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PLANTS PEOPLE
POSSIBILITIES



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Since 2004, there has been a Namibian SEPASAL team, based at the National Botanical Research Institute of the Ministry of Agriculture which has been updating the information on Namibian species from Namibian and southern African literature and unpublished sources. By August 2007, over 700 Namibian species had been updated.

Work on updating species information, and adding new species to the database, is ongoing. It may be worth visiting the web site and querying the database to obtain the latest information for this species.

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 *Display help*In names list include: synonyms vernacular names and display: All names per page*Your query found 1 taxon***Phoenix reclinata Jacq. [1362]**

Family: PALMAE

Synonyms

Phoenix pumila Regel

Phoenix senegalensis Van Houtte ex Salomon

Phoenix spinosa Schum. & Thonn.

Vernacular names

Unspecified language (Mozambique)	Makindu palm quinzo [316], sundo [316], inchece [316], iguindo [316], guindo [316] [5480], mitchinzo [316], mutchindo [316], muchindo [316], inchido [316], tcheu [316], erendge [316], cororo [316], lichindo [316], kandjedza [5480]
(Mozambique) [beverage]	utchema [316], ussura [316]
(Mozambique) [fruits]	inzo [316], sundo [316], chece [316], guindo [316], quindo [316], tchinzó [316], inchindo [316], chindo [316], inchido [316], tcheu [316], erendge [316], uindo [316]
Adangme (Ghana)	nkeresia [2816]
Afrikaans (Namibia)	dadelpalm [5087], wilde dadelpalm [5083] [5087] [5121]
Afrikaans (Southern Africa)	datelboom [1171], kaffer-koffie [1171], wilde dadelpalm [1171] [3045] [5097], wildedadel [2795], wildedadelboom [5082]
Akan-Fante (Ghana)	nykeresia [2816]
Anyi-Aowin (Ghana)	elehyia [2816], melehyia [2816]
Balanta (Guinea-Bissau)	sérquè [2816], serk? [2816]
Barakwengo-Bushmen (Namibia)	dl'gaa [5087], t!gaa [5087]
Basari (Guinea)	a-nib [2816]
Basari (Guinea) [cabbage]	yabà [2816]
Basari (Guinea) [leaf]	a-ngóm [2816]
Basari (Senegal)	inib [2816], i-nib [2816]
Bedik (Senegal)	gi-nyamèl [2816]
Bidyogo (Guinea-Bissau)	madjaca [2816]
Boni (Kenya)	gonyooriya [2719]
Borana (Kenya)	meti [2719]
Bulom (Sierra Leone)	shaka-le [2816]

Bura (Nigeria)	jara [2816]
Chopi	ingenda [1340]
Crioulo (Senegal)	tàmbra [2816]
Digo (Kenya)	mchindu [2719], makindu [2719]
Diola (Senegal)	diidioka [2816], fu duka [2816], fudak [2816], fuduka [2816], gi duka [2816], hu diak [2816], hudiak [2816], ka sakat [2816], kutupata [2816], t? diange [2816]
Diola (Senegal) [fruit]	si dia [2816]
Edo (Nigeria)	ukukon [2816]
Efik (Nigeria)	éyòp inùèn [2816]
English	Senegal date [2403] [2719], Senegal palm [2485], swamp date-palm [2816], dwarf date-palm [2816], Senegal date-palm [2816], wild date palm [2719], wild date [1340]
English (Botswana)	dwarf date palm [5093], wild date palm [5093]
English (Gambia)	swamp palm [2485]
English (Kenya)	wild date palm [2719], Senegal date [2719]
English (Namibia)	wild date palm [1171] [5083] [5121]
English (Southern Africa)	wild date palm [1279] [2485] [2795] [2968] [3045] [5082], dwarf date palm [1171], feather palm [1171]
English (Zimbabwe)	wild date palm [5082]
French	dattier sauvage [2816], dattier de marais [2816], dattier du Sénégal [2816], dattier nain S? n?gal [2816]
Fula (Nigeria)	forondo [2485]
Fula-Fulfulde (Burkina)	tamaroohi [2816], tambaroohi [2816]
Fula-Fulfulde (Nigeria)	deli [2816]
Fula-Pulaar (Gambia)	forondo [2816]
Fula-Pulaar (Senegal)	soréhi [2816]
Ga (Ghana)	ametrobi [2816], amitsobi [2816], amitsrobi [2816], mitfo-ga [2816]
Gbe-Fon (Togo)	selli [2816]
Gbe-Vhe (Ghana)	ayede [2816]
Gciriku (Namibia)	makereva [5087]
German (Namibia)	Wilde Dattelpalme [5083] [5087]
Giriama (Kenya)	mkindu [2719], mkindwi [2719], kindwi (fruit) [2719]
Giriama (Kenya) [fruit]	kindwi [2719]
Gwari (Nigeria)	bagalahi [2816]
Hausa (Nigeria)	afutu [2816], kabba [2816], kilijjiri [2816], d?biin?n b?rii [2816], k?jiiijir?? [2816], k? jiiijir?? [2816]
Herero (Southern Africa)	omuvare [1171]
Igbo (Nigeria)	ngala [2816]
Jukun (Nigeria)	mby? [2816]
Jul'hoan (Namibia)	jokarekare [5083] [5121]
Kamba (Kenya)	mukindu [2719]
Khoekhoegowab (Namibia)	dadel!hanab [5083]
Kikuyu (Kenya)	mukindu [2719], muthuthi [2719]
Kipsigis (Kenya)	sosiyot [2719]
Koro (Nigeria)	nne [2816]
Kposo (Togo)	odyonni [2816]
Kung Bushmen	j?k?r?k?r? [5087]

(Namibia)	
Kwangali (Namibia) [fruit]	sikereva [5087]
Kwangali (Namibia) [plant]	sikereva [5087]
Kwangali (Southern Africa)	dkindu [1171]
Kxoe (Namibia)	tlgae [5083], la [5083]
Lovedu (Southern Africa)	modudu [1171]
Lozi (Namibia)	bomusanza [5083], namusanza [5083], nzalo [5083] [5087], nzalu [5083] [5087], sipupa [5083] [5087] [5121]
Luhya (Kenya)	lushindu [2719]
Luhya (Marachi) (Kenya)	lushindu [2719]
Luo (Kenya)	othith [2719]
Maa (Kenya)	oltukai [2719]
Malakote (Kenya)	gedo [2719]
Manding-Mandinka (Gambia)	kere [2816], koroso [2816], kurusow-o [2816]
Manding-Mandinka (Guinea-Bissau)	bam-? [2816]
Manding-Soce (Senegal)	koroso [2816], korosso [2816]
Mandinka (Senegal)	kurusowo [2485], bamo [2816], krurso [2816]
Mandyak (Guinea- Bissau)	bedjaca [2816]
Mandyak (Senegal)	bedjaka [2816], bu diaka [2816], bu diakadi [2816]
Maninka (Senegal)	koroso [2816], kortolingo [2816]
Mankanya (Senegal)	be diak [2816]
Mbukushu (Namibia) [plural]	makindhu [5087]
Mbukushu (Namibia) [singular]	dikindhu [5087]
Mende (Sierra Leone)	keli [2816], keri [2816], kundi [2816]
Mpondo	idama [1340]
Ndut (Senegal)	kis [2816]
Ninzam (Nigeria)	ine [2816]
Non (Senegal)	bisao [2816], bisau [2816], isao [2816], ndun [2816]
Northern Sotho (Southern Africa)	mopalamo [5097]
Nupe (Nigeria)	ef? [2816]
Orma (Kenya)	konchor [2719]
Oshikwanyama (Namibia)	omulunga wangolo [5083]
Pepel (Guinea-Bissau)	medjaca [2816]
Portuguese	palmeira-da-tara [2816]
Portuguese (Mozambique)	Tamareira cafreal

