

Kew

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which has been updating the information on Namibian species from Namibian and southern African literature and unpublished sources.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

Internet SEPASAL

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 *Display help*In names list include: synonyms vernacular names and display: 10 names per page*Your query found 1 taxon***Acacia erioloba E.Mey. [1355]**

Family: LEGUMINOSAE-MIMOSOIDEAE

Synonyms

Acacia giraffae sensu auct. mult. non Willd.

Vernacular names

!Kung (Botswana)	/ana [1413] [5093] [5120]
!xo Bushmen (Botswana)	//ah [1413] [5093] [5120]
Afrikaans	Kameeldoring [1340] [5082] [5097] [5120], doringboom [1340], kameel [1340], kameelboom [1340]
Afrikaans (Botswana)	kameeldoring [1413]
Afrikaans (Namibia)	grootdoring [1304], olifantsdoring [1304], kameelboom-doring [1304], kameeldoring [5087] [5121], kameeldoringboom [2136] [5087]
Afrikaans (South Africa)	kameeldoring [1120]
Afrikaans (Southern Africa)	kameelboom [1171], doringboom [1171], grootdoring [1171], kameel [1171], kameeldoring [1171], kameeldoringboom [1171], vaalkameeldoring [1171]
Barakwengo-Bushmen (Namibia)	lláalà [5087]
Barotse/Caprivi	muhoto [1340]
Bergdama (Namibia)	llganab [5087]
Damara (Namibia)	llganab [5084] [5095]
Damara (Namibia) [rotten wood]	àgae [5095]
Diroko (South Africa)	gruntu [1120]
English	camel thorn [1340] [5120], mimosa [1340], Transvaal camelthorn [1340], bushman cwanap [1340], thorn tree [1340]
English (Botswana)	giraffe thorn [5093], camel thorn [1413], camelthorn [5092]
English (Namibia)	camel thorn [1304], camelthorn [5088], camelthorn [5087] [5088], giraffe thorn [5087]
English (Southern Africa)	Transvaal camelthorn [1171], bushman cwanap [1171], mimosa [1171], camel thorn [1171] [5082], giraffe thorn [1171], thorn tree [1171]
Eunda (Namibia)	omuonde [5087]
G//ana Bushmen (Botswana)	//kara [1413]
Gciriku (Namibia)	ghuntu [5087], muntú [5087]
German (Namibia)	Kemeldornbaum [1304], Kameldorn [5087], Kameldornbaum [5087] [5121]
Heikum Bushmen (Namibia)	!anab [5087]

Herero	omunbonde [1340]
Herero (Botswana)	omumbonde [1413]
Herero (Namibia)	omuhiviriko [5095], otumbuende [5095], omumbonde [5087] [5091] [5121]
Herero (Namibia) [fruit]	orukarakaka [5112]
Herero (Southern Africa)	omunbonde [1171]
Himba (Namibia)	omumbonde [5087]
Jul'hoan (Namibia)	l'ànà [5088] [5101]
Jul'hoan (Namibia) [pods]	!'aì [5101]
Jul'hoan (Namibia) [young shrub or small tree]	nll'hârà [5101]
Kavango	munto ghutu [5120]
Kgalagadi (Botswana)	mokala [1413]
Khoekhoegowab (Namibia)	llganab [5121]
Kung Bushmen (Namibia)	l'ana [5087]
Kwaluudhi (Namibia)	omuonde [5087]
Kwambi (Namibia)	omuonde [5087]
Kwangali (Namibia)	mùsú [5087]
Kwangali (Southern Africa)	musu [1171]
Kwanyama	Amutok [5120], Omuande [5120], ano [5120]
Kwanyama (Namibia)	eno [1304], omuonde [1304] [5087], omwoonde [1304] [5087]
Kwena	mogotlho [1340]
Kûa (Botswana)	go [1413] [5093] [5120]
Lozi	maHota [5120], maHoto [5120], mahota [1340], muhoto [1340]
Lozi (Namibia)	muhoto [5087] [5121]
Lozi (Southern Africa)	muhoto [1171]
Mbalantu (Namibia)	omuonde [5087]
Mbukushu	ghuthu [5120]
Mbukushu (Botswana)	ghuthu [1413]
Mbukushu (Namibia)	ghuthu [5087], muthu [5087]
Mungambo	Mupombe [5120]
Nama	//ganab [5120], khus [1340]
Nama (Namibia) [female plant]	llganas [5087]
Nama (Namibia) [gum]	heirab [5084]
Nama (Namibia) [male plant]	llganab [5087]
Nama (Namibia) [powder from rotten tree trunk]	!gub [5084]
Nama (Namibia) [root powder]	!gulgai [5095]
Nama (Namibia) [trees]	llganadi [5087]
Nama (Southern Africa)	khus [1171]
Ndebele	isiNga [5120], umFola [5120], umHohlo [5120], isinga [1340], mwohlo [1340], umhohlo [1340], umfola [1340]
Ndebele (Southern Africa)	isinga [1171], mwohlo [1171], umfola [1171], umhohlo [1171]
Ndebele (Zimbabwe)	umwhohlo [5399]
Ndonga (Namibia)	omuthiya [5087]
Ngandjera (Namibia)	omuonde [5087]
Ngwaketse	mohoto [1340], mokala [1340]
Nkolonkadhi (Namibia)	omuonde [5087]

Nkumbi (Angola)	muwonde [5087], omuhonde [5087]
Norekau Bushmen (Namibia)	!ai [5087]
Oshikwanyama (Namibia)	omuonde [5121]
Oshindonga (Namibia)	omuthiya [5121]
Punguvlei (Namibia)	!eyie [5111]
Ralong	mokala [1340]
Rolong (Botswana)	mokala [1413]
Rumanyo (Namibia)	muntu [5121]
Sambiu (South Africa)	gruntu [1120]
SeTswana (Botswana)	Mogotho [5154], mogotlho [1413] [5093], mokala [5093], omumbonde [5093]
Shambyu (Namibia)	muntu [5087], untu [5087]
Silozi (Namibia)	muhoto [5121]
Sotho	Mogôtlhô [5097], mbukushu mosu [1340], mpatsaka [1340], mopatsaka [1340]
Sotho (South Africa)	mpatsaka [1120]
Sotho (Southern Africa)	mopatsaka [1171], mpatsaka [1171]
Tawana	mogotlo [1340]
Tlhaping	mokala [1340]
Tswana	mokala [1340], mogotho [1340], mogotlho [1340]
Tswana (Botswana)	Mogôtlho [5092]
Tswana (South Africa)	mogoto [1120]
Tswana (Southern Africa)	mogotlho [1171], mokala [1171], mogotho [1171]
Unknown	Vaalkameel [1340]
Unknown (Okavango)	musu [1340]
Vasekele (Namibia)	!eyie [5111]
Wambo	omuonde [5120]
g//ana Bushmen	//kara [5120]

