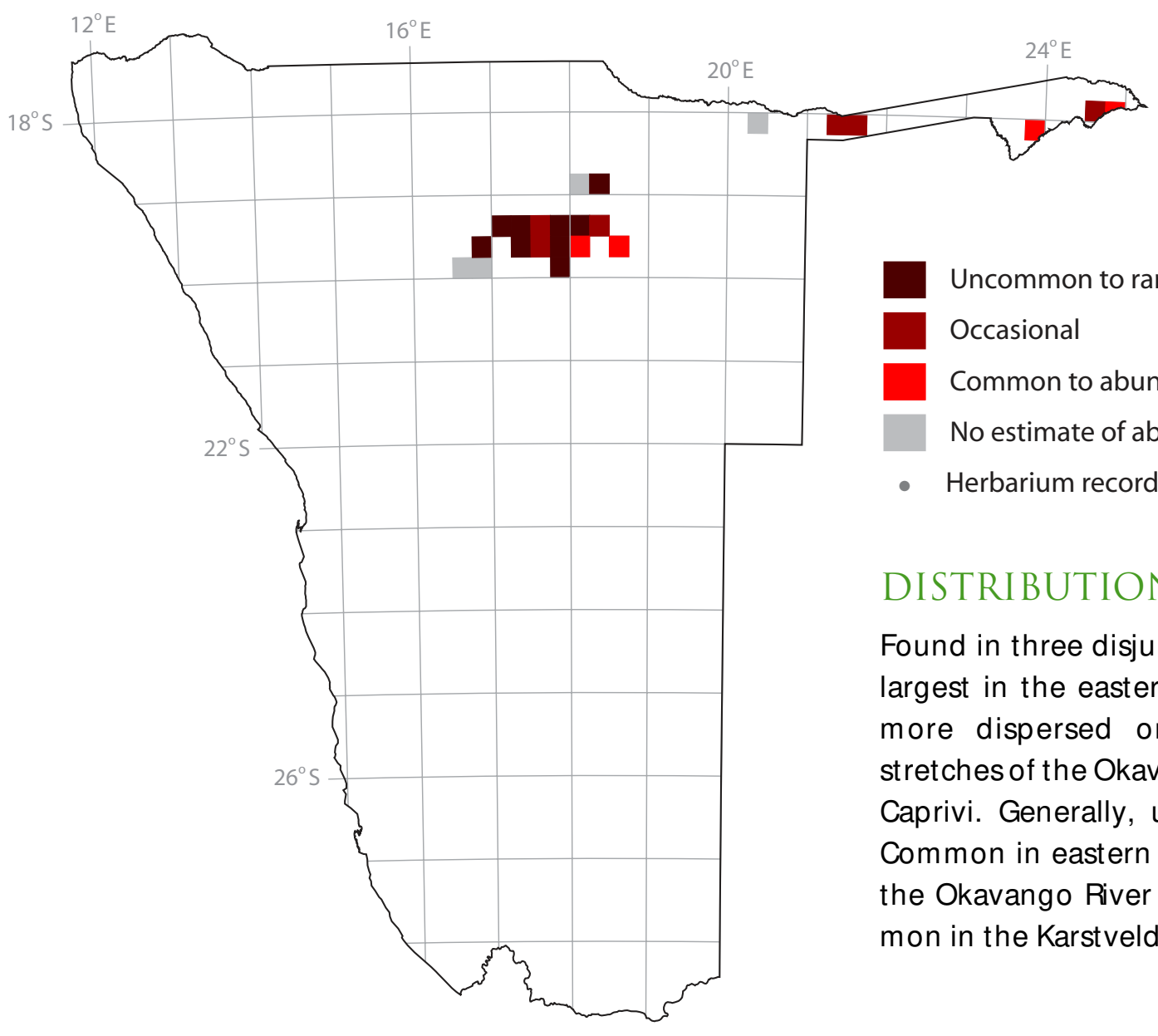
Omundjimune

Live-long (E); dikbas (A); Baumtraube (G); musamba (L); musinga (Rk); mushama (T)

[103 records from 23 (2%) squares]



Deciduous tree. BARK grey, cracked, crumbly; underbark red; young branches brown, velvety. LEAVES compound, clustered on branch tips; leaflets oblong-ovate to elliptic, **dark green to red-brown above; dense, grey, woolly covering below, which is very obvious as a silvery flashes when the wind blows.** FLOWERS small, cream-coloured to yellow, sweetly scented. FRUIT an ovoid, fleshy berry, reddish to deep purple when ripe, about 10 mm long.

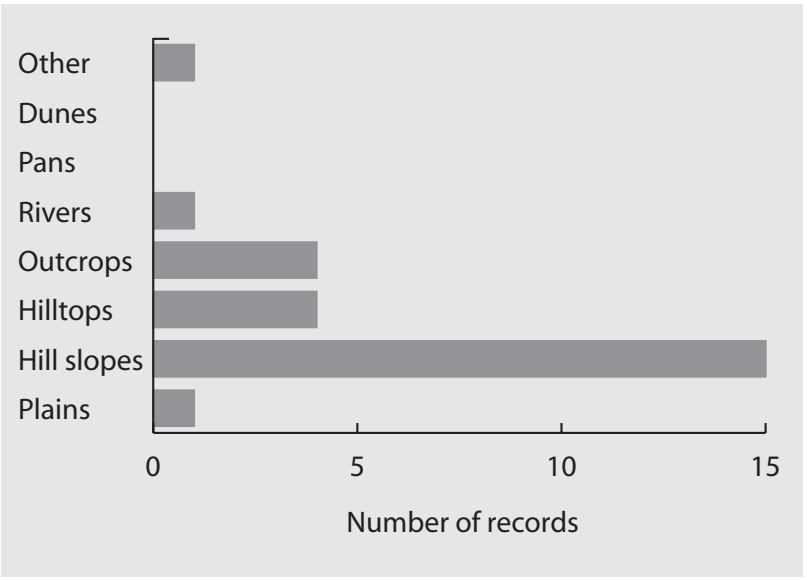


DISTRIBUTION & ABUNDANCE

Found in three disjunct populations, with the largest in the eastern Karstveld, and smaller, more dispersed ones along the eastern stretches of the Okavango River and in eastern Caprivi. Generally, uncommon to common. Common in eastern Caprivi, occasional along the Okavango River and common to uncommon in the Karstveld.

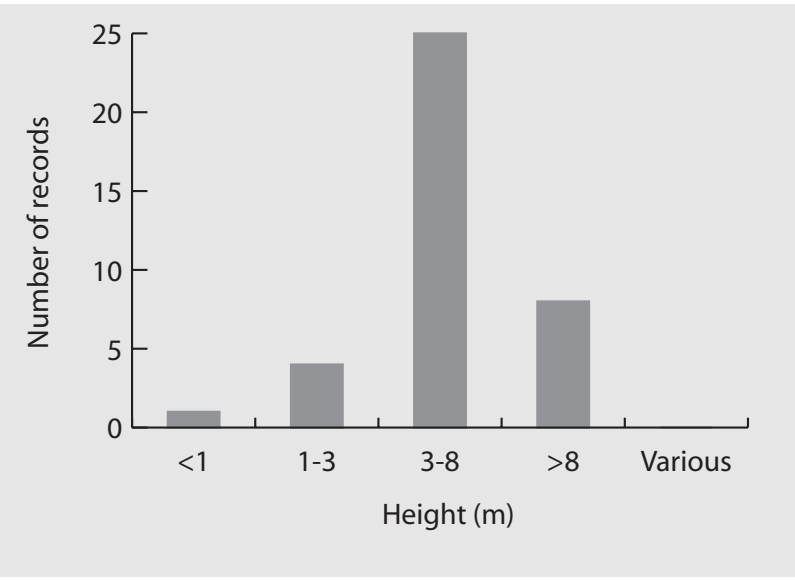
HABITAT

Chiefly found on hillsides, but also hilltops and rocky outcrops. Appears to be confined to the southern side of hills in some areas.



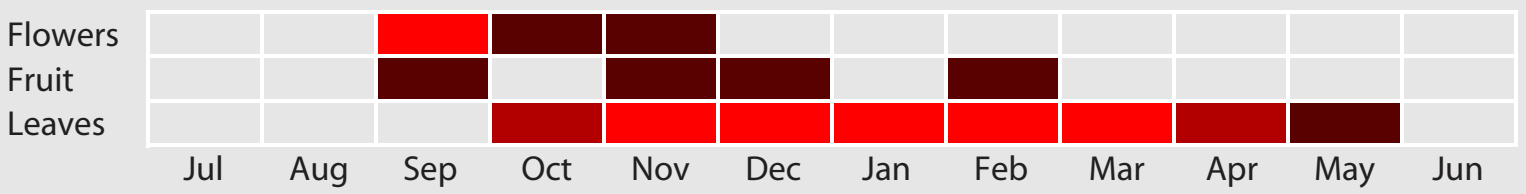
GROWTH FORM

Generally a tree 3–8 m high, sometimes over 8 m. There were few young ones recorded, and those that were recorded were in the Karstveld.



ANNUAL CYCLE

There were very few records of flowers or fruit. FLOWERS mostly September. FRUIT one record each in September, November, December and February. LEAVES from October through to May, with new leaves appearing in October and November.

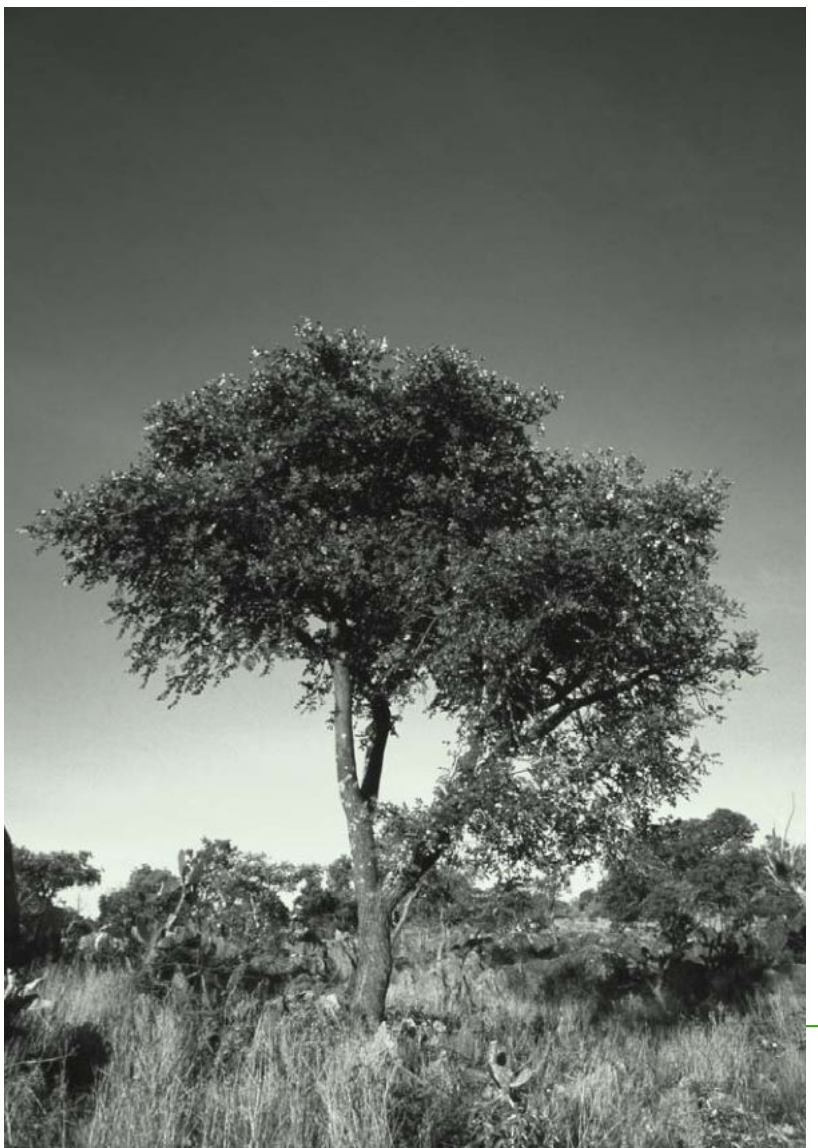


GENERAL

Edible fruit; various parts used in traditional medicine.

CONSERVATION CONCERNS

Protected by forestry legislation.



Lannea discolor, L.Hoffmann

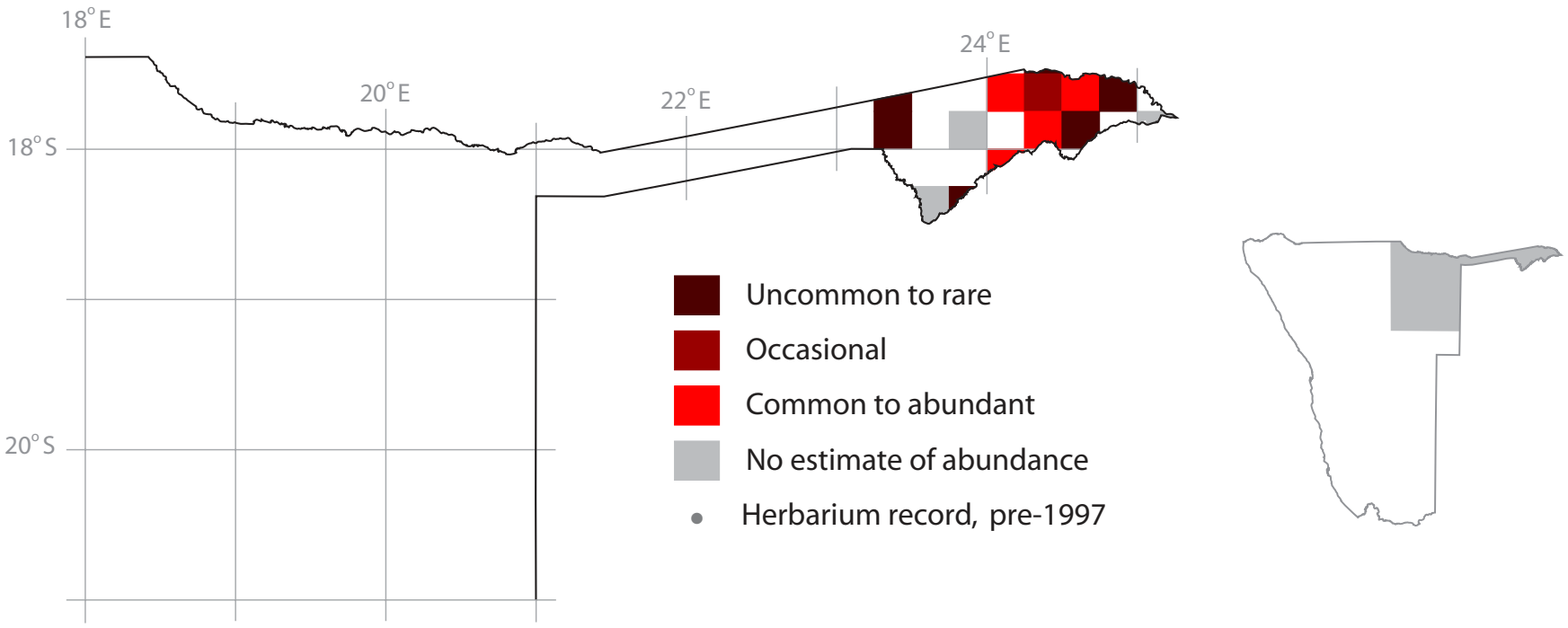
Lannea schweinfurthii

= Lannea stuhlmannii

Musamba

[29 records from 14 (1%) squares]

Erect, deciduous tree, slightly aromatic. BARK grey to light brown, flaking off to reveal pale orange underbark. LEAVES compound, petiole long and slender; lateral petiolules very short to almost absent, terminal petiolule much longer; leaflet ovate to almost circular, 20–90 mm long; **fresh green, hairy at first, becoming shiny and hairless when older**. FLOWERS small, cream-coloured to yellow, sweetly scented. FRUIT an elongate-ovoid, fleshy berry, about 12 mm long; reddish to brown-black when ripe.



DISTRIBUTION & ABUNDANCE

Widespread in eastern Caprivi only. Uncommon to common.

ANNUAL CYCLE

Observations were only made from October to March. FLOWERS October to December, but mainly November. FRUIT only recorded once, in February, possibly because they are sought after and rapidly eaten by birds and other animals. LEAVES present when observations made.

GENERAL

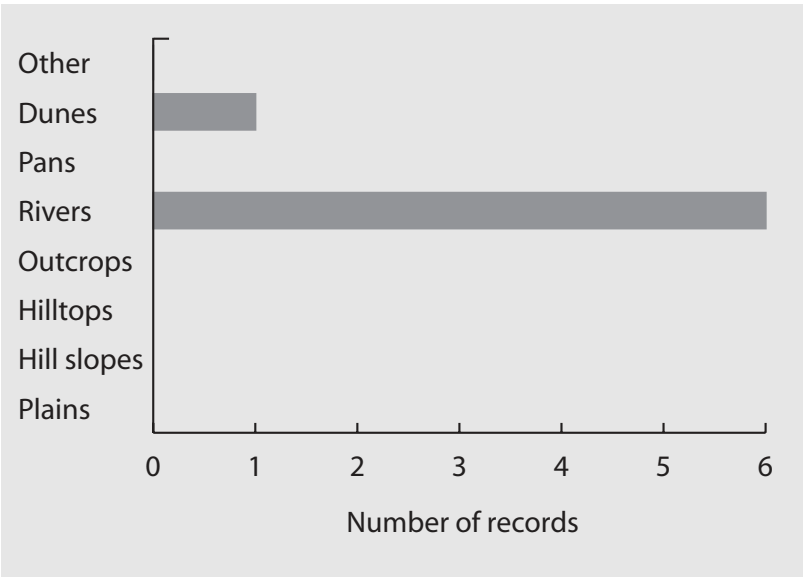
May form thickets in places. The fruit are edible.

CONSERVATION CONCERNS

None recorded.

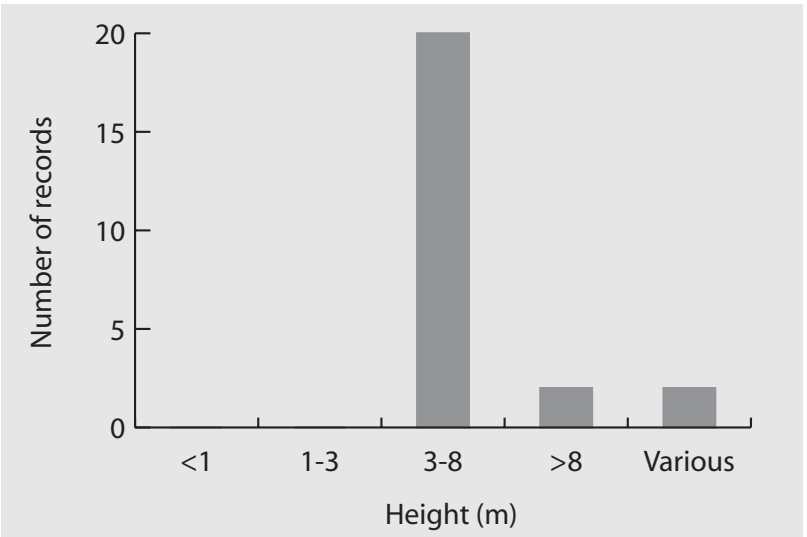
HABITAT

Found mainly on floodplains, in mixed woodland.



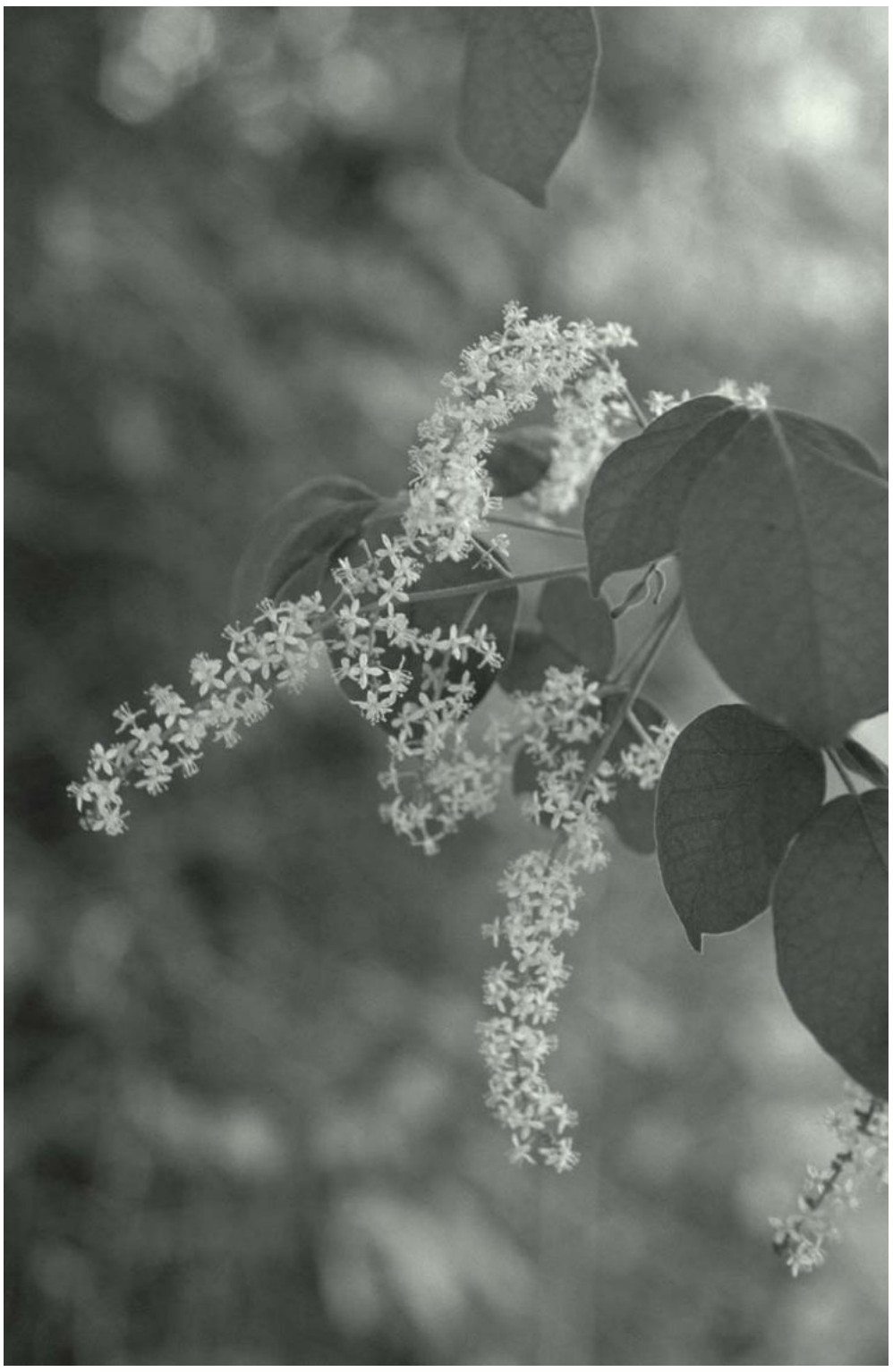
GROWTH FORM

Always a tree, generally 3–8 m high, but sometimes over 8 m. Young plants were only recorded once.



ANACARDIACEAE | MANGO FAMILY

A large, diverse and widespread family including a number of commercially valuable species such as *Anacardium occidentale* (cashew nuts) and *Mangifera indica* (mango). *Schinus molle* (South American pepper) is often used in gardens as a shade and ornamental tree. Most members of the family produce a clear, aromatic resin, although the leaves are not glandular. Some of these resins are poisonous. The flowers are small, unisexual and inconspicuous; male and female flowers usually on different plants. In Namibia this family is composed of shrubs and trees which may have spiny twigs. Two genera, *Ozoroa* and *Rhus*, each have a number of species. *Sclerocarya birrea* (marula) has traditionally been a very important tree and is also becoming so commercially, particularly for the northern regions of Namibia.



Lannea schweinfurthii inflorescence, G. Maggs-Kölling

Ozoroa crassinervia

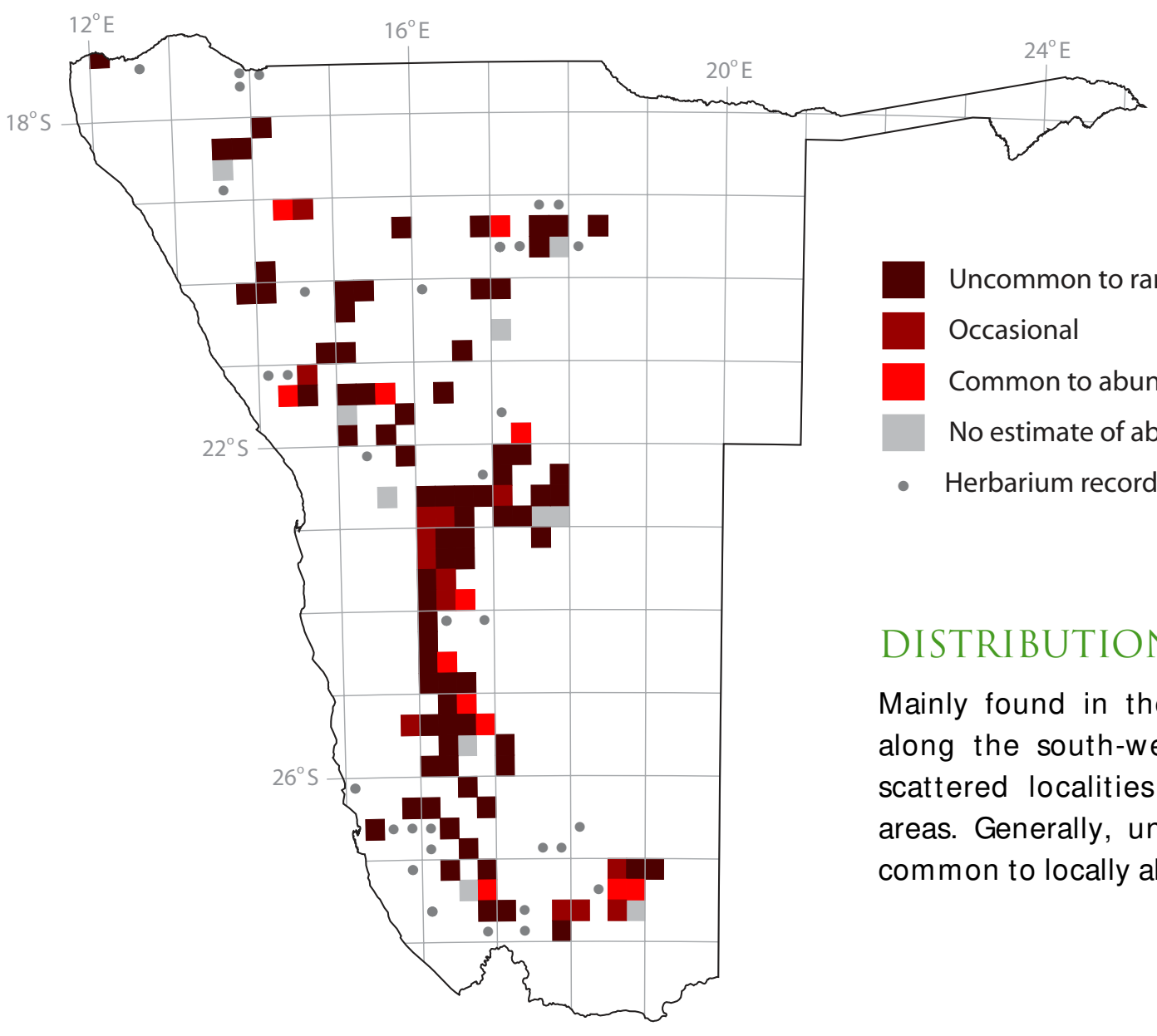
Namibian Resin-tree

Namibiese harpuisboom (A); Schwarzborkenbaum (G); omuryahere (H); mudirera (T)

[233 records from 114 (11%) squares]



Deciduous tree. BARK **dark grey to black, very coarse, cracked to form square fragments**. LEAVES simple, **obovate, rough and leathery**; green-grey and hairy above, secondary veins almost parallel to each other; pale olive-green and densely velvety below; margin entire, slightly undulate. INFLORESCENCE a terminal spray. FLOWERS small, white. FRUIT kidney-shaped, black when ripe.

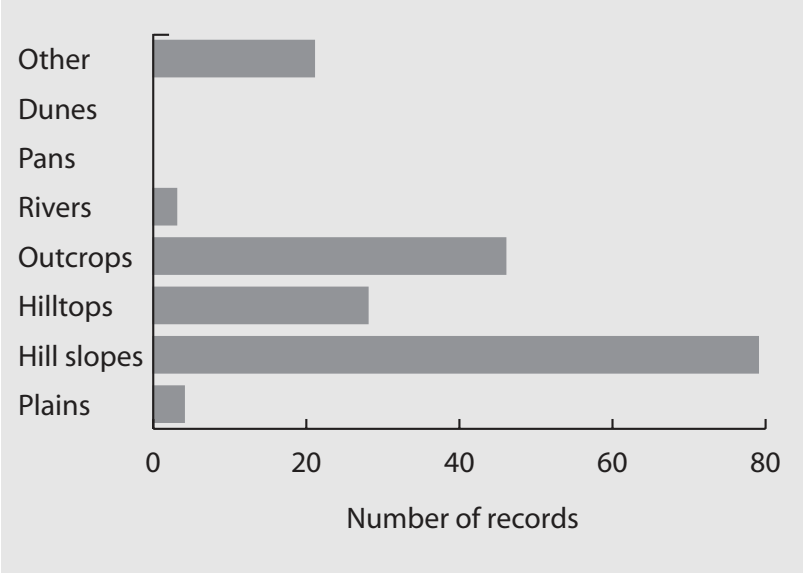


DISTRIBUTION & ABUNDANCE

Mainly found in the central highlands and along the south-western escarpment, with scattered localities in other mountainous areas. Generally, uncommon to occasional; common to locally abundant in a few areas.

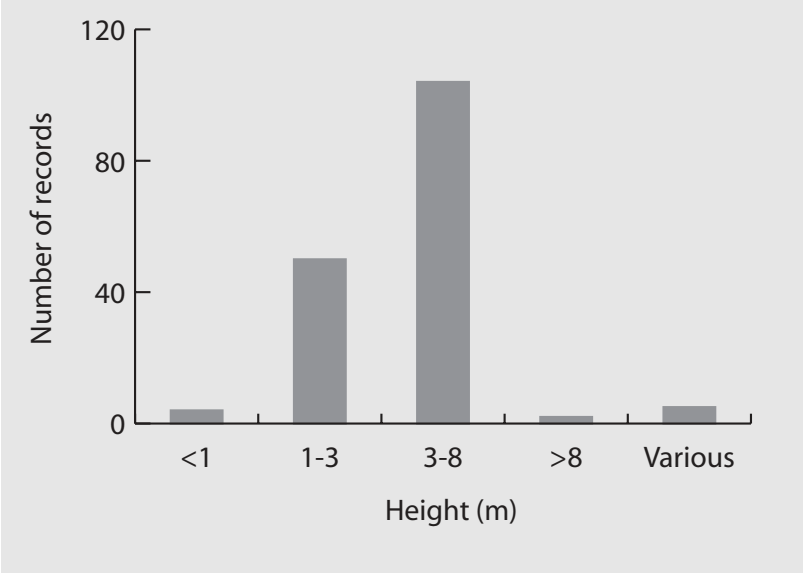
HABITAT

Always in mountainous areas or on rocky outcrops; often found on cliff faces. Grows on a variety of rock types, but mostly granite, dolomite and mica schist.

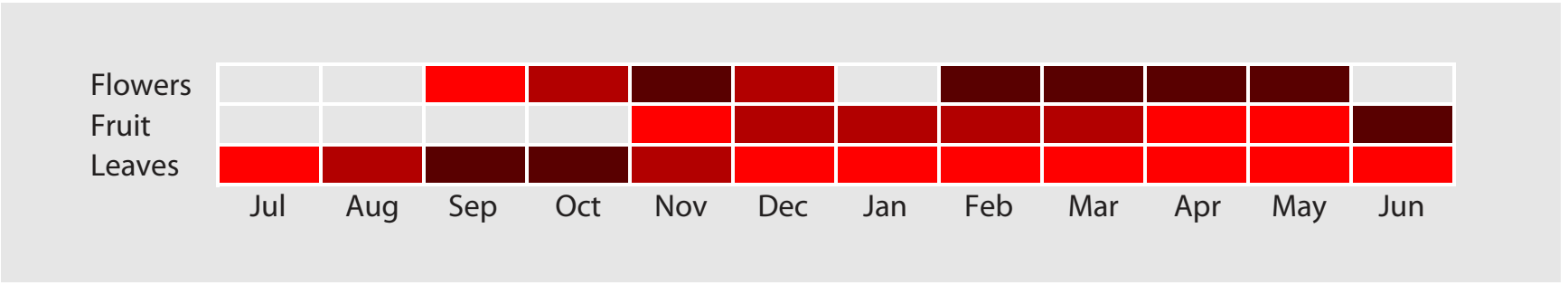


GROWTH FORM

Mostly a tree in the 3–8-m height class, but often less than 3 m and occasionally over 8 m. Few young trees recorded.



ANNUAL CYCLE



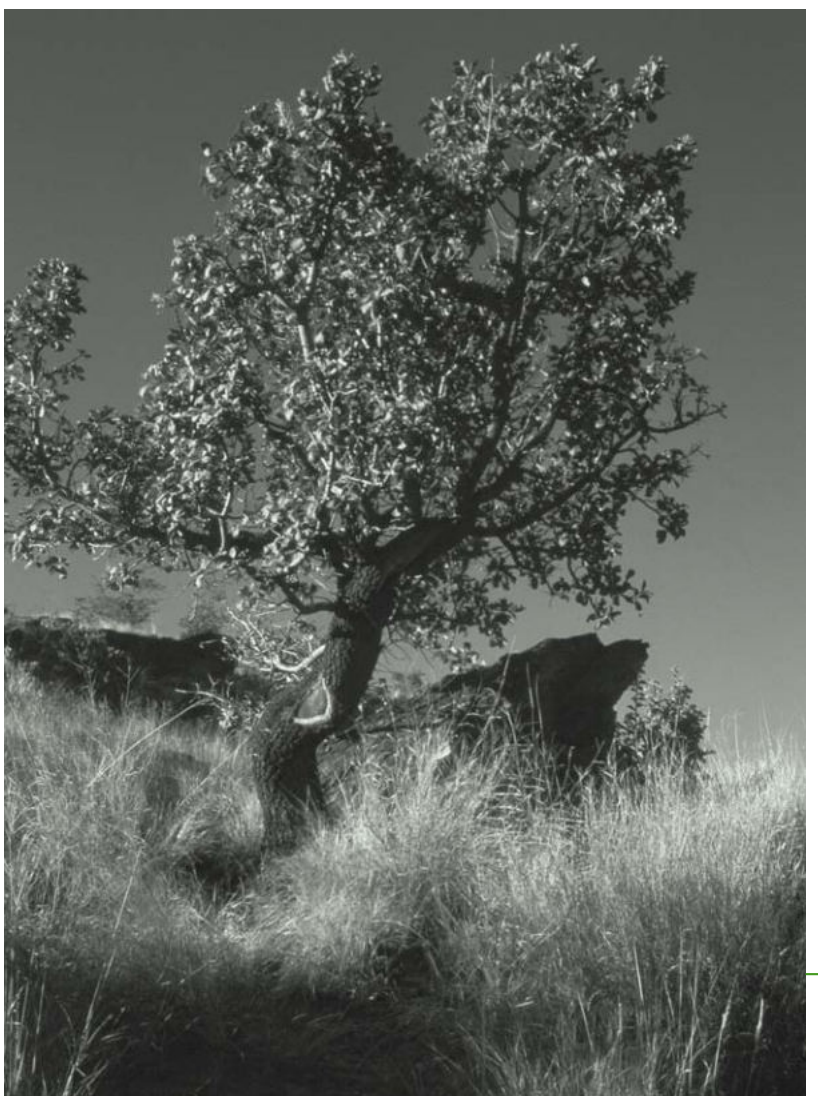
FLOWERS mainly September, but sometimes extending until May. FRUIT one or two records almost every month, but mostly November to June. LEAVES bare trees found from June to November; young leaves from September.

GENERAL

Attractive, drought-tolerant and able to grow in mica schist, this plant is of horticultural potential. Some specimens on lower hill slopes were frost-damaged after a severe Windhoek winter. Large, black caterpillars were observed eating the leaves (MAN1), sometimes causing severe defoliation.

CONSERVATION CONCERNS

Near-endemic to Namibia, extending into the Richtersveld in South Africa. Protected by forestry legislation.



Ozoroa crassinervia, Central Highlands, L. Hoffmann

Ozoroa insignis

African Resin-tree

Tropiese harpuisboom (A); omutaareka (H)

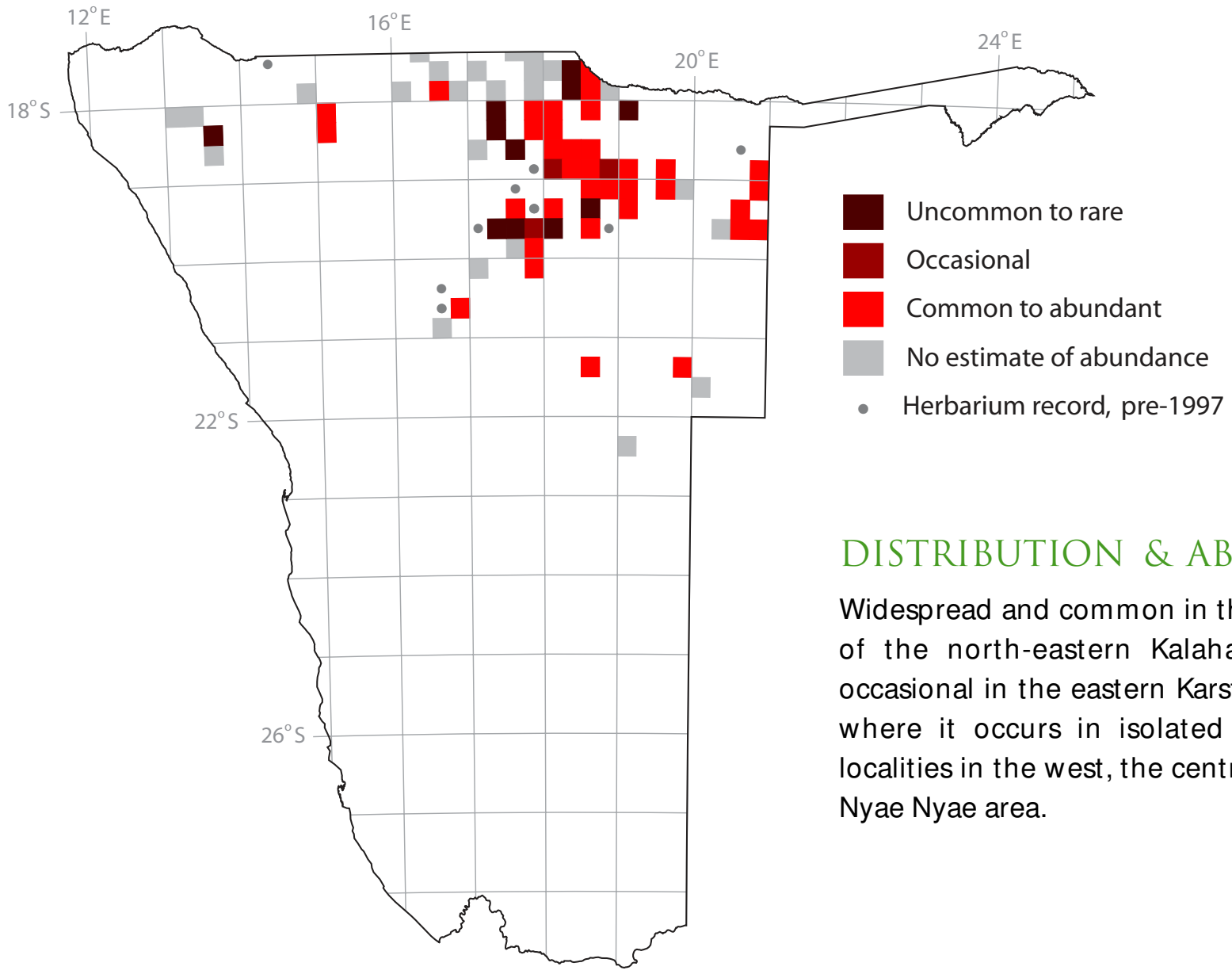
[92 records from 73 (7%) squares]



Shrub or single- to many-stemmed tree. BARK grey, irregularly fissured. LEAVES simple, **elliptic to ovate-elliptic**; pale green above, hairless, secondary veins conspicuous; green with silvery covering below; margin entire; apex bluntly tapering, **with distinct bristle-like tip**; base broadly tapering; petiole 5–30 mm long. FLOWERS small, white. FRUIT kidney-shaped, up to 4.5 x 7.5 mm; black when ripe.

Very similar to *O. paniculosa*, and may have been misidentified by atlassers – see text below.

There are two subspecies, *latifolia* and *reticulata* (= O. reticulata); here, both are treated together.

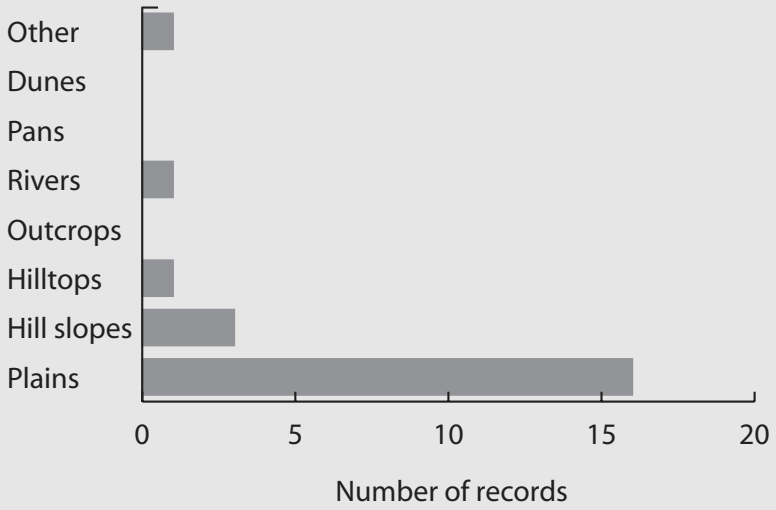


DISTRIBUTION & ABUNDANCE

Widespread and common in the western part of the north-eastern Kalahari woodlands; occasional in the eastern Karstveld. Common where it occurs in isolated and scattered localities in the west, the central-east and the Nyae Nyae area.

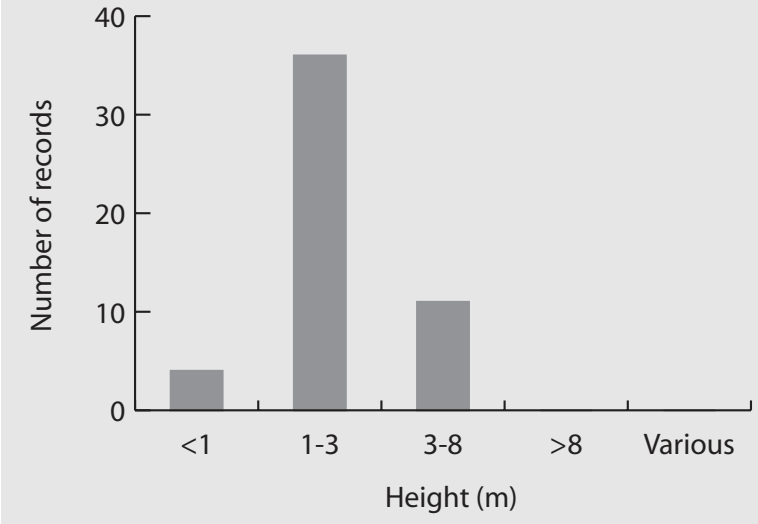
HABITAT

Various habitats, but mostly on sandy plains; also shallow soils with calcrete in the Karstveld.



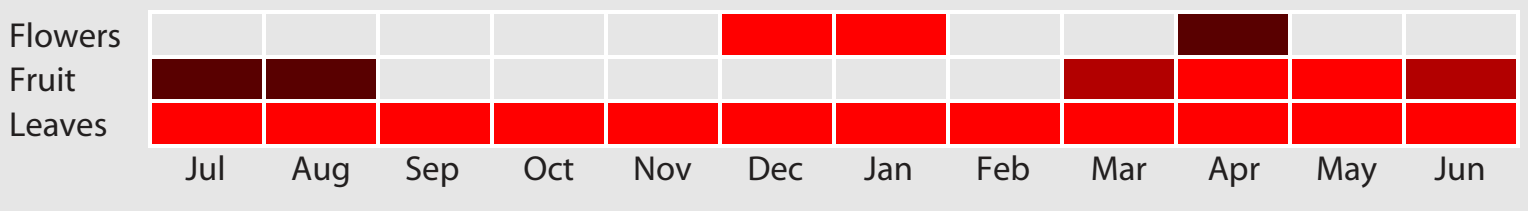
GROWTH FORM

Mostly a shrub in the 1–3-m height class (68% of records), but sometimes a tree of over 3 m.



ANNUAL CYCLE

FLOWERS December and January. FRUIT March to August. LEAVES evergreen.



GENERAL

New leaves are eaten by antelope; the fruit is edible.

CONSERVATION CONCERNS

None recorded.

Differences between *Ozoroa paniculosa* and *Ozoroa insignis*

Ozoroa paniculosa generally has a shorter (up to 15 mm long) and more robust petiole and a leafblade with a rounded apex and a short hard tip, while *O. insignis* has a more slender and longer petiole (up to 30 mm long) and a leaf blade with a slender, tapering apex and a distinct hair-like tip. The leaf of *O. paniculosa* appears to have parallel sides, while that of *O. insignis* has a more lanceolate to elliptic outline. There is also a difference in the size of the ripe fruit. *Ozoroa paniculosa* fruit reaches up to 10 mm across its longest axis (width) when mature, while that of *O. insignis* seldom reaches more than 7.5 mm.

Ozoroa paniculosa

Common Resin-bush

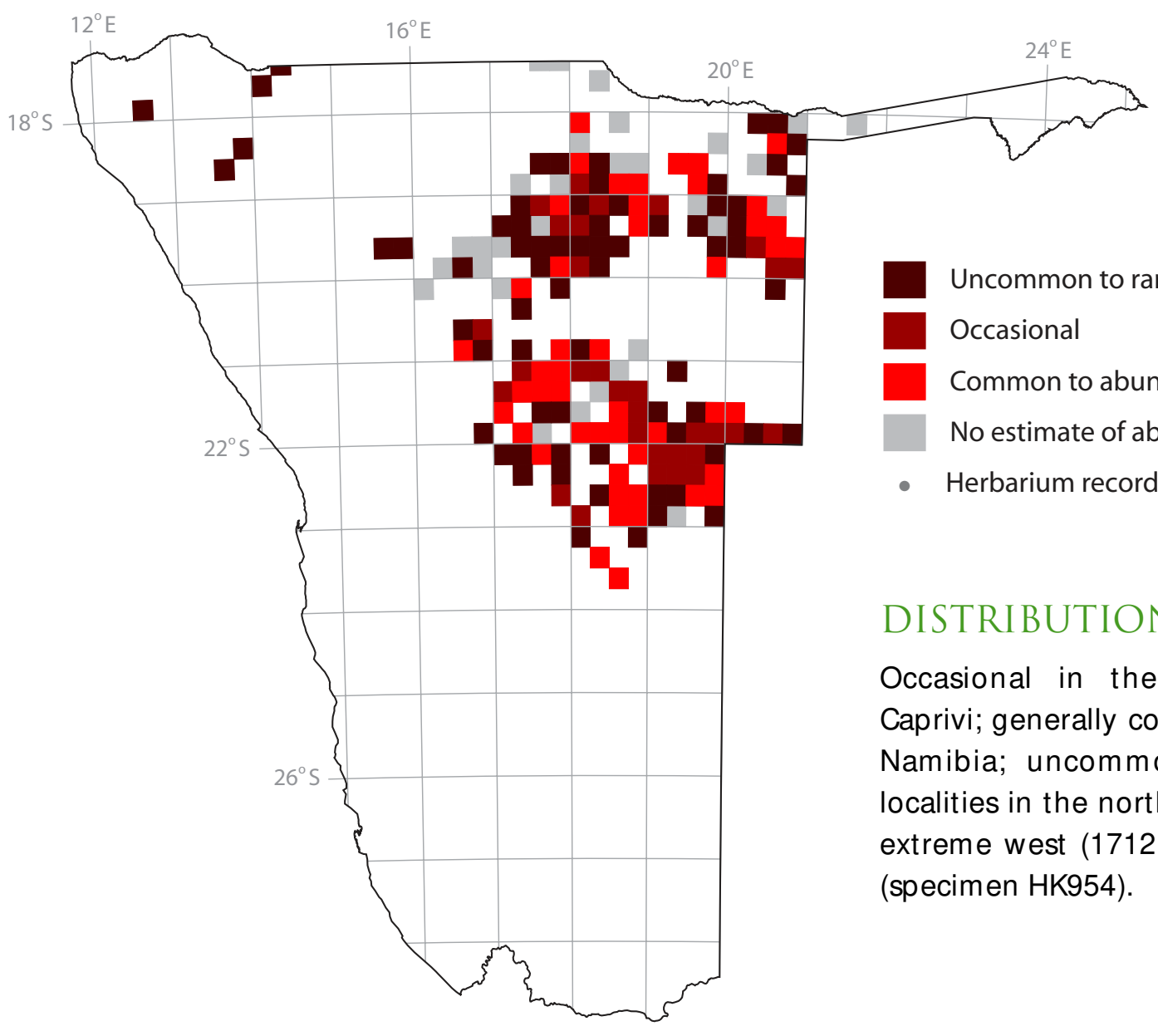
Plattbeerenstrauch, Wurzelbusch (G)

[454 records from 184 (17%) squares]



Many-stemmed, untidy, lax shrub or a single-stemmed tree. BARK grey, rough; older branchlets speckled black. LEAVES simple, spirally arranged or whorled in threes, **elliptic to elliptic-oblong**, 40–100 x 13–40 mm; **dark green and hairless, or sparsely downy above; silvery, velvety covering below, midrib prominent**, lateral veins characteristically parallel; margin entire; **apex with bristle-tip**; base broadly tapering to blunt; petiole 6–16 mm long. INFLORESCENCE an axillary or terminal spray, **up to 60 mm long**. FLOWERS small, white. FRUIT kidney-shaped, up to 7 x 10 mm; black when ripe.

May be confused with *O. insignis*. (See *O. insignis* for differences.)



DISTRIBUTION & ABUNDANCE

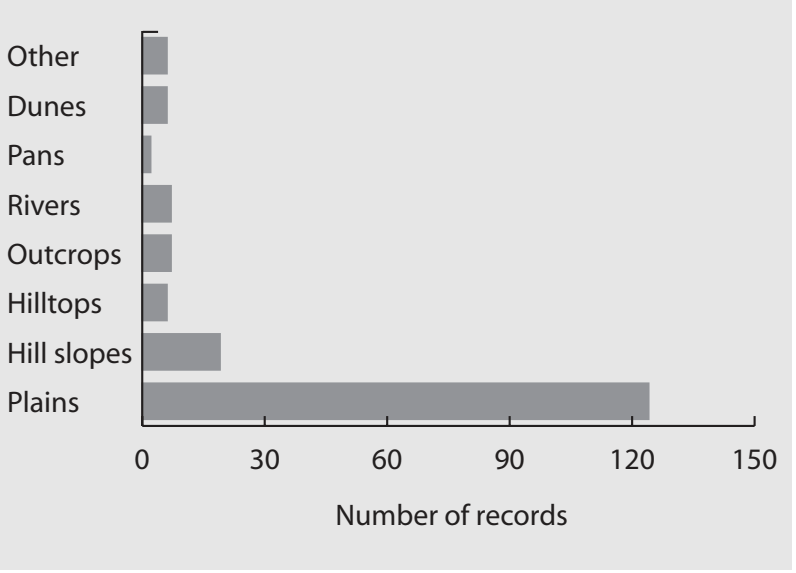
Occasional in the north-east, excluding Caprivi; generally common in eastern-central Namibia; uncommon in a few scattered localities in the north-west. The record in the extreme west (1712DC) is a range extension (specimen HK954).

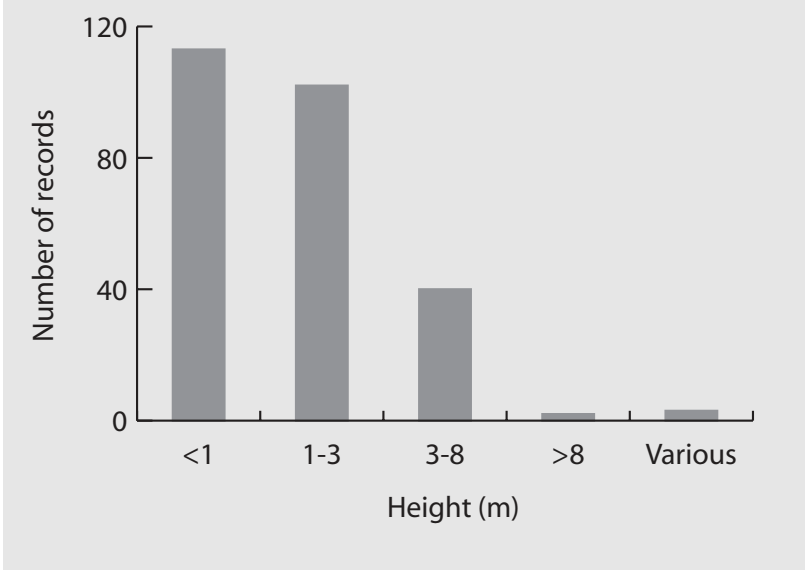
HABITAT

Mainly found on sandy plains, occasionally hill slopes.

GROWTH FORM

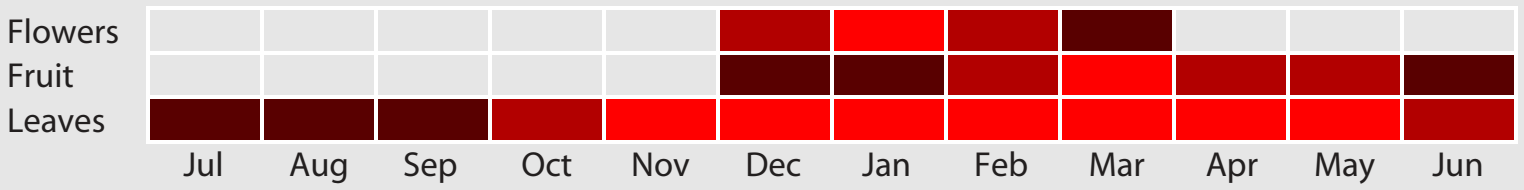
Mostly a shrub of less than 1 m high; sometimes up to 3 m; occasionally a tree of 3–8 m high. Often many-stemmed and forming quite large stands in some sandy areas.





ANNUAL CYCLE

FLOWERS December to March. FRUIT December to June. LEAVES mainly October to June, with young leaves from September to November.



GENERAL

The leaves are used medicinally. The Otjiherero name, ‘omutareka‘, means ‘shade‘, so-called because in the shade of this plant grows a climber, *Fockea angustifolia*, which has a thick, edible root, as long as a hand (HOF1).

CONSERVATION CONCERNS

None recorded.

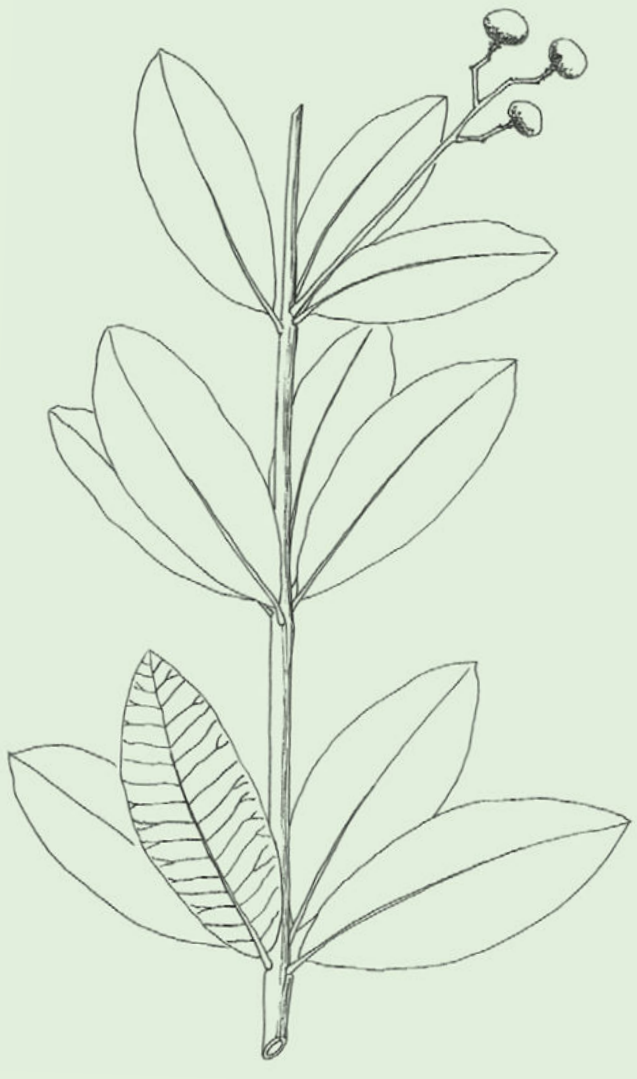


Ozoroa paniculosa,
tree growth form, L. Hoffmann

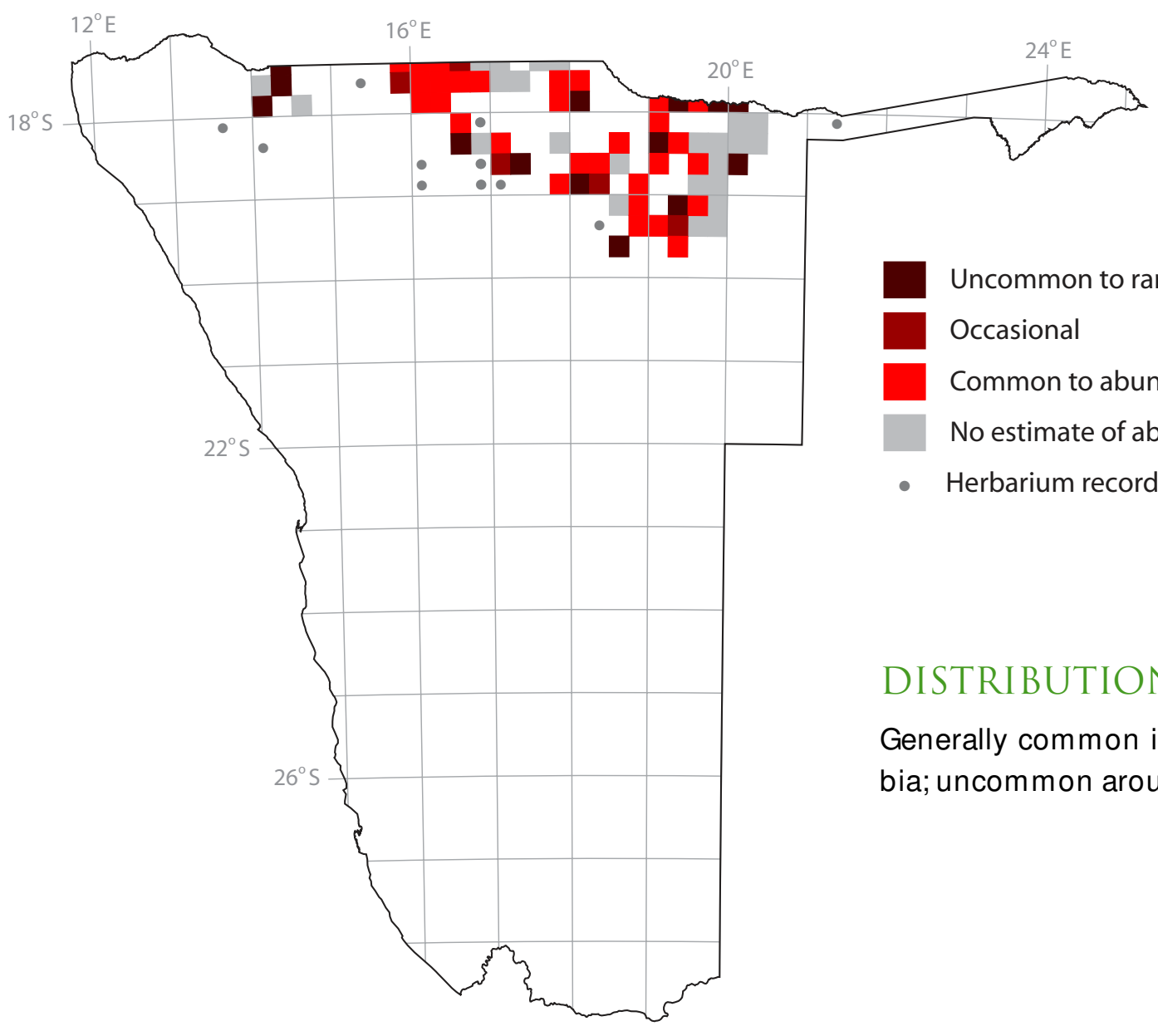
Ozoroa schinzii

Hiatata / Oifuku

[99 records from 75 (7%) squares]



Deciduous shrub. LEAVES simple, spirally arranged or **(often) 3–4-whorled, obovate to elliptic**, 8–25 mm long; **dark green and slightly hairy above; olive-green and slightly hairy below**, margin entire; apex blunt, rounded; base broadly tapering; **petiole 1–3 mm long**. INFLORESCENCE an axillary or terminal spray. FLOWERS small, white. FRUIT a kidney-shaped, somewhat flattened berry, 7–8 mm long; black when ripe.



DISTRIBUTION & ABUNDANCE

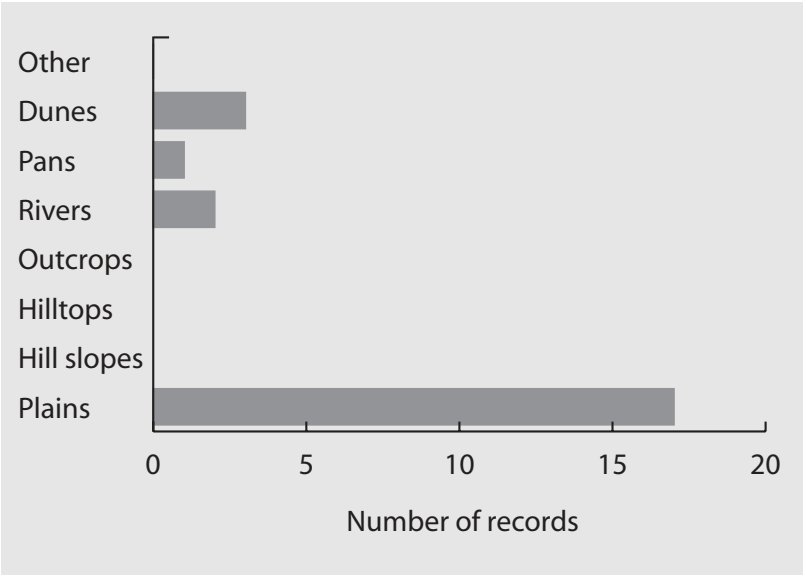
Generally common in central-northern Namibia; uncommon around Ruacana.

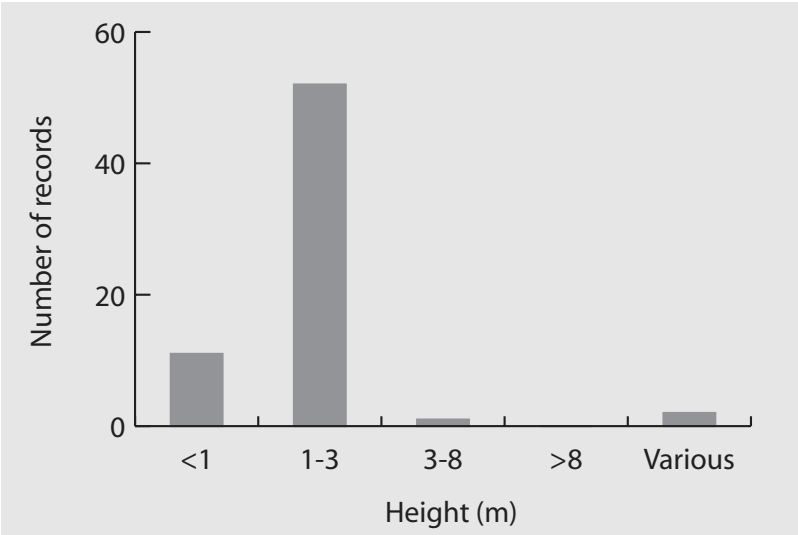
HABITAT

Predominantly found on sandy plains in woodlands.

GROWTH FORM

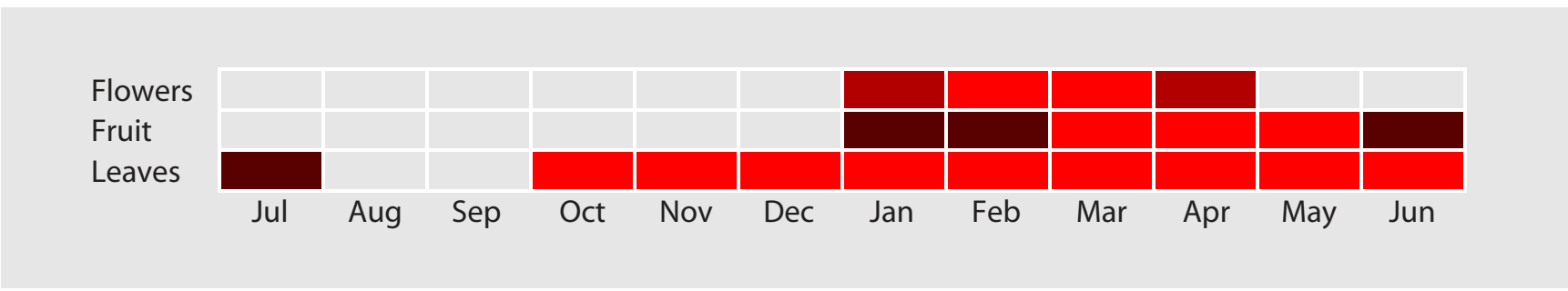
A shrub in the 1–3-m height class. About 30% of observations were of stands of shrubs of various heights.





ANNUAL CYCLE

FLOWERS January to April. FRUIT January to June. LEAVES October to June.



GENERAL

The roots, fruit and leaves are used medicinally, as well as the smoke produced on burning this plant. Dried stems are used to light fires. The fruit is used to make necklaces as toys for children.

CONSERVATION CONCERNS

None recorded.

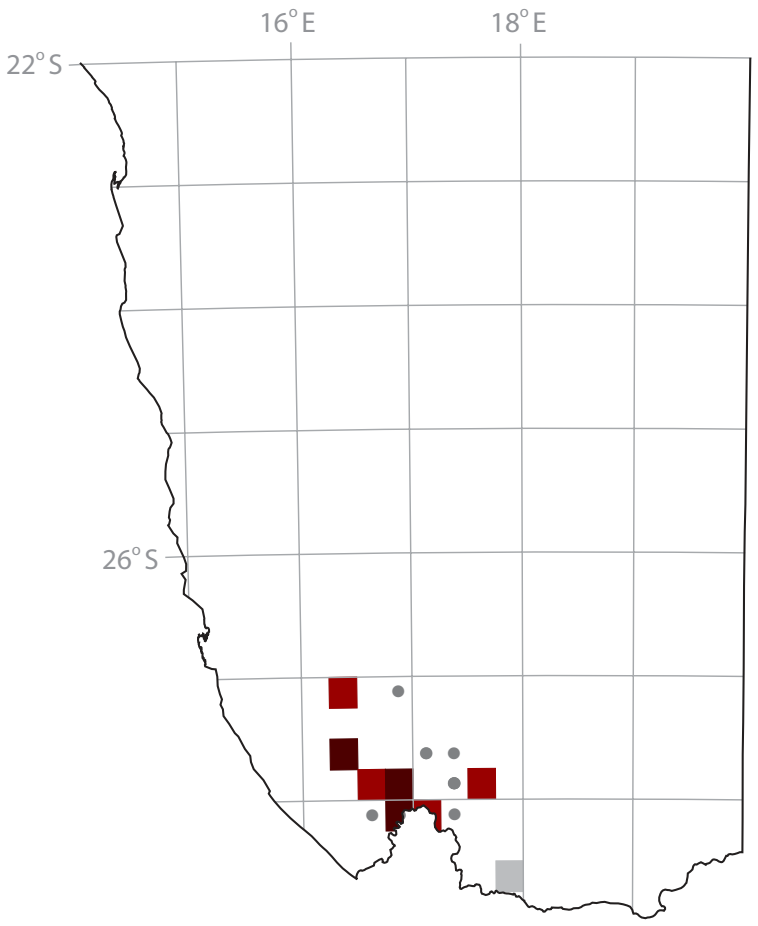
Ozoroa concolor

Green Resin-tree

Groenhaarpuisboom (A)

[18 records from 8 (<1%) squares]

Semi-deciduous, shrubby tree with copious, strong-smelling resin. BARK grey, fissured; young branchlets reddish to grey with black leaf-scars. LEAVES simple, **obovate**, up to 50 mm long; **both surfaces dark green, often glossy; margin very undulate**. FLOWERS small, cream-coloured, waxy; in terminal sprays. FRUIT a black, kidney-shaped berry.



DISTRIBUTION & ABUNDANCE

Restricted to a small area in the south-west; generally uncommon, but common in places. The record to the south-east (2817DB) is a range extension that needs confirmation by collection of a specimen.

HABITAT

Rocky hills and gorges.

GROWTH FORM

A tree in the 1–3-m height class, with few records of young ones.

ANNUAL CYCLE

Observations from September to November and in March. FLOWERS in February and from June to October. FRUIT in March and from August to October. Leaves recorded during all months of observations.

GENERAL

This plant has horticultural potential – the leaves, flowers and fruit are all attractive. Large, black caterpillars have been seen eating the leaves, sometimes defoliating the tree quite extensively.

CONSERVATION CONCERNS

Near-endemic; almost entirely restricted to Namibia with a few localities in the Richtersveld.

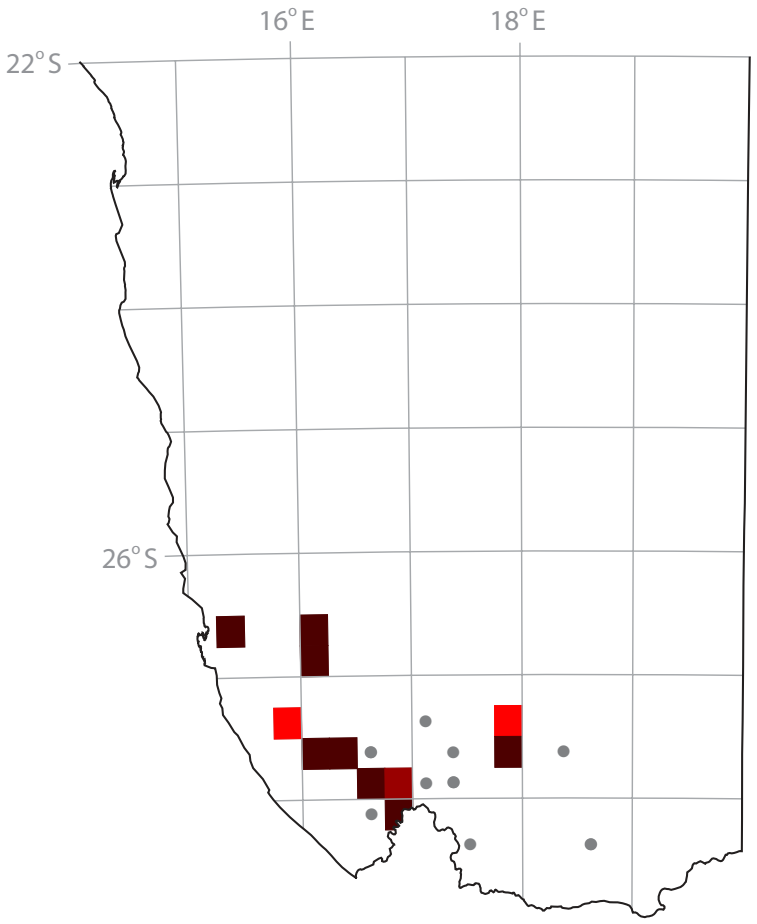
Ozoroa dispar

Namaqua Resin-tree

Namakwa-haarpuisboom (A)

[20 records from 12 (1%) squares]

Shrub or much-branched, compact tree. BARK **grey to grey-brown, deeply fissured**. LEAVES **narrowly ovate to obovate**, up to 55 mm long; **bright matt-green and hairless or almost so above; olive-green below with grey-green, densely woolly covering**. FLOWERS tiny, cream-coloured. FRUIT small, kidney-shaped, black when ripe.



Uncommon to rare
Occasional
Common to abundant
No estimate of abundance
Herbarium record, pre-1997

DISTRIBUTION & ABUNDANCE

Uncommon to locally common, mainly in the south-west. There was a record from Brukkaros (2517DD), which has not been included as it would be a range extension and needs confirmation by collection of a specimen.

HABITAT

Rocky hill slopes and outcrops.

GROWTH FORM

A tree, mostly in the 1–3-m height class, occasionally taller. Very few young ones recorded.

ANNUAL CYCLE

Observations were mainly from September to November, with single records in March, April, June and August. FLOWERS no TAP records; herbarium records in March, from May to July and in October. FRUIT mostly September, also June, November and December. LEAVES apparently evergreen.

GENERAL

An attractive tree of horticultural potential. The leaves are eaten by caterpillars.

CONSERVATION CONCERNS

None recorded. This species was either overlooked by atlassers or there has been a die-back in the population.

Ozoroa longipes

Round-leaved Resin-bush

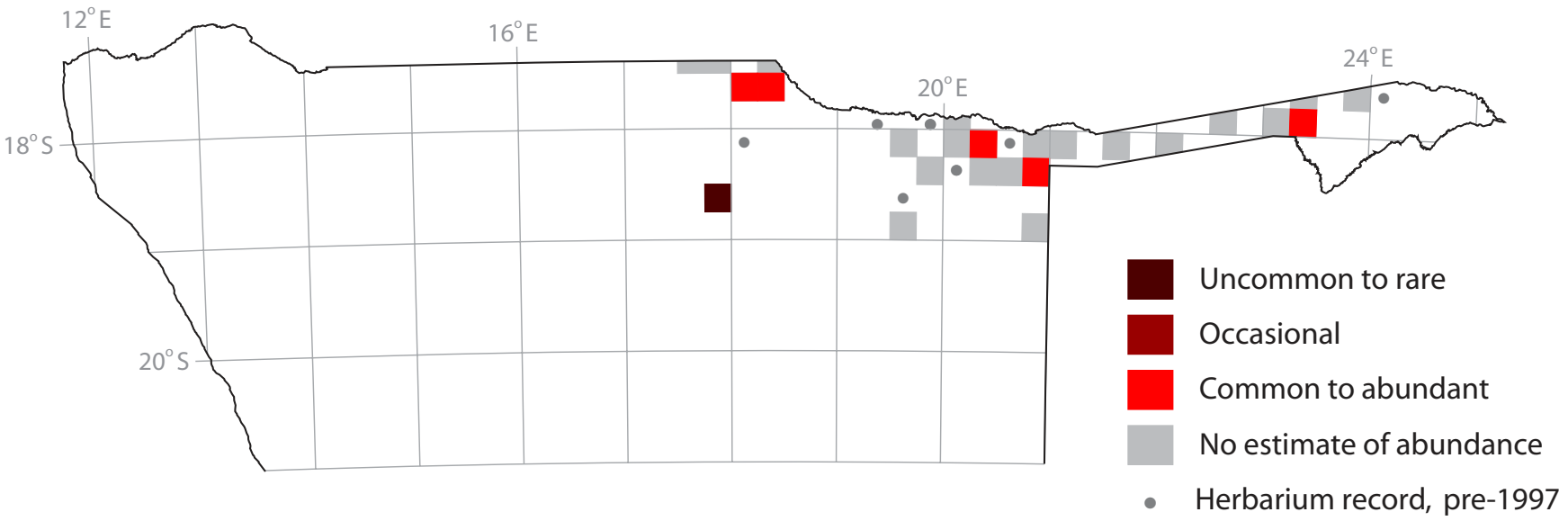
Rondeblaarharpuisbos (A); biatata, mululira (K); mukanga (Rk, Rum, T)

[25 records from 25 (2%) squares]

Many-stemmed, deciduous shrub; branches drooping. BARK dark brown. LEAVES simple, **broadly elliptic to obovate-elliptic to almost circular; shiny, bright green, hairless above**, lateral veins conspicuous; **green with silvery covering below**; margin entire; apex blunt to mucronate; base broadly tapering; **petiole 20–40 mm long**. INFLORESCENCE an axillary or terminal spray. FLOWERS small, cream-coloured to white. FRUIT kidney-shaped, black when ripe.

This species is very easy to confuse with *O. okavangensis* and may have been recorded as such. *Ozoroa longipes* has a petiole that is at least half as long or longer than the leaf blade, which is broadly ovate to almost circular, while *O. okavangensis* has a petiole usually at most one-third the length of the blade, which is broadly elliptic and thus far more tapered at both ends than that of the former.

Ozoroa longipes may also be confused with *Diplorhynchus condylocarpon*, which has a milky latex, which both *O. longipes* and *O. okavangensis* lack.



DISTRIBUTION & ABUNDANCE

Apparently restricted to a small area along the Okavango River and just south of it, and an even smaller area in eastern Caprivi. Common where it occurs.

HABITAT

Found on sandy plains in woodland.

GROWTH FORM

A shrub, ranging in height from less than 1 m to less than 3 m.

ANNUAL CYCLE

Observations from February to April and in October. FLOWERS November to May. FRUIT December to May. LEAVES only recorded from February to April, with young leaves in October.

GENERAL

Roots used medicinally. Low height possibly due to fire. Attractive and of horticultural potential for frost-free areas.

CONSERVATION CONCERNS

None recorded.

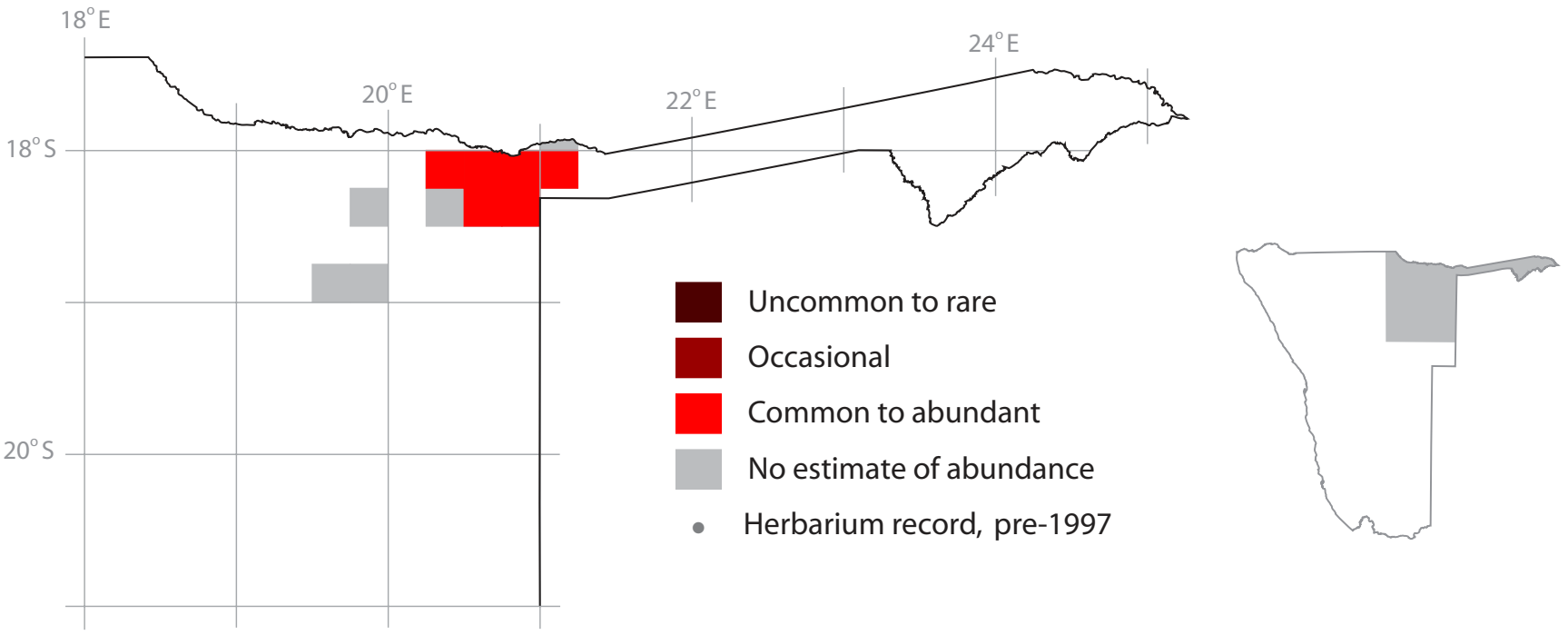
Ozoroa okavangensis

Okavango Resin-bush

[12 records from 11 (1%) squares]

Many-stemmed shrub. BARK grey; young branchlets brown-red, densely woolly. LEAVES simple, **broadly elliptic**, 18–50 x 10–25 mm; **dark green to brown-green and downy above; with silvery, velvety covering below**, secondary veins parallel to each other; margin entire; apex blunt to mucronate; base broadly tapering; petiole 5–13 mm long. INFLORESCENCE a terminal spray. FLOWERS small, cream-coloured to white. FRUIT kidney-shaped, black when ripe.

May easily be confused with *O. longipes* and *Diplorhynchus condylocarpon*. (See *O. longipes* for differences.)



DISTRIBUTION & ABUNDANCE

Common in a small area just south of the Okavango River. The range has been extended slightly to the south-west by the TAP.

HABITAT

Found on sandy plains in open Kalahari woodland.

GROWTH FORM

A shrub 1–3 m high; one record of a tree of over 3 m.

ANNUAL CYCLE

Observations only for October, February and March. FLOWERS in January. FRUIT in March, April, August and October. LEAVES present in months of observation.

GENERAL

Possible horticultural potential for frost-free areas due to attractive foliage.

CONSERVATION CONCERNS

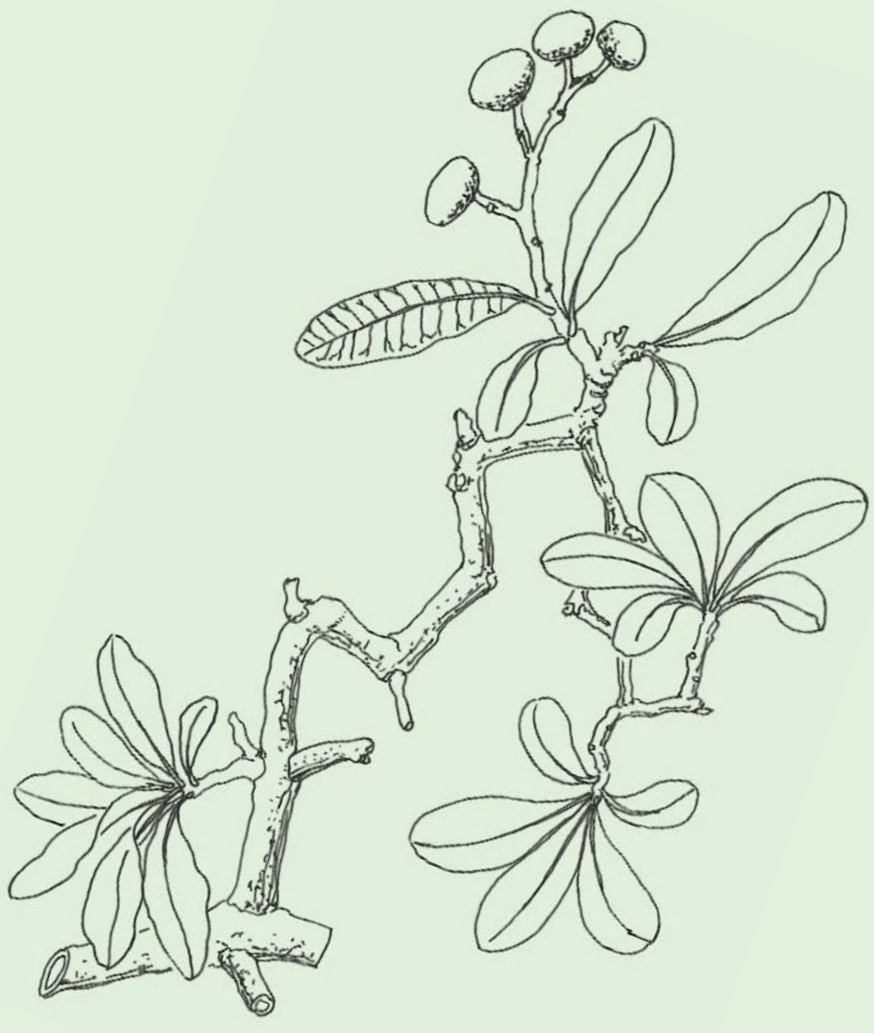
None recorded.

Ozoroa namaensis

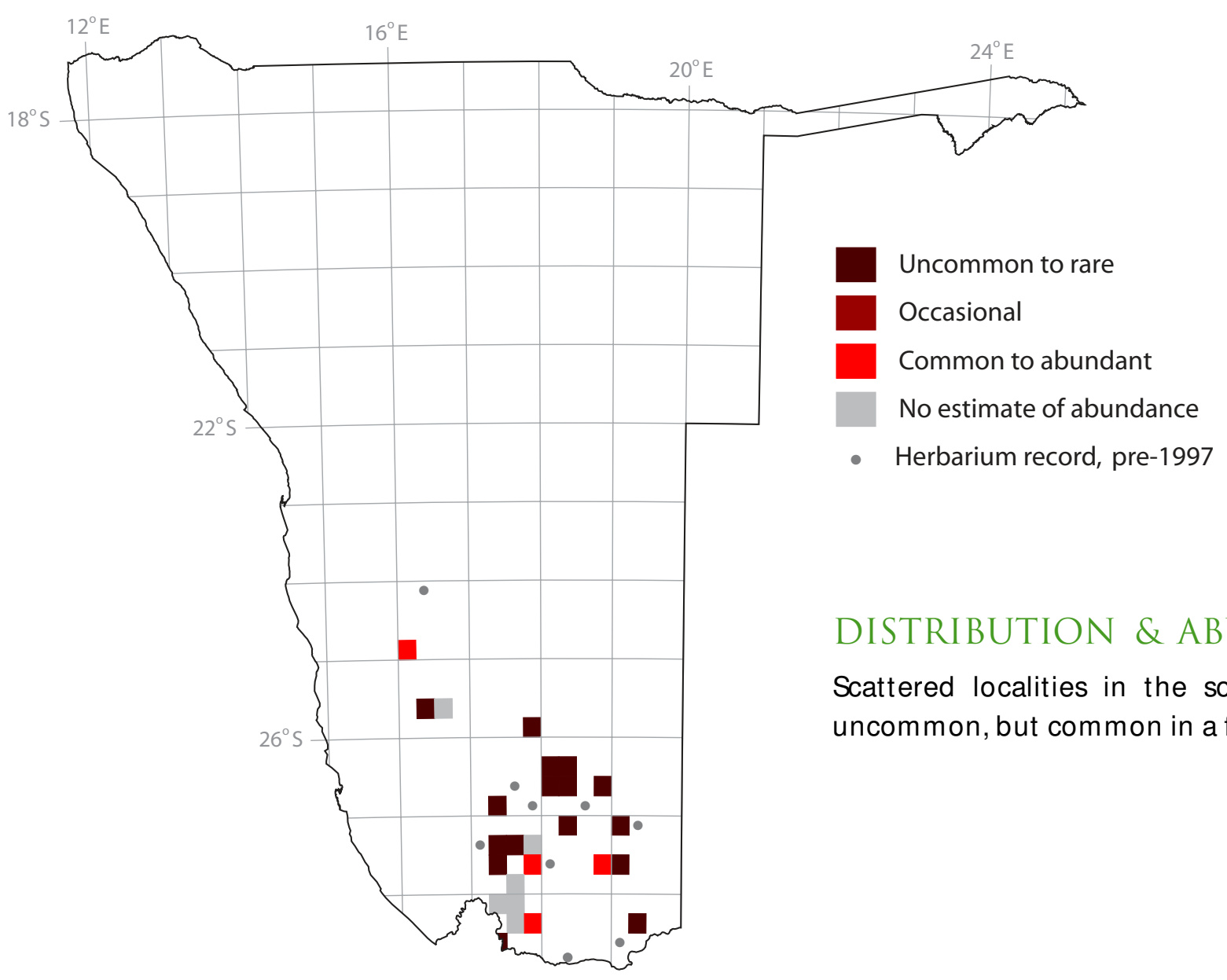
Nama Resin-tree

Nama-haarpuisboom (A)

[36 records from 26 (2%) squares]



Much-branched, gnarled tree. BARK brown, fissured. LEAVES simple, **oblong to obovate, smallish; grey-green and densely woolly above**; paler below; margin slightly undulate; apex blunt; **petiole short**. FLOWERS cream-coloured to white. FRUIT slightly bilobed, *c.* 6 mm in diameter; black when ripe.

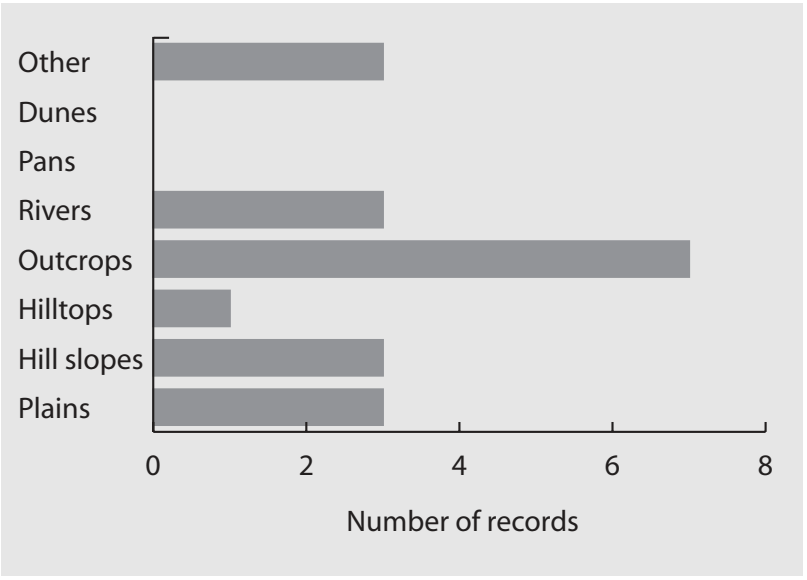


DISTRIBUTION & ABUNDANCE

Scattered localities in the south; generally uncommon, but common in a few localities.

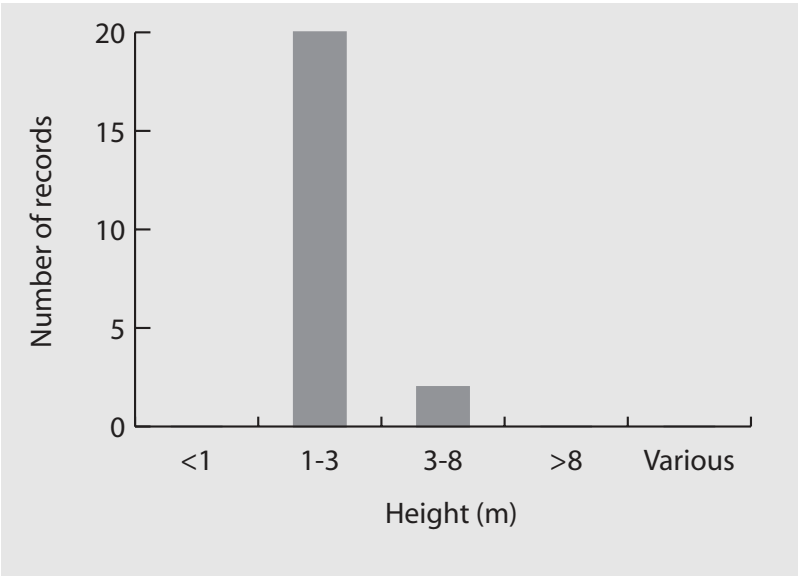
HABITAT

Found in various habitats, but mainly rocky outcrops. Grows on rocky, gravel or sandy substrates.



GROWTH FORM

Generally a tree in the 1–3-m height class, with no records of young plants.



ANNUAL CYCLE

FLOWERS March, May and December. FRUIT March, May and July to November. LEAVES evergreen, with young leaves in October.

GENERAL

A small tree, possibly of horticultural potential; drought-tolerant.

CONSERVATION CONCERNS

The lack of reconfirmation of earlier herbarium records in some areas could be due to lack of atlasing, or to a decline in the population.

Ozoroa namaquensis

= Protorhus namaquensis

Gariep Resin-tree

[2 records from 2 squares]

Multi-stemmed shrub or small tree. BARK light brown to grey; red-brown on young twigs. LEAVES simple, leathery, **linear-lanceolate**; shiny, smooth when mature; paler below than above, veins distinct, parallel; margin slightly toothed, undulate. INFLORESCENCE generally a terminal spray; male and female flowers on separate plants. FLOWERS small, fragrant; cream to greenish. FRUIT slightly wrinkled, somewhat-flattened kidney-shaped, black when ripe.

Recorded from the south (2818CC and CD), one with a specimen (BS3469); one, earlier herbarium record exists for 2818CD. A rare shrub or tree of 1 m growing on a rocky outcrop. Flowers recorded in June. Classified as ‘rare‘ according to IUCN criteria (Loots 2005).

Rhus burchellii

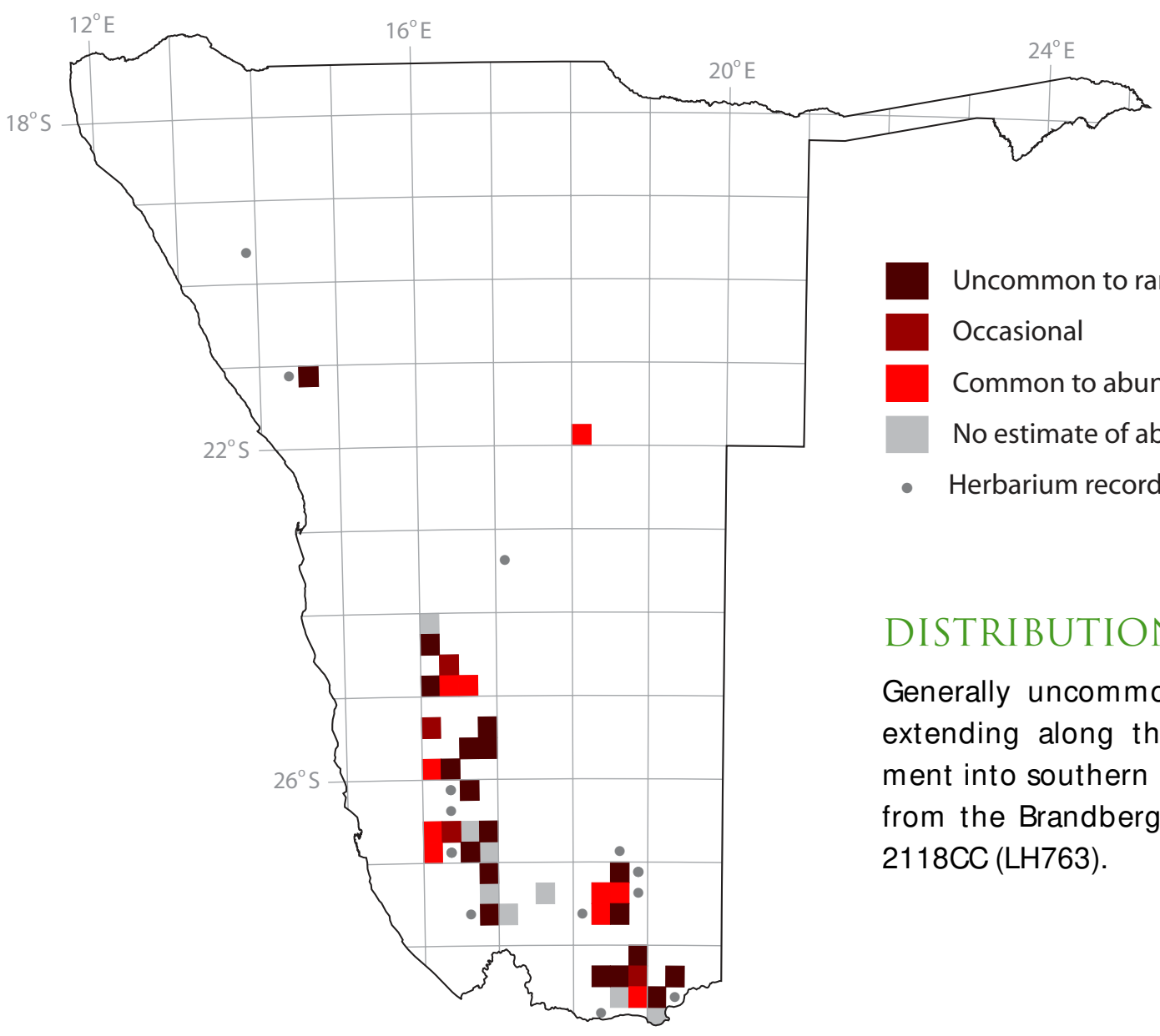
Karoo Kuni-bush

Karoo-koeniebos (A)

[61 records from 41 (4%) squares]



Evergreen shrub. BARK grey-brown, granular; **young branchlets with waxy scales, with distinct lenticels.** LEAVES trifoliolate, clustered, leathery, dark green with a **lacquered appearance; leaflets sessile, elongate, obtriangular to obcordate**; margin undulate; **apex usually distinctly notched and with a tiny, bristle-like tip**. FLOWERS tiny, star-like, green to yellow. FRUIT spherical, laterally flattened, up to 5 mm in diameter; shiny green, becoming shiny red-brown then dull brown when ripe.



DISTRIBUTION & ABUNDANCE

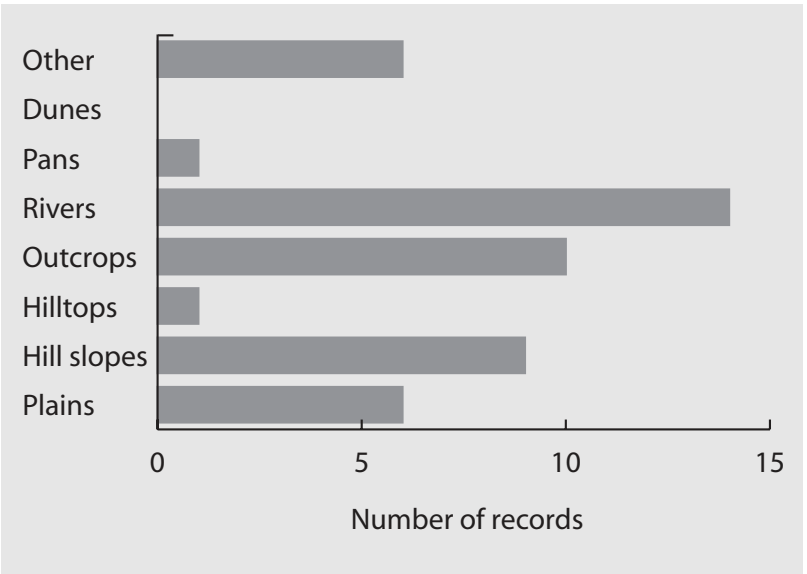
Generally uncommon in scattered localities extending along the south-western escarpment into southern Namibia, with one record from the Brandberg and a new record from 2118CC (LH763).

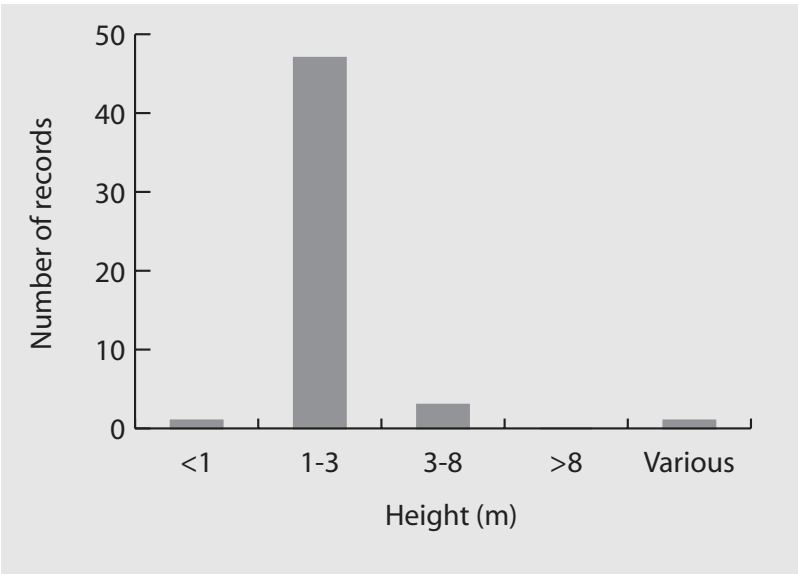
HABITAT

Found in various habitats, but mainly along dry watercourses and on rocky outcrops in mountainous areas. Generally on rocky or gravel substrates.

GROWTH FORM

A shrub, generally in the 1–3-m height class; sometimes less than 1 m; rarely taller than 3 m.





ANNUAL CYCLE

FLOWERS mostly May, with single records in April, July, October and December. FRUIT mostly May, with single records in June, July, September and October. LEAVES evergreen.

GENERAL

Of horticultural potential: attractive with shiny foliage; frost- and drought-resistant.

CONSERVATION CONCERNS

Fairly restricted in Namibia, but has a wider range in the arid parts of South Africa.

Rhus burchellii, C. Mannheimer

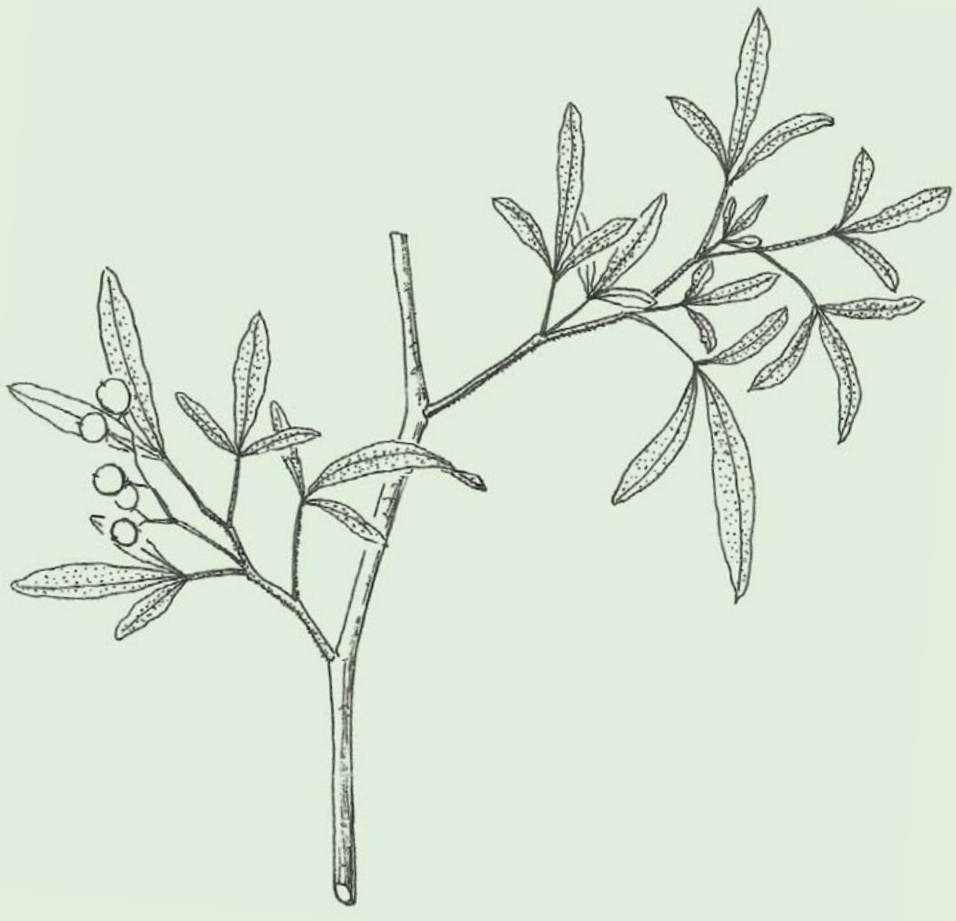


Rhus ciliata

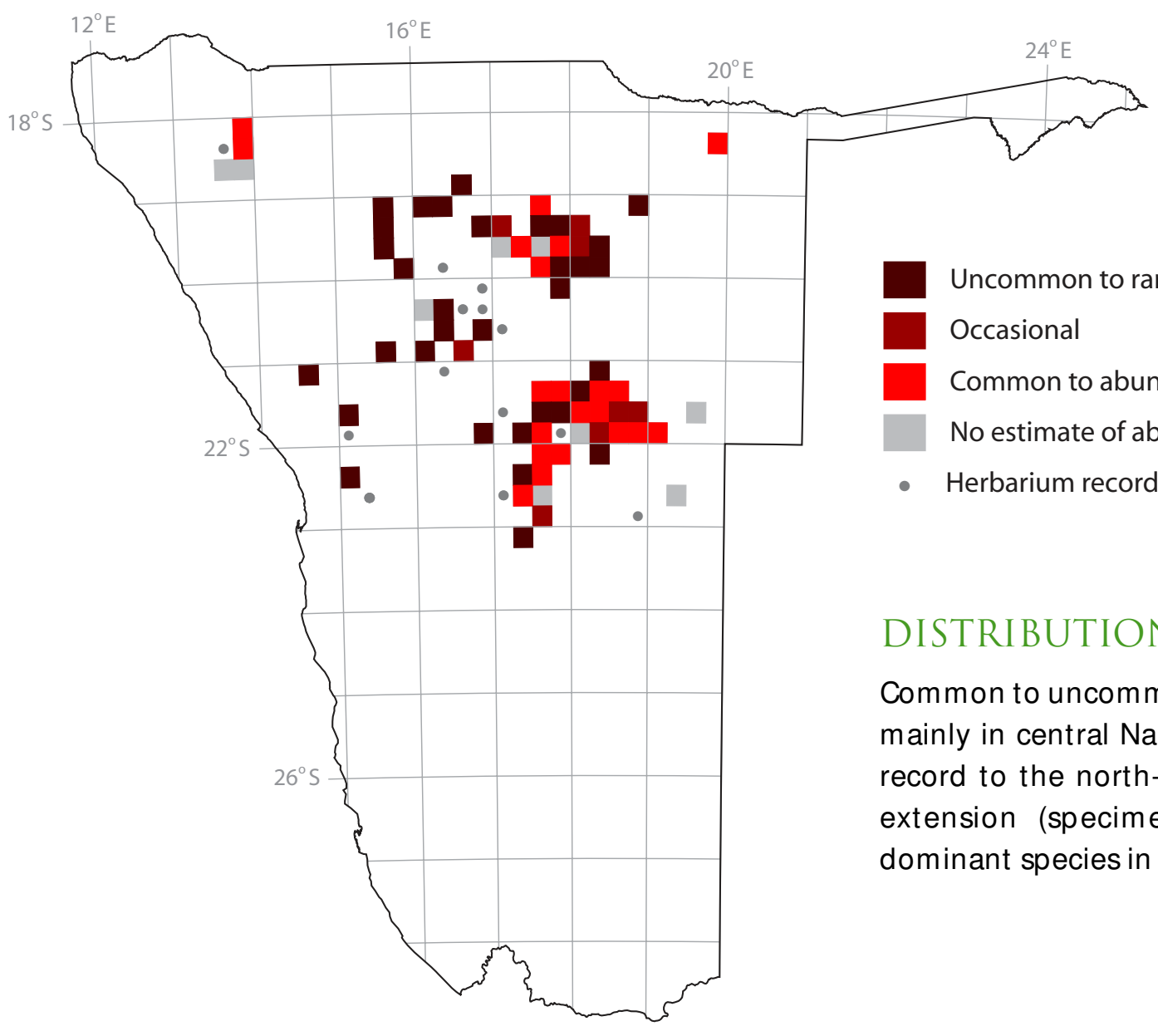
Sour Karee

Sauerstrauch (G); okasauroro (H)

[188 records from 71 (7%) squares]



Shrub with **lateral branches occasionally spine-tipped**. LEAVES trifoliolate; leaflets sessile, elliptic-lanceolate, 14–35 mm long, **somewhat leathery; both surfaces dark green, usually finely downy**; apex pointed, mucronate; **petiole slightly winged or grooved above**. FLOWERS tiny, star-like; greenish to pale yellow. FRUIT almost round, slightly flattened.

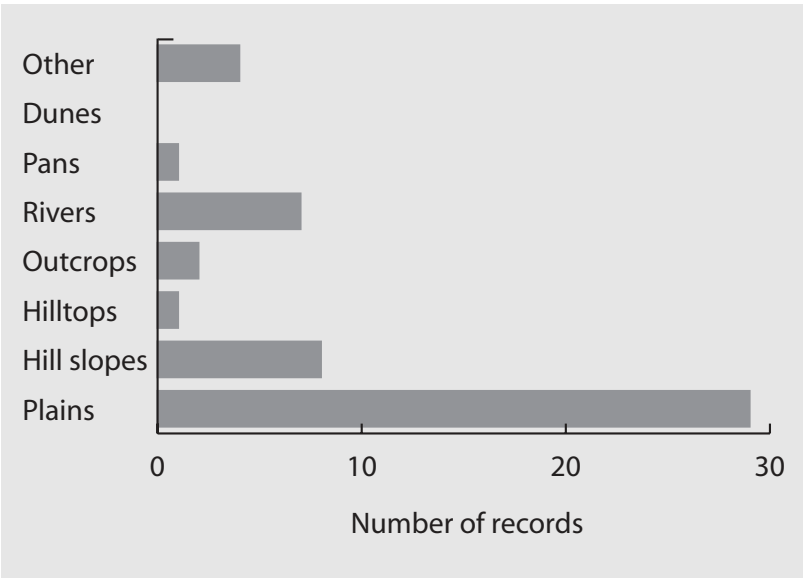


DISTRIBUTION & ABUNDANCE

Common to uncommon in scattered localities, mainly in central Namibia north of 23° S. The record to the north-east (1819BD) is a range extension (specimen LH500). One of the dominant species in a few squares.

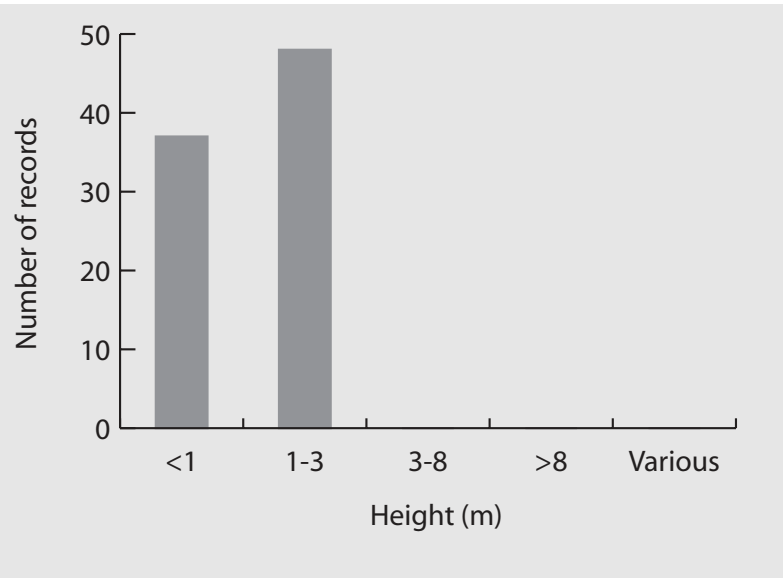
HABITAT

Found in various habitats, but mostly on plains. Grows on sand or loam, or calcareous substrates.



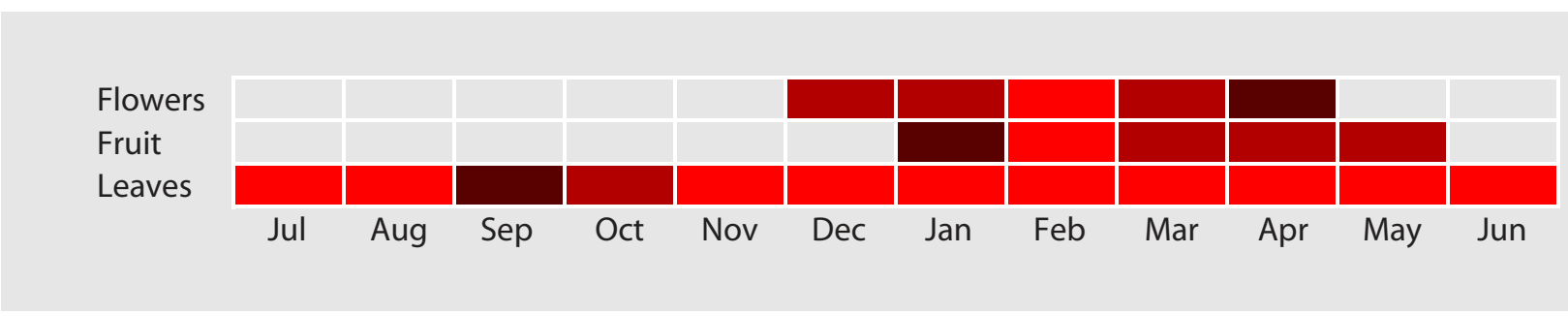
GROWTH FORM

A shrub, mainly in the 1–3-m height class, but often less than 1 m high. Sometimes growing in clumps.



ANNUAL CYCLE

FLOWERS December to April. FRUIT January to May. LEAVES semi-deciduous, with some individuals bare in September and October.



GENERAL

Often growing along road verges or on disturbed lands; sometimes encroaching. The flowers are visited by insects such as ants and butterflies. The fruit is edible.

CONSERVATION CONCERNS

None recorded.

Rhus lancea

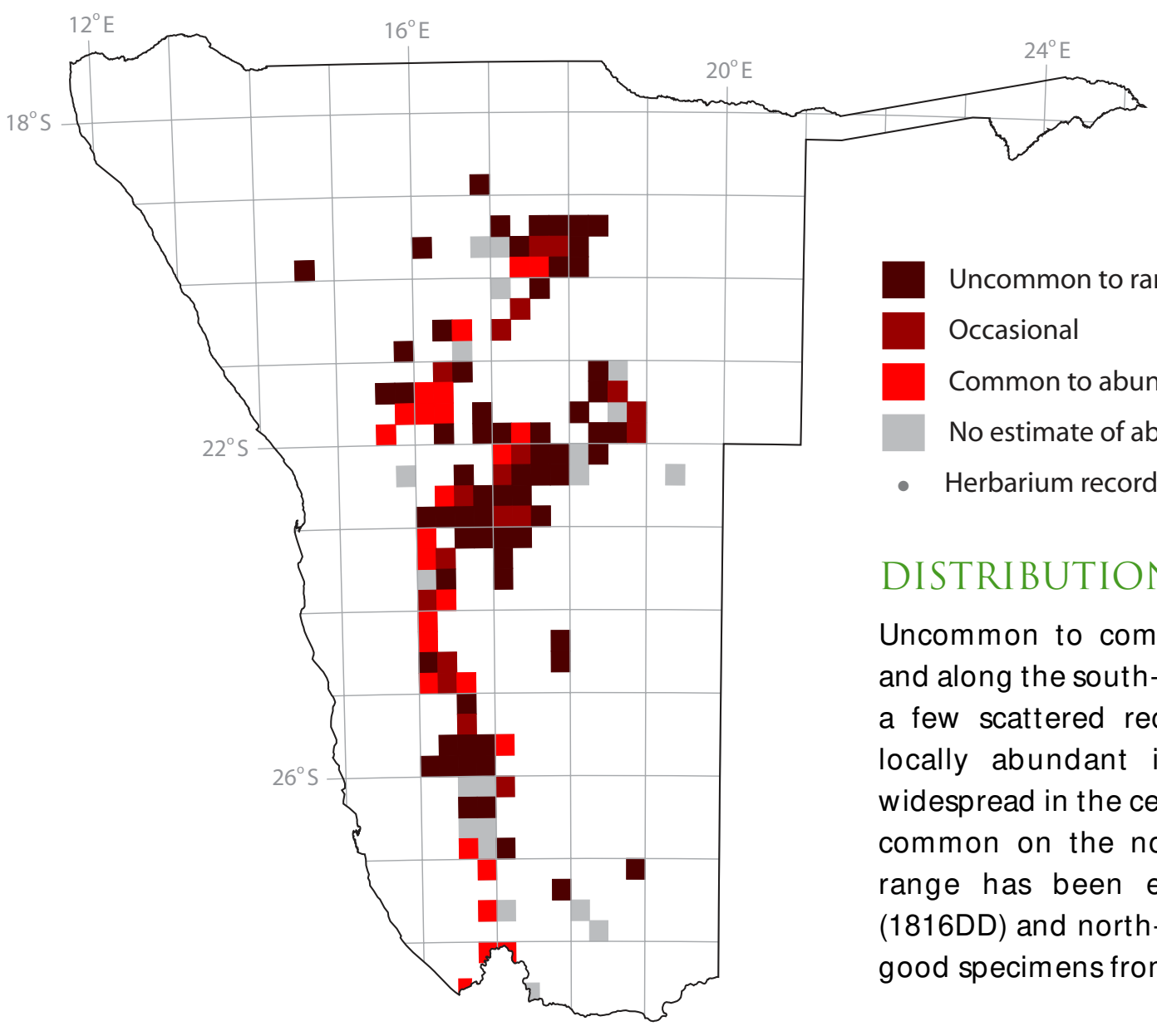
Karee

Willow rhus (E); soetkaree (A);
Afrikanische Rivierweide (G); !areb (N)

[426 records from 131 (12%) squares]



An evergreen, untidy shrub or single-stemmed tree with spreading crown and **drooping branches**. BARK grey to blackish, rough; irregularly fissured to form fragments that flake off, exposing a pale brown to reddish underbark; young branchlets slightly reddish. LEAVES trifoliolate; **leaflets sessile, linear-lanceolate, straight or slightly sickle-shaped**; shiny, dark green above, often sticky-looking; dull olive-green below. FLOWERS tiny, star-like; greenish to green-yellow. FRUIT almost round, slightly flattened.

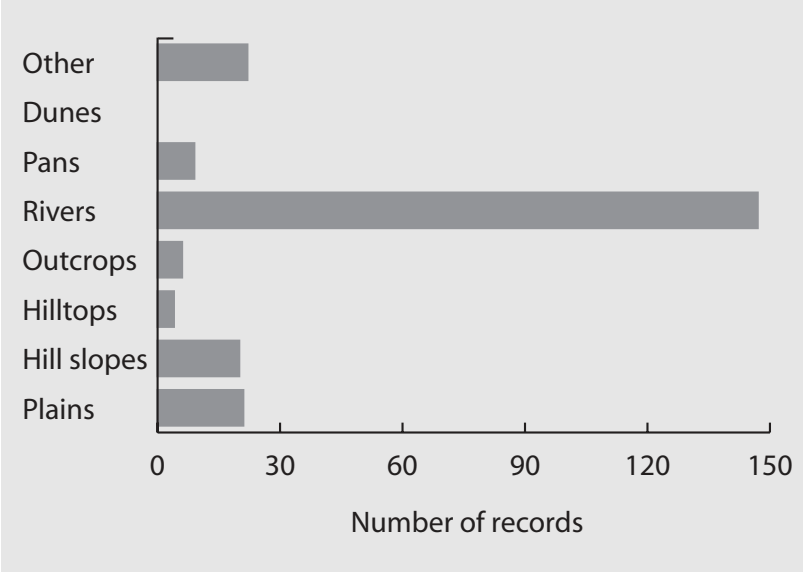


DISTRIBUTION & ABUNDANCE

Uncommon to common in central Namibia and along the south-eastern escarpment, with a few scattered records further eastwards; locally abundant in the Karstveld. Most widespread in the central highlands, but most common on the north-central plateau. The range has been extended to the north (1816DD) and north-west (1914DC), although good specimens from these areas are lacking.

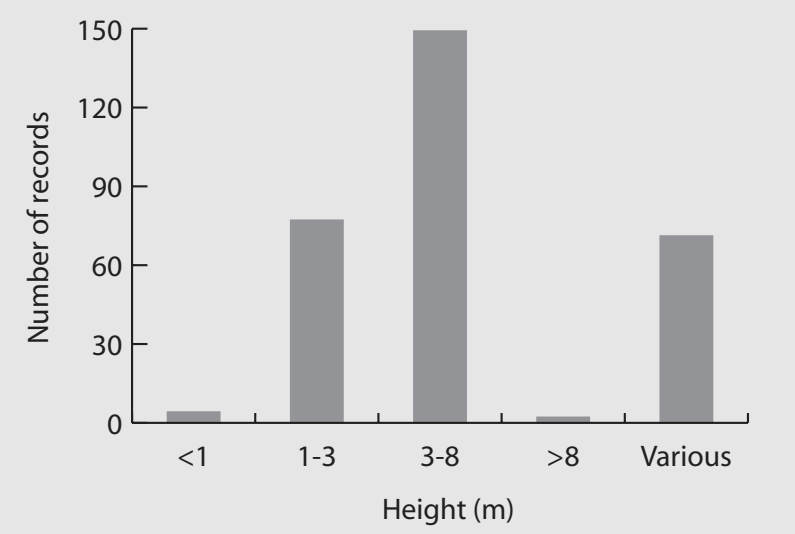
HABITAT

Found in various habitats, but mostly along rivers; also on plains and hill slopes; pans in the central-east.



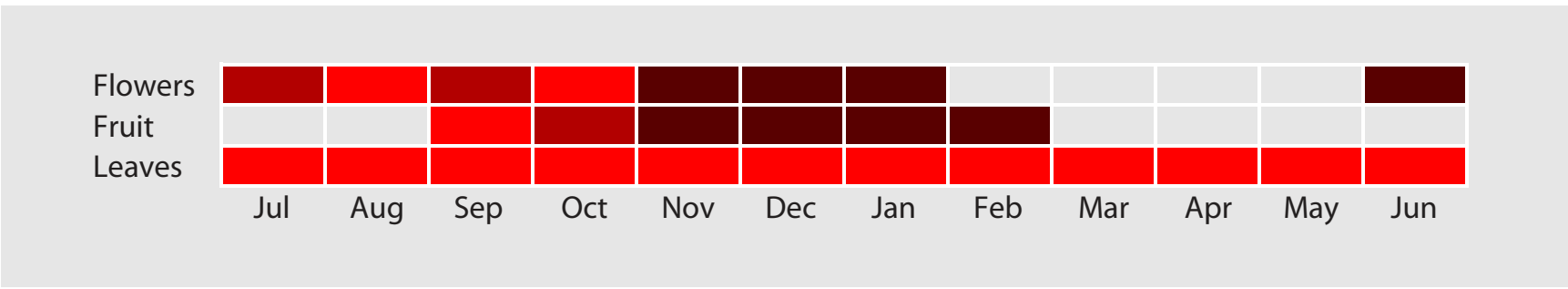
GROWTH FORM

Generally a tree in the 3–8-m height class, with shrubby forms in the 1–3-m height class. Seldom over 8 m, with relatively few young plants.



ANNUAL CYCLE

FLOWERS June to January. FRUIT September to February, with old fruit on some trees almost every month. LEAVES evergreen, with young leaves in October and January.



GENERAL

Fruit edible and used to make an alcoholic beverage; also eaten by birds. The leaves are browsed by game. Makes a good garden plant.

CONSERVATION CONCERNS

Some trees in the central highlands seem to be affected by a disease that causes leaves at the extremities of the young branches to become entirely deformed. Protected by forestry legislation.



Rhus lancea, L. Hoffmann

Rhus marlothii

Bitter Karee

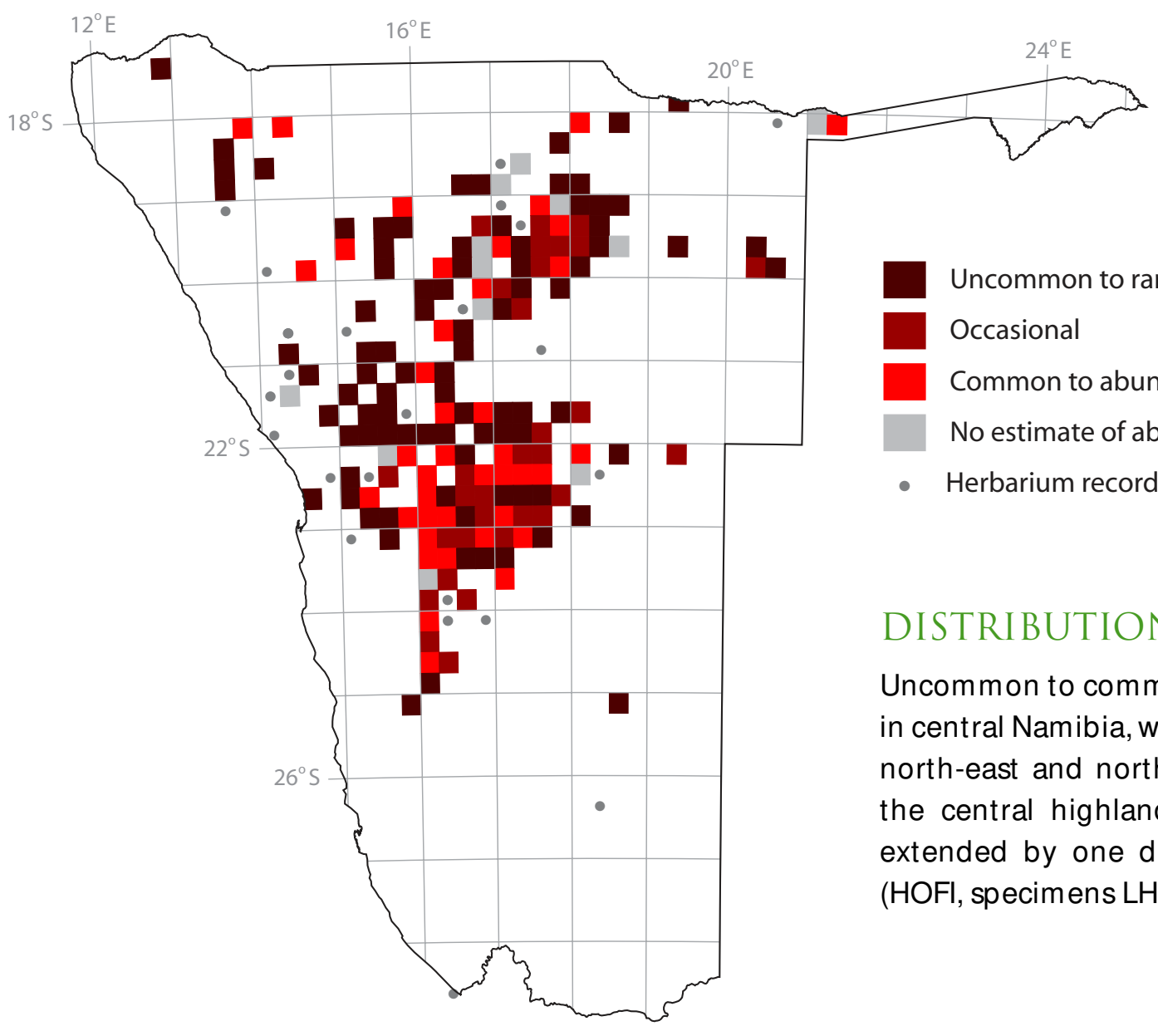
|khurubeb (K)

[474 records from 182 (17%) squares]



Shrub; sometimes a small tree. BARK grey-white, relatively smooth; often with distinct lenticels on young branchlets. LEAVES trifoliolate; **leaflets sessile, obovate to broadly oblanceolate; both surfaces olive-green, slightly downy; margin entire to slightly crenate near apex**, fringed with fine white hairs; **apex blunt to sub-acute**; base tapering. FLOWERS tiny, star-like; greenish to pale yellow. FRUIT almost round, slightly flattened, cinnamon-brown, shiny.

Can be confused with *R. tenuinervis*, which has far broader, softer, hairier leaves with a more distinctly crenate margin, and is usually found growing in sandy areas.

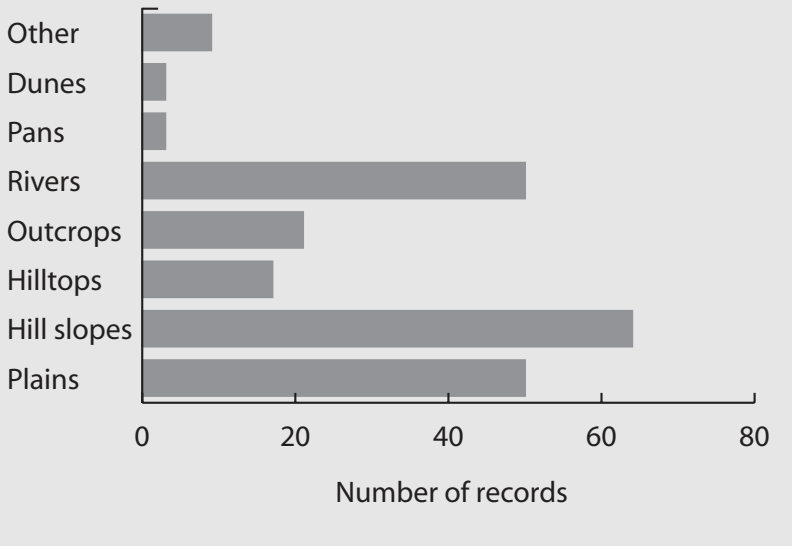


DISTRIBUTION & ABUNDANCE

Uncommon to common and fairly widespread in central Namibia, with isolated records in the north-east and north-west. Most common in the central highlands. The range has been extended by one degree to the north-west (HOFI, specimens LH954 and LH955).

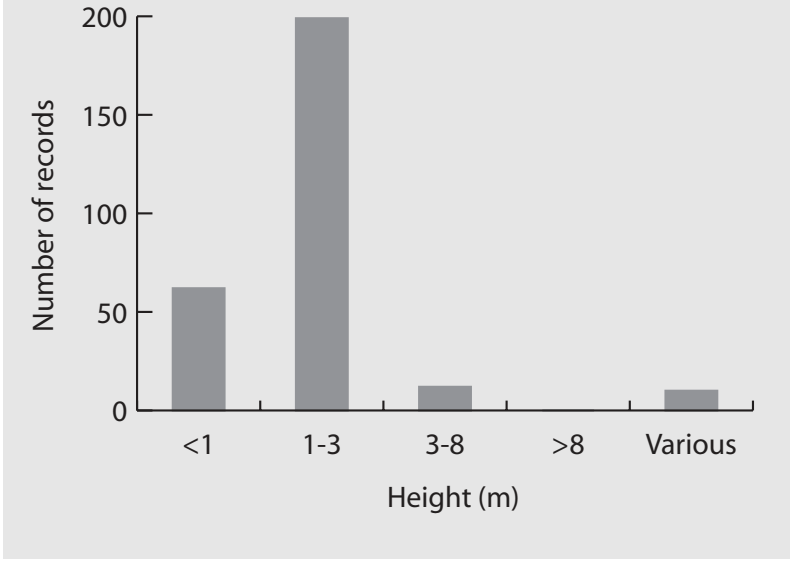
HABITAT

Various, but mainly on hill slopes, especially in the central highlands; also found on plains and in dry rivers. Substrates include calcrete, mica schist, sand and occasionally loamy soil.



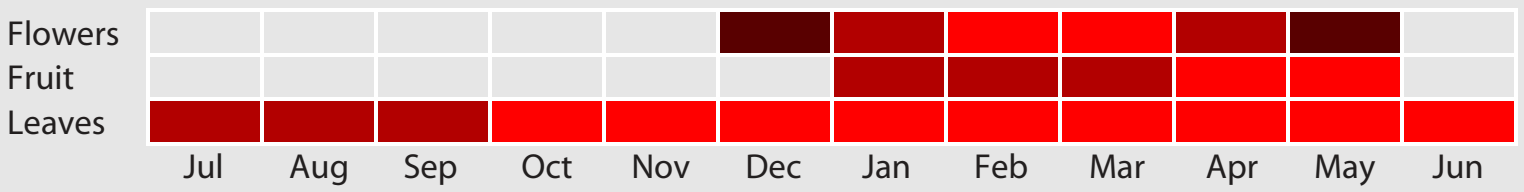
GROWTH FORM

Mostly a shrub in the 1–3-m height class, rarely a tree of over 3 m high.



ANNUAL CYCLE

FLOWERS December to May. FRUIT January to May. LEAVES semi-deciduous; bare individuals from July to September, young leaves from November to January.



GENERAL

The edible fruit is chewed to quench thirst; the roots are used medicinally. The leaves are eaten by caterpillars and rhino, but apparently not by stock as they are bitter. This plant often grows under other trees.

CONSERVATION CONCERNS

None recorded.



Rhus marlothii, Grootfontein area, G. Friederich

Rhus pendulina

= Rhus viminalis

Witkaree

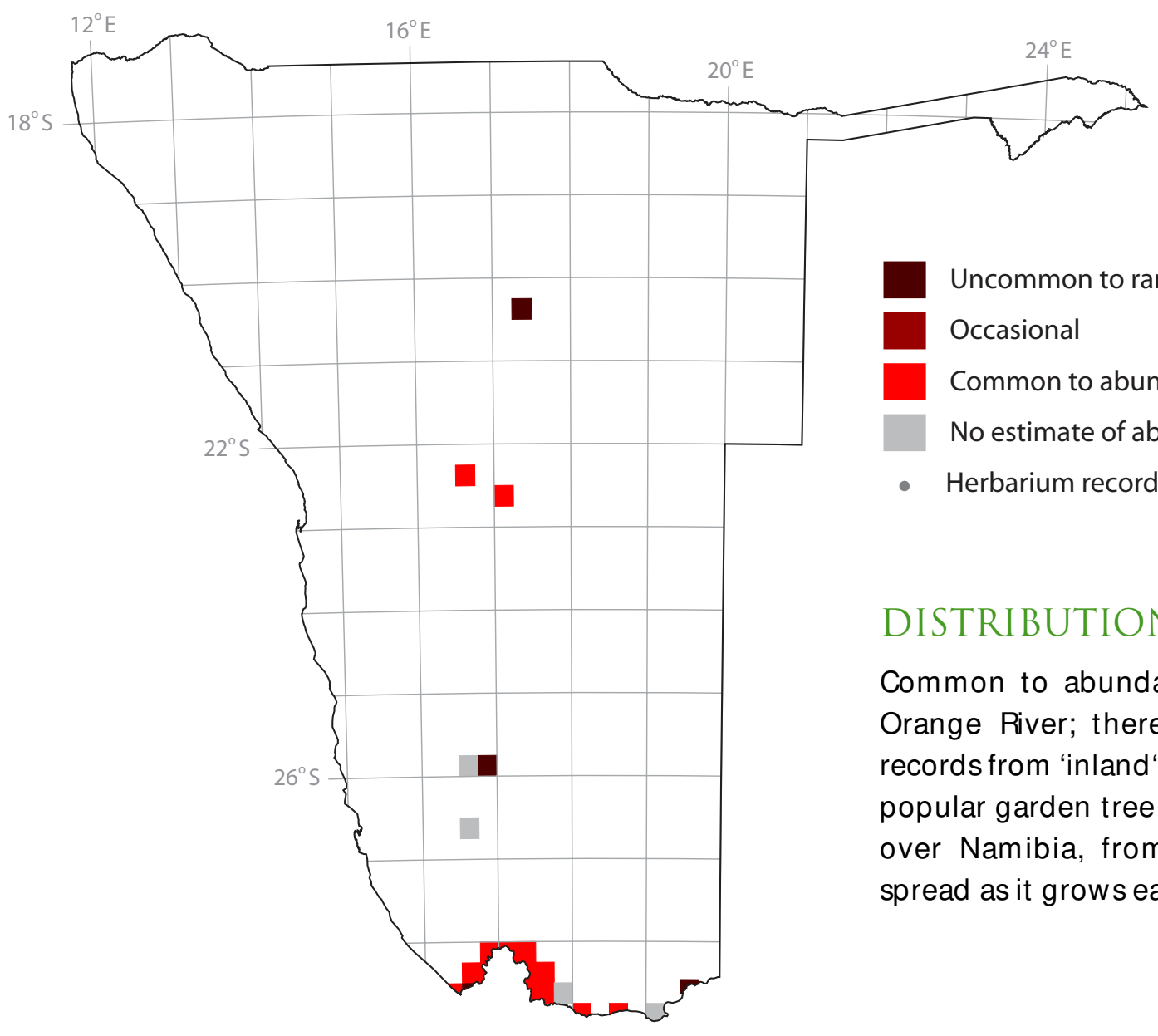
White karee (E); |gara.s (K)

[37 records from 22 (2%) squares]



A tree with a spreading crown and drooping branches. LEAVES trifoliolate; leaflets sessile, **oblong-lanceolate, 50–120 mm long**; dark green and hairless above; paler below; **margin entire, fringed with hairs**. FLOWERS tiny, star-like; greenish. FRUIT almost round, flattened; dark red when ripe, drying to black.

Can be confused with *R. lancea*, which has tougher and narrower leaves that are often shiny or sticky-looking.

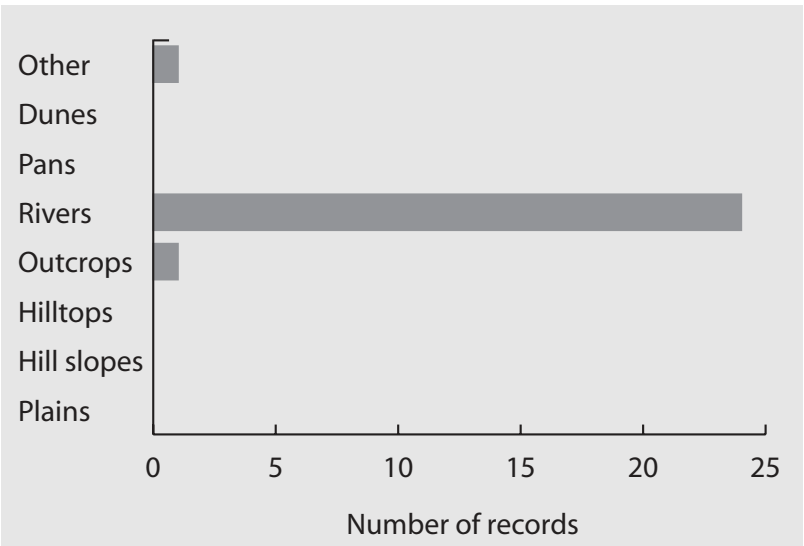


DISTRIBUTION & ABUNDANCE

Common to abundant on the banks of the Orange River; there are also a number of records from 'inland' Namibia. This species is a popular garden tree and has been planted all over Namibia, from where it could easily spread as it grows easily from seed.

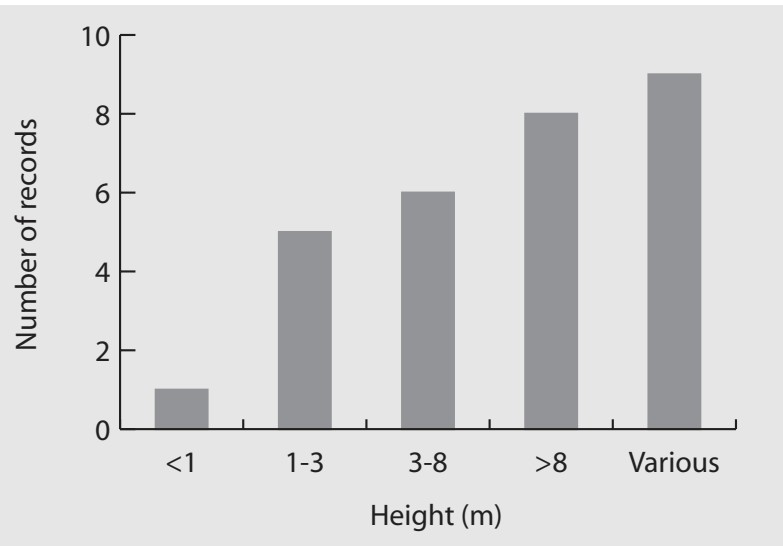
HABITAT

Found on the banks and floodplains of perennial rivers.



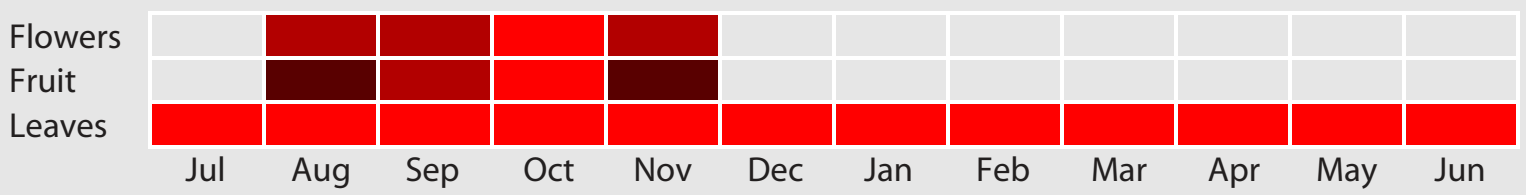
GROWTH FORM

Mostly a tree, ranging from 1 m to over 8 m high. Younger, shrubby forms and many stands of trees of various heights were recorded.



ANNUAL CYCLE

FLOWERS August to November. FRUIT August to November. LEAVES evergreen.



GENERAL

A good garden plant that is drought- and frost tolerant and can be transplanted. May have invasive roots and seedlings are self-establishing.

CONSERVATION CONCERNS

None recorded.

RHUS | KAREE

A genus consisting of 12 shrub or tree species, and two dwarf shrubs that were not included in the TAP. Generally, they are evergreen, with fragrant resin, and often difficult to tell apart. Leaves are trifoliolate, except for *R. problematodes* (which was too small to be included in the Tree Atlas), often with scalloped leaf margins. Flowers are small, yellowish, in sprays. Fruits are small, slightly fleshy and bilaterally flattened.

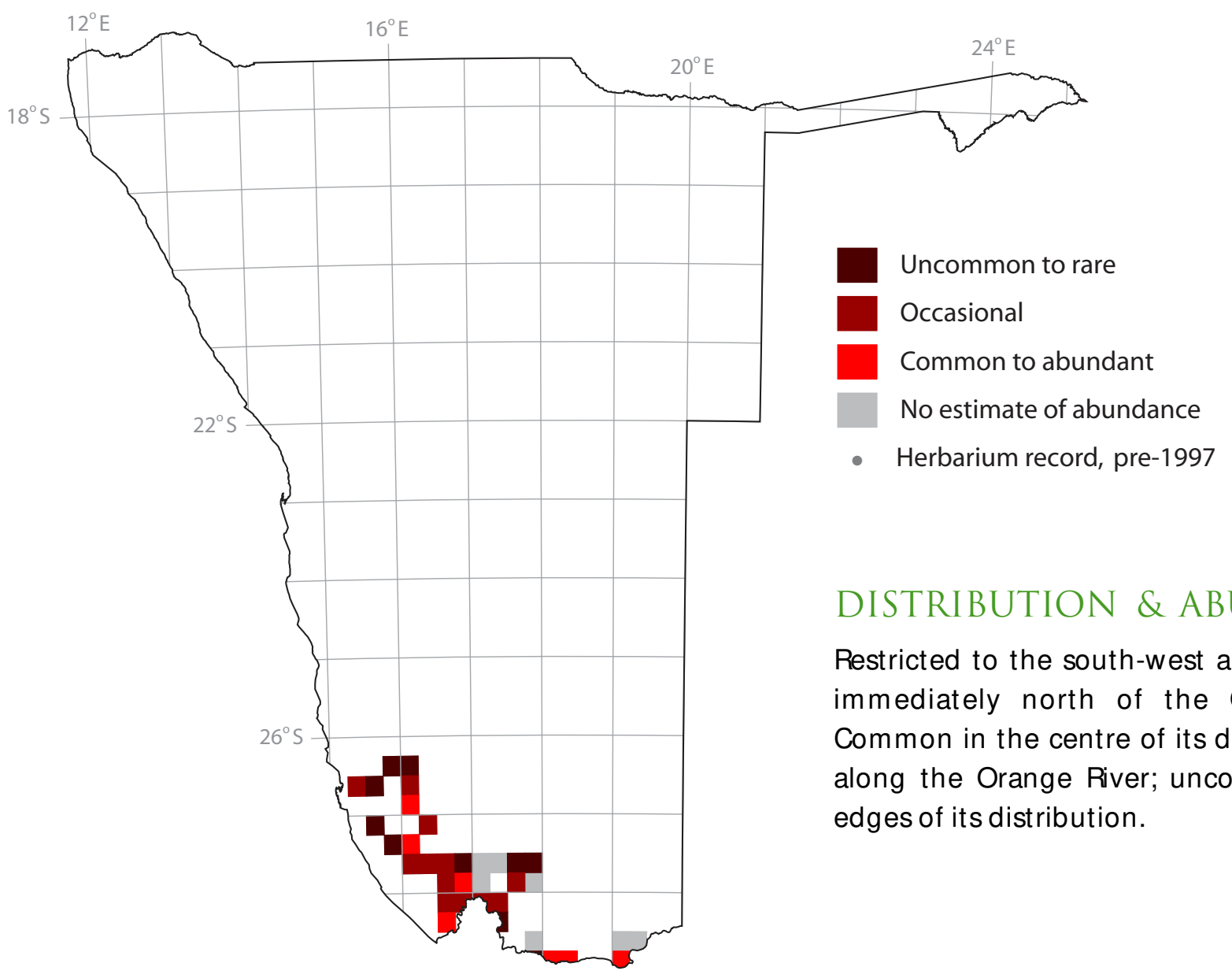
Rhus populifolia

Poplar-leaved Karee

[78 records from 37 (3%) squares]



Dense, evergreen shrub. LEAVES trifoliolate, fairly small; **glossy and dark olive-green above , with grey-yellow hairs on young leaves**; dull and much paler below; margin scalloped. FLOWERS greenish, tiny. FRUIT almost round, flattened, brown, rough.

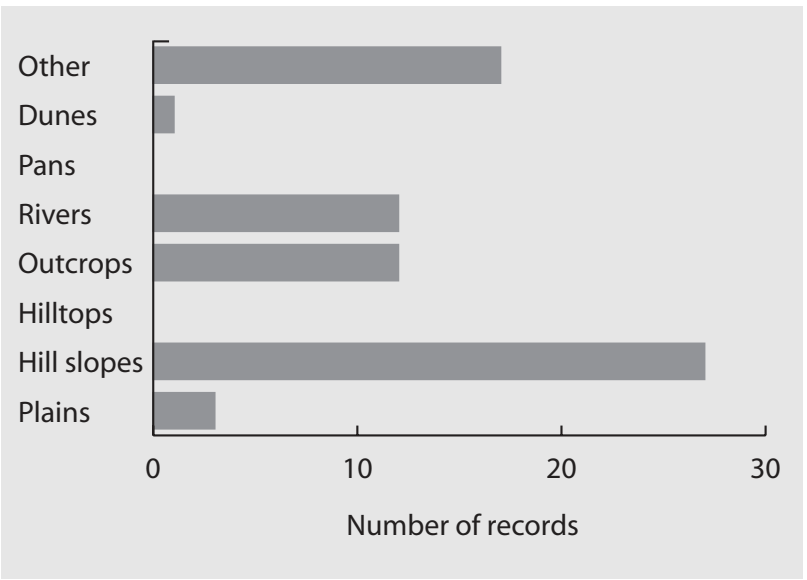


DISTRIBUTION & ABUNDANCE

Restricted to the south-west and some areas immediately north of the Orange River. Common in the centre of its distribution and along the Orange River; uncommon on the edges of its distribution.

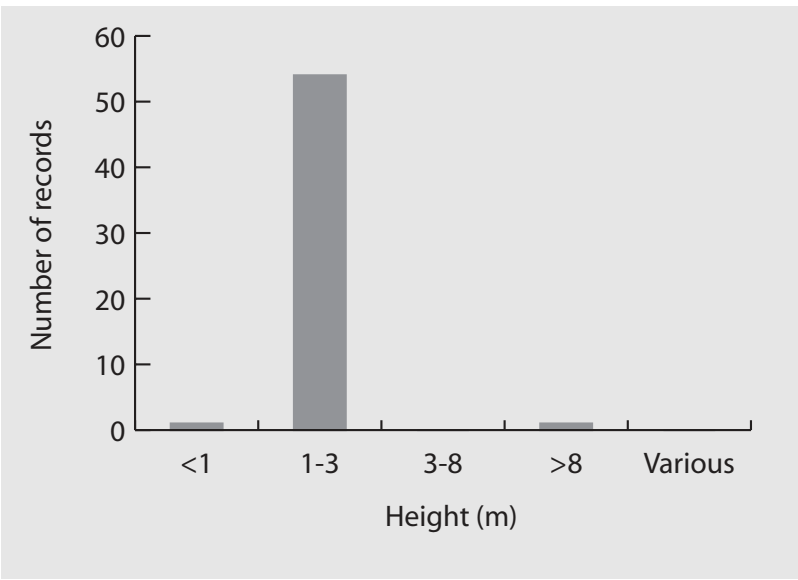
HABITAT

Various habitats, but mostly on hill slopes, in kloofs, on rocky outcrops and inselbergs.



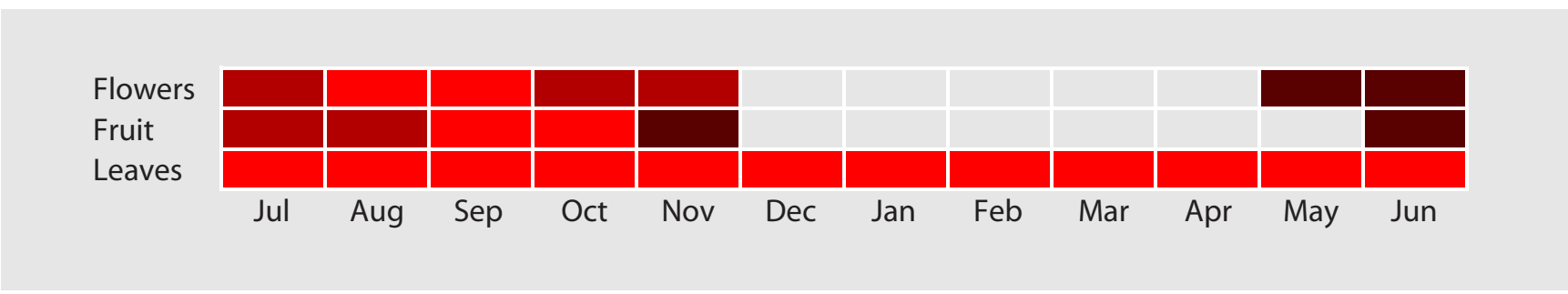
GROWTH FORM

A shrub in the 1–3-m height class.



ANNUAL CYCLE

FLOWERS May to November. FRUIT June to November. LEAVES evergreen.



GENERAL

High horticultural potential due to it being drought-tolerant, and evergreen with very attractive foliage.

CONSERVATION CONCERNS

None recorded.



Rhus populifolia, leaves and flowers, C. Mannheimer

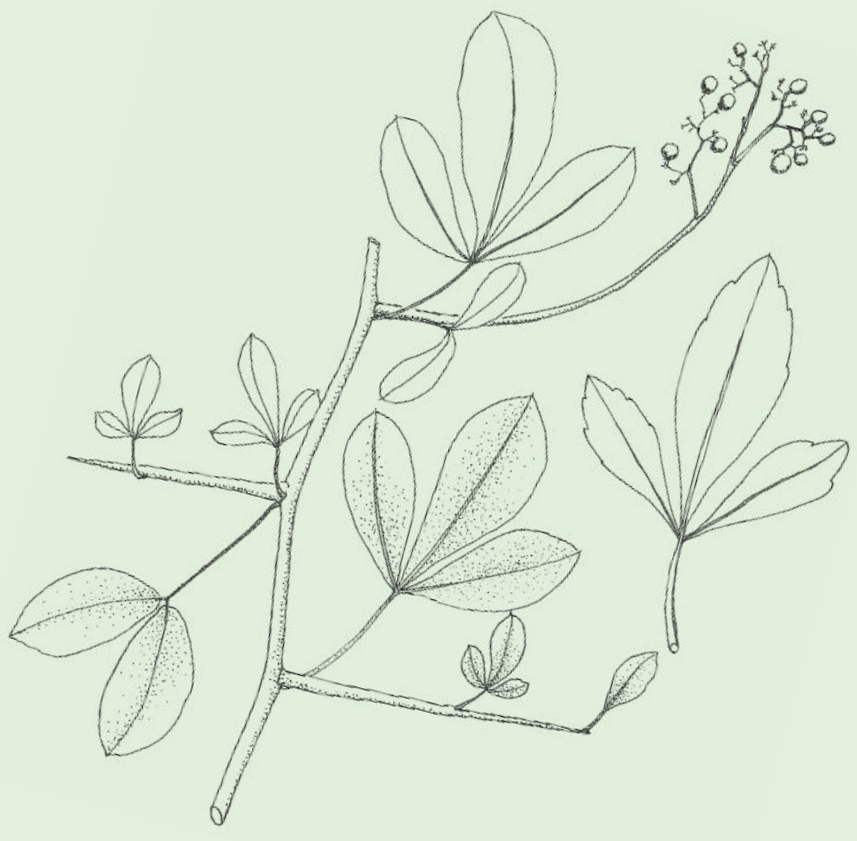
Rhus pyroides

= Rhus dinteri

Fire-thorn Rhus

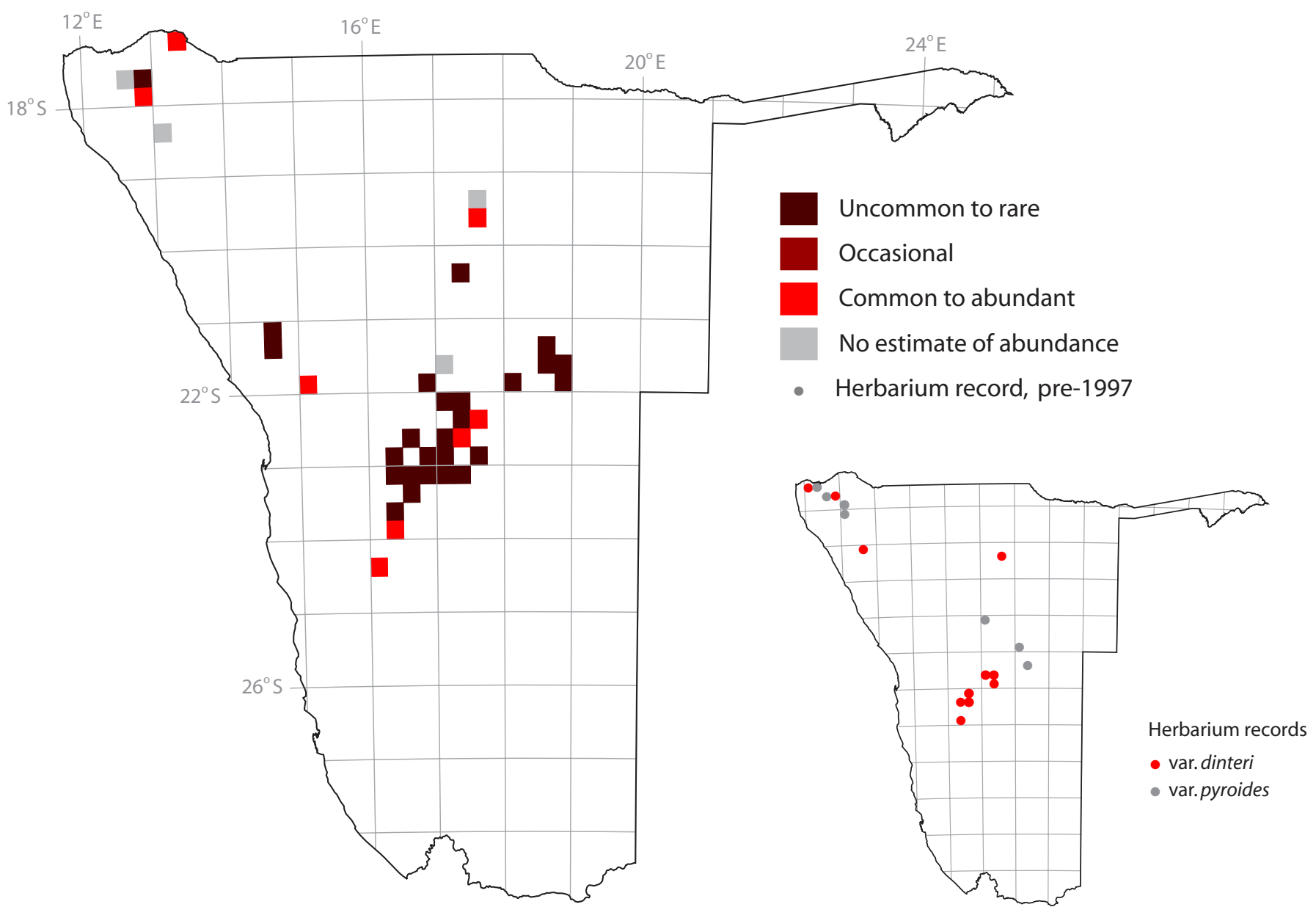
Common currant (E);
gewonetaaibos (A)

[61 records from 36 (3%) squares]



Evergreen, many-stemmed, dense shrub, **with or without spines**. LEAVES **both surfaces dark green with variable, white silky covering; margin entire**, slightly turned under; **apex with a fine, hair-like** tip; petiole with white, downy covering. FLOWERS tiny, star-like, greenish-yellow. FRUIT almost round, slightly flattened.

Flowers and fruit may be overlooked. There are two varieties in Namibia, *pyroides* and *dinteri*, but TAP records were seldom differentiated, thus the two have been treated together.

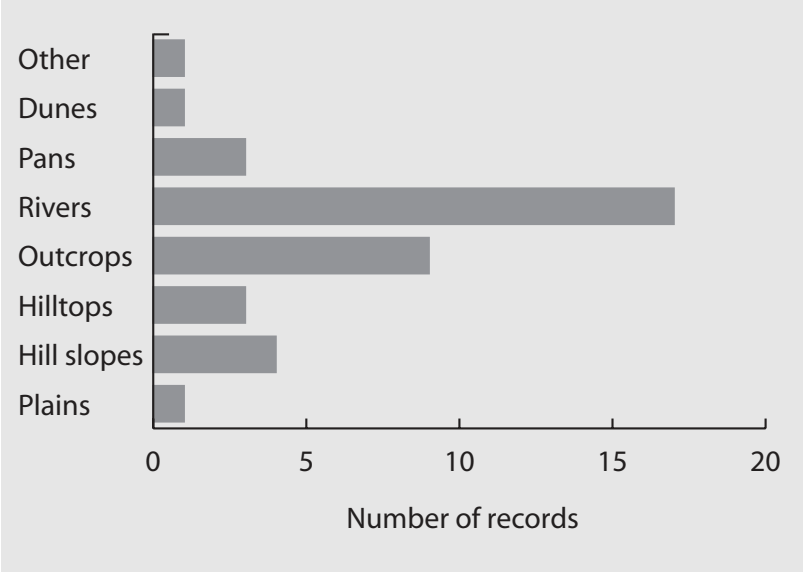


DISTRIBUTION & ABUNDANCE

Very disjunct, mainly in the central highlands, with a small population in the north-west and a few scattered, unconfirmed records elsewhere. There is a specimen from near Tsumeb in 1917BC (BAS1/101) which is a range extension. Atlassers recorded it from isolated localities along the Okavango River and in eastern Caprivi, but as these would be range extensions, and they were not accompanied by specimens, they have not been included. Uncommon to rare; sometimes locally common.

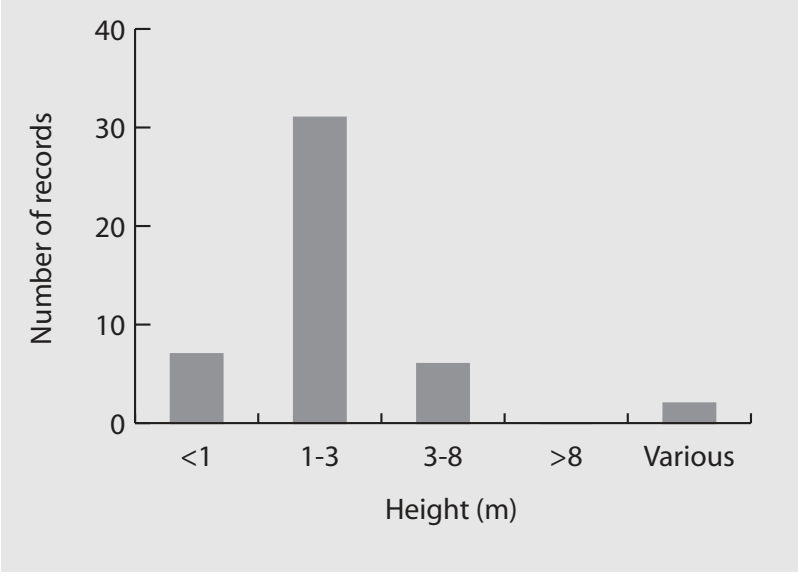
HABITAT

Mostly found along dry rivers, but also on rocky outcrops and hills.



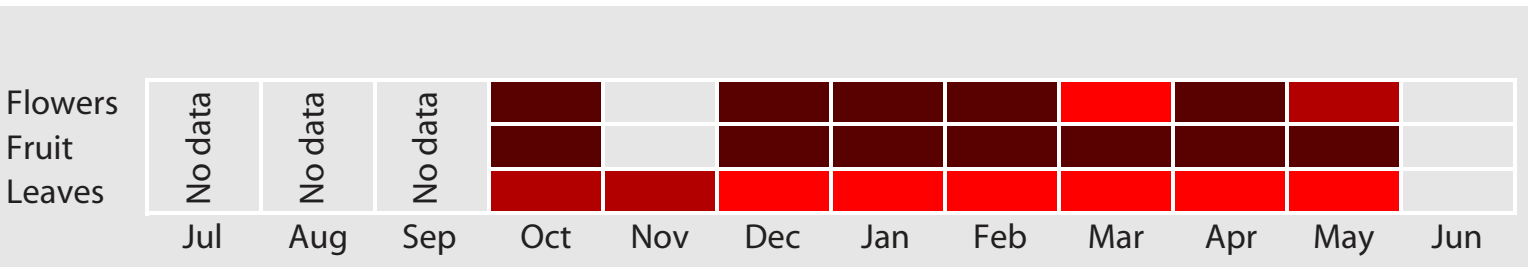
GROWTH FORM

Generally a shrub in the 1–3-m height class, sometimes over 3 m.



ANNUAL CYCLE

Very few observations of flowers or fruit. FLOWERS October to May, peaking in March. FRUIT October to May. LEAVES recorded on every report, but observations few in winter.



GENERAL

Fruit edible. A scratch from the thorn burns for some time. The specific name, *pyroides*, means ‘like a pear tree‘.

CONSERVATION CONCERNS

None recorded.

Rhus tenuinervis

Kalahari Currant

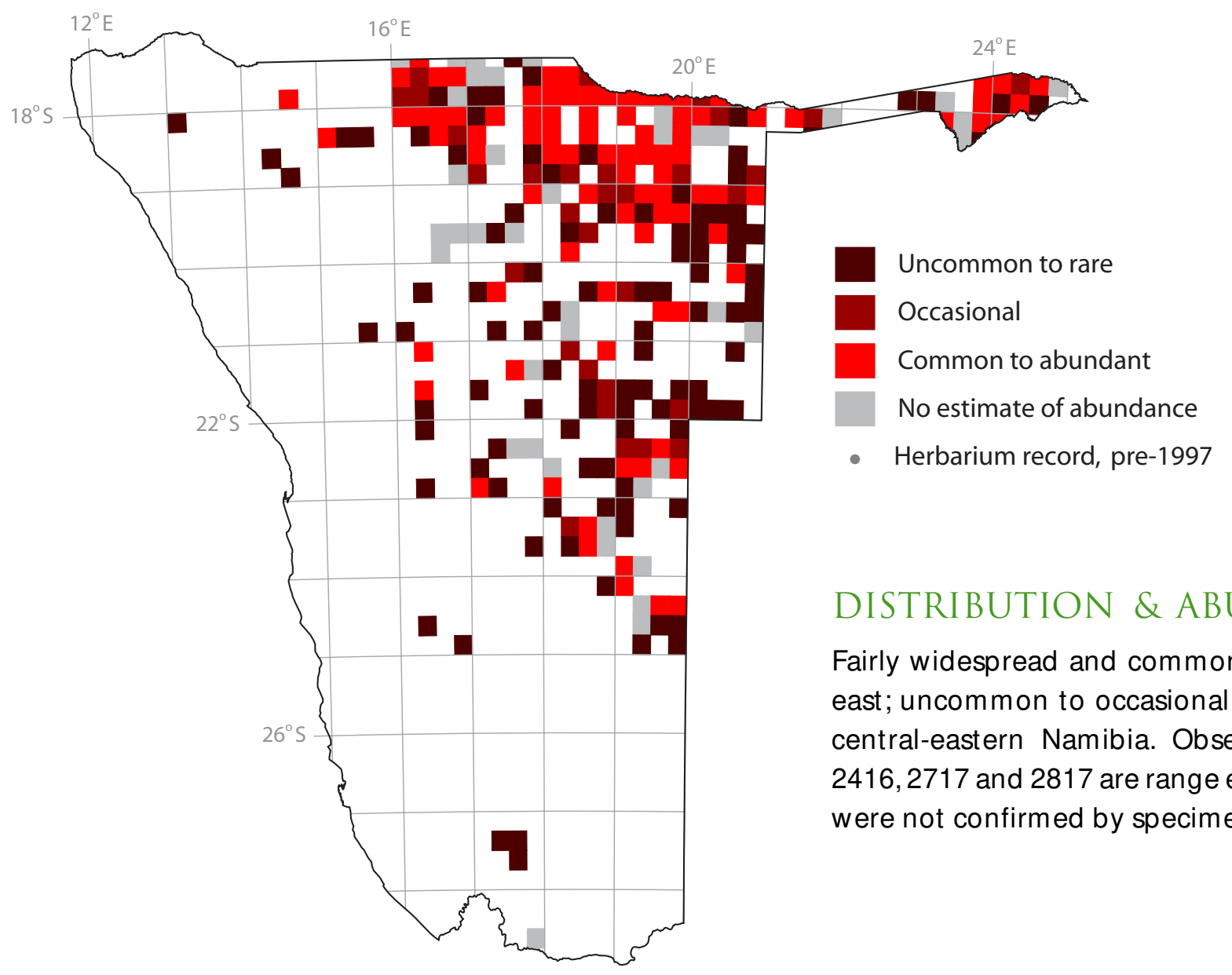
Kalahari-taaibos (A)

[532 records from 273 (26%) squares]



Shrub. LEAVES trifoliolate; terminal leaflet obovate to almost circular, lateral leaflets similar but smaller; **texture soft**; dull green above, paler below, **both surfaces with soft hairs and distinct veins; margin crenate in upper half**. FLOWERS tiny, star-like, greenish. FRUIT round to ovoid, somewhat flattened; green becoming shiny brown-red when ripe.

Can be confused with *R. marlothii*. (Refer to *R. marlothii* for differences.)

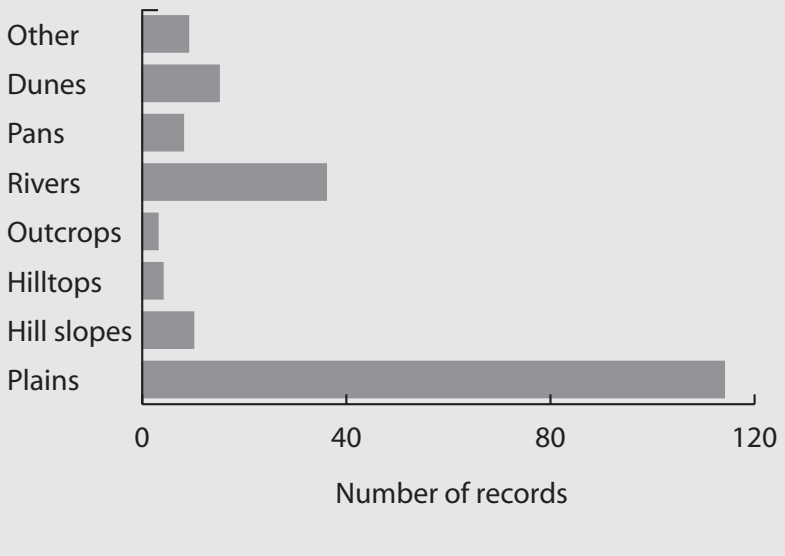


DISTRIBUTION & ABUNDANCE

Fairly widespread and common in the north-east; uncommon to occasional in central and central-eastern Namibia. Observations from 2416, 2717 and 2817 are range extensions, but were not confirmed by specimens.

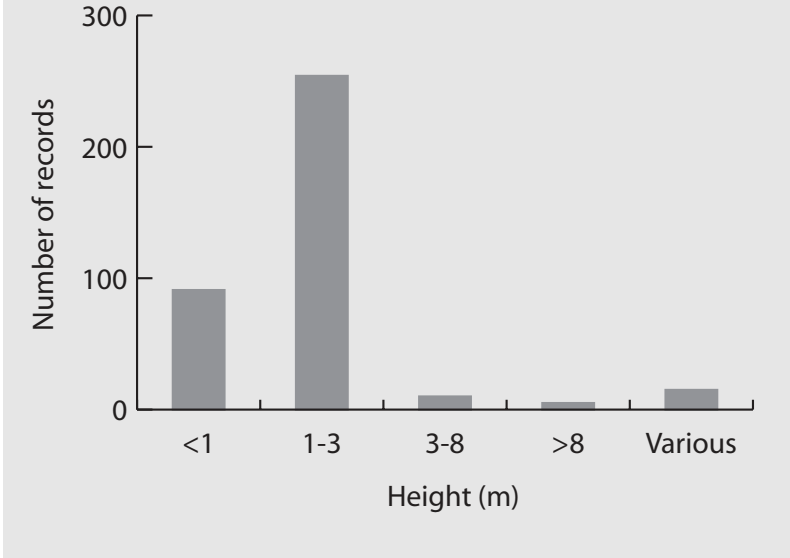
HABITAT

Various habitats, but mostly found on sandy plains; also along rivers and on dunes in the north-east.



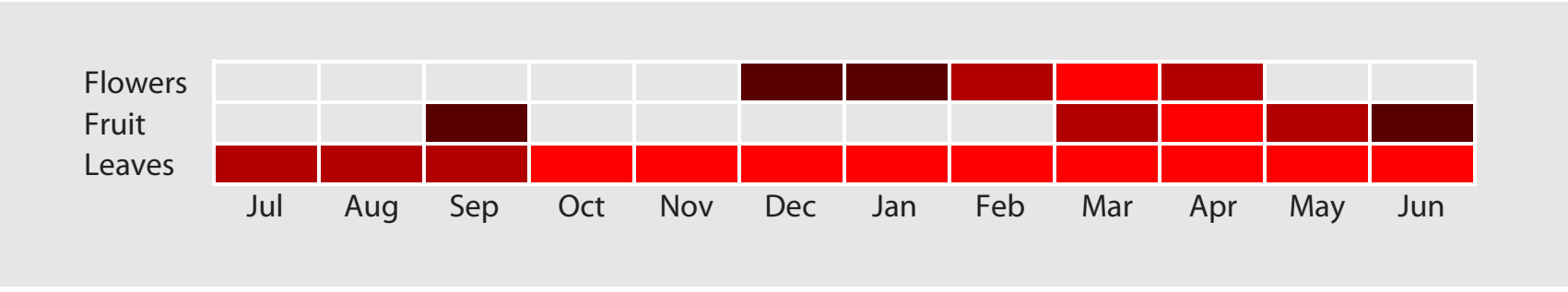
GROWTH FORM

A shrub of 1-3 m high, occasionally over 3 m in the far north and in Caprivi.



ANNUAL CYCLE

FLOWERS December to April, occasionally starting in September. FRUIT March to June, with a few records in September. Leaves semi-deciduous; some bare individuals recorded from July to October and young leaves from September to December.



GENERAL

Attractive with possible horticultural potential. Fruit edible; bark used for tanning; dry roots used to carve arrowheads and joints, also used medicinally. This shrub is used variously when robbing beehives: the smoke is used to drive off the bees when robbing hives, and the leaves are crushed and rubbed on skin to prevent bee-stings, and to relieve the pain and promote the healing of bee-stings.

CONSERVATION CONCERNS

None recorded.



Rhus tenuinervis, leaves and flowers, C. Hines

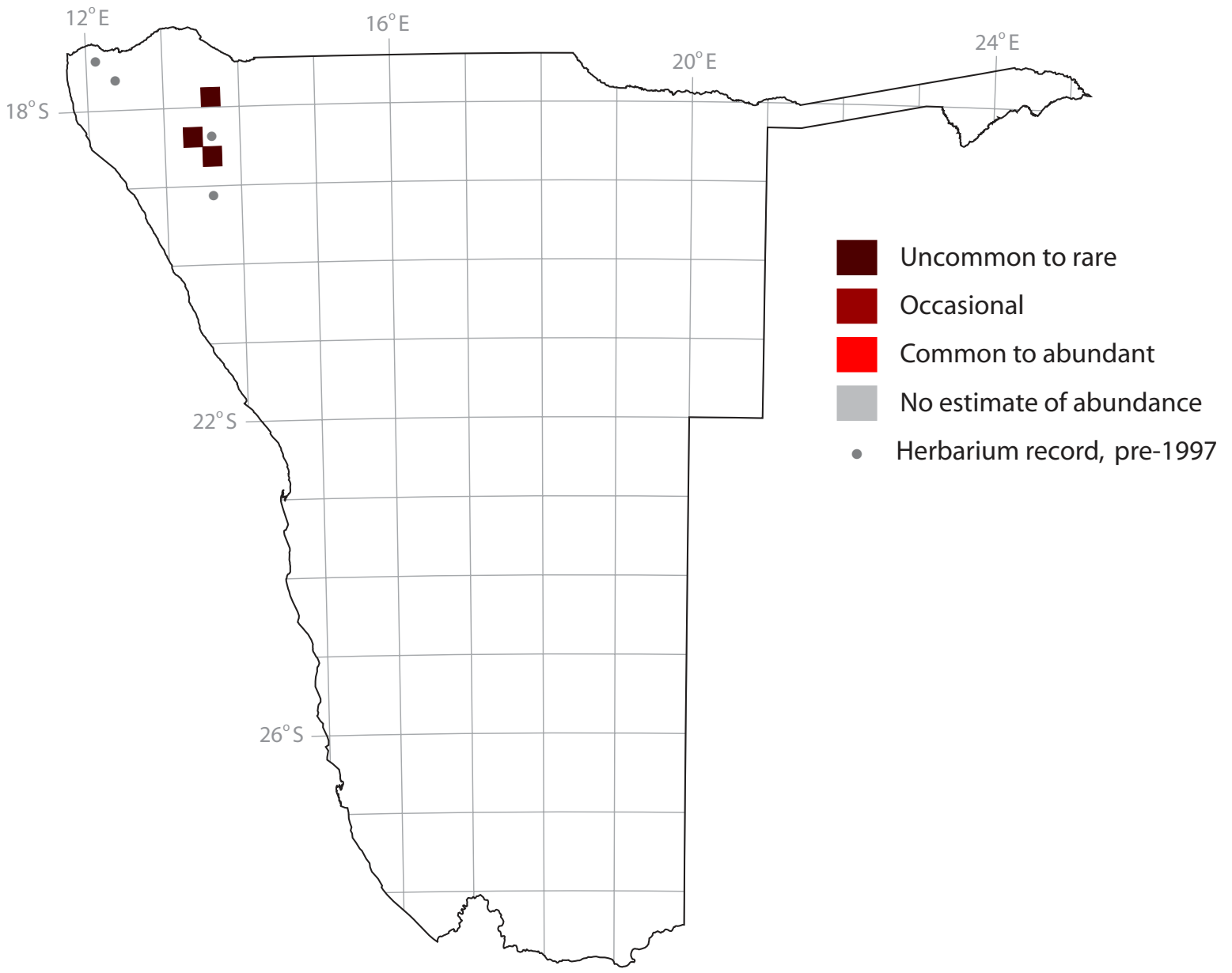
Rhus leptodictya

Rock Karee

Bergkaree (A)

[5 records from 3 squares]

Evergreen spreading shrub, sometimes a small tree. LEAVES trifoliolate, spirally arranged; **leaflets sessile, lanceolate; dull green above, slightly paler below; margin entire to crenate-serrate; apex tapering, acute or almost so, often with a fine hair-like tip**; base tapering; petiole slightly channelled above.



DISTRIBUTION & ABUNDANCE

Uncommon in three squares in the north-west. Probably overlooked by atlassers.

HABITAT

Found on rocky outcrops.

GROWTH FORM

A shrub, or sometimes a tree, in the 1–3-m height class.

ANNUAL CYCLE

FLOWERS in February and old ones in May (herbarium records). FRUIT recorded in November and April. LEAVES recorded in January, March and April.

CONSERVATION CONCERNS

None recorded.

Rhus quartiniana

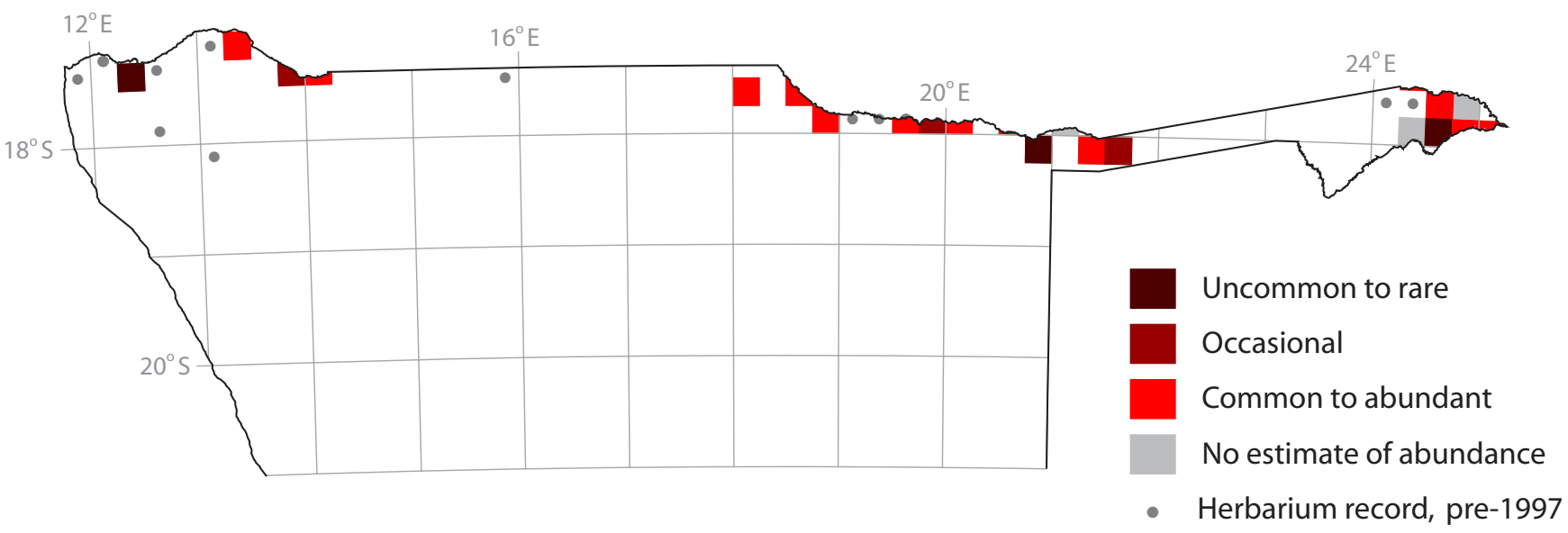
River Rhus

Chikwekwe (L); mudò (T)

[39 records from 22 (2%) squares]



Dense shrub or tree, **sometimes with spines**. BARK brownish, fissured, smooth, **with lenticels; young branchlets striate with dense, white to yellow downy covering**. LEAVES trifoliolate; leaflets lanceolate to elliptic, terminal ones three times as long as broad; **shiny, dark green and sticky above; yellow-green to orange and downy below, with scales and glandular hairs**. FLOWERS tiny, star-like, yellow-green. FRUIT almost round, slightly flattened, yellow-brown.

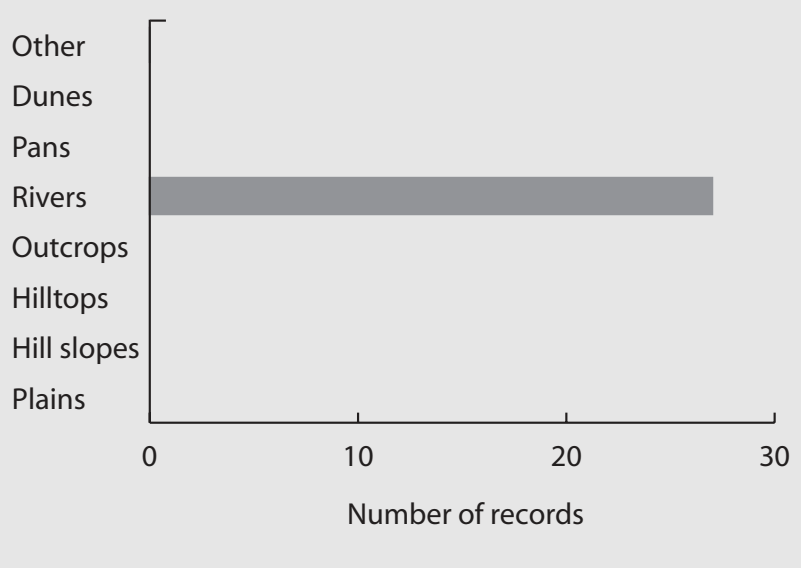


DISTRIBUTION & ABUNDANCE

Along the northern perennial rivers excluding the Kwando River. Common on the Kunene and Okavango rivers; common to abundant on the Zambezi and Chobe rivers.