Ronga	mikondya [1340]
Rukwangali (Namibia)	sikereva [5083] [5121]
Rumanyo (Namibia)	makereva [5083], shikerewa [5083]
Samburu (Kenya)	lekawai [2719]
Sanya (Kenya)	itkindu [2719], gonyora [2719]
SeTswana (Botswana)	moxinxa-mokulane [5093], nlala [5093], thikerva [5093], tsaro [5093]
Serer (Senegal)	bisao [2816], isao [2816], ser [2816], sing [2816], singi [2816]
Shambyu (Namibia)	makereva [5087]
Shangaan (Southern Africa)	ntshindo [1171], tchinzo [1171]
Somali (Kenya)	maydho [2719]
Somali (Kenya, Tana River)	alol [2719], maydho [2719]
Swahili (Kenya)	mkindu [2719]
Swati (Southern Africa)	isundu [1171], lilala [1171]
Swati (Southern Africa) [wine]	njaman [1171]
Taita (Kenya)	kigangachi [2719]
Taveta (Kenya)	mhongana [2719]
Tem (Togo)	kplafulagna [2816], palau?manga [2816]
Temne (Sierra Leone)	an-tanka [2816]
Teso (Kenya)	emusogot [2719]
Tharaka (Kenya)	mukiindu [2719]
Thimbukushu (Namibia)	thikindu [5083]
Thimbukushu (Namibia) [fruit]	dikindhu [5083]
Thonga (Southern Africa)	amasundu [1171], ankindu [2795], musundu [1171], quinzoo [1171], sundu [1171]
Tiv (Nigeria)	wure [2816]
Tswana (Southern Africa)	mubu [1171], mupudu [1171], muqwana [1171]
Turkana (Kenya)	nakadoki [2719]
Twi (Ghana)	nkeresia [2816]
Venda (Southern Africa)	mutshema [1171], mutshevho [1171]
Vhe (Togo)	ayede [2816]
Wolof (Gambia)	chob [2816], koroso [2816]
Wolof (Senegal)	tiob [2816], tior [2816], tiortior [2816]
Wolof (Senegal) [frond]	sorsor [2816]
Wolof (Senegal) [fruits]	siba [2816], s?ba [2816]
Wolof (Senegal) [leaf]	sorsor [2816]
Xhosa	idama [1340]
Xhosa (Southern Africa)	idama [1171], isundu [1171] [2795]
Yoruba (Nigeria)	elekikobi [2816], ?k?n [2816]
Yoruba-Nago (Togo)	itschile [2816]
Zulu (Southern Africa)	iSundu [5097], isundu [1171] [2795]

Partial distribution

Plant origin	Continent	Region	Botanical country
Native	Africa	East Tropical Africa	Kenya [1362] [3037], Tanzania [1362] [3034], Uganda [1362] [3035]
		Northern Africa	
		South Tropical Africa	Mozambique [1279] [5480], Zambia [5481], Zimbabwe [1279] [2988] [5419]
		Southern Africa	Botswana [1279] [5093] [5104], Cape Province [5104], Namibia [1279] [5104] [5121] [5327], Natal [3007] [3008] [3009] [5104], Swaziland [5104] [5452], Transvaal [5104]
		West Tropical Africa	Ghana [2403], Senegal [2403]
		Western Indian Ocean	Madagascar [3033] [3038]
Assumed Native	Africa	West-Central Tropical Africa	Cameroon [3032]
Status Unknown	Africa	West Tropical Africa	Ivory Coast [3036], The Gambia [2485]
	Asia-Temperate	Arabian Peninsula	

ISO countries: South Africa [1279] [3007] [3008] [3009] [5104]

Descriptors

Category	Descriptors and states
DESCRIPTION	Evergreen [1171] [5097] [5121]; Single Stemmed [5097] [5121]; Can be Coppiced [3038]; Tussock Forming/Tufted/Caespitose [2401] [2719]; Erect [2719] [3045]; Multistemmed [2719] [3037] [3038] [5097] [5121]; Dioecious [1171] [1279] [2795] [2988] [3045] [5082]; Moderate Growth Rate [2403]; Terrestrial; Shrub [5104]; Slow Growth Rate [2988]; Tree [1171] [2719] [5104]; Perennial [5104]; Thorny/Spiny - leaves [1279] [2401] [2402] [3037] [3045]; Plant Height 1-12 m [5097] [5104]
CLIMATE	Not Frost Tolerant [1378]; Frost Tolerant [5097]
SOILS	Sometimes Waterlogged (frequency unknown) [2485] [3035]; Boulders/Rocky [1362]; Saline [189]; Poorly Drained [316]; Sandy [1171]
HABITAT	Coastal Regions [2401]; Lowland [1362]; Forest [1362] [2719] [3035] [5121]; Non-Coastal Regions [2401]; Woodland [316] [3037]; Montane [1362]; Grassland/Forb-Land [1279] [2968] [3037] [5097]; Cliffs [1362]; Hillsides/Slopes [1362] [2719]; Gullies [2719]; Crevices/Fissures/Fractures [2395]; Termitaria [1279] [5082]; Watercourses [316] [1279] [1362] [2719] [3037] [5082] [5097]; Permanent Watercourses [5097] [5121]; Other Topographical Sites [2485] [3035]; Floodplains [5097] [5121]; Vlei/Dambo/Seasonally Flooded Grassland [982] [1362] [2485] [3035]; Altitude 0-2600 m a.s.l. [2719]
PHYSIOLOGY	Light Demanding [5097]; Semi-Shade Tolerant [5097]; Drought Tolerant [5097]
WOOD	Wood Resistant to Termites [2403]

PROPERTIES

PRODUCTION AND VALUE Traded Within a Country [2795]

