

# Flowering Plants of Africa

Volume 67

June 2021



Celebrating 100 years: 1921–2021

# Flowering Plants of Africa

Since its inception in 1921, this serial, modelled on the former *Curtis's Botanical Magazine*, has published well over 2 000 colour plates of African plants prepared by some 80 artists.

The object of the journal is to convey to the reader the beauty and variety of form of the African flora, to stimulate an interest in the study, conservation and cultivation of African plants, and to advance the science of botany, as well as botanical art.

The illustrations are mostly prepared by artists on the staff of the South African National Biodiversity Institute (SANBI), but we welcome other contributions of suitable artistic and scientific merit. Please see *Guide for authors and artists* on page 214.

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## History of this series

(note Afrikaans translation and changes in title)

### Volume 1 (1921) to Volume 24 (1944):

*The Flowering Plants of South Africa*

### Volume 25 (1945–1946) to Volume 26 (1947):

*The Flowering Plants of Africa*

### Volume 27 (1948–1949) to Volume 52 (1992–1993):

*The Flowering Plants of Africa*

*Die Blomplante van Afrika*

### Volume 53 (1994) to Volume 67 (2021):

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**Cover illustration:** *Adenia repanda* (Plate 2373)

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# Flowering Plants of Africa

A peer-reviewed journal containing colour plates with descriptions of flowering plants of Africa and neighbouring islands

Edited by

Alicia Grobler

with assistance of

Gillian Condry

Volume 67



Pretoria  
2021

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*Aloiampelos tenuior* var. *decidua* (Reynolds) Van Jaarsv., comb. nov., p. 33  
*Aloiampelos tenuior* var. *densiflora* (Reynolds) Van Jaarsv., comb. nov., p. 34  
*Aloiampelos tenuior* var. *rubriflora* (Reynolds) Van Jaarsv., comb. nov., p. 34  
*Psychotria suber* Van Jaarsv. & S.Venter sp. nov., p. 143  
*Carissa sebrabergensis* Van Jaarsv. & Swanepoel sp. nov., p. 150

*Carissa sebrabergensis*

Apocynaceae

Namibia

***Carissa sebrabergensis*** Van Jaarsv. & Swanepoel sp. nov., differs from *C. bispinosa* by its much smaller size; its ascending, zig-zagging, layered stem ramifications; consistently much smaller leaves of 10–17 × 6–7 mm; smaller, round berries of 10 mm in diameter; and unique habitat among anorthosite boulders in semi-arid savanna.

TYPE.—Namibia (1713): Sebraberg, Kloofsonderend, south-facing slopes (–BC), 1 400 m, 29 May 2012; Van Jaarsveld, Swanepoel, Nanyeni & Nicolson 24476, (WIND, holo.!).

*Carissa sebrabergensis* (Figures 1–4) is named as new from the Sebraberg (Zebra Mountains) in northern Namibia. Features which distinguish it from *C. bispinosa* include its generally smaller size; ascending, zig-zagging, layered stem ramifications; small, leathery leaves; and rounded berries. These features are retained in cultivation.

*Carissa* belongs to the family Apocynaceae, a large cosmopolitan family with about 322 genera and 4 300 species (Christenhusz et al. 2017). This morphologically diverse family was divided into five subfamilies: Rauvolfioideae, Apocynoideae, Periplocoideae, Secamonoideae and Asclepiadoideae. *Carissa* belongs to subfamily Rauvolfioideae and was established by Linnaeus in 1767. The genus consists of about 35 shrubby species and the type, *C. carandas* L., is from India. The generic name, *Carissa*, is the Sanskrit name for a species in India (Clarke & Charters 2016).

