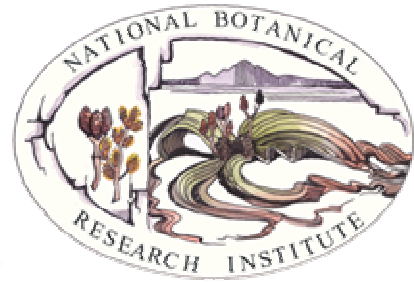


Kew

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This report was generated from the SEPASAL database (www.kew.org/ceb/sepasal) in August 2007. This database is freely available to members of the public.

SEPASAL is a database and enquiry service about useful "wild" and semi-domesticated plants of tropical and subtropical drylands, developed and maintained at the Royal Botanic Gardens, Kew. "Useful" includes plants which humans eat, use as medicine, feed to animals, make things from, use as fuel, and many other uses.

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which has been updating the information on Namibian species from Namibian and southern African literature and unpublished sources.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.

Internet SEPASAL

New query

Edit query

View query results

 *Display help*In names list include: synonyms vernacular names and display: 10 names per page*Your query found 2 taxa***Citrullus lanatus (Thunb.) Matsum. & Nakai [3]**

Family: CUCURBITACEAE

Synonyms

Citrullus lanatus (Thunb.) Mansf.
 Colocynthis citrullus (L.) Kuntze
 Cucurbita citrullus L.
 Momordica lanata Thunb.
 Citrullus vulgaris Schrad.

Vernacular names

Unspecified language egusi [2671]
 (Ghana) neri [1994], niri [1994]
 (India) tarbuz [320]
 (India, Rajasthan) matiro [1096], matira [1321]
 (South Africa) marotse [1257], mokgatse [1257], mokatse [1257], makatane [772]
 (Southern Africa) tsama melon [1610], tsamma [1980], karkoer [1980]
 Afrikaans (Namibia) soetwaatlemoen [1304], tsama [5087] [5098], tsamma [5098], tsammawaatlemoen [1304]
 Afrikaans (Southern Africa) bitterappel [1171], bitterwaatlemoen [2795], kafferwaatlemoen [1171], karkoer [1171] [2795] [5173], karkool [1171], kolokwint [1171], soetwaatlemoen [1171]
 Central Ndebele (Zimbabwe) ibotola [2506], ijodo [2506], inopi [2506]
 Central Shona (Zimbabwe) majoda [2506], manyani [2506], mubvembe [2506], mufera [2506], munwiwa [2506], rushambwa [2506]
 Chonyi (Kenya) matikiti [2719]
 Damara (Namibia) au(se)tsama.s [5095], tsama.b/s [5095], lotsama.b [5095]
 Damara>Nama (Namibia) ausersamas [5098]
 English sweet melon [1643], watermelon [1297]
 English (Australia) afglida melon [1139], bastard melon [1139], bitter melon [1139] [1609], camel melon [1139] [1609], pie melon [1139], wild melon [1139] [1609]
 English (Kenya) egusi melon [2719], watermelon [2719]
 English (Namibia) sweet melon [1304], tsama [5088], tsama watermelon [5111], wild water melon [5087] [5098]
 English (Namibia) white watermelon [1304]
 [white flesh in fruit]
 English (Namibia) yellow watermelon [1304]
 [yellow flesh in fruit]

English (South Africa)	t'samma melon [5151]
English (Southern Africa)	bitter melon [1171], colocynth [1171], common wild melon of South Africa [1171], desert melon [1171], khama melon [1171], tsama watermelon [1171], tsamma [2795] [5173], tsamma melon [2795], tsamma watermelon [1171], wild watermelon [1171] [2795]
English (Zimbabwe)	dry melon [2506], melon [2506], sweet melon [2506], tsama [2506], watermelon [2506]
Gciriku (Namibia)	katjama [5098]
German (Namibia)	Tsamas [5098], Tsamma [5087], Wilde Melone [5098], Wilde Wassermelone [5087]
Giriama (Kenya)	matikiti [2719]
Herero (Namibia)	etanga [5087] [5098]
Jul'hoan (Namibia)	tamah [5088]
Kamba (Kenya)	itikitiki [2719]
Kambe (Kenya)	matikiti [2719]
Khoisan (southern Africa)	t'sama [2795]
Kung Bushmen (Namibia)	tama [5098], thama [5087]
Kwangali (Namibia)	katjama [5087] [5098]
Kwanyama	domaliua [1304]
Kwanyama (Namibia)	domaliua [1304], ekanuwa [1304], ekanwa [1304], enuua [1304], etanga leliua [1304], etanga lepuputa [1304], etanga lomungengo [1304], omanuua [1304], omumbada [1304], etanga leliwa [5553], etanga lemuwa [5553], etanga lomumbada [5553], etanga lomungongo [5553]
Kwanyama (Namibia) [fruit]	etanga [5087]
Kwanyama (Namibia) [plant]	ohanga [5087] [5098]
Lovedu (Southern Africa)	khakha [1171]
Lozi (Namibia)	mazana [5553], munali [5553], mutuhumusu [5553], nakati [5553], nyati [5553], pisi [5553], runovi [5553], sivalasipisi [5553]
Luo (Kenya)	afwoto [2719]
Marakwet (Kenya)	sot [2719]
Mbukushu (Namibia)	katjama [5098]
Mozambique	melancia [5480], narracuene [5480]
Nama (Namibia)	/otsamab [5084], tsamas [5084] [5087]
Ndebele (Southern Africa)	ibotola [1171]
Ndonga (Namibia)	ontanga [5087] [5098]
Ndonga (Namibia) [fruit]	etanga [5087]
Pedi (Southern Africa)	habu [1171], lehlikihli [1171], lerotse [1171], lethikithi [1171], mahlitihli [1171], mathikithi [1171], mathyathya [1171], matikitiki [1171], motshatsha [1171]
Punguvlei (Namibia)	tava [5111]
Sanya (Kenya)	mkikili [2719]
Shona (Southern Africa)	bawora [1171], majoda [1171], manwiwa [1171]
Sotho (Southern Africa)	lehapu [1171], makakabane [1171], thoomo [1171], tjoto [1171]
Swahili (Kenya)	mtikiti [2719]
Tswana (Southern Africa)	kgengwe [1171], lekatane [1171], makapuntjie [1171], makataan [2795]

Africa)	
Turareg (Niger)	illagasane [1643]
Turkana (Kenya)	namunye [2719], amamnyet [2719]
Vasekele (Namibia)	#a'ani [5111], tava [5111]
Venda (Southern Africa)	bvani [1171], gwadi [1171]
Xhosa (Southern Africa)	ityabontyi [1171], umxoxozi [1171]
Zulu (Southern Africa)	ibece [1171], ikhabe [1171]

Distribution

Plant origin	Continent	Region	Botanical country		
Native	Africa	East Tropical Africa	Kenya [1362], Tanzania [1362], Uganda [1362]		
		Middle Atlantic Ocean	Ascension		
		Northeast Tropical Africa	Ethiopia, Somalia [1605], Sudan		
		South Tropical Africa	Angola, Malawi [3], Mozambique [3] [5480], Zambia [3] [5481], Zimbabwe [3] [5419]		
		Southern Africa	Botswana [3], Cape Province [5104], Lesotho [5104] [5550], Namibia [3] [5104], Natal [5104], Orange Free State [5104], Swaziland [5104] [5452], Transvaal [5104]		
		West Tropical Africa	Benin [1360], Ghana [1360], Ivory Coast [1360], Liberia, Mali [1360], Mauritania [1981], Niger [1360], Nigeria [1360], Senegal [1360], Sierre Leone [1360], The Gambia [1360], Togo [1360]		
		West-Central Tropical Africa	Burundi [1979], Zaire [1979]		
		Western Indian Ocean	Madagascar		
		Introduced	Africa	Northern Africa	Egypt [1297], Libya, Tunisia
			Asia-Temperate	China	
	Eastern Asia		Japan		
Asia-Tropical	Indian Subcontinent		Bangladesh, Bihar, Maharashtra, Pakistan, Rajasthan [68], Tamil Nadu, West Bengal		
	Malesia		Philippines		
	Australasia	Australia	Australian Capital Territory		