FURTHER DATA SOURCES Botanical Illustration [1171] [5093] [5121]; Additional References [2816] [5319] [5680]; Regional Distribution Map [3045] [5082]; Botanical Photograph [2795] [3045]; Databases [5123] [5327]; Habit Illustration/Photograph [3045] [5082] [5088] [5376]; Use Related Illustration/Photograph [2795] [5088]; Grid Map [5093] [5121] [5123]

SEPASAL DATASHEET STATUS All Data Transferred from SEPASAL Paper Files; Comprehensively Researched; Nomenclature Checked

CHEMICAL ANALYSES Biological Activity - infructescences [2795] [2816]; Unspecified Carbohydrates - infructescences [2719] [5118]; Unspecified Sugars - infructescences [2719] [5118]; Tannins - 'roots' [1340]; Nutritional Analyses - infructescences [5118]; Nutritional Analyses - sap/leaf sap [3009]; Proteins - infructescences [5118]; Other Analyses - other parts [3033]; Polysaccharides - 'roots' [1340]; Vitamin B7/Vit. P-P (nicotinamide, nicotinic acid) - sap/leaf sap [3009]; Vitamin C (ascorbic acid) - sap/leaf sap [3009]

Uses

Major use	Use group	Specific uses
FOOD	Unspecified Parts	
	Stems	other stem parts, vegetables, famine food [1188]; other stem parts, vegetables [316] [1244] [3037]
	Leaves	young leaves [1171]
	Infructescences	fruits, raw [1171] [1279] [1304] [2485] [2719] [2968] [2988] [3035] [3036] [3037]; fruits, other preparations [1304] [3037]; fruits [316] [1188] [1340] [2485] [2795] [2988] [3035] [3036] [3037] [3045] [5097] [5118] [5121]; fruit pulp [1340] [2403] [2485]; fruit juice [1171]
	Seeds	kernels, cereal/starch based preparations [2816]
	Exudates	sap, alcoholic beverages [316] [1171] [1279] [1340] [2403] [2982] [2988] [3007] [3008] [3009] [3032] [3037] [5082] [5097] [5121]; sap, wines [1331] [2401] [2403] [2719] [2795] [2816] [2982] [2988] [3007] [3008] [3009] [3032] [3037] [3045] [5097]; sap, beverages [1340] [2403] [2982] [2988] [3007] [3008] [3009] [3032] [3037]; gum, children's snack food [5097]; sap, beers [1340]
ANIMAL FOOD	Fertile Plant Parts	fruits, primates [3037] [5097]; fruits, birds [5097]; fruits, game mammals; fruits, primates
	Aerial Parts	leaves, game mammals [3045] [5097]
INVERTEBRATE FOOD		'roots', other invertebrates [3037]
MATERIALS	Fibres	leaves, baskets [2403] [2719] [2795] [3035] [3037] [3045] [5088] [5118] [5121]; leaves, mats [1331] [2403] [2719] [2795] [3037] [5097]; leaves, plaiting, mats [2401] [3037]; leaves, plaiting, baskets [2401] [3035] [3037]; leaves, hats [1331] [2403] [2719] [2816] [5097]; leaves, ropes [1331] [2403] [2816] [3035] [3037]; leaves, cord/string/twine [1331] [5088] [5118]; leaves, bags [2403]; leaves, sieves [2403]; leaves, clothing [2403] [2719] [2816]; leaves, other fibrous materials, fences [3035]; leaves, other fibrous materials, brushes/brooms [2719] [3035] [3037]; leaves, dolls [3037]; leaves, fans [3037]; leaves, ornaments [3037]; other leaf parts,

		other fibrous materials, fish traps [3037]; leaves, thatch, roofs [2719]; stems, hats [2816]; mats [2816]; packing/stuffing/filling [2816]; leaves, personal items [2719]; other leaf parts, huts [2795]; other leaf parts, fishing equipment [2795] [3045]; leaves [2795]; leaves, musical instruments [5088]; leaves, bracelets [5088]; stems, brushes/brooms [2795] [3045]; other leaf parts, constructions [3037]; other leaf parts, buildings [3037]; other leaf parts, cord/string/twine [3037]; other leaf parts, doors [3037]; other leaf parts, thatch [3037]; other leaf parts, cleansers [2719]; leaves, thatching spars [2719]; leaves, brushes/brooms [2719]
	Wood	stems, beams/scantlings, roofs [2403] [3035]; roofs [2403]; beds [2403]; stems, wood, beehives [3034]; stems, constructions [3035] [3037]; stems, poles (from wood), buildings [3037]; stems; stems, bridges [2816]; stems, piers/jetties [2816]; stems, traps/snares [2816]; stems, poles (from wood), houses [2816]; stems, joinery [2816]; stems, poles (from wood), huts [2816]; stems, poles (from wood), roofs [2816]; stems, poles (from wood), bed frames [2816]; wood, membranophones [2403] [2816]
	Tannins/Dyestuffs	roots, dyes, brown [1331] [2719] [2816]; fruits, stains [2816]
	Other Materials/Chemicals	inflorescences, brushes/brooms [5097]
FUELS	Unspecified Fuels	stems, other uses of fuel, other fuel qualities [3035]
	Fuelwood	
SOCIAL USES	Unspecified Social Uses	
	'Religious' Uses	leaves, ritual/religion/magic [2719] [2816]; leaves [2719]; roots, ritual/religion/magic [2795]
	Miscellaneous Social Uses	
MEDICINES	Unspecified Medicinal Disorders	other leaf parts [1340]; roots [1340]; fruits [2816]
	Digestive System Disorders	roots, humans, intestine, diarrhoea, oral ingestion [2816]; roots, humans, colic, oral ingestion [2816]; roots, humans, intestine, diarrhoea, oral ingestion [2816]
	Genitourinary System Disorders	roots, humans, oral ingestion [2816]
	Ill-defined Symptoms	other stem parts, humans, malaise/fatigue, baths [2816]
	Inflammation	roots, humans, pleura, inflammation [2816]
	Nervous System Disorders	
	Pain	roots, humans, stomach, anodyne, oral ingestion [2816]
	Respiratory System Disorders	
	Sensory System Disorders	leaflets, humans, eyes [2816]
ENVIRONMENTAL USES	Erosion Control	brushwood, dunes [2816]
	Shade/Shelter	shelterbelts [2255]
	Ornamentals	live plant in situ, gardens [1279] [2403] [2988] [5082] [5097] [5121]; live plant in situ, roads/streets/highways [2403] [5097]; live plant in situ, towns [2719]
	Boundaries/Barriers/Supports	brushwood, homesteads [2816]
	Agroforestry	other agroforestry uses [3037]
GENE SOURCES		other beneficial genetic traits [2816]

Picture

None recorded

Notes

NOMENCLATURE/TAXONOMY

P. reclinata is the 'central' type for the African populations which display a range of intermediate forms blending into each other. *P. reclinata* is the specific name that can be applied continentally for all the forms [2968] .