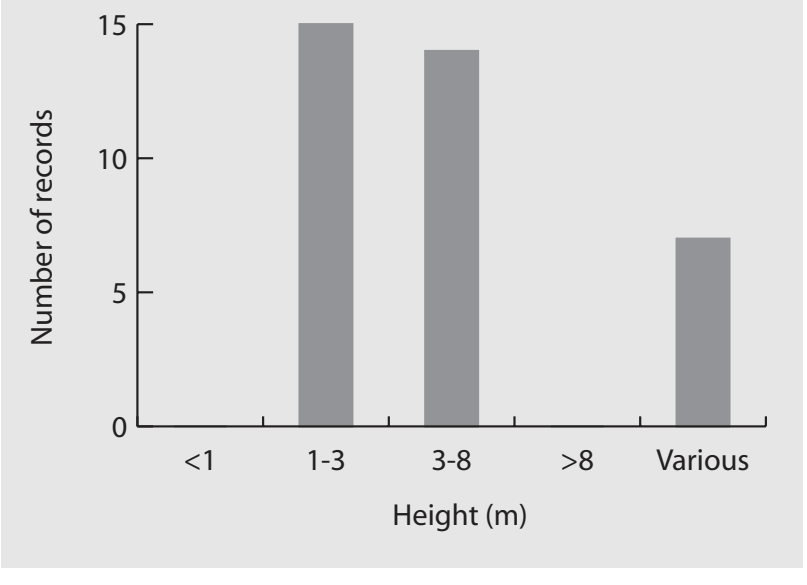
HABITAT

Mostly found on river banks, also on floodplains in Caprivi; occasionally in dry watercourses.



GROWTH FORM

A shrubby tree of up to 3 m high along the Kunene River and in the Caprivi. Mostly a tree in the 3–8-m height class along the Okavango River, but sometimes a shrub of less than 3 m.



ANNUAL CYCLE

FLOWERS October to June, but never many records. FRUIT occasional records from October to June. LEAVES evergreen.

CONSERVATION CONCERNS

None recorded.

Rhus undulata

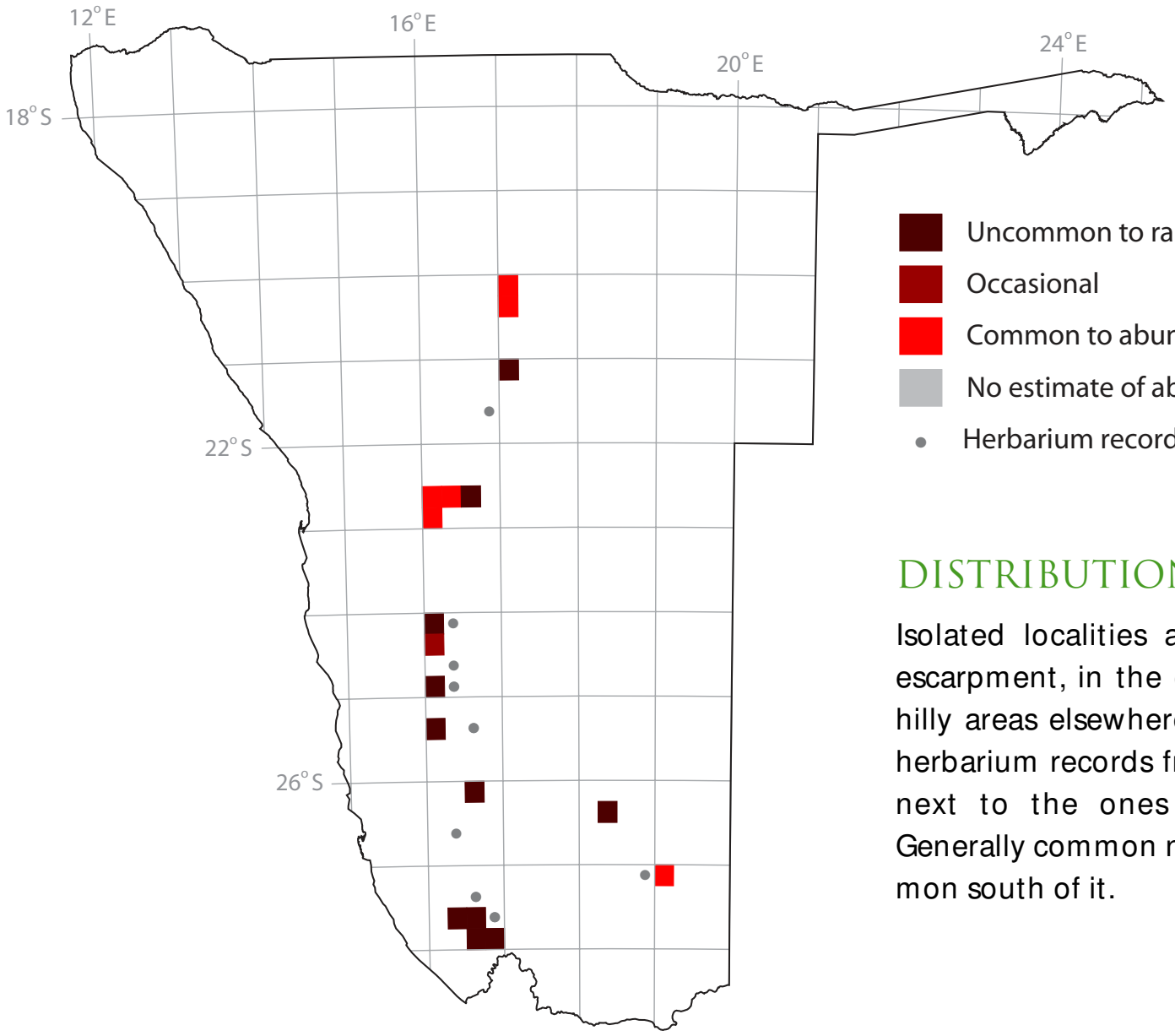
Kuni Bush

Koeniebos (A); |kuni (K)

[25 records from 18 (2%) squares]

Evergreen, dense shrub. BARK grey-brown; **young branchlets covered in waxy scales; occasionally spiny, especially older branches**. LEAVES **with a shiny, lacquered appearance**; leaflets obovate, small, glandular, sticky; both surfaces dark green. FLOWERS small, star-like, greenish-yellow. FRUIT shiny, green to creamy yellow, but occasionally reddish when ripe.



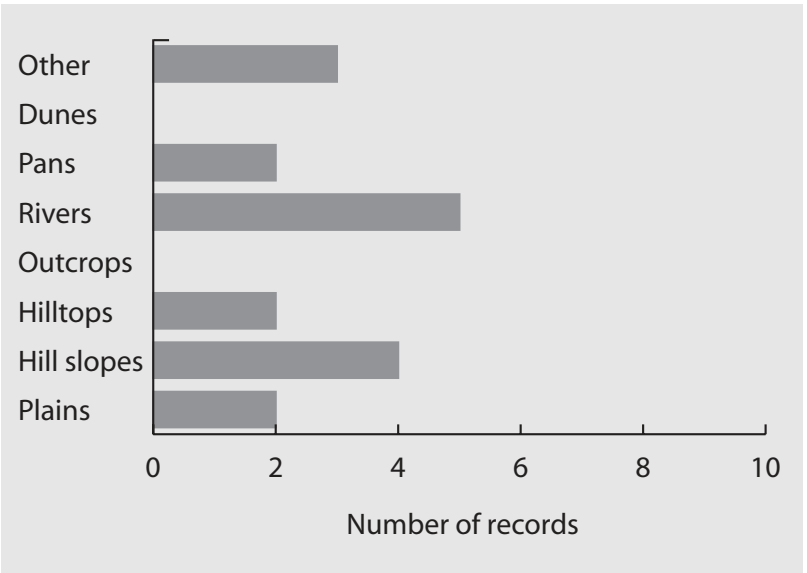


DISTRIBUTION & ABUNDANCE

Isolated localities along the south-western escarpment, in the central highlands, and in hilly areas elsewhere. There are some earlier herbarium records from a number of squares next to the ones recorded by the TAP. Generally common north of 23° S and uncommon south of it.

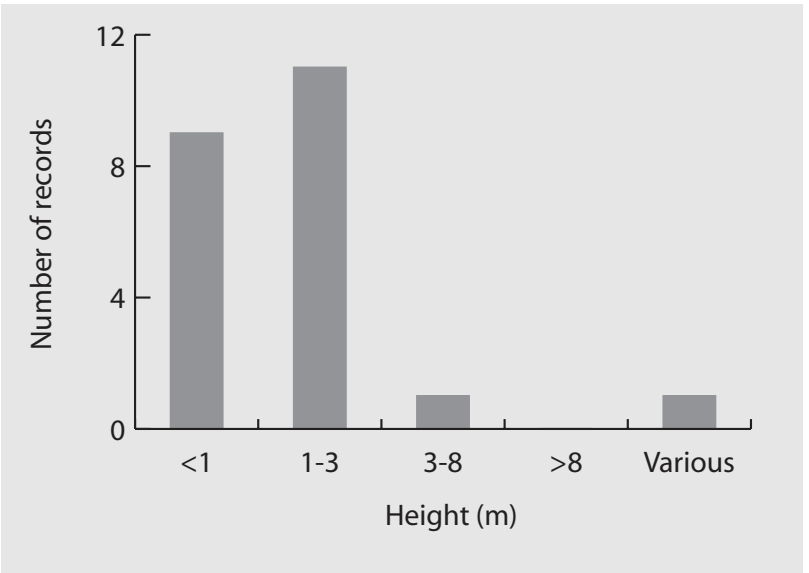
HABITAT

Various habitats, but mainly found along dry watercourses and on hill slopes. Always on rocky terrain.



GROWTH FORM

A shrub in the 1–3-m height class, often lower, occasionally higher.



ANNUAL CYCLE

FLOWERS March, August and December. FRUIT August to November, with old fruit in April. LEAVES apparently evergreen.

GENERAL

Used medicinally.

CONSERVATION CONCERNS

Rare in Namibia, but more widespread in South Africa.

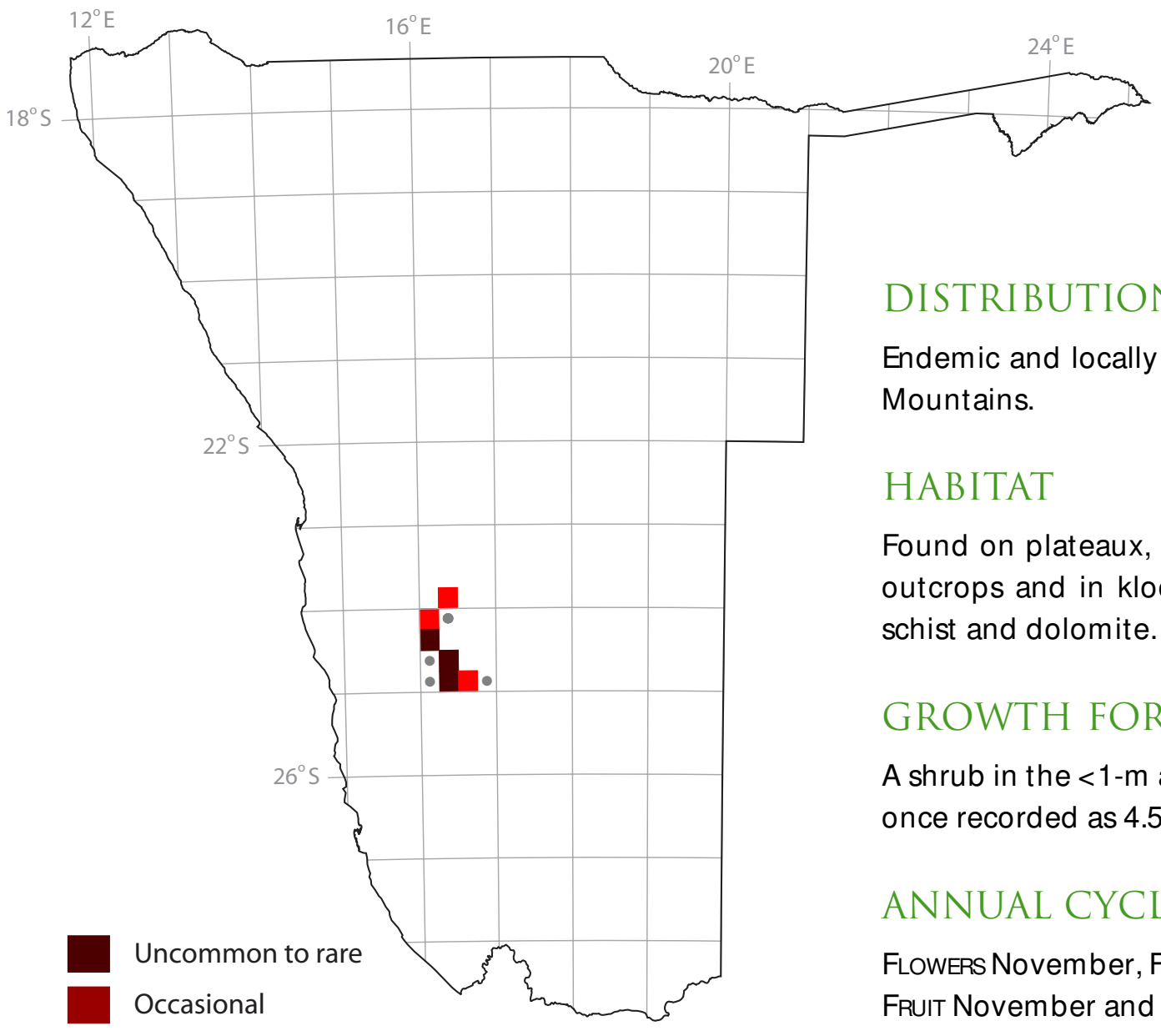
Rhus volkii

Naukluft Rhus

[9 records from 6 (<1%) squares]



A semi-deciduous, **small, quite stiff shrub**. BRANCHLETS **pale brown with dense white, downy covering when young**. LEAVES trifoliolate; leaflets oblanceolate to obovate to lanceolate; **dark olive-green above, pale silvery green below, densely silky above and below**. FRUIT almost round, somewhat flattened, **densely downy**.



DISTRIBUTION & ABUNDANCE

Endemic and locally common in the Naukluft Mountains.

HABITAT

Found on plateaux, hilltops, hill slopes, rocky outcrops and in kloofs; on gravel, clay, mica schist and dolomite.

GROWTH FORM

A shrub in the <1-m and 1–3-m height classes; once recorded as 4.5 m high.

ANNUAL CYCLE

FLOWERS November, February, March and June. FRUIT November and June. LEAVES evergreen.

CONSERVATION CONCERNS

Endemic and restricted.

CELASTRACEAE | SPIKETHORN FAMILY

This family has many tree species in southern Africa, but is not well represented in Namibia. The plants have no clearly distinguishing features. They are often spiny and the young twigs are often greenish and somewhat angular; the leaves are usually leathery, generally alternate or in clusters. The flowers are small, white or greenish, with a nectar-secreting disc around the ovary and a very short style.

Pleurostylia capensis | Coffee Pear

This evergreen tree has leathery leaves which are lanceolate to elliptic in shape and glossy green above. Its yellow-green flowers are small and its fruit a brown, leathery, ellipsoid capsule.

A single specimen (SWA3/167) from the Omuvanda Mountains, just south of the Kunene River (1713AA), was brought in as the Tree Atlas was going to press. This is the first record for Namibia, and represents a disjunct range extension.

Gymnosporia (= Maytenus) | SPIKETHORN, PENDORING

This genus has recently undergone revision, with many members formerly within the genus *Maytenus*. There are two new species in Namibia, whose names have not yet been published. All Namibian species are untidy, somewhat rigid shrubs with long spines. Their leaves are simple, leathery and slender, often with toothed margins. Their flowers are small, but generally in large, conspicuous sprays; the fruit are small, dry, two- to three-chambered capsules.

Gymnosporia sp. B

= Cassine szyszylowiczii

Namibian Orange-spikethorn

[2 records from 2 squares]

Rigid, very spiny shrub up to 2.5 m high. SPINES **robust**. LEAVES small (up to 10 mm long), ovate to obovate; blue-green; margins entire. INFLORESCENCE **longer than leaves**, axillary; composed of small, whitish flowers, honey-scented. FRUIT a smooth, round capsule, with three chambers; pale yellow.

The recent name change has not been published yet.

Two records from the hills of the south-eastern Sperrgebiet (2716CB and DC). It is a near-endemic which occurs just south of the Orange River as well.

Gymnosporia buxifolia

= Maytenus heterophylla (in part)

Gewone Pendoring

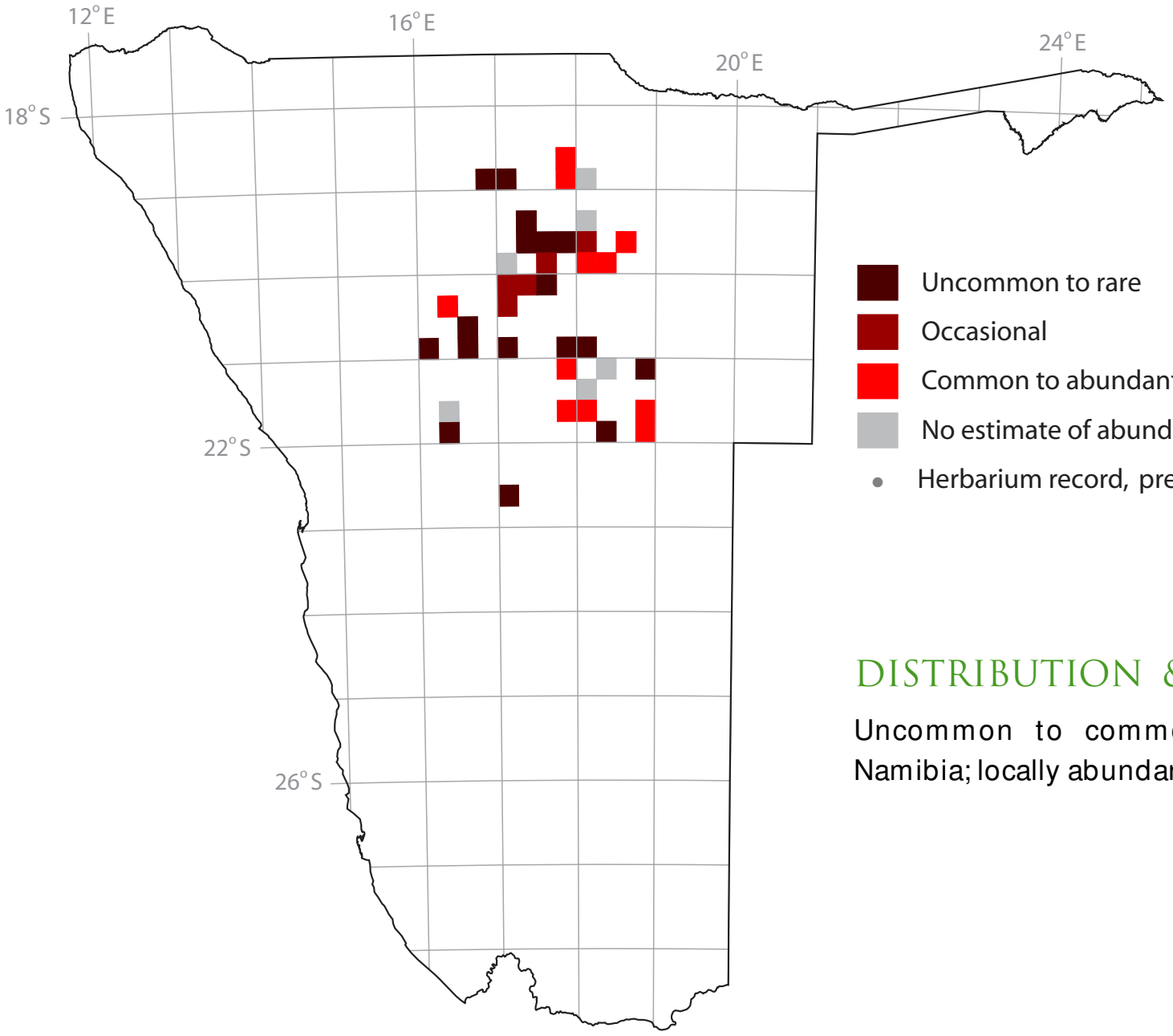
Common spikethorn (E);
lemoendoring (A); g!o#obe (J)

[96 records from 39 (4%) squares]



A very spiny, evergreen shrub, with terminal branches drooping. SPINES up to 100 mm long, **seldom leafy**. LEAVES **clustered on branch tips**, elongate-obovate, 25–80 mm long; **smooth, papery to parchment-like**; dull green, midrib sunken above; margin irregularly toothed; apex rounded to slightly notched. FLOWERS small, white to cream, **with a strong, unpleasant scent**. FRUIT **a rough-textured capsule which usually splits into three parts**, 2–5 mm in diameter.

Flowers are produced in profusion and are thus conspicuous. Fruit may be overlooked when green.

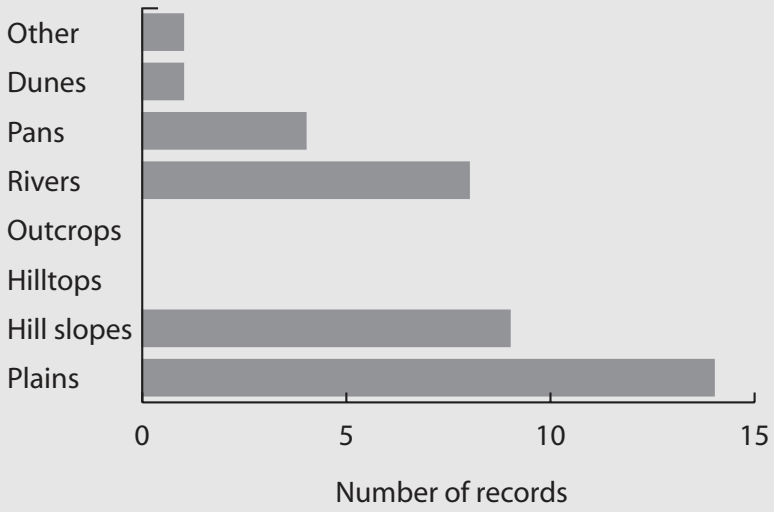


DISTRIBUTION & ABUNDANCE

Uncommon to common in north-central Namibia; locally abundant in places.

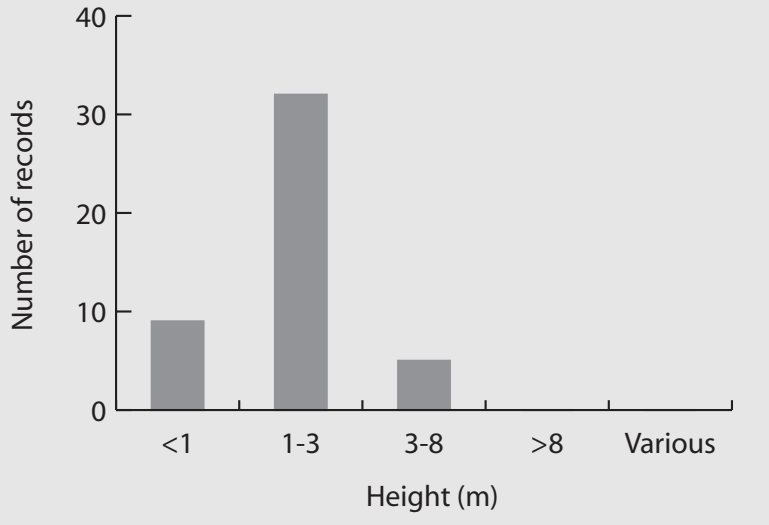
HABITAT

Found in various habitats, but mainly on plains and hill slopes. Often on calcareous soils.



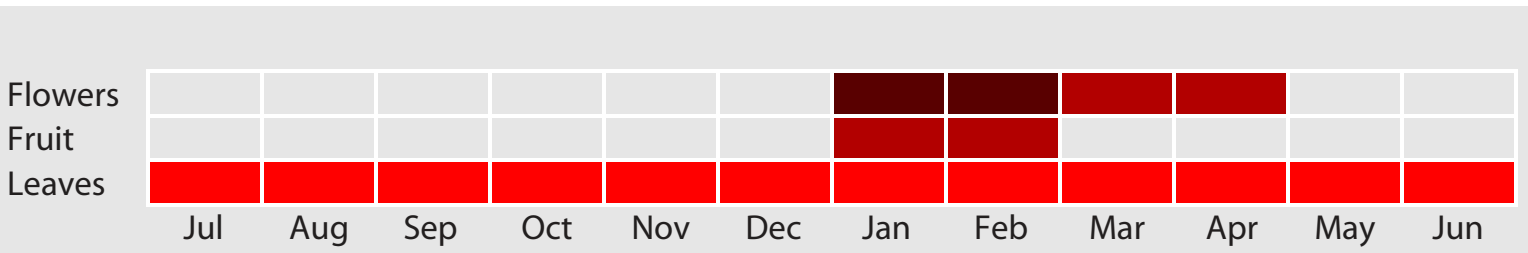
GROWTH FORM

A shrub up to 3 m high, occasionally a tree of over 3 m.



ANNUAL CYCLE

Flowering and fruiting records are sparse. FLOWERS mainly March and April, with single records from August to February. FRUIT January and February, with single records intermittently in other months. LEAVES evergreen.



GENERAL

These plants are able to coppice. It is the common spike-thorn in South Africa, but in Namibia *G. senegalensis* is more common.

CONSERVATION CONCERNS

None recorded.

This species is often confused with *G. senegalensis*, which has a much wider distribution. *Gymnosporia buxifolia* has a thinnish-textured leaf with a short petiole (up to 5 mm long); its spines rarely carry leaf clusters, its capsules are smooth and usually split into three parts and its seed has a yellow aril. *Gymnosporia senegalensis* has a thick-textured leaf with a petiole that can reach up to 17 mm in length; its spines often carry leaf clusters, and it has a rough capsule that usually splits into two parts, and a white to pinkish seed aril.

Gymnosporia linearis

= Maytenus linearis

Smalblaarpendoring

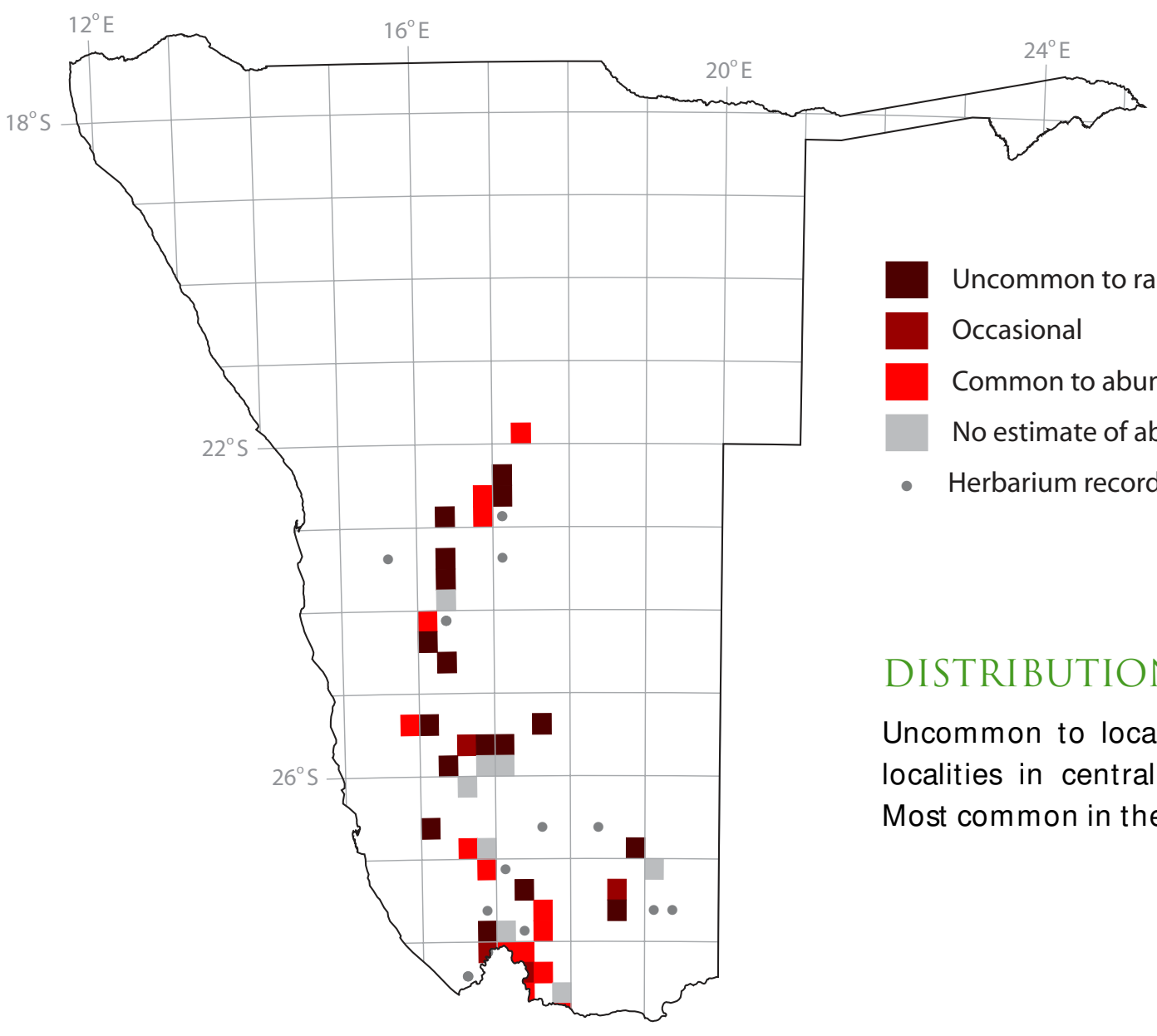
Narrow-leaved Spikethorn

[60 records from 43 (4%) squares]



Shrub or small tree, with an overall white appearance; **branches often drooping**. THORNS straight, 25–60 mm long, often with leaves and flowers. LEAVES simple, **narrow, linear**, 25–90 mm long; leathery, both surfaces grey-green, hairless; margin entire or **irregularly toothed**. FLOWERS in short sprays; small, yellow. FRUIT a capsule up to 7 mm in diameter, two-lobed. SEEDS usually covered with white aril.

Can be confused with *G. garipensis*. *Gymnosporia linearis* has leaves up to 12 mm wide, often with toothed margins; it also has a round capsule. *Gymnosporia gariepensis* has leaves usually only up to 5 mm wide, with margins entire or almost so, and a capsule that is somewhat triangular in cross-section.

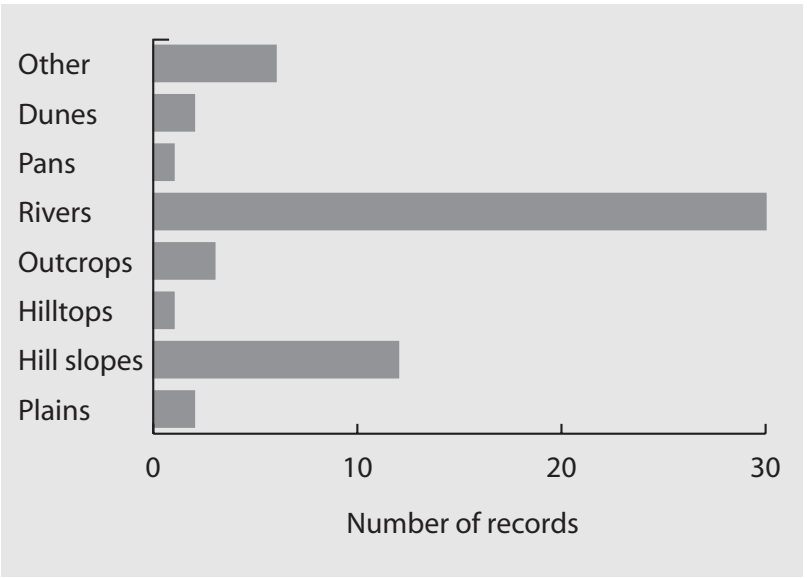


DISTRIBUTION & ABUNDANCE

Uncommon to locally common in scattered localities in central and southern Namibia. Most common in the south.

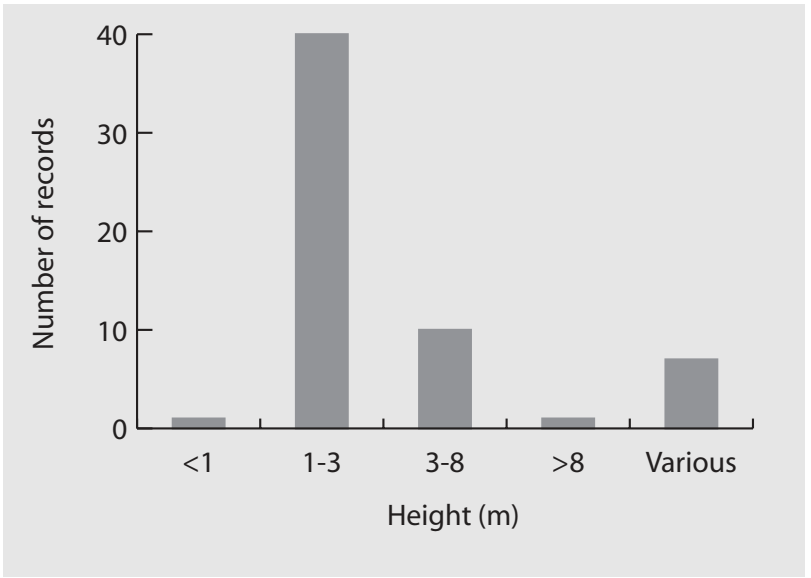
HABITAT

Various habitats, but mainly found along watercourses; on hill slopes in the central highlands.



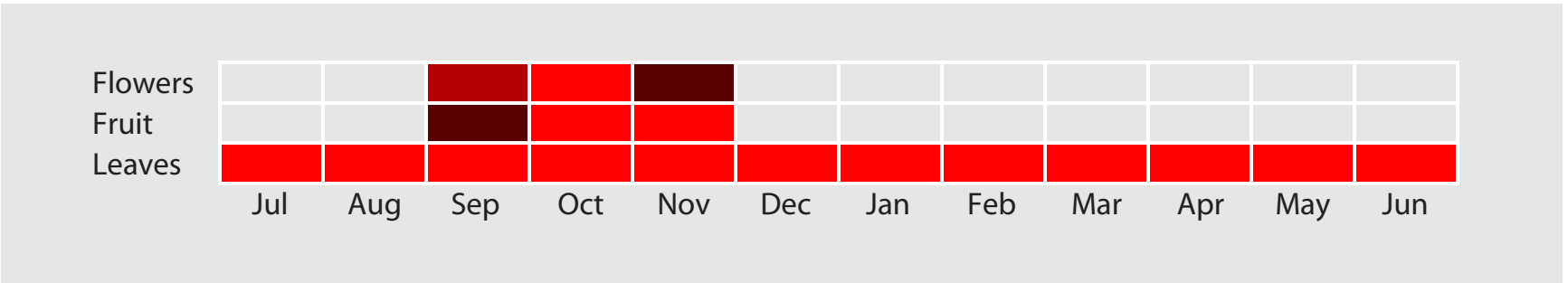
GROWTH FORM

Generally a shrub (77% of records) but sometimes a tree; mostly up to 3 m high, but also over 3 m, with one record over 8 m. Sometimes clambers in other trees or shrubs.



ANNUAL CYCLE

FLOWERS September to November. FRUIT September to November. LEAVES apparently evergreen.



GENERAL

Leaves browsed by goats and game.

CONSERVATION CONCERNS

None recorded.



Gymnosporia linearis, leaves and fruit, C. Mannheimer

Gymnosporia senegalensis

= Maytenus senegalensis

Bloupendoring

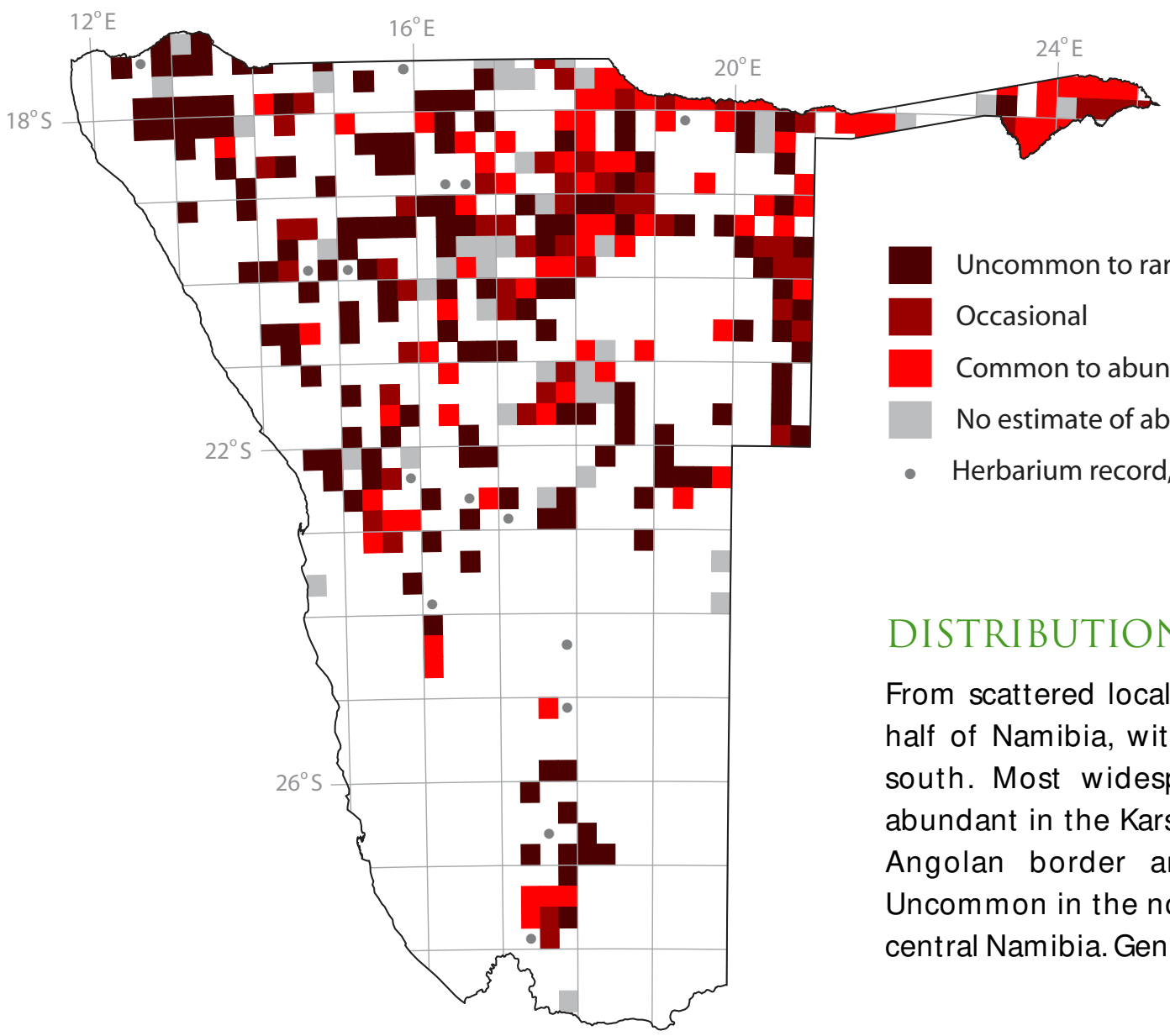
Confetti spike-thorn (E); omutungambara (H); !goo!goob (K); omungonze (O); mungorwe (Rk, Rum), mutungambara (T)

[632 records from 339 (32%) squares]



Semi-deciduous shrub, seldom a tree. BARK light grey, relatively smooth; **young branchlets reddish** to brown. THORNS straight, up to 70 mm long. LEAVES often clustered on spines; **petiole initially plum-red**; leaf oblanceolate to oblong, 30–125 mm long; thick and leathery; lead-grey, with a dull, waxy coating, veins prominent; **midrib often red-tinged**; margin finely toothed. FLOWERS small, cream-coloured to green-white, sweetly scented. FRUIT up to 6 mm in diameter, **two-lobed**, greenish with a pink tinge, becoming reddish brown.

Flowers and fruit are obvious. Species can be confused with *G. buxifolia*. (See *G. buxifolia* for differences.)

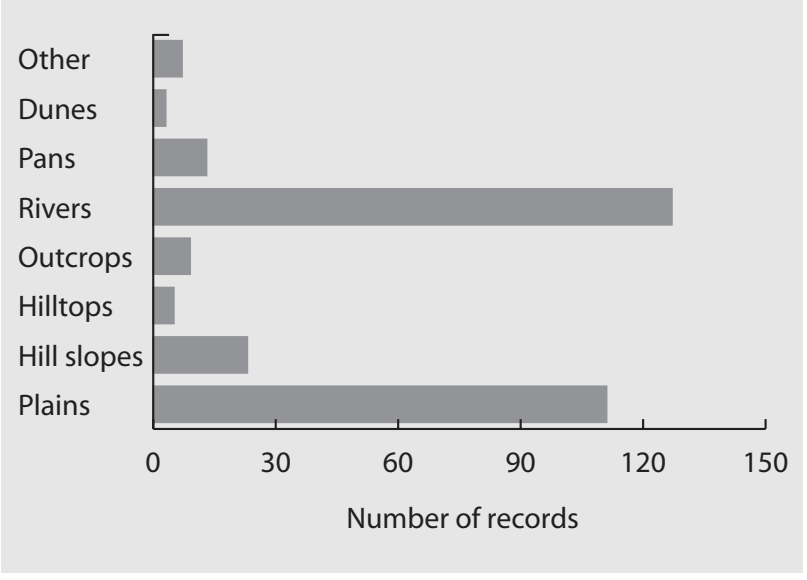


DISTRIBUTION & ABUNDANCE

From scattered localities across the northern half of Namibia, with a few localities in the south. Most widespread and common to abundant in the Karstveld, northwards to the Angolan border and in eastern Caprivi. Uncommon in the north-west, and south and central Namibia. Generally uncommon overall.

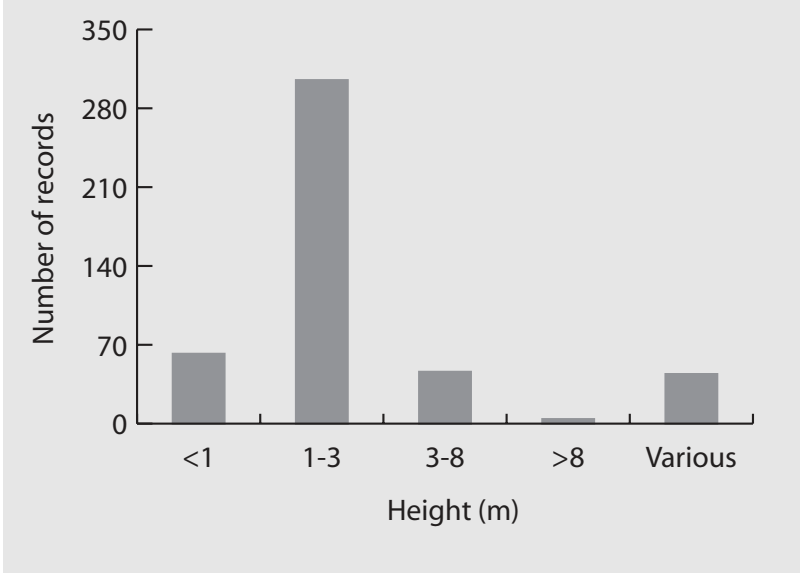
HABITAT

Found in various habitats, but mostly on plains and along rivers; also on hill slopes on the north-central plateau, and around pans in the north-east. Generally growing on sand, sometimes calcrete.



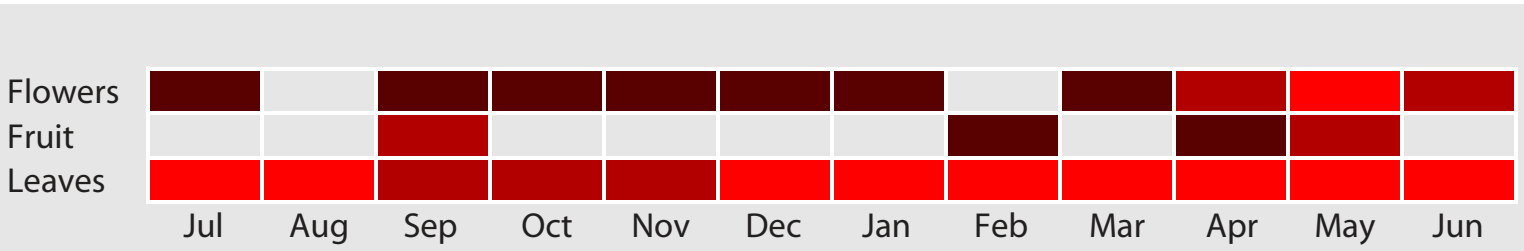
GROWTH FORM

Generally a shrub (92% of records) up to 3 m high (66% of records) but often higher. Tree forms mostly in the 3–8-m height class.



ANNUAL CYCLE

FLOWERS a few records almost all year, but mostly in May. FRUIT a few records almost every month; never many plants with fruit recorded, but the highest months were September and May. LEAVES virtually all year round, with some bare individuals noted from September to October and young leaves from October to November.



GENERAL

Browsed by rhino; generally not browsed much by livestock in the more arid parts, but is sometimes; in the wetter areas it is an important fodder species. The roots are used medicinally for heart disorders and other complaints, as well as an aphrodisiac.

CONSERVATION CONCERNS

None recorded.



Gymnosporia senegalensis, Omaheke Region, C. Mannheimer

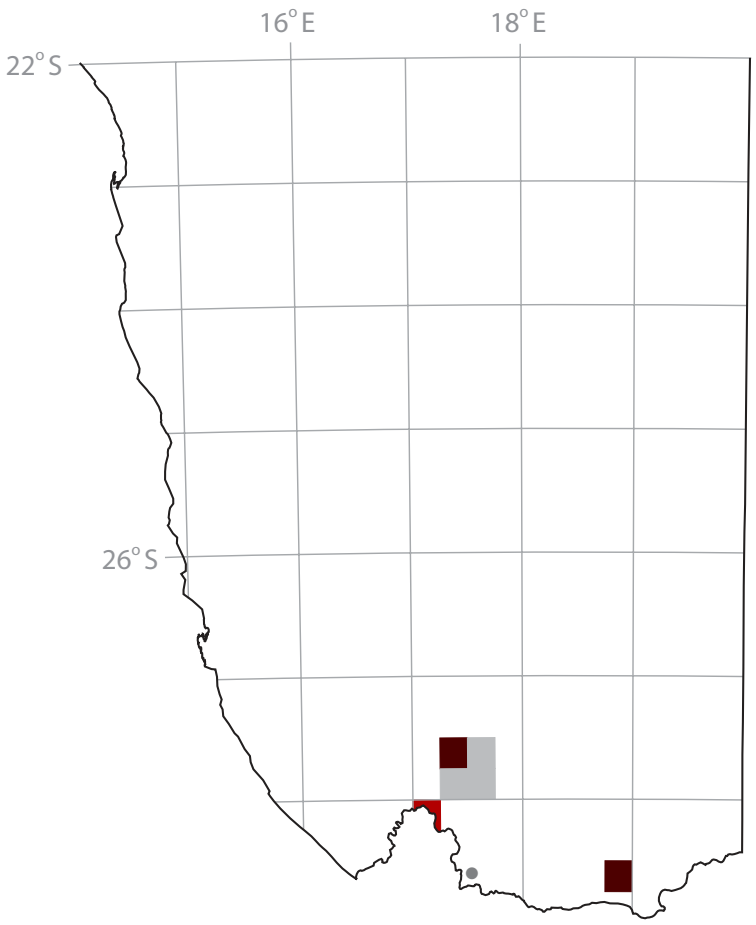
Gymnosporia sp. A

Orange River Spikethorn

[6 records from 6 squares]

Very lax, spinescent shrub. LEAVES clustered or alternate, oblong to obovate-oblong; leathery, pale green; **margins entire or almost so, veins inconspicuous**. INFLORESCENCE a short cluster of tiny yellowish-green flowers, usually carried at the tip of a short branch. FRUIT a smooth capsule; pendulous, with three chambers, somewhat triangular in cross-section; green, flushed red.

This is a new species that has not been published yet.



DISTRIBUTION & ABUNDANCE

Uncommon just north of the Orange River.

HABITAT

Found on plains and plateaux, in kloofs and along the banks of the Orange River.

GROWTH FORM

A shrub in the 1–3-m height class.

ANNUAL CYCLE

FLOWERS recorded in October. FRUIT in September, March and April. LEAVES recorded in October, March and April.

CONSERVATION CONCERNS

None recorded.



Gymnosporia maranguensis, Erongo Mountains, C. Mannheimer

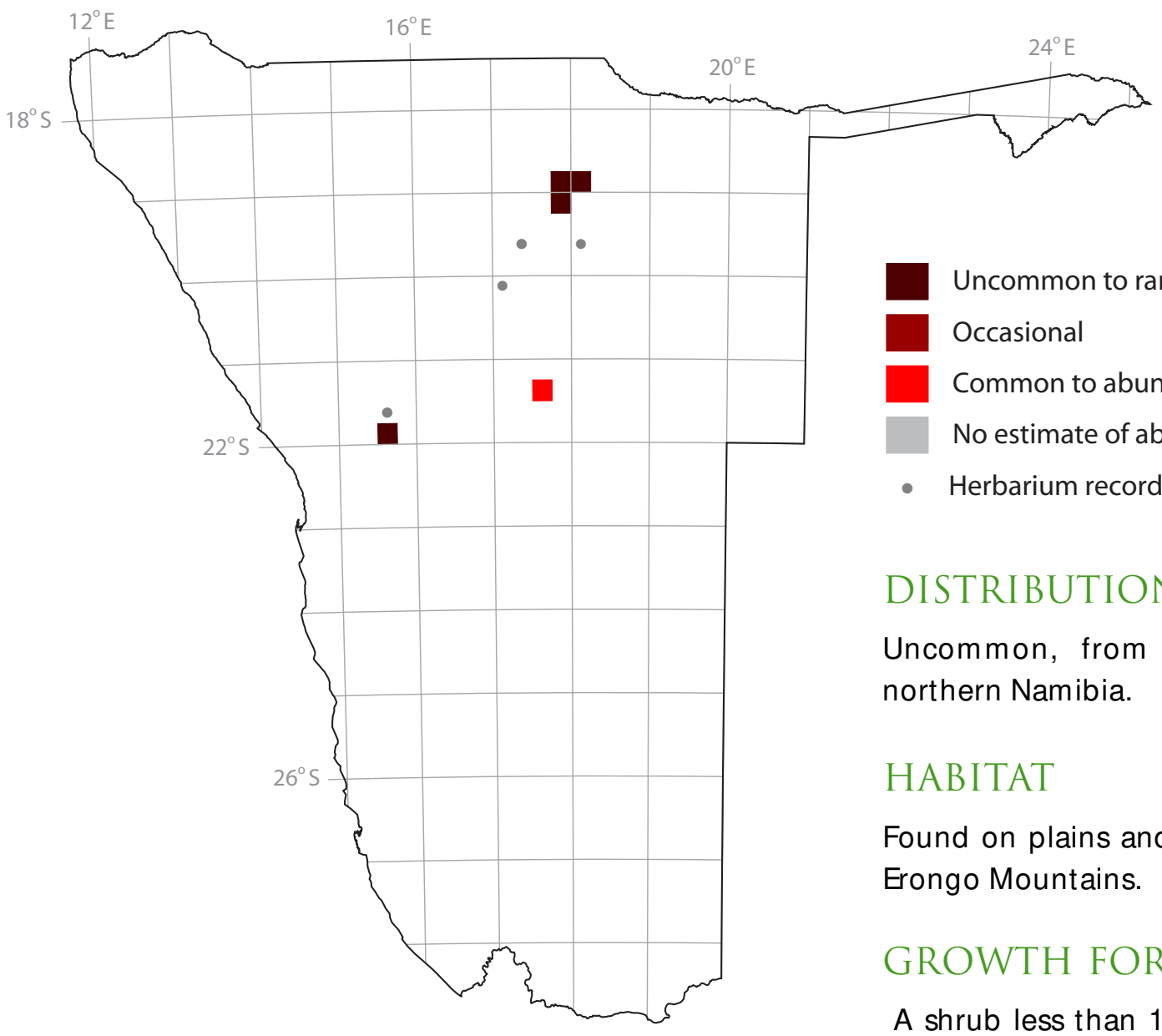
Gymnosporia maranguensis

= Maytenus heterophylla (in part)

Tropical Spikethorn

[10 records from 5 (<0.5%) squares]

Small, dense, rigid shrub. BRANCHES green when young, **slightly angular, sometimes with a tendency to twine**. SPINES **very slender and needle-sharp on terminal branches**, older spines more robust. LEAVES oblanceolate to obovate; **quite thin-textured** although leathery; **bright green**; margins irregularly toothed in upper half; petiole short. INFLORESCENCE a cluster longer than the leaves, often carried on the spines; composed of small, white, sweetly scented flowers. FRUIT a smooth capsule, with two, occasionally three chambers; yellow, flushed pinkish or reddish; bright yellow inside.



DISTRIBUTION & ABUNDANCE

Uncommon, from scattered localities in northern Namibia.

HABITAT

Found on plains and in rocky crevices in the Erongo Mountains.

GROWTH FORM

A shrub less than 1 m high or in the 1–3-m height class.

ANNUAL CYCLE

FLOWERS and FRUIT were recorded in April and May. LEAVES were recorded in summer; old leaves in July and August, new leaves in October.

CONSERVATION CONCERNS

None recorded.

Elaeodendron transvaalense

= Cassine transvaalensis

Transvaal Saffron

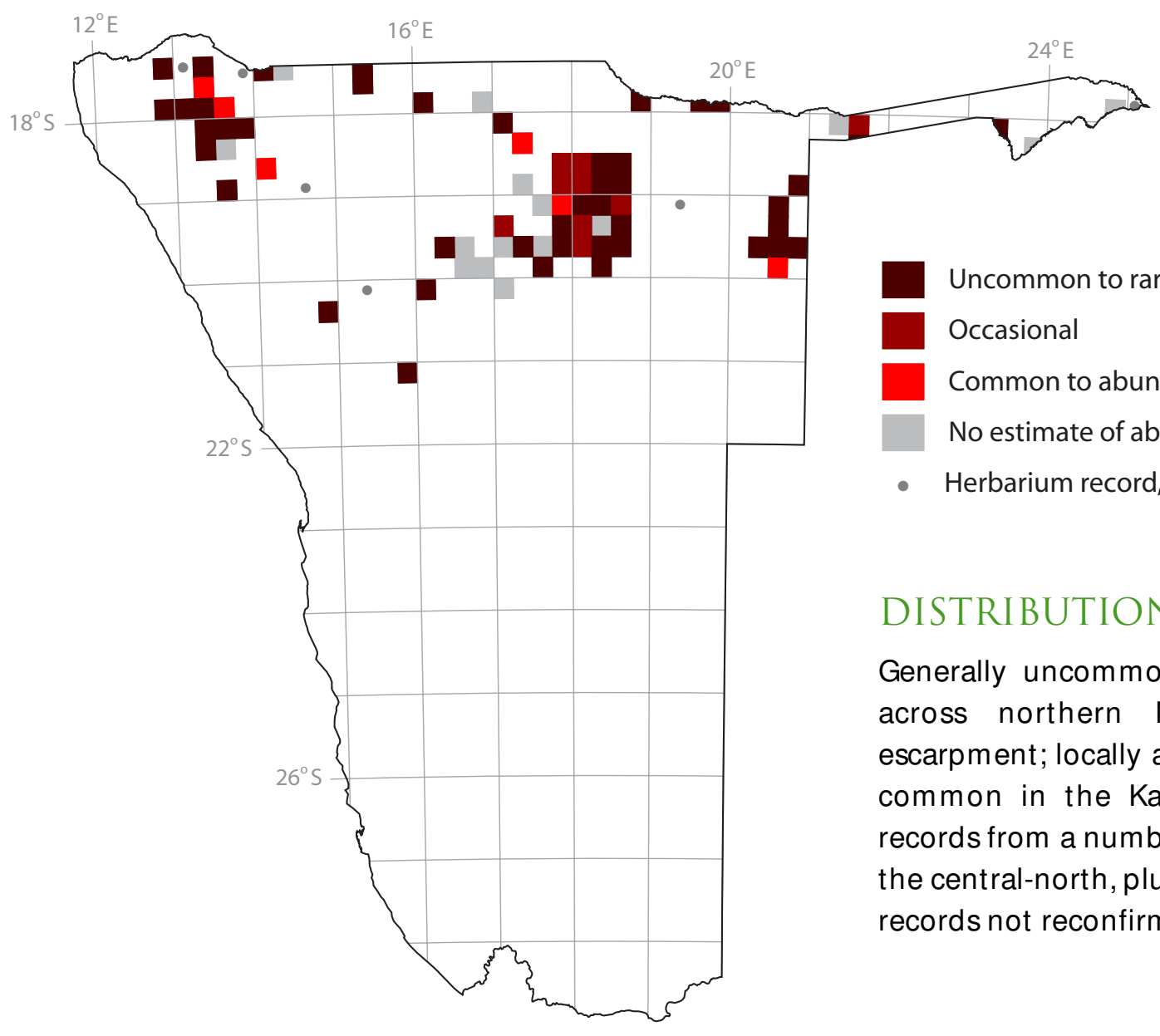
Bushveld saffron (E); lepelhout (A); omudengambwa (Ok); soohai (K)

[190 records from 74 (7%) squares]



Semi-deciduous shrub or tree, with spreading crown. BARK pale to dark grey, smooth to crumbly. LEAVES simple, often **clustered on dwarf-shoots**; leaf narrowly elliptic to obovate, medium sized, **variable in shape, leathery**; dark green to dull grey-green above, margin entire or toothed. FLOWERS small, green-white. FRUIT **a small berry, broadly tapering at both ends, yellow to red-brown when ripe**.

Flowers and fruit can be overlooked.

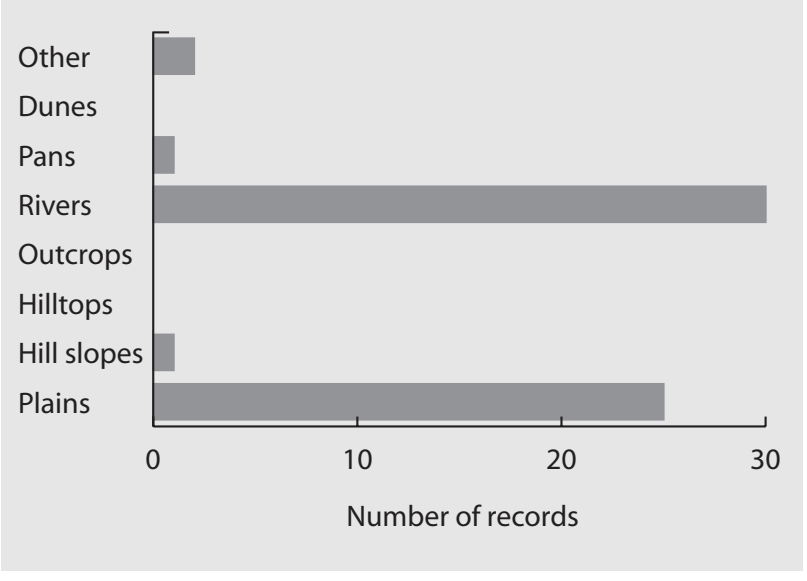


DISTRIBUTION & ABUNDANCE

Generally uncommon in scattered localities across northern Namibia east of the escarpment; locally abundant in places; most common in the Karstveld. There are new records from a number of isolated localities in the central-north, plus a few earlier herbarium records not reconfirmed.

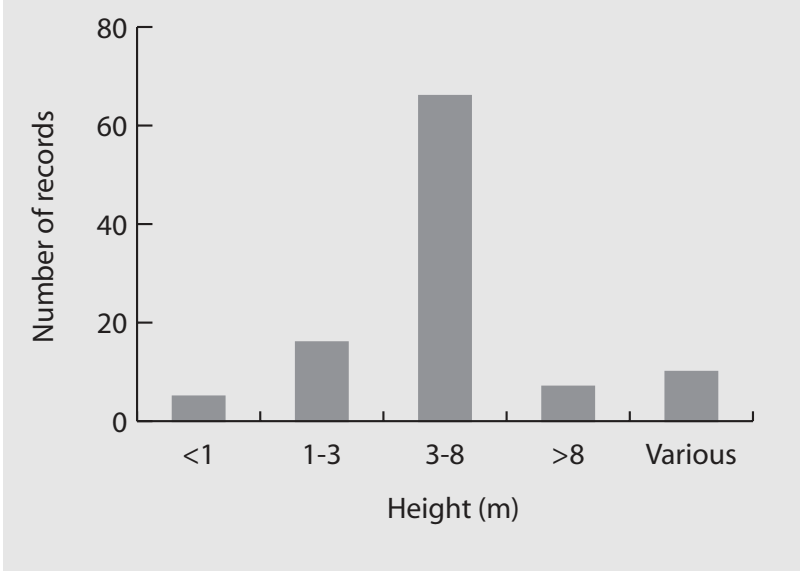
HABITAT

Mostly found on plains and in dry river courses; occasionally on floodplains or in other habitats. In the north-west, mainly along river banks; on plains in the Karstveld, and equally on both in the north-east.



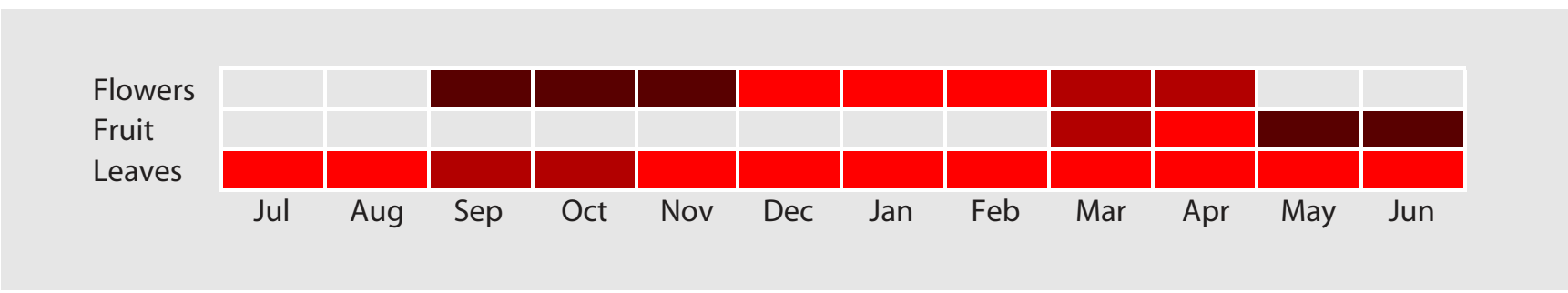
GROWTH FORM

Generally a tree up to 8 m high, seldom taller.



ANNUAL CYCLE

FLOWERS September to April, but mostly from December to February. FRUIT March to June, although old fruit may be found all year. LEAVES essentially evergreen, with some bare trees in September and October.

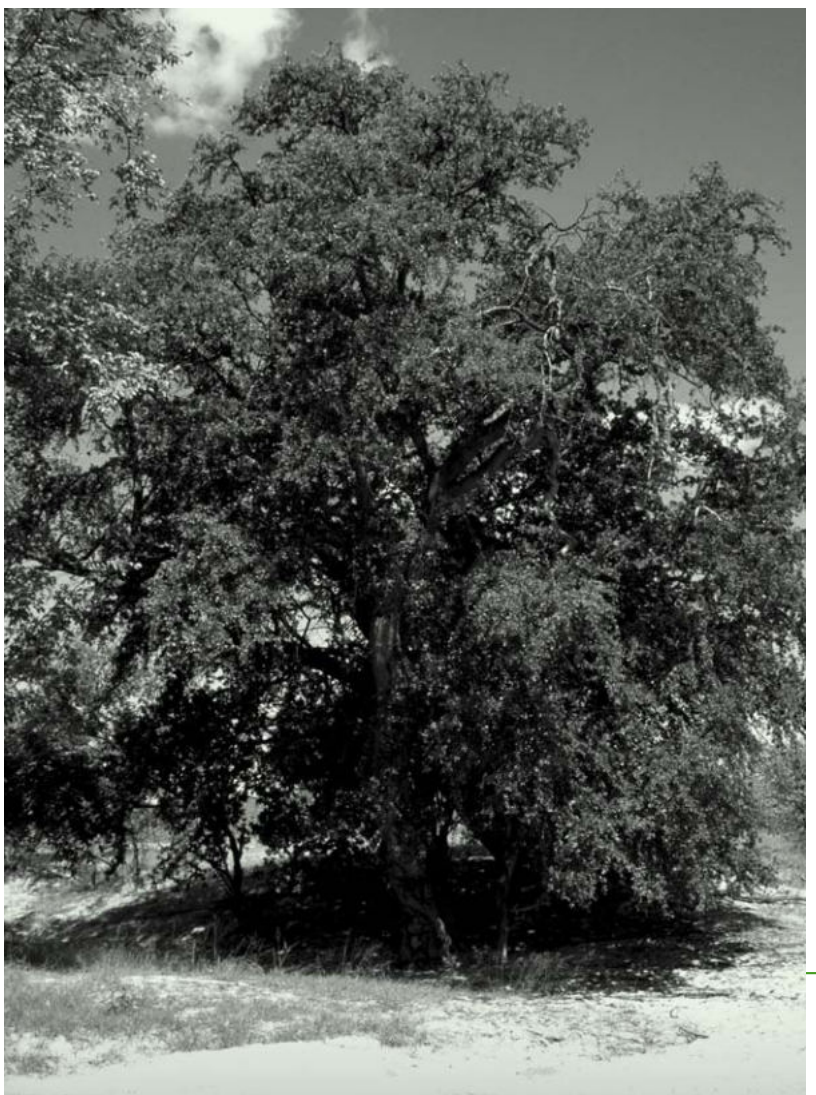


GENERAL

Browsed by livestock and game. The bark, leaves and sap are used medicinally; the bark is also used as a tanning agent; the wood is used to make small items. This plant can be grown from seed and is drought- and frost-resistant.

CONSERVATION CONCERNS

None recorded. Protected by forestry legislation.



Elaeodendron transvaalense, Kaokoveld, B. Curtis

Mystroxylon aethiopicum

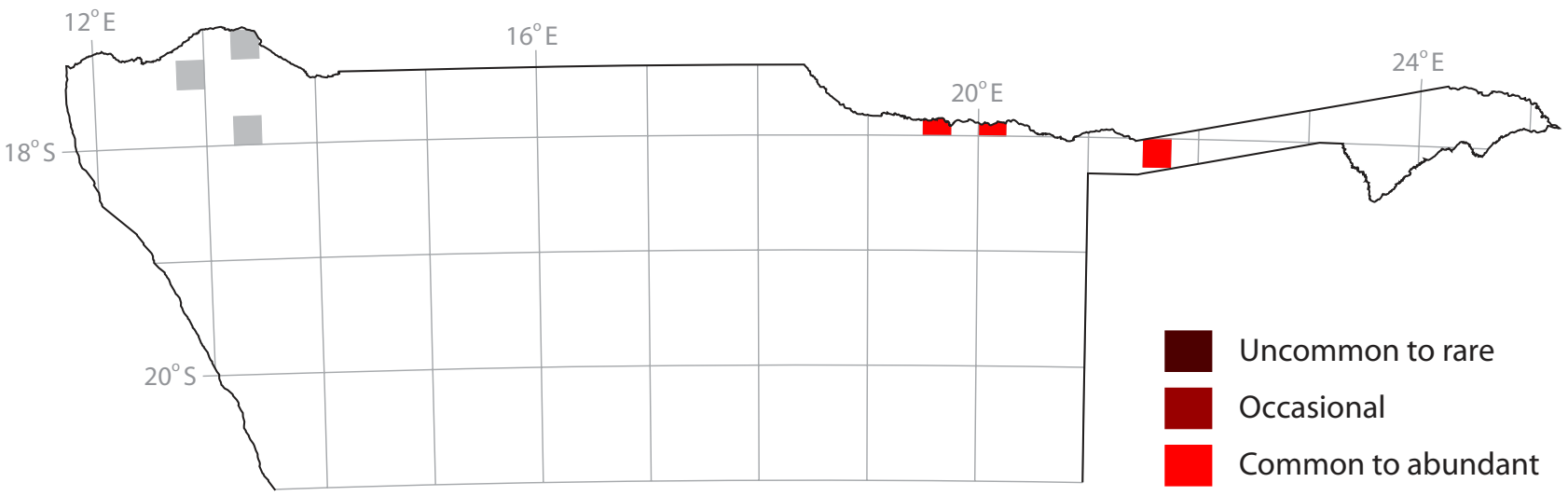
= Cassine aethiopica

Kooboo-berry

Koeboebessie (A)

[7 records from 6 (<1%) squares]

Semi-deciduous to evergreen shrub, or multi-stemmed tree with spreading crown and **dense, dark foliage**. LEAVES simple, ovate to lanceolate or oblong, 13–120 mm long, **leathery**; dark green above, with a dull, waxy coating or glossy, smooth; margin entire to finely toothed. FLOWERS yellowish-green, small, with a delicate fragrance. FRUIT a round to ovoid berry, up to 20 mm long; smooth, **bright red to purplish-red when ripe**.



DISTRIBUTION & ABUNDANCE

Uncommon in the north-west; locally common in a few localities along the Okavango River. The three north-western records are range extensions for Namibia that have all been confirmed by specimens (LH896, 952 and 958). There is one earlier herbarium record from the eastern Okavango River.

HABITAT

River banks.

GROWTH FORM

A tree or shrub, mostly in the 3–8-m height class, but also lower.

ANNUAL CYCLE

FLOWERS herbarium records in October and November. FRUIT April, November and December. LEAVES observations only in March, May and December.

CONSERVATION CONCERNS

None recorded. Has probably always been uncommon in Namibia.

Allophylus africanus

Kieriehout

Malaova (L)

[1 record]

Evergreen shrub or small tree. LEAVES **trifoliolate**; leaflets obovate to elliptic, sometimes with one lateral leaflet conspicuously smaller than the other two; margin crenate. FLOWERS small, creamy-yellow or greenish. FRUIT a small, round, somewhat fleshy berry; red, hanging in spikes.

May be confused with *Rhus* spp., but it lacks the resinous latex of *Rhus* and has larger fruit.

Only recorded once by the TAP, as a common shrub and tree of various heights growing along the banks of the Kunene River at Epupa Falls (1713AB). No one else who visited that area recorded it, but it may have been mistaken for *Rhus quartiniana*. The only two herbarium records were trees of 3 m and 8 m on the waters edge of the Okavango River in 1822CA.

Erythrophysa alata

Namaqua Red-balloon

Namakwarooiklapperbos (A)

[1 record]

Evergreen shrub. LEAVES compound; rachis and petiole **winged**. FLOWERS **showy, dark red; stamens up to 20 mm long, red. FRUIT an inflated three-locular, triangular, membranous red capsule with a slender, pointed tip**.

This species is rare in Namibia, and is limited to the Naukluft Mountains. There is one TAP record and two earlier herbarium specimens. Common in one small area on a cliff in the upper kloof at Lemoenputz in the Naukluft Mountains (2416AC). A shrub of up to 2 m high. FLOWERS and FRUIT recorded in February and May. It is a very attractive plant when in flower or fruit and can be spotted from afar.

Traditional Ndonga hut with palisade at Olukonda, P. Reiner



Pappea capensis

Jacket-plum

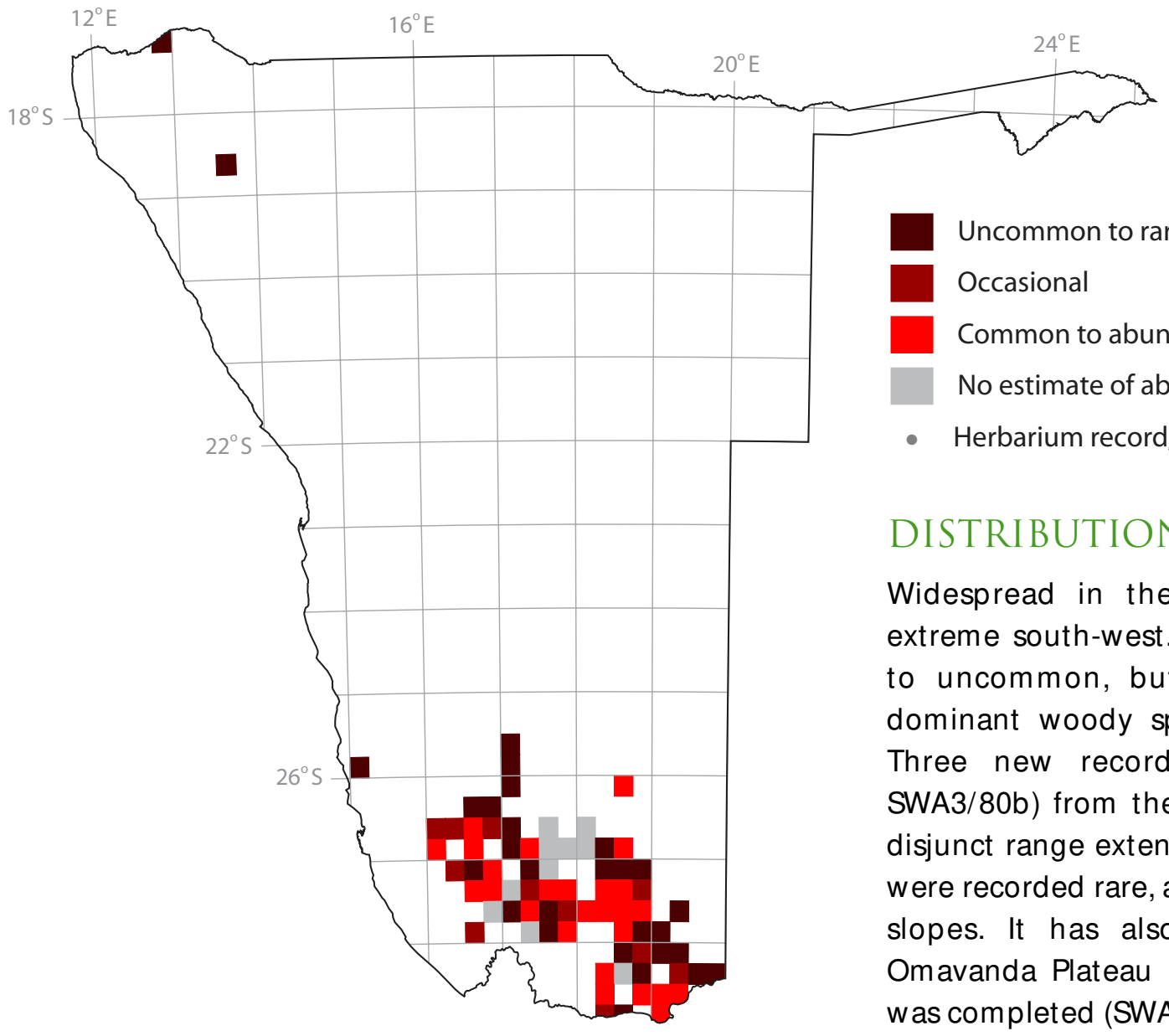
Doppruim, kouboom (A)

[136 records from 76 (7%) squares]



Spreading tree. LEAVES simple, spirally arranged or terminally clustered on branchlets; **leathery, dull green; margin entire, but markedly wavy and conspicuously spine-toothed on young leaves and coppice growth**. FLOWERS small, unisexual, green to cream-coloured. FRUIT fairly small, almost round; hard, furry, brown; splitting open when ripe to reveal a single **shiny, black seed, covered by an orange-red, jelly-like aril**.

The flowers might be overlooked but the fruit are obvious.

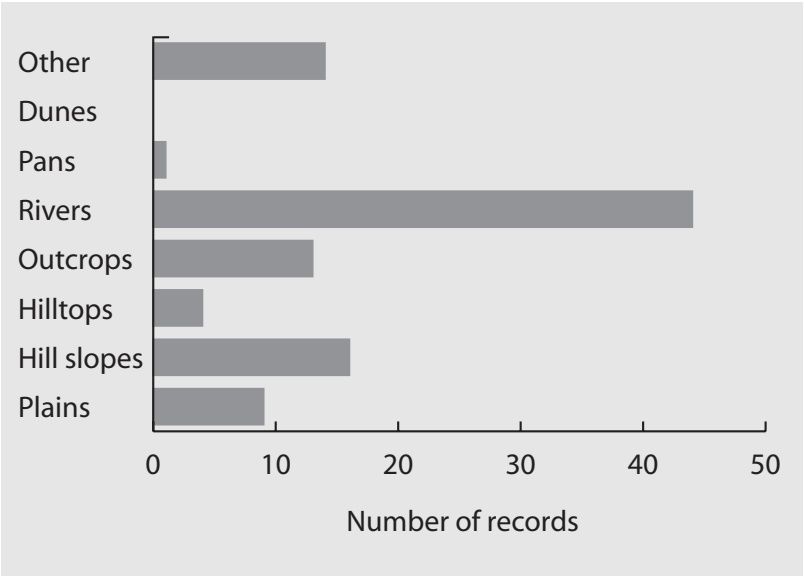


DISTRIBUTION & ABUNDANCE

Widespread in the south, excluding the extreme south-west. Ranging from common to uncommon, but never abundant; the dominant woody species in three squares. Three new records (BC1653, 2028 and SWA3/80b) from the north-west represent a disjunct range extension; all three specimens were recorded rare, and growing on steep hill slopes. It has also been recorded from Omavanda Plateau (1713AA) since the map was completed (SWA3, CUR1).

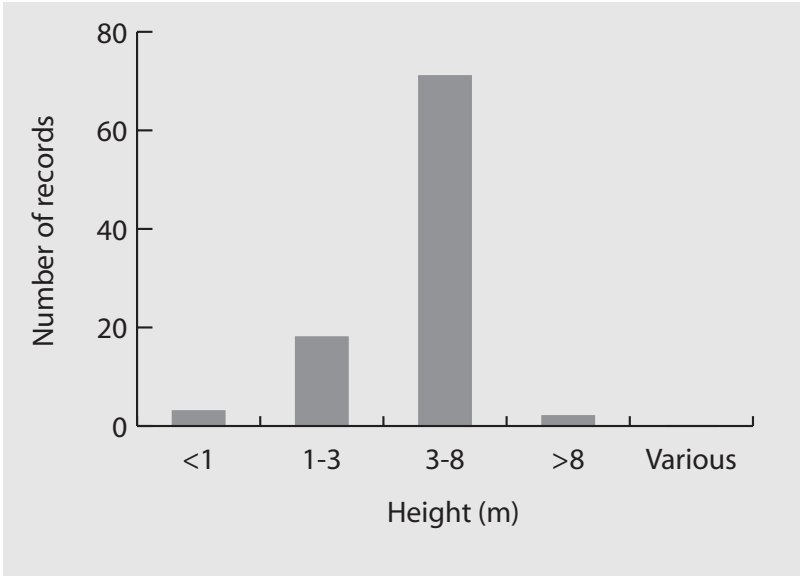
HABITAT

Various, but mainly along dry watercourses. Generally found on rocky or gravel substrates.



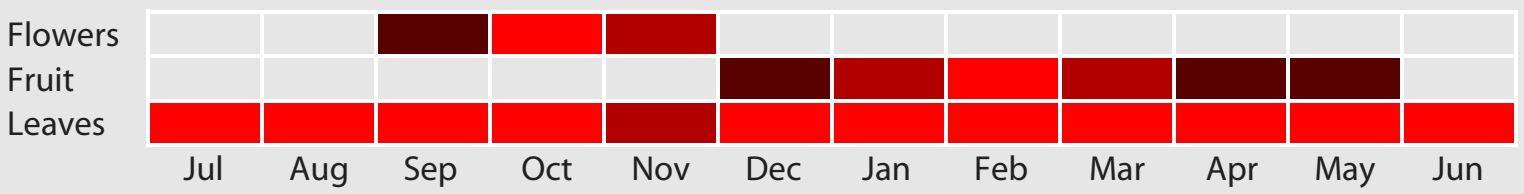
GROWTH FORM

Generally a tree in the 3–8-m height class. Mixed height stands were noted in a number of areas.



ANNUAL CYCLE

FLOWERS September to November. FRUIT December to May. LEAVES evergreen.



GENERAL

The leaves are browsed by animals. The bark is toxic; the fruit are edible and the seeds contain an oil which is used medicinally. The wood is hard and durable.

CONSERVATION CONCERNS

None recorded. Protected by forestry legislation.



Pappea capensis, Southern Namib, C. Mannheimer

Melianthus comosus

Tintenbusch

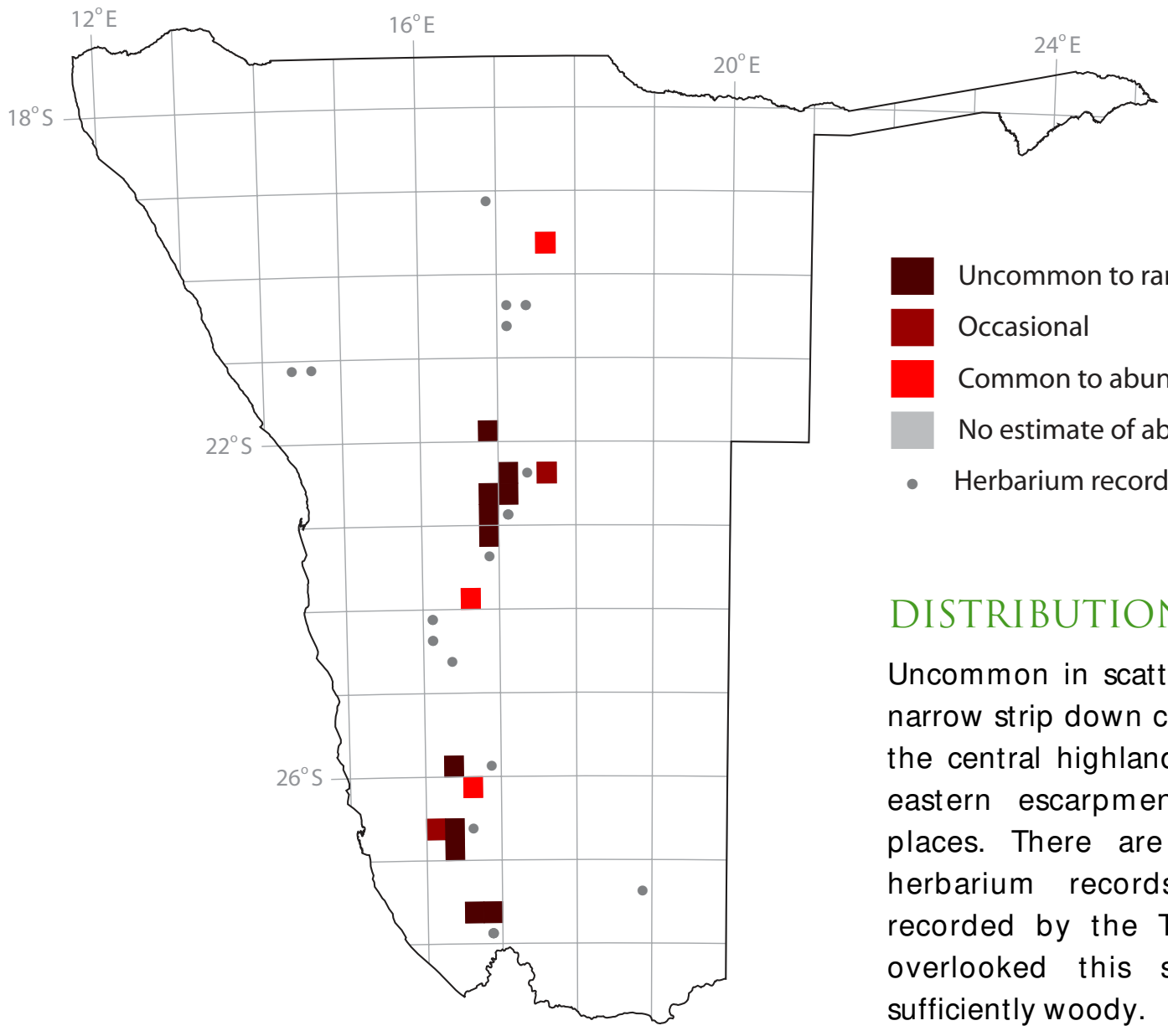
Touch-me-not (E); kruidjie-roer-my-nie (A); /ing (K)

[29 records from 16 (1%) squares]



Rounded shrub with softly woody stems. LEAVES compound, clustered at ends of branches, **drooping; petiole and rachis somewhat flattened to narrowly winged**; leaflets lanceolate; dull, dark grey-green above; pale green to dirty yellow and velvety below; **often folded along midrib; deeply toothed**. FLOWERS **fairly large and conspicuous**, in a hanging spray **below the leaves, scarlet**; asymmetric with the **flower-base boat-shaped** with four long, curved stamens. FRUIT **a papery, four-winged inflated capsule**.

Flowers and fruit conspicuous.

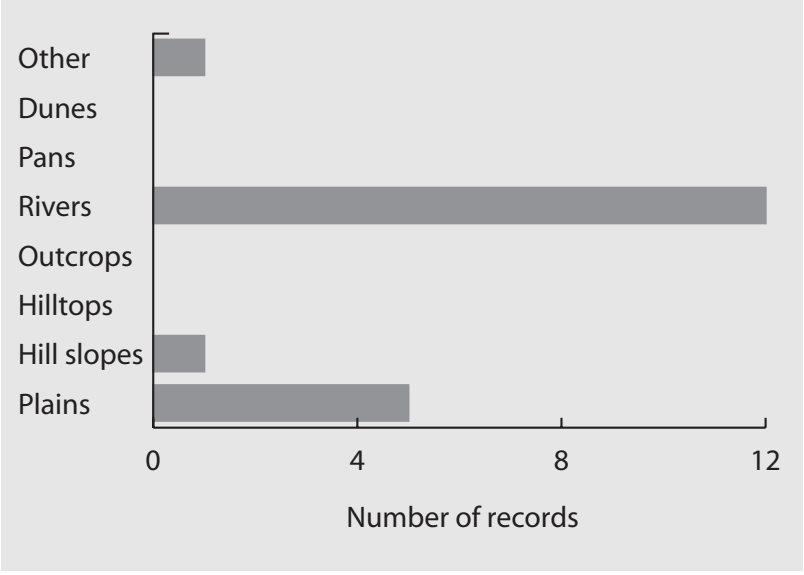


DISTRIBUTION & ABUNDANCE

Uncommon in scattered localities in a long, narrow strip down central Namibia, mostly in the central highlands and along the south-eastern escarpment; locally common in places. There are a number of earlier herbarium records from localities not recorded by the TAP. Atlassers probably overlooked this species as not being sufficiently woody.

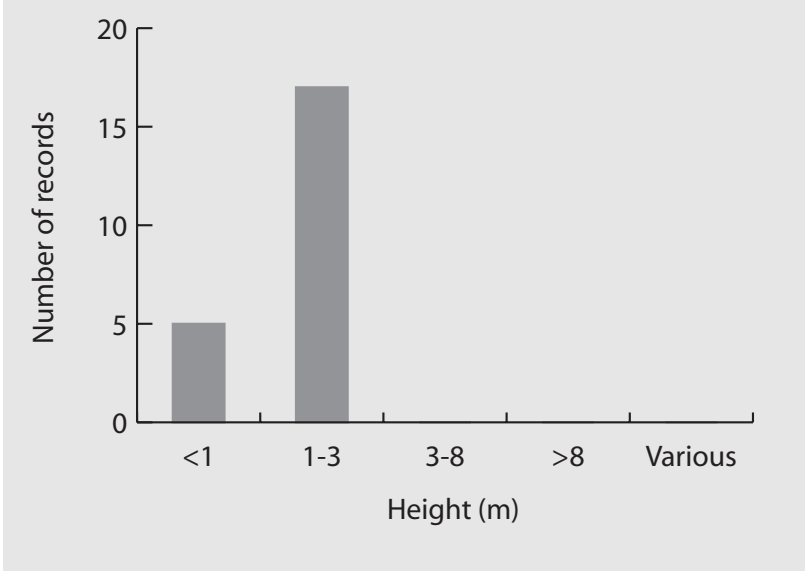
HABITAT

Found in seasonally inundated places; mostly along dry watercourses, but also on plains, road verges and along the margins of dams. Grows on sandy or gravel substrates.



GROWTH FORM

A shrub, generally in the 1–3-m height class. In 2217BC some large individuals, of up to 2 m high and with diameters of *c.* 2.5 m, were recorded (FRI2).



ANNUAL CYCLE

FLOWERS April to November, but seems to be mostly September. FRUIT a few records most of the year; fruiting, when it occurs, is usually quite profuse. LEAVES mainly October to June, with young leaves September to November; sometimes with dry, old leaves in winter.

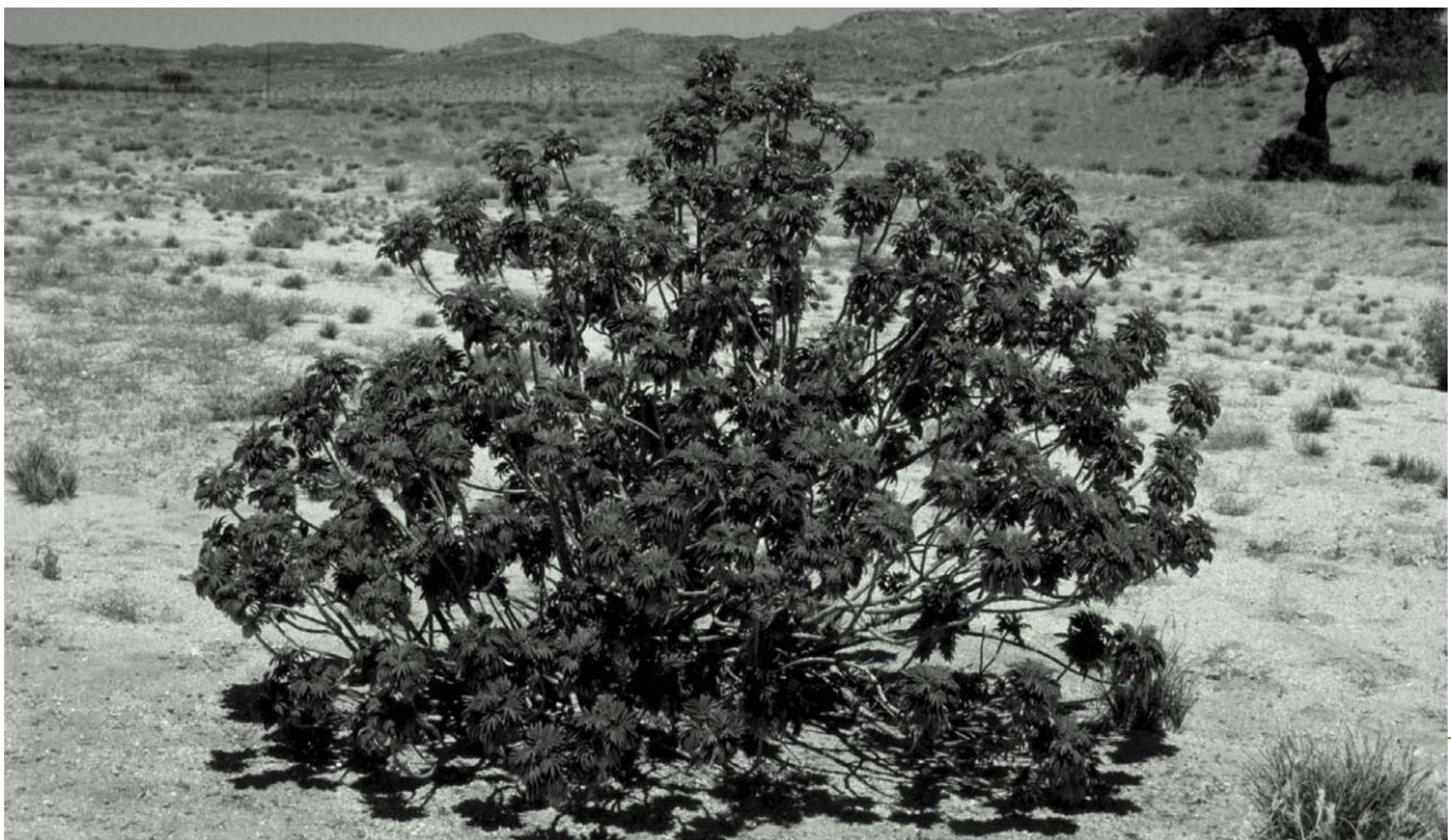
GENERAL

The flowers are visited by many insects. Leaves and other parts are used medicinally; the leaves are also boiled and eaten, as well as the flowers. Of horticultural potential, as this plant is frost-hardy and has very attractive foliage, flowers and fruit.

CONSERVATION CONCERNS

None recorded.

Melianthus comosus, Southern Namib, C. Mannheimer



Ziziphus mucronata

Buffalo-thorn

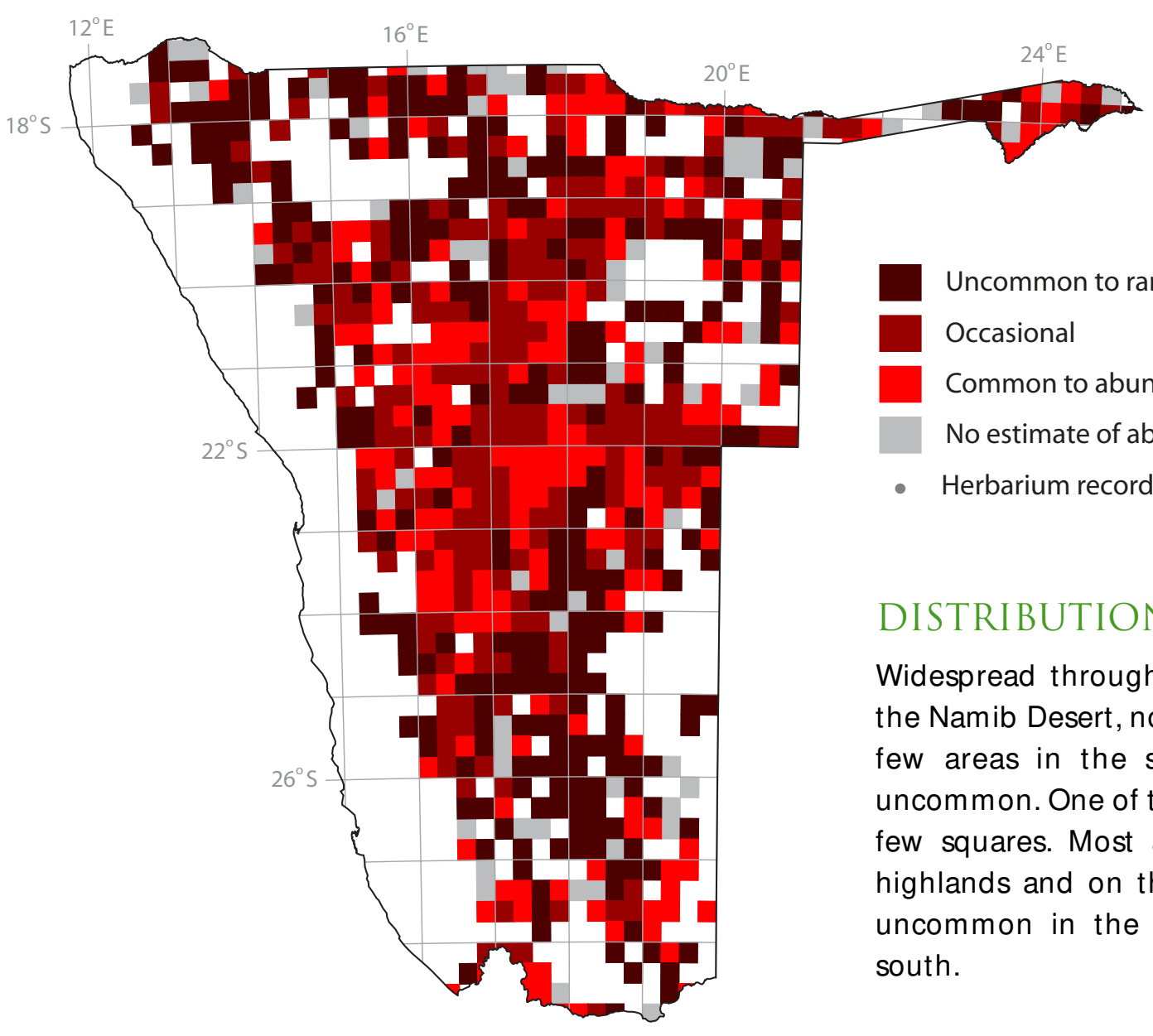
Blinkblaarwag-'n-bietjie (A); omukaru (H); faros (K); mukalu (L); omukekete (O); omusheshete (Od); mukekete (Rk)

[2,454 records from 751 (70%) squares]



Semi-deciduous tree with a spreading crown and rough, grey bark which is deeply and **vertically fissured**. BRANCHLETS **mostly zig-zag and often drooping when young**. THORNS one pair per node, comprised of **one straight and one curved**. LEAVES simple, alternate; **ovate, shiny green** with **two characteristic lateral veins originating together with midrib at base; apex pointed, often with a hair-like tip**. FLOWERS in axillary clusters, small, green to yellow-green. FRUIT a small, round red-brown berry, with thin, dry flesh.

Flowers and young fruit can be overlooked; ripe fruit are conspicuous when plentiful. This species cannot be mistaken.

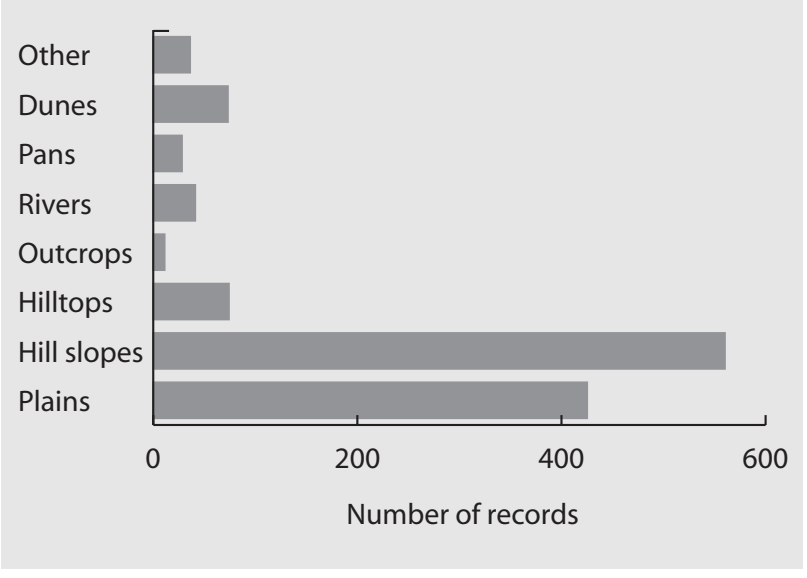


DISTRIBUTION & ABUNDANCE

Widespread throughout the country, except the Namib Desert, north-west of Etosha and a few areas in the south-east. Common to uncommon. One of the dominant species in a few squares. Most abundant in the central highlands and on the north-central plateau; uncommon in the north-west and central-south.

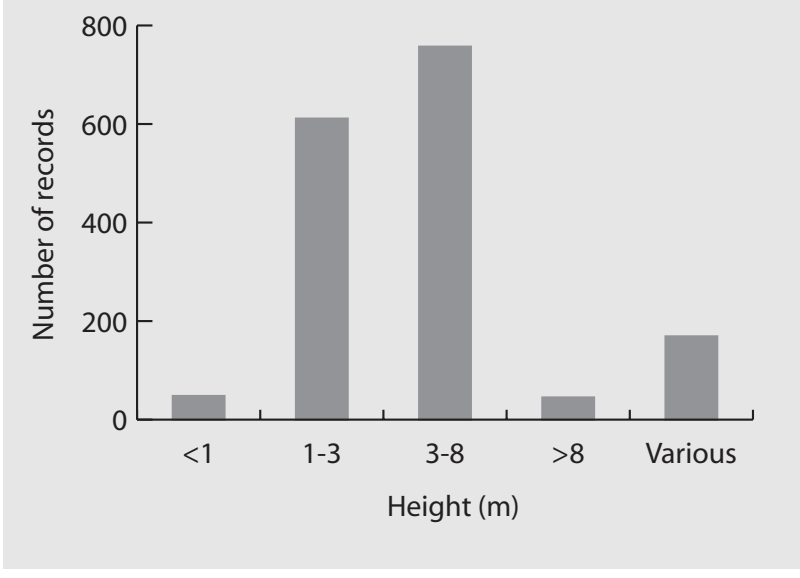
HABITAT

Found in various habitats, but chiefly on dry riverbeds, river banks and plains. Often found around farm dams; also around pans, especially in the north-east and south; on hills in the central highlands and north-central plateau; and dunes in the south-east. Substrates include sand, clay, calcrete, gravel and stony or rocky areas.



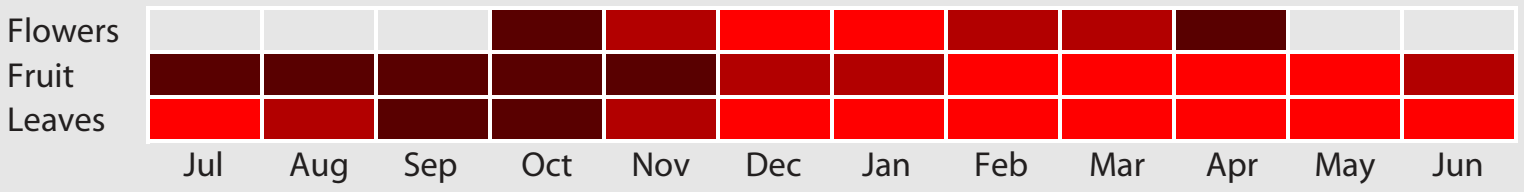
GROWTH FORM

Mostly a shrub up to 3 m high (45% of records), or shrubby trees up to 8 m (52%). Often grows as trees near water. About 3% of records higher than 8 m, in the central highlands and around Ruacana. In general, the average height of this species was greater in the western half of the country than the eastern half, with the exception of eastern Caprivi. Roughly 33% of the stands observed ranged in height from small to large, mostly in the central highlands and north-east.



ANNUAL CYCLE

FLOWERS mostly November to March, though there were recordings throughout the year. FRUIT all year, but mostly December to June, with ripe fruit from March. LEAVES mainly November to August, but present on some trees all year; young leaves mainly October and November.



GENERAL

Many animals, including birds, insects, mice, bush squirrels, giraffe, kudu and rhino feed on either the leaves or fruit. Weavers nest in the trees. The fruit are edible and are used to make 'ombike', an alcoholic beverage; the wood is used for carving; the roots, bark and leaves are used medicinally. An excellent garden plant as it is fast-growing, drought- and frost-resistant (although some trees are damaged by severe frost), and attracts birds and insects.

Often infested by parasites, such as *Tapinanthus*. Many trees were reported dying in 2217CC and 2216BD (ELL1 and WIS1). Overgrazing has resulted in low shrubs in some areas.

CONSERVATION CONCERNS

None recorded.

Berchemia discolor

Bird Plum / Ombe

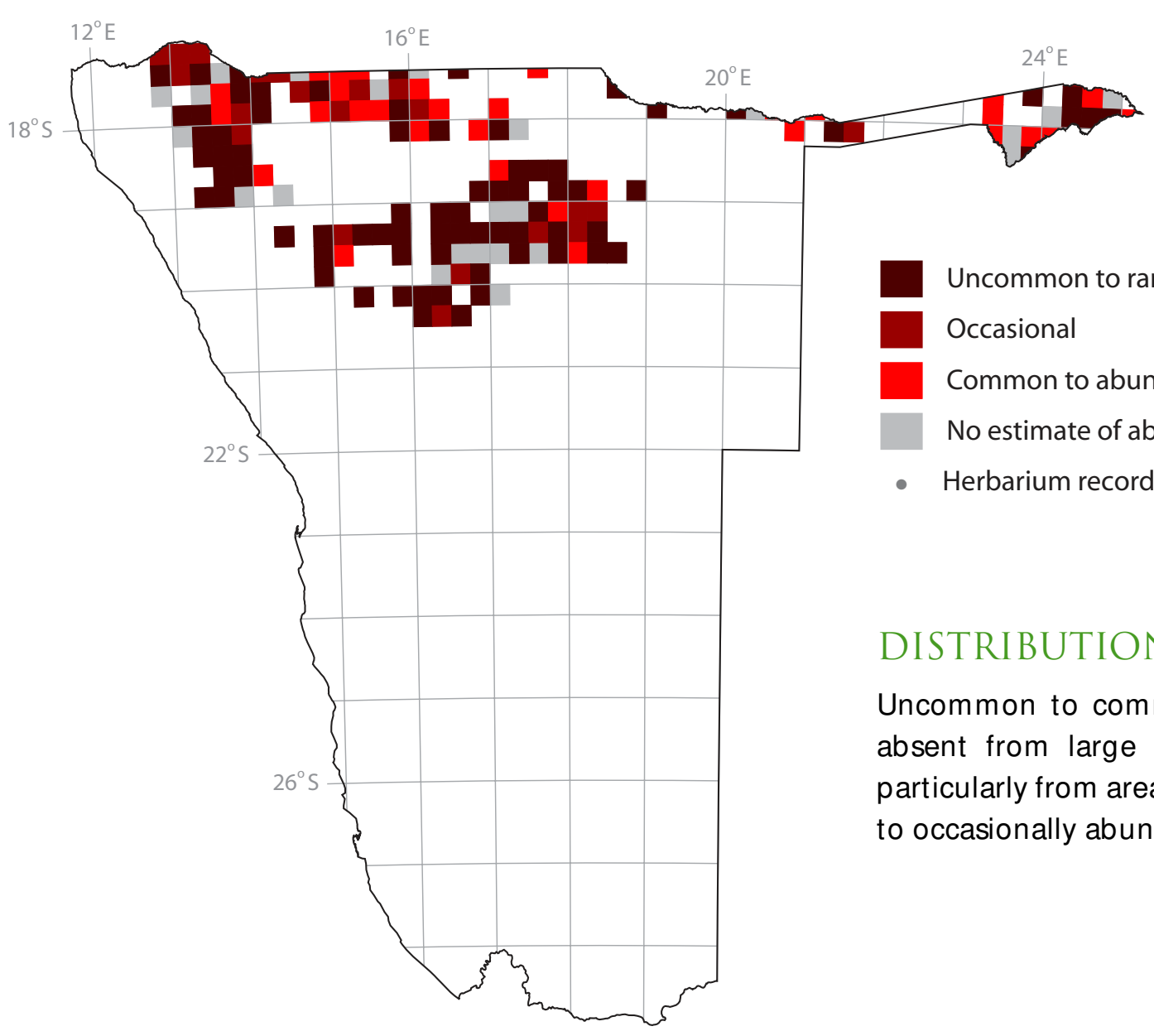
Bruinivoor (A); Wilde Dattel (G); omuve (H, Od); fhûin (K); mukalu, muzinzila (L); eembe (= fruit, Ok); nombe (Rk); mukerete (Rum)

[394 records from 152 (14%) squares]



A medium-sized to large tree with a rounded crown. BARK dark grey, rough, fissured. LEAVES simple, **oblong-elliptic**, about 70 mm long; shiny, dark green above; paler below, with a very prominent midrib; **lateral veins forming herring-bone pattern**. FLOWERS small, greenish yellow. FRUIT almost cylindrical, up to 20 mm long; fleshy, yellow-orange when ripe; brown, crinkly, raisin-like when dry.

Flowers are easily overlooked, but fruit is conspicuous when ripe.

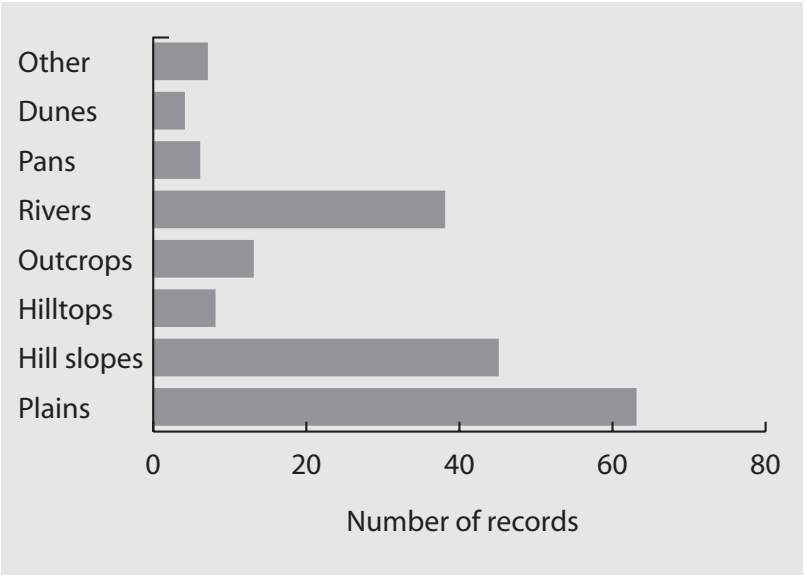


DISTRIBUTION & ABUNDANCE

Uncommon to common north of 21° S, but absent from large areas within this range, particularly from areas of deep sand. Common to occasionally abundant in the Cuvelai.

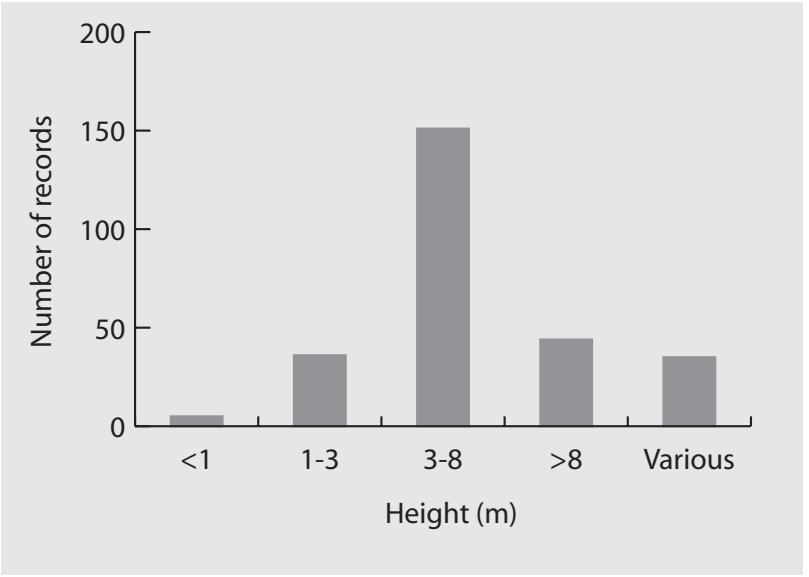
HABITAT

Found in various habitats but mainly on plains, hill slopes and river banks; recorded on rocky outcrops in the north-west and along river banks in the north-east. Substrates include sand, loam, sandy clay, gravel, dolomite ridges and calcareous soils.



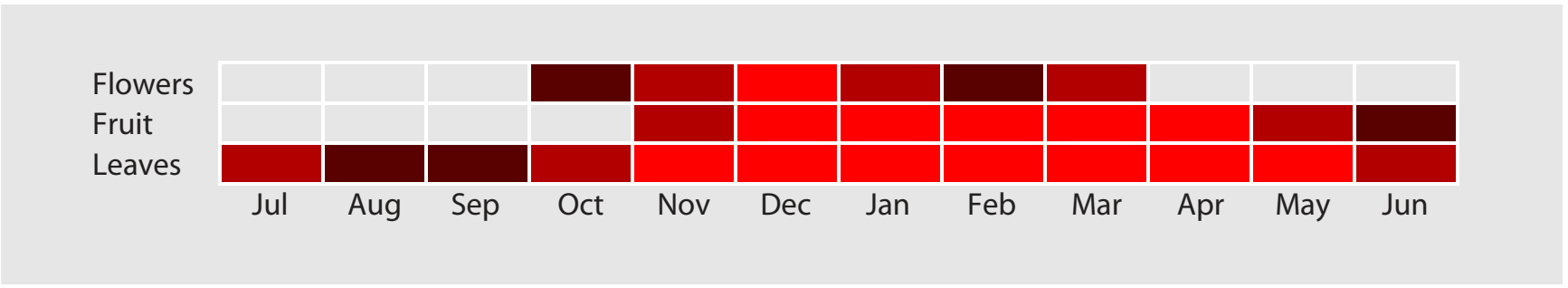
GROWTH FORM

Generally a tree 3–8 m high, but sometimes over 8 m. There were not many records of young trees.



ANNUAL CYCLE

FLOWERS peak in December, with a smaller peak in March (March flowering occurred across its range in two of the six years). FRUIT November to June. LEAVES deciduous, but always some individuals with leaves; new leaves in October.



GENERAL

This species has many uses. The fruit is high in sugar and contains vitamin C. Large trees, which are left when woodlands are cleared for fields, are protected for their fruit for home use and market. It is eaten fresh, or dried and stored for use in the dry season; dried fruit have a date-like flavour. Fresh fruit is fermented to make beer. The bark is used medicinally and for basket dye; the wood is used for furniture, hut construction and other items.

Birds, monkeys and tree squirrels also eat the fruit. The leaves are browsed by game and livestock.

Berchemia discolor has horticultural potential in frost-free areas. Although few young trees were recorded by atlassers, it was recorded that many young ones are found where seeds have been deposited by those eating the fruit (HOR2); the seeds are also dispersed by birds, as demonstrated by the many seedlings beneath big trees of other species.

CONSERVATION CONCERNS

This species is protected by forestry legislation, as well as by traditional Owambo cultures for its fruit and shade. The population does not appear to be in any real danger at the moment, but communities could be encouraged to plant this species.

Cissus nymphaeifolia

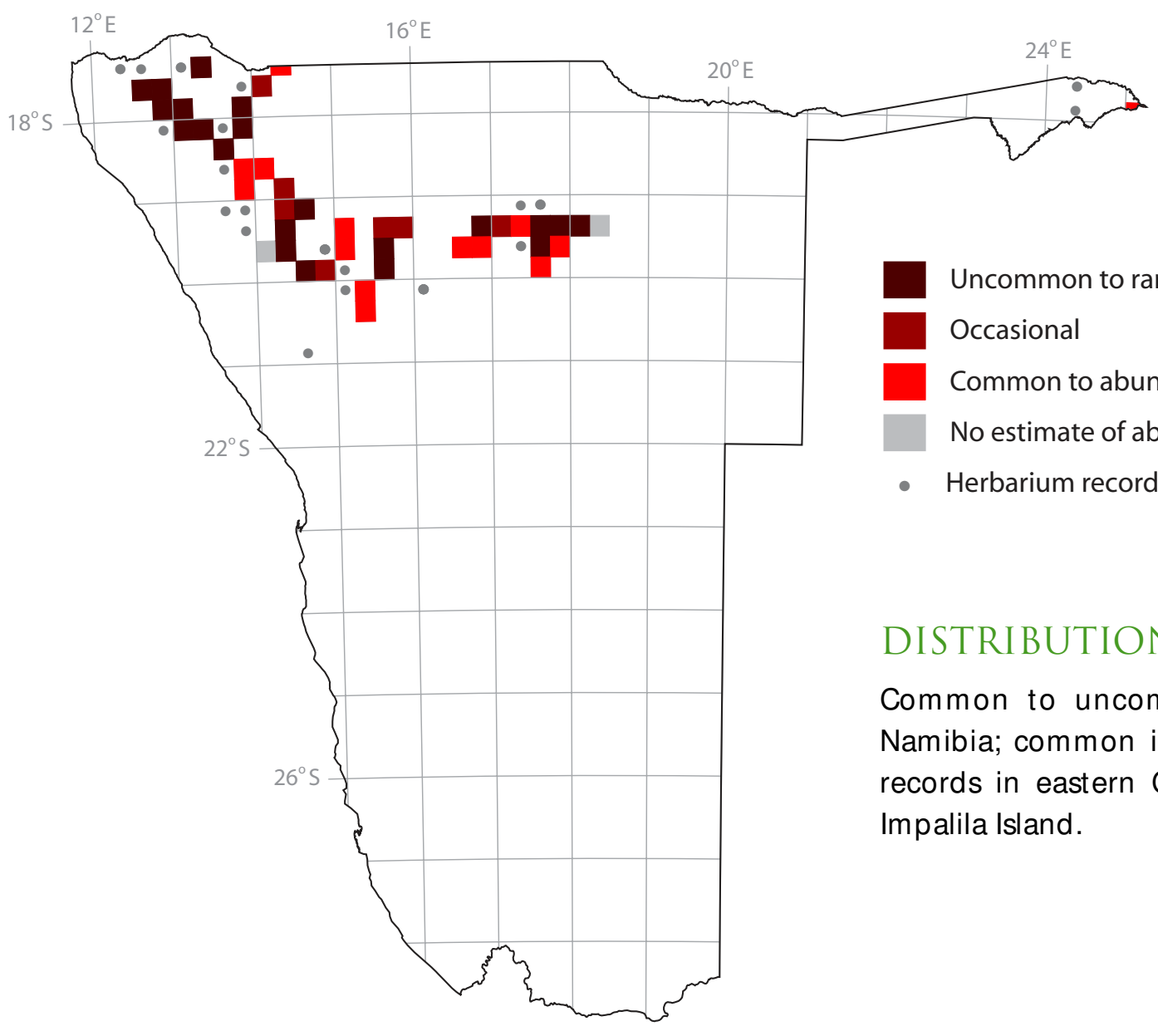
Wild Grape

Omuzenga (H)

[83 records from 44 (4%) squares]



A climbing shrub. BARK light brown. LEAVES simple, fleshy, **almost round**; light green; **toothed** margin; fairly long petiole. FLOWERS in axillary sprays; small, creamy white. FRUIT loose clusters of ovoid berries; red when ripe.

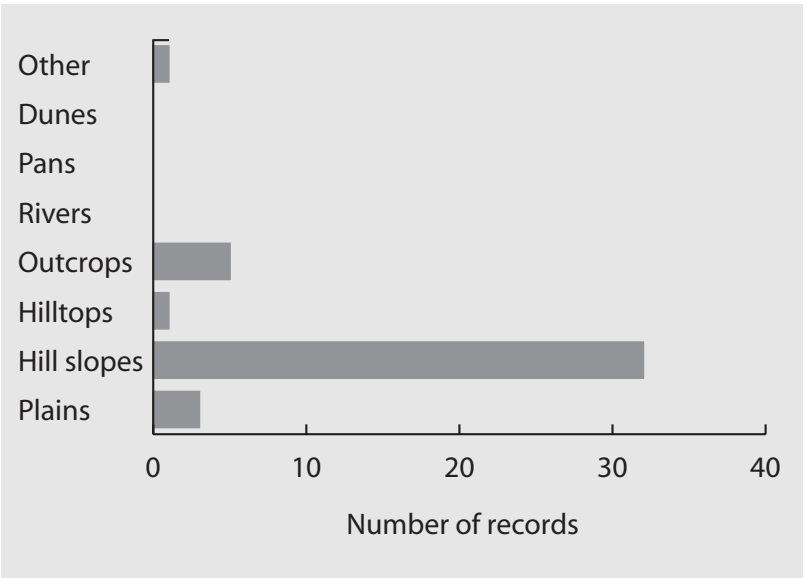


DISTRIBUTION & ABUNDANCE

Common to uncommon in north-western Namibia; common in the Karstveld; isolated records in eastern Caprivi, but common on Impalila Island.

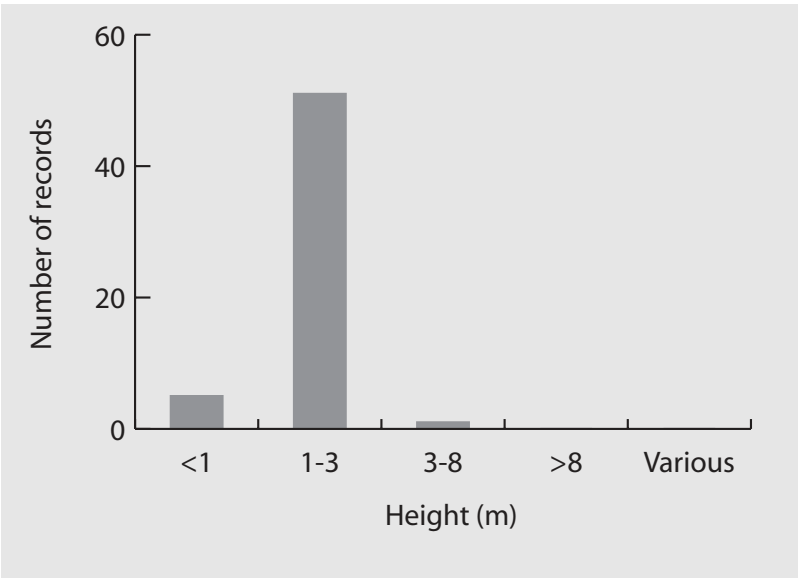
HABITAT

Found on hill slopes, rocky outcrops and plains; on stony or rocky substrates.



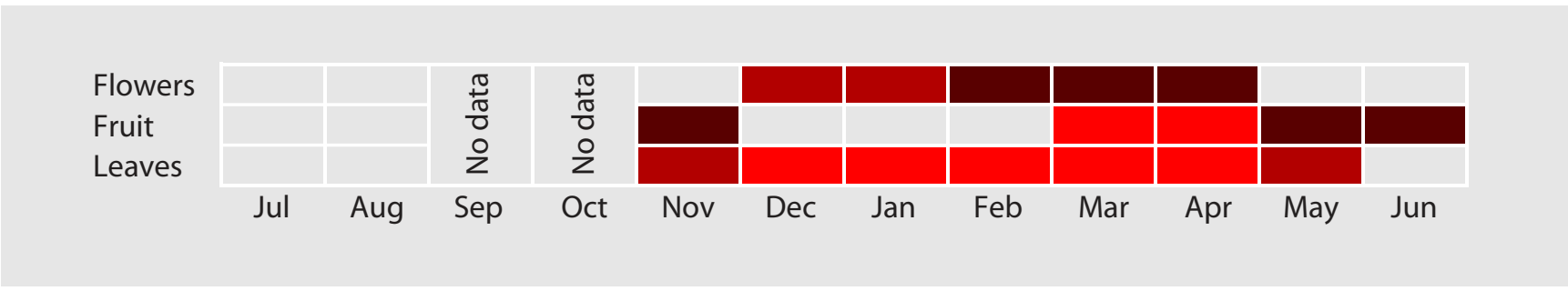
GROWTH FORM

A shrub or climber up to 3 m high.



ANNUAL CYCLE

FLOWERS December to April. FRUIT March to June, with some records in November. LEAVES November to May.



CONSERVATION CONCERNS

None recorded.



Cissus nymphaeifolia, leaf and fruit, B. Curtis

Cyphostemma bainesii

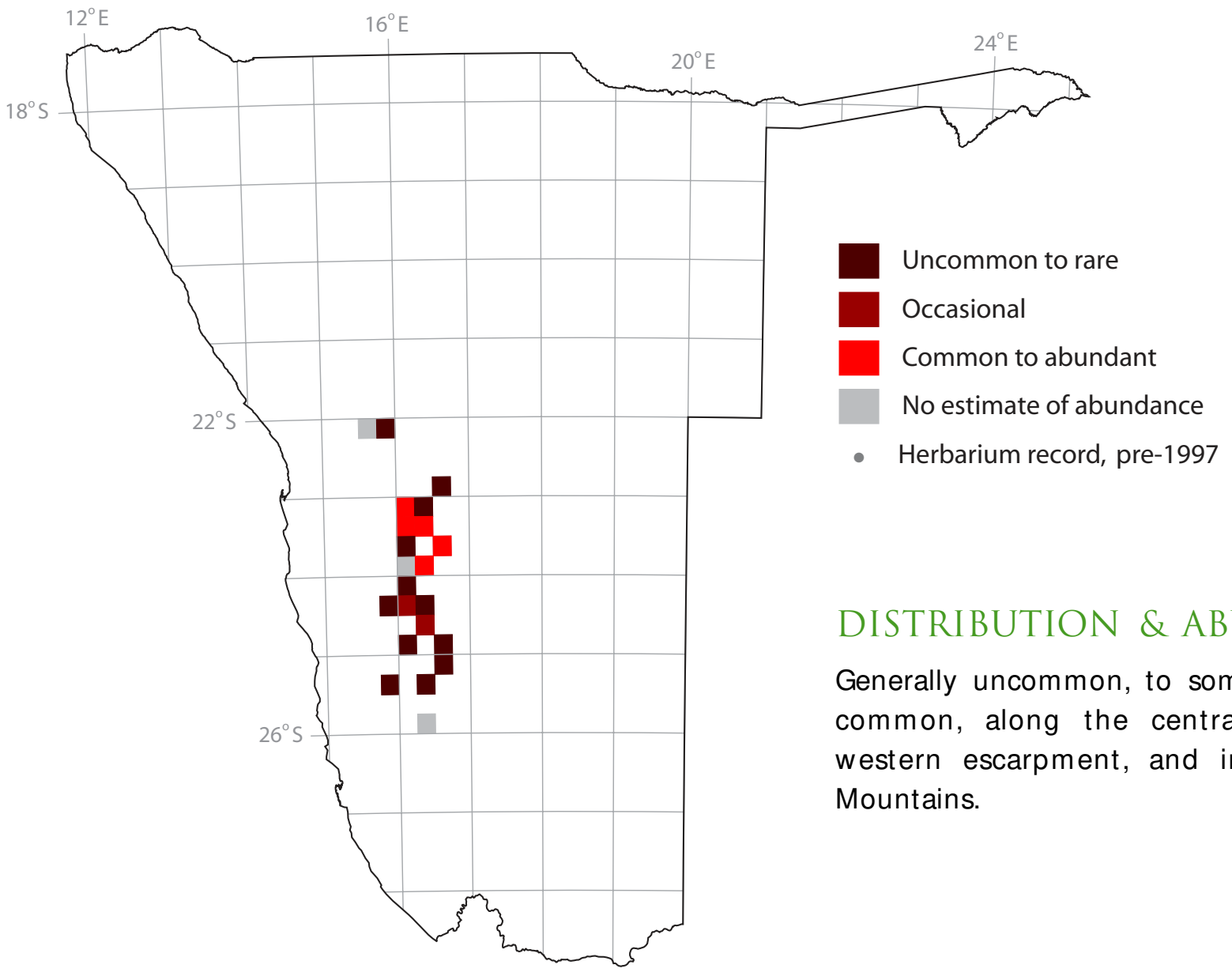
Baines-kobas

Gouty-vine (E); kowas (K)

[40 records from 22 (2%) squares]

Deciduous **dwarf tree, with a very swollen stem**. BARK **smooth, yellowish-orange; peeling in cream-coloured, thin, papery strips**. LEAVES **succulent, trifoliolate**, alternate; petiole up to 20 mm long, thick, succulent; leaflets ovate to oblong, up to 270 x 110 mm; **bright green to bluish green, often with red margin**; margin toothed, apex pointed, base tapering. FLOWERS small, yellowish-green. FRUIT in clusters of red, grape-like berries.

Flowers and fruit are conspicuous.



DISTRIBUTION & ABUNDANCE

Generally uncommon, to sometimes locally common, along the central and south-western escarpment, and in the Erongo Mountains.

GENERAL

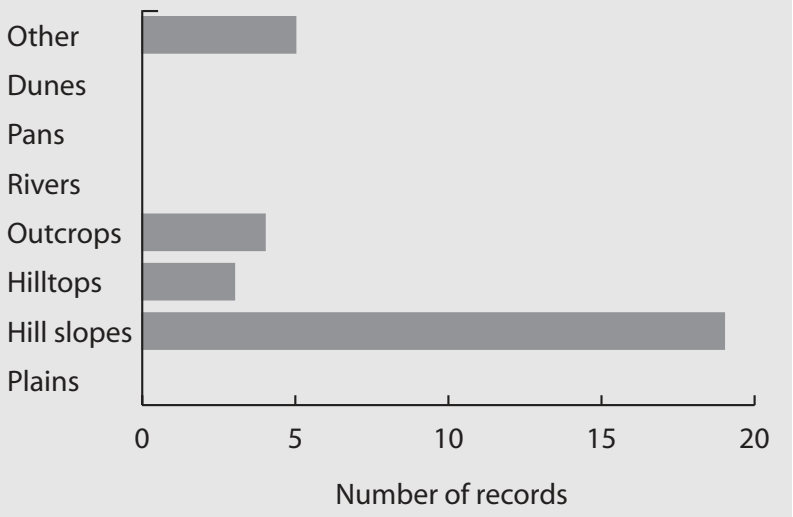
Of horticultural importance.

CONSERVATION CONCERNS

Rare and endemic to Namibia. Protected by the Nature Conservation Ordinance; classified as 'least concern' according to the IUCN criteria (Loots 2005), although potentially threatened by the pachycaul trade.

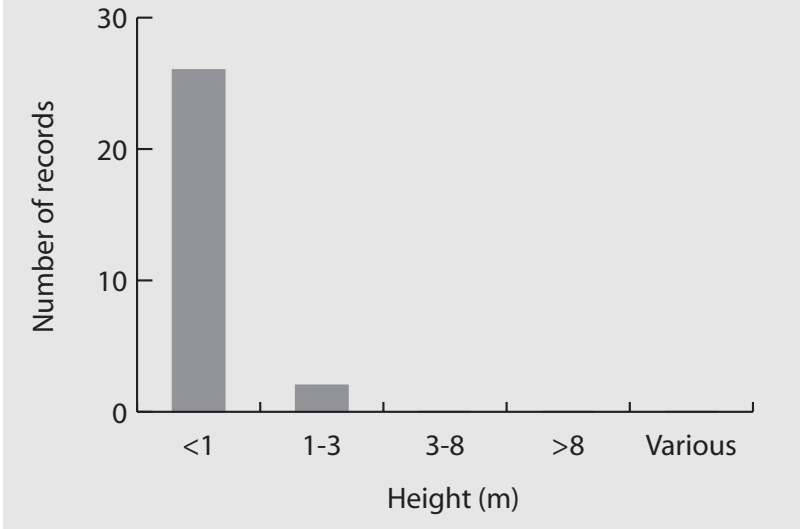
HABITAT

Mostly found on rocky hill slopes; also on cliffs, in kloofs and on rocky outcrops; occasionally other habitats, including near a spring (2416AD, CUR1 and MAN1).



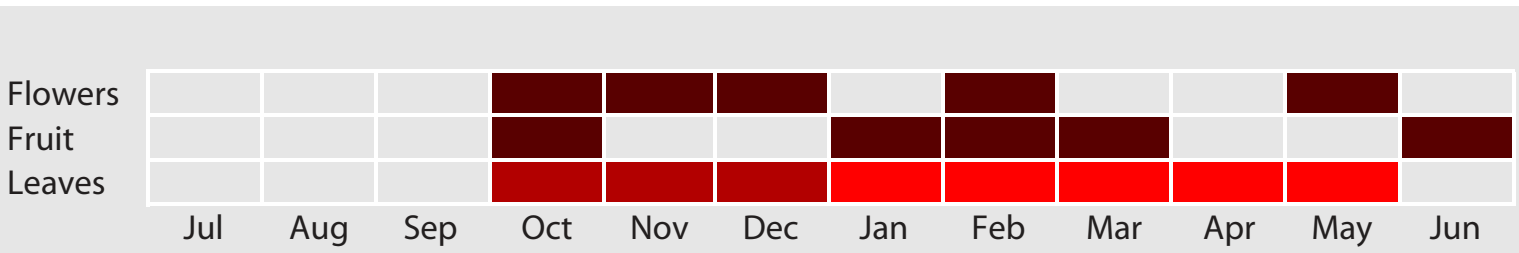
GROWTH FORM

Almost always a shrub or dwarf tree of less than 1 m high.



ANNUAL CYCLE

FLOWERS isolated records in five months. FRUIT isolated records in five months. LEAVES January to May; bare June to September, with young leaves October to December.



Cyphostemma bainesii, L. Burmeister



Cyphostemma currorii

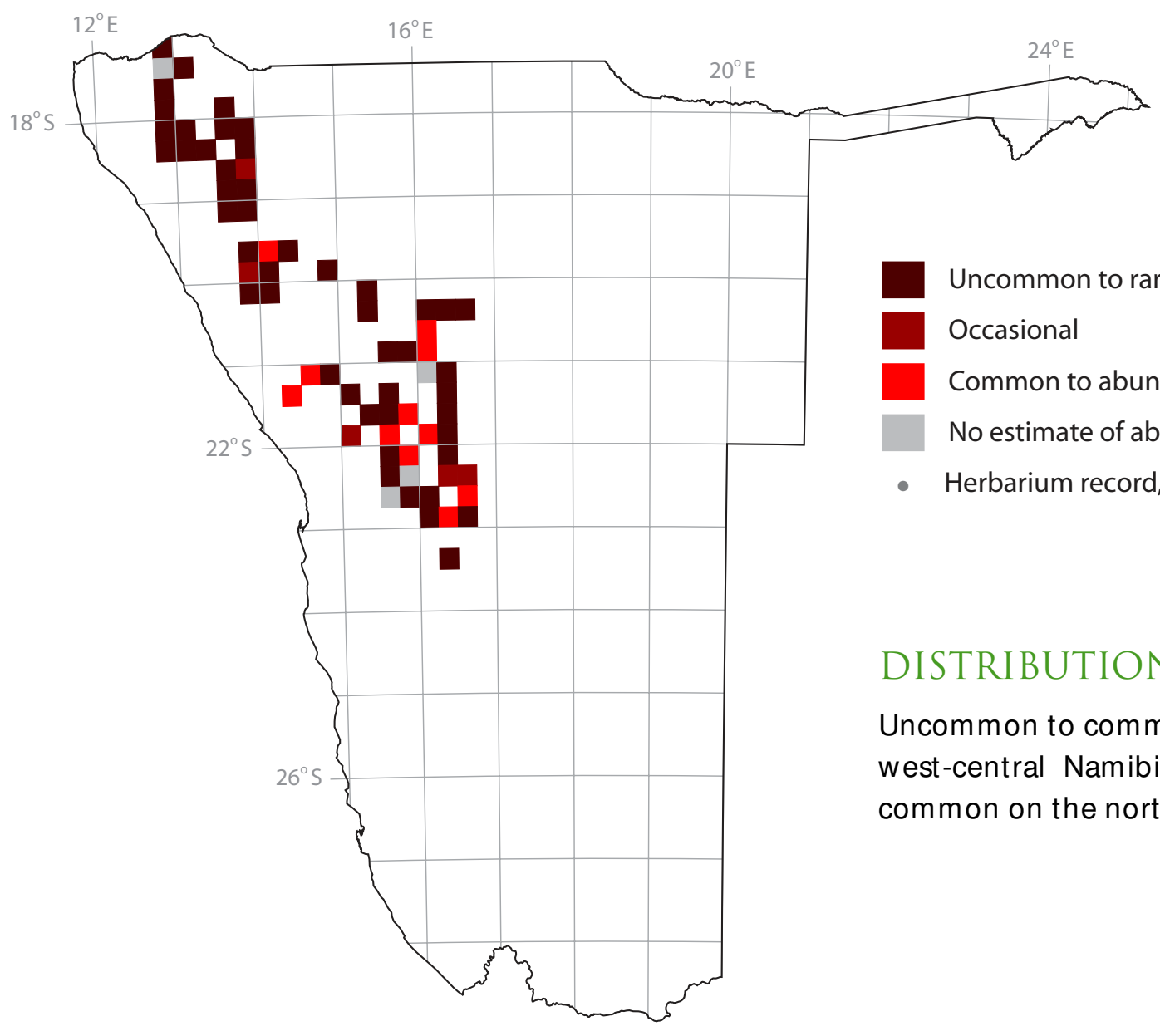
Kobas

Omutindi (H); kowas (K)

[113 records from 67 (6%) squares]



Deciduous **tree, with large succulent trunk**. BARK **smooth, peeling in yellowish papery strips** to expose a greenish underbark. LEAVES **large, succulent, trifoliolate, with long petiole; bright green; margin irregularly toothed, with incisions 1–3 mm deep and spaced at 2–10 mm intervals**. FLOWERS small, yellowish-green. FRUIT in clusters of red, grape-like berries.

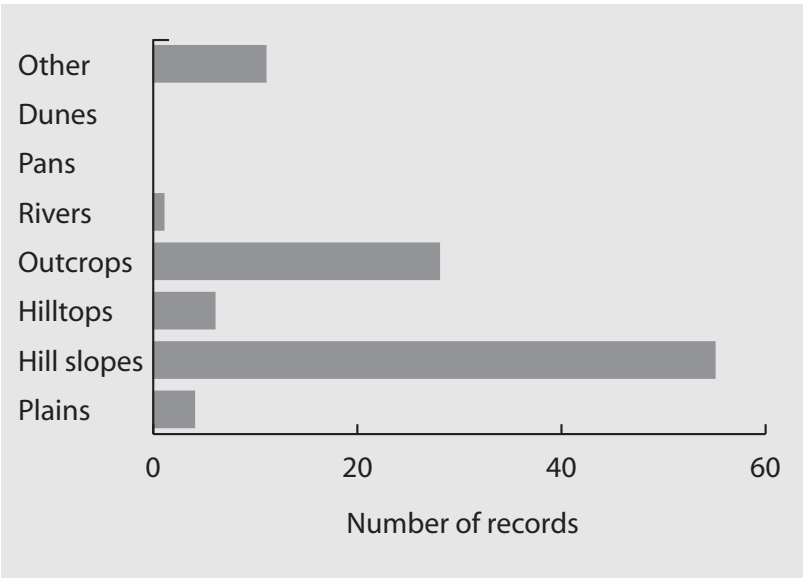


DISTRIBUTION & ABUNDANCE

Uncommon to common in north-western and west-central Namibia; often localised. Most common on the north-central plateau.

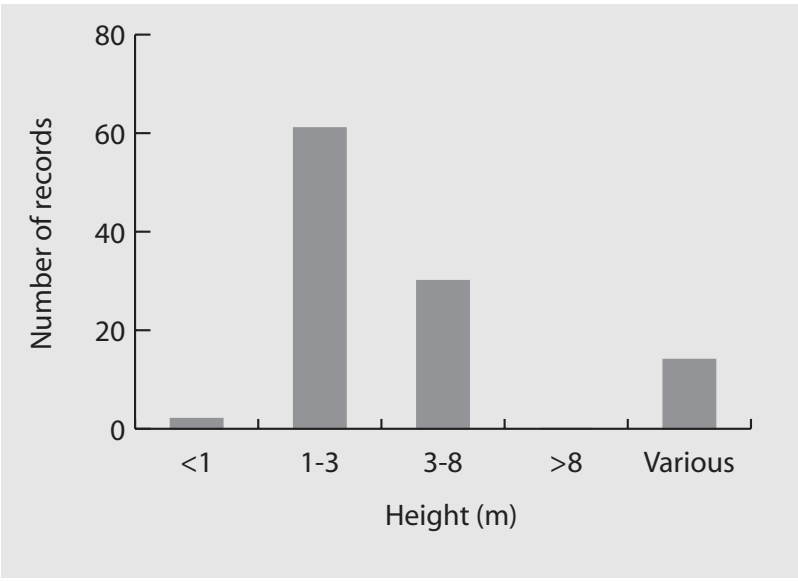
HABITAT

Various, but most often on rocky hill slopes and rocky outcrops, often growing on steep slopes.



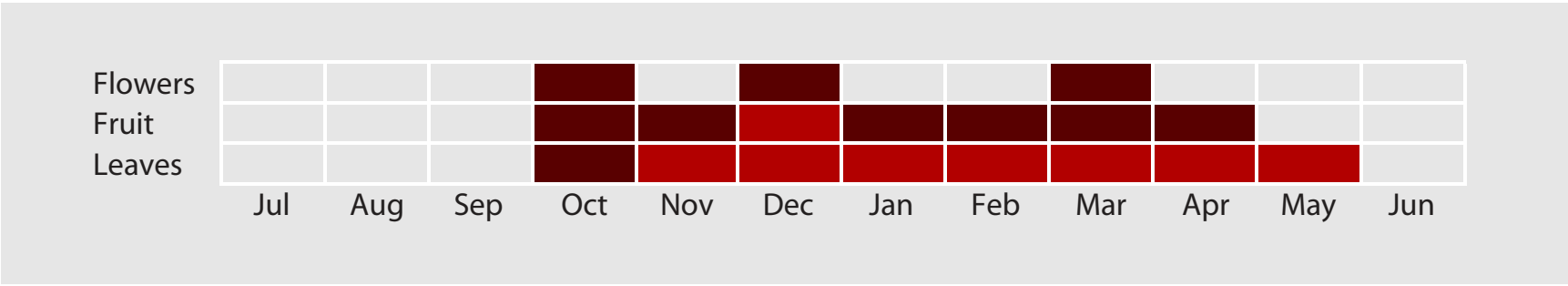
GROWTH FORM

Described as both a shrub and a tree, most often 1–3 m high, but sometimes over 3 m.



ANNUAL CYCLE

FLOWERS recorded in October, December and March, but only on a few individuals each month. FRUIT individual records from October to April, but most often in December. LEAVES October to May; bare from June to September, with young leaves October to December.



GENERAL

The berries contain oxalic-acid crystals which cause extreme irritation of the mouth and throat if eaten. The outer, papery pieces of bark are used to carry honeycombs. The sap is used to cure mange in livestock and skin diseases in people. Of great horticultural importance for dry gardens as it grows well from seeds or cuttings. Of considerable interest to specialist pachycaul collectors, with a potential export market.

CONSERVATION CONCERN

Potentially threatened by the pachycaul trade. Protected by the Nature Conservation Ordinance.



Cyphostemma currorii, Kaokoveld, B. Curtis

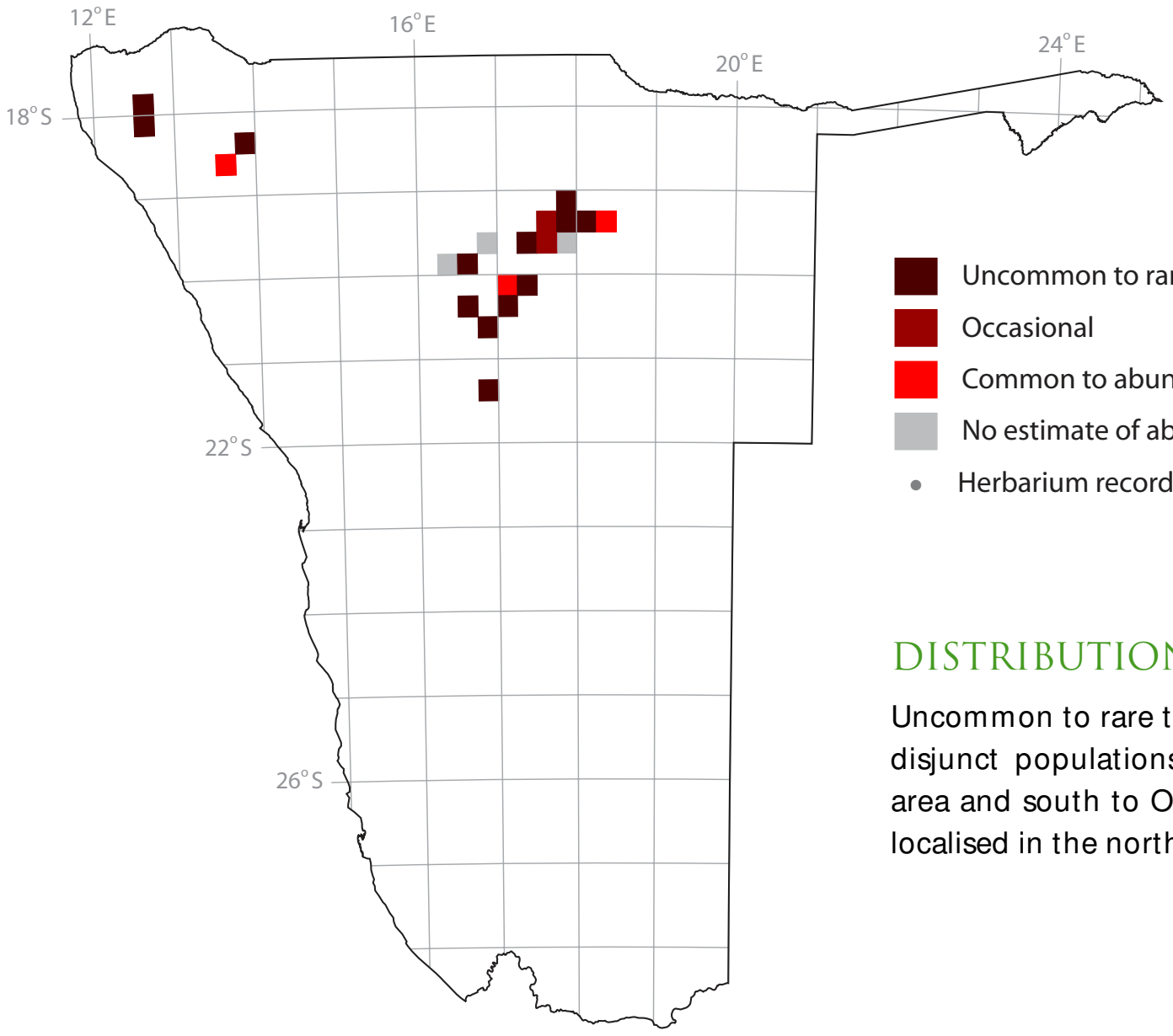
Cyphostemma juttae

Blue Kobas

Kowas (K)

[57 records from 22 (2%) squares]

Deciduous shrub or dwarf tree, with a thick, **swollen stem**. BARK **pale cream, smooth; peeling in thin, papery pieces to reveal green underbark**. LEAVES **large, succulent, simple and often deeply lobed when young, but becoming trifoliolate** with various intermediate stages; **petiole winged** in mature leaves; **blue-green**, with scattered prickles along the midrib below; margin coarsely toothed; base of **lateral leaflets symmetric, running into petiolules**. INFLORESCENCE armed with prickles. FLOWERS small, yellowish-green. FRUIT in clusters of grape-like berries; red to purplish-black when ripe.



DISTRIBUTION & ABUNDANCE

Uncommon to rare to locally common, in two disjunct populations, mainly in the Tsumeb area and south to Otjiwarongo, but also very localised in the north-west.

GENERAL

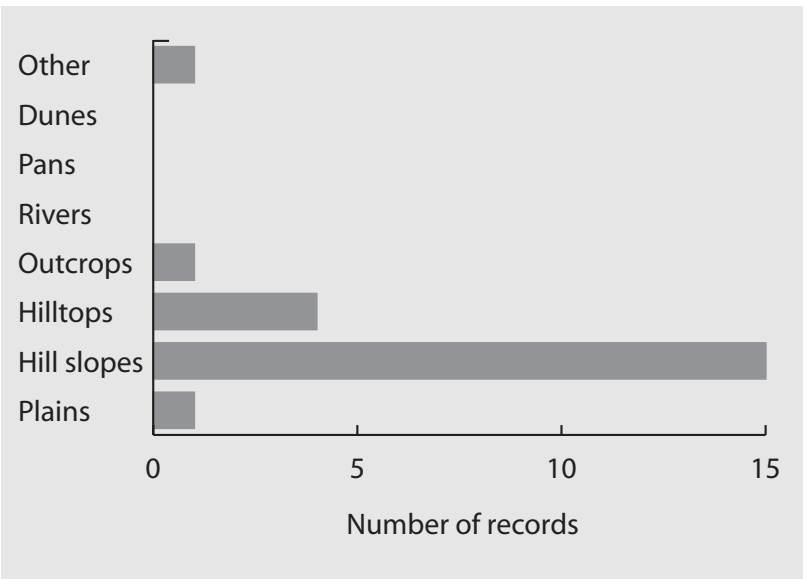
On two occasions an atlasser (ELL1) saw these plants growing as shrubs (<1 m tall) in the holes of live mopane tree trunks (1916DC). This plant is of great horticultural potential for dry gardens as they are appealing and grow easily from seed and cuttings.

CONSERVATION CONCERN

Endemic, with a very small population, and vulnerable to illegal collection for the pachycaul trade. However, recently assessed to be of 'least concern' according to IUCN criteria (Loots 2005). Protected by the Nature Conservation Ordinance.

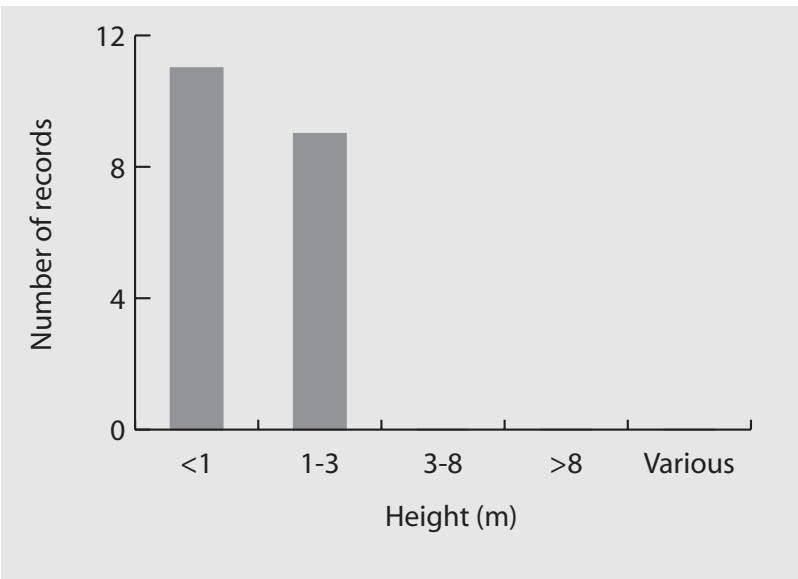
HABITAT

Mostly found on hill slopes and hilltops.



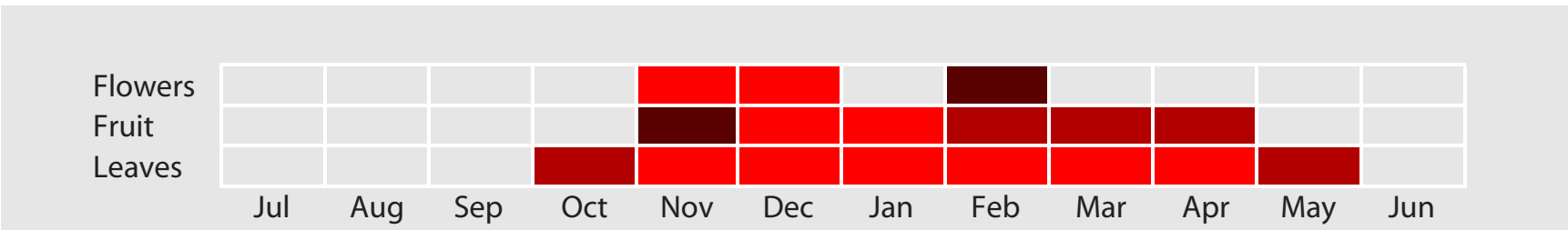
GROWTH FORM

A shrub or dwarf tree less than 3 m tall, but often lower than 1 m.



ANNUAL CYCLE

FLOWERS November and December, mostly. FRUIT November to April, but mainly December and January. LEAVES November to April, with most plants bare from June to September; new leaves produced in October.



Cyphostemma juttae, Kaokoveld, A. Cunningham

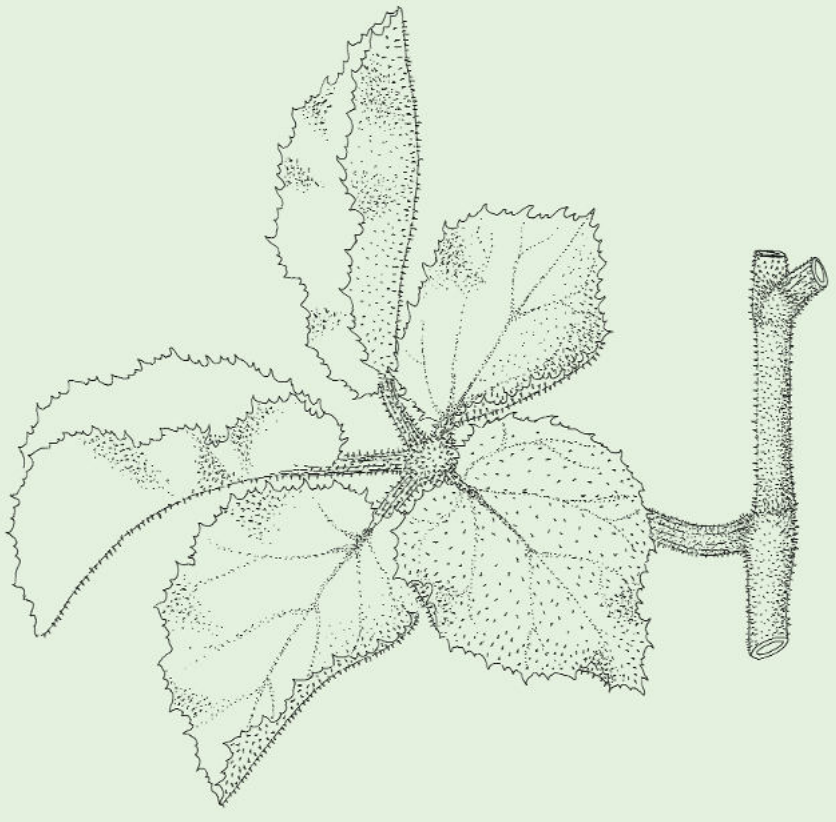


Cyphostemma uter

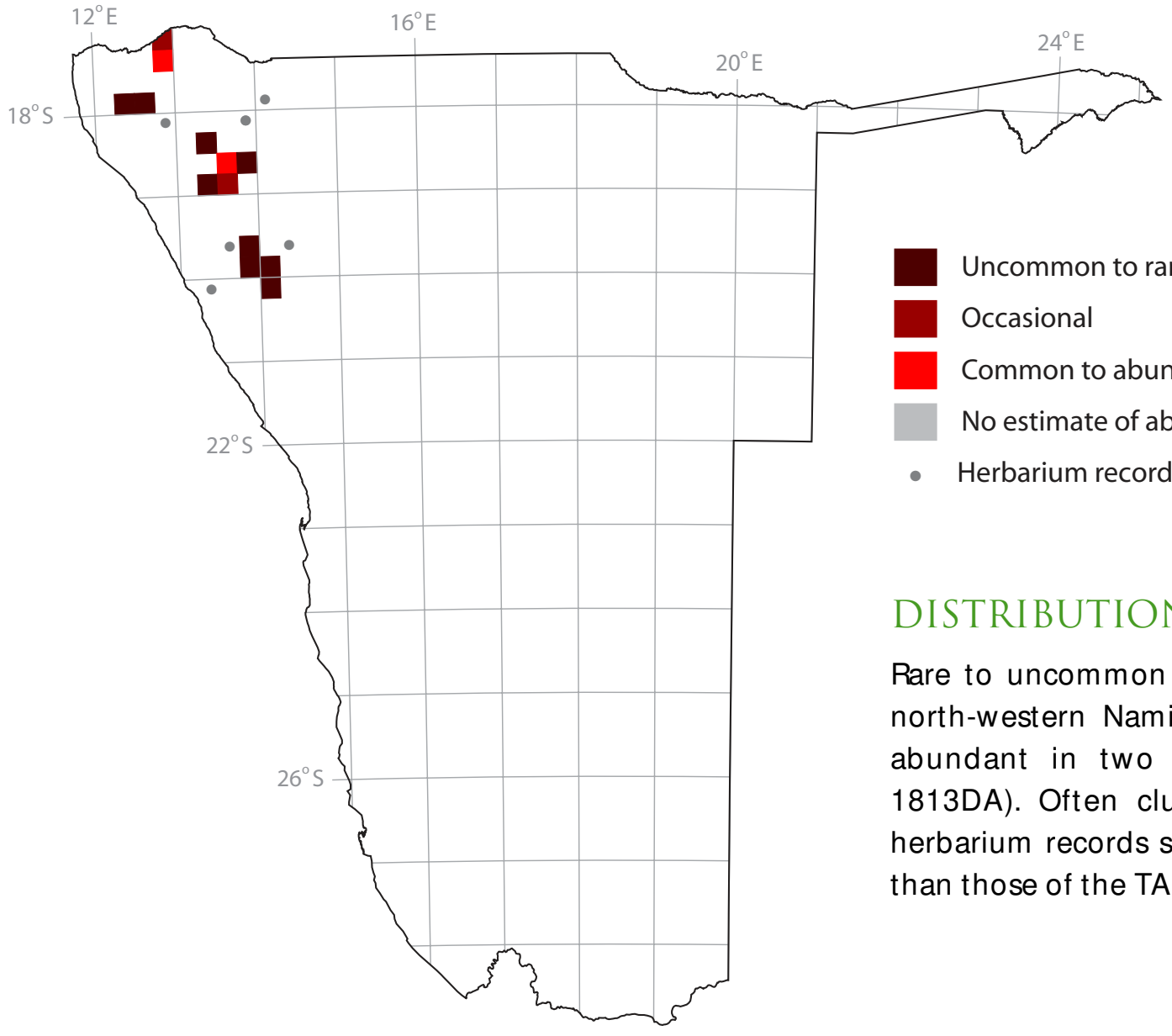
Kaoko Kobas

Omutindi (H); kowas (K)

[18 records from 11 (1%) squares]



Deciduous shrub or dwarf tree with **succulent stem**; much-branched from ground level. BARK **yellow to white**, smooth, horizontally grooved; **flaking off in thin, papery strips**. LEAVES **five-palmate, succulent; small** compared to other *Cyphostemma spp.*; conspicuous **glandular hairs; longitudinally folded** with apex somewhat recurved; light green, **finely woolly; margin irregularly toothed, fringed with hairs**. FLOWERS small, yellowish-green. FRUIT as clusters of red, grape-like berries.



DISTRIBUTION & ABUNDANCE

Rare to uncommon in scattered localities in north-western Namibia. Locally common to abundant in two localities (1712BD and 1813DA). Often clumped together. Earlier herbarium records show a wider distribution than those of the TAP.

HABITAT

Mostly found on rocky hill slopes.

GROWTH FORM

A shrub or dwarf tree, usually less than 1 m high, occasionally over 1 m. The leaves of the population in the valley to the west of the Baynes Mountains have exceptionally large leaves. This could be due to the fact that they are growing in shaded conditions under other trees.

ANNUAL CYCLE

Observations made in December, March, April and May. FLOWERS August to November. FRUIT November, December, February and March. LEAVES present in every month that observations were made.

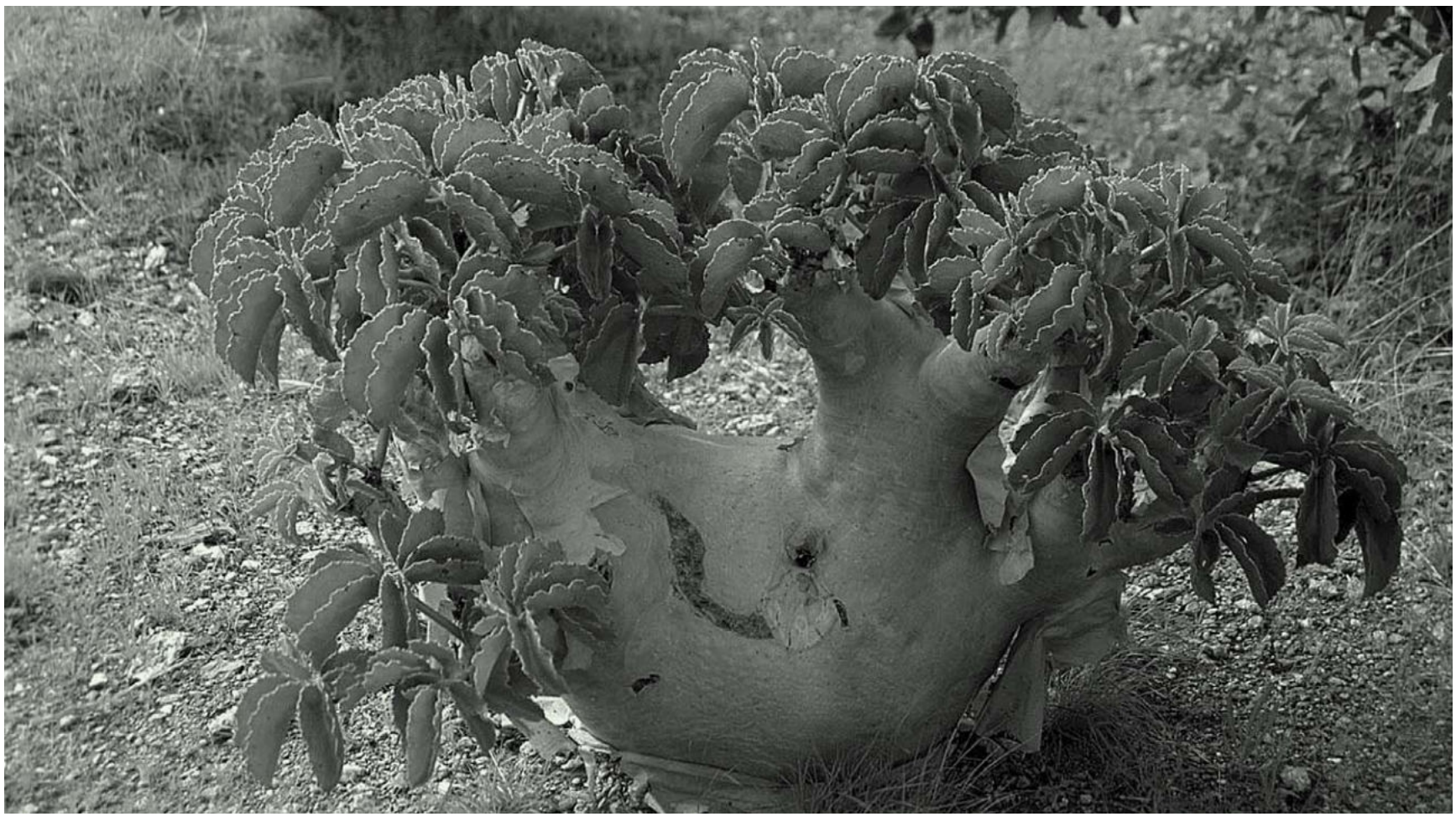
GENERAL

The peeling papery bark is used to carry honeycombs. The berries contain oxalic-acid crystals which cause severe mouth and throat irritation if eaten. Of horticultural potential for dry gardens.

CONSERVATION CONCERNS

Restricted to the greater Kaokoveld region including southern Angola. Vulnerable to horticultural overexploitation and illegal collection for the pachycaul trade. Protected by the Nature Conservation Ordinance. Recently assessed to be of 'least concern' according to IUCN criteria (Loots 2005). The lack of reconfirmation of earlier herbarium localities by the TAP could be due to atlassers not having been to those areas, or to a loss of the species there.

Cyphostemma uter, Kaokoveld, B. Curtis



VITACEAE | GRAPE FAMILY

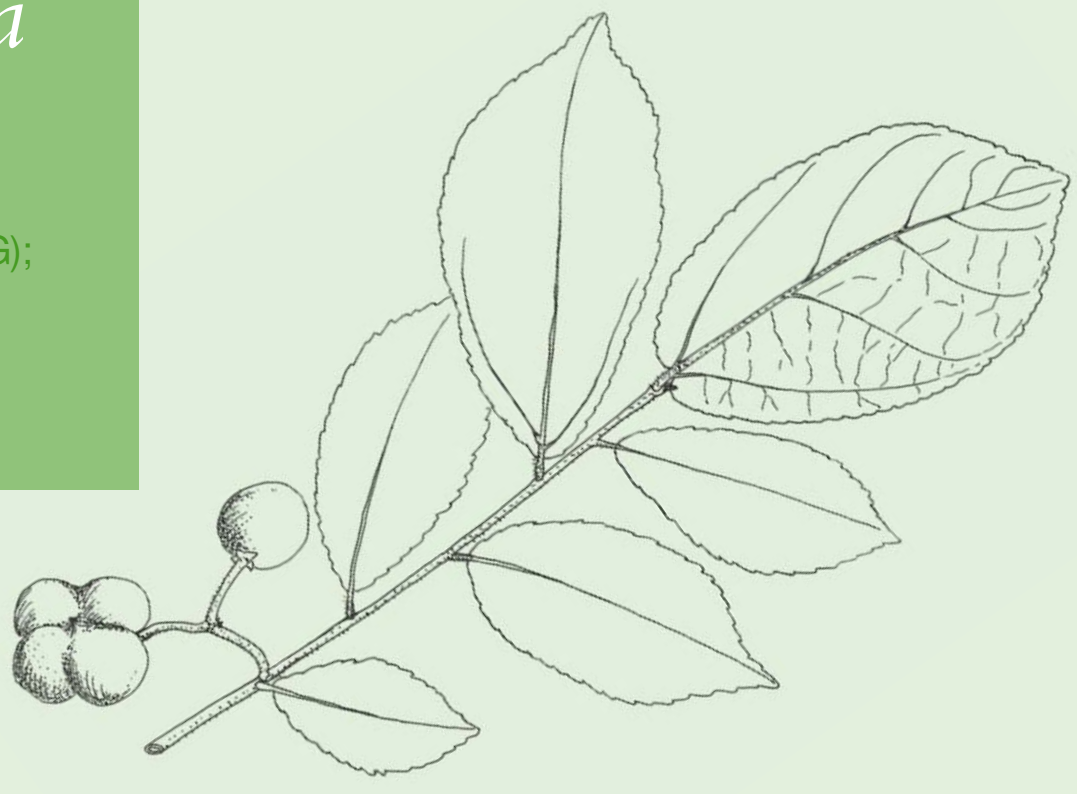
This family is composed mostly of climbing shrubs or woody vines with tendrils opposite the leaves. The genus *Cyphostemma* has four species with thick, succulent stems (pachycauls). The flowers are small and greenish-yellow, and generally in sprays held above the leaves. The fruit grow in bunches of attractive red, fleshy berries which are inedible due to the presence of crystals of oxalic acid.

Grewia avellana

Muzunzunvani

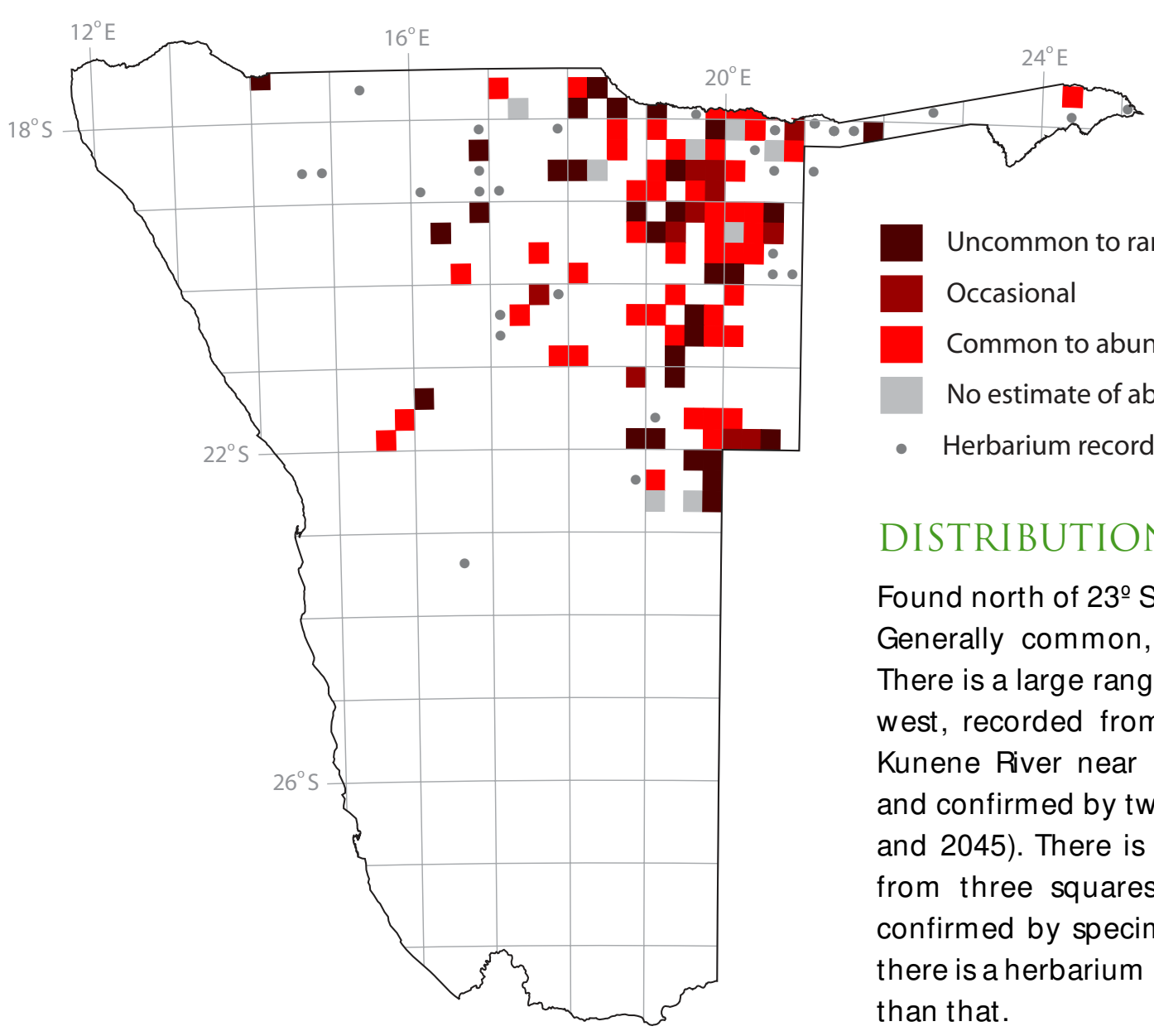
Kerbblättriger Rosinenstrauch (G); //khoos (K); makopa (Rk)

[141 records from 101 (9%) squares]



Shrub. BRANCHLETS yellow-brown when young, with dense, rough hairs. LEAVES dark green to **yellow-green with rough hairs**. FLOWERS **white**; terminal or leaf-opposed, larger than those of most other Namibian grewias. FRUIT **a four-lobed berry, 15–25 mm in diameter; red-brown** when ripe, smooth, shiny, with a few bristles.

Flowers and fruit are conspicuous.

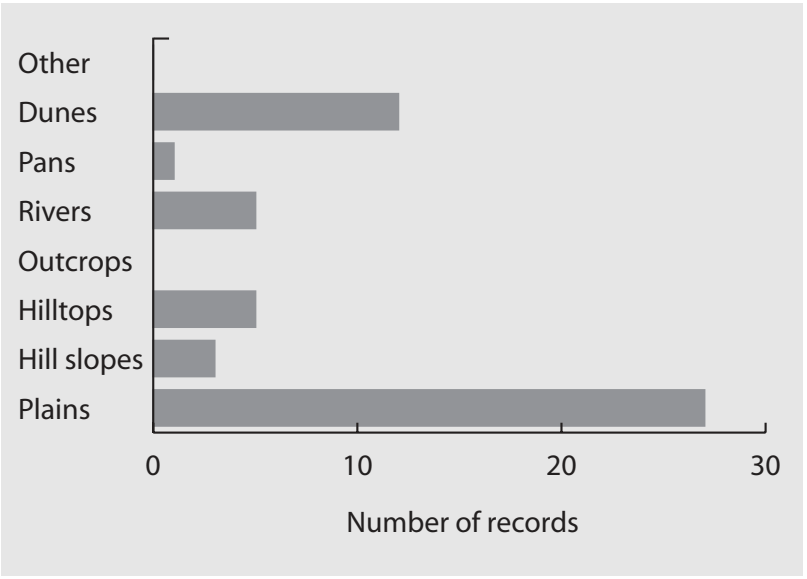


DISTRIBUTION & ABUNDANCE

Found north of 23º S, mainly in the north-east. Generally common, sometimes uncommon. There is a large range extension to the north-west, recorded from three localities on the Kunene River near Ruacana (1714AC, GRE3) and confirmed by two specimens (CUR1/1903 and 2045). There is another range extension from three squares further south, not yet confirmed by specimens, but accepted since there is a herbarium record even further south than that.

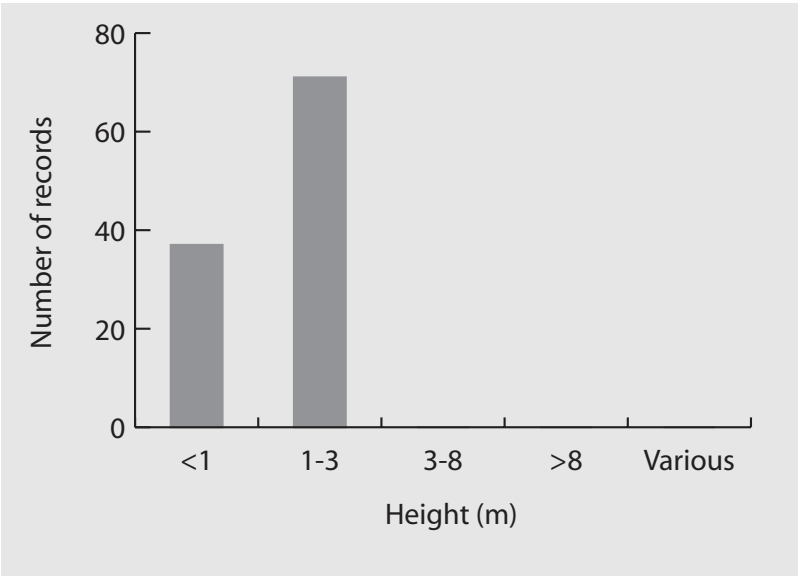
HABITAT

Various habitiats, but mostly found on sandy plains and dunes.



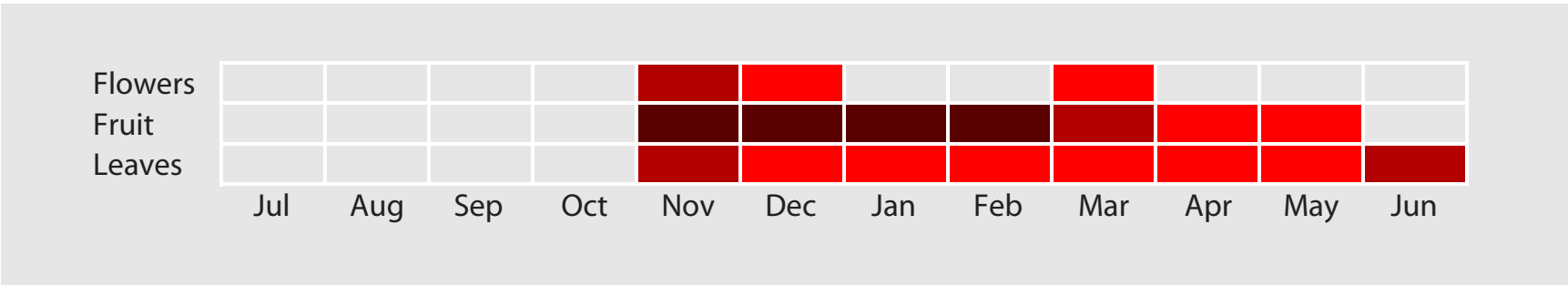
GROWTH FORM

A shrub, mostly in the 1–3-m height class.



ANNUAL CYCLE

FLOWERS in November and December and in March, with single records in other months. FRUIT from November to May, but mostly from April to May, with old fruit recorded until September. LEAVES mainly from December to May, with young leaves in November.



GENERAL

The fruit are edible, and used ornamentally; the roots are used to treat stomach ailments.

CONSERVATION CONCERNS

None recorded.



Grewia avellana, flowers, C. Hines

Grewia bicolor

Omundjembere

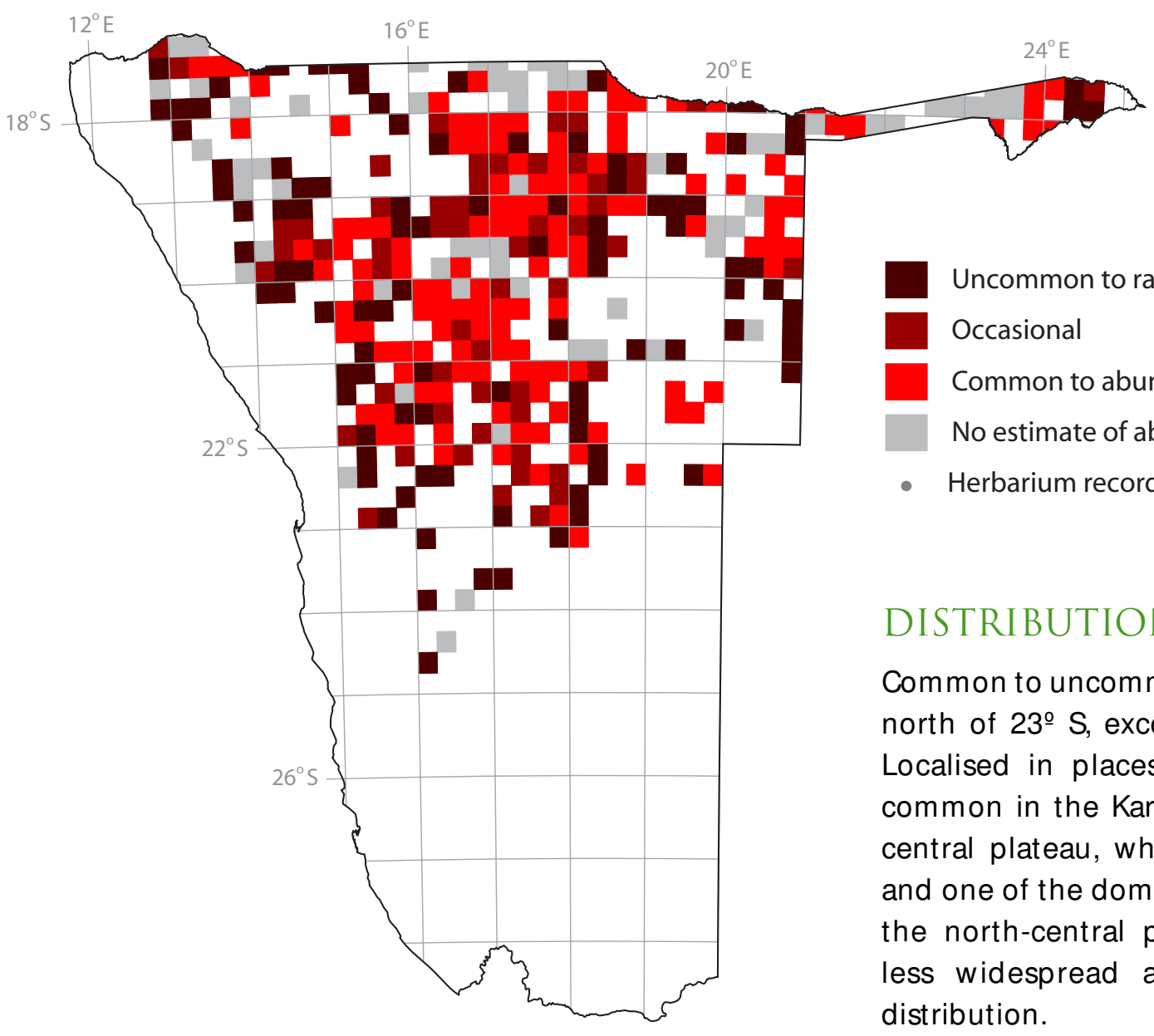
Two-coloured raisin-bush (E); basterrosyntjie (A); Zweifarbiger Rosinenstrauch (G); muwhana (L); omuhonga (O); ngogo (Rk, Rum)

[751 records from 355 (33%) squares]



Slender shrub or small tree. LEAVES held horizontally in one plane or **drooping**; dark green above; **grey to white, densely woolly below**; margin coarsely toothed; **base asymmetrically blunt** to slightly heart-shaped. FLOWERS yellow, **2–3 per stalk**. FRUIT a 2–3-lobed berry, 3–5 mm in diameter; yellow or orange to red-brown when ripe; **on a branched stalk**.

Flowers and fruit are conspicuous. Small-leaved forms are easily confused with *G. flava*, but may be distinguished by the branched flower and fruit stalks and more drooping leaves. Large-leaved forms may be confused with *G. falcistipula* and *G. subspathulata*. *Grewia falcistipula* never has bilobed fruit, generally a more asymmetrical, cordate-based leaf and its characteristic sickle-shaped stipules are a give-away, when present. *Grewia subspathulata* generally has much larger leaves than those of *G. bicolor*.

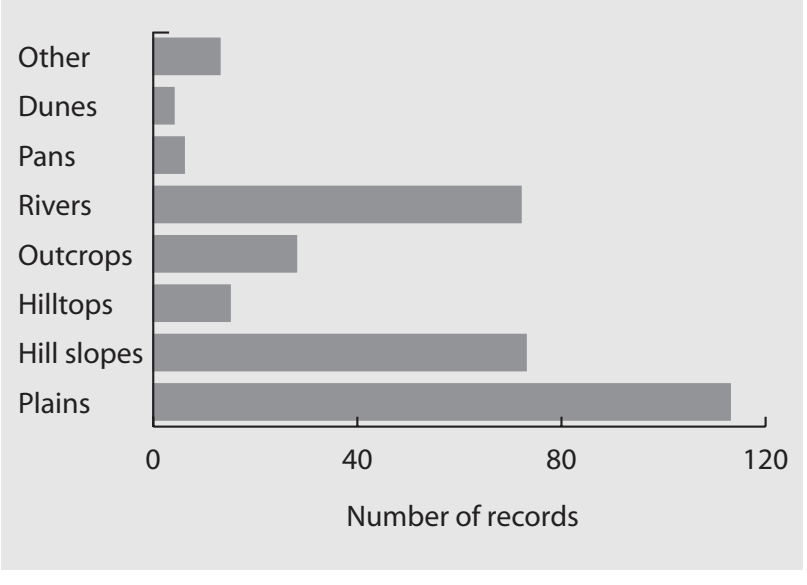


DISTRIBUTION & ABUNDANCE

Common to uncommon and fairly widespread north of 23º S, except in the Namib Desert. Localised in places. Most widespread and common in the Karstveld and on the north-central plateau, where it is often abundant and one of the dominant species in places on the north-central plateau. Uncommon and less widespread along the edges of its distribution.

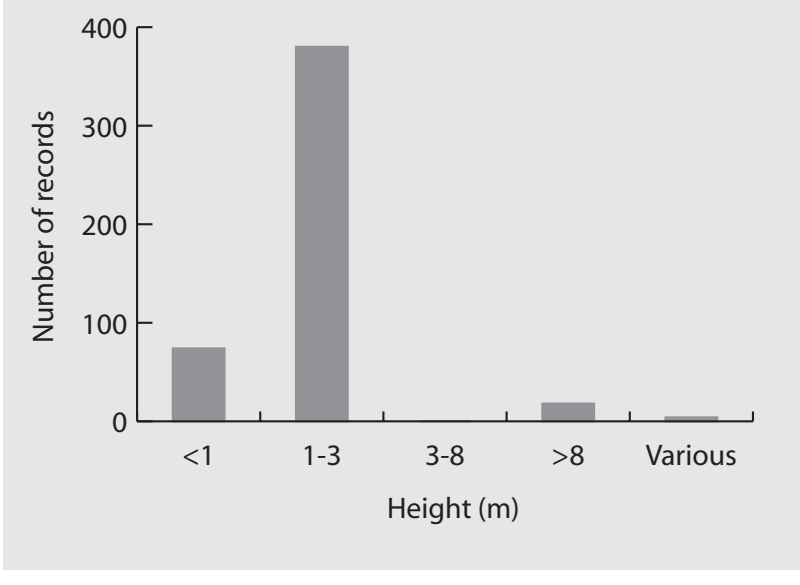
HABITAT

Found in most habitats, but mainly on plains, along dry rivers and on hill slopes; sometimes on rocky outcrops, especially in the central highlands. Substrates included sand, calcrete, stones and rock.