		[1609], New South Wales [1609], Northern Territory [1609], Queensland [1609], South Australia [1609], Victoria [1609], Western Australia [1609]
Northern America Pacific	Southwestern U.S.A. Southwestern Pacific	California American Samoa, Vanuatu, Western Samoa
Southern America	Brazil Northern South America Western South America	Guyana, Venezuela Bolivia

ISO countries: Indonesia , Mexico , South Africa [5104]

Descriptors

Category	Descriptors and states
DESCRIPTION	Herb [5104] [5553]; Prostrate/Procumbent/Semi-erect [5104] [5553]; Monoecious [1297] [2719] [5553]; Annual [5104] [5553]; Terrestrial [5553]; Climber/Scrambler/Scandent [2719] [5104] [5553]; Taproot Present [5553]; Plant Height 0.5-3 m [5104]
CLIMATE	Not Frost Tolerant [1297]; Marked Dry Season [5104]; Subtropical, Hot and Arid [5104]
SOILS	Poorly Drained [2719]; Sandy [2719] [5553]; Sands [633]; Dry [1297] [1661]; Loams [1983]
HABITAT	Coastal Regions [2719]; Lowland [5550]; Pioneer Species [5553]; Non-Coastal Regions; Plains/Flats/Pans [2719] [5151] [5553]; Shrubland/Bushland/Scrub [3] [1362] [5173]; Grassland/Forb-Land [3] [1362] [2719] [5173]; Watercourses [3] [2719]; Non-Permanent Watercourses [5151] [5553]; Anthropogenic Landscapes [1362] [1609] [5151] [5173] [5553]; Croplands [2719]; Altitude 0-1785 m a.s.l. [3] [5104]
PHYSIOLOGY	Drought Tolerant [1139] [1297] [1661]
PRODUCTION AND VALUE	Subsistence Value [1304] [5084]; Wild Plants Utilised [2795] [5084]; Traded Locally [2719] [5553]; Used in Pharmaceutical Industry [1340]; 'Semi-Domesticated' Plants Utilised [1171] [5111] [5553]; Commercial Value [1610] [1661] [2719]; Traded Within a Country [1171] [1340] [1610]; Major Crop/Forestry Species [1340] [1610] [1661]
CONSTRAINTS	Agricultural Weed [1171] [5173] [5553]; Susceptible to Fungal Diseases [5553]; Susceptible to Invertebrate Pests [5553]
SOURCES OF PLANTING MATERIAL	RBG Kew Seed Bank; In Living Collection, RBG, Kew; Other Seed Sources [5181]
FURTHER DATA SOURCES	Botanical Illustration [1171] [5151] [5173] [5553]; Additional References [328] [1140] [1147] [1205] [1714] [2101] [2928] [5159] [5192] [5196] [5203] [5332] [5349] [5405] [5412] [5489] [5513] [5516] [5601] [5626] [5650] [5659] [5724] [5743] [5744] [5745] [5746] [5747] [5748] [5749] [5750] [5751] [5752] [5753] [5754] [5755] [5756] [5757] [5758] [5759] [5760] [5761] [5762] [5763] [5764] [5765] [5766] [5768] [5769] [5770] [5771] [5798] [5799] [5800] [5801] [5802] [5803] [5804] [5805] [5806] [5807] [5808] [5809]; Included in PROTABASE [5450]; Regional Distribution Map [1609] [5450] [5463]; Databases [5123] [5341]; Habit Illustration/Photograph [5173] [5450] [5463]; PROTA 2 - Vegetables [5463]; Grid Map [5123] [5553]
SEPASAL DATASHEET STATUS	All Data Transferred from SEPASAL Paper Files; Nomenclature Checked
CHEMICAL ANALYSES	Unspecified Analyses - infructescences [1340] [5553]; Poisonous Compounds - infructescences [2795]; Unspecified Carbohydrates - infructescences [187] [1297]; Unspecified Lipids - infructescences [1661] [5553]; Biological Activity - seeds [1340]; Unspecified Carbohydrates -

seeds [187]; Unspecified Lipids - seeds [633] [1321] [1340] [1661] [5553]; Unspecified Organic Acids - seeds [1340]; Poisonous Compounds - unspecified parts [1139] [1171] [1340] [5098]; Biological Activity - unspecified parts [1340]; Vitamin A (carotene) - infructescences [1297]; Unspecified Sugars - infructescences [1321]; Amino-Acids - infructescences [1340]; Essential Oil Analyses - seeds [1340]; Tannins - seeds [1340]; Amino-Acids - other parts [1340]; Nutritional Analyses - infructescences [187] [1297] [1340] [1661] [5553]; Monosaccharides - infructescences [1661]; Nutritional Analyses - seeds [187] [1297] [5553]; Lipids - Phospholipids - seeds [1340] [1661]; Proteins - infructescences [187] [1297] [5553]; Proteins - seeds [187] [1297] [1340] [1576] [5553]; Other Analyses - unspecified parts [1340]; Vitamin B1 (thiamine) - infructescences [187]; Vitamin B1 (thiamine) - seeds [187] [1576]; Polysaccharides - seeds [633]; Vitamin B2/Vitamin G (riboflavin) - infructescences [187]; Vitamin B2/Vitamin G (riboflavin) - seeds [187] [633]; Sugar Alcohols - seeds [1340]; Vitamin B7/Vit. P-P (nicotinamide, nicotinic acid) - infructescences [187]; Vitamin B7/Vit. P-P (nicotinamide, nicotinic acid) - seeds [187] [1576]; Saponins - unspecified parts [1340]; Vitamin C (ascorbic acid) - leaves [1340]; Vitamin C (ascorbic acid) - infructescences [187] [1340]; Vitamin C (ascorbic acid) - seeds [633]