Partial distribution

Plant origin	Continent	Region	Botanical country
Native	Africa	South Tropical Africa	Angola [1171] [1355] [5097], Zambia [1171] [1355] [5097], Zimbabwe [1171] [1355] [5082] [5419]
		Southern Africa	Botswana [1120] [1171] [1355] [5082] [5092] [5093] [5104], Cape Province [1171] [5082] [5097] [5104], Caprivi Strip [3045] [5121], Namibia [1120] [1171] [1355] [3045] [5082] [5104] [5121], Orange Free State [1120] [1171] [5082] [5104], Transvaal [1120] [1171] [5082] [5104]
Introduced	Asia-Temperate		
	Asia-Temperate	Western Asia	Israel [1355]

ISO countries: South Africa [[1120](#)] [[1355](#)] [[1582](#)] [[5082](#)] [[5097](#)] [[5104](#)]

Descriptors

Category	Descriptors and states
DESCRIPTION	Evergreen [5097]; Single Stemmed [1120] [5398]; Can be Coppiced [5097] [5399]; Deciduous [5092] [5097]; Erect [1332]; Terrestrial [5082]; Shrub [1332] [1355] [5082] [5104]; Slow Growth Rate [5082] [5092] [5097] [5111] [5120] [5121]; Tree [1355] [5082] [5097] [5104]; Perennial [1355] [5104]; Taproot Present [5082] [5092] [5120]; Thicket Forming [5121]; Fragrant - other parts [5092]; Thorny/Spiny - stems [1304] [5091]; Thorny/Spiny - bark [5082]; Plant Height 2-22 m [2136] [5082] [5398]; Crown Width <= 22 m [5120]; Age at First Fruiting >= 10 years [5120]
CLIMATE	Marked Dry Season [628]; Frost Tolerant [5097] [5120] [5399]; Subtropical, Hot and Arid [628] [3045]; Annual Rainfall 40-900 mm [5120]; Dry Season Length 5.5-12 months [628]
SOILS	Deep [3045] [5092] [5097] [5398]; Boulders/Rocky [5121]; Gravels/Stony [5082] [5121]; Alluvial Soils [5398]; Sandy [1171] [3045] [5082] [5092] [5097] [5111] [5121] [5177] [5398]; Loamy [5097] [5111]; Dry [5082] [5097]; Clayey [5121]
HABITAT	Forest [5121]; Pioneer Species [5120] [5121]; Woodland [1171] [5082] [5092] [5097] [5121] [5177]; Shrubland/Bushland/Scrub [1171] [2795] [3045] [5121] [5177]; Grassland/Forb-Land [3045]; Wooded Grassland [2795] [5121]; Hillsides/Slopes [5121]; Outcrops/Kopjes/Inselbergs [5121]; Desert [2136] [5082] [5120]; Termitaria [5121]; Dunes [5121]; Fixed Dunes [5120]; Watercourses [2136] [3045] [5091] [5092] [5121] [5177] [5398]; Non-Permanent Watercourses [5097] [5111] [5121]; Anthropogenic Landscapes [5121]; Floodplains [5092]; Pans [5121]; Plains [5092] [5121]; Altitude 120-1675 m a.s.l. [5104]
PHYSIOLOGY	Root Nodules Present [5120] [5399]; Nitrogen Fixer [5092] [5111]
WOOD PROPERTIES	Heartwood Brown/Shades of Brown [1120] [1340] [2795] [5082] [5092] [5097] [5398]; Very Durable [5120] [5399]; Wood Resistant to Termites [1120] [1340] [1413] [5082] [5092] [5098] [5120] [5398] [5399]; Heartwood Red/Shades of Red [1120] [1340] [2795] [5092] [5097] [5098] [5398]; Durable [1413] [3045]; High Density [2795] [5092] [5098] [5111]; Sapwood White/Yellow [1120] [2795] [5097]; Sawing - Difficult [5120]
PRODUCTION AND VALUE	Subsistence Value [5082] [5120]; Commercial Value [2795]; Traded Internationally (Single Continent) [2795]; Potential Material Uses [1257]
SOURCES OF PLANTING MATERIAL	RBG Kew Seed Bank [2255]; Other Seed Sources [5181]
FURTHER DATA SOURCES	Dot Distribution Map [5093] [5120] [5123]; Botanical Illustration [1120] [1413] [5092] [5093] [5399]; Additional References [302] [1147] [5181] [5301] [5312] [5327] [5402] [5403] [5404] [5405] [5406] [5407] [5408] [5409] [5410] [5411] [5412] [5413] [5414] [5415]; Regional Distribution Map [3045] [5082] [5398]; Botanical Photograph [1120] [1171] [3045] [5088] [5097] [5398]; Habit Illustration/Photograph [2177] [5092] [5093] [5097] [5111] [5398]; Use Related Illustration/Photograph [5088]; Grid Map [5093] [5121]
SEPASAL DATASHEET STATUS	All Data Transferred from SEPASAL Paper Files
CHEMICAL ANALYSES	Poisonous Compounds - stems [5092]; Poisonous Compounds - leaves [2136] [5097] [5120]; Poisonous Compounds - infructescences [302] [5082] [5120] [5407] [5409] [5506] [5507]; Unspecified Carbohydrates - infructescences [5120]; Poisonous Compounds - seeds [1413]; Unspecified Carbohydrates - seeds [187] [5120]; Unspecified Carbohydrates - other parts [5120]; Antinutritional Factors - leaves [1340]; Antinutritional Factors - infructescences [1340]; Tannins - seeds [5120]; Tannins - other parts [5120]; Nutritional Analyses - stems [5120]; Nutritional Analyses - leaves [1413] [5092] [5120]; Nutritional Analyses - infructescences [5120]; Lignans - infructescences [5120]; Nutritional Analyses - seeds [187] [1413] [5092] [5097] [5120]; Nutritional Analyses - gum/resins [5120]; Nutritional Analyses - unspecified parts [1582]; Nutritional Analyses - other parts [1413] [5092] [5097] [5120]; Proteins - leaves [1413] [5092]; Proteins - infructescences [1340] [1413] [5120]; Proteins - seeds [187] [1413] [5092] [5097]