Related to the cultivated date palm of North Africa, *P. dactylifera* L [2719] .

Name derivation:

Phoenix is the Greek name for the date palm, and *reclinata* is Latin for 'bending down', referring to the leaves [5097] .

DISTRIBUTION

Southern Africa:

Occurs on sandy soils near water from the eastern Cape Province and Transkei to Natal and the eastern and north-eastern Transvaal, widespread in the higher rainfall areas [1171] .

Southern Africa:

Subtropical and tropical regions of southern Africa, from the eastern Cape northwards to Mozambique, Zimbabwe, northern Botswana, northern Namibia, Angola, Zambia and Malawi [2795] .

Zambia:

Lusaka Province, Southern Province [5481] .

Zimbabwe:

Widespread [5419] .

South Africa:

The 156,000 ha of palmveld extending southwards from the Mozambique border along the Maputulan coastal plain in Natal, South Africa is dominated by *Hyphaene coriacea* Gaertn. and *Phoenix reclinata* Jacq. [3008] .

Kenya:

In the Tana River District of north-eastern Kenya, *P. reclinata* is abundant. In the Tana River National Primate Reserve in the Mchelelo forest, *P. reclinata* is the most common species occurring at densities of 194 individuals/ha [3037] .

Madagascar:

It grows in north-west, north-east and north Madagascar, and around the maritime fringe of tropical and sub-tropical Africa. In Madagascar, its status as a native is uncertain [3038] .

Kenya:

Widely distributed, e.g. Loita forest (Narok), Nandi Hills (Nandi) and cultivated in towns .

Kenya, Southern Africa:

Widely distributed in Kenya and southern Africa [2719] .

Kenya:

May be locally common [2719] .

Africa:

From Egypt in the north to the Eastern Cape in the south [5097] .

Botswana:

North [5093] .

Africa:

Widely distributed in Africa [1360] .

Mozambique:

Inhambane, Manica, Maputo and Tete Provinces [5480] .

Namibia:

Common along all the rivers in eastern Caprivi; uncommon to locally abundant on the eastern banks of the Okavango River; uncommon on the western banks of the Okavango [5121] .

ORIGIN/DOMESTICATION

The first date palms in the northern Cape and southern Namibia are said to have originated from pips discarded by English and German soldiers [2795] .

This species is believed to come originally from along the Zambesi river system, but today it is widely planted in gardens in Zimbabwe [2988] .

Presumed to be native to west Asia from where it spread to North Africa and the Nile Valley several millennia ago [2719] .

RARITY/CONSERVATION

South Africa:

Protected [5097] .

Uganda:

Swamp forests with *P. reclinata* are being cleared. The economic value of the swamp forest plant resources (*Calamus deerratus* G.Mann & H.Wendl. and *P. reclinata* Jacq.) is currently very low and not commensurate with the current market values of their products [3035] .

Kenya:

Regulated harvesting outside protected areas and cessation of harvesting within protected areas are necessary to provide benefits to both humans and the Tana River crested mangabey [3037] .

Madagascar:

Not Threatened [3038] .

Kenya:

May be locally common [2719] .

Namibia:

Threatened by habitat destruction along river banks, especially along the Okavango [5121] .

BOTANICAL DESCRIPTION

See Flora of Tropical East Africa [1362] .

DESCRIPTION

Stems:

Bark is absent, but stem has prominent markings of the shed leaves [5097] .

Habit:

In typical form it is a freely suckering palm producing stocky stems 3-4 m high. Some individuals exhibit decumbent trunks, giving rise to the name of this form [2968] .

Leaves:

The leaves clearly arch from inception and are shiny green. It is similar in structure to the date palm, but the distinctly arching habit and green shiny appearance are markedly different from date palm [2968] .

Stems:

The trunk is slender and typically covered in the fibrous remains of leaf bases and hessian-like felting around the lower petiole. Only taller specimens have smoother stems with a regular spiral pattern of leaf scars in the lower parts [2968] .

Inflorescences:

The inflorescence follows the general pattern for the genus, with the flat strap-like stalk emerging from the boat-like prophyll. The male is a shorter structure that scarcely exceeds the split enveloping prophyll in length, with a mass of thin, somewhat contorted rachillae bearing the flowers held more or less upwards in line with the stalk. The female tends to be more robust with the stalk elongating to twice the length of the prophyll or more. The branchlets tend to be thicker and fewer than in the male and are held and tend to bend slightly downwards at the base, and then arch outwards and upwards. The female inflorescence tends to be held stiffly outwards from the stem, with a less pendulous habit than found elsewhere in the genus [2968] .

Fruits:

Like immature dates, very variable but typically compressed and with a stubby rather than elongated stone. The epicarp is usually tough and the inner flesh fibrous or near absent [2968] .

Leaves:

Up to 2.5 m long, pinnate with proximal leaflets modified into spines, and with induplicate venation [3037] .

Fruits:

Small fleshy drupes, varying in colour from pale yellow to orange or dull red, depending on the ripeness. The mesocarp is 1-2 mm thick, moist and sweet when ripe [3037] .

Height:

4 - 6 m high, rarely 10 m [2719] .

Lifeform:

A tree palm [2719] .

Habit:

Solitary or in tufts [2719] .

Leaves:

Pinnate, pinnae sharply pointed [2719] .

Flowers:

Cream, in much-branched panicles [2719] .

Fruits:

Oval, to 2.5 cm long, yellow to orange, ripening almost to dark red [2719] [2816] .

DBH:

Up to 30 cm [3045] .

Stems:

Often several stems from the base, leaning but curving upwards at the apex [1279] .

Flowers:

In bunches [3045] .

Leaves:

Pinnate, 3-4 m long, the lower ones being reduced to spines [1279] [3045] .

Fruits:

Oval, 1-1.5 cm, green but becoming bright orange [1279] .

Fruits:

The stone is big, often being about 89 - 90 % of the fruit [1171] .

Height:

1 - 7.5 m [5104] .

Height:

3 - 6 m, sometimes reaching 10 m [1171] [1279] [5082] .

Habit:

Can grow in isolation or in communities [316] .

Height:

Up to 10 m [3045] .

Height:

Up to 12 m [5097] .

Height:

Up to 8 m in Namibia, occasionally higher in eastern Caprivi [5121] .

Habit:

Forms caespitose thickets protected by spinous leaflets of leaf bases [2401] .

Armature:

Spines formed from modified pinnae [2402] .

IDENTIFICATION

This genus is easily recognised as its leaves are pinnate and induplicate (V-shaped in cross section). Other pinnate leaved palms are reduplicate (Λ-shaped in cross section) [2968] .

FOOD - STEMS

Thonga and Xhosa people sometimes eat the base of the stem [1171] .