Uses

Major use	Use group	Specific uses
FOOD	Unspecified Parts	famine food [633] [1188] [1576]
	Leaves	green vegetables [1340] [1987] [2719] [2795]; savoury preparations [1340] [1610] [2506] [2514]; young leaves, condiments/relishes/chutneys [1171]; vegetable dishes [1171]; young leaves [5553]
	Infructescences	fruits, dessert fruits [1661]; fruits [320] [1171] [1188] [1304] [1340] [1610] [1661] [2506] [5084] [5088] [5094] [5095] [5098] [5101] [5103]; potable water [633] [1171] [1188] [1321] [1340] [1576] [1610] [2795] [5742]; fruit pulp, non-alcoholic beverages [320] [1661]; fruits, famine food [68] [633] [1988]; fruits, raw [68] [633] [1297] [1304] [2719] [5095] [5103]; fruits, meat dishes [633] [1171] [1340]; fruits, jams/jellies [1297] [1340] [2506] [2795]; entire immature fruits, raw [2719]; fruits, pickles [1171] [1340]; fruit pulp, soups [1340]; fruit pulp, raw [1340]; fruit pulp, porridges [1171] [2506] [2795]; fruits, condiments/relishes/chutneys [1171]; fruits, vegetable dishes [1171] [2719]; fruit juice, juices [1340] [5098]; fruits, porridges [2506] [5553]; fruits, raw [1171] [1304] [2795]; fruits, green vegetables [2795]; fruit juice, juices [5098]
Seeds	raw [1304]; seed oil, oils/fats [320] [1297] [1986] [1988]; bread [1171]; porridges [1340] [2719]; condiments/relishes/chutneys [1340] [5553]; seed oil [5553]; kernels, oils/fats [1340]; entire seeds, starches [68] [633] [1171] [2506] [2795]; entire seeds, bread [1297] [1340] [1610] [1661]; entire seeds, porridges [2719]; entire seeds, beverages [2506]; entire seeds [1340] [5098]	
ANIMAL FOOD	Unspecified Parts	rodents [633]; reptiles [633]; game mammals [633]
	Fertile Plant Parts	fruits, pigs, fodder [1304] [1988]; seed cake [1297]; fruits, other animal food types, dry season; seeds, cattle [1610]; fruits, cattle [1340]; fruits, mammals, fodder, dry season [1610] [2795]; seeds, birds [1139]; seeds, pigs [5553]; seeds, chickens [5553]; entire seeds, cattle [68]; fruits, mammals, forage [1610]; seeds, birds, forage [1139]
	Aerial Parts	leaves, pigs, fodder [1988]; young leaves, birds [5553]; leaves, mammals [1610]
	Other Parts	seedlings/germinated seeds, birds [5553]

MATERIALS	Unspecified Materials	seed cake, detergents [1610]; fruits, toys/games [2719]; seed oil, cosmetics [5553]
	Lipids	seed oil, semi-drying oils, illuminants [1297]; seed oil, candles [1321]; seed oil, soap [1321]; seed oil, lubricants [1321]; seed oil, hair oil/lacquer [1321]; seed oil, illuminants [1297] [1321] [1340]; seed oil [1610] [5553]; seed oil, cosmetics [1304] [1340] [1988] [5553]; seeds, detergents [1340]
	Other Materials/Chemicals	fruits, containers/holders [633]; fruits, toys/games [2719]; roots, adhesives [1340]; seeds, skin lotions/creams [2795]; fruit pulp, other material types [1340]
SOCIAL USES	Smoking Materials/Drugs	seeds, masticatories [1340] [1610]
	'Religious' Uses	fruits, ritual/religion/magic [1340]; ritual/religion/magic [1340]
VERTEBRATE POISONS	Unspecified Vertebrates	roots, arrows/spears [1340]
	Mammals	other infructescence parts, camels, stored products protection [1610]; cattle [1139]
NON-VERTEBRATE POISONS	Arthropoda	Insecta [1610]
MEDICINES	Unspecified Medicinal Disorders	seeds, humans [1610]; seed oil, humans [1321] [1610]; fruit pulp, humans [1610]; roots, humans [1610]
	Abnormalities	fruit pulp, humans, oedemas [1340]
	Circulatory System Disorders	seeds, humans, blood pressure, hypertension [1340]
	Digestive System Disorders	fruit pulp, purgative [1610] [1661] [5098]; fruit pulp, humans, purgative [1340]; roots, humans, intestine, diarrhoea, teas [5098]
	Genitourinary System Disorders	kernels, humans, diuretic [1340]; fruit pulp, humans, diuretic [1340] [5098]; seeds, humans, diuretic [1340] [5098]
	Infections/Infestations	kernels, mammals, roundworm infection, teas [1340]; kernels, mammals, tapeworm infections, teas [1340]; testa, mammals, roundworm infection, teas [1340]; testa, mammals, tapeworm infections, teas [1340]; seed oil, mammals, roundworm infection, teas [1340]; seed oil, mammals, tapeworm infections, teas [1340]; seeds, humans, anthelmintic [1340]
	Injuries	roots, humans, haemostatic [1340]; roots, humans, burns, external applications [5098]
	Nutritional Disorders	kernels, humans, tonic [1340]
	Pregnancy/Birth/Puerperium Disorders	roots, goats, post partum, other pregnancy/birth/puerperium disorders/effects, oral ingestion [5084]; roots, sheep, post partum, other pregnancy/birth/puerperium disorders/effects, oral ingestion [5084]; roots, humans, haemorrhages of pregnancy [1340] [5098]

Picture

None recorded

Notes

NOMENCLATURE/TAXONOMY

Name derivation:

'lanatus' means 'woolly' and refers to the dense, lanose indumentum especially on the young stems [5553] .

VERNACULAR NAMES

Kwanyama (Namibia), etanga:

'Etanga' means 'melon' and 'leliua' means 'to be cooked', thus 'etanga leliua' refers to the large, elongated, dark green fruit which are eaten cooked [1304] .

Kwanyama (Namibia):

'etanga leliwa' means 'something that can be eaten' and refers to the large cooking melon; 'etanga lenuwa' means 'something from which you can drink' and refers to the white to pale red landrace which is eaten raw as a thirst-quencher; 'etanga lepuputa' means 'something which is not usable' and refers to a melon of any type that is no longer usable after being exposed to unfavourable conditions; 'etanga lomungongo' means 'something that can roll easily on the ground' [5553] .

Southern and Eastern Africa:

See Watt & Breyer-Brandwijk (1962) for a listing of vernacular names [1340] .

English (Kenya), egusi melon:

This name is sometimes also applied to species in the genus *Cucumeropsis* [2671] .

DISTRIBUTION

Lesotho:

Lowland zone only [5550] .

Mozambique:

Gaza, Maputo and Niassa provinces only [5480] .

Namibia:

Occurs in the following forms: wild populations distributed throughout the country in a wide range of habitat types; modern cultivars grown for commercial purposes; watermelon, cooking melon and seed melon landraces of the traditional agrosystems in northern Namibia; and possibly introgressed types which are regarded as agronomic weeds but are also often found vast distances from human habitation [5553] .

Namibia:

Widespread. Bitter-fruited forms occur in the western regions, and the form occurring on the sandy plains of the south-eastern region bears non-bitter fruits [5553] .

Worldwide:

Tropical Africa and America [2719] .

Kenya:

Southern Turkana along Turkwell and in the coastal region [2719] .

Southern Africa:

Namaqualand, Great Escarpment, Upper, Great and Tanqua Karoo, eastern and northern Cape, Botswana, Lesotho, Mozambique and Namibia [5151] .

Worldwide:

Indigenous to south-west Asia and throughout Africa. Also cultivated or found in a semi-wild state in the warmer parts of the world [1171] .

Zambia:

Northern, Eastern and Southern provinces only [5481] .

Zimbabwe:

North, West, Central and East floristic regions [5419] .

Botswana, Namibia:

Kalahari [3] .

Map sources, Australia:

Map 193 in volume 8 [1609] .

ORIGIN/DOMESTICATION

Kalahari Desert is predicted to be the centre of origin for the cultivated watermelon (Esquinas-Alcazar and Gulick 1983) [5553] .

The early history of the watermelon can be traced back to at least 4,000 years and the plant was grown as a crop in the Nile valley (Bates and Robinson 1995) [2795] .

The local form of the watermelon is among the earliest cultivated food plants of the Ng'ikebootok in southern Turkana, who believe that it came with elephant dung [2719] .

RARITY/CONSERVATION

Kenya:

Common in cultivation (Turkana). Rare elsewhere [2719] .

DESCRIPTION

Fruits, Iraq:

The long-fruited variety has two colour forms, green/light green and deep green. The fruits of these forms differ in colour and size, the latter being larger and heavier. The lighter form is harvested later [1661] .