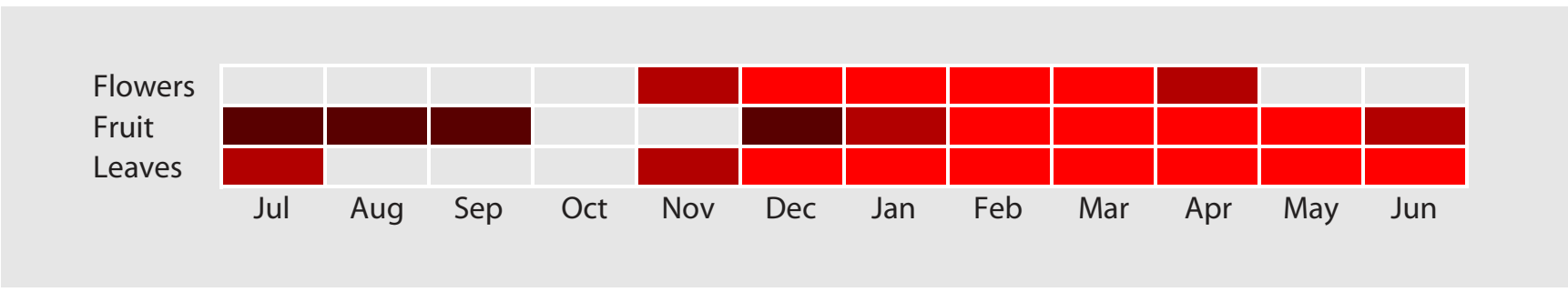
GROWTH FORM

Usually a shrub (98% of records) up to 3 m high (96%); occasionally a shrub or tree (2%) over 3 m (4%).



ANNUAL CYCLE

FLOWERS November to April. FRUIT mostly January to June, some found most of the year. LEAVES mainly December to June, with young leaves from September to December.

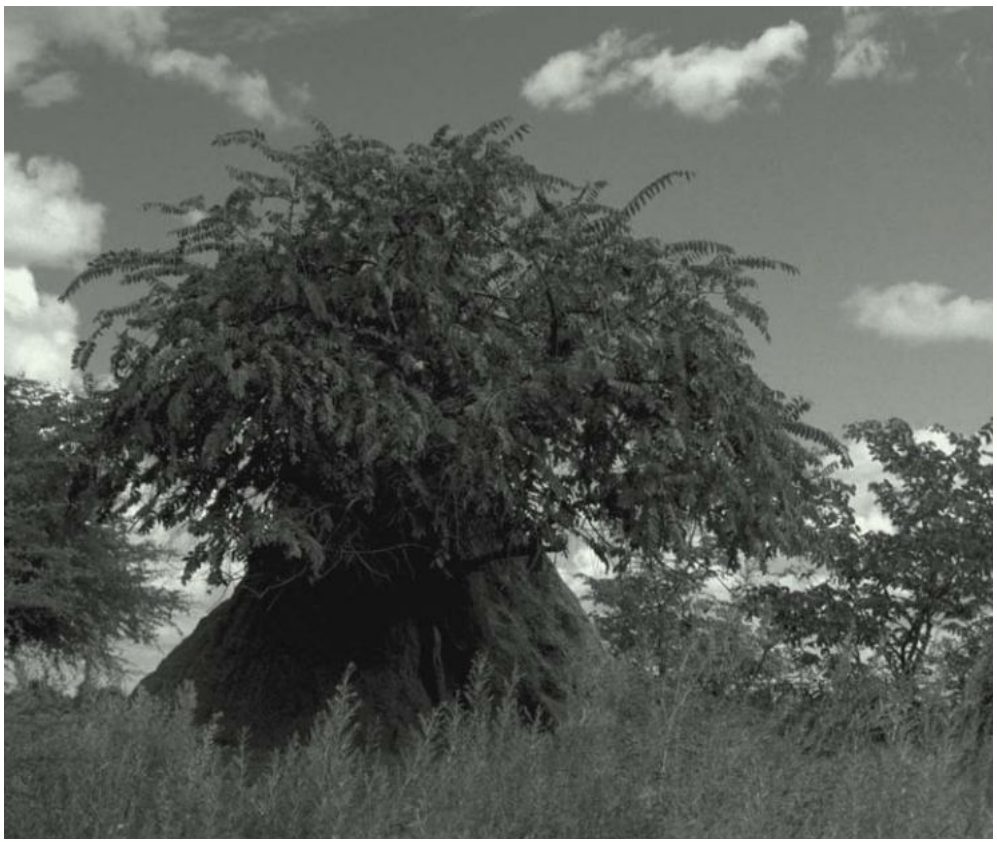


GENERAL

Goats and game browse the leaves; rhino and giraffe browse the leaves and twigs; the fruit is also eaten by animals. People eat the fruit fresh or make an alcoholic beverage from it; excessive consumption of the fruit may cause constipation. The roots are used medicinally.

CONSERVATION CONCERNS

None recorded.



Grewia bicolor growing on termite mound, Oshana Region, B. Curtis

Grewia falcistipula

Mulomolomo

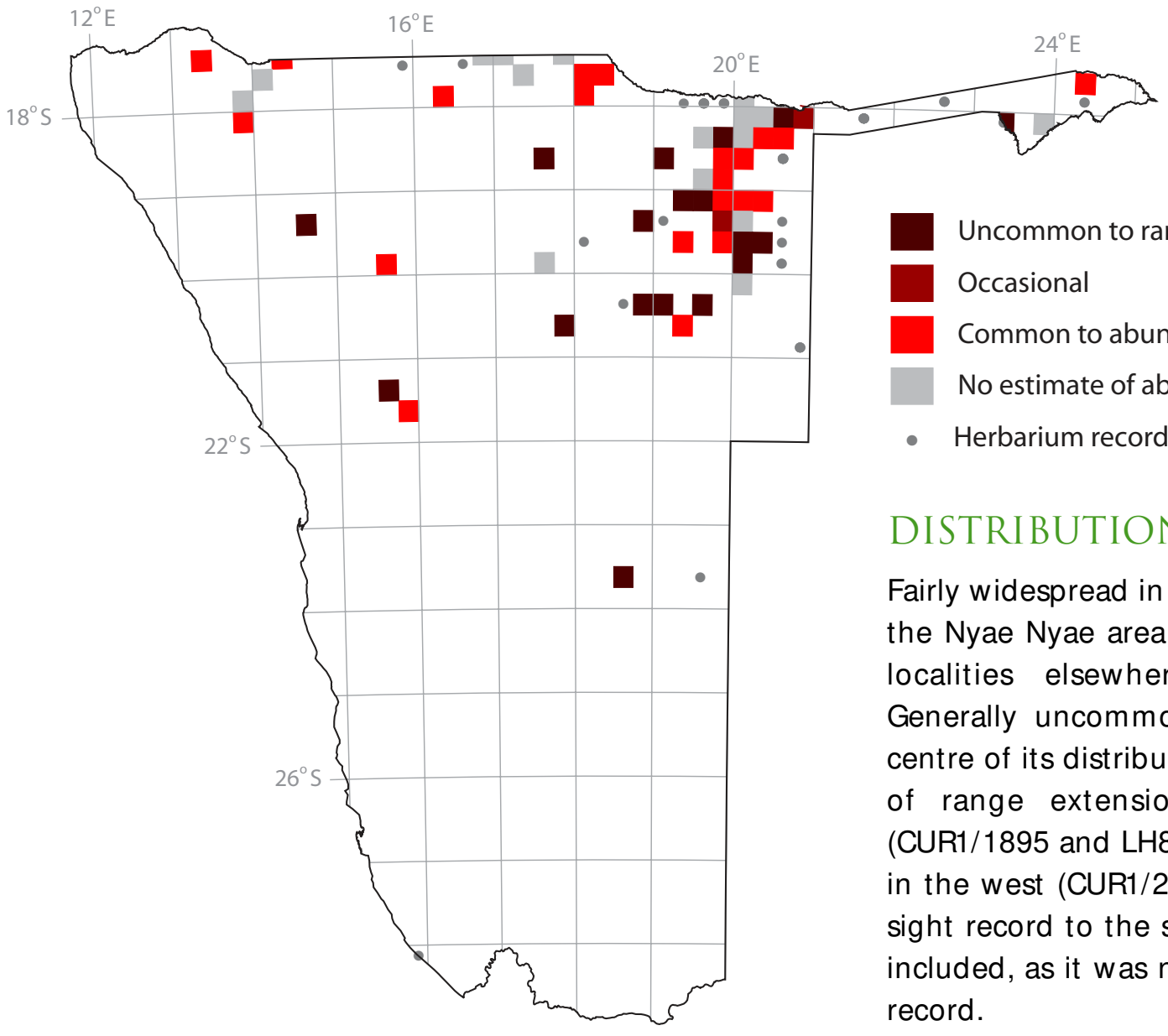
Heart-leaved raisin-bush, sickle-stipule grewia (E); s(h)imaka (Rk, Rum); thimaka (T)

[61 records from 55 (5%) squares]



Lax shrub. BARK of young branchlets with grey, densely woolly covering. STIPULES **large**, deciduous, **sickle-shaped, with a wide base, tapering to the tip**. LEAVES dark green above, with long, soft, hairs; **grey-white, densely woolly below**; base asymmetrically blunt to **practically heart-shaped**. FLOWERS bright yellow, axillary. FRUIT a round, yellow berry, **never lobed**, up to 10 mm in diameter.

Flowers and fruit are conspicuous. When the stipules are present, it cannot be confused with any other species. When the stipules are absent, it can be confused with *G. bicolor*, but it never has the lobed-fruit characteristic of *G. bicolor*.

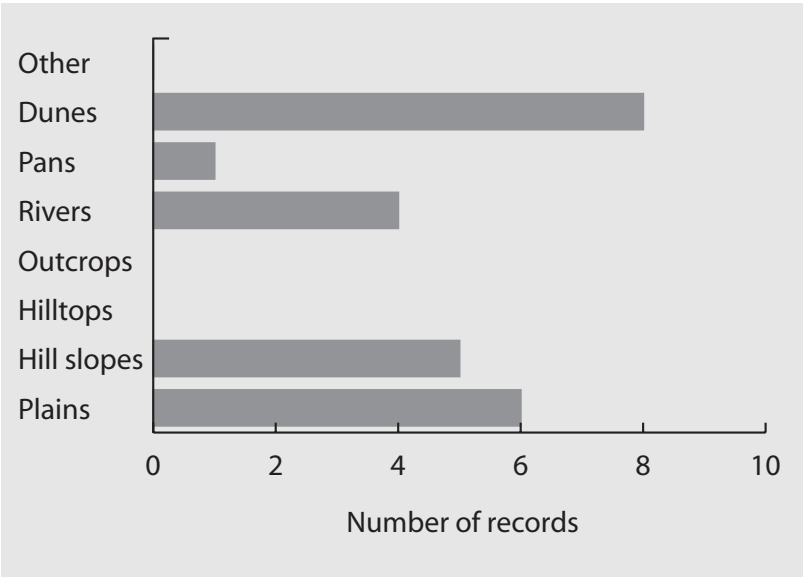


DISTRIBUTION & ABUNDANCE

Fairly widespread in the Kavango Region and the Nyae Nyae area, but also from scattered localities elsewhere in the north-east. Generally uncommon, but common in the centre of its distribution. There are a number of range extensions to the north-west (CUR1/1895 and LH890), as well as elsewhere in the west (CUR1/2155 and 2046; LH975). A sight record to the south (2318DA) has been included, as it was near an earlier herbarium record.

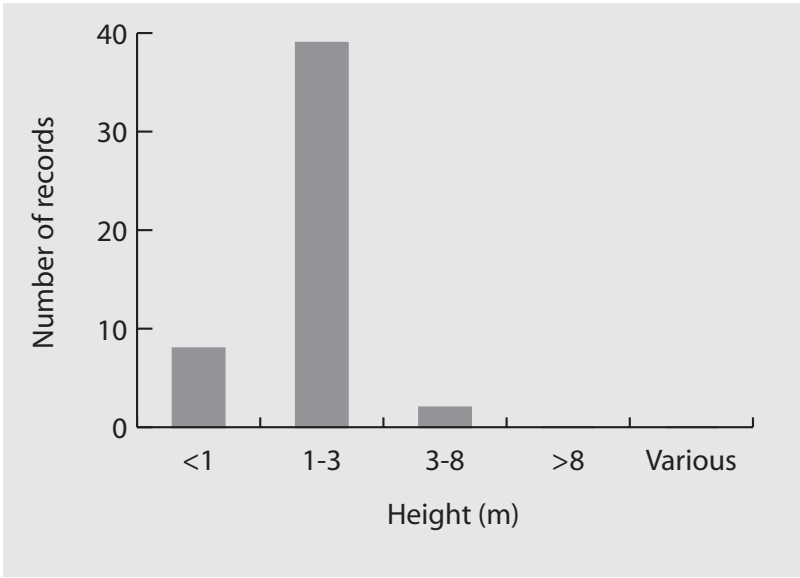
HABITAT

Found in various habitats, but mostly on dunes and deep sandy plains.



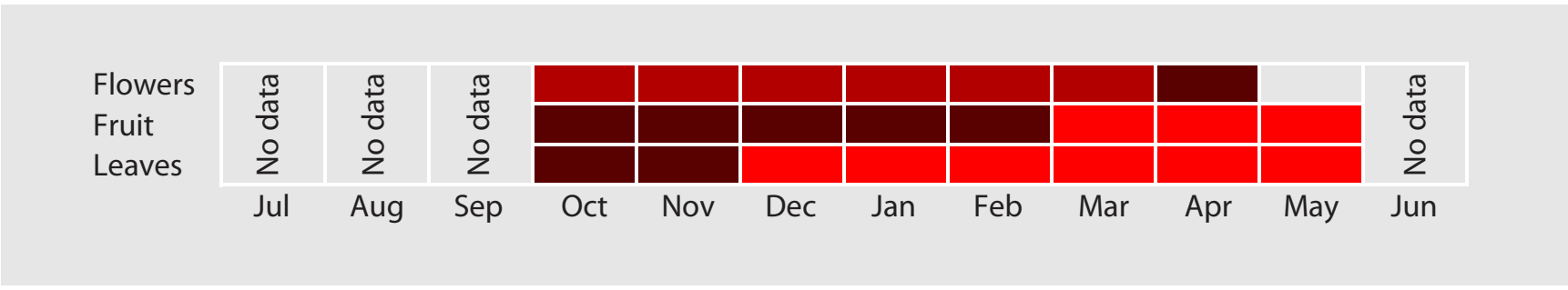
GROWTH FORM

A shrub up to 3 m high, seldom taller.



ANNUAL CYCLE

FLOWERS few records, October to April. FRUIT October to May, but mostly March to May. LEAVES December to May, with young leaves in October and November.



GENERAL

The fruit are edible and are used to make an alcoholic beverage by locals; roots are eaten; straight stems are made into arrow-shafts.

CONSERVATION CONCERNS

None recorded.



Grewia falcistipula leaves and fruit, B. Curtis

Grewia flava

Velvet Raisin

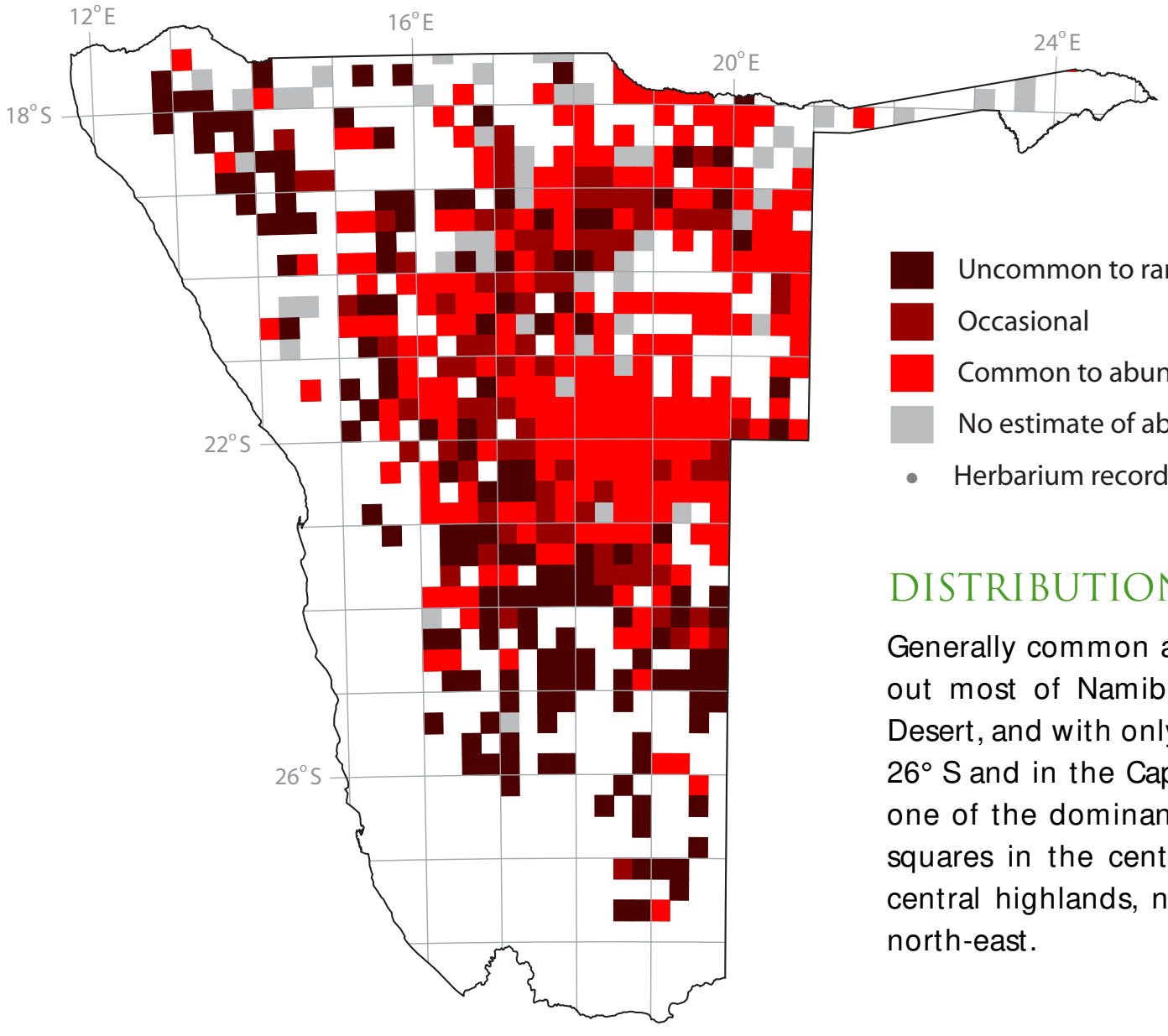
Fluweelrosyntjie, brandewynbessie (A); omuvapu (H); /awa#âus (K)

[1,465 records from 536 (50%) squares]



Semi-deciduous, compact shrub. BRANCHLETS sturdy, grey. LEAVES **erect; silvery grey-green and densely woolly above**; paler below; base tapering, slightly asymmetric. INFLORESCENCE axillary, one-flowered. FLOWERS yellow, **one per stalk**. FRUIT a round to bilobed berry, up to 8 mm in diameter; dark brown when ripe.

Flowers and fruit are conspicuous. Easily confused with *G. bicolor*, but distinguished by the more erect leaves and unbranched flower and fruit stalks.

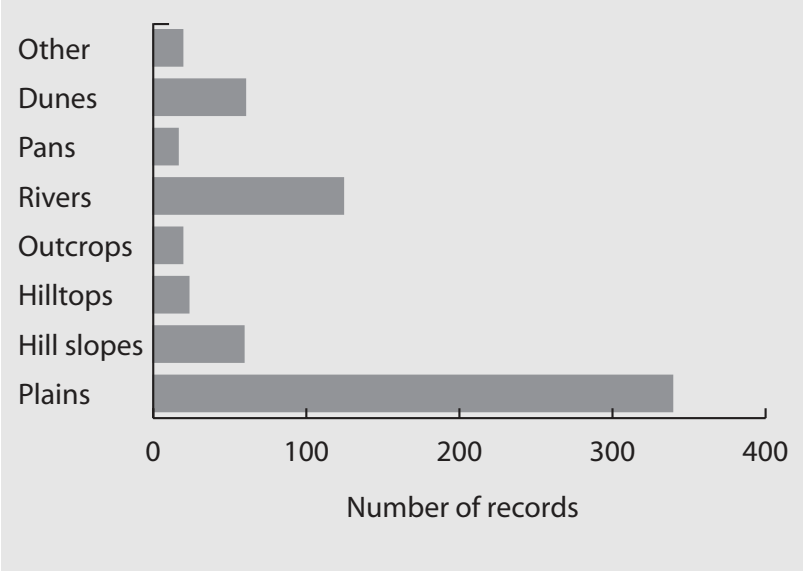


DISTRIBUTION & ABUNDANCE

Generally common and widespread throughout most of Namibia, excluding the Namib Desert, and with only few recordings south of 26° S and in the Caprivi. Most abundant and one of the dominant shrubs in a number of squares in the central-east; common in the central highlands, north-central plateau and north-east.

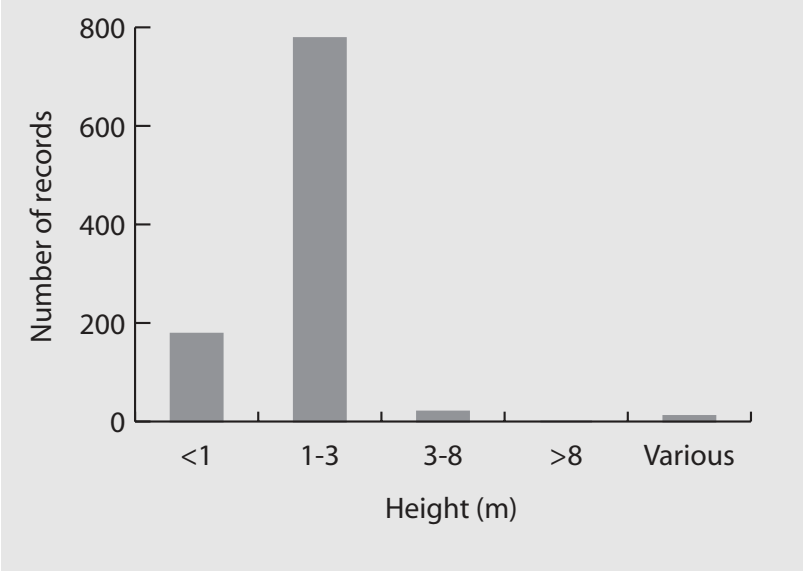
HABITAT

Found in various habitats, but most often on plains. Also found along dry rivers on the south-central plateau, in the north-west and central-west; along dry rivers and on hills in the central highlands; on hill slopes on the north-central plateau and dunes in the south-east. This plant was found on a number of substrates including sand, clay and loam.



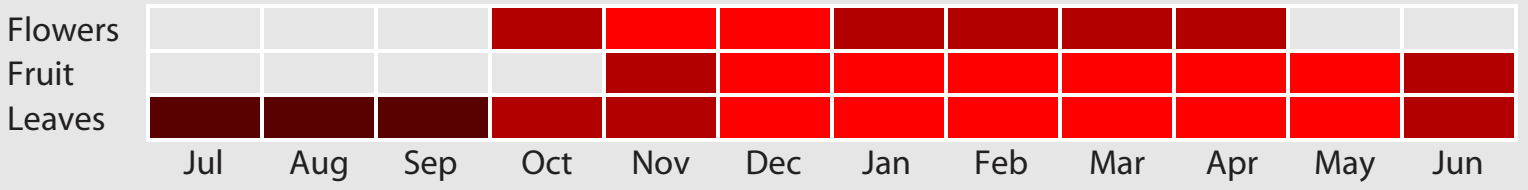
GROWTH FORM

A shrub up to 3 m high, occasionally over 3 m (1% of records).



ANNUAL CYCLE

FLOWERS October to April, with a peak in November and December. FRUIT November to June. LEAVES mostly October to June, with young leaves in September and October.



GENERAL

The leaves are browsed by game and livestock; the fruit eaten by birds and baboons. The plant is often infested with a parasite that causes finger-like outgrowths on the leaves. The fruit is eaten fresh and made into an alcoholic beverage; excessive consumption of fruit can cause constipation. The stems are used to make lightweight but sturdy walking-sticks. Various parts are used medicinally for the treatment of people and their cattle.

CONSERVATION CONCERNS

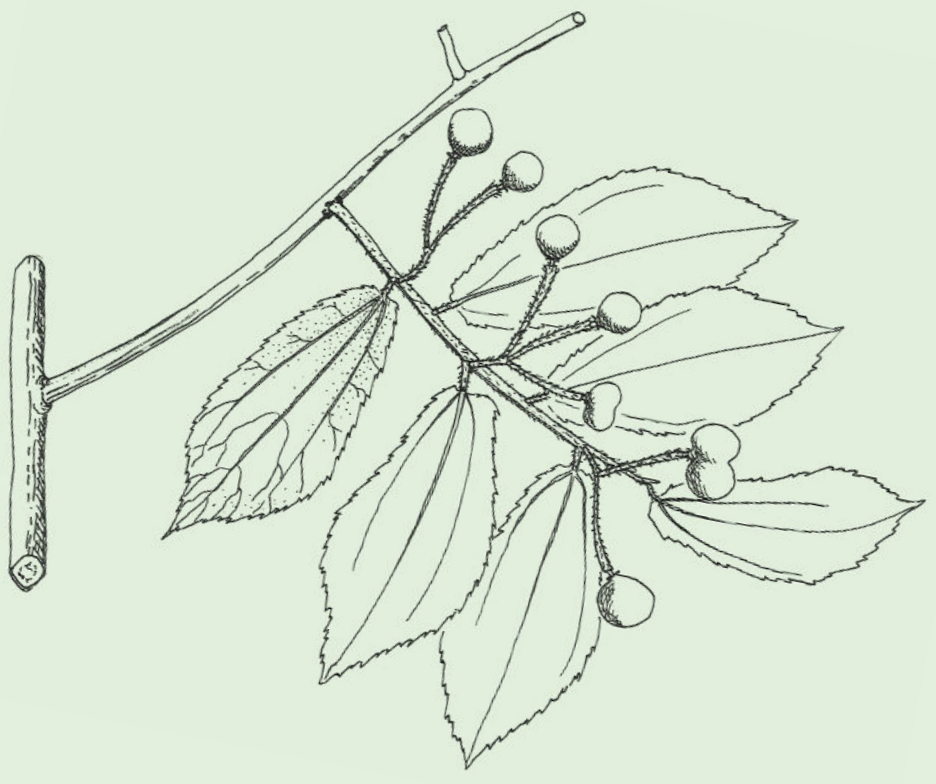
None recorded.

Grewia flavescens

Sandpaper Raisin

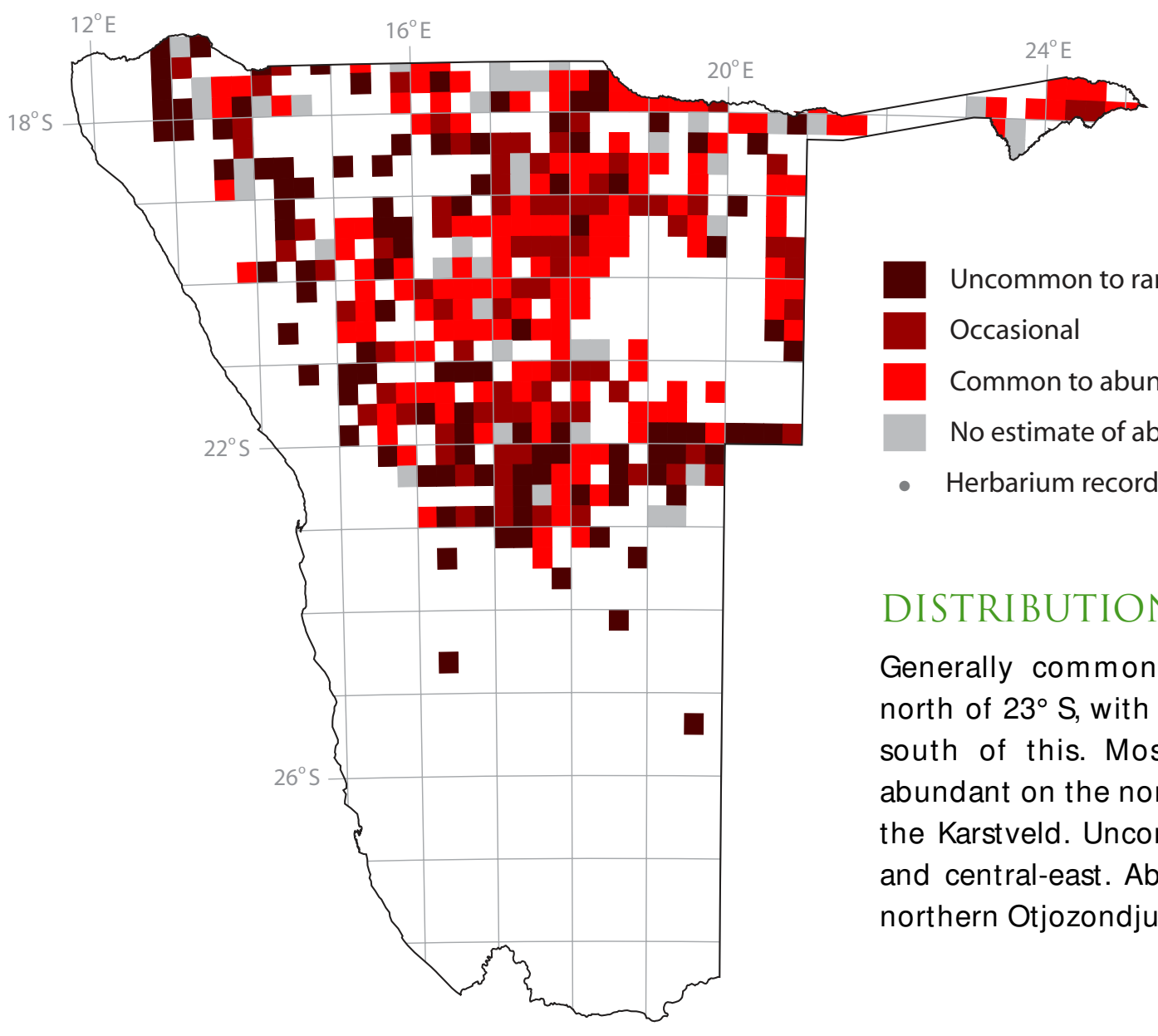
Skurwerosyntjie (A); Gelbgrüner Rosinenstrauch (G); omuhe (H); /goren/s (K); mumaka (L); rupundu (Rk, Rum)

[988 records from 387 (36%) squares]



Slender shrub, often climbing into other plants. STEMS **characteristically square, longitudinally grooved**. LEAVES **held horizontally**; light green; **both surfaces rough**. FLOWERS yellow, held erect, 2–3 per stalk. FRUIT round to bilobed (seldom four-lobed), up to 15 mm in diameter; yellow-brown, downy, shiny when ripe.

It may be confused with *G. olukondae*, which has much larger leaves, or *G. retinervis*, which generally has smaller leaves and a stem which is usually flattened and grooved on two sides and not four.



DISTRIBUTION & ABUNDANCE

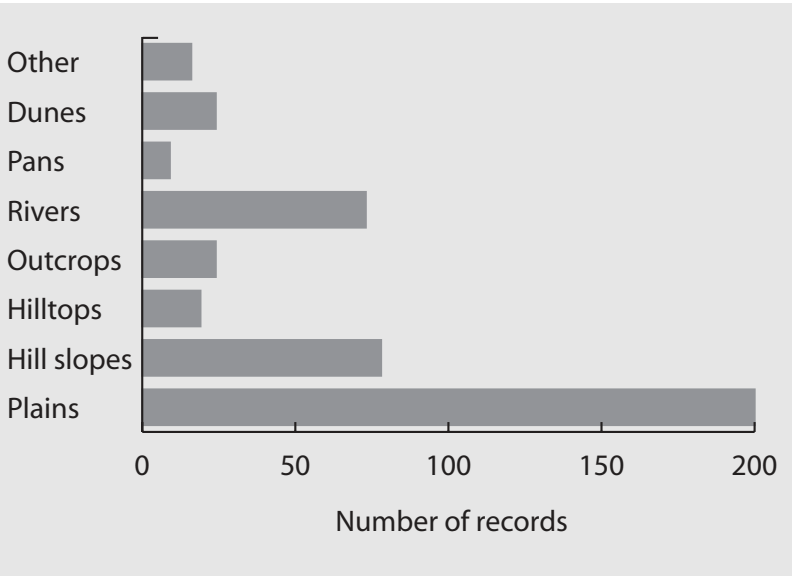
Generally common and fairly widespread north of 23° S, with a few scattered localities south of this. Most common and locally abundant on the north-central plateau and in the Karstveld. Uncommon in the north-west and central-east. Absent from large parts of northern Otjozondjupa.

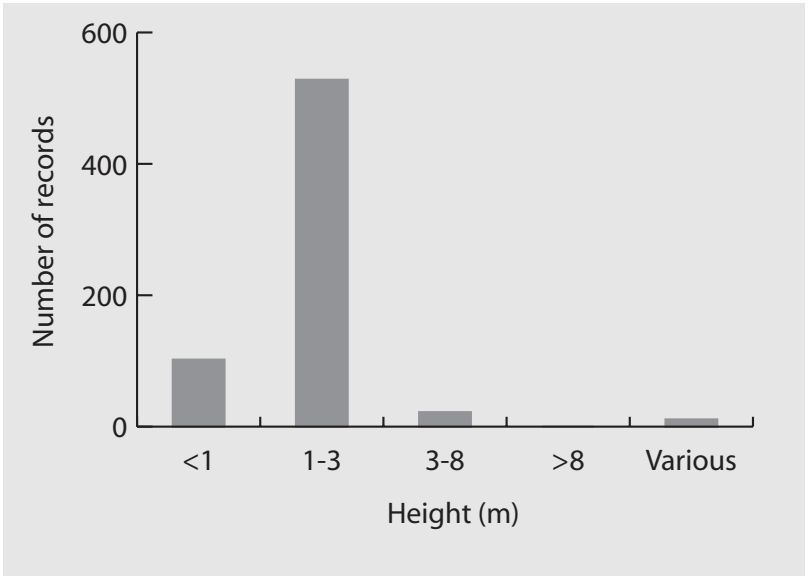
HABITAT

In a wide variety of habitats, but mostly on plains, hillsides and along dry rivers. Also on dunes in the north-east. Found on sandy and rocky substrates, including granite, calcrete and schist.

GROWTH FORM

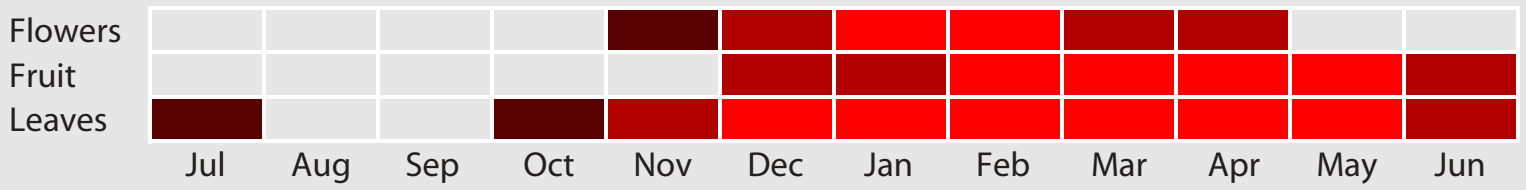
Generally a shrub up to 3 m high, occasionally over 3 m where it is climbing in other plants.





ANNUAL CYCLE

FLOWERS November to April, with some observations throughout the year. FRUIT mainly December to June; old seeds on plants all year round. LEAVES November to June, with young leaves from August to December.



GENERAL

The fruit are eaten by baboons and birds, as well as people, but are not very tasty. The leaves are browsed by game. The leaves, fruit and roots are used for medicinal purposes.

CONSERVATION CONCERNS

None reported.



Square stem of *Grewia flavescens*, C. Mannheimer

Grewia retinervis

= Grewia deserticola

Mupundu

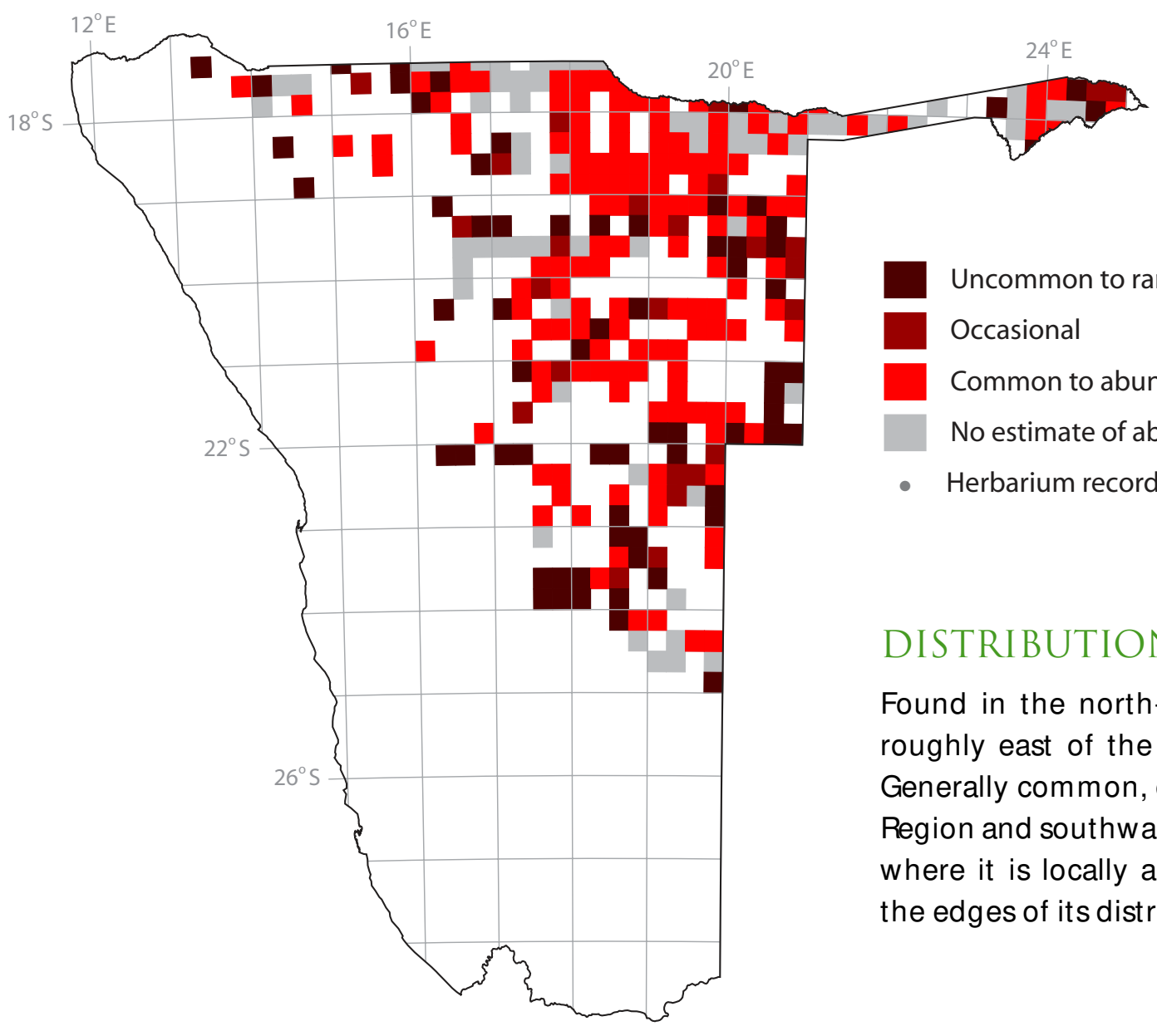
Kalahari raisin (E); Kalahari-rosyntjie (A); omuhe (H); makopa (Rk)

[454 records from 297 (28%) squares]



Deciduous shrub. BRANCHES as they get older, **become flattened on two** (or four) sides, sometimes grooved. LEAVES **usually fairly small, neat, stiff and somewhat rough**. FLOWERS yellow, axillary, 1–3 per stalk. FRUIT round to **pear-shaped**, never lobed; small, yellow-brown to orange-red when ripe.

Larger-leaved individuals may be confused with *G. flavescens*.

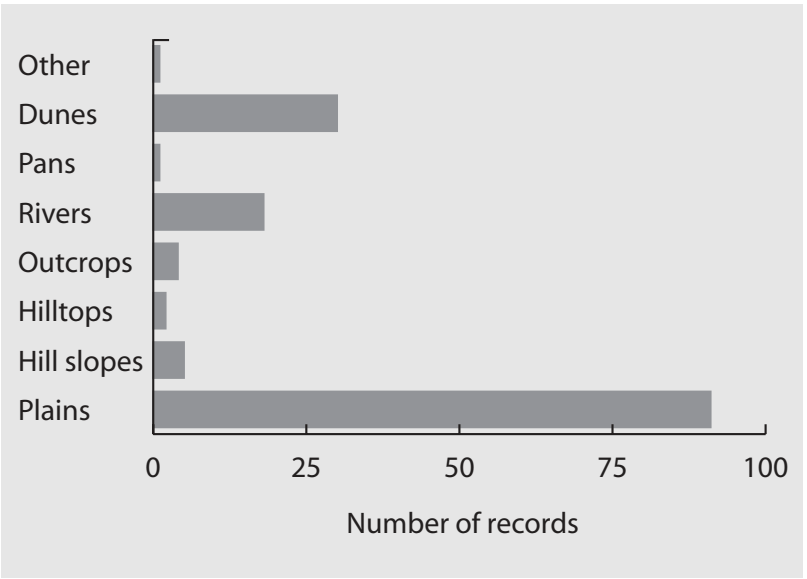


DISTRIBUTION & ABUNDANCE

Found in the north-eastern half of Namibia, roughly east of the 250-mm rainfall isohyet. Generally common, especially in the Kavango Region and southwards to northern Omaheke, where it is locally abundant. Uncommon on the edges of its distribution.

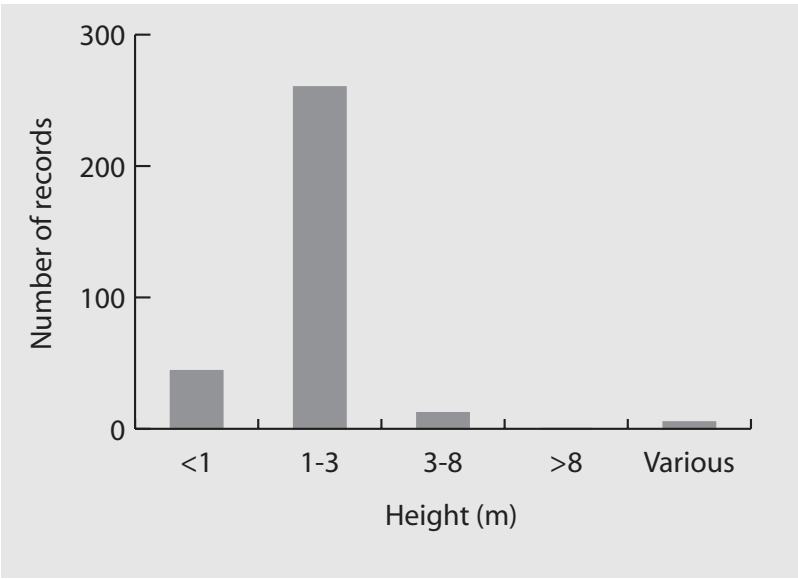
HABITAT

Found in various habitats, but most often on sandy plains and dunes, also along rivers in the north-east.



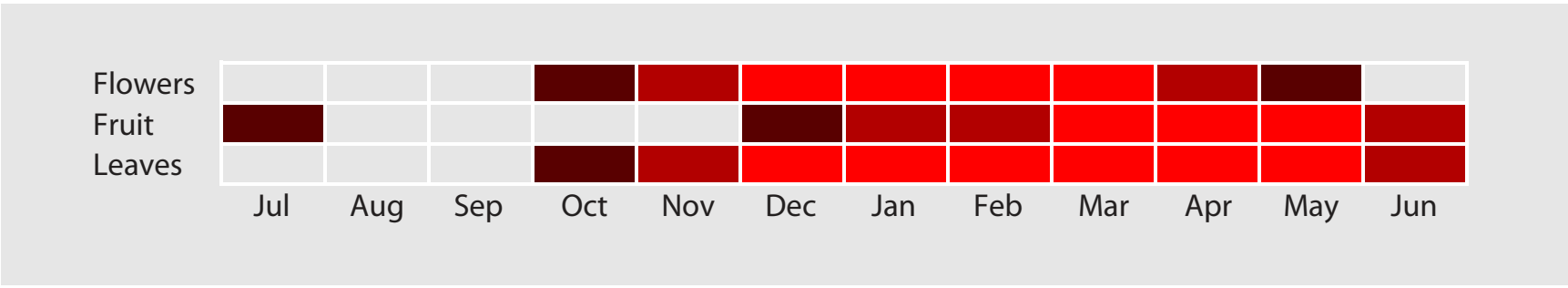
GROWTH FORM

A shrub up to 3 m high, occasionally higher; sometimes climbing into other plants.



ANNUAL CYCLE

FLOWERS October to May, with a peak from December to March. FRUIT December to July, but mainly March to May. LEAVES October to June, with young leaves in October and November.



GENERAL

The leaves are browsed and the fruit eaten by both animals and people. Roots are used medicinally; branchlets as toothbrushes. This is an attractive species that flowers profusely, and so is of horticultural potential. The village of Ivilivinzi in the Caprivi is apparently named after this plant.

CONSERVATION CONCERNS

None recorded.



Grewia retinervis, leaves and fruit,
C. Mannheimer

Grewia schinzii

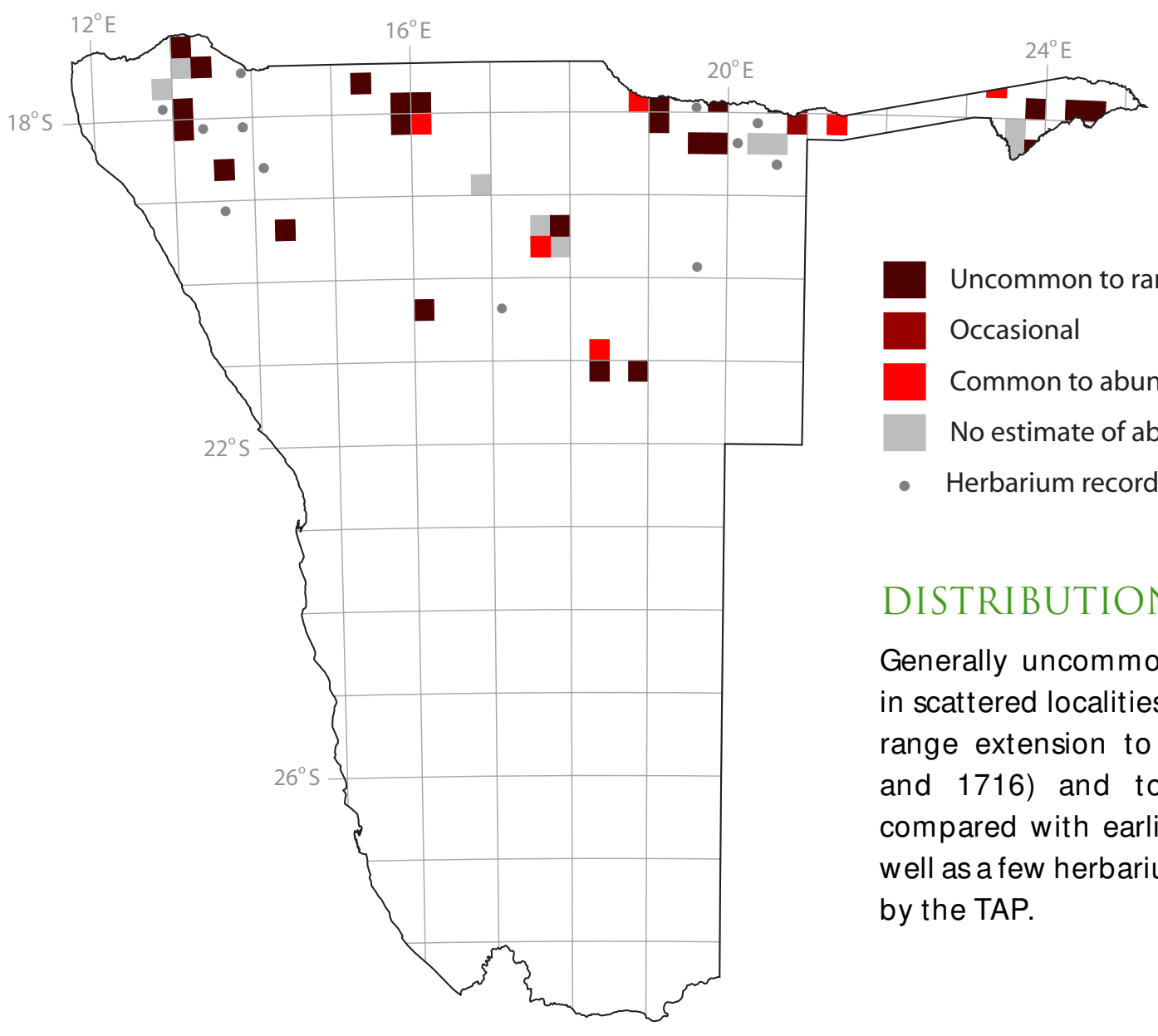
Shaggy Raisin

Rusty-haired raisin (E); rooihaarrosyntjie (A); mutulu (L); mudu (Rk, Rum)

[62 records from 43 (4%) squares]



Deciduous shrub or small tree, with **rust-coloured, densely woolly hairs on young branchlets, petioles and flower stalks**. LEAVES **large, densely woolly**. FLOWERS fairly large, yellow, axillary, 2–3 per stalk. FRUIT **large, usually deeply bilobed, with sparse, long, soft hairs**.

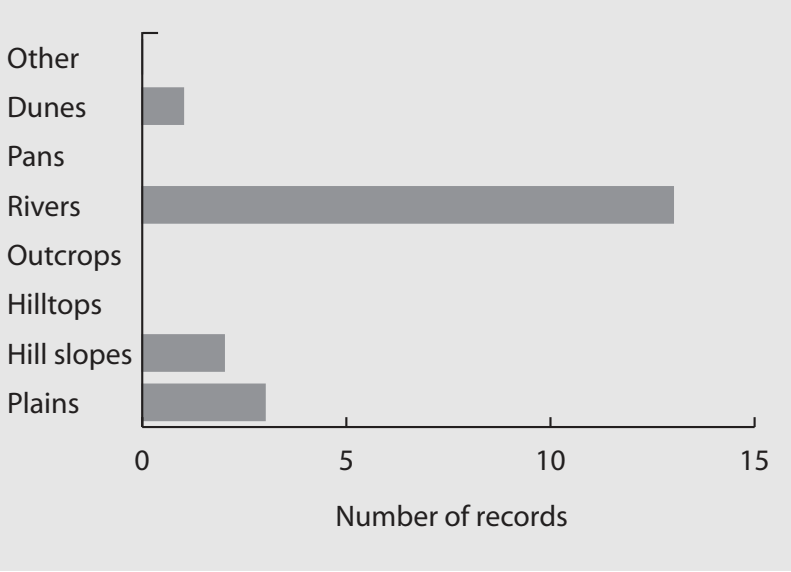


DISTRIBUTION & ABUNDANCE

Generally uncommon, occasionally common in scattered localities north of 22° S. There is a range extension to the central-north (1715 and 1716) and to the south (2118) as compared with earlier herbarium records, as well as a few herbarium records not confirmed by the TAP.

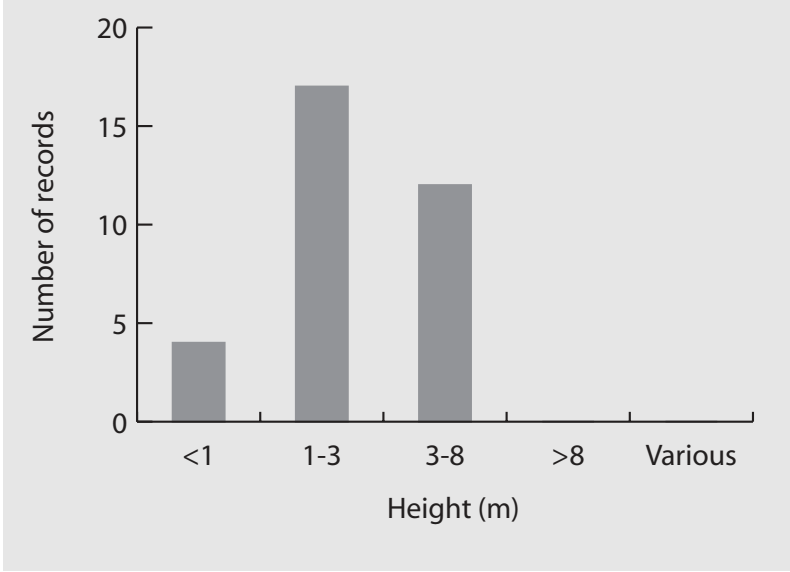
HABITAT

Various habitats, but mostly associated with rivers and riverine forest.



GROWTH FORM

Mostly a shrub up to 3 m high; sometimes a tree of over 3 m (29% of records).



ANNUAL CYCLE

FLOWERS November to April. FRUIT mainly January to May. LEAVES October to May.



CONSERVATION CONCERNS

None recorded.



Grewia schinzii, leaves and flower, B. Curtis

Grewia tenax

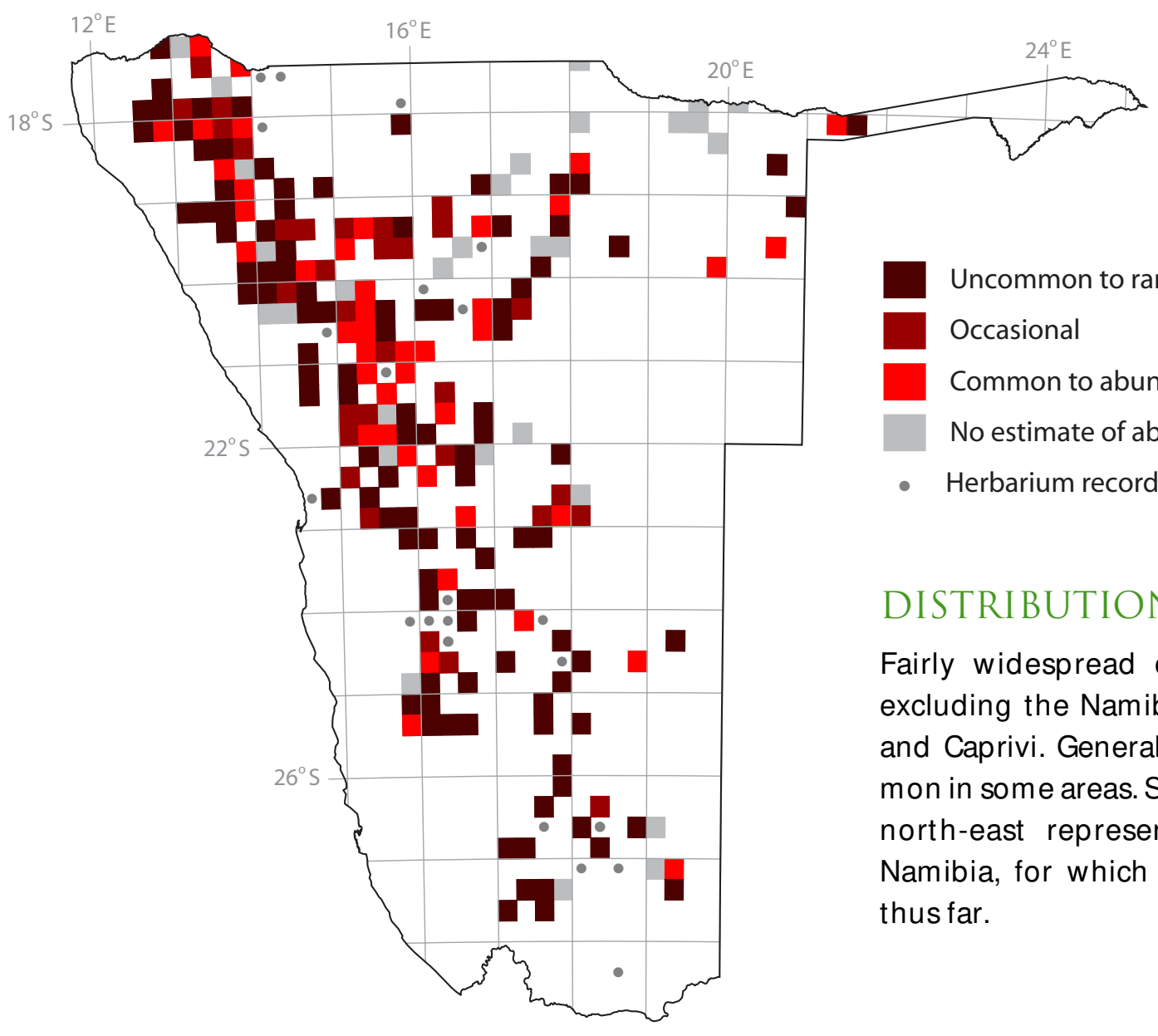
Small-leaved Cross-berry

Kleinblaarkruisbessie (A); Kreuzbeere (G); omundjendjere (H); //ain (K); omundjebele (O)

[382 records from 211 (20%) squares]



Slender, deciduous shrub. LEAVES **small**, leathery; dark green above; grey-green below; both surfaces slightly hairy to hairless. FLOWERS solitary, **leaf-opposed, small and white**. FRUIT deeply **four-lobed** (occasionally 2–3-lobed); small, yellow to **orange-red**.

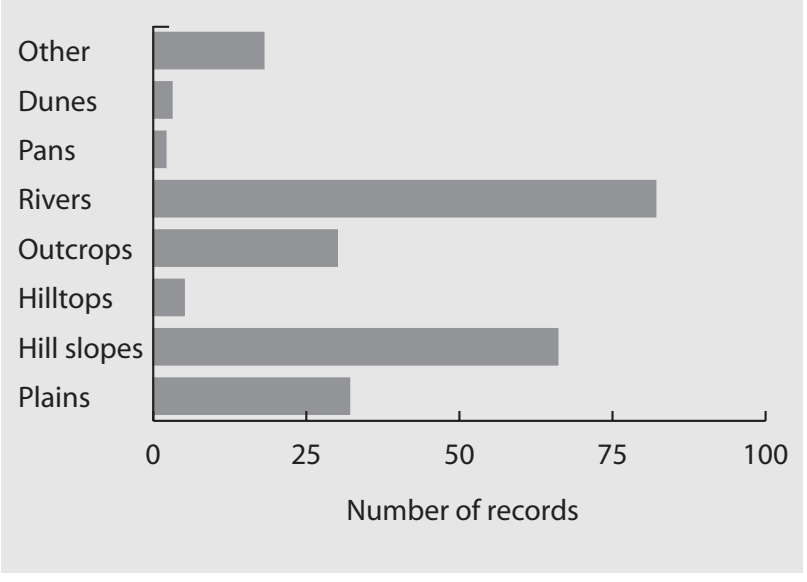


DISTRIBUTION & ABUNDANCE

Fairly widespread over much of Namibia, excluding the Namib Desert, the central-east and Caprivi. Generally uncommon, but common in some areas. Scattered records from the north-east represent range extensions in Namibia, for which there are no specimens thus far.

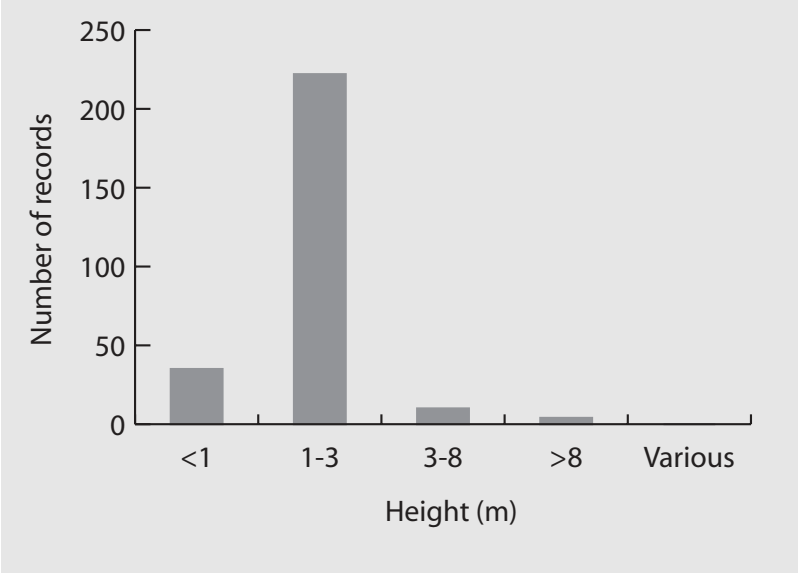
HABITAT

Found in various habitats, although mostly associated with dry rivers and hill slopes. In the south it is often found on rocky outcrops. Grows on stony, rocky, sandy and loamy substrates.



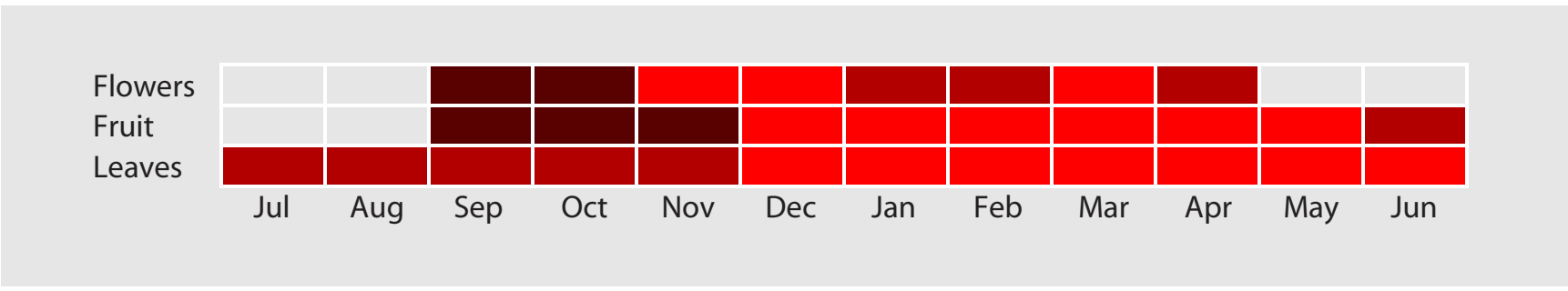
GROWTH FORM

A shrub up to 3 m high, occasionally higher (4% of records).



ANNUAL CYCLE

FLOWERS from September to April, peaking in November and December and again in March; flowering appears to be affected by rainfall. FRUIT some present all year round, but mostly from December to June. LEAVES on some plants all year round, but most profuse from December to June; young leaves from September to December.



GENERAL

Goats and cattle browse leaves and twigs. The fruit is edible and made into an alcoholic beverage; stems are used for arrow-shafts.

CONSERVATION CONCERNS

None recorded.



Grewia tenax, Karas Region, B. Curtis

Grewia villosa

Mallow Raisin

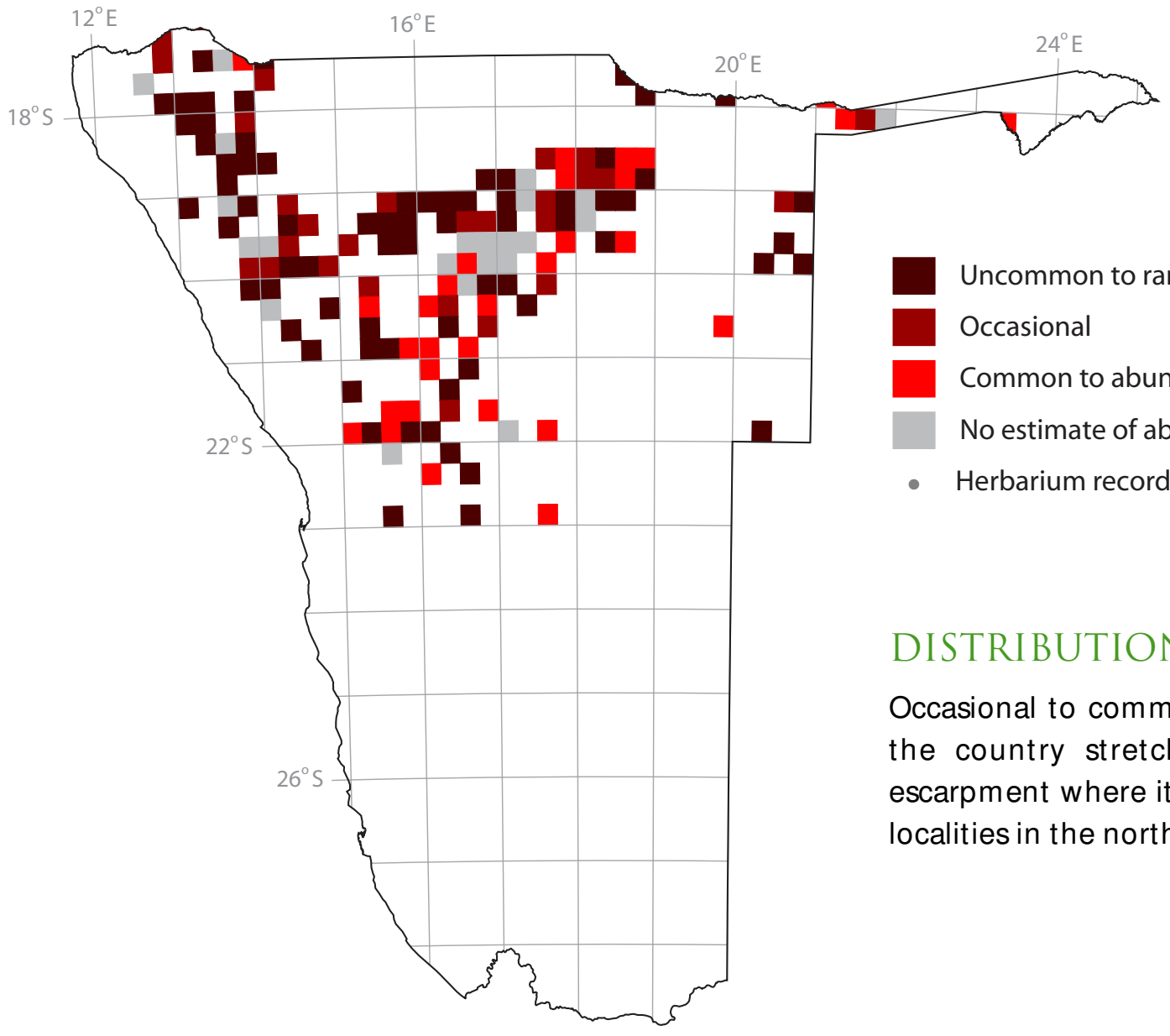
Malvarosyntjie (A); Zottiger Rosinenstrauch (G); omanjembere (H); //khoos (K)

[328 records from 154 (14%) squares]



Small, deciduous shrub. BRANCHES hairy. LEAVES **almost round to heart-shaped, hairy, surface puckered**; veins indented, very regular and distinct; margin irregularly toothed and fringed with hairs; petiole with small, pale brown bristles. FLOWERS **yellow turning pink, in tight clusters**. FRUIT in tight clusters; round or slightly four-lobed; **reddish to pink-orange, with long, soft hairs or short bristles**.

This is the most easily identified *Grewia* species and cannot be confused with any others.

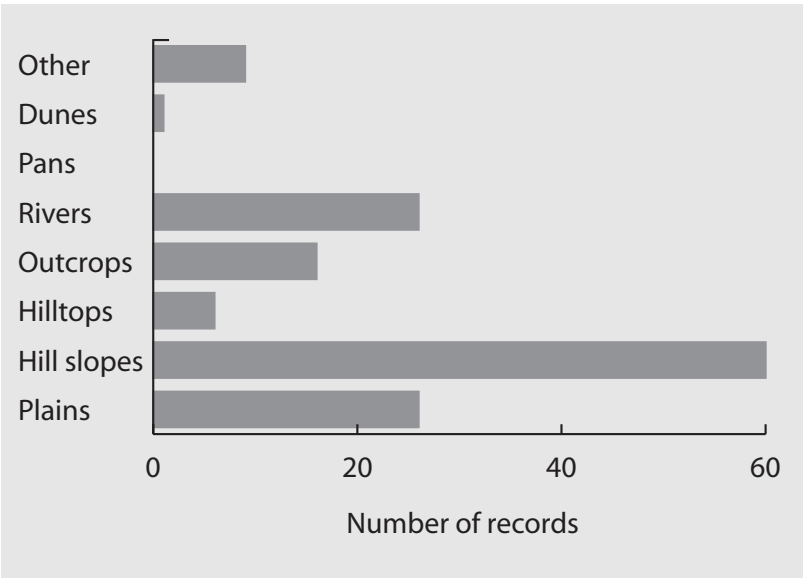


DISTRIBUTION & ABUNDANCE

Occasional to common in the central part of the country stretching westwards to the escarpment where it is uncommon; scattered localities in the north-east.

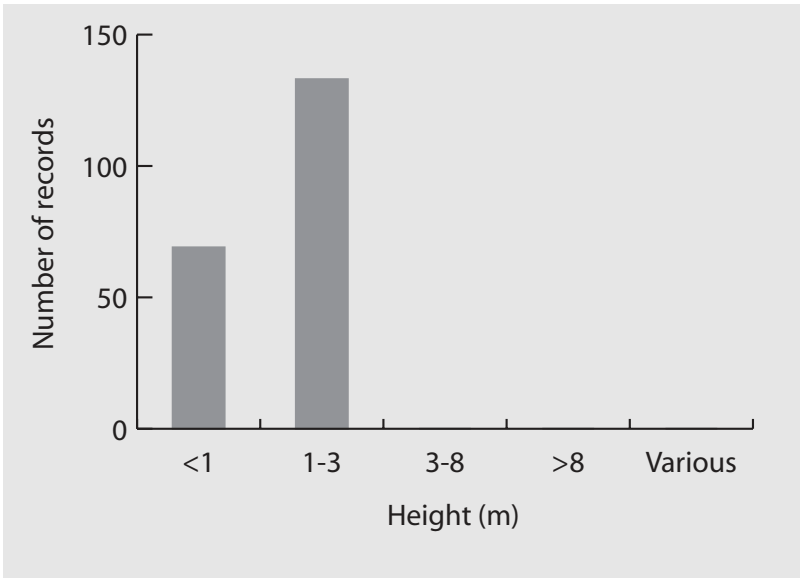
HABITAT

Found in various habitats, but most often on hill slopes. Also on plains in the Karstveld and along dry rivers in the north-west. Grows on sand, soil, rock, stone and calcrete substrates.



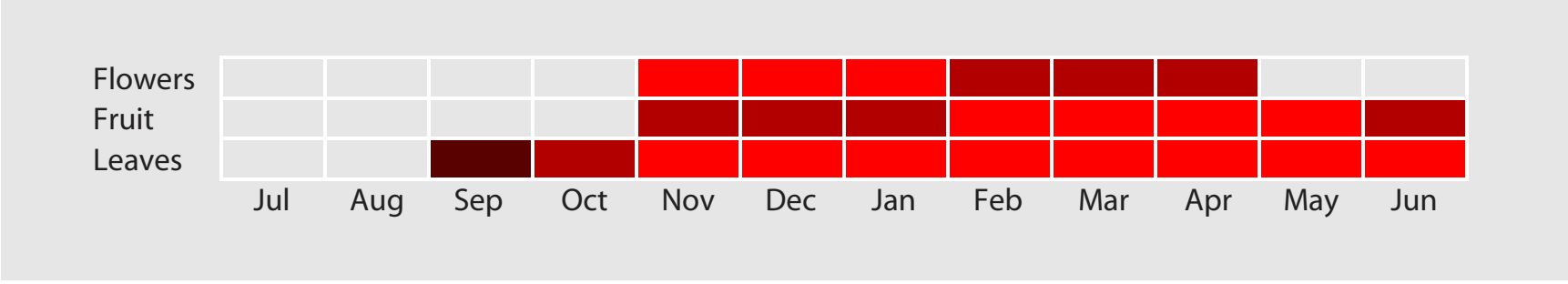
GROWTH FORM

A shrub in the 1–3-m height class, but often less than 1 m.



ANNUAL CYCLE

FLOWERS November to April. FRUIT November to June. LEAVES mainly November to June, with young leaves in September and October.



GENERAL

The leaves are browsed. The fruit are good to eat and also used to make an alcoholic beverage; the seeds are pounded and eaten. This plant has horticultural potential.

CONSERVATION CONCERNS

None recorded.



Grewia villosa, leaves and fruit, E. Ellinger

Grewia olukondae

= Grewia flavescens var. olukondae

Omukopakopa

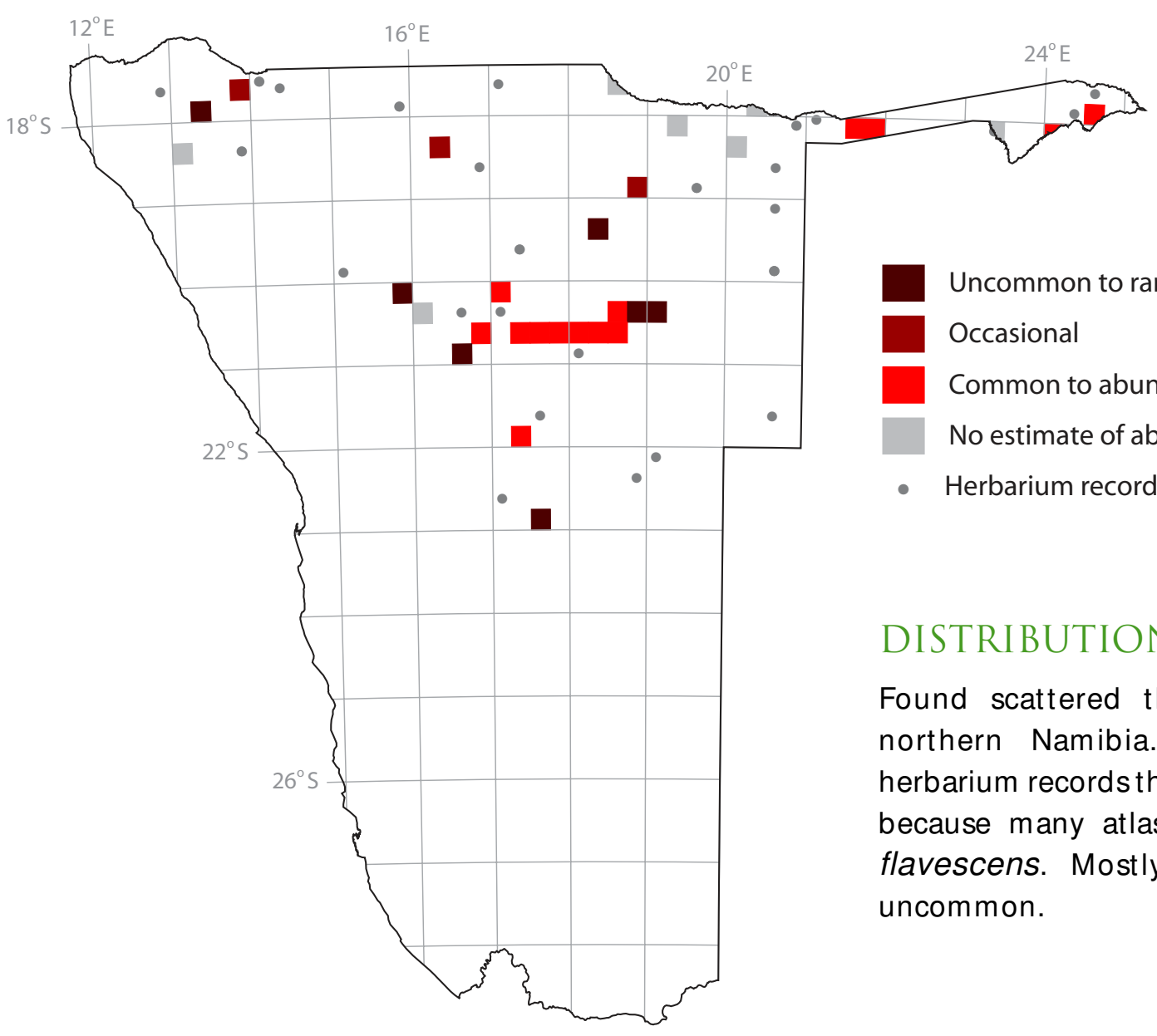
Broad-leaved sandpaper-raisin (E);
Kalahari Rosinenstrauch (G); //aris (K)

[38 records from 31 (3%) squares]



A scrambling shrub or small, shrubby tree. STEMS rounded, **occasionally fluted**. LEAVES **drooping**, large, almost round, dull green to yellow-green, velvety on both sides. FLOWERS yellow, three per stalk. FRUIT usually single.

Probably often confused with *G. flavescens* of which it was regarded as a subspecies until recently. However, the leaves are larger and less sandpapery than those of *G. flavescens*.

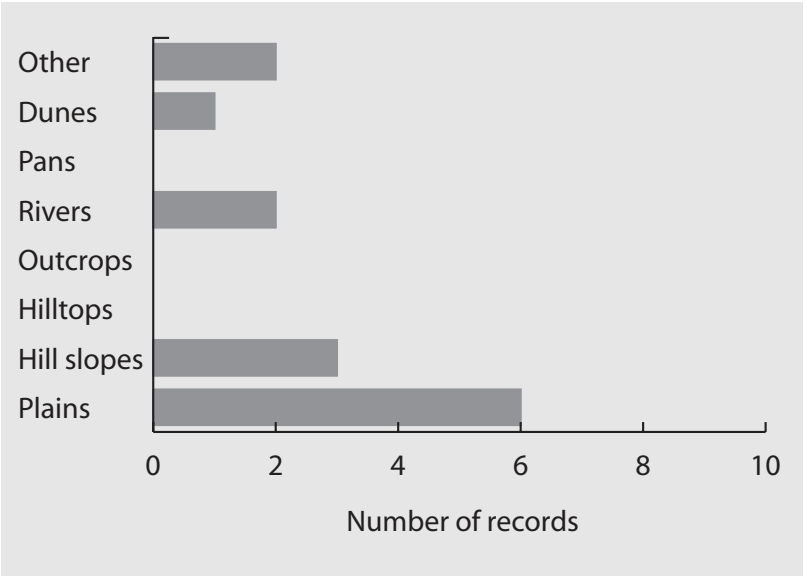


DISTRIBUTION & ABUNDANCE

Found scattered throughout central and northern Namibia. There are far more herbarium records than TAP records, probably because many atlassers thought it was *G. flavescens*. Mostly common, sometimes uncommon.

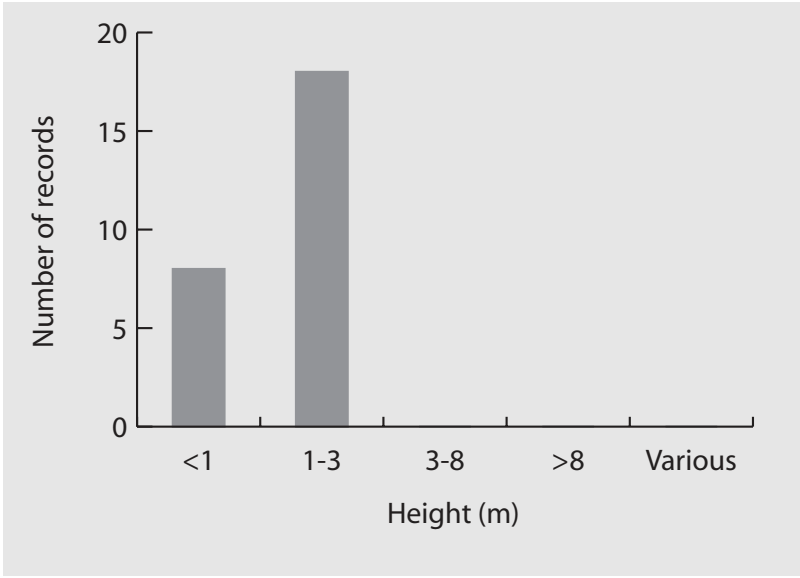
HABITAT

Various, but most often on plains and hillsides; on sand and rocky substrates.



GROWTH FORM

A shrub up to 3 m high.



ANNUAL CYCLE

There were no observations and no herbarium records for June to November. FLOWERS, FRUIT and LEAVES recorded from December to May.

CONSERVATION CONCERNS

Unknown. This plant may be more common than records suggest due to the confusion of its taxonomy with *G. flavescens*, or the population could be seriously declining.

Grewia subspathulata

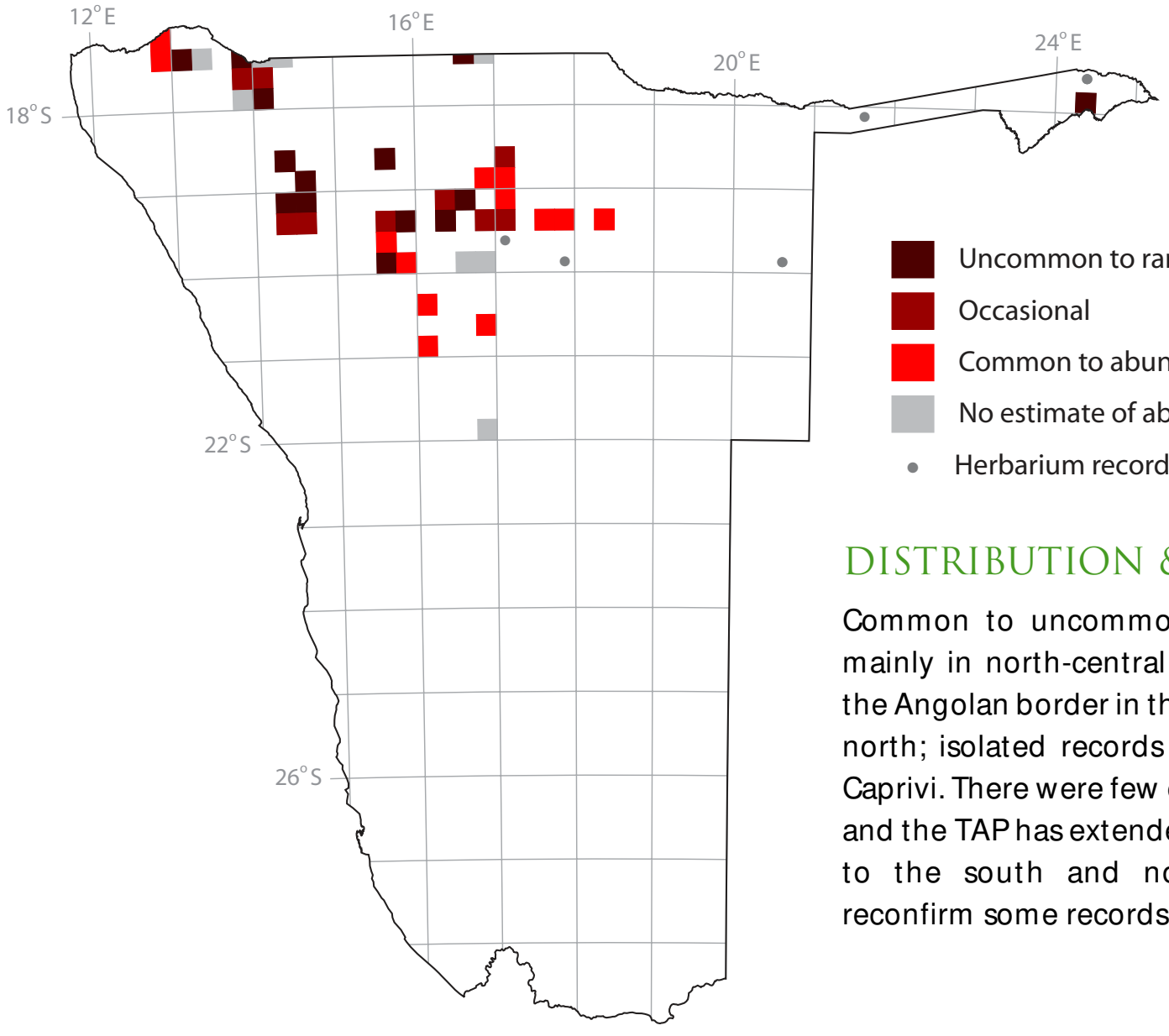
Mupundukaina

[52 records from 44 (4%) squares]



Deciduous shrub. BRANCHLETS yellow-brown and **densely woolly when young**. LEAVES **large, oblong-ovate** to ovate; olive-green above; woolly, grey covering below. FLOWERS yellow, terminal or axillary, 2–12 per stalk. FRUIT round or bilobed, yellow when ripe.

May be confused with *G. bicolor*. This plant is thought by some authorities to be a hybrid between *G. bicolor* and *G. monticola*, but where it mostly occurs in Namibia *G. monticola* does not. It is more likely to be either a subspecies of *G. bicolor* or a separate species, and is treated as the latter here.

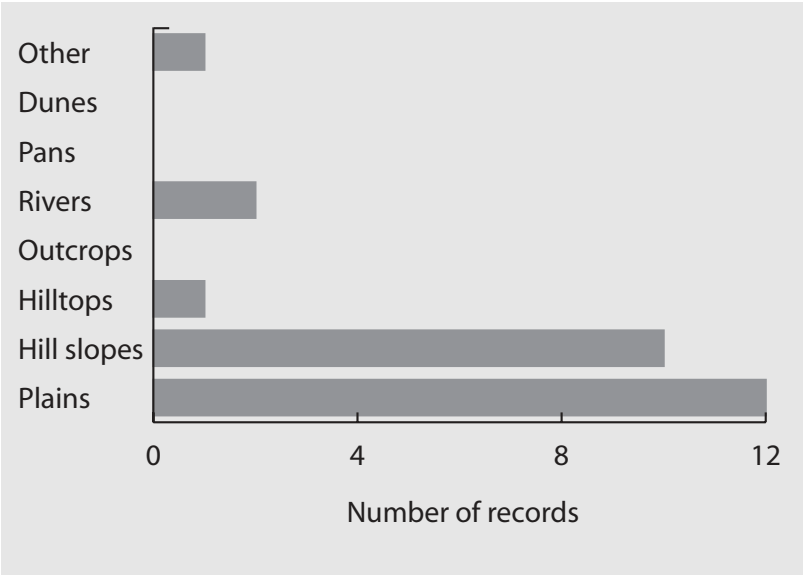


DISTRIBUTION & ABUNDANCE

Common to uncommon in scattered localities, mainly in north-central Namibia, but also along the Angolan border in the north-west and central-north; isolated records in Kavango and eastern Caprivi. There were few earlier herbarium records, and the TAP has extended the range substantially to the south and north-west, but did not reconfirm some records from the east.

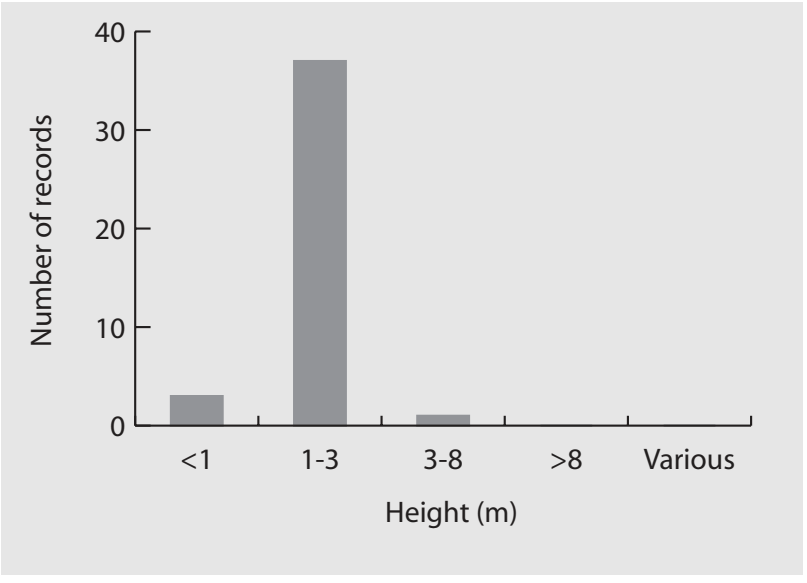
HABITAT

Various habitats, but mostly on plains and hill slopes.



GROWTH FORM

A shrub up to 3 m high.



ANNUAL CYCLE

Data only collected from January to June. FLOWERS recorded in January, March and April. FRUIT from January to June. LEAVES only recorded from March to May, with single records in January and February.

CONSERVATION CONCERNS

None recorded.

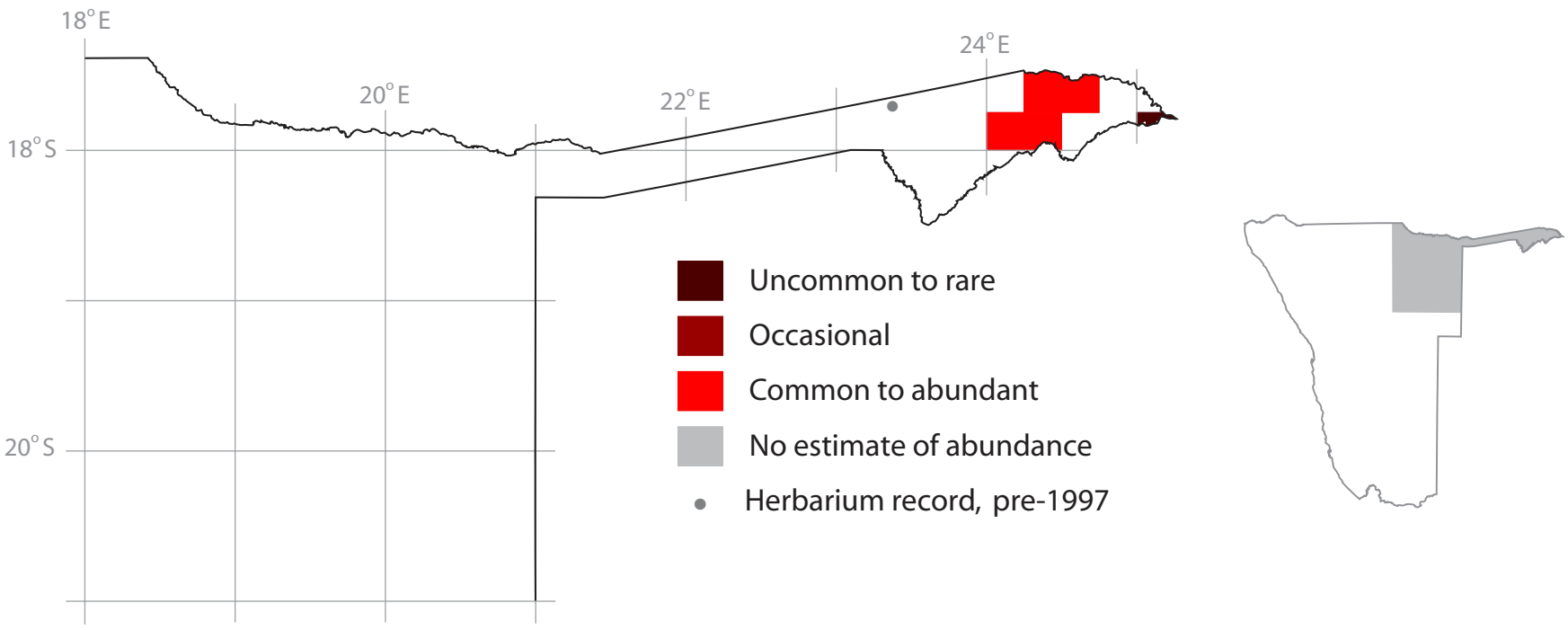
Grewia monticola

Muwhana

Grey raisin (E)

[7 records from 6 (<1%) squares]

Deciduous shrub. BRANCHLETS often drooping when young; with dense, **velvety, golden hairs**. LEAVES **obliquely elliptic-oblong**; somewhat wrinkled and **leathery**; bright green to **grey-green** above; almost white and densely woolly below. FLOWERS yellow, axillary, 2–3 per stalk. FRUIT one- or deeply two-lobed; woolly, yellowish-brown when ripe.



DISTRIBUTION & ABUNDANCE

Common to abundant in the Caprivi east of 24° E.

HABITAT

Found on sandy plains, river banks and floodplains.

GROWTH FORM

A shrub up to 3 m high.

ANNUAL CYCLE

FLOWERS recorded in January. FRUIT in March and May. LEAVES observed in January, March, May and October; one record of a bare plant in November.

CONSERVATION CONCERNS

None recorded.

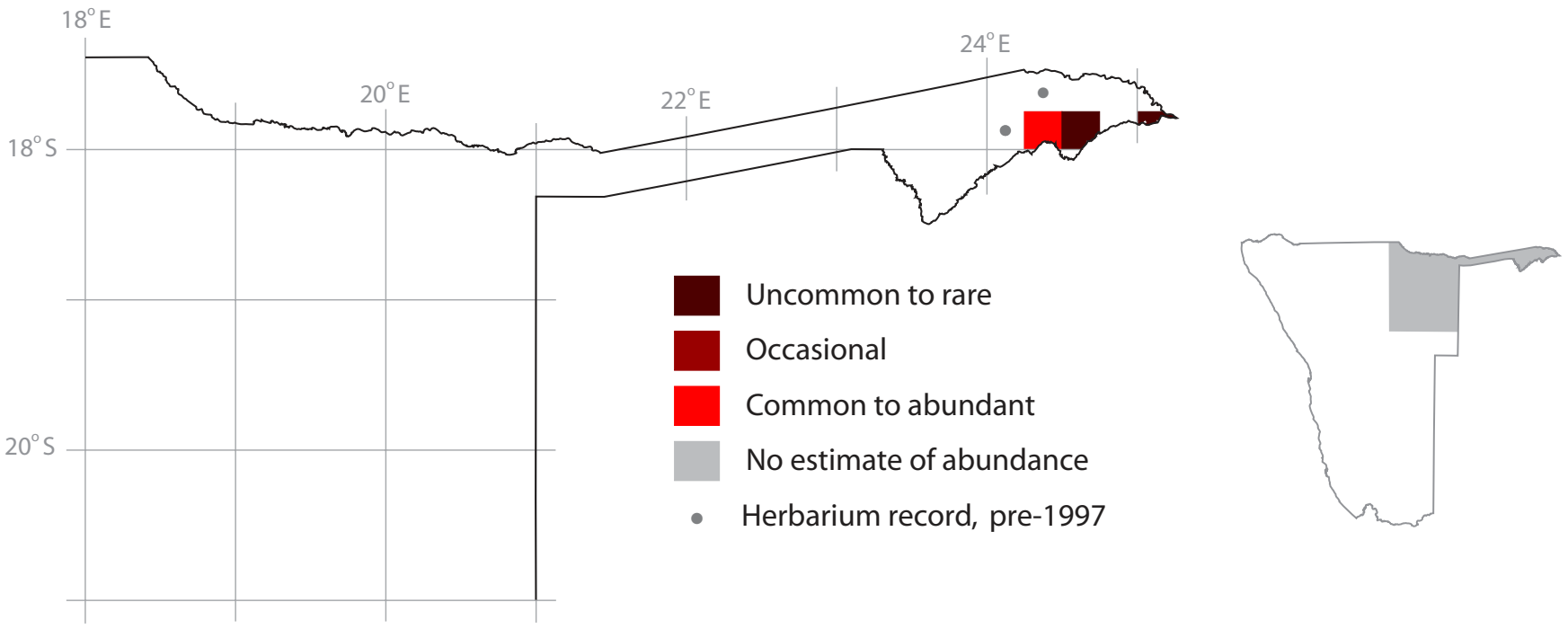
Grewia pachycalyx

Large-flowered White Raisin

[4 records from 3 squares]

Shrub, with drooping branches and a **tendency to scramble**. LEAVES oblong-lanceolate, **thinly textured**, downy to hairless; **stipules up to 14 mm long, lance-like with a drawn-out tip**. FLOWERS **large, white, with thick fleshy sepals**; leaf-opposed; 3–9 per stalk. FRUIT **four-lobed, large; orange-red** and shiny when ripe.

May be confused with other *Grewia* spp. when without flowers or fruit.



DISTRIBUTION & ABUNDANCE

Uncommon in the Caprivi east of 24° E. Earlier herbarium records show it to be more widespread in eastern Caprivi than recorded by the TAP.

HABITAT

Mainly found on dunes; also river banks.

GROWTH FORM

A shrub up to and occasionally over 3 m high.

ANNUAL CYCLE

FLOWERS and FRUIT recorded in November, February, March and May. LEAVES only recorded in November and March.

CONSERVATION CONCERNS

Population may be declining, or atlassers may have overlooked the species since, without flowers, it may be mistaken for a number of other grewias.

Azanza garckeana

Monego

Snot apple (E); snotappel (A)

[4 records from 3 squares]

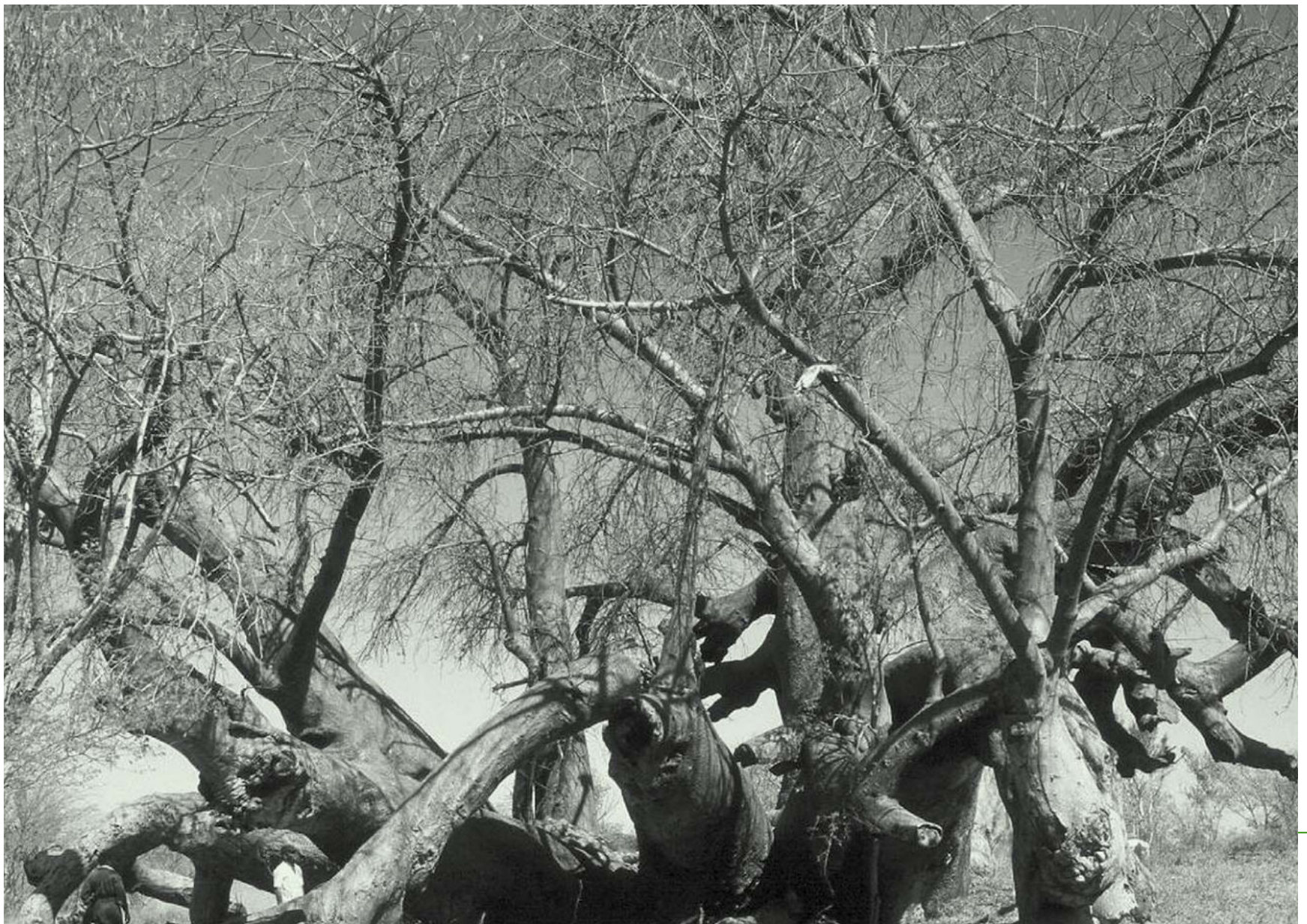
A shrubby tree. BRANCHLETS shaggy, woolly. LEAVES **large, deeply lobed**; rough hairs above, soft hairs below. FLOWERS **showy, yellow with a maroon centre**.

Four records from three widely scattered localities in the north (1715CC, 1717BD and 1725CC). Uncommon shrubby tree in the 3–8-m height class. FRUIT recorded in March. Earlier herbarium records are of a tree from 1725CC and 1717DC, with flowers in January and February.

MALVACEAE | HIBISCUS FAMILY

This family consists largely of herbs and dwarf shrubs. There is only one truly tree-like species in Namibia, but some members of the genus *Gossypium* (wild cotton) can attain a height of well over 1 m. They have not been included in the TAP as they are not very woody, despite their height. The family is characterised by the showy flowers, which comprise five separate petals and the stamens are fused into a tube around the style. There is often an additional outer calyx whorl, the epicalyx.

Trekker tree baobab (*Adansonia digitata*), Nyae Nyae, B. Curtis



Adansonia digitata

Baobab / Omukwa

Kremetartboom; dorsboom (A); Affenbrotbaum (G); mubuyu (L); uyu (Rk, Rum); divuyu (T)

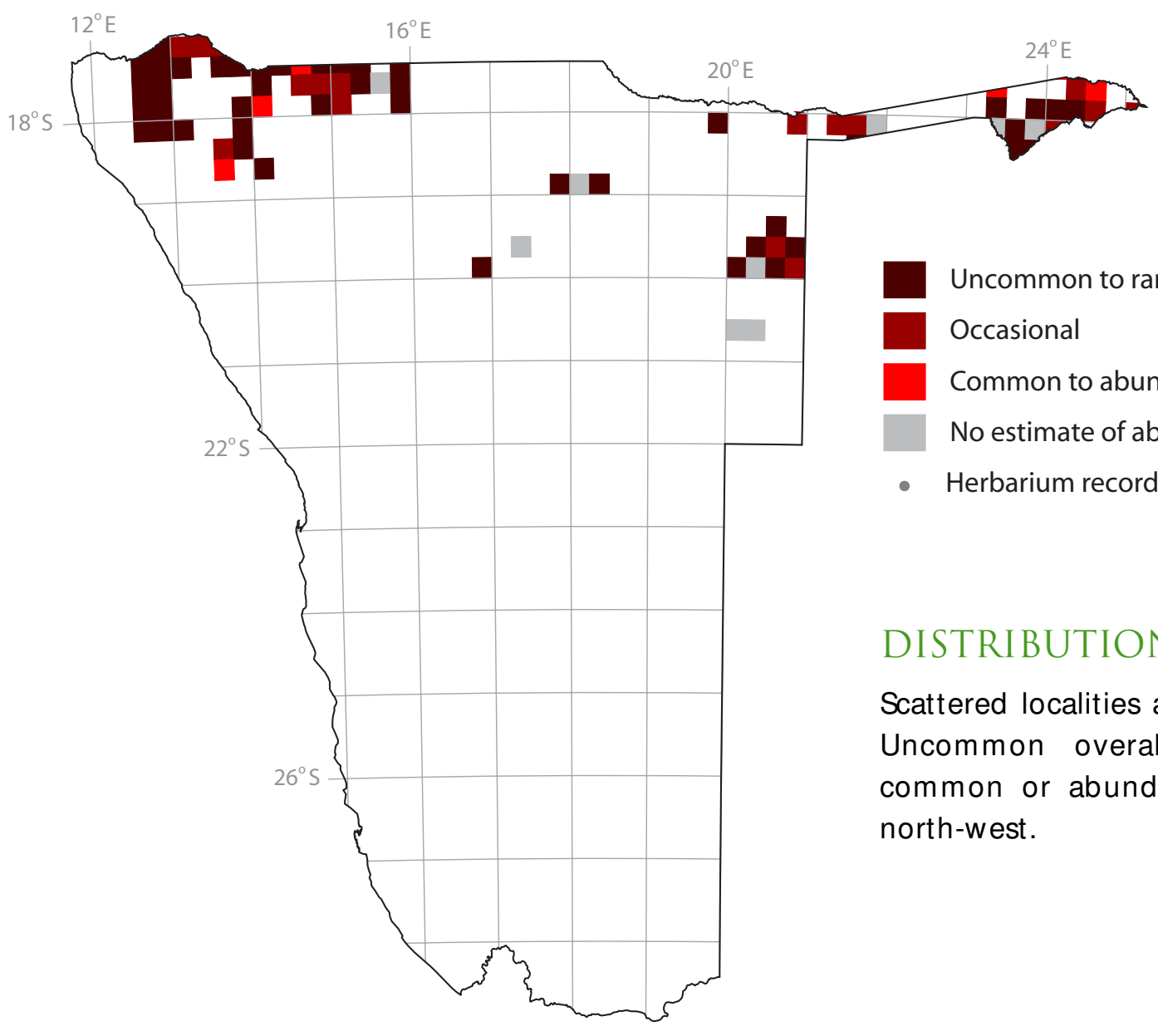
[195 records from 81 (8%) squares]



See page 449 for photo.

Deciduous tree with a **massive trunk**, often greater than 1 m in diameter. BARK **smooth**, pinkish brown to grey-brown, often convoluted. LEAVES **5–7-palmately compound**. FLOWERS **large, pure white, with five crinkled, curled-back, waxy petals and numerous stamens fused to form a central column; hanging on long stalks**. FRUIT very **large, ovoid**, with olive-green, velvety covering.

Fruit and flowers are very conspicuous. Adult trees cannot be mistaken; young may be overlooked as they have simple leaves which are very different from those or older plants, and they lack the thick stem.

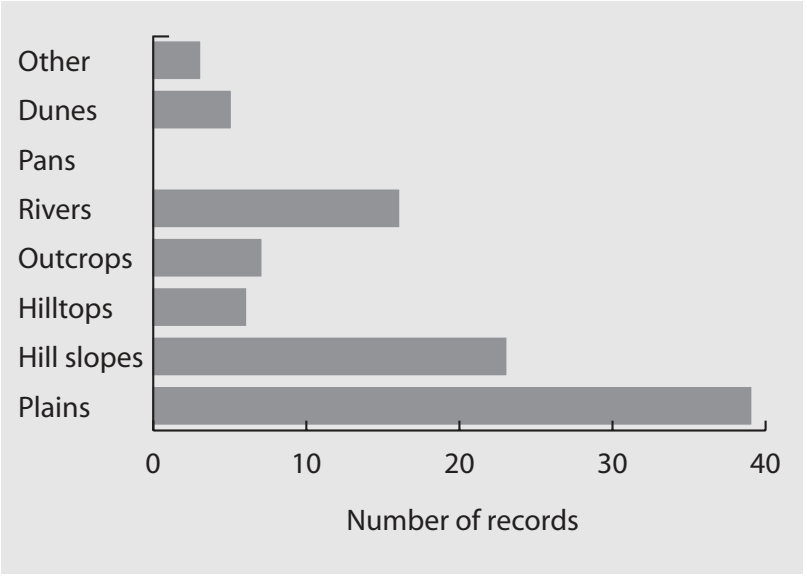


DISTRIBUTION & ABUNDANCE

Scattered localities across northern Namibia. Uncommon overall. Occasionally locally common or abundant in the Cuvelai and north-west.

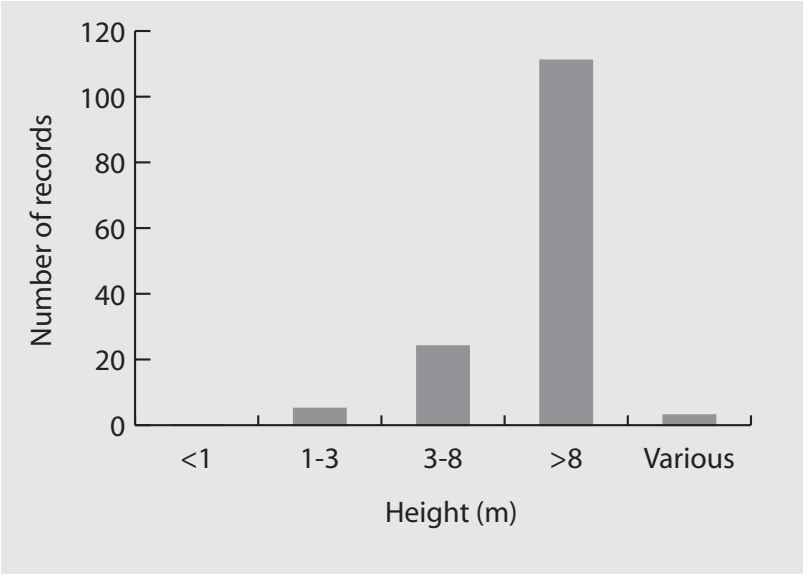
HABITAT

Mostly found on sandy plains, also rocky hill slopes; occasionally on clay or sandy loam on floodplains. Generally in woodlands.



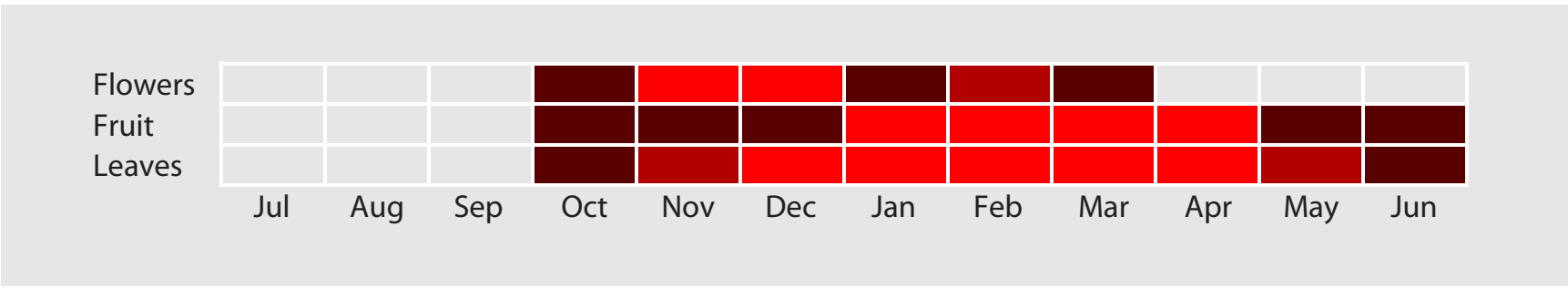
GROWTH FORM

Always a tree, usually over 8 m tall; >20 m near the Kunene River. Few young ones recorded.



ANNUAL CYCLE

FLOWERS October until March, but most often in November and December, with a second peak in February (the only two herbarium flowering records were in February and November). FRUIT mostly January until April; young fruit appear in October and November. LEAVES bare from July to September, with young leaves appearing in October.



GENERAL

The uses of this species are numerous and well documented and will not be repeated here. No new information came from the TAP. Severe damage to the trunk was reported from near Tsintsabis in 1817DD (FRI1). Some individual trees are known as 'holboom' as these trees are often hollow in the centre (FRI1).

CONSERVATION CONCERNS

This species is generally protected by local communities for its medicinal uses and place in folklore. It is indirectly threatened by fire and elephant, in areas where elephant occur. The apparent lack of young plants to replace the old ones may be a concern, but young trees may have been overlooked. Protected by forestry legislation.

Dombeya rotundifolia

Wild Pear / Omuryahere

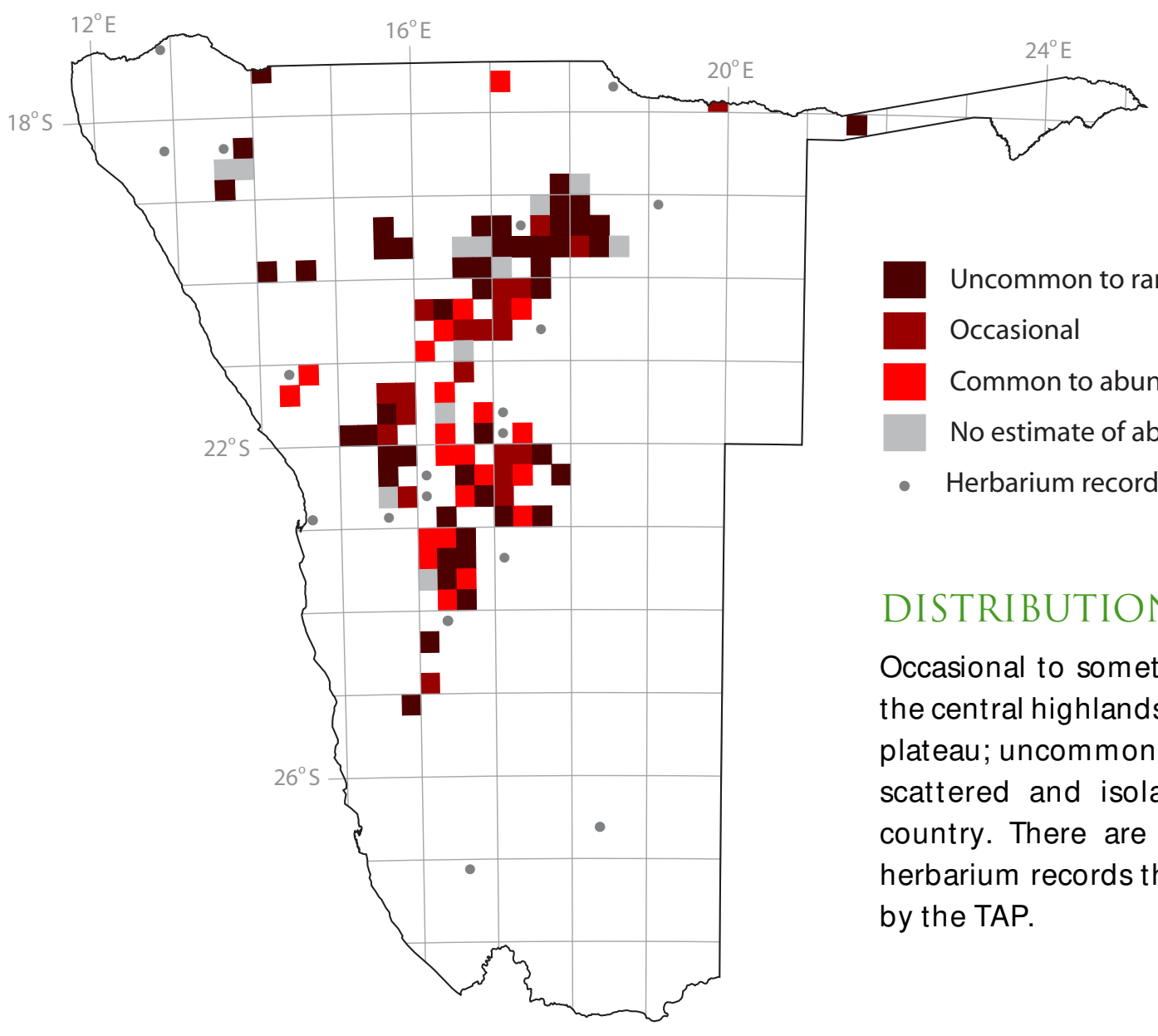
Drolpeer (A); Schneeballstrauch (G)

[320 records from 103 (10%) squares]



Semi-deciduous shrub or many-stemmed tree. LEAVES simple, broadly ovate to **almost round**, 30–150 mm in diameter; **leathery**, pale grey, finely woolly covering, **rough; veins forming a characteristic reticulate pattern**. FLOWERS **creamy white**, occasionally pink, **papery**. FRUIT a small, woolly capsule cupped by brown, papery flower remains.

In Namibia there are two varieties, the most widespread of which is var. *rotundifolia*. Variety *velutina* is restricted to a valley in the Naukluft Mountains and is distinguished by the dense covering of stellate hairs on the ovary; it was not recorded by the TAP.



DISTRIBUTION & ABUNDANCE

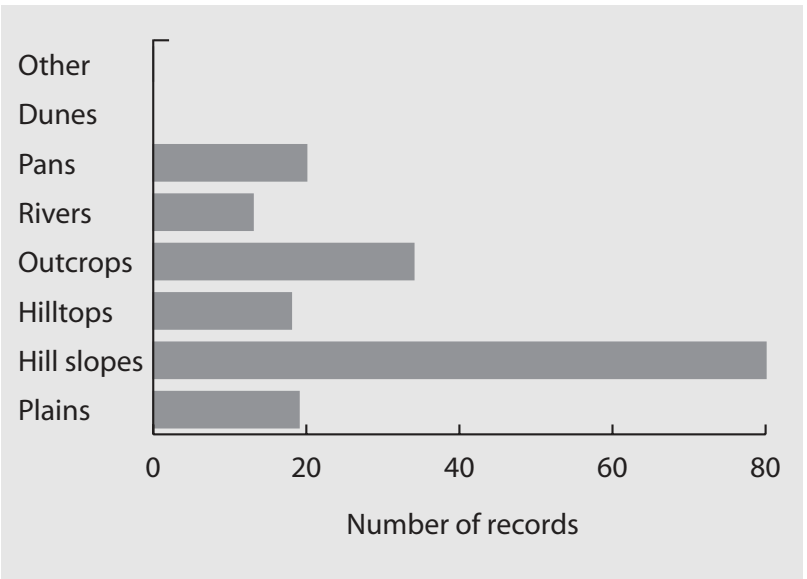
Occasional to sometimes locally abundant in the central highlands and on the north-central plateau; uncommon in the eastern Karstveld; scattered and isolated in the rest of the country. There are various outlying, earlier herbarium records that were not reconfirmed by the TAP.

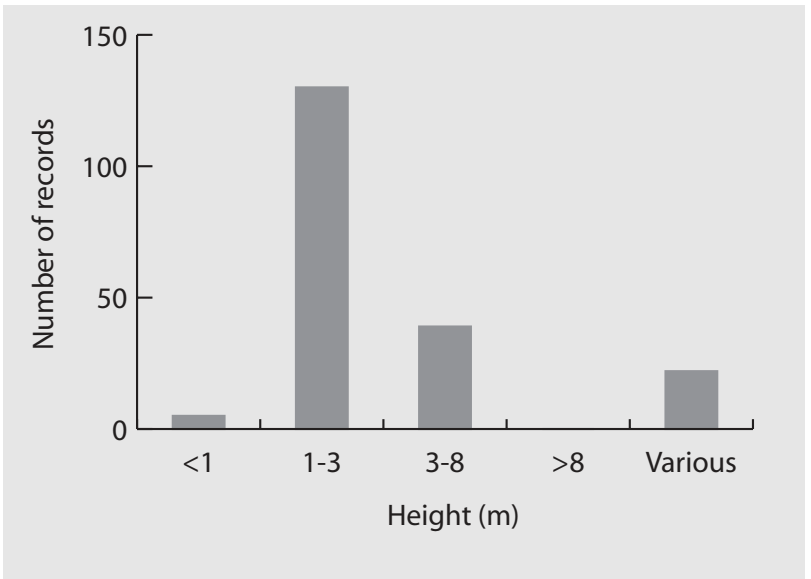
HABITAT

Found in various habitats, but most often on hill slopes. Also on rocky outcrops in the north-west, on the north-central plateau and in the central highlands; plains in the Karstveld and in kloofs or gorges. Always on rocky substrates including mica schist, granite, dolomite and calcrete.

GROWTH FORM

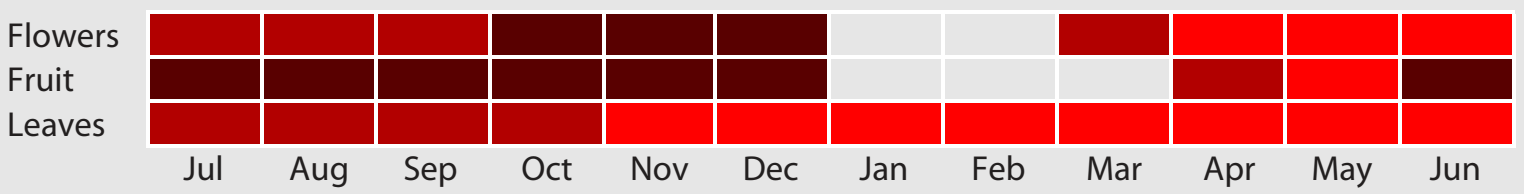
Generally a shrub up to 3 m high, sometimes a shrubby tree over 3 m.





ANNUAL CYCLE

FLOWERS March to September, tailing off to December, with a peak from April to June. FRUIT April to December, with a peak in April and May. LEAVES all year round, but mostly November to June, with young leaves August to November. There were no TAP records of var. *velutina*, but from the few herbarium records, flowers appear in October and November.



GENERAL

Leaves are browsed by game and livestock; the fruit is edible. The dried wood is termite resistant. This is a popular garden plant.

CONSERVATION CONCERNS

None recorded. Variety *velutina* is endemic and classified as 'least concern' (Craven & Loots 2002).



Dombeya rotundifolia, leaves and flowers, C. Mannheimer

Sterculia africana

Sterculia / Omuhako

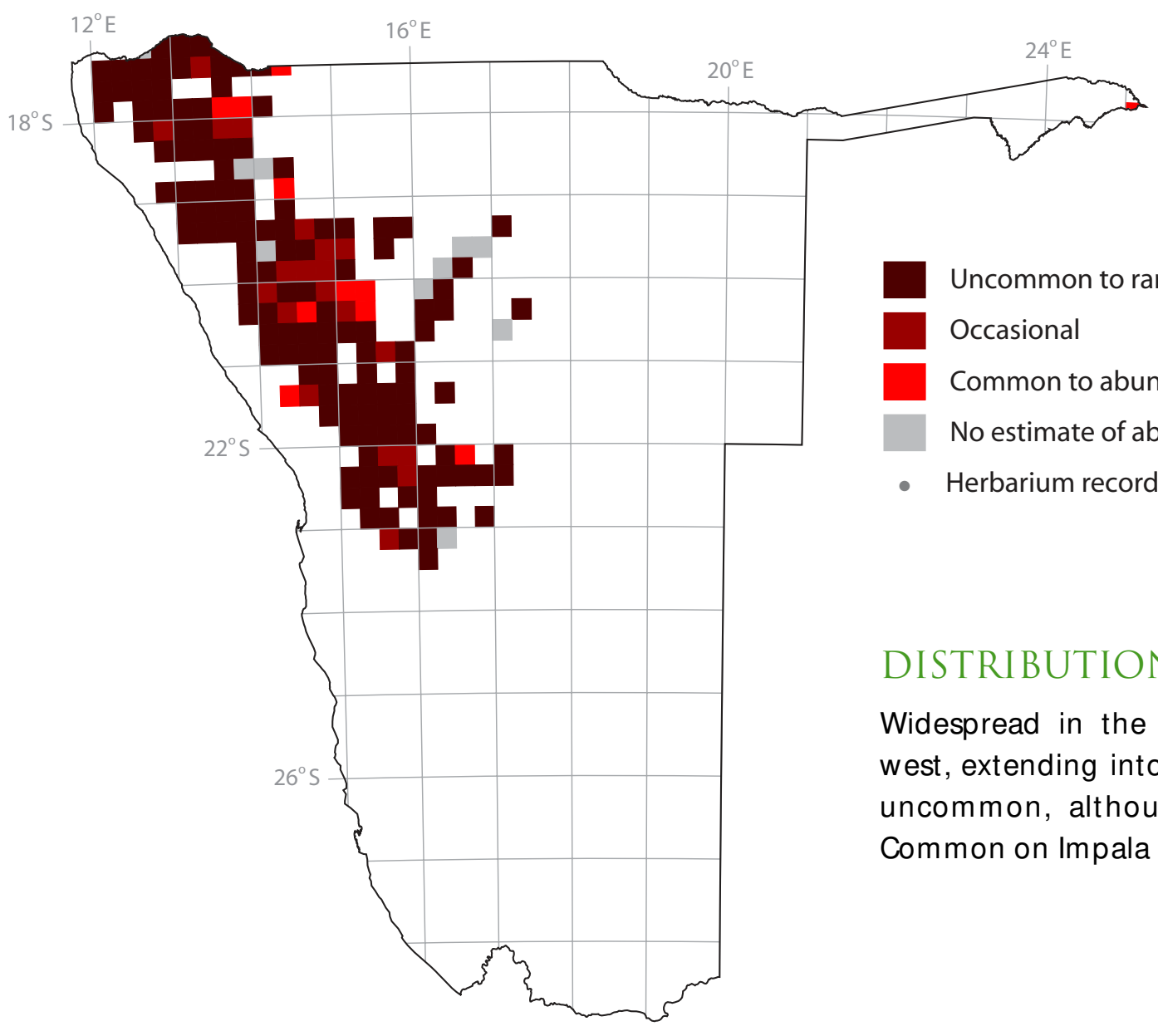
Tick tree (E); bosluisboom (A); Sterkulie (G); mukosa (L); #gûuge-anme/s (K)

[419 records from 171 (16%) squares]



A **fairly thick-stemmed** tree. BARK **smooth**, white to cream, often **red-brown or purple**; peeling in papery strips or woody discs to reveal a green underbark. LEAVES simple, **with 3–5 lobes**, 50–140 mm long; dark olive-green, rough; **conspicuously seven-veined**. FLOWERS **green-yellow with red stripes, cup-shaped**, up to 25 mm in diameter. FRUIT **a dry, woody capsule, up to 150 mm long; borne in clusters of 3–5; densely hairy**, beaked, mouth fringed with irritating bristles; splitting along one seam to form a boat-shaped receptacle. SEEDS **blue-grey with a small, white aril at base; attached at edge of opening between the bristles like engorged ticks**.

White-stemmed individuals may be confused with *S. quinqueloba*, which has larger and more deeply lobed leaves.

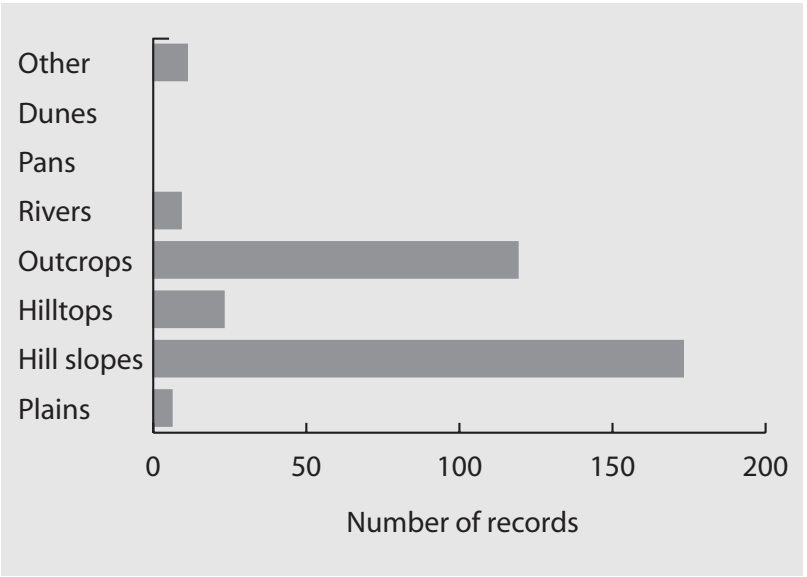


DISTRIBUTION & ABUNDANCE

Widespread in the north-west and central-west, extending into the Karstveld. Generally uncommon, although common in places. Common on Impala Island.

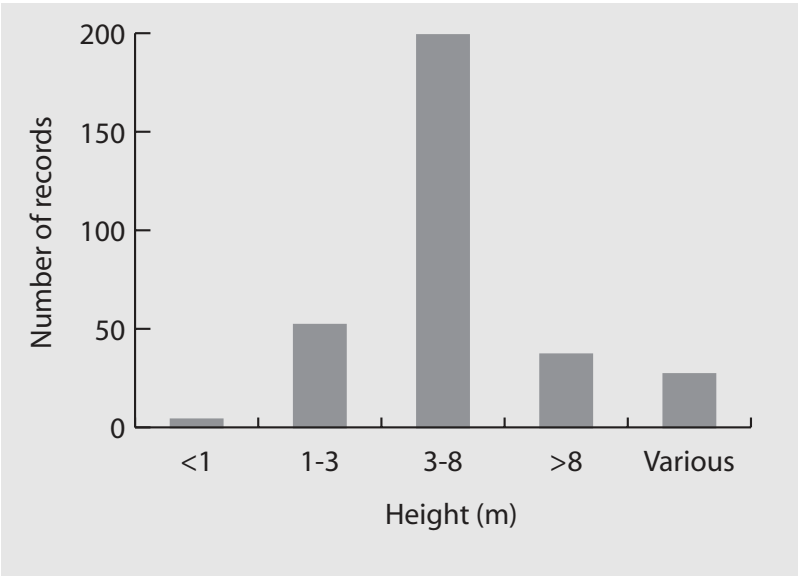
HABITAT

Found on rocky outcrops and rocky hill slopes; hilltops in the north-west; rarely on sandy plains. Often the most conspicuous tree on a rocky outcrop.



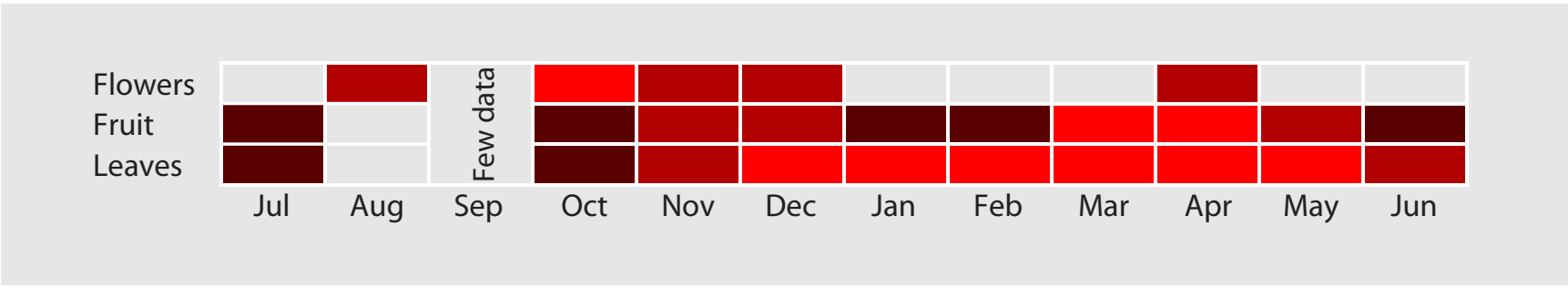
GROWTH FORM

A tree up to 8 m high or taller. Occasionally stunted in rock fissures or after damage by elephant. Few young plants recorded.



ANNUAL CYCLE

FLOWERS mainly October, continuing until December, with a smaller flush in April and an early flush in August; individual trees with flowers have been recorded almost every month. FRUIT some records every month, but mostly March and April; a record of fruit present does not indicate that there will be seed, as these are shed soon after the pod splits open. LEAVES November to June, mainly.

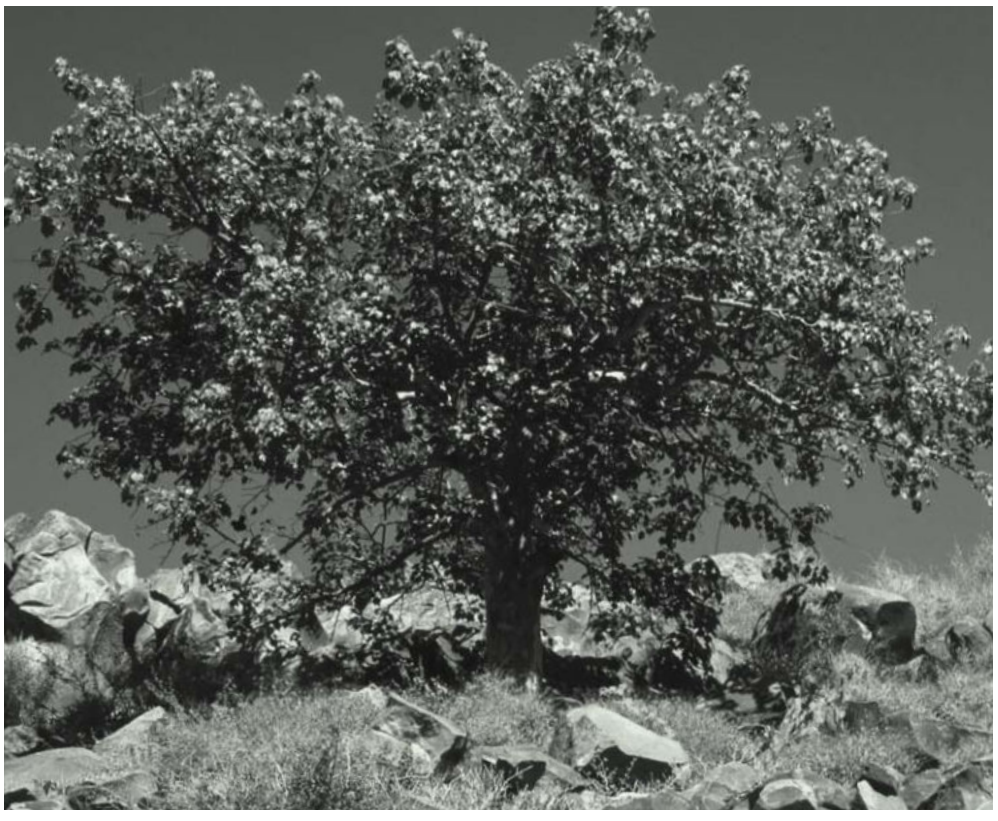


GENERAL

Of immense horticultural potential for dry gardens and the pachycaul trade. The trunk is attractive all year round. Known as 'false baobab' on Impalila Island.

CONSERVATION CONCERNS

None recorded. Protected by forestry legislation.



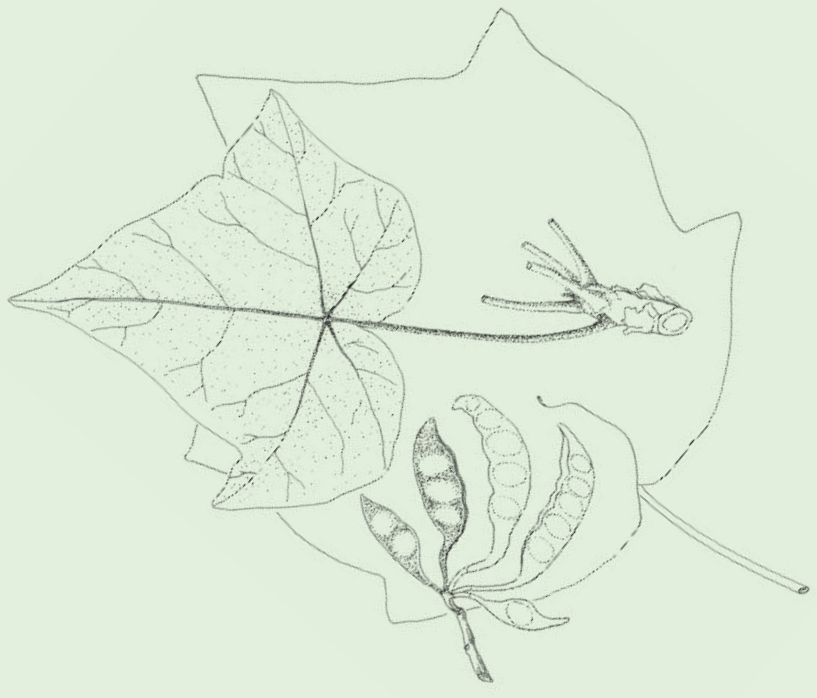
Sterculia africana, B. Curtis

Sterculia quinqueloba

Large-leaved Sterculia

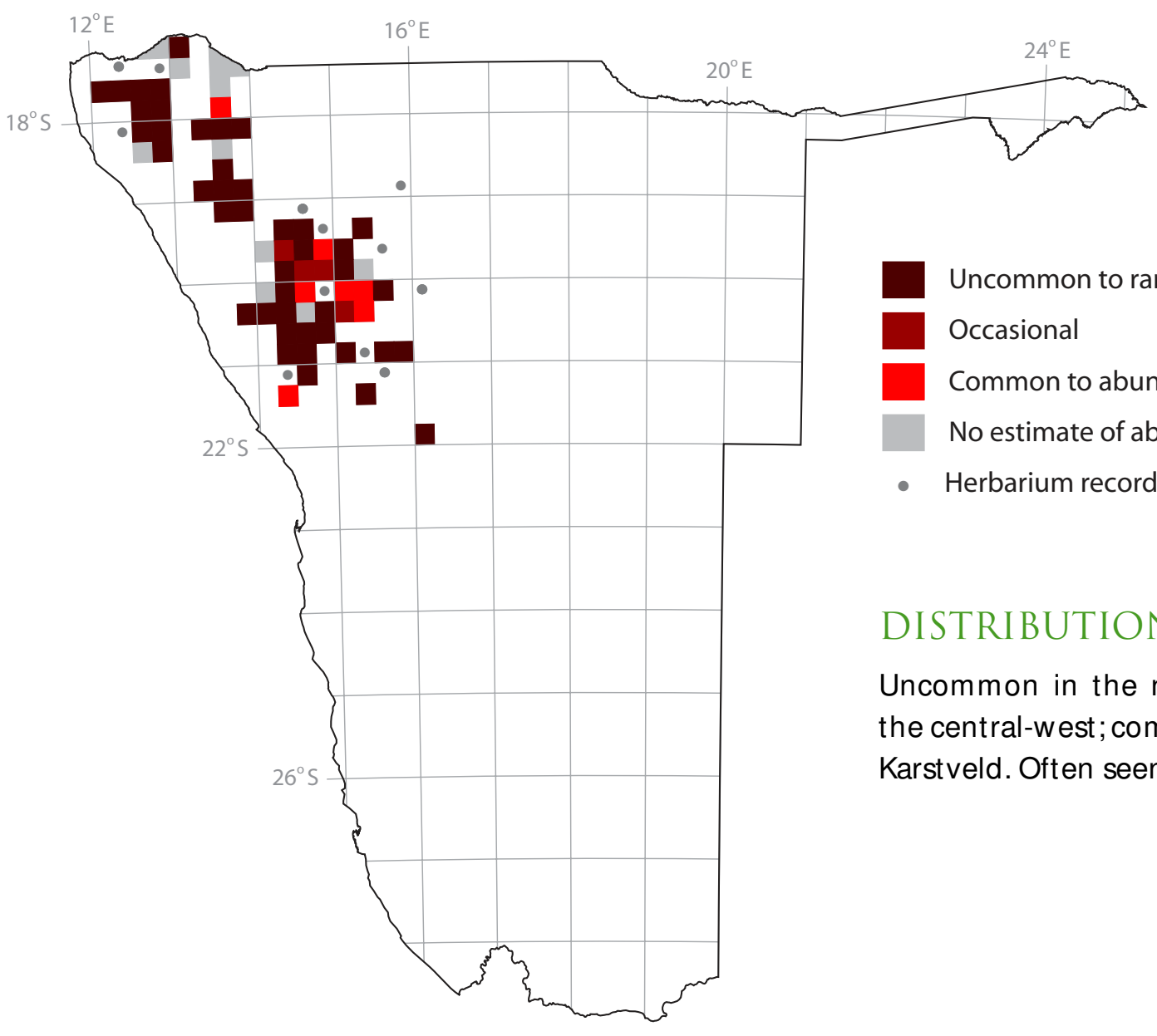
Grootblaarsterkastaing (A);
#khaugammeb (K); mukosa (L)

[122 records from 69 (6%) squares]



Erect tree. BARK **smooth, creamy white**, peeling in thin strips to expose a silver-white to pale brown-pink underbark. LEAVES simple, 3–5-lobed, **100–400 mm long**; pale green above; dull white-green to rust-coloured, finely woolly below, midrib prominent; **five-veined**. FLOWERS small, yellow. FRUIT five separate, dry capsules, 40–60 x 15–30 mm, with or without short point; covered in short, golden hairs; splitting along one seam to form a boat-shaped receptacle. SEEDS black, with small, inconspicuous aril; attached to rim of opening among long, irritating hairs.

May be confused with white-stemmed *S. africana*, but has larger leaves, which are five-veined and not seven-veined.

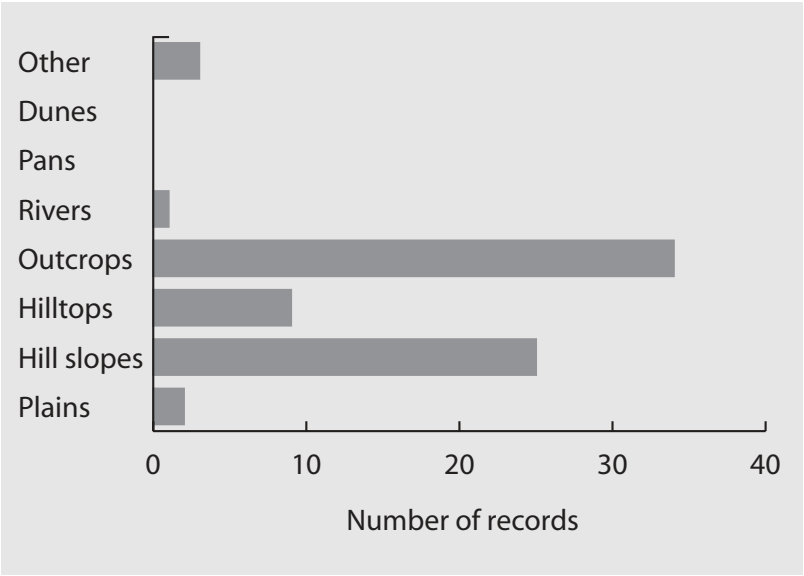


DISTRIBUTION & ABUNDANCE

Uncommon in the north-west; occasional in the central-west; common to occasional in the Karstveld. Often seen as single trees.

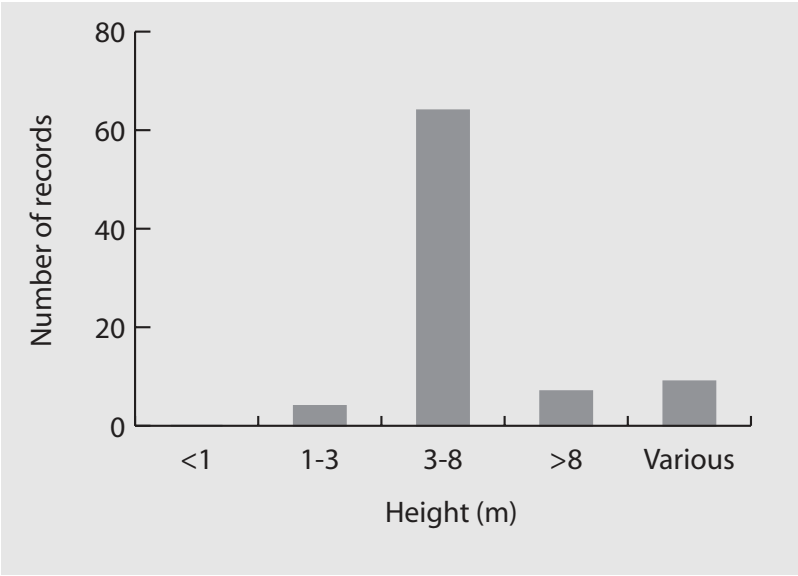
HABITAT

Rocky outcrops and rocky hill slopes.



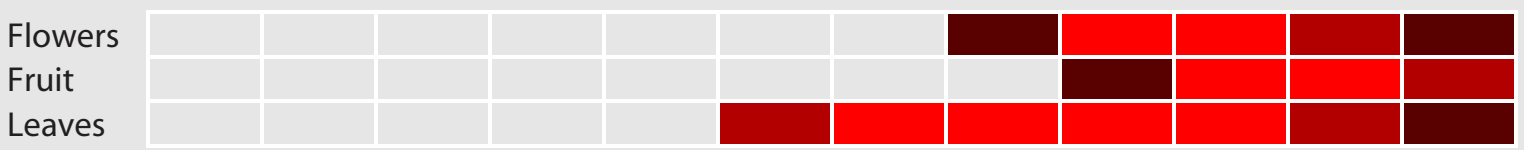
GROWTH FORM

A tree up to 8 m high and taller.



ANNUAL CYCLE

FLOWERS February to June, with a single record in spring. FRUIT March to June, with old fruit remaining till December. LEAVES December to May.

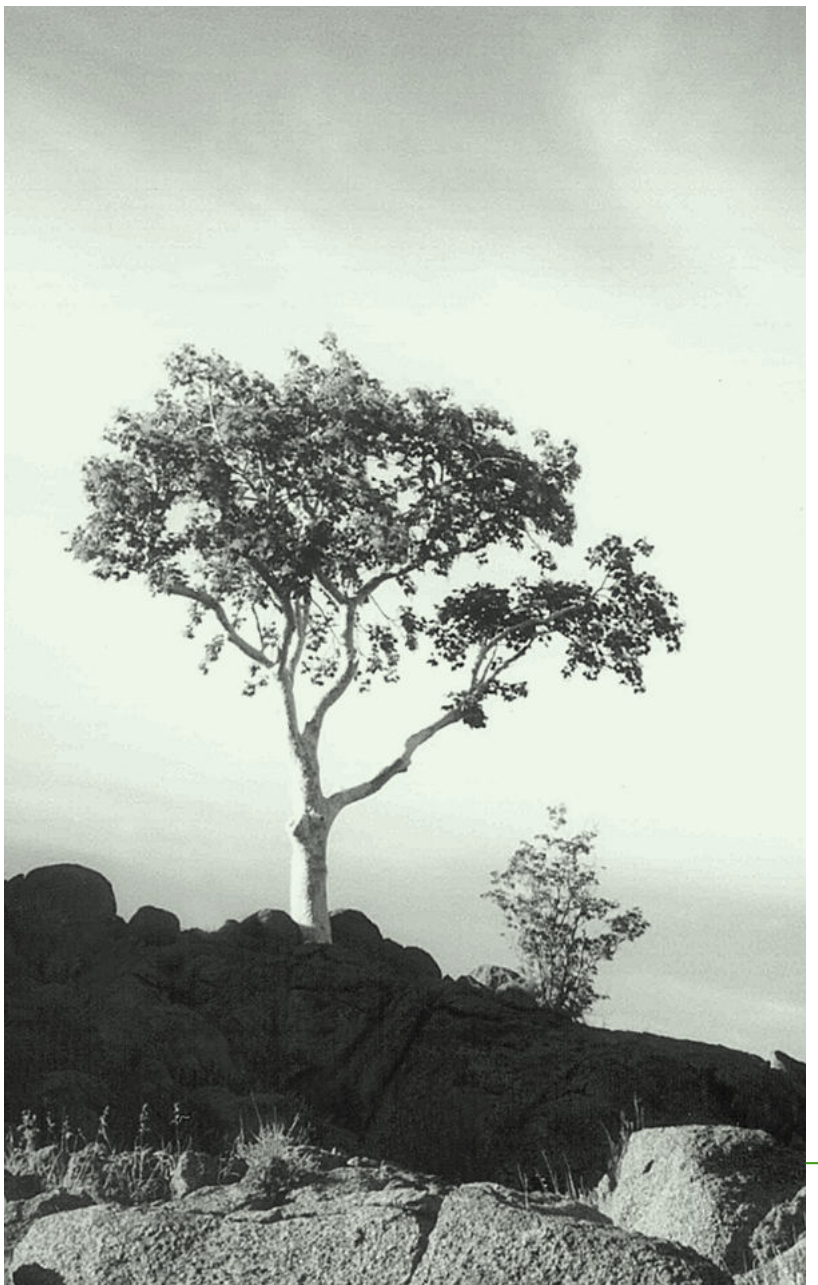


GENERAL

Of horticultural potential for dry gardens and the pachycaul trade. Attractive year-round.

CONSERVATION CONCERNS

None recorded. Protected by forestry legislation.



Sterculia quinqueloba, L. Hoffmann

Ochna cinnabarina

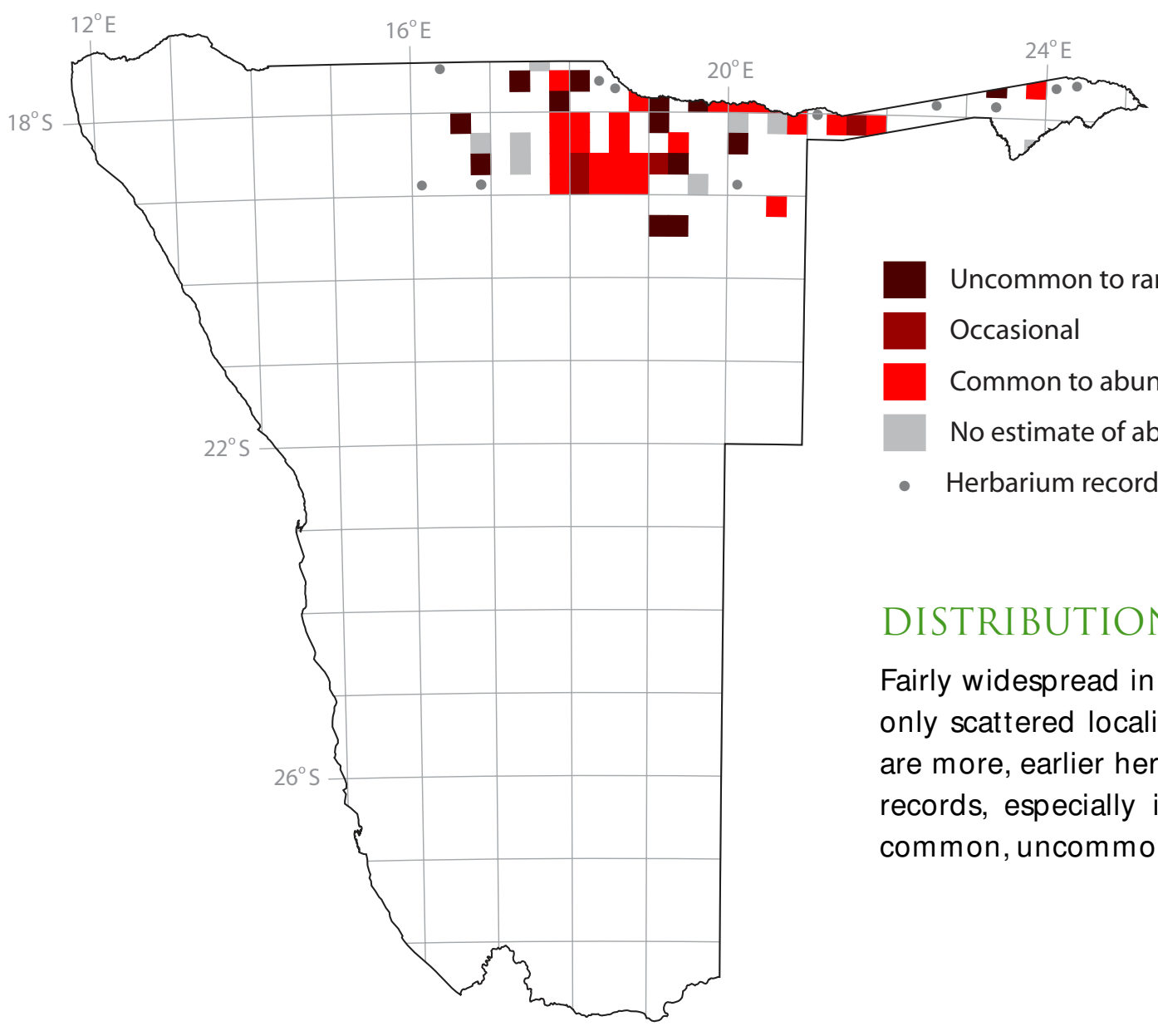
Small-leaved Ochna

#noubexare (K); kateko (L); sipungo (Rk); mupindu (T)

[75 records from 52 (5%) squares]



Deciduous shrub with **slender stems**. LEAVES simple, often clustered on branches; **elliptic to narrowly oblong, thin-textured; shiny, dark green above**; pale olive-green below; **margin finely toothed**. FLOWERS small, solitary. FRUIT a kidney-shaped berry, 8–14 mm; red when ripe, cupped by conspicuous flower remains.

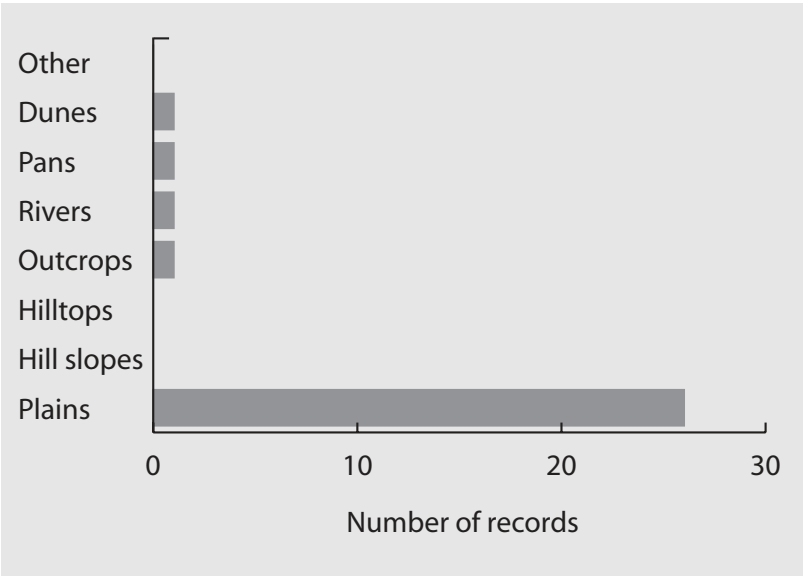


DISTRIBUTION & ABUNDANCE

Fairly widespread in the north-east, although only scattered localities in the Caprivi. There are more, earlier herbarium records than TAP records, especially in the Caprivi. Generally common, uncommon in places.

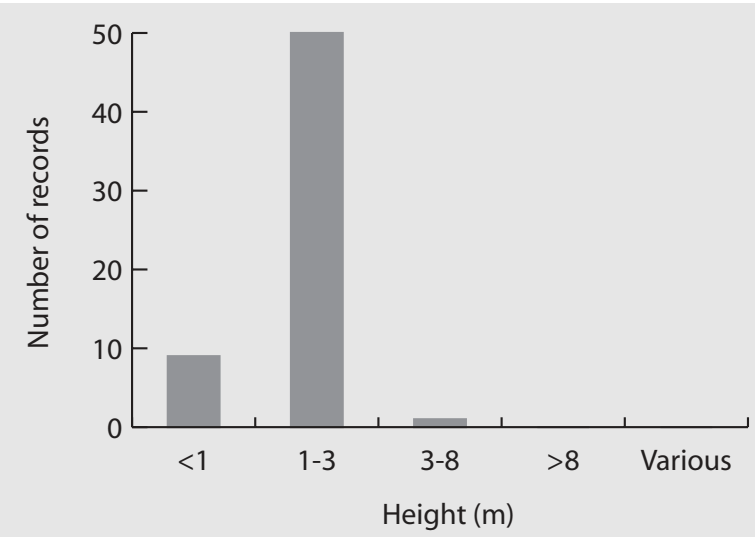
HABITAT

Mostly found on sandy plains.



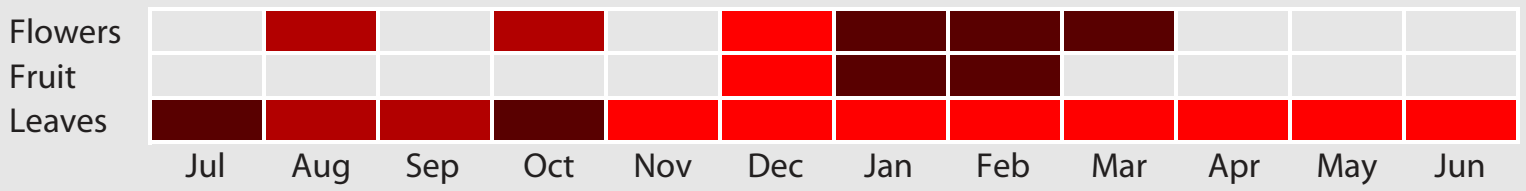
GROWTH FORM

A shrub 1–3 m high, seldom over 3 m.



ANNUAL CYCLE

FLOWERS December, with a few records in August, October and late summer; individuals flower for a very short period. FRUIT December, with isolated records from other months. LEAVES mainly November to June, although some individuals may be in leaf all year.



GENERAL

Of horticultrual potential in frost-free areas for their attractive foliage and fruit.

CONSERVATION CONCERNS

None recorded.



Ochna cinnabarina, fruit, G. Friederich

Ochna pulchra

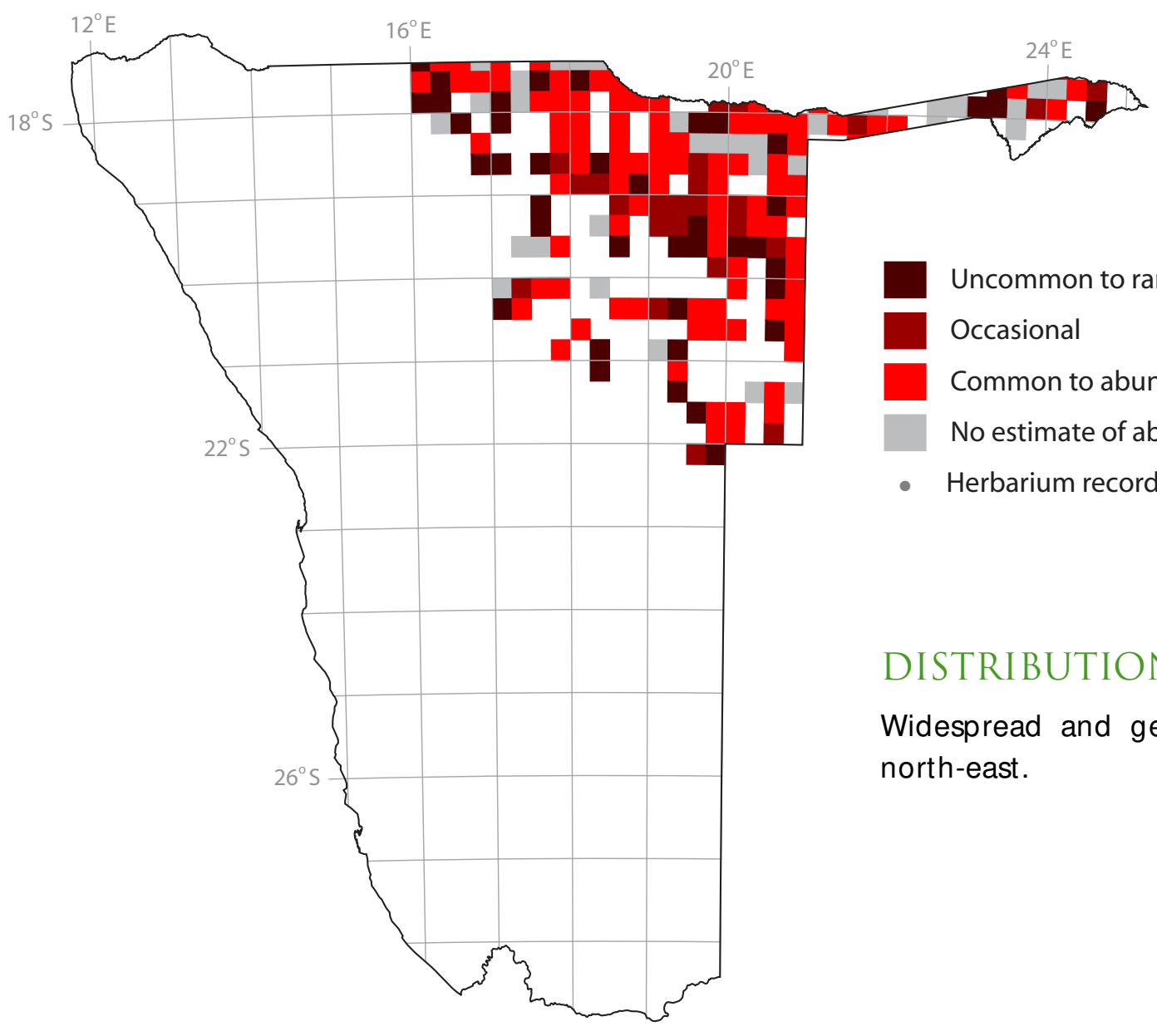
Lekkerbreek

Peeling-bark ochna (E); kyala (Kx); muywela (L); muzwe (Rk, Rum)

[364 records from 192 (18%) squares]



Deciduous shrub or tree, with sparsely branched crown. BARK **smooth, blue-grey**, flaking off in thick strips to expose a cream-coloured to **orange-brown underbark; on thinner branches the growth of successive years is clearly differentiated by colour**. LEAVES simple, elliptic, 50–110 mm long, leathery; shiny, green-yellow above, duller below. FLOWERS pale, greenish-yellow; petals falling early; **sepals pink to red**, 12 x 8 mm. FRUIT **a black berry**, ***c.*** **14 mm long; enclosed in the conspicuous persistent calyx**.

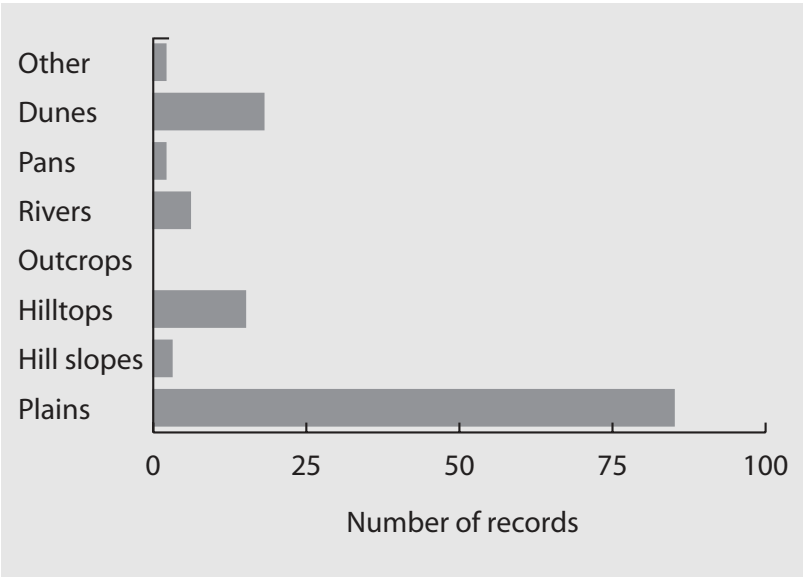


DISTRIBUTION & ABUNDANCE

Widespread and generally common in the north-east.

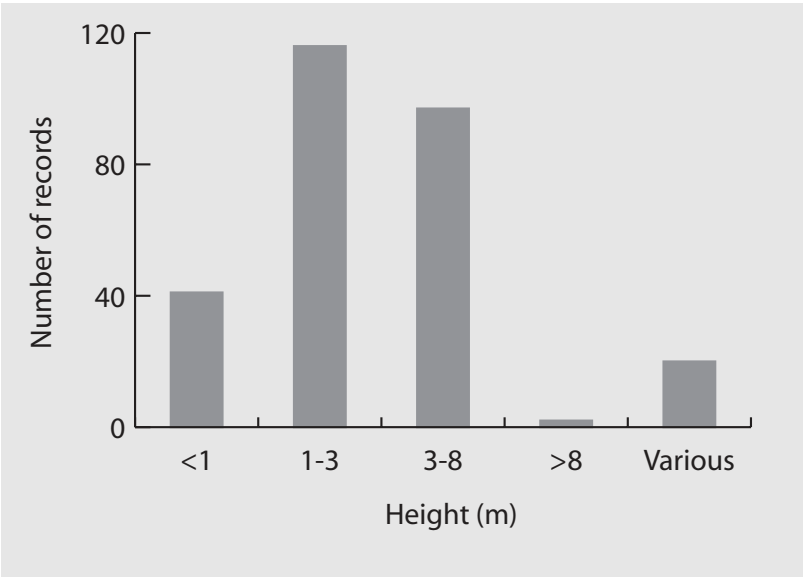
HABITAT

Found in various habitats, but mostly on plains.



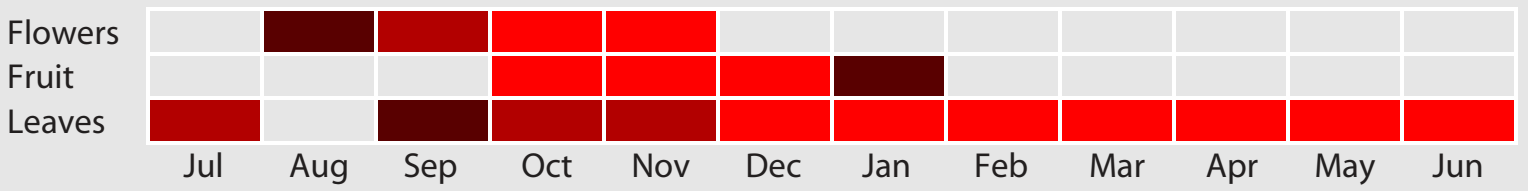
GROWTH FORM

Equally often trees as shrubs. Mostly in the 1–3-m and 3–8-m height classes, but can be over 8 m tall. About 30% of the stands observed had plants of various heights.



ANNUAL CYCLE

Flowers August to November. Fruit October to January. Leaves October to July, with new leaves from August to October.

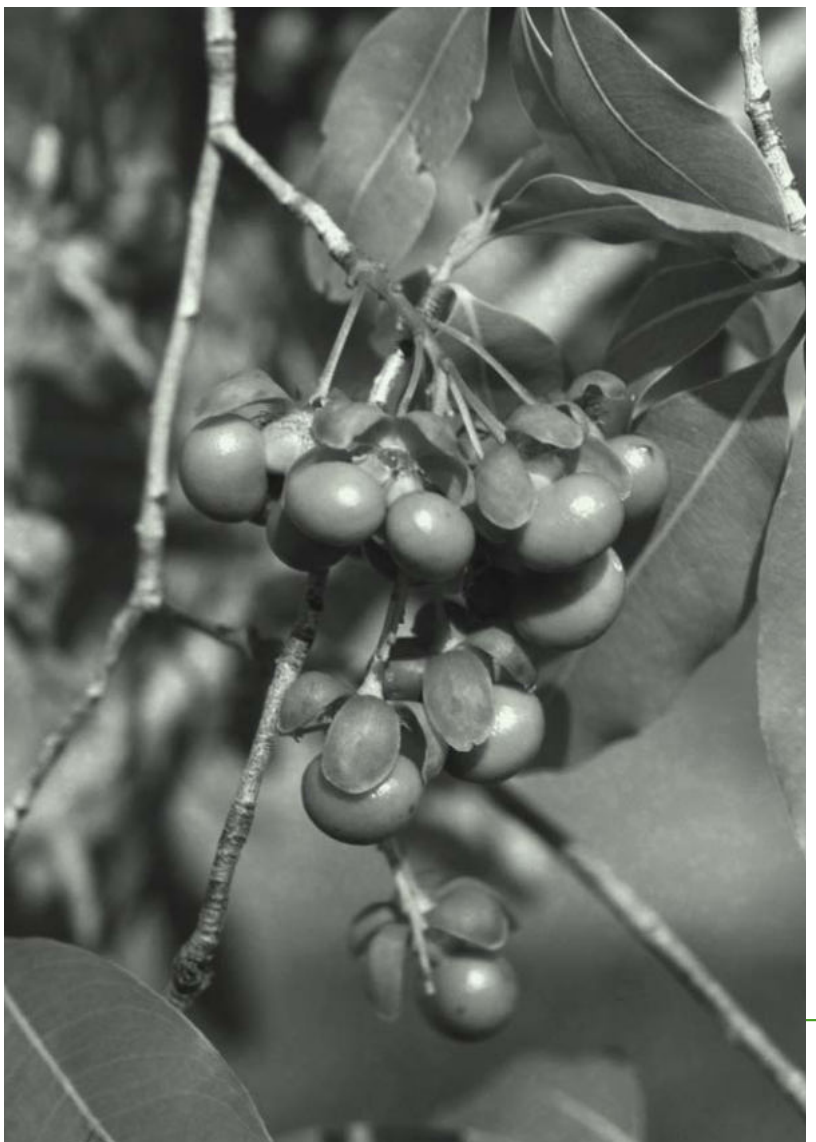


GENERAL

A rain-dependent species (FRI1). The young leaves are toxic. The wood has various uses; ripe seed has a high oil content, which is used for cooking and polishing metal; the leaves and roots are used medicinally. The Afrikaans common name, 'lekkerbreek', refers to the fact that twigs are easily broken – they do not bend much before snapping cleanly. This plant is of horticultural potential for frost-free areas as the bark, flowers and fruit are attractive.

CONSERVATION CONCERN

None recorded. Protected by forestry legislation.



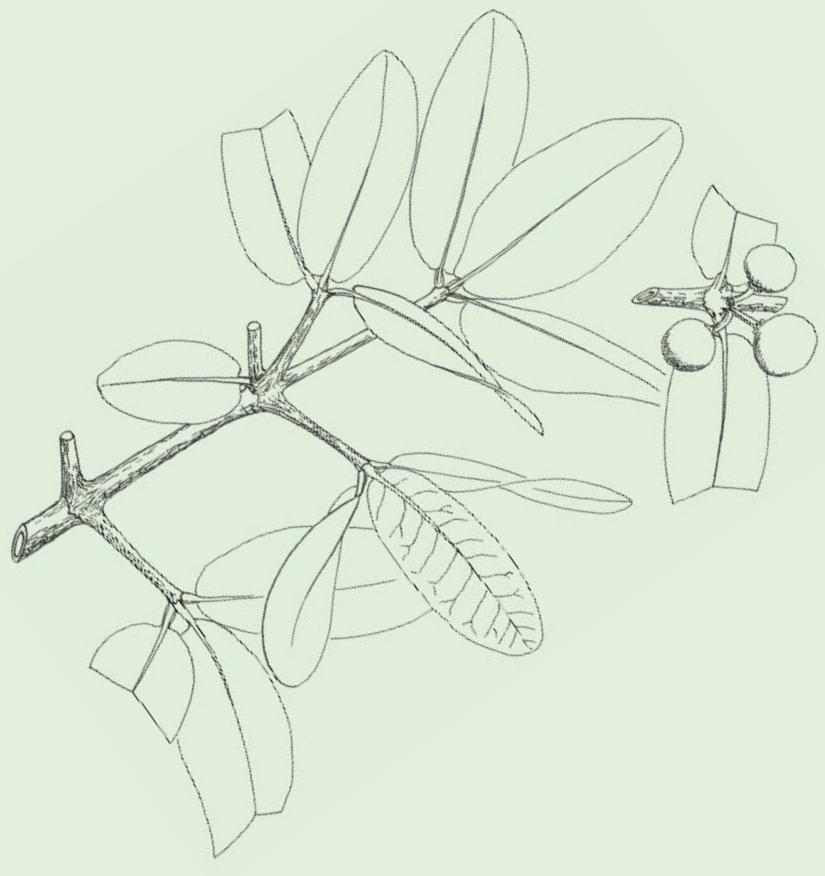
Ochna pulchra, fruit, C. Hines

Garcinia livingstonei

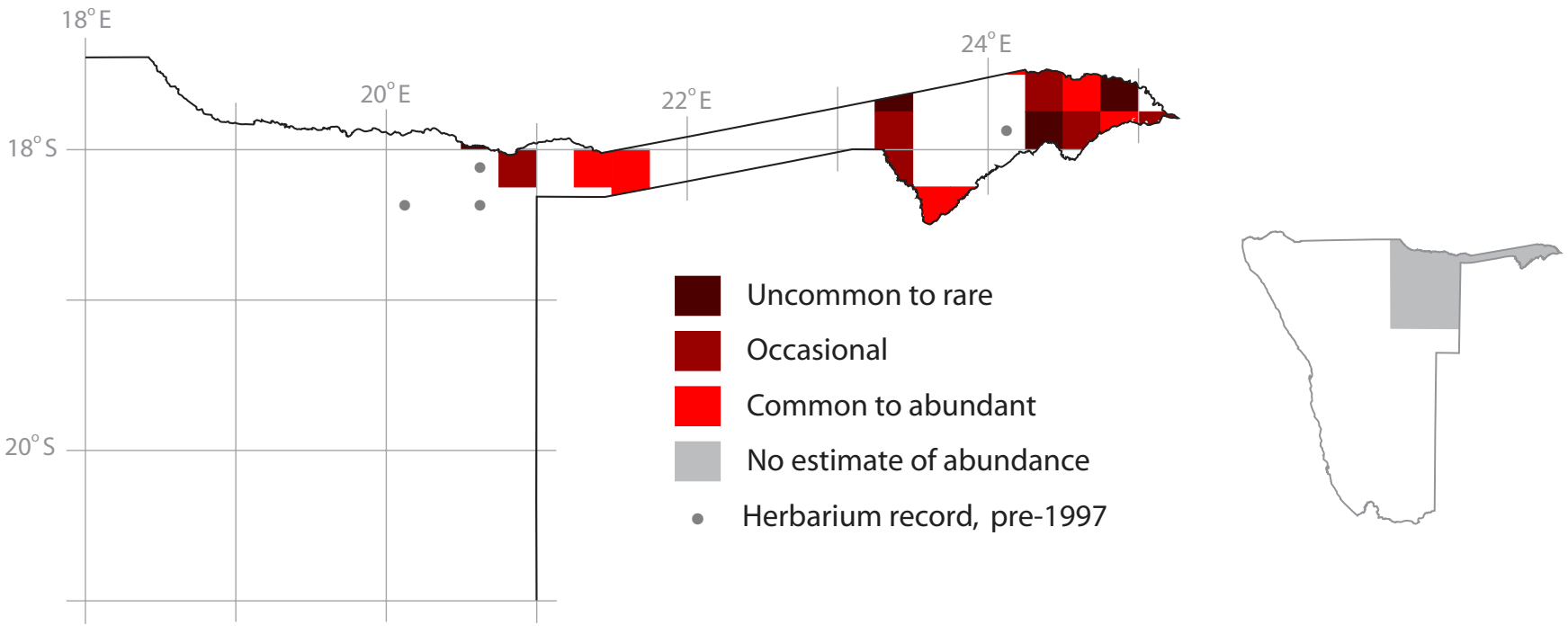
Ushika

African mangosteen (E); geelmelkhout (A); ghushika (L)

[60 records from 20 (2%) squares]



Erect tree. BRANCHES **characteristically rigid, short, at acute angles to the main stem, generally in whorls of three**; with yellow latex. LEAVES fairly large, whorled; **stiff, leathery, dark green**, hairless. FLOWERS small, green-white to yellowish; sweetly scented, with copious nectar; male and female flowers on separate plants. FRUIT **a fleshy, almost-round berry; yellow to orange-red when ripe, resembling an apricot**.

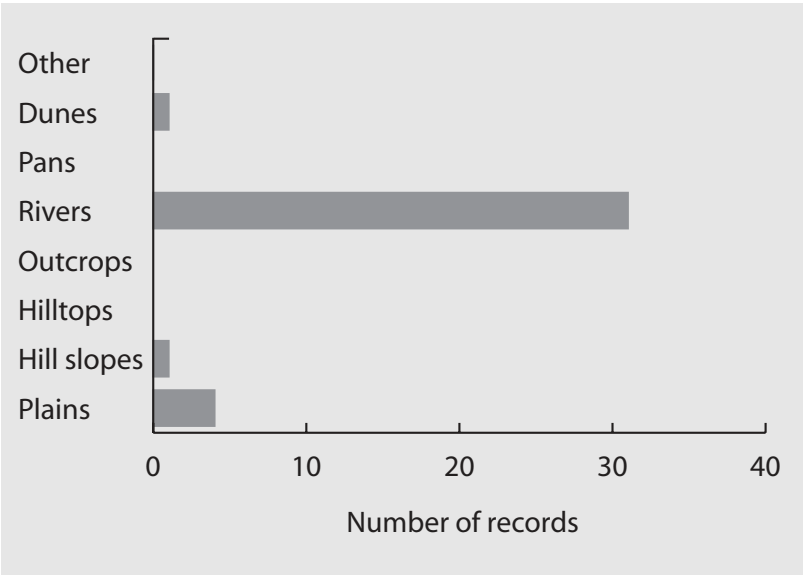


DISTRIBUTION & ABUNDANCE

Generally common along the eastern stretches of the Okavango River; common to occasional in eastern Caprivi. Locally dominant near Susuwe (1724DA).

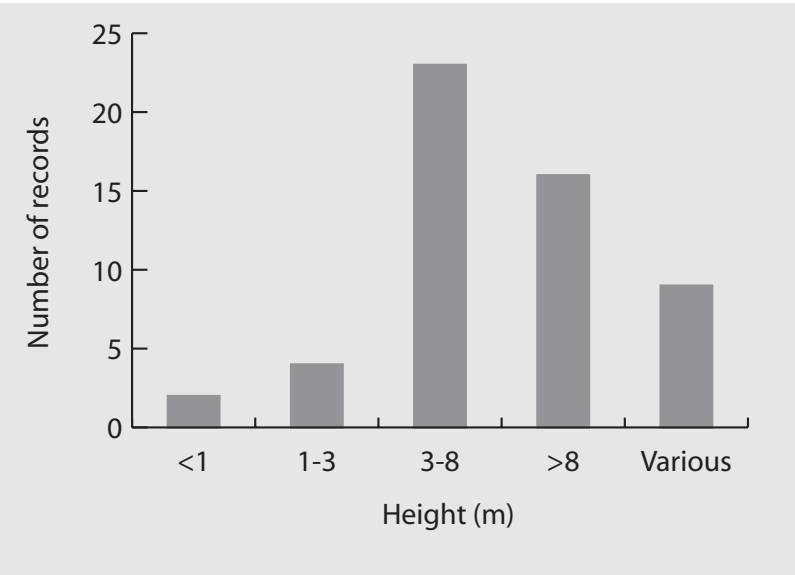
HABITAT

Found along river banks and on floodplains in riverine forest.



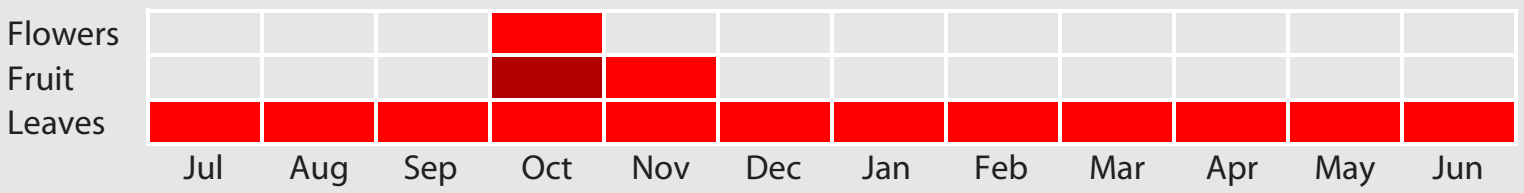
GROWTH FORM

A tree, mostly up to 8 m high (64% of records), but often taller (36%). Fairly often in stands of trees of varying heights.



ANNUAL CYCLE

FLOWERS October. FRUIT October and November (with one record in May). LEAVES evergreen.



GENERAL

The fruit is edible and tasty, and eaten by people and birds.

CONSERVATION CONCERNS

May be disappearing in the Kavango Region as there were fewer TAP records than earlier herbarium records in squares that were visited by atlassers.



Garcinia livingstonei, Katima Mulilo, Caprivi, B. Curtis

Tamarix usneoides

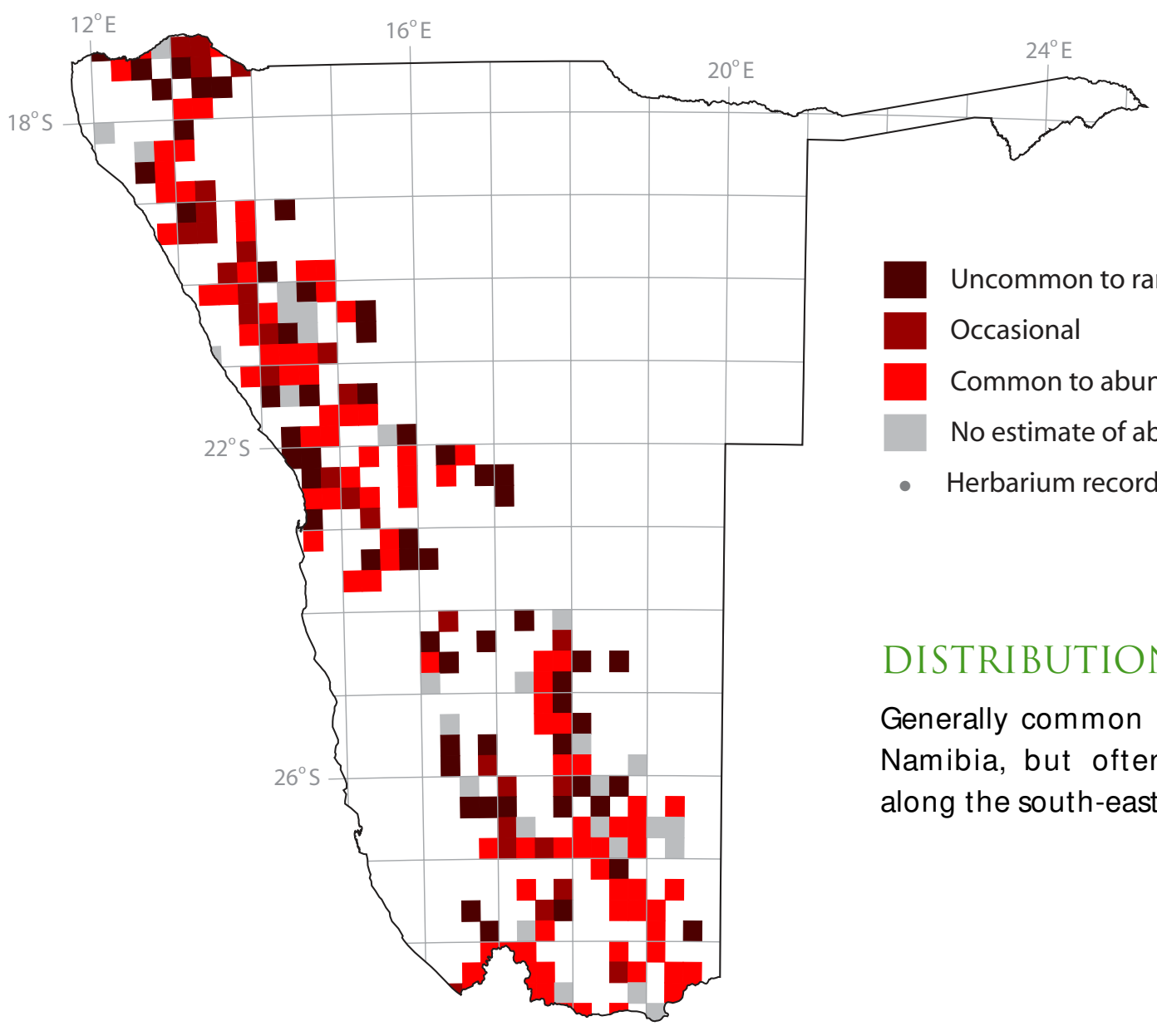
Wild Tamarisk

Abiekwasgeelhout (A); Tamariske (G); omungwati (H); daweb (K)

[487 records from 215 (20%) squares]



Shrub or tree. LEAVES simple, **very small**, c. 1 x 0.5 mm; **almost scale-like**, sessile, closely overlapping each other; both surfaces **grey-green**. FLOWERS **very small, white, in feathery sprays**; male and female flowers on separate plants. FRUIT a three-valved capsule with small seeds.