Other stem parts, vegetables:

The palm is topped and the heart cut out and eaten raw or boiled [3037] .

Other stem parts, vegetables:

The terminal cabbage is cooked and eaten like a vegetable. In Gabon, it is said to be slightly bitter [2816] .

Other stem parts, vegetables, famine food:

Buds used as supplementary and/or emergency wild food in West Africa (Irvine, 1952 cited in Grivetti, 1981)

[1188] .

Kernels of stems and stem apex are sometimes eaten [3045] .

Other stem parts, vegetables:

Terminal bud edible [316] [1244] .

FOOD - LEAVES

Young leaves:

Young leaves are eaten in the Ubombo area, by Swazi people [1171] .

FOOD - INFRUCTESCENCES

Thonga and Xhosa people remove the fruit stones, crush the fruits and dissolve them in a little water. This results in a liquid which is served with other uncooked food [1171] .

Fruits:

Occasional specimens do produce a limited date-like flesh and some are worth eating [2968] .

Fruits:

The fruits are eaten like dates [2485] .

Fruits, raw, other preparations:

In Kenya, the rachillae of unripe fruits is cut, dipped in water, and hung out until the fruits ripens. They are eaten raw, or the fruits are squeezed in a cloth to extract the sweet mesocarp which is used in baking [3037] .

Fruits:

The mesocarp is sweet and is eaten, though inferior to the true date (*Phoenix dactylifera* L.) and is little sought after [2816] .

Fruits:

The date has a very high sugar and carbohydrate content and is an important food for desert communities of Arabia and North Africa [2719] .

Fruits, raw:

The Kwanyama Ovambos eat the fruits raw or preserved by drying [1304] .

Fruits, raw:

Sweet when ripe [316] [1279] .

Fruits, raw:

Thonga, Shangaan and Xhosa people eat the fruits when soft and quite ripe direct from the palm [1171] .

Fruits:

In Caprivi/Kavango, Namibia, fresh fruit is eaten between February and April, serving as a good source of protein, carbohydrates and calcium [5118] .

Fruits:

Used in West Nile and Madi Districts, Uganda (Tallantire and Goode, 1975 cited in Grivetti, 1981) [1188] .

Fruits:

Used by Masai and Kipsig of Kenya (Glover et al., 1966 cited in Grivetti, 1981) [1188] .

Fruits:

Used in Lushoto District, Tanzania (Fleuret, 1979 cited in Grivetti, 1981) [1188] .

Fruits:

Much sought after by indigenous people of Mozambique [316] .

FOOD - SEEDS

Kernels, cereal/starch based preparations:

On Bonthe Island, Sierra Leone, the kernels are parched and ground to a flour [2816] .

FOOD - EXUDATES

Sap, alcoholic beverages, beverages:

Both fermented and unfermented drinks are made from the sap [1340] .

Sap, alcoholic beverages:

Palm wine or beer is prepared from sap by Swazi people in the Ubombo area, Shangaan people and Zulu people [1171] .

Sap, alcoholic beverages:

Swazi in the Hluti district trim off the leaves during summer and collect the liquid which oozes from the stem. This is allowed to ferment to provide a popular drink [1171] .

Sap, wines:

Palm sap, tapped from *P. reclinata* and fermented by naturally occurring yeasts, produces an alcoholic beverage sold in the Ingwavuma district, Natal, South Africa [3007] [3009] .

Sap, wines:

The palm is cut at the top, covered and a gourd is hung underneath the cut to collect the oozing exudate. The sap ferments to produce palm wine [3037] .

Sap, wines:

The stem is tapped for sap which quickly ferments into wine. For this purpose an incision is made near the base. The sap is obtained with minimal effort since climbing is unnecessary. The wine is said to be an inferior beverage compared to that from *Cocos* and *Elaeis* [2816] .

Sap, beers:

The Tonga make an intoxicating beer by fermenting the sap (Stevenson-Hamilton 1929; Almeida 1930) [1340] .

Sap, beverages:

Unfermented sap is harmless and tastes like flat ginger beer (Stevenson-Hamilton 1929) [1340] .

Saps, wines:

A type of wine (muyence) may be tapped from the palm, though not a common practice now in Tharaka [2719] .

Sap, alcoholic beverages:

Tapped at the spadix just before the flowering season (when there is an increased flow of sap) and used to prepare an intoxicating drink [1279] .

Gum, children's snack food:

The roots produce an edible gum eaten mainly by children [5097] .

Sap, alcoholic beverages:

The sap is fermented into a refreshing drink much sought after by indigenous people [316] .

ANIMAL FOOD - FERTILE PLANT PARTS

Fruits, primates:

Along the Tana River in north-eastern Kenya, *P. reclinata* fruits are important in the diet of the endangered Tana River crested mangabey. The Tana mangabey feeds heavily on the fruits and plays a role in seed dispersal [3037] .

Fruits, primates, birds, game mammals:

The ripe fruit are eaten by baboons, vervet monkeys and birds (grey louries, mousebirds, black-collared barbets, black-eyed bulbuls). The dropped fruits are eaten by bushpigs, nyala and bushbuck .

ANIMAL FOOD - AERIAL PARTS

Leaves, game mammals:

Leaves are eaten by elephants [3045] [5097] .

INVERTEBRATE FOOD

Insects, larvae:

In Kenya, the leaf litter at the base of the palm is dug up to extract the large wood grubs from the roots which are used as a fishing bait [3037] .

MATERIALS

Wood properties:

Very fibrous, pale brown with darker flecks and light. Air dry 590kg/m³ [5097] .

MATERIALS - FIBRES

Other leaf parts, huts:

The midribs are used in hut construction [2795] .

Leaves, clothing:

Used to make waistbands [2403] .

Stems, brooms:

Hand brooms are made by pounding the end of a suitable length of stem so that the fibres separate [2795] .

Other leaf parts, rachis, buildings, constructions:

In Kenya, leaflets are removed from the rachis, which is then mounted horizontally between poles as a wattle. Mud is then applied [3037] .

Other leaf parts, constructions, buildings, cord/string/twine, doors, thatch:

In Kenya, the leaf rachis is used to bind together poles in construction. The rachis is also used for doorways and as a thatching material [3037] .

Leaves, baskets, woven products, fish traps, brooms:

In Kenya, leaflets are used to make oblong funnel fish traps. The leaves are also used for basketry, matting, brooms, fans and for making ornaments and dolls [3037] .

Leaves, stems, hats:

The large Bida hats (Hausa: malafa) are commonly made from strips of young shoots as well as the mature leaves, plaited into a braid 2-3 cm wide and stitched together with fibre of *Raphia* over a wooden block [2816] .

Mats:

Sleeping mats made with strips dyed black, from yellow and red form a popular article for trade. This industry has been passed on to other regions by Hausa traders [2816] .