Fruits:

Ellipsoid to almost round, usually 15-20 cm long, green with pale green longitudinal stripes and white juicy flesh (Note: the form with dark green stripes on the surface and red-pink flesh is the one more commonly found in markets) [2719] .

Flowers:

Monoecious, petals yellow, joined below [2719] .

Stems:

Hairy, usually creeping extensively [2719] .

Leaves:

With deep lobes, usually 3-5 lobes. Central lobe the largest. Tendrils usually divided into two, rarely simple [2719] .

Fruit pulp:

White or slightly pink [1321] .

Fruits:

Ellipsoid or subspherical, 13-30 cm in diameter (or larger) [1362] .

Fruit pulp:

Dull red to bright red, white or yellow, sweet or flaccid [1661] .

Seed oil:

Clear, bland, pale coloured, limpid [320] .

IDENTIFICATION

Wild populations, including var. *citroides* (L.H.Bailey) Mansf., are sometimes confused with *Citrullus colocynthis* [2671] .

FOOD - UNSPECIFIED PARTS

Unspecified parts:

Used by Igwi and Ilgana Bushmen (Tanaka, 1969) and eaten by Zaghawa of Sudan and Chad (Tubiana & Tubiana, 1977) [1188] .

Unspecified parts, famine food:

At times, *C. lanatus* is the sole means of survival for Bushmen of the central Kalahari, as both a water and food source [1576] .

Unspecified parts:

The most important food and moisture plant of the Kalahari [633] .

FOOD - STEMS

Stems, relishes:

Woolly hairs removed from stalks and stems of soft leaves. Leaves then cut into thin slices, immersed in boiling water until tender, then oil, salt and peanut butter added to make a relish [2506] .

FOOD - LEAVES

Savoury preparations:

Pot herb [1610] .

Green vegetables:

The Southern Sotho use the cooked young plant as a vegetable (Phillips 1917) [1340] .

Savoury preparations:

The Sukuma of Tanganyika (Tanzania) eat the leaf in a gruel as a savour with their porridge. Used as a potherb by

the Pedi (Quin 1954) [1340] .

Green vegetables:

Boiled [1987] .

Vegetable dishes:

Sothos cook the leaves and small young fruits as a vegetable [1171] .

Young leaves, relishes:

The Pedi in Sekukuniland cook the young tender leaves together with the fruit and, after seasoning with salt, use it as a relish for other foods [1171] .

Young leaves:

In Caprivi, the young leaves of sikululu types (cooking melons) are eaten, though pumpkin leaves are much preferred [5553] .

Green vegetables:

Leaves reported to be used as a leafy vegetable [2719] .

Leaves, relishes:

Woolly hairs removed from stalks and stems of soft leaves. Leaves then cut into thin slices, immersed in boiling water until tender, then oil, salt and peanut butter added to make a relish [2506] .

FOOD - INFRUCTESCENCES

Fruits, porridges:

In Caprivi, the flesh of sikululu types (cooking melons) is cut up into pieces and boiled in water. Maize or millet flour is added to make a slightly stiff, sweet porridge. One melon can feed many people, and the fruit can be utilised in this way even when immature [5553] .

Fruits:

The wild plants may produce sweet or bitter fruits, without any observable structural differences [320] .

Fruits:

In Botswana the fruits are cut into slices and dried on frames in the sun [1171] .

Fruits:

Melons eaten for their moisture and sugar by the !Kung, !Gwi and !Gana San (Marshal 1976, Tanaka 1976, Lee 1979) [5095] .

Fruits:

The flesh of the melon is roasted and eaten by the Nharo of Namibia [5094] .

Fruits:

Used as stewed fruit by the Pedi (Quin 1954) [1340] .

Fruits, green vegetable:

Young fruits utilised as green vegetables [2795] .

Potable water:

Story (1958) says that the fruit is used by the Kalahari Bushman as his sole source of water for months and he is very doubtful whether the Bushman would be able to live permanently in the Kalahari without it [1340] .

Potable water:

The San consume the flesh of the melon as a source of water [5742] .

Fruits:

Used as food in Ethiopia (Getahun, 1974) [1188] .

Fruits, seeds, raw, cooked:

The Kwanyama Ovambos of southern Africa distinguish between the following types: 1) large, elongated, dark green fruit weighing up to 9 kg (cooked before eating); 2) small, round fruit, 180-250 mm long, mottled green and yellow (not sweet, fed to swine, seeds eaten raw or roasted); 3) similar to 2, seeds white (sour, fruit eaten cooked); 4) oblong fruit, light green with dark stripes, flesh white or red, seeds reddish (fruits eaten raw); 5) soft, green, oblong fruit, seeds white (cooked and flesh eaten, seeds eaten raw or fried) [1304] .

Potable water:

Primary water source for the Khoisan during the 8-9 months of the year when there is no surface water [1576] .

Potable water:

At times, *C. lanatus* is the sole means of survival for Bushmen of the central Kalahari, as both a water and food source [633] [1576] .

Fruits, famine food:

Fried [1988] .

Fruit juice, juices:

In Haiti the fruit juice is served as a beverage in the same way as citrus juice (Cheney 1947) [1340] .

Fruit juice, juices, meat dishes:

The juice of the sweet variety is drunk or used for cooking of meat [5098] .

Fruit pulp, porridges:

Cooked as porridge with mealie meal [2795] .

Fruit pulp, porridges:

In Transkei the fruit is a staple food, eaten either fresh or dried. It is peeled, cut into pieces, boiled and mixed with mealie meal; about 500 g per person is eaten at a time [1171] .

Fruit pulp, porridges:

Melon is sliced, peeled, cut into small pieces and boiled until soft in a very little water. Maize meal is added, cooked into a thick porridge and served with creamy milk [2506] .

Fruit pulp, raw, soups:

In West Africa eaten raw or in soup depending on the degree of sweetness or bitterness (Dalziel 1937) [1340] .

Fruits, jams:

Cultivated in some parts for making into konfyt (Quin 1954) [1340] .

Fruits, jams:

The normal sweet form is a favourite for making jam. Pieces of the fruit from just below the rind are cut into neat squares and used to make what is known in Afrikaans as 'waatlemoenstukkekonyt' [2795] .

Fruits, meat dishes:

The Bushmen of the Kalahari may add the fruit to a meat stew (Story 1958) [1340] .

Fruits, meat dishes:

The melon can be cut up, mixed with meat to make a stew and conveniently cooked in the rind itself [1171] .

Fruits, pickles:

According to Thunberg (179?) and Pappe (1857), both Europeans and Africans in olden times ate the pickled fruit despite its bitterness [1171] [1340] .

Fruits, raw:

Eaten by the Nharo of Namibia [5094] .

Fruits, raw:

Eaten raw by the Damara along the Ugab river, Namibia [5103] .

Fruits, relishes:

The Pedi in Sekukuniland cook the young, tender leaves together with the fruit and, after seasoning with salt, use it as a relish for other foods [1171] .

Fruits, vegetable dishes:

The Sothos in southern Africa cook the leaves and small, young fruits as a vegetable [1171] .

Fruits, raw:

According to MacCrone (1937), a person can survive for 6 weeks on an exclusive diet of tamma. The fruit is cut open at one end and the first piece of flesh is eaten. Using a stick, the content is then pounded to a pulp which is eaten and drunk [1171] [2795] .

Fruits:

Eaten by the Martujarra Aborigines in Western Australia (Veth and Walsh 1988) [5095] .

Fruits:

Eaten cooked by the Damara along the Ugab river, Namibia [5103] .

Fruits:

Entire fruit can be cooked in glowing embers [5098] .