[5120]; Proteins - gum/resins [5120]; Proteins - unspecified parts [1582]; Proteins - other parts [1413] [5120]; Polysaccharides - infructescences [5120]; Polysaccharides - seeds [5120]

Uses

Major use	Use group	Specific uses
FOOD	Infructescences	fruit pulp, children's snack food [5084]; fruit pulp, famine food [2136] [2795]
	Seeds	coffee substitutes [1171] [1340] [1413] [2136] [2795] [5092] [5097] [5121] [5177]
	Exudates	gum [1171] [1304] [1332] [1340] [3045] [5082] [5084] [5092] [5097] [5101] [5177]
ANIMAL FOOD	Bark	stem bark, rodents [5120]; stem bark, mammals [5120]; stem bark, game mammals [1413]
	Exudates	gum [5082] [5084] [5092] [5097]; gum, rats [5092]; gum, birds [5092] [5097]
	Fertile Plant Parts	seeds, fodder [123] [5082]; mammals, concentrates [1413]; flowers, game mammals, browse [5120]; flowers, mammals, fodder [5120]; fruits, mammals, fodder, drought season [5097]; fruits, mammals, concentrates [1413]; fruits, mammals, fodder [1413] [5082] [5092] [5097] [5120]; fruits, mammals [1340] [2136] [5082] [5091] [5399]; primates [1340]; flowers, mammals, browse [5120] [5121] [5399]; flowers, game mammals, browse [5120] [5121] [5399]; flowers, game mammals, fodder [5120]; flowers, mammals, fodder [5120]; fruits, mammals, fodder, drought season [5097] [5399]; fruits, mammals, concentrates [1413]; fruits, mammals [1340] [2136] [5082] [5091] [5399]; primates [1340]; fruits, game mammals [1340] [3045] [5092]; fruits, fodder [5082] [5097] [5118]; seeds, rats [5092]; fruits, game mammals, fodder [1304] [5097]; fruits, cattle [1340] [5082] [5092] [5097]; fruits, game mammals, browse [1413] [5121] [5177]; fruits, game mammals, browse, dry season [1413]; fruits, mammals, browse, dry season [1413]; fruits, mammals, fodder [1413] [5082] [5092] [5097] [5120] [5121] [5398]; fruits, mammals, browse [1413] [5121] [5177] [5399]
Aerial Parts	leaves, game mammals, browse, dry season [1413]; leaves, mammals, browse [5097] [5121] [5177]; mammals, browse, dry season [5120]; game mammals, browse, dry season [5120]; rodents, browse, dry season [5120]; fodder [940]; leaves, mammals, dry season [1413] [5092]; leaves, mammals, fodder [1340] [2136] [5092] [5095]; leaves, game mammals, browse [5097] [5177]; leaves, mammals, browse, winter [5092]; leafy stems/branches, goats [1304]; cattle, fodder [940]; cattle, browse [940]; leaves, mammals, browse, winter [5092]; leafy stems/branches, cattle [1304]; leafy stems/branches, goats [1304]; game mammals [1340]; leafy stems/branches, mammals, browse [5121]; leafy stems/branches, game mammals, browse [5121]; leaves, rats [5092]; leaves, game mammals, browse [1413] [5097] [5121] [5177]; leafy stems/branches, game mammals, browse, dry season [1413]; leafy stems/branches, mammals, browse, dry season [1413]	
BEE PLANTS	Other Parts	seedlings/germinated seeds, mammals [5082] [5091] nectar source [1413] [5177]; nectar source [1413] [5177]

MATERIALS	Fibres	inner bark, ropes [5092] [5097]
	Wood	wood, clubs [5084]; poles (from wood) [5111] [5120]; wood, containers/holders [5103]; heartwood, walking sticks [1304]; wood, poles (from wood), outbuildings [1304]; heartwood, bearings [5092] [5098]; stems, wood, axe handles [1304]; defoliated stems/branches, fences [5091]; wood, pestles [5111] [5118]; wood, agricultural tools [5111]; stems, wood, agricultural tools [1304]; wood, constructions [5084] [5103] [5177]; wood, wagons/carts [1340] [5082]; wood, props, mines [1340] [5082]; root bark, flutes [1340]; stems, wood, axe handles [1304]; defoliated stems/branches, fences [5091]; wood, pestles [5111] [5118]; wood, agricultural tools [5111]; stems, wood, agricultural tools [1304]; wood, constructions [5084] [5103] [5177]; wood, wagons/carts [1340] [5082]; wood, props, mines [1340] [5082]; root bark, flutes [1340]; wood, poles (from wood), fences [5121]; wood, tools [5121]; wood, buildings [1120] [5092] [5121]; wood, timber [5092]; stems, outbuildings [1304]; trunks, cosmetics [5084]; heartwood, poles (from wood), houses [1413]; heartwood, machines [1413]; wood, fences [5120] [5177] [5399]; wood, poles (from wood), huts [5399]
	Tannins/Dyestuffs	bark, dyes [5084]; bark, tannins [5092]
	Other Materials/Chemicals	root bark, flutes [5084] [5092]; seeds, beads, necklaces [5088]; root bark, quivers [5092]; fruits, necklaces [5088] [5101]; inner bark, perfumes [2136]; seeds, body paints [1304]; bark, huts [5120]; leafy stems/branches, ornaments [1257]; roots, perfumes [5095]; fruits, ornaments [1257] [5088]; fruits, musical instruments [5101] [5118]
FUELS [1120]	Fuelwood	other fuel qualities [2136] [5084] [5095] [5097] [5111]
[1332] [1355] [1413]		
[2136] [2795] [5082]		
[5084] [5091] [5092]		
[5095] [5097] [5103]		
[5111] [5120] [5121]		
[5177] [5398] [5399]		
	Charcoal	
SOCIAL USES	Smoking Materials/Drugs	fruits, other smoking materials/drugs [5095]
	'Religious' Uses	roots, ritual/religion/magic [5088]; roots [5088] [5095]; wood, ritual/religion/magic [1304]; other plant parts, sacred plant [5092]; live plant in situ, ritual/religion/magic [5177]; trunks, ritual/religion/magic [1340]; other plant parts, ritual/religion/magic [1340]
	Miscellaneous Social Uses	thorns [5084]
VERTEBRATE	Mammals	seeds [1413]
POISONS		
MEDICINES	Abnormalities	fruits, humans, oedemas, external applications [1304] [2136] [5095] [5098]
	Circulatory System Disorders	roots, humans, heart [5088]
	Digestive System Disorders	bark, humans, diarrhoea, oral ingestion [2136] [5098]
	Infections/Infestations	gum, humans, tuberculosis, oral ingestion [2136] [2795]; roots, humans, tuberculosis, oral ingestion [5111]; fruits, humans, ears [1413] [5082] [5092] [5097] [5098]; gum, humans, colds, oral ingestion [2136] [2795]; gum, humans, gonorrhoea [1340] [1413] [5092]