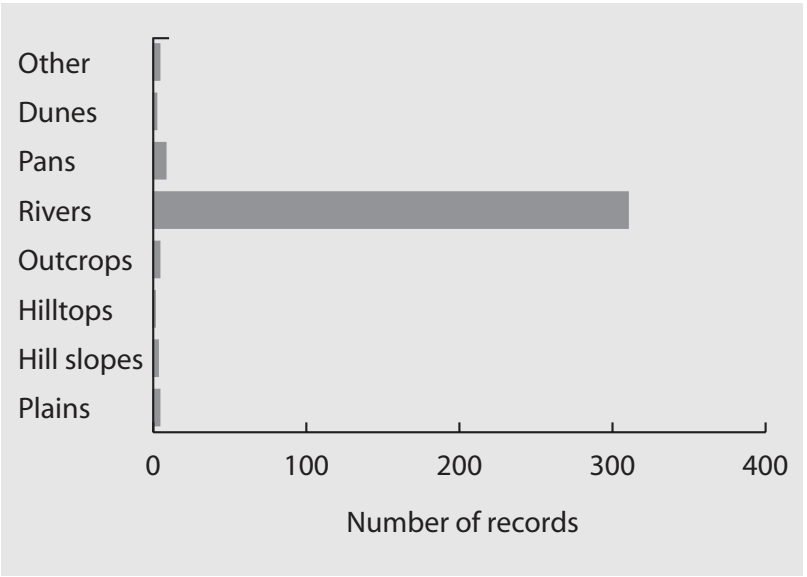


DISTRIBUTION & ABUNDANCE

Generally common in western and southern Namibia, but often localised. Uncommon along the south-eastern escarpment.

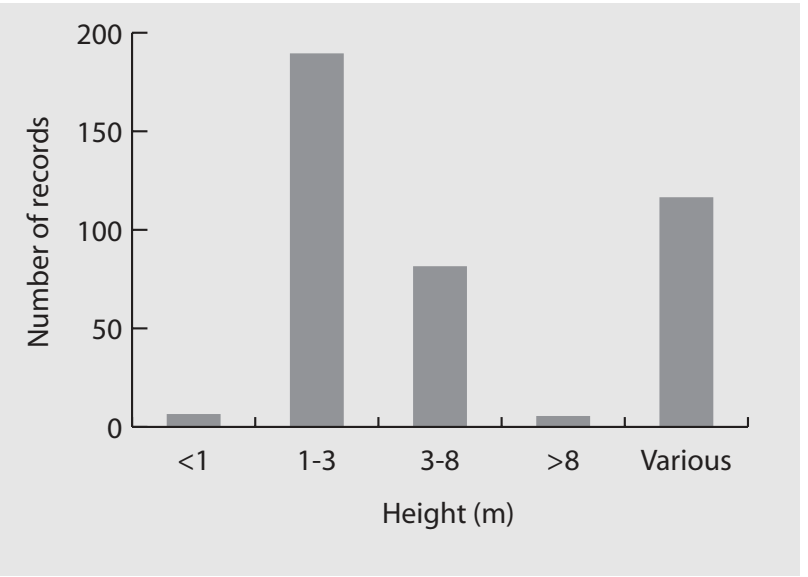
HABITAT

Almost exclusively associated with rivers, also pans and floodplains; occasionally on rocky outcrops or hills. Generally in saline soils.



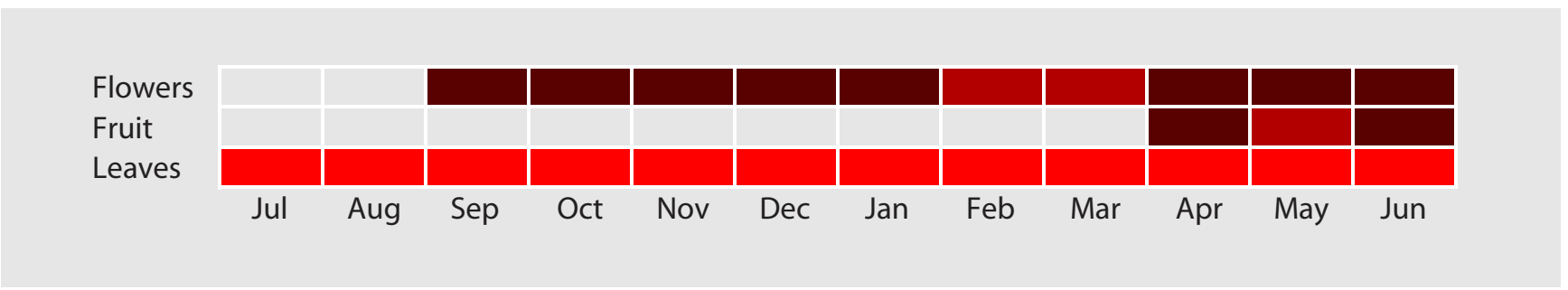
GROWTH FORM

Predominantly a shrub (70% of all records) in the 1–3-m height class (68% of shrub records), but often taller. Trees also mainly 1–3 m high (57% of tree records), but may be up to 8 m or over. About 25% of records were of stands of trees of mixed heights. Numerous young seedlings seen in riverbeds after floodwaters have receded.



ANNUAL CYCLE

FLOWERS almost all year but never prolific. FRUIT single records almost every month, but a few records April to June. LEAVES essentially evergreen, with a few bare individuals noted in September; old and young leaves from April to October.



GENERAL

Usually an indicator of a high, saline water table. Prolific seedling production in the westward-flowing ephemeral rivers after a flood. Often parasitised by *Tapinanthus*. The leaves are browsed; the wood is used for fuel and other purposes.

CONSERVATION CONCERNS

None recorded.



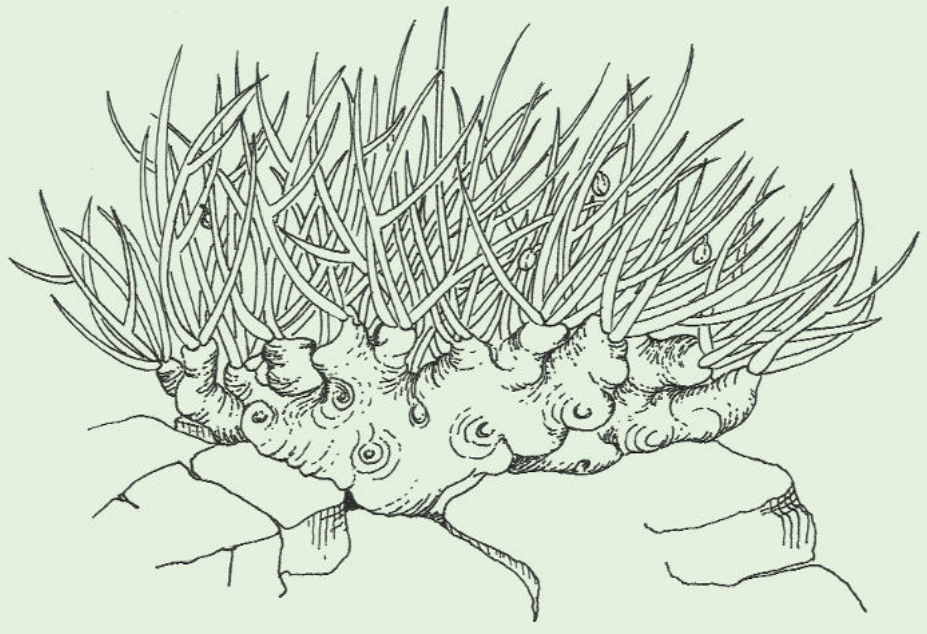
Tamarix usneoides, leaves and flowers, C. Mannheimer

Adenia pechuelii

Elephants-foot

Wüstenkohlrabi (G)

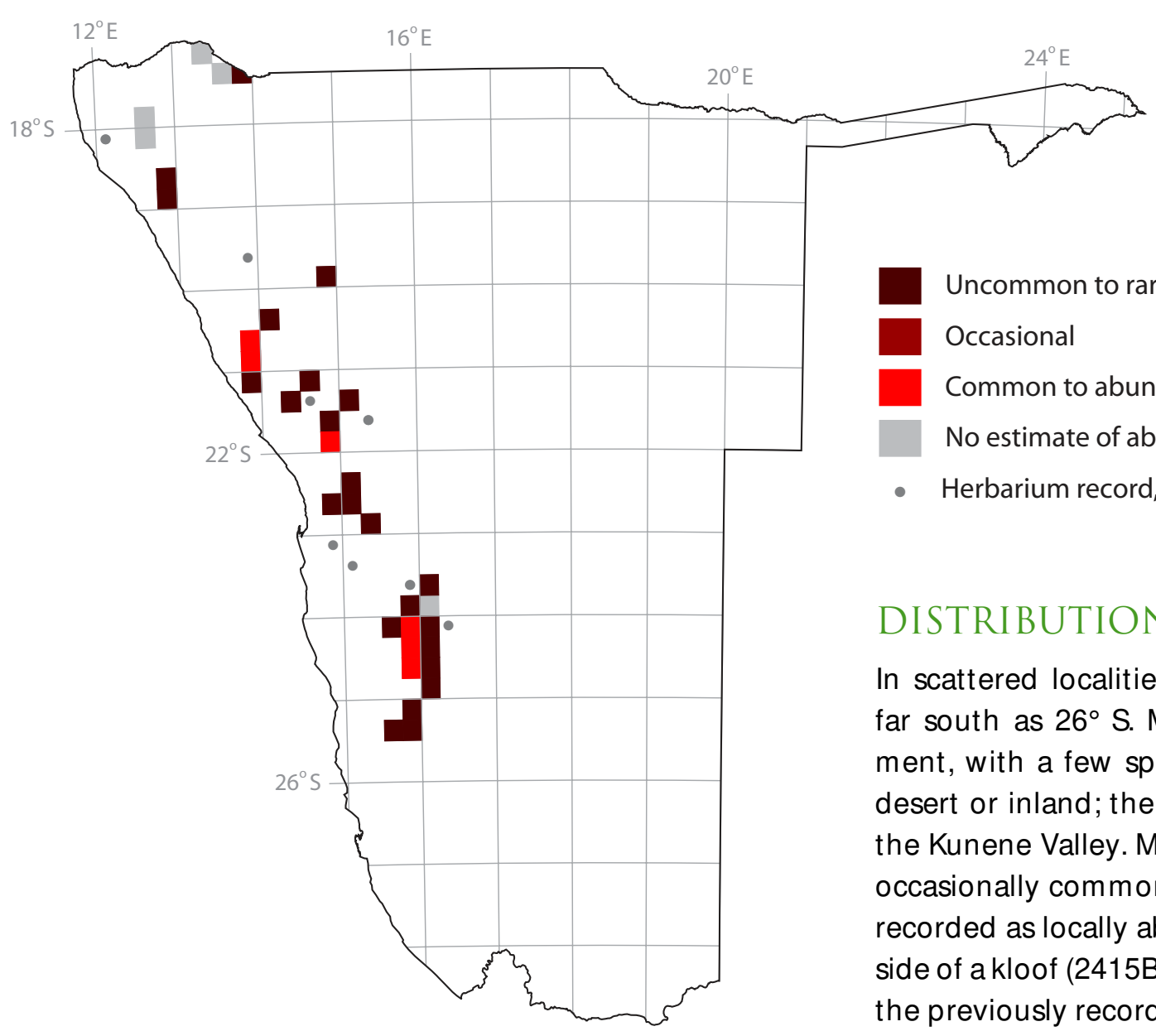
[74 records from 35 (3%) squares]



A dwarf tree with a **very large, squat, swollen, almost-round trunk** and **succulent, green, finger-like** branches orientated in all directions. BARK smooth, **cream to light grey-green**. LEAVES few, small, grey-green. FLOWERS small, greenish. FRUIT **a three-lobed capsule; red when ripe**.

Flowers inconspicuous, but fruit conspicuous when ripe. Looks like a euphorbia with a thick stem. Twenty-five of the TAP records are of the same plants in different months (2215AC).

In strict taxonomic order, this family should come after Flacourtiaceae.

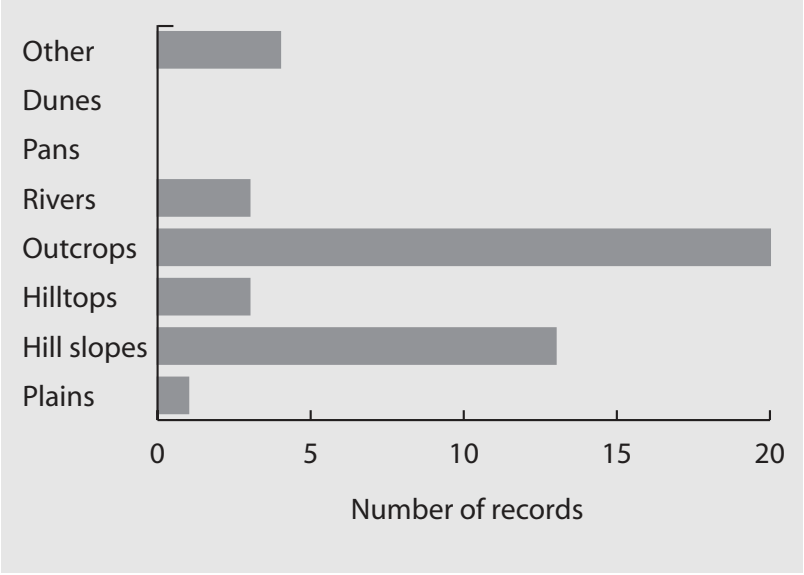


DISTRIBUTION & ABUNDANCE

In scattered localities in western Namibia as far south as 26° S. Mostly along the escarpment, with a few specimens further into the desert or inland; there is also a population in the Kunene Valley. Mostly rare to uncommon, occasionally common. Always localised. Once recorded as locally abundant on the southern side of a kloof (2415BB). The TAP has increased the previously recorded range of this species.

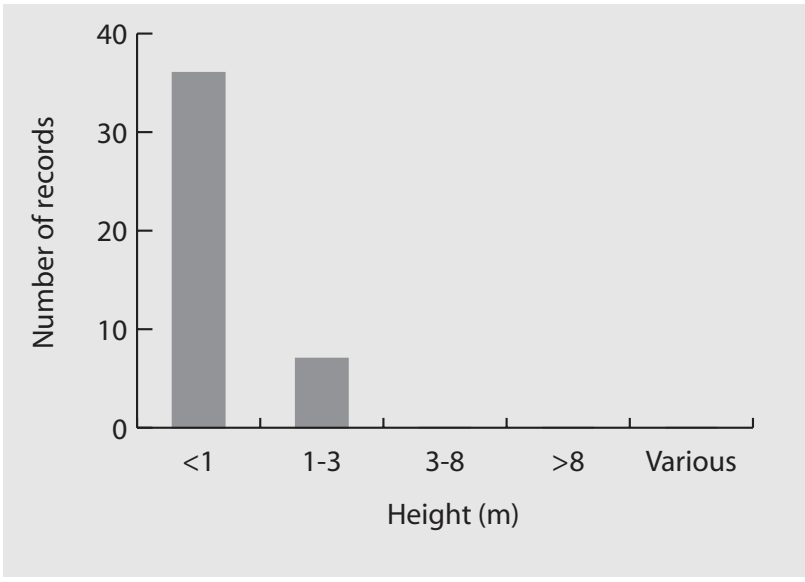
HABITAT

Mostly found on rocky outcrops and hill slopes.



GROWTH FORM

A shrub (or dwarf tree with a swollen trunk), <1 m high; occasionally >1 m. One specimen, 2 m tall was recorded in 2316CC (CRA1, specimen 8073). In 2115AC there are large individuals up to 3 m in diameter (ELL1). In 2416AA they have an unusual growth form, with stems 'branching like *Cyphostemma*' (TAP excursion).



GENERAL

Of horticultural potential for dry gardens and the pachycaul market.

ANNUAL CYCLE

FLOWERS February to June. FRUIT February to April. LEAVES never many leaves any time of year, but for most months at least one record of leaves.

This species appears not to flower or fruit regularly. On Rössing Mine (2215AC), flowering was only observed twice (in February 2000 and March 2003) in 25 observations (KER1); fruiting was never observed.

CONSERVATION CONCERNS

Endemic and restricted to a fairly small area, and increasingly threatened by the pachycaul trade. Worthy of protection. Assessed as 'near threatened' according to IUCN criteria (Loots 2005).

Flacourtia indica

Mubukushu

Governors-plum (E)

[2 records from 2 squares]

In strict taxonomic order, this family should come before Passifloraceae.

A shrub or small tree. LEAVES very variable, ovate. FLOWERS greenish-yellow flushed with dull red; petals absent; stamens many, forming a central mass. FRUIT round, fleshy, dark red to purple; edible but acidic.

One record from Impalila Island (1725CC) and one from Popa Falls (1821BA). A common tree where it occurs, 3–6 m high. FLOWERS and FRUIT were recorded in November. There is one earlier herbarium record from Katima Mulilo, with fruit in February.

Oncoba spinosa

Munzenze

Snuff-box tree, fried-egg flower (E)

[3 records from 2 squares]

A spiny shrub or small tree. LEAVES ovate-elliptic, leathery; dark, glossy green; coarsely toothed margin. FLOWERS showy, white with a central mass of golden-yellow stamens. FRUIT a round, hard-shelled, reddish-brown capsule.

Three records from eastern Caprivi (1724DC) and on the Okavango River (1821BA). There are earlier herbarium records from six additional squares, including Impalila Island. A shrub or tree in the 1–3-m and 3–8-m height classes on the banks of perennial rivers. FLOWERS recorded in September and February. FRUIT recorded in November, December, January, February and May.

Combretum apiculatum

Kudu-bush

Koedoebos (A); Kudubusch (G); omumbuti (H); #óó.b/s (K); kalanga; mumpaumpa (L); omunaluko (O)



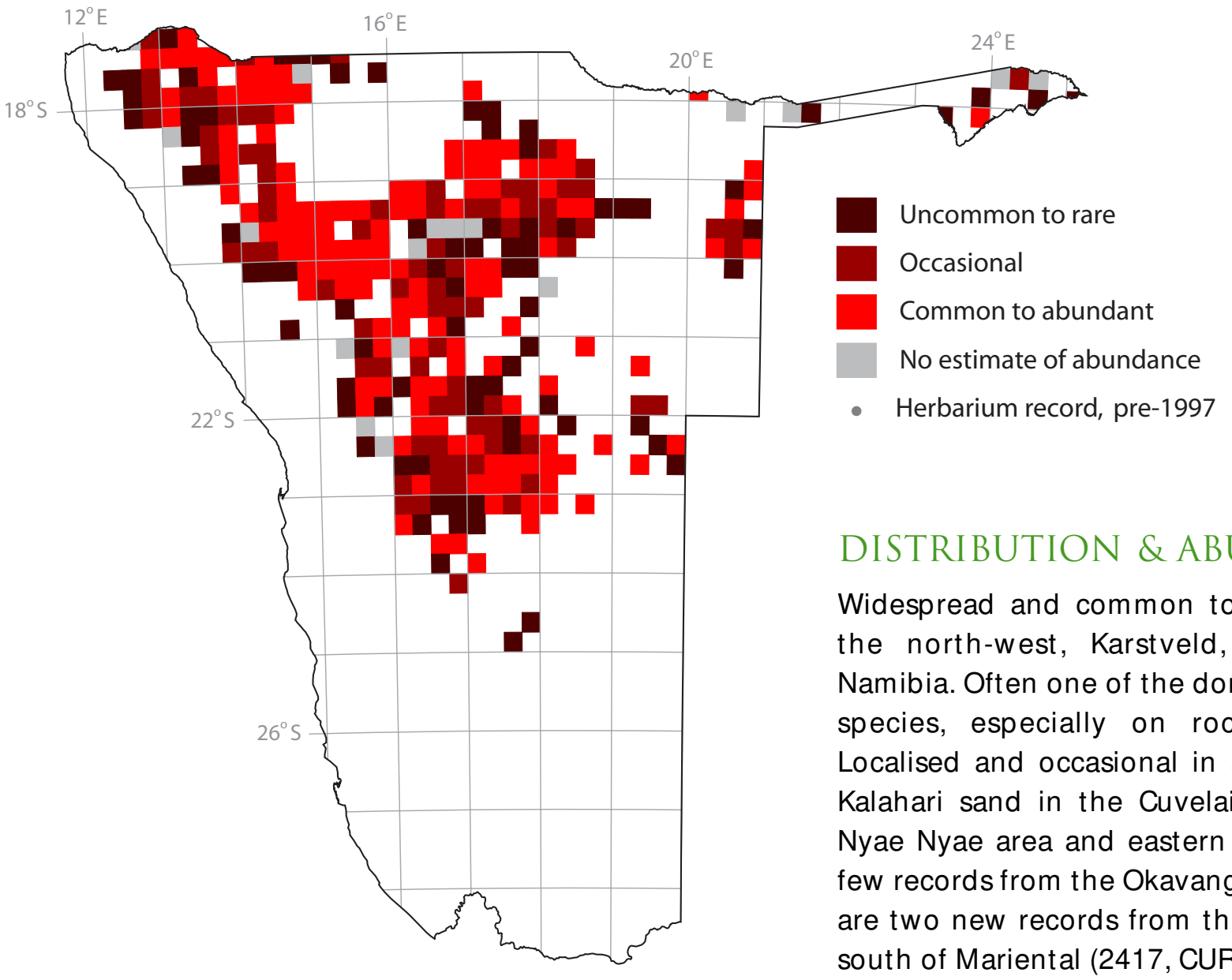
Shrub or tree. LEAVES with successive pairs set at right angles to each other; broadly elliptic, up to 110 mm long; **leathery, margin undulate; apex abruptly pointed, often twisted**. FLOWERS cream-coloured to yellow with a strong, pleasant scent. FRUIT usually four-winged (can vary from 3–6); ovoid to almost round, c. 30 mm, mustard-yellow central part; wings papery, greenish with pale to dark purple tints.

There are two subspecies in Namibia, which are easily distinguished by their leaves. By far the more common and widespread is subsp. *apiculatum*, thus all records not specifically identified as subsp. *leutweinii* have been assigned to *apiculatum*. Data for annual cycle have been combined; all other data for the two subspecies are presented separately.

C. apiculatum subsp. *apiculatum*

[1,119 records from 319 (30%) squares]

LEAVES both surfaces **bright green to yellow-green, hairless, shiny, sticky**.

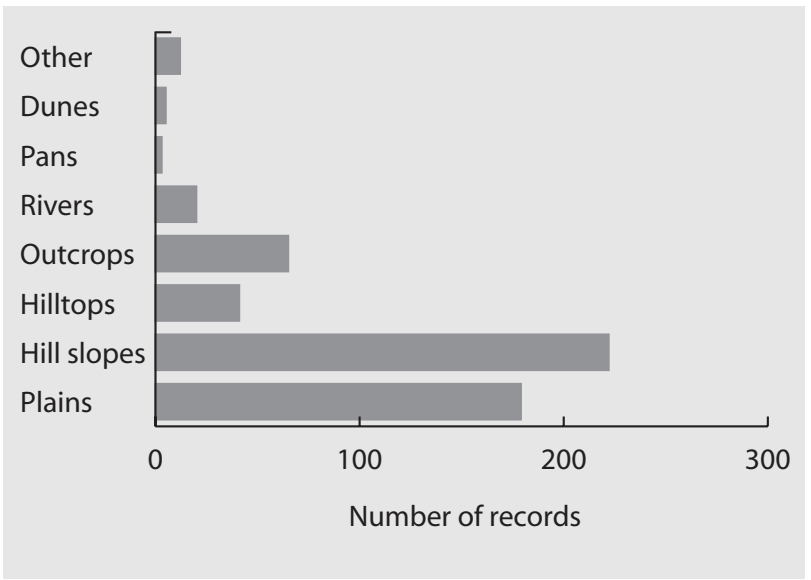


DISTRIBUTION & ABUNDANCE

Widespread and common to abundant in the north-west, Karstveld, and central Namibia. Often one of the dominant woody species, especially on rocky outcrops. Localised and occasional in areas of deep Kalahari sand in the Cuvelai, central-east, Nyae Nyae area and eastern Caprivi and a few records from the Okavango River. There are two new records from the Lewer River, south of Mariental (2417, CUR1 and MAN1).

HABITAT

Found in all habitats, but most often on hillsides and plains. Also on rocky outcrops in the west and central areas, and along dry rivers in the north-west. Grows on various substrates, including granite, calcrete, dolomite, basalt, mica schist, as well as gravel and sand.

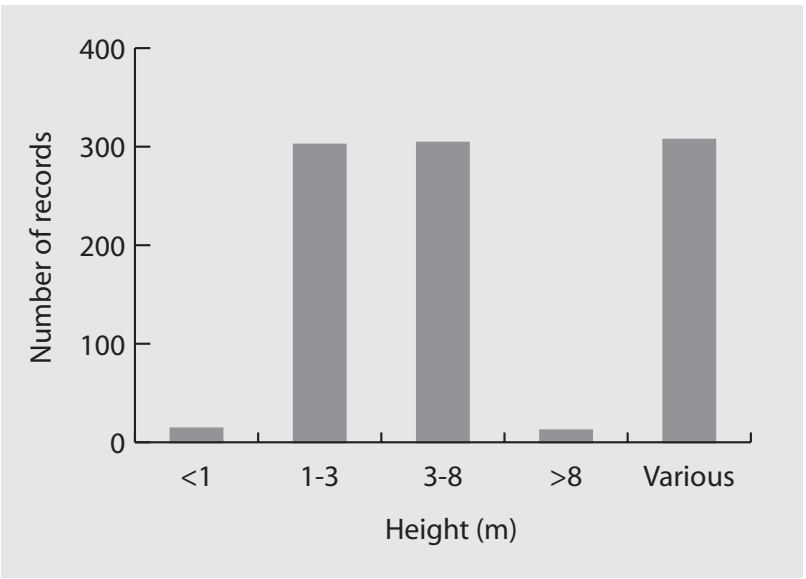


CONSERVATION CONCERNS

None recorded.

GROWTH FORM

Generally a shrub or shrubby tree up to 8 m high; occasionally, a tree of over 8 m. Often in stands of mixed height.



GENERAL

Heavily browsed by kudu, giraffe, rhino and other game, as well as cattle, often resulting in stunting; elephant eat the bark. Produces an edible but not very desirable gum. The leaves are used medicinally; the bark for tanning leather. The wood is termite resistant and used in kraal construction, for making pestles and stirring implements, for reinforcing gourds used as butter-churns, and for fuel.

Makes an attractive, frost-resistant, drought-hardy garden plant that is ideal for Windhoek as it tolerates mica schist. Might encroach in areas where other bush species have been removed (BES1).

COMBRETACEAE | COMBRETUM AND TERMINALIA FAMILY

This large, mainly tropical family is characterised by having four- to five-winged fruit and clusters of generally small flowers, often without petals. The leaves are always simple, opposite or in whorls of three, often with characteristic scales. The bark of the stems or twigs often peels in long fibres.



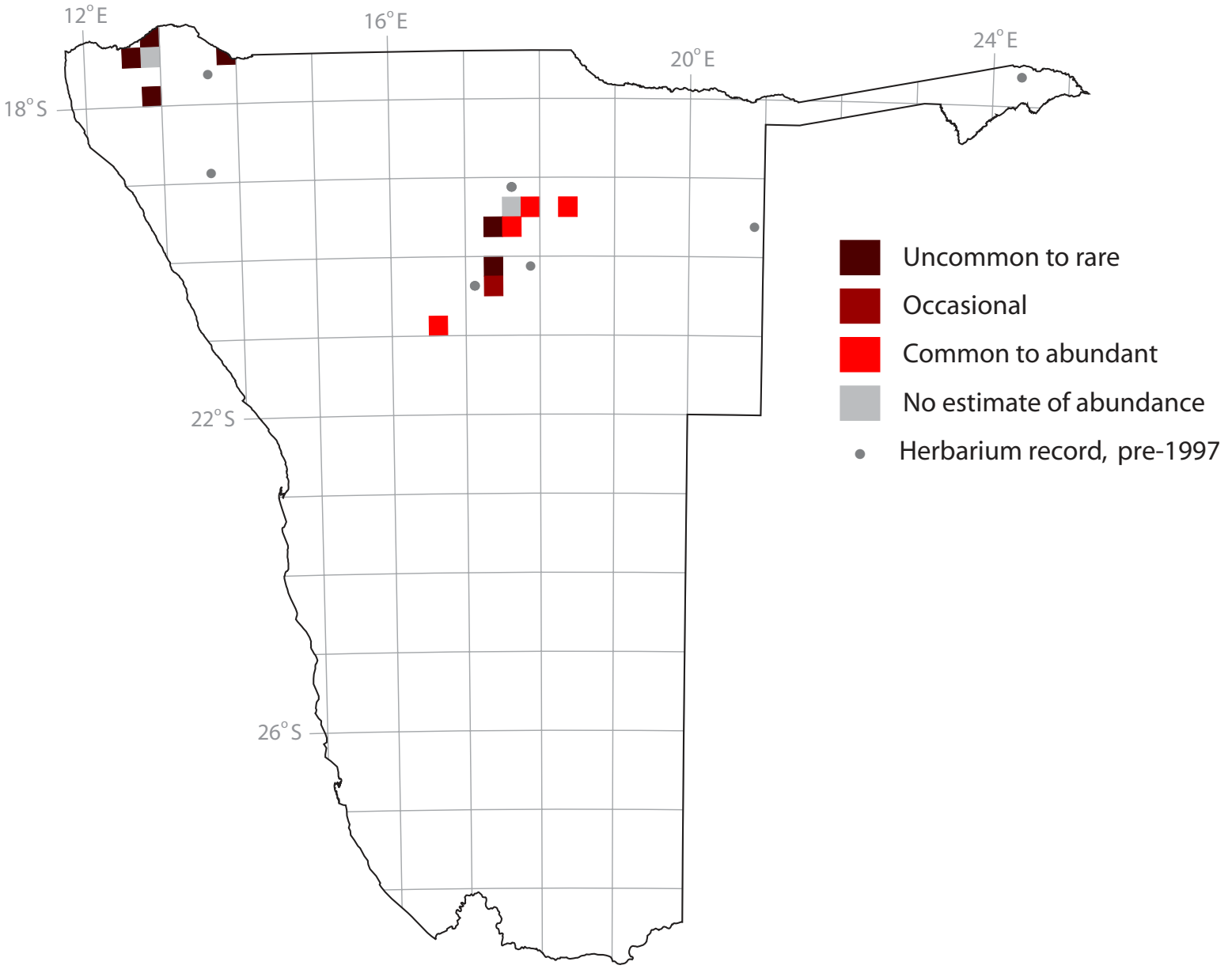
Combretum oxystachyum inflorescences, B. Curtis

C. apiculatum subsp. *leutweinii*

[28 records from 13 (1%) squares]

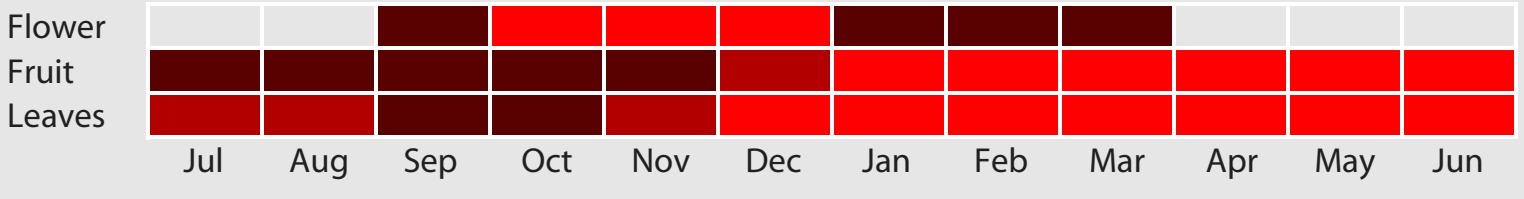
LEAVES **dull green, matt, velvety, often almost round.** FRUIT **hairy.**

Recorded from a few localities, mostly in the Waterberg area and eastern Karstveld, as well as just south of the Kunene River. There are single herbarium specimens from the eastern Caprivi, Nyae Nyae area, and 1813DC that were not substantiated by TAP records. Found on hillsides, plains and plateaux. Uncommon in the north-east, but common in the Karstveld and Waterberg area. More commonly recorded as trees than subsp. *apiculatum* was.



ANNUAL CYCLE (both subspecies combined)

FLOWERS from September to March, but mainly October to December. FRUIT found throughout the year, but most prolifically from January to June. LEAVES mainly December to June; most plants bare or with old leaves from July to September, and new leaves in October and November.

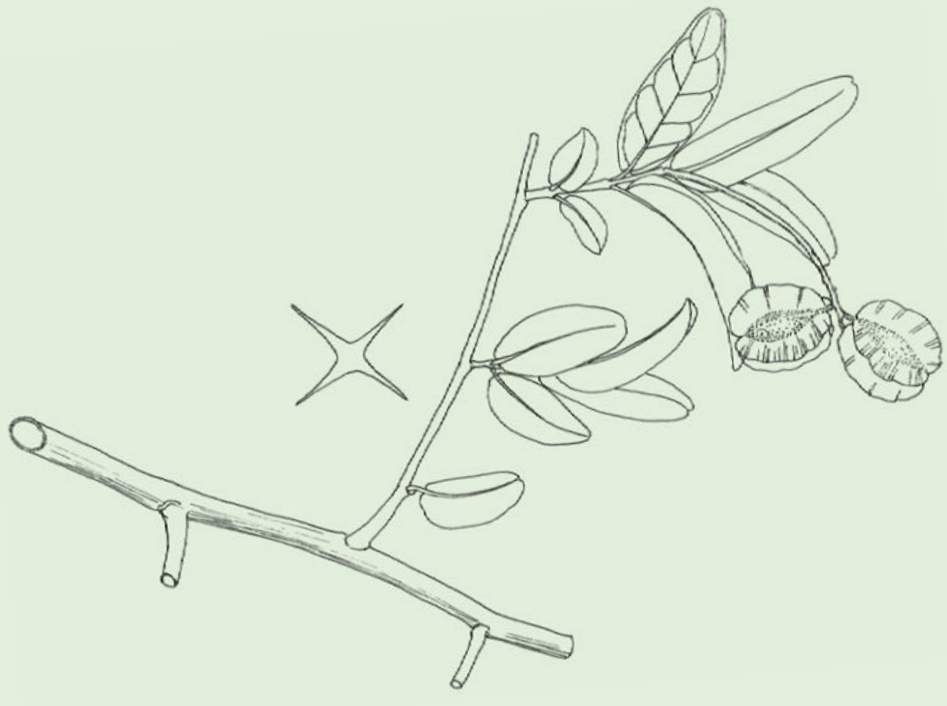


Combretum celastroides

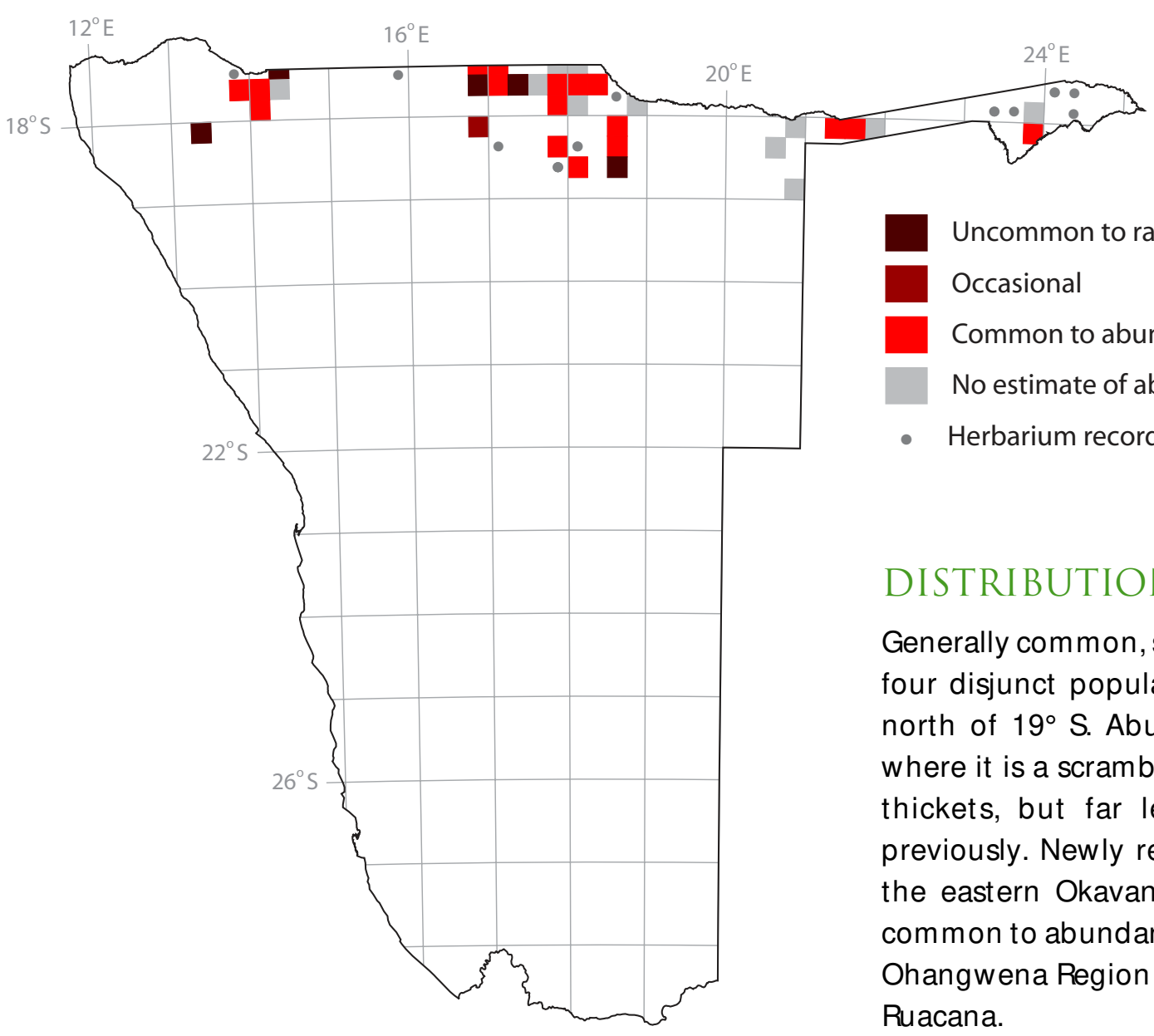
Omunjere

Trailing combretum (E); rankboswilg (A); Savannenweide (G); musetela (L)

[36 records from 34 (3%) squares]



Shrub, **occasionally scrambling**. BRANCHLETS with dense, **rust scales** on young growth points; older branches grey with fine, **vertical cracks giving them a striated appearance**. LEAVES elliptic, up to 85 mm long; with sparse but **conspicuous, large, round scales; apex drawn-out and teat-like**. FLOWERS yellow to green-yellow. FRUIT four-winged, ovate with tapering base, 15–20 mm in diameter; yellow-green with dark red wings; style persistent, forming a peg.

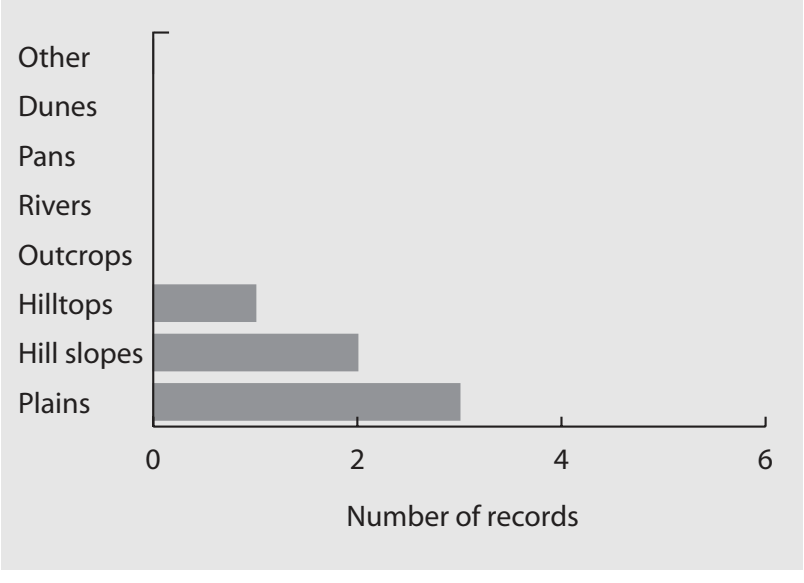


DISTRIBUTION & ABUNDANCE

Generally common, sometimes uncommon, in four disjunct populations across the country north of 19° S. Abundant in eastern Caprivi where it is a scrambling shrub forming dense thickets, but far less recorded here than previously. Newly recorded and common on the eastern Okavango River and just south; common to abundant and fairly widespread in Ohangwena Region; locally common south of Ruacana.

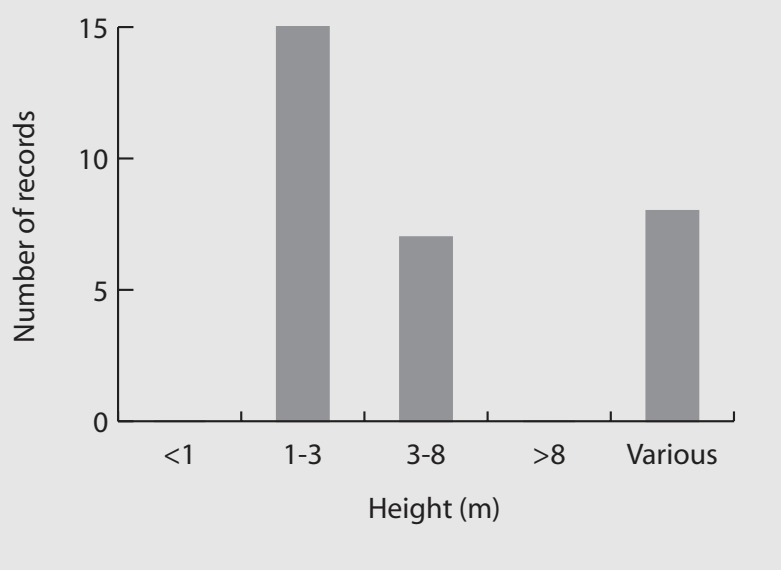
HABITAT

Mainly found on plains, on deep Kalahari sand.



GROWTH FORM

Mostly a shrub in the 1–3-m height class, sometimes over 3 m. Occasionally scrambling. Thicket-forming in places.



ANNUAL CYCLE

Observations were mostly made in March and April, with one or two observations in May, June, December and January; records of flowers and fruit were combined with earlier records from the herbarium. FLOWERS recorded from December to May. FRUIT March to July. LEAVES present in all months of observation, with leaves turning colour in April and young leaves in May.

CONSERVATION CONCERNS

None recorded.

Combretum collinum

Variable Combretum

Mupupu (Rk, T); otjindanda (H); mutobo (L); omupupwaheke (O)

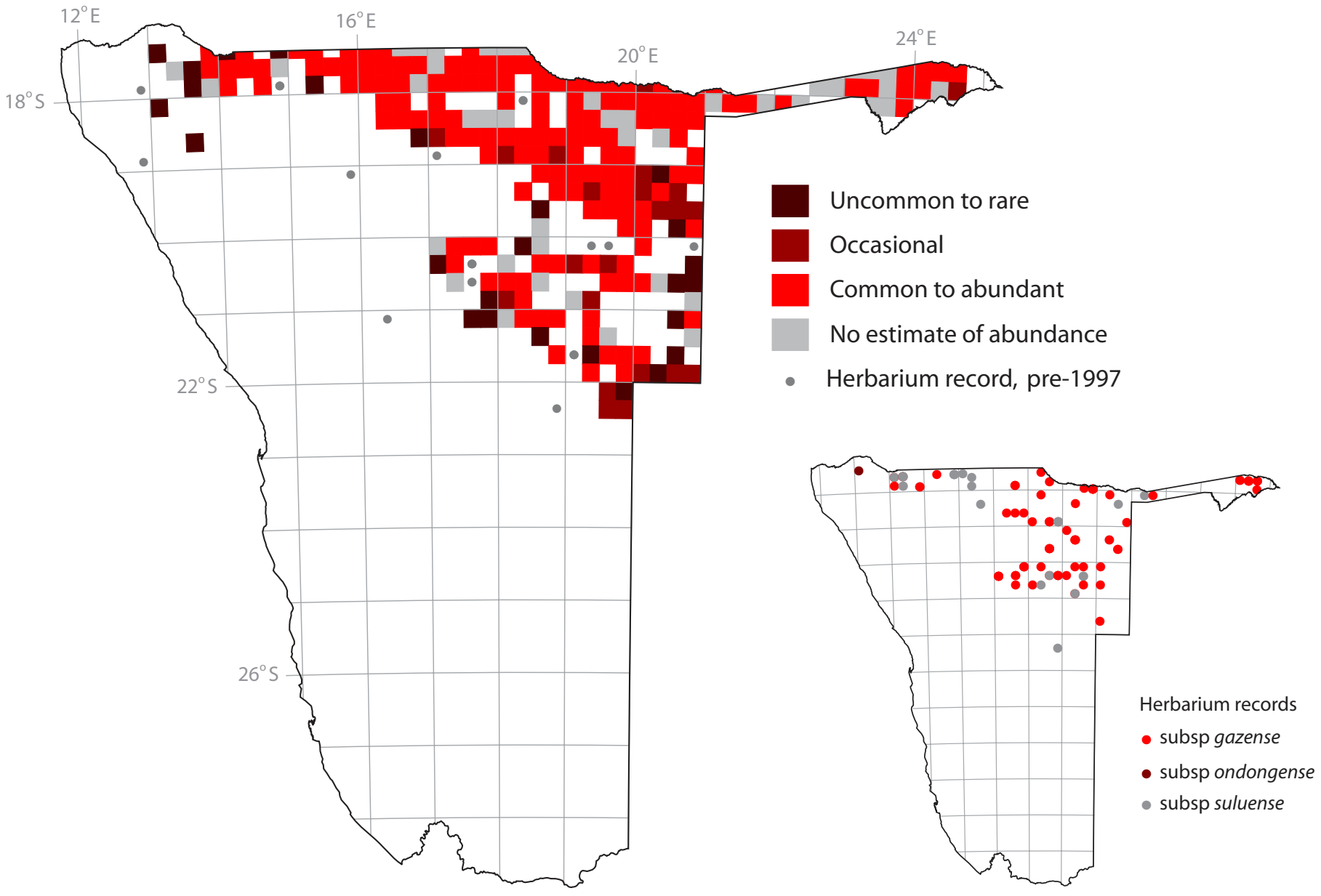
[543 records from 236 (22%) squares]

Shrub or tree, with a **rounded, drooping crown**. BARK grey to dark grey, occasionally flaking off in fibrous strips to expose a **reddish underbark**. LEAVES very **variable** in shape, up to 130 mm long; dark green to yellow-green above; petiole quite long and slender. FLOWERS tiny, cream-coloured to yellow. FRUIT four-winged, broadly ovate to spherical, up to 50 mm; yellow-rust to deep rust-red; wings yellow-brown to rust.

Flowers and fruit are conspicuous. There are three subspecies, which may be differentiated by the hairiness of the leaves and the fruit, thus it is not possible to identify the subspecies without pods. The most common one is subsp. *gazense*, and the majority of records for which the subspecies was not specified probably belong to this subspecies. The data for all three subspecies have been combined, unless stated otherwise.

The subspecies of *Combretum collinum*

	CHARACTERISTICS	TAP RECORDS
C. collinum subsp. *gazense* Bicoloured Variable-combretum	Leaf hairy below, fruit hairless	140 records from 96 (9%) squares
C. collinum subsp. *ondongense* Kalahari Variable-combretum	Leaf hairless below, fruit hairless	47 records from 39 (4%) squares
C. collinum subsp. *suluense* Weeping Variable-combretum	Leaf hairless below, fruit densely hairy	5 records from 4 (<0.5%) squares

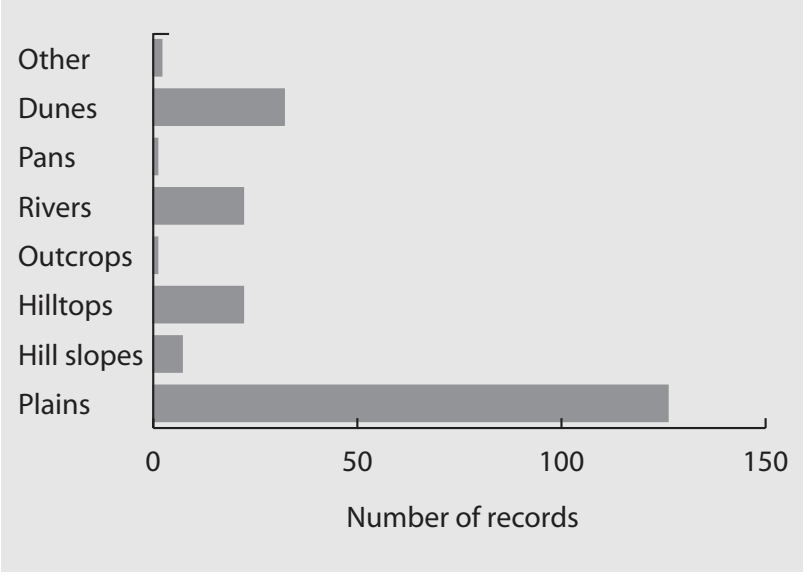


DISTRIBUTION & ABUNDANCE

Subspecies *gazense* is common and abundant in places in north-eastern Namibia, extending westwards to the Ruacana area and south-eastwards to the 'bend of Botswana' (2120), where it is occasional. Often one of the dominant species in the north-central and Waterberg areas. Subspecies *ondongense* is common to abundant in scattered localities within the same distribution pattern, with no TAP records and only one herbarium record from Caprivi. Subspecies *suluense* is occasional in a very restricted distribution in the north-west.

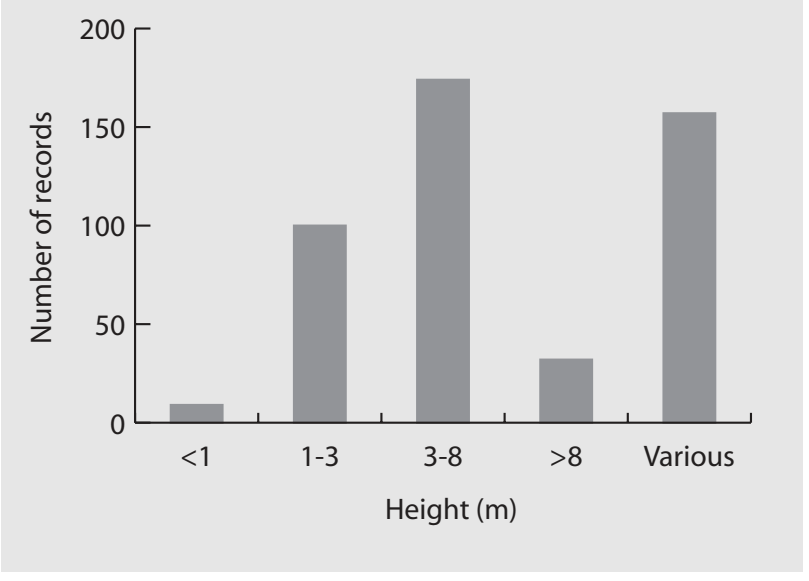
HABITAT

Found in various habitats, but predominantly on plains; also on dunes and along rivers in the north-east, and on plateaux and hilltops on the north-central plateau. Subspecies *ondongense* is more often on dunes than plains. Subspecies *suluense* found on rocky outcrops and hill slopes. The substrate is always sand or sandy loam, except for subspecies *suluense*.



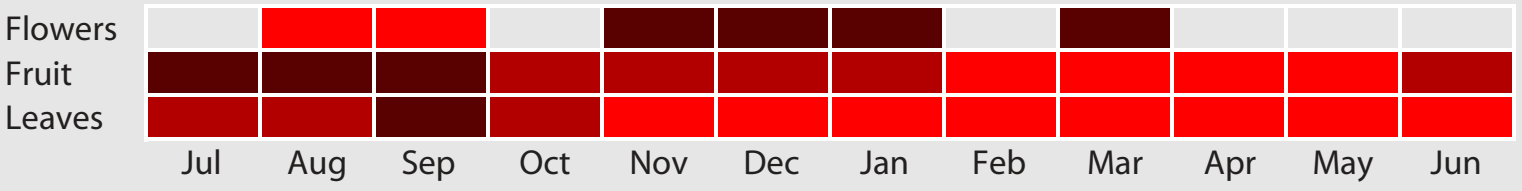
GROWTH FORM

Mostly a tree of up to 8 m but often a shrub in the 1–3-m height class. Occasionally a tree over 8 m. Subspecies *ondongense* is most often a shrub of up to 8 m, and subspecies *gazense*, a tree up to 8 m.



ANNUAL CYCLE

FLOWERS mainly August and September, with individual to a few records from July to March. FRUIT all year round, but mainly from February to May; often the previous season's fruit. LEAVES were recorded all year round, with many bare plants from July to October, and leaves turning colour from May; new leaves produced from October to December.



GENERAL

The gum is edible and used medicinally, but not produced in large quantities; the roots are chewed as a cold remedy. The wood is used for fuel and for poles, although it is not termite-resistant.

CONSERVATION CONCERNS

None recorded.



Combretum engleri

Sand Combretum

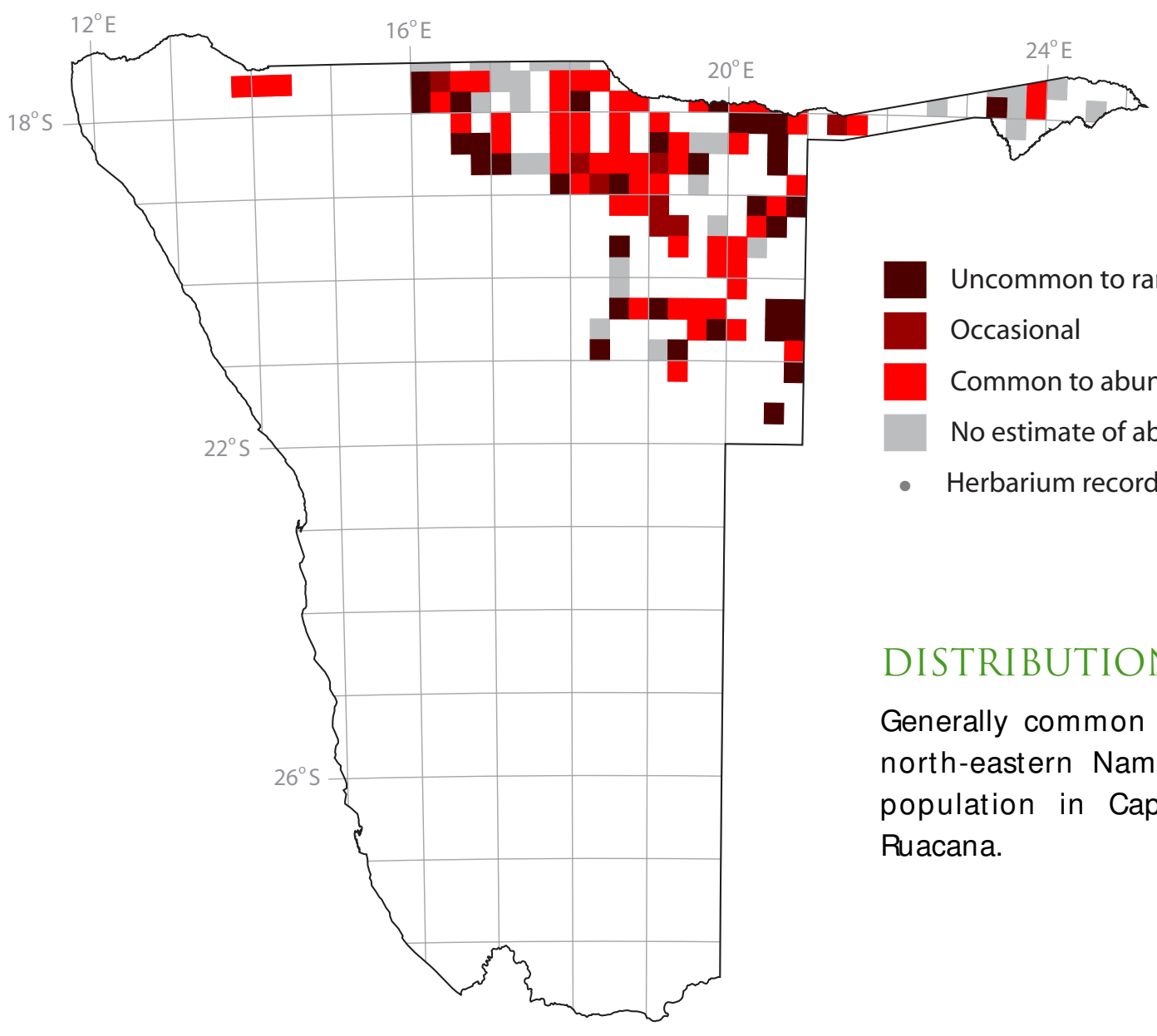
Kleinsandboswilg (A); Sandbuschweide (G); rutapa (L); ruputa (Rk, Rum); ruputwi (T)

[177 records from 131 (12%) squares]



A neat, compact shrub or **small tree**. LEAVES **small, thinly textured; both surfaces bright green**, shiny, hairless; **folded along the midrib**. FLOWERS pale yellow, in small clusters. FRUIT four-winged, elliptic, larger than leaves; **bright green** to yellowish becoming golden brown.

This plant is easily recognised by its shiny green, folded leaves and bright green, young fruit.

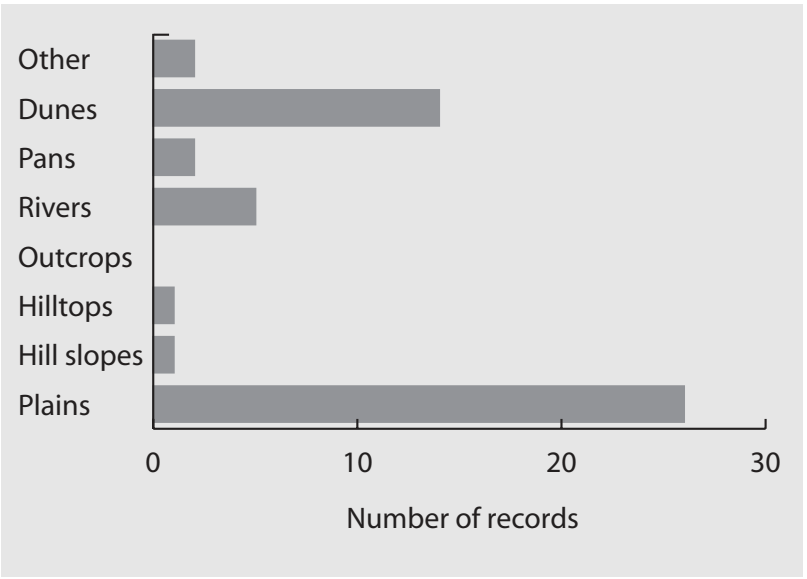


DISTRIBUTION & ABUNDANCE

Generally common in scattered localities in north-eastern Namibia, with only a small population in Caprivi and another near Ruacana.

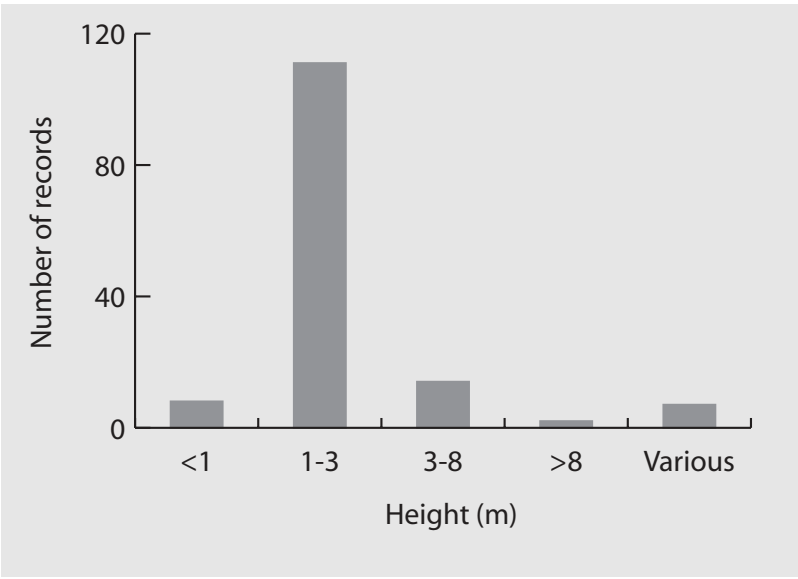
HABITAT

Found mainly on plains and dunes; always on sand.



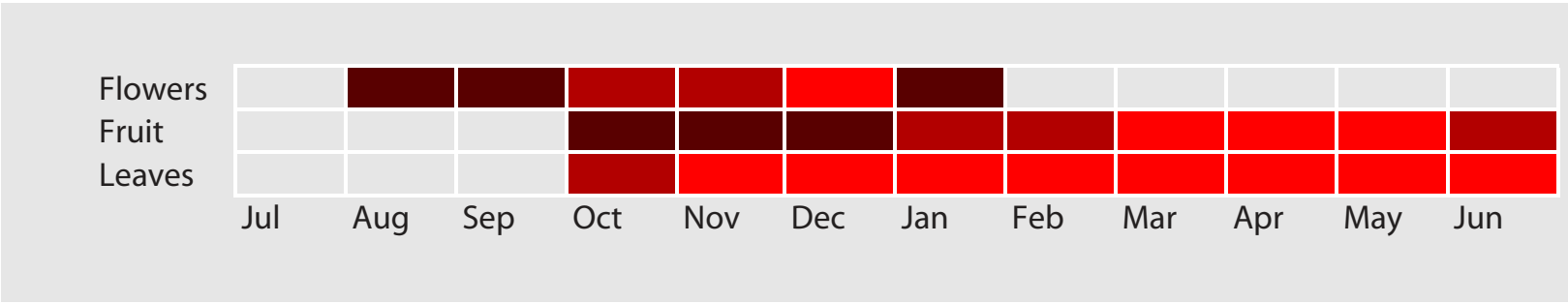
GROWTH FORM

Mostly a shrub up to 3 m high, sometimes over 3 m; occasionally a tree.



ANNUAL CYCLE

FLOWERS mostly in December, but may start in August and carry on till January. FRUIT can be found all year, but mainly from March to May; those recorded from July to November are mainly the previous season's pods. LEAVES bare from July to September, with new leaves in October.



GENERAL

Heavily browsed in places. Utensils, such as cups and knife handles, are carved from the wood; thin branches are used for weaving calabash carriers or strengthening baskets. Of horticultural potential due to its attractive foliage, neat shape and contrasting fruit.

CONSERVATION CONCERNS

None recorded.

Combretum hereroense

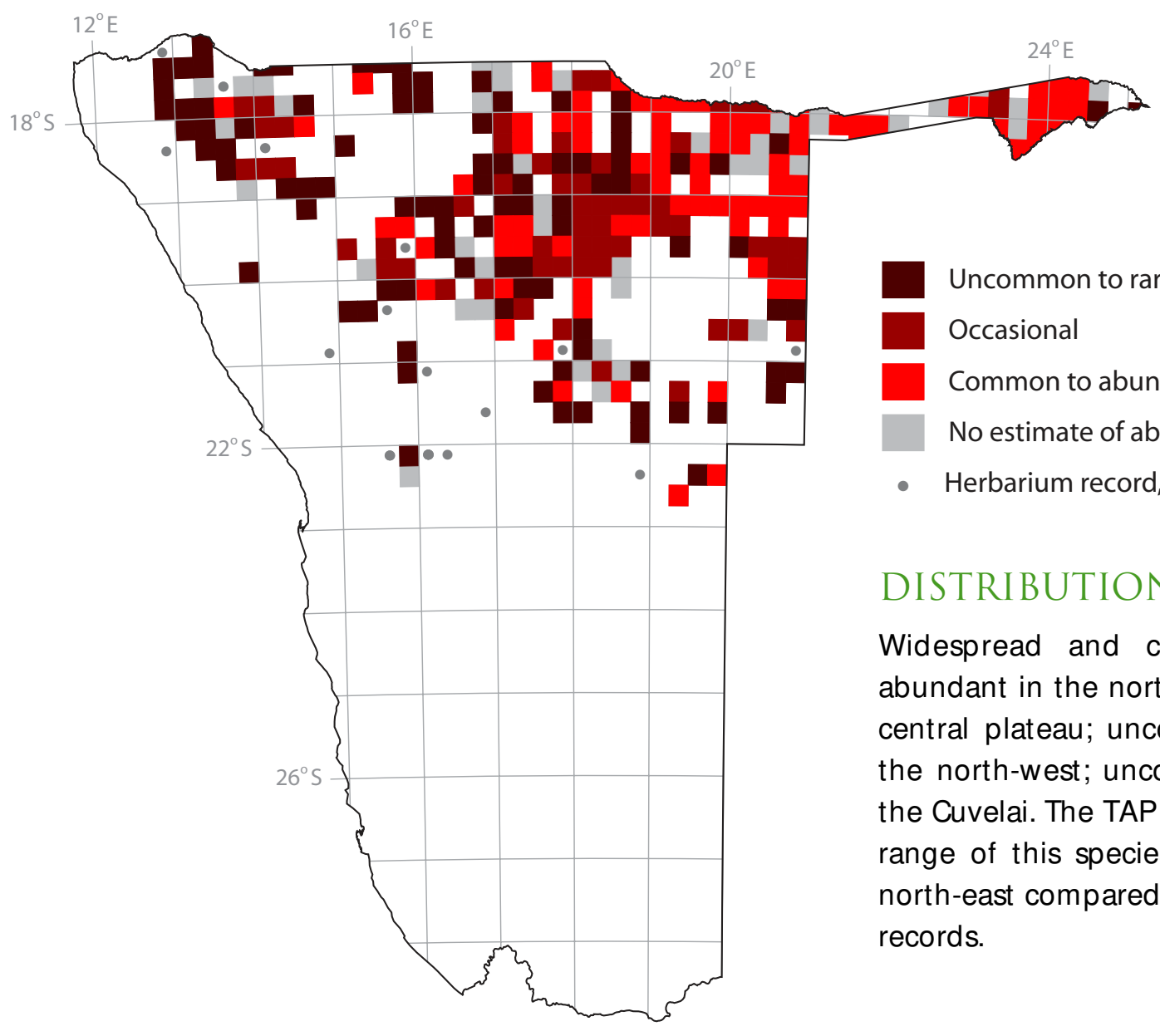
Mutumba

Mouse-eared combretum (E); kierieklapper (A); !kabe (J); mububu (L)

[771 records from 284 (27%) squares]



Shrub or tree. BRANCHLETS with **dense, grey, finely woolly covering when young**. LEAVES broadly elliptic to obovate, **generally small**, leathery; grey-green to yellow-green, with **dense downy covering**, often red-tinged; veins prominent; **apex pointed or notched**. FLOWERS cream-coloured, in short spikes. FRUIT four-winged, small, densely woolly with dense covering of yellow and red scales; margin of wings often undulate.



DISTRIBUTION & ABUNDANCE

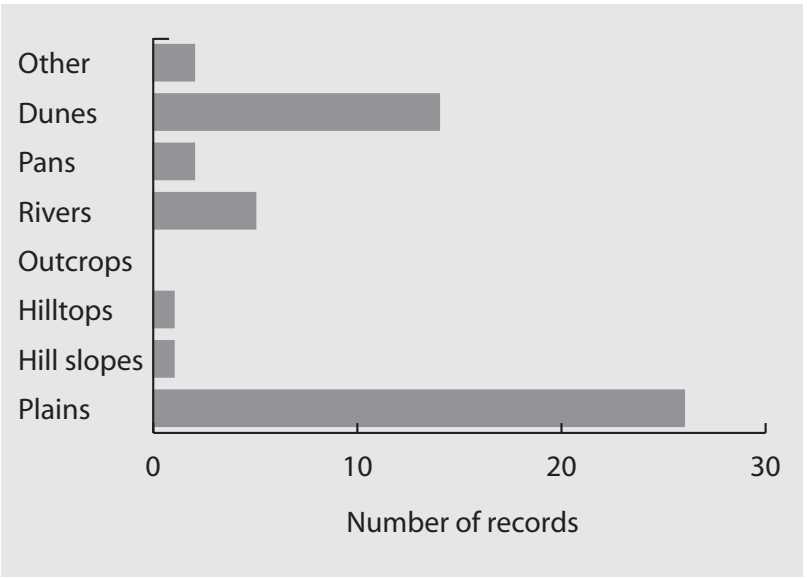
Widespread and common to sometimes abundant in the north-east and on the north-central plateau; uncommon to occasional in the north-west; uncommon and scattered in the Cuvelai. The TAP has greatly increased the range of this species to the north-west and north-east compared with previous herbarium records.

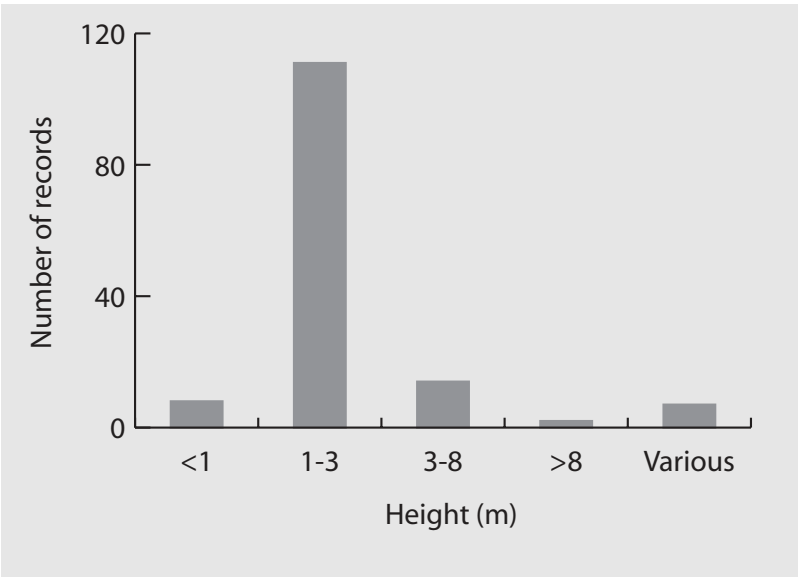
HABITAT

Found in a wide variety of habitats, but mostly on plains and along dry watercourses; around pans in the central-east and north-east. Grows on a wide variety of soil types, including sand, clay and calcrete.

GROWTH FORM

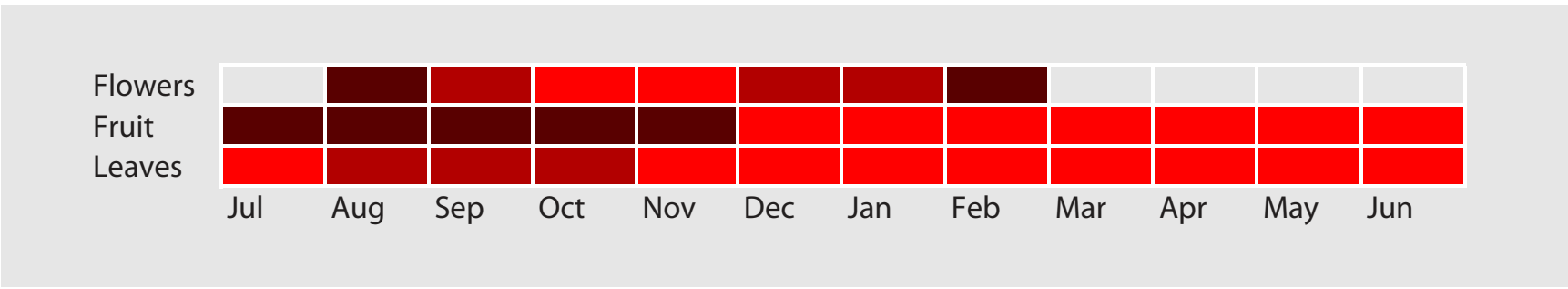
Mostly a shrub up to 3 m high, sometimes a tree up to 8 m, rarely over 8 m. Forms thickets in places.





ANNUAL CYCLE

FLOWERS mainly October and November, but may start as early as July or go on until May in some years; rain-dependent. FRUIT present all year, but from August to November they are generally from the previous season. LEAVES throughout the year, with some bare trees from August to October.



GENERAL

Browsed by game such as kudu, eland, giraffe and rhino, as well as by goats. The fruit and gum are edible. The wood is used for fencing and building, and the handles of various implements, as well as for fire-wood. The branches are pliable, and used to make musical instruments. The roots and leaves are used medicinally.

This plant sometimes colonises distrubed areas. It is of horticultural potential, as it is easily grown from seed, relatively fast-growing and frost-tolerant. Occasionally parasitised by *Tapinanthus* spp.

CONSERVATION CONCERNS

None recorded.

Combretum imberbe

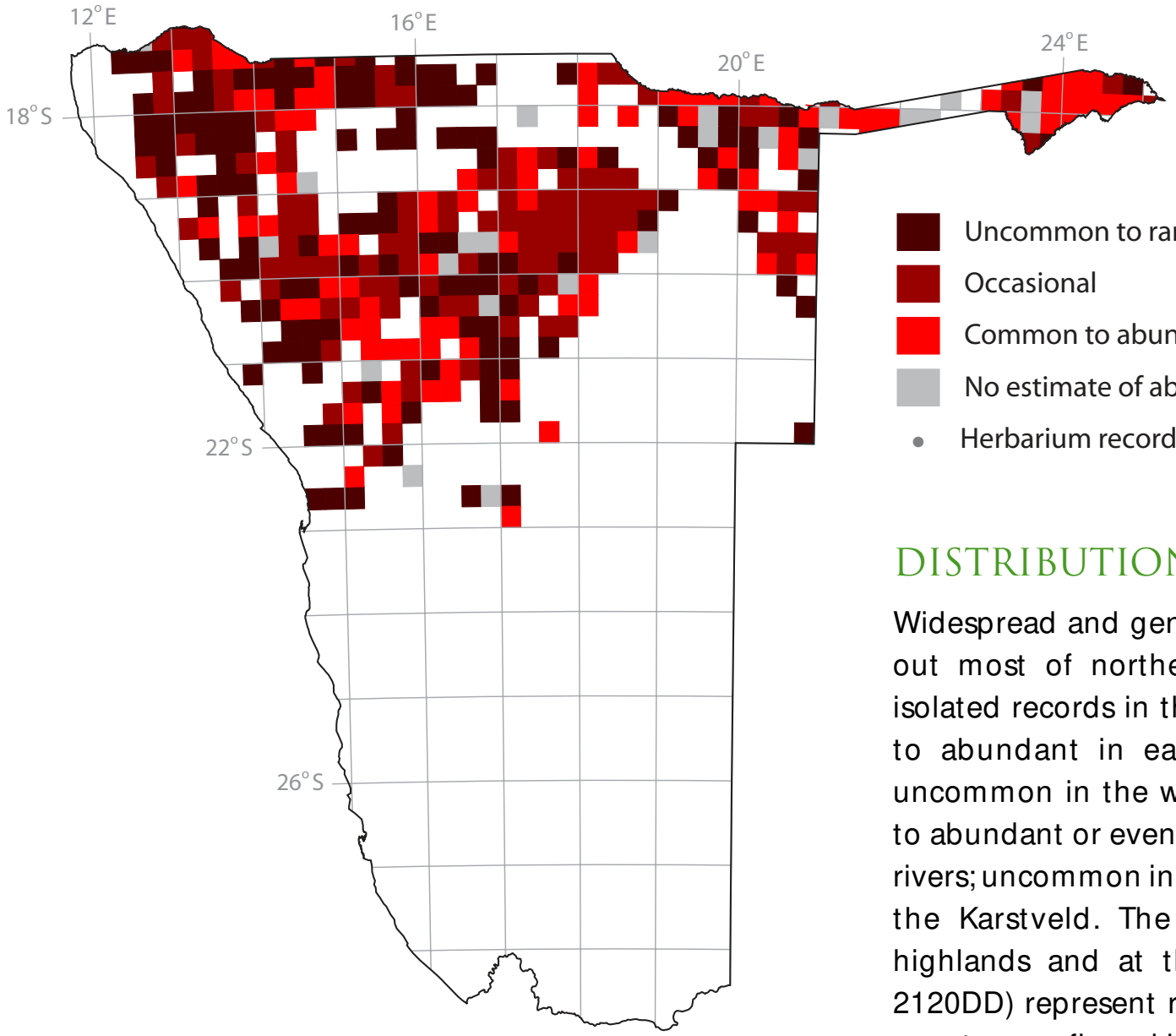
Omumborongbonga

Leadwood (E); hardekool (A); Ahnenbaum (G); muzwili (L); omukuku (O); omumbolombongo (Od); munyondo (Rk, Rum, T)

[1,254 records from 371 (35%) squares]



Semi-deciduous tree with **characteristic grey-green appearance**. BRANCHES young growth **decussate**; lateral branches sometimes **spinescent**. BARK dark grey, rough with **characteristic deep, vertical and transverse fissures dividing the bark up into small, square fragments**. LEAVES narrowly elliptic, 30–80 mm long; **both surfaces grey-green** due to fine scales; margin often undulate. FLOWERS yellow to cream-coloured, sweet-scented. FRUIT four-winged, **small**, (smallest of all combretum pods in Namibia); characteristically yellow-green, densely covered in scales; wings papery.



DISTRIBUTION & ABUNDANCE

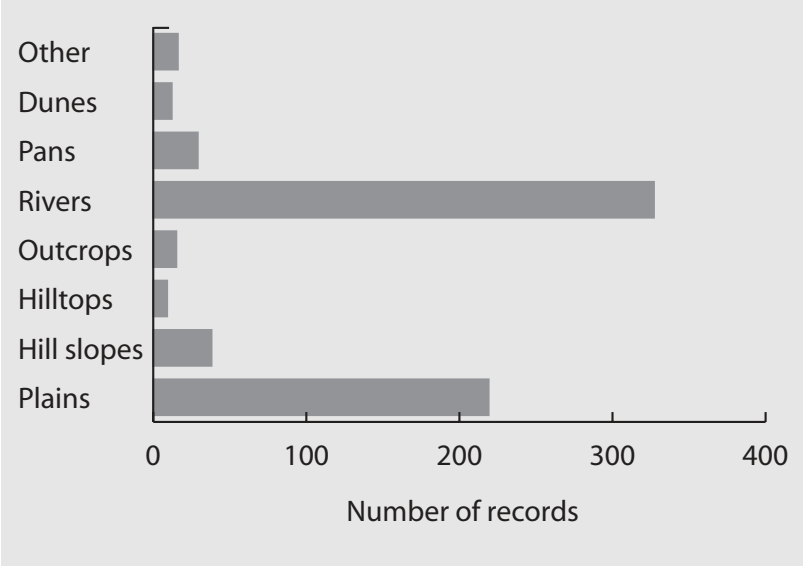
Widespread and generally common throughout most of northern Namibia, with some isolated records in the central area. Common to abundant in eastern Caprivi; generally uncommon in the west, but locally common to abundant or even dominant in the western rivers; uncommon in the Cuvelai; occasional in the Karstveld. The records in the central highlands and at the Botswana border (in 2120DD) represent range extensions, but are as yet unconfirmed by specimens.

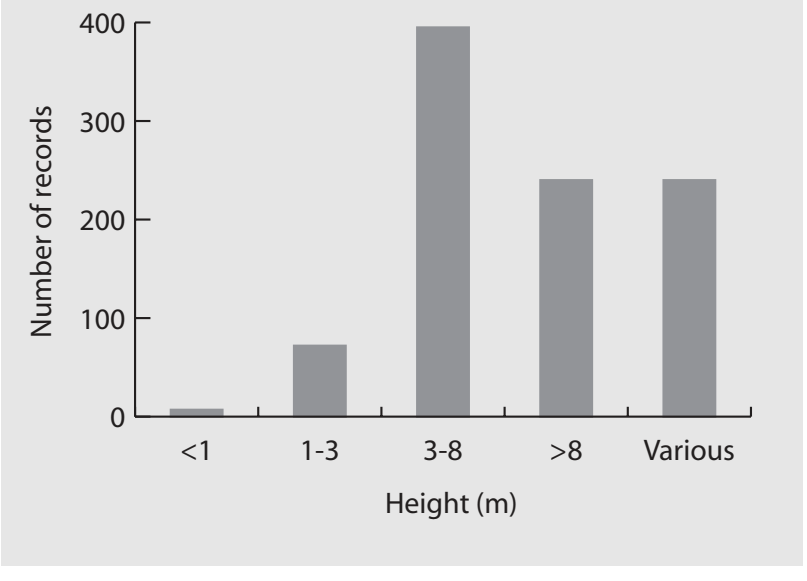
HABITAT

Found in various habitats, but mostly along dry rivers and on plains; on hill slopes in the Karstveld and on the north-central plateau. Substrates recorded included sand, loam, calcrete, and stony or rocky areas.

GROWTH FORM

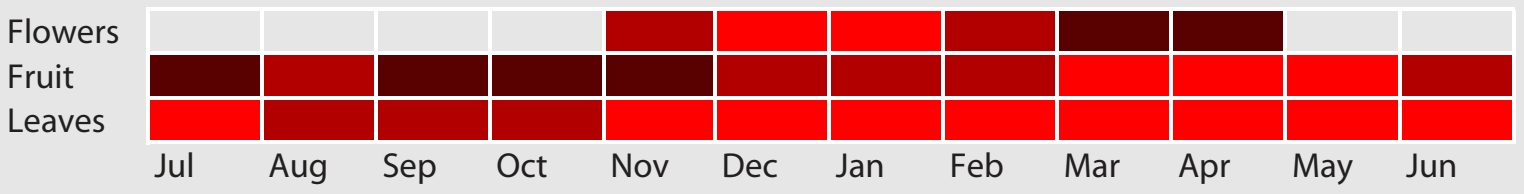
Mostly a tree up to 8 m high, although about 20% taller than 8 m. One particularly large individual was recorded on Farm Paderborn (1914DD) – *c.* 12 m high, with a basal cone of 6.8 m circumference, tapering to a trunk circumference of 2.8 m at a height of half a metre (PLE1). There are also very old, majestic trees with gnarled and twisted trunks in the Khan River (CUR1, 2115DC). Young trees are probably under-recorded as often they bear little resemblance to mature trees. Along the Okavango floodplain there are many young trees ranging from a half to 3 m in height, as well as in the road-reserve in many places along the road from Otjiwarongo to Rundu (HOR2).





ANNUAL CYCLE

FLOWERS have been recorded almost all year round, but mainly from November until February. FRUIT present all year, but mostly from December to June. LEAVES present all year, with some bare trees from August to November, and young leaves from September to November.



GENERAL

Excellent shade tree, providing nesting sites for birds, such as White-browed Sparrow-weavers and raptors. It is browsed by antelope, giraffe, rhino and elephant, and livestock. The wood is hard, durable and termite-resistant, and is used for firewood, charcoal, and as building material, fencing and mine-props. The Owambo use the trunks to make ‘oshini‘, a strong pounding instrument for grinding mahangu. Ash from the wood is used to clean teeth. The gum is edible.

In the Owambo and Herero cultures, this tree holds great importance and is regarded as having mystical properties. In Kaokoland, *C. imberbe* poles are planted in graves during a burial ceremony known as ‘okuhujambera‘. The tree also has numerous medicinal properties.

The tree is attractive, and thus of horticultural potential, but slow-growing.

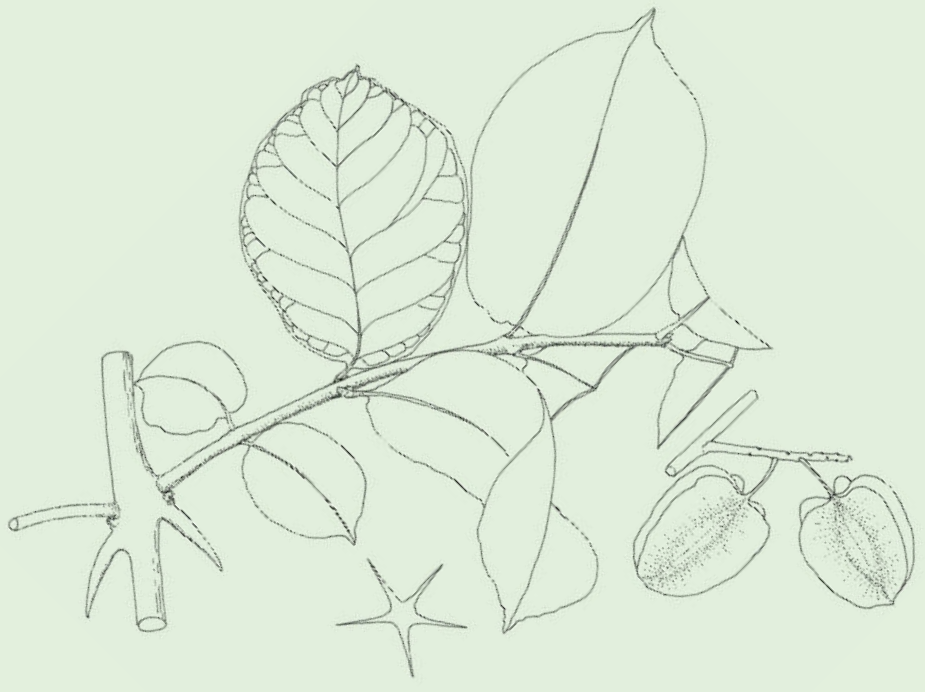
Continued on page 487.

Combretum mossambicense

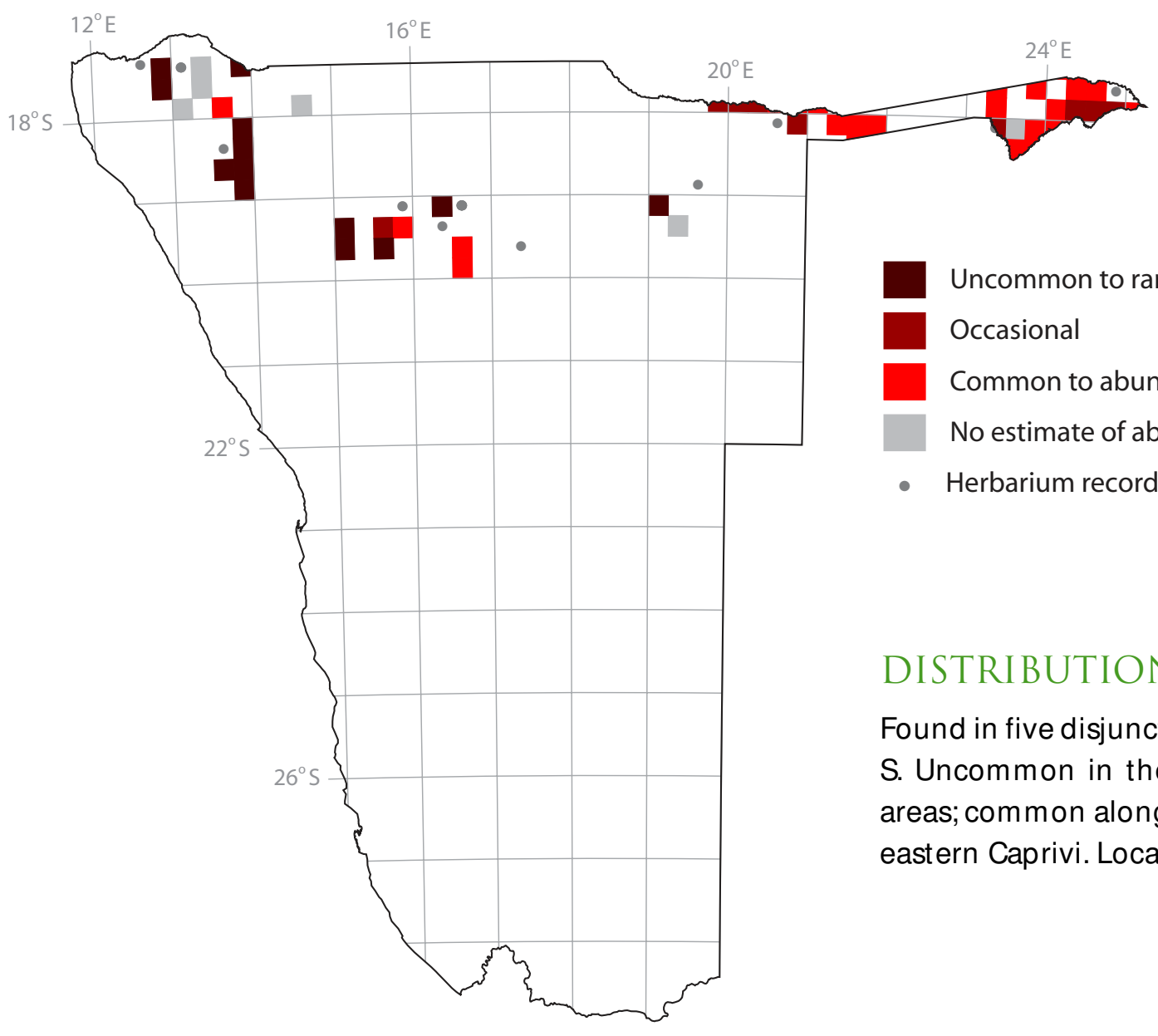
Knobbly Combretum

Knoppiesklimop (A, G); omutuurungu (H); mubesuba (L); mungongangonga (Rk, Rum, T)

[120 records from 51 (5%) squares]



Scrambling shrub or liana. BRANCHES long, twining, often with pairs (occasionaly three) of rigid, **downward-pointing spines or slightly protruding knobs** formed by the persistent petioles of fallen leaves. LEAVES **broadly elliptic, large, leathery**; dark green and hairless above; pale green with dense silvery down and prominent veins below. FLOWERS **white; stamens white with orange to reddish anthers; in large clusters**. FRUIT mosty with **five wings**, but quite often four-winged; wings straw-coloured, downy to densely woolly.

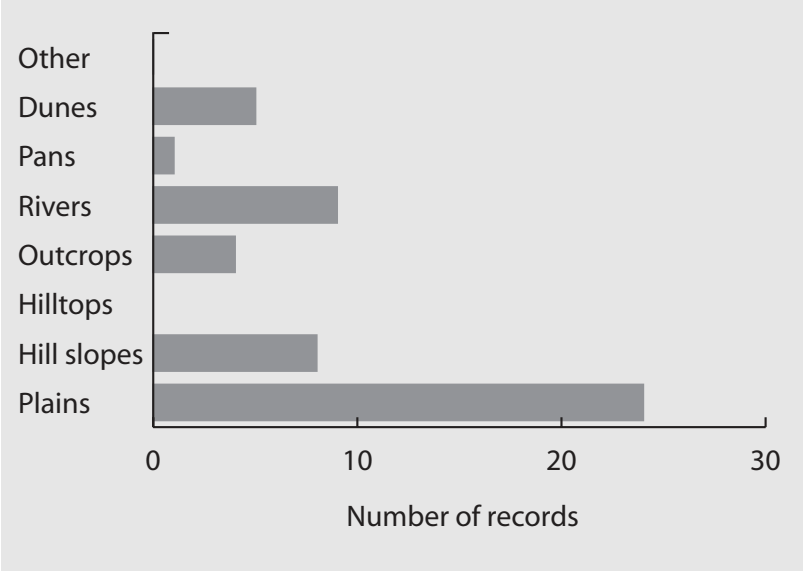


DISTRIBUTION & ABUNDANCE

Found in five disjunct populations north of 20° S. Uncommon in the north-west and central areas; common along the Okavango River and eastern Caprivi. Locally abundant in places.

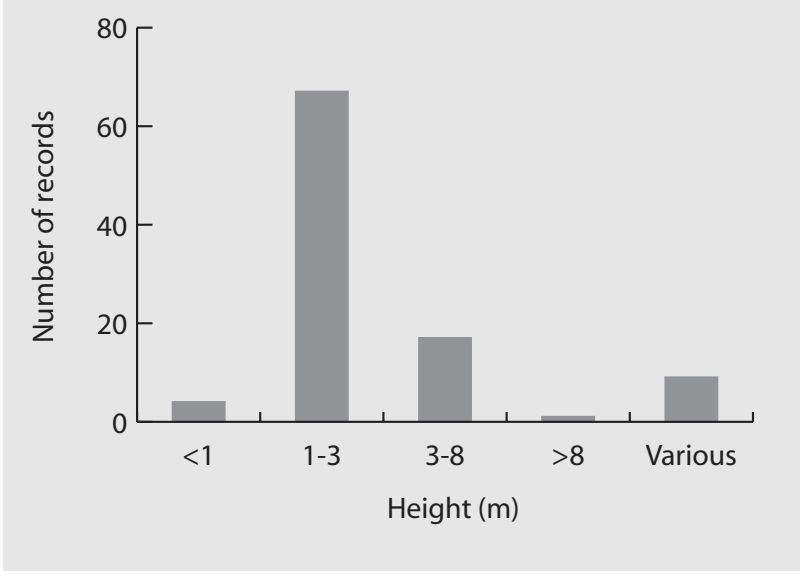
HABITAT

Mostly on plains in mixed or mopane woodland, but also found in other habitats, including termite hills and floodplains; on hill slopes in the north-west and Karstveld; on rocky outcrops in the north-west; along rivers in the north-east. Mostly growing on sand, but also dolomite and calcrete.



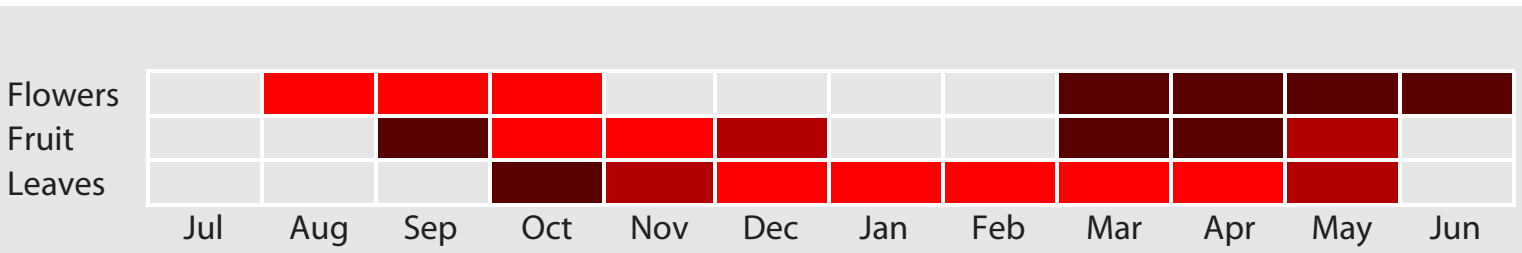
GROWTH FORM

A scrambling shrub, generally in the 1–3-m height class, but sometimes higher. Sometimes grows in dense thickets, and often clambers in other species, especially in riverine areas.



ANNUAL CYCLE

FLOWERS mainly August to October, but flowers have been recorded almost every month of the year. FRUIT most noticeable in October and November, but have been recorded from March to May as well. LEAVES mostly bare from June until September, with new leaves produced in November.



GENERAL

The roots and leaves are used medicinally. This plant is of horticultural potential as it grows easily, is drought-resistant and will even withstand light frost, and has masses of sweet-scented flowers. The common name refers to the rigid knobs on the stems.

CONSERVATION CONCERNS

None recorded.



Combretum mossambicense, B. Curtis

Combretum psidioides

Peeling-twig Combretum

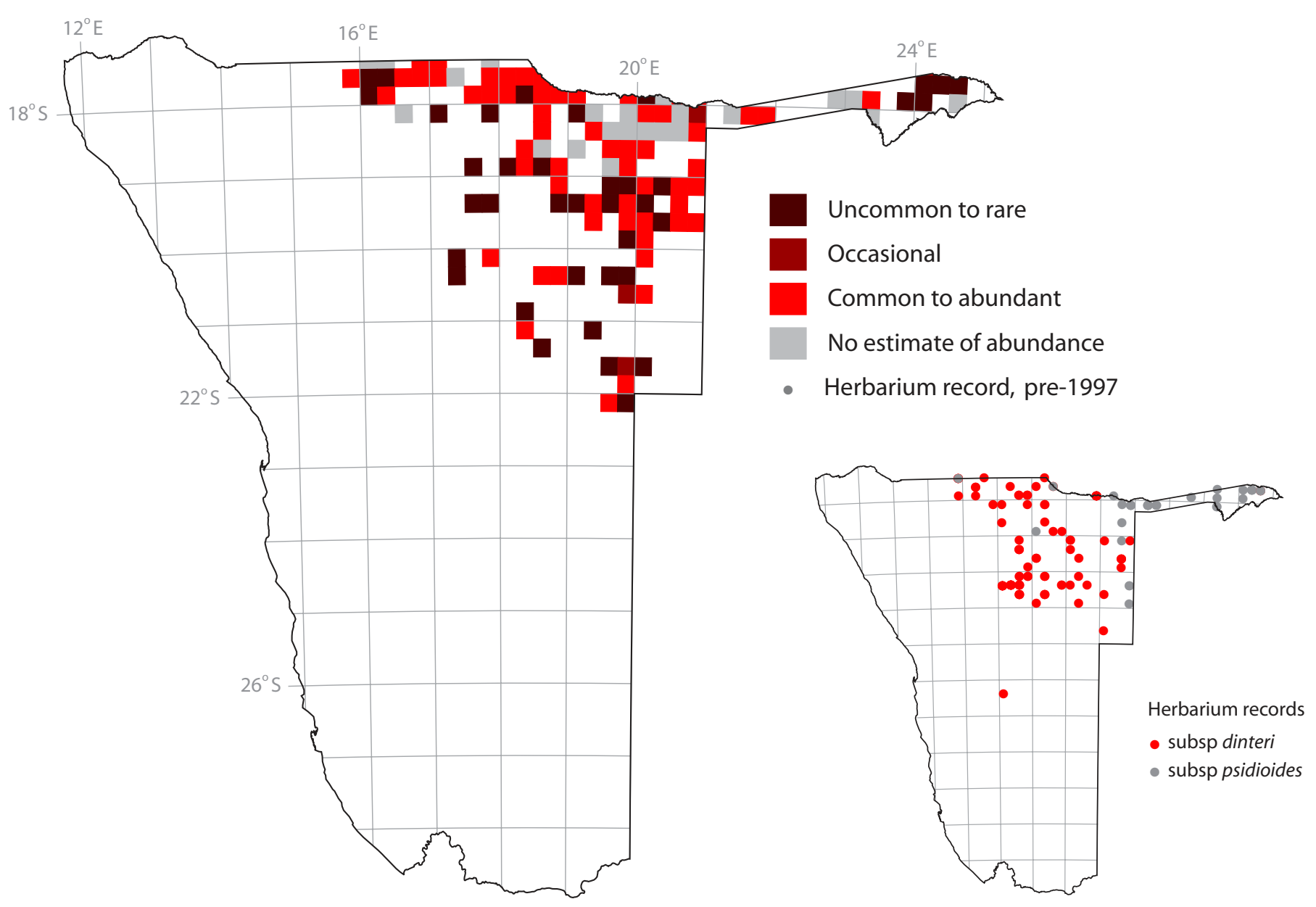
Savanneboswilg (A); Silberbusch (G); otjindanda (H); omunaluko (O); mupupu (Rk, Rum, T)

[172 records from 137 (13%) squares]



Shrub or **erect tree with a neat, rounded crown**. BARK of branchlets becoming **purplish-brown** and peeling off in **tubular segments**, not threads. LEAVES **elliptic to oblong**, leathery; both surfaces **dull olive-green with or without a dense, grey, silky covering** over the entire surface; veins prominent on both surfaces with a **clearly defined reticulate pattern below**. FLOWERS yellow-green, appearing before the leaves. FRUIT **four-winged, small; wings wine red to red-brown with golden central portion**.

There are two subspecies in Namibia, *dinteri* and *psidioides*, which are distinguishable by the arrangement hairs on the leaf. Most atlassers did not note subspecies, but since they have fairly different distributions, records were separated on distribution for analyses, but discussed together.

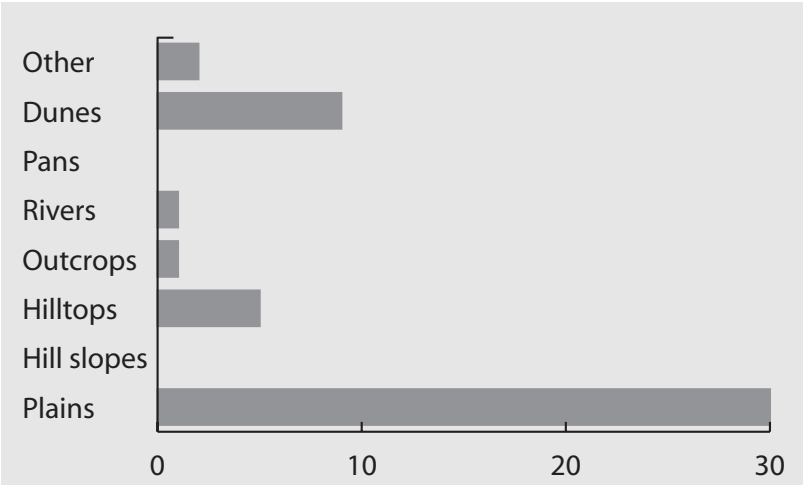


DISTRIBUTION & ABUNDANCE

Generally common in north-eastern Namibia; uncommon in the Cuvelai and Karstveld. According to herbarium records, subsp. *psidioides* occurs in Caprivi, along the Okavango River and south along the Botswana border, while subsp. *dinteri* (which is the more common one) does not occur in Caprivi and extends further west than subsp. *psidioides*. There is overlap between the two along the Okavango River and along the Botswana border. There has been a range extension of subsp. *dinteri* by one degree to the south (2219).

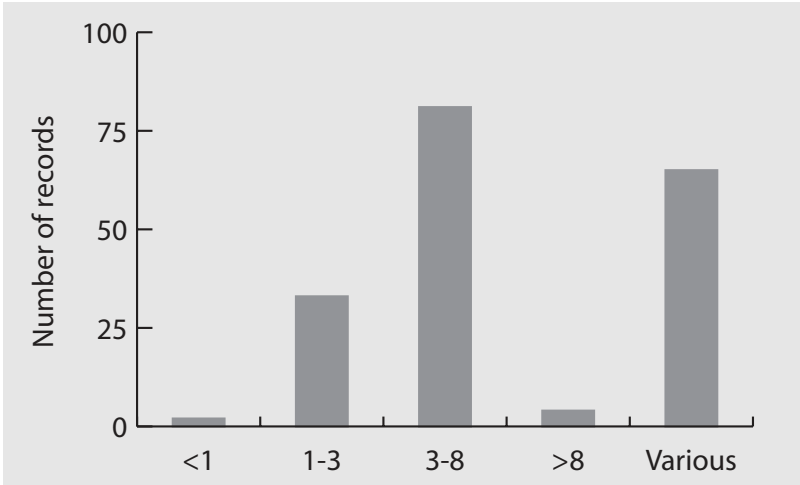
HABITAT

Mostly found on sandy plains, occasionally dunes; on hilltops on the north-central plateau.



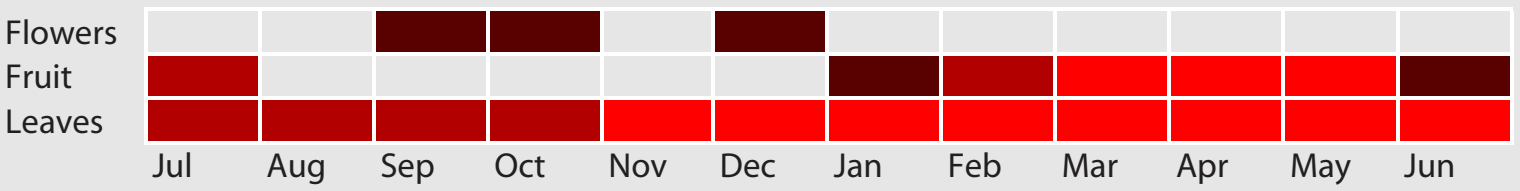
GROWTH FORM

Both subspecies are generally trees in the 3–8-m category. Subspecies dinteri is sometimes taller than 8 m (4% of records), or shrubs less than 3m high (34% of records).



ANNUAL CYCLE

FLOWERS only one record in each month of September, October and December. FRUIT January to July. LEAVES evergreen, but with occasional bare trees from July to October, when new leaves are produced.



GENERAL

Shade tree. The wood is used to make handles for implements. The roots are used medicinally, as well as to make fishing baskets. The fruit and powdered bark are used to flavour marula wine, and meat and fish dishes. When injured, the tree exudes an edible gum. This tree is of horticultural potential due to its attractive grey foliage and wine-red pods.

CONSERVATION CONCERNS

None recorded.

Combretum wattii

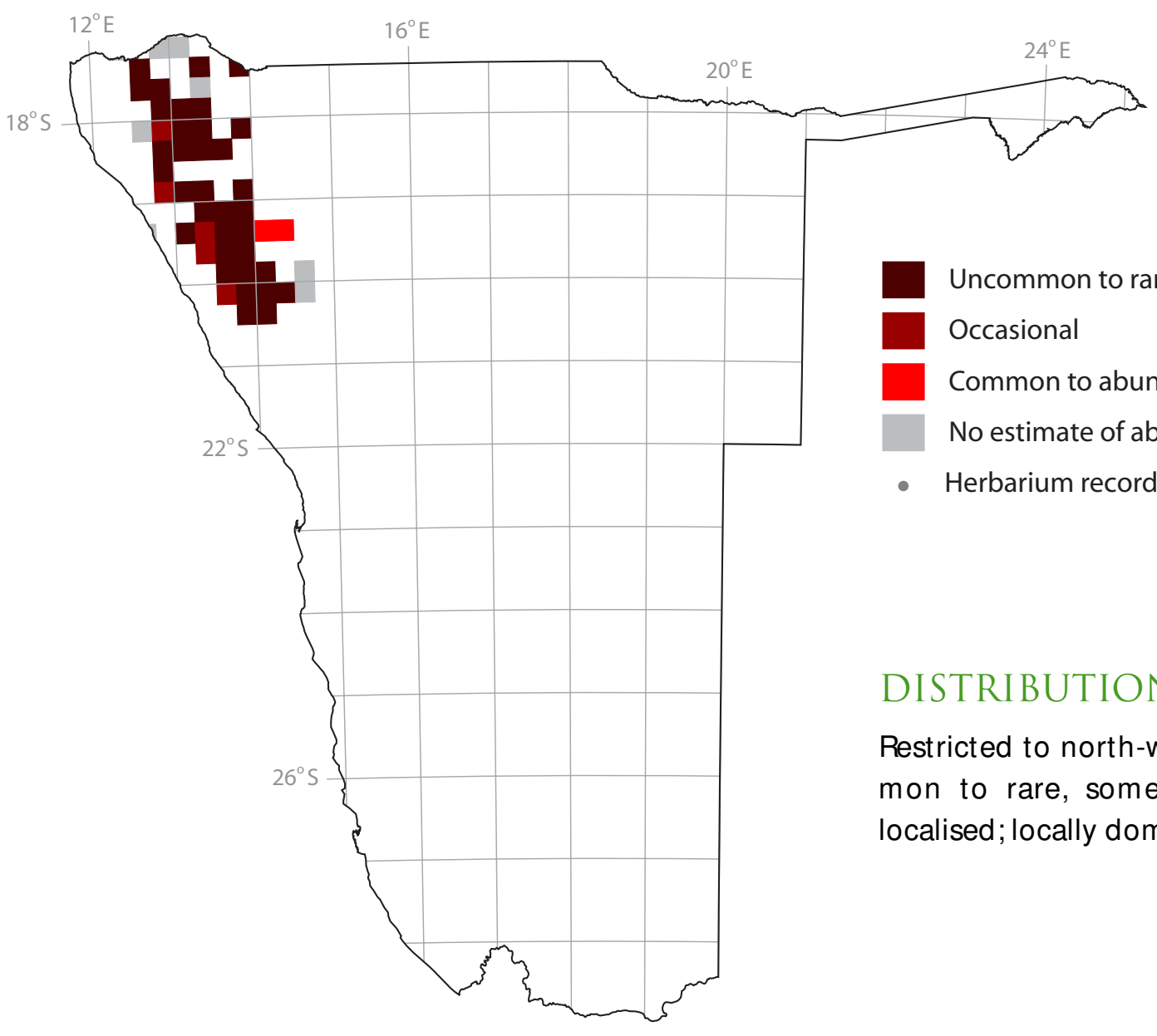
Kaoko Combretum

Waterboswilg (A); Rundblättriger Combretum (G); omutapati (H); #nabi (K); omupupu (O)

[115 records from 50 (5%) squares]



Untidy, dense shrub, usually greater in diameter than in height, sometimes climbing into or **leaning against other plants**. LEAVES simple, **almost circular**, 20–45 mm in diameter; **with silvery down**. FLOWERS **largest** of all the Namibian *Combretum* species, up to 25 mm long, with pale brown, velvety covering; **petals deep pink to red; filaments and style protruding up to 20 mm beyond petals**. FRUIT **four- or five-winged; velvety, young fruit pink**.

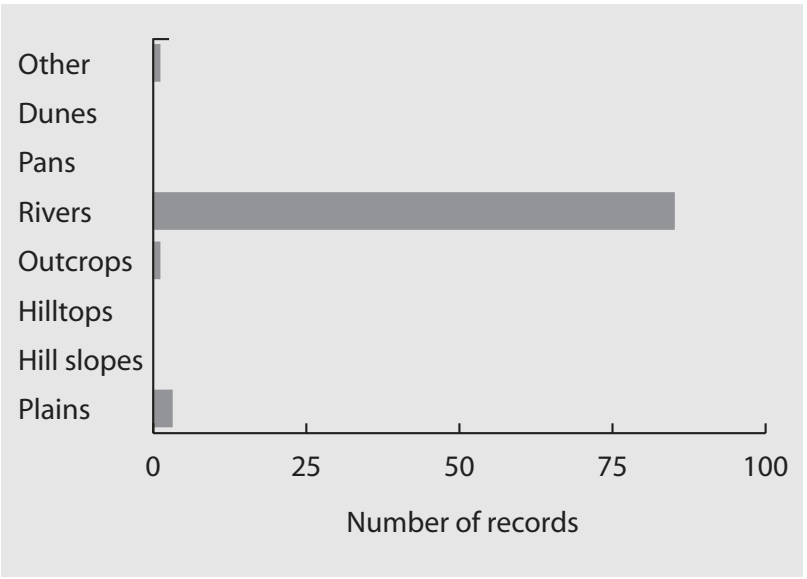


DISTRIBUTION & ABUNDANCE

Restricted to north-western Namibia. Uncommon to rare, sometimes common; usually localised; locally dominant in a few places.

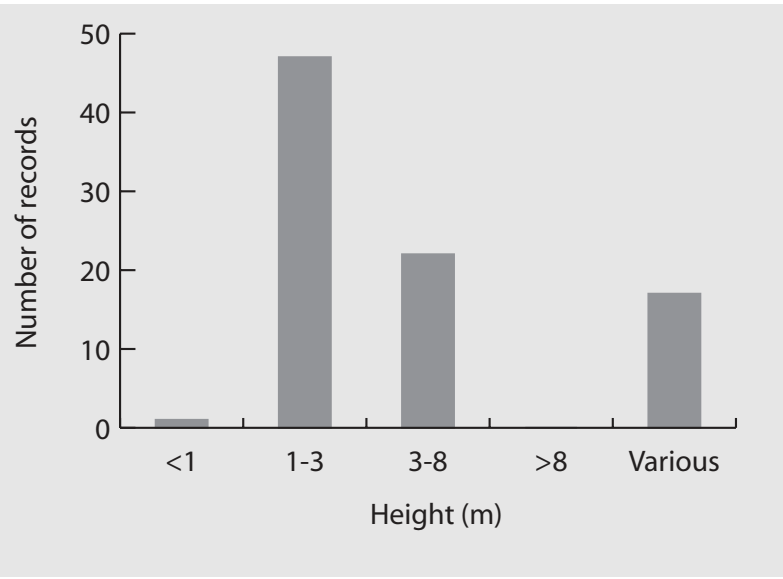
HABITAT

Mostly found in dry rivers and along river banks, occasionally on plains. On sandy or gravel substrates.



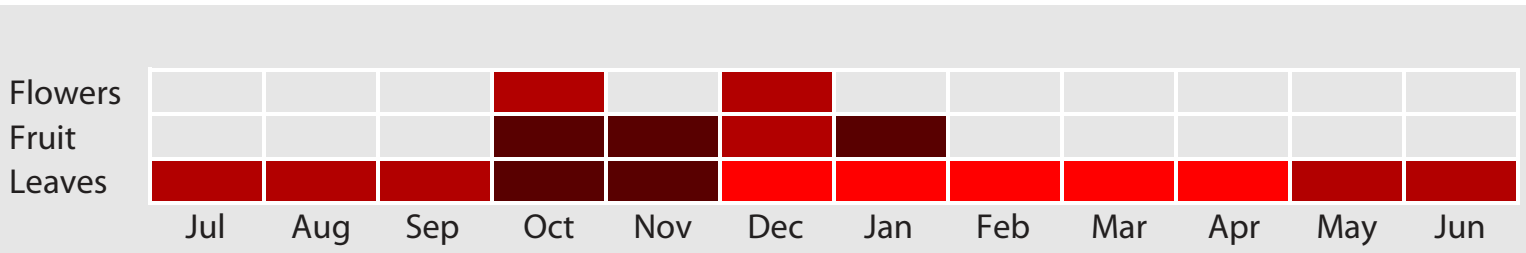
GROWTH FORM

Generally a shrub, mostly up to 3 m high. Can be a shrub or tree of over 3 m.



ANNUAL CYCLE

FLOWERS recorded in December, with single records other months; recorded in October by herbarium. FRUIT October to January, with single records most months. LEAVES mostly December to April, with young leaves in December.



GENERAL

Leaves browsed by various game species, but a favourite food of giraffe. Wood used to make knopkieries.

CONSERVATION CONCERNS

None recorded.

Combretum imberbe *Continued from page 481:*

CONSERVATION CONCERNS

Although heavily utilised by people, regrowth is good and growth of young trees is vigorous. Because of its religious importance and many uses, it is protected locally; it is also formally protected by forestry legislation. There are many really old and beautiful specimens that warrant special protection as monuments.

Combretum zeyheri

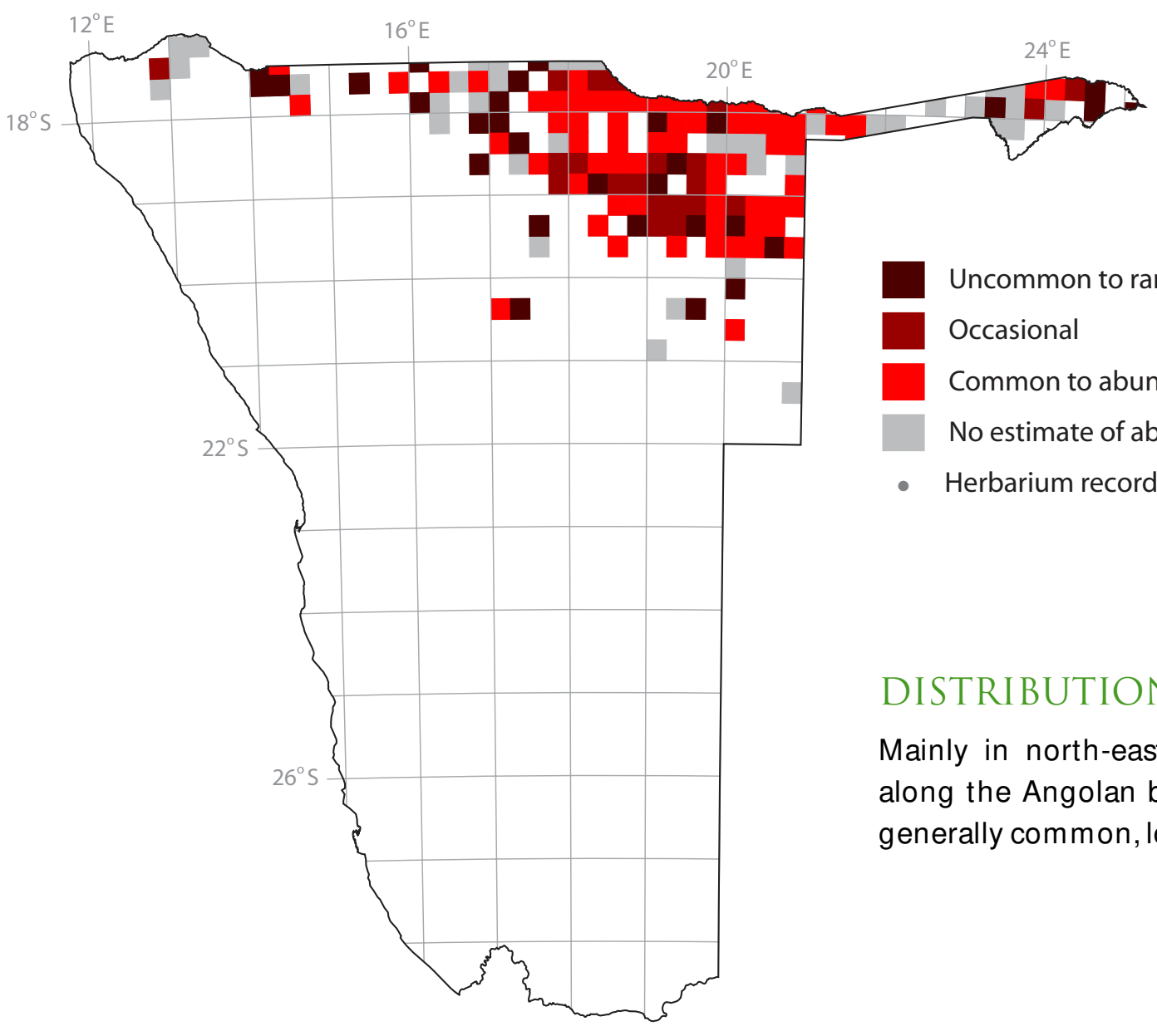
Mukenge

Large-fruited combretum (E); raasblaar (A); n//abe (J); ghuvu (Kx); omusheshe (O)

[272 records from 158 (15%) squares]



Shrub or small tree. LEAVES **often whorled (3–4 leaves)**; obovate to elliptic, **large, somewhat leathery**; dark green above; pale grey-green below with **domatia in the axils of veins**; margin undulate. FLOWERS yellow with orange stamens, appearing before the leaves. FRUIT **four-winged, large** (the largest of all Namibian combretums); **brown to golden; wings undulate, equally wide all the way down**.

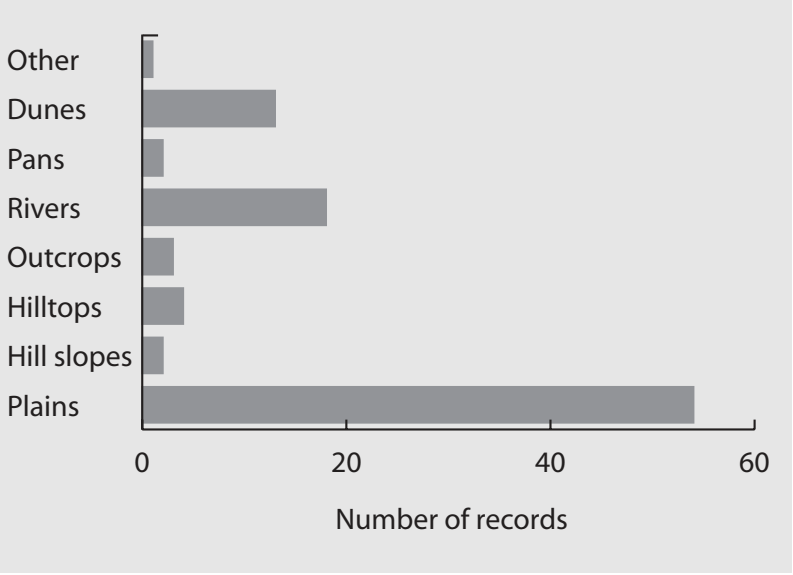


DISTRIBUTION & ABUNDANCE

Mainly in north-eastern Namibia, extending along the Angolan border to the north-west; generally common, locally abundant in places.

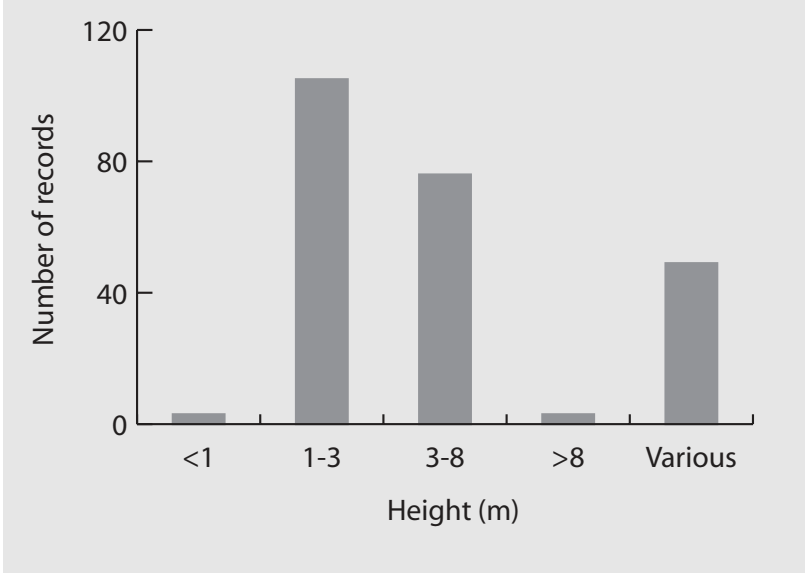
HABITAT

Mainly found on sandy plains, also on dunes and along river banks in the north-east.



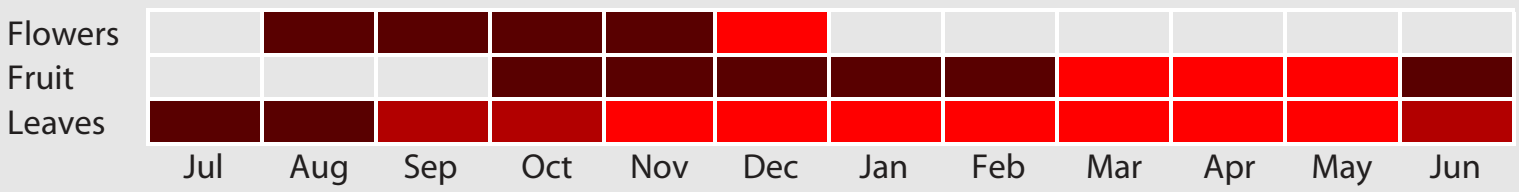
GROWTH FORM

A shrub or tree up to 3 m high, but also a tree up to 8 m high (37%) of records.



ANNUAL CYCLE

FLOWERS from August, but mostly in December. FRUIT from October, but mostly March to May. LEAVES mostly November to May, with new leaves in September and October.



GENERAL

The leaves are browsed by game and livestock. The wood is used as fencing and building material; the leaves and roots are used medicinally; the gum is edible. The bark, twigs and root fibres have various uses, and are used for weaving baskets and fish traps, as well as brides‘ wedding bands and belts. Used in rituals. The Afrikaans common name ‘raasblaar‘ refers to the rustling sound made by the fruit and leaves in the wind.

CONSERVATION CONCERNS

None recorded.



Combretum zeyheri, flowers and fruit, B. Curtis

Combretum albopunctatum

Muramata

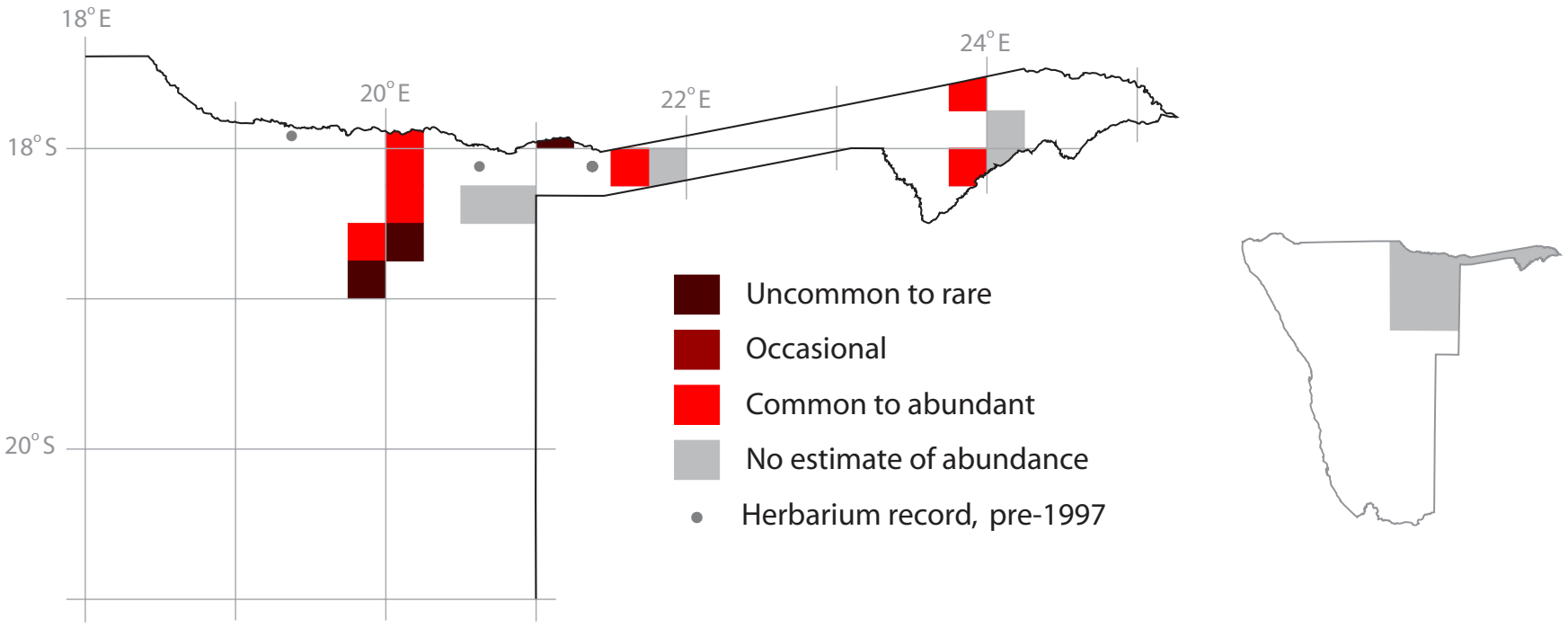
Silver-dot combretum (E); Okavango-boswilg (A); Okavango Buschweide (G); mufufu (T)

[19 records from 15 (1%) squares]



Shrub or tree **with smooth, grey-brown bark**. LEAVES with successive pairs at right angles to each other; elliptic, up to 60 mm long; dark green above; olive-green below with scattered hairs and **small, white scales**, veins prominent. FLOWERS small, yellow. FRUIT four-winged, ovoid to almost spherical, up to 20 mm in diameter; straw-coloured with a slight, red-purple tint.

It may be confused with *C. celastroides*, which has a more teat-like tip to the leaves and larger, yellowish scales on the underside of the leaf.



DISTRIBUTION & ABUNDANCE

Common in scattered localities along the Okavango River and just south of it, as well as in eastern Caprivi. It has previously been recorded further west than it was during the TAP.

HABITAT

Found on sandy plains, sometimes river banks.

GROWTH FORM

A shrub or tree up to 8 m tall, seldom over 8 m. Sometimes scrambling. Occasionally thicket-forming.

ANNUAL CYCLE

Observations were only made in November, December and March to May. FLOWERS recorded in November and December. FRUIT November to June. LEAVES were recorded in all the months of observation, with young leaves in November.

GENERAL

Used for fuel and to make 'knopkieries'.

CONSERVATION CONCERNS

Restricted, but apparently not threatened.

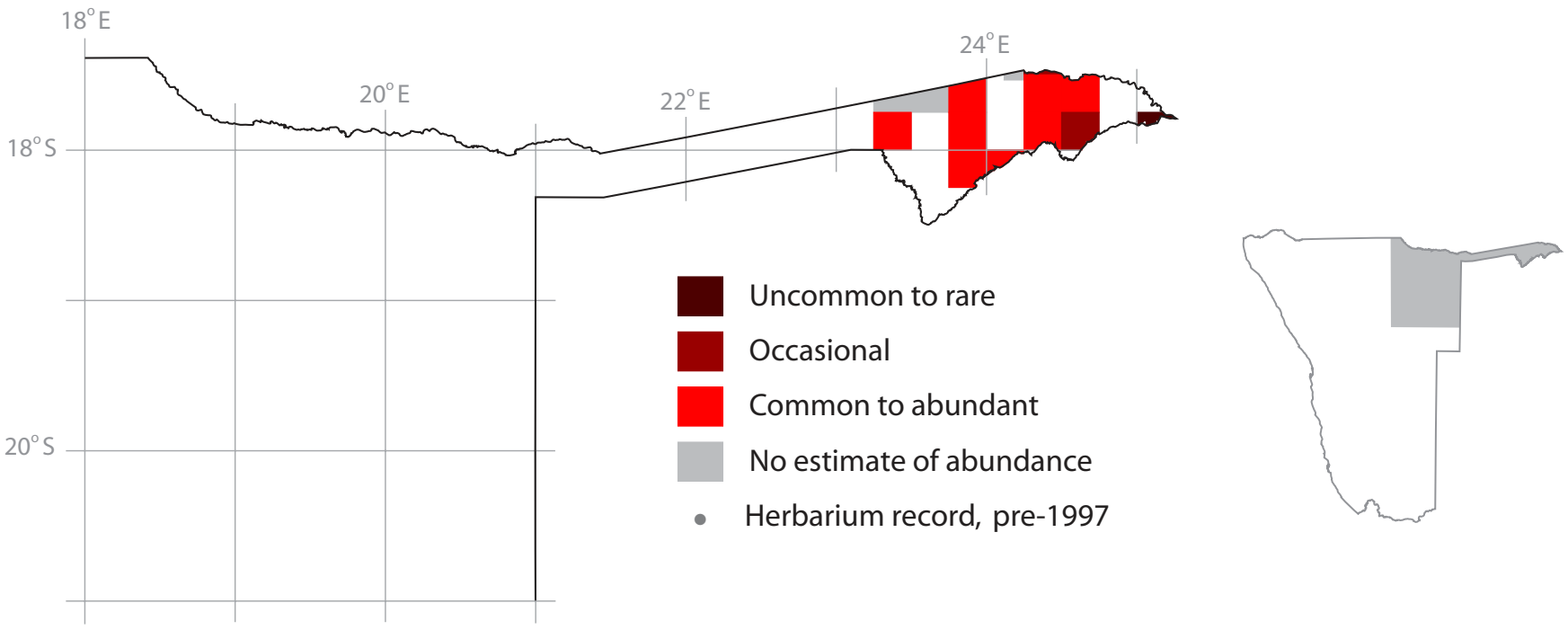
Combretum elaeagnoides

Caprivi Combretum

Ölbaumweide (G)

[32 records from 16 (1%) squares]

Shrub or small tree, with a **tendency to scramble**. LEAVES **narrowly elliptic**, up to 130 mm long; paler below than above with many **silvery scales on both surfaces**; margin sometimes undulate. INFLORESCENCE a **showy mass** of tightly packed, creamy-white to yellow flowers, appearing **before or with the young leaves**. FRUIT four-winged; up to 35 mm long; apex and base often deeply notched; wings often distinctly finely undulate; creamy-green becoming brown.



DISTRIBUTION & ABUNDANCE

Widespread and common to abundant in eastern Caprivi.

HABITAT

Found on sandy plains, dunes and river banks.

GROWTH FORM

Generally a shrub of up to 3 m, but sometimes a tree of up to 8 m; twice recorded as over 8 m high.

ANNUAL CYCLE

FLOWERS mainly October and November, with a few records in February and March. FRUIT February to June. LEAVES December to June, with new leaves in October and November.

GENERAL

Easily colonises disturbed habitats, such as road verges.

CONSERVATION CONCERNS

None recorded.

Combretum oxystachyum

Bottlebrush Combretum

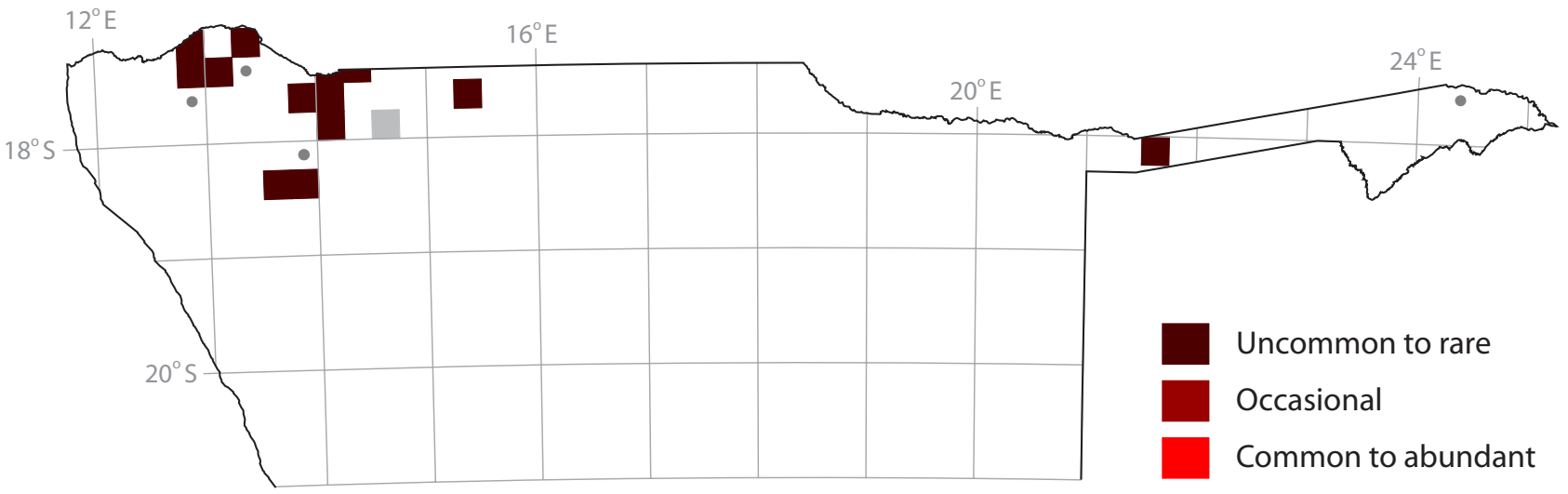
Spitzähriger Combretum (G)

[19 records from 14 (1%) squares]

Scrambling shrub or liana. BARK peeling in stringy strips. LEAVES **longitudinally folded**; ovate to **lanceolate**; upper surface dull green with dense to scattered white hairs and occasionally with conspicuous, stalked glands. FLOWERS **in dense, erect spikes; large and very striking with crimson to red-brown stamens.** FRUIT usually **five-winged**.

Cannot be confused with any other species.

(See photo of flowers, page 470).



DISTRIBUTION & ABUNDANCE

Uncommon to rare in north-western Namibia, with an outlier in Mahango Game Reserve (FRI1/292) and an earlier herbarium record from eastern Caprivi.

HABITAT

Found on dolomite hill slopes and rocky outcrops, sometimes sandy plains and along dry rivers. Also recorded on termite mounds in the Cuvelai area.

GROWTH FORM

A scrambling shrub in the 1–3-m height class.

ANNUAL CYCLE

No observations from August to October. FLOWERS January to June, but mainly March and April; there is a single herbarium record in November. FRUIT February to July, mainly March. LEAVES present during months of observation.

GENERAL

Of horticultural potential for frost-free areas, as its flowers and fruit clusters are very striking.

CONSERVATION CONCERNS

None recorded.

Combretum platypetalum

Kantakaba

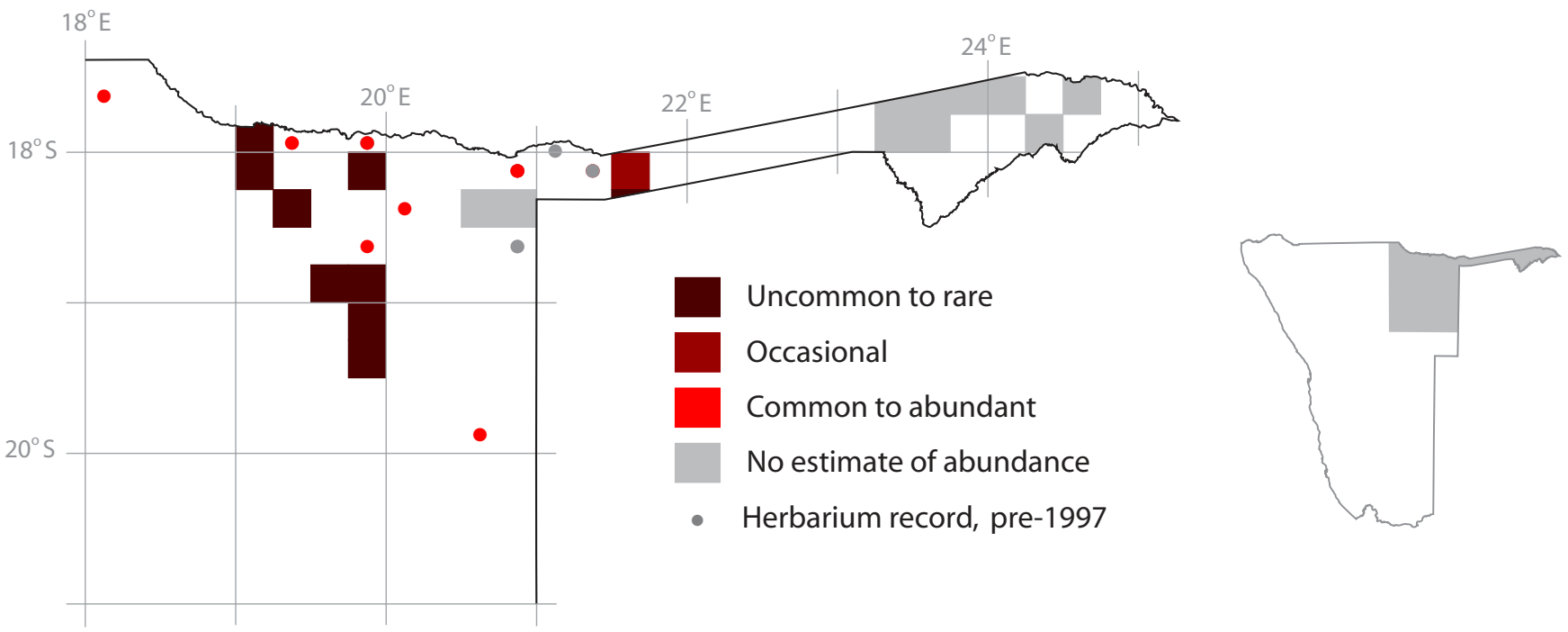
Scarlet combretum (E);
moluko (Rk, Rum)

[27 records from 18 (2%) squares]



Sparsely branched shrub with long, straight, slender branches. BARK **purplish-grey**. LEAVES **alternate** to sub-opposite, sometimes three-whorled; **narrowly lanceolate to broadly elliptic**, mostly **longitudinally folded**; petiole 8–9 mm long, with rust-red covering. FLOWERS **conspicuously bright red, appearing before the leaves**. FRUIT four-winged; central portion pale brown; wings thin, straw-coloured to pale brown.

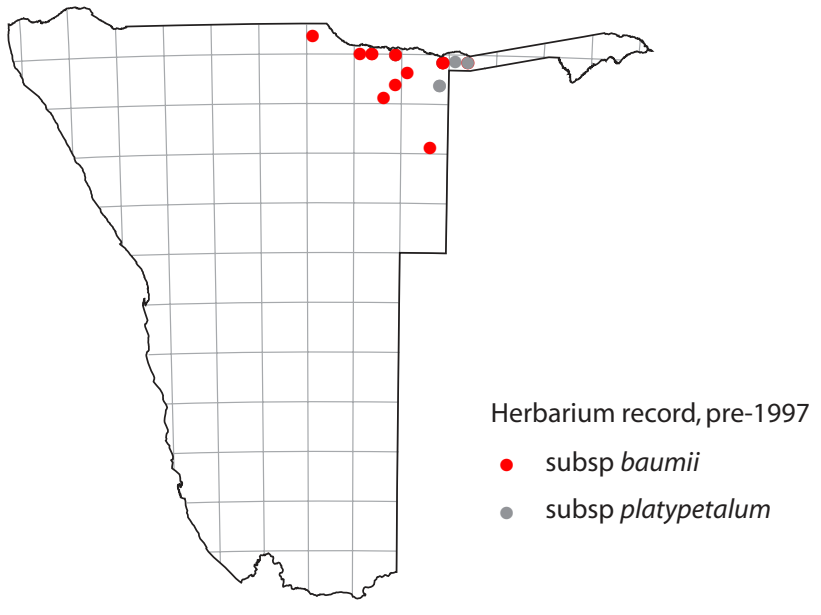
According to herbarium records, there are two subspecies in Namibia, *platypetalum* and *baumii*, but only the former was recorded by the TAP.



DISTRIBUTION & ABUNDANCE

Uncommon to occasional along the Okavango River and southwards to the Nyae Nyae area. Locally common in places. Herbarium records show subsp. *baumii* on the outer edges of the species distribution, with subsp. *platypetalum* concentrated around the Andara-Popa Falls area, and along the road to Kaudum (1820).

Was probably overlooked by atlassers as it is usually less than 2 m high and not easy to identify without flowers or pods.



HABITAT

Found on dunes, sandy plains, along omurambas and on floodplains.

GROWTH FORM

A shrub less than 3 m high.

ANNUAL CYCLE

Observations in March, May and October, only. FLOWERS August to October. FRUIT March, August and September. LEAVES deciduous, but present in the months of observation.

GENERAL

This plant has horticultural potential. The brilliant red flowers make it the most striking of the Combretaceae in Namibia. It flowers during the dry months while most other plants are still dormant, at which time it can be spotted from far away. The flowers and roots are used during ceremonies and dances. The roots are also used medicinally.

CONSERVATION CONCERNS

None recorded.

Pteleopsis myrtifolia

Two-winged Stink-bush

[1 record]

Densely leafy shrub or small tree. LEAVES elliptic, shiny green, usually small, with two tiny, yellow dots sometimes visible on upper surface. FLOWERS white to creamy-yellow, unpleasantly scented. FRUIT two- or three-winged, greenish-yellow.

Found on Impalila Island. An uncommon shrub in the 1–3-m height class on river banks; fruit recorded in April. Herbarium records are all from Angola.

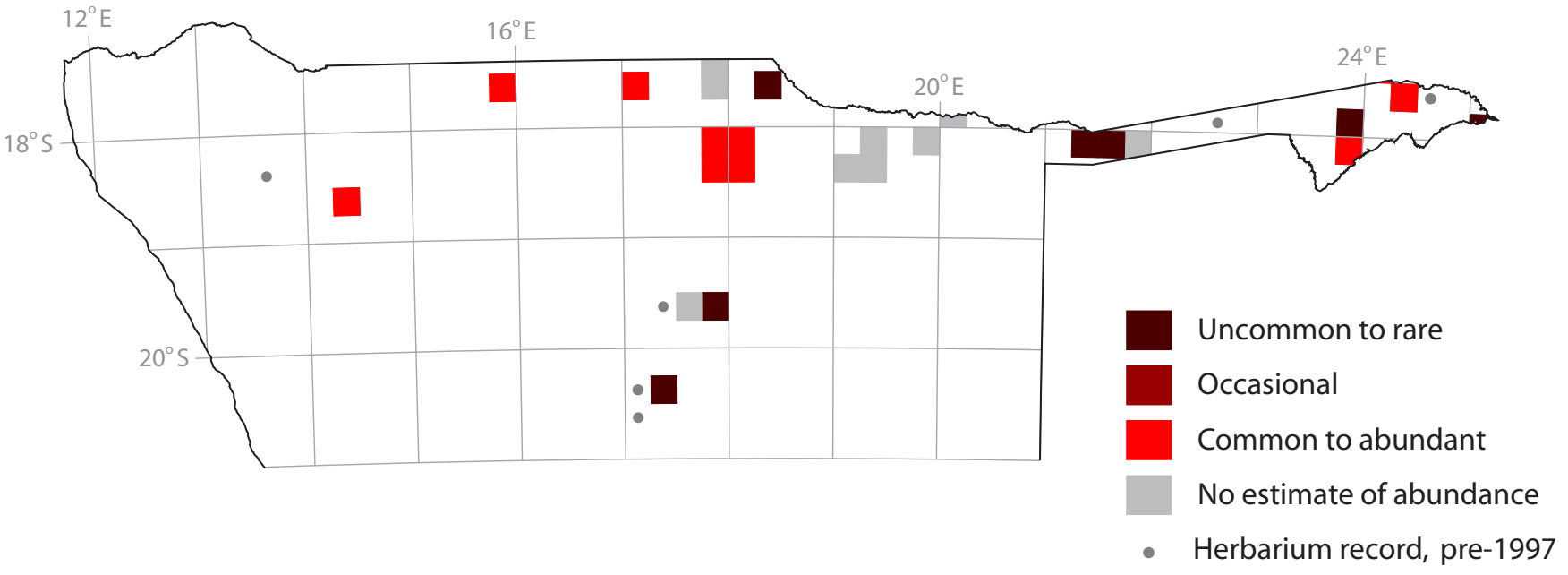
Terminalia brachystemma

Kalahari Cluster-leaf

[27 records from 25 (2%) squares]

A small bushy tree, with **conspicuously layered branches**. BARK grey, stringy, dark on branchlets; peeling to **reveal tan underbark**. LEAVES elliptic to obovate, 90–150 mm long, leathery; **green above, blue-green below; base narrowly tapering and running into the petiole**. FLOWERS cream to pale yellow. FRUIT up to 50 mm long, **wing almost circular, bright crimson** to purplish-brown when dry.

Sometimes confused with *T. sericea*, with which it is said to hybridise. It usually has much larger and less hairy leaves than *T. sericea*.



DISTRIBUTION & ABUNDANCE

Found in scattered localities in northern to north-eastern Namibia. The TAP has extended the known range in the central-north, but there are also old herbarium records that were not reconfirmed by the TAP. There is a new record for Omavanda (1713AA) since the map was drawn (BC2236, January 2005). Un-common in the Karstveld and on the north-central plateau; common to uncommon in the north-east.

HABITAT

Found in various habitats, but mainly on plains.

GROWTH FORM

A tree from 1–8 m high.

ANNUAL CYCLE

No observations in August and September. FLOWERS recorded in October. FRUIT from December to May. LEAVES were recorded from December to July, with young leaves in October.

GENERAL

The wood is used for making implements.

CONSERVATION CONCERNS

None recorded. The species was probably under-recorded by atlassers because of the confusion with *T. sericea*.

Terminalia prunioides

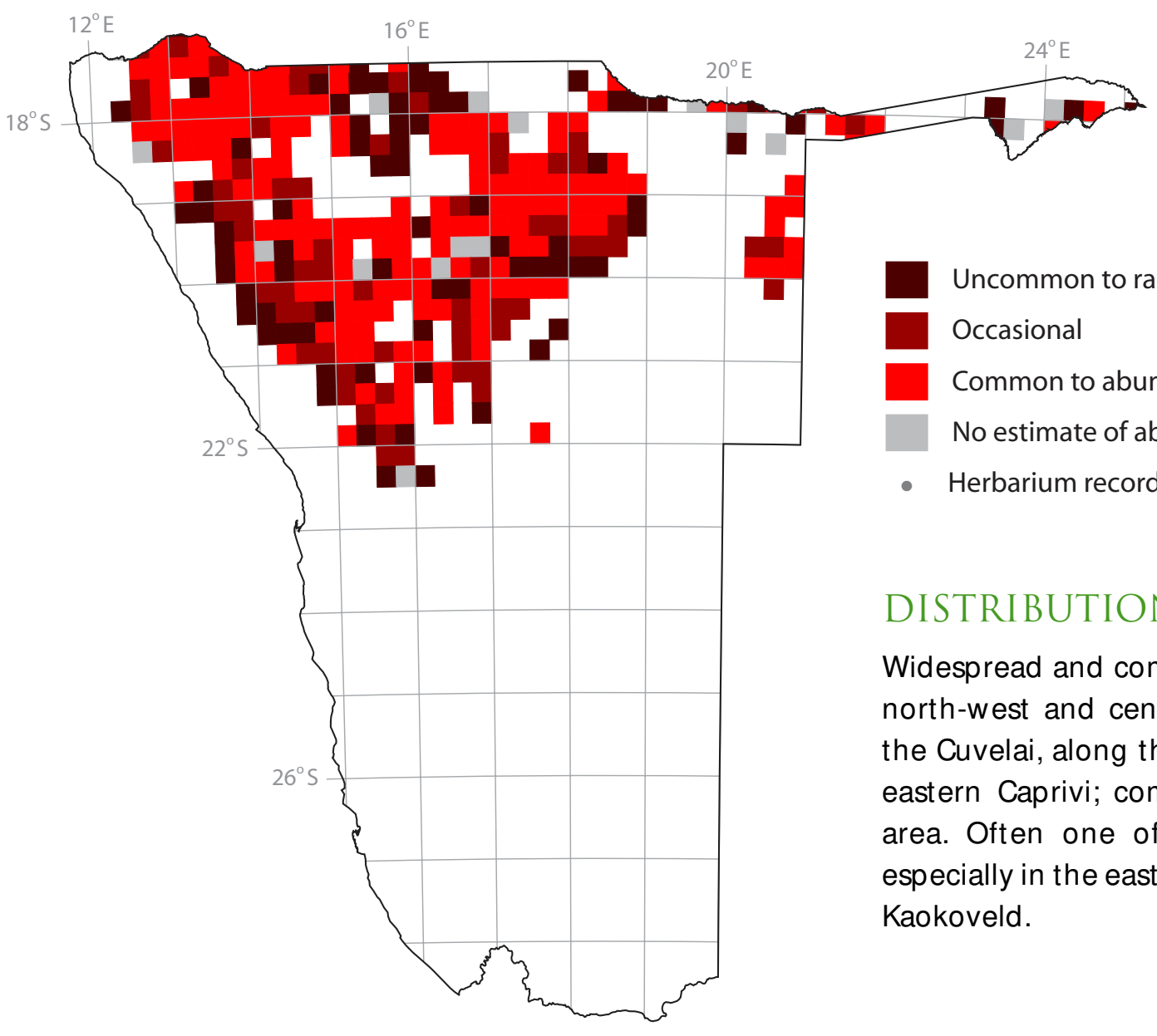
Blutfruchtbaum / Muhama

Purple-pod terminalia (E); deurmekaarbos (A); omuhama (H, O); heras (K)

[1,248 records from 328 (31%) squares]



Shrub or tree. BARK dark, rough, **vertically striated and fibrous**; young branchlets **plum-coloured**, often long and **becoming entangled with each other**; with spinescent dwarf branchlets. LEAVES **clustered on dwarf branchlets**, obovate-elliptic; dark green above, paler below; base running into petiole. FLOWERS cream, in long, slender spikes on ends of dwarf branchlets, unpleasant smelling. FRUIT up to 60 mm long, with **bright plum-red to purple wing**.

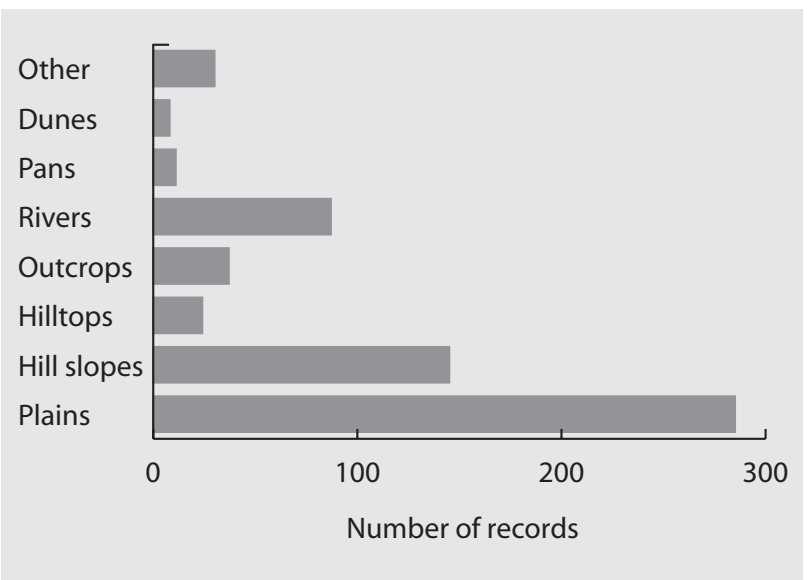


DISTRIBUTION & ABUNDANCE

Widespread and common to abundant in the north-west and central-north; uncommon in the Cuvelai, along the Okavango River and in eastern Caprivi; common in the Nyae Nyae area. Often one of the dominant species, especially in the eastern Karstveld and parts of Kaokoveld.

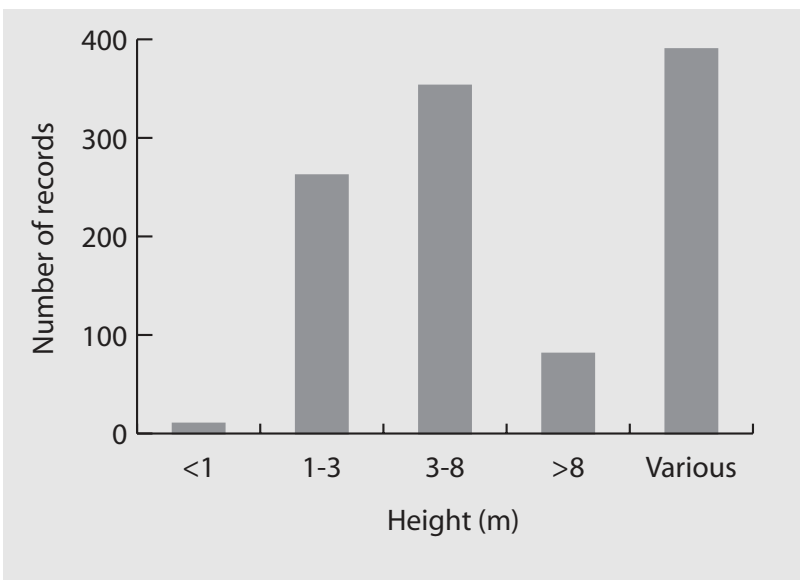
HABITAT

Found in various habitats, but mostly on plains. Also found on hill slopes in the north-west and on the north-central plateau; along rivers in the central-west and north-west; on rocky outcrops and hilltops in the north-west; around pans in the Cuvelai. Substrates include sand, gravel, calcrete, various types of rock including granite, calcrete, basalt. Also around salt pans and on termite mounds.



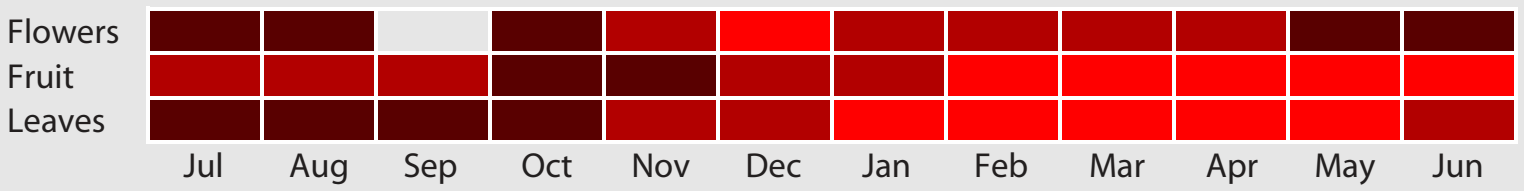
GROWTH FORM

About 60% trees and 40% shrubs. Shrubs mainly in the 1–3-m height class, trees mainly 3–8-m height class, although both can be taller. About 33% of stands were of mixed heights. In the Cuvelai and the north-east trees were mostly 8 m or taller. In the north-west, north-central plateau and central highlands trees were mostly in the 3–8 m range; in the central-west, shrubs were around 3 m.



ANNUAL CYCLE

FLOWERS mainly November to April, but can continue until August in some years. Flowering is rainfall-dependent and the species often flowers twice in one season if there are late rains; it is not uncommon to see fresh new pods and new flowers on the same tree. FRUIT all year round, but mostly from December to the following September. LEAVES mainly November to June, with young leaves from October to January.



GENERAL

Heavily browsed by game. Bees produce good honey from the nectar; vultures nest in tall specimens in some areas. The wood is, amongst other uses, used for wagon parts, implement handles, knopkieries, building, fencing and firewood. Tea is made from the leaves and fruit, and the roots are used medicinally.

The species is often invasive, and is a major problem in the Karstveld, especially where trees (this or other species) have been harvested. Subject to bush-clearing and charcoal production in some areas; some individuals have been killed by parasites such as *Tapinanthus*.

A good shade tree, with attractive flowers and fruit, drought-resistant and fairly frost-tolerant.

CONSERVATION CONCERNS

None recorded.

Terminalia sericea

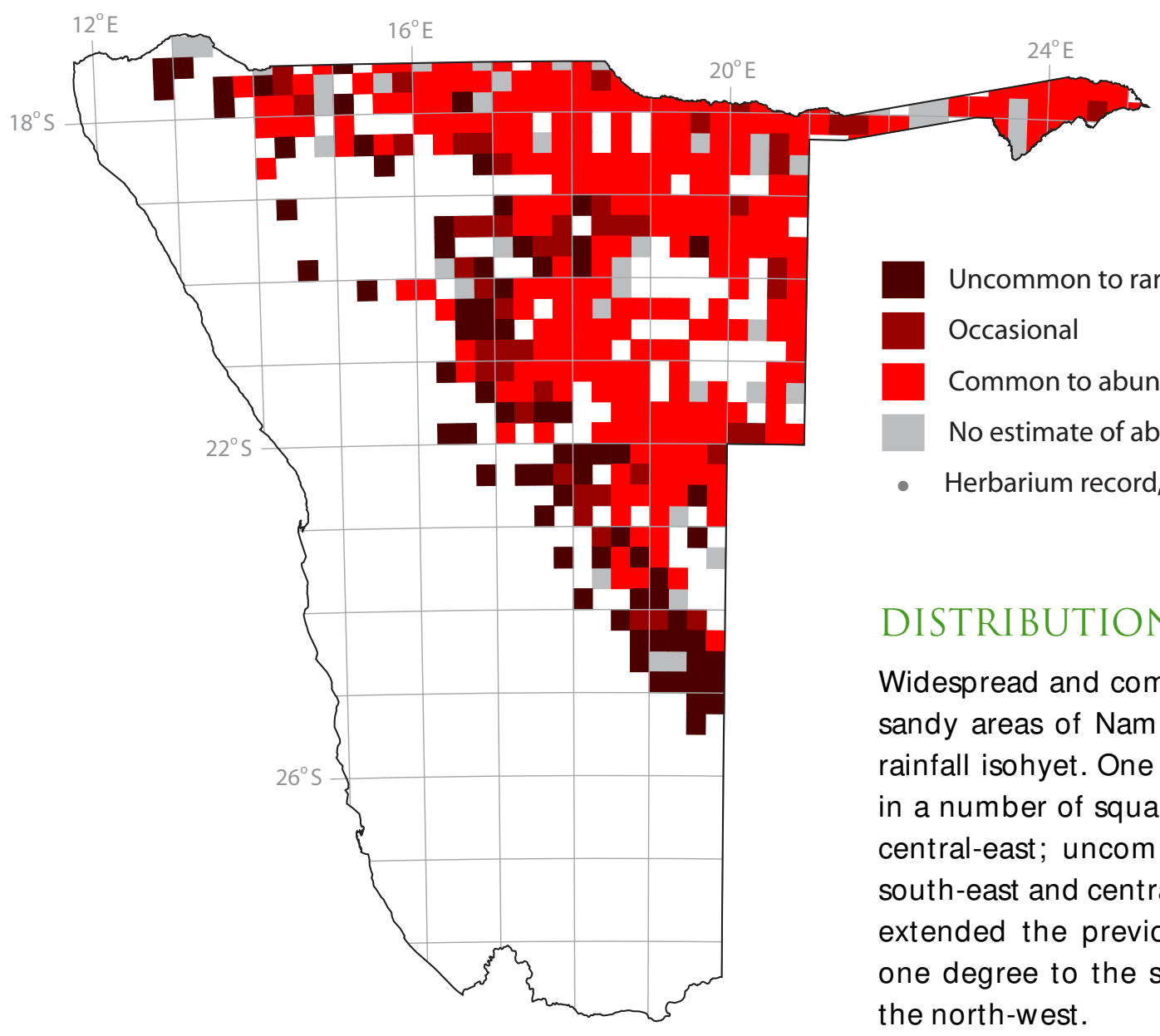
Silver Cluster-leaf

Geelhout, vaalboom (A); Gelbholtz (G); omuseasetu (H); |gaab (K); muhorono (L); mugoro (Rk, Rum); ghushosho (T)

[1,359 records from 429 (40%) squares]



A medium-sized tree with **branches growing horizontally, giving the crown a layered appearance**. BARK dark grey and deeply fissured; branchlets purplish, **peeling and flaking in rings to expose tan underbark**. LEAVES **clustered towards ends of branchlets**; obovate-elliptic, **3–4 times longer than wide; pale silvery-green, with silky hairs**. FLOWERS cream to pale yellow, in axillary spikes. FRUIT up to 35 mm long; **pink to rose-red**, drying to brown.

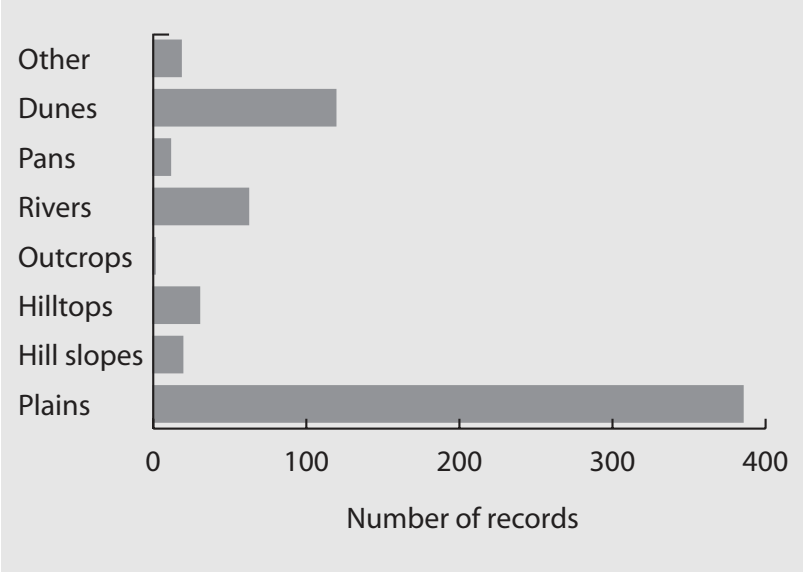


DISTRIBUTION & ABUNDANCE

Widespread and common to abundant in the sandy areas of Namibia east of the 150-mm rainfall isohyet. One of the dominant species in a number of squares in the north-east and central-east; uncommon in the north-west, south-east and central highlands. The TAP has extended the previously recorded range by one degree to the south and one degree in the north-west.

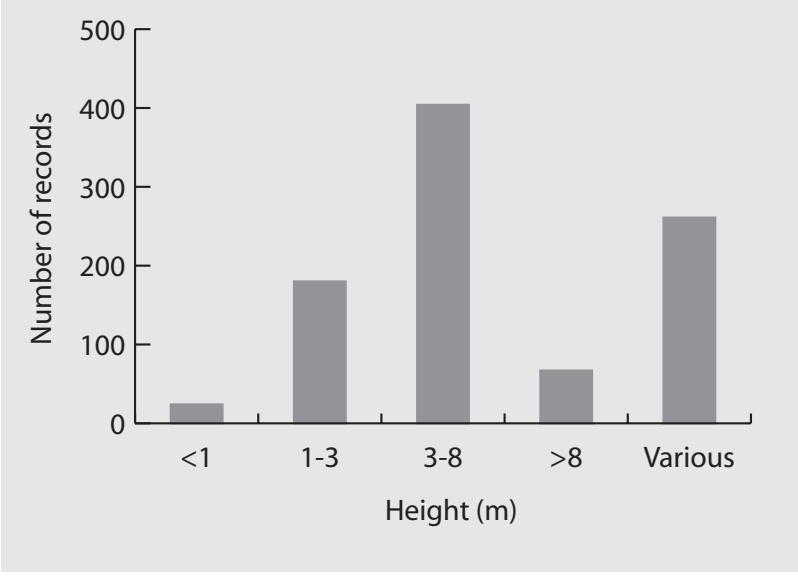
HABITAT

Found in various habitats, but mostly on plains and dunes; often along dry watercourses in the north-east. Always on sand.



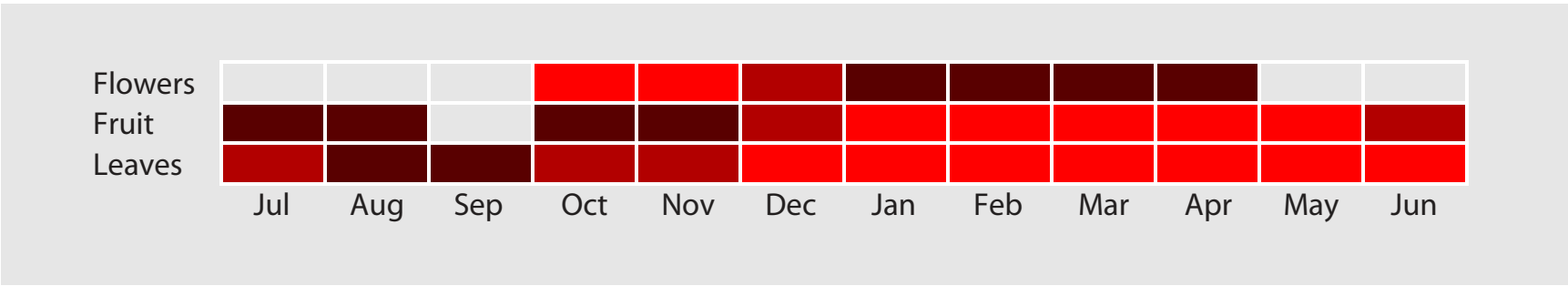
GROWTH FORM

Usually a tree up to 8 m (60% of records), sometimes higher (10%); sometimes a shrub or tree up to 3 m (30%). Roughly 67% of the stands recorded had trees covering a range of heights from small to large.



ANNUAL CYCLE

FLOWERS mostly October and November, continuing until April in some years. FRUIT mostly from December to June, but found throughout the year. LEAVES mainly October to July, but present on some trees all year; young leaves from September to December.



GENERAL

The wood has a lovely yellow colour, hence the Afrikaans and German common names. The wood, roots and bark are used for a variety of purposes. The leaves, bark, roots, resin and ash are used medicinally. The gum is edible, and also used to glue arrows. The San use the leaves for tea, and sometimes as a tobacco substitute.

It is heavily browsed by cattle and game, and sometimes parasitised. It may be invasive in places. This rain-dependent species is of horticultural potential for frost-free areas as an attractive shade tree with silvery leaves and wine-red pods.

CONSERVATION CONCERNS

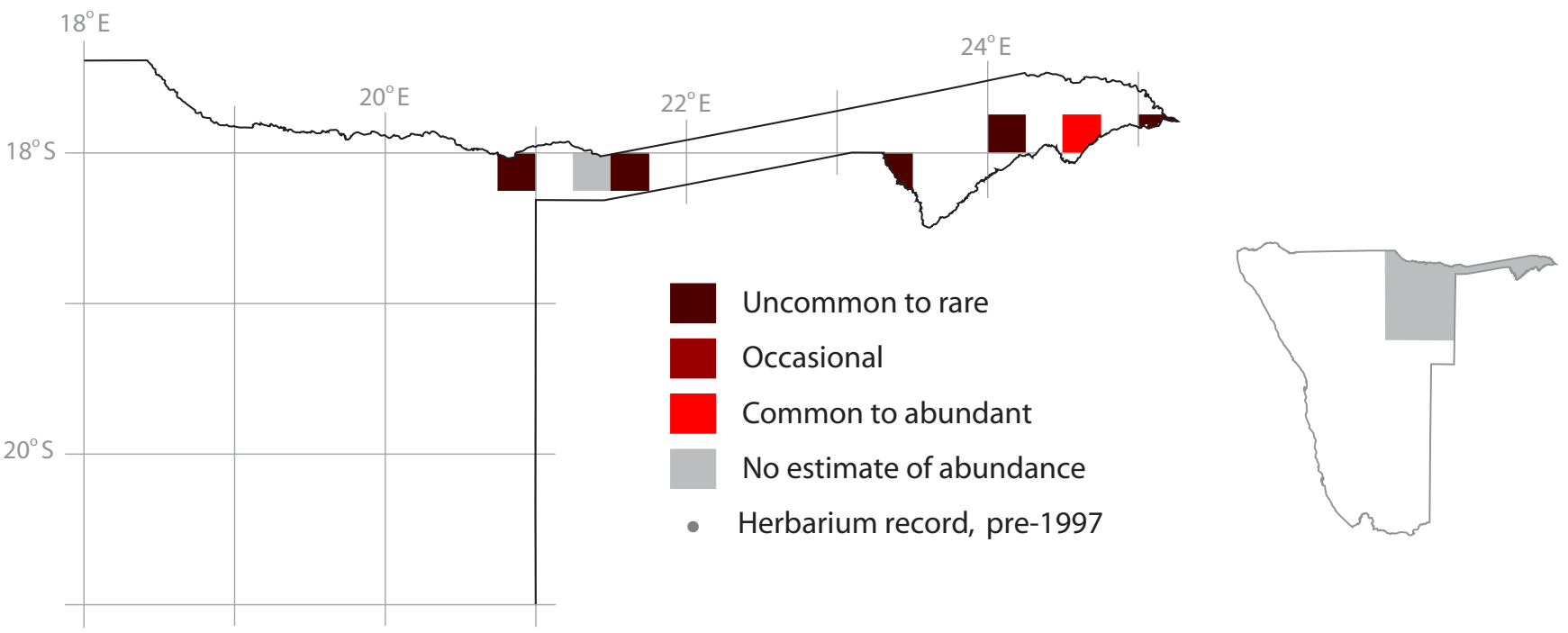
None recorded.

Terminalia stuhlmannii

Zigzag Cluster-leaf

[8 records from 7 (<1%) squares]

Small tree with a **flat crown, sometimes with spines** at the base of lateral branches. LEAVES narrowly obovate, **short**, leathery; **blue-green above, yellow-green below**; base narrowly tapering; **margins rolled under**. FLOWERS white to cream with fairly long stamens. FRUIT elliptic, **small; yellow-red drying to brown**.



DISTRIBUTION & ABUNDANCE

Generally uncommon in eastern Caprivi and the eastern stretches of the Okavango River. Locally abundant in Salambala Conservancy (1724DC) in eastern Caprivi.

HABITAT

Various.

GROWTH FORM

A tree of up to 8 m or taller.

ANNUAL CYCLE

Observations only from January to May and in August. FLOWERS none recorded. FRUIT recorded from February to May. LEAVES were recorded every month in which there were observations.

CONSERVATION CONCERNS

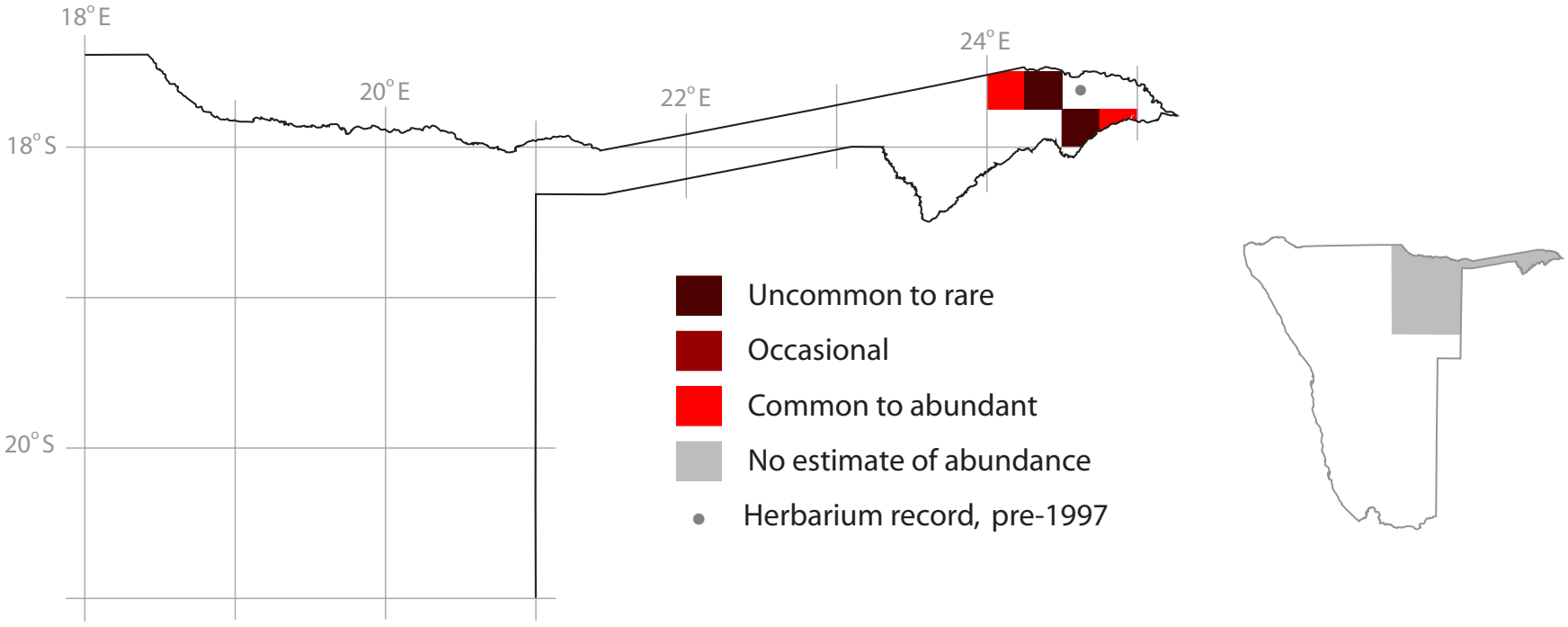
Rare in Namibia, no threats recorded.

Terminalia trichopoda

Tawny Cluster-leaf

[7 records from 4 (<0.5%) squares]

Medium-sized tree. BARK rough with longitudinal fissures and light brown underbark. LEAVES obovate, **100–180 mm long**, leathery; hairy below, often with long, shaggy hairs; **petiole thick**. FLOWERS greenish-cream to pale yellow. FRUIT in heavy clusters, dull pink.



DISTRIBUTION & ABUNDANCE

Uncommon to common in the Caprivi east of 24° E. Locally abundant on the floodplain in 1724DC.

HABITAT

Found on floodplains and plains.

GROWTH FORM

A tree in the 3–8-m height category, but often in a mixed stand of shrubs and trees of all heights.

ANNUAL CYCLE

Observations only in March, November and December. FLOWERS in November. FRUIT in November and May. LEAVES present in the three months that observations were made.

CONSERVATION CONCERNS

Rare, no threats recorded.



Terminalia trichopoda, B. Curtis

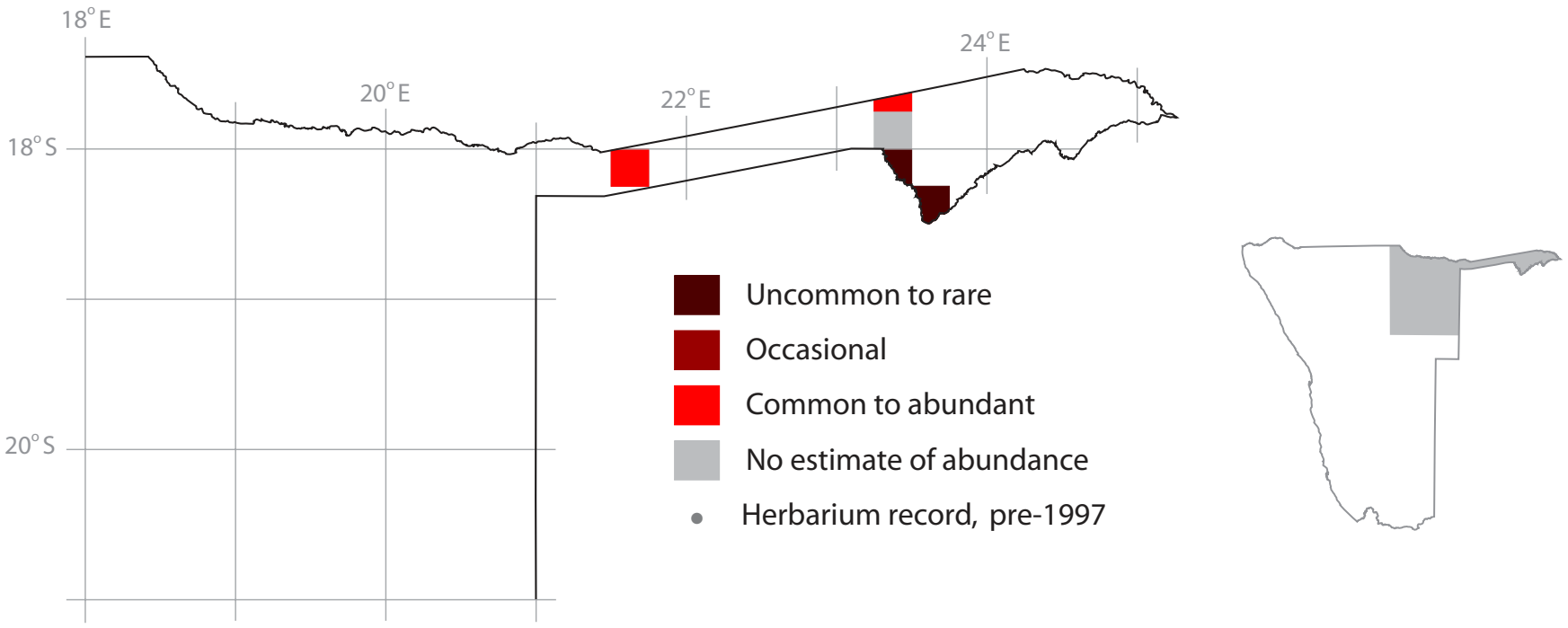
Syzygium cordatum

Waterberry

Mutoya (L); mukwe (T)

[6 records from 5 (<0.5%) squares]

Evergreen tree. BRANCHLETS four-angled. LEAVES simple, **with successive pairs set at right angles to each other, overlapping the ones above**; elliptic to oblong to almost round, up to 80 mm long; blue-green above, paler green below; leathery; **base deeply lobed; petiole absent or very short**. FLOWERS creamy-white to pinkish, with **numerous conspicuous stamens**; sweetly scented, with copious nectar. FRUIT a berry, ovoid, up to 17 mm long; fleshy, deep purple when mature; tipped by remains of calyx.



DISTRIBUTION & ABUNDANCE

Common to uncommon to rare as one moves southwards along the Kwando River; locally common along the eastern stretches of the Okavango River. These latter records represent a range extension.

HABITAT

Found on the banks of perennial rivers.

GROWTH FORM

A tree in the 3–8-m height category.

ANNUAL CYCLE

Observations were in May, June, August and December, only. FLOWERS in June, August and December. FRUIT in August and December. LEAVES present during months of observation, probably evergreen.

GENERAL

The wood is durable in water and used for building boats, as well as for fence poles. The fruit is edible, but sour, and is eaten fresh and used to make an alcoholic drink; it is also used medicinally and in magic.

CONSERVATION CONCERNS

None recorded.

Syzygium guineense

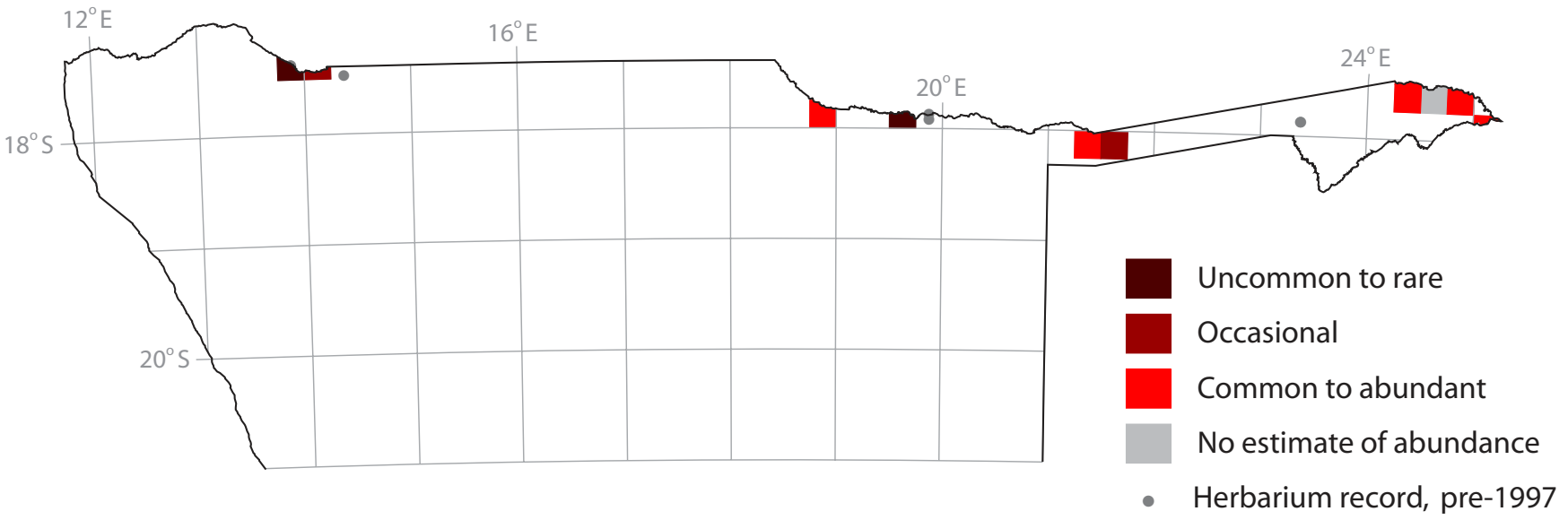
Water Pear

Waterpeer (A); omutareka (H); omuhombo (H, O); mutoya (L); murenga, mukudikudi (T)

[29 records from 12 (1%) squares]



Evergreen tree, **with a drooping crown**. LEAVES simple, **broadly lanceolate to elliptic**, 50–100 mm long, leathery; upper surface dark green, with a dull, waxy coating, hairless; lower surface paler green, midrib prominent; margin entire, rolled under; apex tapering; base broadly tapering to tapering. FLOWERS up to 5 mm in diameter, cream-coloured to white, **with many fluffy stamens**. FRUIT fleshy oblong, 10–15 mm long; dark red to purple-black, with persistent calyx remains.