Fruits:

In olden times, the crossing of the Kalahari between Botswana and Namibia was only possible during a good tamma season as the fruit supplied food and water to the oxen of the traveller and often to the traveller himself (Galpin 1926, Hutchinson 1946, Langley 1890, Marloth 1913-32) [1171] [1340] .

Fruits:

Roasted under the fire or cooked [5101] .

Fruits, entire immature fruits, raw:

Both the immature and mature fruits are eaten raw. The mature ones are sweeter [2719] .

Fruits, vegetable dishes, raw:

The fruit is peeled and the flesh eaten raw or boiled. It can also be peeled, seeds removed and chopped into small pieces which may be eaten raw or cooked with pumpkin leaves or those of *Lycium europaeum* L. (Turkana; ekereru, Daasanach; il-maarach) [2719] .

Potable water:

Frequently the only source of water for Bushmen of the Kalahari Desert [633] .

Fruits, famine food:

Extremely important in the Kalahari [633] .

Fruits, meat dishes:

The hollowed fruit and its contents are used as a pot, into which pieces of meat are added to make a stew. The flavour is said to be greatly improved if some edible gum from Acacia is added during cooking [633] .

Fruits, raw, potable water:

The central portion of the fruit is cut out and eaten raw before the rest of the fruit pulp is mashed for its liquid [633] [1171] .

Fruits, raw, potable water:

The sweet, juicy pulp of ripe fruit is eaten raw, providing a valuable alternative to drinking water in the desert [1297] .

Fruits, potable water:

In olden times, the crossing of the Kalahari between Botswana and Namibia was only possible during a good tamma season as the fruit supplied food and water to the oxen of the traveller and often to the traveller himself (Galpin 1926, Hutchinson 1946, Langley 1890, Marloth 1913-32) [1171] [1340] .

Potable water:

Good source for quenching thirst in the Rajasthan desert [1321] .

Fruit pulp, non-alcoholic beverages:

Widely used by all castes in India as a cooling drink during summer to quench thirst [320] .

Fruits, dessert fruits:

The brilliant red sweet pulp of var. viridis is highly esteemed in Iraq during the summer season (May to November) especially by poorer people and by labourers during their lunch period [1661] .

Fruit pulp, non-alcoholic beverages:

Highly esteemed in Iraq during the summer season (May to November) as a cold drink, especially by poorer people and by labourers during their lunch period [1661] .

Fruits:

One of the best liked fruits of the dry countries of the Middle East, because of its refreshing properties [1661] .

FOOD - SEEDS

Entire seeds, starches:

The seeds are dried and pounded into flour [68] .

Entire seeds:

In China and in India the roasted seed is eaten and contains no poisonous constituent (Burkill 1935) [1340] .

Entire seeds, bread:

Probably the most important article of food from the plant, roasted and eaten or ground and baked as a bread. The seeds from bitter fruits can also be used [1610] .

Kernels, oils:

Kernel oil used in cooking (Anon 1925, Sao et al 1952) [1340] .

Porridges:

Used as vegetable porridges (Quin 1954) [1340] .

Relishes:

Seed-meal paste remaining after traditional oil extraction is used as a relish reminiscent of peanut butter [5553] .

Relishes:

Used as a relish by the Pedi (Quin 1954) [1340] .

Entire seeds:

Roasted, crushed and eaten. Nutritious, but tend to be constipating [5098] .

Entire seeds:

Used as food in Ethiopia (Getahun, 1974) [1188] .

Entire seeds:

The Khoisan people roast the kernel and shell and grind them into a pleasant-flavoured coarse meal [1576] .

Seed oil:

Used throughout rural Namibia, by rural people, for cooking [5553] .

Entire seeds:

Porridges: Seeds may be sun-dried, ground and the resulting meal mixed with sorghum flour and made into a porridge (atap) Turkana [2719] .

Entire seeds:

In other parts of Africa, seeds may be roasted and eaten [2719] .

Entire seeds:

Cultivated in Nigeria for edible seeds [1986] .

Entire seeds:

The Bushmen of the Kalahari eat the roasted seed [1340] .

Entire seeds, starches:

The seeds are considered to be a delicacy and are extracted from the fruits, roasted in the fire and then sieved and winnowed to separate them from the sand and ash. The seeds are then ground on a flat stone and the white tamma meal is gathered on a tanned animal skin. This meal is said to be nutritious and have a pleasant nutty taste [2795] .

Entire seeds, beverages:

If pounded, steeped in boiling water, cooled and flavoured, they make a refreshing fruit drink [2506] .

Entire seeds, bread:

In the Kalahari, the seed is used as a food by grinding and making it into bread (Anon 1925) [1340] .

Carefully separated, roasted and pounded before being mixed with other food [5088] .

Entire seeds:

Eaten by the Nharo of Namibia after roasting and pounding [5094] .

Entire seeds, starches:

Dried and roasted, then pounded (without being peeled) to make an edible meal [633] [1171] [2506] .

Entire seeds:

The dried, parched seeds are chewed, especially in southern China [1297] .

Entire seeds, bread:

Sometimes the seeds are ground and baked as a bread [1297] [1661] .

ANIMAL FOOD - FERTILE PLANT PARTS

Entire seeds, cattle:

In most years fruits are abundant in India and the seeds are thrown to cattle [68] .

Fruits, mammals, fodder, dry season:

Fed to stock [1610] .

Fruits, mammals, forage:

Valuable source of water for lions, jackal, brown hyena, elephant and game animals in southern Africa [1610] .

Fruits, cattle:

In olden times, the crossing of the Kalahari between Botswana and Namibia was only possible during a good tamma season as the fruit supplied food and water to the oxen of the traveller (Galpin 1926, Hutchinson 1946, Langley 1890, Marloth 1913-32) [1340] .

Fruits, pigs, fodder:

Small, round fruit, 180 - 250 mm long, mottled green and yellow, non sweet are fed to swine by Kwanyama people of Namibia [1304] .

Seed, pigs, chickens:

Seed-meal remaining after extraction of oil is fed to chickens and pigs [5553] .

ANIMAL FOOD - AERIAL PARTS

Leaves, mammals:

Stock eat the leaves [1610] .

MATERIALS - LIPIDS

Seed oil:

Good substitute for cottonseed oil [1610] .

Seed oil, cosmetics:

Expressed seed oil is used as a base for red ochre cosmetics by the Kwanyama people of Namibia (Loeb 1956) [1340] .

Seed oil, illuminants:

Seed oil is used as an illuminant (Anon 1925, Sao et al 1952) [1340] .

Seed oil:

Extracted traditionally by Namibian women for a variety of household purposes. The traditional hot water flotation method of oil extraction is extremely simple and the equipment required is readily available to rural women. However oil yields tend to be low and the process is time-consuming and arduous. Additionally, the oil quality is probably compromised. Freshly harvested seeds are sun-dried to reduce moisture content and then roasted in a pot over an open fire for about 30 minutes. Seeds are then crushed with a traditional pestle and mortar to form a thick paste. To try and separate the seed coats, the paste is boiled in water (estimated 10 kg of crushed seed to 20 l of water) for about 3 h until the water evaporates. Alternatively the floating oil can be decanted off the water [5553] .

Seeds, detergents:

The ground seed is used by the Kalahari bushmen as a detergent [1340] .

Non volatile matter is extracted by boiling or under pressure .

MATERIALS - OTHER MATERIALS/CHEMICALS

Roots, adhesives:

The Bushman has used the juice of the root in preparing the grub of *Diamphidia simplex* for use as an arrow poison (Schapera 1925). The juice is probably without toxic action, its main role being probably as a cohesive. It may, however, be included to produce tissue irritation [1340] .