Six species of *Carissa* are recorded for South Africa and Namibia (Coates Palgrave 2002; Van Wyk & Van Wyk 2013). The South African and Namibian species include *C. bispinosa* (L.) Desf. ex Brenan, *C. haematocarpa* (Eckl.) A.DC., *C. macrocarpa* (Eckl.) A.DC., *C. spinarum* L., *C. tetramera* (Sacleux) Stapf and *C. wyliei* N.E.Br. In the revision of *Carissa* by Leeuwenberg & Van Dilst (2001), *C. haematocarpa* and *C. wyliei* was synonymised under *C. bispinosa*. This arrangement, however, was not followed by Coates Palgrave (2002), nor by Van Wyk & Van Wyk (2013) and the authors of this text, similarly, retain the two species. These species grow in a variety of habitats, from the semi-desert Karoo, through the Highveld inland region, to the subtropical coast, with one species confined to lowland forest. All *Carissa* species produce edible fruit. The largest and most popular species, *C. macrocarpa*, is known in South Africa as num-num or *noem-noem* (Afrikaans), which, according to Smith (1966) was recorded by the early explorers Thunberg and Burchell (Burchell 1822–1824) and is derived from the plant's Koi name (Smith 1966). *Carissa macrocarpa*, originally indigenous to the Eastern Cape and coastal KwaZulu-Natal, has become a favourite plant in ornamental horticulture and is grown worldwide. Only *C. bispinosa*, *C. haematocarpa* and *C. spinarum* have been recorded for Namibia (Mannheimer & Curtis 2009; Bruyns 2014).

PLATE 2375.—1, flowering and fruiting branch, × 1; 2, forked and simple spine, × 2; 3, gynoecium, × 12; 4, longitudinal slit through corolla, × 4.5; 5, corolla with calyx removed, × 4; 6, fruit, × 1; 7, dried fruit, × 5.5; 8, mature fruit, × 4. Voucher specimen: Van Jaarsveld 28242 in Compton Herbarium, Cape Town. Artist: Marieta Visagie.