Inflammation	fruits, humans, ears, inflammation [5098]
Injuries	thorns, humans, feet, foreign bodies [5094]; wood, humans, injuries, external applications [1304] [2136] [5098]
Nervous System Disorders	roots, humans, external applications [5101]
Pain	fruits, humans, ears [5082]; thorns, humans, other medicine types, oral ingestion [5098]; roots, humans, other medicinal applications [5088]; roots, humans, anodyne [5088]; roots, humans, stomach, anodyne [5088]; roots, humans, head, anodyne [5088]; roots, humans, chest, anodyne, neck bands [5088]; roots, humans, teeth, anodyne, mouth washes [5111]; bark, humans, head, anodyne [5082] [5092] [5097] [5098]; thorns, humans, other medicine types [5088]; stem bark, humans, other medicine types, oral ingestion [5098]; thorns, humans, anodyne, inhalers [5088]; thorns, humans, other medicine types [5088]; stem bark, humans, other medicine types, oral ingestion [5098]; thorns, humans, anodyne, inhalers [5088]; bark, humans, head, anodyne [1413] [5082] [5092] [5097] [5098]
Pregnancy/Birth/Puerperium Disorders	humans, miscarriages, scarification [5095]
Respiratory System Disorders	gum, humans, coughs, oral ingestion [2136] [2795] [5095]; leaves, humans, lungs, coughs, teas [5098]; thorns, humans, other medicine types, oral ingestion [5098]; roots, humans, nose, other respiratory system disorders/effects, oral ingestion [2136] [5154]; bark, humans, other medicine types, oral ingestion [5086] [5098]; roots, humans, coughs, other medicine types, teas [1304] [2795] [5098]; 'roots', humans, coughs, oral ingestion [2136]; inner bark, humans, coughs, other medicinal applications [5098]; 'roots', humans, coughs, oral ingestion [2136]; inner bark, humans, coughs, other medicinal applications [5098]; roots, humans, coughs [1413]
Sensory System Disorders	thorns, humans, squints, inhalers [5088]
Skin/Subcutaneous Cellular Tissue Disorders	resin, humans, astringent [5098]
ENVIRONMENTAL USES	
Erosion Control	dunes [1413]
Shade/Shelter	deserts [1413] [5082] [5092]
Indicators	groundwater [1413]
Soil Improvers	live plant in situ, fertility improvers [5120]
Ornamentals	live plant in situ, potted plants [5120]; live plant in situ, gardens [5097]
Boundaries/Barriers/Supports	animal barriers, homesteads [5091]

Picture

None recorded

Notes

NOMENCLATURE/TAXONOMY

Name derivation:

Erioloba is Latin for half-moon shaped, referring to the pods. The old name giraffae refers to the giraffes that were

often seen browsing this tree [1413] .

Name derivation:

Erioloba is derived from Greek, meaning woolly lobe, referring to the shape of the pods [5399] .

Name derivation:

Akanthos is Greek for thorn, erioloba is Latin for half-moon shaped, referring to the pods [5177] .

VERNACULAR NAMES

Herero (Namibia), omuhiviriko:

Hahn (1928) recorded that omuhiviriko means 'the praiseworthy' [5095] .

DISTRIBUTION

Mozambique:

One published record for Mozambique only [5120] .

Namibia:

Most widespread species in Namibia, occurring throughout most of the country [5121] .

Africa:

From Angola and Zambia in the north to the Northern Cape in the south [5097] .

Okavango Delta:

Very common and widespread, often associated with abandoned watercourses [5177] .

Asia-Temperate:

Found in Middle East [1355] .

RARITY/CONSERVATION

Namibia:

Increasing quantities of firewood and charcoal are imported into South Africa from Namibia with a potential danger of over-exploiting the resource [2795] .

Namibia:

Protected by the Forestry Ordinance [5121] .

Africa:

Neither rare nor threatened [1355] .

Namibia:

Much sought after for firewood and is subject to over-exploitation [5121] .

South Africa:

Protected tree [5097] .

DESCRIPTION

Bark:

Grey to blackish-brown, deeply furrowed. Young branchlets shiny, reddish brown [5082] .

Crown width:

Old trees can reach 12m in height with a canopy diameter of 22m (Carr, 1976) [5120] .

Flowers:

Bright golden yellow balls [5082] .

Fruits:

A much-thickened, comparatively short and squat pod, up to 11 x 4.7 cm, straight or slightly curved, densely covered with creamy grey to grey velvety hairs, indehiscent [5082] .

Habit:

Canopies begin to spread at 17 years. Old trees can reach 12 m in height with a canopy diameter of 22 m (Carr, 1976) [5120] .

In Matabeleland, Zimbabwe, trees of around 20 years old had a mean height of 5.7 m (range 3.7 - 7.3 m) and mean stem diameter at ankle height 18.4 cm (10.1 - 35.0 cm) (Barnes et al, 1996) [5120] .

Odour:

The fresh fine roots give off a rather strong odour [5098] .

Leaf fall:

Loses its leaves for a short period only [5092] .