Seeds, skin creams:

The roasted seeds are ground to a coarse white meal. This meal is chewed and moistened with saliva and is then smeared over the body and rubbed in thoroughly. The treatment is used mainly by women in the same way as skin creams are used nowadays. Their skins become smooth and take on a healthy reddish colour (MacCrone 1937) [2795] .

Toys, fruits:

Children make toy wheels from the fruits (Makueni) [2719] .

Bait, fruit pulp:

In French West Africa the fruit pulp is used in the preparation of poison bait for the grasshopper *Schistocerca gregaria*. 100 kg of the pulp is mixed with 4 kg of sodium silicofluoride for this purpose (Mallamaire 1946) [1340] .

SOCIAL USES - SMOKING MATERIALS/DRUGS

Seeds, masticatories:

Used in West Africa (Dalziel 1937) [1340] .

SOCIAL USES - 'RELIGIOUS' USES

Ritual:

The plant is included in all the crop rites of the Pedi (Quin 1954) [1340] .

Fruits, magic:

The Southern Sotho use the fruit as a charm to drive 'worms' away from crops (Phillips 1917) [1340] .

VERTEBRATE POISONS

Roots, arrows:

The Bushman has used the juice of the root in preparing the grub of *Diamphidia simplex* for use as an arrow poison (Schapera 1925). The juice is probably without toxic action, its main role being probably as a cohesive. It may, however, be included to produce tissue irritation [1340] .

VERTEBRATE POISONS - MAMMALS

Other infructescence parts, camels, stored products protection:

Fruit infusion is smeared on water bags to prevent damage by camels [1610] .

Cattle:

Suspected of poisoning cattle [1139] .

MEDICINES - ABNORMALITIES

Fruit pulp, humans, oedemas:

Formerly used in the Western Province as a cathartic in oedemas and other complaints (Pappe 1857) [1340] .

MEDICINES - CIRCULATORY SYSTEM DISORDERS

Seeds, humans, hypertension, blood pressure:

A patented preparation of watermelon seed has low toxicity to the rabbit. It lowers the blood pressure, the fall being slight, gradual and persistent. This effect is thought to be due to some action on the capillaries and the blood pressure drop is sometimes seen in the human subject (Barksdale 1926). Cucurbititrin has been described as a glucosidal saponin and has been used in hypertension at a dose of 50-150 mg in capsule. It is marketed as citrin capsules containing 50 mg each [1340] .

MEDICINES - DIGESTIVE SYSTEM DISORDERS

Fruit pulp, humans, purgative:

Fruit pulp is a drastic purgative (Pappe 1857) [1340] .

MEDICINES - GENITOURINARY SYSTEM DISORDERS

Fruit pulp, fruit juice, seeds, humans, diuretic:

Each have been credited with diuretic properties (Power 1912, Power et al 1910) [1340] .

Kernels, humans, diuretic:

In India the kernel is used as a diuretic (Watt 1889-1896) [1340] .

MEDICINES - INFECTIONS/INFESTATIONS

Seed oil, kernels, testa, cats, roundworm infections, tapeworm infections, teas:

The fixed seed oil, as well as watery and alcoholic extracts of the hull and of the kernel, paralyses the tapeworm and the roundworm in the cat. This anthelmintic action is graded higher than that of pumpkin seed (Fefer 1955) [1340] .

MEDICINES - INJURIES

Roots, humans, burns, external applications:

Pulverised roots are strewn onto burns [5098] .

Roots, humans, haemostatic:

The juice of the roots is said to be haemostatic (Hurst 1942) [1340] .

MEDICINES - NUTRITIONAL DISORDERS

Kernels, humans, tonic:

In India the kernel is used as a tonic (Watt 1889-1896) [1340] .

MEDICINES - PREGNANCY/BIRTH/PUERPERIUM DISORDERS

Roots, goats, sheep, post partum, expulsion of afterbirth, oral ingestion:

A decoction of the pounded root is given by the Nama people of Namibia to goat and sheep ewes to help with expulsion of the afterbirth [5084] [5095] .

Roots, humans, haemorrhages of pregnancy:

The juice of the root is used to arrest haemorrhage after abortion (Burkill 1935) [1340] [5098] .

NUTRITIONAL VALUE

A dietetic analysis is available in Wehmer (1929-31) and Dragendorff (1898) and from the Imperial Bureau of Animal Nutrition (1936) [1340] .

Fruits, var. viridis:

#: 89.9-94.8 water; 5.2-10.1 dry matter; 3.2-5.4 reducing sugars (fructose and some glucose); 0.22-0.3 ash; 0.06-0.8 fibre [1661] .

Fruits, var. albidus:

%: 90.3-94.8 water; 5.2-9.69 dry matter; 2.6-5.8 reducing sugars (fructose and some glucose); 0.2-0.26 ash; 0.07-0.1 fibre [1661] .

Seed oil:

Specific gravity (15°) 0.914-0.923; nD (40°) 1.463-1.467; saponification value 190-198; iodine value 115-125; unsaponifiable matter 0.4-1.3% [1661] .

Seed oil, fatty acid composition (%):

Caprylic (0.2); capric (1.1); lauric (0.8); myristic (0.2); palmitic (7.6); stearic (6.1); oleic (35.5); linoleic (48.7) (Dhingra & Biswas, 1945 cited in Chakravarty, 1966) [1661] .

Fruit, energy, protein, fibre, oil:

Gross energy value of fruit flesh is 13.3 MJ/kg, fibre content 20.9%, protein content 13.4% and oil content 1.2% [5553] .

Kernels, oils:

Yields 15.3 to 45.5 % of oil, depending on locality of origin (Anon 1925, Dhingra 1945, Sao et al 1952) [1340] .

Leaves, vitamin C:

2-4.3 mg/100gm in the dry leaf (Quin 1954) [1340] .

Seeds, nutritional analyses:

Rich in protein, oil, fibre, magnesium, iron, zinc, thiamin and nicotinic acid; energy value high [1576] .

Seeds, ash, essential oil:

Ash, or dry matter, content 0.02% and oil content 15.5% [5553] .

Seeds, energy:

Gross energy value of 22.4 MJ/kg [5553] .

Seeds, fibre:

Crude fibre content of 51.5% [5553] .

Seeds, oils, protein:

West African seed yields 45% of oil and 34% of protein. The oil is of the semi-drying type and is a good substitute for cotton-seed oil (Dalziel 1937) [1340] .

Seeds, protein:

Protein content of 15.8% [5553] .

Fruit juice, amino acids:

Isawa et al (1938) ascribe the diuretic action of the distilled fruit juice to the presence of two amino acids, arginine and citrulline. Fowden et al (1959) report the presence of an isomer of histidine C₆H₉O₂N₃ [1340] .

Fruit juice, amino acids:

Wada (1930) has isolated 0.17% of citrulline, which Isawa et al (1938) have found to triple the output of urea and so may be used to reduce the NH₃ level in the blood in cases of liver dysfunction [1340] .

Fruits:

%: 94.2 moisture; 1.1 ash; 0.4 protein; 0.04 fat; 1.2 fibre; 3.1 carbohydrate 60 kJ 100 g⁻¹ energy mg 100 g⁻¹: 31.6 Ca; 16 Mg; 0.3 Fe; 2.1 Na; 267 K; 0.27 Cu; 0.09 Zn; 5.1 P; 0.06 thiamin; 0.01 riboflavin; 0.34 nicotinic acid (>20% average daily requirement); 9.2 vitamin C [187] .