Packing/stuffing/filling:

In Guinea, Fula make mats which are used for packing bananas [2816] .

Leaves, ropes:

Strong rope is made for tying up canoes and for casting fish-nets [2816] .

Leaves, clothing:

In Senegal, loin clothes are made from the leaves and are used by young initiates at circumcision ceremonies [2816] .

Other leaf parts, cleansers:

The leaf rachis is used for cleaning the inside of milk gourds (Maasai, Narok) and Kipsigis, Kenya. Charcoal is used as the scouring agent [2719] .

Leaves, clothing:

The Tharaka (Kenya) make a skirt (manyugi) from the leaves for use during circumcision ceremonies [2719] .

Leaves, personal items:

Leaves are woven by the Tharaka (Kenya) and used for adorning women during the irua ceremony [2719] .

Leaves, musical instruments:

The Jul'hansi of Namibia use the leaves to make strings for a traditional musical instrument [5088] .

Leaves:

Widely used in southern Africa for weaving [2795] .

Leaves, baskets, mats, hats, ropes, string:

Fibres are extracted from the young, unexpanded leaves for these products [1331] .

Other leaf parts, baskets:

The midrib of mature leaves is used for basket making [1331] .

Other leaf parts, fishing equipment:

The midribs are used for making fish kraals [2795] [3045] .

MATERIALS - WOOD

Stems, beehives:

In Tanzania, log hives made from *P. reclinata* are made from the Magugu/Minjugu area where stands of this palm are numerous [3034] .

Stems, buildings:

Trunks are used in the construction of traditional political or community buildings [3037] .

Stems, bridges, piers/jetties:

In Gabon, the wood is used for making single-span bridges and riverside landing stages [2816] .

Stems, traps/snares:

In Gabon, the wood is used for making animal traps [2816] .

Stems, poles (from wood), houses:

In Gabon, used in houses [2816] .

Stems, joinery:

Used in Ethiopia in carpentry [2816] .

Stems, poles (from wood), huts, roofs:

Used in southern Nigeria for hut posts and roof frames [2816] .

Stems, poles (from wood), bed frames:

Used in southern Nigeria for making bedsteads [2816] .

Membranophones:

In Ghana, a sort of drum (Ga: mi) is made from the wood [2816] .

MATERIALS - TANNINS/DYESTUFFS

Dyes, brown, roots:

In Zanzibar, the liquid resulting from pounding the roots in water is used for dyeing to obtain a brown colour [2816] .

Fruits, stains:

The fruit is used to stain teeth [2816] .

Dyes, brown, roots:

The Kikuyu (Kenya) make a brown dye from the roots [2719] .

MATERIALS - OTHER MATERIALS/CHEMICALS

Inflorescences, brooms:

The dried inflorescences are used as brooms to sweep areas around dwellings [5097] .

SOCIAL USES - 'RELIGIOUS' USES

Roots, ritual/religion/magic:

The roots, used in a mixture of other plants, are taken orally by apprentice healers to facilitate learning the healing arts [2795] .

Leaves, ritual/religion/magic:

In Gabon, Christian missionaries use the leaves during Palm Sunday processions [2816] .

Leaves, ritual/religion/magic:

Leaves are weaved by the Tharaka (Kenya) and used for adorning women during the irua ceremony [2719] .

SOCIAL USES - MISCELLANEOUS SOCIAL USES

Leaves, ritual/religion/magic:

In Senegal, loin clothes are made from the leaves and are used by young initiates at circumcision ceremonies [2816] .

MEDICINES - UNSPECIFIED MEDICINAL DISORDERS

Other leaf parts, roots:

The roots and thorns are used in traditional Zulu medicine [1340] .

Fruits:

The fruit has unspecified medicinal uses (Dalziel, 1937 cited in Burkill, 1997) [2816] .

MEDICINES - DIGESTIVE SYSTEM DISORDERS

Roots, humans, diarrhoea, intestine, oral ingestion:

The root macerate is astringent and is taken in west Senegal for diarrhoea [2816] .

Roots, humans, colic, oral ingestion:

The root macerate is astringent and is taken in west Senegal for colic [2816] .

MEDICINES - GENITOURINARY SYSTEM DISORDERS

Roots, humans, oral ingestion:

In Sudan, the root is used (? as an oestrogenic stimulant) to improve sexual satisfaction [2816] .

MEDICINES - ILL-DEFINED SYMPTOMS

Other stem parts, humans, malaise/fatigue, baths:

A decoction of the growing point is put into baths and draughts by the Basari and Tenda of Senegal who favour this to counteract fatigue before and after an action requiring physical effort [2816] .

MEDICINES - INFLAMMATION

Roots, humans, inflammation, pleura:

In Ethiopia, the root is put into a treatment for pleurisy [2816] .

MEDICINES - PAIN

Roots, humans, anodyne, stomach, oral ingestion:

The root macerate is astringent and is taken in west Senegal for stomach ache [2816] .

MEDICINES - SENSORY SYSTEM DISORDERS

Leaflets, humans, eyes:

In a medico-magical connotation, a preparation made from the base of the leaflets is used in Senegal for eye troubles [2816] .

ENVIRONMENTAL USES

Agroforestry, other agroforestry uses:

In Kenya, the leaves of *P. reclinata* are tied around the lower trunk of mango trees to protect healthy trees and to cure diseased ones [3037] .

ENVIRONMENTAL USES - EROSION CONTROL

Brushwood, dunes:

On the shifting sand dunes at Cap Vert, near Dakar, Senegal, attempts have been made to anchor them to stop encroachment on cultivated land by implanting bundles of leaves [2816] .

ENVIRONMENTAL USES - SHADE/SHELTER

Shelterbelts:

Used as windbreaks [2255] .

ENVIRONMENTAL USES - ORNAMENTALS

Live plant in situ, towns:

Cultivated in towns as an ornamental [2719] .

Live plant in situ, gardens:

Makes an attractive, evergreen garden plant. Has horticultural potential [5121] .

ENVIRONMENTAL USES - BOUNDARIES/BARRIERS/SUPPORTS

Brushwood, homesteads:

The spiny petioles used to be fixed into the ground around villages in Gabon for defence [2816] .

GENE SOURCES

Other beneficial genetic traits:

Pollen from *Phoenix reclinata*, and other *Phoenix* species, is effective in pollinating the date palm (*P. dactylifera* L.) which has become an important minor crop in U.S.A. In so doing, it alters the ripening season of the crop, a

potentially significant factor for cultivation under irrigation [2816] .

USES NOTES - MISCELLANEOUS

Men are the main palm wine tappers in South Africa although the number of women who now tap palms is increasing. In south-eastern Africa, *P. reclinata* provides a commonly used resource for the local Tembe-Thonga people who also use the area for cattle grazing, subsistence cultivation and gathering of wild fruits and traditional medicines [3007] .