Leaves:

Leaflets 4-13 x 1-4 mm, with veins prominent below [5082] .

Leaves:

Rachis with a small gland at the junction of each pair of pinnae. Petiole shorter than 1.5cm, without a gland [5082] .

Leaves:

With 1-5 pairs of pinnae, each bearing 8-15 pairs of leaflets [5082] .

Lifeform:

On rocky outcrops in Namibia grows mainly as shrubs of 1 - 3 m high [5121] .

Lifespan:

Reputed to reach ages of 300 years [1413] .

Lifespan:

Two specimens (Botswana) were carbon-dated at ages 102 and 87 years for a 78 and 73 cm trunk diameter, respectively [5092] .

Odour:

Wood exudes a cinnamon-like smell when burnt [5092] .

Height:

Usually 6-7 m but may reach 22 m [5398] .

Roots:

Penetrate soil to great depths to obtain water. Tap roots can attain a depth of around 45 m [5092] .

Roots:

Root system is aggressive and the tree should not be planted close to buildings and pavings [5097] .

Roots:

The fresh fine roots give off a rather strong odour [5088] .

Gum:

Said to be of the gum-arabic type (Wehmer 1929-31, Githens 1949, cited in Watt & Breyer-Brandwijk 1962) [1340] .

Seeds:

Dark, reddish-brown, lenticular [2136] .

Armature:

Spines strongly developed, almost straight, whitish or brown, up to 6 cm long, often inflated or swollen and fused at the base, forming 'pseudo-galls' [5082] .

FOOD - SEEDLINGS/GERMINATED SEEDS

Coffee substitute:

The seed has been used as a coffee substitute by both European and the indigenous inhabitants of Namaqualand (Dragendroff 1898, cited in Watt & Breyer-Brandwijk 1962) [1340] .

FOOD - INFRUCTESCENCES

Fruit pulp, famine food:

In periods of scarcity, the pulp of the pods is eaten by Topnaar people (Namibia) [2136] [2795] .

Pulp:

In Namibia, the pulp contained in the pods is sometimes eaten by children [5084] .

FOOD - SEEDS

Coffee substitutes:

Roasted and used as a coffee substitute [2795] [5092] [5097] .

Coffee substitutes:

The seeds are used as a coffee substitute all over southern Africa [2136] .

Coffee substitutes:

The seed has been used as a coffee substitute by both European and the indigenous inhabitants of Namaqualand (Dragendroff 1898, cited in Watt & Breyer-Brandwijk 1962) [1340] .

ANIMAL FOOD

Mammals, game mammals, browse:

Both wild and domestic animals browse the leaves, flowers, young shoots and pods which are highly nutritious [5121] .

ANIMAL FOOD - BARK

Stem bark, elephants:

Some trees in Moremi Wildlife Reserve, Botswana have been killed after being ringbarked by elephant who are after the nutritious bark [1413] .

Stem bark, game mammals:

Elephants eat the bark [1413] .

Stem bark, rodents:

Ring-barking by porcupines can kill established trees [5120] .

ANIMAL FOOD - EXUDATES

Gum:

Eaten by a variety of animals including Kori bustard, tree rat and bushbaby [5092] .

Gum:

Eaten by animals and birds [5092] .

ANIMAL FOOD - FERTILE PLANT PARTS

Fruits, game mammals, fodder:

Seed pods eaten by giraffes [1304] .

Fruits, elephant, giraffe, eland, kudu, gemsbok, grey duiker:

The sweetish and astringent pods are an excellent fodder [5097] .

Fruits, cattle, fodder:

Cows fed on the pods show an increased milk production [5082] [5092] [5097] .

Infructescences, mammals, fodder, drought season:

Pods are sometimes milled and given as fodder during periods of drought [5097] .

Flowers, mammals, game mammals, browse:

The flowers are browsed off the tree and picked up off the ground by stock and game and may make a valuable contribution to their nutrition at a time when grass and browse are at their lowest in the range [5120] .

Fruits, mammals, fodder:

Pods can be fed safely to stock provided small dry quantities are fed at a time (Steyn, 1934) [5120] .

Fruits, mammals, fodder:

Pods provide excellent fodder for stock, farmers say animals pick them up as fast as they fall to the ground [5082] .

Fruits, mammals, fodder:

Toxicity of pods can be reduced by boiling the pod or meal before feeding or mixing it with sulphur or molasses (Steyn, 1934) [5120] .

Fruits, elephants:

Elephants shake pods from trees to eat [5092] .

Fruits, mammals:

Pods eaten by livestock [2136] .

Fruits, mammals:

Small stock eat pods and seedlings [5082] .

Fruits, baboons:

The young pod is eaten by the baboon (Pardy 1953, cited by Watt & Breyer-Brandwijk 1962) [1340] .

Fruits, cattle, game mammals:

In Southern Rhodesia (Zimbabwe) the pod is relished by cattle and game (Wild 1953, cited by Watt & Breyer-Brandwijk 1962) [1340] .

Fodder:

A mixture of grape seed and maize seed is superior in nutritive value to a mixture of the pod and maize seed (Myburgh 1945, cited in Watt & Breyer-Brandwijk 1962) [1340] .

Mammals, fodder, drought season, fruits:

In times of drought the pods are collected, milled with some sulphur to neutralise the prussic acid often found in

them and fed to cattle [5399] .

Fruits, cattle, sheep, drought seasons:

In South Africa, milled pods are sometimes fed to cattle or sheep during droughts [5320] .

Fruits, cattle, game mammals:

In Southern Rhodesia (Zimbabwe) the pod is relished by cattle and game (Wild 1953, cited by Watt & Breyer-Brandwijk 1962) [1340] .

Fruits, mammals, concentrates:

Crushed pods mixed with mealie meal make a good livestock food; sulphur should be added to prevent poisoning [1413] .

ANIMAL FOOD - AERIAL PARTS

Leaves, mammals, browse, winter:

One of the first trees to get new leaves in late winter, providing valuable fodder at a time which is critical for most browsers [5092] .

Leaves, mammals, fodder:

Considered good fodder for livestock [2136] [5095] .

Game mammals:

Favoured by elephant and eland (Henkel 1931; Pardy 1953, cited in Watt & Breyer-Brandwijk, 1962) [1340] .