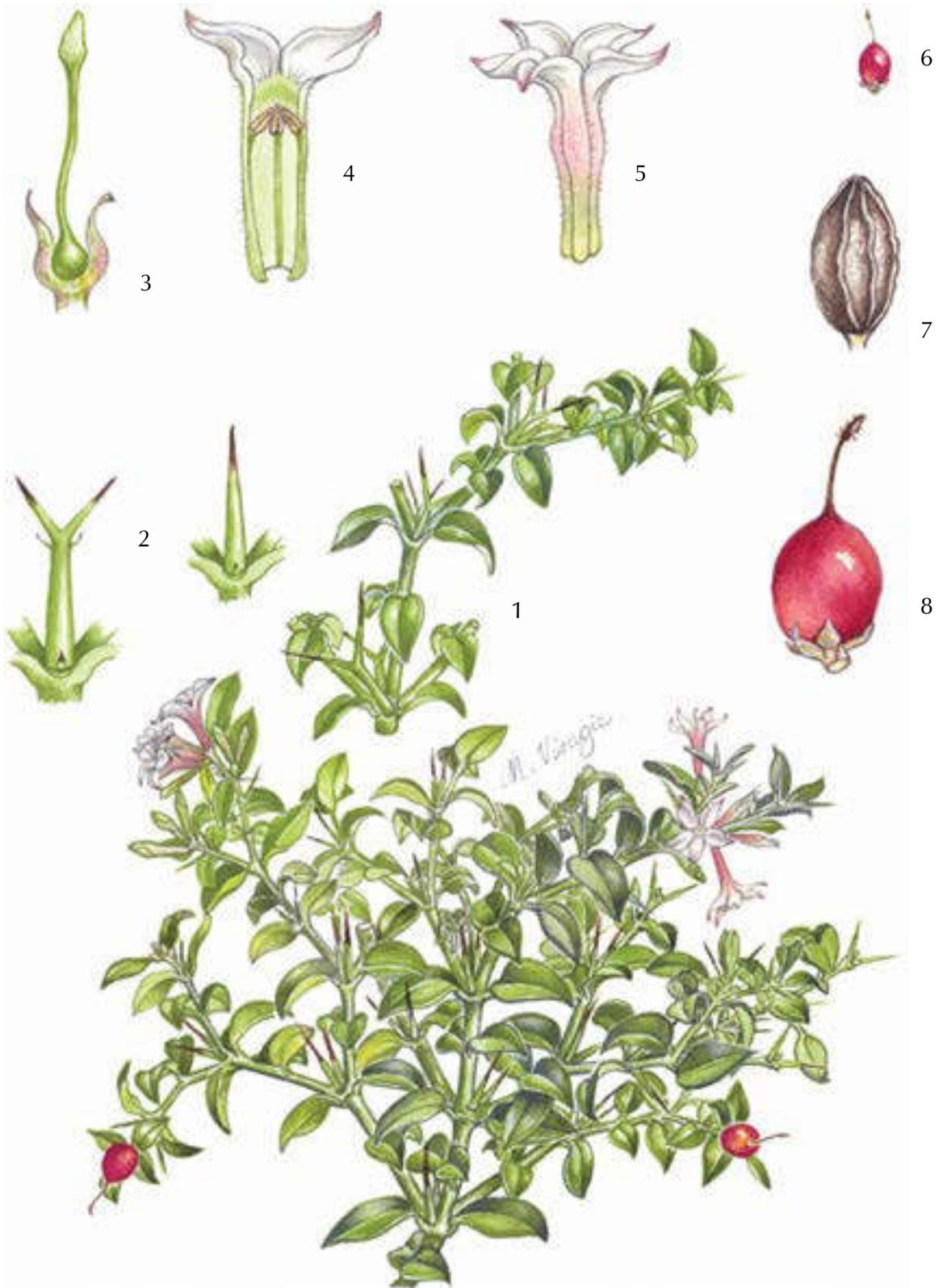


PLATE 2375 *Carissa sebrabergensis*



FIGURE 1.—*Carissa sebrabergensis* fruit: a, fruiting branches; b, close-up of globose, glossy berry. Photographs: E.J. van Jaarsveld.

On an expedition to Namibia in May 2012, two of us (Swanepoel & Van Jaarsveld) jointly decided to investigate the, hitherto unknown, Sebraberg, a geologically unique formation consisting of igneous anorthosite of the Kunene Complex (Miller & Schalk 1980, Mendelsohn et al. 2002) – one of the largest anorthosite massifs on Earth (up to 18 000 km<sup>2</sup>). Liudmila Ozepowa from the Moscow Botanical Garden, Leevi Nanyeni from the Namibia Botanical Research Institute and Gregory Nicolson, freelance ecologist from the Western Cape, South Africa, also joined us. The igneous rock weathers into rounded boulders with vertical streaks of scree slopes, not unlike dolerite, and that led to the name Sebraberg. We investigated both the southern and northern portions of this mountain complex and were surprised to find interesting new taxa (e.g. *Maerua sebrabergensis* Swanepoel; others still in preparation) and new distribution records.

As we ascended Kloofsonderend, a boulder-strewn kloof on the southern slope, a species of *Carissa* was found growing with *Euclea divinorum* Hiern and *Croton gratissimus* Burch. Its leaves were markedly smaller than those of the widespread *Carissa bispinosa* and its zig-zagging, layered, ascending, spreading branches were distinct; it also had rounded fruits, 10 mm in diameter (Figure 1). Specimens were prepared, and seed and cuttings gathered of which both were later grown and rooted at Kirstenbosch National Botanical Garden. Here the plants retained their small leaves and other diagnostic vegetative and floral features. When the plants came into flower in 2017, a voucher was given to Marieta Visagie to illustrate. Meanwhile a description was prepared and the new species named for its Sebraberg habitat in the northern Kaokoveld, Namibia (Figure 2).

We climbed to the highest peak in the southwest where we encountered *Celtis africana* Burm.f. and *Chaetachme aristata* Planch. belonging to the Cannabaceae (formerly sorted

under the Ulmaceae), both first records for Namibia. Here we also encountered *Brachylaena huillensis* O.Hoffm., *Nuxia congesta* R.Br. ex Fresen. and *Ricinus communis* L. As we ascended the peak, Wessel Swanepoel heard and spotted the Angola Cave Chat, *Xenocopsychus ansorgei* (Hartert, 1907), the first record of this bird for Namibia. Along a stream bank on the northern portion of the Sebraberg we also encountered a potentially new species of *Ocimum* and in one of the intermontane plains, potentially new species of *Premna* and *Distephanus* were discovered. The vegetation of the Sebraberg, in general, compared to the surrounding mopane savanna is extremely spiny and the best way to access certain areas is to remain in the boulder fields. This spinescent vegetation is an example of mechanical defence in reaction to herbivory, as the fertile soil (known as sweet veld) support various palatable grass, shrub and tree species. The tree and shrub vegetation of the Sebraberg consists of *Combretum apiculatum* Sond., *Spirostachys africana* Sond., *Kirkia acuminata* Oliv. and various *Commiphora*, *Senegalia* and *Vachellia* species; the vegetation of the intermontane plains consists mainly of mopane savanna with *Colophospermum mopane* (J.Kirk ex Benth.) J.Kirk ex J.Leonard the dominant tree. The boulder fields consists of thickets with, among other plants, *Aloe littoralis* Baker, *Adenium boehmianum* Schinz, *Croton gratissimus*, *Cyphostemma currorii* (Hook.f.) Desc., *Entandrophragma spicatum* (C.DC.) Sprague, *Euphorbia eduardoi* L.C.Leach, *Ficus bubu* Warb., *F. glumosa* Delile, *Pappea capensis* Eckl. & Zeyh., *Steganotaenia araliacea* Hochst., *Moringa ovalifolia* Dinter & A.Berger, *Sterculia africana* (Lour.) Fiori, *S. quinqueloba* (Garcke) K.Schum., *Adansonia digitata* L. and