DISTRIBUTION & ABUNDANCE

Uncommon to common along the Kunene River near Ruacana; common in scattered localities along the Okavango River and common to abundant along the Zambezi and Chobe rivers.



Syzygium guineense, Kunene River, B. Curtis

HABITAT

Found on river banks and floodplains.

GROWTH FORM

A tree, generally up to 8 m high, but sometimes higher.

ANNUAL CYCLE

No observations from July to September. FLOWERS herbarium records September to December. FRUIT October to June. LEAVES apparently evergreen.

GENERAL

Stands in water for part of the year, if the river levels rise. The fruit is edible and refreshing, and is also used to make beverages; probably eaten by birds as well. The wood is used to make watos.

CONSERVATION CONCERNS

None reported.

ARALIACEAE

Cussonia angolensis

Angolan Cabbage Tree

[1 record]

An erect tree up to 10 m high. TRUNK tapering, crowned by a round head of branches. LEAVES digitate with 6–9 leaflets; leaflets ovate, margin toothed; apex tapering. INFLORESCENCE a crowded terminal group of erect racemes. FLOWERS green. FRUIT dry, ovoid.

First recorded for Namibia in 2002 by Ernst van Jaarsveld of Kirstenbosch Gardens. Locally common on Omavanda Plateau, Baynes Mountains (1713AA). A tree with leaves in July and January, flowers in January (specimen BC2231, CUR1).

APIACEAE

Heteromorpha papillosa

Namibian Wild-parsley

[3 records from 1 square]

Densely branched shrub; seldom a small tree. LEAVES **very variable**, up to 120 mm long including petiole, may be trifoliolate or pinnate; leaflets narrowly elliptic, **more than four times long as wide**. FLOWERS small, cream-coloured to greenish-yellow. FRUIT laterally compressed, up to 10 mm long and 3 mm wide; usually slightly hairy.

The three TAP records are from Windhoek area (2217CA) where it grows as a shrub of around 1 m high on the hill slopes of the Auas Mountains on farms Regenstein and Aris, as well as in the Eros Hills to the east of the city. There are earlier herbarium records from a much wider area. Atlassers possibly overlooked it due to its rather nondescript appearance, especially when sterile. Endemic.

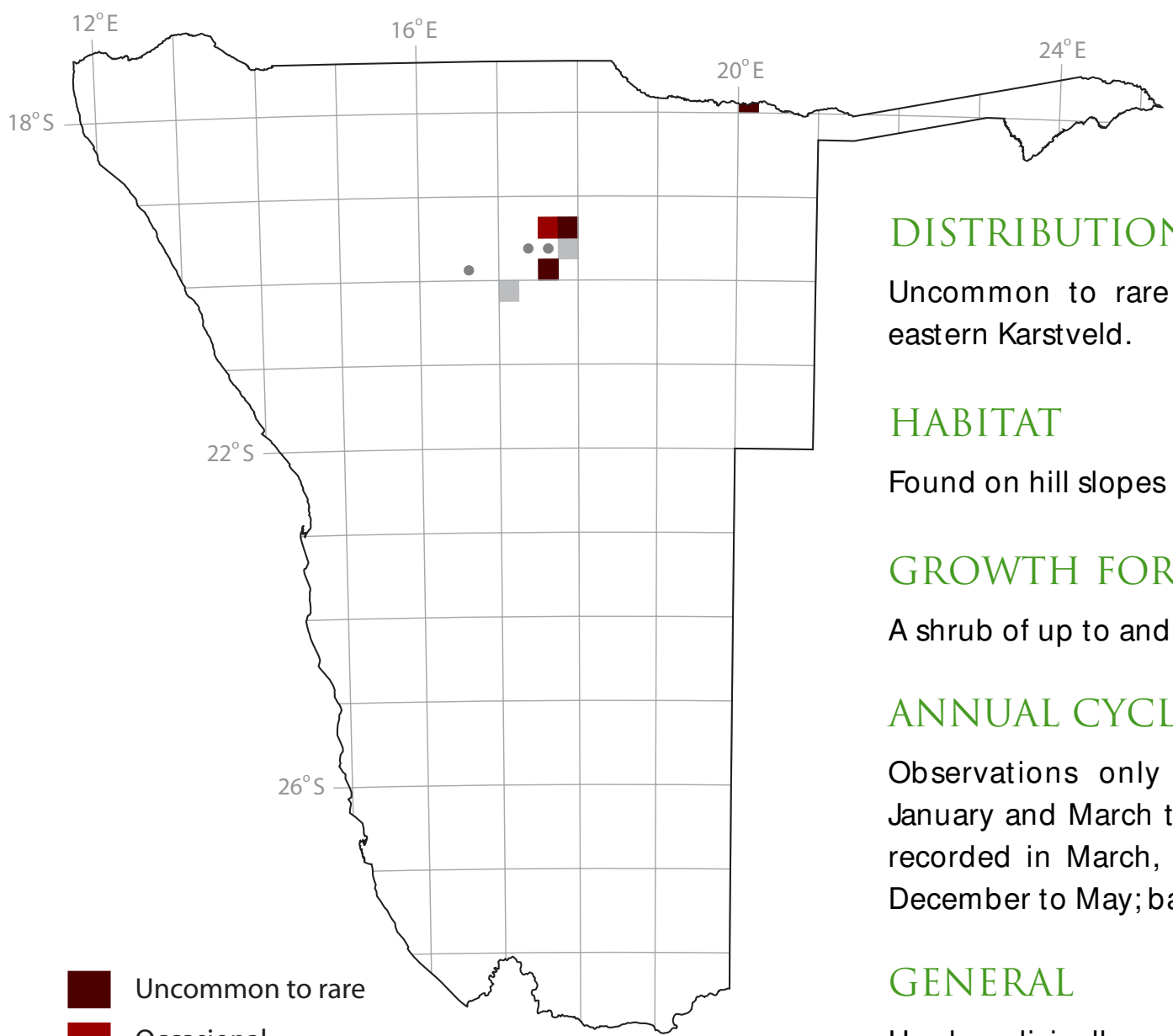
Heteromorpha stenophylla

Karstveld Wild-parsley

[19 records from 6 (<1%) squares]



Deciduous shrub or tree. BARK red- to purple-brown, smooth, papery; **peeling off in transverse strips to leave ring-shaped marks**. LEAVES **simple and three-lobed, trifoliolate or compound with 1–2 leaflet pairs**; linear-lanceolate or elliptic, often oblique; pale to dark green, hairless, thin textured; midrib prominent with tertiary veins forming a fine network below; apex pointed to mucronate; base tapering to oblique; **petiole broad-based and clasping the stem**. FLOWERS small, yellow-green, in umbels. FRUIT obovate to heart-shaped.



DISTRIBUTION & ABUNDANCE

Uncommon to rare in a small area of the eastern Karstveld.

HABITAT

Found on hill slopes

GROWTH FORM

A shrub of up to and just over 1 m.

ANNUAL CYCLE

Observations only in August, December, January and March to May. FLOWERS and FRUIT recorded in March, April and August. LEAVES December to May; bare in August.

GENERAL

Used medicinally.

CONSERVATION CONCERNS

None recorded.

Steganotaenia araliacea

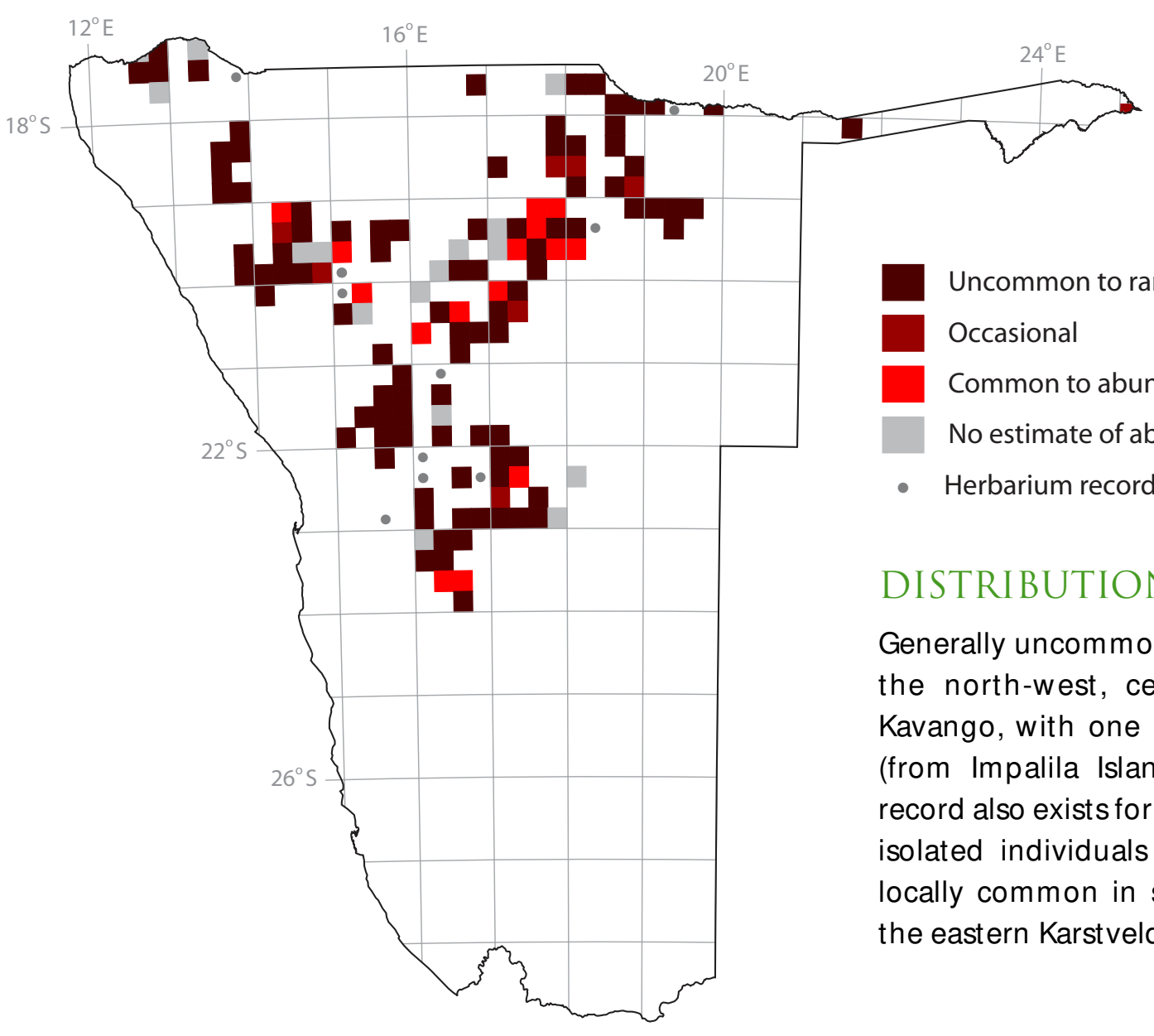
Carrot-tree

Omutiwonyoka (H); kaab (K); muketo (L); mufuramvhuu (Rk, Rum)

[303 records from 132 (12%) squares]



Deciduous tree. BARK smooth, greenish-yellow, **flaking off in white, papery pieces**. LEAVES **compound**, large; petiole long with broad base; leaflets ovate to elliptic; **both surfaces bright-green, thin-textured, pendulous; margin coarsely toothed with each tooth ending in a fine hair-like point**; apex pointed. FLOWERS greenish-white, in large compound umbels. FRUIT flattened, obovate, up to 13 x 8 mm; two-winged.

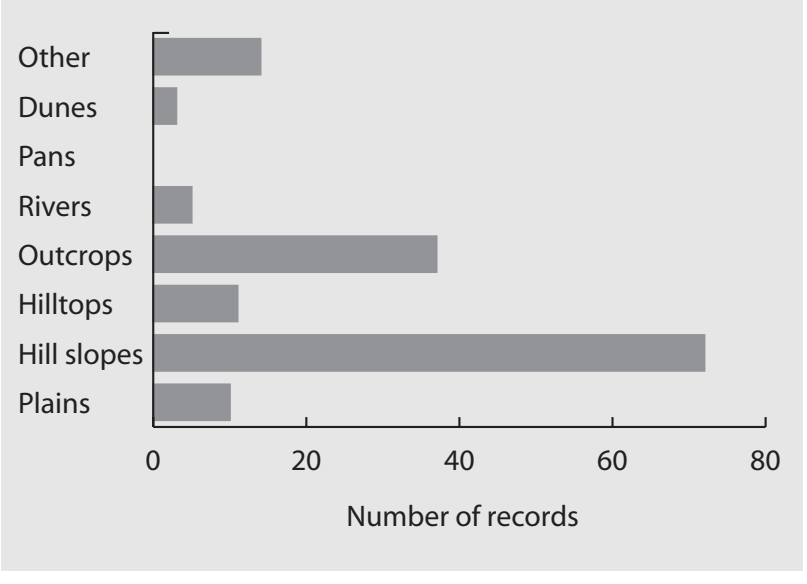


DISTRIBUTION & ABUNDANCE

Generally uncommon in scattered localities in the north-west, central Namibia and the Kavango, with one record in eastern Caprivi (from Impalila Island; an earlier herbarium record also exists for Katima Mulilo). Usually as isolated individuals or in small groups, but locally common in some areas, especially in the eastern Karstveld.

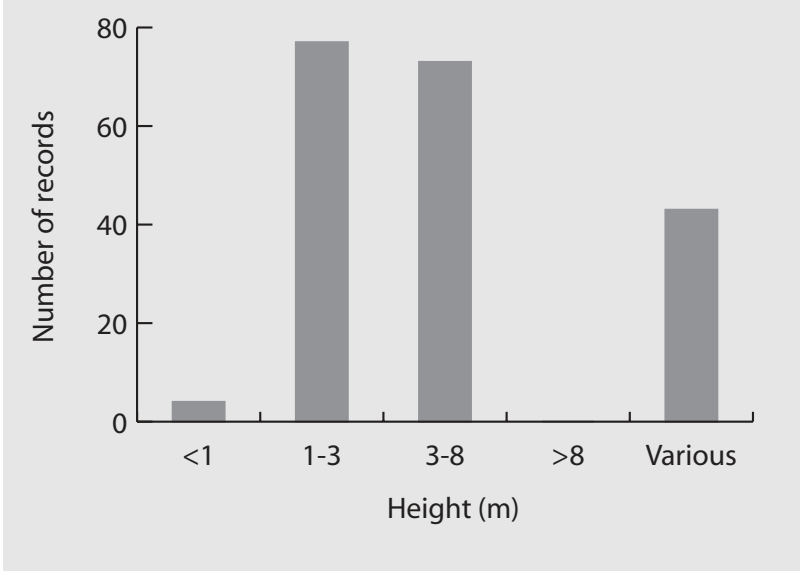
HABITAT

Mainly found on steep, rocky hill slopes, kloofs and rocky outcrops; occasionally on sandy plains. Grows on dolomite, granite, basalt, mica schist and sandstone.



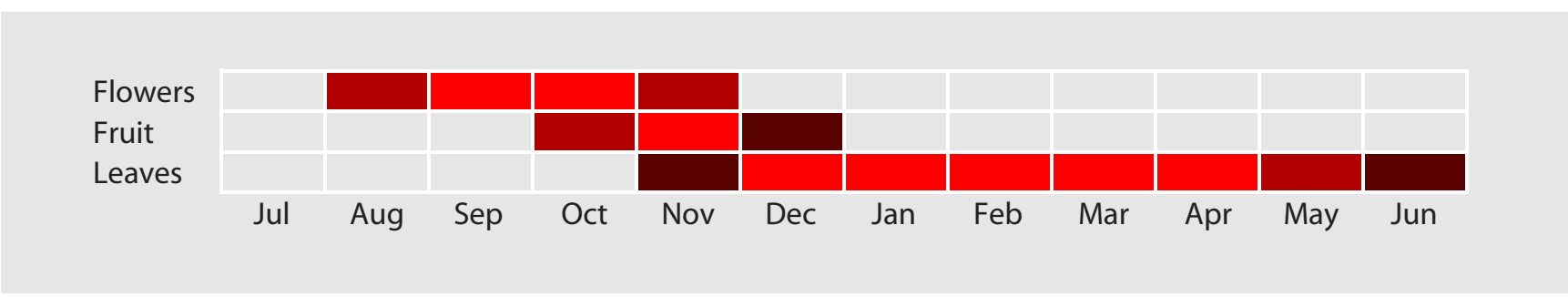
GROWTH FORM

Mainly recorded as trees (65% of records) in the 3–8-m height class (46% of records). Shrubs generally in the 1–3-m height class (24%). There were also a number of observations (25%) of stands with plants of various heights.



ANNUAL CYCLE

FLOWERS August to November. FRUIT October to December. LEAVES totally absent in winter, with young leaves November to March.



GENERAL

'Omutiwonyoka', the Otjiherero common name, is a name given to several species of dense trees which might harbour snakes in their lush foliage. The leaves are eaten by kudu, rock dassies and insects; the trunks are also gnawed by animals. The roots and bark are used medicinally; also of cultural significance in Kaokoveld. This species is of horticultural potential as it is attractive, grows easily from seed and is fairly drought- and cold-tolerant. It is sensitive to frost, however.

CONSERVATION CONCERNS

None recorded.



Steganotaenia araliacea, W. Friederich

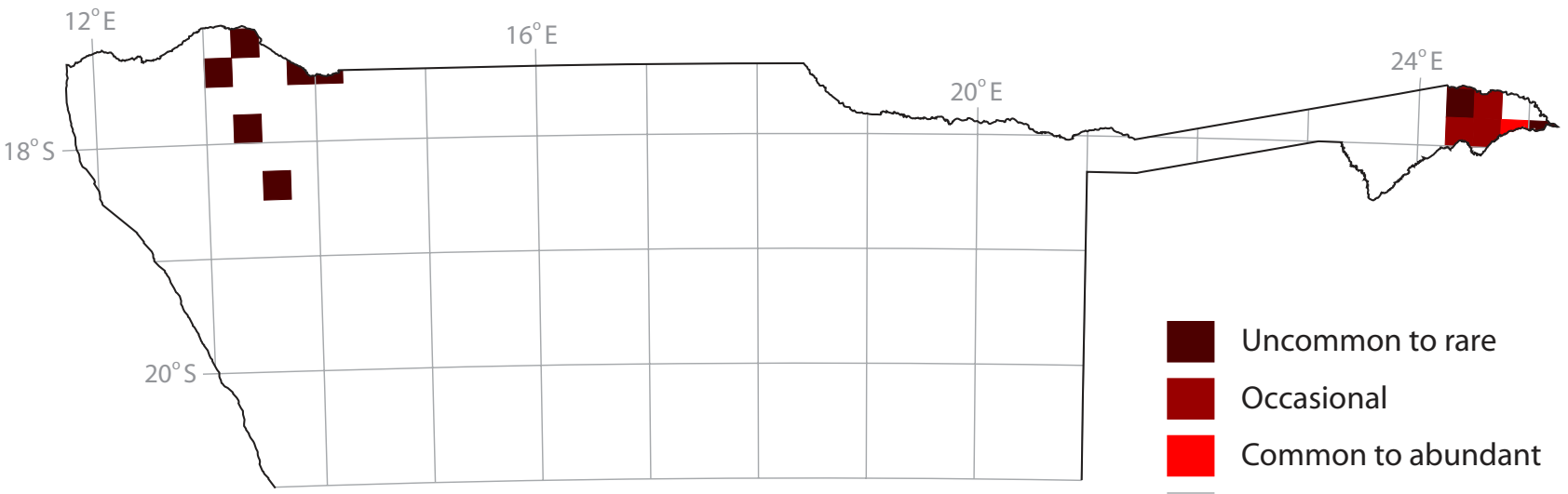
Manilkara mochisia

Lowveld Milkberry

Laeveld melkbessie (A); muchisa, muhumu (L)

[25 records from 13 (1%) squares]

Deciduous or evergreen tree, branching low down, with somewhat drooping branches. BARK rough, greyish, **peeling off in flat scales to expose yellow underbark**. LEAVES **densely clustered** on branch tips and short, lateral shoots; dark green and hairless above with protruding midrib. FLOWERS small, yellow-green, **drooping in dense clusters below the leaves**. FRUIT **orange when ripe, with red pulp**.



DISTRIBUTION & ABUNDANCE

Occurs in two small, disjunct populations. Uncommon to rare in the north-west; occasional in eastern Caprivi.

HABITAT

Generally found on river banks and floodplains, also along dry river courses in the north-west. Grows on rocky or sandy substrates.

GROWTH FORM

A tree, generally up to 8 m high, but sometimes taller (33% of records). Specimens over 12 m were reported from the floodplains east of Katima Mulilo (1724DA).

ANNUAL CYCLE

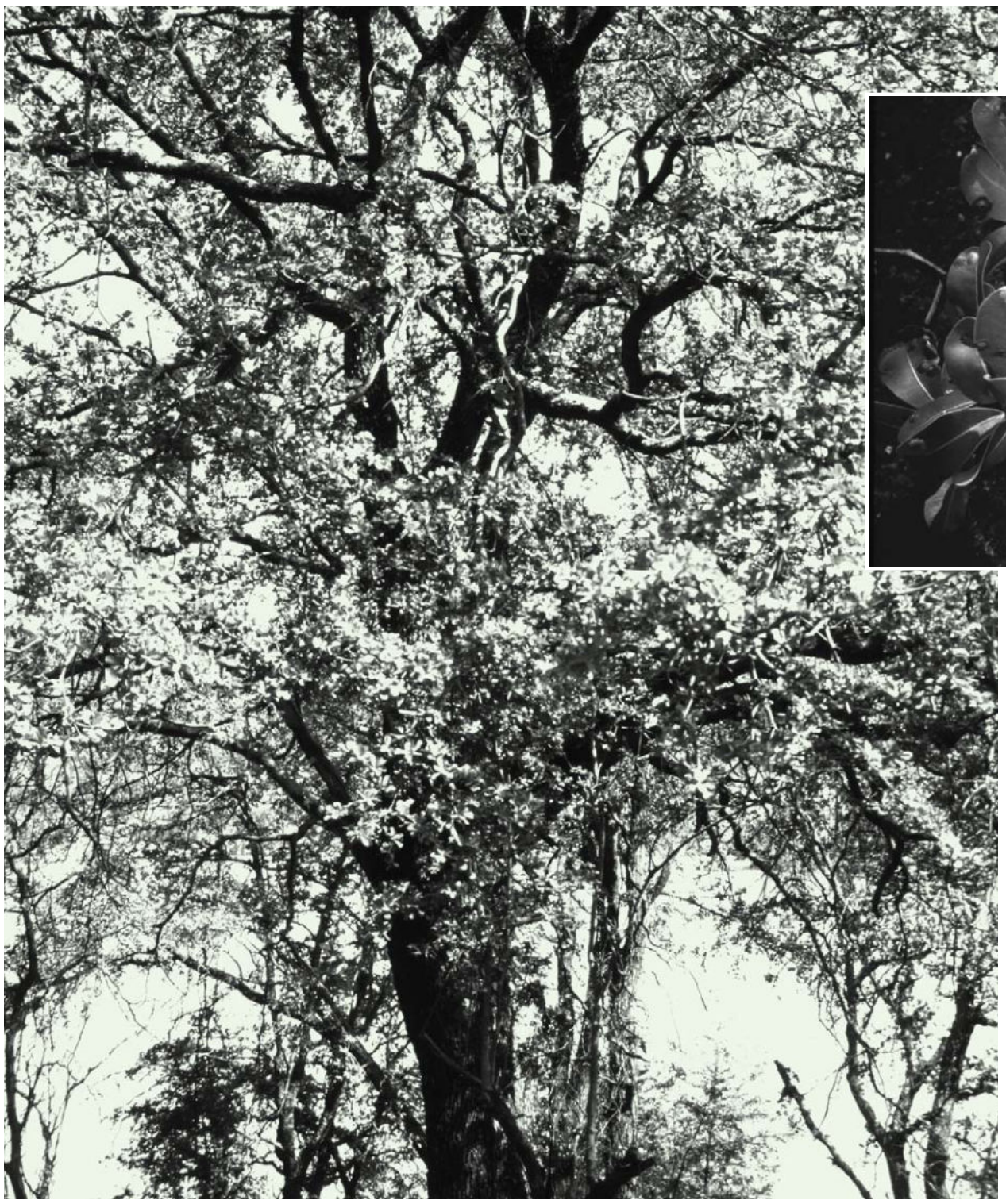
Observed from October to January, and in April and May. FLOWERS recorded in November. FRUIT August (herbarium record) and December. LEAVES present in every month that observations were made.

GENERAL

The strongly scented flowers attract insects; the wood is termite-resistant, but probably not used extensively in Namibia.

CONSERVATION CONCERNS

None recorded.





Manilkara mochisia,
Kunene River, B. Curtis

Mimusops zeyheri

Red Milkwood

Moepel (A); mucenenge (L)

[1 record]

A tree with a large, **spreading and drooping crown**. BARK dark, deeply fissured. LEAVES oblong, elliptic to lanceolate; leathery, **shiny green above**. FLOWERS **creamy white**, about 10 mm in diameter, in clusters. FRUIT **ovoid, fleshy, yellow, cupped by a persistent calyx**.

This species, known from Zambia and Zimbabwe, only occurs on Impalila Island in Namibia and was added to the Namibian species list for the first time during the TAP. It is a locally common tree of 8–12 m in the riverine woodlands on the island; with a low, spreading crown. In November, when the observation was made, it had leaves and fruit.

Euclea divinorum

Magic Guarri

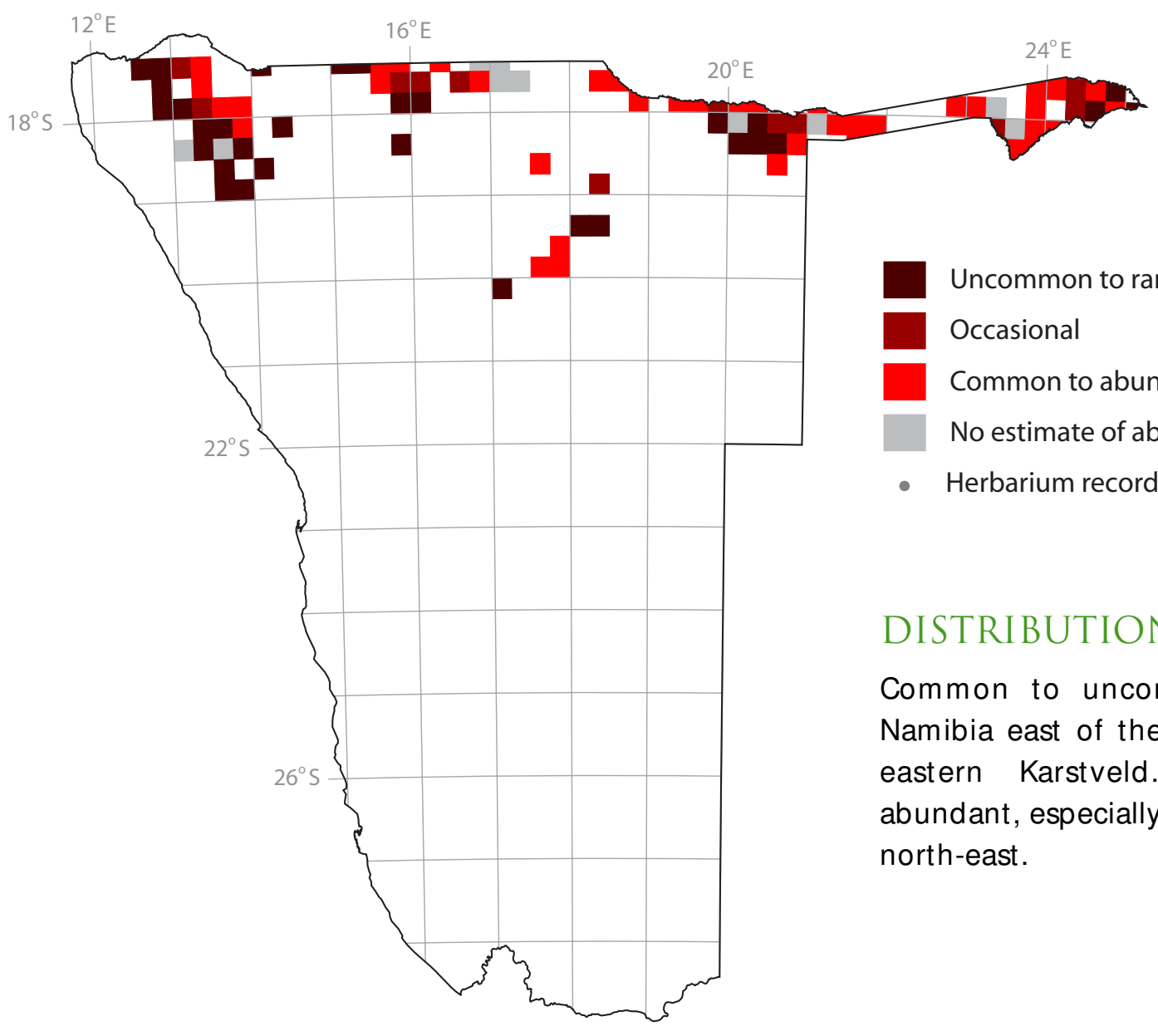
Towerghwarrie (A); mutakula (L); mpumutwi (Rk, Rum)

[172 records from 99 (9%) squares]



Evergreen shrub. LEAVES narrowly **elliptic to lanceolate, up to 80 mm long; dark green** above, shiny, leathery; paler below; margin **conspicuously undulate**. FLOWERS cream-coloured to white **in clusters**. FRUIT **5–6 mm in diameter; olive-green with fine down**.

The flowers and fruit may be easily overlooked. Can be confused with *E. undulata*, which generally has a more southerly distribution and shorter, narrower leaves with a red-brown appearance.

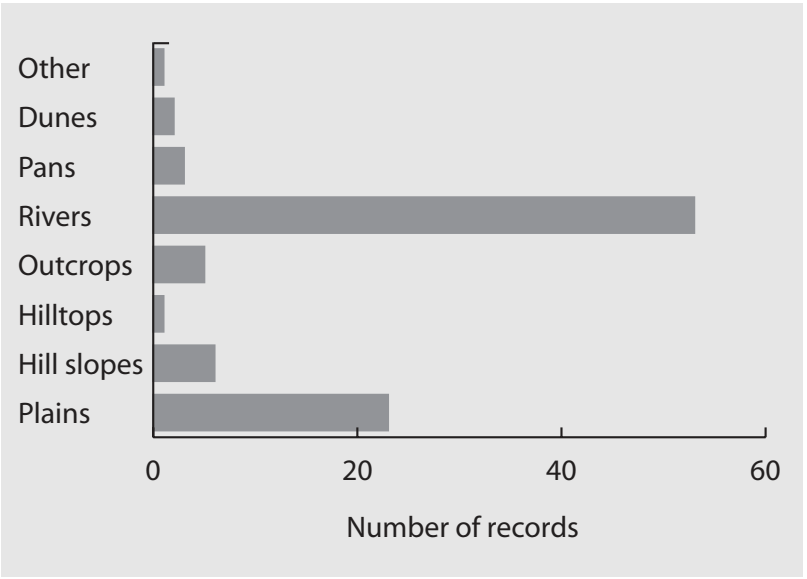


DISTRIBUTION & ABUNDANCE

Common to uncommon across northern Namibia east of the escarpment and in the eastern Karstveld. Occasionally, locally abundant, especially along river banks in the north-east.

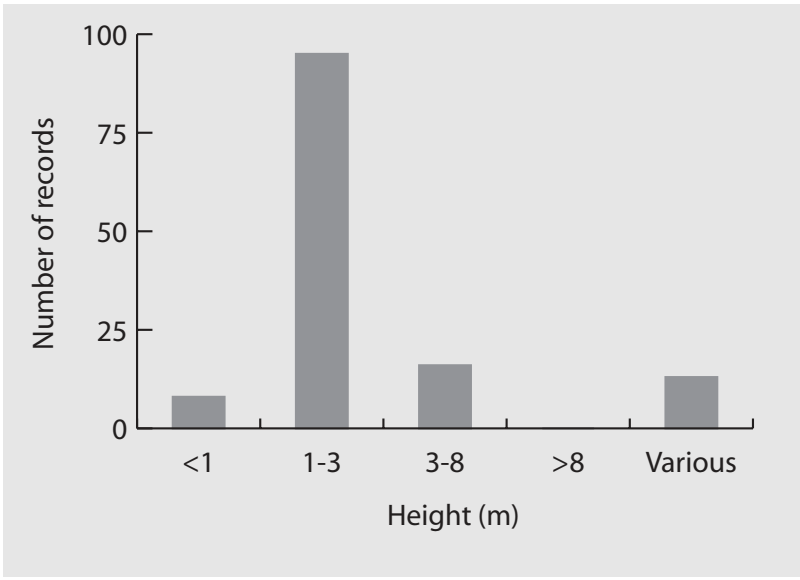
HABITAT

Found in various habitats, but mainly along rivers in the north-west and north-east, and on plains and in oshanas in the Cuvelai. Grows within riverine forest, woodland and shrubland; always on sand or sandy loam.



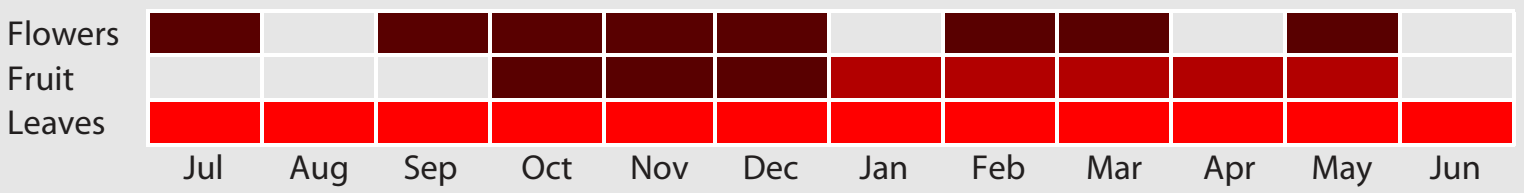
GROWTH FORM

Generally a shrub up to 3 m high, but sometimes over 3 m; seldom a tree.



ANNUAL CYCLE

FLOWERS a few recorded most months of the year, or on individual shrubs. FRUIT October to May, but never prolific. LEAVES evergreen.



GENERAL

The fruit and bark are used to produce dyes and inks, notably by the Kxoe. The bark also has a high potential for tanning. The fruit is edible, but not palatable and slightly purgative; it is used to make an alcoholic beverage. The wood is used for construction and making knobkerries. The roots are used medicinally. The twigs and root bark are chewed as a tooth and mouth cleanser.

This shrub is regarded as a holy tree in the north-west; and it is taboo to use the wood for fire in kraals.

CONSERVATION CONCERNS

None recorded.

Euclea pseudebenus

Wild Ebony

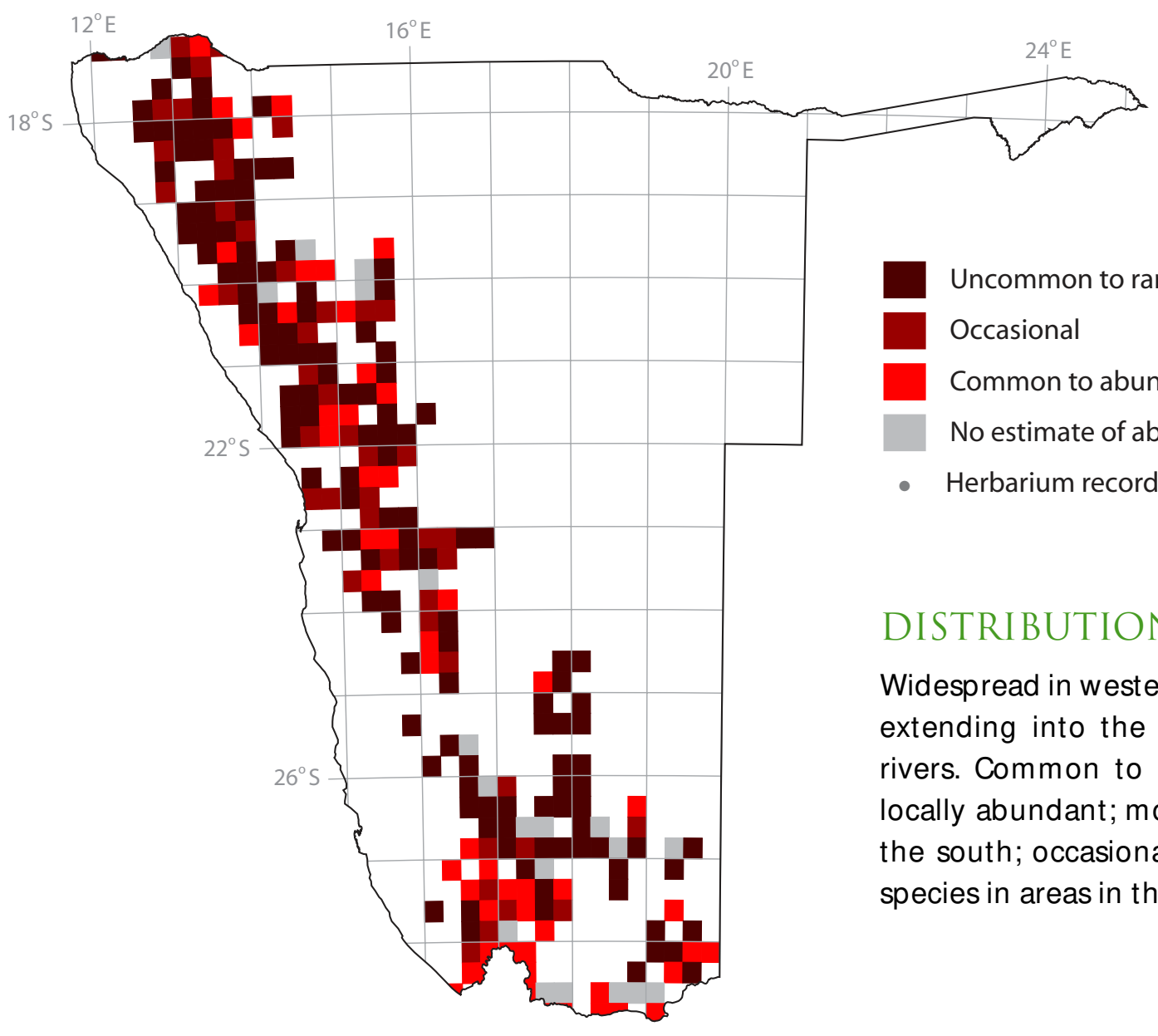
Abikwa, swartebbe (A); Ebenholzbaum (G); omuzema (H); tsabi (K)

[606 records from 256 (24%) squares]



Evergreen tree or shrub with **characteristically thin, drooping branches**. BARK grey to black-grey, very rough, deeply fis-sured with oblong fragments. LEAVES **linear**, leathery; blue-green above, pale olive-green below; petiole very short. FLOWERS small, yellow-green. FRUIT **6–7 mm in diameter; red to dark brown to black when ripe**.

Flowers and young fruit may be easily overlooked. Superficially, this plant can be confused with the alien pepper tree, *Schinus molle*.

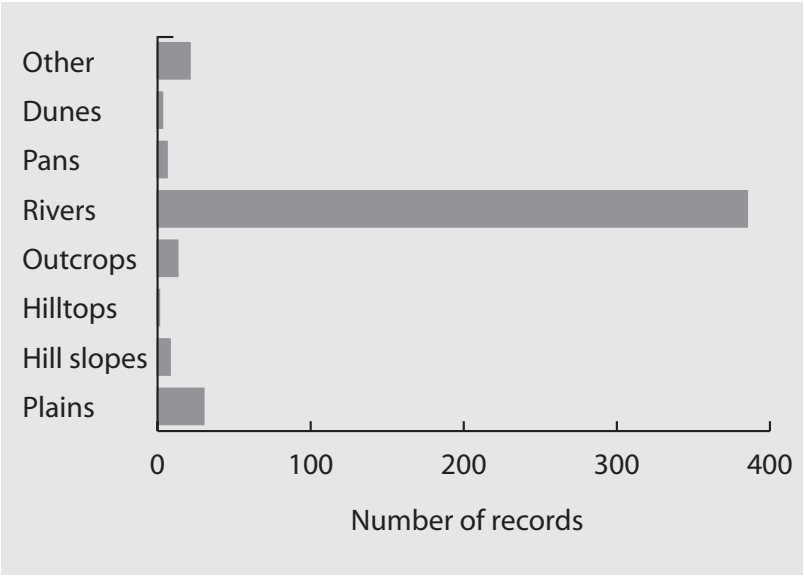


DISTRIBUTION & ABUNDANCE

Widespread in western and southern Namibia, extending into the Namib along ephemeral rivers. Common to uncommon, occasionally locally abundant; most abundant in places in the south; occasionally one of the dominant species in areas in the south-west.

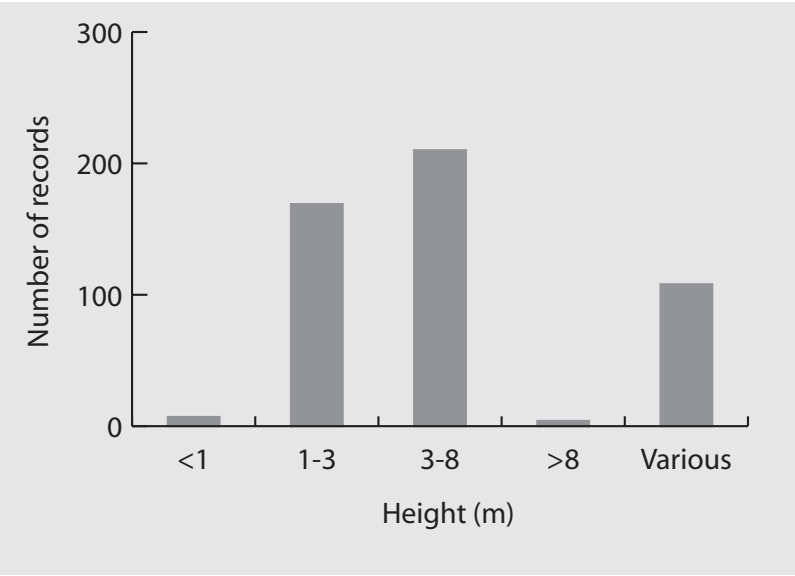
HABITAT

Generally found along dry rivers; sometimes on plains and floodplains or around pans.



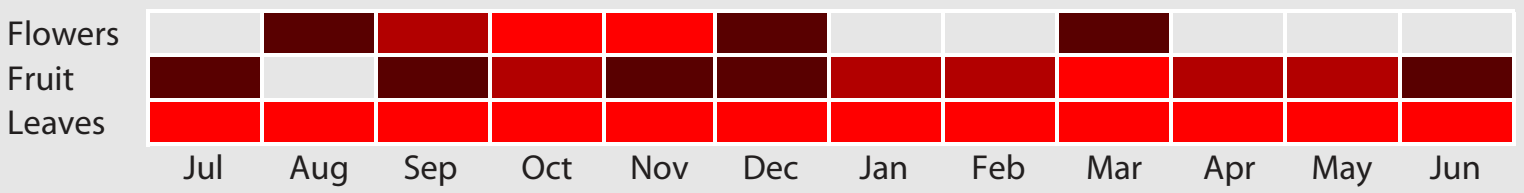
GROWTH FORM

Generally a tree up to 8 m high, seldom higher; very often shrubby. Plants with a mix of heights are found in most areas.



ANNUAL CYCLE

FLOWERS August to December, but mostly October, with some flowers produced in March in some years. FRUIT old fruit may be found almost all year, but most are produced in October and from January to May. LEAVES evergreen, with young leaves produced in October.

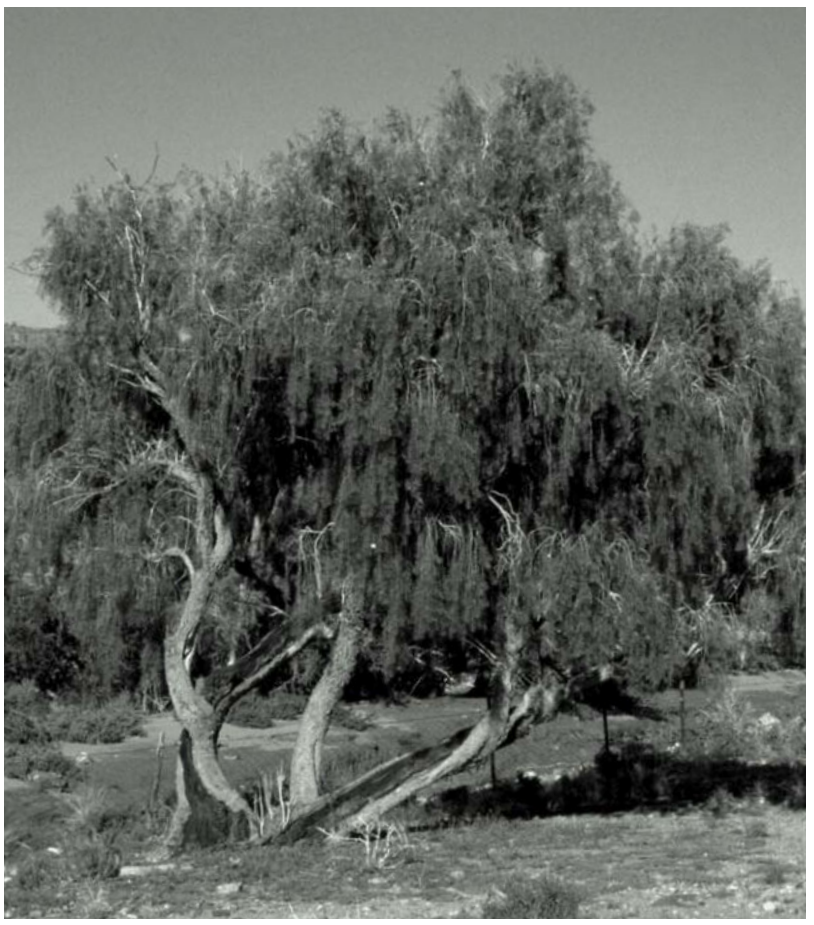


GENERAL

The wood is hard, with black heartwood, and is used for construction and carving. The fruit is edible; the twigs are used as toothbrushes. This is a good garden plant as it grows quickly, is frost-resistant, evergreen and attractive.

CONSERVATION CONCERNS

None recorded. Protected by forestry legislation.



Euclea pseudebenus, Karas Region, C. Mannheimer

Euclea undulata

Common Guarri

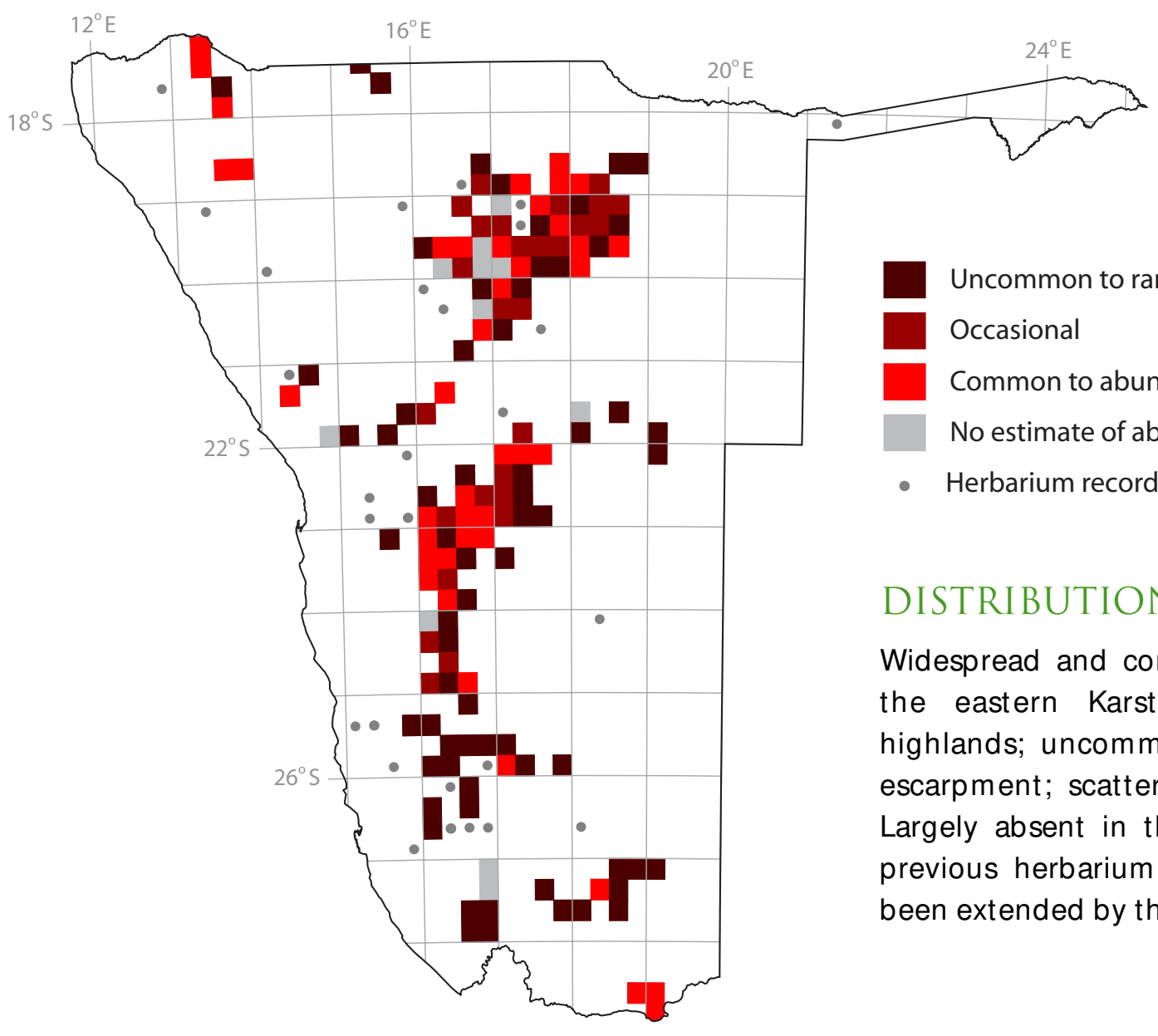
Mountain ebony (E); besembos (A); Feuerlöschbusch, Bergebenholzstrauch (G); omukarambandje (H); #haub (K)

[466 records from 149 (14%) squares]



Erect shrub or tree. BRANCHLETS with rust-red scale-like hairs when young. LEAVES linear-lanceolate to oblong-elliptic, **up to 50 mm long**, leathery; yellow-green to dark green, with a **characteristic red-brown appearance due to many scale-like hairs**; margin usually undulate. FLOWERS cream-coloured to white, **single**. FRUIT **spherical, 5–8 mm in diameter; shiny, green-brown to black when ripe**.

Flowers are inconspicuous and fruit may be overlooked when green. Species can be confused with *E. divinorum*, which has longer leaves that lack a red-brown appearance.

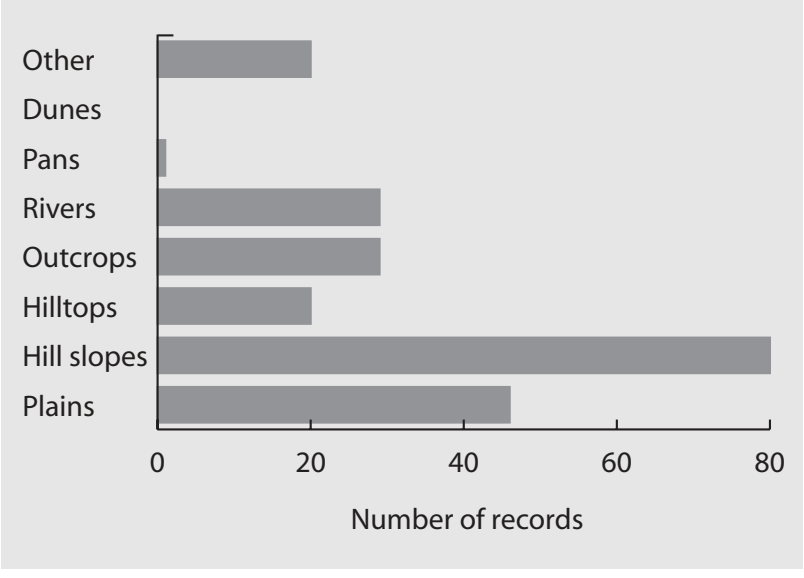


DISTRIBUTION & ABUNDANCE

Widespread and common to uncommon in the eastern Karstveld and the central highlands; uncommon along the southern escarpment; scattered localities elsewhere. Largely absent in the east. Compared with previous herbarium records, the range has been extended by the TAP in all directions.

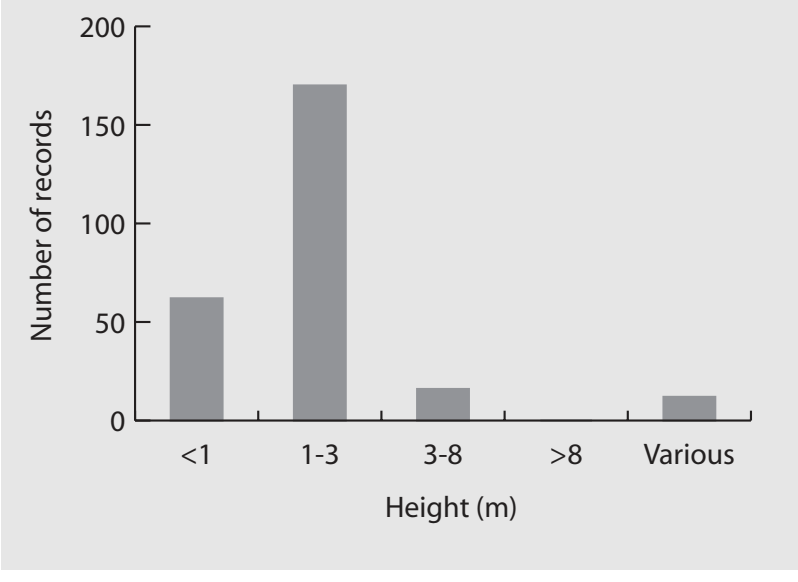
HABITAT

Found in various habitats, but mainly on hill slopes and plains; also on rocky outcrops in the central highlands and south and along dry watercourses in the south. Always on stony or rocky substrates such as dolomite, mica schist, granite and other rock types.



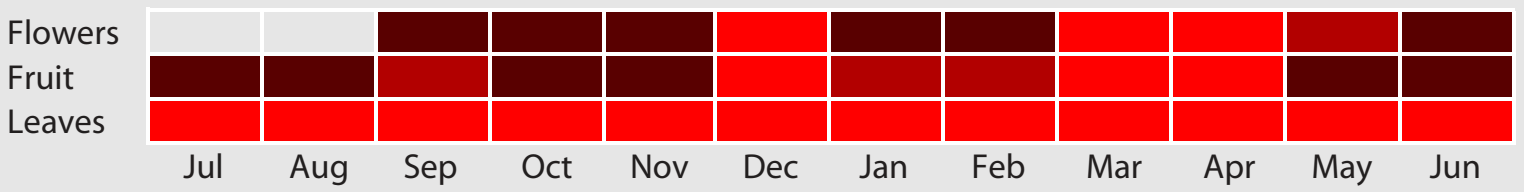
GROWTH FORM

Generally a shrub up to 3 m high, occasionally over 3 m; sometimes tree-like. Thicket-forming in places.



ANNUAL CYCLE

FLOWERS from September to June with two peaks, one in December and the other in March/April. FRUIT found all year, with peaks in the same months as the flowers. LEAVES evergreen, with young leaves in January and February.



GENERAL

Used for fighting bush fires. The leaves are browsed by game and livestock. The fruit is edible; the root is used as a toothbrush in some areas. Could be useful horticulturally as a hedge plant.

CONSERVATION CONCERNS

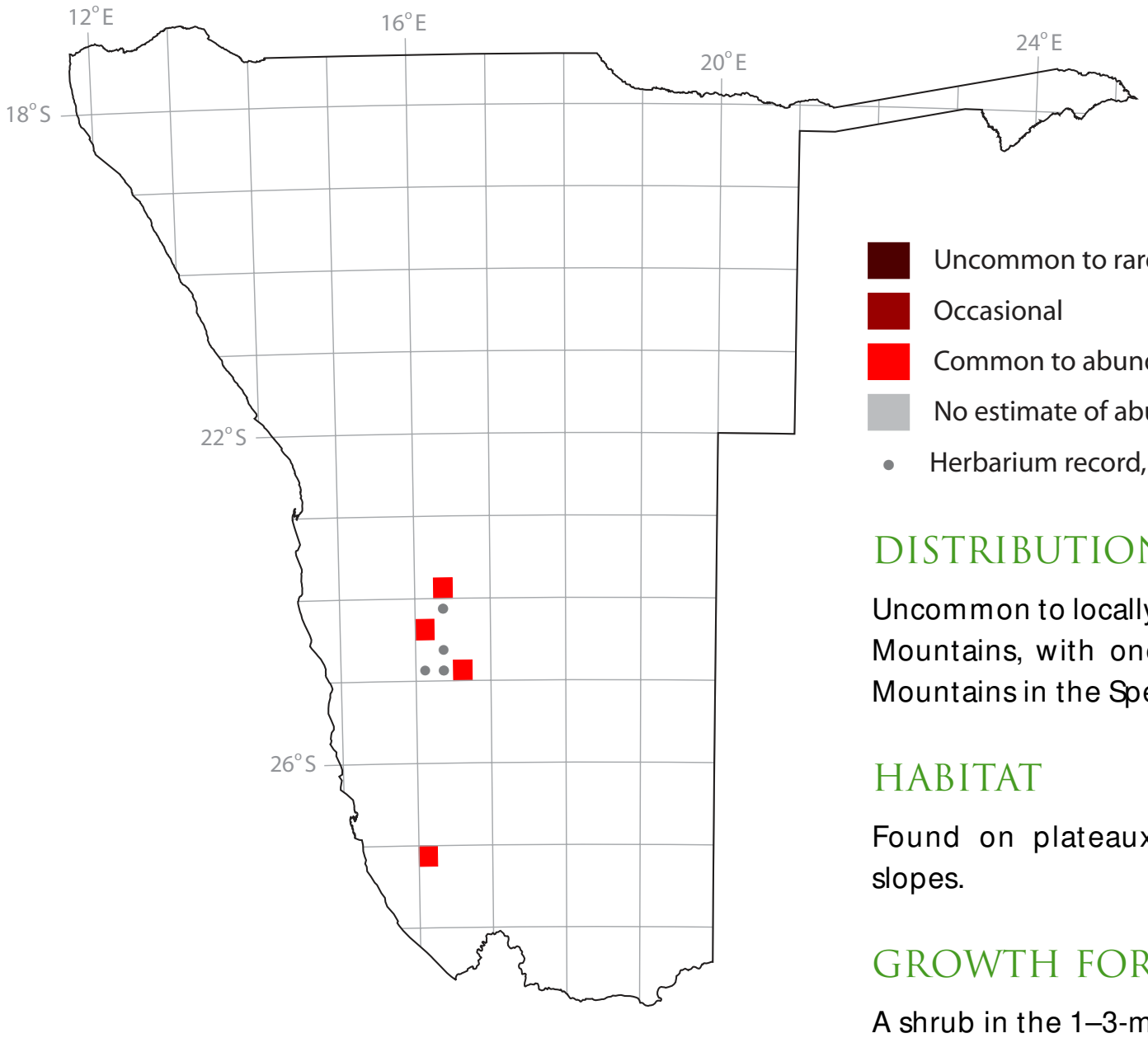
None recorded.

Euclea asperrima

Mountain Guarri

[6 records from 4 (<0.5%) squares]

Semi-deciduous shrub. BRANCHLETS sturdy; red-brown when young. LEAVES simple, **spirally arranged; elliptic to obovate**, 20–40 mm long; leathery, pale green **with red glandular hairs below**. FLOWERS small, yellow-white. FRUIT a downy berry.



DISTRIBUTION & ABUNDANCE

Uncommon to locally common in the Naukluft Mountains, with one record from the Tsaus Mountains in the Sperrgebiet (2716AA).

HABITAT

Found on plateaux, hill slopes and scree slopes.

GROWTH FORM

A shrub in the 1–3-m height class.

ANNUAL CYCLE

FLOWERS herbarium records in March and June. FRUIT herbarium records in June and October. No flowers or fruit recorded by the TAP. LEAVES present when observations were made (March, May, June, October).

CONSERVATION CONCERNS

Endemic and very restricted; worthy of conservation.

Diospyros acocksii

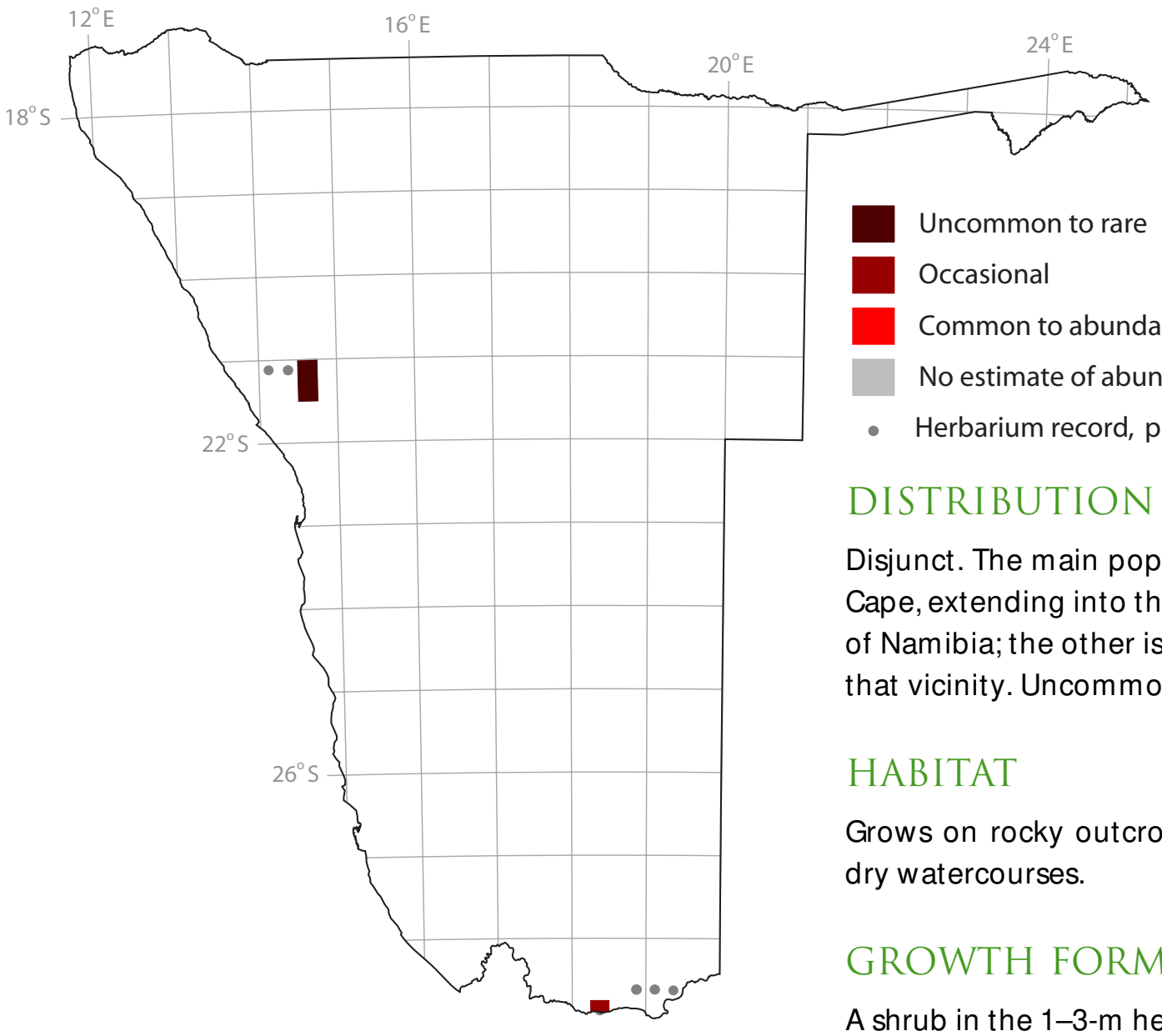
Namaqua Jackal-berry

Namakwa-jakkalsbessie (A)

[4 records from 3 (<0.5%) squares]



Rigidly branched shrub with a reddish appearance. BARK pale grey with blackish markings and **a red-brown tint; branchlets wine-red**. LEAVES elliptic, small, leathery; shiny green above, **sparsely downy with red glands below**. FLOWERS solitary, axillary, up to 10 mm long; cream-coloured to white. FRUIT ovoid to almost round, small; red when ripe.



DISTRIBUTION & ABUNDANCE

Disjunct. The main population is in the northern Cape, extending into the extreme southern areas of Namibia; the other is on the Brandberg and in that vicinity. Uncommon.

HABITAT

Grows on rocky outcrops, hill slopes and along dry watercourses.

GROWTH FORM

A shrub in the 1–3-m height class, seldom taller.

ANNUAL CYCLE

FLOWERS no records. FRUIT from August to October and January to May. LEAVES semi-deciduous.

GENERAL

This shrub provides browse for small stock and game during periods of drought.

CONSERVATION CONCERNS

None recorded.

Diospyros chamaethamnus

Dwarf Jackal-berry

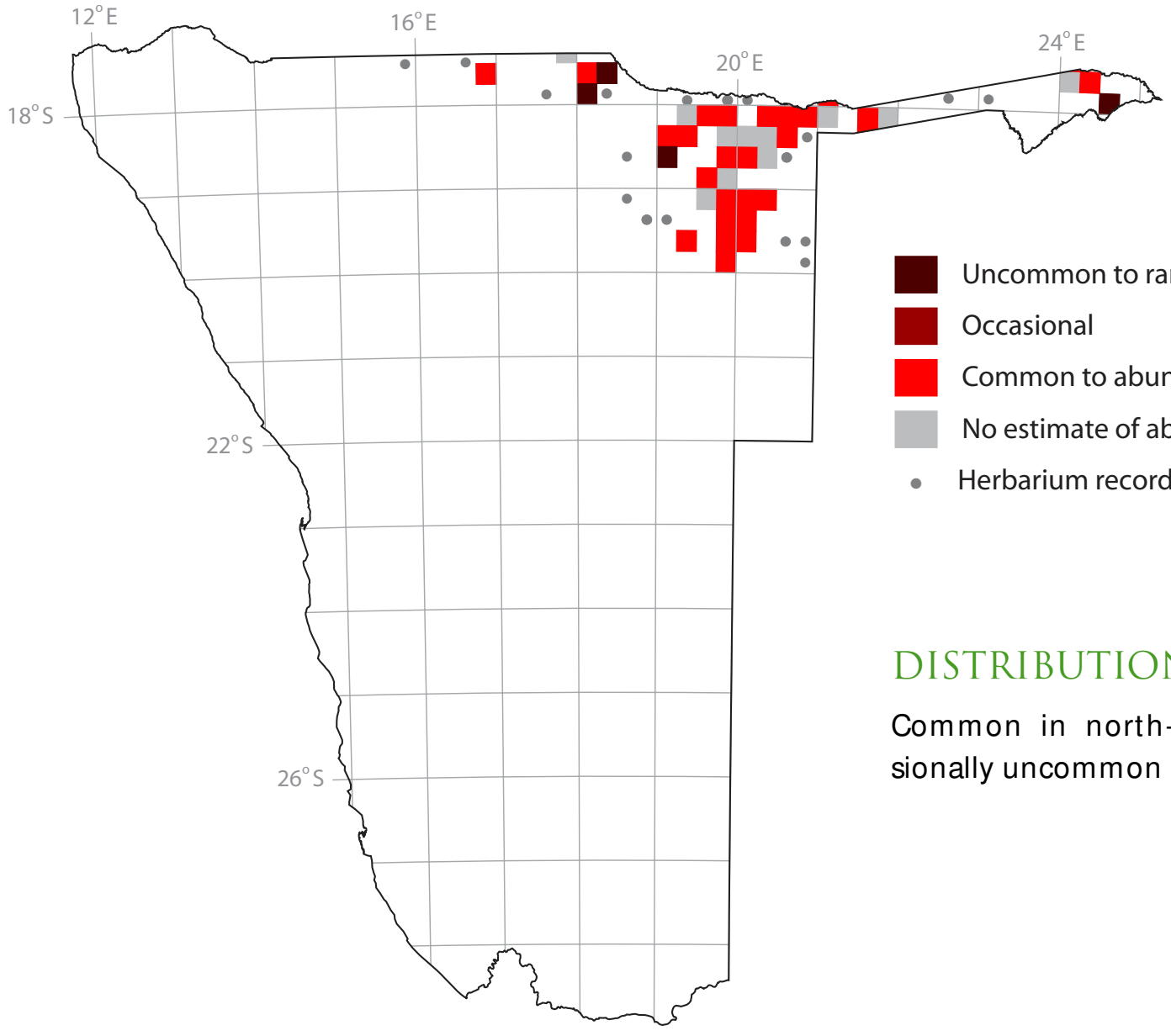
Mukushuwa (L); shikwewo (Rk, Rum)

[47 records from 42 (4%) squares]



Low, evergreen **suffrutex, which forms dense thickets**. BRANCHES **flexible, yellow** with pale brown tint when older. LEAVES simple, spirally arranged; oblong to oblong-elliptic, **much longer than broad, leathery; glossy, dark olive-green above**. FLOWERS small, cream-coloured; in dense, axillary clusters. FRUIT a round berry, covered in red-brown hairs.

Flowers may be overlooked, but the fruit is conspicuous. This plant might have been disregarded by some atlassers, as being too low for inclusion in the project.

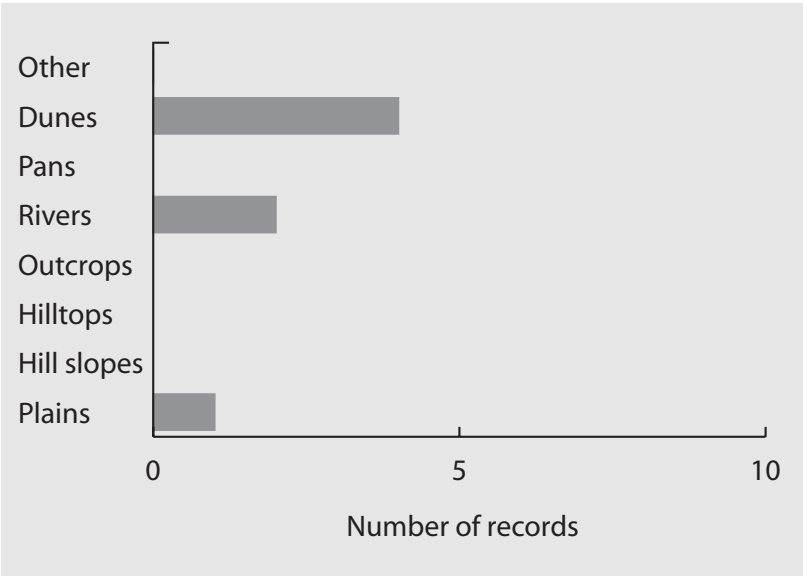


DISTRIBUTION & ABUNDANCE

Common in north-eastern Namibia; occasionally uncommon or locally abundant.

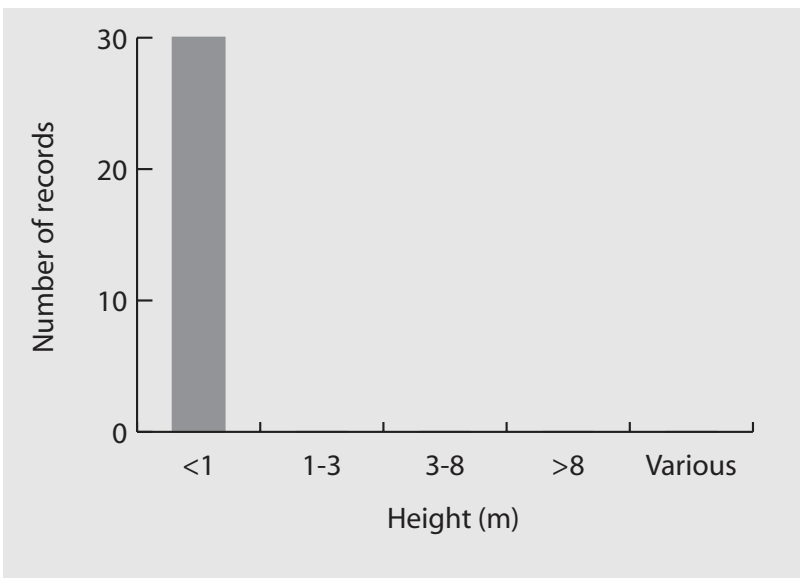
HABITAT

Found on sandy plains, dunes and along dry river beds.



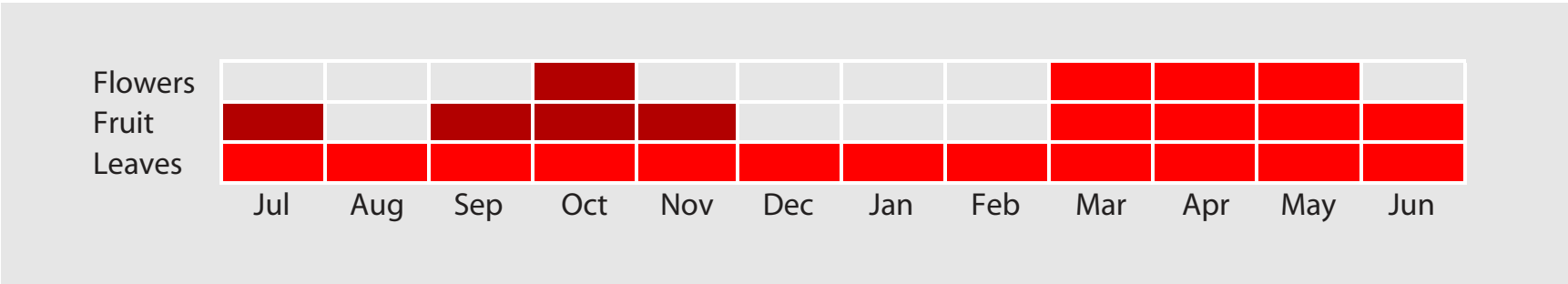
GROWTH FORM

Always a suffrutex, less than 1 m high.



ANNUAL CYCLE

FLOWERS usually from March to May, but sometimes in October. FRUIT March to June, occasionally July to November. LEAVES evergreen.



GENERAL

The fruit is edible.

CONSERVATION CONCERNS

None recorded.



Diospyros chamaethamnus, leaves and flowers, C. Hines

Diospyros lycioides

Bluebush / Omuzeme

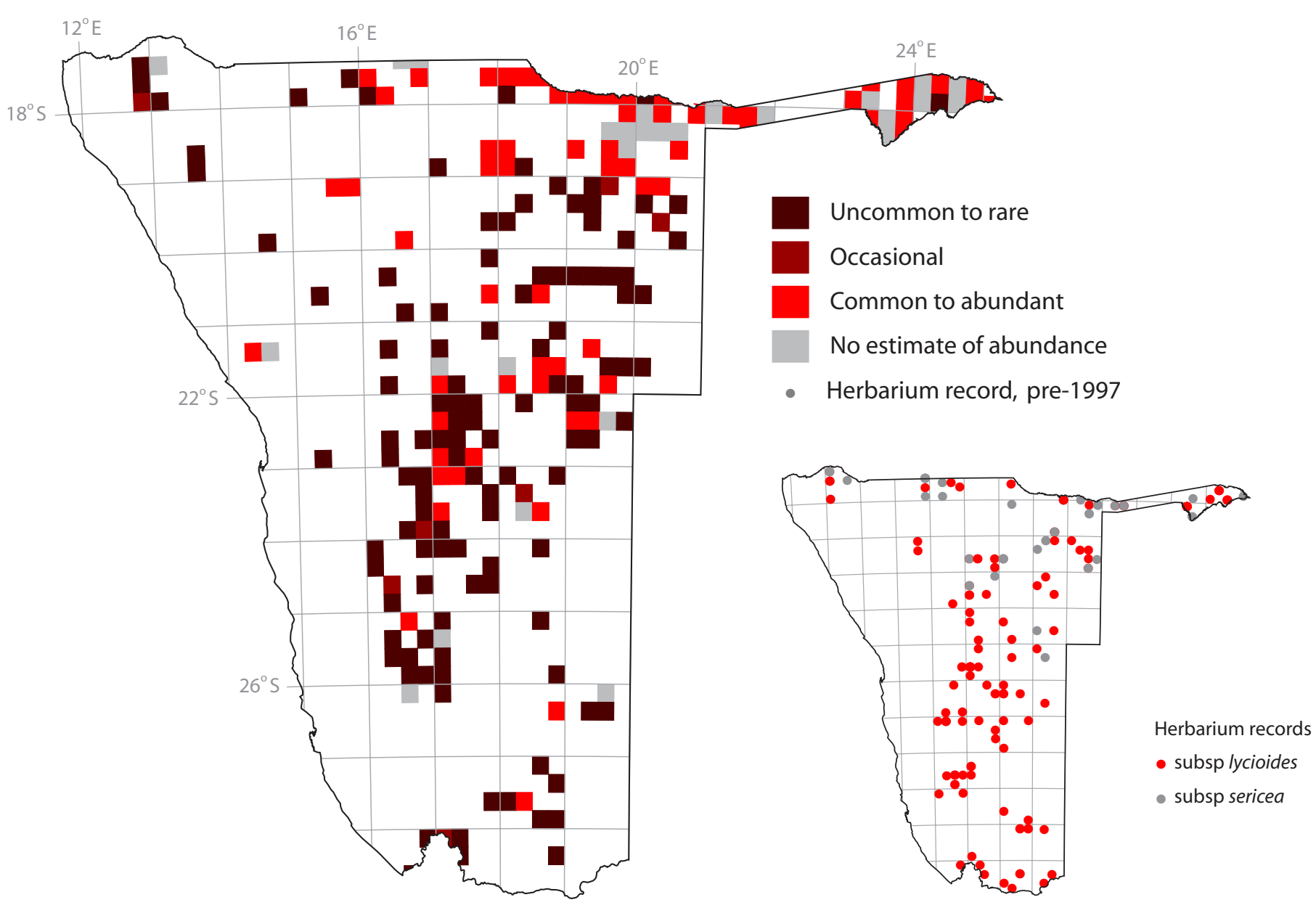
Bloubos (A); Zahnbürstenstrauch (G); sihorowa (Rk, Rum)

[434 records from 222 (21%) squares]



Semi-deciduous shrub, occasionally a small tree. LEAVES simple, small, elliptic to oblanceolate; both surfaces olive-green, covered with **silvery** hairs. FLOWERS small, solitary, **cream-coloured to pale yellow**. FRUIT an ovoid berry; orange to red or red-brown, with **conspicuous calyx remains**.

Flowers may be overlooked, but the ripe fruit are conspicuous. There are two subspecies in Namibia, which can be separated by the visibly densely hairy leaves of subsp. *sericea* that are lacking in subsp. *lycioides*. Few atlassers were aware of this difference, hence most records were not differentiated to subspecies and the analysis has been done on the species as a whole.

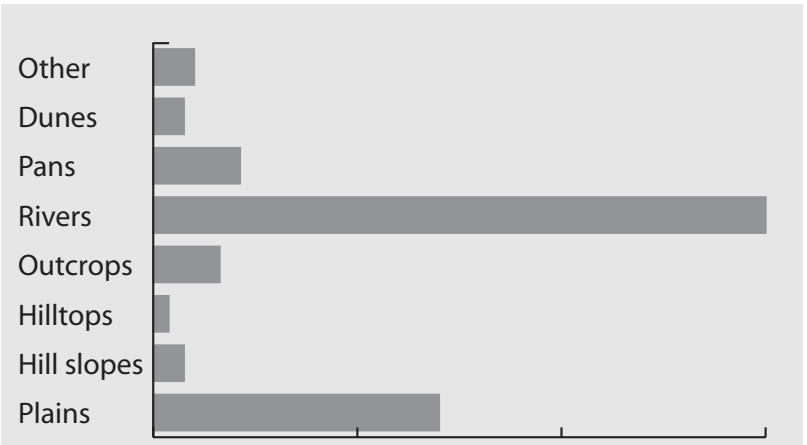


DISTRIBUTION & ABUNDANCE

Scattered throughout the whole of Namibia, except in the Namib Desert. Most abundant along rivers and on floodplains in the north-east; locally common in places in the Karstveld; generally uncommon in the rest of the country. Subspecies *lycioides* is the most common and widespread of the two subspecies, occuring over the whole range. Subspecies *sericea* occurs mostly in eastern Caprivi, but also in other very scattered localities in the north-east, extending north-westwards to the northernmost parts of the north-west.

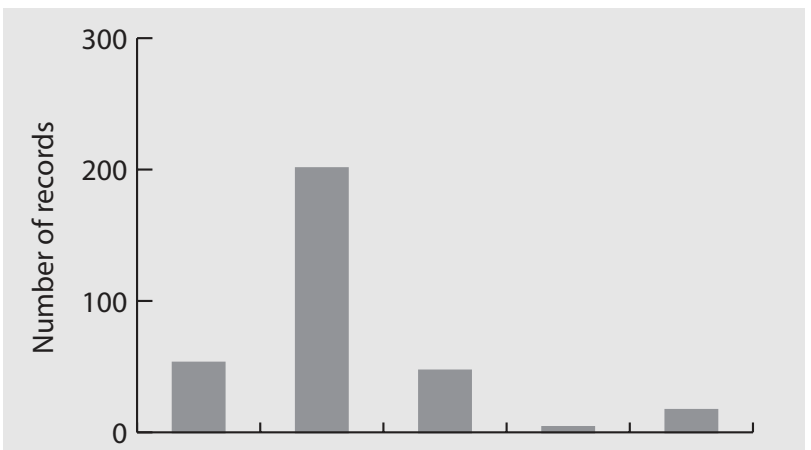
HABITAT

Found in various habitats, but mostly associated with watercourses and plains. Also found on pans in the central-east, on dunes in the south-east and rocky outcrops in the central highlands. Subspecies *sericea* was more often found on floodplains than subsp. *lycioides*. Grows on stony or rocky ground, as well as on sand.



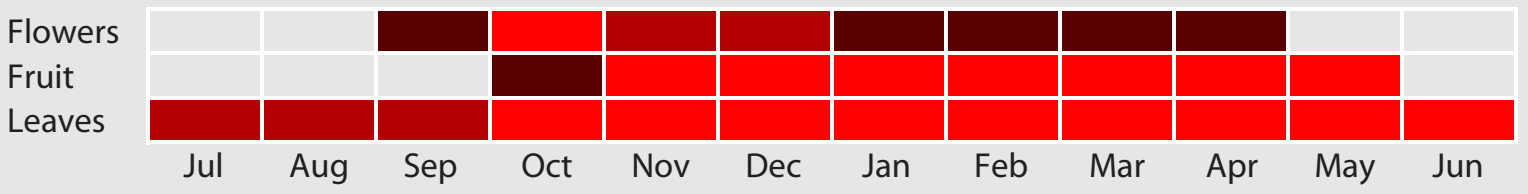
GROWTH FORM

Generally a shrub, but occasionally a tree (11% of records); up to 3 m high, usually, but sometimes taller than 3 m. Most of the stands less than 1 m high were recorded from the plains; those over 1 m were along rivers. Individual shrubs can have a diameter as wide as, or wider than, their height. They often tend to grow in clumps. Many small ones were noted growing in a depression in 2018DA (CUR1).



ANNUAL CYCLE

FLOWERS mainly October, but extending to April. FRUIT mostly from November to May, but a few recorded in October. LEAVES may be found all year, with some bare individuals in winter and with new leaves from September to November.



GENERAL

This plant is heavily browsed by game and livestock. The fruit is eaten by animals, as well as people, but has a laxative effect if consumed in large quantities (CUR1); also sometimes used to distill alcohol. The wood is used for kraal and hut construction, especially where smaller branches are needed. The roots of young shrubs are used as toothbrushes, and used medicinally.

CONSERVATION CONCERNS

None recorded.

Diospyros mespiliformis

Jackal-berry / Omwandi

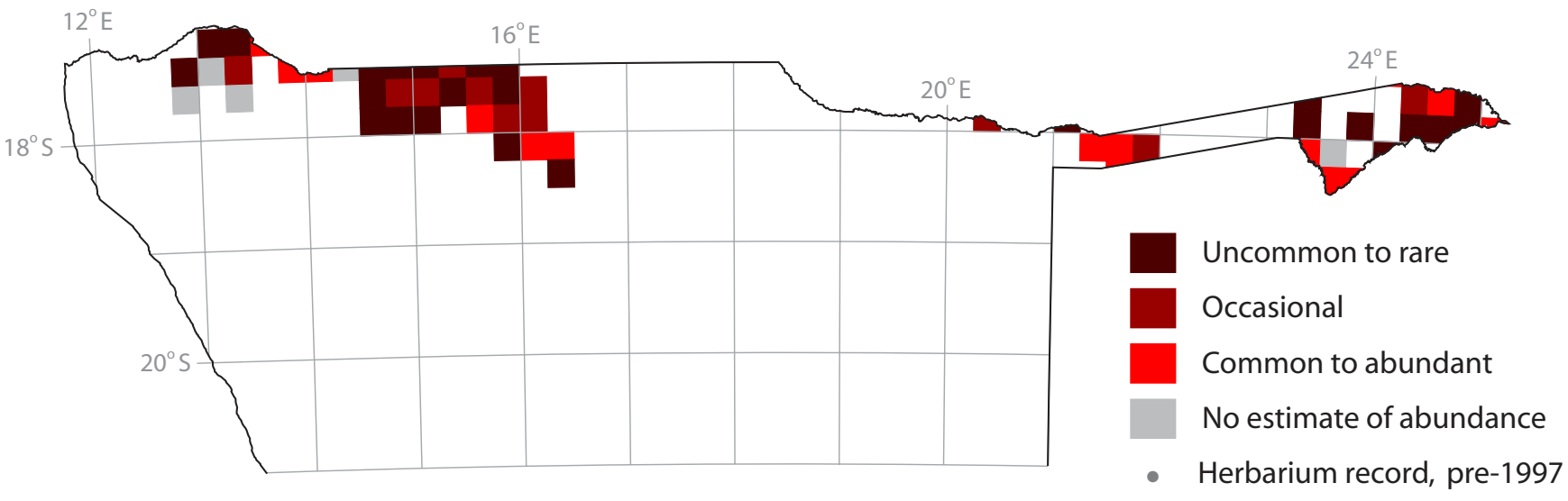
African ebony (E); jakkalsbessie (A); omunjande (H); muchenje (L); ohutunda (T)

[176 records from 59 (6%) squares]



A tall, erect tree, up to 16 m high, **with dark foliage**. BARK grey to **black-grey, rough; transversely fissured**, crumbly. LEAVES **simple, elliptic, leathery, 40–140 mm long; shiny, dark green above**; pale green below. FLOWERS cream-coloured to pale yellow. FRUIT almost spherical, up to 25 mm in diameter, with a fine, hair-like tip; fleshy, yellow to purple when ripe; calyx persistent, encircling one-third of the fruit.

Flowers and fruit can easily be overlooked unless one goes close up to the tree.

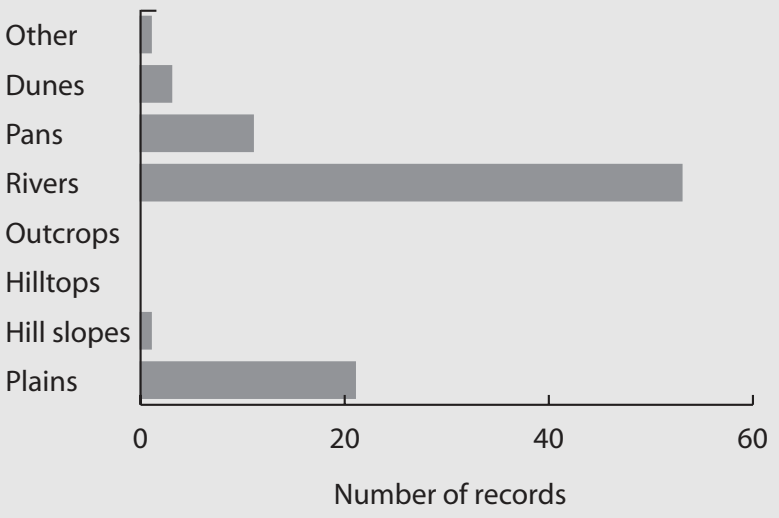


DISTRIBUTION & ABUNDANCE

Common to locally abundant in the Cuvelai, along the eastern Okavango River and the eastern Caprivi rivers; occasional to uncommon west of the Cuvelai, and in the central areas of eastern Caprivi.

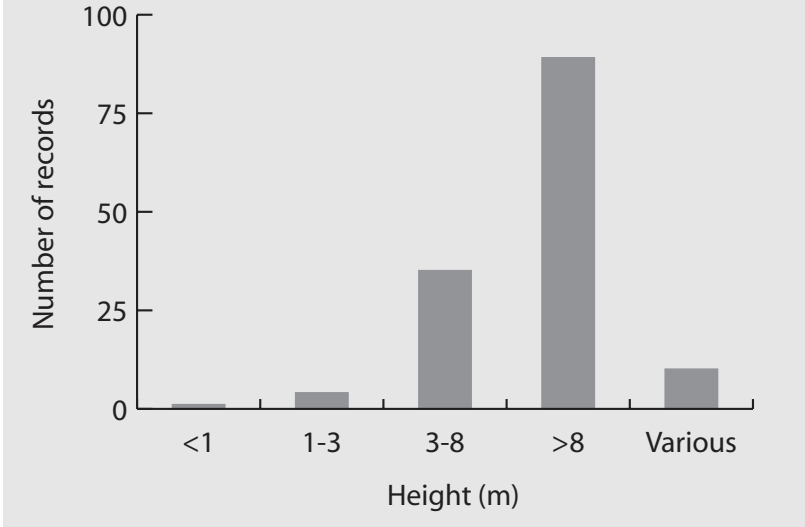
HABITAT

Most often found on river banks and floodplains, generally on sandy substrates. Never far from water. Abundant only on river banks and around deeper pools in the Cuvelai.



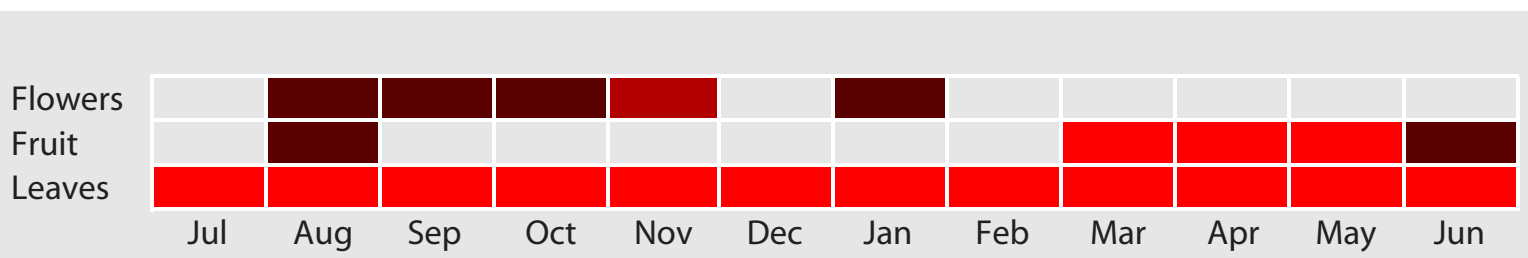
GROWTH FORM

A tree, sometimes up to 8 m tall, but generally taller. There were a few records of shrubby forms less than 3 m high.



ANNUAL CYCLE

FLOWERS August to January with a slight peak in November, but few records per month. FRUIT a few were recorded in almost all months, but mostly March to May. LEAVES evergreen, with young leaves in October.



GENERAL

An important constituent of riverine and oshana vegetation, and a good shade tree. The fruit flesh and kernels are edible; they are dried and stored for later use or sold in markets and used to produce wine, beer and brandy. Animals, including jackals, also eat the fruit; the leaves are used for fodder. The wood is used for firewood, charcoal production and as timber; watos (dugout canoes), household utensils, as well as traditional assegais are carved from the wood. The leaves and bark are used medicinally; the twigs and roots used as tooth brushes.

CONSERVATION CONCERNS

Because this is such a valuable species, the older trees are protected locally. The distribution range has not decreased in comparison to earlier herbarium records, but it is a serious concern that so few young trees were recorded.

Diospyros ramulosa

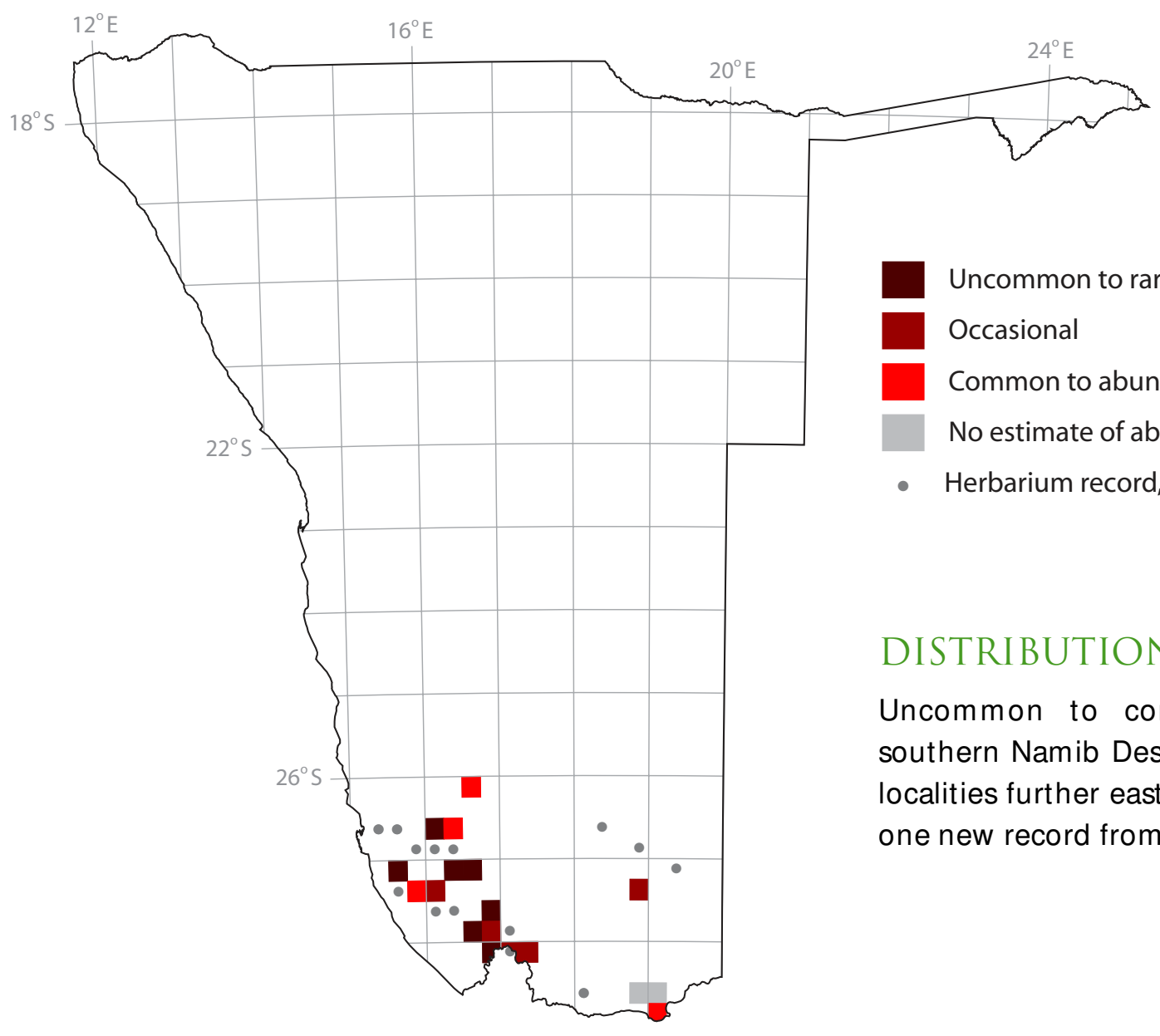
Namaqua Fire-sticks

Small-leaved jackal-berry (E)

[25 records from 18 (2%) squares]



A stiff, evergreen shrub, **with a grey-green appearance**. BARK pale grey to brown, peeling off in fibrous strips. LEAVES simple, **very small**, elliptic to obovate; both surfaces dark green, **silky with red glands below**. FLOWERS small, solitary, greenish-white. FRUIT a small berry, yellow to dark brown, with slightly recurved calyx lobes.

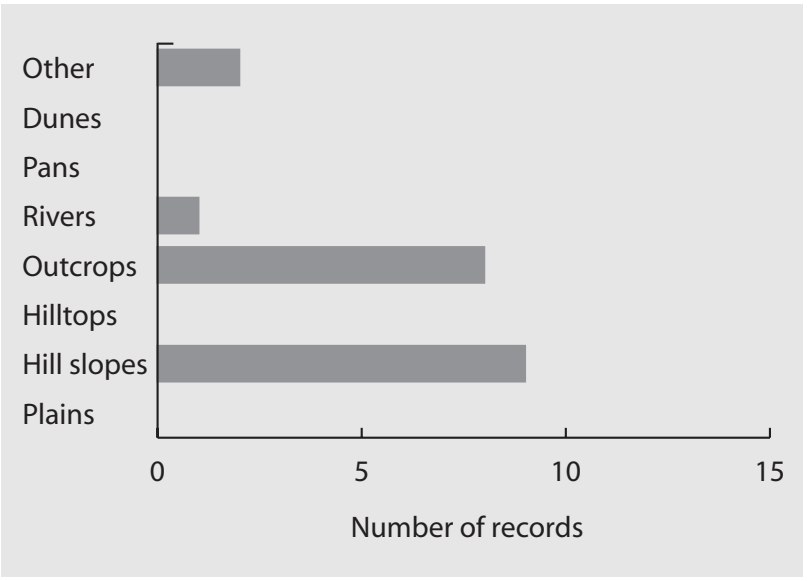


DISTRIBUTION & ABUNDANCE

Uncommon to common, mainly in the southern Namib Desert, but also in scattered localities further east along the Orange River; one new record from 2718BB (MAN1).

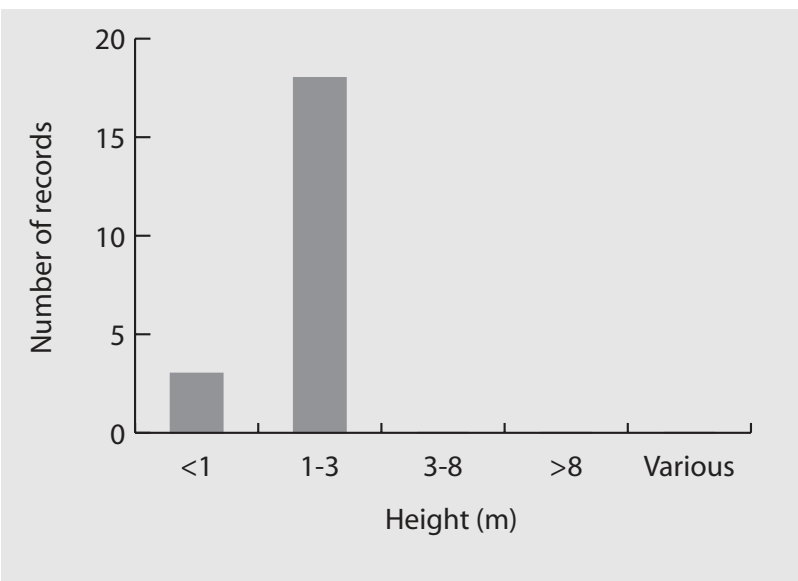
HABITAT

Found on stony or rocky hill slopes and rocky outcrops. According to herbarium records, it is often on, or at the base of, granite outcrops.



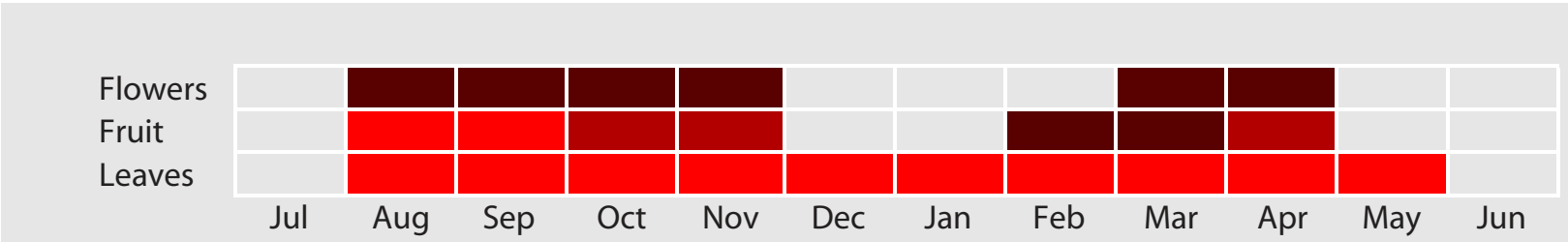
GROWTH FORM

A shrub up to 3 m high.



ANNUAL CYCLE

No observations from May to July. FLOWERS individual records from August to November and March and April. FRUIT most often in August and September. LEAVES recorded for every month of observation.



CONSERVATION CONCERNS

None recorded.

EBENACEAE | EBONY FAMILY

This woody family with two genera in southern Africa has few distinguishing features. The leaves are simple, often leathery with entire margins and no stipules. The flowers are small, cup- or urn-shaped, generally with the tips curling back; sexes are on separate plants. The fruit are round berries, which are small in *Euclea*, but larger and edible in *Diospyros*. The five-lobed calyx is persistent in the fruit of *Diospyros*. Commercial ebony is the hard, dark heartwood of various *Diospyros* species. The name *Diospyros* is derived from Greek and means ‘heavenly pear’, referring to the delicious fruit of many species.

Diospyros virgata

Tawny Jackal-berry

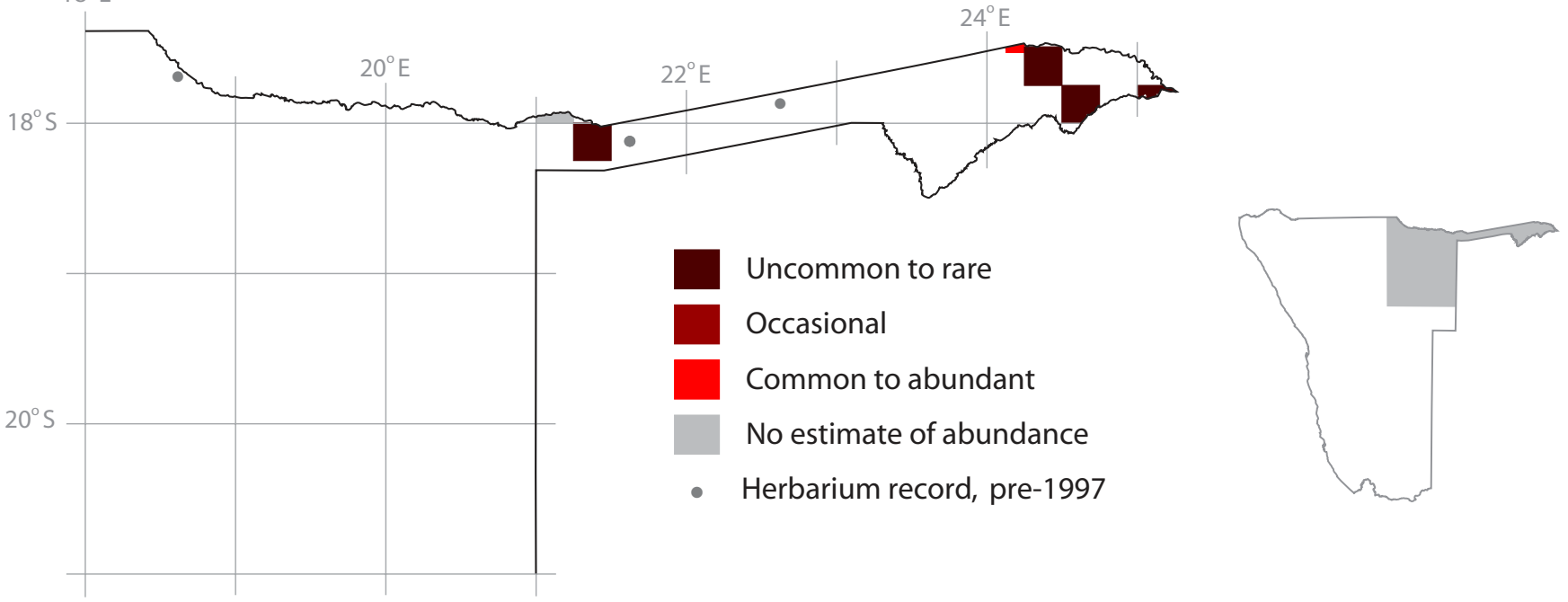
Ghutono (T)

[6 records from 6 (<1%) squares]



Evergreen suffrutex, with long, straight, **slender, soft shoots**. BRANCHLETS with **rust-brown** covering. LEAVES simple, ovate to lanceolate, 25–70 mm long; olive-green, shiny, almost hairless above; covered with **dense, tawny, silky hairs below**. INFLORESCENCE a dense, axillary cluster; **densely downy**. FLOWERS with a calyx up to 5 mm long. FRUIT round, up to 25 mm in diameter; with **dark brown, densely woolly covering**.

Can be confused with *D. chamaethamnus*, which has hairless leaves, and a calyx at least 8 mm long and incised midway, while *D. virgata* has leaves with a yellow-brown, silky covering below and a calyx less than 5 mm long which is incised almost to the base.



DISTRIBUTION & ABUNDANCE

Uncommon and only recorded from the Andara-Popa Falls area along the Okavango River, and in eastern Caprivi. There are earlier herbarium records from further west along the Okavango River, western Caprivi and Ruacana.

HABITAT

Found on river banks.

GROWTH FORM

Mostly a shrub of less than 1 m high, but also a shrub or tree up to 8 m or more.

ANNUAL CYCLE

FLOWERS recorded in March, April and June. FRUIT recorded in November and from February to May. LEAVES recorded every month of observation.

CONSERVATION CONCERNS

None recorded.

Schrebera trichoclada

Wooden pear

[5 records from 4 squares]

A shrub or tree with **conspicuous, circular, corky lenticels** on branchlets. LEAVES small, elliptic. FLOWERS small, **creamy-white with a dark maroon patch**. FRUIT a **woody, bivalved, pear-shaped capsule**.

DISTRIBUTION & ABUNDANCE

Rare in three squares along the eastern Okavango River and in eastern Caprivi.

HABITAT

Found on dunes and sandy plains

GROWTH FORM

A shrub in the 1–3-m height class or a tree in the 3–8-m class; various heights recorded in eastern Caprivi.

ANNUAL CYCLE

Observations only in February, May, October and November. FLOWERS in November and December. FRUIT recorded in February (young fruit) and in May (mature fruit). LEAVES recorded during all months of observation.

CONSERVATION CONCERNS

None recorded.



Schrebera trichoclada, leaves and flowers, P. Horn

Schrebera alata

Wild Jasmine

A small tree with compound leaves that are shiny dark green above, paler below; the rachis and petiole are winged. The flowers are white; the fruit a wedge-shaped, woody capsule.

A single specimen (SWA3/163) from the Omuvanda Mountains, just south of the Kunene River (1713AA), was brought in as the Tree Atlas was going to press. This is the first record for Namibia, and represents a disjunct range extension.

Olea europaea

Wild Olive

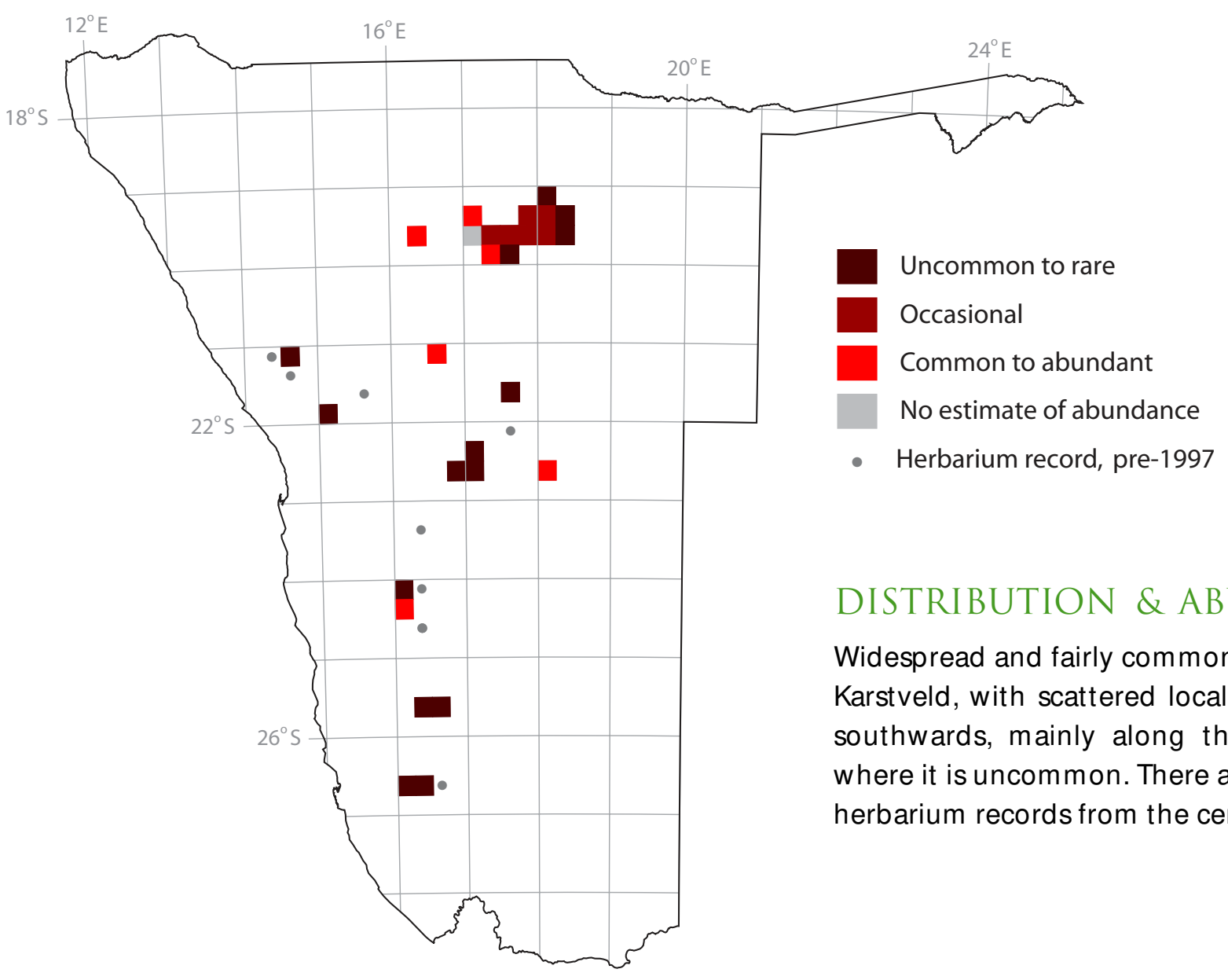
Olienhout (A); kanongovandu (H); !goms (K)

[90 records from 28 (3%) squares]



Shrub or tree with **dense, rounded crown and a greyish appearance**. LEAVES simple, oblong to **narrowly lanceolate**, 30–95 mm long; grey-green to shiny dark green, hairless above, densely covered in **pale silvery to greenish scales below**; margin entire, somewhat turned under; apex pointed to blunt; base narrowly tapering. FLOWERS small, whitish. FRUIT an ovoid berry; black when ripe.

There is one subspecies in Namibia, *africana*.

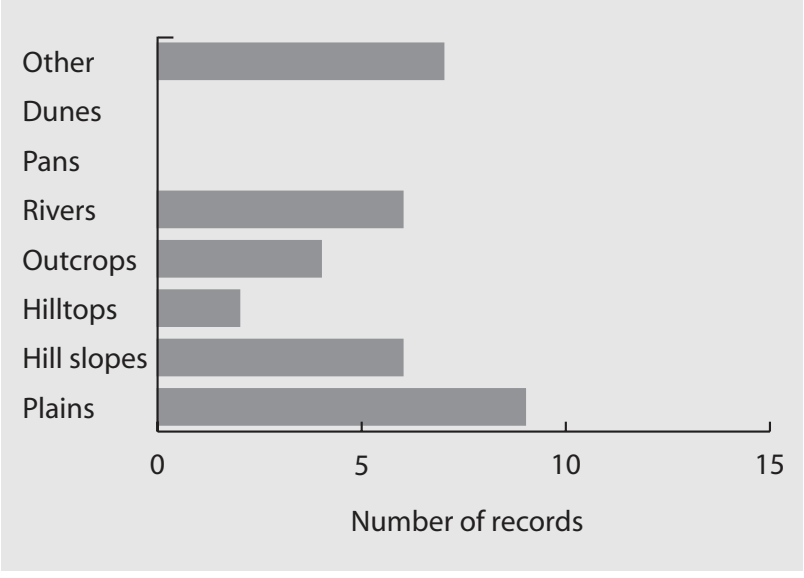


DISTRIBUTION & ABUNDANCE

Widespread and fairly common in the eastern Karstveld, with scattered localities extending southwards, mainly along the escarpment, where it is uncommon. There are some earlier herbarium records from the central-west.

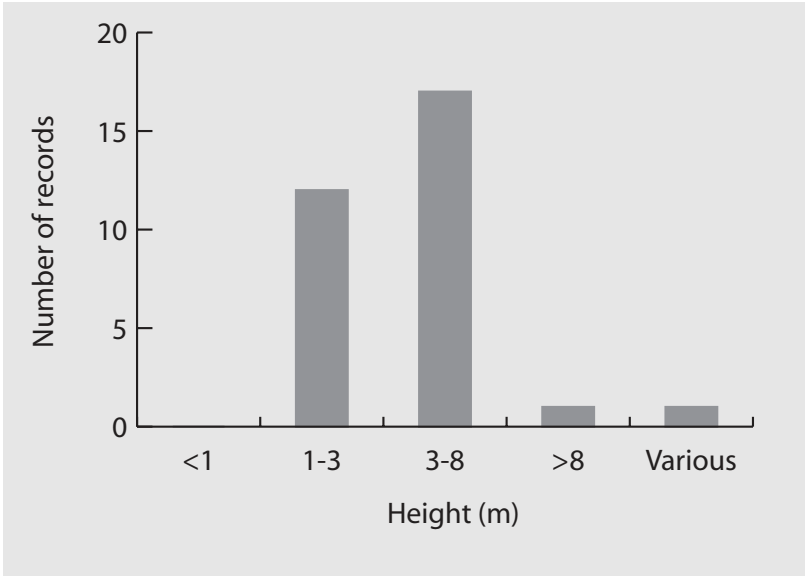
HABITAT

Found in various habitats; on plains in the Karstveld; along dry rivers in the central highlands and the south; on hill slopes in the south; and rocky outcrops in the south-west. Grows on rocky or gravel substrates, often calcrete.



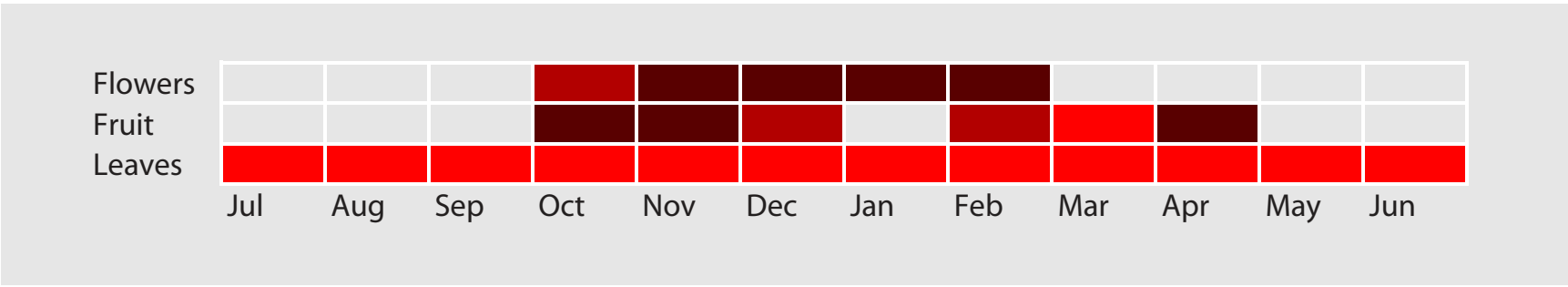
GROWTH FORM

Mostly a tree in the 3–8-m height class.



ANNUAL CYCLE

Very few records of flowers or fruit. FLOWERS in October, with single records till February. FRUIT from October to April, but mostly in March. LEAVES evergreen.



GENERAL

The leaves are browsed by game and livestock. The wood is resistant to termites and wood-borers (cerambycids), and is used for fencing and small articles. Various parts of the plant are used medicinally. An ideal garden plant, as it is frost- and drought-tolerant.

CONSERVATION CONCERNS

None recorded. Protected by forestry legislation.



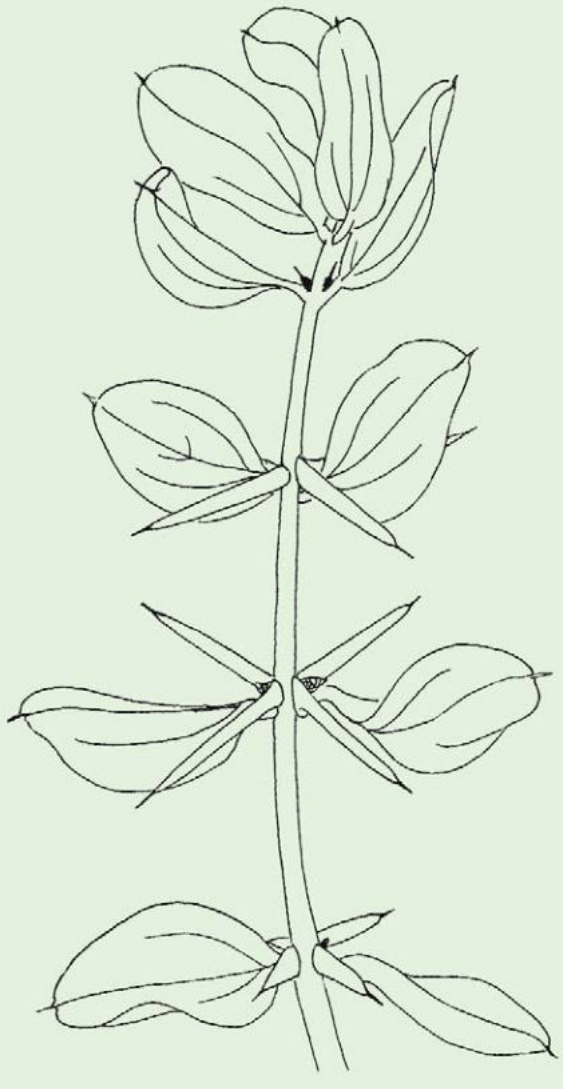
Olea europaea subsp. *africana*,
L. Hoffmann

Azima tetracantha

Four-thorns

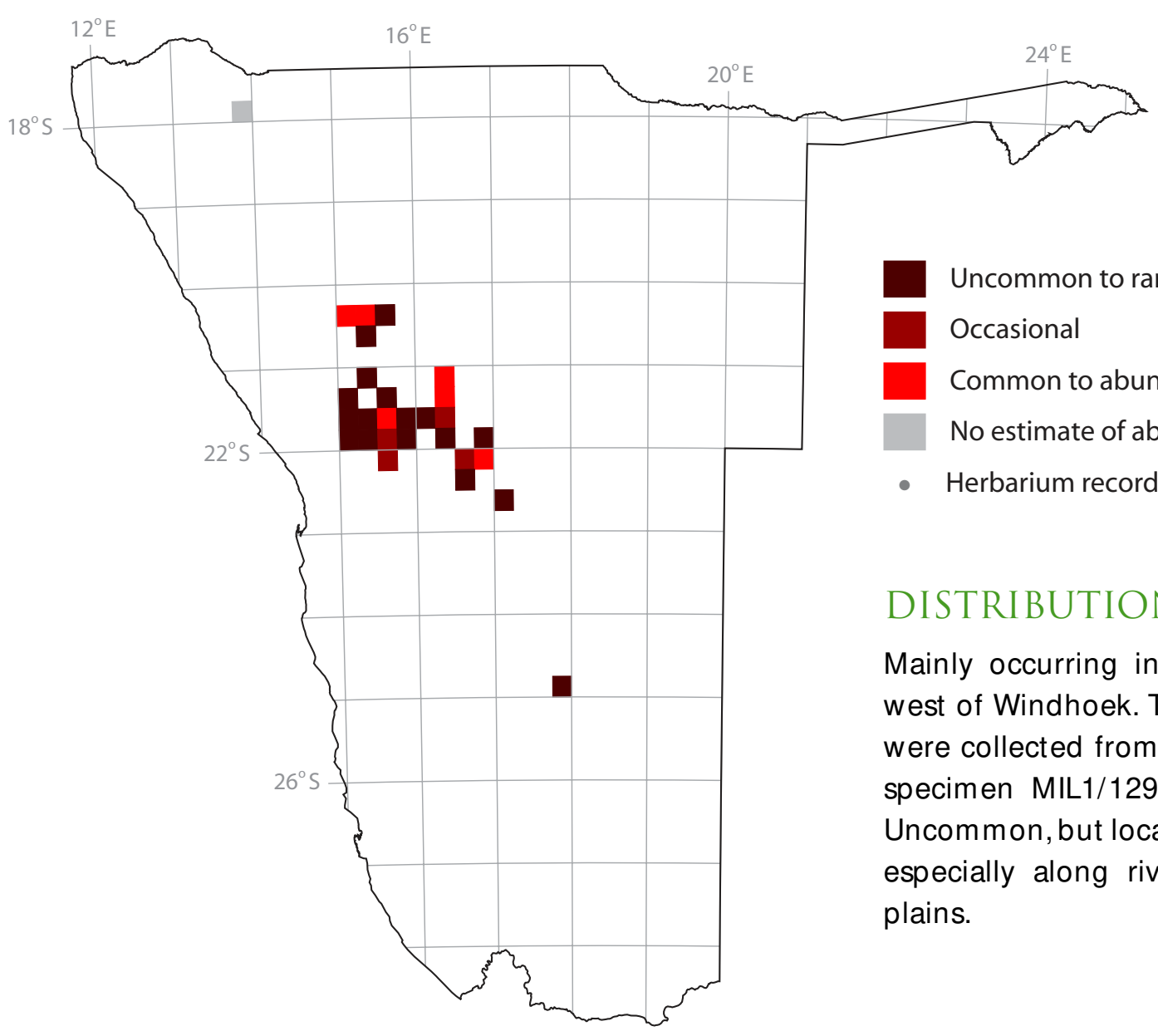
Needle-bush (E); groendoring (A);
Gründorn (G);
onyarayongwe (= leopard's claw, H)

[51 records from 28 (3%) squares]



A spiny, evergreen shrub with a tendency to scramble. BRANCHLETS blue-green, often densely hairy; **with four sharp, axillary spines up to 50 mm long**. LEAVES simple, opposite, **with successive pairs at right angles to each other**; elliptic-oblong to almost round; **leathery**. FRUIT round, small; yellow to white when ripe.

Flowers and fruit are easily overlooked, but this plant cannot be confused with any other species.

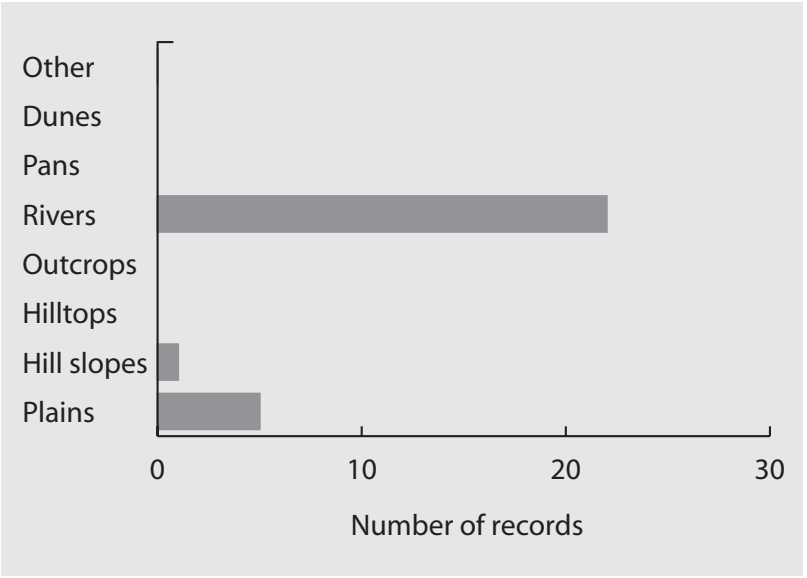


DISTRIBUTION & ABUNDANCE

Mainly occurring in central Namibia, north-west of Windhoek. Two new, isolated records were collected from the south (confirmed by specimen MIL1/129) and the north (CUR1). Uncommon, but locally common to abundant, especially along river banks and on flood-plains.

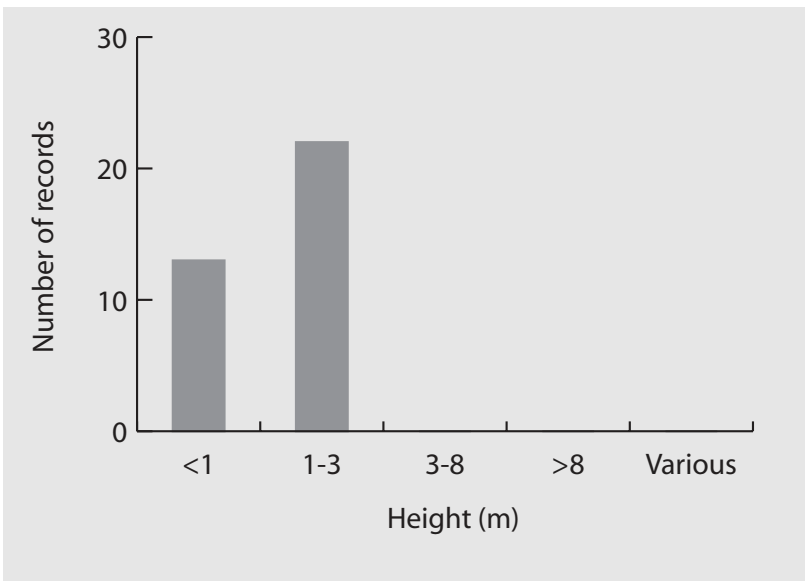
HABITAT

Mainly found on river banks, occasionally on plains. Also found in disturbed areas. This plant was found along 'most river banks in the Kunene Region' (BES1).



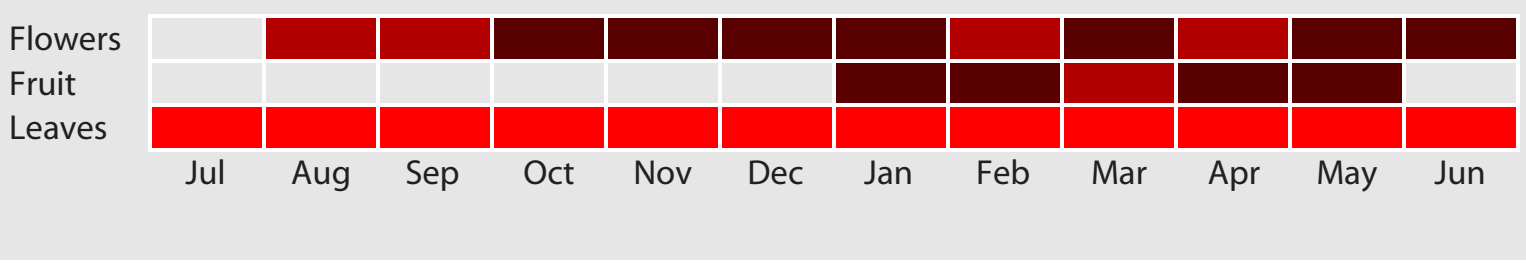
GROWTH FORM

Always a shrub, mostly in the 1–3-m height class. May be thicket-forming.



ANNUAL CYCLE

FLOWERS from August to June, but never many records per month. FRUIT January to May. LEAVES evergreen, with only one record of a bare plant in October.



GENERAL

Browsed by unspecified animals, but imparts a strange flavour to milk and butter from animals that have eaten it. Possible horticultural potential as a hedge plant.

CONSERVATION CONCERNS

None recorded.



Azima tetracantha, leaves and thorns, E. Ellinger

Salvadora persica

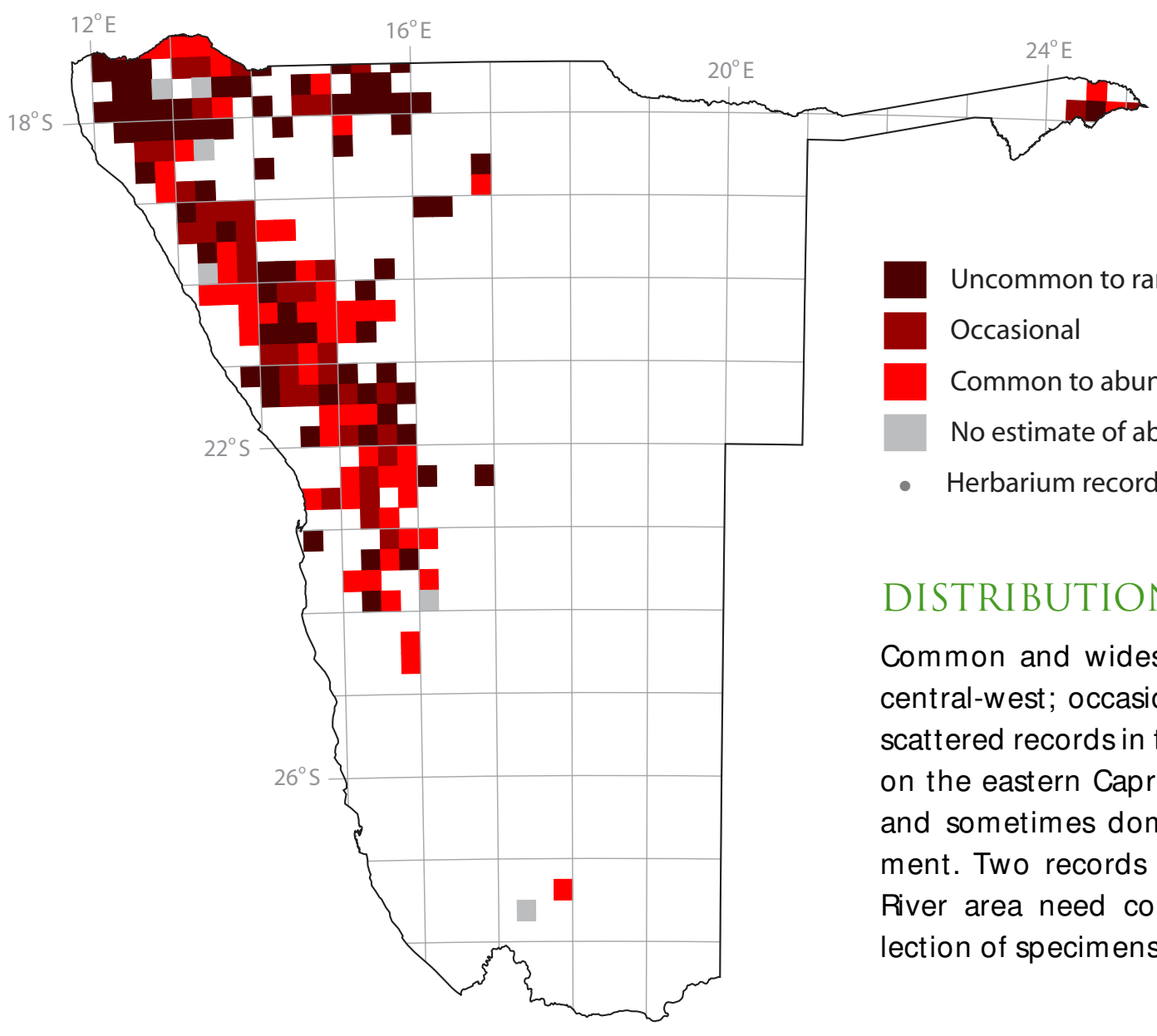
Mustard bush

Kerriebos (A); Pfefferstrauch (G); omungambu (H); khooris (K)

[588 records from 180 (17%) squares]



Dense evergreen shrub, often broader than high, and often browsed into a tree. LEAVES simple, up to 80 mm long; **pale yellow-green, hairless, leathery-succulent.** FLOWERS small, greenish-yellow. FRUIT a small, round berry, dark red-purple when ripe.

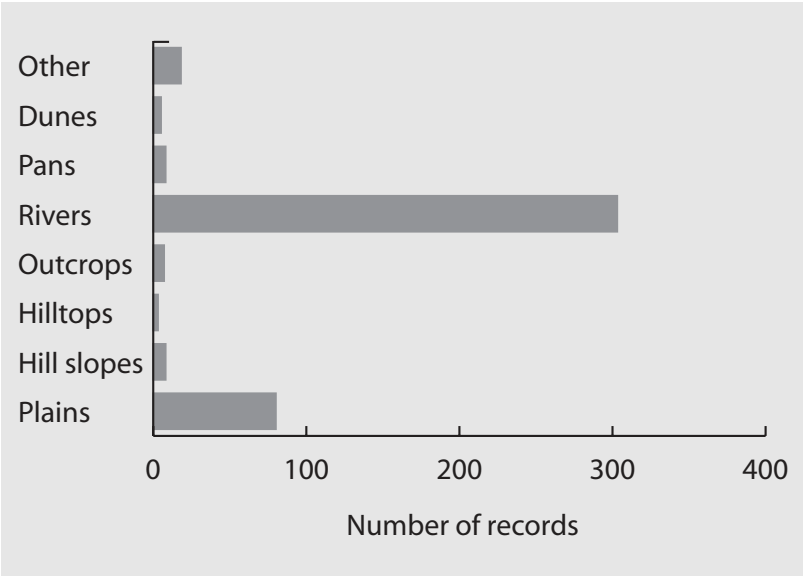


DISTRIBUTION & ABUNDANCE

Common and widespread in the north- and central-west; occasional in the Cuvelai, with scattered records in the Karstveld; uncommon on the eastern Caprivi floodplains. Abundant and sometimes dominant along the escarpment. Two records in the south in the Fish River area need confirmation with the collection of specimens.

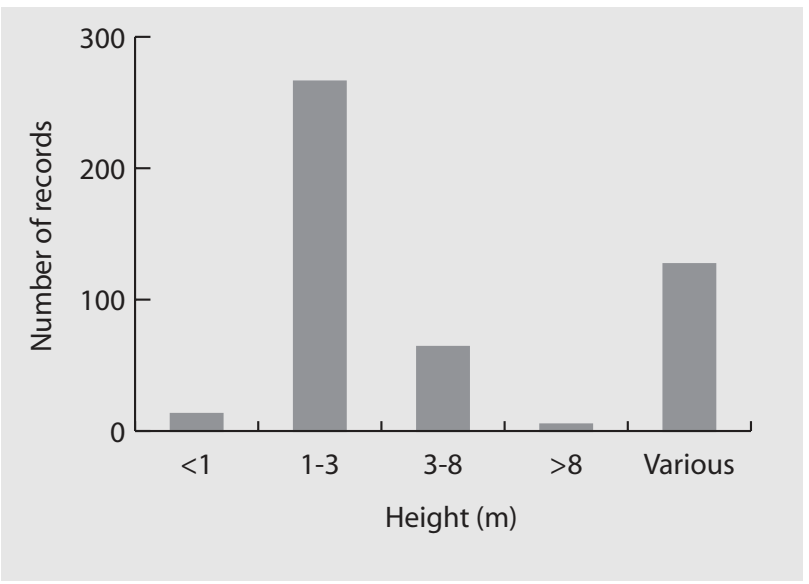
HABITAT

Most often found in dry riverbeds and on river banks, where it was common to abundant; sometimes on plains and valley floors. Mostly grows on clay or sandy substrates, but also on calcrete, granitic soils or other stony substrates; often on termite mounds.



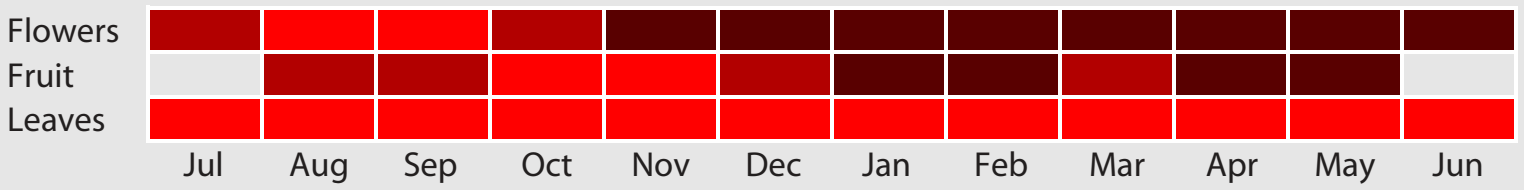
GROWTH FORM

Mostly a shrub (75% or records) up to 3 m high, but often over; sometimes a tree (17%) between 2 and 8 m high; also recorded climbing into other plants (8%). Often browsed into tree form. A number of records were of stands of mixed heights.



ANNUAL CYCLE

FLOWERS all year round, but mostly July to October. FRUIT recorded most months, but most common from August to December. LEAVES evergreen.



GENERAL

The leaves are heavily browsed by stock and game; birds feed on the fruit. The fruit are edible, and the leaves and roots are used for medicinal purposes; young branchlets and roots are used for cleaning teeth.

CONSERVATION CONCERNS

None recorded.

Strychnos cocculoides

Corky Monkey-orange

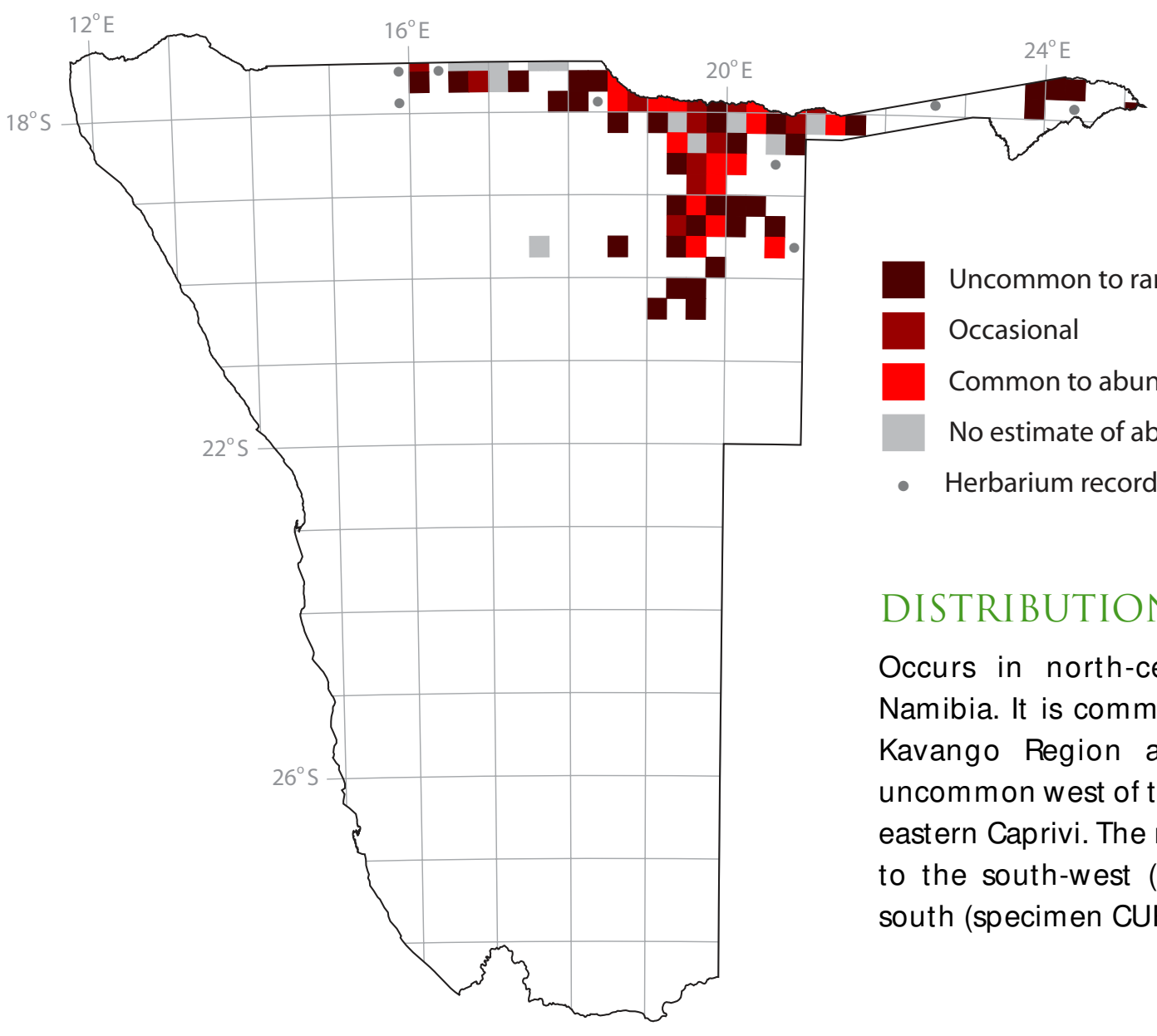
Geelklapper (A); muhuluhulu (L); eguni (Od, Rk)

[125 records from 77 (7%) squares]



Semi-deciduous tree, **with a compact canopy**. BARK grey-brown, **thickly corky and deeply grooved to expose a pale brown underbark; young branchlets plum-coloured, densely downy**. SPINES **curved in pairs at nodes and straight at ends of branches**. LEAVES ovate to almost circular; bright green, shiny, sparsely downy; 5–7 pale green, protruding veins originating at or near base; apex broadly tapering with a pointed tip. FLOWERS green-white in dense, terminal clusters. FRUIT **60–100 mm in diameter, dark green with white to pale green specks; yellow when ripe with a hard, woody shell**.

Flowers are inconspicuous, fruit conspicuous, especially when ripe. Can be confused with *S. spinosa*, but *S. cocculoides* generally has much thicker cork with deeper fissures. The plum-coloured young branchlets are diagnostic.

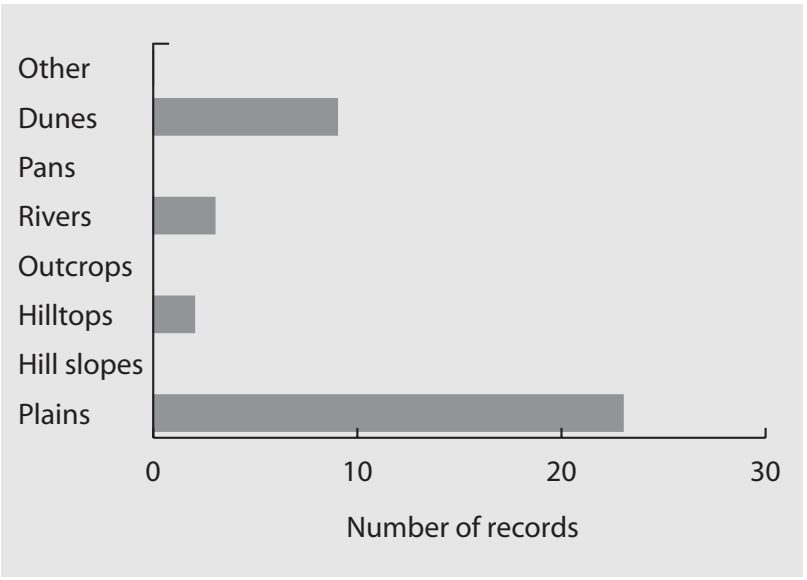


DISTRIBUTION & ABUNDANCE

Occurs in north-central to north-eastern Namibia. It is common to uncommon in the Kavango Region and west of Tsumkwe; uncommon west of the Okavango River and in eastern Caprivi. The range has been extended to the south-west (specimen HIL1/200) and south (specimen CUR1/1031).

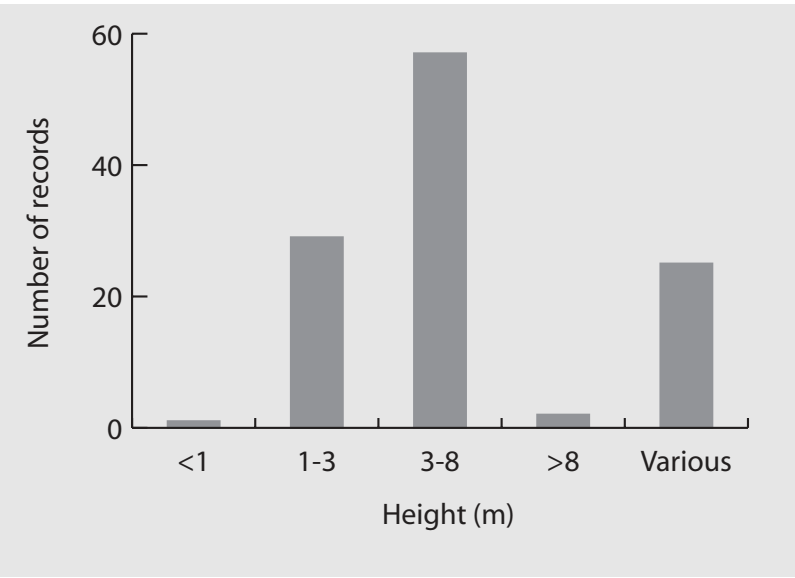
HABITAT

Generally, found on sandy plains and dunes in areas of mixed woodland and riverine forest.



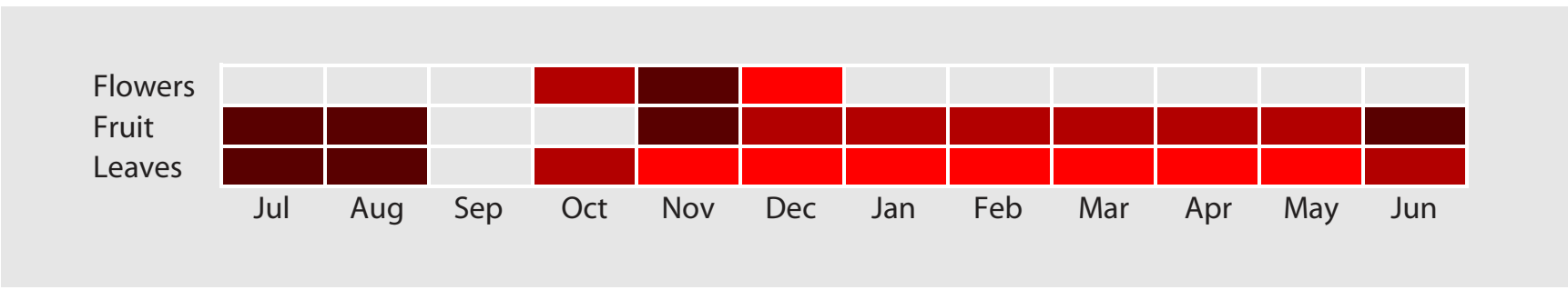
GROWTH FORM

Usually a tree in the 3–8-m height class.



ANNUAL CYCLE

FLOWERS October to December, with individual records from May some years. FRUIT November to May, sometimes up to August. LEAVES mainly from October to June, with leaves present on some individuals most of the year.



GENERAL

The fruit are edible and palatable, and can be stored for relatively long periods of time. They are becoming an important cash crop, even as far south as Windhoek and Swakopmund. The pulp is eaten raw or made into wine or brandy; green fruit are buried in sand and collected later, when the pulp has liquified and makes a refreshing beverage. The seeds are not eaten and, as well as the bark, are said to contain the poison, strychnine. The roots, green fruit and juice are used medicinally. Dry fruit shells are used to make rattles, store small items, or hold cosmetic fats and butters. The wood of the tree is used for implement handles.

CONSERVATION CONCERNS

Local communities conserve the trees for their food and economic values, and they are starting to cultivate them. Protected by forestry legislation.

Strychnos pungens

Spine-leaved Monkey-orange

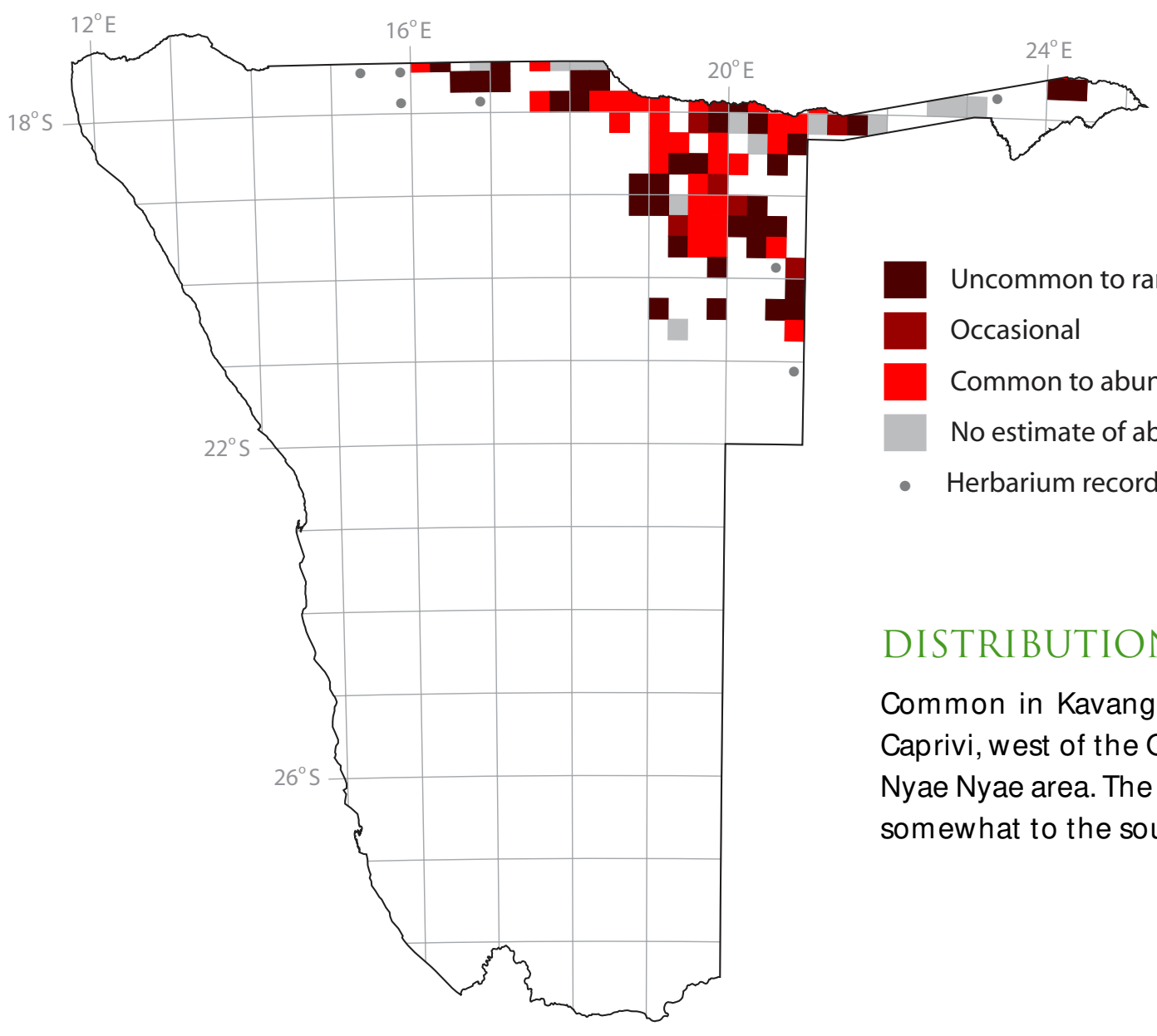
Steekblaarklapper (A); muhwawa (L); omupwaka (O); utu (Rk, Rum); ghutu (T)

[118 records from 86 (8%) squares]



Semi-deciduous tree with a **compact canopy and no thorns**. BARK pale grey, thick, corky, vertically and transversely grooved to form oblong fragments; pale green underbark. LEAVES elliptic-lanceolate, 60 mm long, leathery, rigid; shiny dark green above, with three prominent veins; **apex pointed with midrib extended as a pungent tip for c. 2 mm**. FLOWERS green-white, up to 9 mm long. FRUIT **round, up to 120 mm in diameter; initially blue-green, but yellow-brown when ripe; shell woody**.

Can be confused with *S. cocculoides*, but *S. pungens* is distinctive in having rigid leaves with a spiny tip.

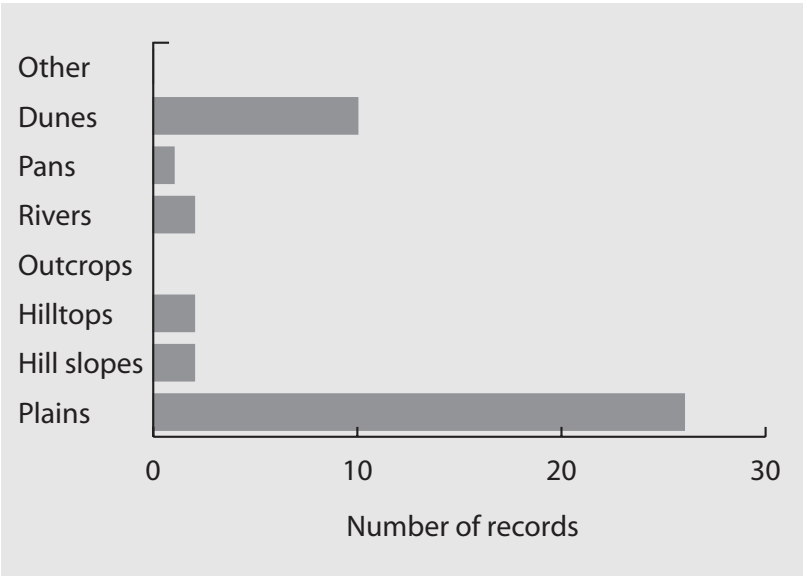


DISTRIBUTION & ABUNDANCE

Common in Kavango; uncommon in eastern Caprivi, west of the Okavango River and in the Nyae Nyae area. The range has been extended somewhat to the south-west.

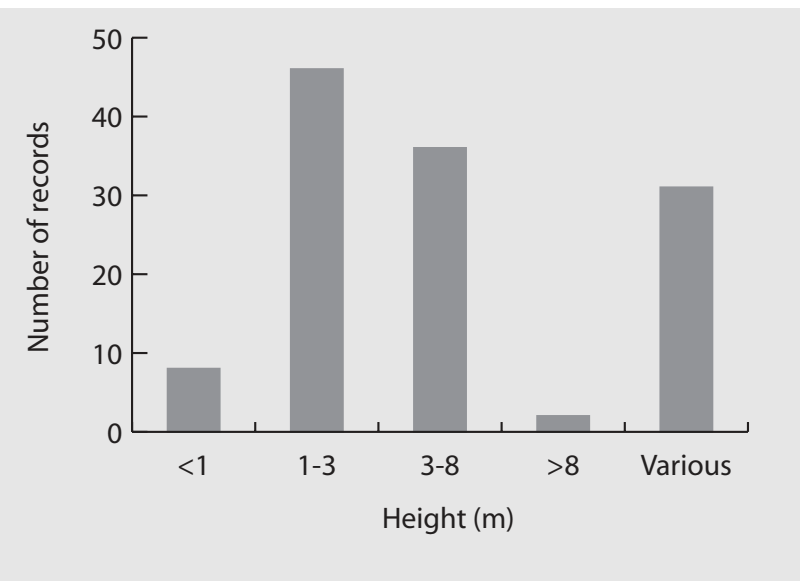
HABITAT

Mainly found on sandy plains and dunes in mixed woodland. Always on sandy substrates.



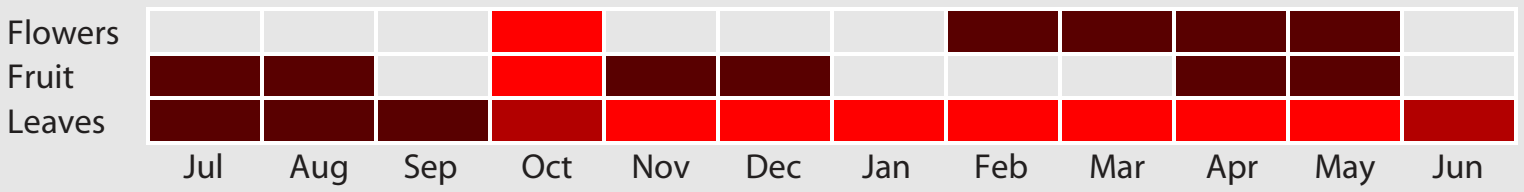
GROWTH FORM

Mostly a tree (60% of records), but often a shrub. Usually from 1–8 m high, rarely taller than 8 m.



ANNUAL CYCLE

FLOWERS mainly October, but with intermittent records from February to May. FRUIT mainly October, but recorded almost all year. LEAVES mainly October to June, with young leaves October to December.



GENERAL

Ripe fruit edible and palatable, but not as tasty as that of *S. cocculoides*. Some sources say that the seeds are edible, but green fruit and seeds are poisonous. The shell is used as a cup, cosmetic container, storage container for small items, or to make rattles. The roots and leaves are used medicinally. The leaves are sometimes browsed.

CONSERVATION CONCERNS

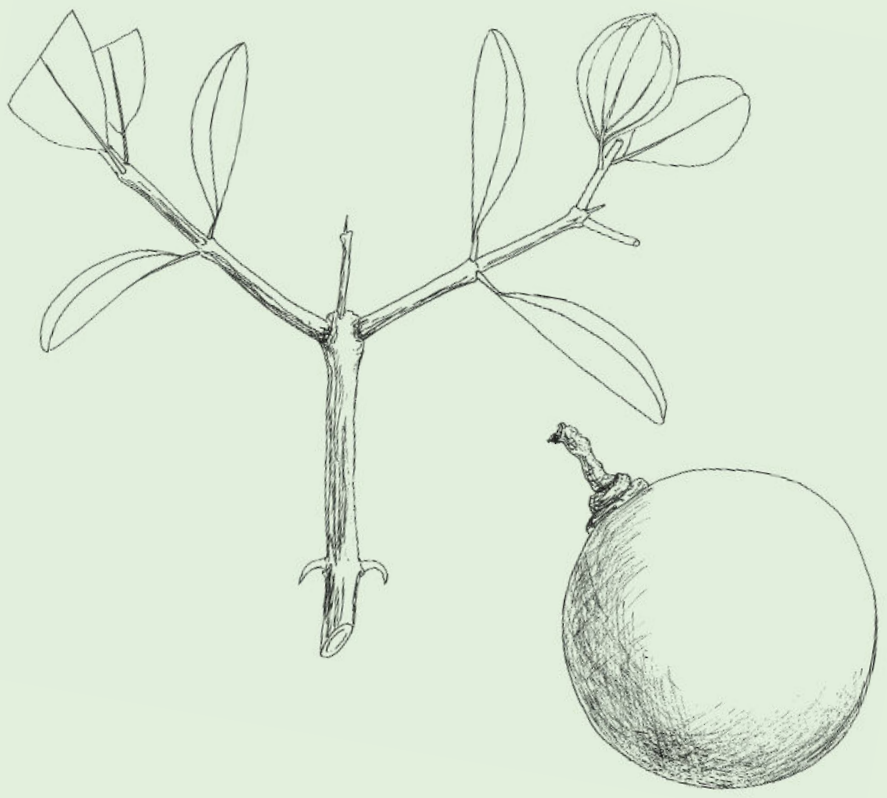
None recorded. Protected by forestry legislation.

Strychnos spinosa

Spiny Monkey-orange

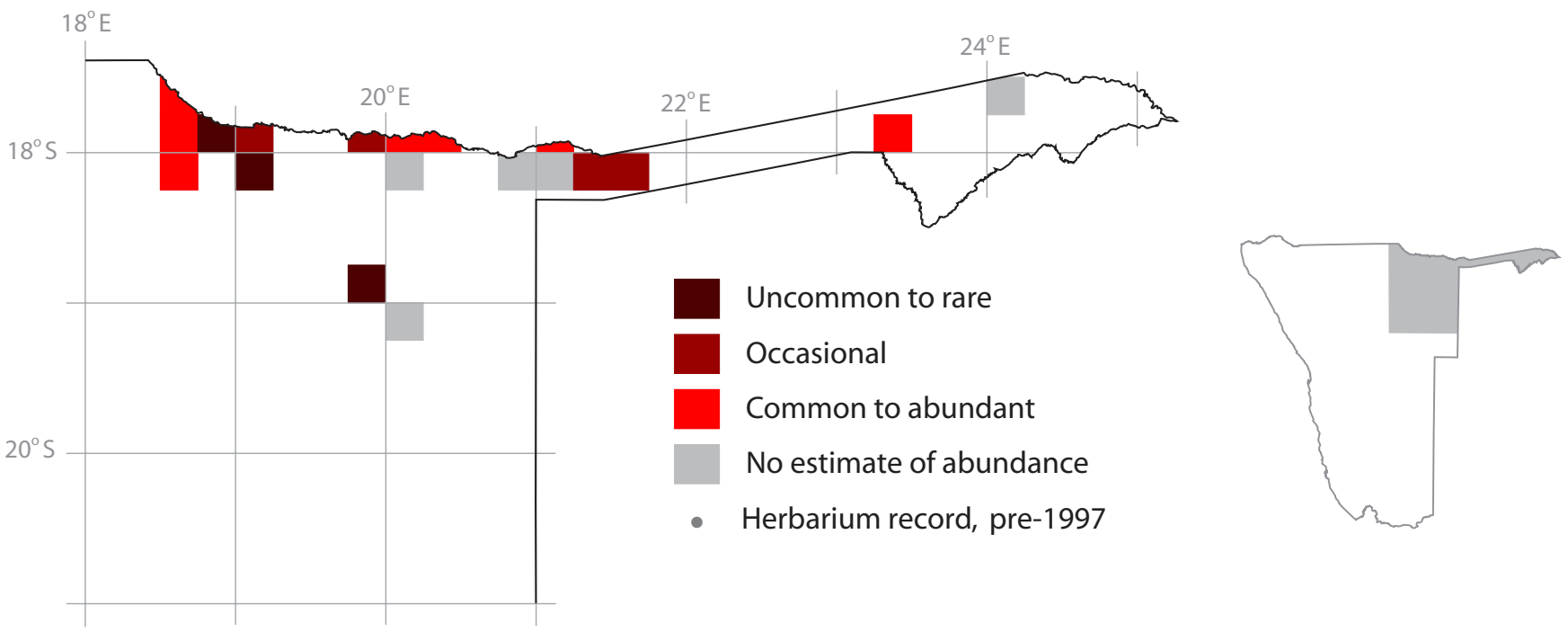
Doringklapper (A); |uana (Kx); mwimbili (L); uguni (Rk, Rum); ghughumi (Rk, T)

[30 records from 21 (2%) squares]



Semi-deciduous tree with a neat canopy. BARK grey to dull brown, thinly corky, flaking in square fragments, leaving smooth, white marks. BRANCHLETS **dirty green**. THORNS **paired at nodes, curved or straight; straight at ends of branches**. LEAVES almost circular, up to 90mm, leathery; shiny, dark green above; wavy, with 2–4 conspicuous lateral veins; apex pointed to drawn out. FLOWERS cream-coloured to green. FRUIT **round, up to 120 mm in diameter with woody shell; green, becoming yellow-brown when ripe, occasionally speckled; with many seeds**.

Can be confused with *S. cocculoides*, but the bark of *S. spinosa* is not as deeply fissured and the young branches are dirty green, not plum-coloured.

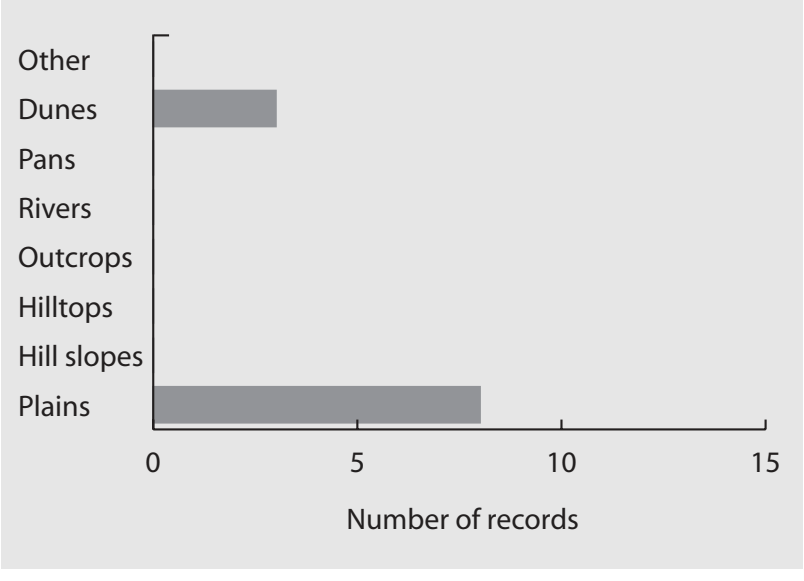


DISTRIBUTION & ABUNDANCE

Common to occasional along the Okavango River, with a large range extension southwards (CM1288, MAN1) and into eastern Caprivi (SOL1/EC10).

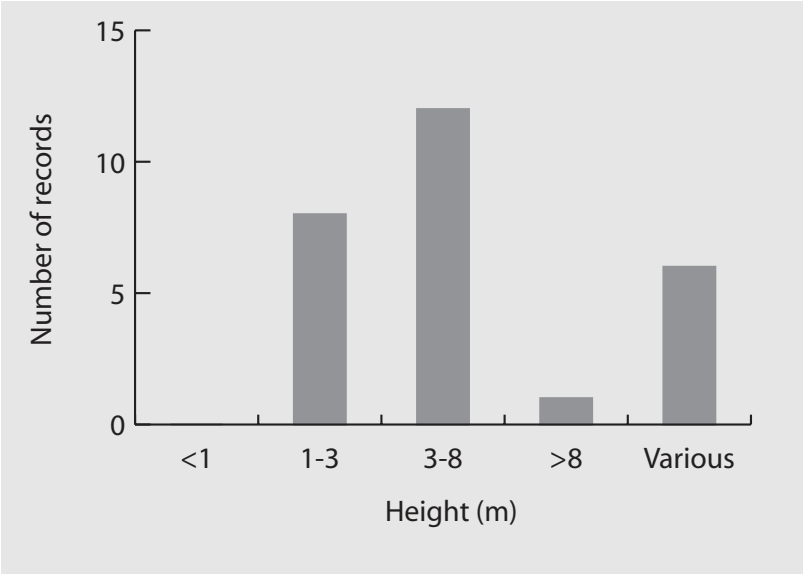
HABITAT

Found on sandy plains and dunes and in woodlands and riverine forests.



GROWTH FORM

A tree, mostly in the 3–8-m height class, sometimes smaller; rarely taller than 8 m.



ANNUAL CYCLE

No observations in winter. FLOWERS in October and December. FRUIT mainly May, but a few records most months. LEAVES probably deciduous.

GENERAL

The fruit pulp is edible; the seeds are poisonous. The roots, green fruit and leaves are used medicinally.

CONSERVATION CONCERNS

None recorded. Protected by forestry legislation.

Strychnos madagascariensis

Black Monkey-orange

Swartklapper (A)

[4 records from 2 squares]

Tree lacking thorns, but with rigid, dwarf, lateral branches that may resemble spines. LEAVES often **clustered at ends of branches**; narrowly **elliptic to almost circular**, velvety, **at least on the veins**. FRUIT up to **100 mm in diameter**; initially blue-green, turning orange-brown when ripe.

Four TAP records were collected from two squares in eastern Caprivi, supported by two specimens (BC735 and 1330, CUR1) and there are no earlier herbarium records. These appear to be new records for Namibia since they are not listed in Craven (1999). Their presence in Namibia is indicated in Coates Palgrave (2002), however.

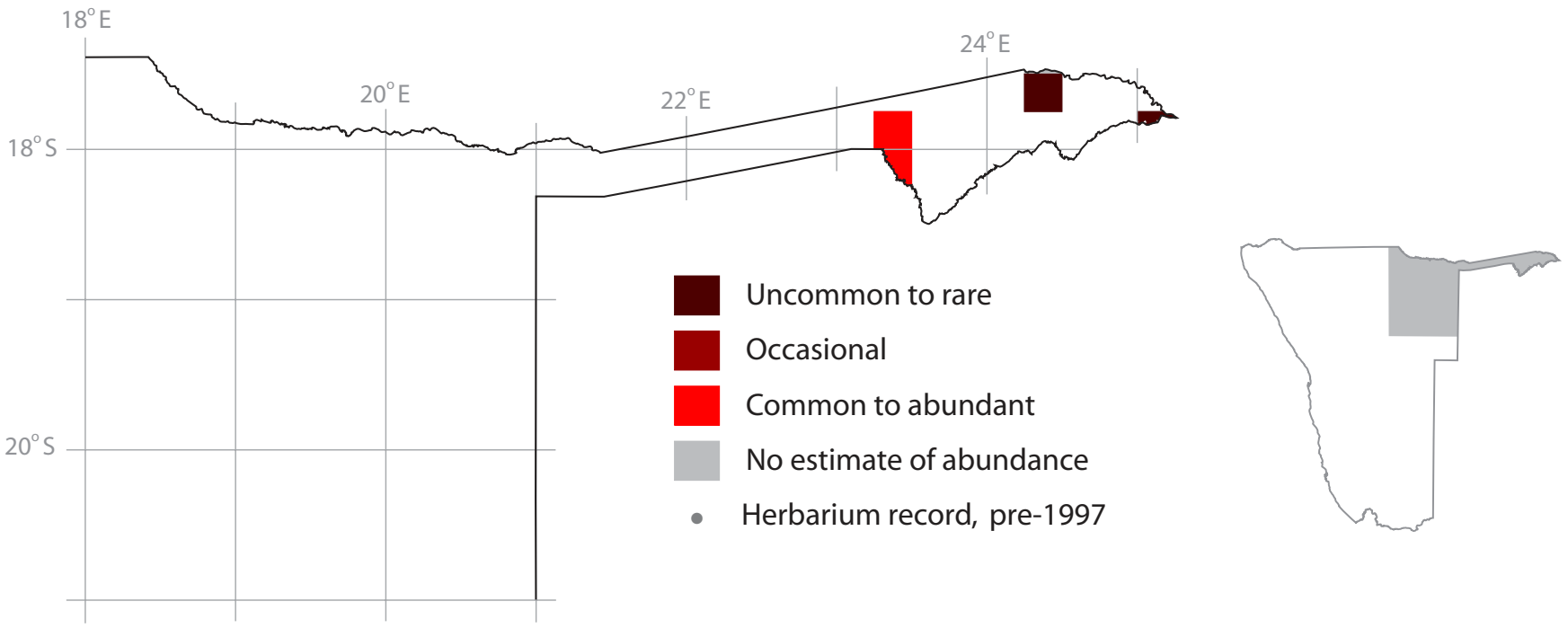
Strychnos potatorum

Black Bitterberry

Grape strychnos (E); swartbitterbessie (A); Traubiger Strychnos (G); mulombelombe (L)

[7 records from 5 (<0.5%) squares]

Semi-deciduous tree with **spreading crown**. BARK **pale silver-grey to yellow-brown, smooth** but may become rough with age. BRANCHLETS **often dichotomously branched, with a ring-like scar left by the first leaves; lacking thorns but sometimes ending in a spine**. LEAVES elliptic to ovate, up to 150 mm long; **papery**, shiny dark green above; 3–5 veins from or near the base, apex pointed. FLOWERS greenish-white. FRUIT **round, *c.* 20 mm in diameter, fleshy, soft-shelled; black when ripe**.



DISTRIBUTION & ABUNDANCE

Generally occurs along the perimeters of the eastern Caprivi. Uncommon to common in places.

HABITAT

Found on river banks, floodplains and dunes.

GROWTH FORM

A tree in the 3–8-m height class.

ANNUAL CYCLE

Observations were made from March to May and in October. FLOWERS none recorded. FRUIT recorded in January, March, April and May, and old fruit in November. LEAVES present from March to May; bare in October.

GENERAL

The fruit is eaten by birds and baboons, but poisonous to man. Crushed bark and roots are used to poison fish.

CONSERVATION CONCERNS

None recorded.

Anthocleista grandiflora

Forest Big-leaf

[2 records from 1 square]

A tall, slender tree, with erect stem branching high up, characteristic of high-rainfall, low-altitude forests. LEAVES **very large**, obovate to oblong. FLOWERS large, tubular, creamy-white. FRUIT fairly small, ellipsoid, fleshy.

Recorded in eastern Caprivi at Katima Mulilo (1724AD). A rare tree, 5 m high, on the river bank with flowers and fruit in March, and flowers in October. These two are new records for Namibia. There is one earlier herbarium record of *Anthocleista liebrechtsiana* from the same locality as these.

Nuxia oppositifolia

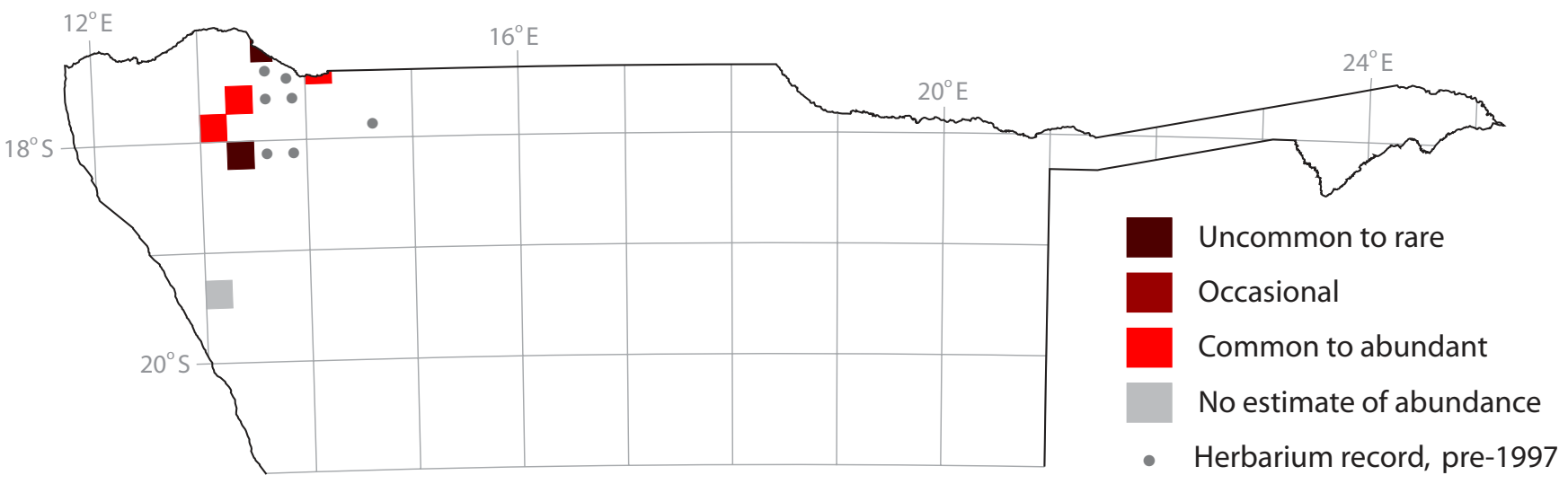
River Nuxia

Water elder (E); watervlier (A)

[7 records from 6 (<1%) squares]



Evergreen shrub or slender tree with **thin, drooping branches**. BARK grey-brown, vertically grooved; young branchlets red-grey, **angular**. LEAVES **simple, long and narrow; olive-green**; margin serrate along upper portion. FLOWERS tiny, white. FRUIT tiny oblong capsule, *c.* 3 mm long; hidden in the remains of the calyx.



DISTRIBUTION, ABUNDANCE & HABITAT

Generally common along dry rivers in a few scattered localities in the north-west. There is a range extension to the south, in the Hoanib River (1913AC; specimen ROX1/70).

Continued on page 543.

Carissa edulis

Simple-spined Carissa

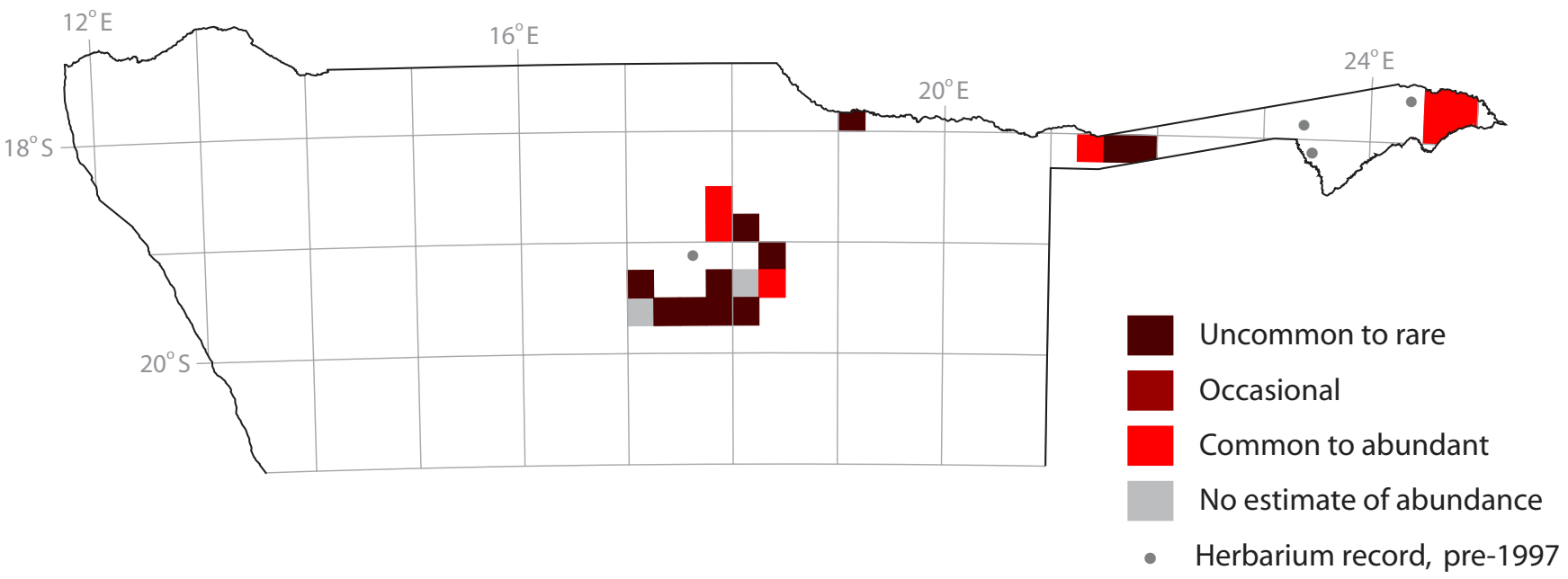
Climbing num-num (E);
enkeldoringnoemnoem (A)

[37 records from 21 (2%) squares]



Shrub or scrambler. BARK on young branchlets dark green with dense, white covering. THORNS **paired, unbranched**. LEAVES ovate to broadly elliptic. FLOWERS **white to lilac; petals overlapping clock-wise**. FRUIT **5–7 mm in diameter, black when ripe**.

Flowers and fruit are conspicuous. Can be confused with *C. bispinosa*, but *C. edulis* has unbranched thorns, petals that overlap clockwise and black fruit.



DISTRIBUTION & ABUNDANCE

Disjunct distribution and generally un-common, but common in eastern Caprivi and locally abundant along the river bank in 1817DD; rare on the Rundu-Nkurenkuru road; occasional in the Popa Falls-Mahango Game Reserve area.

GENERAL

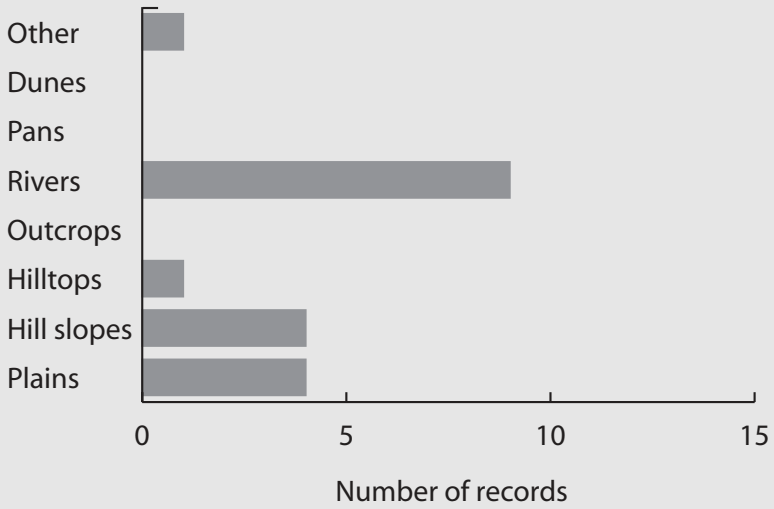
The branches are used as fencing material. The fruit is edible, juicy and sweet; it can be fermented to make vinegar. The crushed roots smell of turpentine and are widely used in traditional medicines.

CONSERVATION CONCERNS

None recorded.