Seeds:

%: 5.7 moisture; 1.9 ash; 17.9 protein*; 20.2 fat*; 41.8 fibre*; 12.5 carbohydrate 1274 kJ 100 g⁻¹ energy* mg 100 g⁻¹: 54 Ca; 209 Mg*; 6.55 Fe*; 5.67 Na; 433 K; 1.14 Cu*; 3.4 Zn*; 474 P; 0.59 thiamin*; 0.27 riboflavin*; 2.45 nicotinic acid* * = greater than 20% of average daily requirement [187] .

Fruits:

Laboratory results showed that 95% of the water content remained seven months after abscission [1980] .

Fruits, vitamin C:

108 mg/100gm in the dry fruits (Quin 1954) [1340] .

Fruits, nutritional analyses:

Very high water content of fruits (94%), therefore nutrient content is very low [1576] .

Seeds:

Contain vitamin C, minerals, fat, starch and riboflavin [633] .

Seeds, nutritional analyses:

Yellowish oil (20-45%), protein (30-40%) and rich in urease enzyme [1297] .

Edible portion (i.e. 60%) of fruit (%):

93.4 water; 0.5 protein; 0.1 fat; 5.3 carbohydrate; 0.2 fibre; 0.5 ash; 70 mcg vitamin A [1297] .

Fruits:

Sugar content varies: e.g. in Rajasthan it is higher in the autumn form than the summer form [1321] .

Seeds, nutritional analyses:
Oil (20-40%) [1321] [1661] .

Fruit pulp:

The pulp of var. rotundus, less commonly cultivated than var. viridis, nevertheless compares favourably in quality and quantity [1661] .

ANTINUTRITIONAL FACTORS

Bitter fruits are unfit for human consumption [1610] .

TOXICITY/POISONOUS COMPOUNDS

Fruits, cucurbitacin:

Bitter fruit is sometimes encountered and it is poisonous and unfit for human consumption on account of its cucurbitacin content (Story 1958) [1340] .

Unspecified parts:

Suspected of poisoning cattle in Australia [1139] .

Unspecified parts:

Some varieties are bitter and are believed to be poisonous [1171] [1340] [5098] .

BIOLOGICAL ACTIVITY

Seeds, elastase:

Show weak elastase activity (Enslin 1954) [1340] .

Unspecified parts, antibiotic activity:

The plant has given negative antibiotic tests (Karel and Roach 1951) [1340] .

CHEMICAL ANALYSES - MISCELLANEOUS

Fruit, ash:

Ash content of fruit flesh is 0.28% [5553] .

Minerals:

Payne (1896) gives an analysis of the mineral content [1340] .

Saponins:

The plant is said to contain a saponin (Greshoff 1913) [1340] .

Seed oil, organic acid, essential oils:

Contains 0.72 % arachidic acid, 63.38 % linoleic acid, 13.03 % oleic acid, 8.84 % palmitic acid and 5.61 % stearic acid (Nolte et al 1939) [1340] .

Seed shell, mannitol:

The seed shell yields 0.06% of alpha-mannitol (Higgins 1945) [1340] .

Seed, essential oil:

The characteristics and composition of the oil have been studied by Nolte et al (1939), Fairchild et al (1955) and Grindley (1950) [1340] .

Seed, essential oil:

The seed yields 37.5 % of a semi-drying (Anon 1925) or non-drying (Anon 1916) oil which Power et al (1912, 1910, 1905) say is similar to pumpkin seed oil [1340] .

Seeds, tannins, volatile oil:

The seed contains tannins and volatile oil but no alkaloid (Fefer 1955) [1340] .

Seeds, nitrogenous compounds:

Krishnan (1939) found the following percentages of N constituents in the seed: globin 73.2, glutelin 9.4, proteases 3.5, water soluble proteins 6.3, no canavanine, no citrulin, a trace of free arginine [1340] .

Unspecified parts, nitrogenous compounds:

The plant contains ascorbic acid oxidase (Farias 1956) [1340] .

Fruit pulp:

Solid foam yield from the fruit pulp is 0.02 - 0.13% [1340] .

Fruit, seed:

Quisumbing (1951) gives many details of other uses and the composition of the fruit and seed [1340] .

Fruits:

Kondo et al (1928) has given a general analysis of the fruit; a dietetic analysis is available in Wehmer (1929-31) and Dragendorff (1898) and from the Imperial Bureau of Animal Nutrition (1936) [1340] .

PHARMACOGNOSY

Fruit juice, humans, diuretic:

Roby et al (1939) report that the juice contains a volatile, diuretic constituent, the action probably due to irritation but producing no renal damage. This principle is present in distilled juice but disappears as the melon ages. Extracts of the juice and of the seed do not contain the diuretic principle. The diuretic action is confirmed by Isawa et al (1938) who ascribe this action to the presence of two amino acids arginine and citrulline [1340] .

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It is marketed as citrin capsules containing 50 mg each [1340] .

WEED PROBLEMS CAUSED

Caprivi, Namibia:

The wild form is reported as a serious weed in cultivated fields [5553] .

Southern Africa:

Sometimes it occurs as a weed in mealie lands [1171] .

Namibia:

Wild form is regarded as a troublesome weed in the agricultural lands of northern Namibia [5553] .

CONSTRAINTS - MISCELLANEOUS

Seeds are nutritious but tend to be constipating [5098] .

Bitter fruit is sometimes encountered and it is poisonous and unfit for human consumption on account of its cucurbitacin content (Story 1958) [1340] .

CLIMATE

Australia:

Sub-humid and semi-arid [1609] .

Hot and dry climates are the most suitable, but the species is grown throughout tropics and subtropics [1297] .

ALTITUDE

0-1,350 m a.s.l. [3] [1362] .

Kenya:

0-1,400 m a.s.l. [2719] .

Southern Africa:

5-1,785 m [5104] .

TOPOGRAPHY/SITES

Kenya:

Cultivated land, abandoned cultivation and flood plains [2719] .

Kalahari:

Sandy and dry areas [633] .

Australia:

Sandy, disturbed sites, roadsides and stream banks [1609] .

South Tropical Africa:

Often along watercourses [3] .

Sandy river banks [1297] .

SOILS

Egypt:

Cultivated on agricultural loams [1983] .

Iraq:

Grows well on any soil provided there is sufficient moisture; in deep, rich soil it flourishes [1661] .

Fertile, sandy soil [1297] .

VEGETATION

East Tropical Africa:

Grassland and bushland; also cultivated and often persisting in old plantations [1362] .

South Tropical Africa:

Grassland and bushland [3] .

POLLINATION

Effected by insects, particularly honey bees [1297] .

FLOWERING/FRUITING/SEED SET

Fruiting, Namibia:

Fruits are available well into the dry season (July - August) although they reach maturity by April - May [5553] .

Flowering, Namibia:

Normally starts flowering in December [5088] .

Fruiting, Namibia:

First fruits can be gathered in mid-summer [5088] .

Fruiting, southern Africa:

The fruits ripen during the winter months [2795] .

Fruiting, Kenya (southern Turkana):

July [2719] .

Fruiting:

Var. nigro-seminus fruits become available end of July. Var. varilgatus fruits become available early July. Var. pulcherrima fruits become available mid-October to end of November. Var. pumilis fruits become available end of May [2255] .

Fruiting, Kalahari Desert:

Usually January to September [633] .

Flowering, fruiting, Rajasthan:

August to September (rainy season) [1322] .