Mammals, game mammals, rodents, browse, winter, dry season:

Antelope, giraffe, elephant, rodents and domestic livestock all browse *A. erioloba* during the dry winter season [5120] .

Leaves, mammals, fodder:

Although the pods have yielded sufficient hydrocyanic acid under suitable conditions to prove both toxic and even fatal, the leaf and pod are eaten by stock or fed purposely to them (Burt Davy 1912; Pardy 1953; Steyn 1935, cited by Watt and Breyer-Brandwijk, 1962) [1340] .

Cattle, fodder:

In Kalahari fodder nutrition survey, acacias were found to have quite high nutrition content, but little browsed by cattle when grazing conditions were acceptable [940] .

Leafy stems/branches, cattle, goats:

Twigs eaten by cattle and goats [1304] .

ANIMAL FOOD - OTHER PARTS

Seedlings, mammals:

Small stock eat the seedlings [5082] .

BEE PLANTS

Bees do not appear to visit the trees during the day [5120] .

INVERTEBRATE FOOD

Larvae of the emperor moth *Gynanisa maja* feed on the foliage and these are sometimes eaten by humans [5399] .

MATERIALS

Wood properties:

Wood is very heavy (1230 kg/m³) [5111] [5120] .

Wood properties:

Strong and durable [3045] .

Wood properties:

The wood is of a dark, red-brown colour, heavy and very strong [5092] .

Wood properties:

Wood is dense and very heavy (1230 kg/m³) [5399] .

Wood properties, durability:

Sapwood is durable, heartwood exceptionally so [5120] .

Wood properties, resistance to termites:

Resistant to termites and borers [1340] [5082] [5120] .

Wood properties:

Almost immune to fungal attack [5120] .

Wood properties:

Dark red-brown and very strong [1340] [5082] [5092] .

Wood properties:

Heartwood is heavy (1144 kg/m³) [5097] .

Wood properties:

Sapwood very thin [5097] .

MATERIALS - FIBRES

Ropes, inner bark:

The inner bark, if stripped, pounded and coiled, provides excellent rope [5092] [5097] .

MATERIALS - WOOD

Bearings:

Heartwood has been used for machine bearings [1340] [5098] .

Constructions:

Used extensively as construction material along the lower Kuiseb River (Namibia) [5084] .

Containers/holders:

The 'hotsikap' used by Dama people to hoist water from wells is made from the wood [5103] .

Pestles:

The pestles are used for pounding mahango (millet), maize etc [5111] [5118] .

Flutes, root bark:

When reeds are not available the Nama Hottentot uses the root bark for making flutes (Ferreira 1952, cited by Watt & Breyer-Brandwijk 1962) [1340] .

Poles (from wood), outbuildings:

Large poles used for vertical poles at kraal entrance because it is believed they drive away non-native stinging bees (Loeb et al, 1956) [1304] .

Root bark, flutes:

When reeds are not available the Nama Hottentot uses the root bark for making flutes (Ferreira 1952, cited by Watt & Breyer-Brandwijk 1962) [1340] .

Outbuildings, stems:

Spiny stems piled around kraal to form cattle and goat enclosures where animals are kept at night [1304] .

Walking sticks, heartwood:

Heartwood of larger stems used for knobkerries (walking sticks) [1304] .

Agricultural tools, stems:

Handles for axes, hoes and other tools [1304] .

Agricultural tools:

Used for hoe handles [5111] .

MATERIALS - TANNINS/DYESTUFFS

Tannins, bark:

The bark is used for tanning purposes [5092] .

Dyes, bark:

The green bark is used for a dyeing agent in skin-working [5084] .

MATERIALS - OTHER MATERIALS/CHEMICALS

Huts, bark:

Used by Topnaar people (Namibia) for building huts (Palmer and Pitman, 1972) [5120] .

Body paints, seeds:

Seeds crushed to obtain an oil which is mixed with red ochre and smeared on body [1304] .

Fruits, leafy stems/branches, ornaments:

Shoots and pods could be used for florist material [1257] .

Fruits, musical instruments:

Strings of pods containing seeds worn around the neck serve as rattles during singing [5101] .

Necklaces, fruits:

Jul'hoansi women (northeastern Namibia) sometimes wear the fruits as decorations e.g. attached to a necklace [5088] .

Perfumes, inner bark:

The powder obtained from between the stem and the bark is liberally applied to the body as a perfume, or is used to scent the house, by the Topnaar people of Namibia [2136] .

Musical instruments, pods:

Put on feet for traditional dancing [5118] .

Flutes, root bark:

Root bark utilised for the manufacture of flutes when suitable reeds were not available [5084] [5092] .

Quivers, root bark:

Bushmen heat a straight section of the live root over a fire and gently slip the bark off. This is then used as a quiver for arrows by closing the bottom with a piece of gemsbok skin and the top with a soft material to protect the arrow heads [5092] .

Perfume, roots:

Hilderheim (1986) recorded that among the Bondelswarts Nama of Warmbad (Namibia) a root powder was frequently used as a body perfume because of its pleasant aroma [5095] .

Trunks, cosmetics:

In Namibia, a powder-like substance is collected from rotten tree trunks which is pounded and, after mixing with hard fat, used as a cosmetic by women [5084] .

FUELS - FUELWOOD

One of the most important sources of firewood in southern Africa, particularly because it grows in sparsely treed bushveld [2795] .

Produces little smoke and good quality charcoal [2136] .

In Namibia, regarded as excellent firewood because it burns slowly and provides hot coals [5084] [5095] [5097] [5111] .

It makes an excellent fire wood with long lasting heat and fire. In Western Bushmanland, Namibia traditionally considered to be the best fuel wood [5111] .

FUELS - CHARCOAL

Increasing quantities of firewood and charcoal are imported into South Africa from Namibia with a potential danger of over-exploiting the resource [2795] .

SOCIAL USES - SMOKING MATERIALS/DRUGS

Pods:

Inhalation of the smoke from burned pods is considered good for general health [5095] .

SOCIAL USES - 'RELIGIOUS' USES

Wood, religion:

Large poles used for vertical poles at kraal entrance because it is believed they drive away non-native stinging bees (Loeb et al, 1956) [1304] .