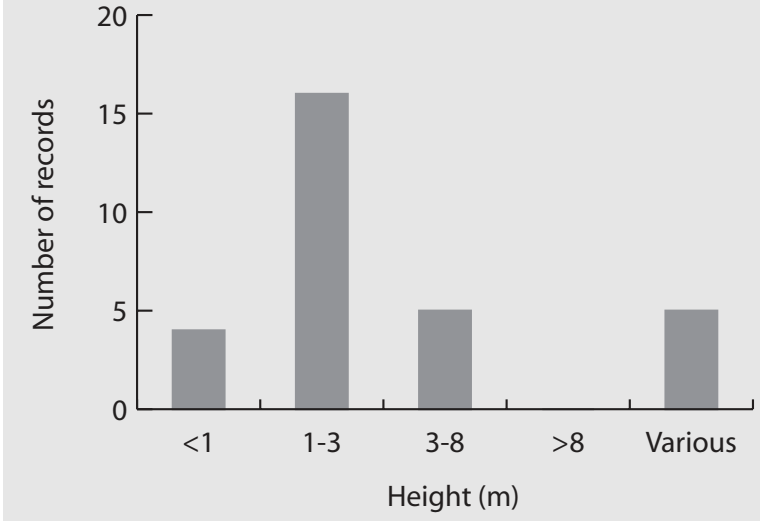
HABITAT

Mainly found along rivers; on hill slopes and plains in the Karstveld; on floodplains in Caprivi and along the Okavango River.



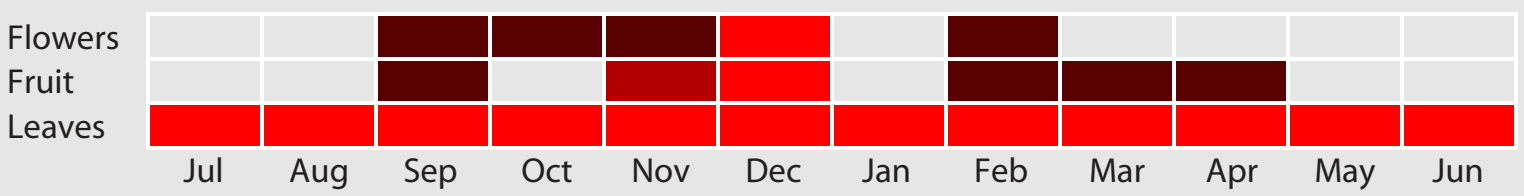
GROWTH FORM

Mainly a shrub of 1–3 m high, occasionally a tree over 3 m.



ANNUAL CYCLE

FLOWERS September to February. FRUIT September to April. LEAVES evergreen; old leaves recorded from July to September.



Nuxia oppositifolia *Continued from page 541:*

GROWTH FORM

A shrub or shrubby tree up to 3 m and more.

ANNUAL CYCLE

FLOWERS recorded in April, June, August, October and November (including herbarium records). FRUIT none recorded. LEAVES recorded in March, April and August (the only months of observation).

CONSERVATION CONCERNS

None recorded.

Nuxia congesta | Common wild elder

Shrub or small, evergreen tree. Leaves 3-whorled. Flowers in crowded terminal heads.

A new record for Namibia from Omavanda Plateau, Baynes Mountains (1713AA) (van Jaarsveld, 17484).

Carissa bispinosa

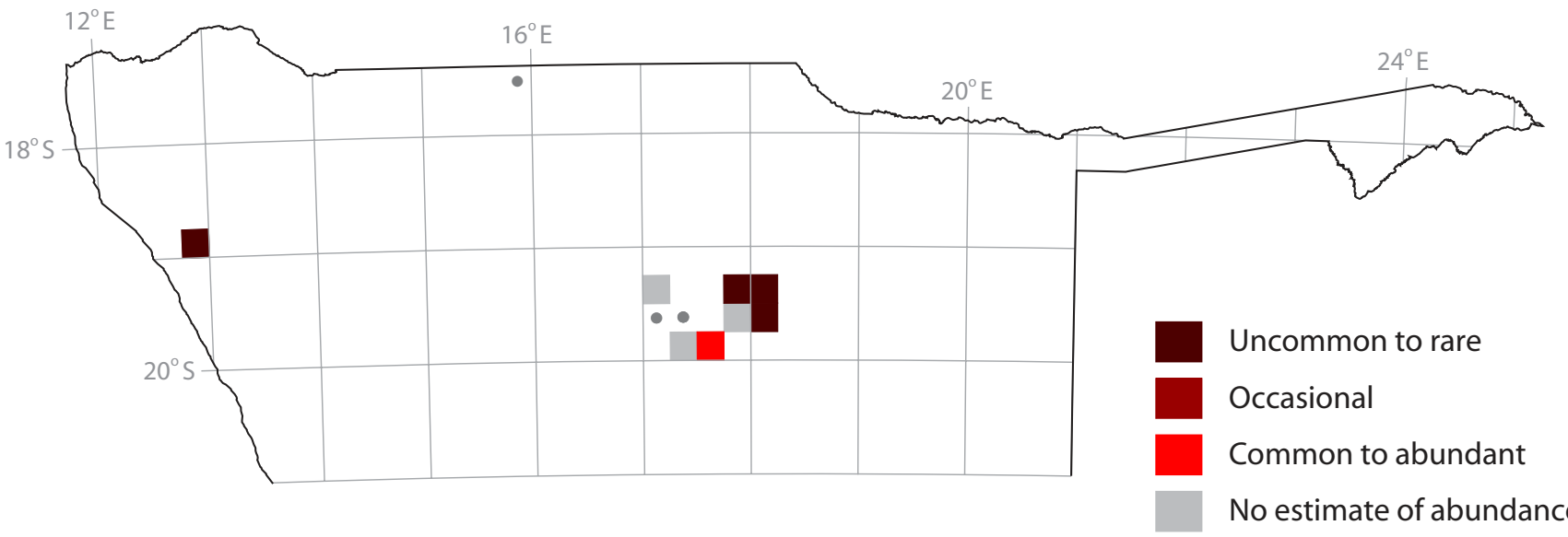
Y-thorn Carissa

Common num-num (E);
bosnoemnoem (A)

[31 records from 8 (<1%) squares]

Shrub or small tree. BARK on young branchlets green, hairless. THORNS **paired; each once or twice forked**, green, rigid with sharp tip. LEAVES almost circular to broadly ovate, hairless. FLOWERS **white to pale pink; petals overlapping anti-clockwise**. FRUIT **red when ripe**.

The flowers and fruit are conspicuous. Can be confused with *C. edulis*, but *C. bispinosa* has forked thorns, flower petals that overlap in an anti-clockwise direction and large, red fruit. Only one subspecies, *bispinosa*, occurs in Namibia.



DISTRIBUTION & ABUNDANCE

Generally uncommon in a very small area in the eastern Karstveld, but locally abundant along the Omuramba Owambo; one record from Purros Rest Camp in 1812DD (specimens HB4 and HB6, BEC1), reported it to be common on the river bank, but rare on a rocky outcrop. The Purros record is a range extension according to herbarium records, but not according to Coates Palgrave (2002).

HABITAT

Found on plains, along watercourses and near pans in the Karstveld; grows on calciferous, shallow soils on Farm Hurisib (1917BD; HIL1). Found on river banks and rocky outcrops at Purros.

GROWTH FORM

A shrub or tree of 1–3 m high, with one record of it clambering.

ANNUAL CYCLE

TAP records were combined with herbarium records. FLOWERS were reported or collected in November and February. FRUIT were found in January, February and November. LEAVES evergreen.

GENERAL

Often found together with *Olea europaea* on Farm Hurisib (1917BD). Heavily browsed in places (FRI1). The fruit have a sweet taste.

CONSERVATION CONCERNS

Rare in Namibia, but probably not threatened; widespread in South Africa.

Carissa haematocarpa

Karoo Num-num

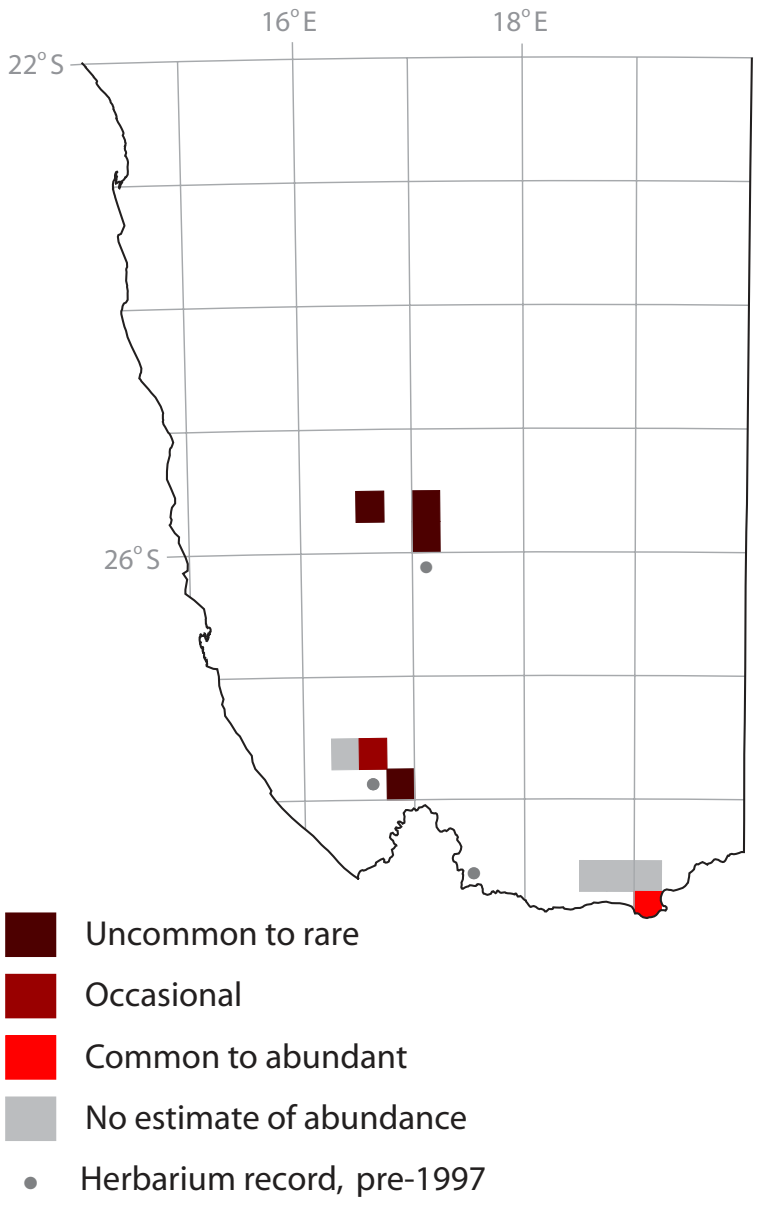
Karoo-noemnoem (A)

[18 records from 10 (<1%) squares]



Evergreen shrub, occasionally a small tree. BARK grey-green; young branchlets pale green and flexible, sparsely downy but becoming almost hairless. THORNS **straight, paired, green; each once or twice forked**, 7–50 mm long. LEAVES broadly elliptic to lanceolate, 15–22 mm long; both sides olive-green, hairless. FLOWERS **white; corolla tube up to 7 mm long; corolla lobes up to 2 mm long, overlapping anti-clockwise; sweet-smelling**. FRUIT **up to 10 mm diameter; black or purple-blue when ripe**.

This species has recently been sunk under *C. bispinosa*, (Germishuizen & Meyer 2003), but because of the differences in appearance and distribution they have been kept separate here.



DISTRIBUTION & ABUNDANCE

Uncommon to locally common in three, small, disjunct populations south of 25° S.

HABITAT

Found on hill slopes and along dry water-courses. Grows on stony ground.

GROWTH FORM

A shrub in the 1–3-m height class.

ANNUAL CYCLE

Observed in September, October and from February to April. FLOWERS and FRUIT recorded in September and from February to April. LEAVES present in each of the months observed.

CONSERVATION CONCERNS

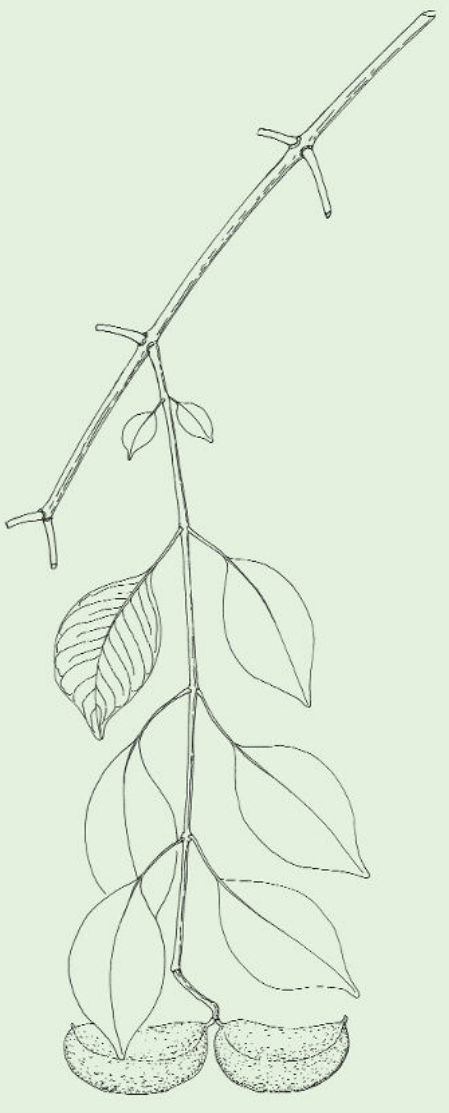
None recorded.

Diplorhynchus condylocarpon

Horn-pod Tree

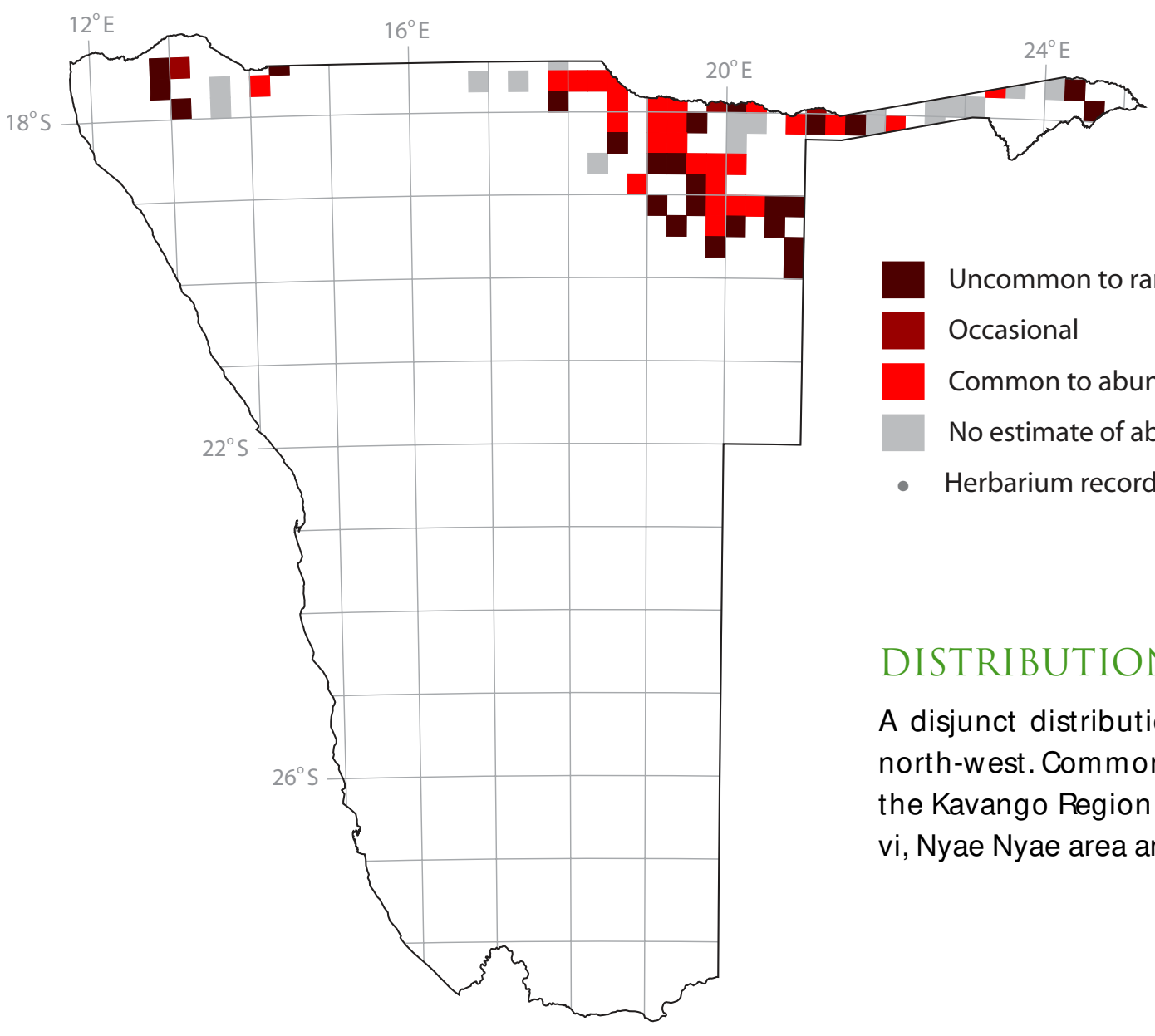
Murere (Rk, Rum); munoma (T)

[89 records from 73 (7%) squares]



Shrub or multi-stemmed tree, **with drooping branches and sticky, milky latex**. LEAVES simple, drooping, with **long petiole; leaf elliptic to almost circular**, 30–100 mm long, dark green, **shiny above; pale to yellow-green below; 8–16 pairs of yellowish, parallel lateral veins**; margin somewhat wavy. FLOWERS **6–8 mm long, white to cream-coloured; in loose, open, few-flowered sprays**. FRUIT **paired, horn-like, woody, dry capsules; reddish-brown with white lenticels; splitting open and flattening into a rectangular structure with seeds attached to the corners**.

The leaves might be confused with *Ozoroa okavangensis* or *O. longipes*, neither of which has the milky latex or the horned pods of this species.

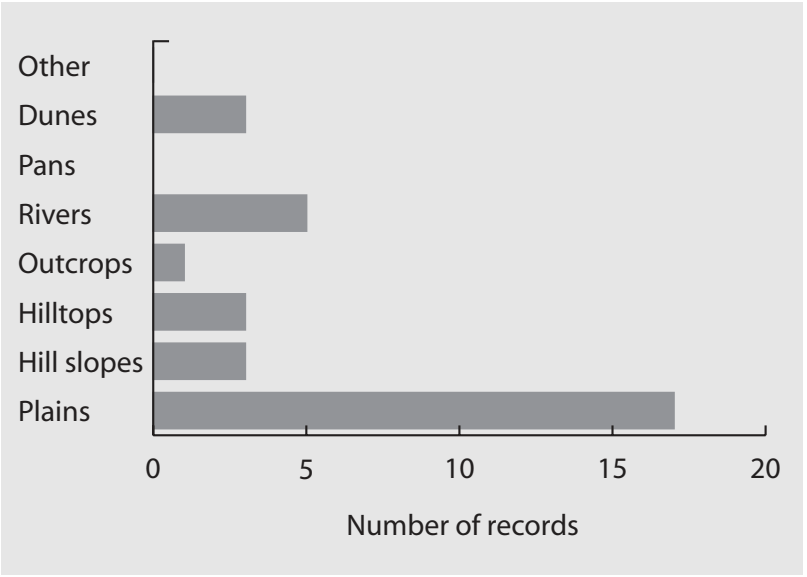


DISTRIBUTION & ABUNDANCE

A disjunct distribution in the north-east and north-west. Common to abundant in places in the Kavango Region; uncommon in the Capri-vi, Nyae Nyae area and in the north-west.

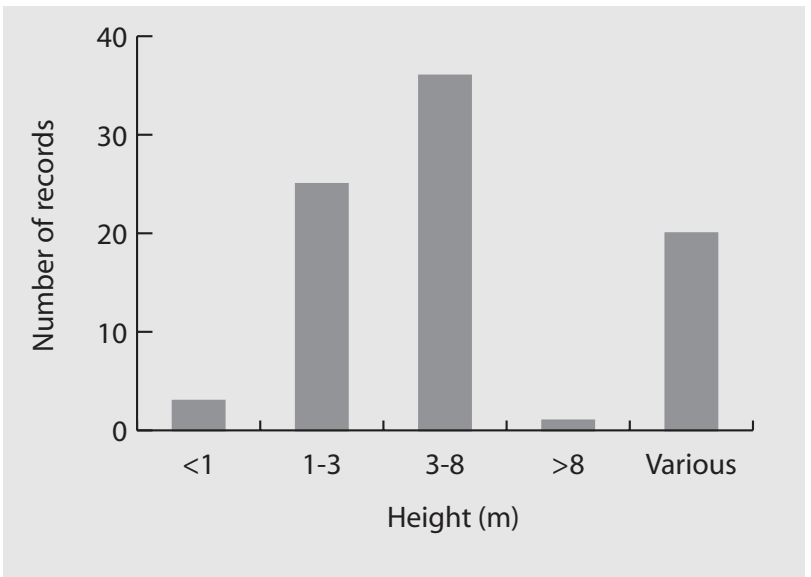
HABITAT

Mainly found on sandy plains in mixed woodland, but also on dunes and along omurambas in the north-east; found on rocky hills and outcrops in the north-west.



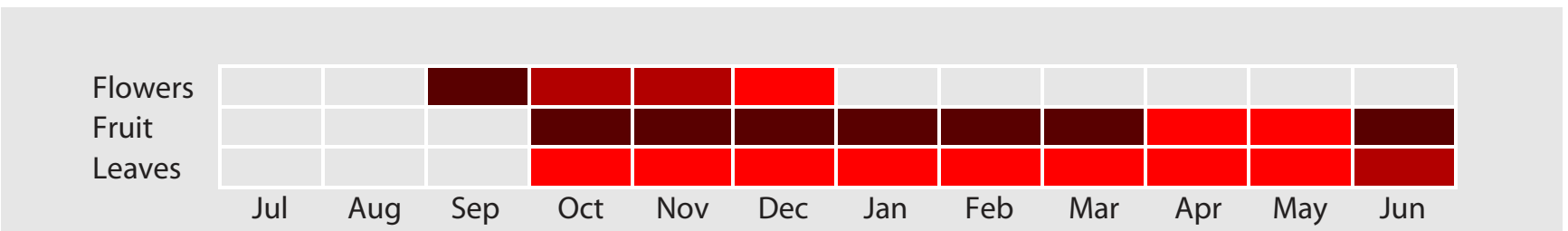
GROWTH FORM

A tree or shrub of 3–8 m high, with many records of stands of plants of mixed heights.



ANNUAL CYCLE

FLOWERS mainly December, but sometimes starting in September. FRUIT from October to June, but mostly April and May. LEAVES October to June.



GENERAL

Heavily browsed by elephants. This plant is very sensitive to veld-fires, thus single-stemmed trees are seldom found in areas which burn frequently; the wood is used as firewood. The latex is used to trap birds. Various parts of the plant are used medicinally. This plant is of horticultural potential for frost-free areas as seeds and cuttings are easily propagated and it has attractive foliage and flowers.

CONSERVATION CONCERNS

None recorded.



Diplorhynchus condylocarpon, Kavango Region, B. Curtis

Adenium boehmianum

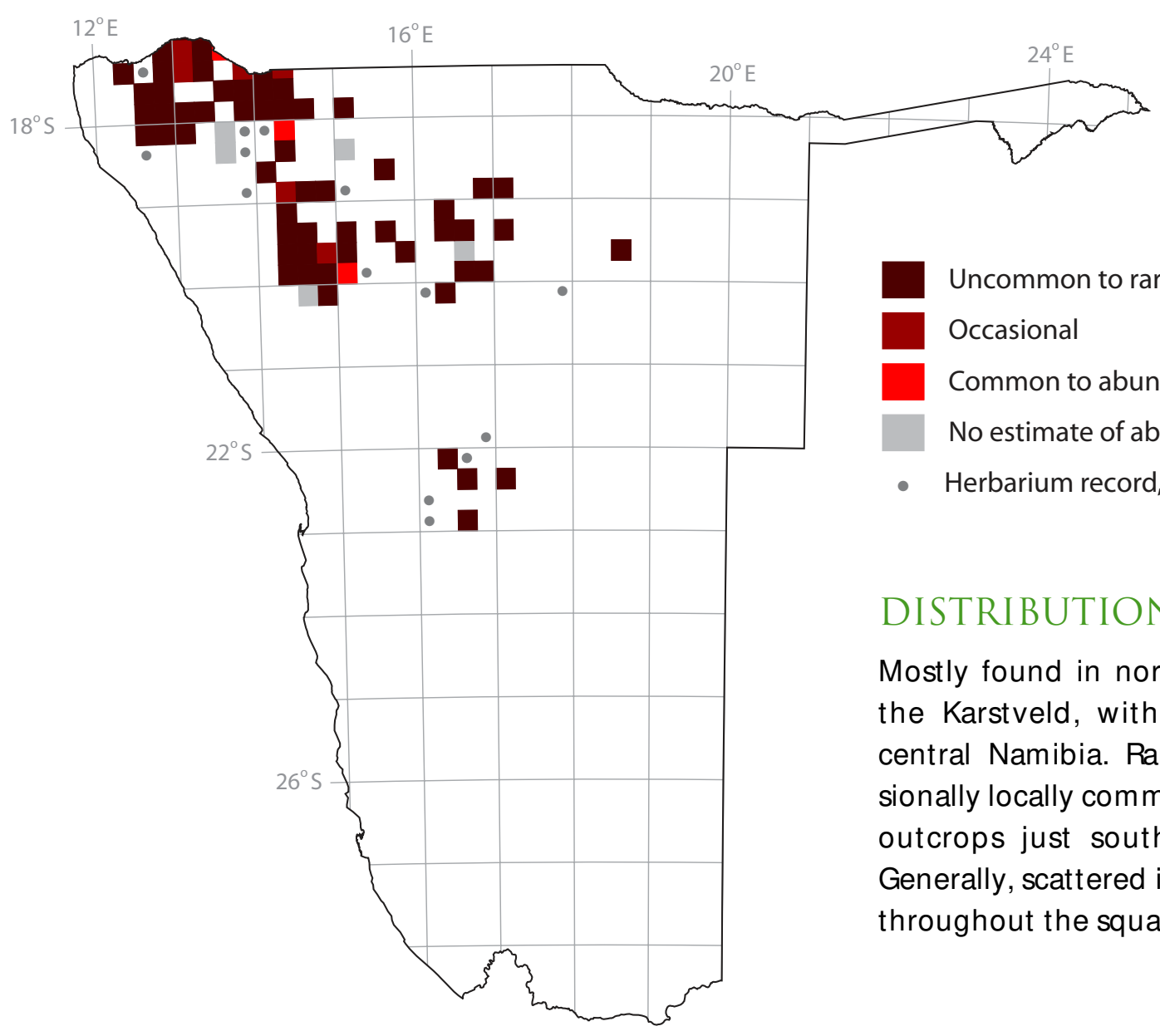
Ouzuwo

Bushman poison (E); boesmangif (A)

[165 records from 73 (7%) squares]



Few-stemmed shrub or tree, **with a fairly thick, succulent trunk**. BARK grey-brown, **smooth**. LEAVES **simple, clustered on ends of branches**, elliptic, 60–200 mm long, **longitudinally folded; dark green above**, pale green below with prominent veins, **both surfaces velvety; margin wavy**, occasionally turned under. FLOWERS **showy, tubular, fairly large; pink with a darker throat**. FRUIT paired, dry, cylindrical capsules, each up to 250 mm long. SEEDS with tufts of silky, golden-brown hairs at both ends.

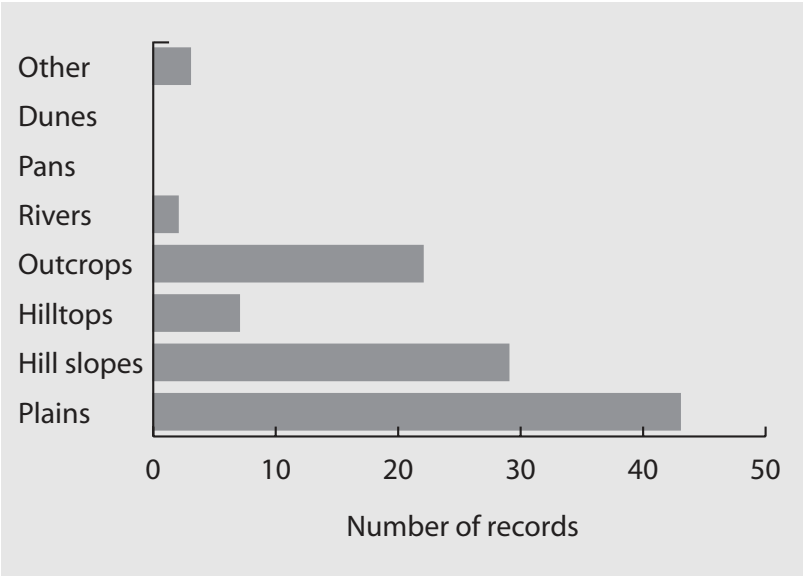


DISTRIBUTION & ABUNDANCE

Mostly found in north-western Namibia and the Karstveld, with a small population in central Namibia. Rare to uncommon; occasionally locally common, for instance on rocky outcrops just south of the Kunene River. Generally, scattered individuals may be found throughout the square.

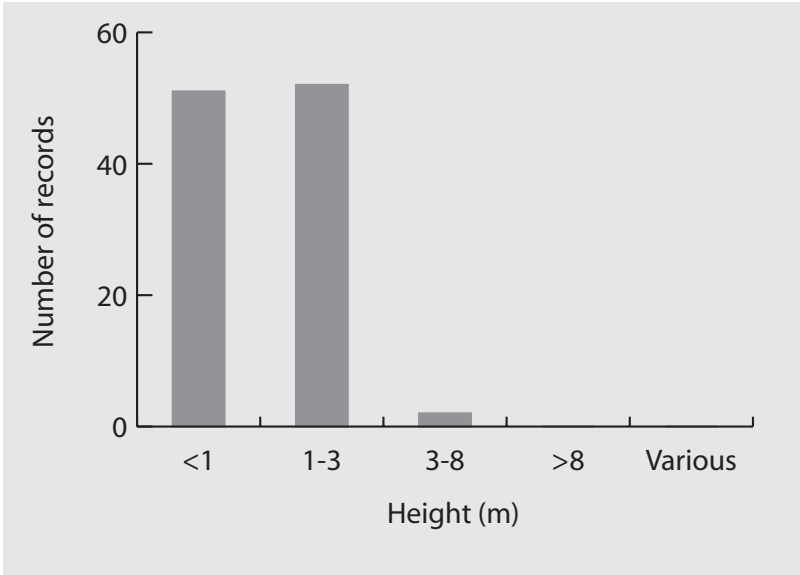
HABITAT

Found on plains, hill slopes and rocky outcrops. Grows on rocky substrates usually, but sometimes on sand. One specimen was found on a floodplain in 2016AB (BUR3).



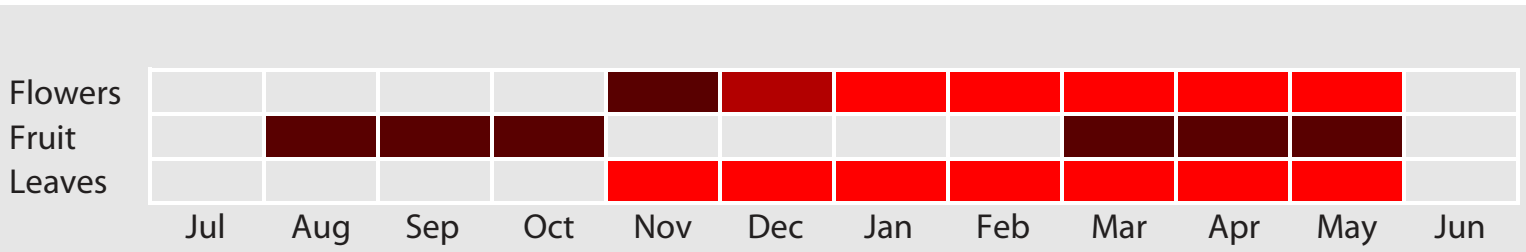
GROWTH FORM

Generally a shrub up to 1 m tall or just over; occasionally a tree up to 3 m or more.



ANNUAL CYCLE

FLOWERS from December to May. FRUIT March to October. LEAVES present from November to May.



GENERAL

Browsed, probably by steenbok or duiker. The milky sap from the tuber is used as arrow poison. This plant is of horticultural potential for dry gardens due to its attractive flowers.

CONSERVATION CONCERNS

Potentially threatened by illegal collecting.



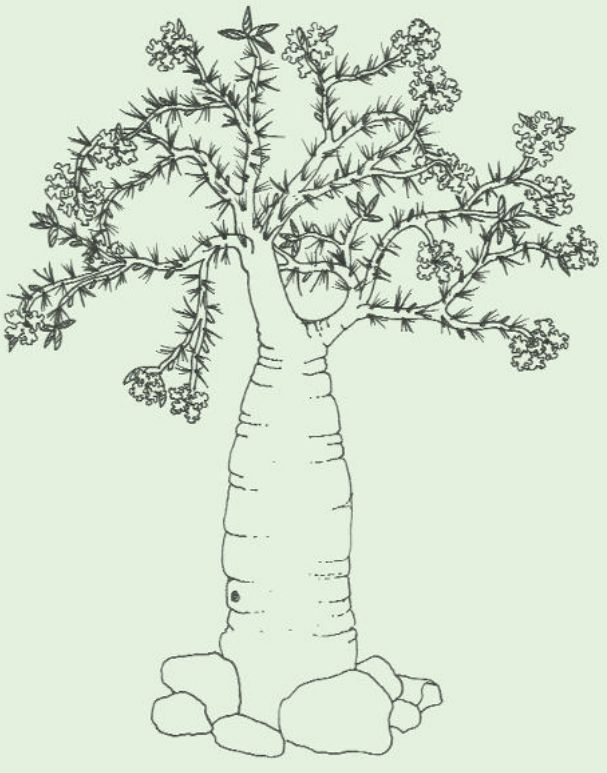
Adenium boehmianum, leaves and flowers, B. Curtis

Pachypodium lealii

Bottle Tree

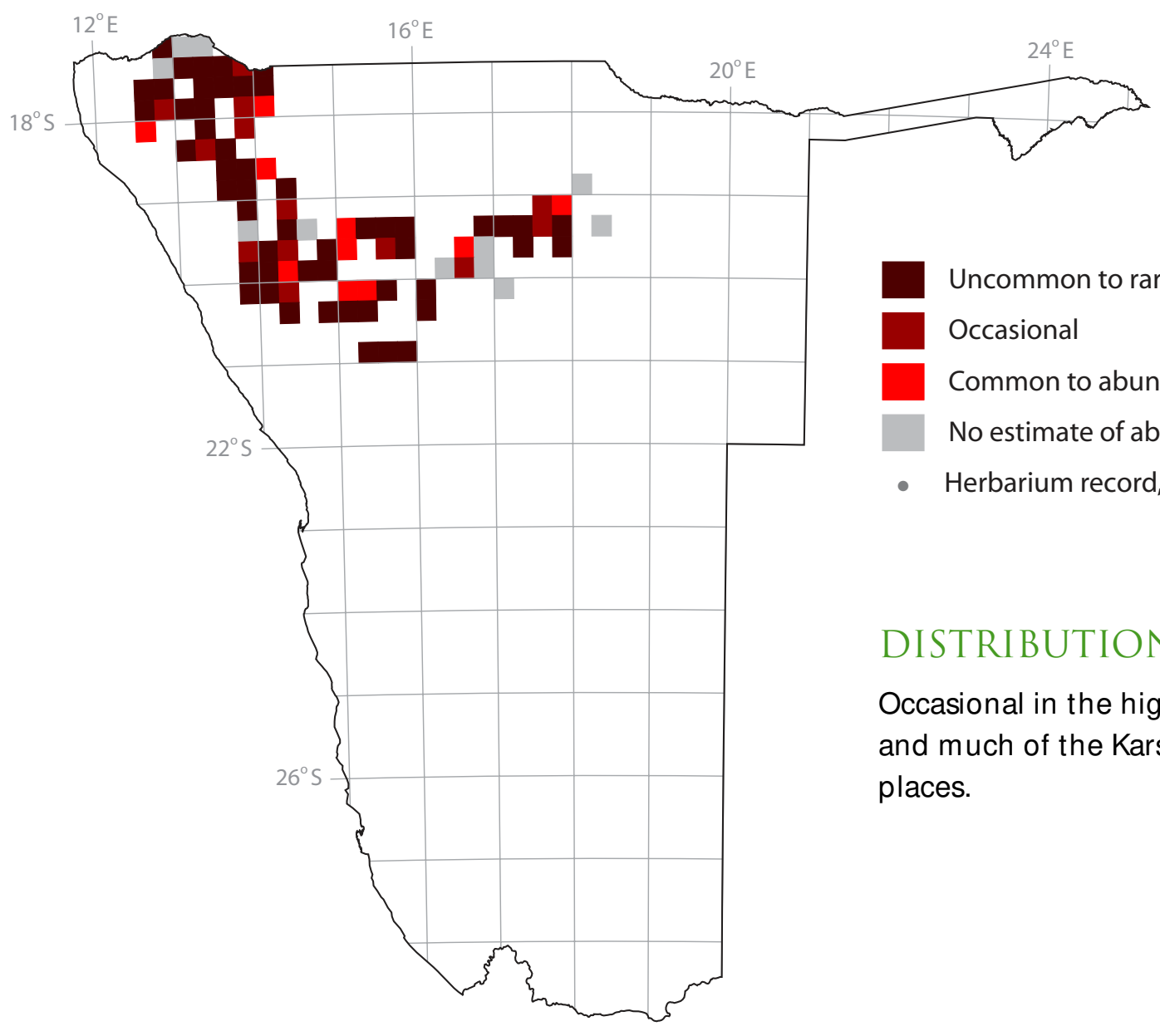
Bottelboom (A); Flaschenbaum (G); ohwanga (H)

[230 records from 85 (8%) squares]



Sparsely branched, with a succulent, bottle-shaped stem, sometimes a squat shrub; not forming a canopy. BARK **smooth, pinkish-grey to pale brown**. THORNS **white with darker tip, in clusters of three**. LEAVES **clustered in the axils of spines; oblanceolate to elliptic**, 60–95 mm long; midrib prominent below; margin wavy; apex pointed; base tapering; petiole very short. FLOWERS **showy, white, flushed with pink in the throat, funnel-shaped; petals crinkled**. FRUIT cylindrical, up to 100 x 10 mm; brown when ripe.

The flowers and fruit are conspicuous.

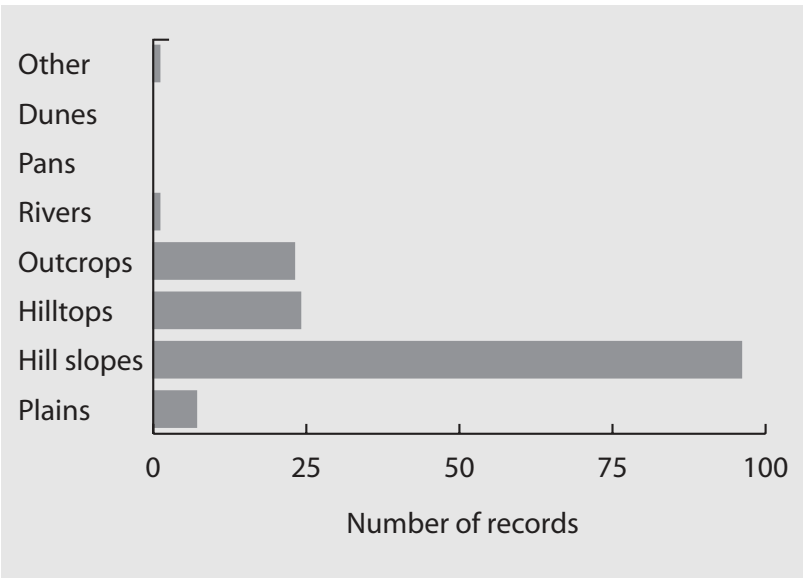


DISTRIBUTION & ABUNDANCE

Occasional in the highlands of the north-west and much of the Karstveld; locally common in places.

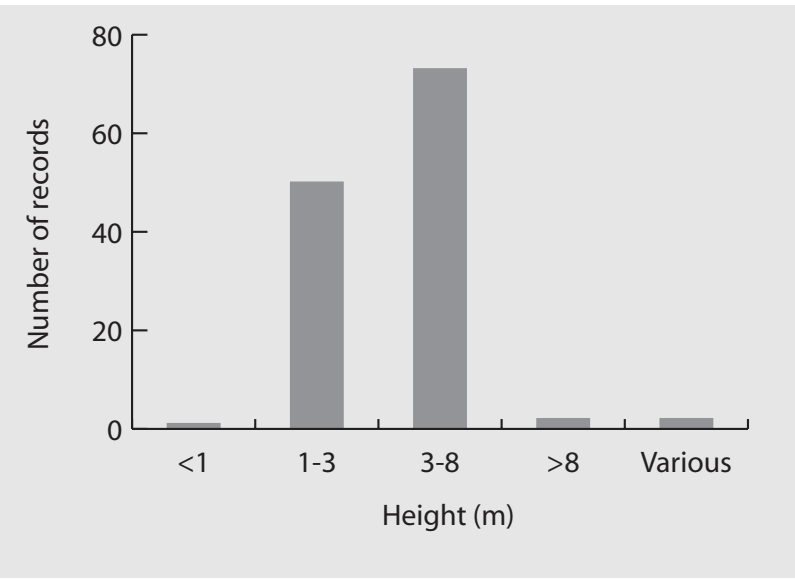
HABITAT

Found on hill slopes, hilltops and rocky outcrops. Always on rocky substrates, generally dolomite and basalt, sometimes granite and schist.



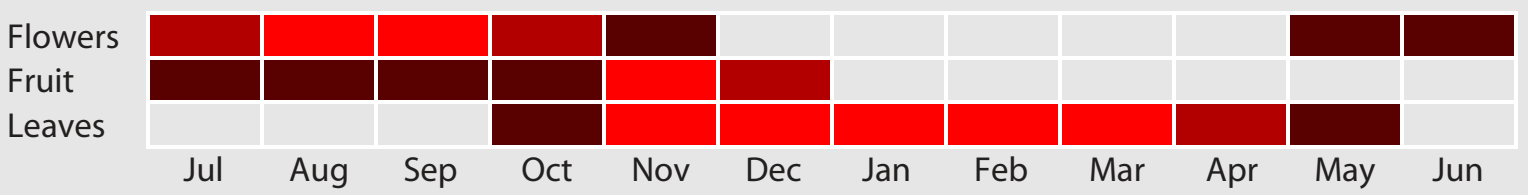
GROWTH FORM

A tree 1–8 m high, sometimes taller. Sometimes with a very squat stem, branching near the ground.



ANNUAL CYCLE

FLOWERS from May to November, with highest peak in August; they flower in winter in the north-west and spring in the Karstveld. FRUIT July to December. LEAVES November to April.



GENERAL

Often damaged by elephant and porcupine in the north-west. The sap contains a glucoside, pachypodin, which is used as a component of arrow poison and applied to inflamed wounds and abscesses on humans and animals. Drinking bowls are carved from the wood by Himba, and used to poison birds.

CONSERVATION CONCERNS

This plant is vulnerable to the pachycaul trade and the lack of evidence of young trees is a concern. Protected by the Nature Conservation Ordinance and listed on CITES Appendix II. It is a near-endemic, extending into the extreme southern areas of Angola.

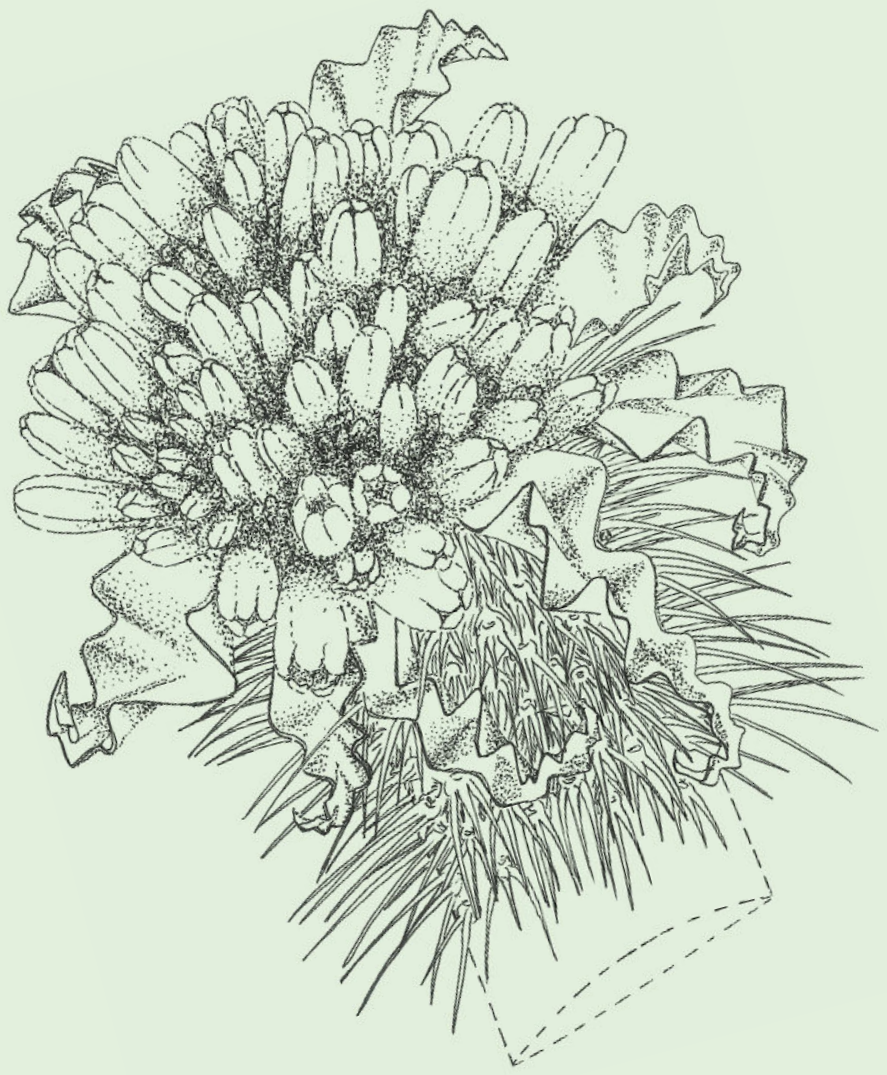


Pachypodium namaquanum

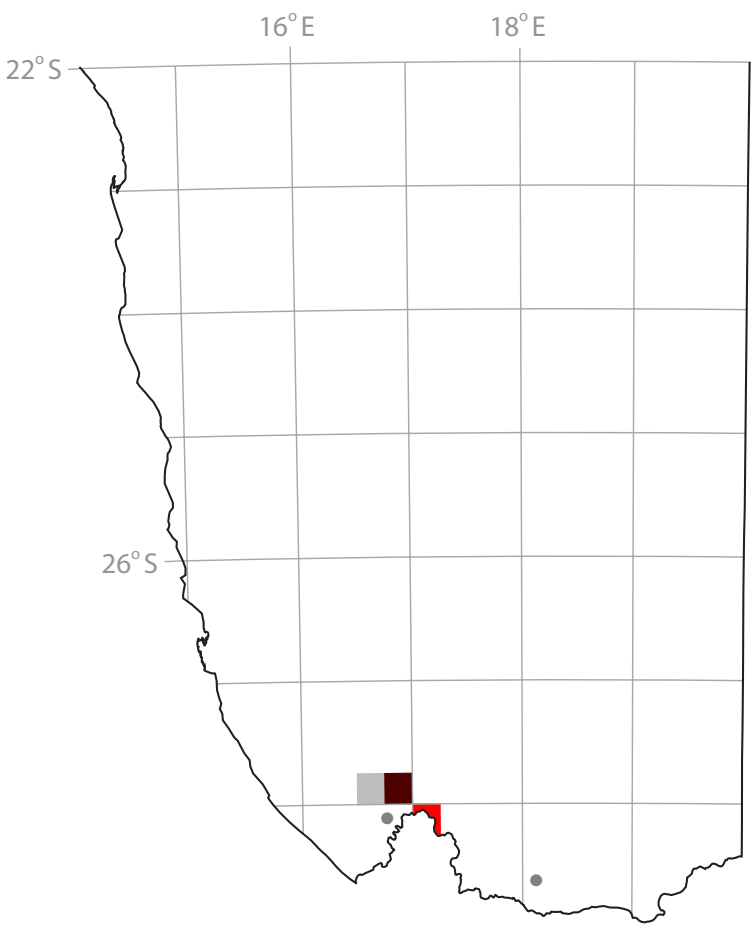
Halfmens

Elephant-trunk (E); Halbmensch (G); gonneb, sanni (K)

[8 records from 3 (<0.5%) squares]



Generally unbranched tree. TRUNK **dark grey, cylindrical, thickened at base with warty protuberances bearing straight thorns; typically bent towards the north**. THORNS **in clusters of three**, straight, 20–50 mm long. LEAVES **clustered at growth points, sessile; elliptic, pale green with dense, bristly covering; margin conspicuously wavy**. FLOWERS **concentric around growth points; corolla tube yellow-green outside and red-brown inside**. FRUIT as two 40 mm long capsules.



Uncommon to rare
Occasional
Common to abundant
No estimate of abundance
Herbarium record, pre-1997

DISTRIBUTION & ABUNDANCE

Uncommon to locally abundant in a very restricted part of the south-west.

HABITAT

Found on rocky hill slopes and once on a hilltop.

GROWTH FORM

A tree, mostly in the 1–3-m height class. A number of young ones recorded.

ANNUAL CYCLE

No observations were made from April to September. FLOWERS September and October. FRUIT none recorded. LEAVES present each time observations were made.

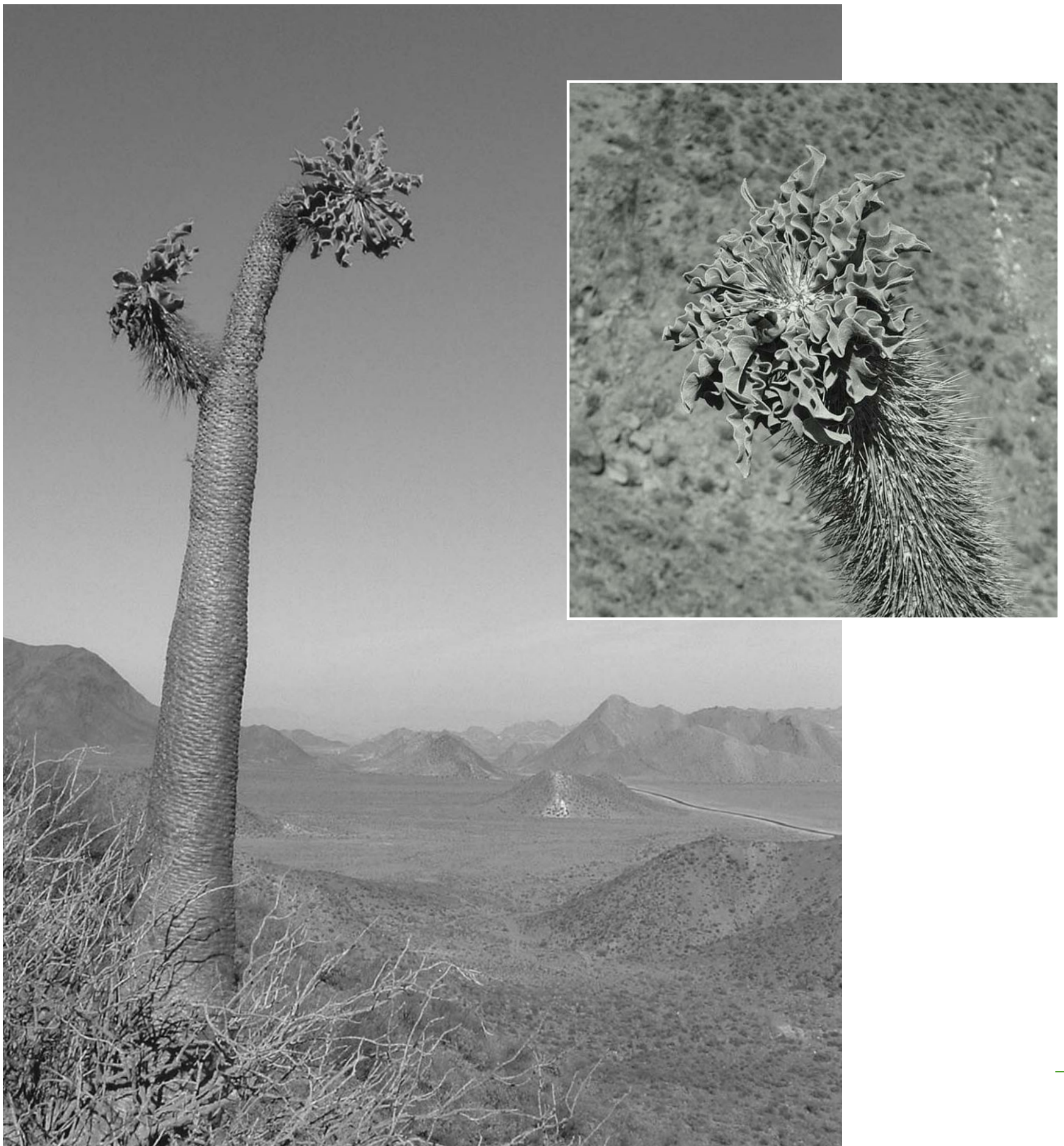
GENERAL

Legend has it that these plants are half human and half plant, hence the Afrikaans and German common names. The English name refers to the shape, texture and colour of the trunk.

CONSERVATION CONCERNS

Rare, both in Namibia and just over the border in South Africa, and threatened by the pachycaul trade. Protected by the Nature Conservation Ordinance, and listed as a CITES Appendix I species. Assessed as 'near-threatened' (Craven & Loots 2002).

Pachypodium namaquanum. Whole plant, Werner Voigt. Leaves and flower, Holger Kolberg

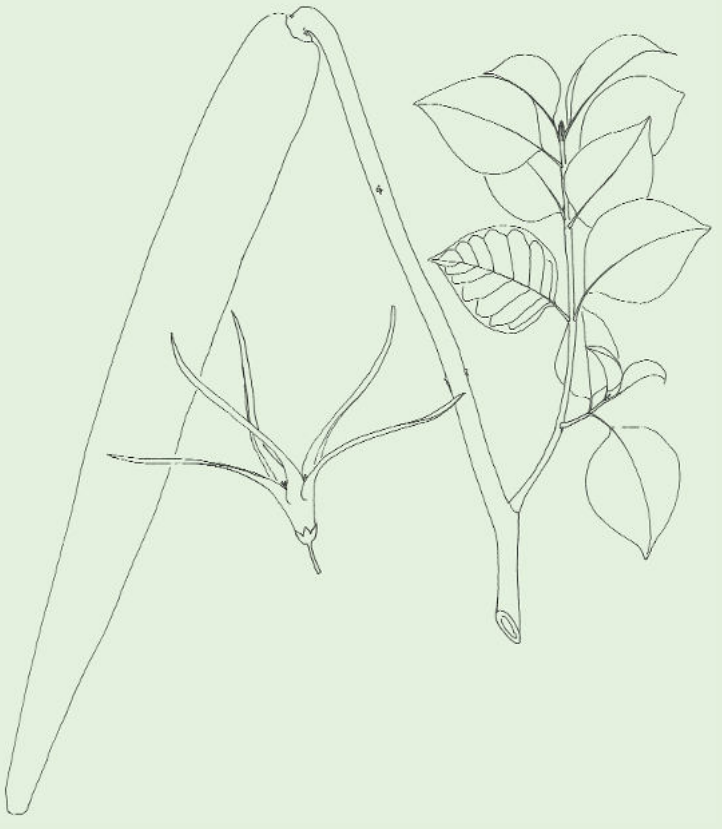


Strophanthus amboensis

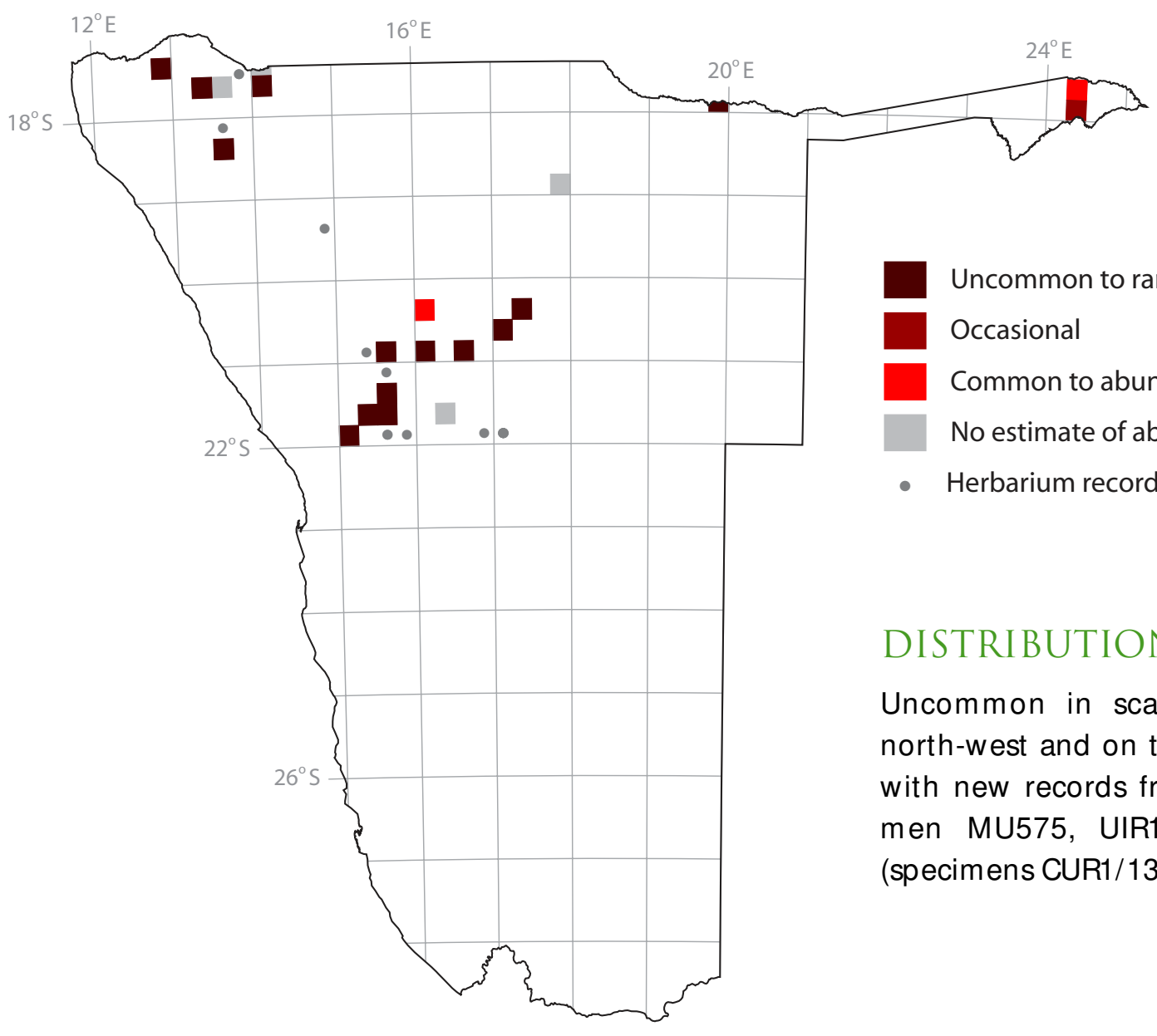
Elephant Vine

Omuhundure (H)

[35 records from 21 (2%) squares]



Deciduous, **densely intertwined shrub or liana, with thick, snake-like stems**. LEAVES **simple, with successive pairs at right-angles to each other; broadly ovate**, 20–50 mm long; pale green; midrib prominent and sparsely downy below. FLOWERS **corolla tube short, red; corolla lobes narrow, up to 40 mm long, twisted, yellow**. FRUIT two dry, woody capsules, each 200–300 mm long, cylindrical, woody; splitting open when ripe. SEEDS many, with a tuft of silky hairs on one end.

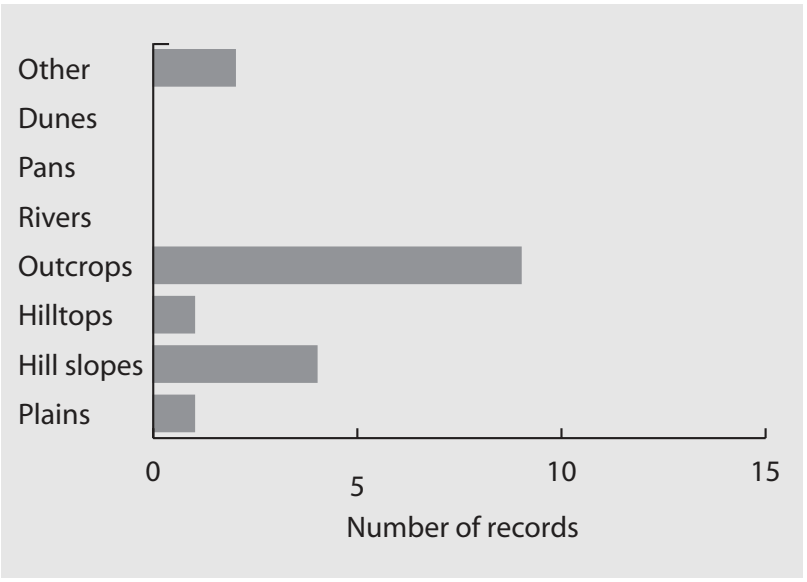


DISTRIBUTION & ABUNDANCE

Uncommon in scattered localities in the north-west and on the north-central plateau, with new records from the Karstveld (specimen MU575, UIR1) and eastern Caprivi (specimens CUR1/1335 and CJHH1118, HIN1).

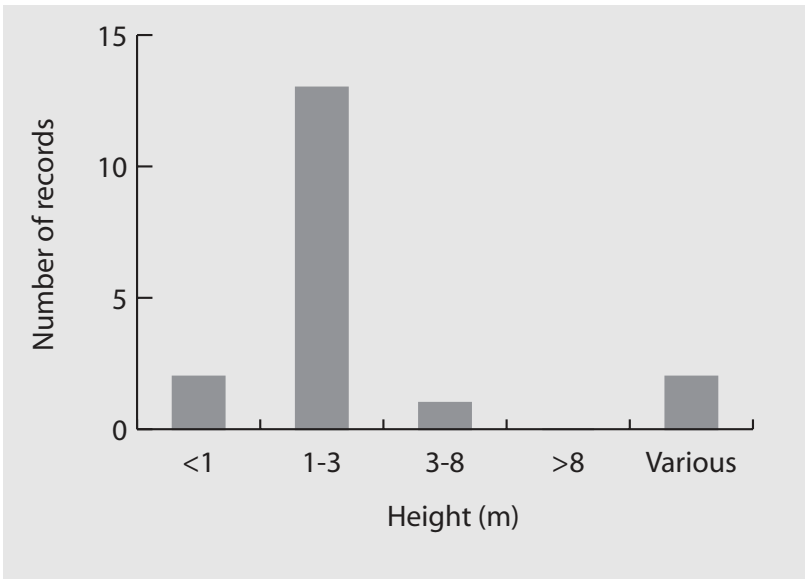
HABITAT

Mainly found on rocky outcrops, hill slopes, kloofs and cliffs, but on sandy plains in eastern Caprivi.



GROWTH FORM

A shrub or climber in the 1–3-m height class; one record over 3 m high.



ANNUAL CYCLE

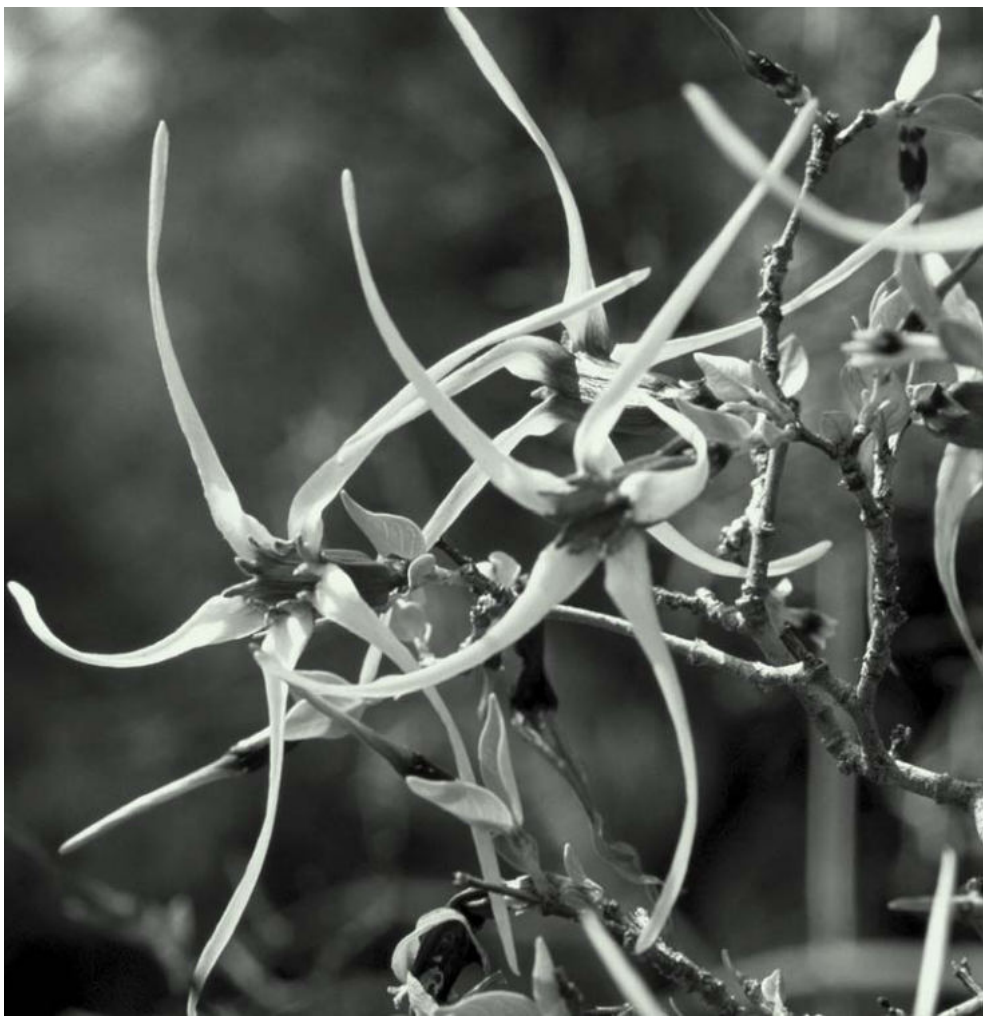
FLOWERS September to April. FRUIT all year. LEAVES no records in July and September (only one or two annual cycle observations per month from June to November).

GENERAL

The seeds contain glucosides and, due to the presence of strophanthin, the plant is lethal if browsed. The plant is used medicinally. Due to its lovely flowers, this plant has horticultural potential.

CONSERVATION CONCERNS

None recorded.



Strophanthus amboensis, Caprivi Region, C. Hines

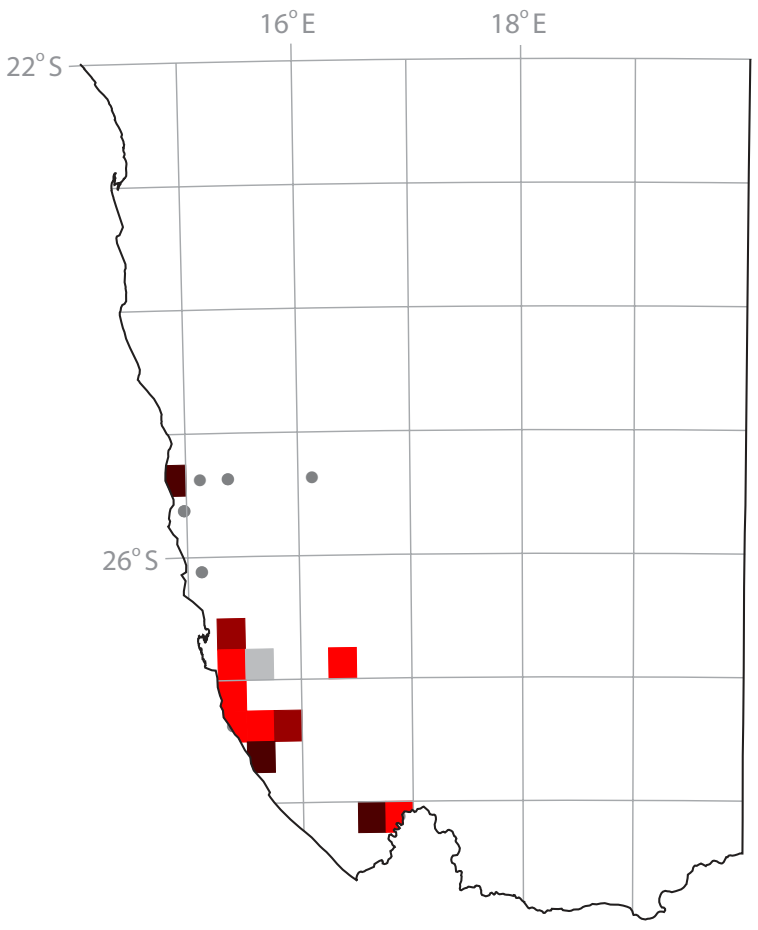
Ectadium latifolium

Broad-leaved Ectadium

[14 records from 11 (1%) squares]



Lax, many-stemmed shrub with milky latex. STEMS **erect** at first, but often drooping near tip. LEAVES simple, **ovate-lanceolate, up to 80 mm long and 17 mm wide**, 5 to 10 times as long as wide, petiolate; yellow-green, thick-textured. FLOWERS in axillary clusters, pale yellow; tubular, tube shorter than lobes. FRUIT a two-horned capsule, **up to 80 mm long**; becoming woody and splitting open when ripe.



Uncommon to rare
Occasional
Common to abundant
No estimate of abundance
Herbarium record, pre-1997

DISTRIBUTION & ABUNDANCE

Locally common in the southern Namib, generally close to the coast, with scattered records further inland. According to earlier herbarium specimens, the plant is slightly more widespread than reported by the TAP.

HABITAT

Found on rocky outcrops and sandy plains; also on the floodplain of the Orange River.

GROWTH FORM

A shrub, 1–3 m high.

ANNUAL CYCLE

FLOWERS recorded in September, October, January and May. FRUIT most months. LEAVES only recorded in September and December.

CONSERVATION CONCERNS

Endemic; worthy of conservation because of its limited distribution.

Ectadium virgatum

Slender Ectadium

[2 records from 2 squares]

A shrub. LEAVES linear to elliptic, 10–20 times longer than wide. FRUIT each capsule 40–50 x *c.* 10 mm.



Two TAP records from the Orange River (2816CB, 2817AA). It is an uncommon shrub in the 1–3-m height class with flowers in October. According to earlier herbarium specimens it is fairly widespread along the Orange River; also from the Uri-Hauchab Mountains (2515AC).

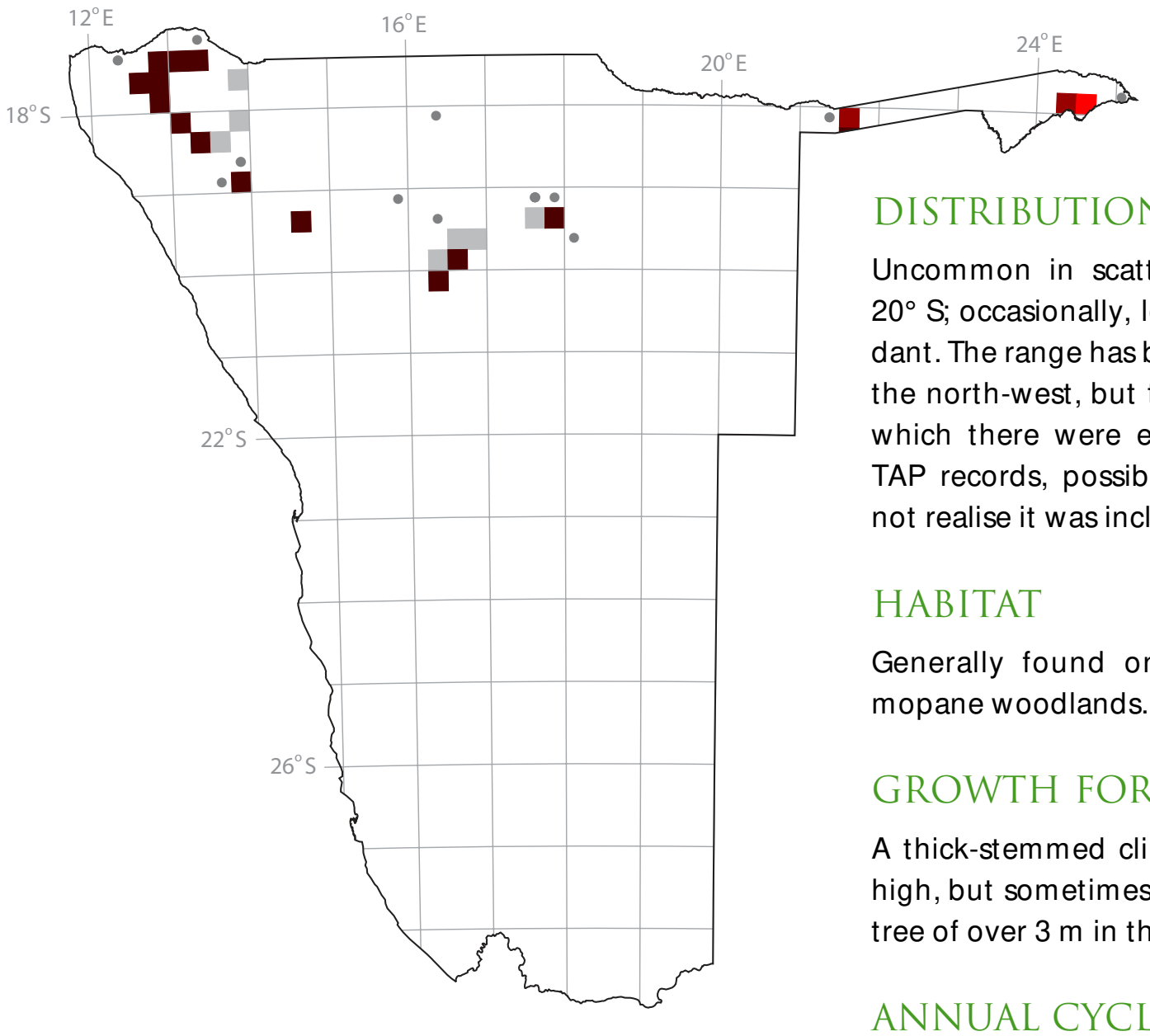
Fockea multiflora

Python Vine

Otjipwiya (H); mbona (T)

[34 records from 22 (2%) squares]

Shrub, **often somewhat strangling**, occasionally with a very large, bulbous stem-base; can twine high into other woody species; **milky latex present**. BARK **olive-brown, waxy, with whitish lenticels when young**. LEAVES opposite, broadly elliptic to ovate, up to 100 mm long and 80 mm wide; **grey-felty below**. INFLORESCENCE a many-flowered axillary cluster. FLOWERS **yellow-green, c. 15 mm in diameter**. FRUIT paired, dehiscent, horn-like capsules. SEEDS **with marginal wing**.



DISTRIBUTION & ABUNDANCE

Uncommon in scattered localities north of 20° S; occasionally, locally common to abundant. The range has been extended in areas of the north-west, but there are also areas from which there were earlier herbarium but no TAP records, possibly because atlassers did not realise it was included.

HABITAT

Generally found on plains, in mixed and mopane woodlands.

GROWTH FORM

A thick-stemmed climber, usually up to 3 m high, but sometimes over 8 m. Occasionally a tree of over 3 m in the north-west.

ANNUAL CYCLE

No observations were made in June, July, September and October and there were no TAP records of flowers or fruit. FLOWERS in October and December, according to herbarium records. FRUIT in August, according to herbarium records. LEAVES recorded from November to May, with young leaves in November.

CONSERVATION CONCERNS

None recorded.



Fockea multiflora, twining stem, P.Tarr

Cordia

Saucer-berry

When the TAP was launched, there were four species of *Cordia* listed for Namibia, namely *C. caffra*, *C. monoica*, *C. pilosissima* and *C. sinensis*, with *C. grandicalyx* listed as being of uncertain presence in Namibia (Craven 1999). During the time data were collected for the TAP, the genus underwent a revision and numerous changes were made (Retief, in prep.). As the revision has not yet been completed and published, there is confusion as to which species really do occur in Namibia (Coates Palgrave 2002; Germishuizen & Meyer 2003).

From TAP records and Windhoek herbarium specimens, it seems clear that there are three certain species in Namibia, namely *C. grandicalyx*, *C. pilosissima* and *C. sinensis*. All TAP records for *C. monoica* and *C. caffra* have been included under *Cordia* sp.

Cordia grandicalyx

Large-fruit Saucer-berry

[2 records from 2 squares]

A shrub with **large, almost circular, sandpapery** leaves and a **conspicuously large calyx** in the flowers and fruit.

Two TAP records from Kaokoveld reported a rare tree of 3–8 m on a hill slope (SWA3, specimen 122 from 1712BB), and a shrub of just over 1 m high, growing in a slight hollow on a rocky hill slope (CUR1 and HOF1). There are no earlier Windhoek herbarium records, but it is listed in Germishuizen & Meyer (2003) from a specimen housed in the National Herbarium, Pretoria.

Cordia sp.

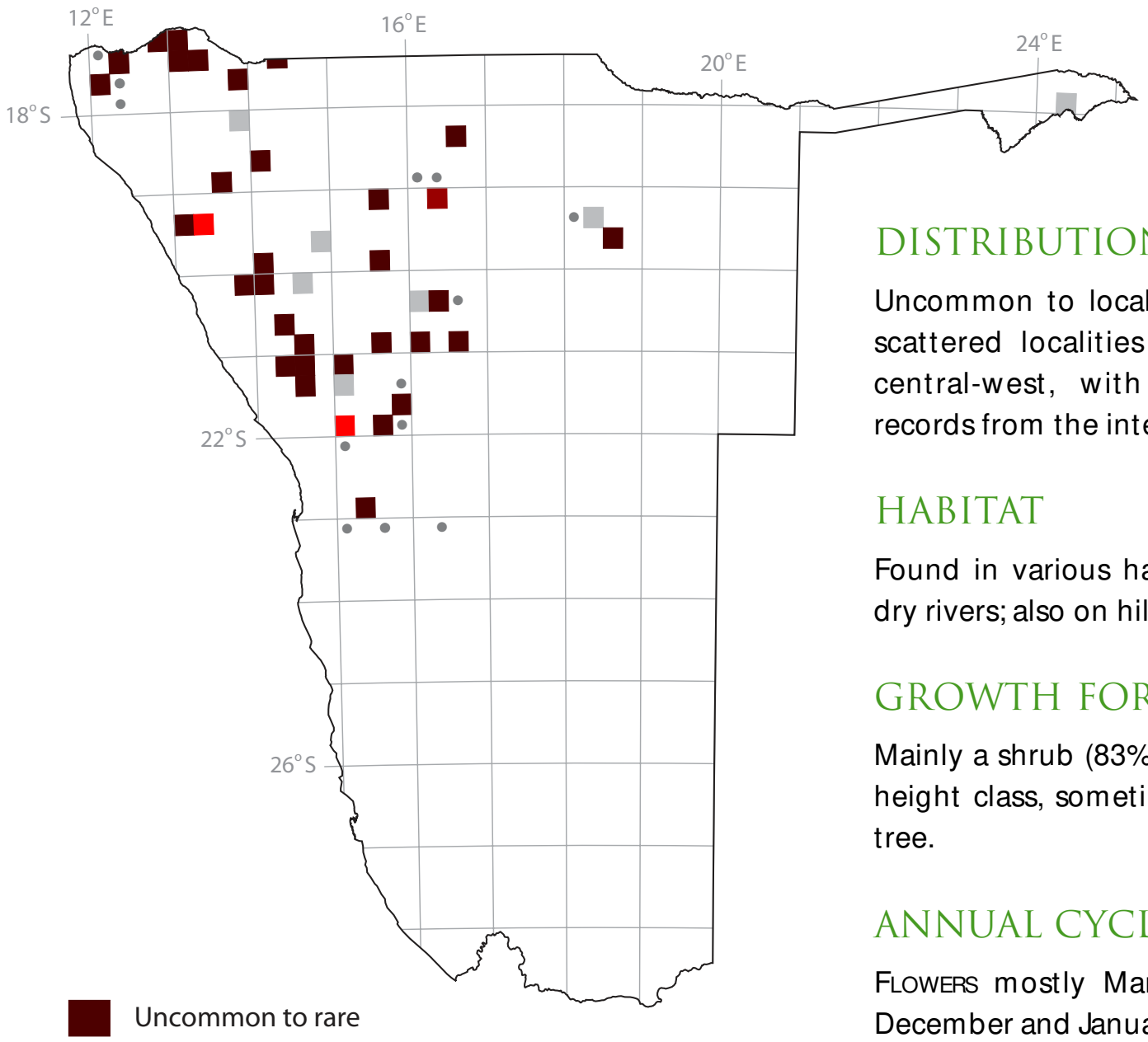
= Cordia monoica

Snotbessie

[52 records from 42 (4%) squares]

A shrub or small tree. LEAVES obovate sandpapery; darker in colour and often smaller than those of *C. sinensis*.

According to Germishuizen & Meyer (2003), the name *Cordia monoica* is a misapplied name for *C. ovalis*, which does not occur in Namibia. The species we have been calling *C. monoica* may well be one or more new species (Retief, in prep.). Thus, the TAP records of *C. monoica* are discussed below as *Cordia* sp. *C. caffra* has also been included here.



DISTRIBUTION & ABUNDANCE

Uncommon to locally common in places, in scattered localities in the north-west and central-west, with even more scattered records from the interior.

HABITAT

Found in various habitats, but mainly along dry rivers; also on hill slopes and plains.

GROWTH FORM

Mainly a shrub (83% of records) in the 1–3-m height class, sometimes taller; occasionally a tree.

ANNUAL CYCLE

FLOWERS mostly March; also April, October, December and January. FRUIT mostly April; also October and from December to June. LEAVES recorded in summer; few observations made in winter.

GENERAL

The leaves are browsed; the berries are edible to humans and birds.

CONSERVATION CONCERNS

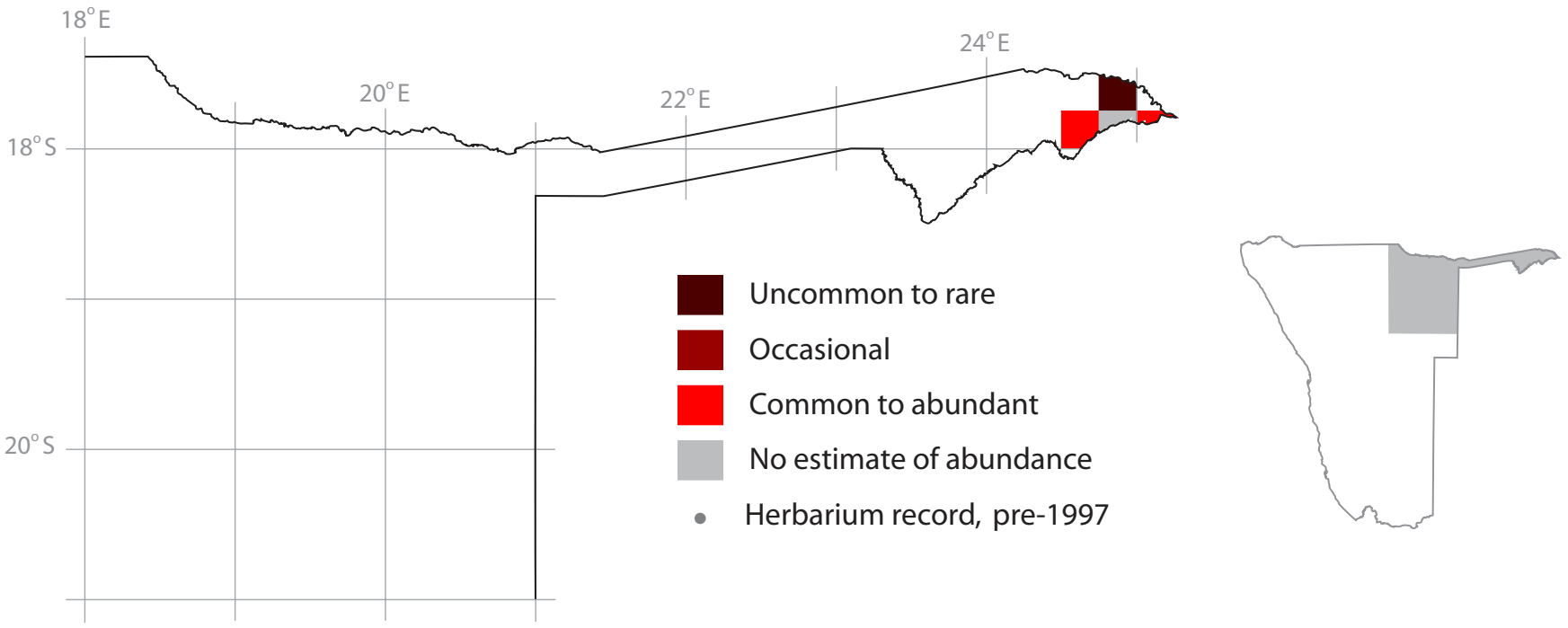
None recorded.

Cordia pilosissima

Woolly Saucer-berry

[4 records from 4 (<0.5%) squares]

Semi-deciduous shrub or small tree, with a tendency to scramble. LEAVES simple, **broadly ovate to almost circular**, 80–160 mm long; **light green, densely covered with hairs; veins conspicuous below**. FLOWERS fairly large; white, cream or whitish-mauve with a tubular, hairy calyx. FRUIT an ovoid berry, up to 38 mm long with a pointed tip; yellow-orange when ripe; **calyx large and conspicuously ribbed; densely hairy**.



DISTRIBUTION & ABUNDANCE

Common to uncommon in far eastern Caprivi and common on Impalila Island (CUR1, specimens BC1409 and 1434). These are new records for Namibia.

HABITAT

Found on floodplains and in riverine thickets.

GROWTH FORM

A shrub in the 1–3-m height class, sometimes taller. Occasionally scrambling.

ANNUAL CYCLE

Only observed in November, when LEAVES, FLOWERS and FRUIT were recorded.

CONSERVATION CONCERNS

None recorded.

Cordia sinensis

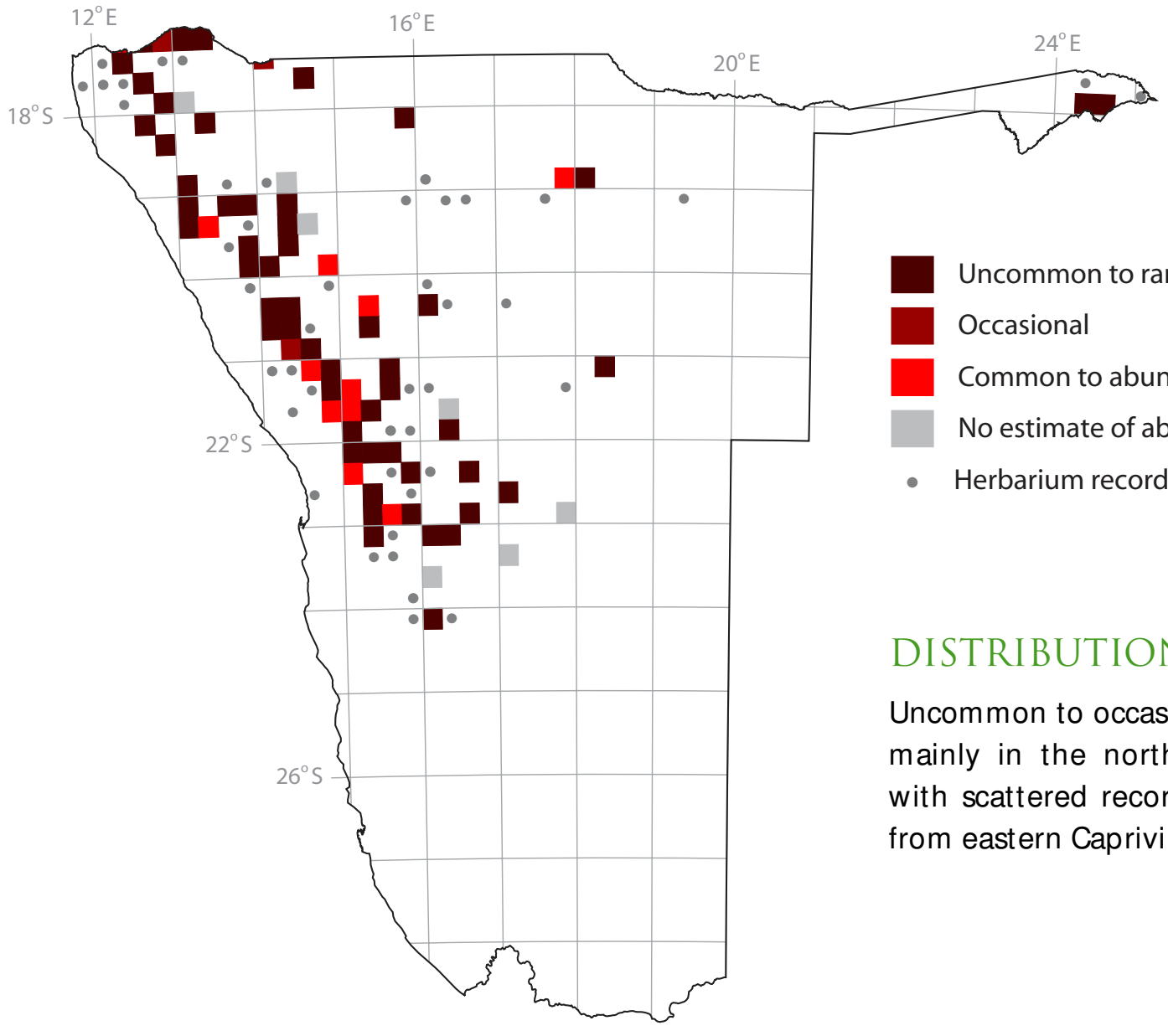
Grey-leaved Saucer-berry

Omusepa (H); muliza (L); kaliko (O)

[177 records from 77 (7%) squares]



Shrub or small tree, often with slender, drooping branches. LEAVES **variable, narrowly elliptic to obovate to oblong; leathery, grey-green, sandpapery**; margin entire to irregularly toothed; apex blunt to slightly notched; base rounded to tapering. FLOWERS up to 10 mm long, white to pink. FRUIT a berry, **oblong-ovoid, up to 20 mm long, with a pointed tip; bottom quarter surrounded by a fused, cup-like calyx, giving the appearance of an acorn; orange-red when ripe**.

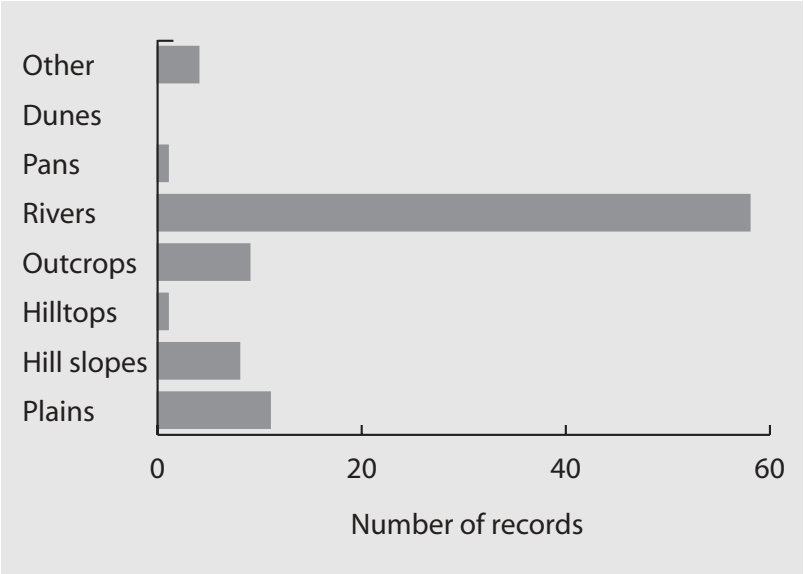


DISTRIBUTION & ABUNDANCE

Uncommon to occasionally common in places, mainly in the north-west and central-west, with scattered records from the interior and from eastern Caprivi.

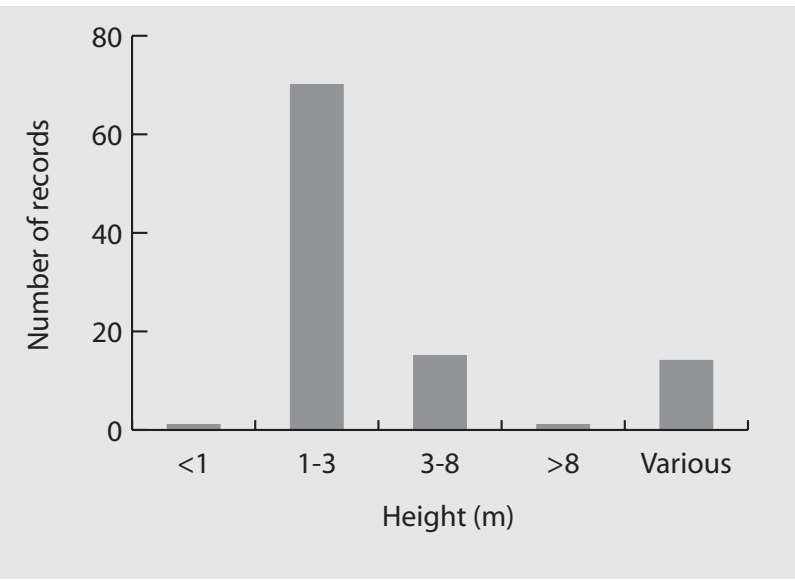
HABITAT

Found in various habitats, but mainly along dry rivers; also on plains in the Karstveld and rocky outcrops in the central-west.



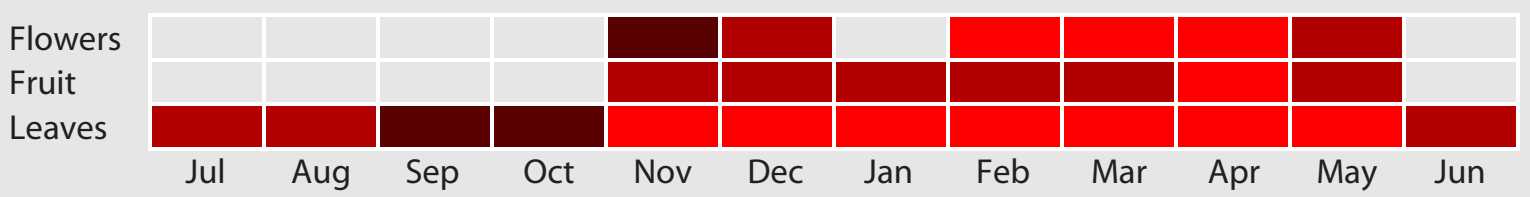
GROWTH FORM

Mainly a shrub (68% of records) in the 1–3-m height class, sometimes taller; occasionally a tree (32% of records).



ANNUAL CYCLE

FLOWERS mostly from February to April, but at least one record every month of the year. FRUIT November to May, with a peak in April. LEAVES mostly November to May, with leaves present on some individuals all year.



GENERAL

The leaves are browsed; the berries are edible to humans and birds.

CONSERVATION CONCERNS

None recorded.

Ehretia

Puzzle Bush

This genus has undergone a revision since the start of the TAP (Retief 2001), and all TAP records have had to be renamed. Records of *E. obtusifolia* or *E. amoena* have largely been renamed *E. namibiensis*. Records of *E. rigida* have been divided into *E. alba* and *E. namibiensis* on the basis of distribution (*E. rigida* is still a valid species, but it only occurs in South Africa). *Ehretia coerulea* is a new species.

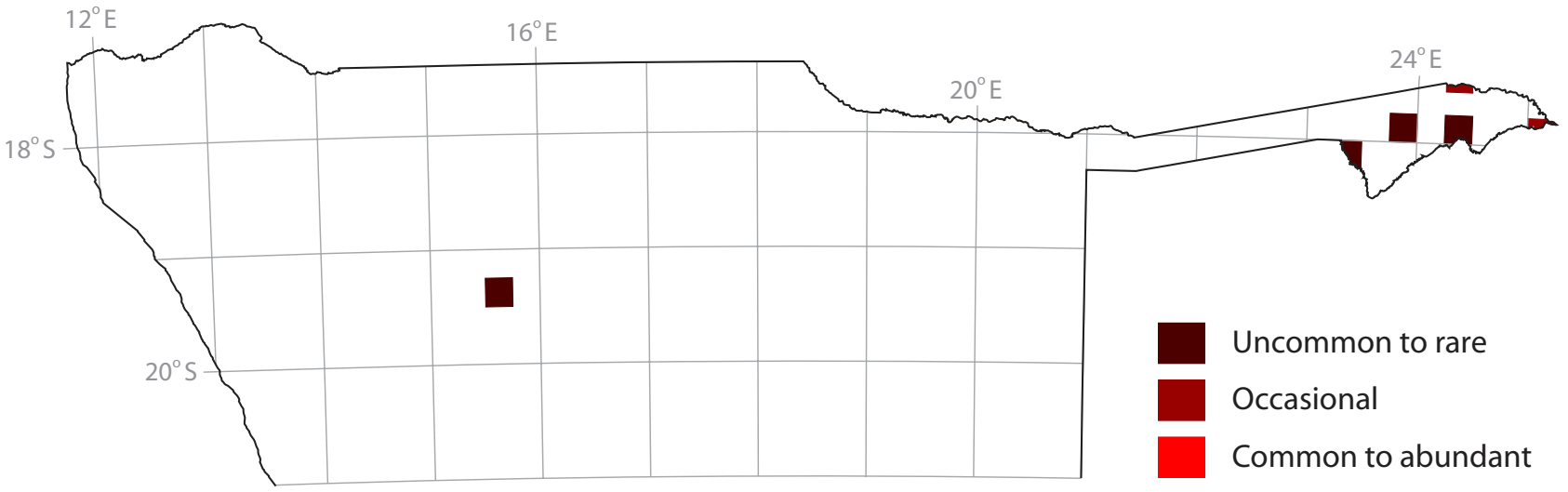
Ehretia coerulea

Purple Stamperwood

[8 records from 6 (<1%) squares]

Shrub or small tree, often wider than high. LEAVES obovate to broadly obovate; 40–80 mm long, both sides with glandular hairs or bristles; veins conspicuous below; margin entire or toothed on the upper half; apex rounded to almost square; base tapering, occasionally asymmetric. FLOWERS **blue to purplish-blue**, sometimes white; 7–9 mm long, **cylindrical or funnel-shaped**; calyx with glandular bristles; showy when in profusion; sweetly scented. FRUIT a fleshy berry; round, 5–7 mm in diameter; orange, with glandular hairs.

This is a new species that was described during the TAP, and may have been overlooked by atlassers who were not aware of its existence.



DISTRIBUTION & ABUNDANCE

Uncommon in eastern Caprivi, with one TAP record from Epacha Lodge (1915BC) and one earlier herbarium specimen from the eastern Okavango River at Andara. The TAP record is a range extension (specimens LH986 and 997, HOF1); it was rare on this farm.

HABITAT

Found on river banks and sandy plains; on a hill slope at Epacha Lodge.

GROWTH FORM

Generally a shrub in the 1–3-m height class; less than 1 m at Epacha Lodge; also a tree of over 3 m along the Kwando River.

ANNUAL CYCLE

No observations were made from May to September FLOWERS recorded in October and March. FRUIT October. LEAVES present during the months of observation.

CONSERVATION CONCERNS

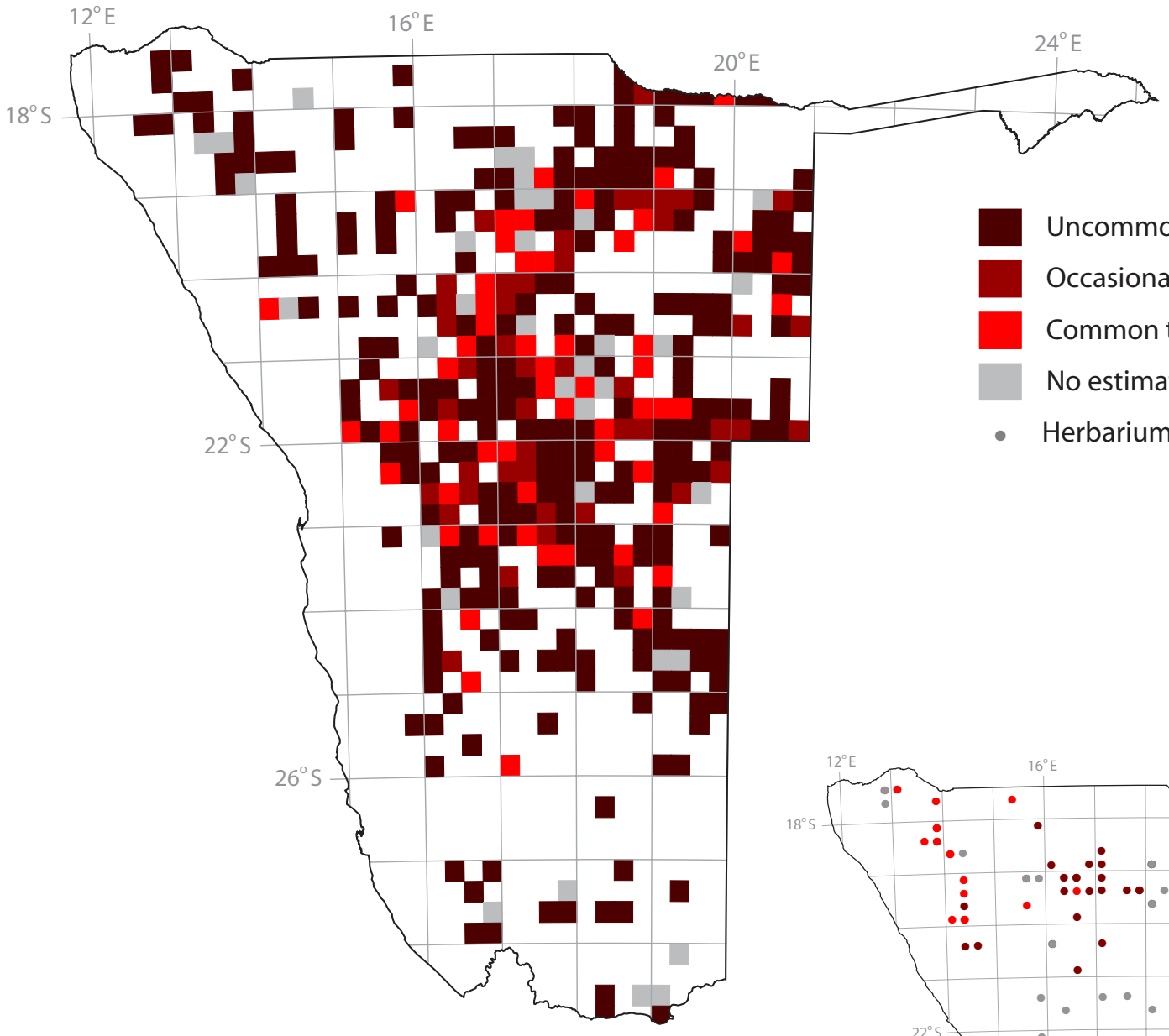
None recorded.

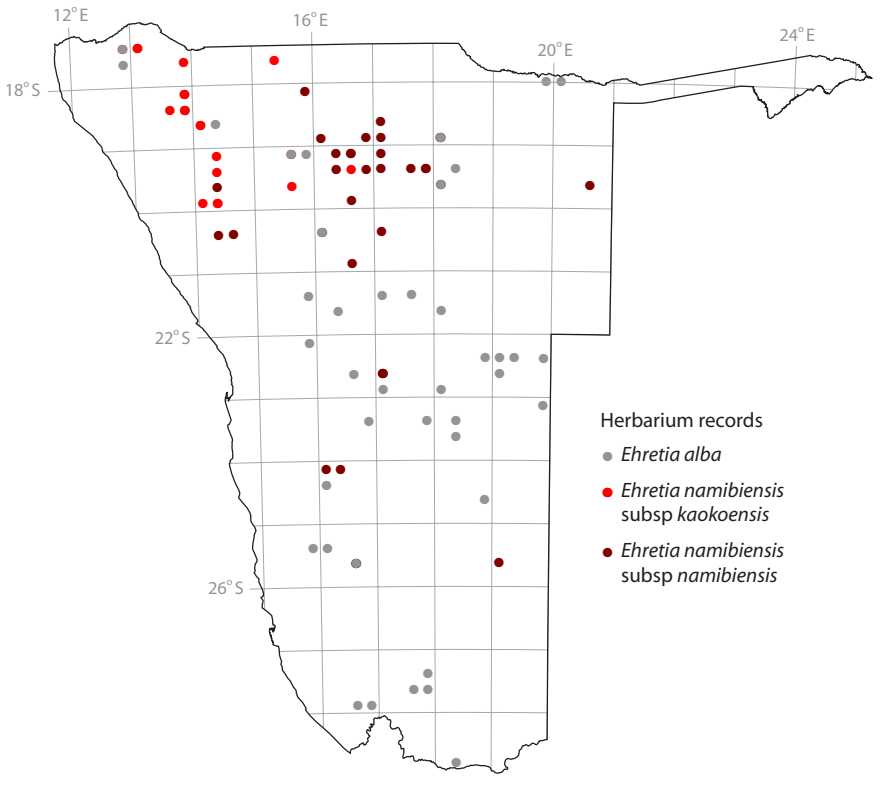
Ehretia alba and *Ehretia namibiensis*

= Ehretia rigida

The revision of the genus *Ehretia* since the start of the TAP (Retief 2001) has divided *Ehretia rigida* in Namibia into *E. alba* and *E. namibiensis* (*E. rigida* is still a valid species, but it only occurs in South Africa).

Because it is not possible to go back to a sight record and check the identification, all abundance records for *E. rigida* have been mapped together and are presented below. Re-identified herbarium records have been included as an inset map to show the distribution of the two species.





Ehretia alba

= Ehretia rigida (in part)

White Puzzle-bush

Deurmekaarbos (A); Bergflieder (G); omusepa (H)

[711 records from 312 (29%) squares]



A semi-deciduous shrub, **with rigid branches going in all directions**. BARK smooth, grey to dark grey. LEAVES **generally clustered on dwarf branches**; obovate to elliptic, **6–25 mm; hairless**; midrib and lateral veins prominent below; **margin entire, but with bristles which make it feel coarse**; apex tapering or rounded; base tapering. FLOWERS **white** to cream, **young buds pale mauve to lilac**; corolla tube and lobes *c.* 3 mm long; sweet-scented. FRUIT almost round, 4–6 mm, with persistent calyx; red.

Flowers are small but conspicuous, fruit might be overlooked at a passing glance. This species was formerly known as *E. rigida* in Namibia, and might be confused with *E. namibiensis*.

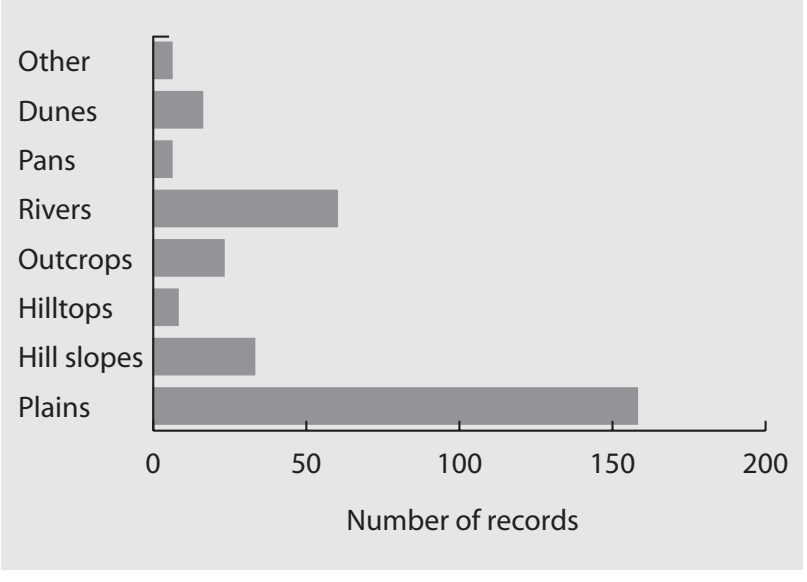
Abundance and distribution are shown along with *E. namibiensis* (page 565). For other aspects of the biology, all records of *E. rigida*, excluding those in the north-west, have been renamed *E. alba*.

DISTRIBUTION & ABUNDANCE

Predominantly in central Namibia and generally uncommon to occasional or common in places. There are only a few records of this species in the north-west.

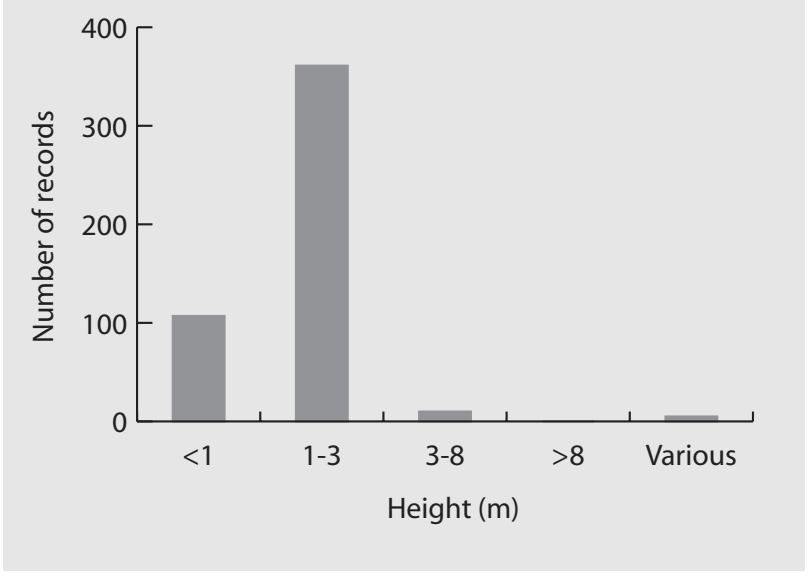
HABITAT

Found in various habitats, but mainly on plains and river banks; also on hill slopes and hilltops in the central highlands and dunes in the south-east. Occurs on rocky, as well as sandy substrates and calcrete.



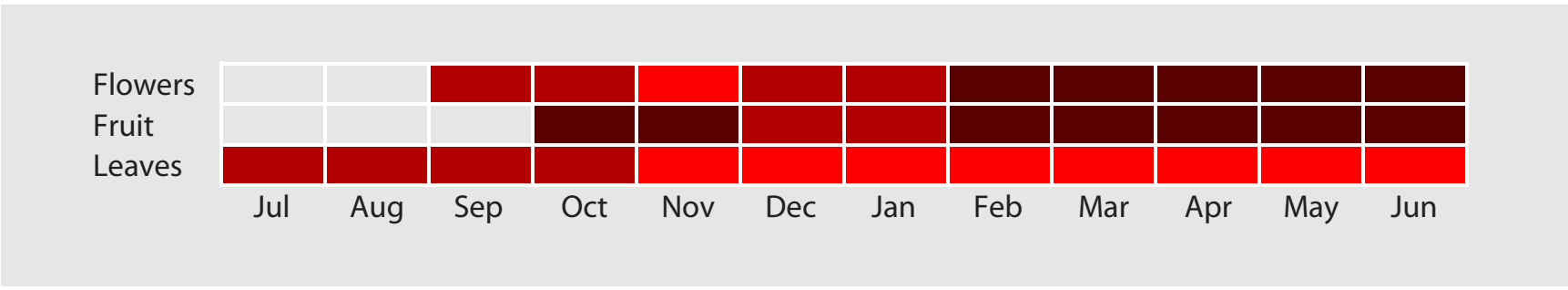
GROWTH FORM

Predominantly a shrub up to 3 m high, but occasionally higher; rarely a tree.



ANNUAL CYCLE

FLOWERS mainly September to January, with some flowers until May. FRUIT October to May, with a peak in December and January, but never prolific. LEAVES some bare individuals from July to November, with young leaves mainly September and October.



GENERAL

Heavily browsed. This plant has the ability to coppice some distance away from the parent plant; it would make a good hedge plant for gardens. Sweetly scented when flowering; often flowers quite profusely.

CONSERVATION CONCERNS

None recorded.

Ehretia namibiensis

= Ehretia rigida (in part)
= Ehretia obtusifolia
= Ehretia amoena

Namibian Puzzle-bush

[121 records from 72 (7%) squares]

Shrub. BARK light grey; stems with scattered bristles and glands. LEAVES alternate or clustered on older branches; broadly obovate to broadly elliptic, 20–50 mm long; sparsely hairy on both sides, dull yellowish-green; midrib with glandular bristles below; margin entire to shallowly toothed; apex rounded, notched or with a small point; base tapering. FLOWERS **lavender blue or light mauve**; 8–9 mm long; corolla lobes shorter than tube; **flower stalk and calyx with dense glandular hairs**. FRUIT a fleshy berry, almost round, 5–6 mm.

This is a recently described species with two subspecies. Subspecies *kaokoensis* occurs in the north-west and subsp. *namibiensis* in the rest of the country. This species can be confused with *E. alba*.

Abundance and distribution are shown along with *E. alba* (page 565). For other aspects of the biology, records of *E. rigida* from the north-west, as well as records of *E. obtusifolia*, have been renamed *E. namibiensis*.

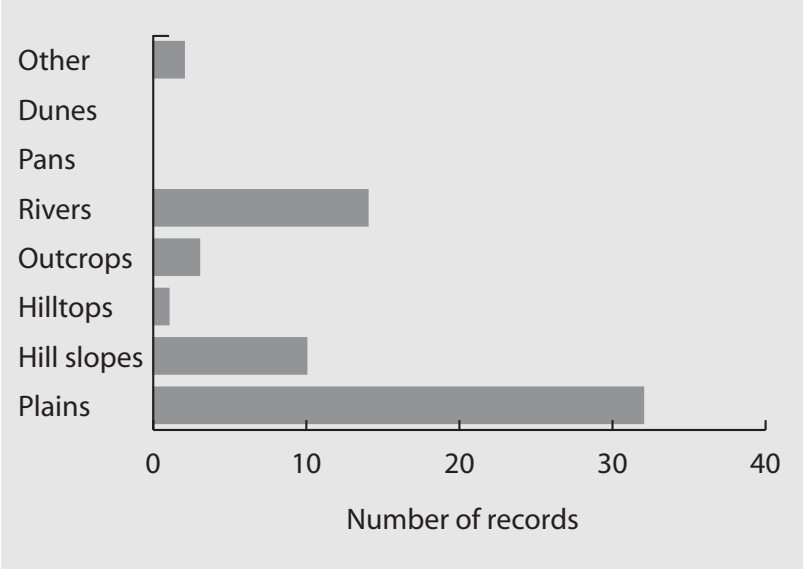


DISTRIBUTION & ABUNDANCE

Found in scattered localities in most of Namibia north of 26° S, but mostly in the north-west. Subspecies *kaokoensis* is uncommon to rare north-west of about 20° S and 16° E. Subspecies *namibiensis* is uncommon to occasionally common in the rest of the country.

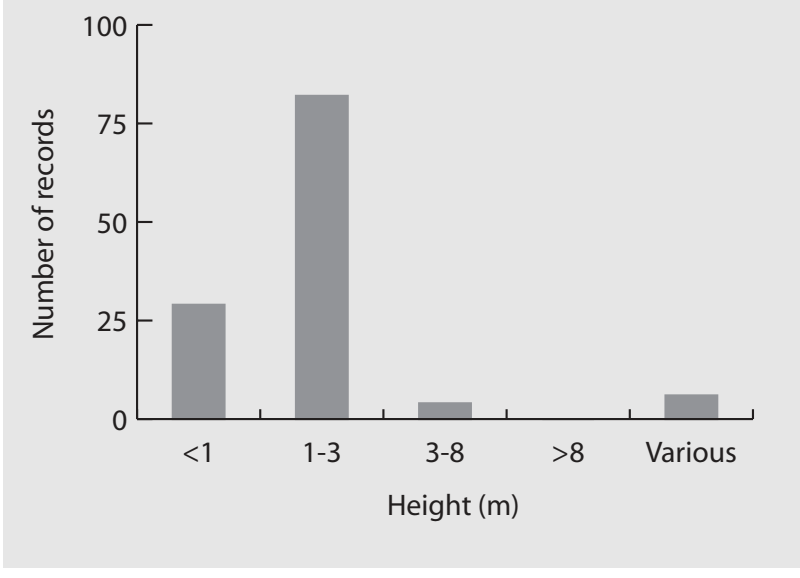
HABITAT

Subspecies *kaokoensis* is found mostly along dry rivers or on plains; subsp. *namibiensis* in various habitats, but mostly on plains, but also hill slopes.



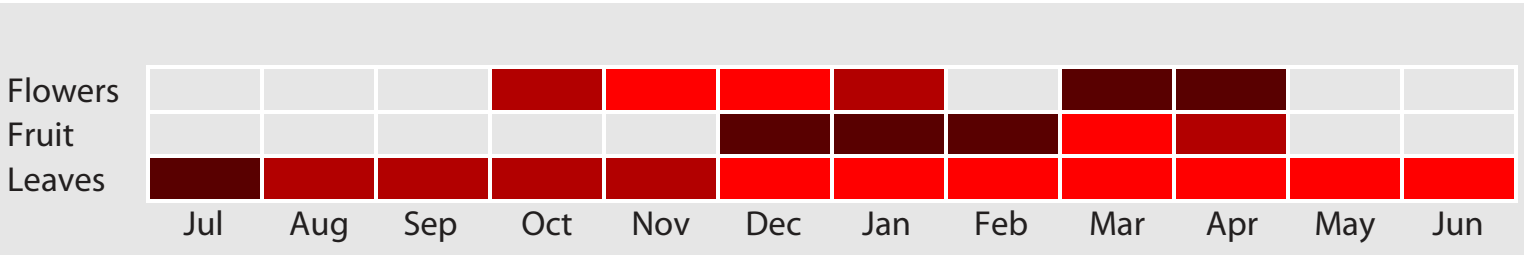
GROWTH FORM

Mostly a shrub in the 1–3-m height class; subsp. namibiensis is occasionally a tree of over 3 m high.



ANNUAL CYCLE

FLOWERS from October to January, with a second flush in late summer. FRUIT mainly March and April. LEAVES mainly December to June, with young leaves in October.



GENERAL

Browsed by game and livestock.

CONSERVATION CONCERNS

None recorded.

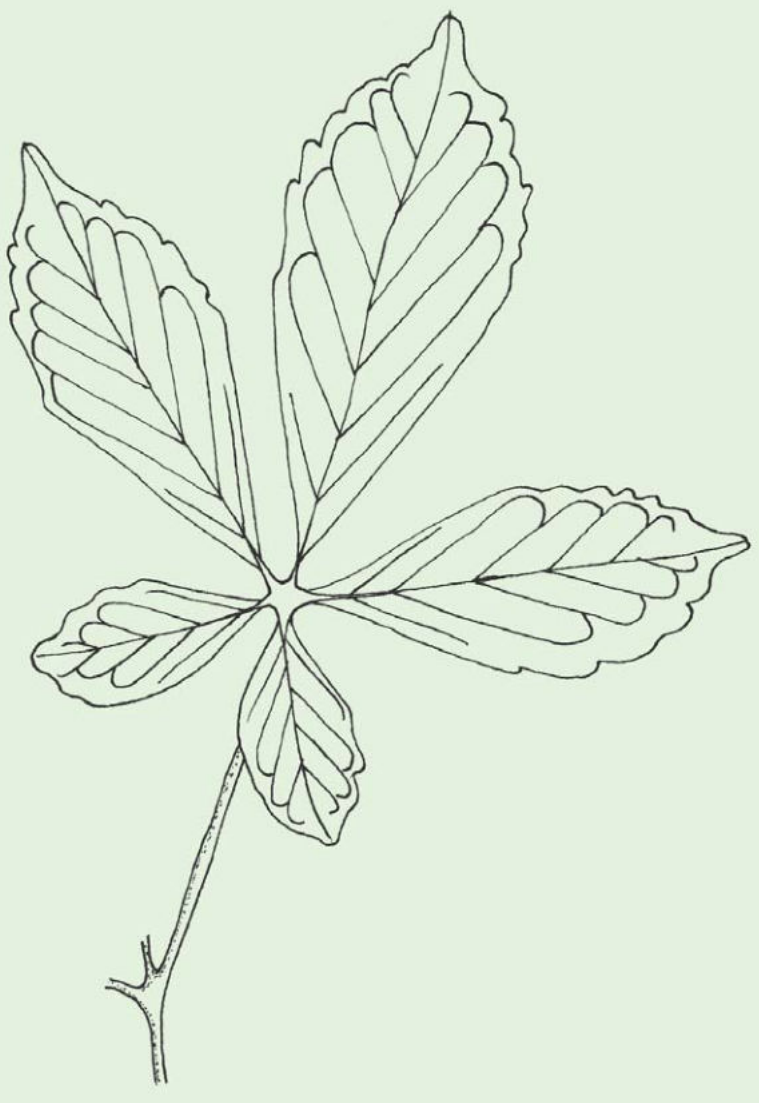


Ehretia namibiensis, C. Mannheimer

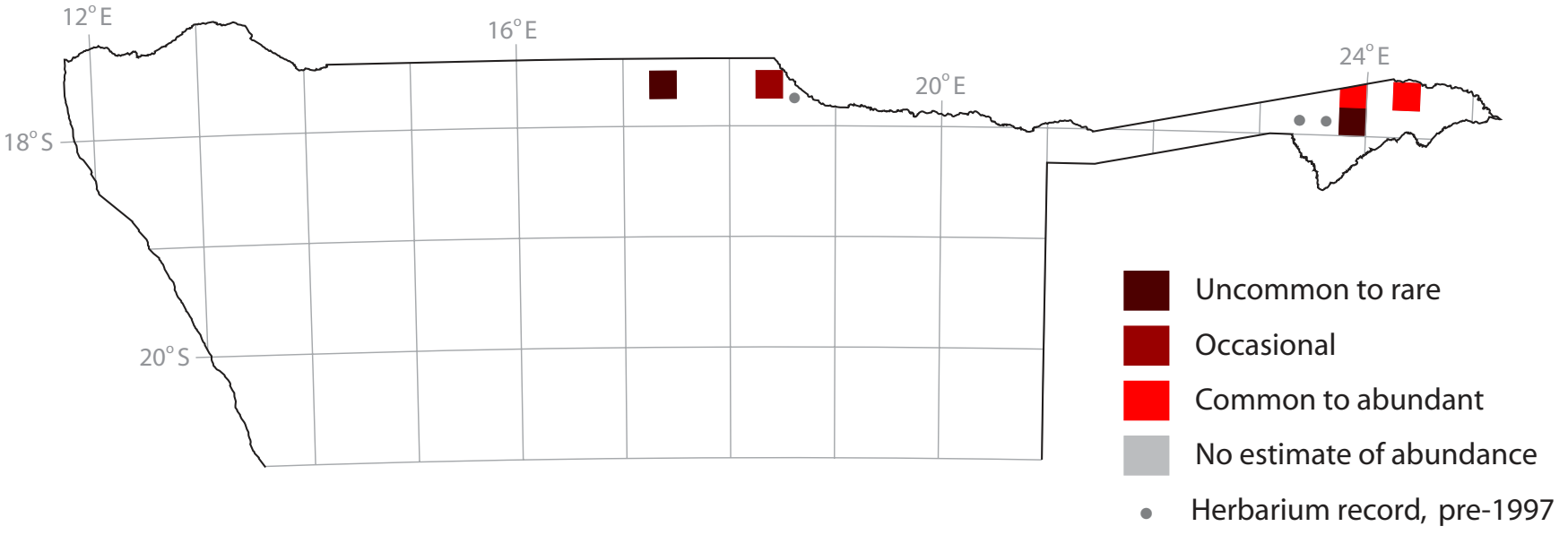
Vitex angolensis

Angolan Fingerleaf

[6 records from 6 (<1%) squares]



Multi-stemmed shrub. LEAVES **palmately compound with 3–7 leaflets**; central leaflet elliptic to narrowly obovate, 30–50 mm long; papery, dark green to yellow-green with yellow hairs on both surfaces; margin entire or irregularly toothed around the upper half. FLOWERS light mauve, two-lipped. FRUIT round or ellipsoid, 15–24 mm diameter, with a persistent calyx; red.



DISTRIBUTION & ABUNDANCE

Occasional in the central-north and common to uncommon in eastern Caprivi.

HABITAT

Unrecorded.

GROWTH FORM

A shrub in the 1–3-m height class.

ANNUAL CYCLE

Only observed in March and April. FLOWERS none recorded. FRUIT and LEAVES recorded in both months of observation.

CONSERVATION CONCERNS

None recorded.

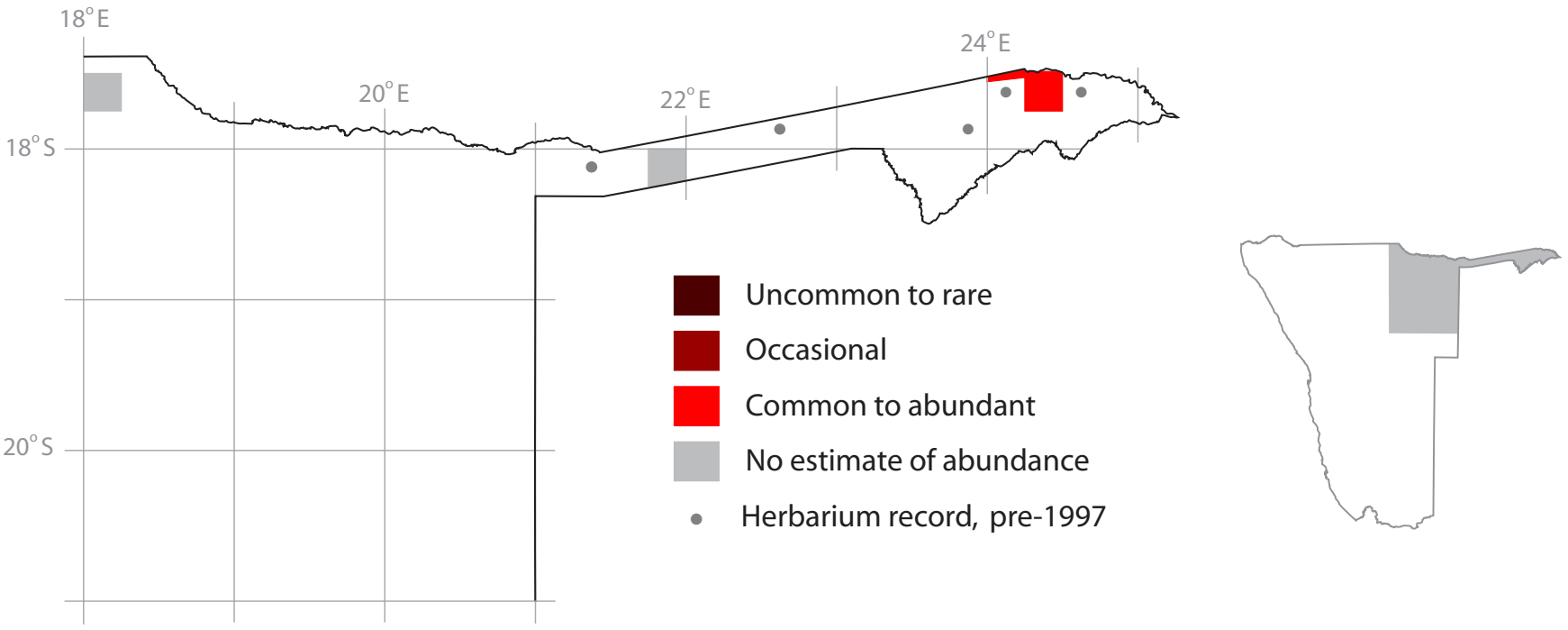
Vitex mombassae

= Vitex flavescens
= Vitex payos

Smelly-berry Fingerleaf

[4 records from 4 (<0.5%) squares]

A semi-deciduous shrub or small tree. LEAVES aromatic, palmately compound, petiole up to 90 mm long; leaflets obovate to elliptic to oblong, central one up to 75 mm long; **sparsely downy above, velvety below with very conspicuous net-veining**; margin sometimes slightly toothed. FLOWERS small; one lip pale blue or mauve and the other white or cream. FRUIT a berry, almost round, black when mature; calyx enlarging to almost cover the fruit, but later opening out and bending backwards.



DISTRIBUTION & ABUNDANCE

No abundance given for the single records in 1717DB or western Caprivi; common in two squares near Katima Mulilo. Earlier herbarium records from a few more squares in both western and eastern Caprivi, but 1717DB is a range extension.

HABITAT

None given.

GROWTH FORM

A shrub in the 1–3-m height class.

ANNUAL CYCLE

FLOWERS recorded in October, January and March. FRUIT recorded in December, February, March and June. LEAVES no data.

GENERAL

Fruit are edible and high in vitamin C; they also contain a black dye.

CONSERVATION CONCERNS

None recorded.

Rotheca myricoides

= Clerodendrum dekindtii

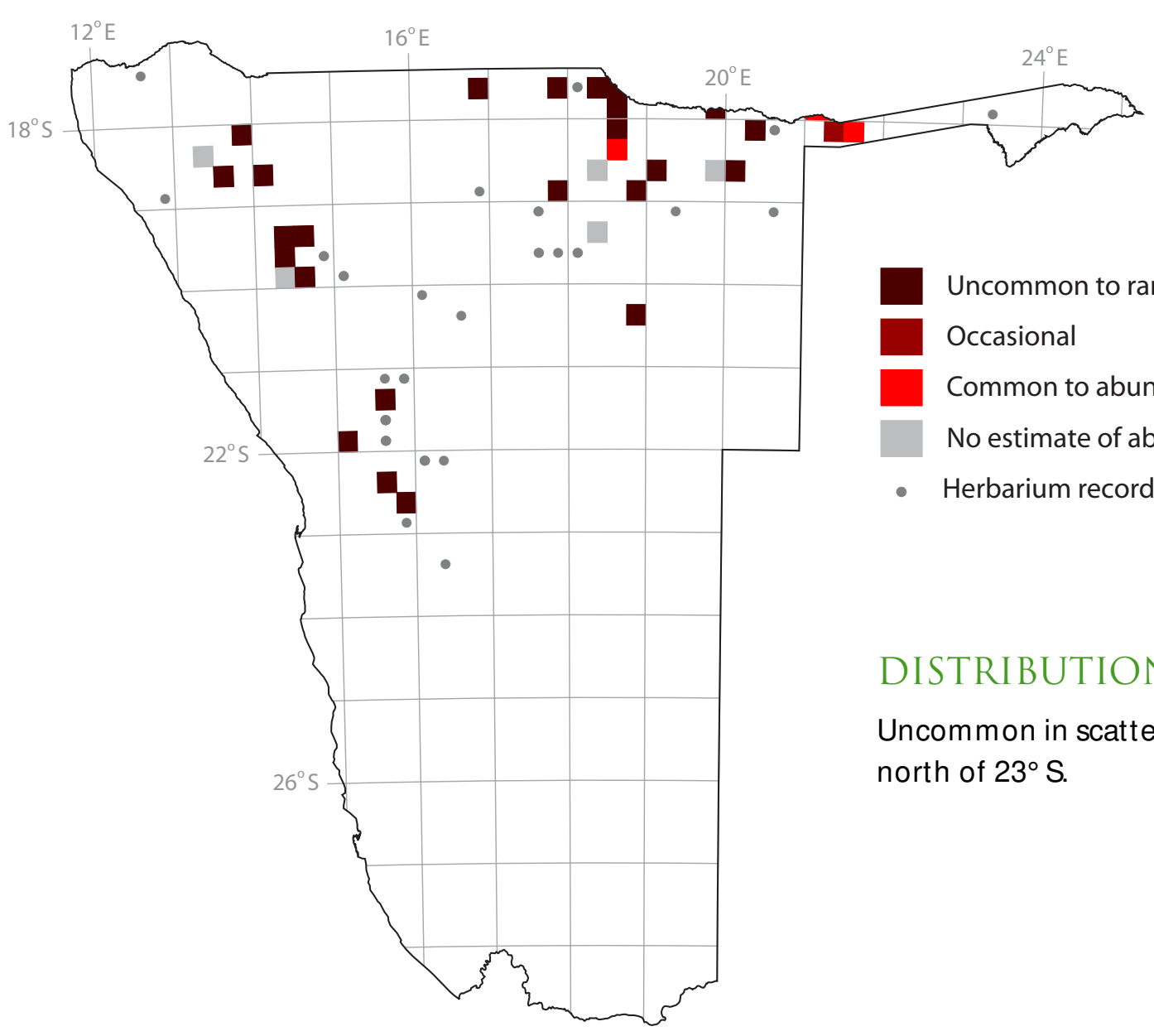
Smelly Cats-whiskers

Katsnorbos (A); neigogana (J); ndimbiswilisi (Rk, Rum)

[40 records from 33 (3%) squares]



A shrub or small tree. BARK grey, striated, marked with lenticels; branches swollen at nodes. LEAVES simple, ovate, usually twice as long as wide; velvety above, woolly and discolorous below; margin coarsely toothed; petiole obscured by tapering base; extremely unpleasant smelling when crushed. FLOWERS **attractive, up to 20 mm in diameter, white with one bright blue to purple petal; stamens long and protruding and resembling a cat's whiskers**. FRUIT a small, fleshy berry; red to black when ripe.

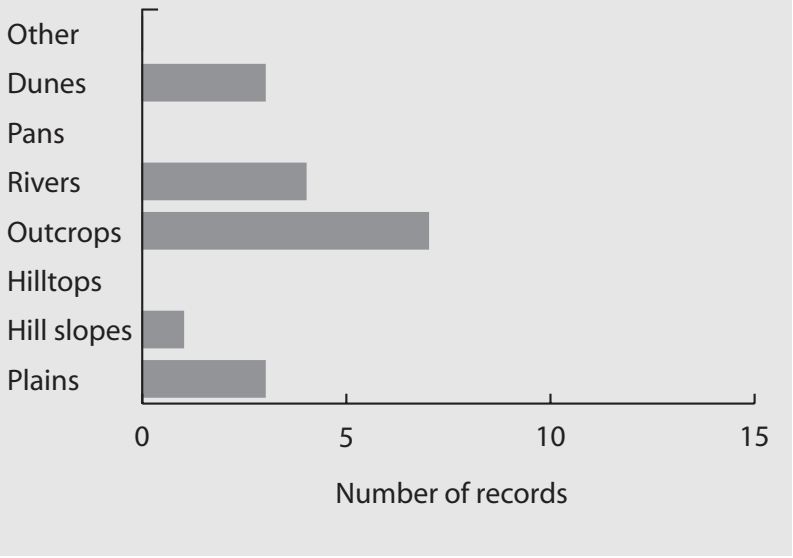


DISTRIBUTION & ABUNDANCE

Uncommon in scattered localities; widespread north of 23° S.

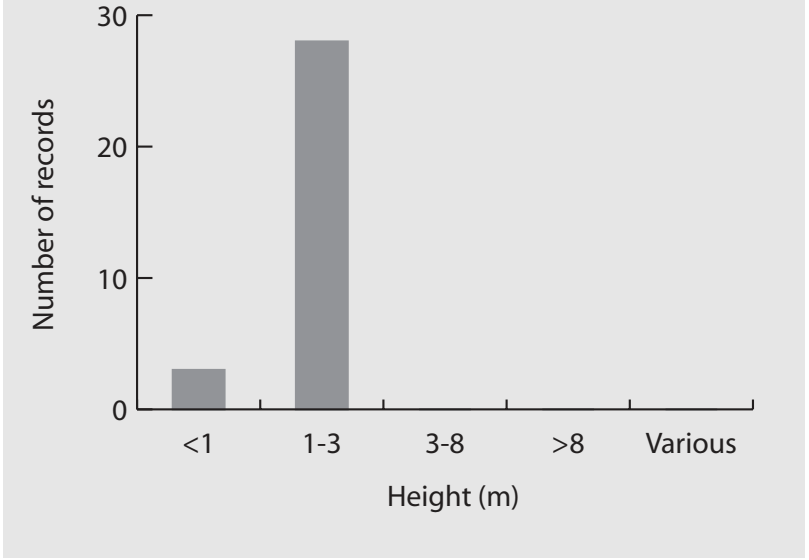
HABITAT

Found mostly on rocky outcrops and along river banks (where it is occasionally common). It grows on rock, mostly granite, and on deep Kalahari sand substrates.



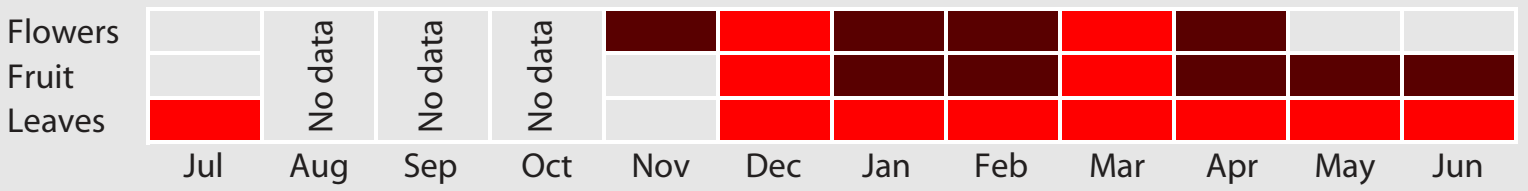
GROWTH FORM

A shrub in the 1–3-m height class.



ANNUAL CYCLE

FLOWERS from November (herbarium specimen) until April, with a peak in December and another in March. FRUIT from December to June, with two peaks similar to the flowers. LEAVES apparently evergreen, but no observations were made from August to November.



GENERAL

The fruit is edible; fruit and roots are used medicinally.

CONSERVATION CONCERNS

None recorded.



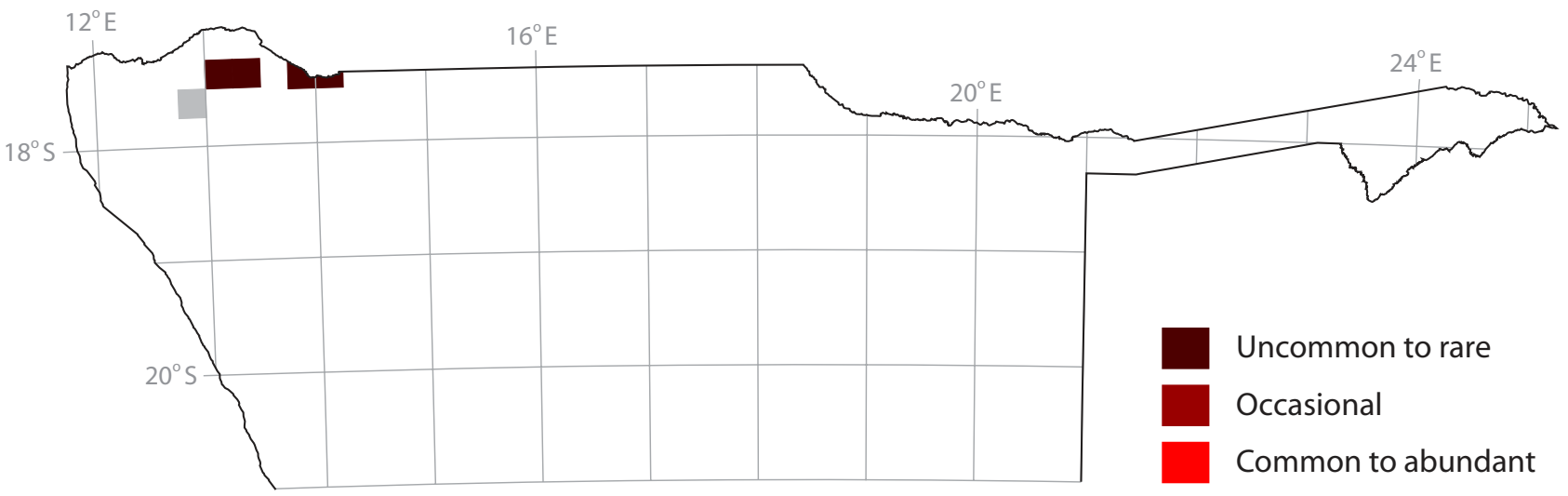
Rotheca myricoides, G. Friedrich

Clerodendrum eriophyllum

Hairy Tinderwood

[5 records from 5 (<0.5%) squares]

A semi-deciduous shrub or small tree. BARK dark, rough, fissured; **branchlets velvety, irregualrly ridged, sometimes with dwarf spur-branchlets**. LEAVES simple, usually in whorls of 3–4; **held horizontal or drooping**; ovate to elliptic; dull green, **velvety**; often with minute, sunken, glandular dots below; apex pointed to drawn-out; strongly aromatic. FLOWERS white, tubular; short; style and stamens purplish and protruding beyond petals. FRUIT a round, fleshy berry, *c.* 10 mm in diameter; with persistent calyx lobes; **whitish or yellow when mature**; massed in dense heads and remaining for months on tree when dry.



DISTRIBUTION & ABUNDANCE

Uncommon in a few localities in the north-west; locally common in places.

HABITAT

Found on river banks

GROWTH FORM

A shrub or tree in the 3–8-m height class.

ANNUAL CYCLE

Only observed in January and March. FLOWERS recorded in March. FRUIT not recorded. LEAVES present in both months of observation.

CONSERVATION CONCERNS

None recorded.

Clerodendrum glabrum

Smooth Tinderwood

Stink-leaf tree (E); omululu (Ok)

[3 records from 3 squares]

A shrub or small tree with a **drooping crown**. LEAVES **variable**, lanceolate to ovate to narrowly ovate, **held horizontal or drooping**; generally hairless. FLOWERS tubular; white, tinged with pink. FRUIT a white or yellow, fleshy berry.

Recorded from three squares in the north (1714AC, 1715CB and 1716CA). An uncommon tree in the 1–3-m height class, but smaller shrubs also recorded in 1714AC. Found on river banks and plains. Old flowers and fruit recorded in February and March.



Clerodendrum glabrum, Oshana Region, C. Mannheimer

Premna senensis

Large-leafed Skunk-bush

[1 record]

Shrub or, occasionally, a small tree. BRANCHES **often drooping; bark with distinct lenticels**. LEAVES simple, ovate, up to 90 mm long; thickly textured, hairy; **margin coarsely toothed**; apex tapering; **petiole long and slender**. FLOWERS white. FRUIT fleshy, ovoid, small, **dark blue; cupped by a persistent, ribbed calyx**.

One TAP record from the extreme eastern Caprivi. A rare shrub in the 1–3-m height class on a sand hummock, with fruit in February. The locals eat the fruit. Earlier herbarium records exist from Impalila Island and the Zambezi River.

Tinnea rhodesiana

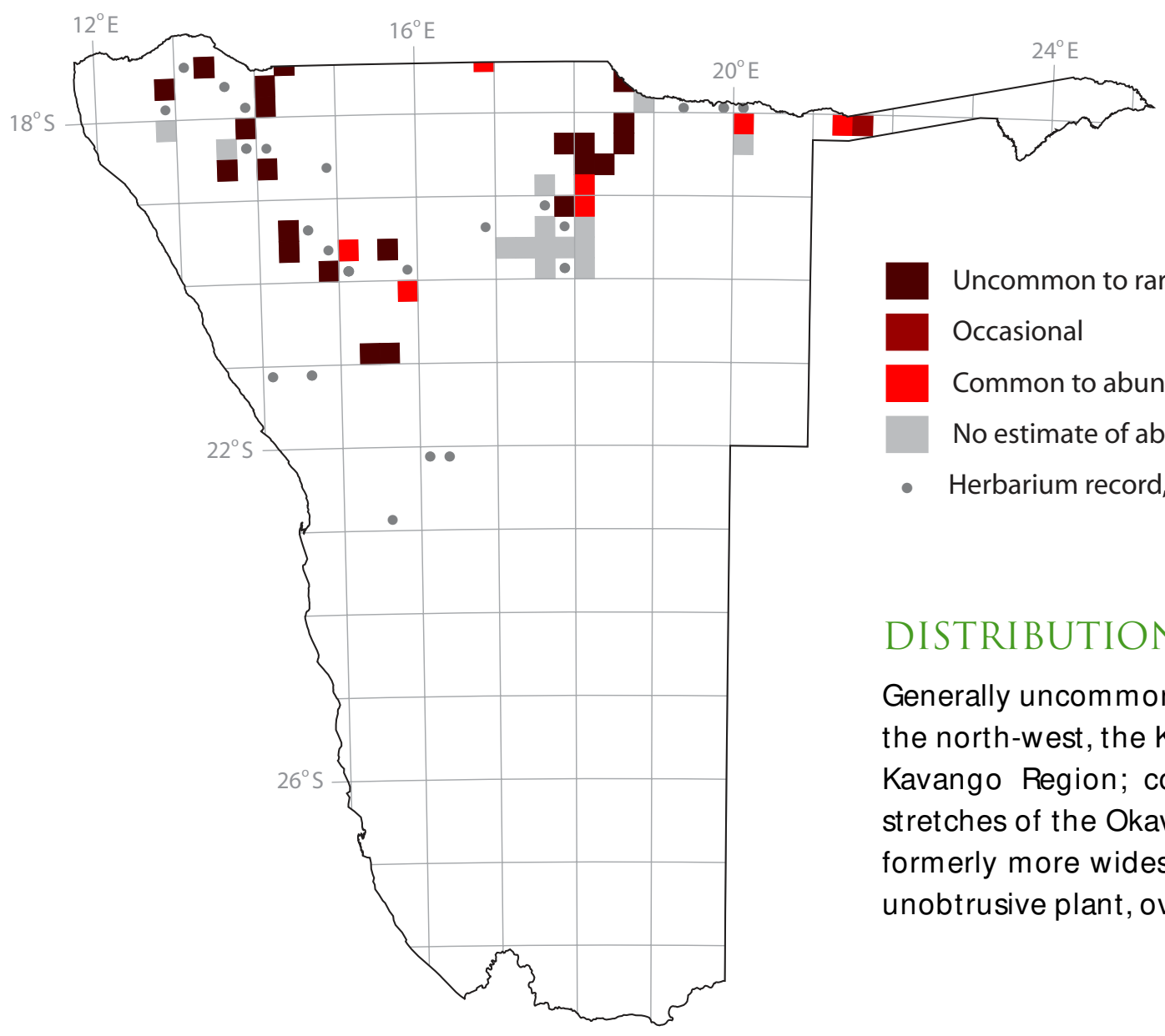
Maroon Bells / Katepo

Shah (Kx, H); !dhunni, !urub (K); cwidoro (T)

[57 records from 44 (4%) squares]



Deciduous, **diffuse shrub**. LEAVES simple, ovate to elliptic, small; dark green above with long, soft hairs; pale green below; often folded along the midrib. FLOWERS **maroon to purple-brown with a yellow spot; 10–18 mm long**. FRUIT **a four-lobed, dry capsule, enclosed in an inflated calyx up to 15 x 8 mm**.

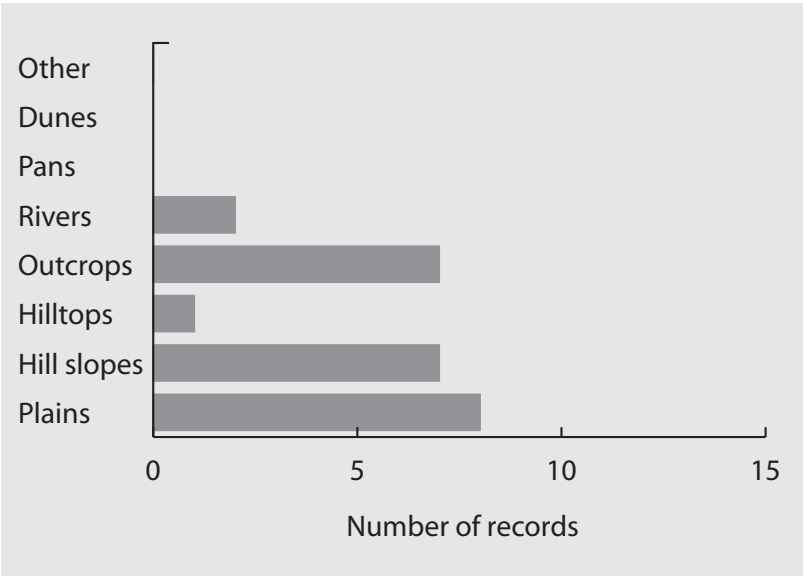


DISTRIBUTION & ABUNDANCE

Generally uncommon in scattered localities in the north-west, the Karstveld and parts of the Kavango Region; common on the eastern stretches of the Okavango River. It was either formerly more widespread or, as it is a small, unobtrusive plant, overlooked by atlassers.

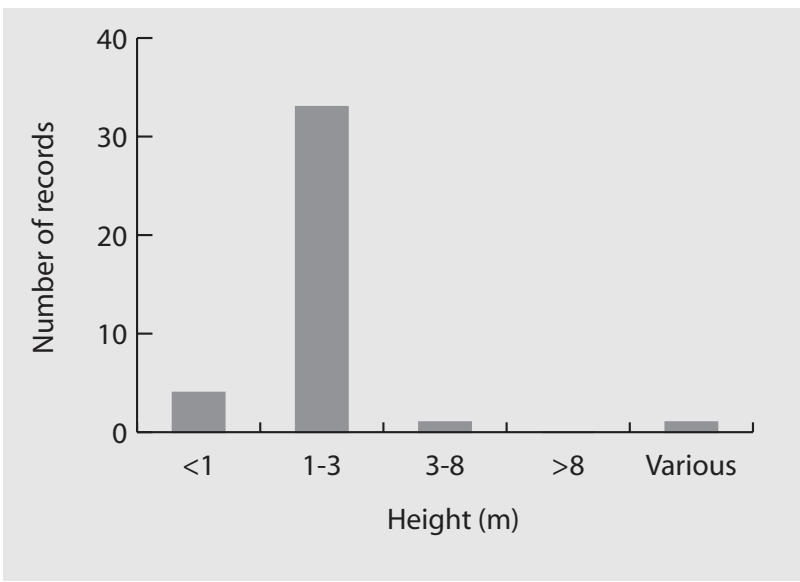
HABITAT

Mainly found on plains, hill slopes and rocky outcrops. Grows on sand, granite and other rock types.



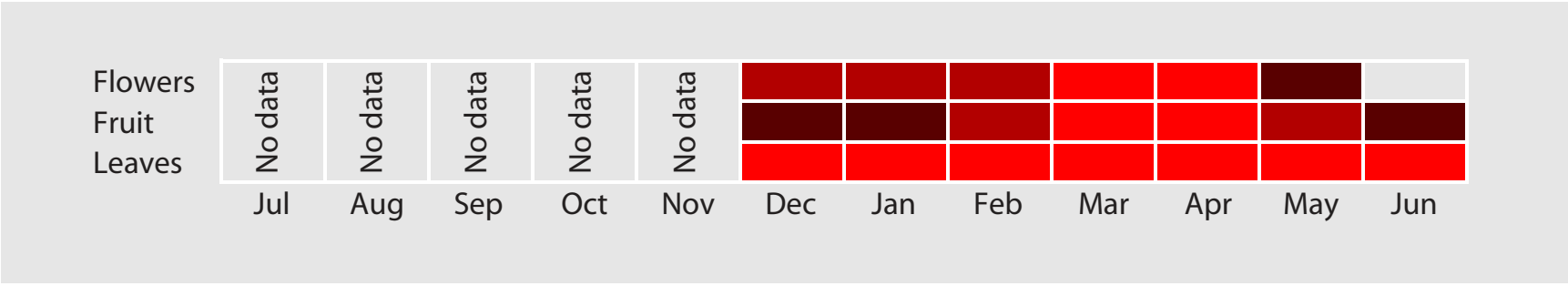
GROWTH FORM

A shrub, mostly in the 1–3-m height class.



ANNUAL CYCLE

FLOWERS December to May. FRUIT December to June. LEAVES in summer; no observations in winter.



GENERAL

Could be of horticultural potential due to its attractive flowers and fruit. Game, as well as large and small stock, browse the leaves.

CONSERVATION CONCERNS

None recorded. The species appears to have been overlooked in many areas, or the range may have decreased; it would be worth investigating.



Tinnea rhodesiana, flowers and inflated fruit capsules, C. Hines

Lycium

Honey-thorn

This untidy, spiny genus closely resembles *Phaeoptilum spinosum*, and was often misidentified as such. The only time it is easily distinguished from *P. spinosum* is when it is in fruit. Lycium fruit are round to ovoid, orange berries with the calyx still attached, whereas the fruit of *P. spinosum* are four-winged capsules, strongly resembling combretums.

These plants might be overlooked from a distance, and many atlassers did not record spiny species because of the uncertainty in their identification. Therefore many species may have been under-recorded. Since the start of the TAP a number of new species have been described, which are not included in the atlas. For a full species list see Appendix 1.

Lycium species not included in the Tree Atlas

SPECIES	COMMON NAME	HEIGHT (M)	DISTRIBUTION
amoenum	slangbessie	1–3	Schakal Mountains, north-east of Oranjemund
decumbens	platkriedoring, platwolwedoring	0.2	coastal belt of northern central Namibia(south of Ugab River to the Swakop River mouth)
gariepense	Gariep box-thorn, Gariepkriedoring	0.6–1.2	southern Namibia, bordering the Orange River (2716 & 2717)
grandicalyx	blaaskelkkriedoring	0.5–1.0	southern Namibia, from Witputz to the Fish River Canyon (2716 & 2717)
horridum	boksdoring, skangbessie(bos), wolwedoring	0.2–1.8	southern Namibia
pilifolium	taaikriedoring	0.3–1.0	south-western Namibia
pumilum	sweet box-thorn, soetkriedoring	0.6–1.2	southern and central Namibia; few in the north-west
schizocalyx	kareedoring	0.7–1.7	southern and central Namibia
shawii		1–3	along the Okavango River in western Caprivi
tetrandrum	Cape box-thorn, muisbos, bokdoring, kraaldoring	1–3	coastal belt from 20° S to 28° S, and along the Orange River

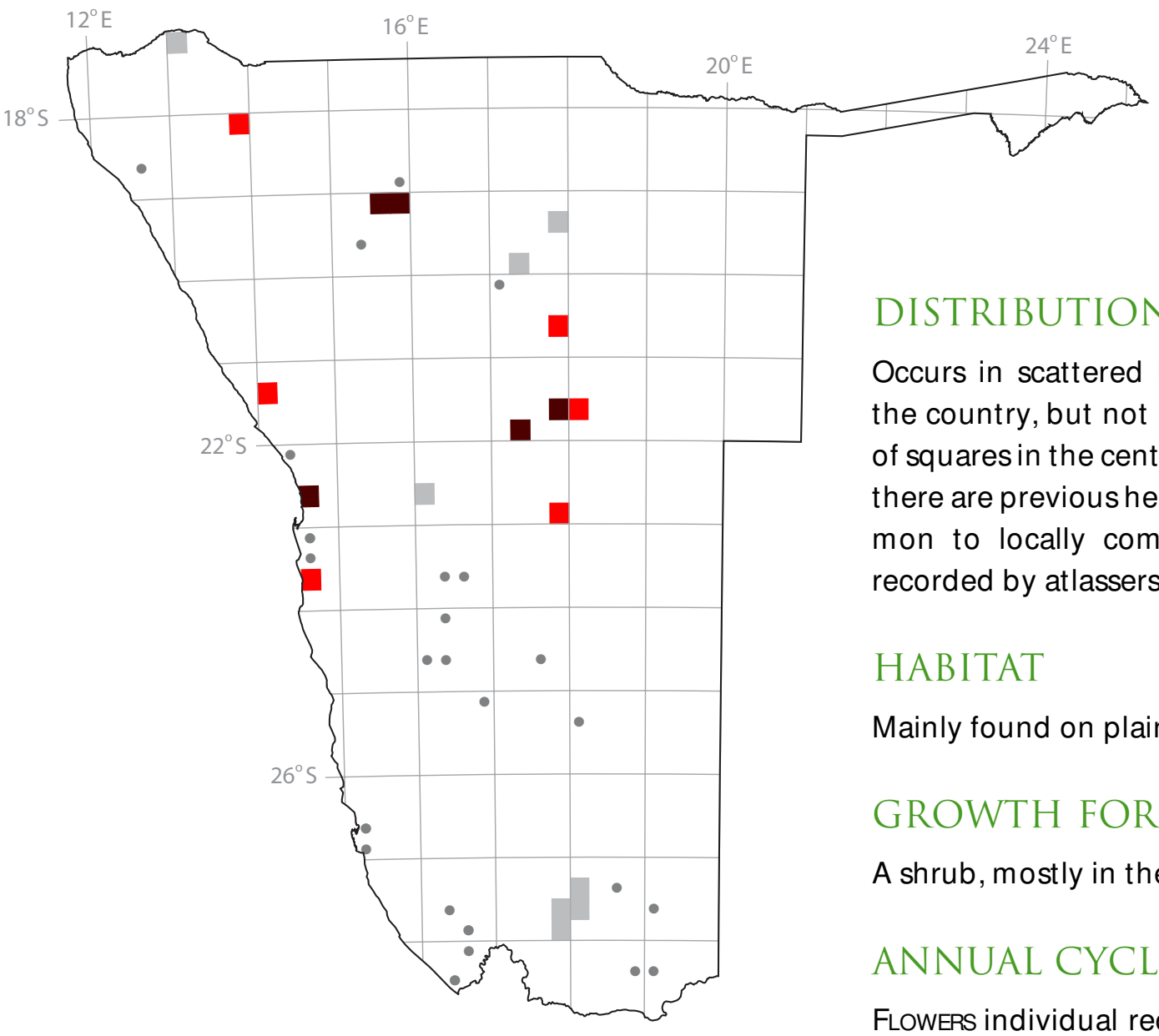
Lycium cinereum

Boksdoring

Kriedoring (A); ||aris (K)

[25 records from 18 (2%) squares]

Erect, rigid, very branched, **very thorny shrub**. STEMS rigid; young stems with thorns up to 30 mm long. LEAVES simple, oblong to narrowly oblong or spathulate, **clustered on branches and thorns**. FLOWERS solitary, trumpet-shaped, creamy white; lobes violet to dark violet, **curved back; corolla tube less than 10 mm long; stamens and styles clearly protruding from the flower; calyx less than half the length of the tube**. FRUIT a small, red, ovoid to globose berry.



Uncommon to rare
Occasional
Common to abundant
No estimate of abundance
Herbarium record, pre-1997

DISTRIBUTION & ABUNDANCE

Occurs in scattered localities across most of the country, but not recorded from a number of squares in the centre and south, from which there are previous herbarium records. Uncommon to locally common. Obviously under-recorded by atlassers.

HABITAT

Mainly found on plains and rivers.

GROWTH FORM

A shrub, mostly in the 1–3-m height class.

ANNUAL CYCLE

FLOWERS individual records from November to June. FRUIT individual records from January to June. LEAVES summer; insufficient observations in winter to comment.

CONSERVATION CONCERNS

None recorded.

Lycium bosciifolium

Wolfdoring

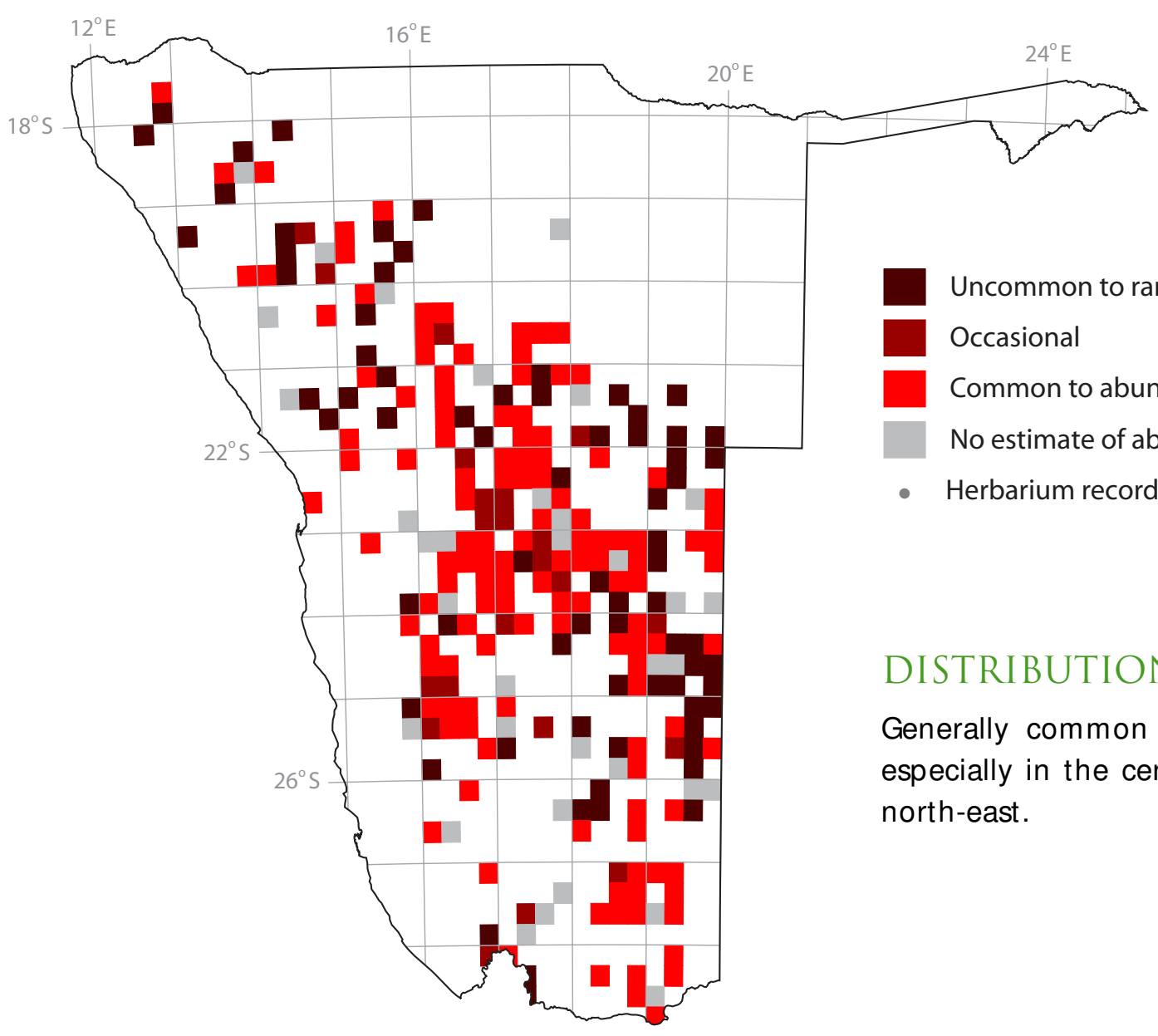
Limpopo honey-thorn (E); slapkriedoring (A); Bocksdorn (G); okahua (H); //khai//aris (K)

[579 records from 261 (24%) squares]



Untidy shrub. STEMS **lax, arched**; young stems with slender thorns up to 10 mm long. LEAVES simple, **semi-succulent to succulent**, elongate-elliptic to narrowly obovate, **10–50 x 3–11 mm**; both surfaces bright green to yellowish-green. FLOWERS solitary, trumpet-shaped; dirty white to greenish-cream; lobes dark violet, spreading; **corolla tube longer than 10 mm, stamens and styles clearly protruding from the flower; calyx shorter than half the length of the tube**. FRUIT a small, glossy red to black ovoid berry.

All records have been combined with those of *L. oxycarpum*, which does not occur in Namibia (Venter 2000), but was previously thought to.

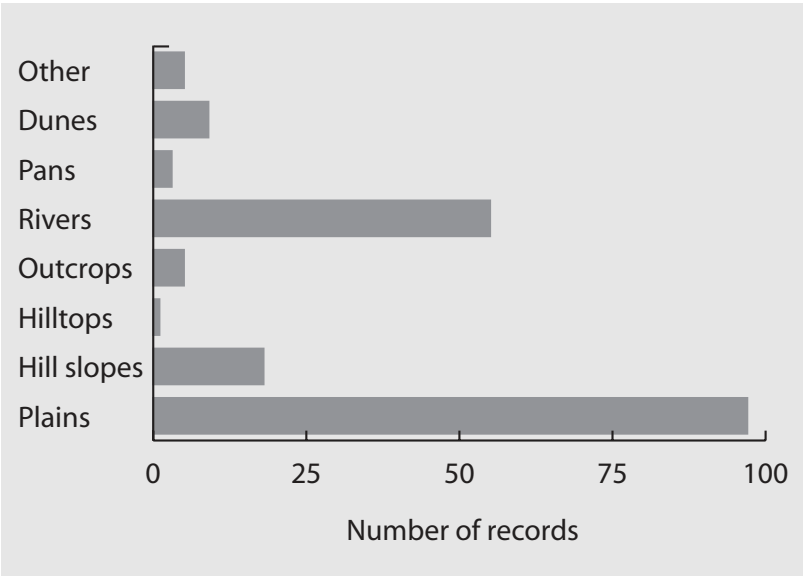


DISTRIBUTION & ABUNDANCE

Generally common over much of Namibia, especially in the central parts; absent in the north-east.

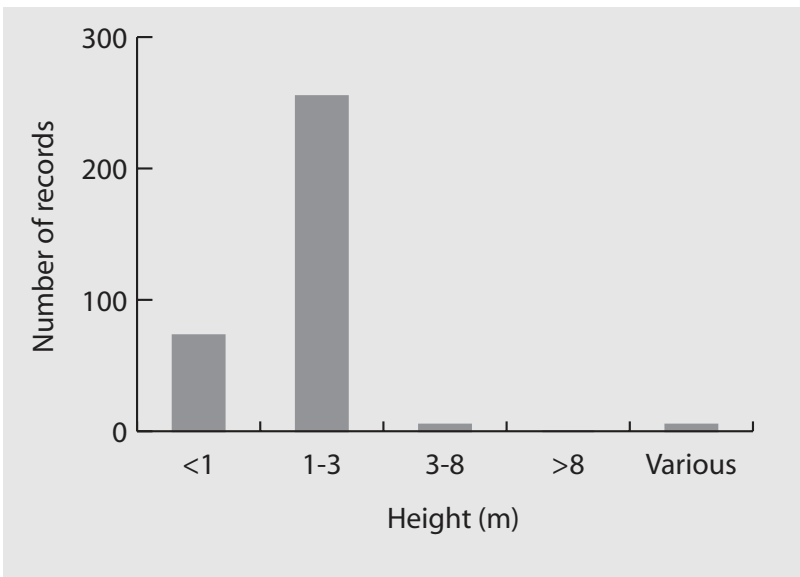
HABITAT

Found in various habitats, but mainly on plains and along river banks. Often grows in the shade of larger trees.



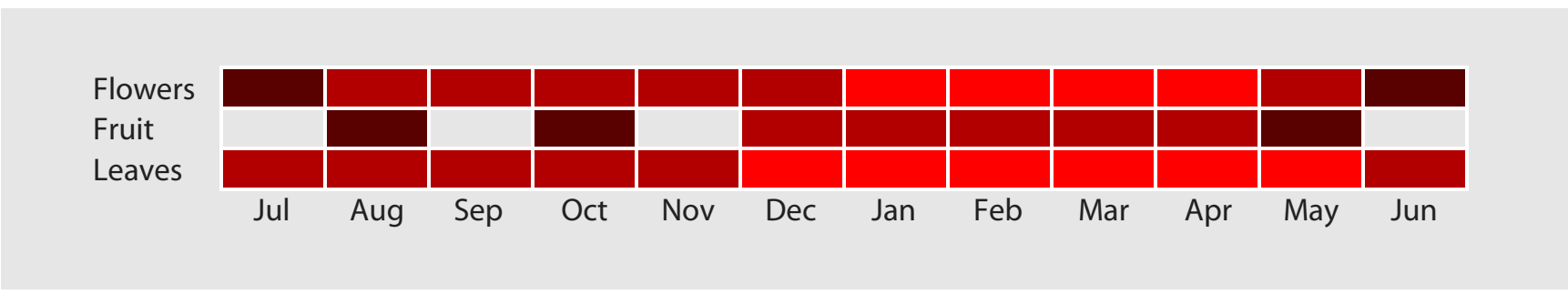
GROWTH FORM

A shrub, mostly in the 1–3-m height class.



ANNUAL CYCLE

FLOWERS recorded all year round, but mostly from January to April. FRUIT records far fewer than flower records, mainly December to April. LEAVES recorded all year round with young leaves in October.

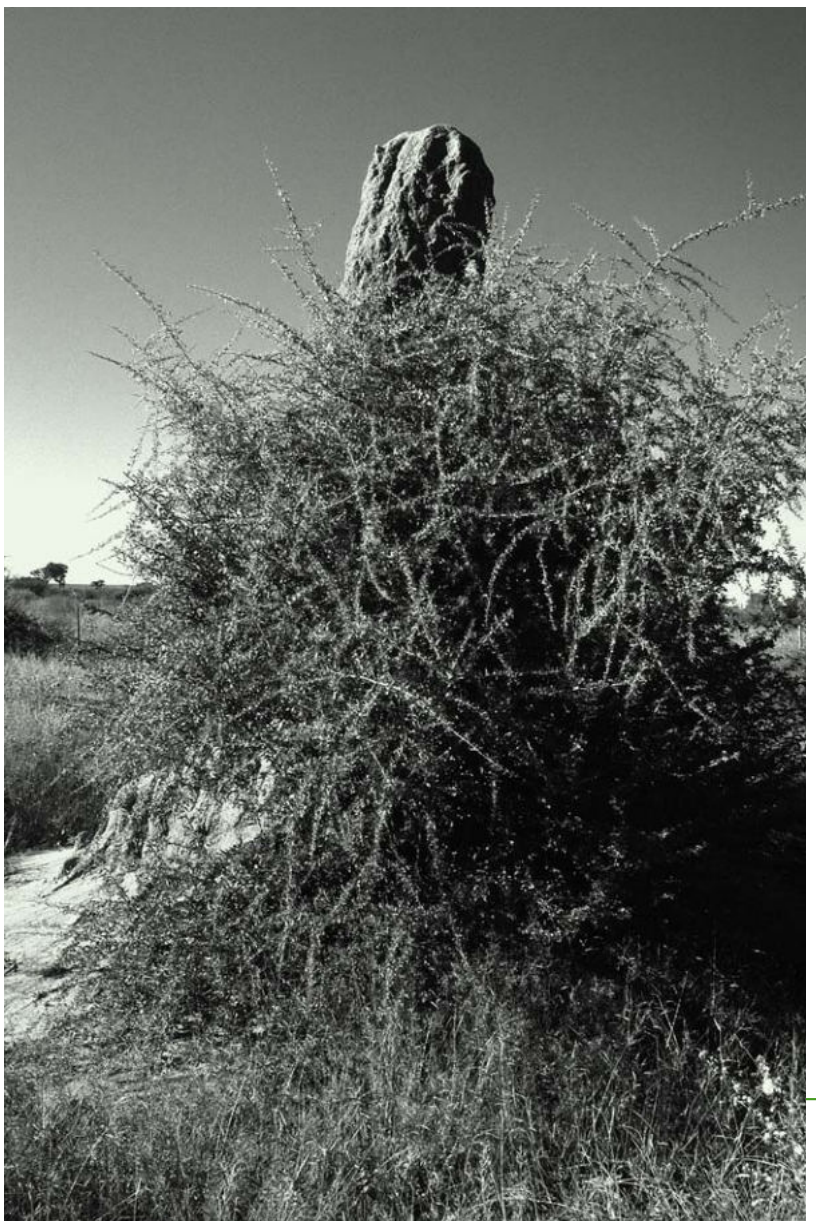


GENERAL

Although the range overlaps with that of *L. eenii* in parts of the country, they are not often found together. Heavily browsed in places and eaten by insects such as 'dikpens' (koringkrieke/armoured ground-crickets).

CONSERVATION CONCERNS

None recorded.



Lycium bosciifolium, E. Ellinger

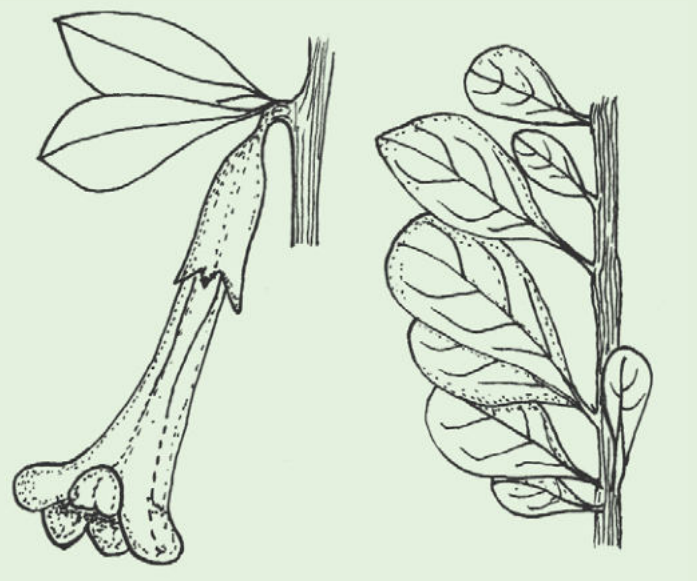
Lycium eenii

= Lycium trothae

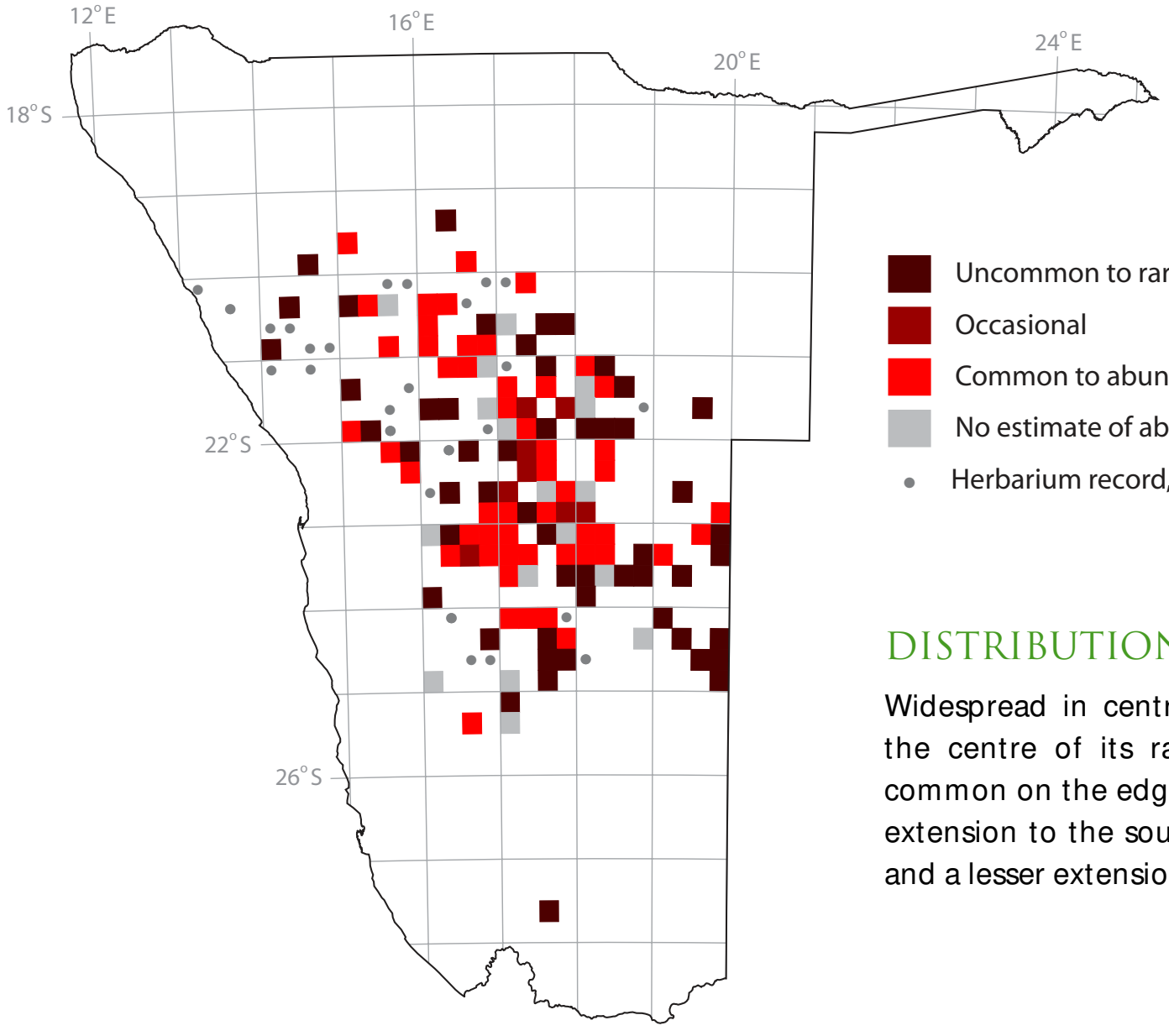
Broad-leaved Honey-thorn

Breëblaarkriedoring (A)

[178 from 129 (12%) squares]



Rigid bushy shrub. STEMS thorny; **young stems creamy to whitish** with thorns up to 30 mm long. LEAVES simple, obovate, ovate or elliptic; both surfaces mostly bright **yellowish-green; apex tapering to a point**. FLOWERS solitary, trumpet-shaped, greenish-white with purple veins and spreading purple lobes; tube 10–18 mm long; **stamens and styles not or hardly protruding beyond the flower**. FRUIT a small, ovate, red berry.

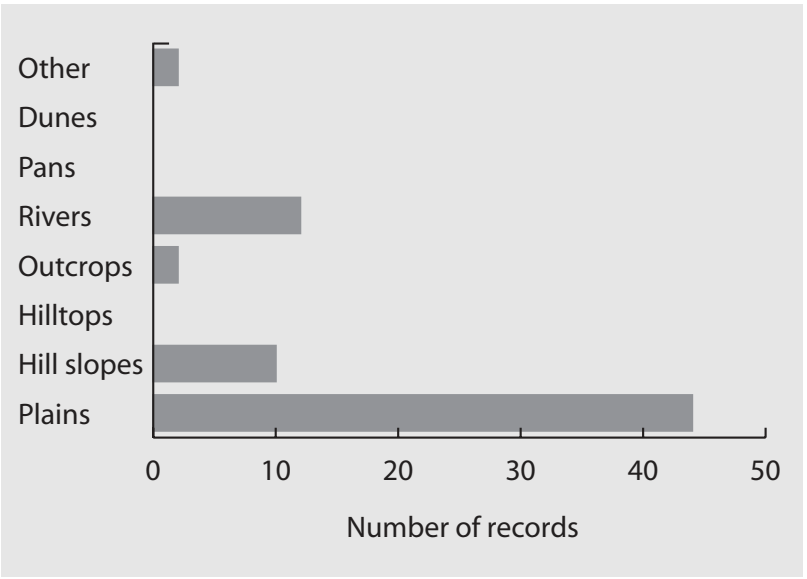


DISTRIBUTION & ABUNDANCE

Widespread in central Namibia; common in the centre of its range and generally uncommon on the edges. There is a large range extension to the south (specimen HEL3/177), and a lesser extension to the east.

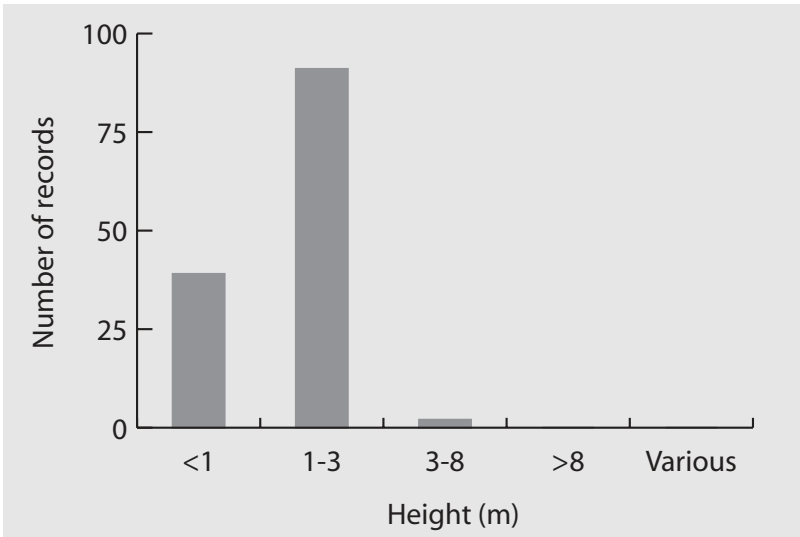
HABITAT

Mainly found on plains on a variety of substrates, often growing in the shade of larger trees.



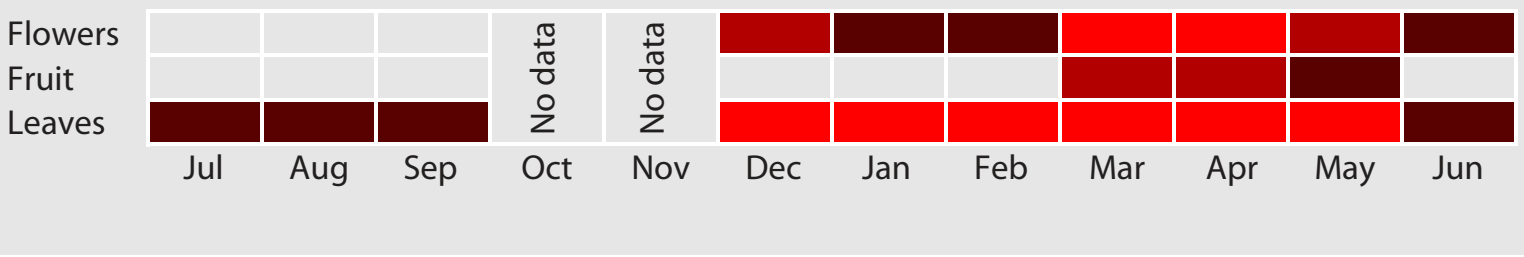
GROWTH FORM

A shrub, mostly in the 1–3-m height class.



ANNUAL CYCLE

FLOWERS from December to June, with a peak in March or April. FRUIT individual records December to June, but mostly March and April. LEAVES mainly from December to May.



CONSERVATION CONCERNS

None recorded.