GERMINATION

An experiment on germination which tested the effects of 3 constant temperatures (25 degrees C, 30 degrees C and 35 degrees C) in the dark found germination rates of 6.7%, 6.0% and 0%, respectively. A further experiment which used a 12 hour light-dark cycle at 4 constant temperatures resulted in germination rates of 1.11% (17 degrees C), 96.67% (22 degrees C), 70.0% (27 degrees C) and 38.89% (32 degrees C). An experiment using a 17/32 degrees C temperature combination and different regimes of light and dark found a germination rate of 96.6 % in constant darkness and 2.2% in constant light [5553] .

CYTOLOGY

For the genus, $x = 11$ (12) [5150] .

PHYSIOLOGICAL TOLERANCES

Drought:

Extremely resistant [1139] .

Drought:

Fairly resistant [1297] [1661] .

Waterlogging:

Not tolerant [1297] [1661] .

ASSOCIATED BIRDS

Galahs and cockatoos eat the seeds with no ill-effect [1139] .

INSECT PESTS

Caprivi, Namibia:

Muhapo type (fresh watermelons) are more susceptible to insect and disease attack than sikululu types (cooking melons). The fruit of the former are often infested by insect larvae [5553] .

Hemiptera:

Although cucurbit bug (*Coridius viduatus*) occurs in large numbers in Caprivi, they do minimal damage [5553] .

FUNGAL DISEASES

Caprivi, Namibia:

Fruit-rot is a prevalent problem during periods of excessive rain [5553] .

CULTIVATION

Egypt:

Mainly a summer and rarely an autumn crop; each district has its own variety [1661] .

Morphotypes, Namibia:

A wide variety of morphotypes are cultivated in Caprivi for a number of uses [5553] .

Planting, Namibia:

Cultivated as a cover crop in the intercropping system of Caprivi. After the first rains have fallen, melons (and other cucurbit species like pumpkin and calabash) as well as groundnuts are planted. A hand-hoe is used to make a hole and two seeds per hole are planted at a depth of 20 - 50 mm. Planting distance was about 200 - 300(-500) mm [5553] .

India:

Cultivated throughout [320] .

Iraq:

Commonly cultivated, in fields or sandy riverbeds when the water has receded [1661] .

Mauritania:

Cultivated in naturally irrigated areas [1981] .

West Africa:

Cultivated on a commercial scale in parts of West Africa for animal food [1610] .

Southern Africa:

Often cultivated as an intercalary crop with maize and kaffir corn in tribal gardens [1171] .

USA:

Cultivated in the State of Illinois and the seed of the black-seeded varieties is collected and used as a diuretic and anthelmintic (Tehon 1951) [1340] .

USA:

Under American cultivation, many edible varieties have been produced (Sturtevant 1919) [1171] .

West Africa:

Cultivated on a considerable scale as a cattle feed and for the seed. The seed is an article of commerce in the markets of West Africa, where it is used as a masticatory, a medicine, a food and a source of oil (Dalziel 1937) [1340] .

Bushmanland, Namibia:

The seeds of selected, non-bitter melons are planted on the fields in between maize, mahango and sorghum [5111] .

Cultivated and used by the Pedi (Quin 1954) [1340] .

Nigeria:

Cultivated for the edible and oil-yielding seeds [1986] .

India, Rajasthan:

A self-sown form grows in the rainy season, bearing large fruits in September to October (autumn form); a cultivated form grows in summer (summer form) [1321] .

India, Rajasthan:

Rarely cultivated [1321] .

Iraq:

Var. rotundus is recommended for cultivation on a larger scale [1661] .

PROPAGATION FROM SEED

Emergence occurs on the fifth day after planting [5553] .

Usually planted in situ [1297] .

'CROP' MANAGEMENT

Sowing, Iraq:

Seeds are sown ca. 300 mm apart in prepared furrows in February to March; a second sowing is needed during May and June for a late crop ready in September and October [1661] .

Fertilisation, Iraq:

For an acre of land (ca. 0.4 ha) 7500 kg of cattle manure, 250 kg of ammonium sulphate, 100 kg of potassium sulphate and 25 kg of super-phosphate are recommended [1661] .

Irrigation, Egypt:

Either cultivated under irrigation or, near the Mediterranean and on Nilotic islands, by exploiting groundwater [1983] .

Caprivi, Namibia:

Neither fertiliser nor kraal manure are used [5553] .

Irrigation, Iraq:

Irrigation is needed with the furrow method of cultivation [1661] .

Irrigation, Mauritania:

Cultivated in naturally irrigated areas in Mauritania [1981] .

HARVESTING

Iraq:

The fruits are picked up when they are fully ripe, 4-5 months after sowing (3 months for some varieties); ripeness is assessed by tapping [1751] .

Caprivi, Namibia:

Muhapo type (fresh watermelons) are harvested first (late January to early May) with sikululu types (cooking melons) maturing later in the season (March to July) [5553] .

STORAGE

Fruits, Namibia:

In the Caprivi the fruit quality in muhapo type (fresh watermelons) deteriorates rapidly after harvesting. In the sikululu types (cooking melons), storage ability is exceptional. Reported storage life varied from 2 to 3 months, if undamaged, and up to a year if buried in the soil [5553] .

Seeds, Caprivi, Namibia:

Seed is retained after fruit consumption and then sun-dried. It is then placed in a calabash, the opening of which is sealed using moistened clay from a termite mound. The seed can be stored in this way until the following season. Seed of the different melon types is stored separately. Weevil damage can occur if the storage containers are damaged by rats [5553] .

Fruits, southern Africa:

The fruits last for many months without deteriorating [1171] [2795] .

Fruits, Namibia:

Can be stored for a while, which makes them even more precious when they are scarce [5088] .

YIELDS

Iraq:
35-40 fruits per row of 30 m can be achieved under proper conditions of cultivation [1661] .

Namibia:
An experiment to assess yields of different races found yields up to 118.8 t/ha (for a cooking melon landrace from Omusati region). Similar cooking melon landraces from eastern Caprivi and western Caprivi yielded 43.1 t/ha and 63.1 t/ha, respectively. Commercial cultivars of the type grown in Grootfontein region had yields of up to 51.6 t/ha [5553] .

Namibia:
Conservative estimate of fruit yield in wild stands is one melon per 2 - 4 m² [5553] .

Botswana:
Cultivated forms show a high yield even in drought years [1576] .

Rajasthan:
Single fruits yield 107-140 g of seeds; a whole plant yields, on average, 1-2.5 Kg of seeds [1321] .

TRADE

Northern Namibia:
Cultivated and traded informally along the roadside or in markets [5553] .

West Africa:
The seed is an article of commerce in the markets of West Africa, where it is used as a masticatory, a medicine, a food and a source of oil (Dalziel 1937) [1340] .

Kenya:
Local form sold in Turkana. Commercially cultivated form common in most markets in large towns [2719] .

Rajasthan:
Fruits are a cash crop [1321] .

FIELD TRIALS

Seed collected from Ovamboland (Namibia) tested in California in 1948 produced very vigorous vines which showed some disease resistance [1304] .

SUMMARY EVALUATION/POTENTIAL

A potential exists for export of dried fruit rolls [1576] .
May prove a useful source of protein and fat for sub-Saharan and savanna populations [1994] .

RESEARCH NEEDS

Further studies should assess the potential of the genera of the Cucurbitaceae as candidates for new oil crops. If possible habitat restrictions could be overcome, these cucurbits are of special interest as they would be non-competitive for a limited water supply in arid areas [5553] .

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Data transferred from Traditional Food Plants by Ruth Adeka, KENRIK, National Museums of Kenya, June 2004 . Updated for southern Africa by A. Jarvis, checked by C. Mannheimer, July 2005. Entire species edited by C. Mannheimer, Aug 2007. SEPASAL Namibia, National Botanical Research Institute .

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