FIGURE 2.—*Carissa sebrabergensis* in habitat on the Sebraberg, Kaokoveld, northwestern Namibia. Photograph: E.J. van Jaarsveld.

a potentially new species of *Sesamothamnus*. Spiny elements of Sebraberg vegetation encountered include *Senegalia mellifera* (Vahl.) Seigler & Ebinger subsp. *detinens* (Burch.) Kyal. & Boatwr., *S. ataxacantha* (DC.) Kyal. & Boatwr., *Chaetacme aristata* Planch., *Obetia carruthersiana* (Hiern) Rendle, *Sansevieria pearsonii* N.E.Br., *Vachellia kirkii* (Oliv.) Kyal. & Boatwr. and species of *Solanum*, *Barleria* and *Hibiscus*.

*Carissa bispinosa* is the most widespread and common *Carissa* in southern Africa and immediately identified by its spines that are forked once, white flowers of which the tube is 6–9 mm long and the lobes up to 5 mm long, and ovate red fruit that are 10–16 mm long. The species also grows in the southeastern and eastern parts of the subcontinent with a few records from northern Namibia, in subtropical thicket and savanna. Furthermore, *C. bispinosa* is a very variable taxon and represent the closest match for our new species. So, when is a new taxon justified? A name provides a ‘handle’ to identify a plant, so that anyone else can clearly recognise it as a unique entity. In the horticultural trade such a distinguishing characteristic can be the slightest variation in colour or shape of plant organs, fruit taste, or other features. A cultivar name, in inverted commas after the binomial name, designates such a cultivated status. Such a cultivar can be the result of a hybrid, mutation (such as variegation), or simply genetic variability within the cultivated plant. In the field, however, different criteria are in place. No efficient species definition is known and in many cases species are very difficult to determine with certainty. Thus the barriers of species definition is not always clear cut and depend on a number of variables specific to the taxon under investigation. For a species new to science, criteria should be easily recognisable, based on unique morphological characteristics and not simply a continuation of variation, which is usually used in describing a new subspecific entity. In naming a new subspecies, geographic separation from its closest



FIGURE 3.—*Carissa sebrabergensis* in typical habitat, among anorthosite boulders in a kloof. Photograph: E.J. van Jaarsveld.

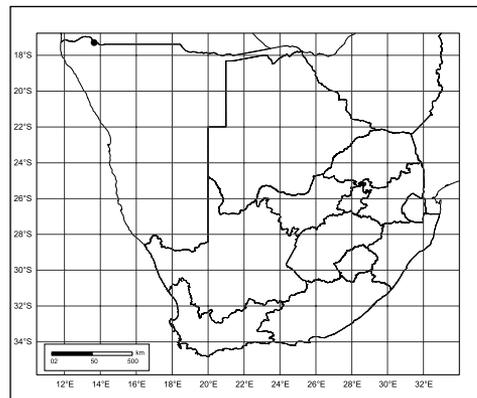


FIGURE 4.—Distribution of *Carissa sebrabergensis*, only known from anorthosite boulder kloofs and fields of the Sebraberg, northwestern Namibia. Since the anorthosite continues on the northern side of the Kunene River, the species may eventually prove to occur in Angola as well.

relative is usually a reliable and good character. Our new species is clear cut, remains genetically distinct in cultivation and can be recognised as different from *C. bispinosa* at once: it has a dwarf stature (usually under a metre in height); its branches are uniquely layered, often zig-zagging; its fruits are rounded to rounded-oval, up to only 10 mm in diameter; and its distribution is confined to a unique geological formation, as it is only known from the Sebraberg, growing among anorthosite boulders (Figure 3) in semi-arid savanna. Since the anorthosite continues on the northern side of the Kunene River, the species may eventually prove to occur in Angola as well (Figure 4).