Other plant parts, sacred plant:

Regarded as sacred by some tribes. Some tribes use a potion containing charred portions of a tree which has been struck by lightning, mixed with goat fat, as a protective charm during public debates. It is believed that a person taking refuge in a camelthorn during war time will be protected from his enemies, and from wild animals [5092] .

Live plant in situ, religious:

The tree is regarded as sacred by some tribes and often only the chief may fell it for timber [5177] .

Live plant in situ, sacred plant:

According to Ferreira 1952, cited by Watt & Breyer-Brandwijk 1962, the Tlhaping regard it as a mighty tree not to be used by common people. Only chiefs and other prominent men are permitted to cut the timber for cattle folds. They also believe that a person who takes refuge in one of these trees during wartime will be protected from his enemies and from wild animals. [1340] .

Roots:

Hildesheim (1986) recorded that among the Bondelswarts Nama of Warmbad (Namibia), a root powder was burnt for luck [5095] .

Roots:

Plaited cords of roots are worn around the neck to ward off evil spirits [5088] .

Other plant parts, religious:

According to Ferreira, 1952, cited by Watt & Breyer-Brandwijk 1962, charred portions of a tree struck by lightning are mixed with goat fat by the tribal doctor for use as a protective charm when public affairs are attended to, by the Tlhaping people [1340] .

Trunk, ritual:

The pole erected by the Tlhaping at a circumcision-lodge is usually a trunk of this tree (Ferreira 1952, cited by Watt & Breyer-Brandwijk 1962) [1340] .

SOCIAL USES - MISCELLANEOUS SOCIAL USES

Thorns:

Thorns were traditionally used in a children's game called //abi in which adult warriors were imitated [5084] .

VERTEBRATE POISONS - MAMMALS

There have been reports that at certain seasons of the year the pods are poisonous [5082] .

MEDICINES - ABNORMALITIES

Fruits, humans, oedemas, external applications:

Pods are applied to swelling, by Damara people, Namibia [5095] .

Fruits, humans, oedemas, external applications:

The Kwanyama/Ovambo (Namibia) heat pods on embers and apply heated pods to swellings [1304] [2136] .

MEDICINES - CIRCULATORY SYSTEM DISORDERS

Roots, humans, heart:

Jul'hoansi (northeastern Namibia) prepare a root decoction for chest and heart ailments. Some people chew the roots and then spray or spit their saliva onto the person suffering the disease [5088] .

MEDICINES - DIGESTIVE SYSTEM DISORDERS

Bark, humans, diarrhoea, oral ingestion:

In Namibia a bark decoction is drunk to cure diarrhoea [2136] .

MEDICINES - INFECTIONS/INFESTATIONS

Fruits, humans, ears:

Dried pods are crushed into a powder which is used to treat discharging and infected ears [1413] [5082] [5097] .

Gum, humans, tuberculosis, colds, oral ingestion:

The gum is dissolved in boiling water which is drunk by the Kuiseb Topnaar to relieve colds and symptoms of tuberculosis [2136] [2795] .

Roots, humans, tuberculosis, oral ingestion:

The outer skin of middle aged roots (finger to arm thickness) is scraped away and the root itself is cut into 3 - 5 cm long pieces. These are put into cold water, brought to the boil, cooked for about 3 min then removed from the water. The infusion is drunk 3 times a day for 1 - 2 months until the patient recovers. Every third day a fresh infusion has to be prepared [5111] .

Gum, humans, gonorrhoea:

The gum is used as an astringent and demulcent in gonorrhoea (de Wildeman 1947, cited in Watt & Breyer-Brandwijk 1962) [1340] .

MEDICINES - INFLAMMATION

Fruits, humans, inflammation, ear:

In Namibia, ear inflammation is treated with finely ground pods [5098] .

MEDICINES - INJURIES

Wood, humans, injuries, external applications:

The Ovambo (Namibia) apply ashes of the wood to injuries [1304] [2136] [5098] .

Thorns, humans, feet, foreign bodies:

The Nharo (Namibia and Botswana) use the long thorns to ply out small thorns from their footsoles [5094] .

MEDICINES - NERVOUS SYSTEM DISORDERS

Roots, humans, external applications:

When a dancer goes into a hypnotic fit during singing, the root of this tree is chewed and the liquid spat onto a person to resuscitate him [5101] .

MEDICINES - PAIN

Stem bark, thorns, humans, other medicine types, oral ingestion:

Damara people state that the bark of young twigs is scraped clean, separated from the stem, chopped, mixed with a few crushed thorns and all of it boiled. The decoction is taken for coughing up of blood or when coughing is accompanied by stabbing chest pains (Wilhemstal, Namibia) [5098] .

Roots, humans, anodyne, neck bands, chest:

Plaited cords of roots are worn around the neck as a medical charm to treat chest pain and related diseases [5088] .

Roots, humans, anodyne, teeth, mouth washes:

The outer skin of middle aged roots (finger to arm thickness) is scraped away and the root itself is cut into 3 - 5 cm long pieces. These are put into cold water, brought to the boil, cooked for 5 - 10 m then removed from the water. After the infusion has cooled a bit, it is swilled around the mouth, especially the area of the tooth ache and then spat out; it should never be swallowed [5111] .

Roots, humans, anodyne:

The fresh fine roots are chewed in the case of any strong pain being experienced, be it in the chest, stomach or head, and are taken to combat severe diseases [5088] .

Thorns, humans, anodyne, inhalers:

Sometimes the charred and crushed thorn tips of *Acacia erioloba* are added to dried and charred plant parts of *Dicoma tomentosa* which have been put in a tin, and had hot coals added. The smoke is inhaled to treat stabbing pains. This treatment is used by Jul'hoansi (northeastern Namibia) [5088] .

Bark, humans, anodyne, head:

The bark has been burnt, then ground to produce a remedy for headaches [1413] [5082] [5097] [5098] .

MEDICINES - PREGNANCY/BIRTH/PUERPERIUM DISORDERS

Humans, miscarriages, scarification:

A powder from plant parts is introduced into incisions on pregnant women who start bleeding, to prevent miscarrying [5095] .

MEDICINES - RESPIRATORY SYSTEM DISORDERS

Bark, humans, other medicine types, oral ingestion:

Bark is boiled in milk to treat a cold [5086] .