In Uganda, the stems, roots, leaves and fruits of *P. reclinata* are used for crafts, medicine, construction, ropes, woodfuel and food supplement [3035] .

P. reclinata is a very useful and important plant species for the people of the lower Tana River. Although direct economic benefits are limited to the sale of mats and baskets, the indirect benefits of free construction material and dietary supplements are numerous [3037] .

NUTRITIONAL VALUE

Sap, wines:

It is a valuable source of nicotinic acid, vitamin C and potassium. These nutrients are important supplements for the starchy diet of rural people in Natal, South Africa [3009] .

BIOLOGICAL ACTIVITY

Infructescences:

Ethanol extracts of the fruits are reported to show anti-cancer properties (Kerharo and Adam, 1964 cited in Burkill, 1997) [2816] .

Fruits:

The fruit of the real date palm has GABA activity [2795] .

CHEMICAL ANALYSES - MISCELLANEOUS

Roots, polysaccharides:

Gum [1340] .

TEMPERATURE

Seasonal variation 1.7-40.6°C [614] .

ALTITUDE

Lowlands, often along watercourses and on swampy sites, but up to 3000 m on open rocky hillsides [1362] .

0-2,600 m [2719] .

0 - 950 m [5104] .

TOPOGRAPHY/SITES

Southern Africa:

Always occurs near water and therefore found along and in streambeds, sometimes with the roots in flowing water or growing in swamps. Occasionally in grassland where the water table is high [5097] .

Southern Africa:

River banks in low-lying grassland, and in the Okavango Delta where they are often associated with termite mounds [5082] .

Found on the margins of swamp marshes, especially on north banks [2485] .

Found in swamp forest edges and sometimes in seasonal wetland systems [3035] .

In the Tana River District of north-eastern Kenya, *P. reclinata* occurs primarily near river banks and in narrow belts separating riverine forests from woodlands and savannas [3037] .

In the lowlands, tending to grow along watercourses and in swampy areas; in high rainfall areas and in the

mountains, growing also on open rocky hillsides, cliffs and even rain forest [1362] .

Kenya:

In Loita forest; Narok, Nandi Hills; Nandi. Naturally growing in hillside gulleys, at forest edges and along watercourses [2719] .

Swampy areas [982] .

Namibia:

On river banks in areas of riverine forest, as well as on floodplains in eastern Caprivi [5121] .

VEGETATION

Occurrence in rain forest only where canopy is sparse [1362] .

Nigeria:

Grows with wild banana near Jos, and also with cactoid euphorbias, small baobabs, aloes, geophytic ferns [2395] .

ENVIRONMENTAL FACTORS - MISCELLANEOUS

Prefers full sun but also thrives in light shade. Drought tolerant [5097] .

FLOWERING/FRUITING/SEED SET

Flowering, Namibia:

September and December [5121] .

Flowering, southern Africa:

August to November [5097] .

Flowering, southern Africa:

August to October [5082] .

Fruiting, Namibia:

November to March [5121] .

Fruiting, southern Africa:

February to April [5082] .

Fruiting, Mozambique:

October to March [316] .

DISPERSAL

Along the Tana River in north-eastern Kenya, the Tana mangabey plays a major role in seed dispersal [3037] .

GERMINATION

Takes 25 days in Calcutta [2335] .

VEGETATIVE GROWTH

Growth rate:

In Ingwavuma, Natal, South Africa, it is estimated that it takes 6 to 8 years for a new coppice shoot to reach a suitable size for tapping [3008] .

Growth rate:

Normally, growth is moderately slow, but it can be speeded up by the use of fertilisers. If suckers are trimmed and the plant is watered throughout the year it can grow to a height of 5 m in three to four years [2988] .

Growth rate:

Relatively fast if plants receive enough water [5097] .

CYTOLOGY

x = 18 (14) [5150] .

n=18 [1730] .

PHYSIOLOGICAL TOLERANCES

Frost tolerance:

Can withstand light frost but young plants must be protected against cold wind and frost for the first 2 years [5097] .

Frost tolerance:

Severely damaged by frost, with burning of horizontal leaves, but may recover [1378] .

ASSOCIATED BIRDS

Birds eat the fruit flesh [1340] .

ASSOCIATED INSECTS

Lepidoptera:

The larvae of the palm-tree nightfighter (*Zophopetes dysmephila*) butterfly, one of the skippers, feed on the leaves [3045] [5097] .

PHYSIOLOGICAL DISEASES

Subject to lethal yellowing disease [2255] .

CULTIVATION

If not thinned, the palms form a thick clump [2719] .

Kenya:

Grown near water in arid areas for its dates [2719] .

Cultivated along the Turkwel River near Lodwar, Kenya [2719] .

PROPAGATION FROM SEED

In Zimbabwe, in January - February, the seeds germinate on the surface of the soil. Once one leaf has been produced, the seed will have deeply rooted. The seedling can be carefully dug out and replanted in a growing bag or planted directly in the soil. Once established it suckers freely [2988] .

Can be propagated from seed [2719] .

Fresh, clean seed germinates easily. Sow the seeds in flat seedling trays filled with a mixture of river sand and compost (5 parts to 1) and cover the seeds lightly, or they can be pressed into the medium with part of the seed still sticking out. Keep moist. The first seedlings should appear after 25 - 35 days. As soon as the first leaf is 50 mm long it can be transplanted into a bag filled with a mixture of half sand, half compost. Plant out into the open after one season in the bag [5097] .

Grows easily from seed and transplants easily [1279] [5082] [5121] .

PROPAGATION - VEGETATIVE

Can be propagated from offshoots taken off adult plants [2719] [5097] .

'CROP' MANAGEMENT

Sap, wines:

Although land in Ingwavuma, south-eastern Africa, is communally owned, tapping rights given to individuals are respected by other tappers. Tapping area boundaries are demarcated by natural markers (trees, bush clumps) and paths. These are adhered to and if disputes occur, they are taken to the tribal court. The maintenance of traditional tapping boundaries, which are often kept within families, and the respect for the tapping rights of other individuals, are important limiting factors on the number of tappers in the palmveld. Both high intensity and frequency of tapping or leaf removal due to fire affect palm vigour, whilst sap yields may also be related to a degree of water stress. In theory, tapping method and skill can be controlled to achieve optimal size, yield or income. Tapping yield could be improved by tapping stems on a quota basis, utilising the smaller stems in a clump and leaving one or two stems in

each clump to continue growing. Increase in the price of wine could compensate for the drop in palm wine yield. Reduced pressure on large stems would result in an increase in the proportion of large, high yielding palms in the area. These are currently only found at dip-tanks and protected areas. Rotational tapping could then be based on fewer, larger palms in a similar way to the West African palm wine industry. As price control is a major limiting factor on palm utilisation more people would turn to palm wine tapping as a source of revenue if the price was substantially increased. This is likely to result in use of previously unallocated marginal areas or palmveld that is only seasonally used at present and increase pressure on the palm resource. To allow a shift towards larger stem size classes would mean control of burning and tapping. This would be exceptionally difficult to implement as the palmveld is a communally owned multi-use area and resistance to change would be encountered from other land users. The growing demand for palm wine could be filled by selling artificial palm wine developed in Nigeria rather than bottling natural palm wine. A disadvantage of selling artificial palm wine would be that palm wine tappers could be pushed out of the market, with very few other local work options. Palm leaf harvesting and sale based on tapping concession areas would have three advantages (i) reduction of an opportunistic cutting of this common property resource (ii) improved income to palm wine tappers and (iii) widespread leaf harvesting through the palmveld, thus reducing the chances of localised leaf overexploitation which has occurred in Botswana [3007] .