Lycium hirsutum

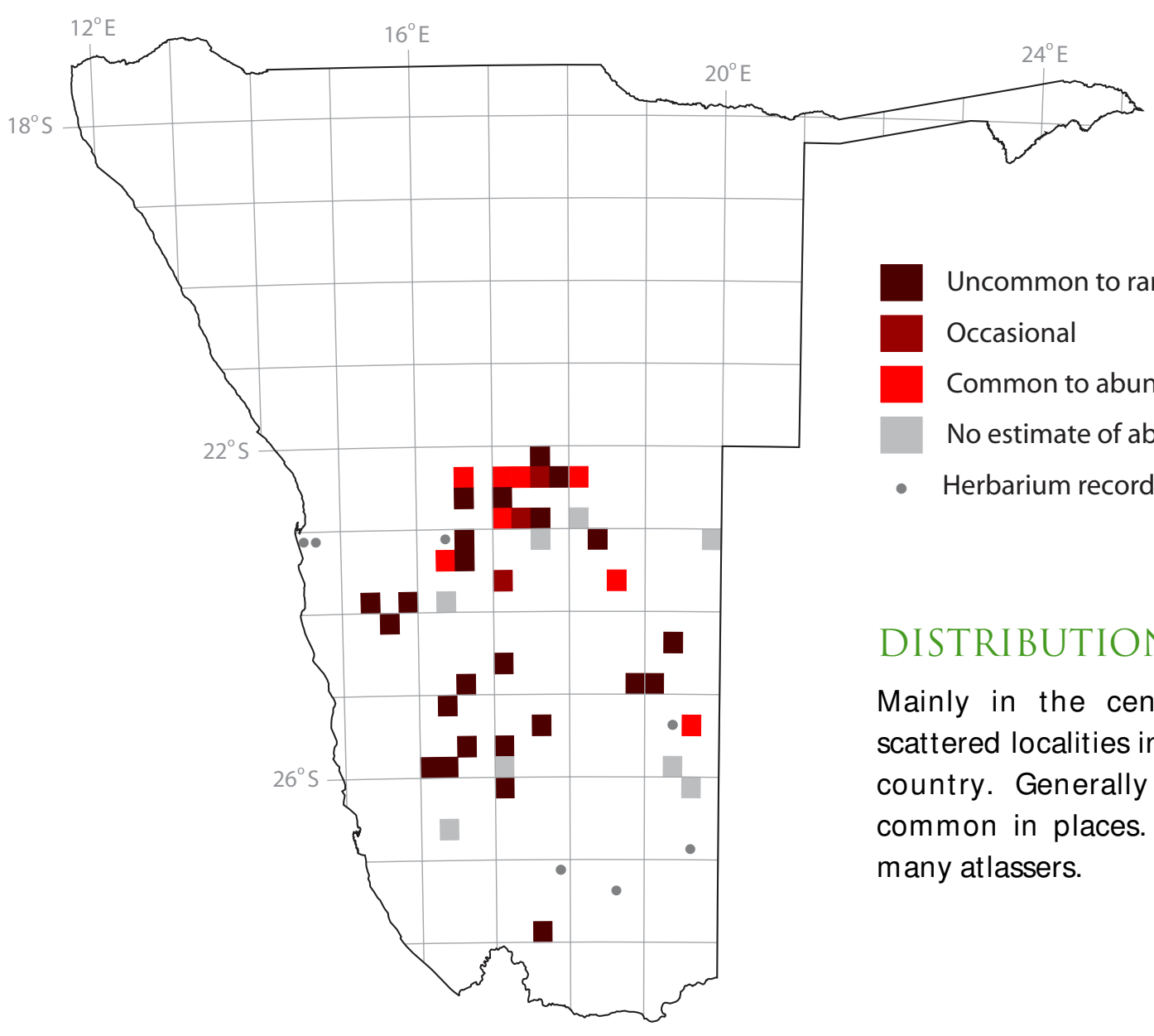
River Honey-thorn

Wolwedoring, wolhaarbos (A)

[56 records from 43 (4%) squares]



Sprawling shrub. STEMS rigid; older stems with **stout, peg-like thorns**; young straight, grey-white to creamy-white, **densely covered with glandular hairs**, with thorns up to 30 mm long. LEAVES simple, thinly textured to slightly fleshy; elliptic to narrowly obovate or obovate; **both surfaces yellowish to greyish-green, dense glandular hairs**. FLOWERS solitary, trumpet-shaped; creamy-white to dirty-white, sometimes with purple veins; **tube 14–28 mm long**, sometimes hairy on the outside; **stamens and styles protruding slightly beyond the flower**. FRUIT a small, globose to ovate, red berry.

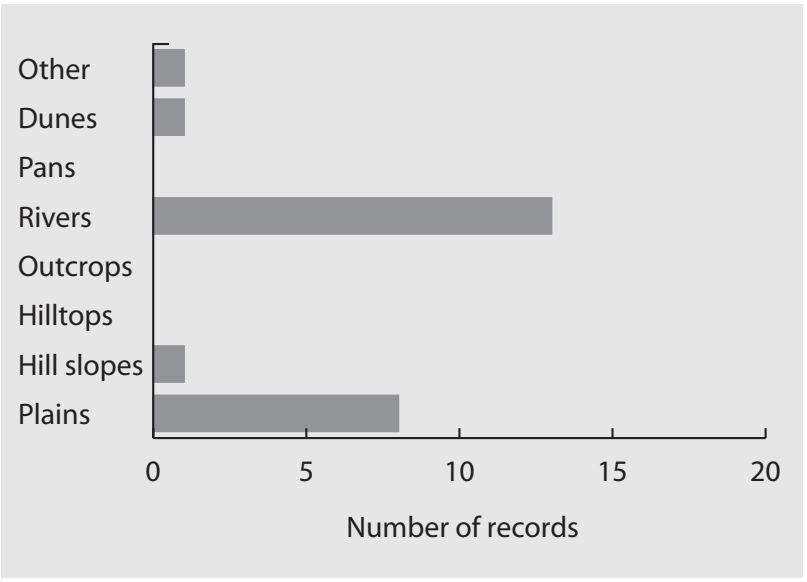


DISTRIBUTION & ABUNDANCE

Mainly in the central highlands, also in scattered localities in the southern half of the country. Generally uncommon to locally common in places. Probably overlooked by many atlassers.

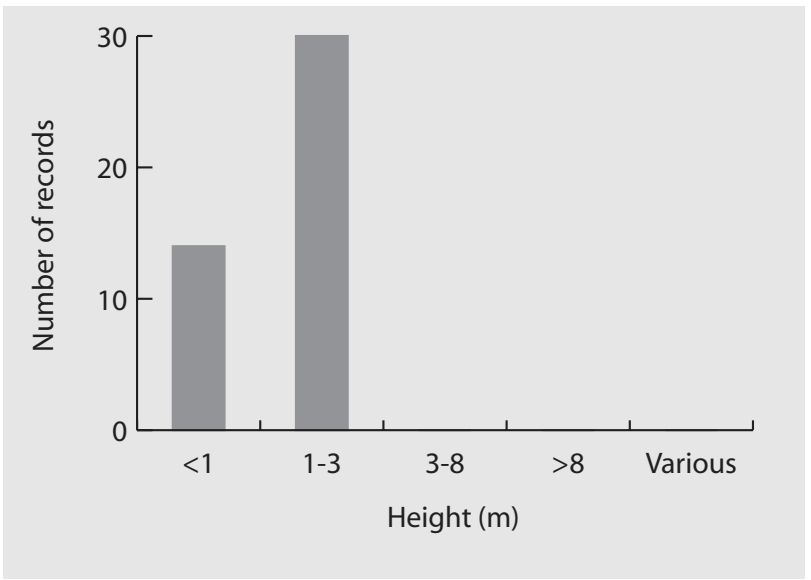
HABITAT

Found in various habitats, but mainly along rivers and on plains.



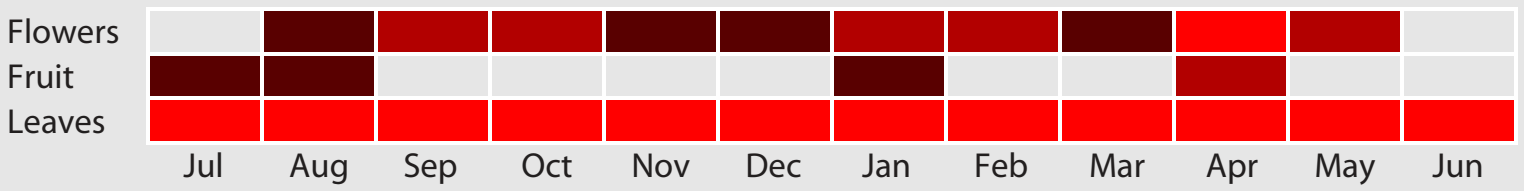
GROWTH FORM

A shrub, mainly in the 1–3-m height class.



ANNUAL CYCLE

FLOWERS most of the year, with various peaks in response to rainfall. FRUIT few records, mostly April. LEAVES apparently all year, though records were few in the winter months.

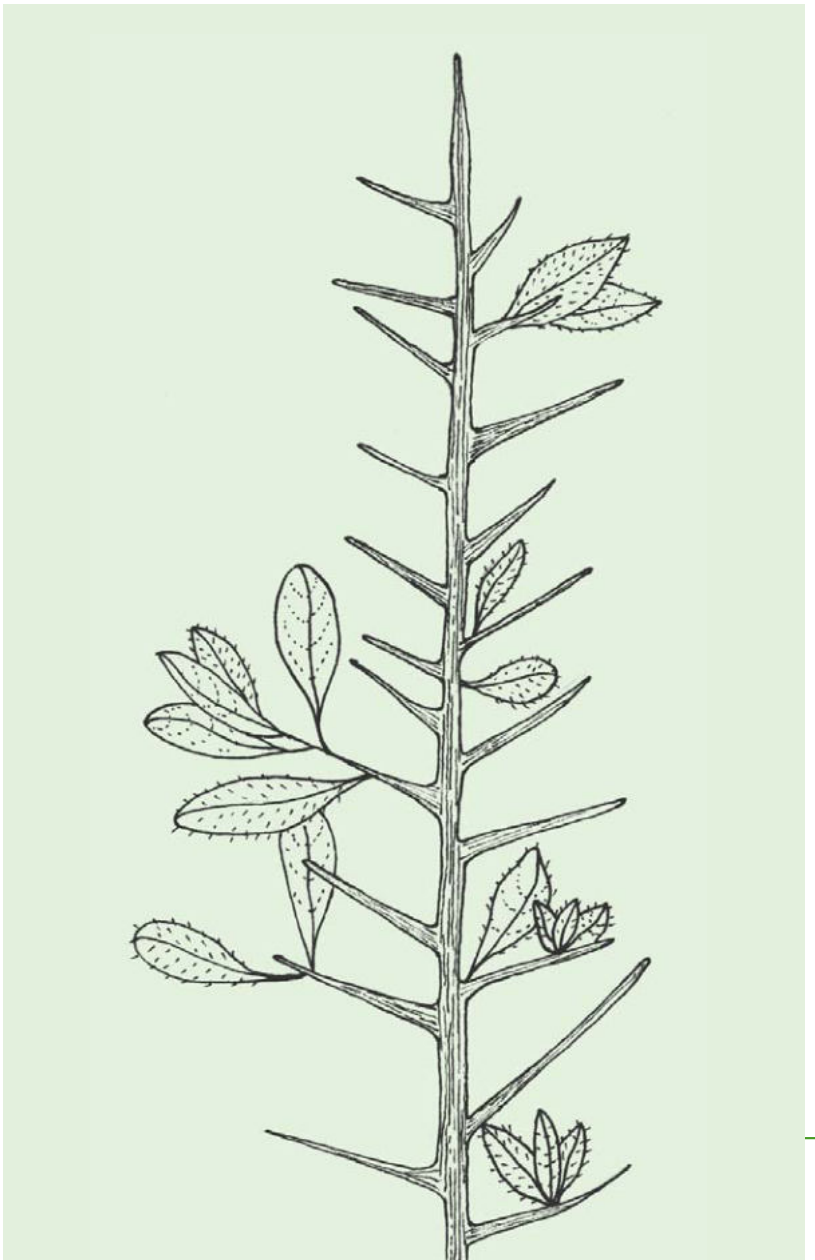


GENERAL

Browsed by domestic stock and kudu. The flowers are visited by bees and butterflies.

CONSERVATION CONCERNS

None recorded.



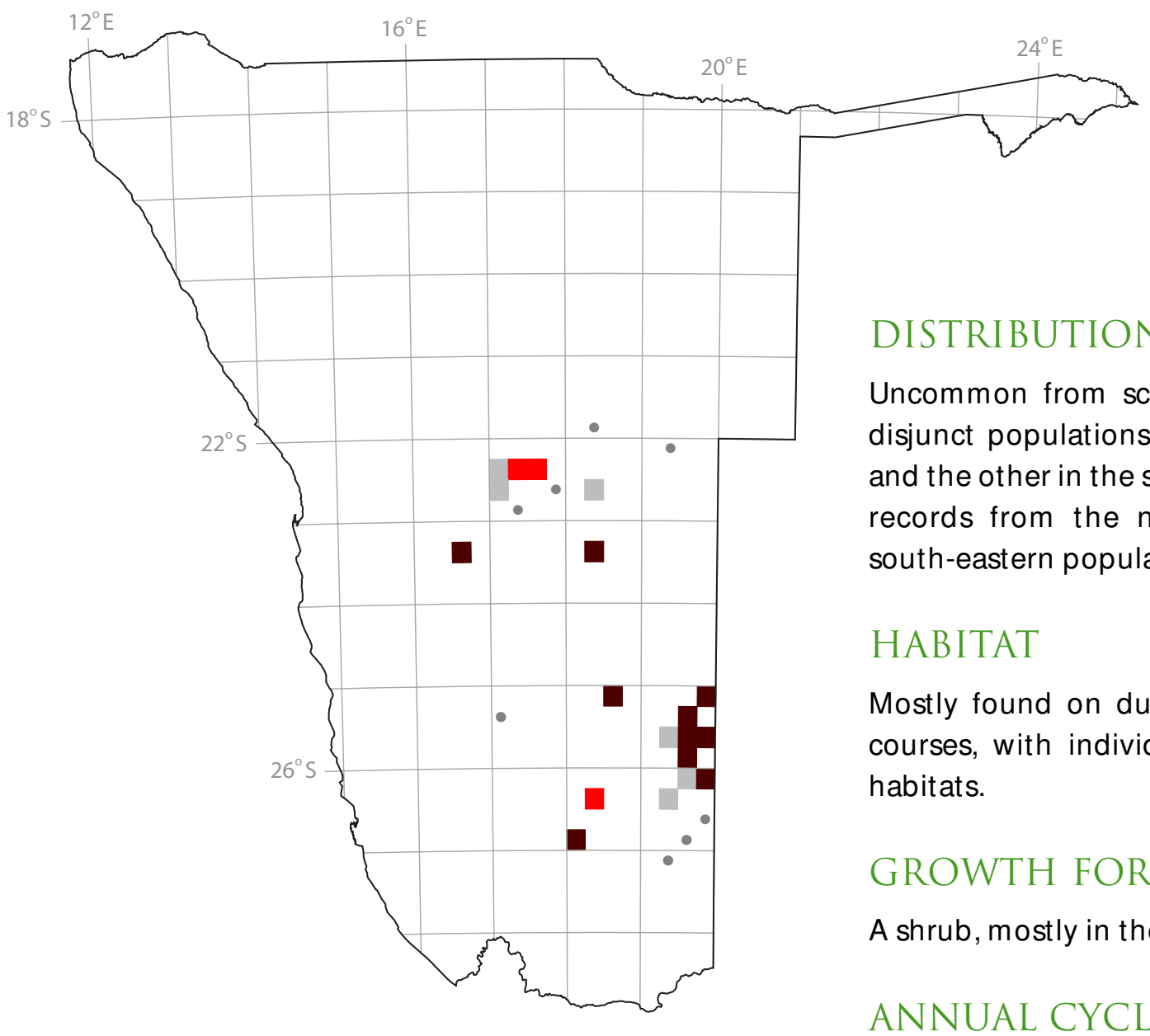
Lycium villosum

Hairy Honey-thorn

Harige sandkriedoring (A)

[19 records from 17 (2%) squares]

Richly branched, thorny shrub. STEMS rigid, **greyish to creamy-white with glandular hairs when young**; thorns longest on older stems. LEAVES simple, usually with a thinnish texture, occasionally a bit succulent; elliptic to narrowly obovate to obovate; **yellowish to greyish-green, with glandular hairs**. FLOWERS solitary, narrowly funnel-shaped; cream-coloured to whitish; lobes spreading, with **densely fringed margins; tube 9–12 mm long**, slightly hairy outside; **stamens slightly protruding beyond the flower**. FRUIT a small, roundish, red berry.



DISTRIBUTION & ABUNDANCE

Uncommon from scattered localities in two disjunct populations, one in central Namibia and the other in the south-east. There are new records from the northern section of the south-eastern population.

HABITAT

Mostly found on dunes and along dry river courses, with individual records from other habitats.

GROWTH FORM

A shrub, mostly in the 1–3-m height class.

ANNUAL CYCLE

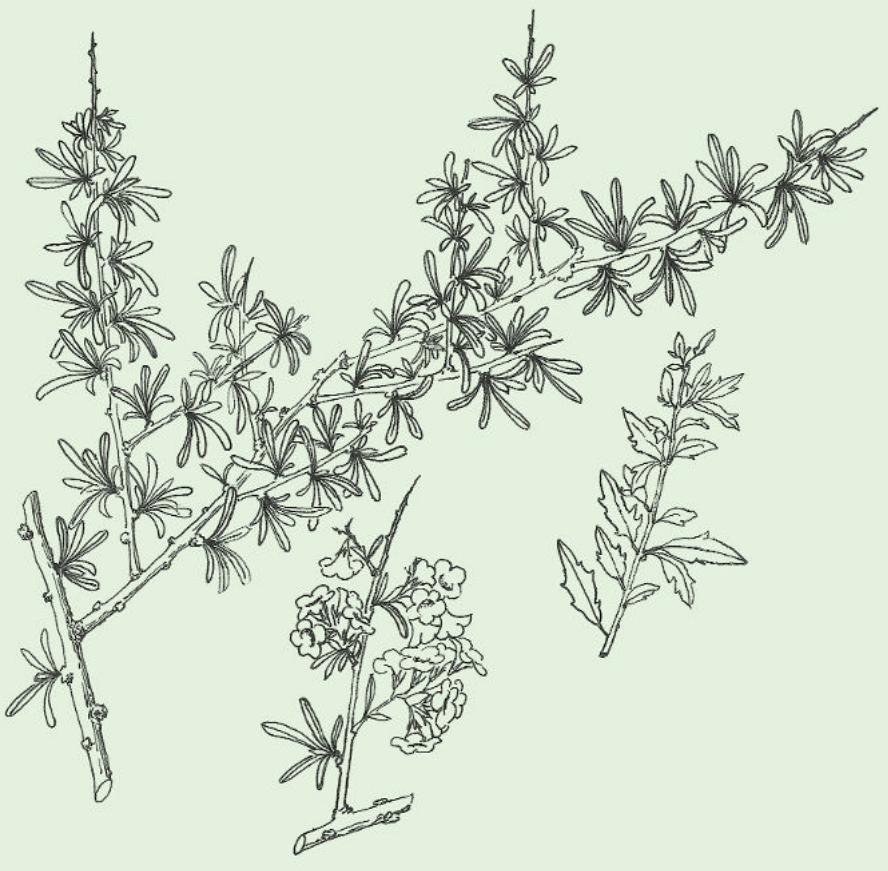
Observations were few most months and absent in winter. FLOWERS September to April. FRUIT December, April and July (herbarium record). LEAVES recorded every time observations were made.

CONSERVATION CONCERNS

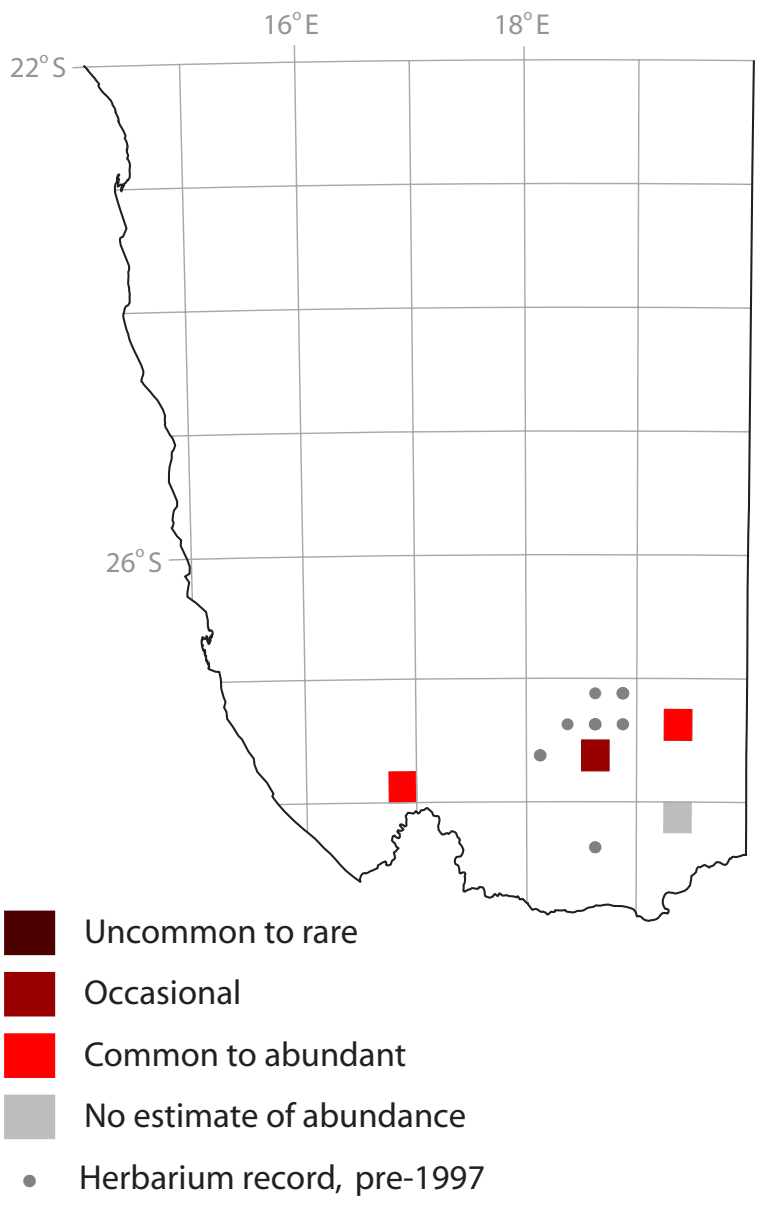
None recorded.

Antherothamnus pearsonii

[5 records from 4 (<0.5%) squares]



Stiff, evergreen shrub. BRANCLETS **often a bit arched, with a slightly spinescent appearance; youngest twigs pale brown, covered in minute glandular hairs**. LEAVES **tiny**, simple, **linear to elliptic** to obovate; margin usually entire, occasionally with a tooth. FLOWERS tiny, tubular, white to pale lilac, sweetly scented. FRUIT a tiny, two-chambered, elongate-ovate capsule.



DISTRIBUTION & ABUNDANCE

Common in a few scattered squares in the south.

HABITAT

Found on hill slopes and rocky outcrops

GROWTH FORM

A shrub up to the 1–3-m height class.

ANNUAL CYCLE

All five TAP records were in March, when FLOWERS and a few FRUIT (20% of records) and LEAVES, were recorded. Herbarium records of flowers are in February, April and May.

CONSERVATION CONCERNS

None recorded.

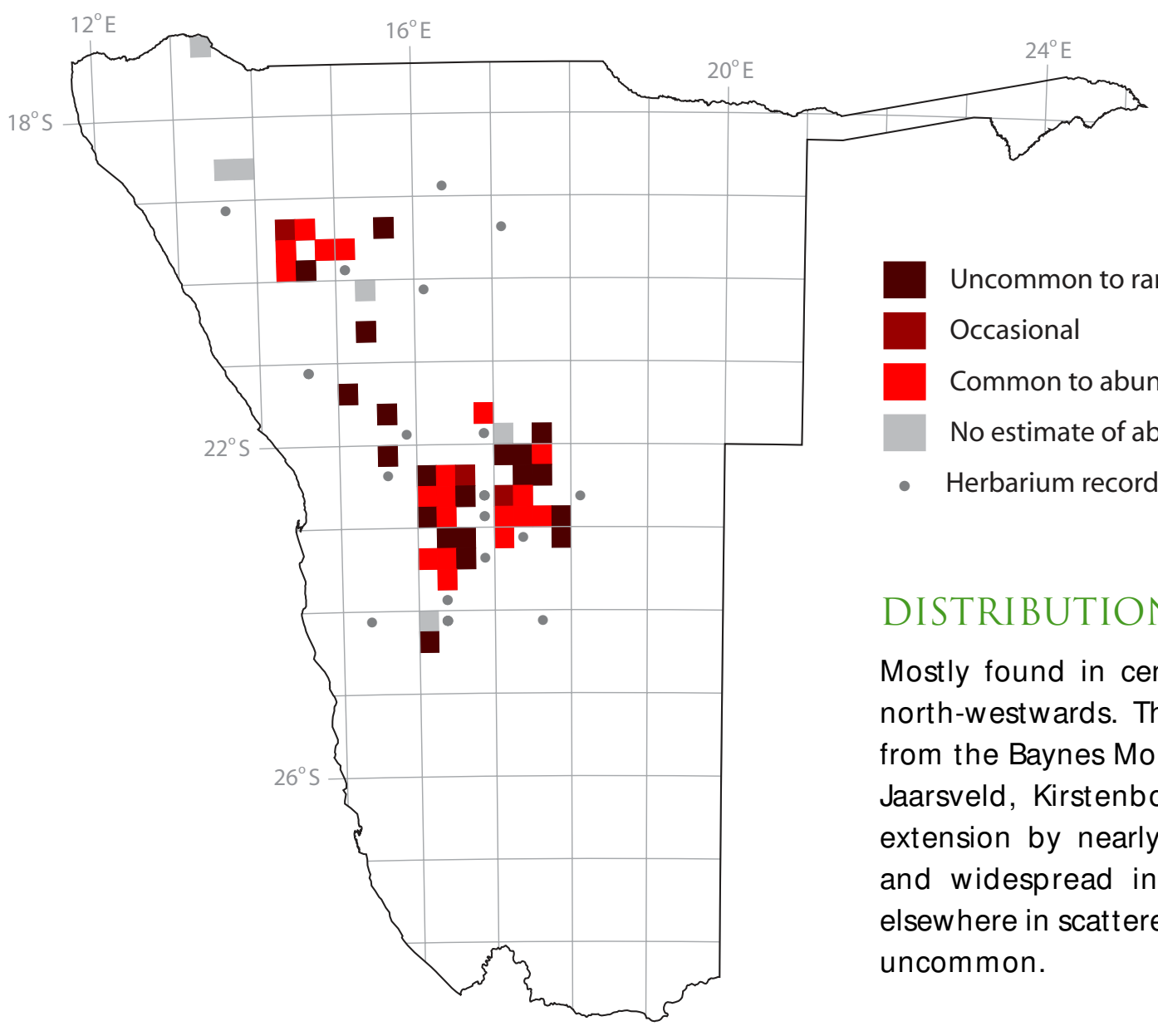
Manuleopsis dinteri

Dinter's bush

[75 records from 48 (4%) squares]



Lax and often untidy shrub. BARK smooth. BRANCLETS lax, squarish. LEAVES simple, **lanceolate to narrowly lanceolate; bright green, soft texture; margin often toothed**; apex pointed; petiole up to 20 mm long. INFLORESCENCE **a lax, terminal spray**. FLOWERS **tubular; white with small, maroon markings in throat**. FRUIT a brown, elongate-ovoid capsule with two chambers. SEEDS winged.

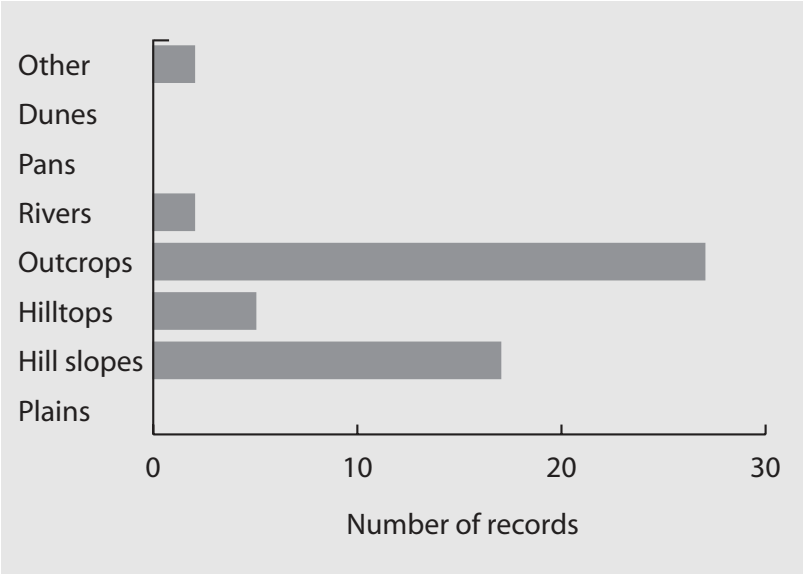


DISTRIBUTION & ABUNDANCE

Mostly found in central Namibia, extending north-westwards. There is one sight record from the Baynes Mountains (pers. comm. van Jaarsveld, Kirstenbosch), which is a range extension by nearly two degrees. Common and widespread in the central highlands; elsewhere in scattered localities and generally uncommon.

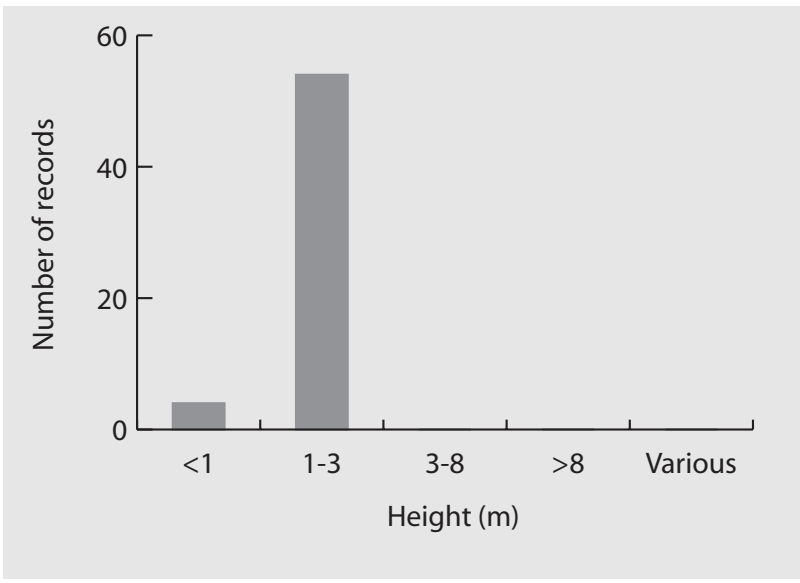
HABITAT

Found in various habitats, but mostly on rocky outcrops and hill slopes. Grows on rocky or stony substrates.



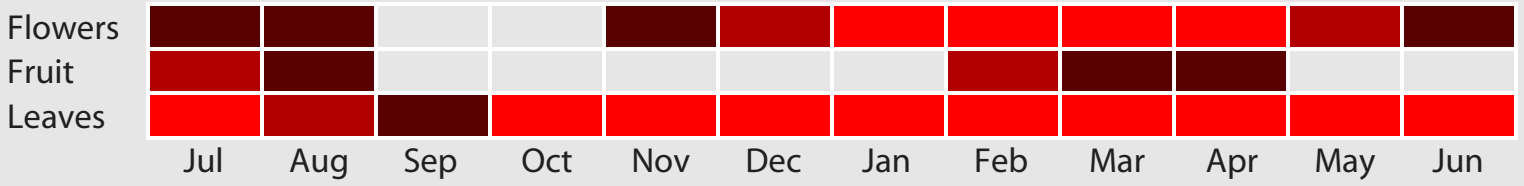
GROWTH FORM

Always a shrub, mostly in the 1–3-m category.



ANNUAL CYCLE

FLOWERS almost all year, but mostly from January to April. FRUIT mostly July and February, but very few recorded. LEAVES virtually evergreen.



CONSERVATION CONCERNS

Endemic to Namibia. No threats reported.



Manuleopsis dinteri, Botanic Garden, Windhoek, C. Mannheimer

Rhigozum brevispinosum

Gelber Kurzdorn

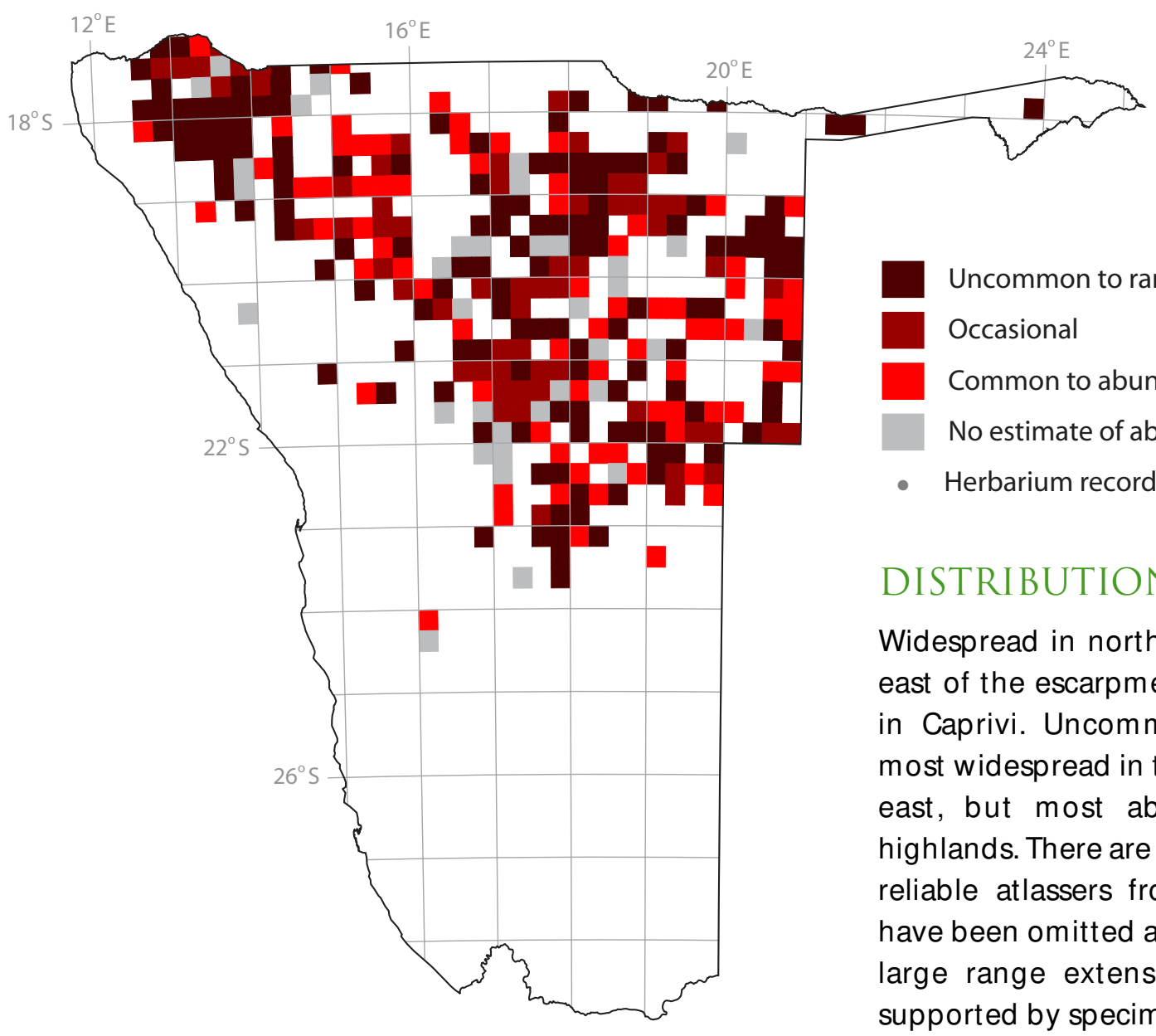
Simple-leaved rhigozum (E); granaatbos, kortdoringgranaat (A); omunditi (H); #nuu!gabab (K); osapati (O); ngandu (Rk, Rum, T)

[745 records from 337 (31%) squares]



Erect, deciduous, **spiny shrub**. BARK of older stems dark grey; young branchlets paler, vertically streaked, **with robust thorns up to 15 mm long**. LEAVES **simple, clustered on furry, knob-like dwarf-shoots; narrow, elongate**, 10–40 mm long; dark green, densely downy; apex blunt, sometimes notched. FLOWERS **yellow to golden-yellow; trumpet-shaped**. FRUIT a dry, papery capsule; splitting early.

Can be confused with *R. obovatum*, which always has trifoliolate leaves, and somewhat shorter flowers. Plant very conspicuous when in flower.

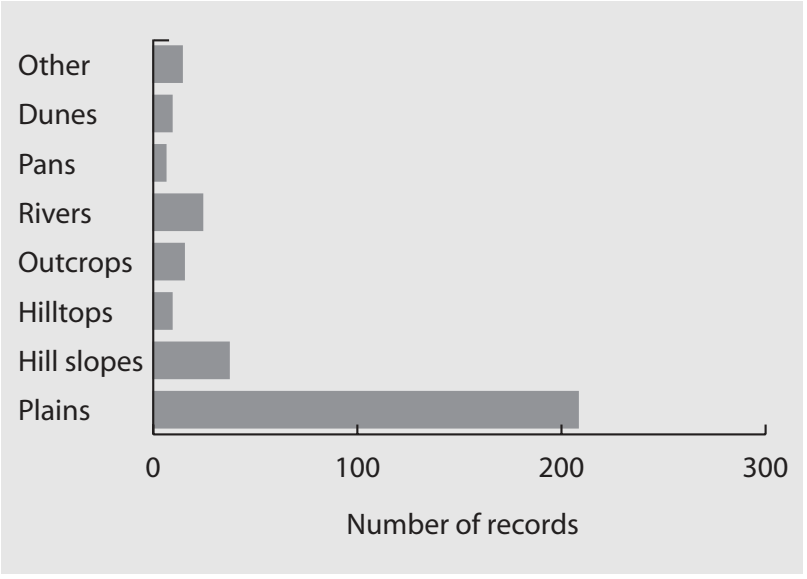


DISTRIBUTION & ABUNDANCE

Widespread in northern and central Namibia east of the escarpment, with only one record in Caprivi. Uncommon to common, being most widespread in the Karstveld and central-east, but most abundant in the central highlands. There are a number of records from reliable atlassers from the south, but they have been omitted as they would constitute a large range extension and they were not supported by specimens.

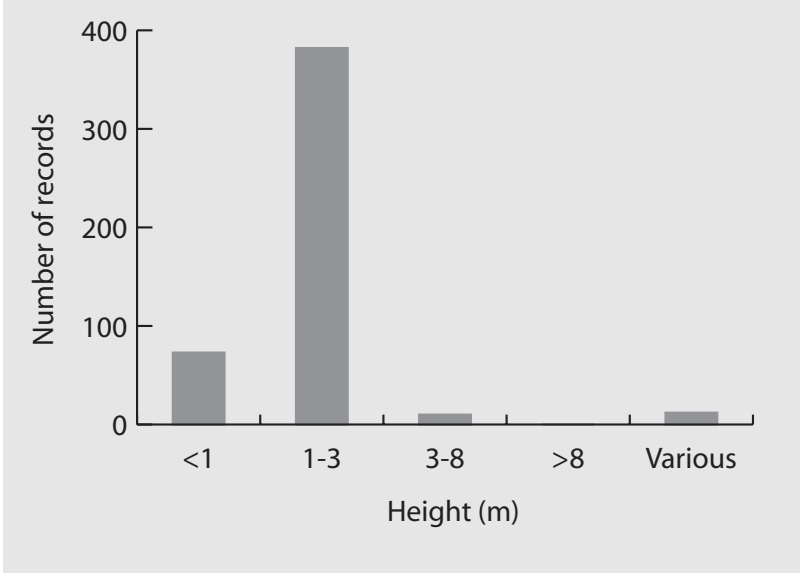
HABITAT

Found in various habitats, but mostly on plains; also, along rivers in the north-east and north-west, and on hills in the central highlands and north-west. Grows on sand, gravel and limestone substrates, and stony ground.



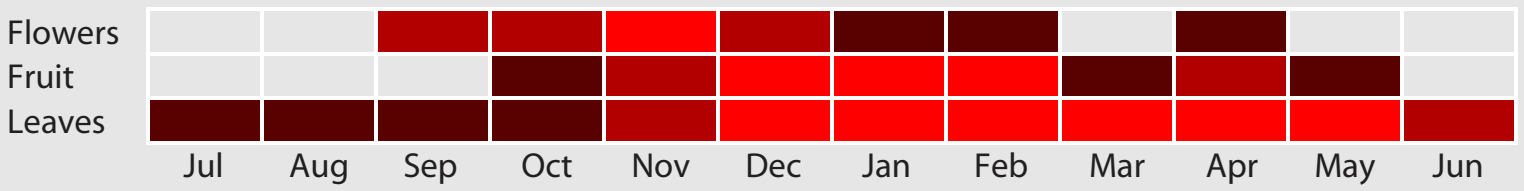
GROWTH FORM

A shrub, generally in the 1–3-m height class; occasionally less than 1 m and sometimes over 3 m.



ANNUAL CYCLE

FLOWERS September to December, continuing until April some years; rain-responsive at times, but not always. In 2219AD, in October 1999 masses of flowers were recorded ten days after 30 mm rainfall, but in 2000 they flowered without rain falling (SIL1). FRUIT a few all year, but mostly from November to April. LEAVES mainly December to May, with young leaves in September and October.



GENERAL COMMENTS

Kudu eat the flowers; the plant is used for fodder in some areas. The stems are used for fencing; the roots are used medicinally. This plant is a potential invader in some areas. It has horticultural potential because of its showy flowers. A rain-dependent species (see above).

CONSERVATION CONCERNS

None recorded.

Rhigozum trichotomum

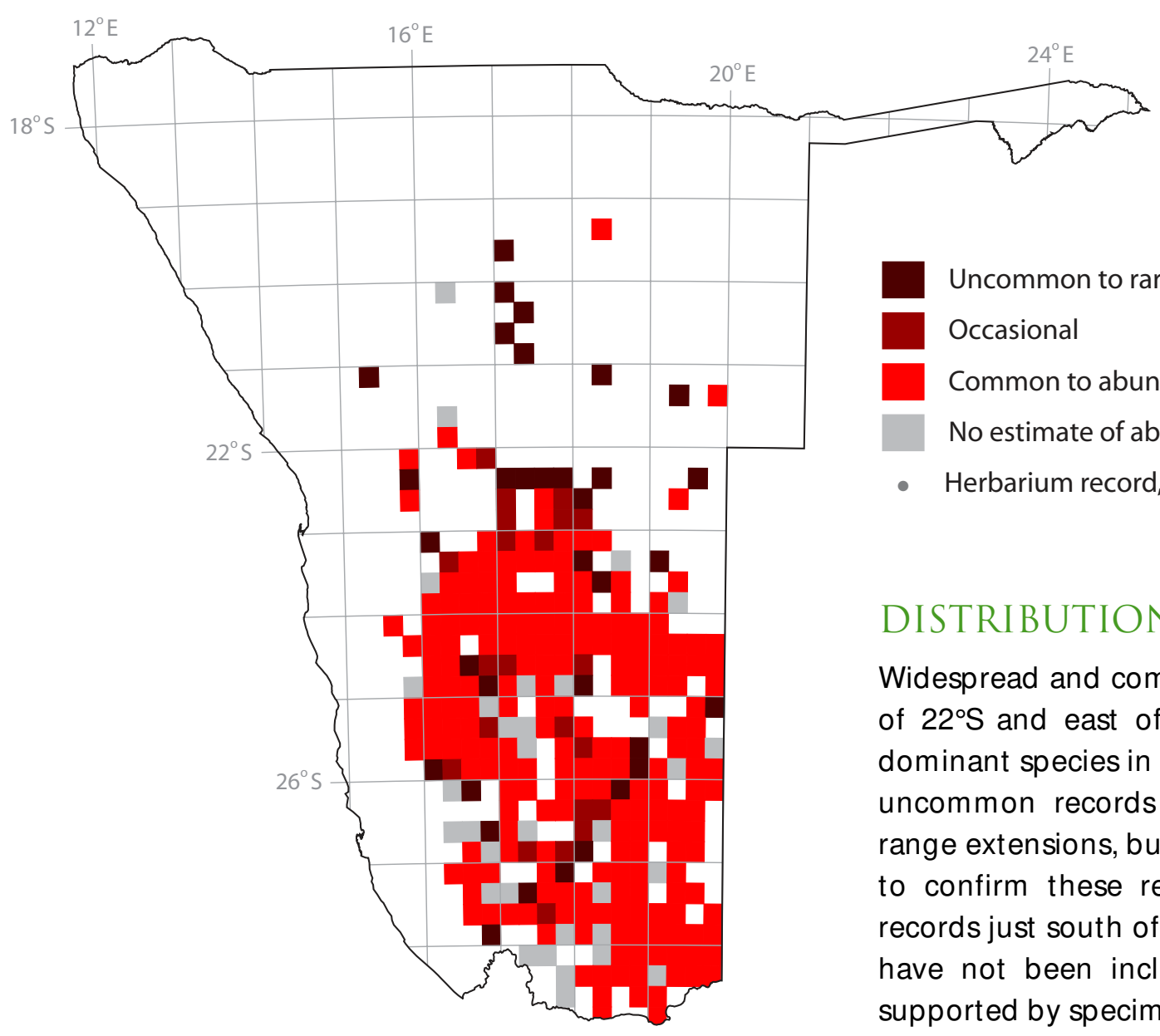
Driedoring

Three-thorn rhigozum (E); Dreidorn (G); okatakambindu (H); ||haub (K)

[718 records from 308 (29%) squares]



Rigid, deciduous shrublet. BARK grey, smooth; **young branchlets branching in threes at growth points, often with a slightly spinous appearance**. LEAVES **simple, spirally arranged or clustered on dwarf shoots, oblong-spathulate; dark green**, often glandular or sticky-looking; margin wavy; apex blunt and slightly recurved; petiole mostly absent. FLOWERS **solitary, trumpet-shaped, showy; white or flushed pale pink**. FRUIT a dry, papery capsule; splitting early.

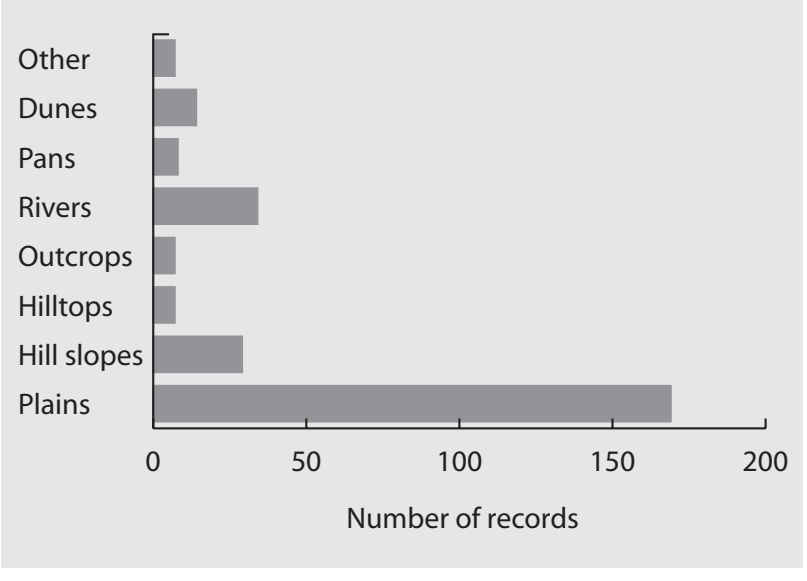


DISTRIBUTION & ABUNDANCE

Widespread and common to abundant south of 22°S and east of the Namib Desert; the dominant species in many squares. Scattered, uncommon records from further north are range extensions, but specimens are required to confirm these records. There were also records just south of the Kunene River, which have not been included as they were not supported by specimens.

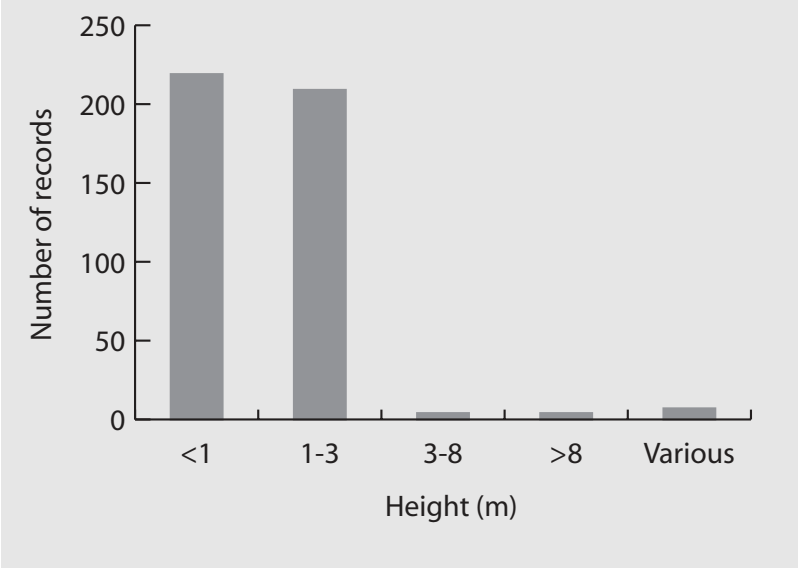
HABITAT

Found in various habitats, but most often on plains; also on dunes and in interdune streets in the south-east; along dry watercourses and on hill slopes in the south. Growing on gravel, sandy, stony or rocky substrates.



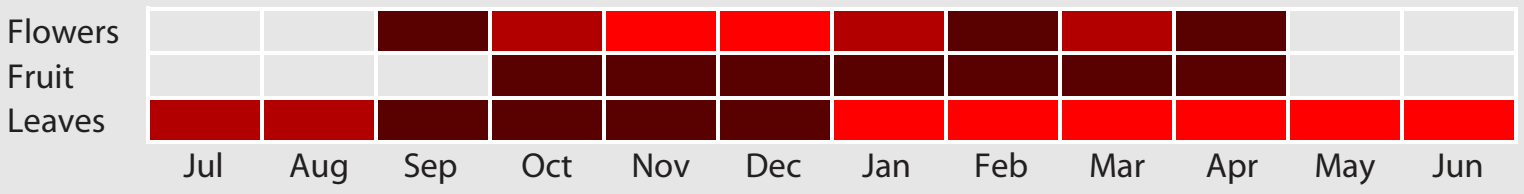
GROWTH FORM

A shrub less than 1 m high or in the 1–3-m height class.



ANNUAL CYCLE

FLOWERS September to April. FRUIT a few every month, but never many recorded. LEAVES mostly January to August, with new leaves from September to January.



GENERAL COMMENTS

This plant is browsed by goats. The stems and leaves are used medicinally. It has a tendency to become invasive; very attractive when in profuse flower.

CONSERVATION CONCERNS

None recorded.

Rhigozum obovatum

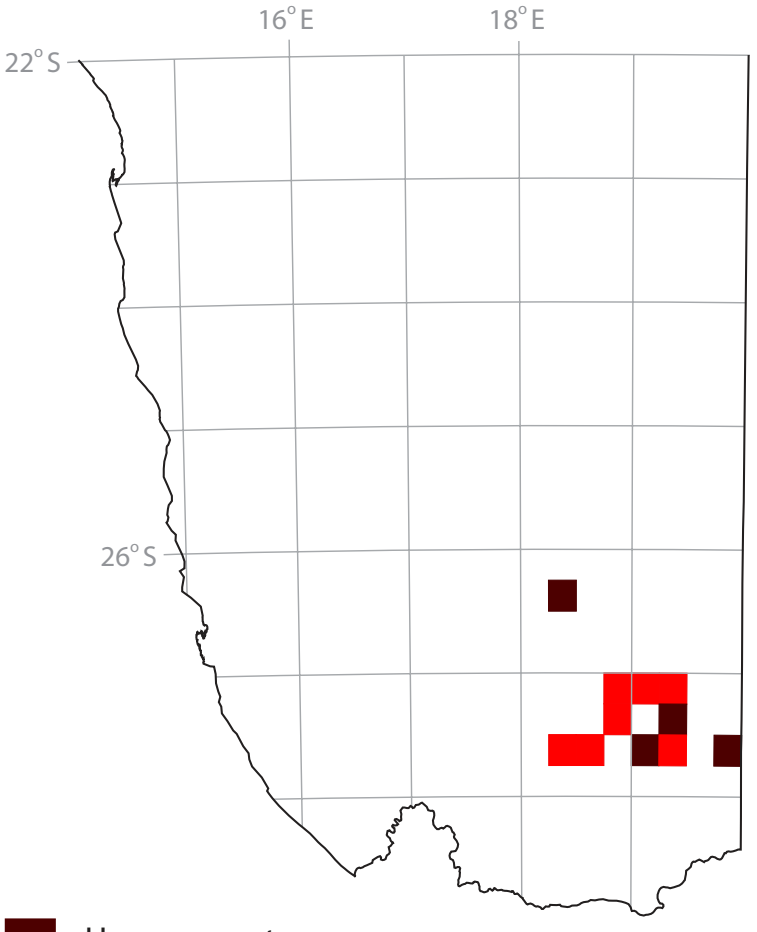
Karoo Rhigozum

Geelberggranaat (A)

[13 records from 11 (1%) squares]



A rigid, deciduous shrub. BARK grey, smooth; young branchlets grey, hairy; lateral branches stiff and rigid. LEAVES simple or **trifoliolate, opposite or clustered on dwarf shoots**, originating from a woolly cushion; obovate to oblanceolate, 3–5 mm long; pale green, felty; apex blunt, sometimes notched. FLOWERS **yellow, shallowly trumpet-shaped**.



DISTRIBUTION & ABUNDANCE

Common to uncommon in a very small area in the south-east; dominant in 2719DB. The previous range was extended by one degree to the east.

HABITAT

Mainly found on hill slopes, but also along dry rivercourses.

GROWTH FORM

A shrub in the 1–3-m height category.

ANNUAL CYCLE

Observations were only made in five months. FLOWERS recorded in February, April and May. FRUIT recorded in March, August and October. LEAVES present during all the months of observation.

GENERAL

Browsed by game and stock; of horticultural potential.

CONSERVATION CONCERNS

None reported. Probably under-recorded as it is rather nondescript when not in flower.

Rhigozum virgatum

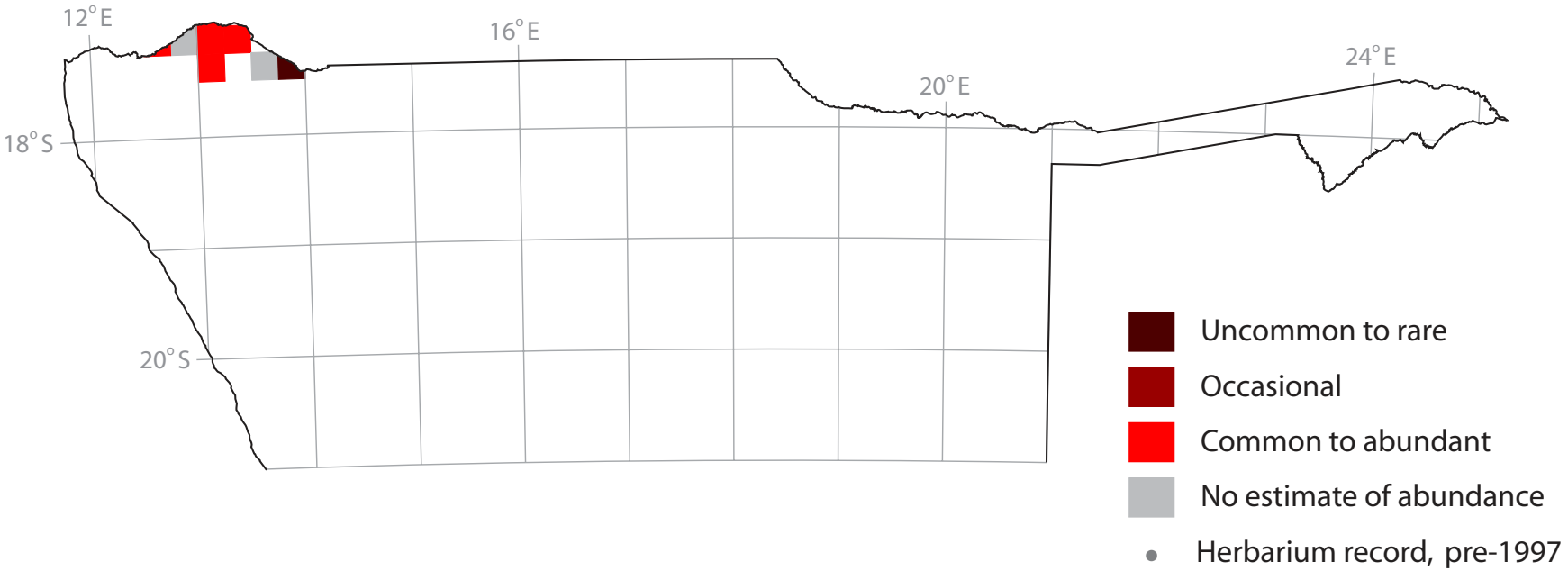
Kaoko Rhigozum

Ruten-Rhigozum (G); omombute, omunditi (H)

[15 records from 9 (<1%) squares]



Slender, many-stemmed, deciduous shrub. BRANCHES **very thin** and pale brown; sometimes spiny. LEAVES **compound, rachis slender, with 1–3 leaflet pairs; leaflets ovate-elliptic to obovate**, slightly leathery, lateral leaflets smaller than terminal leaflet; both surfaces grey-green, hairless; base asymmetric; petiole 3–8 mm long. FLOWERS **pale yellow to yellow, trumpet-shaped**.



DISTRIBUTION & ABUNDANCE

Common to abundant just south of the Kunene River.

HABITAT

Found on stony, gravel or rocky hill slopes and plains.

GROWTH FORM

A shrub in the 1–3-m height class, and lower.

ANNUAL CYCLE

FLOWERS herbarium records from October to March. FRUIT November to June (herbarium records). LEAVES March, May and November (the only months of observations).

CONSERVATION CONCERNS

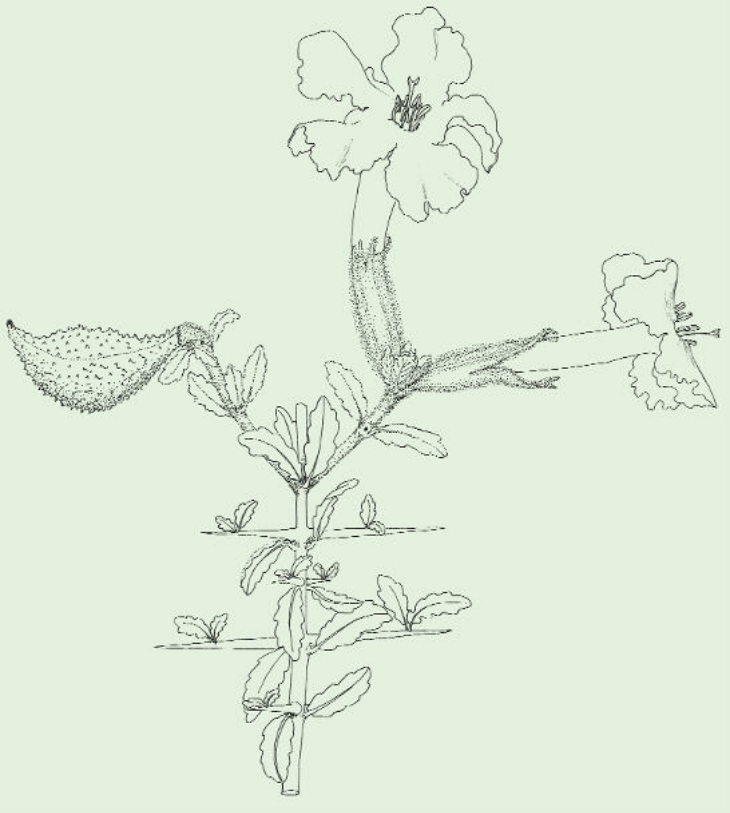
None recorded.

Catophractes alexandri

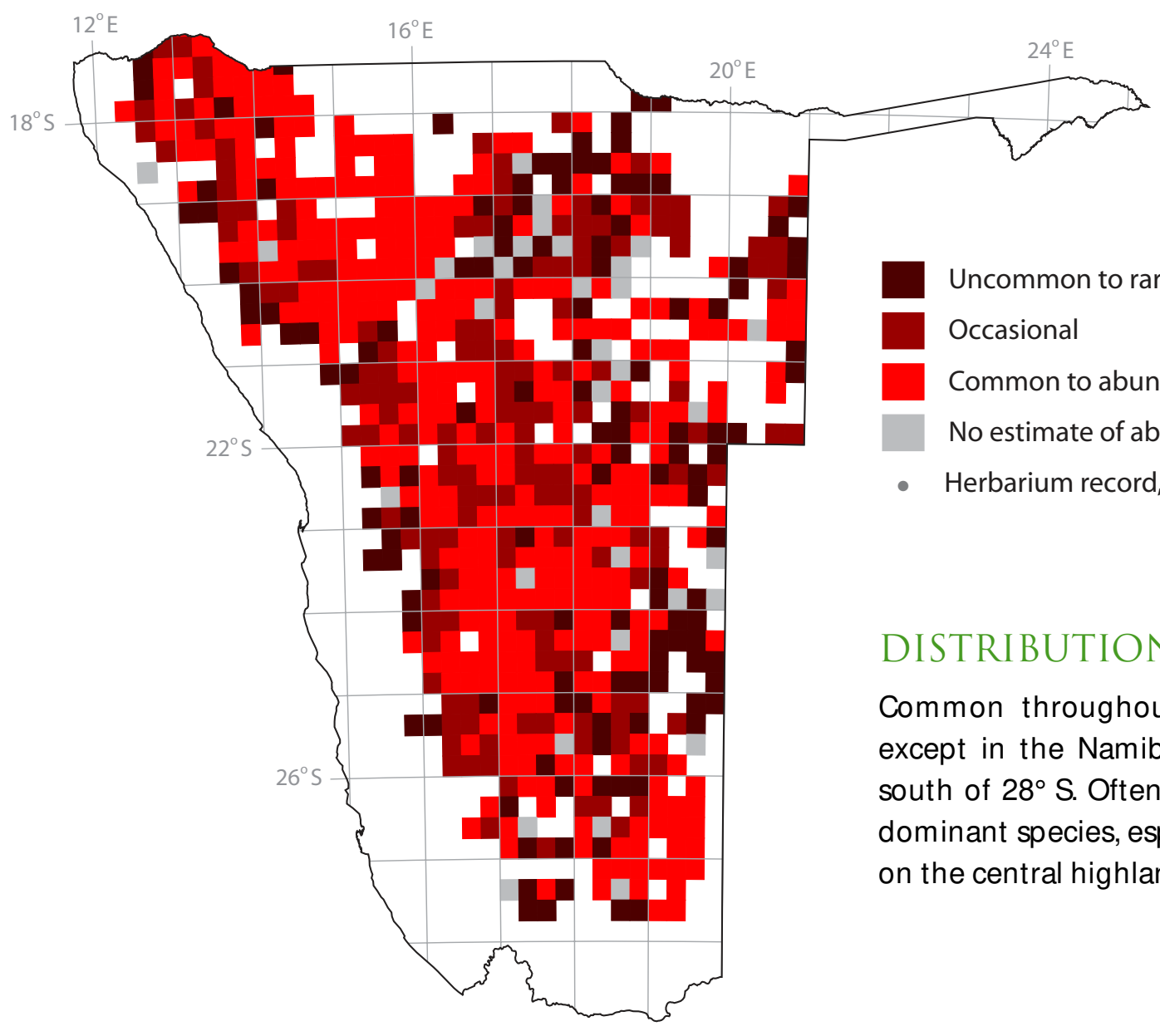
Ghabbabos

Trumpet-thorn, rattlepod (E); trompetdoring (A); Schwartzdornsilberbusch, Gabbabusch (G); omundumba (H); !gaba (K); mutwatwa (L)

[2,346 records from 665 (62%) squares]



Rigid shrub. BRANCHES **pairs at right angles to each other; bearing straight thorns that are grey and densely woolly at first, becoming brown-black later.** LEAVES simple, **obovate to oblong; densely grey-woolly**, paler below than above; veins prominent below; margin toothed and wavy. FLOWERS **solitary, trumpet-shaped with long tube; white to pale pink.** FRUIT **a woody, warty capsule that rattles when shaken and splits open when the seeds are ripe.**

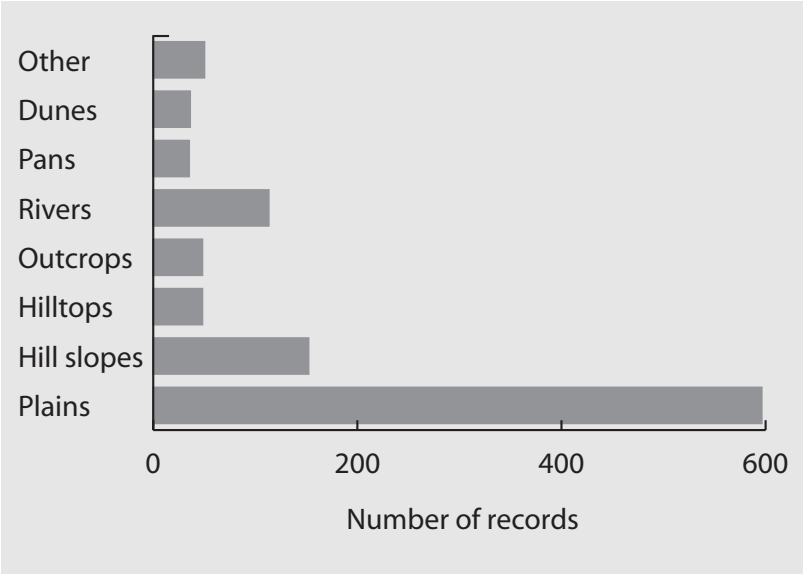


DISTRIBUTION & ABUNDANCE

Common throughout most of the country, except in the Namib Desert, the Caprivi and south of 28° S. Often abundant and often the dominant species, especially in the north-west, on the central highlands and in the south.

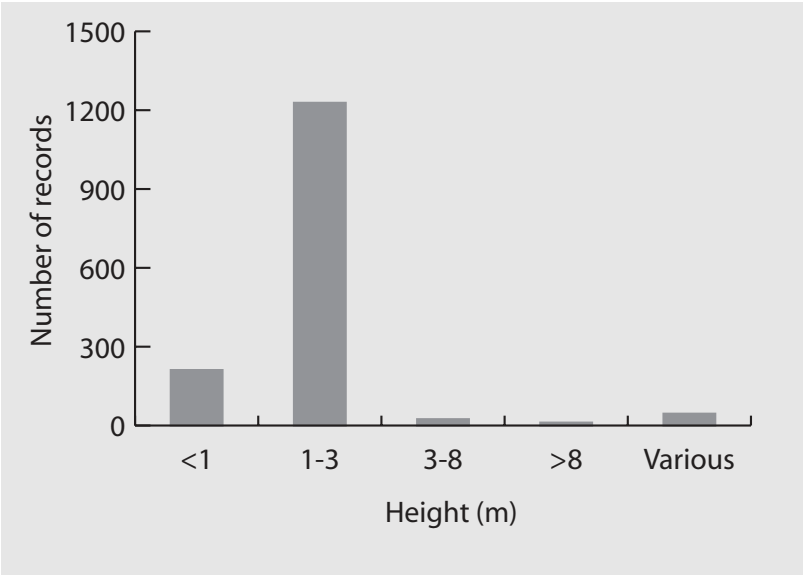
HABITAT

Found in many habitats, but mostly on plains. Also on hill slopes and along dry rivers in many areas; around pans in the central-east and south-east; on dunes and in interdune streets in the south-east. Uncommon in dunes, but common in the interdune streets. Most often on calcrete, but also other rocky, stony and gravel substrates, including granite and mica schist.



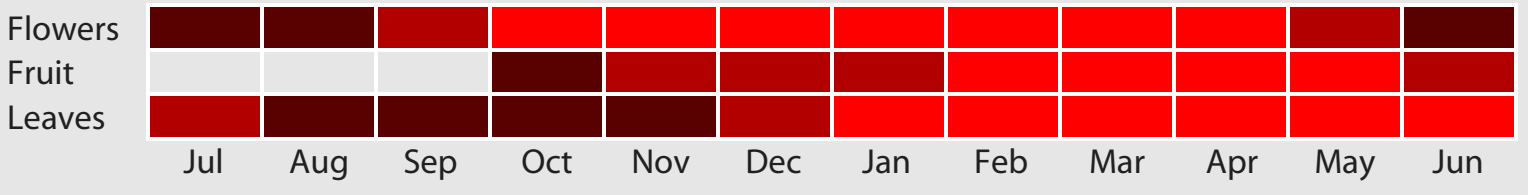
GROWTH FORM

A shrub up to 3 m high, rarely higher; often thicket-forming.



ANNUAL CYCLE

FLOWERS mainly from September to May, with a peak in March and April, but sporadic flowering has been recorded all year; this species is very responsive to rain and can flower more than once per season. FRUIT mostly from February to May. LEAVES from December till July, with most plants bare from August to November.



GENERAL

This plant is an indicator of calcereous soils; it often grows in association with *Acacia nebrownii* on pans; and is parasitised by *Tapinanthus* spp. It is invasive in many areas, especially disturbed areas, increasing by up to 60% in areas where other species have died back; this trend has become very prominent in the past five years (BES1).

The foliage is eaten by springbok and zebra; it is browsed by black rhino in Etosha; the flowers are eaten by kudu. Goats browse this shrub, and eat the flowers. The roots are used medicinally. The plant is of horticultural potential as it is tolerant of mica schist and thrives best in poor soils, and has attractive, grey foliage and pretty flowers.

CONSERVATION CONCERNS

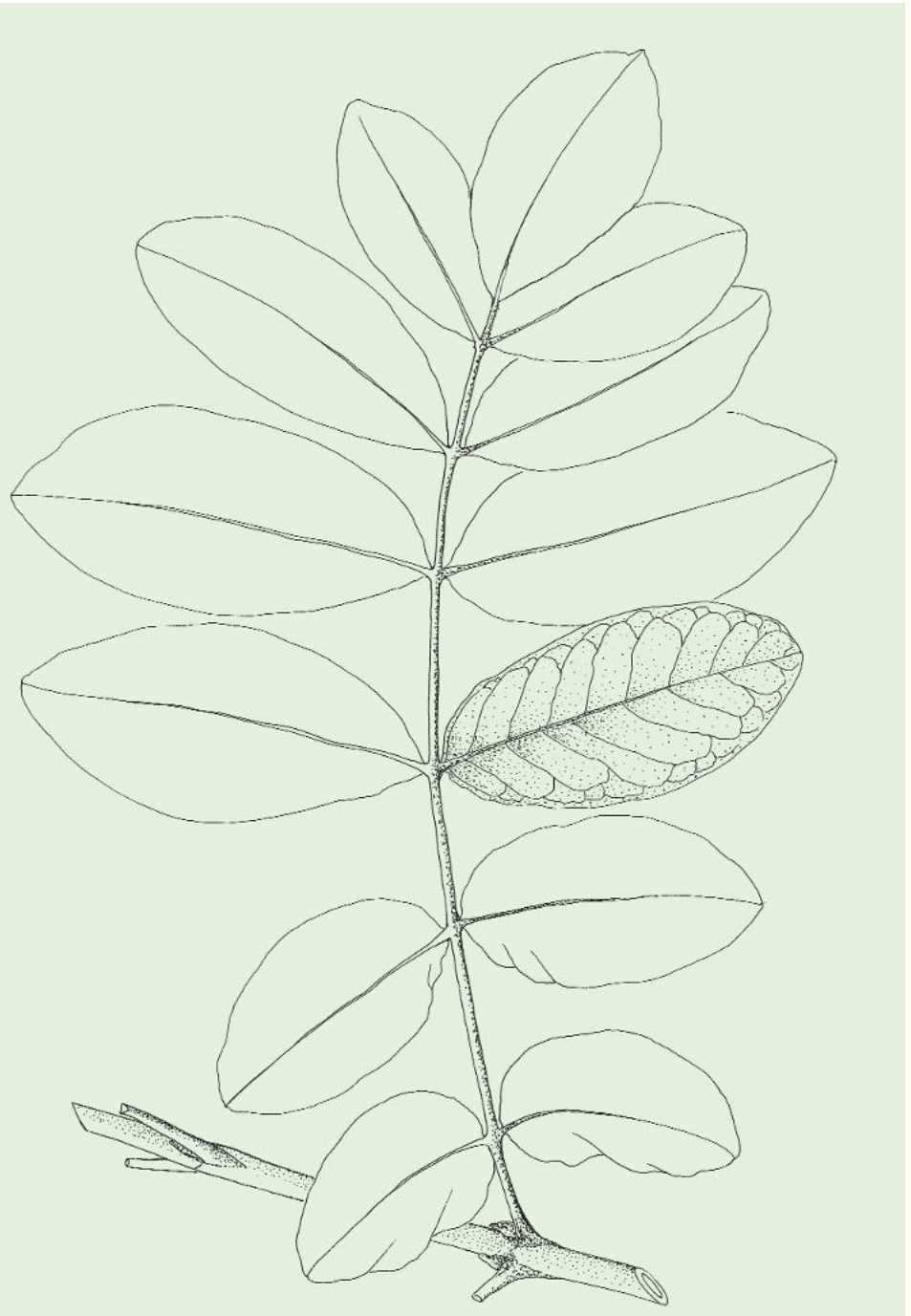
None recorded.

Markhamia obtusifolia

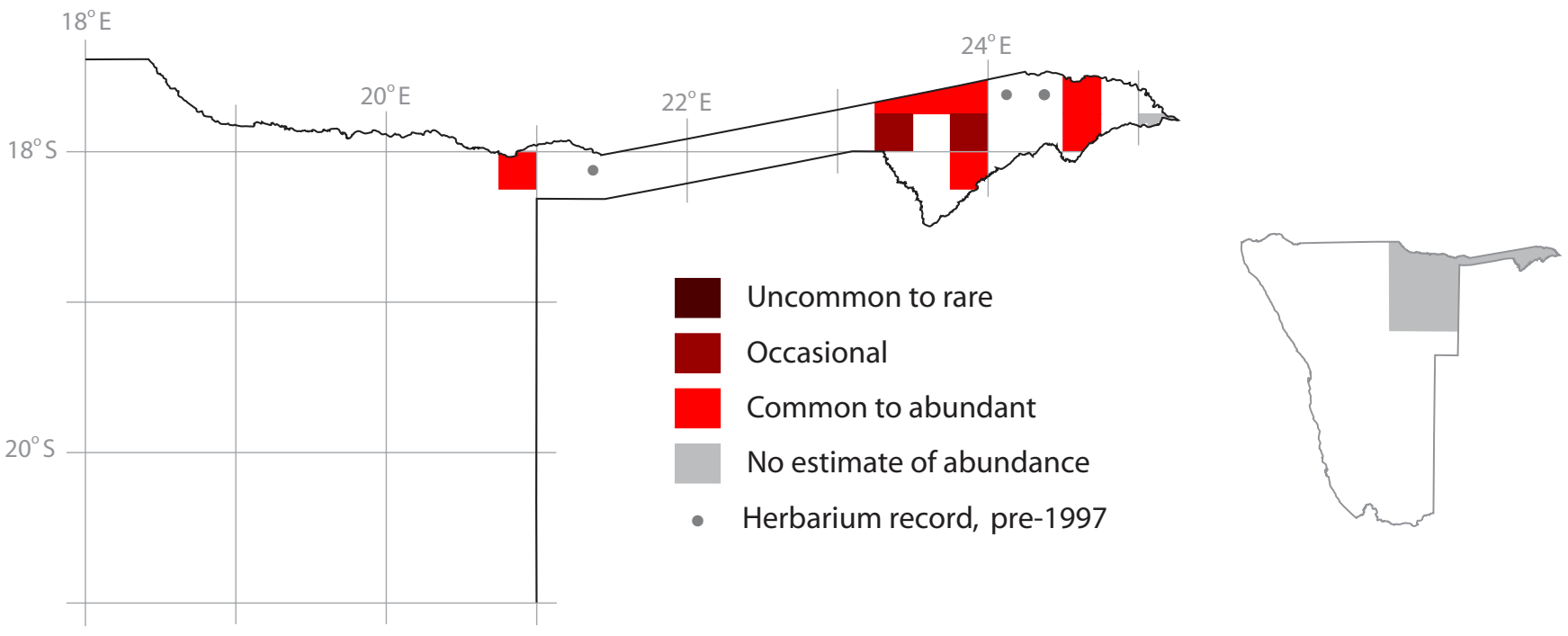
Golden Bell-bean

Goueklokkiesboontjie (A); |kgai-tara (Kx); mukupukupu (L); mukurathiku (T)

[16 records from 10 (<1%) squares]



Deciduous, **untidy shrub**; rarely a small tree. BARK brownish-grey, with white lenticels and vertical grooves; youngest branchlets with golden, hairy covering. LEAVES compound, 250–400 mm long; leaflets **ovate to elliptic, darker green above than below**; hairy below. FLOWERS **large, irregularly tubular, showy, golden-yellow with red streaks on the lower three corolla lobes**. FRUIT **a long, slender capsule in clusters; up to 400 mm long**; light brown, velvety when young; dark brown when ripe.



DISTRIBUTION & ABUNDANCE

Mainly found in eastern Caprivi, with one locality along the Okavango River and another earlier herbarium record from a bit further downstream. Common to abundant; sometimes forming dense stands.

HABITAT

Found on sandy plains in woodland; also on floodplains in the Caprivi.

GROWTH FORM

Always a shrub, mostly in the 1–3-m height category.

ANNUAL CYCLE

FLOWERS November to March. FRUIT October to March. LEAVES apparently deciduous, but no observations made in winter; bare in October.

GENERAL

Easily colonises disturbed areas. Has horticultural potential for frost-free areas due to its lovely flowers.

CONSERVATION CONCERNS

None recorded.

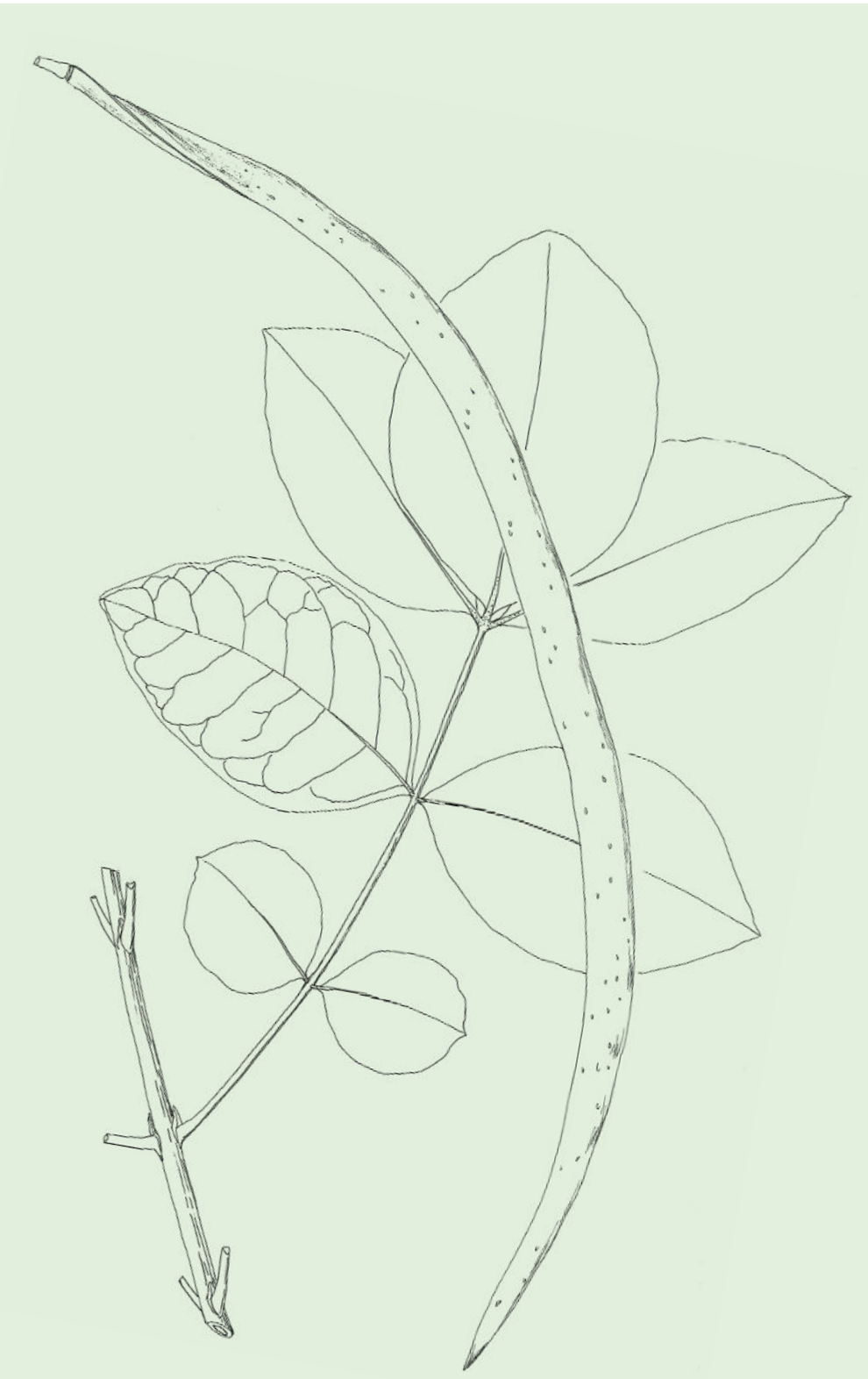
Markhamia zanzibarica

= Markhamia acuminata

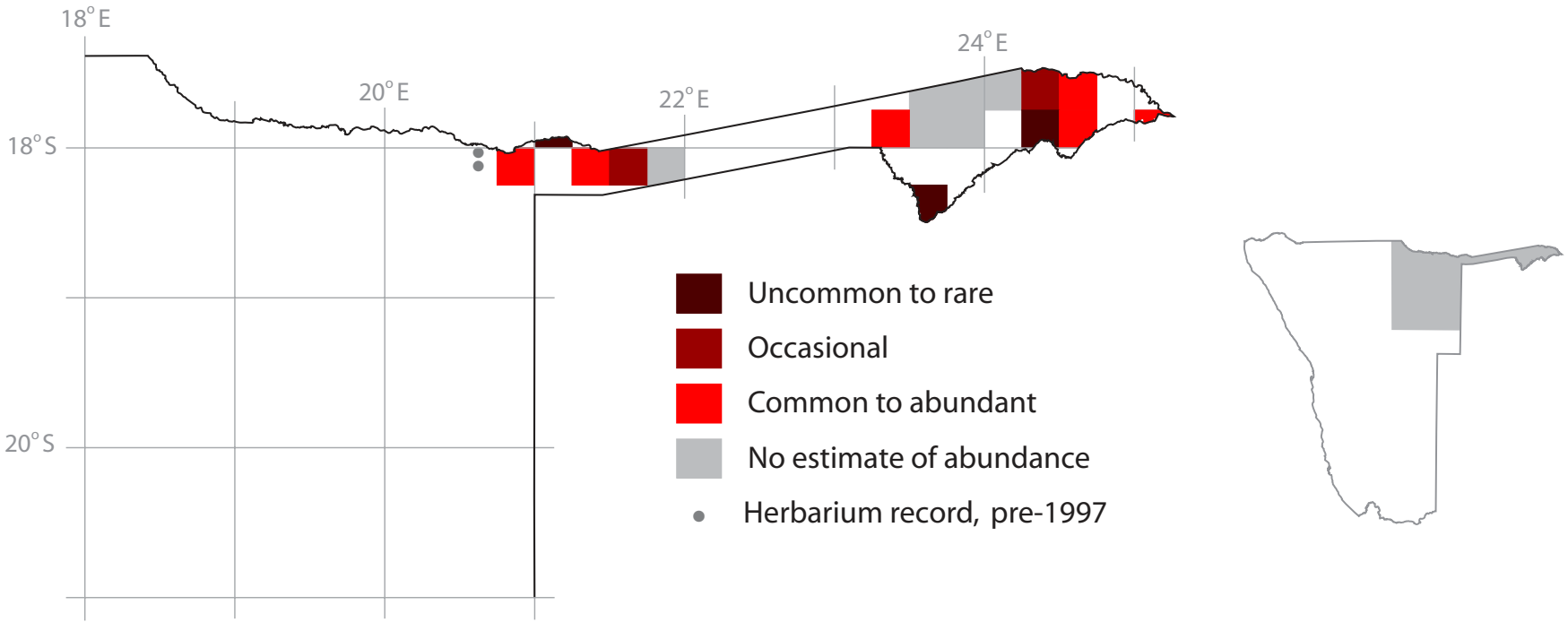
Bell-bean

Klokkiesboontjieboom (A); kaitala (Kx); mupatagwali (L)

[27 records from 20 (2%) squares]



Deciduous, **untidy shrub** or tree. BARK smooth, shiny, grey-brown to dark grey; flaking near the base in uneven plates. BRANCHES brittle; young branchlets white-downy. LEAVES compound, with 2–3 sessile leaflet pairs, **the basal pair is distinctly smaller than the others; leaflets obovate to almost circular**; dark green above, with sparse hairs and scales; paler below. FLOWERS **large, bell-shaped, striking; yellow with dense, maroon flecks**. FRUIT **a long, sickle-shaped, twisted capsule up to** c. **10 mm broad; brown with whitish dots when ripe**.

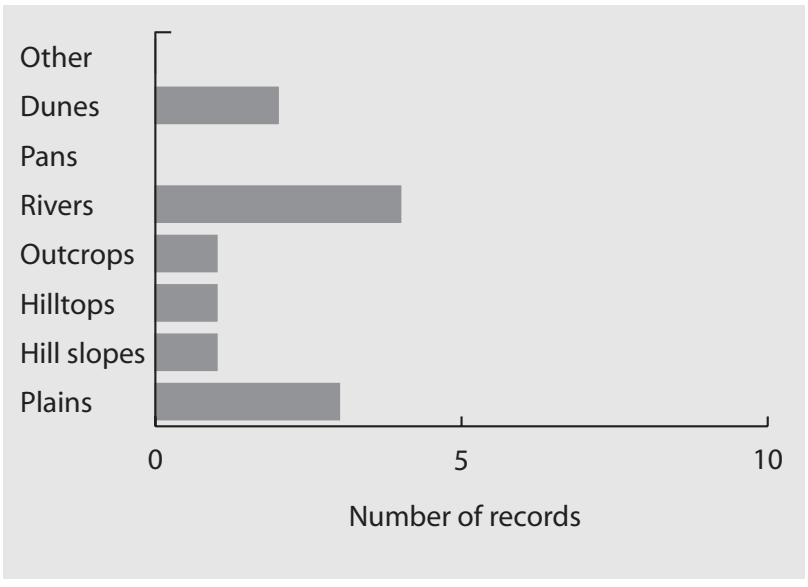


DISTRIBUTION & ABUNDANCE

Found mostly along the rivers of the eastern Caprivi, as well as the Okavango River.

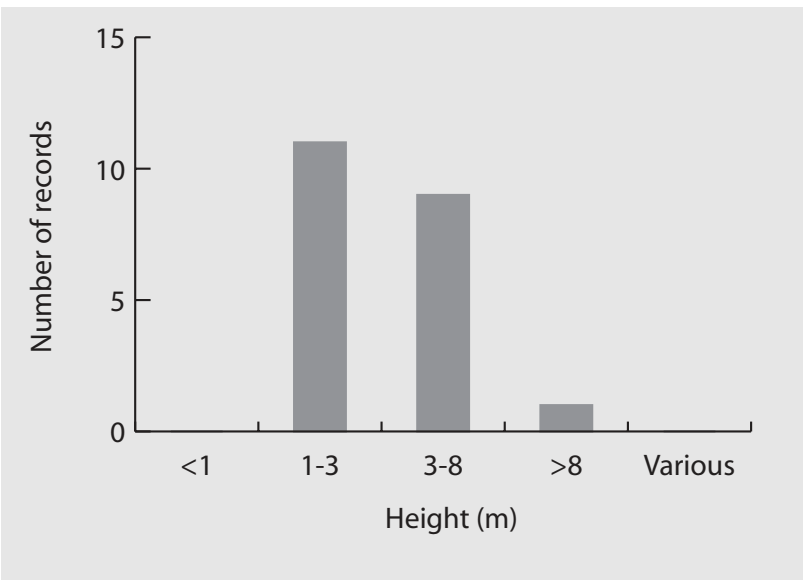
HABITAT

Found on river banks and floodplains in riverine woodland; also on sandy plains and dunes.



GROWTH FORM

Mostly a tree (62% of records), but often shrubby or clambering.



ANNUAL CYCLE

FLOWERS mainly in December, but also in November and January. FRUIT from December to June. LEAVES apparently deciduous, but no observations in winter; bare trees recorded in November.

GENERAL

Of horticultural potential for frost-free areas due to its lovely flowers.

CONSERVATION CONCERNS

None recorded.

BIGNONIACEAE | JACARANDA FAMILY

This family of shrubs, trees and lianas generally has large, compound leaves. The large, showy flowers are bell- or trumpet-shaped, with the corolla tips free and curled backwards. The fruit are generally long, narrow, dehiscent pods or large berries.





Top left: *Markhamia obtusifolia*, C. Hines

Top right: *Kigelia africana*, tree with fruit, B. Curtis

Right: *Kigelia africana*, flower, P. Reiner



Kigelia africana

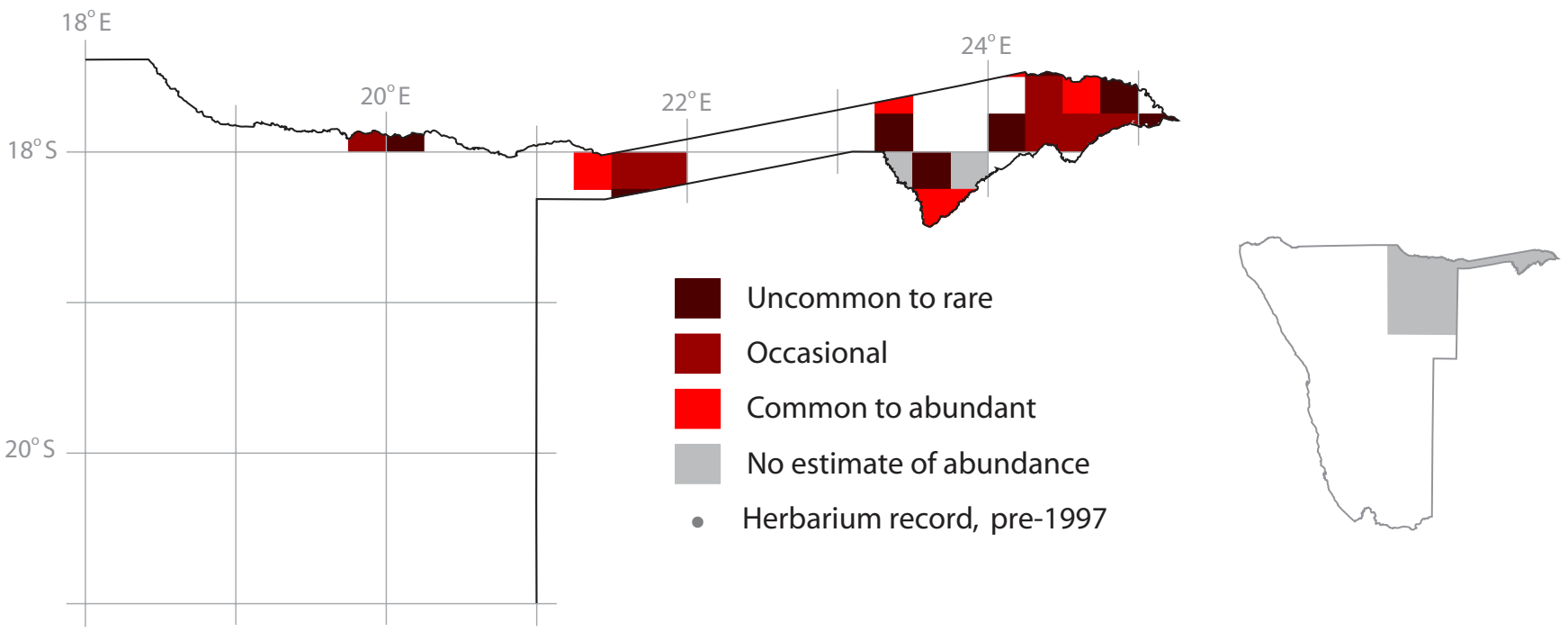
Sausage Tree

Worsboom (A); Wurstbaum (G); |tollo (Kx); kazungula, mupolota (L); vunguvungu (Rk, Rum); divunguvungu (T)

[61 records from 24 (2%) squares]



Semi-deciduous tree with **spreading crown**. LEAVES **large, compound, 3–4 leaflet pairs with basal pair much smaller than others; leaflets broadly elliptic to obovate, hard, brittle; shiny, dark green above**; paler green and densely downy below; margin entire, occasionally toothed. FLOWERS **large, showy, deep red and crinkly; in a robust hanging spray**. FRUIT **very large, heavy, sausage-shaped; hanging on an almost 1-m-long stalk; light greyish-brown dotted with lenticels**.

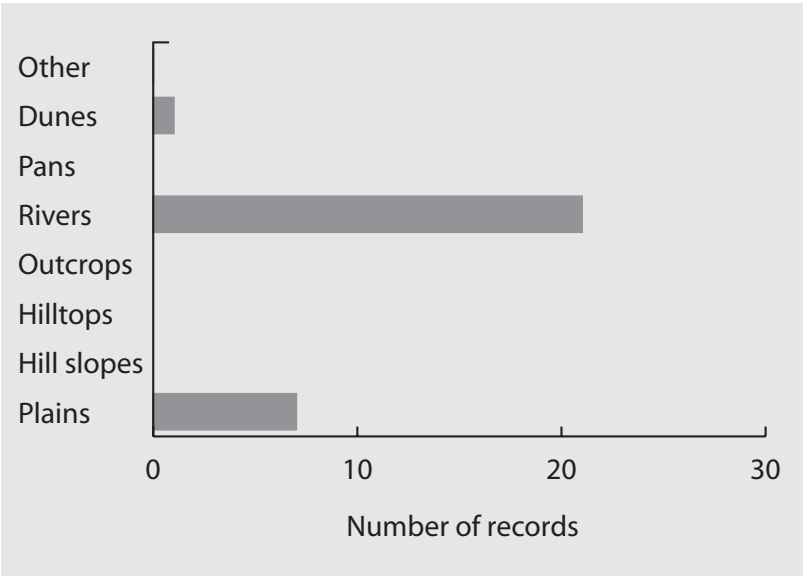


DISTRIBUTION & ABUNDANCE

Common in places along the Okavango River; common to uncommon in eastern Caprivi.

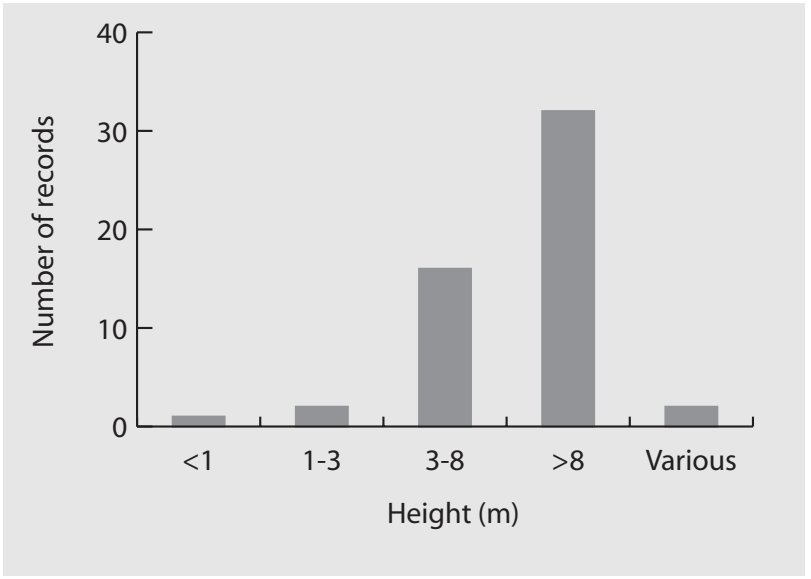
HABITAT

Mainly found on floodplains and along river banks; sometimes on sandy plains. Always in woodland.



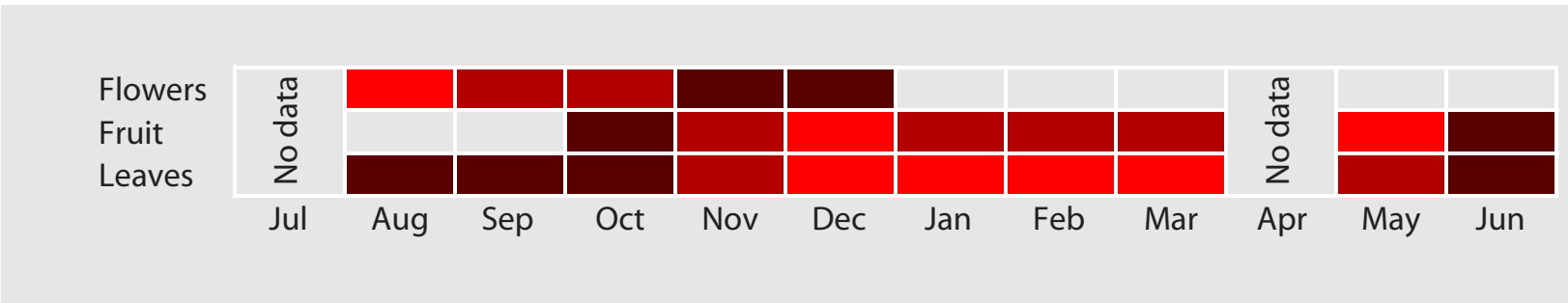
GROWTH FORM

Always a tree, up to 8 m high (35% of records) or taller (65%). Very few young trees reported.



ANNUAL CYCLE

FLOWERS mainly August, continuing to December. FRUIT from October to March, and also in May and June. LEAVES on some trees most months, with young leaves in August.



GENERAL

There are numerous uses of this tree. The bark and fruit are used medicinally; the seeds are sometimes roasted and eaten. A beautiful shade tree with lovely flowers commonly planted in gardens in the north, with a few in Windhoek, though they are frost-sensitive when young. The fruit is the larval food and home of certain moths.

CONSERVATION CONCERNS

Because this species is conspicuous and cannot have been overlooked, the lack of recent records along the Okavango River suggests that it has been over-exploited. Generally found only in protected areas, such as national parks, on islands and within fenced-off areas. Absent from highly utilised areas along the river.

Sesamothamnus guerichii

Herero Sesame-bush

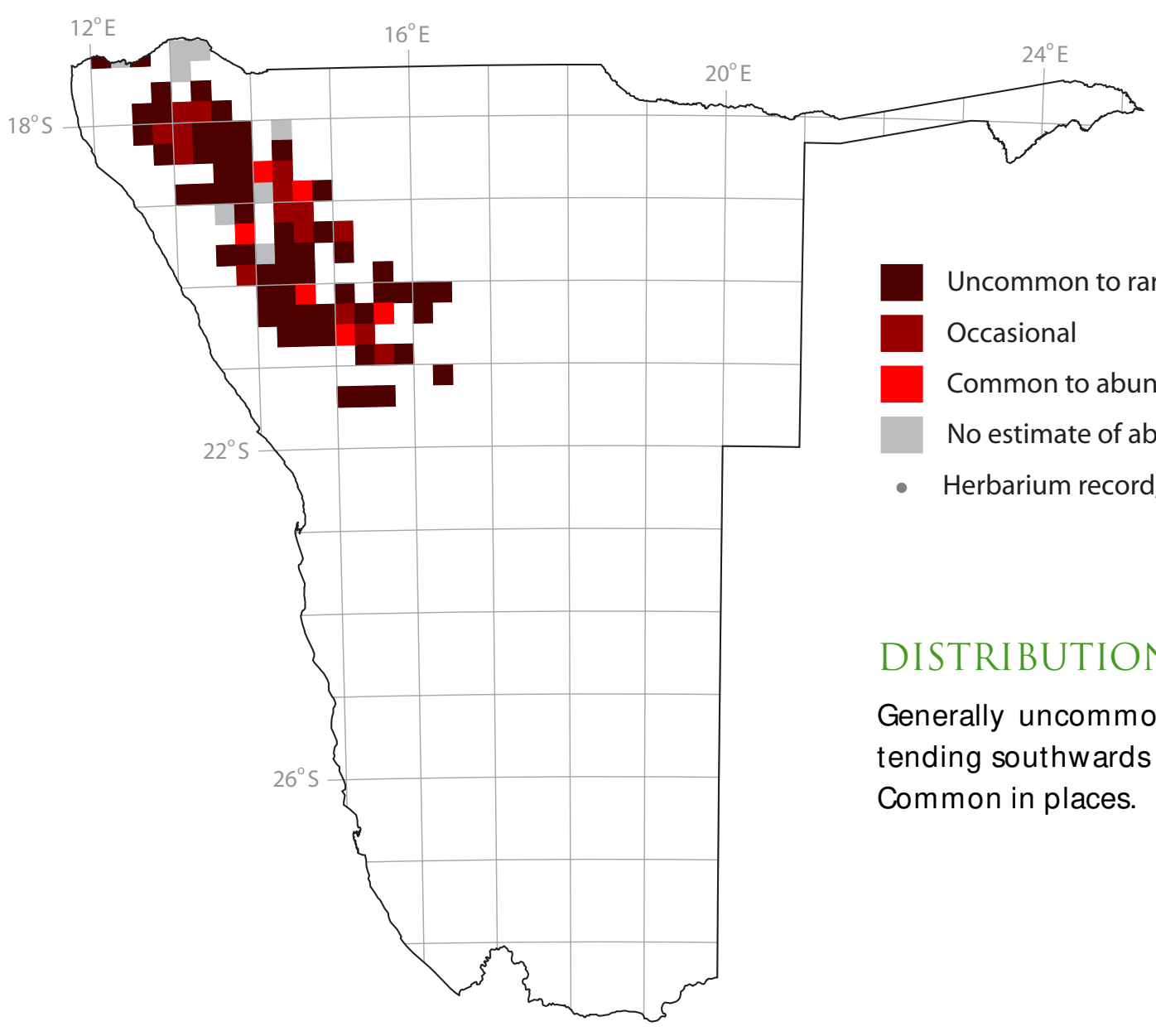
Ongumbati (H); |hoeb (K)

[215 records from 86 (8%) squares]



Rigid, erect shrub or multi-stemmed tree, **with a succulent trunk**. BARK yellow-brown to **creamy-grey, not peeling**. LEAVES obovate to oblanceolate, **20–30 mm long; grey-green** with **dense hairs and white woolly covering**; midrib prominent below; apex blunt; base tapering. FLOWERS **bright yellow**; corolla tube curved, sometimes almost S-shaped; 50–65 mm long, swollen at base. FRUIT obovoid, up to 60 x 35 mm; apex rounded to indented, with or without a point.

Can be confused with *S. benguellensis*, which has white flowers with a spur, and larger leaves, and a far more restricted distribution.

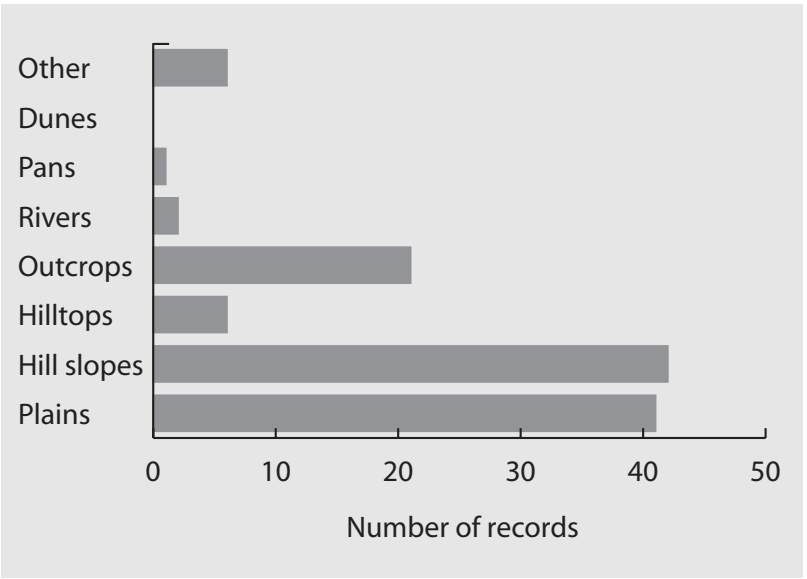


DISTRIBUTION & ABUNDANCE

Generally uncommon in the north-west, extending southwards to almost 22° S. Common in places.

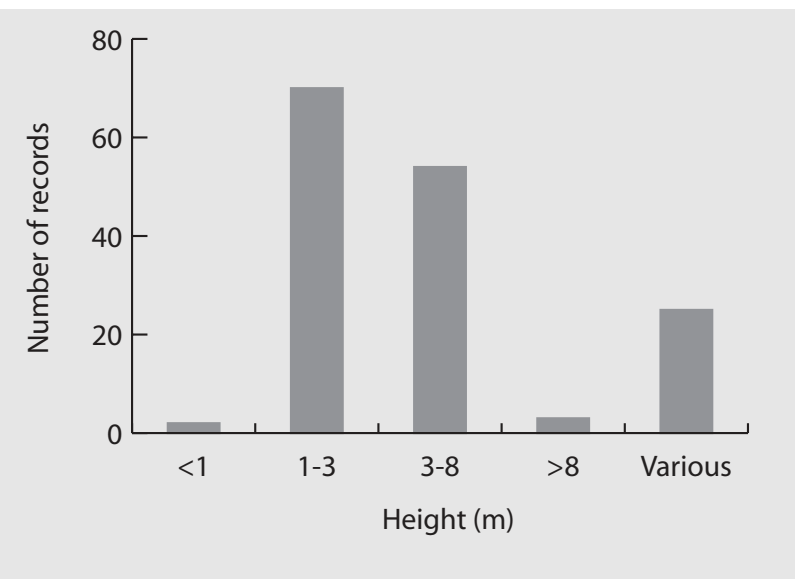
HABITAT

Found in various habitats, but mainly on gravel plains, hill slopes and rocky outcrops. Grows on rocky or stony substrates.



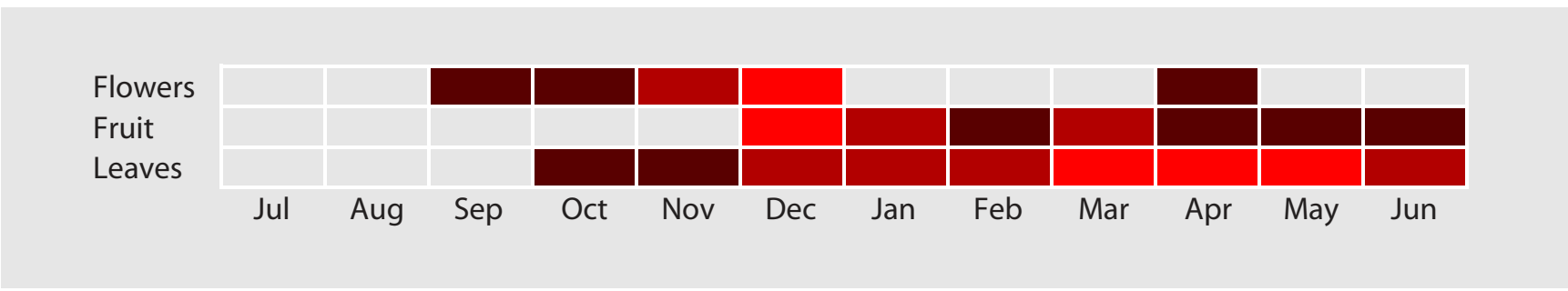
GROWTH FORM

Equally often described as a tree as a shrub. Shrubs generally in the 1–3-m height class; trees 3–8 m, seldom over 8 m.



ANNUAL CYCLE

FLOWERS September to December, and again in April. FRUIT December to June. LEAVES present on some trees from October to June, but mainly March to May, during and just after the rains.



GENERAL

The roots are chewed as a cough remedy. This plant is of horticultural potential for dry gardens and the pachycaul trade.

CONSERVATION CONCERNS

None recorded.



Sesamothamnus guerichii, B. Curtis

Sesamothamnus benguellensis

Kaoko Sesame-bush

Kaokosesambos (A)

[7 records from 5 (<1%) squares]



Rigid shrub with a succulent, often angular trunk. BARK yellow-brown to **creamy-grey, not peeling**. LEAVES obovate to ob-lanceolate, **40–60 mm long**; both surfaces **dark green, hairless**; apex blunt, often recurved; base narrowly tapering. FLOWERS **white to cream-coloured**, tinged with pink or light purple; corolla tube slightly curved, 50–80 mm long; **spur at base of flower**, **20–40 mm long**. FRUIT oblong to obovoid, up to 80 x 34 mm; apex rounded or indented, with or without a pointed tip.

Often confused with the more widespread *Sesamothamnus* sp. nov. and *S. guerichii*, but easily distinguished by the colour, shape and size of the FLOWERS. *Sesamothamnus* sp. nov. is generally taller, with larger LEAVES; *S. guerichii* generally has a less angular stem, is often taller, with smaller, greyer LEAVES.

DISTRIBUTION & ABUNDANCE

Occasional to locally common in the hills and mountains south of the Kunene River in the Marienfluss and Hartmann's Valley area (1712AA & AB); uncommon to rare in 1712AD, BC & DC. Reported far more widespread by atlassers, but since none of these records was substantiated by specimens and there are no old herbarium records from further south, they were probably misidentifications of the other two species.

HABITAT, GROWTH FORM & ANNUAL CYCLE

A shrub of less than 3 m high, found mainly on rocky outcrops and hill slopes, occasionally on plains. Only observed in January, April and May, when there were LEAVES. FLOWERS and FRUIT recorded January and April. Herbarium records in October, May and June.





Sesamothamnus benguellensis, A. van Wyk

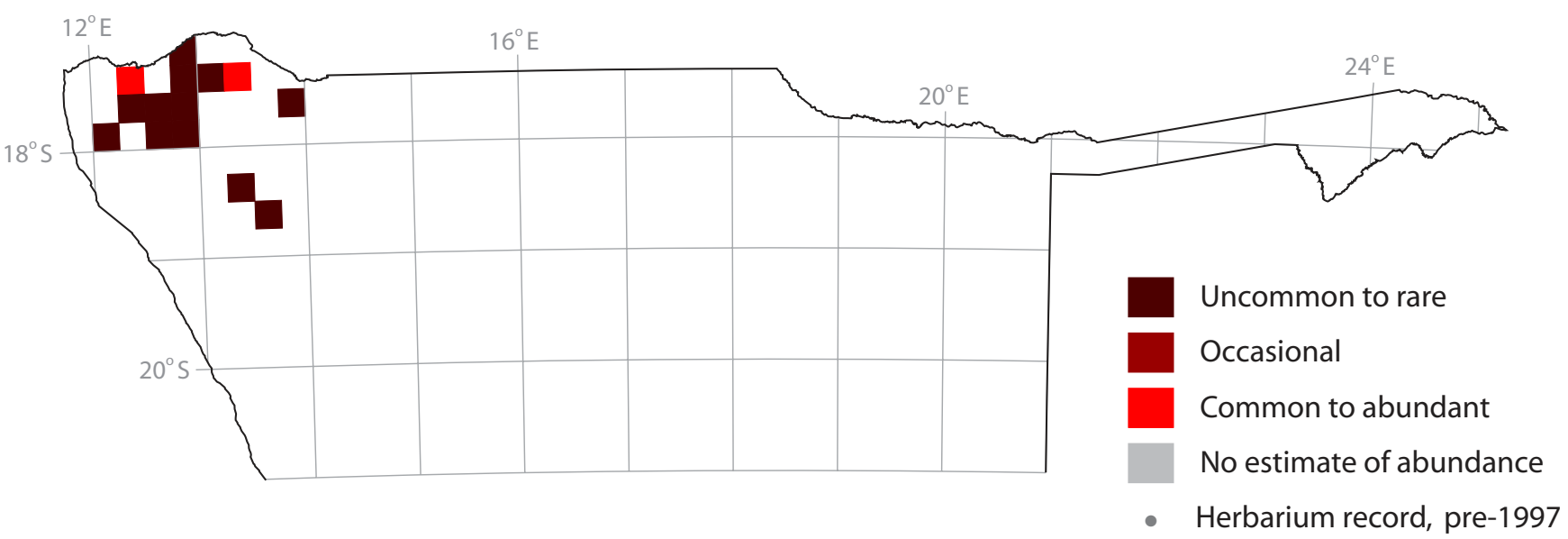
Sesamothamnus sp. nov.

Large-leaved Sesame-tree

[23 records from 14 (1%) squares]

Tree often fluted at the base and branching fairly high. BARK **creamy-yellow, often peeling in papery strips.** LEAVES broadly obovate, 35–70 mm long; both surfaces green, sparsely hairy; apex rounded; **base extending down the petiole.** FLOWERS **white, almost straight**; corolla **tube very narrow, up to 110 mm long**; corolla lobes up to 55 mm. FRUIT obovate, 80–90 mm long; tapering towards the apex with a pointed tip.

Easily distinguished from the other two species by taller, more tree-like growth form, with angular stems and yellow peeling bark; larger, darker green leaves; long, slender flowers.



DISTRIBUTION & ABUNDANCE

Uncommon to locally common in the extreme north-west of Namibia, with two records (specimen BC1659, CUR1) from 1813.

HABITAT

Mainly found on rocky hill slopes, also along dry rivers and on rocky outcrops.

GROWTH FORM

A tree in the 3–8-m height class.

ANNUAL CYCLE

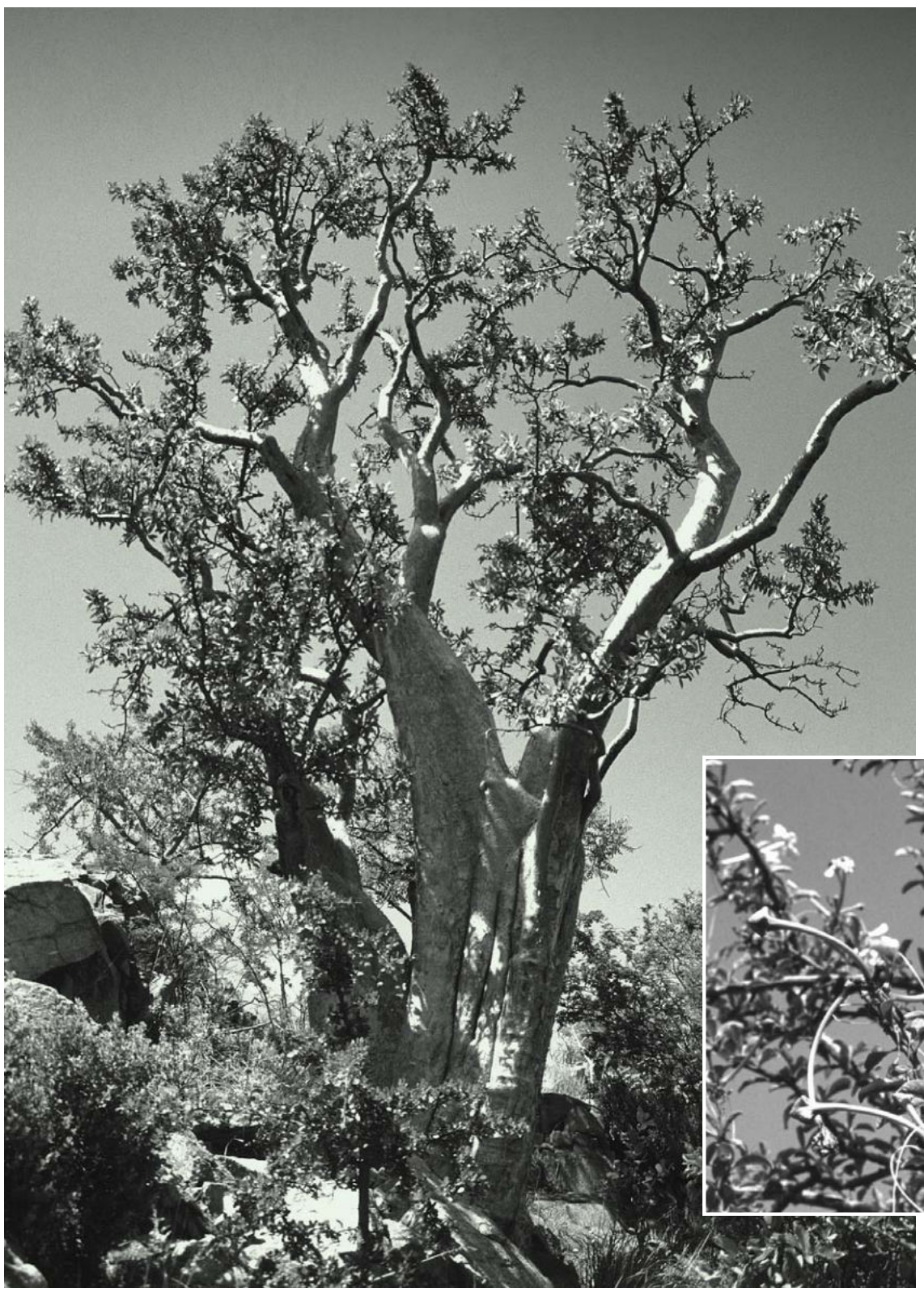
FLOWERS from February to April, with one record in June. FRUIT February to April. LEAVES presumably deciduous.

GENERAL

Of horticultural potential for dry gardens and the pachycaul trade.

CONSERVATION CONCERNS

Endemic to Kaokoveld and only recently described; not very well known at present, but could become threatened by the pachycaul trade once it is better known.





Sesamothamnus sp. nov, Kaokoveld, B. Curtis

RUBIACEAE | GARDENIA FAMILY

This is one of the largest families of flowering plants worldwide. It is widespread, particularly in the tropics and subtropics, and includes many trees and shrubs. The family is easy to recognise due to its distinctly opposite or whorled leaves, the characteristic interpetiolar stipules (which leave a distinct scar or line between the leaves after they have fallen) and an inferior ovary (which results in the fruit being crowned by persistent calyx remains or a circular scar). Economically, its most important products are coffee (from *Coffea*) and quinine (from *Cinchona*), but it includes many cultivated ornamental plants, such as *Gardenia*.

Carphalea pubescens

Cups-and-saucers Bush

[no TAP records]

A shrub with erect stems. BARK thick and corky. LEAVES lanceolate to narrowly elliptic. FLOWERS small, greenish-white. FRUIT obconical, hard, ribbed; enlarged, persistent calyx.

Previously recorded from Impalila Island only.

Hymenodictyon floribundum

Firebush

[1 record]

A deciduous tree. BARK purplish-grey, flaking in small squares. LEAVES obovate, leathery; crowded near the ends of branches. FLOWERS small, greenish-white in spikes. FRUIT reddish-brown capsules, crowded along the spike.

A new record for Namibia and a large range extension. The record was collected from the track leading to the Kunene River between the Baynes and Otjihipa Mountains (1712BB) where it was an uncommon shrub and tree in the 1–3- and 3–8-m height classes. Found on a rocky, west-facing hill slope. LEAVES, FLOWERS and FRUIT were recorded in March (specimen LH944, HOF1).

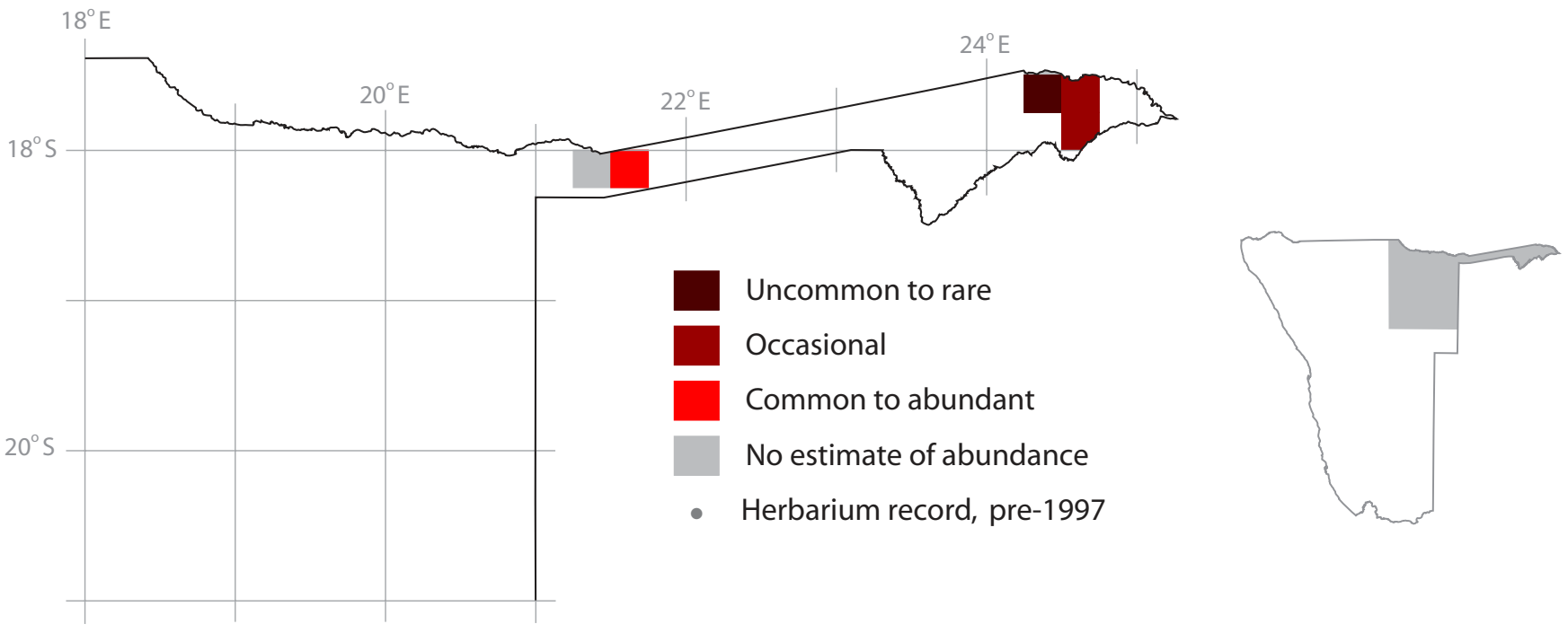
Crossopteryx febrifuga

Murombe

Sand crown-berry (E); sandkroonbessie (A)

[9 records from 6 (<1%) squares]

Deciduous shrub or small, lanky to rounded tree with drooping branches. BARK brownish-grey, often flaking in small squares. LEAVES simple, **ovate to oblong**; dark green, shiny and downy above; dull green and **velvety** below with **conspicuous veins**; young leaves shiny red-brown. INFLORESCENCE a compact, rounded, terminal spray. FLOWERS tubular, white to creamy-pink, strongly perfumed. FRUIT a small, ovate **capsule**, brown when ripe; splits into two halves to release the seeds; carried in neat clusters.



DISTRIBUTION & ABUNDANCE

Uncommon to occasionally common along the Okavango River around Andara and Popa Falls, and in eastern Caprivi.

HABITAT

Found on sandy plains.

GROWTH FORM

Mostly a tree up to 8 m high, once recorded as over 8 m.

ANNUAL CYCLE

FLOWERS recorded in November, December, February and March. FRUIT in November, December, February, March, May and June. LEAVES recorded in November, March and May.

GENERAL

The specific name refers to its fever-reducing properties.

CONSERVATION CONCERNS

Rare in Namibia. The distribution and abundance of this plant does not appear to have changed from earlier herbarium records.

Tarenna luteola

Butterspoon

Velvet-leaved tarenna (E)

[3 records from 2 squares]

A shrub, scrambling climber or small tree. LEAVES tightly clustered on the ends of long, slender decussate branches; obovate to elliptic, up to 70 mm long; thinly textured with long, soft hairs. FLOWERS small, cream, in dense heads. FRUIT small, almost round, black, fleshy berry.

Locally common shrub in the 1–3-m height class on floodplains in eastern Caprivi (1723DD and 1724CB). Observed in three months only. FLOWERS were recorded in November and March, with buds in October; FRUIT in March, with ripe fruit in October and old fruit in November; and LEAVES in March, with young leaves October and November.

Gardenia resiniflua

Resin Gardenia

Sulu (L)

[1 record]

Shrub or tree. LEAVES simple, on stubby lateral branches which are often whorled in threes; obovate; **very wrinkled, rough**. FLOWERS tubular with spreading corolla lobes, **corolla up to 30 mm across, tube up to 30 mm long**; white fading to cream; heavily scented. FRUIT ovoid to almost spherical, **up to 13 mm in diameter**.

Only found on Impalila Island, both by TAP and previous herbarium records. An occasional shrubby tree in the 3–8-m height class. FLOWERS recorded in November; FRUIT in January, March and November.

Gardenia ternifolia

Yellow Gardenia

[1 record]

Shrub or small tree. LEAVES simple, in whorls of three at the ends of dwarf shoots; **obovate to oblanceolate; domatia often present**; shiny, dark green; **hairy, rough**. FLOWERS large, long, tubular with spreading corolla lobes; **corolla up to 40 mm across, tube up to 45 mm long; white turning yellow with age**; sweetly scented. FRUIT ovoid, **50 x 25 mm**; woody, **yellow-brown when ripe**; crowned with the remains of the calyx lobes.

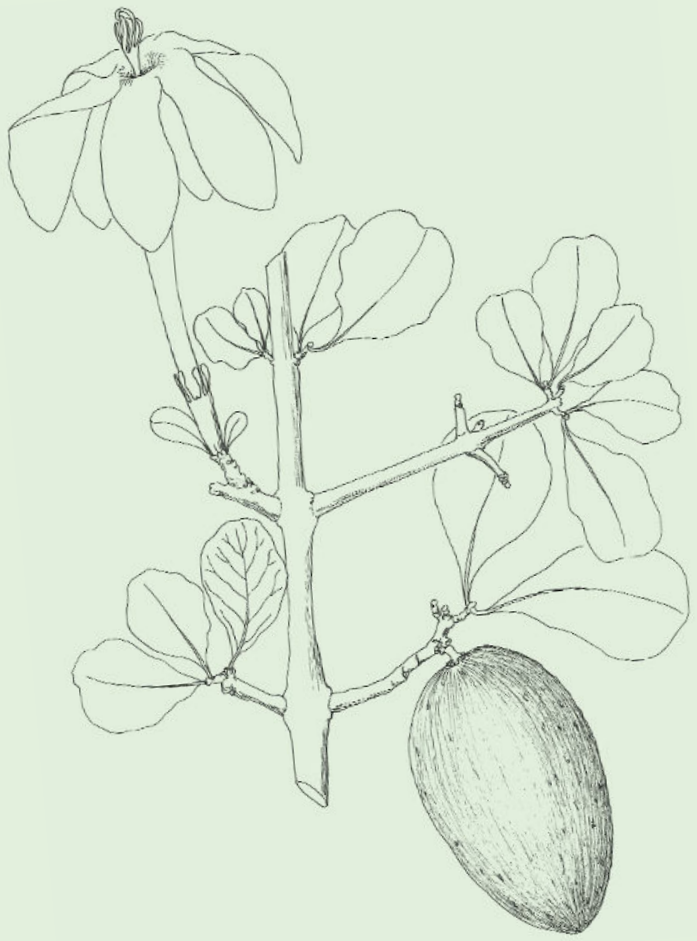
One TAP record from 1715CC (specimen CJB99/4, BRO1). Uncommon, with FLOWERS in October. There are no other herbarium records.

Gardenia volkensii

Chibungu

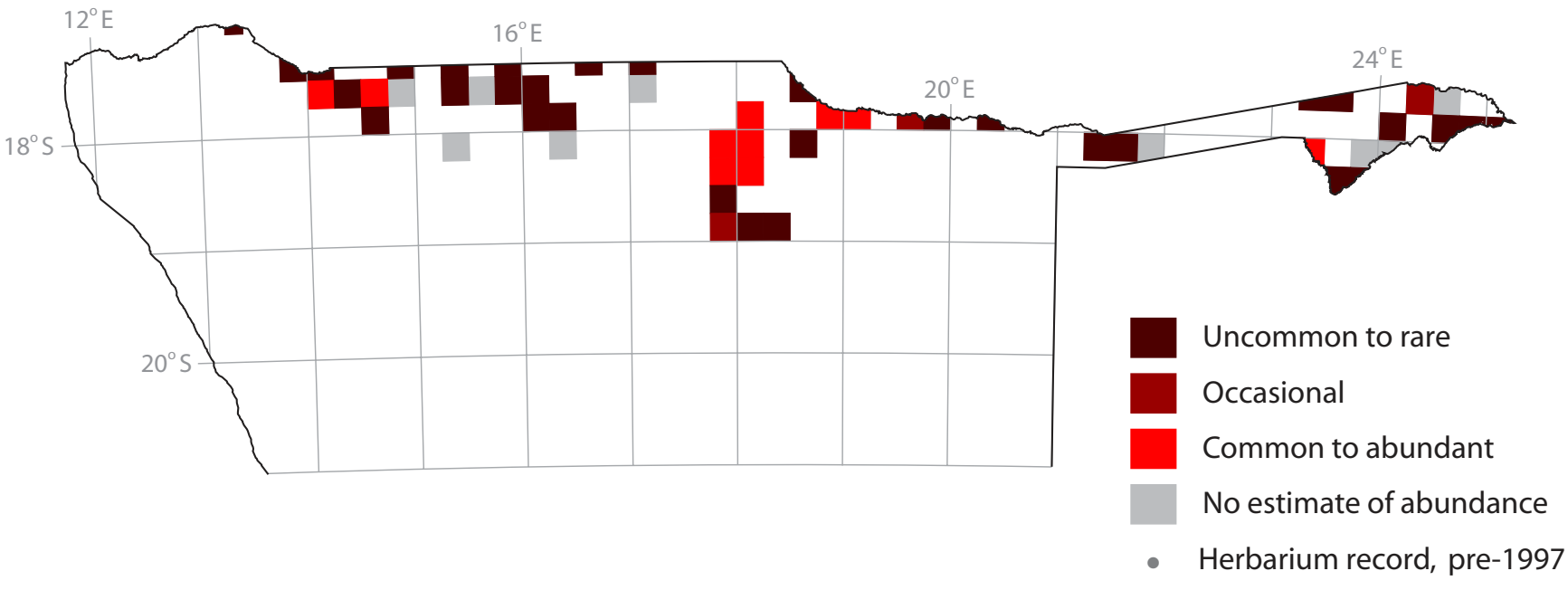
Savanna gardenia (E);
bosveldkatjiepiering (A);
omundana (H); omulayi (O);
muravi (Rk, Rum); muthiothio (T)

[93 records from 55 (5%) squares]



Deciduous shrub or tree. BARK pale grey. LEAVES often **clustered** or **whorled** in **threes** on short, **stubby** branchlets that are also whorled in threes; obovate and tapering down the petiole, papery; domatia often conspicuous; shiny green above, paler below and finely downy; margin very wavy. FLOWERS very large; tubular with spreading and recurved corolla lobes; white turning to yellowish-cream; corolla up to 80 mm across, corolla tube up to 80 mm long; strongly scented. FRUIT **ovoid** to almost **spherical, up to 70 mm in diameter**; woody, warty, with raised, whitish dots and **vertical grooves**, up to 70 mm in diameter; greyish when ripe.

Two subspecies, *spathulifolia* and *volkensii* occur in Namibia, but they have not been differentiated by the TAP.

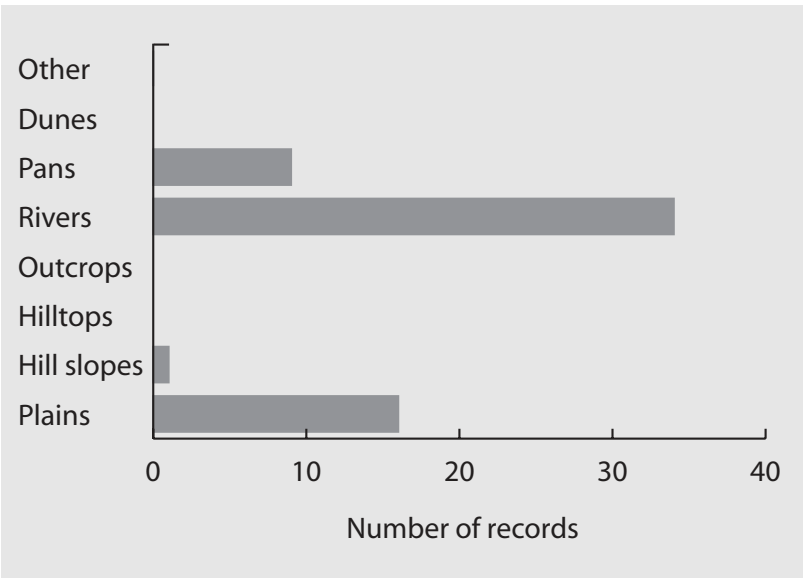


DISTRIBUTION & ABUNDANCE

Generally uncommon, but fairly widespread across the far northern parts of Namibia, from the Kunene River to eastern Caprivi; common in places in Kavango. The range has been extended slightly to the south (specimens FRI2/14 and HIL1/064).

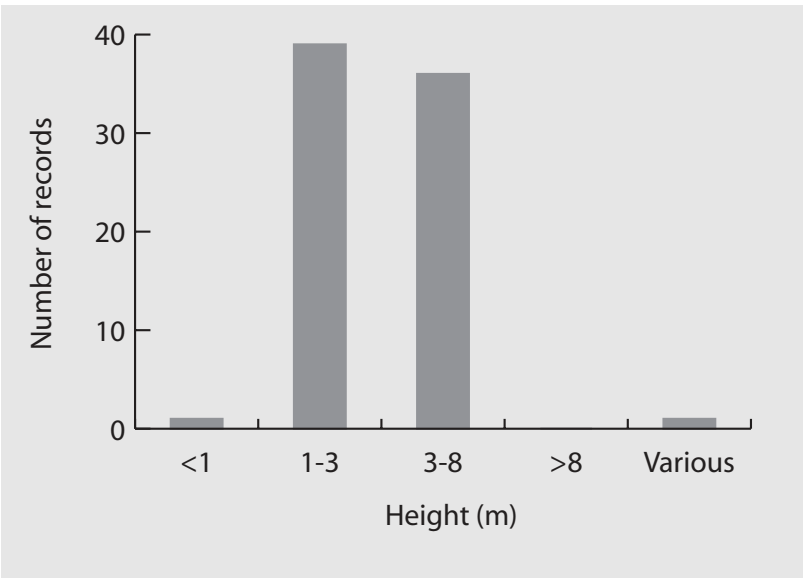
HABITAT

Mostly found on sandy soils in forest savanna and woodlands along river banks and on plains, as well as along the edges of pans and oshanas, where water collects seasonally.



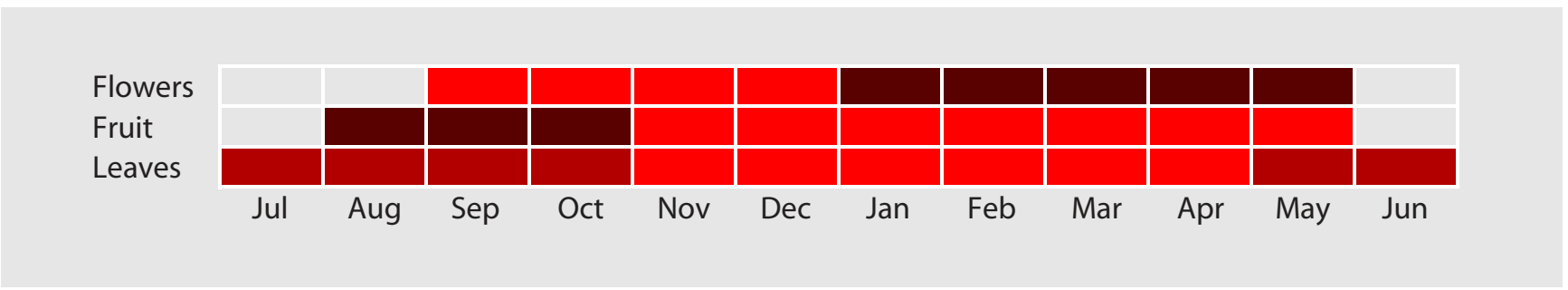
GROWTH FORM

Mostly recorded as a tree 1–8 m high, but also as a shrub in the 1–3-m category.



ANNUAL CYCLE

FLOWERS mostly from September to December, but up till May some years. FRUIT August to May. LEAVES recorded every month, but mostly from November to April, with new leaves in October.



GENERAL

Browsed by game and livestock. The wood is extremely hard and is used for carving. Wood and roots used medicinally. Fruit eaten as porridge. Branches placed on thatched roofs are believed to protect the building against lightning. The plant is of horticultural potential for frost-free areas because of its lovely flowers.

CONSERVATION CONCERNS

None recorded.



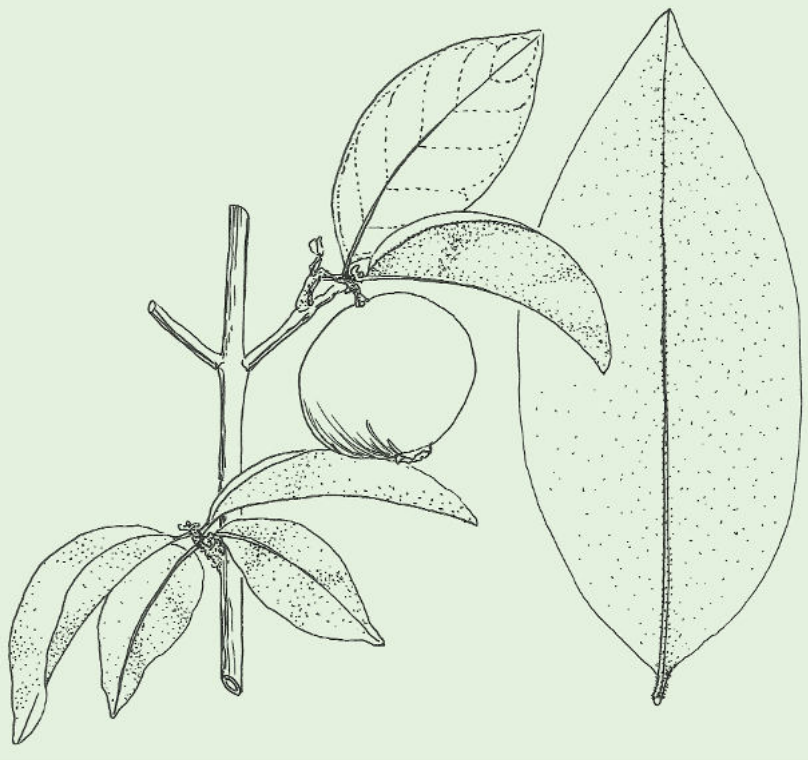
Gardenia volkensii, Caprivi Region, B. Curtis

Vangueria infausta

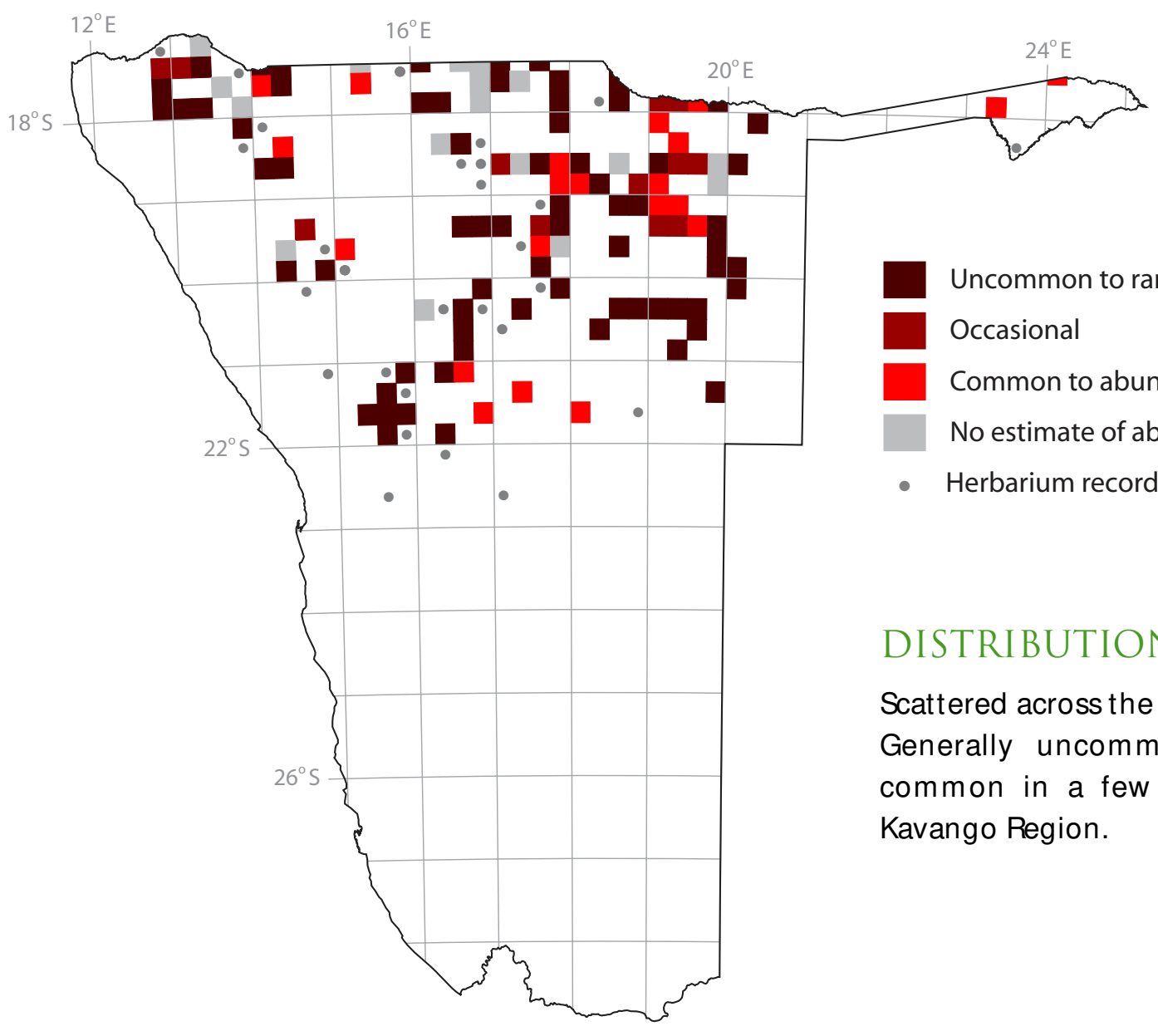
Nombumbu

Velvet wild-medlar (E); wildemispel, bergmispel (A); omudenja (H); ibbu (L); omumbu (O)

[182 records from 125 (12%) squares]



Deciduous, erect, shrub. BARK smooth, grey; young branchlets pale rust-brown, **densely downy**. LEAVES simple, opposite, broadly elliptic to ovate; **with dense, usually yellow-brown downy covering**; petiole **covered in dense rust-coloured down**; stipules hairy, tapering up to 20 mm long. FLOWERS in axilllary clusters; greenish-white to yellowish, hairy. FRUIT round, hairy, up to 30 mm in diameter; tip with persistent ring left by the calyx; brown when ripe.

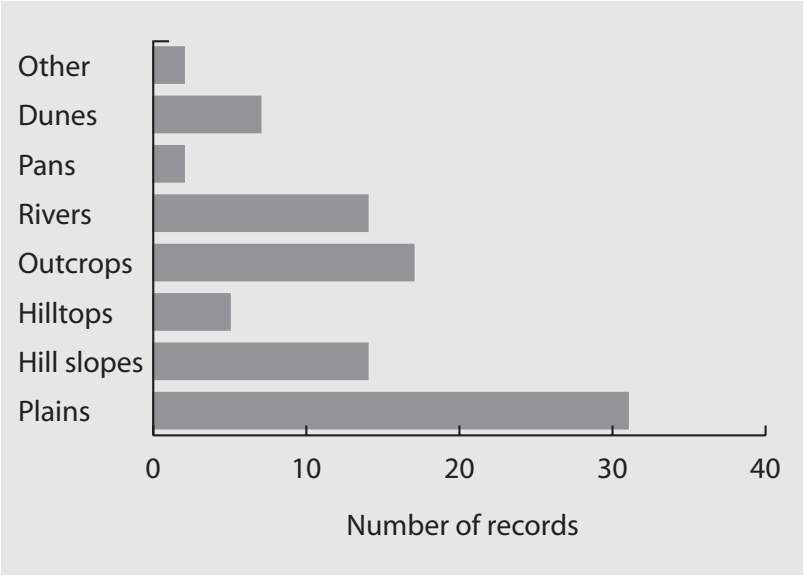


DISTRIBUTION & ABUNDANCE

Scattered across the northern half of Namibia. Generally uncommon and localised, but common in a few localities, especially in Kavango Region.

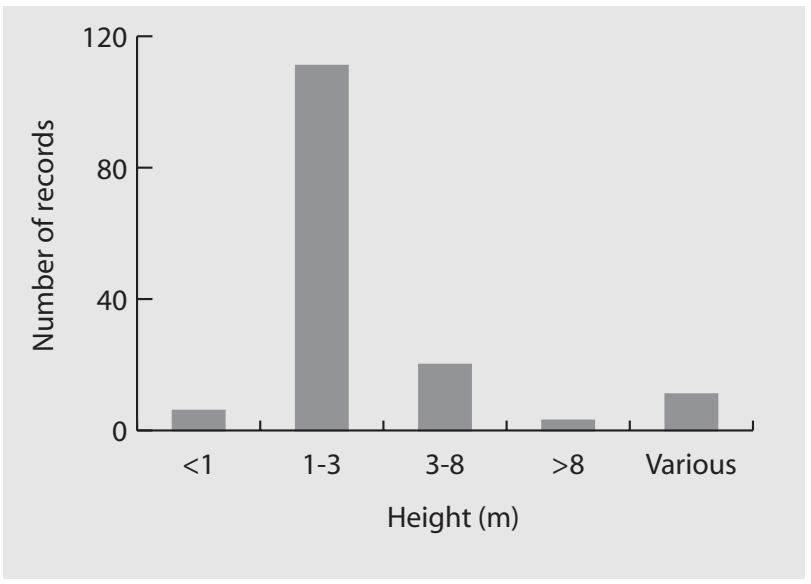
HABITAT

Found in various habitats, but mainly on plains and rocky outcrops; also along rivers in the north-west and north-east; on hill slopes on the north-central plateau; and on dunes in the north-east. Grows on sand, gravel or rocky substrates. Usually in mixed woodland and riverine forest.



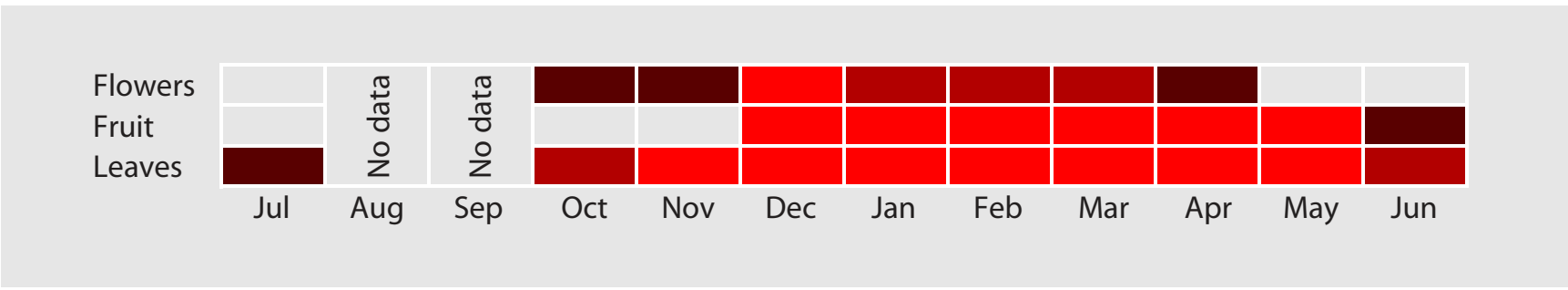
GROWTH FORM

Generally a shrub (88% of records), mostly in the 1–3-m height class; tree forms usually 3–8 m high, with one record over 8 m.



ANNUAL CYCLE

FLOWERS from October to April, but mainly December. FRUIT December to June. LEAVES mainly October to June, with young leaves in October and November.



GENERAL

Often growing in the shade of other trees. The fruit is edible; the roots are used medicinally.

CONSERVATION CONCERNS

None recorded.



Carved elephant, Kavango Region, P. Reiner

Vangueria cyanescens

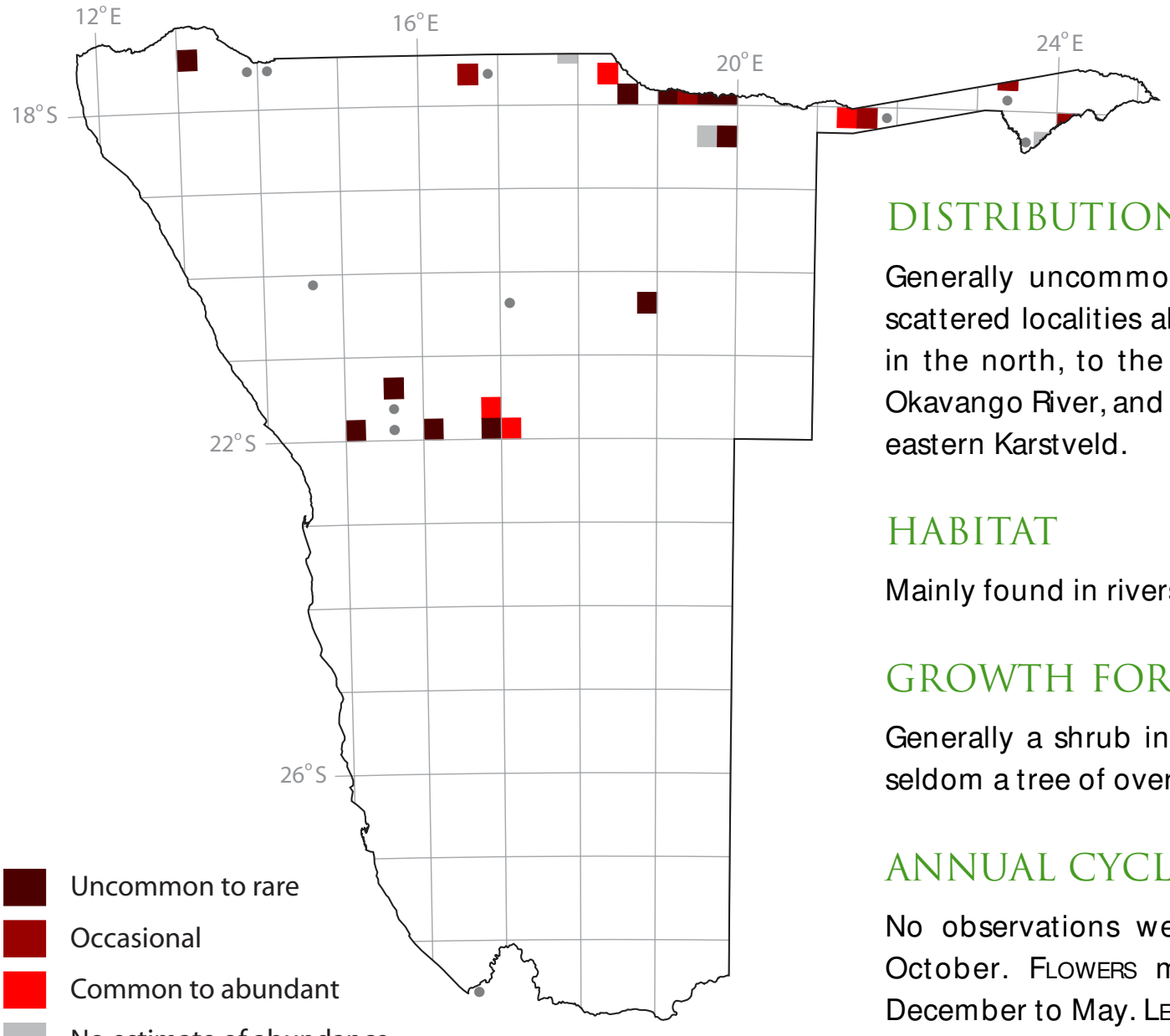
Kalahari / Forest Wild-medlar

Blinkblaarmispel (A)

[33 records from 23 (2%) squares]



Deciduous shrub, rarely a tree. BARK smooth, grey; **young branchlets pale brown, hairless**. LEAVES simple, elliptic, 30–120 mm long; **papery and hairless**; tapering section of stipules *c.* 5 mm long. FLOWERS yellow-green, bell-shaped. FRUIT spherical, 25 mm diameter; tip with a persistent ring left by the calyx; yellow-brown when ripe.



DISTRIBUTION & ABUNDANCE

Generally uncommon to locally common in scattered localities along the Angolan border in the north, to the eastern stretches of the Okavango River, and in the central-west to the eastern Karstveld.

HABITAT

Mainly found in rivers and on rocky outcrops.

GROWTH FORM

Generally a shrub in the 1–3-m height class; seldom a tree of over 3 m high.

ANNUAL CYCLE

No observations were made from June to October. FLOWERS mainly December. FRUIT December to May. LEAVES present in summer.

GENERAL

The flowers are visited by butterflies and eaten by caterpillars. The fruit is edible; the leaves and roots are used medicinally.

CONSERVATION CONCERNS

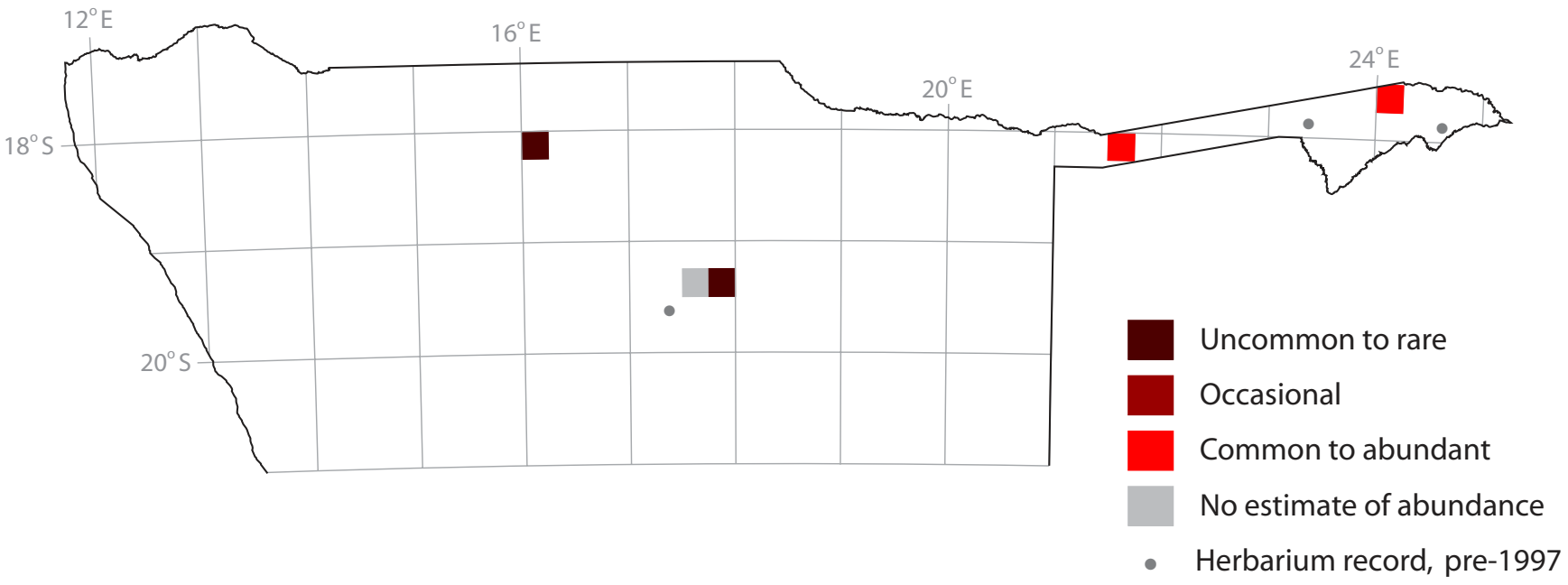
None recorded.

Vangueriopsis lanciflora

False-medlar / Valsmispel

[8 records from 5 (<0.5%) squares]

Semi-deciduous shrub or small tree. BARK smooth, with orange-red underbark; **young branchlets rusty-red, often powdery and knobbly**. LEAVES elliptic to oblong to broadly elliptic; leathery; dark green above; **yellowish-white** or **yellowish-green below and densely downy**; margin usually undulate; stipules joined at the base, triangular, about 10 mm long; petiole robust and up to 10 mm long. FLOWERS up to 25 mm long, shallow-tubular with markedly recurved lobes; cream-coloured; calyx cup-like, densely downy. FRUIT ovoid, often asymmetric, up to 20 mm in diameter; yellowish-brown when ripe; edible.



DISTRIBUTION & ABUNDANCE

Found in very scattered localities. Common where found in the Caprivi, uncommon in the Cuvelai and Karstveld.

HABITAT

Found on hill slopes in the Karstveld, rocky outcrops on the Okavango River and sandy plains in the Cuvelai.

GROWTH FORM

A shrub of 1–3 m in the Cuvelai and Karstveld; a tree of 1–3 m on the Okavango, and 3–8 m in eastern Caprivi.

ANNUAL CYCLE

No observations were made for June and July, September to November and January and February. FLOWERS only recorded in December. FRUIT in March and December. LEAVES recorded from March to May, and December; bare in August.

CONSERVATION CONCERNS

A rare species in Namibia. No threats recorded.

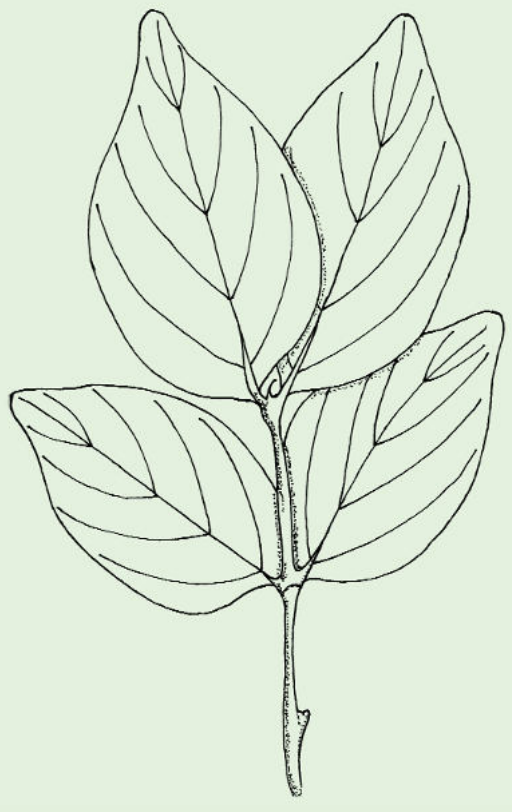
Psydrax livida

= Canthium huillense

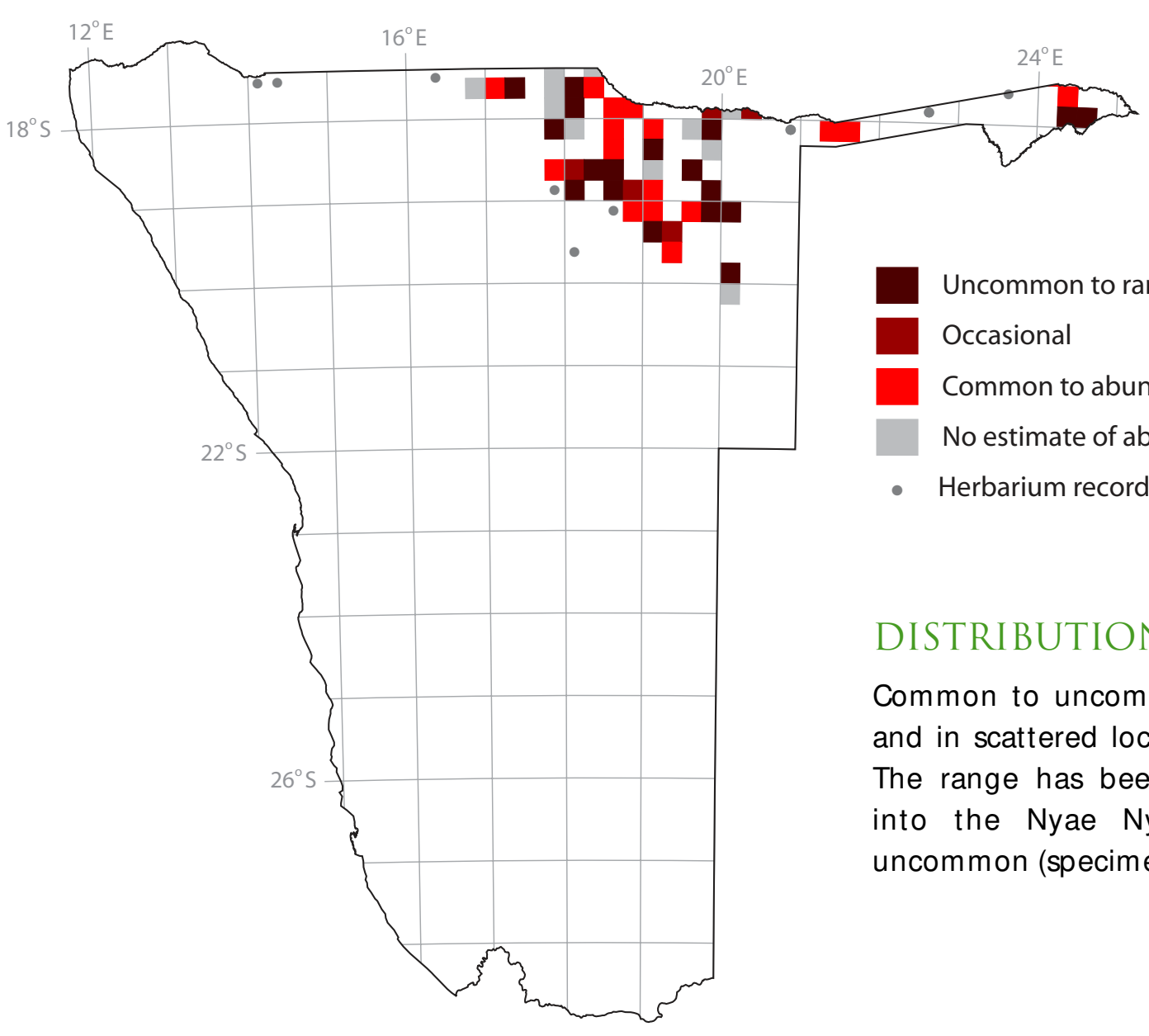
Green Tree

Groenboom (A); |a'arqa (J); mumpumulenge (L); muputwe (Rum); mudhigho-dhigo (T)

[64 records from 52 (5%) squares]



Stiff, evergreen or semi-deciduous shrub or small tree. BARK pale, smooth; young branchlets stiff, greenish, carried almost perpendicular to main branches. LEAVES simple, mainly on young, green branchlets; **broadly ovate to broadly lanceolate**; dark green, smooth; apex tapering to a point; base broadly **rounded** to almost **square**. FLOWERS small, tubular, white to greenish-cream; scented. FRUIT round to oval or two-lobed; black when mature.

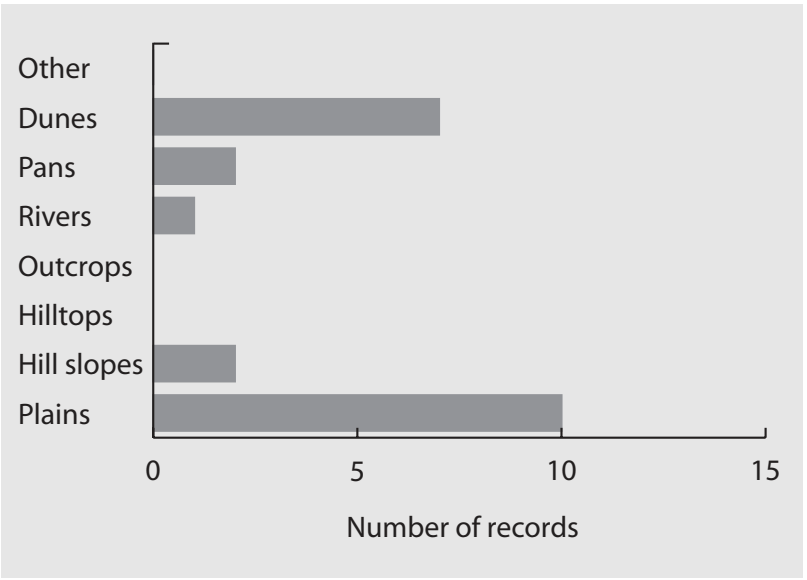


DISTRIBUTION & ABUNDANCE

Common to uncommon in Kavango Region and in scattered localities in eastern Caprivi. The range has been extended southwards into the Nyae Nyae area, where it is uncommon (specimen BC1751, CUR1).

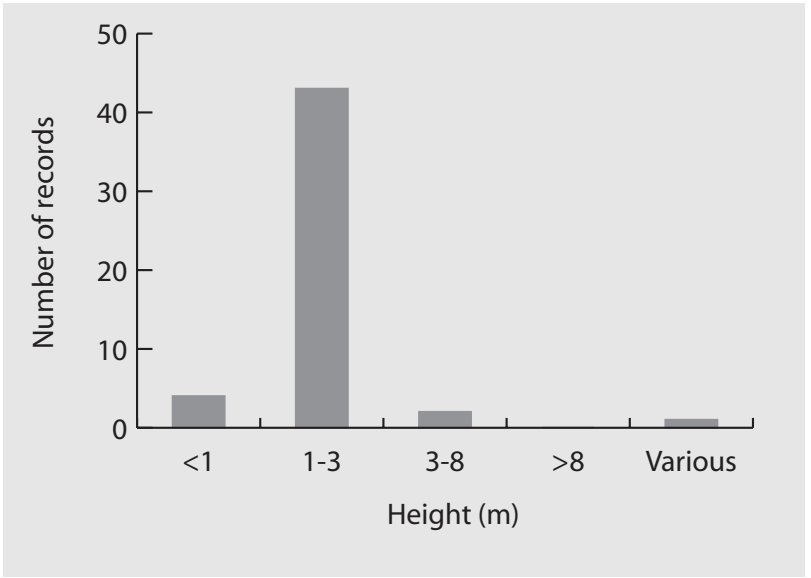
HABITAT

Mainly found on sandy plains in mixed woodlands and riverine forest; occasionally on dunes and pans; once in a dry river.



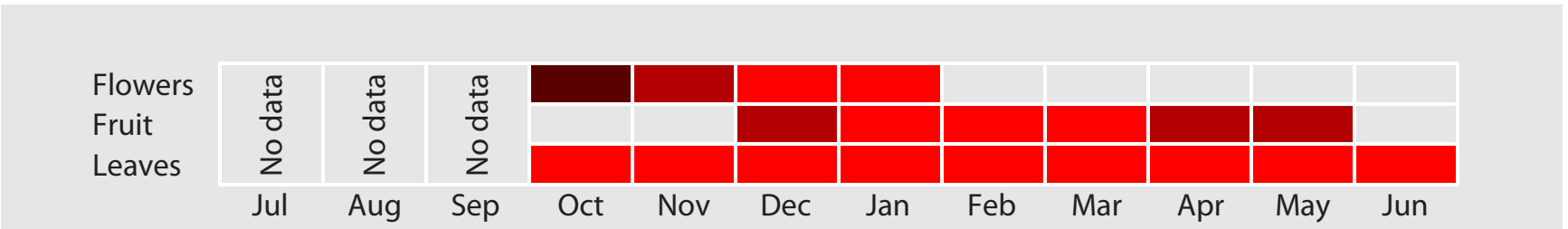
GROWTH FORM

Generally a shrub in the 1–3-m height class; occasionally (6% of records) over 3 m.



ANNUAL CYCLE

FLOWERS October to January, with single records up till June. FRUIT December to May. LEAVES apparently evergreen (no observations from July to September).



GENERAL

The leaves are browsed by game and livestock. The roots are used medicinally. The Thimbukushu common name, 'mudhighodhigo', is pronounced mutheewho-theewho.

CONSERVATION CONCERNS

None recorded.



Psydrax livida, leaves and flowers, C. Hines

Canthium glaucum

Mupuli

Pink-fruit turkey-berry, rock elder (E)

[no TAP records]

Deciduous shrub or small tree with dark brown spines. LEAVES crowded on dwarf branchlets; elliptic, fairly small. FLOWERS very small; white to creamy-green. FRUIT square, pink, on slender stalk.

Earlier herbarium records from three squares in eastern Caprivi, including Impalila Island.

Tricalysia junodi

Fluffy-flowered Jackal-coffee

[3 records from 3 squares]

Deciduous shrub or tree with flaky bark. LEAVES simple, opposite, crinkly; **dark green with sunken veins above**. FLOWERS white, tinged with pink, bell-shaped, **throat densely fluffy; apex of lobes notched**. FRUIT almost spherical, hairy, up to 8 mm in diameter; with distinct circular scar on apex; black when ripe.

Three records from three squares in eastern Caprivi (1723DD, 1724CB and 1824AA). Earlier herbarium records from three additional squares (1722DC, 1723CB, 1724DA) A common to uncommon shrub in the 1–3-m height class; once recorded as abundant. There is one herbarium record of a tree over 4 m. Found in woodland, also on a floodplain; once on a termitarium. FLOWERS recorded in March; FRUIT in February, March, May and December.

Feretia aeruginescens

Pink Medlar

[1 record]

Scrambling shrub or small tree. LEAVES simple, opposite. FLOWERS **appearing before the leaves**; tubular, waxy-white, sweet-scented. FRUIT almost spherical, fleshy; crowned with the remains of the calyx, or with a circular scar left after the calyx falls; **pink when ripe**.

Specimen CJHH/1144 (HIN1) was collected from eastern Caprivi (1724CD). There are two earlier herbarium records from 1724CC. Recorded as a rare shrubby tree up to 3 m high in woodland. No records of FLOWERS. FRUIT recorded from herbarium specimens in December and January. LEAVES recorded in December, January and March.

Pavetta cataractarum

Zambezi Bride's-bush

[2 records from 2 squares]

A shrub or small tree. LEAVES obovate to oblanceolate; densely velvety-grey below. FLOWERS white, tubular. FRUIT small, round, velvety; with the remains of the calyx.



The two TAP records were from Bukalo Channel in eastern Caprivi (1724CD) and from Popa Falls on the Okavango River (1821BA). A shrub in the 1–3-m height class, with flowers in December and March. There is one earlier herbarium record from Andara on the Okavango River (1821AB) and two from eastern Caprivi (1723DA, 1823BC).

Pavetta gardeniifolia

Common Bride's-bush

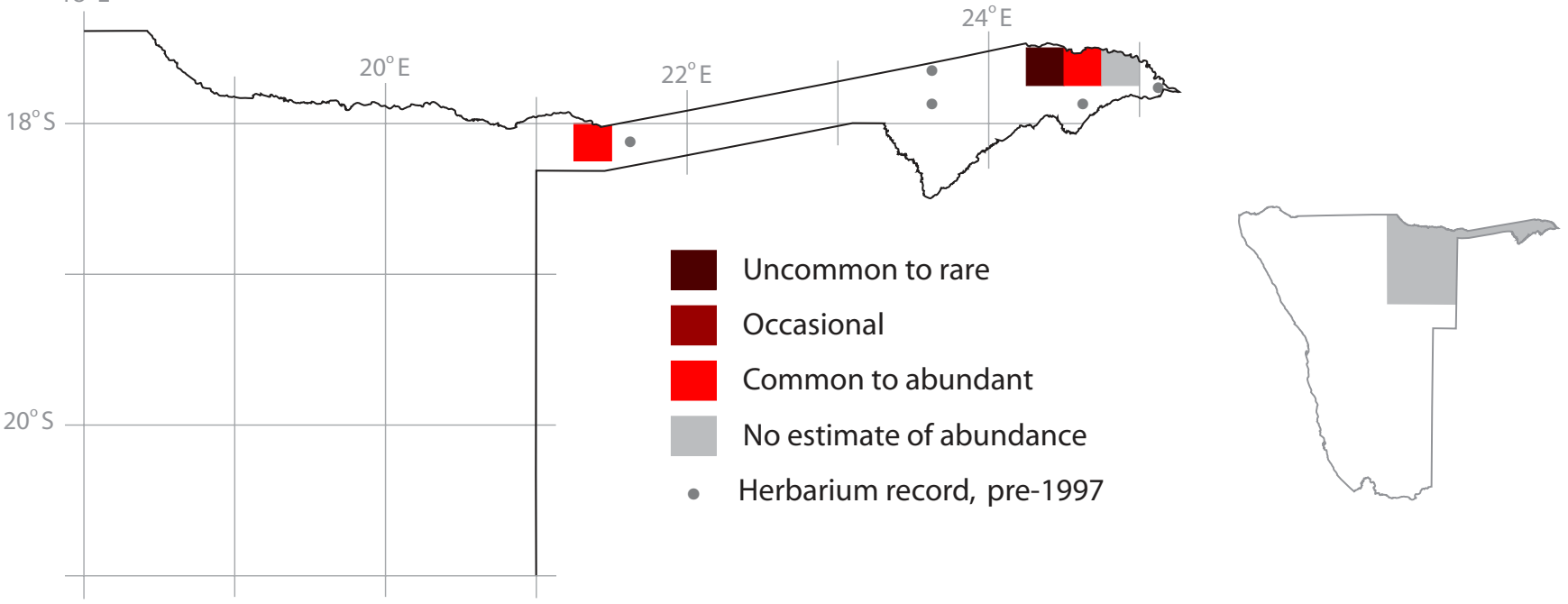
Stinkblaarbruidsbos (A)

[4 records from 4 squares]



Deciduous shrub. LEAVES simple, each leaf-pair at right angles to the previous pair (decussate), with black bacterial nodules; **obovate**, up to 60 mm long; dark green and shiny above; dull, dark green below; petiole 4–10 mm long. FLOWERS dirty white, tubular, scented; hairless on outside. FRUIT spherical, up to 8 mm in diameter; with remains of **calyx at tip**; shiny black when ripe.

There are two subspecies in Namibia, *gardeniifolia* and *subtomentosa*, but no distinction has been made between the two.



DISTRIBUTION & ABUNDANCE

Common in the Andara area on the Okavango River and on the eastern Caprivi floodplains; uncommon just south of Katima Mulilo.

HABITAT

Found on river banks and floodplains.

GROWTH FORM

A shrub in the 1–3-m height class, once recorded as taller.

ANNUAL CYCLE

Observations in October, November and March only. FLOWERS recorded in November by the TAP, and in January and March from herbarium records. FRUIT recorded in March by the TAP, and June and July from herbarium records. LEAVES present in the three months of observation.

CONSERVATION CONCERNS

None recorded.

Pavetta schumanniana

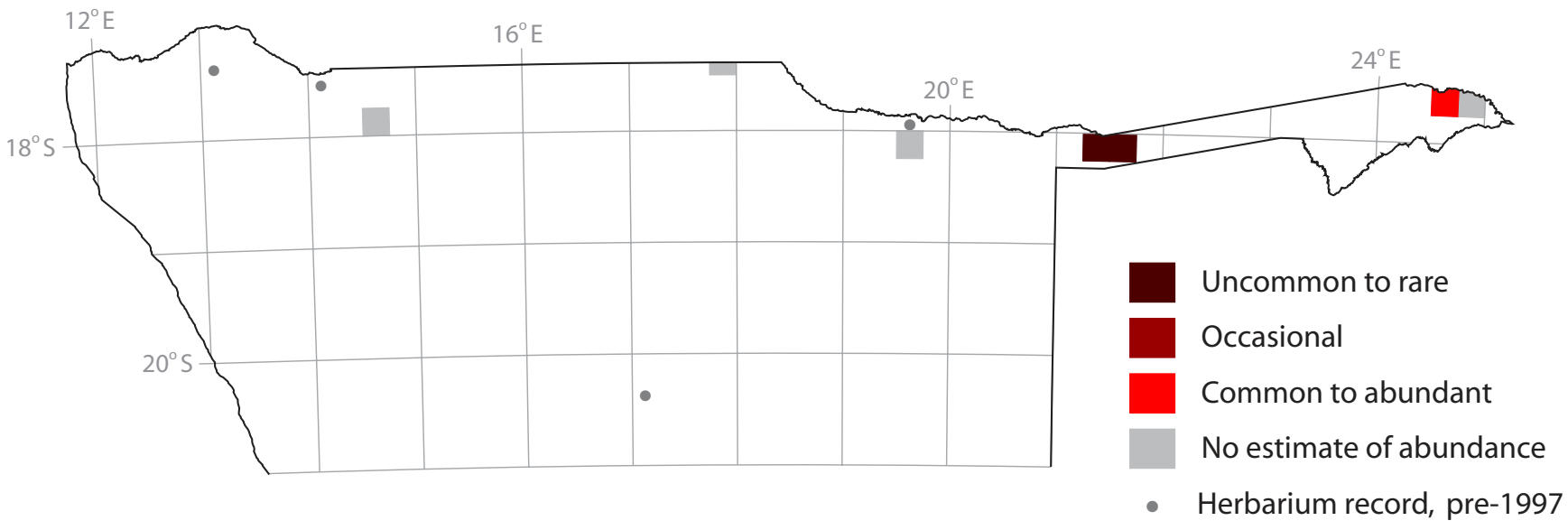
Poison Brides-bush

Gifbruidsbos (A); t!eyoii (K); mugcaragcaca (T = wood that breaks easily)

[5 records from 5 squares]



Deciduous shrub, occasionally a suffrutex. BARK grey-brown; older trunk grooved. LEAVES simple, with black bacterial nodules; **oblong to obovate, often over 60 mm long**; dark green above with scattered grey hairs; paler and densely woolly below. FLOWERS white, tubular; downy on outside. FRUIT spherical, up to 8 mm in diameter; carried in clusters; with remains of calyx on tip; black when ripe.



DISTRIBUTION & ABUNDANCE

Uncommon in widely scattered localities across extreme northern Namibia.

HABITAT

Found on river banks and plains, and a rocky outcrop in 1714DC.

GROWTH FORM

A shrub in the 1–3-m height class.

ANNUAL CYCLE

Observations in December, January and March to May. FLOWERS recorded in December and February (herbarium). FRUIT January to April (herbarium records) and May. LEAVES present in months of observation.

GENERAL

The leaves are poisonous to livestock, causing 'gousiekte'.

CONSERVATION CONCERNS

Almost unknown in Namibia; rare. Either the species was overlooked by atlassers or the population has declined.

Pavetta zeyheri

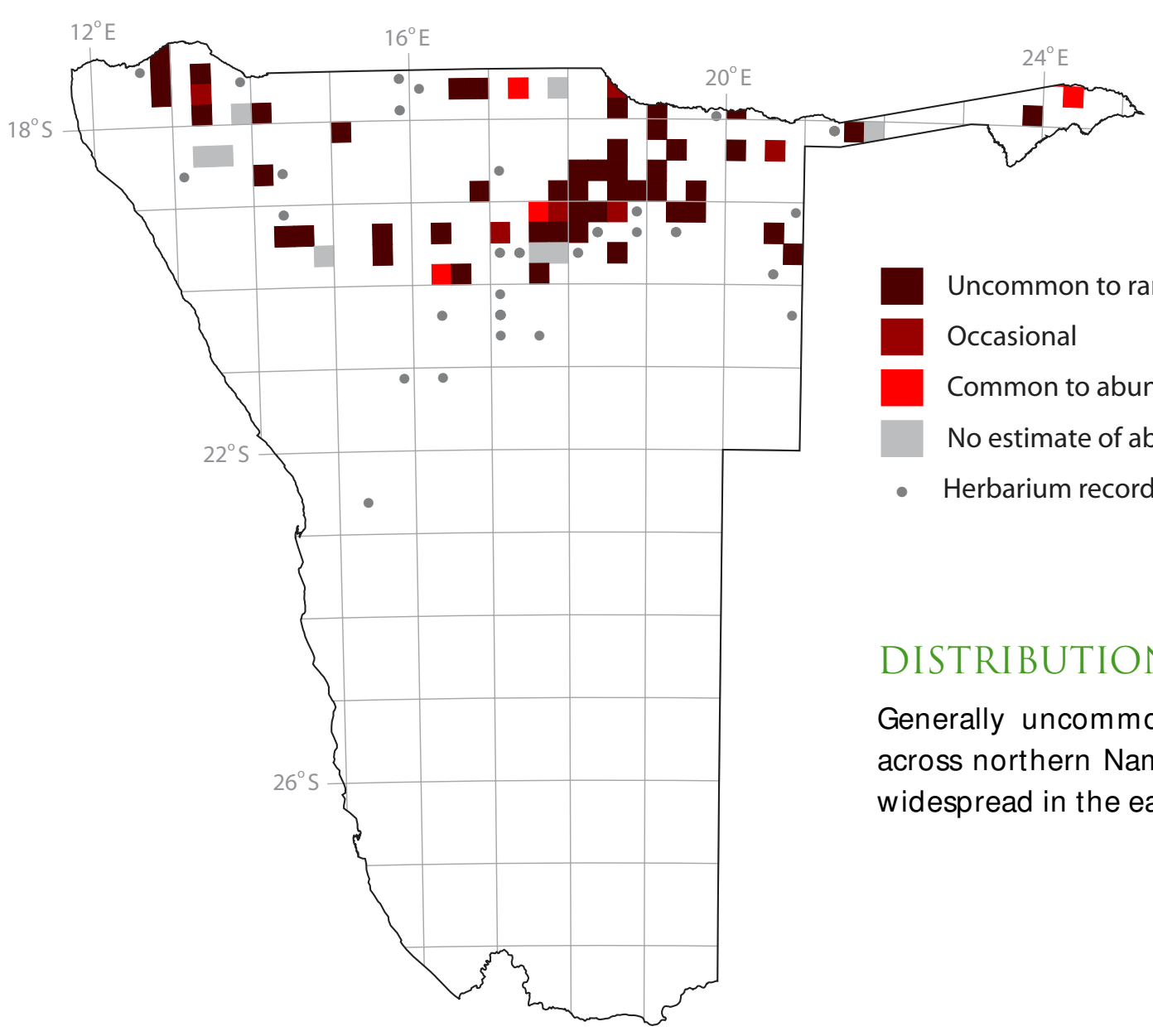
Oshihone

Small-leaved brides-bush (E);
fynblaarbruidsbos (A); omutete (H)

[111 records from 66 (6%) squares]



Deciduous, sparse, shrublet. BARK grey; young branchlets almost white. LEAVES simple; successive pairs at right angles to one another (decussate), clustered on dwarf-shoots of old branches; black bacterial nodules present; **narrowly obovate, up to 10 mm wide**; both surfaces **hairless**; midrib prominent, especially below; base tapering down petiole. FLOWERS white, tubular. FRUIT spherical, 7–9 mm in diameter, with remains of calyx on tip; black when ripe.