The habitat of *Carissa sebrabergensis* lies well within the tropics with the rainfall (through convectional rain) measuring between 100–400 mm per annum, received mainly during the summer and autumn months of the southern hemisphere. Summers are very hot and winters hot, but cool during the evenings without frost (Mendelsohn et al. 2002).

*Carissa sebrabergensis* grows well in cultivation, both in containers and out of doors. As with other species of *Carissa*, it is easily propagated from stem cuttings or seed. With its layered evergreen growth of small glossy leaves, fragrant white flowers and red berries, it is a decorative little shrub. It makes for a great waterwise garden plant as it can withstand heat and drought. Plants grown in the biomes garden of the Babylonstoren Farm near Paarl (Western Cape Province, South Africa) during the summer drought of 2017–2018 grew well without being watered.

**Description.**—Evergreen much-branched (dichotomously) leafy spiny shrub, to 1 m tall from a solitary stem. *Young stems* ascending with zig-zagging and layered ramification; surface green, minutely puberulous; older stems becoming grey. *Sap* milky. *Main branch* 25 mm in diameter at base, often with erect side shoots arising from near base; bark grey, wrinkled; spines simple to once forked, 5–7 mm long, persistent. *Leaves* ascending spreading, leathery, linear ovate, 10–17(–18) × (2–)6–7 mm; petiole short, to 1 mm long; lamina sparsely puberulous becoming glabrous with a shiny surface, paler below, margin semi-translucent, minutely ciliolate, main vein semi-translucent; base rounded to obtuse; apex acute with sharp mucro pointing down. *Flowers* in terminal clusters; bracts ovate acuminate, 1.5–2.0 × 0.5 mm; calyx 3 mm long, lobes lanceolate acuminate, 1.5 mm long, sparingly beset with glandular hairs; corolla white, salver-shaped, up to 9 mm in diameter; tube slender 5.3–7.2 × 1.4–1.6 mm, minutely pilose, throat beset with longer white hairs 0.5 mm long; lobes ovate lanceolate, spreading 3–5 × 1.3–1.8 mm. *Stamens* 5, inserted at the top of the tube. *Gynoecium* 4.1 mm long; ovary entire, 2-chambered; style filiform; stigma stipitate. *Fruit* globose, 10 mm in diameter, more or less of the same length, glossy, red, 1–2-seeded. Plate 2375.

## REFERENCES

- BRUYNS, P.V. 2014. The Apocynaceae of Namibia. *Strelitzia* 34. South African National Biodiversity Institute, Pretoria.
- BURCHELL, W.J. 1822–1824. *Travels into the interior of southern Africa*. 2 vols, London.
- CHRISTENHUSZ, M.J.M., FAY, M.F. & CHASE, M.W. 2017. *Plants of the World, an illustrated Encyclopedia of Vascular Plants*. Royal Botanic Gardens, Kew.

- CLARKE, H. & CHARTERS, M. 2016. *The Illustrated Dictionary of Southern African Plant Names*. Jacana Media, Auckland Park.
- COATES PALGRAVE, M. 2002. *Keith Coates Palgrave Trees of southern Africa*, edn 3. Struik, Cape Town.
- LEEUWENBERG, A.J.M. & VAN DILST F.J.H. 2001. *Series of revisions of Apocynaceae XLIX Carissa* L. Backhuys Publishers, Leiden.
- LINNAEUS, C. 1767. *Systema naturae per regna tria naturae*. Salvius, Stockholm.
- MANNHEIMER, C. & CURTIS, B. 2009. *Le Roux and Muller's Field Guide to the Trees & Shrubs of Namibia*. Macmillan Education, Windhoek.
- MENDELSON, J., JARVIS, A., ROBERTS, C. & ROBERTSON, T. 2002. *Atlas of Namibia*. Philip, Cape Town.
- MILLER, R. MCG. & SCHALK, K.E.L. 1980 *Geological map of South West Africa/Namibia* (1:1 000 000). Geological Survey of the Republic of South Africa and South West Africa/Namibia, Windhoek.
- SMITH, C.A. 1966. *Common Names of South African Plants*. Botanical Survey Memoir no. 33. Botanical Research Institute, Pretoria.
- VAN WYK, B. & VAN WYK, P. 2013. *Field Guide to the Trees of Southern Africa*, Struik Nature, Cape Town.

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