Thinning:

If not thinned, the palms form a thick clump [2719] .

HARVESTING

Sap, wines:

Palm wine tappers are traditionally allocated territories in the palmveld for their exclusive use in producing palm wine. People wanting to tap palm sap for the first time must first approach the local headman. He, or a tribal policeman, then indicates a suitable area. Thereafter, a payment of R2 or 20 l of palm wine is made to the headman and a further 20 l during the course of tapping. Boundaries of these tapping areas are respected by other tappers and any disputes are taken back to the tribal policeman or headman. Most palm wine tappers live adjacent to the palmveld where subsistence crops are grown. Temporary shelters (known as amaGobela) are set up in the palmveld in allocated tapping areas. When large palms in the immediate vicinity of the shelter have been tapped, a new shelter is set up in another part of the tapping area. Palm clumps are selected and large stems within these clumps are prepared for tapping after burning each clump to remove undergrowth and leaf spines. Selected stems are trimmed to initiate sap flow using a razor sharp bush knife whetted against a stick kept for that purpose. A woven *Hyphaene coriacea* leaf is placed over the palm stem and collection container, protecting it from dust, sun and insects. The stem and young leaf bases are cut at a slight angle to guide sap onto a leaf gutter and into the clay collection container. By the end of the tapping period these young bases have been removed by trimming 2-3 times per day over a 5- to 7-week period. This process is carried out with a group of palms in the tapping territory. Sap fermentation is initially slow and sap is not collected during the first few days after stem preparation. Although three palm species occur in the Ingwavuma district (South Africa) and all are potential sources of palm wine, only *Hyphaene coriacea* and *Phoenix reclinata* are tapped. The third species, *Raphia australis*, occurs in localised and relatively inaccessible coastal areas and is not tapped. Tapping of *P. reclinata* and *H. coriacea* palms depends on their local abundance and possibly on seasonal selection. Neither species grows in sufficiently large populations to support commercial tapping. Both species occur as multi-stemmed clumps due to the effects of fire and tapping in the past. Tappers practise a type of rotational management within clumps, selecting larger stems for tapping. Smaller stems which would yield less sap are left to be tapped later [3007] .

Sap, wines:

In Ingwavuma, Natal, South Africa, a single tapper tapped 712 palms (902 stems) producing 4846 litres of palm wine during a 12 month period - this was considered to be representative of other tappers in the area. It is estimated that the area could support a maximum of 300 to 400 full-time tappers at the current level of palm use and yields [3008] .

Several harvesting techniques are destructive. Cutting palms for buildings, heart extraction, alcohol production and access to high growing leaves damages the apical meristem and prevents further growth. Preferential harvesting of the reproductive size classes may affect the population structure. [3037] .

YIELDS

Sap, wines:

Over the tapping period sap flow from batches of *Hyphaene coriacea* and *Phoenix reclinata* palms increased to a peak and then declined over about 43 days in South Africa. Yields were affected by the skill of the tapper, the

frequency and efficiency of collections and trimming and insect infestation of tapped stems. Tappers also discard sap diluted with rainfall as this affects palm wine quality. There are no significant differences between summer and winter yields of palm sap although species selection sometimes varies with season. As sap yield from the earlier batches starts to decline, new stems are prepared for tapping. This buffers major fluctuations in total yield and income as sap yield from new batches increases whilst yields from the previous batch are decreasing. During a 12 month period between November 1981-October 1982, a selected tapper tapped 712 palms (902) stems, producing 4846 litres of palm wine. In contrast to the palm wine industries in the Philippines and West Africa, tapping in south-eastern Africa is based on small palms with low yields [3007] .

TRADE

Southern Africa:

Regularly available at farm stalls [2795] .

South Africa:

Men were not observed carrying palm wine to sale points and this is apparently always done by women, who then sell the palm wine. Women employed to transport palm wine work in their fields in the early morning before visiting the tapping shelter to fetch palm wine. In some cases the tapper's wife will transport palm wine and the income is then kept within the family. Traditionally income is split 2 to 1 between tapper and seller, the tapper tapping 6 h each day. All income figures in this study were derived from daily measurements of palm wine yield converted to income on the basis of the set price per volume. Income to the selected tapper from palm wine sales averaged R49.50 plus or minus R21.00 per month. Sellers earned half this amount. Transport to sale points (known as eziKhombozini) is done on foot. Most women carry plastic 25 l containers. If a tapper collects more than 25 l per day, two women are sometimes employed, working on alternate days of the week. Palm wine in Nigeria sells for a higher price, some two to three times more than in south-eastern Africa. Palm wine tapping in south-eastern Africa is clearly not a high income earner. It is continuous and strenuous work which is locally regarded as a means of tiding a person over a bad period when no other work is available. Money earned from the sale of palm wine is used for buying goods from the store, paying school fees or to pay herd boys if cattle are owned [3007] .

South Africa:

In Natal, income is generated through the sale of undiluted palm wine within the palmveld area (primary sales) and transport outside the palmveld zone and subsequent resale of dilute palm wine (secondary sales). Primary sales constitute a total volume of nearly 980,000 l. After initial sale, palm wine is transported to centres outside the palmveld zone for dilution and resale. This substantially increases income from palm wine. Palm wine bought for local consumption rather than for resale is drunk at the sale point or at home. It is also used as payment for various services such as hut-building, moving a hut to a new site or agricultural services. Gross income to entrepreneurs transporting palm wine from three major areas was estimated to be R15,189 for the 12-month period November 1981-October 1982. The trade in palm wine from tapper to seller, seller to customer, transport entrepreneur and secondary seller, is a chain of events bringing income to a wide spectrum of 460 to 480 people. This reduces individual profits but enables more people on the poverty line to have the option of an additional source of income [3008] .

RESEARCH NEEDS

There appears to be some variability in quality of the mesocarp of the fruit, varying between unpalatable and soft and savoury, suggesting selection would be rewarding [2816] .

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