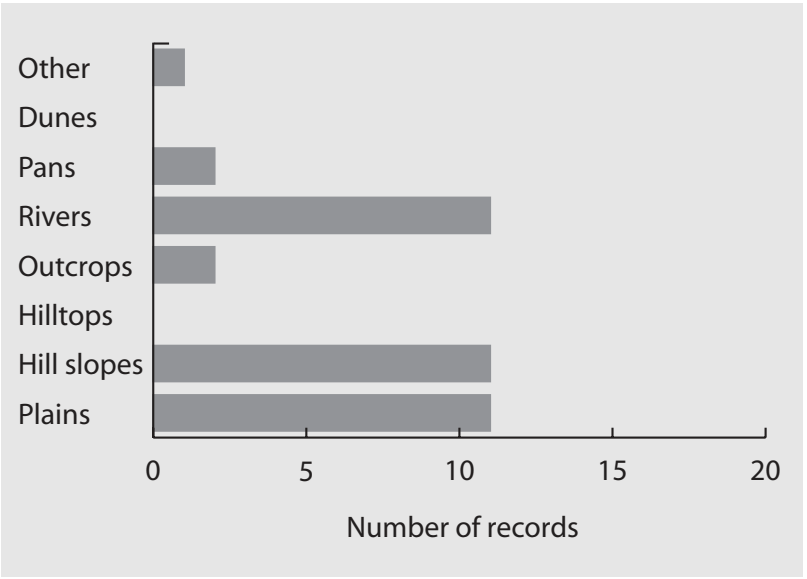


DISTRIBUTION & ABUNDANCE

Generally uncommon in scattered localities across northern Namibia. Most common and widespread in the eastern Karstveld.

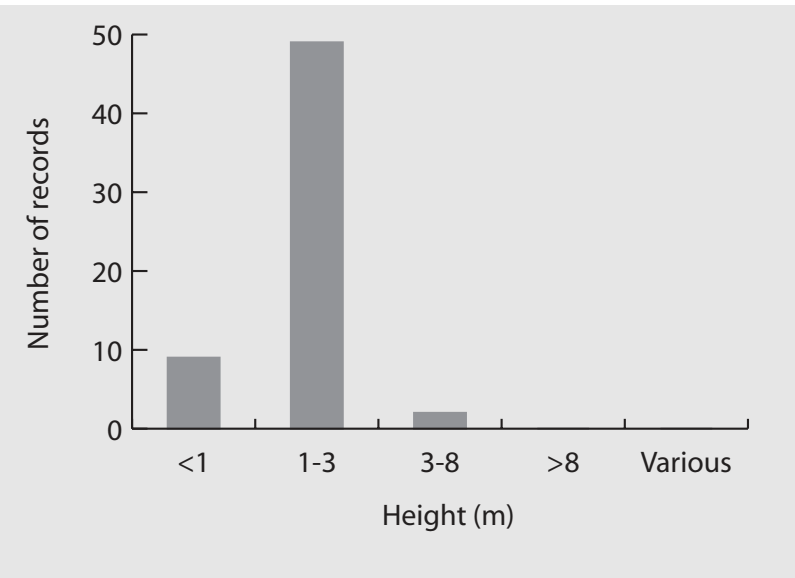
HABITAT

Found in various habitats, but mostly on plains and hill slopes. Grows on deep sand and calcareous soils.



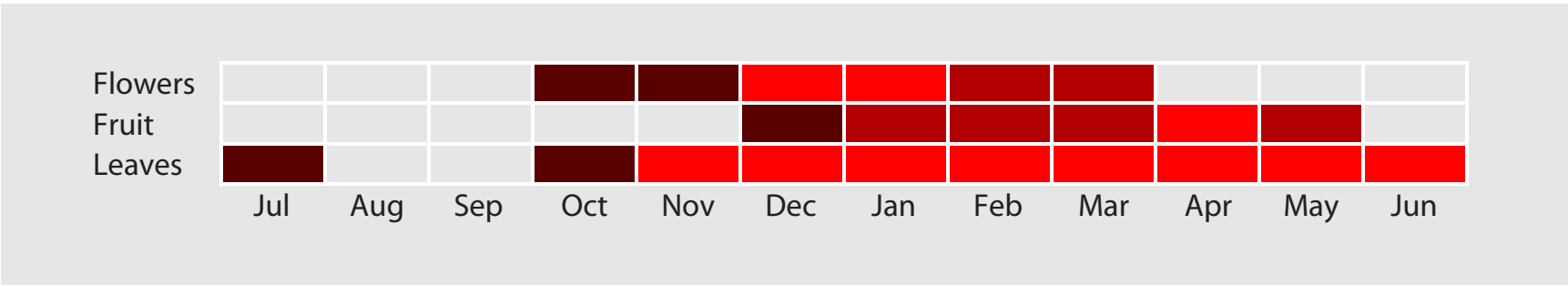
GROWTH FORM

Generally a shrub in the 1–3-m height class.



ANNUAL CYCLE

FLOWERS October to March. FRUIT December to May. LEAVES mainly November to June, with young leaves in October.



GENERAL

Used in ceremonies.

CONSERVATION CONCERNS

There are many more earlier herbarium records than TAP observations. This is a small and not very woody species that was probably overlooked by many atlassers, but the possibility of a reduction in range should be investigated further.



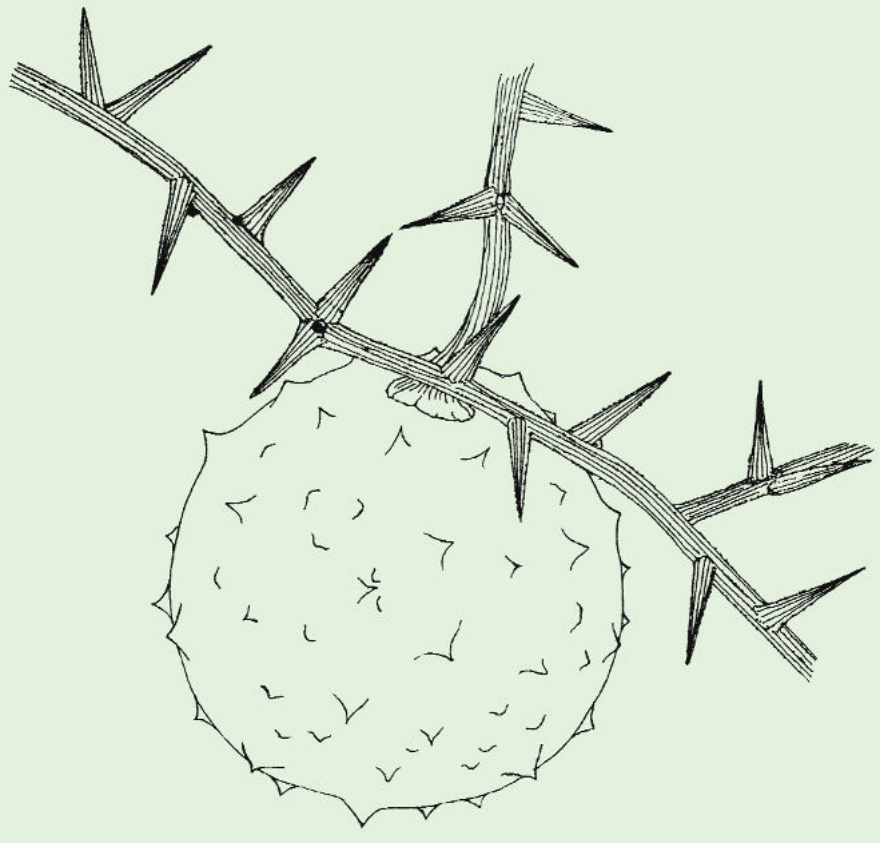
Pavetta zeyheri, Grootfontein area, G. Friederich

Acanthosicyos horridus

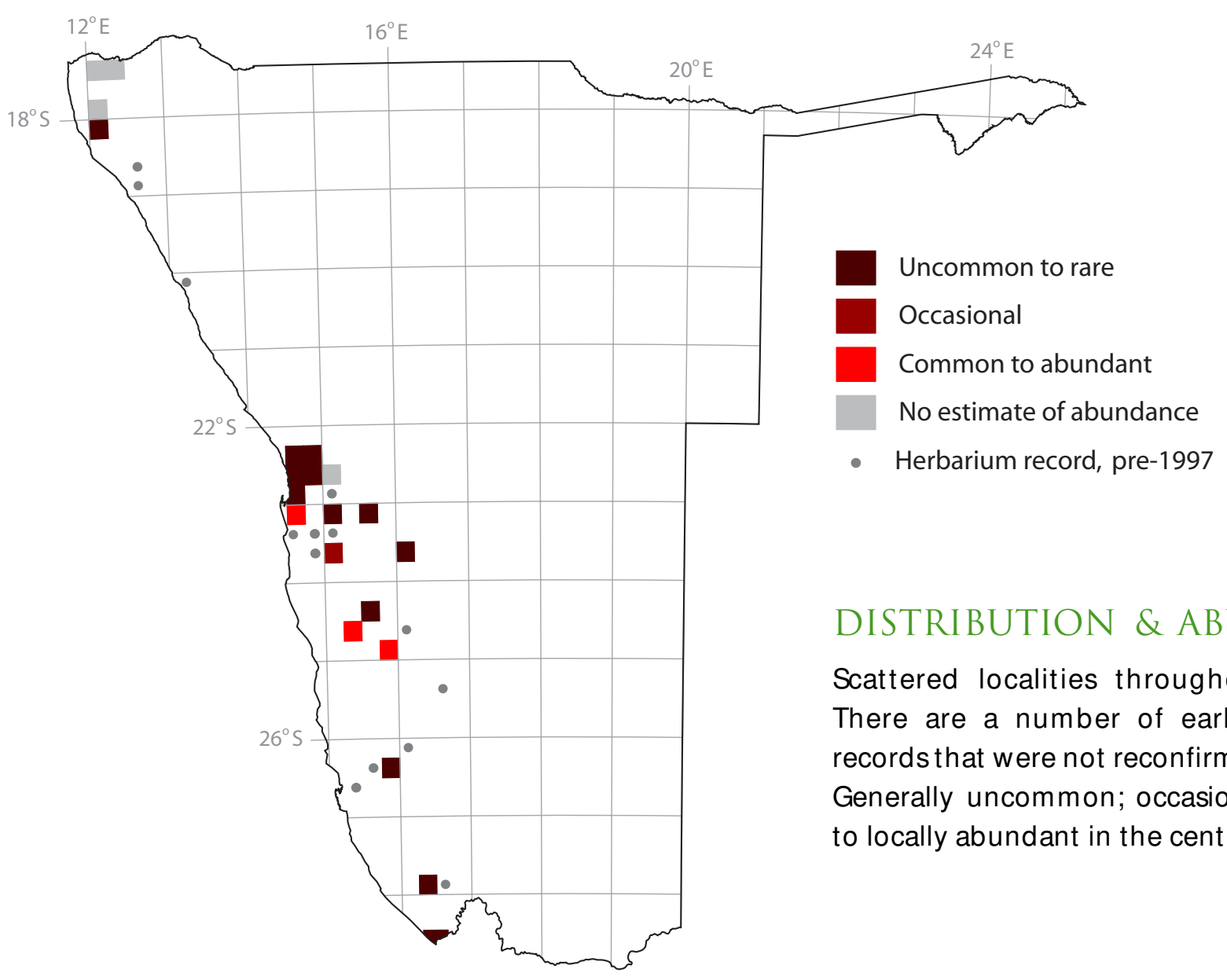
!Nara

Botterpitte (A); omungaraha (H); !naras/b (K)

[42 records from 22 (2%) squares]



Spiny, leafless, spreading shrub with arching branches, **sprawling** over areas up to 10 m in diameter. BARK young branchlets grey-green, **finely longitudinally grooved**; with **paired straight thorns**. FLOWERS **yellow-green; bell-shaped**; male and female flowers on different plants. FRUIT a spherical or sub-spherical, **grapefruit-sized, spiny melon**.



DISTRIBUTION & ABUNDANCE

Scattered localities throughout the west. There are a number of earlier herbarium records that were not reconfirmed by the TAP. Generally uncommon; occasionally common to locally abundant in the central-west.

HABITAT

Mostly found on dunes and in dry river beds, but also on sand hummocks and along river banks, often causing the formation of sand hummocks. Mostly growing on sand.

GROWTH FORM

Mostly a shrub in the 1–3-m height category, often a scrambler.

ANNUAL CYCLE

FLOWERS recorded every month, but mainly in October; prolific flower buds recorded in June and July 1999. FRUIT recorded every month. LEAVES reduced to minute scales.

GENERAL

The fruit are eaten by variety of wild animals such as rodents, jackal and antelope. The spreading bushes provide a microhabitat within the desert, which supports a myriad of small organisms. The fruit also forms an important part of the diet of locals; the roots and seeds are used medicinally and the fruit peels are fed to livestock.

CONSERVATION CONCERNS

Endemic to the Namib Desert. Classified as 'Lower-risk, least concern' (Craven & Loots 2002). Often in large, but very localised, populations.



Right: *Acanthosicyos horridus*, flower, B. Curtis

Below: !Nara seed oil is used cosmetically, J. Pallett



Tarchonanthus camphoratus

Camphor Bush

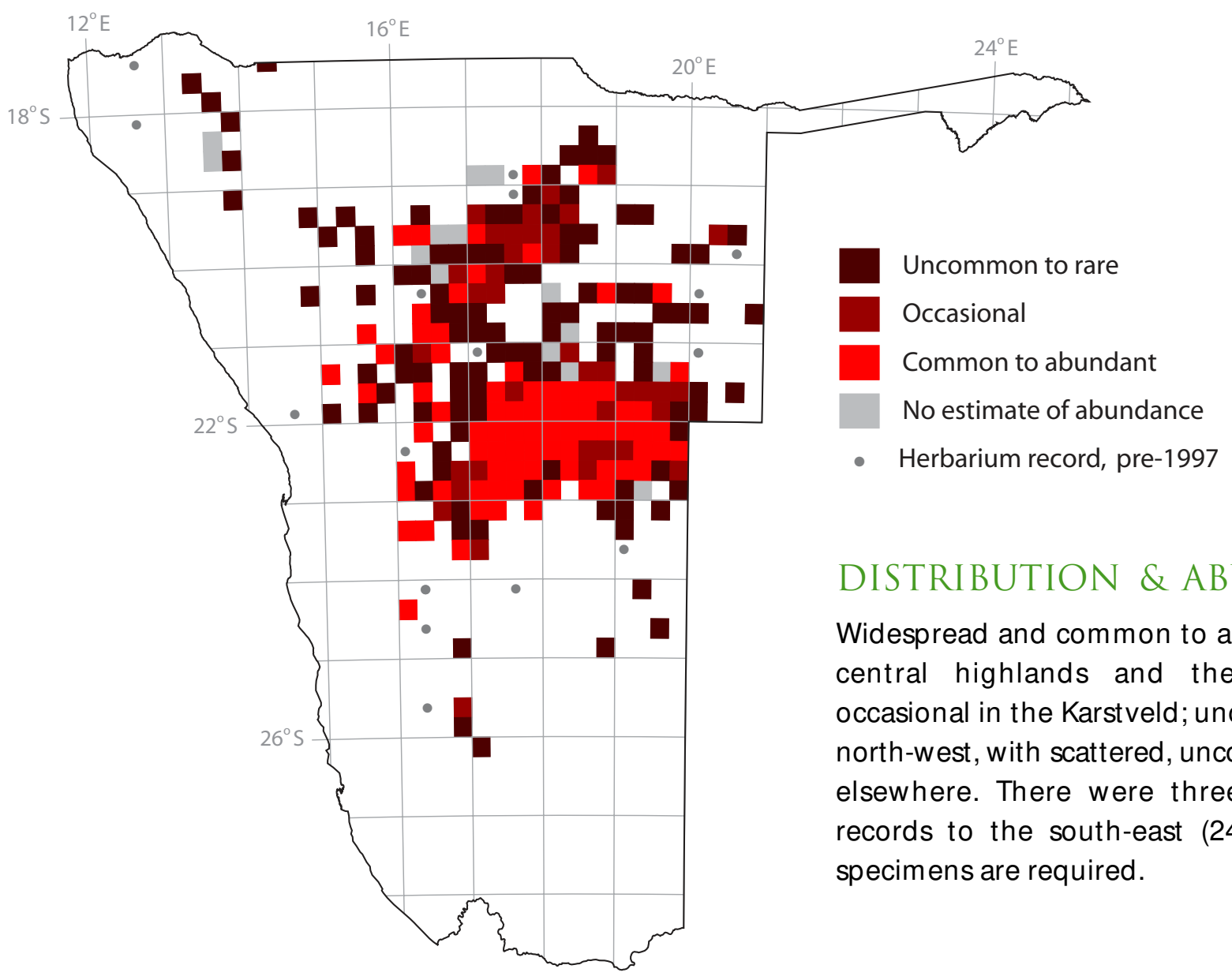
Vaalbos, wildekanferbos (A); Fahlbusch, Kampferbusch (G); omuteatupa (H); g!o (J); !abusa (K)

[862 records from 241 (23%) squares]



Semi-deciduous shrub. LEAVES simple, oblanceolate to narrowly elliptic or obovate; tough; olive-green above; white-grey, **woolly below**, with distinct net-veining; margin entire to finely toothed; a **pleasant camphor-like fragrance when crushed**. INFLORESCENCE a terminal spray of **small fluffy heads**. FRUIT **with cottonwool-like covering**.

The fruit are inconspicuous and have probably been under-recorded. Some atlassers may have mistakenly recorded the flowers as fruit, and vice versa.

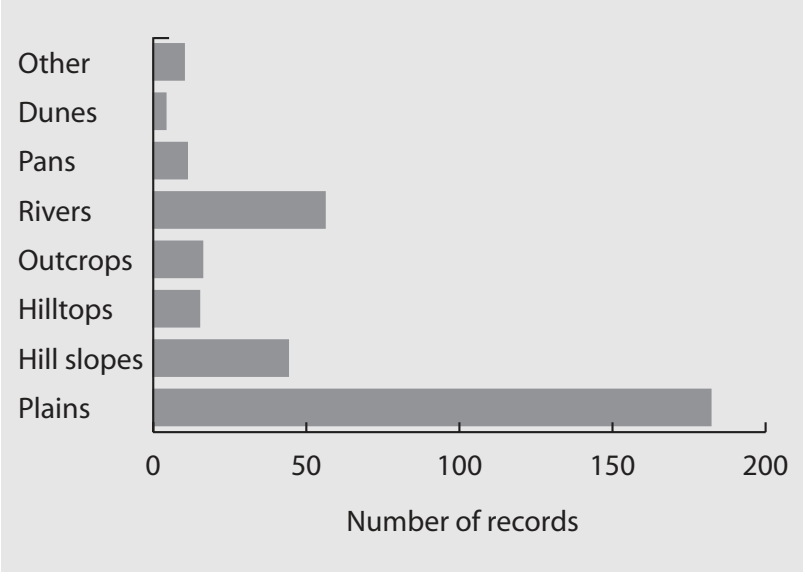


DISTRIBUTION & ABUNDANCE

Widespread and common to abundant in the central highlands and the central-east; occasional in the Karstveld; uncommon in the north-west, with scattered, uncommon records elsewhere. There were three, uncommon, records to the south-east (2419) for which specimens are required.

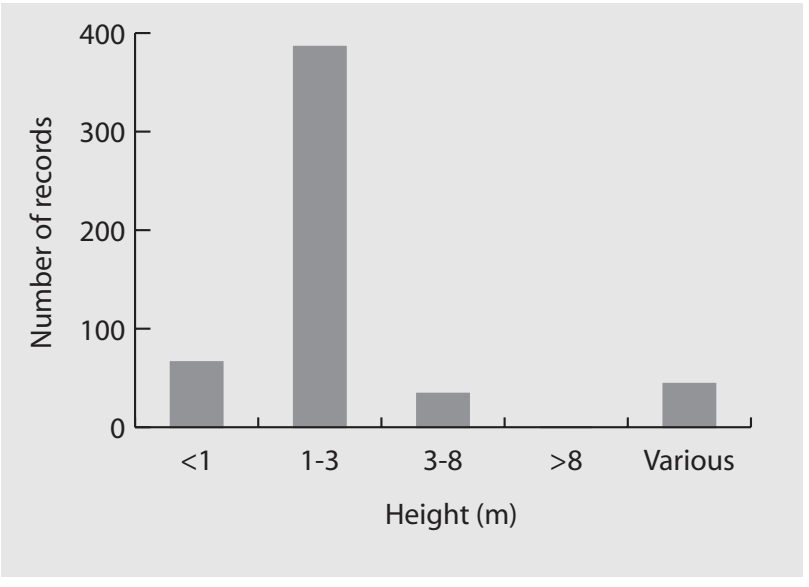
HABITAT

Found in various habitats, but mostly on plains. Also found on hills and along dry rivers in the central highlands; along dry rivers on the north-central plateau; and on pans in the central-east. Substrates include sand, calcrete, mica schist, dolomite, gravel and other rocks.



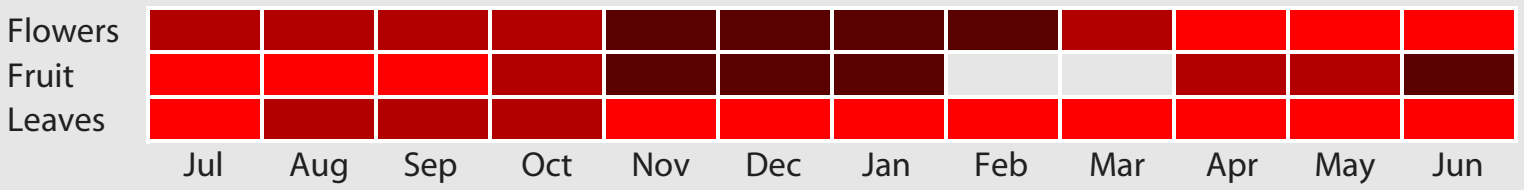
GROWTH FORM

Generally a shrub in the 1–3-m height class (75% of records); sometimes taller. Occasionally a tree (5% of records). At a village in 2119AB there is a relatively huge specimen of 8 m high with a single, smooth trunk (20 cm diameter), growing in a depression; it has been browsed into a tree.



ANNUAL CYCLE

FLOWERS all year, but mostly in early winter. FRUIT all year, but mostly in late winter. LEAVES essentially evergreen, with bare individuals found from August to November, and young leaves from October to December.



GENERAL

A favourite browse of livestock. Good honey is produced from the blossoms. The Cape Penduline Tit uses the woolly seeds for nesting material (FRI1). Often whole clumps of shrubs are destroyed by termites. The leaves are used medicinally. The plant may become encroaching in places. Roots are extremely hard and woody and can be polished and used for decorative purposes. It is of horticultural potential because the silvery foliage is attractive and fragrant, and it has flowers or fruit most of the year; the seeds also germinate easily, and the plant is drought- and frost-resistant.

CONSERVATION CONCERNS

None recorded.

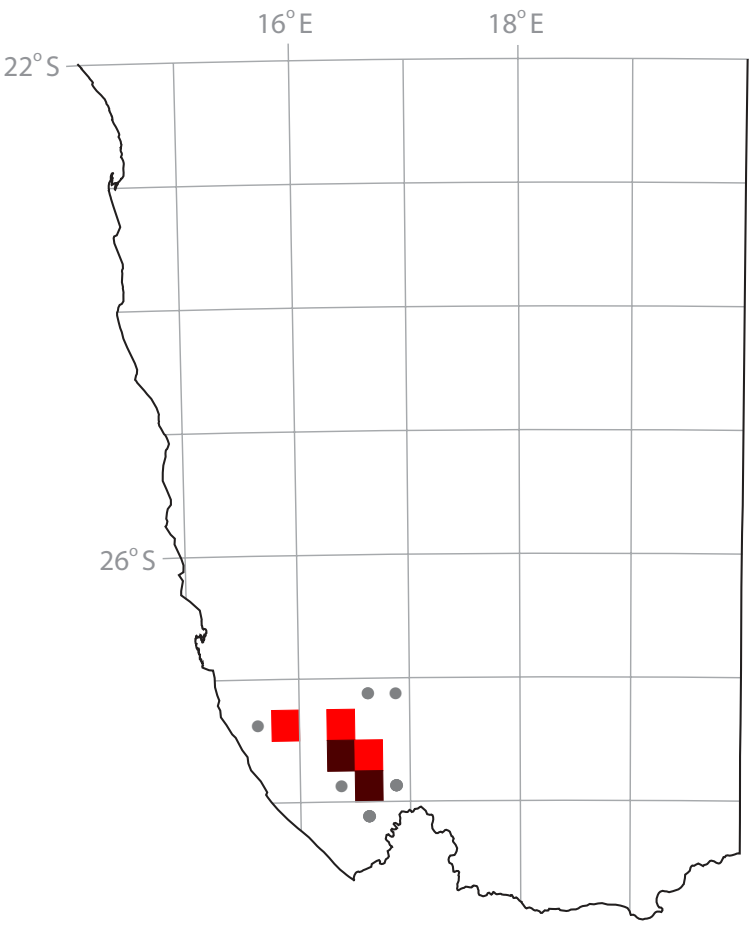
Didelta spinosa

Slaaibos

Thorny salad-bush (E)

[8 records from 6 (<1%) squares]

Shrub. LEAVES simple, **ovate** to broadly **elliptic**; smooth, **thinly textured to slightly succulent**; bright green, sometimes with a sparse, **cobwebby covering**; margin with irregular, **spine-tipped teeth**; veins conspicuous; apex broadly tapering to a spine-tip; base broadly tapering to rounded to lobed and clasping the stem; petiole absent or almost so. FLOWERS yellow, daisy-like; with an outer row of conspicuous, leaf-like bracts that become membranous when dry.



DISTRIBUTION & ABUNDANCE

Common to uncommon in the south-west, with one new record from the Tiras Mountains in 2616BA.

HABITAT

Found in kloofs, and on hill slopes (south-west facing, sheltered) and rocky outcrops.

GROWTH FORM

A shrub, mostly in the 1–3-m height class.

ANNUAL CYCLE

Observations only in March, September and November. FLOWERS from July to November (herbarium records), but mostly in September (September was the month with the highest number of observations). FRUIT only recorded in September. LEAVES recorded every month of observation.

GENERAL

Leaves may be used for salads and are heavily browsed by livestock. Of horticultural potential as the leaves and flowers are attractive and it is drought-resistant.

CONSERVATION CONCERNS

None recorded.

Brachylaena huillensis | Laeveldvaalbos

The leaves of this untidy small tree are clustered towards ends of branches, obovate to broadly elliptic in shape, glossy olive-green above and white-felted below, and have a bristle-like tip. The flowers are creamy white and small; the fruit small, with tufts of stiff hairs.

A single specimen (SWA3/169) from the Omavanda Mountains, just south of the Kunene River (1713AA), was brought in as the Tree Atlas was going to press. This is the first record for Namibia, and represents a disjunct range extension. There is another, unidentified *Brachylaena* species (cf *discolor*) from the same area.

HOT OFF THE PLANT PRESS

Trees of the Omavanda Plateau, Baynes Mountains

The Baynes and Otjihipa mountains cover a large, rugged area in north-western Namibia that is inaccessible by vehicle, making it virtually unknown territory from a botanical perspective. During the time of the TAP a total of at least twenty new records has been collected from a few brief trips into the area. Ernst van Jaarsveld and his colleagues have carried out three collecting trips over the past three years. Each trip has brought back new records, either for Namibia or for the Kaokoveld, as well as some unidentified trees and shrubs, and some interesting variants on known species. The senior author had the privilege of joining the latest trip in January 2005, just before this book went to the printers. As a result, some new species and records have been squeezed into the book, noticeable by the fact that their format is slightly different and they are not shown on the maps.

The Omavanda is a plateau of over 1800 m in the southern section of the Baynes Mountains (1713AA). It is a fascinating area and, judging by the plant growth there, it apparently has a much higher rainfall locally than the rainfall map for Namibia suggests. Being inaccessible by vehicle, it requires a long hike, and a steep climb up a scree slope and a cliff to get to the top. But it is well worth the effort. The diversity of woody vegetation is amazing with over 100 species recorded. Of these, six are new records for Namibia, and a further five represent range extensions for species in Namibia. There are an additional six species which have not been positively identified yet, which probably also represent new records for the area. Most of these newly recorded species probably come down from higher rainfall areas in Angola. For *Cussonia angolensis*, the Omavanda represents the southern-most extent of its distribution. For *Ficus bubu*, *Nuxia congesta*, *Brachylaena huillensis*, *Schrebera alata* and *Pleurostylia capensis*, the Omavanda represents a disjunct range extention to the west of their previously known distribution in the eastern parts of the sub-continent.

It is highly likely that even more new records will be found if the area were to be more comprehensively sampled. Many of the unusual forms of well-known species could also prove to be other species, either from Angola or new to science. This is definitely an area worthy of more attention.

ALIENS

The terms ‘alien‘ and ‘exotic‘ refer to plants that are not native or indigenous to a particular area. Generally, these terms are used to refer to plants that have been introduced from another continent, but a plant indigenous to South Africa that has been introduced to Namibia is also alien. This section covers some of the woody plants introduced to Namibia from elsewhere that have become naturalised, in other words, they have spread from the places where they were first planted (usually gardens) to other areas of their own accord, and continue to multiply without human assistance.

An alien is regarded as invasive when it spreads far from its point of introduction without any deliberate assistance from people, usually with detrimental effects on the environment. In places with higher rainfall, such as South Africa, invasive alien plants can become a major problem as they often out-compete the natural vegetation in an area. Thus, dense stands of aliens may be found where plants indigenous to the area were once found.

Aliens pose a threat to the environment, not only by displacing the indigenous species, but also by consuming large quantities of valuable water, for example, aliens such as *Eucalyptus* spp., *Prosopis* spp. and *Schinus* spp. Many aliens are also poisonous, especially to livestock.

Because Namibia is such an arid country, alien plants do not naturalise and spread as easily as in wetter areas. There are 16 species of woody aliens on the TAP database, of which eight are trees and eight are shrubs. They were probably under-recorded by the TAP, because many atlasers did not record aliens, particularly the smaller species. Atlasers were asked only to record naturalised aliens, and it is sometimes difficult to decide whether a tree was deliberately planted or came up by itself; it was generally felt that trees near human habitations had been planted.

Prosopis glandulosa is probably the most problematic of our alien species. It is found throughout central and southern Namibia, except for the driest parts of the desert. It is largely confined to farm homesteads and kraals, road verges and riverbeds. It is most prolific in the south-eastward flowing rivers such as the Black and White Nossob, Olifants and Auob, where dense stands out-compete the slower-growing *Acacia erioloba* and *A. karroo*.

Three other fairly widespread aliens are *Ricinus communis*, *Datura* spp., and *Nicotiana glauca*. These are all most prolific in ephemeral rivers.

A number of species that are major problems in South Africa occur in Namibia, but in very restricted localities, for example, *Lantana camara* and *Pinus* spp. One concern is the introduction of potentially invasive alien species by well-meaning organisations that are encouraging local communities to plant trees. These species, for example guava (*Psidium guajava*) and *Leucaena leucocephala*, need to be monitored very carefully to ensure that they do not become invasive at the expense of indigenous species. It would be more valuable to encourage the planting of some of our more useful indigenous species, than aliens.

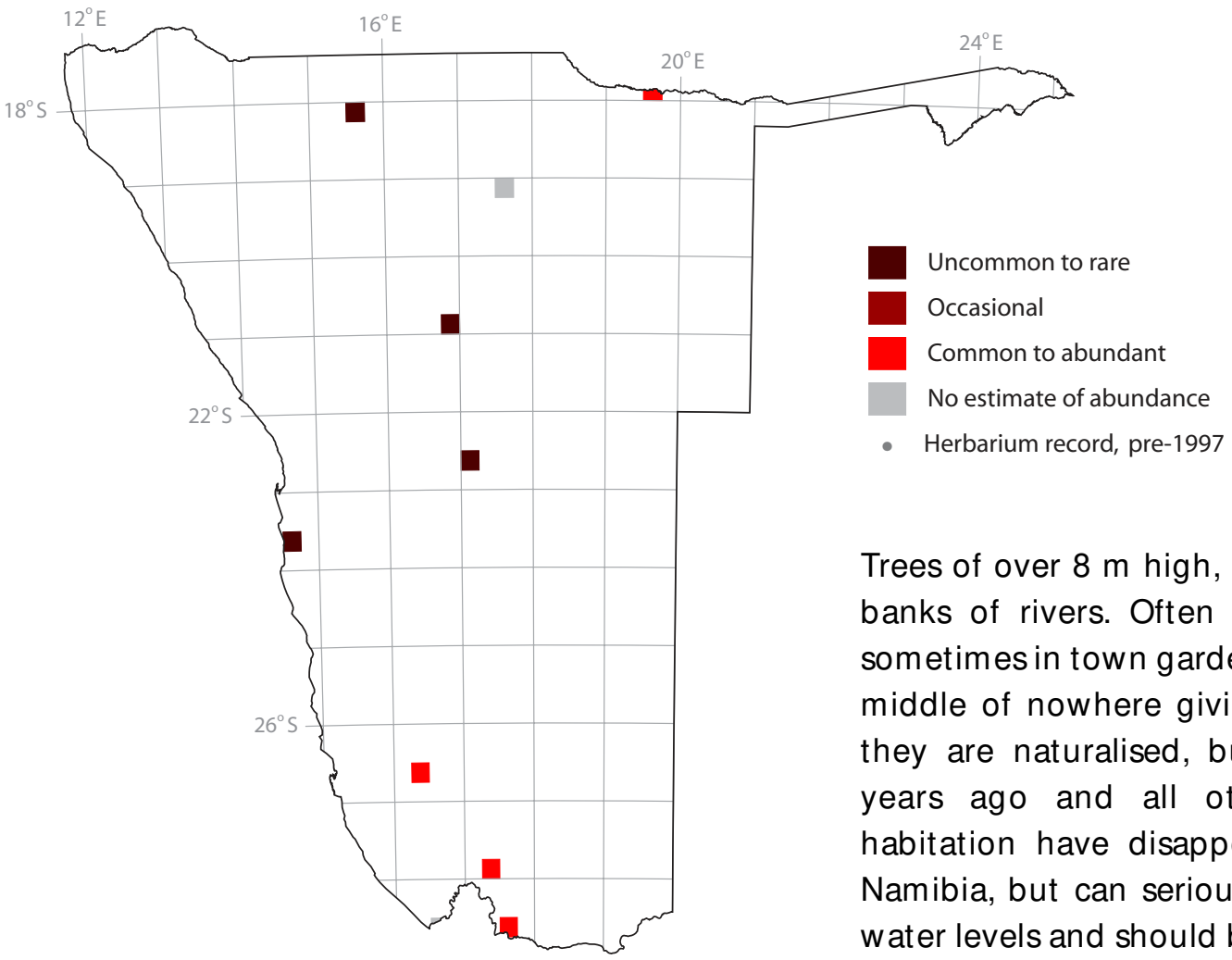
Unfortunately there is, at present, no legislation in Namibia controlling the introduction and spread of alien plants. The City of Windhoek does, however, have a by-law prohibiting the planting of *Prosopis* spp. and the Alien Invasive Working Group (AIWG) is assessing the problem of alien plants in the country and developing legislation to combat this problem.

For a more complete identification guide, see Henderson (2001). If you would like to know more about alien organisms in Namibia see Bethune et al (2004), or if you have information on their distribution, please contact the AIWG through Carol Steenkamp at **csteenkamp@polytechnic.edu.na** or Pierre Smit at **psmit@unam.na**.

Eucalyptus spp. / Australian Wattle / Gum / Ironbark

MYRTACEAE | Origin: Australia | [12 records from 10 squares]

Very tall trees with straight trunks. BARK grey, **peeling in long strips** to reveal a white underbark or with rough, fissured bark. LEAVES **drooping, leathery, lanceolate**.



Trees of over 8 m high, mainly found along the banks of rivers. Often planted on farms and sometimes in town gardens; seen growing in the middle of nowhere giving the impression that they are naturalised, but were planted many years ago and all other signs of human habitation have disappeared. Not a threat in Namibia, but can seriously impact the ground-water levels and should be eradicated.

Pinus spp. / Pine Tree

PINACEAE | Origin: Northern Hemisphere | [2 records from 2 squares]

A tall, erect tree with long, thin, **needle-like LEAVES and cones**. Sometimes planted at farm homesteads.

Recorded from the banks of the Orange River. Generally uncommon. Not considered a threat in Namibia.

Prosopis spp.

FABACEAE: MIMOSOIDAE

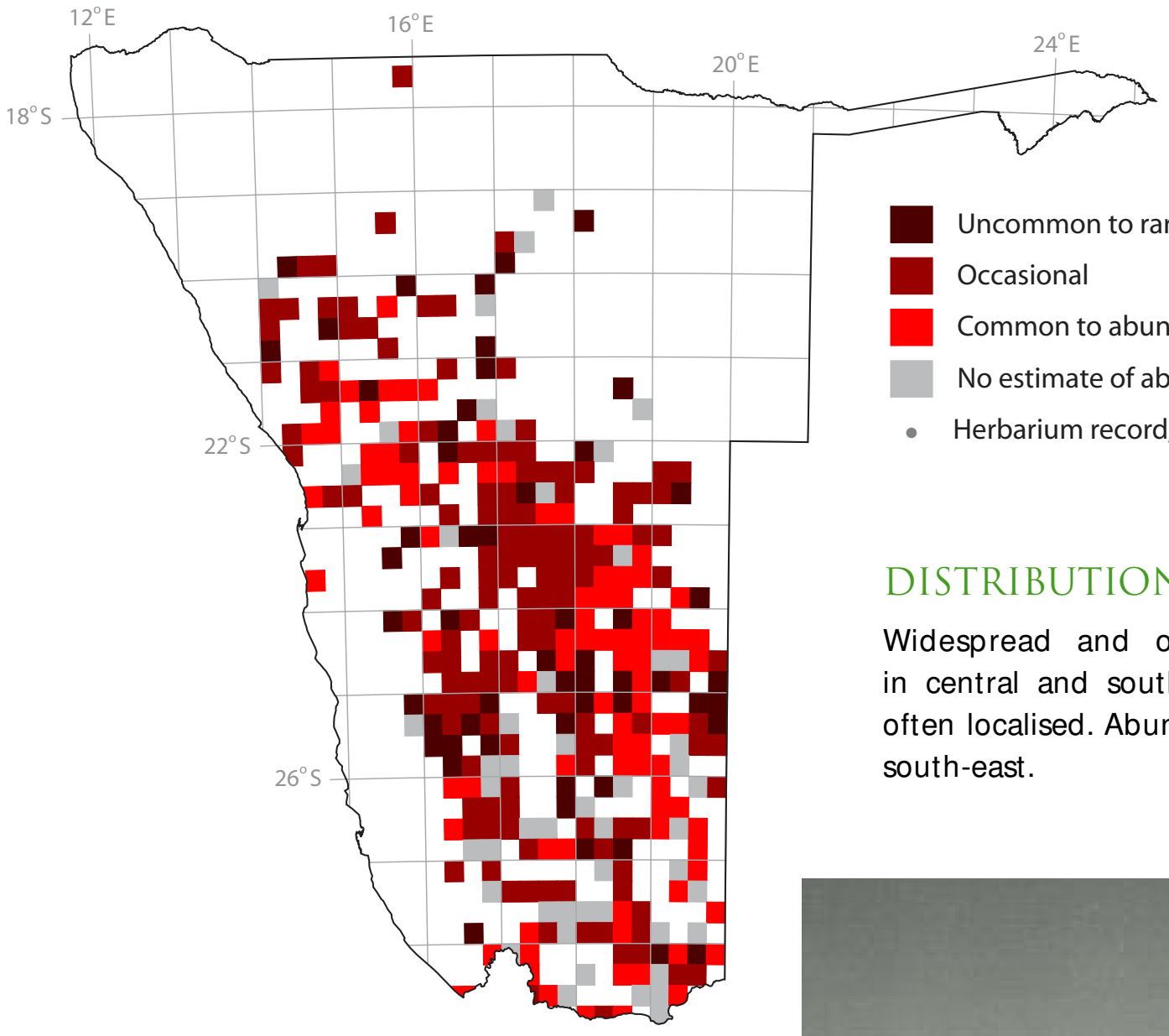
Mesquite

Origin: South-western USA

[812 records from 345 (32%) squares]

A shrub or multi-stemmed tree with a spreading canopy and **very strong spines**. LEAVES **twice-compound with small leaflets**. FLOWERS in **spikes; golden-yellow**. FRUIT a cylindrical or flattened pod, with seeds embedded in sweet, floury tissue.

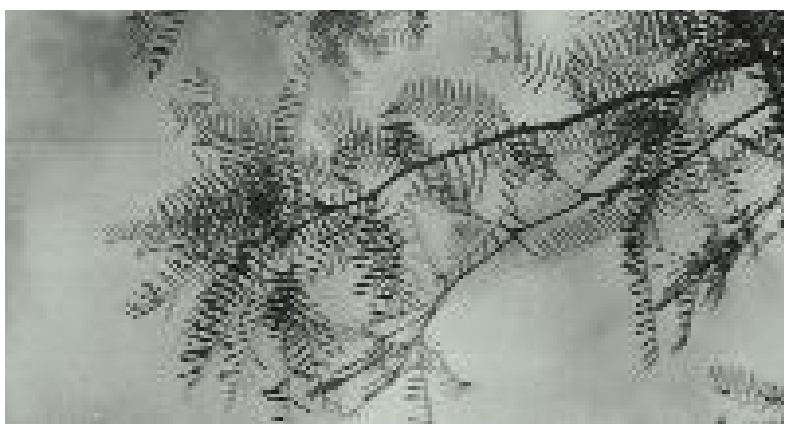
There are at least three species in Namibia, the most common of which is *P. glandulosa*. All three are discussed together. *Prosopis* can be confused with *Acacia*, but has straight spines rather than thorns.



DISTRIBUTION & ABUNDANCE

Widespread and occasional to common in central and southern Namibia, although often localised. Abundant in riverbeds in the south-east.

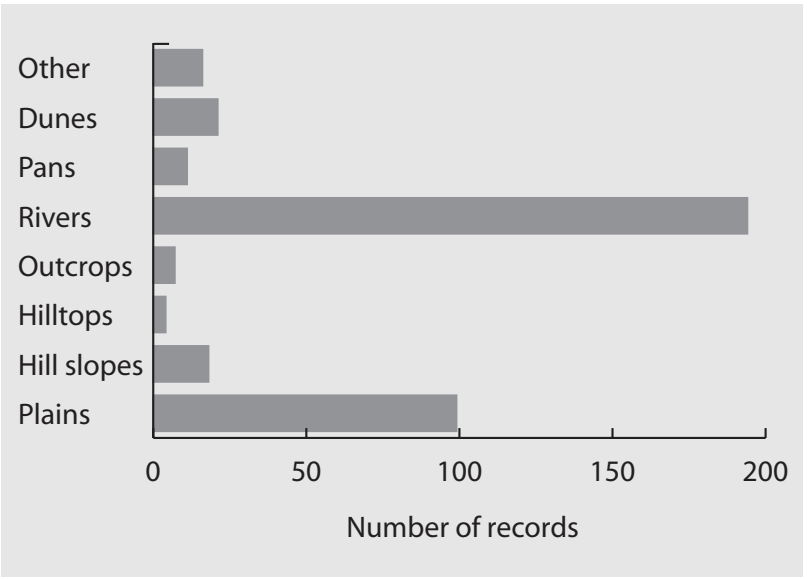
Prosopis sp., L. Hoffmann





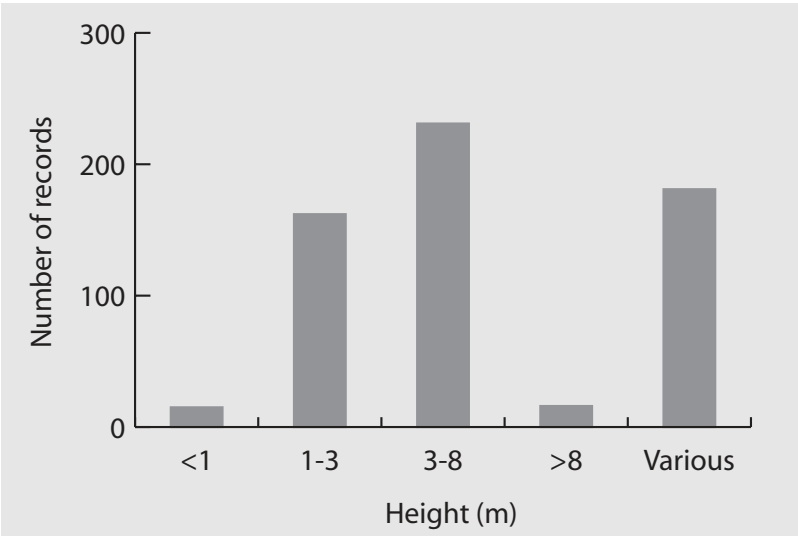
HABITAT

Mostly found in riverbeds and along dry watercourses; also along road verges, at homesteads, and livestock kraals and cattle posts.



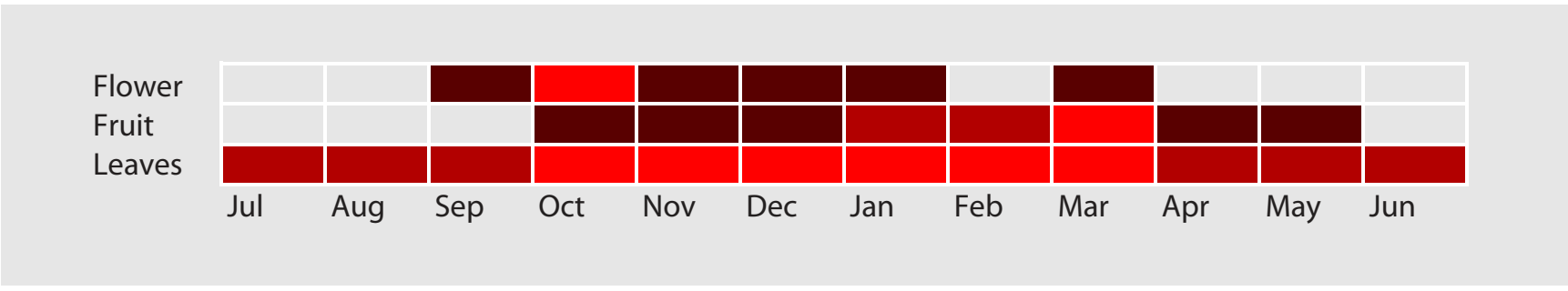
GROWTH FORM

Generally a tree in the 3–8-m height class, but also a shrub of 1–3 m; numerous groups of plants of various heights recorded.



ANNUAL CYCLE

FLOWERS mostly October, continuing to March some years. FRUIT mostly January to March. LEAVES some all year round, but mostly October to March.



GENERAL

An aggressively invasive species that is out-competing indigenous species, especially *Acacia erioloba* and *A. karroo*, in many of the south-eastern flowing rivers and the Klein Windhoek River just north of Windhoek. The pods are highly nutritious and the wood makes good firewood. The plants coppice easily and provide good shade. The spines are lethal to tyres. These plants produce masses of pollen in spring to which many people are extremely allergic, sometimes with near-fatal effect.

Apparently there are species of *Prosopis* that are not invasive and could be used for shade (HOF1), but few people can tell the difference and generally plant the wrong species. Thus, it is better not to plant any. The City of Windhoek has a by-law prohibiting the planting of any of these species.

In the Northern Cape, projects utilising *Prosopis* spp. have been successful at creating jobs and reducing populations of these species.

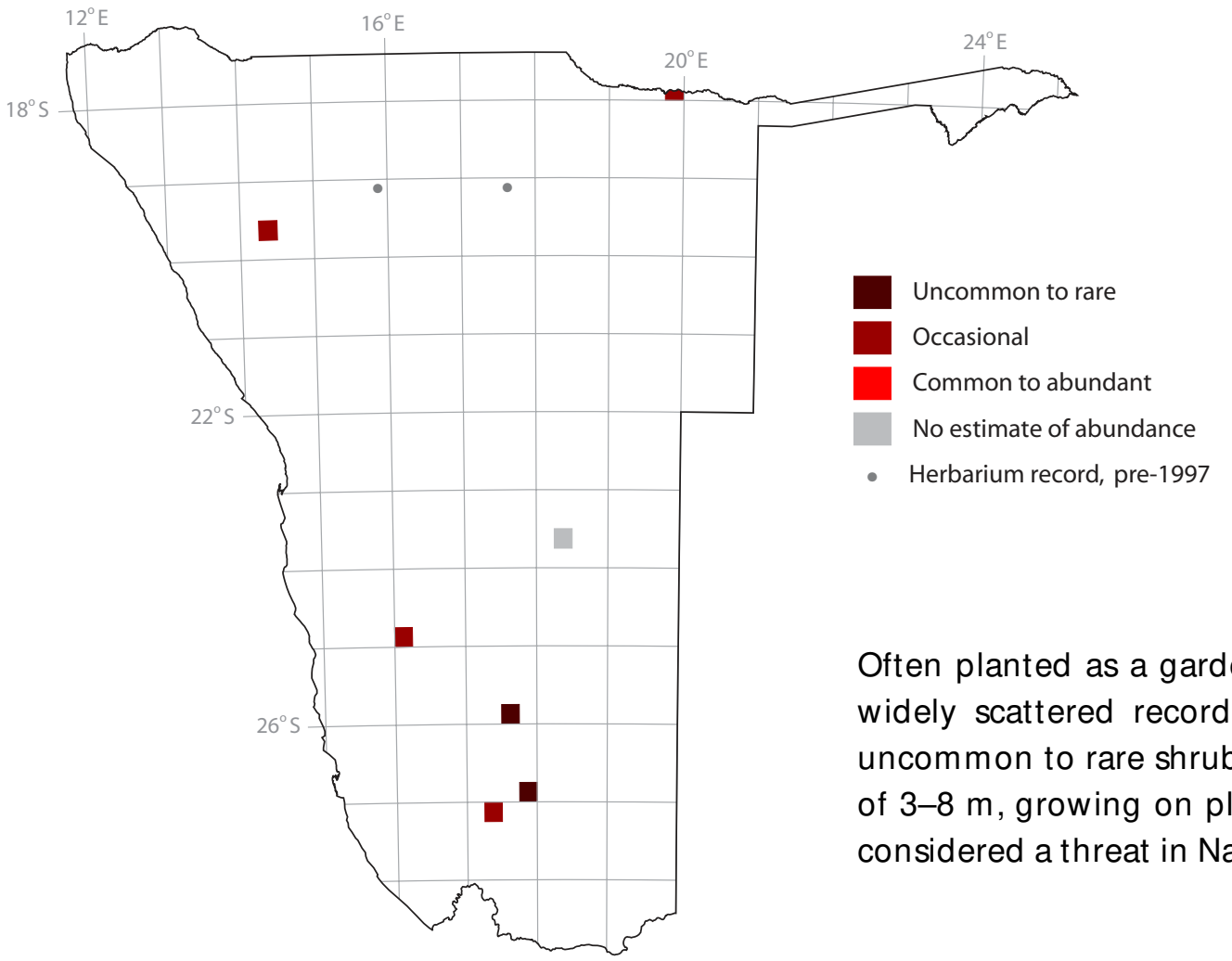
CONSERVATION CONCERNS

This species is a threat to indigenous vegetation, particularly in the riverine habitats in the south-east.

Parkinsonia aculeata | Jerusalem-thorn

FABACEAE: CAESALPINIOIDAE | Origin: Mexico | [9 records from 7 squares]

Evergreen tree with **smooth, greenish-yellow stem; armed with stout spines**. LEAVES **very long, slender, hanging; twice-compound with tiny leaflets which are sometimes absent**; light green. FLOWERS **yellow, fragrant**. FRUIT brown, narrow, slightly flattened pods.



Often planted as a garden tree. There are a few widely scattered records of it, generally as an uncommon to rare shrub of 1–3 m high or a tree of 3–8 m, growing on plains and hill slopes. Not considered a threat in Namibia.

Caesalpinia gilliesii | Bird-of-paradise

FABACEAE: CAESALPINIODAE | Origin: South America | [2 records from 1 square]

A shrub of up to 2 m high with feathery, twice-com-pound LEAVES and **very attractive, open FLOWERS with bright yellow petals and long, red stamens**.

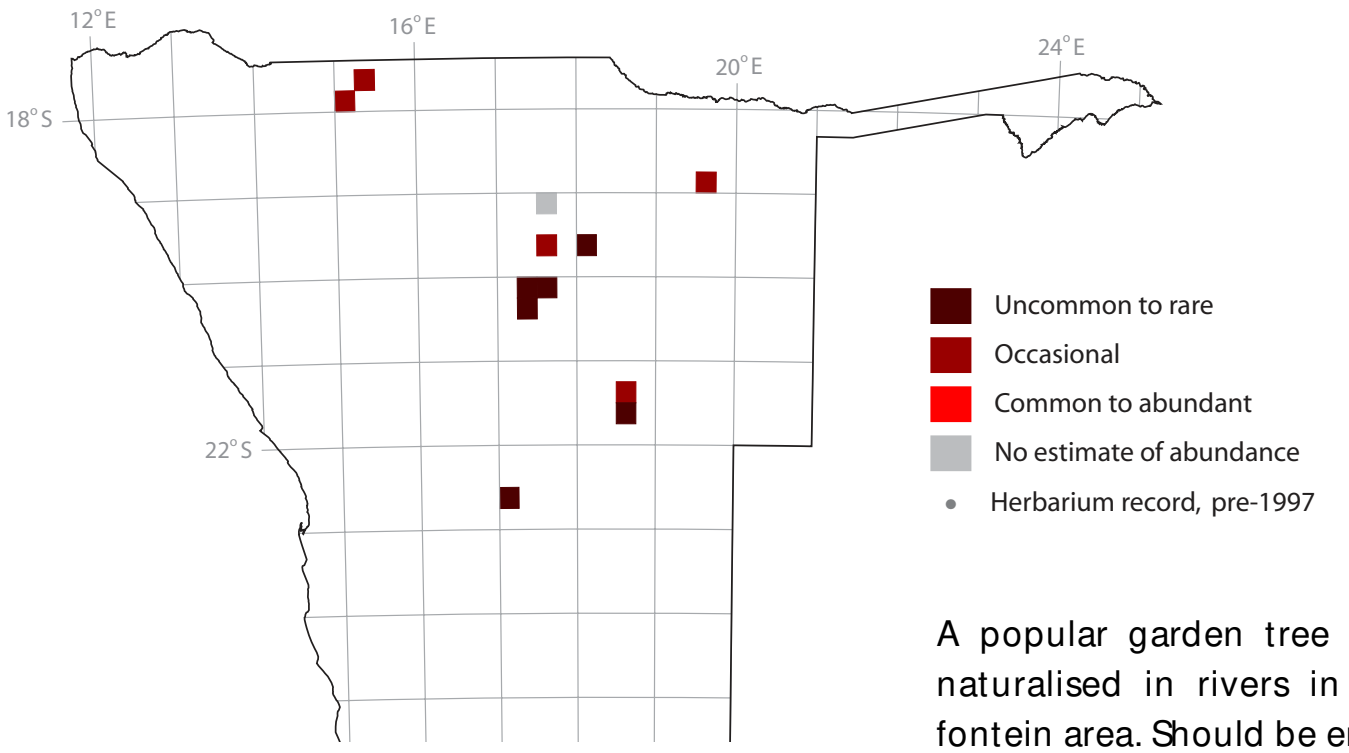
An easily grown garden plant that has escaped into dry river courses in a few places in Windhoek, where it is locally common. Not a threat in Namibia.

Melia azedarach / Syringa

MELIACEAE | Origin: Asia | [14 records from 12 squares]

A single-stemmed tree with spreading crown. LEAVES compound; leaflets lanceolate, margins serrate. FLOWERS small, lilac with darker central column; strongly and pleasantly scented. FRUIT round, light brown berries; **thinly fleshy, becoming wrinkled**.

The leaves, bark, flowers, and especially the ripe fruit are poisonous.



A popular garden tree of 3–8 m high. Mostly naturalised in rivers in the Waterberg–Grootfontein area. Should be eradicated.

Leucaena leucocephala / Wonderboom

FABACEAE: MIMOSOIDEAE | Origin: Tropical America | [1 record]

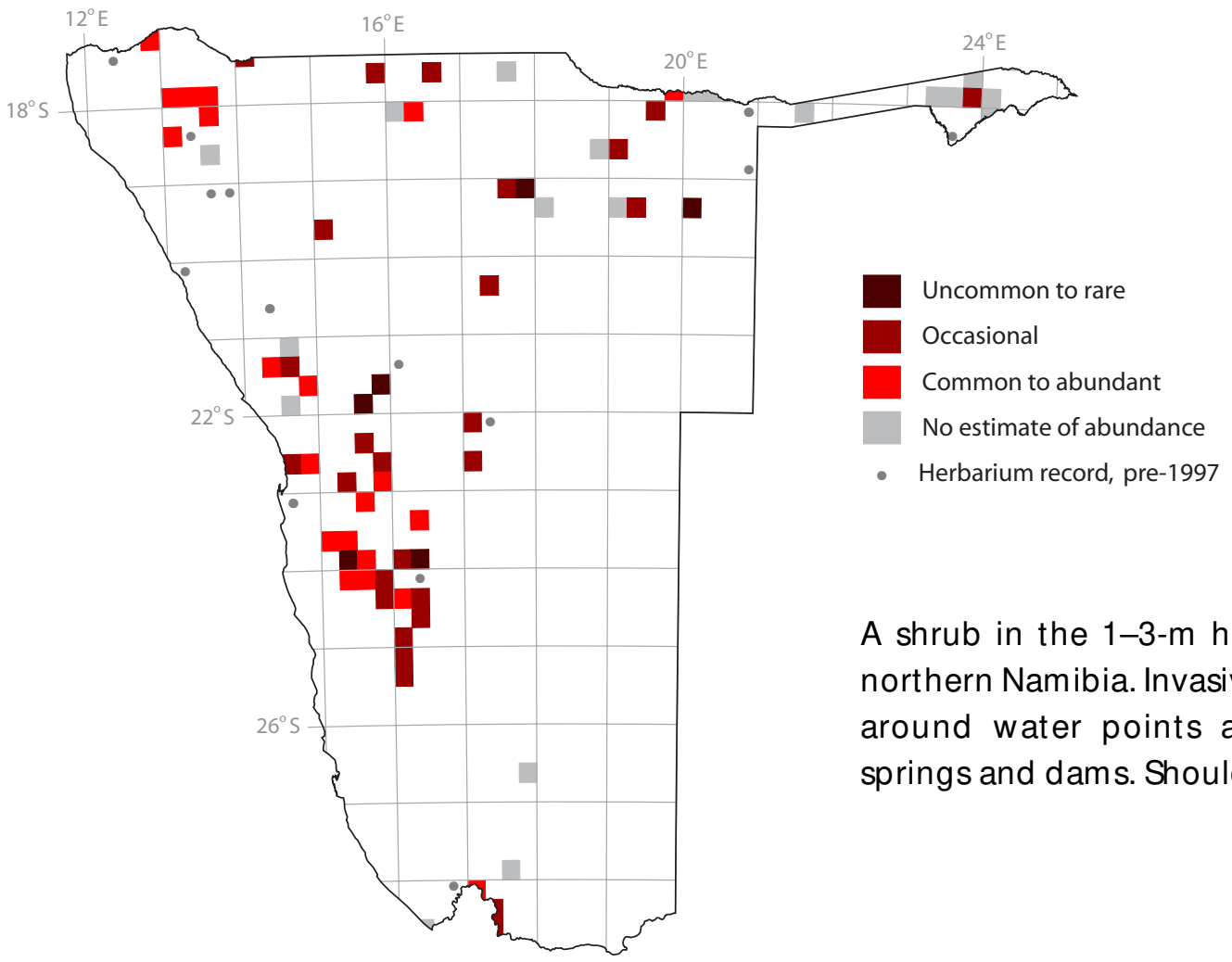
Shrub or small tree without thorns. LEAVES **twice-compound, dark green, drooping**. FLOWERS in globose heads; white or pale yellow. FRUIT brown pods, 110–180 mm long **in distinctive clusters**.

A common tree, 3–8 m high, which has been introduced widely throughout northern Namibia. Its seeds spread and germinate easily and it has become invasive in gardens in Windhoek. There is only one record of it having spread on its own in Rundu townlands and along the river (1719DD). This species potentially poses a major threat and needs careful monitoring.

Ricinus communis / Castor-oil Bush

EUPHORBIACEAE | Origin: Tropical Africa | [106 records from 74 squares]

Softly woody shrub or small tree with **sap, not milky**. LEAVES **palmately five- to nine-lobed, margins closely serrated**. FLOWERS upper parts reddish, lower cream-coloured. FRUIT three-lobed capsules with soft 'spines'. The leaves are poisonous and the **seed coat highly toxic and lethal**; the seed oil used medicinally.



A shrub in the 1–3-m height class. Cultivated in northern Namibia. Invasive in many riverbeds, and around water points and wet areas, such as springs and dams. Should be controlled.

Jatropha curcas / Physic Nut

EUPHORBIACEAE | Origin: Tropical America | [2 records from 1 square]

Perennial tree or shrub, with **swollen stem and milky latex**. LEAVES fairly large, **deeply lobed**, dark shiny green. FLOWERS small, **but in erect sprays, bright scarlet**. FRUIT a round, grape-like berry, **red**. Planted in gardens as an ornamental.

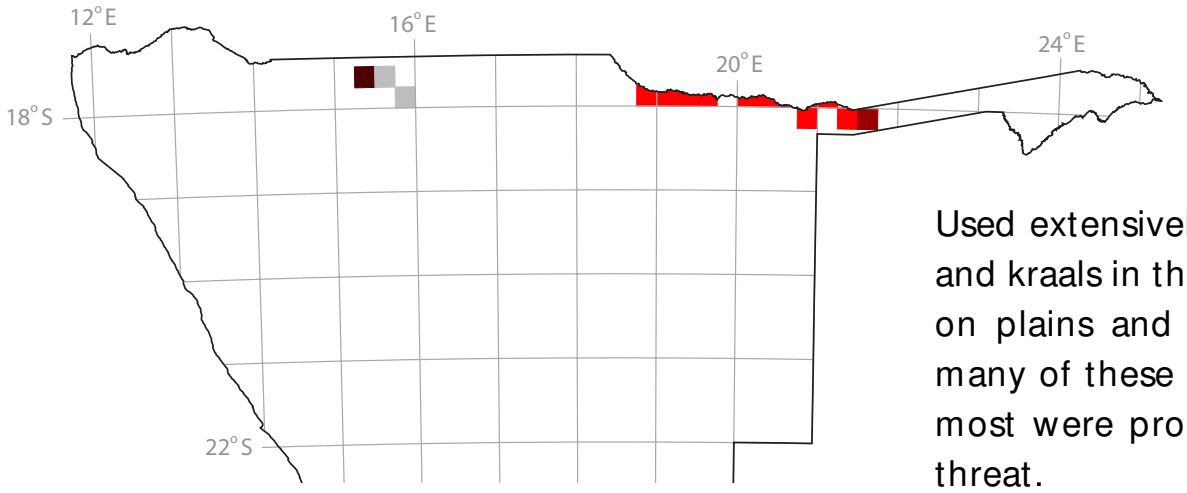
Uncommon shrub of up to and over 3 m high in one locality along the Orange River (2719DC). Causes poisoning in children occasionally. Used in traditional medicine. Not considered a threat in Namibia.

Euphorbia tirucalli / Rubber Euphorbia, Kraalnaboom

EUPHORBIACEAE | Origin: Eastern and south-eastern Africa | [17 records from 15 squares]

Spineless shrub or small, succulent tree, with a rounded crown. BRANCHLETS **cylindrical**. LEAVES small and slender, falling very early. FLOWERS yellowish-green. FRUIT a weakly three-lobed capsule.

The latex is toxic, and used medicinally, to repel or kill insects, and as a fish poison.

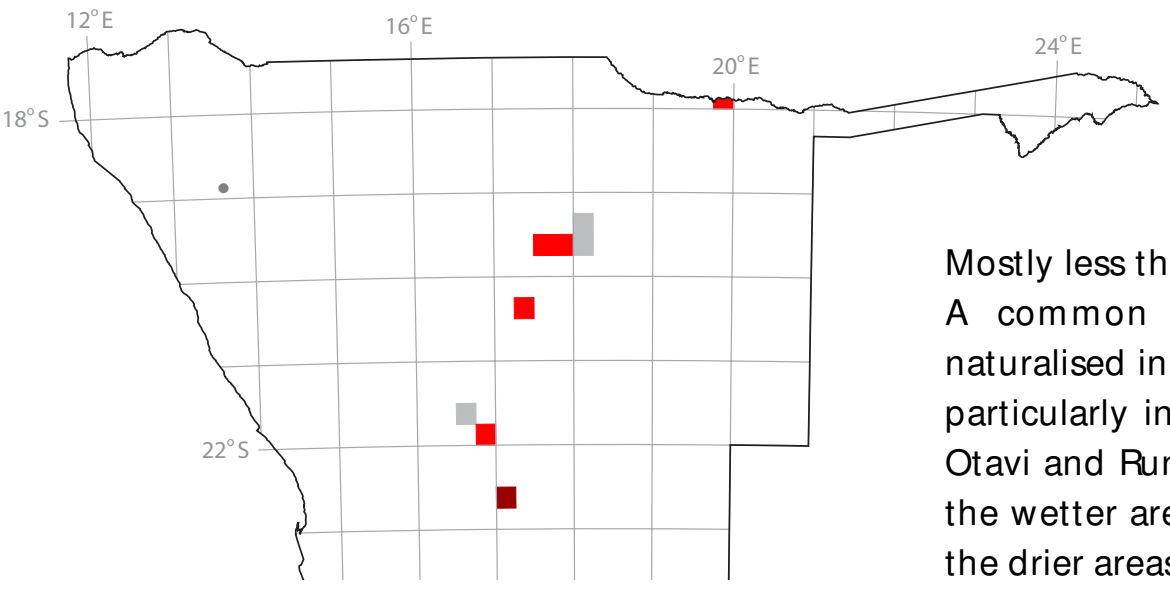


Used extensively as hedges around homesteads and kraals in the north – mainly Kavango. Found on plains and river banks. It is uncertain how many of these records are of naturalised plants; most were probably planted. Not considered a threat.

Lantana camara / Lantana

VERBENACEAE | Origin: Central and South America | [12 records from 9 squares]

Shrub with a tendency to clamber over other plants. STEMS with small spines. LEAVES leathery, **puckered; margins serrate**. FLOWERS **small, but in attractive dense clusters; yellow, orange and red**. FRUIT in clusters of small berries; black when ripe. Fruit are poisonous to mammals, but birds eat them.



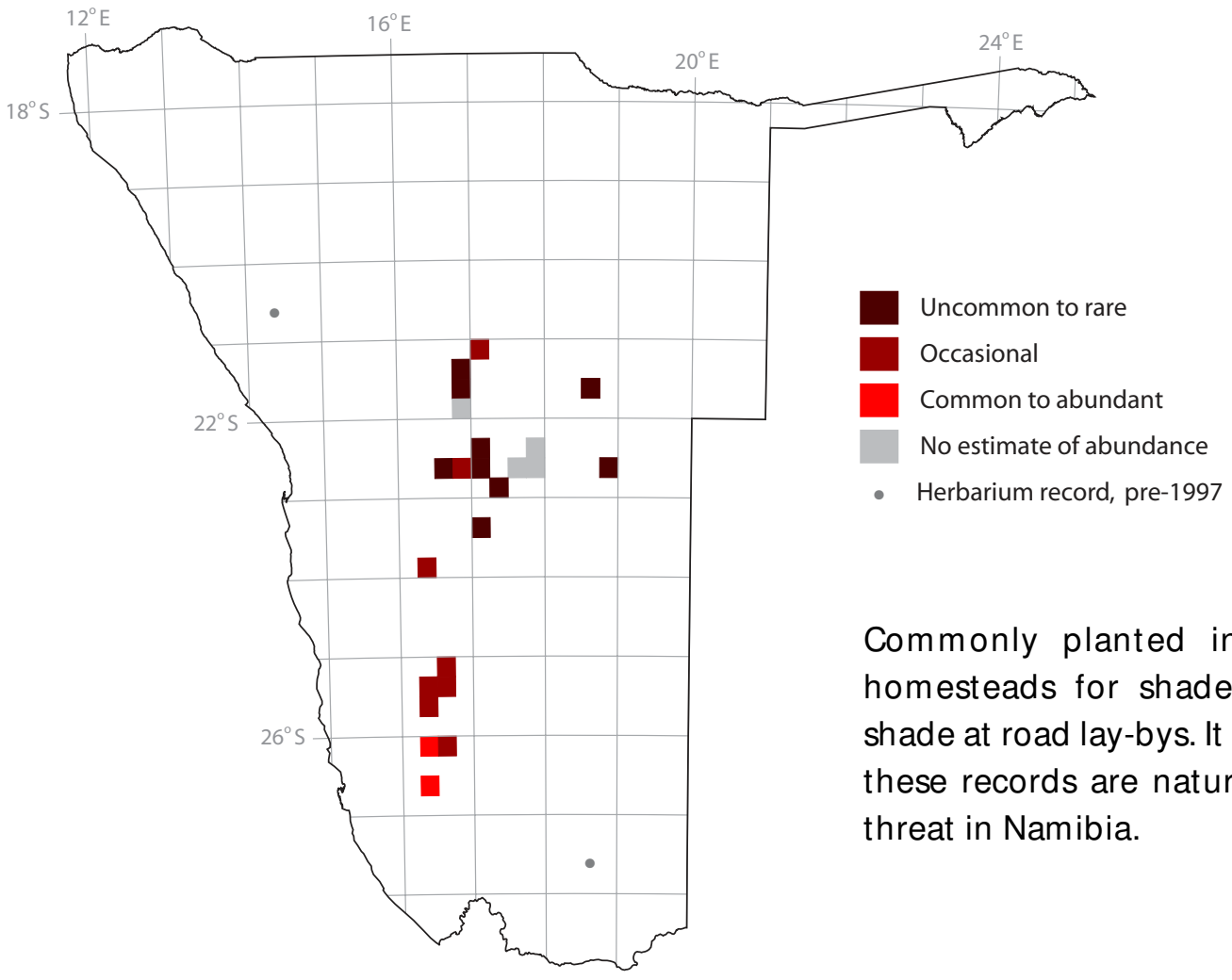
Mostly less than 1 m high, but sometimes taller. A common garden plant, which is found naturalised in riverbeds in towns. It has become particularly invasive in the Waterberg, and the Otavi and Rundu areas. Should be controlled in the wetter areas, but not considered a threat in the drier areas.

Schinus molle / Pepper Tree

ANACARDIACEAE | Origin: South America | [40 records from 23 squares]

A large tree with slender, drooping branches and rough, fissured bark. LEAVES **drooping, compound**; leaflets narrowly lanceolate, with a **peppery smell when crushed**. FLOWERS small, cream-coloured. FRUIT a small, red berry with papery skin surrounding a black stone.

Can be used as a pepper substitute.



Commonly planted in gardens and around homesteads for shade; has been planted for shade at road lay-bys. It is uncertain how many of these records are naturalised. Not considered a threat in Namibia.

Dodonaea viscosa var. *angustifolia* / Sand Olive

SAPINDACEAE | Origin: South-eastern Africa | [2 records from 2 squares]

Shrub or small tree, usually **multi-stemmed**. LEAVES **narrowly elliptic; sticky and resinous; shiny**, somewhat rough to the touch. FLOWERS small, greenish-yellow. FRUIT a capsule with **two or three membranous, papery wings**.

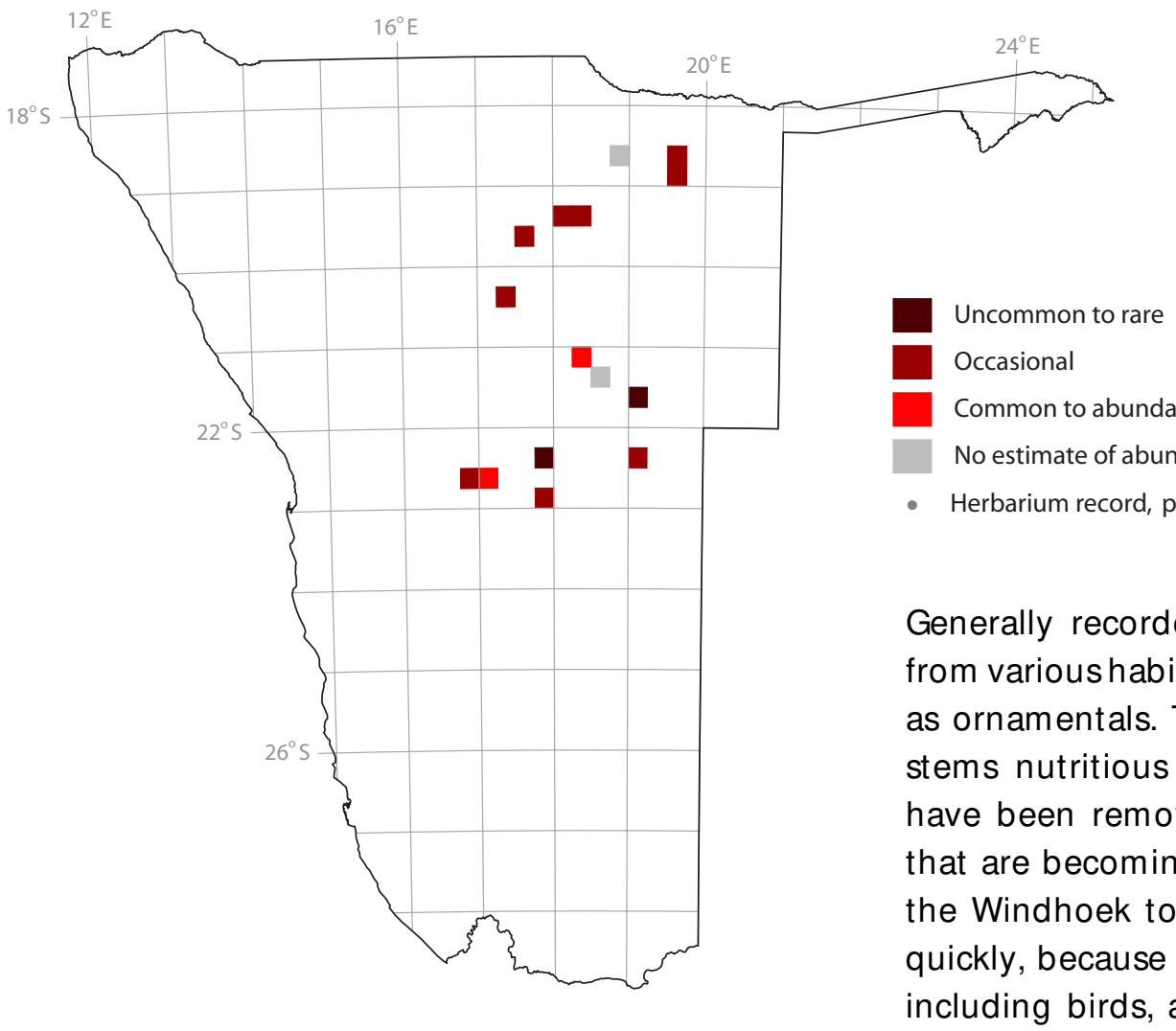
Used to consolidate sandy areas in South Africa. Often planted as hedges.

One record from Otavi area (1917C), one from Grootfontein area (1918CD) and another from Farm Regenstein (2217CA). Probably not a threat in Namibia, but should be monitored.

Opuntia spp. / Spiny Cactus / Prickly-pear

CACTACEAE | Origin: America | [18 records from 15 squares]

Spiny succulent, generally with broad, flattened, segmented, green stems which resemble leaves. LEAVES **absent**, replaced by **numerous extremely sharp, slender spines**. FLOWERS **fleshy calyx, with brightly coloured petals.** FRUIT ovoid with numerous spines; **fleshy, juicy**.

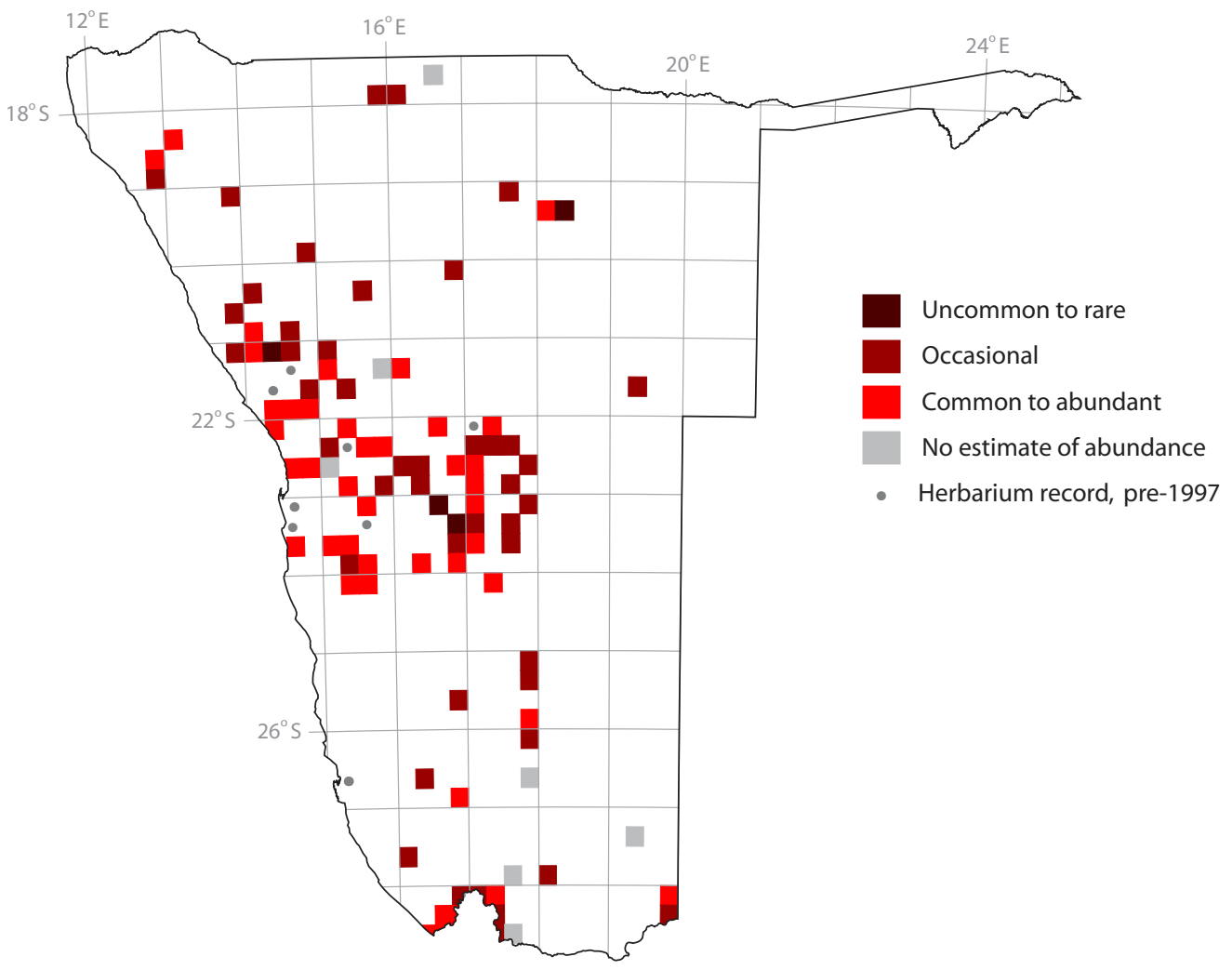


Generally recorded in the 1–3-m height class, from various habitats. Planted for cattle fodder or as ornamentals. The fruit are delicious and the stems nutritious for livestock once the spines have been removed. There are several species that are becoming a problem in public areas in the Windhoek townlands. They proliferate very quickly, because the fruit are eaten by animals, including birds, and the seeds are thus rapidly spread. They also grow vegetatively from sections of stem thrown onto the ground, thus chopping them up does not eradicate them, but rather exacerbates the problem.

Nicotiana glauca / Wild Tobacco

SOLANACEAE | Origin: Argentina | [176 records from 98 (9%) squares]

Slender, evergreen shrub. LEAVES blue-green, **leathery, with long petioles**. FLOWERS **tubular, yellow**, in hanging clusters. FRUIT brown capsules.



DISTRIBUTION & ABUNDANCE

Locally common to abundant in central Namibia and scattered localities elsewhere.

HABITAT

Mostly found in dry rivers and disturbed areas.

GROWTH FORM

Mostly a shrub in the 1–3-m height class, but sometimes tree-like and occasionally over 8 m high.

ANNUAL CYCLE

FLOWERS may be found all year round, but mainly from September to November and January to May. FRUIT mainly from November to May. LEAVES virtually evergreen.

GENERAL

A noticeable increase was noted in the Kuiseb River at Gobabeb (2315CA) in 1997 following several floods (BER1). It produces huge quantities of seeds, and has spread along watercourses. The leaves are poisonous.

CONSERVATION CONCERNS

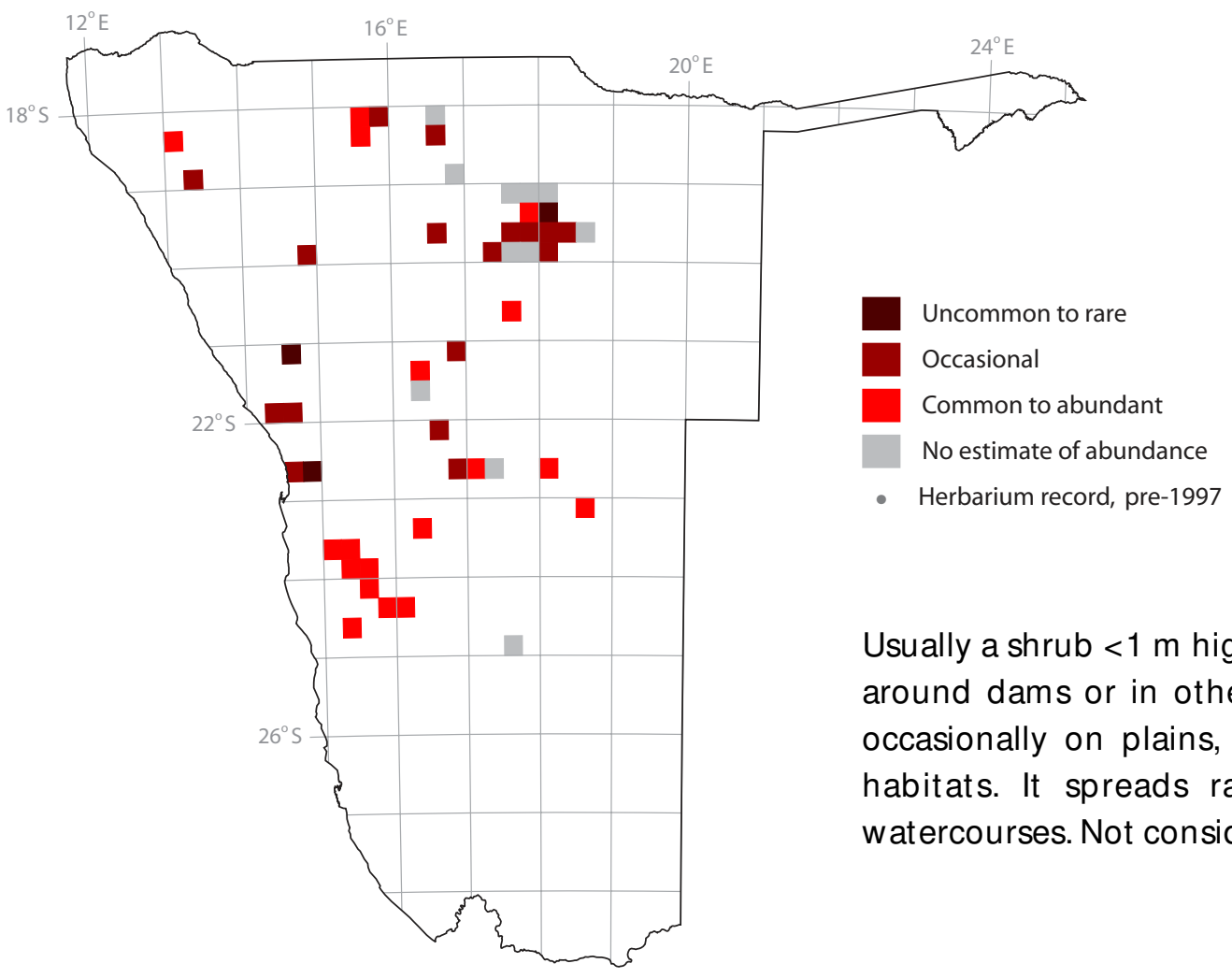
Not considered a major threat as it pretty much stays in watercourses, where a good flood will wash it away. However, dense stands in slower flowing and rarely flooded areas, such as the Kuiseb Delta (2314), might not be washed away, choking the watercourse and tapping the ground-water. This plant is worth investigating to see whether it out-competes indigenous vegetation.

Datura spp. / Thorn Apple

SOLANACEAE | Origin: North and Central America | [124 records from 63 squares]

Erect, robust, shrubby annual. LEAVES ovate, up to 200 mm long; on long petioles; margins coarsely and irregularly toothed or lobed; bad smelling. FLOWERS large, solitary, narrowly funnel-shaped; white to light purple . FRUIT brown, hardened **capsules covered with stout or slender, spreading spines**.

This plant is poisonous to mammals, especially the seeds, which are eaten by birds. There are three species that occur in Namibia, *D. ferox*, *D. innoxia* and *D. stramonium*.



Usually a shrub <1 m high, mostly found in rivers, around dams or in other seasonally wet places; occasionally on plains, hill slopes and in other habitats. It spreads rapidly, especially along watercourses. Not considered a threat in Namibia.

REFERENCES

ALLABY, M (ed.). 1998. *Oxford Dictionary of Plant Sciences*. Oxford University Press, Oxford.

BERRY, C. 2000. *Trees and Shrubs of the Etosha National Park and in Northern and Central Namibia*. Namibia Scientific Society, Windhoek.

BESTER, FV. 1998/99. Major problem – bush species and densities in Namibia. *Agricola*, Vol. 10: 1–3.

BETHUNE, S, GRIFFIN, M & JOUBERT, D. 2004. National review of invasive alien species – Namibia. Final Report to SABSP. Directorate of Environmental Affairs Discussion Document, Ministry of Environment and Tourism, Windhoek.

BREYER-BRANDWIJK, MG & WATT, JM. 1962. *The Medicinal and Poisonous Plants of Southern and Eastern Africa*. Second Edition. Livingstone, London.

BURROWS, J & S. 2003. *Figs of Southern and South-central Africa*. Umdaus Press, South Africa.

COATES PALGRAVE, K. 2002. *Trees of Southern Africa*. Third Edition. Struik Publishers, Cape Town.

CRAVEN, P (ed.). 1999. A checklist of Namibian plant species. *Southern African Botanical Diversity Network Report*, No. 7: 206pp. SABONET, Windhoek.

CRAVEN, P & KOLBERG, H. In prep. Common names of Namibian plants.

CRAVEN, P & LOOTS, S. 2002. Namibia. In GOLDING, J (ed). 2002. *Southern African Plant Red Data Lists. Southern African Botanical Diversity Network Report*, No.14: 61–92. SABONET, Pretoria.

DE KLERK, JN. 2004. *Bush Encroachment in Namibia*. Ministry of Environment and Tourism, Windhoek.

DE WINTER, B. 1971. Floristic relationships between the northern and southern arid areas in Africa. *Mitt. Bot. Staatssamml. München*, Vol.10: 424–437.

DHARANI, N. 2002. *Field Guide to Common Trees and Shrubs of East Africa*. Struik Publishers, Cape Town.

EDWARDS, D & LEISTNER, OA. 1971. A degree reference system for citing biological records in southern Africa. *Mitt. Bot. Staatssamml*. München, Vol. 10: 501–509.

FODEN, W. 2002. A demographic study of *Aloe dichotoma* in the Succulent Karoo: Are the effects of climate change already apparent? MSc Thesis. University of Cape Town. Cape Town.

GERMISHUIZEN, G & MEYER, NL (eds.). 2003. Plants of southern Africa: An annotated checklist. *Strelitzia*, 14.

GIESS, W. 1998. A preliminary vegetation map of Namibia. Third revised edition. *Dinteria*, 4: 1–112.

GOLDING, J (ed). 2002. Southern African Plant Red Data Lists. *Southern African Botanical Diversity Network Report*, No.14.

HARRIS, JG & HARRIS, MW. 1999. *Plant Identification Terminology, an Illustrated Glossary*. Spring Lake Publishing, Spring Lake, Utah.

HENDERSON, L. 2001. *Alien Weeds and Invasive Plants*. Agricultural Research Council, South Africa.

JONES, CE & LITTLE, RJ. 1980. *A Dictionary of Botany*. Litton Educational Publishing, New York.

LEFFERS, A. 2003. *Gemsbok Bean and Kalahari Truffle*. Gamsberg Macmillan Publishers, Windhoek.

LE ROUX, P. 1971. The common names and a few uses of the better known indigenous plants of South West Africa. Department of Forestry. South West Africa. 78pp.

LOOTS, S. 2005. A Red Data Book of Namibian Plants. *Southern African Botanical Diversity Network Report* 38. SABONET, Pretoria.

MAGGS, GL, CRAVEN, P & KOLBERG, HH. 1998. Plant species richness, endemism and genetic resources in Namibia. *Biodiversity and Conservation*, 7(4): 435–446.

MANNHEIMER, CA & CURTIS, BA [eds]. In prep. *Müller and le Roux's Field Guide to Trees and Shrubs of Namibia*. Gamsberg Macmillan, Windhoek.

MENDELSOHN, J, & EL OBEID, S, in press. *Woodlands and Forests in Namibia*. RAISON, Windhoek, Namibia.

MENDELSOHN, J, JAVIS, A, ROBERTS, C & ROBERTSON, T. 2002. *Atlas of Namibia: A Portrait of the Land and its People*. David Philip Publishers, Cape Town.

OSTERMEIER-NOCZIL, B. 1997. Smallholders of northern Namibia: Ethnobotanical case study of the traditional Mbukushu village 'Kaké' in the Kavango/Caprivi-Region. Unpublished PhD Thesis. University of Vienna, Vienna.

RETIEF, E & VAN WYK, AE. 2001. The genus *Ehretia* (Boraginaceae: Ehretiodeae) in Southern Africa. *Bothalia*, Vol. 31(1): 9–23.

RODIN, RJ. 1985. *The Ethnobotany of the Kwanyama Ovambos*. Missouri Botanical Garden, Missouri.

SMIT, N. 1999. *Acacias of South Africa*. Briza Swanepoel Publications, Pretoria.

SWANEPOEL, W. in press. A new species of *Commiphora* (Burseraceae) from Namibia, with notes on *C. dinteri* and *C. namaensis*. *Bothalia* Vol. 35.

TAP (TREE ATLAS PROJECT). 1997. *Guidelines for Atlassers*. National Botanical Research Institute (NBRI), Windhoek.

TAP (TREE ATLAS PROJECT). 2003. Monthly recordings from farmers. *Omusati*, 14: 11–18. National Botanical Research Institute (NBRI), Windhoek.

TIMBERLAKE, J, FAGG, C & BARNES, R. 1999. *Field Guide to the Acacias of Zimbabwe*. CBC Publishing, Harare.

VAN KOENEN, E. 2001. *Medicinal, Poisonous and Edible Plants in Namibia*. Klaus Hess Publishers, Windhoek & Göttingen.

VAN NOORT, S. 2004. How fig trees are pollinated. *Veld & Flora: Journal of the Botanical Society of South Africa*, 90(10): 13–15.

VAN WYK, B & VAN WYK, P. 1997. *Field Guide to Trees of Southern Africa*. Struik Publishers, Cape Town.

VENTER, AM. 2000. Taxonomy of the Genus *Lycium* L. (Solanaceae) in Africa. PhD Thesis, Department of Botany and Genetics. University of the Free State, Bloemfontein.

WATTS, S. 2003. The effects of communal land resource management on forest conservation in northern and north-eastern Namibia. *Development Southern Africa*, 20(3): 337–359.

WAUGH, D. 1995. *Geography, an Integrated Approach*. Second Edition. Thomas Nelson and Sons, Walton-on-Thames.

WHITE, F. 1983. The vegetation of Africa: a descriptive memoir to accompany the UNESCO/AETFAT/UNSO Vegetation map of Africa. Natural Resources Research XX. UNESCO Paris.

USEFUL FIELD GUIDES

BERRY, C. 2000. *Trees and Shrubs of the Etosha National Park and in Northern and Central Namibia*. Namibia Scientific Society, Windhoek.

BURKE, A. 2003. *Wild Flowers of the Central Namib*. Namibia Scientific Society, Windhoek.

BURKE, A. 2003. *Wild Flowers of the Southern Namib*. Namibia Scientific Society, Windhoek.

BURKE, A. In press. *Wild Flowers of the Northern Namib*. Namibia Scientific Society, Windhoek.

COATES PALGRAVE, K. 2002. *Trees of Southern Africa*. Third edition. Struik Publishers, Cape Town.

CRAVEN, P & MARAIS, C. 1986. *Namib Flora*. Gamsberg Macmillan, Windhoek.

CRAVEN, P & MARAIS, C. 1989. *Waterberg Flora*. Gamsberg Macmillan, Windhoek.

CRAVEN, P & MARAIS, C. 1992. *Damaraland Flora*. Gamsberg Macmillan, Windhoek.

GRANT, R & THOMAS, V. 1997. *SAPPI Tree Spotting Series: Lowveld*. Jacana Education, Johannesburg.

GRANT, R & THOMAS, V. 1998. *SAPPI Tree Spotting Series: Highveld and Drakensberg*. Jacana Education, Johannesburg.

GRANT, R & THOMAS, V. 1998. *SAPPI Tree Spotting Series: KwaZulu-Natal*. Jacana Education, Johannesburg.

GRANT, R & THOMAS, V. 1999. *SAPPI Tree Spotting Series: Bushveld*. Jacana Education, Johannesburg.

MANNHEIMER, CA & CURTIS, BA (eds). In prep. *Müller and le Roux's Field Guide to Trees and Shrubs of Namibia*. Gamsberg Macmillan, Windhoek.

ROODT, V. 1998. *Trees and Shrubs of the Okavango Delta: Medicinal Uses and Nutritional Value*. Shell Field Guide Series, Part I. Shell Oil Botswana, Gaborone.

SMIT, N. 1999. *Guide to the Acacias of South Africa*. Briza Publications, Pretoria.

STEYN, M. 1994. *SA Acacias*. Published by the author, Pietersburg.

STEYN, M. 1996. *SA Ficus*. Published by the author, Pietersburg.

STEYN, M. 1998. *SA Combretums & Terminalia*. Published by the author, Pietersburg.

STEYN, M. 2003. *Southern Africa Commiphora*. Published by the author, Pietersburg.

TIMBERLAKE, J, FAGG, C & BARNES, R. 1999. *Field Guide to the Acacias of Zimbabwe*. CBC Publishing, Harare.

VAN WYK, B, VAN WYK, P & VAN WYK, B-E. 2000. *Photographic Guide to Trees of Southern Africa*. Briza Publications, Pretoria.

VAN WYK, P & VAN WYK, B. 1997. *Field Guide to the Trees of Southern Africa*. Struik, Cape Town.

VENTER, F & VENTER, J-A. 1996. *Making the Most of Indigenous Trees*. Briza Publications, Pretoria.

CONTACT ADDRESSES

EXCHANGE OF INFORMATION AND IDENTIFICATION OF PLANT SPECIMENS:

National Botanical Research Institute
8 Orban Street, Windhoek

Tel: +264-61-2029111
Fax: +264-61-258153
E-mail: nbri@mweb.com.na
Post: Private Bag 13184, Windhoek

PERMITS TO COLLECT PLANT SPECIMENS:

Permit Office
Ministry of Environment and Tourism
LTA Building, 3 Ruhr Street
Northern Industria, Windhoek

Tel: +264-61-263131
Fax: +264-61-263195
E-mail: peter.wildlife@mweb.com.na / tuahengo@mweb.com.na
Post: Private Bag 13306, Windhoek

FORESTRY PERMITS AND ENQUIRIES:

Directorate of Forestry
Ministry of Environment and Tourism
6th Floor City Centre
Windhoek

Tel: +264-61-221478
Fax: +264-61-222830
E-mail: christa@forestry.met.gov.na
Post: Private Bag 13346, Windhoek

ENVIRONMENTAL LEGISLATION AND ENQUIRIES:

Directorate of Environmental Affairs
Ministry of Environment and Tourism
6th floor Capital Centre, Levinson Arcade
Independence Avenue
Windhoek

Tel: +264-61-249015
Fax: +264-61-240339
E-mail: contact@dea.met.gov.na
Post: Private Bag 13306, Windhoek

OTHER ORGANISATIONS AND INSTITUTIONS WITH AN INTEREST IN TREES:

Botanical Society of Namibia
PO Box 11531
Windhoek

Grootfontein State Nursery
Tel; +264-67-242548/242128
Fax: +264-67-242128/243389
Post: PO Box 333, Grootfontein

Okahandja State Nursery
Tel: +264-62-501925
Fax: +264-62-501805
E-mail: nfrc@iafrica.com.na

Wildlife Society of Namibia
PO Box 3508
Windhoek

APPENDIX 1

Large woody species indigenous to Namibia

List of all indigenous woody species (usually over 1 m in height) covered in this publication. The taxonomy used follows that of Germishuizen & Meyer (2003), except where the practice adopted by the National Herbarium, Windhoek differs from this publication. An asterix (*) denotes those species recorded in Namibia for the first time, or species with previously uncertain presence confirmed, during the TAP.

GYMNOSPERMAE
Welwitschiaceae
Welwitschia mirabilis Hook.f.
ANGIOSPERMAE: MONOCOTYLEDONAE
Arecaceae
Phoenix reclinata Jacq.
Hyphaene petersiana Klotzsch ex Mart.
Aloaceae
Aloe dichotoma Masson var. *dichotoma*
Aloe littoralis Baker
Aloe pearsonii Schönland
Aloe pillansii L.Guthrie
Aloe ramosissima Pillans
ANGIOSPERMAE: DICOTYLEDONAE
Salicaceae
Salix mucronata Thunb. subsp. *capensis* (Thunb.) Immelman
Salix mucronata Thunb. subsp. *mucronata*
Myricaceae
Morella serrata (Lam.) Killick
Celtidaceae
Trema orientalis (L.) Blume
Moraceae
Ficus burkei (Miq.) Miq.
Ficus bubu Warb.*
Ficus capreifolia Delile
Ficus cordata Thunb.
Ficus fischeri Warb. ex Mildbr. & Burret
Ficus glumosa Delile
Ficus ilicina (Sond.) Miq.
Ficus ingens (Miq.) Miq. var. *ingens*
Ficus pygmaea Welw. ex Hiern
Ficus sycomorus L. subsp. *gnaphalocarpa* (Miq.) C.C.Berg
Ficus verruculosa Warb.
Urticaceae
Obetia carruthersiana (Hiern) Rendle
Pouzolzia mixta Solms
Proteaceae
Protea gaguedi J.F.Gmel.
Santalaceae
Osyris lanceolata Hochst. & Steud.
Opiliaceae
Opilia campestris Engl. var. *campestris*
Olacaceae
Olax dissitiflora Oliv.
Ximenia americana L. var. *americana*
Ximenia americana L. var. *microphylla* Welw. ex Oliv.
Ximenia caffra Sond. var. *caffra*
Ximenia caffra Sond. var *natalensis* Sond.
Chenopodiaceae
Salsola aphylla L.f.
Salsola arborea C.A.Sm. ex Aellen
Salsola nollothensis Aellen
Nyctaginaceae
Phaeoptilum spinosum Radlk.
Aizoaceae
Tetragonia schenkii (Schinz) Engl.
Portulacaceae
Ceraria carrissoana Exell & Mendonça *
Ceraria fruticulosa H.Pearson & Stephens
Ceraria longipedunculata Merxm. & Podlech
Ceraria namaquensis (Sond.) H.Pearson & Stephens
Annonaceae
Friesodielsia obovata (Benth.) Verdc.
Hexalobus monopetalus (A.Rich.) Engl. & Diels var. *monopetalus*
Xylopia odoratissima Welw. ex Oliv.
Xylopia tomentosa Exell
Artabotrys brachypetalus Benth. *
Hernandiaceae
Gyrocarpus americanus Jacq. subsp. *africanus* Kubitzki
Capparaceae
Capparis tomentosa Lam.
Boscia albitrunca (Burch.) Gilg & Gilg-Ben.
Boscia angustifolia A.Rich. var. *corymbosa* (Gilg) DeWolf
Boscia foetida Schinz subsp. *foetida*

Boscia microphylla Oliv.
Boscia mossambicensis Klotzsch
Boscia tomentosa Tölken
Cadaba aphylla (Thunb.) Wild
Cadaba schroeppelii Suess. ex Suess. & Merxm.
Maerua gilgii Schinz
Maerua juncea Pax subsp. *juncea*
Maerua parvifolia Pax
Maerua schinzii Pax

Moringaceae

Moringa ovalifolia Dinter & A.Berger

Crassulaceae

Tylecodon paniculatus (L.f.) Tölken

Montiniaceae

Montinia caryophyllacea Thunb.

Chrysobalanaceae

Parinari curatellifolia Planch. ex Benth.

Connaraceae

Rourea orientalis Baill.

Fabaceae: Mimosoideae

Albizia anthelmintica (A.Rich.) Brongn.
Albizia antunesiana Harms
Albizia brevifolia Schinz
Albizia harveyi E.Fourn.
Albizia tanganyicensis Baker f. subsp. *tanganyicensis*
Albizia versicolor Welw. ex Oliv.
Faidherbia albida (Delile) A.Chev.
Acacia arenaria Schinz
Acacia ataxacantha DC.
Acacia erioloba E.Mey.
Acacia erioloba E.Mey. x *haematoxylon* Willd.
Acacia erubescens Welw. ex Oliv.
Acacia fleckii Schinz
Acacia galpinii Burtt Davy *
Acacia haematoxylon Willd.
Acacia hebeclada DC. subsp. *chobiensis* (O.B.Mill.) A.Schreib.
Acacia hebeclada DC. subsp. *hebeclada*
Acacia hebeclada DC. subsp. *tristis* (Welw. Ex Oliv.) A.Schreib.
Acacia hereroensis Engl.
Acacia karroo Hayne
Acacia kirkii Oliv. subsp. *kirkii* var. *kirkii*
Acacia luederitzii Engl. var. *luederitzii*
Acacia mellifera (Vahl) Benth. subsp. *detinens* (Burch.) Brenan
Acacia mellifera (Vahl) Benth. subsp. *mellifera*
Acacia montis-usti Merxm. & A.Schreib.
Acacia nebrownii Burtt Davy
Acacia nigrescens Oliv.
Acacia nilotica (L.) Willd. ex Delile subsp. *kraussiana* (Benth.) Brenan
Acacia polyacantha Willd. subsp. *campylacantha* (Hochst. ex A.Rich.) Brenan
Acacia reficiens Wawra subsp. *reficiens*
Acacia robusta Burch. subsp. *clavigera* (E.Mey.) Brenan
Acacia robynsiana Merxm. & A.Schreib.
Acacia schweinfurthii Brenan & Exell var. *schweinfurthii* *
Acacia senegal (L.) Willd. var. *rostrata* Brenan
Acacia sieberiana DC. var. *woodii* (Burtt Davy) Keay & Brenan
Acacia tortilis (Forssk.) Hayne subsp. *heteracantha* (Burch.) Brenan
Acacia tortilis (Forssk.) Hayne subsp. *spirocarpa* (Hochst. ex A.Rich) Brenan var. *spirocarpa*
Mimosa pigra L.
Dichrostachys cinerea (L.) Wight & Arn. subsp. *africana* Brenan & Brummitt var. *africana*
Dichrostachys cinerea (L.) Wight & Arn. subsp. *africana* Brenan & Brummitt var. *setulosa* (Welw. ex Oliv.) Brenan & Brummitt
Amblygonocarpus andongensis (Welw. ex Oliv.) Exell & Torre
Elephantorrhiza elephantina (Burch.) Skeels
Elephantorrhiza goetzei (Harms) Harms subsp. *goetzei*
Elephantorrhiza rangei Harms
Elephantorrhiza schinziana Dinter
Elephantorrhiza suffruticosa Schinz
Entada arenaria Schinz subsp. *arenaria*

Fabaceae: Caesalpinioideae

Erythrophleum africanum (Welw. ex Benth.) Harms
Burkea africana Hook.
Colophospermum mopane (J.Kirk ex Benth.) J.Kirk ex J.Léonard
Guibourtia coleosperma (Benth.) J.Léonard
Schotia afra (L.) Thunb. var. *angustifolia* (E.Mey.) Harv.
Baikiaea plurijuga Harms
Afzelia quanzensis Welw.
Bauhinia petersiana Bolle subsp. *macrantha* (Oliv.) Brummitt & J.H. Ross
Bauhinia urbaniana Schinz
Piliostigma thonningii (Schumach.) Milne-Redh.
Adenolobus garipensis (E.Mey.) Torre & Hillc.
Dialium engleranum Henriq.
Cassia abbreviata Oliv. subsp. *beareana* (Holmes) Brenan
Senna singueana (Delile) Lock
Parkinsonia africana Sond.

Haematoxylum dinteri (Harms) Harms
Caesalpinia merxmuellerana A.Schreib.
Caesalpinia pearsonii L.Bolus
Caesalpinia rubra (Engl.) Brenan
Peltophorum africanum Sond.
Fabaceae: Papilionoideae
Swartzia madagascariensis Desv.
Baphia massaiensis Taub. subsp. *obovata* (Schinz) Brummitt var. *obovata*
Mundulea sericea (Willd.) A.Chev.
Sesbania sesban (L.) Merr. subsp. *sesban*
Ormocarpum kirkii S.Moore
Dalbergia martinii F.White
Dalbergia melanoxylon Guill. & Perr.
Dalbergia nitidula Baker
Pterocarpus angolensis DC.
Pterocarpus lucens Lepr. ex Guill. & Perr. subsp. *antunesii* (Taub.) Rojo
Pterocarpus rotundifolius (Sond.) Druce subsp. *polyanthus* (Harms) Mendonça & E.C.Sousa
Pterocarpus rotundifolius (Sond.) Druce subsp. *rotundifolius*
Philenoptera violacea (Klotzsch) Schrire
Philenoptera nelsii (Schinz) Schrire
Xeroderris stuhlmannii (Taub.) Mendonça & E.C.Sousa
Erythrina decora Harms
Erythroxylaceae
Erythroxylum zambesiacum N.Robson *
Zygophyllaceae
Zygophyllum prismatocarpum E.Mey. ex Sond.
Neoluederitzia sericeocarpa Schinz
Sisyndite spartea E.Mey. ex Sond.
Balanitaceae
Balanites aegyptiaca (L.) Delile var. *aegyptiaca*
Balanites angolensis (Welw.) Welw. ex Mildbr. & Schltr. subsp. *welwitschii* (Tiegh.) Sands
Balanites maughamii Sprague subsp. *maughamii* *
Rutaceae
Zanthoxylum ovatifoliolatum (Engl.) Finkelstein
Citropsis daweana Swingle & M.Kellerm.
Kirkiaceae
Kirkia acuminata Oliv.
Kirkia dewinteri Merxm. & Heine
Burseraceae
Commiphora africana (A.Rich.) Engl. var. africana
Commiphora anacardiifolia Dinter & Engl.
Commiphora angolensis Engl.
Commiphora capensis (Sond.) Engl.
Commiphora cervifolia J.J.A.van der Walt
Commiphora crenato-serrata Engl.
Commiphora dinteri Engl.
Commiphora discolor Mendes
Commiphora edulis (Klotzsch) Engl. subsp. *edulis*
Commiphora giessii J.J.A.van der Walt
Commiphora glandulosa Schinz
Commiphora glaucescens Engl.
Commiphora gracilifrondosa Dinter ex J.J.A.van der Walt
Commiphora karibensis Wild *
Commiphora kraeuseliana Heine
Commiphora mollis (Oliv.) Engl.
Commiphora mossambicensis (Oliv.) Engl.
Commiphora multijuga (Hiern) K.Schum.
Commiphora namaensis Schinz
Commiphora oblanceolata Schinz
Commiphora pyracanthoides Engl.
Commiphora saxicola Engl.
Commiphora tenuipetiolata Engl.
Commiphora viminea Burtt Davy
Commiphora virgata Engl.
Commiphora wildii Merxm.
Commiphora sp. Swanepoel ined. [kaokoensis]
Ptaeroxylaceae
Ptaeroxylon obliquum (Thunb.) Radlk.
Meliaceae
Entandrophragma caudatum (Sprague) Sprague
Entandrophragma spicatum (C.DC.) Sprague
Nymania capensis (Thunb.) Lindb.
Turraea zambesica Sprague & Hutch.
Trichilia emetica Vahl subsp. *emetica*
Polygalaceae
Securidaca longepedunculata Fresen. var. *longepedunculata*
Euphorbiaceae
Pseudolachnostylis maprouneifolia Pax var. *dekindtii* (Pax.) Radcl.-Sm.
Pseudolachnostylis maprouneifolia Pax var. *glabra* (Pax.) Brenan
Flueggea virosa (Roxb. ex Willd.) Voigt subsp. *virosa*
Phyllanthus reticulatus Poir. var. *reticulatus*
Margaritaria discoidea (Baill.) G.L. Webster var. *nitida* (Pax) Radcl.-Sm.
Antidesma rufescens Tul.
Antidesma venosum E.Mey. ex Tul.
Bridelia cathartica Bertol.f. subsp. *melanthesoides* (Baill.) J.Léonard var. *melanthesoides* (Bail.) Radcl.-Sm.
Bridelia tenuifolia Müll.Arg.
Croton gratissimus Burch. var. *gratissimus*
Croton gratissimus Burch. var. *subgratissimus* (Prain) Burtt Davy
Croton leuconeurus Pax subsp. *leuconeurus*
Croton longipedicellatus J.Léonard subsp. *longipedicellatus*

Croton megalobotrys Müll.Arg.
Croton menyhartii Pax
Croton pseudopulchellus Pax
Erythrococca menyharthii (Pax) Prain
Schinziophyton rautanenii (Schinz) Radcl.-Sm.
Excoecaria bussei (Pax) Pax
Spirostachys africana Sond.
Maprounea africana Müll.Arg.
Euphorbia avasmontana Dinter var. *avasmontana*
Euphorbia damarana L.C.Leach
Euphorbia eduardoi L.C.Leach
Euphorbia espinosa Pax
Euphorbia gregaria Marloth
Euphorbia guerichiana Pax
Euphorbia gummifera Boiss.
Euphorbia ingens E.Mey. ex Boiss.
Euphorbia matabelensis Pax
Euphorbia venenata Marloth
Euphorbia virosa Willd. subsp. *virosa*

Anacardiaceae

Sclerocarya birrea (A.Rich.) Hochst. subsp. *caffra* (Sond.) Kokwaro
Lannea discolor (Sond.) Engl.
Lannea schweinfurthii (Engl.) Engl. var. *stuhlmannii* (Engl.) Kokwaro
Lannea schweinfurthii (Engl.) Engl. var. *tomentosa* (Dunkley) Kokwaro
Ozoroa concolor (C.Presl ex Sond.) De Winter
Ozoroa crassinervia (Engl.) R.Fern. & A.Fern.
Ozoroa dispar (C.Presl) R.Fern & A.Fern.
Ozoroa insignis Delile subsp. *latifolia* (Engl.) R.Fern. var. *latifolia*
Ozoroa insignis Delile subsp. *reticulata* (Baker f.) J.B.Gillet
Ozoroa longipes (Engl. & Gilg) R.Fern. & A.Fern.
Ozoroa namaensis (Schinz & Dinter) R.Fern.
Ozoroa namaquensis (Sprague) Von Teichman & A.E.van Wyk
Ozoroa okavangensis R.Fern. & A.Fern.
Ozoroa paniculosa (Sond.) R.Fern. & A.Fern. var. *paniculosa*
Ozoroa schinzii (Engl.) R.Fern. & A.Fern.
Rhus burchellii Sond. ex Engl.
Rhus ciliata Licht. ex Schult.
Rhus lancea L.f.
Rhus leptodictya Diels
Rhus marlothii Engl.
Rhus pendulina Jacq.
Rhus populifolia E.Mey. ex Sond.
Rhus pyroides Burch. var. *dinteri* (Engl.) Moffett
Rhus pyroides Burch. var. *pyroides*
Rhus quartiniana A.Rich.
Rhus tenuinervis Engl.
Rhus undulata Jacq.
Rhus volkii Suess.

Celastraceae

Gymnosporia buxifolia (L.) Szyszyl.
Gymnosporia linearis (L.F.) Loes. subsp. *lanceolata* (E.Mey. ex Sond.) M.Jordaan
Gymnosporia senegalensis (Lam.) Loes.
Gymnosporia maranguensis (Loes.) Loes.
Gymnosporia sp. A M.Jordaan ined. [garipensis]
Gymnosporia sp. B (Knutze) M.Jordaan ined. [szyszylowiczii]
Elaeodendron transvaalense (Burtt Davy) R.H.Archer
Mystroxylon aethiopicum (Thunb.) Loes. subsp. *aethiopicum*
Pleurostylia capensis (Turcz.) Loes.*

Sapindaceae

Allophylus africanus P.Beauv. var. *africanus*
Pappea capensis Eckl. & Zeyh.
Erythrophysa alata (Eckl. & Zeyh.) Hutch.

Melianthaceae

Melianthus comosus Vahl

Rhamnaceae

Ziziphus mucronata Willd. subsp. *mucronata*
Berchemia discolor (Klotzsch) Hemsl.

Vitaceae

Cissus nymphaeifolia (Welw. ex Baker) Planch.
Cyphostemma bainesii (Hook.f.) Desc.
Cyphostemma currorii (Hook.f.) Desc.
Cyphostemma juttae (Dinter & Gilg) Desc.
Cyphostemma uter (Exell & Mendonça) Desc.

Tiliaceae

Grewia avellana Hiern
Grewia bicolor Juss. var. *bicolor*
Grewia falcistipula K.Schum.
Grewia flava DC.
Grewia flavescens Juss.
Grewia monticola Sond.
Grewia olukondae Schinz
Grewia pachycalyx K.Schum.
Grewia retinervis Burret
Grewia schinzii K.Schum.
Grewia subspathulata N.E.Br.
Grewia tenax (Forssk.) Fiori var. *tenax*
Grewia villosa Willd. var. *villosa*

Malvaceae

Azanza garckeana (F.Hoffm.) Exell & Hillc.

Bombacaceae

Adansonia digitata L.

Sterculiaceae

Dombeya rotundifolia (Hochst.) Planch. var. *rotundifolia*

Dombeya rotundifolia (Hochst.) Planch. var. *velutina*
Sterculia africana (Lour.) Fiori var. *africana*
Sterculia quinqueloba (Garcke) K.Schum.
Ochnaceae
Ochna cinnabarina Engl. & Gilg
Ochna pulchra Hook.f.
Clusiaceae
Garcinia livingstonei T.Anderson
Tamaricaceae
Tamarix usneoides E.Mey. ex Bunge
Flacourtiaceae
Oncoba spinosa Forssk. subsp *spinosa*
Flacourtia indica (Burm.f.) Merr.
Passifloraceae
Adenia pechuelii (Engl.) Harms
Combretaceae
Combretum albopunctatum Suess.
Combretum apiculatum Sond. subsp. *apiculatum*
Combretum apiculatum Sond. subsp. *leutweinii* (Schinz) Exell
Combretum celastroides Welw. ex M.A.Lawson subsp. *celastroides*
Combretum collinum Fresen. subsp. *gazense* (Swynn. & Baker f.) Okafor
Combretum collinum Fresen. subsp. *ondongense* (Engl. & Diels) Okafor
Combretum collinum Fresen. subsp. *suluense* (Engl. & Diels) Okafor
Combretum elaeagnoides Klotzsch
Combretum engleri Schinz
Combretum hereroense Schinz
Combretum imberbe Wawra
Combretum mossambicense (Klotzsch) Engl.
Combretum oxystachyum Welw. ex M.A.Lawson
Combretum platypetalum Welw. ex M.A.Lawson subsp. *baumii* (Engl. & Gilg) Exell
Combretum platypetalum Welw. ex M.A.Lawson subsp. *platypetalum*
Combretum psidioides Welw. subsp. *dinteri* (Schinz) Exell
Combretum psidioides Welw. subsp. *psidioides*
Combretum wattii Exell
Combretum zeyheri Sond.
Pteleopsis myrtifolia (M.A.Lawson) Engl. & Diels
Terminalia brachystemma Welw. ex Hiern subsp. *brachystemma*
Terminalia prunioides M.A.Lawson
Terminalia sericea Burch. ex DC.
Terminalia stuhlmannii Engl.
Terminalia trichopoda Diels
Myrtaceae
Syzygium cordatum Hochst. ex C.Krauss
Syzygium guineense (Willd.) DC. subsp. *barotsense* F. White
Araliaceae
Cussonia angolensis Hiern. *
Apiaceae
Heteromorpha papillosa C.C.Towns.
Heteromorpha stenophylla Welw.ex Schinz var. *stenophylla*
Steganotaenia araliacea Hochst. var. *araliacea*
Sapotaceae
Manilkara mochisia (Baker) Dubard
Mimusops zeyheri Sond. *
Ebenaceae
Euclea asperrima Friedr.-Holzh.
Euclea divinorum Hiern
Euclea pseudebenus E.Mey. ex A.DC.
Euclea undulata Thunb.
Diospyros acocksii (De Winter) De Winter
Diospyros chamaethamnus Dinter ex Mildbr.
Diospyros lycioides Desf. subsp. *lycioides*
Diospyros lycioides Desf. subsp. *sericea* (Bernh.) De Winter
Diospyros mespiliformis Hochst. ex A.DC.
Diospyros ramulosa (E.Mey. ex A.DC.) De Winter
Diospyros virgata (Gürke) Brenan
Oleaceae
Schrebera alata (Hochst.) Welw.*
Schrebera trichoclada Welw.
Olea europaea L. subsp. *africana* (Mill.) P.S.Green
Salvadoraceae
Azima tetracantha Lam.
Salvadora persica L. var. *persica*
Strychnaceae
Strychnos cocculoides Baker
Strychnos potatorum L.f.
Strychnos pungens Soler.
Strychnos madagascariensis Poir.
Strychnos spinosa Lam.
Gentianaceae
Anthocleista grandiflora Gilg
Anthocleista liebrechtsiana De Willd. & T.Durand
Buddlejaceae
Nuxia congesta R. Br ex Fresen*.
Nuxia oppositifolia (Hochst.) Benth.
Apocynaceae
Carissa bispinosa (L.) Desf. ex Brenan
Carissa edulis Vahl
Carissa haematocarpa (Eckl.) A.DC.
Diplorhynchus condylocarpon (Müll.Arg.) Pichon
Adenium boehmianum Schinz
Pachypodium lealii Welw.

Pachypodium namaquanum (Wyley ex Harv.) Welw.
Strophanthus amboensis (Schinz) Engl. & Pax
Ectadium latifolium (Schinz) N.E.Br.
Ectadium virgatum E.Mey.
Fockea multiflora K.Schum.

Boraginaceae

Cordia grandicalyx Oberm. *
Cordia pilosissima Baker
Cordia sinensis Lam.
Ehretia alba Retief & A.E.van Wyk
Ehretia coerulea Gürke
Ehretia namibiensis Retief & A.E.van Wyk subsp. *kaokoensis* Retief & A.E.van Wyk
Ehretia namibiensis Retief & A.E.van Wyk subsp. *namibiensis* Retief & A.E.van Wyk

Lamiaceae

Vitex angolensis Gürke
Vitex mombassae Vatke
Rotheca myricoides (Hochst.) Steane & Mabb.
Clerodendrum glabrum E.Mey. var. *glabrum*
Clerodendrum eriophyllum Gürke *
Premna sinensis Klotzsch
Tinnea rhodesiana S.Moore

Solanaceae

Lycium amoenum Dammer
Lycium bosciifolium Schinz
Lycium cinereum Thunb.
Lycium tetrandrum Thunb.
Lycium eenii S.Moore
Lycium grandicalyx Joubert & A.M. Venter
Lycium hirsutum Dunal
Lycium horridum Thunb.
Lycium pilifolium C.H.Wright
Lycium pumilum Dammer
Lycium schizocalyx C.H.Wright
Lycium shawii Roem. & Schult.
Lycium villosum Schinz

Scrophulariaceae

Antherothamnus pearsonii N.E.Br.
Manuleopsis dinteri Thell.

Bignoniaceae

Rhigozum brevispinosum Kuntze
Rhigozum obovatum Burch.
Rhigozum trichotomum Burch.
Rhigozum virgatum Merxm. & A.Schreib.
Catophractes alexandri D.Don
Markhamia obtusifolia (Baker) Sprague
Markhamia zanzibarica (Bojer ex DC.) K.Schum.
Kigelia africana (Lam.) Benth.

Pedaliaceae

Sesamothamnus benguellensis Welw.
Sesamothamnus guerichii (Engl.) E.A.Bruce
Sesamothamnus sp. ined. [leistneri]

Rubiaceae

Carphalea pubescens (Klotzsch) Verdc.
Hymenodictyon floribundum (Hochst. & Steud.) B.L.Rob. *
Crossopteryx febrifuga (Afzel. ex G.Don) Benth.
Tarenna luteola (Stapf) Bremek.
Catunaregam spinosa (Thunb.) Tirveng. subsp. *spinosa*
Gardenia resiniflua Hiern subsp. *resiniflua*
Gardenia ternifolia Schumach. & Thonn. subsp. *jovis-tonantis*
Gardenia volkensii K.Schum. subsp. *spatulifolia* (Stapf & Hutch.)
Feretia aeruginescens Stapf
Tricalysia junodi (Schinz) Brenan var. *kirkii* (Hook.f.) Robbr.
Rytigynia umbellulata (Hiern) Robyns
Vangueria cyanescens Robyns
Vangueria infausta Burch. subsp. *infausta*
Vangueriopsis lanciflora (Hiern) Robyns ex R.D.Good
Canthium glaucum Hiern subsp. *frangula* (S.Moore) Bridson var. *frangula*
Psydrax livida (Hiern) Bridson
Pavetta cataractarum S.Moore
Pavetta gardeniifolia A.Rich. var. *gardeniifolia*
Pavetta gardeniifolia A.Rich. var. *subtomentosa* K.Schum.
Pavetta schumanniana F.Hoffm. ex K.Schum.
Pavetta zeyheri Sond.

Cucurbitaceae

Acanthosicyos horridus Welw. ex Hook.f.

Asteraceae

Brachylaena huillensis O.Hoffm*.
Tarchonanthus camphoratus L.
Didelta spinosa (L.f.) Aiton



Makalani palms (*Hyphaene petersiana*), K. Roberts

APPENDIX 2

Trees and shrubs endemic to Namibia

A list of large woody species (arranged in alphabetical order) that are endemic within the political boundaries of Namibia, and the areas of the country in which they are found (Craven 1999).

SPECIES	AREA FOUND
Acacia montis-usti	north-west
Adenia pechuelii	north-west and central-west
Caesalpinia merxmuellerana	south
Caesalpinia pearsonii	west-central
Ceraria longipedunculata	north-west
Commiphora anacardiifolia	north-west
Commiphora cervifolia	south
Commiphora dinteri	north-west and central-west
Commiphora giessii	north-west
Commiphora kraeuseliana	north-west
Commiphora saxicola	north-west and central-west
Commiphora virgata	north-west and central-west
Commiphora sp. nov.	north-west
Cyphostemma bainesii	west-central
Cyphostemma juttae	north-west and Karstveld
Ectadium latifolium	south-west
Elephantorrhiza rangei	Nauté Dam
Elephantorrhiza schinziana	Otavi Mountains
Erythrina decora	north-west and central
Euclea asperrima	Naukluft area
Euphorbia damarana	north-west and central-west
Euphorbia venenata	central-north
Haematoxylum dinteri	south
Heteromorpha papillosa	central
Lycium grandicalyx	south
Manuleopsis dinteri	north-west and central
Neoluederitzia sericeocarpa	south
Rhus volkii	Naukluft area
Salsola arborea	north-west
Sesamothamnus sp. nov.	north-west

APPENDIX 3

Most widespread woody species in Namibia

The woody species most widespread in Namibia are arranged in descending order of the number of quarter-degree squares (QDS) in which they were found.

SPECIES	QDS	RECORDS	ATLASSERS
Acacia erioloba	883	3376	179
Boscia albitrunca	777	2861	187
Acacia mellifera subsp. *detinens*	751	2846	169
Ziziphus mucronata	746	2555	174
Catophractes alexandri	664	2364	157
Dichrostachys cinerea	585	2201	158
Acacia hebeclada subsp. *hebeclada*	577	2050	148
Boscia foetida	555	1832	128
Grewia flava	523	1468	110
*Phaeoptilum spinosum**	487	1416	92
Albizia anthelmintica	478	1575	144
Terminalia sericea	420	1365	110
Acacia karroo	408	1371	115
Parkinsonia africana	386	1219	82
Grewia flavescens	379	992	114
Combretum imberbe	371	1271	118
Maerua schinzii	361	1012	111
Acacia tortilis subsp. *heteracantha*	353	1102	72
Philenoptera nelsii	353	1126	106
Croton gratissimus	349	968	102
Acacia fleckii	348	1013	83
Gymnosporia senegalensis	339	640	82
Grewia bicolor	338	757	94
Rhigozum brevispinosum	327	756	94
Terminalia prunioides	325	1271	113
Mundulea sericea	323	806	99
Acacia luederitzii	320	937	89
Combretum apiculatum subsp. *apiculatum*	318	1134	123
Acacia reficiens	317	1063	92
Ehretia alba	313	712	88
Commiphora glandulosa	309	584	75
Rhigozum trichotomum	309	720	58
Commiphora pyracanthoides	304	554	83

Note: *Records = number of observations/records*

Atlassers = number of atlassers who observed the species

** under-recorded due to confusion with other spiny shrubs*

APPENDIX 4

Indigenous pioneer and invasive woody species in Namibia

SPECIES	INVASIVENESS
Acacia arenaria	3
Acacia erubescens	1
Acacia fleckii	2
Acacia luederitzii	3
Acacia mellifera subsp. *detinens*	1
Acacia nebrownii	1
Acacia nilotica	3
Acacia reficiens	1
Acacia - most spp.	3
Baphia massaiensis	3
Bauhinia petersiana	2
Catophractes alexandri	1
Colophospermum mopane	2
Combretum apiculatum subsp. *apiculatum*	3
Combretum elaeagnoides	3
Combretum hereroensis	3
Commiphora - some species	3
Dichrostachys cinerea	1
Grewia - some species	3
Gymnosporia senegalensis	2
Lycium spp.	3
Mundulea sericea	3
Phaeoptilum spinosum	2
Rhigozum brevispinosum	2
Rhigozum trichotomum	1
Terminalia prunioides	1
Terminalia sericea	2

1 = aggressively invasive in places

2 = invasive, sometimes aggressive

3 = pioneer, sometimes invasive

APPENDIX 5

Legal and conservation status of large woody species in Namibia

Only those species that are protected under Namibian law, or are in the 'high risk' red-data categories or listed in the CITES appendices are listed below. There are numerous other species that have been assessed for red data status and have been found to be under a low risk of extinction and of least concern (LR-lc). Some species assessed as 'high risk' in 2002, but more recently reassessed as data deficient (DD), rare (R) or low risk and of least concern (LR-lc) in 2005, have also been included.

SPECIES	PROTECTED	RED DATA	CITES	ENDEMISM
Acacia erioloba	F			
Acacia haematoxylon	F			
Acacia montis-usti	F	LR-lc		E
Acacia robynsiana	F	LR-lc		nE
Acacia sieberiana	F			
Acanthosicyos horridus	F	LR-lc		nE
Adansonia digitata	F			
Adenia pechuelii		LR-nt		E
Albizia anthelmintica	F			
Aloe dichotoma	NC	LR-lc	C2	
Aloe littoralis	NC	LR-lc	C2	
Aloe pearsonii	NC	LR-nt	C2	
Aloe pillansii	NC	EN	C1	nE
Aloe ramosissima	NC	LR-lc	C2	
Baikiaea plurijuga	F	LR-nt		
Berchemia discolor	F			
Boscia albitrunca	F			
Boscia angustifolia var. *corymbosa*		LR-nt		
Boscia tomentosa		LR-nt		
Burkea africana	F			
Caesalpinia merxmuellerana		LR-lc		E
Colophospermum mopane	F			
Combretum imberbe	F			
Commiphora cervifolia		LR-nt		nE
Commiphora gracilifrondosa		LR-nt		nE
Commiphora oblanceolata		LR-nt		nE
Cyphostemma bainesii	NC	LR-lc		E
Cyphostemma currorii	NC			
Cyphostemma juttae	NC	LR-lc		E
Cyphostemma uter	NC	LR-lc		nE
Dombeya rotundifolia var. *velutina*		LR-lc		E

SPECIES	PROTECTED	RED DATA	CITES	ENDEMISM
Elaeodendron transvaalense	F			
Elephantorrhiza rangei		DD		E
Entandrophragma spicatum	F			
Erythrina decora	F	LR-lc		E
Euclea asperrima		LR-nt		E
Euclea pseudebenus	F			
Euphorbia avasmontana			C2	
Euphorbia damarana			C2	E
Euphorbia eduardoi		LR-lc	C2	
Euphorbia espinosa			C2	
Euphorbia gregaria			C2	
Euphorbia guerichiana			C2	
Euphorbia gummifera		LR-nt	C2	
Euphorbia ingens		DD	C2	
Euphorbia matabelensis			C2	
Euphorbia venenata		DD	C2	E
Euphorbia virosa			C2	
Faidherbia albida	F			
Ficus burkei	F			
Ficus cordata	F			
Ficus sycomorus	F			
Guibourtia coleosperma	F			
Gyrocarpus americanus subsp. *africanus*	F			
Kirkia acuminata	F			
Kirkia dewinteri		R		E
Lannea discolor	F			
Maerua schinzii	F			
Moringa ovalifolia	NC			
Ochna pulchra	F			
Olea europaea subsp. *cuspidata*	F			
Ozoroa crassinervia	F			
Ozoroa namaquensis		R		
Pachypodium lealii	NC		C2	nE
Pachypodium namaquanum	NC	LR-nt	C1	
Pappea capensis	F			
Parkinsonia africana	F			
Peltophorum africanum	F			
Philenoptera nelsii	F			
Philenoptera violacea	F			
Pterocarpus angolensis	F	LR-nt		
Rhus lancea	F			
Salix mucronata	F			
Schinziophyton rautanenii	F			
Schotia afra var. *angustifolia*	F			
Sclerocarya birrea subsp. *caffra*	F			
Securidaca longepedunculata	F			
Spirostachys africana	F			

SPECIES	PROTECTED	RED DATA	CITES	ENDEMISM
Sterculia africana	F			
Sterculia quinqueloba	F			
Strychnos cocculoides	F			
Strychnos pungens	F			
Strychnos spinosa	F			
Tamarix usneoides	F			
Tylecodon paniculatus		LR-nt		
Welwitschia mirabilis	NC		C2	
Ziziphus mucronata	F			

Note the following use of abbreviations

Protected under Namibian legislation:

F = Forestry Ordinance No. 37 of 1952 and/or Forest Act No. 72 of 1968

NC = Nature Conservation Ordinance No. 4 of 1975

Red data status (as assessed by Craven & Loots (2002) and Loots (2005)):

EN = endangered

DD = data deficient

LR-lc = lower-risk, least concern

LR-nt = lower-risk, near-threatened

R = rare

CITES protection:

C1 = CITES, Appendix 1

C2 = CITES, Appendix 2

Endemism:

E = endemic

nE = near-endemic

Bottle tree (*Pachypodium lealii*), B. Curtis



APPENDIX 6

Specimens required

Information collected during the TAP extended the previously known distribution ranges of many species of trees and shrubs in Namibia. The range extension of other species requires confirmation through the collection of specimens from certain localities. Below is a list of some species and the localities from which the TAP would appreciate specimens to confirm these potential range extensions.

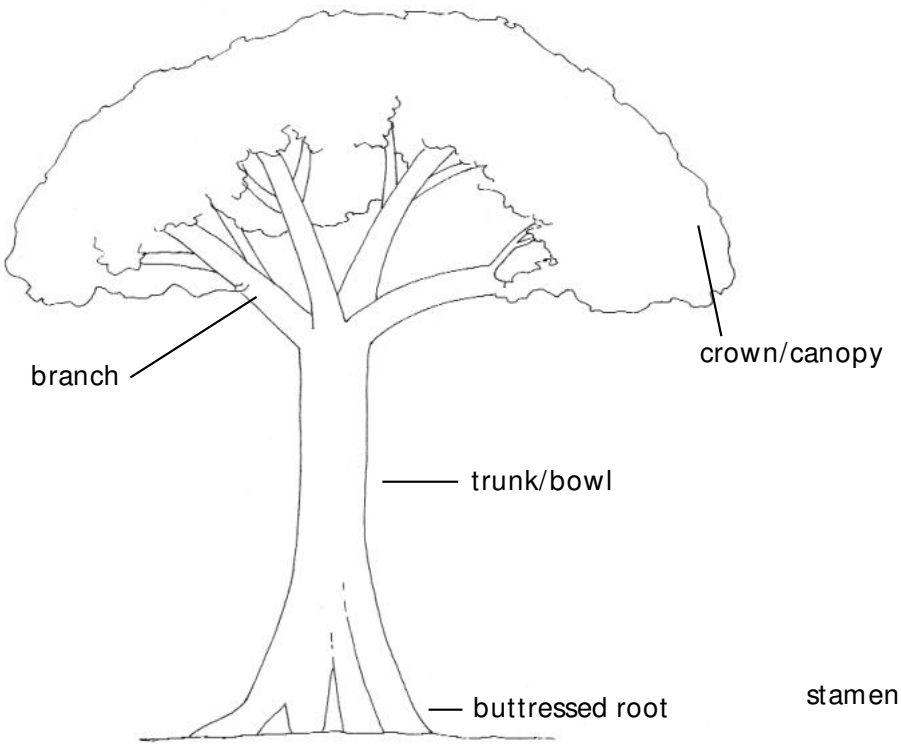
SPECIES	LOCALITY
Acacia karroo	Cuvelai; the north-east
Acacia sieberiana	1814CA; western boundary of Etosha National Park
Albizia antunesiana	Katima Mulilo
Albizia versicolor	west of the Okavango River
Aloe dichotoma	Paresis Mountains north-west of Otjiwarongo
Combretum imberbe	central highlands; 2120DD
Commiphora dinteri	south of the Kunene River
Commiphora glaucescens	the north-east
Commiphora mossambicensis	western Caprivi
Euphorbia damarana	along the Kunene River
Faidherbia albida	Cuvelai; Grootfontein area; south-eastern Namibia
Grewia avellana	the south
Grewia falcistipula	the south
Grewia tenax	the north-east
Maerua juncea	Nyae Nyae area; eastern Caprivi
Ozoroa concolor	2817DB
Ozoroa dispar	Brukkaros
Rhigozum brevispinosum	the south
Rhigozum trichotomum	north of 22° S; south of the Kunene River
Rhus lancea	the north (1816DD) and north-west (1914DC)
Rhus pyroides	Okavango River; eastern Caprivi
Rhus tenuinervis	2416, 2717 and 2817
Salvadora persica	Fish River area
Sesamothamnus benguellensis	south of the mountains along the Kunene River (1813, 1913 and 1914)
Tarchonanthus camphoratus	the south-east (2419)

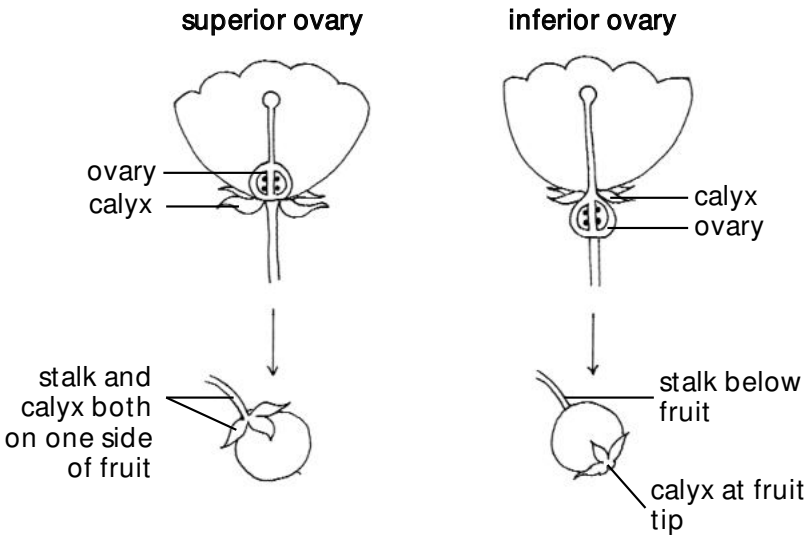
GLOSSARY

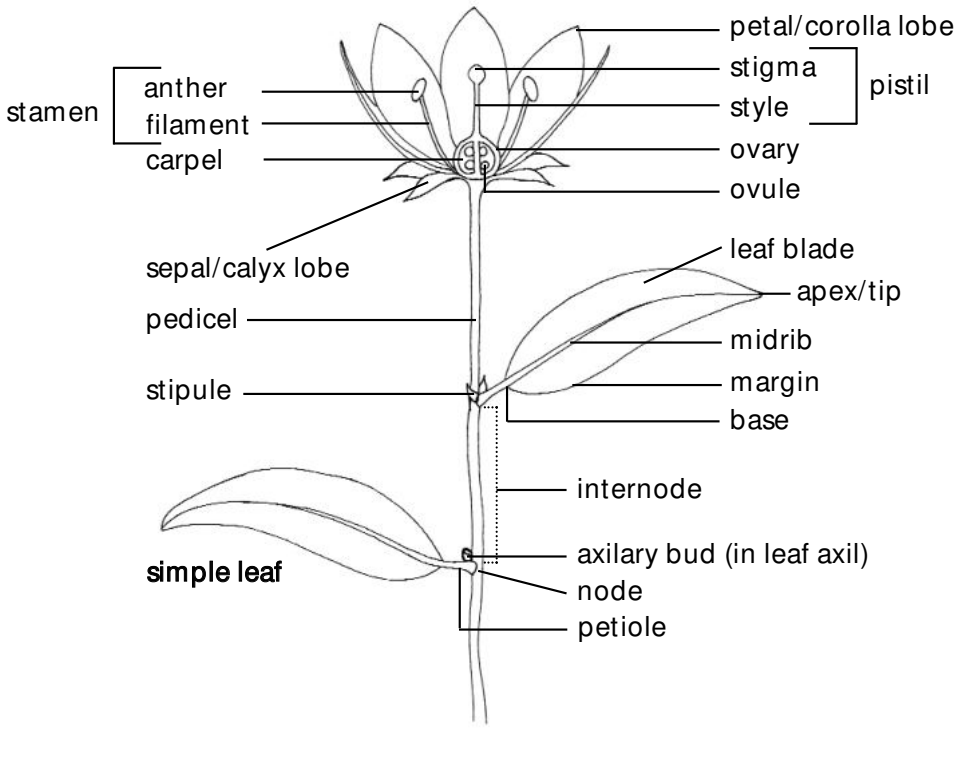
abundance - the number of individuals of a species in an area
abundant - many individuals within an area
acute - sharply pointed (usually referring to apex of leaf)
aerial root - root that grows above the ground or water
alien - a plant (or animal) not native to an area, but introduced by man from elsewhere
alternate - borne singly at each node, not opposite
androgynophore - a common stalk carrying both the female and male reproductive parts (i.e. the pistil and the stamens)
anther - the expanded portion at the tip of the stamen that bears the pollen
apex - the tip; (plural: apices)
apical - at the tip
aril - a fleshy appendage growing on the seed, often seen in the genus *Commiphora*
aromatic - strong (and usually pleasant) smelling
atlasser - participant in the Tree Atlas Project
authority - the person credited with naming a taxon
awl-shaped - narrowly triangular and sharply pointed (usually referring to the shape of stipules)
axil - the upper angle between the stem and another adjoining part (usually a leaf or a petiole)
axillary - in, or arising from, the axil
ball (of flowers) - a head of small, tightly packed flowers
basalt - a fine-grained volcanic rock with a high iron content, as found in the Grootberg area and to the west thereof
base - the bottom, or end at which attached; opposite to the apex
beaked - bearing a sharp, beak-like structure
berry - a fleshy fruit with many seeds, such as a tomato; sometimes applied to any fruit that is fleshy throughout, and lacks a pit or core
bifoliolate - with two leaflets
bilobed - with two lobes
bisexual - with both male and female reproductive parts
blade - leaf surface
bole - the trunk or main stem of a tree
brackish - somewhat salty
bract - reduced leaf or leaf-like structure at the base of a flower or inflorescence
branch - secondary axis, branching off the trunk or bole
branchlet - a small branch
browse - (noun) shrubs or trees as food for browsing animals; (verb) to eat leaves, shoots and branches of trees and shrubs
bud - an immature, unopened leaf or flower
bush - a shrub; a woody plant with a number of stems of more-or-less equal size arising from near the ground and often branching low down
buttressed - with props or supports, as in the flared trunks of some trees
calcareous - containing calcium carbonate
calcrete - a hard, calcium-carbonate-rich layer formed in soil in semi-arid regions under conditions of low rainfall
calyx - a collective term for the sepals; the outer whorl of the flower; usually green; often persistent on the fruit after the flower has withered
canopy - the layer formed by the uppermost foliage, or crown, of trees
capsule - a dry, dehiscent fruit with more than one chamber
catkin - a hanging inflorescence consisting of a dense spike of small, unisexual flowers that lack petals, as found in the willow family (Salicaceae), for example
CITES, Appendix I - taxa that are listed in Appendix 1 of the International Convention on Trade in Endangered Species (CITES) may not be traded internationally at all because it is believed that any international trade would endanger the survival of the species in the wild
CITES, Appendix II - international trade is allowed in taxa that are listed in Appendix 2 of the International Convention on Trade in Endangered Species (CITES), but it is strictly regulated on an international basis in order to ensure that it is not endangering the species
clay - a fine-grained soil with a high water-holding capacity and often with a slimy feel when wet
cliff / cliff face - vertical slope; a steep rock-face
climber - a plant that grows more-or-less erect by leaning on, or twining into other plants or structures, for support
clumped - growing in clusters with large gaps between groups
cluster - a small group of plants growing relatively close together
columnar gland - erect gland with the appearance of a tiny column
common - numerous individuals of one species in a given area
concave - curved inward; slightly hollow
cone - a dry fruit consisting of scales arranged around a central axis
confined - restricted
conical - cone-shaped
convex - rounded; surface curved outward
coppice - (noun) thicket of bushes or small trees, sprouts arising from a stump; (verb) sprout from a stump;
corolla - a collective term for the petals, often brightly coloured
corolla lobe - lobe of a flower whose corolla is not divided to the base, and thus lacks true petals
corolla tube - the fused basal part of the corolla
creeper - a plant that grows along the surface of the ground, often rooting at the nodes
crenate - with rounded teeth along the margin (see scalloped)
critically endangered - refers to a species considered to be facing an 'extremely high risk', or on the brink, of extinction in the wild when assessed according to IUCN red-data criteria
crown - the top part of a tree
cushion - used to describe a small, cushion-like structure at the base of the leaf or leaves, usually appearing to consist of hairs or scales
cyathium - specialised inflorescence found in the family Euphorbiaceae, consisting of a cup-like structure (involucre) containing a single pistil and male flowers each with a single stamen (plural: cyathia)
cylindrical - elongate, and round in cross-section
data deficient - this category is assigned to species for which the available data are inadequate to assign it to any other IUCN red-data category during assessment
deciduous - shedding its leaves or other parts seasonally
decussate - arranged along the stem in pairs such that each pair is at right angles to the pair above and below
dehiscent - opening when mature to release its contents (usually referring to fruit)

dichotomous - branched into two more-or-less equal divisions
discolourous - coloured differently above and below
disjunct - distribution which is not continuous; with a gap between populations
distichous - carried in two vertical rows on opposite sides of the axis
distribution - the area in which the species grows
dolomite - a rock with a high calcium- and magnesium-carbonate content characteristic of the Karstveld; generally very rough due to elephant-skin weathering
domatia - small pits or tufts of hairs in the forks of the midrib and the main veins
dominant - the most common or abundant species in an area
downy - covered with soft, fine hairs
drought-tolerant - able to survive dry conditions
dune - large mound of unconsolidated sand
dwarf shoot - very short shoot; spur-branchlet; usually thick in relation to length
dwarf tree - a small plant with a thick, woody stem
ellipsoid - shaped like a rugby ball; elliptic in long section, circular in cross-section
elliptic - oval and narrowed to rounded and equal ends, widest in the middle
endangered - refers to a species considered to be facing a 'very high risk' of extinction in the wild when assessed according to IUCN red-data criteria
endemic - found only in a certain, defined area, naturally
entire - margin even and continuous, and lacking teeth or lobes
ephemeral - lasting a very short time (flowers); usually dry, flowing occasionally (rivers)
evergreen - not deciduous; having green leaves throughout the year
exotic - alien; a plant (or animal) not native to an area, but introduced by man
family - a group of related genera
fig - the specialised inflorescence (syconium) of the genus *Ficus* consisting of a hollow receptacle that carries the flowers internally and which develops into a fleshy fruit
filament - the thread-like stalk of the stamen that carries the pollen-bearing anther
floodplain - area next to a river which is seasonally flooded
fruit - a ripened ovary and any structures that are attached and ripen with it, such as seeds
genus - a group of species with common characteristics distinct from those of other genera (plural)
germinate - sprout, bud or put forth shoots
gland - an appendage or structure secreting a sticky or oily liquid
glandular - having glands; in the context of glandular hairs, those that terminate in tiny glands, often sticky to the touch
gorge - narrow valley with very steep sides
granite - a coarse-grained, acidic rock with a high quartz content, such as those forming the Spitzkoppe; typically light-coloured, with a characteristic pattern of large boulder and koppie weathering
granitic soil - soil derived from granite
grassland - vegetation types consisting solely or predominantly of grasses
gravel - rounded particles coarser than 4 mm in diameter
gregarious - growing in clusters
growth form - form, or overall shape, in which a plant usually grows
gynophore - a stalk carrying only the pistil
habitat - the living place of a plant or animal
hair - very fine, thread-like outgrowth
hardy - strong, and able to endure difficult conditions
hemiparasite - partially parasitic; in plants, usually means dependent on another plant for minerals and water, but able to photosynthesise
hill - a small area of ground higher than the surrounding country, a small mountain
hill slope - side of a hill or mountain; hillside
hilltop - highest point or area of a hill or mountain
horticultural potential - may be suitable as a plant for gardens or for use in the ornamental plant trade
hummock - a small mound of earth, often sandy
hybrid - the offspring of two plants (or animals) of different species or varieties
indehiscent - not breaking open when mature (usually referring to fruit)
indigenous - native to an area, occurring naturally
inferior - attached below; of an ovary that is attached behind the point where the calyx and corolla are attached (i.e. between the stalk and the flower)
inflorescence - the flowering part of a plant; the arrangement of the flowers on the flowering axis
inselberg - an isolated hill, mountain or rocky outcrop on an otherwise flat plain
interdune valley - valley between dunes, usually with a firmer substrate
invasive - of a species that out-competes other species eventually excluding them from an area; may be indigenous or alien
island - area of land (sometimes) surrounded by water; area of trees surrounded by (seasonally flooded) grassland
isohyet - a line defining an area which receives the same amount of rainfall annually
kernel - seed flesh
kloof - narrow valley with very steep sides
lanceolate - lance-like; shaped like a small sword, or the tip of a spear
latex - a sticky sap, usually white or milky, produced by a plant
lax - loose, with parts open and drooping, not stiff or compact
leaflet - a leaf-like division of a compound leaf, usually with the appearance of a leaf
leaflet pair - two opposite leaflets
leaf-opposed - arising in a position opposite a leaf
leaf-scar - mark left on the stem when a leaf falls
least concern - refers to a species which is considered to be under 'no threat' or facing no imminent threats - usually it is widespread and abundant - when assessed according to IUCN red-data criteria
lenticel - a small, slightly raised, lens-shaped area on a young stem, which acts as a pore allowing air to reach the tissues below
liana - a woody, climbing vine
limestone - a rock with a high calcium-carbonate content; the term may have been used loosely in the TAP when referring to calcrete or dolomite
linear - usually referring to shape of the blade - long and narrow, with parallel sides
loam - soil containing a mixture of clay, sand, silt and humus, which is good for growing plants
lobed - with rounded extensions
localised - only in certain localities, not widespread
locally abundant/common - abundant/common in certain localities, not everywhere
locule - chamber of an ovary
mahangu - pearl millet (*Pennisetum glaucum*) a staple diet item for people in the northern areas of Namibia
margin - edge
marsh - wet area, usually with standing water and vegetation
mica - a shiny platy material, visible as tiny, silver flecks in rocks and in the Windhoek dust

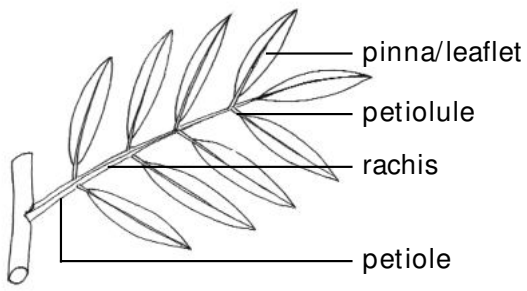
mica schist - fine-grained layered rock with a high content of mica
midrib - central vein of a leaf or leaflet
mixed woodland - woodland comprising a number of different woody species
monocarp - a one-chambered fruit
mucronate - with a tiny, sharp, abrupt point
near-endemic - almost endemic, but occurring just beyond the defined area (usually Namibia)
near-threatened - species that could become threatened in the near future
net-veined - veins interconnecting, forming a network
node - position on the stem where leaves or branches emerge
notched - with a small, v-shaped indentation
nursery plant - a plant that shelters another plant during the early, and often vulnerable, stages of growth
nut - a hard, dry, indehiscent fruit, usually with a single seed
obconical - inverted cone shape
obovoid - inverted egg shape
occasional - not common, but occurs regularly
omuramba(s) - shallow, ephemeral watercourse(s)
opposite - opposing each other at the same level on the axis
oshana(s) - shallow, interconnected, ephemeral watercourse(s) in the Cuvelai
ovary - the portion of the flower that contains the ovules, and becomes the fruit
ovate - egg-shaped
ovoid - three-dimensional egg shape
ovule - an immature seed
pachycaul (trade) - plant with swollen stems, often a collector's item
palmately compound - a compound leaf, divided from a common point, like the fingers on a hand
palmately lobed - a simple leaf, deeply lobed like the fingers of a hand
pan - shallow depression, sometimes filled with water
parasite - an organism that obtains its food and water from another organism, and is thus fully dependent on that host
pedicel - flower-stalk of a single flower
pendulous - hanging or drooping downward
persistent - remaining attached after similar parts are usually dropped, after their function has been completed
petal - an individual segment of the corolla, often brightly coloured, or white
petiolar gland - gland situated on the leaf-stalk or petiole
petiole - leaf-stalk
petiolule - leaflet-stalk (i.e. on compound leaves only)
pinna(e) - the primary division(s), or leaflet(s), of a compound leaf
pinnate - feather-like, in a compound leaf with leaflets arranged on opposite sides of an elongated axis
pioneer plant - one that rapidly colonises cleared areas such as a road verge, a field left fallow, the edge of a dam or any other disturbed area
pistil - female reproductive structure in flower, consisting of the style and stigma
plain - area of fairly level low ground
plateau(x) - area(s) of fairly level high ground
pod - any dry, dehiscent fruit, often applied to a legume
pseudaril - fleshy appendage growing on a seed; the aril and pseudaril look alike and have the same function, but they develop differently
quarter-degree square - one-sixteenth of a degree-square; the basic grid cell used in the collection of TAP data, see page 2
quartzite - a rock with a high quartz content, usually light in colour, very tough
raceme - an unbranched inflorescence of stalked flowers
rachis - the main axis of a structure such as a compound leaf or inflorescence
rain-dependent - in the context of the TAP, refers to a species that flowers when it has sufficient moisture, almost regardless of the time of year
rebranched - branched more than once
recruitment - young plants growing and adding numbers to a population
recurved - curved backwards
reflexed - curved backwards, rolled under
regeneration - regrowth
river - watercourse that may be perennial (permanently flowing) or ephemeral (flowing intermittently)
river bank - edges of a river
riverbed - the base of a river, especially a dry river
riverine - growing along the banks of a river
rock - solid part of the earth's crust
rock-splitter - plants growing in rock crevices and expanding the crevices as it grows
rocky outcrop - small hill or ridge with many rocks
rootstock - a horizontal, underground stem (rhizome)
rosette - a dense, radiating cluster, usually of basal leaves
sand - particles less than 2 mm in diameter which are the result of the breakdown of rock, consisting almost entirely of quartz grains
sandy loam - loam with a high percentage of sand
sap - the juice of a plant; the fluids circulating throughout a plant
savanna - an area of grassland interspersed with occasional trees; in Namibia it tends to refer to areas with a relatively high proportion of woody plants
scalloped - rounded and broad protrusions on the margin; crenate
scattered - sparsely distributed; wide apart; sporadic occurrence
schist - layered rock of fine-grained minerals, characteristic of the central highlands
scrambler - a plant that grows over other plants but is not dependent on the other plants for support
scree slope - mass of loose stones on a hillside
seed - a ripened ovule; that part of the plant that produces the next generation; generally enclosed within the fruit
seedling - a young plant that has grown from a seed (as opposed to a cutting)
semi-deciduous - losing some, but not all, leaves in the dry season, or losing all leaves in years of poor rain and retaining some in years of good rain
sepal - one part of the calyx, often green, protects the flower buds
serrate - sharply toothed along the margin
sessile - without a stalk, attached directly
shrub - a bush; a woody plant with several stems of more-or-less equal size arising from near the ground and often branching low down
shrubby tree - a tree with several to many stems; often smaller than the average tree
shrubland - vegetation type consisting predominantly of shrubs
silt - fine-grained river deposits
simple - referring to a single leaf, without divisions of any kind
solitary - single
spathulate/spatulate - shaped like a spatula, but gradually tapering to the base
species - a group of plants (or animals) within a genus having a similar and unique characteristics, setting them apart from other species; usually implies a group of plants that can only reproduce successfully with one another



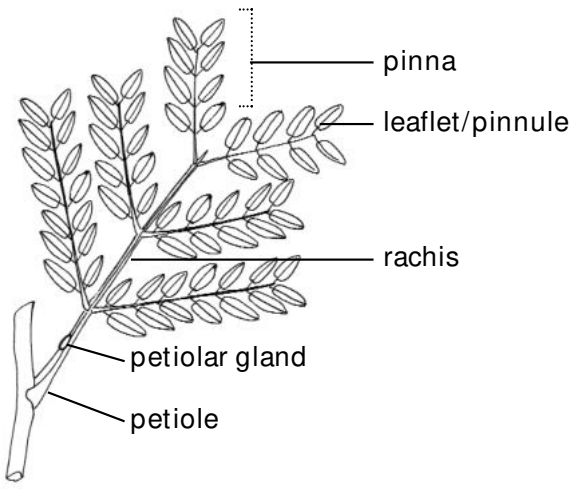




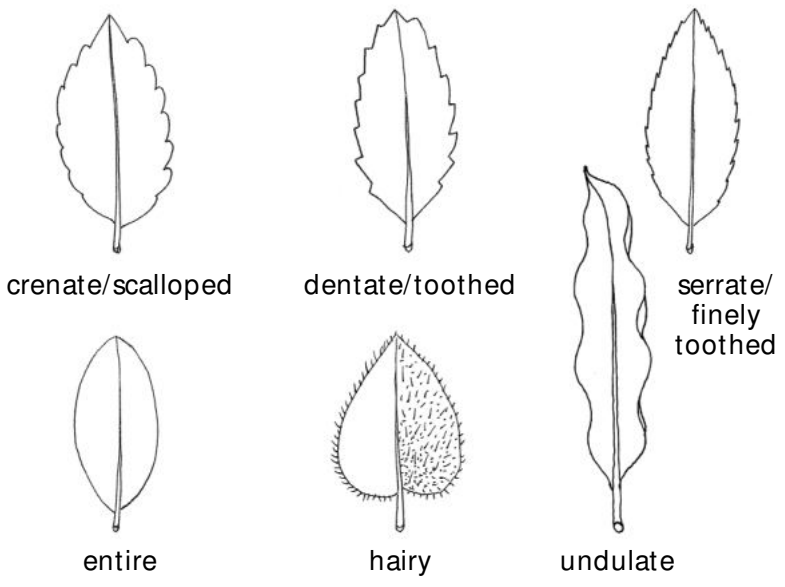
pinnately compound leaf (once-compound leaf)



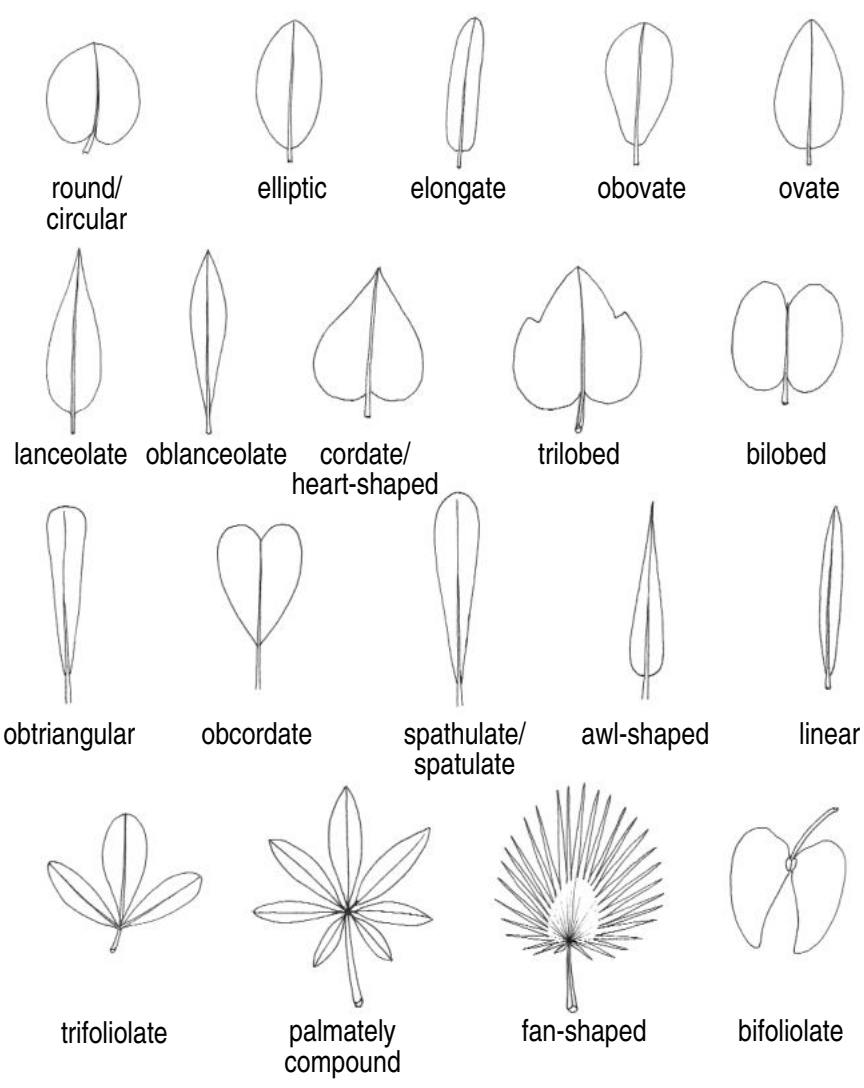
bipinnately compound leaf (twice-compound leaf)



leaf margins



leaf shapes

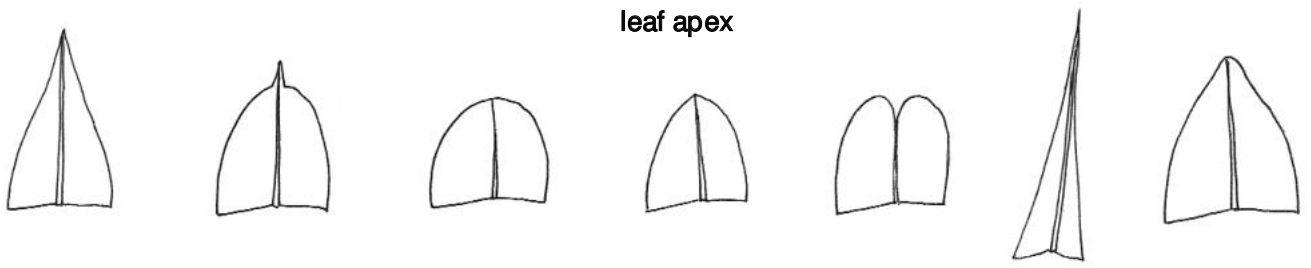


spike - an unbranched inflorescence of sessile or sub-sessile flowers
spine - a stiff, slender, sharp structure arising from below the epidermis, representing a modified leaf or stipule; commonly also used for any structure with the appearance of a true spine
spinescent - bearing a spine or a spine-like point at the tip; bearing spines
spirally arranged - arranged one above and slightly to one side of another, in a spiral arrangement
spray - a branched inflorescence
spring - place where groundwater comes to the surface
spur-branchlet - dwarf shoot; very short shoot that is usually quite thick in relation to its length
square - usually referring to a quarter-degree square, the basic grid cell used in the collection of TAP data; see page 2
stalk - the axis carrying the fruit, flower or leaf
stamen - male reproductive part, usually consisting of a filament and an anther
stellate - hair star-shaped hair
stigma - the part of the pistil that is receptive to the pollen, often found near the tip of the pistil
stipule - one of a pair of appendages found at the base of the petiole in some leaves
stone-fruit - a drupe; a fleshy, indehiscent fruit with a single central seed surrounded by a hard layer, i.e. with a stony pit, such as a cherry, or peach
strangler - a climber that twines and clings so tightly to its host plant that it strangles it, eventually killing it, or a tree whose seed germinates in the forked trunk of the host plant and whose roots grow down to the ground, eventually strangling the host as they thicken
striate - lined or grooved
style - stalk of the female reproductive organ that carries the stigma, which receives the pollen
sub- - almost
subsessile - almost sessile
subspecies - the taxonomic category below species, which divides a species into two or more groups
substrate - any material in which an organism grows or that it is attached to
succulent - juicy and fleshy, as in the leaves of aloes
suffrutex - many-stemmed, largely non-woody plant with a woody base
synonym - name of plant no longer in current use
taxon - any taxonomic group (plural: taxa)
taxonomic order - the systematic arrangement of the categories of organisms or taxa
taxonomy - the study and description of variation in organisms
terminal - at the tip (see apical, apex)
terminal leaflet - leaflet at the tip of the leaf
termitarium - mound of earth constructed by termites; the home of termites
thicket - a small, dense group of trees or bushes growing closely together
thorn - a stiff, woody modified stem with a sharp point; often applied to any structure resembling a true thorn
thornbush savanna - savanna in which the dominant woody vegetation comprises thorny shrubs
tree - a woody plant with one or a few main stems (trunks), and usually branching well above the ground
trifoliolate - with three leaflets
trilobed - with three lobes
truncheon - a short, thick stick
trunk - the main stem of a tree below the branches
tubular - cylindrical
twice-compound - bipinnately compound, twice divided
umbel - a flat-topped or convex inflorescence with the pedicels arising more-or-less at one point, like the struts of an umbrella
uncommon - more than one, but not many
underbark - layer of bark below the outermost layer, visible when the outer layer peels off
undulate - wavy, up-and-down of the leaf margin
unisexual - with either male or female reproductive parts or flowers
valley floor - low area between hills or mountains
valve - one of the segments of a dehiscent fruit, which separates from other such segments at maturity
variant - a different form from the normal, or most common, form
variety - a subgroup of a species usually fertile within the species to which it belongs but differing from the species type in some qualities capable of perpetuation
vein - transport vessel for water and foodstuffs, often visible in leaves (vascular bundle)
vulnerable - refers to a species considered to be facing a 'high risk' of extinction in the wild when assessed according to IUCN red-data criteria
wash - a very shallow ephemeral water course
watercourse - drainage line where water flows in the rainy season
wato - carved, wooden, canoe-like boat
widespread - commonly distributed over a wide area
winged - with appendages that resemble wings, usually membranous or papery
woodland - a vegetation type consisting of mature trees whose crowns are not touching and are not forming a closed canopy; trees are more widely spaced than in a forest
woodland savanna - a mosaic of woodland and savanna, or savanna with a higher proportion of trees than true savanna

BOTANICAL NOMENCLATURE - WHAT'S IN A NAME?

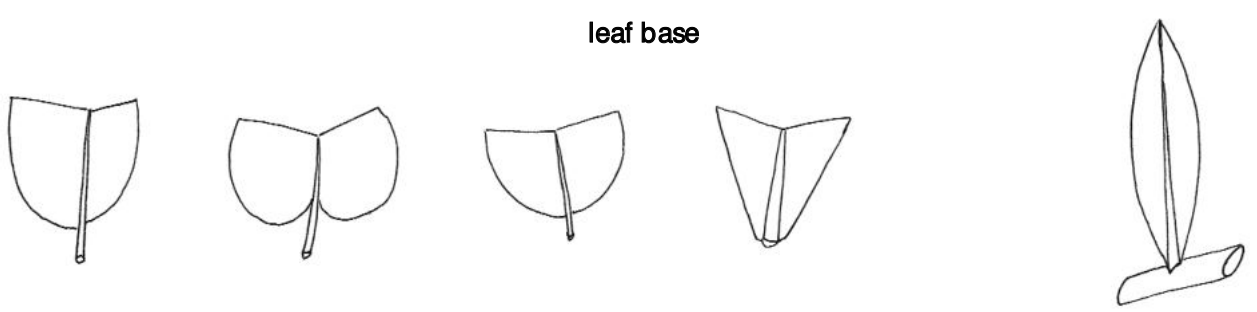
Each plant (or animal) species has its own unique binomial scientific name, that is, it has two names by which it is known. The first is the generic (genus) name and the second is the specific (species) name. There are very strict rules in botany about how plants are named and how the names are written. The scientific name is always printed in italics when it appears among other text; the generic name always comes first and starts with a capital letter; and the specific name always comes second and does not have a capital. If the specific name is not known, the generic name is followed by 'sp.', for example, *Ficus* sp. If more than one species of the same genus is being referred to it is written as *Ficus* spp. If a number of members of the same genus are being mentioned consecutively, the

leaf apex



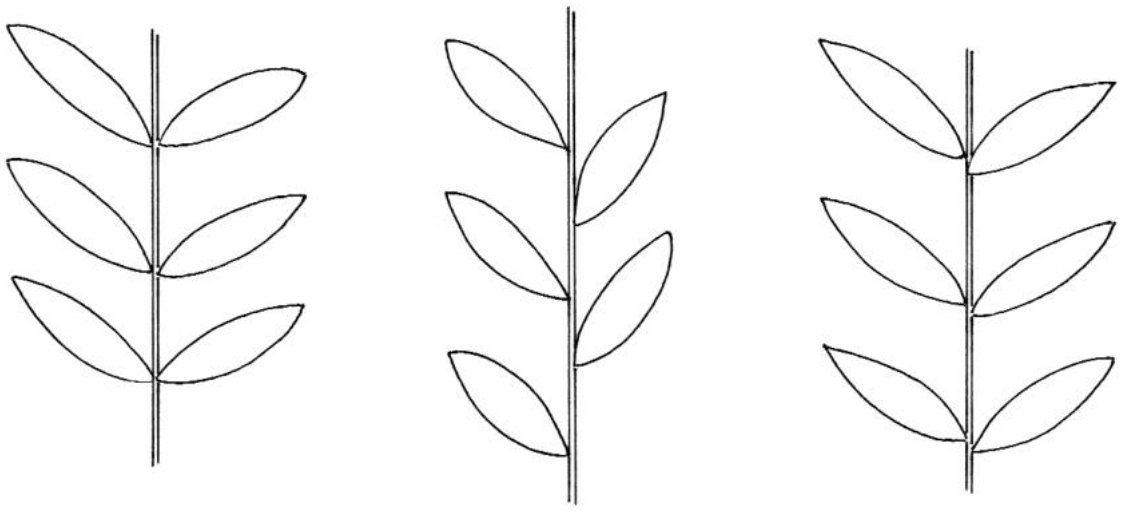
acute mucronate rounded blunt notched fine teat shaped

leaf base

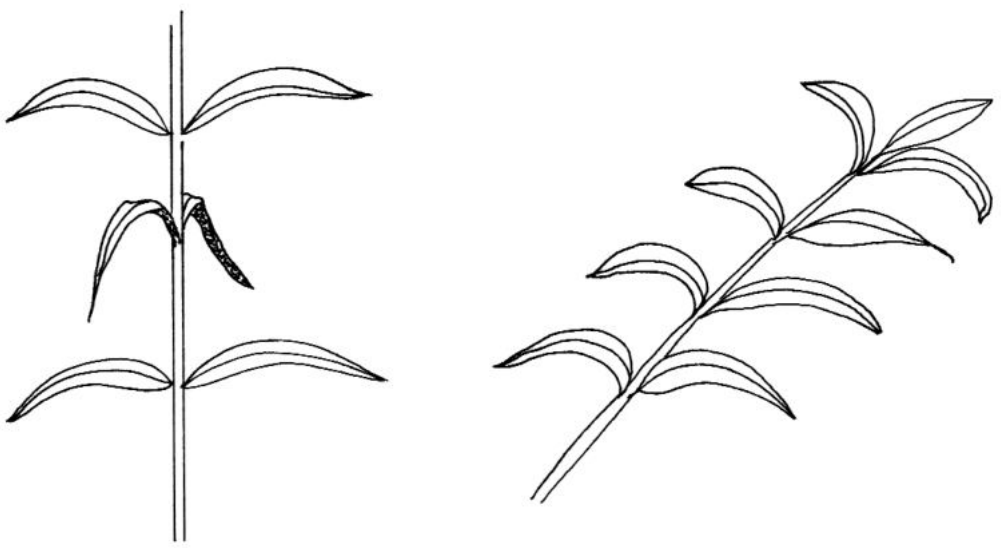


asymetric cordate heart-shaped round(ed) wedge-shaped sessile

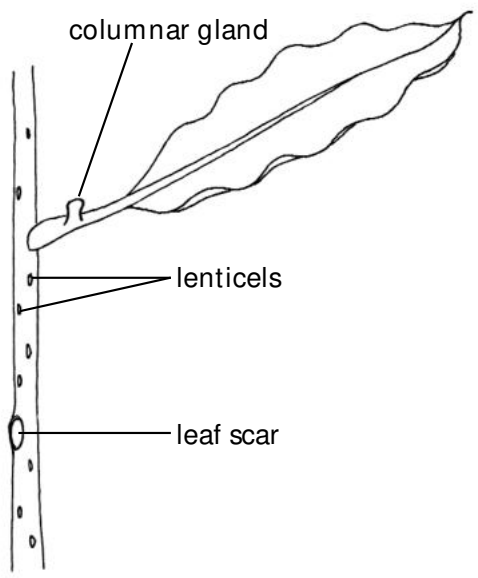
leaf arrangement



opposite alternate sub-opposite



decussate distichous



generic name is written in full for the first species and thereafter may be abbreviated by putting the initial letter followed by a full stop, for example, *Ficus cordata*, *F. burkei*, *F. ilicina*.

In formal scientific writing the botanical name is followed by the authority's name (not in italics). The authority is the person who described the plant and gave it its name. This name is sometimes also abbreviated, especially if it is a well-known botanist, such as Linnaeus - the father of biology - which is abbreviated 'L.'. This is standard international convention adhered to by botanists throughout the world, and standard author abbreviations are used. Authority names have not been included in the species accounts in this atlas, but a complete species list with authorities is given in Appendix 1.

What is a species?

For simplicity, a species (plural = species, too!) may be defined as a group of organisms which breed with each other, but do not naturally breed with members of other species. Members of a species generally look alike, but variation between individuals can occur (humans are the best example of this). If these variations are sufficiently marked, the species may be divided into subspecies (subsp.) or varieties (var.). For completeness, the subspecies and varieties occurring in Namibia have been included in Appendix 1.

Closely related species are grouped together in a genus (plural = genera). Members of a genus usually differ by only a few characteristics. Sometimes hybridisation between species in the same genus may occur, for example, between *Acacia erioloba* and *A. haematoxylon*.

Genera with similar flower and/or fruit characteristics are grouped into families. Family names can be recognised by the ending 'aceae' (pronounced 'AYSEE' in English) and are not written in italics, for example, Fabaceae (pronounced FABAYSEE) - the pea family, or Poaceae - the grass family.

Scientific name changes

From time to time, for various reasons, taxonomists change the names of species (or even families). Recent previous names (synonyms), by which readers may know a species, have been given with the relevant species and are listed in the index. The current scientific name may not be the most recently given name. For instance, *Swartzia madagascariensis* was changed to *Bobgunnia madagascariensis*, and later changed back to *Swartzia*.

What is taxonomy?

Taxonomy is the science of describing and naming organisms, and follows very strict international rules. Taxonomic order is the order in which organisms are arranged in a list or collection and is from those genera regarded as being most primitive up to those that are most advanced. In plants, this is based on the structure of the flower or fruit.

Common names versus botanical names

Botanical names frighten many people because they are long, and difficult to pronounce and remember. However, each name refers to a specific plant. Very often a well-known plant will have a number of common names - it will have different common names in different areas or more than one name in the same area. Useful species often have different indigenous names for different parts of the tree. Often one common name will describe several completely unrelated species, for example haak-en-steek or wag-'n-bietjie. Often members of a genus all have the same common name, such as rosyntjiebos which refers to all *Grewia* species. There is no simple solution to standardising common names, thus only those that were felt to be most used or were supplied by atlassers were included.

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PHOTO CREDITS:

FRONT COVER: Kokerboom, *Aloe dichotoma*, **R. Müller**.
FRONT FLAP: Feather-leaved corkwood, *Commiphora kraeuseliana* , **K. Roberts**.
BACK COVER: left to right, Mopane leaves, **S. Bethune**; Mopane worm, **P. Tarr**; Sekelbos flowers, **B. Curtis**; Riverine woodland, **S. Bethune**; Monkey oranges in dish, **P. Reiner**; Brandberg acacia, **R. Swart**; Boys with wato, **P. Reiner**; Camel-thorn, **B. Curtis**; Purple-pod terminalia, **P. Tarr**; Boys with bed, **P. Reiner**; *Aloe ramosissima*, **C. Mannheimer**; Butterfly on camel-thorn flowers, **P. Tarr**.
BACK FLAP: left to right, *Burkea africana*, **B. Curtis**; *Welwitschia mirabilis*, **B. Curtis**; *Guibourtia coleosperma* fruit, **B. Curtis**; *Markhamia obtusifolia*, **C. Hines**; Makalani palms, **K. Roberts**; *Cyphostemma uter*, **B. Curtis**; !Nara, **B. Curtis**; Halfmens, **W. Voigts**.
BACK PAGE: left to right: Boabab, **P. Tarr**; *Aloe pillansii*, NBRI; *Euphorbia virosa*, Brandberg, **S. Bethune**; *Adenium boehmianum* flower, **W. Voigts**; Ovambo wooden banana, *Entandrophragma spicatum*, **B. Curtis**; Makalani fruit, NBRI.

HALF TITLE PAGE - Bottle tree, *Pachypodium lealii*, **B. Curtis**; TITLE PAGE - Camel-thorn in dunes, **P. Tarr**; p. iv - Welwitschia, **P. Tarr**; p.viii - (left) bark of camel-thorn, **P. Tarr**; (right) Welwitschia leaf, **B. Curtis**; p. x - (left) CUR1 collecting plant sample, **S. Schubert**; (centre) HOF1 pressing a sample, **S. Schubert**; (right) FRI1 and FRI2 photographing bark, **T. Friederich**; p. 1 - Kokerboom with sociable weavers nest, **B. Curtis**; p. 16 - Brandberg acacia, **R. Swart**; p. 21 - Camel-thorn leaves and flowers, **B. Curtis**; p. 22 - uses of wood: top two **P. Reiner**, lower two RAISON; p. 25 - Sekelbos, **B. Curtis**; p. 32 - mopane worm, **P. Tarr**; p. 33 - browsing giraffe, **W. Swanepoel**; p. 184 - lichen on wood, **RAISON**.
Other photos credited at the photos.

12°E
16°E
20°E
24°E
18°S
22°S
26°S
Katima Mulilo
Ondangwa
Opuwo
Rundu
Tsumeb
Tsumkwe
Terrace Bay
Khorixas
Otjiwarongo
Windhoek
Walvis Bay
Mariental
Lüderitz
Keetmanshoop
Noordoewer
0
200
Kilometres











The authors with students from Ogongo Agricultural College after a workshop on tree identification.
Front row, third from left, *Coleen Mannheimer*, fourth from left, *Barbara Curtis*.

ABOUT THE AUTHORS

Although a zoologist by training, with a Masters degree on desert ants, BARBARA CURTIS has always had a love of trees. Three years at Gobabeb and five years in former Damaraland led to a fascination for the weird and wonderful plants and animals of the Namib Desert. Her research topics have ranged from rodents to ants to freshwater invertebrates to the woody vegetation of some of Namibia's conservancies. As project manager for the Tree Atlas Project (TAP) from 1997, she was responsible for the daily running of the project. At the same time she also undertook a number of Environmental Impact Assessments (EIAs) throughout Namibia, and in Botswana.

COLEEN MANNHEIMER has an interest in all things natural, ranging from freshwater invertebrates to mosses and ferns to the flora of the forbidden Sperrgebiet. She has worked for the National Botanical Research Institute (NBRI) since 1994, acting as the curator for several years while employed as a SABONET Research Associate. As co-ordinator between the TAP and the NBRI, she ensured that botanical standards were maintained, assisted in the identification of the hundreds of plant specimens that were sent in and generally assisted in the implementation and completion of the project. She has been involved in EIAs in the Sperrgebiet and is currently finalizing her Masters degree in mesemb taxonomy.

Together, Barbara & Coleen have written a number of popular articles on Namibian trees, produced keys to aid in their identification and held talks and training workshops throughout the country. The highlight of the project for both was exploring the vast open spaces of Namibia in search of "new" trees.

Currently they are both freelance consultants and part-time research associates of the NBRI, working on a collaborative project with the Royal Botanic Gardens, Kew in London. They are also editing a fieldguide to the trees and shrubs of Namibia, written by the late Dr Mike Müller and Piet le Roux.

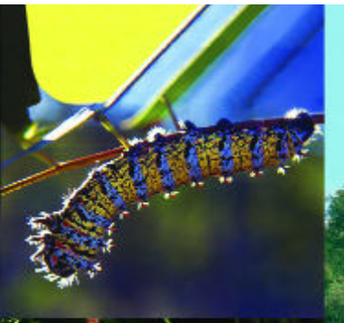


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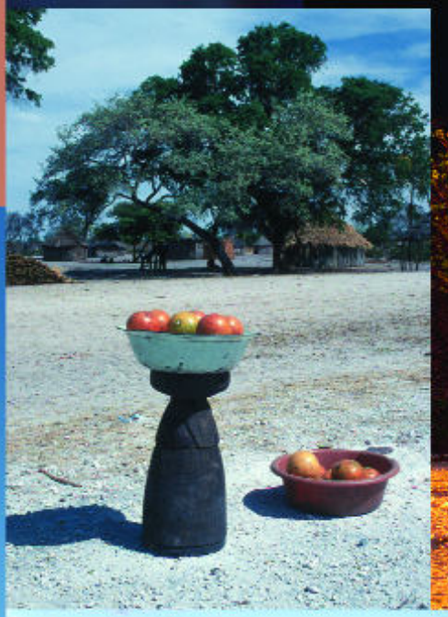






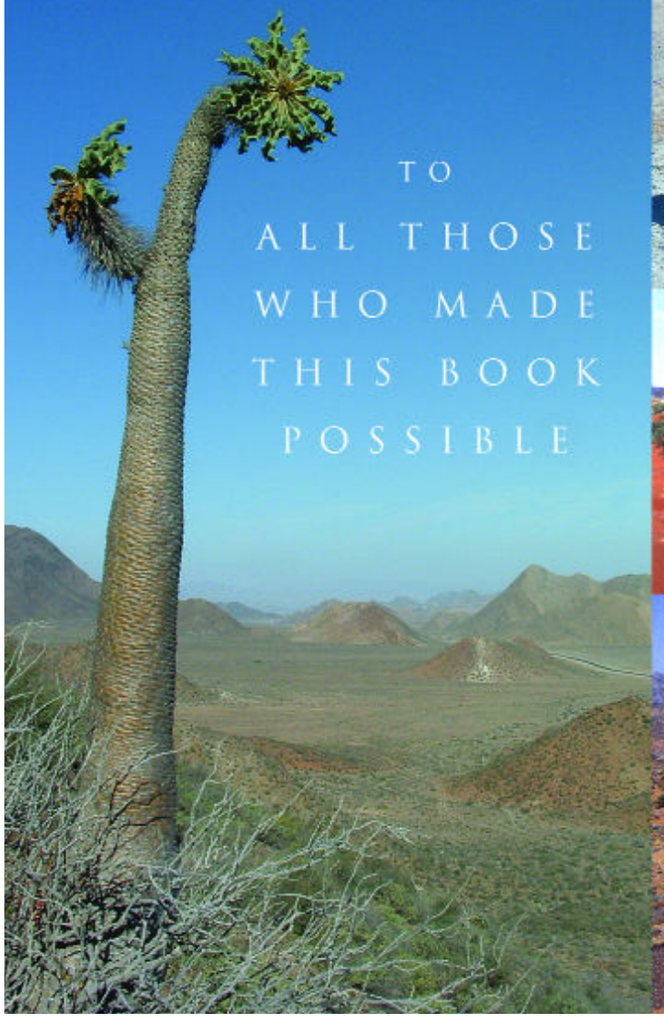












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ISBN 99916-68-06-3