Bark, thorns, humans, other medicine types, oral ingestion:

Damara people state that the bark of young twigs is scraped clean, separated from the stem, chopped, mixed with a few crushed thorns and all of it boiled. The decoction is taken for coughing up of blood or when coughing is

accompanied by stabbing chest pains (Wilhemstal, Namibia) [5098] .

Leaves, humans, lung, coughs, teas:

Herero people take a leaf tea for lung conditions and coughs (Windhoek, Namibia) [5098] .

Gum, humans, coughs, oral ingestion:

The gum is dissolved in boiling water which is drunk by the Kuiseb Topnaar, Namibia to relieve coughs [2795] .

Roots, humans, chest:

Jul'hoansi (northeastern Namibia) prepare a root decoction for chest and heart ailments. Some people chew the roots and then spray or spit their saliva onto the person suffering the disease. A modification of this treatment is to chew a plaited cord or necklace made of the roots and then spray one's saliva onto the sick person [5088] .

Roots, humans, coughs, other medicine types, teas:

According to Le Roux (1971), roots used as a cough remedy by the Mbukushu people of Kavango region (Namibia). Thin roots up to 1 cm in diameter chopped into about 2.5 cm length, boiled in water until water becomes black. One dessert spoon taken in early evening and one in morning [1304] .

Roots, humans, coughs, other medicine types, teas:

The Himba of Kaokoland (Namibia) make a dark tea out of the chopped roots and take one teaspoonful mornings and evenings for a cough [5098] .

Roots, humans, other respiratory system disorders/effects, oral ingestion, nose:

A root decoction is used to stop nose bleeds [2136] [2795] .

Roots, humans, other respiratory system disorders/effects, oral ingestion, nose:

In Botswana three to four cups of water boiled with powdered roots are taken per day to treat nose bleeding [5154] .

Roots, humans, coughs:

The roots are used as a cough remedy by the Mbukushu, Botswana [1413] .

'Roots', humans, coughs, oral ingestion:

In Namibia, a root decoction is drunk as a cough remedy [2136] .

Inner bark, humans, coughs, other medicinal applications:

For a cough the white inner bark may be chewed or boiled in milk by Herero people (Okahandja, Namibia) [5098] .

ENVIRONMENTAL USES - EROSION CONTROL

Dunes:

Has been planted at Bokspits, Botswana to help in sand dune stabilisation [1413] .

ENVIRONMENTAL USES - SHADE/SHELTER

Farmers can plant groups of up to 15 trees in a suitable habitat to provide fodder, protection and shade to animals [5097] .

Deserts:

Has tremendous value as a shade tree in desert areas for both humans and animals [5082] [5092] .

ENVIRONMENTAL USES - INDICATORS

Groundwater:

Where rainfall is less than 250 mm, the presence of *A. erioloba* is said to indicate that there is underground water [1413] .

ENVIRONMENTAL USES - SOIL IMPROVERS

Fertility improvers, live plant in situ:

Soils beneath living *A. erioloba* trees in the Kalahari had higher concentrations of organic carbon, nitrogen and phosphorus than soil from surrounding grasslands and scrubland. Fleshy-fruited shrubs were significantly more frequent beneath the trees than in intervening desert grassland. Animal activities focussed around large trees also served to enrich the soil beneath them, improving soil condition (Milton and Dean, 1995) [5120] .

ENVIRONMENTAL USES - ORNAMENTALS

Live plant in situ, gardens:

Makes an attractive and interesting garden tree [5097] .

Potted plants, live plant in situ:

There is a record of *A. erioloba* being successfully cultivated for miniature (bonsai) trees (Ormond, 1968) [5120] .

ENVIRONMENTAL USES - BOUNDARIES/BARRIERS/SUPPORTS

Animal barriers, homesteads:

Spiny stems are piled around kraals to form cattle and goat enclosures where animals are kept at night [1304] [5091] .

NUTRITIONAL VALUE

Barnes (1996) calculates that *A. erioloba* grown at 15 stems/ha would yield around 2.25 t of pods/ha providing a crude protein yield of 372 kg/ha. This is more than a comparable crop of maize (maximum 360 kg/ha). The metabolisable energy from the acacia pods is only slightly lower (21150 MJ/ha) than the average maize crop (22500 MJ/ha). In addition, the yields from the acacia parkland are produced without input costs of seed and labour, other than for pod collection. The browse value of the foliage, the high yield of nutritious grasses that grow beneath the canopies and the environmental benefits are added and substantial bonuses [5120] .

Gum, protein:

53 - 56 % [5120] .

Fruits, protein:

Crude protein content of milled pods plus seeds 16.54 % (Barnes et al, 1996) [5120] .

Leaves, protein:

Up to 17 % protein (February) with 35 % digestibility (Ncojane, Botswana) [1413] [5092] .

Leafy stems/branches:

Stem and leaf digestibility about 40 % in the Namib (Nel, 1983) [5120] .

Fruits, carbohydrate:

10.86 % from 15 - 20 year old trees in Zimbabwe (Barnes, 1996) [5120] .

Pods, fat:

Shell of pods yields 1.2 % fat [5092] [5097] .

Pods, fibre:

44.9 % Fibre - NDF; 34.3 % Fibre - ADF from 15 - 20 year old trees in Zimbabwe (Barnes, 1996) [5120] .

Pods, lignin:

4.33 % from 15 - 20 year old trees in Zimbabwe (Barnes, 1996) [5120] .

Pods, phosphorus:

High phosphorus content [5092] .

Pods, protein:

10 - 16 % crude protein (Nel, 1983) [5120] .

Pods, protein:

11.4 % crude protein [5097] .

Pods, protein:

12 % crude protein (Steyn 1943) [5120] .

Pods, protein:

6 % crude protein [1413] .

Pods, protein:

9.9 % from 15 - 20 year old trees in Zimbabwe (Barnes, 1996) [5120] .

Pods, starch:

25.82 % from 15 - 20 year old trees in Zimbabwe (Barnes, 1996) [5120] .

Pods:

Pods collected in Hwange National Park, Zimbabwe contained 9.4 % water; 3.3 % acid-soluble ash; 1.6 % ether extract; 31.0 % fibre; 11.4 % crude protein; 0.9 % calcium; 0.24 % phosphoric acid; 1.3 % potassium (Henkel, 1931) [5120] .

Fodder:

A mixture of grape seed and maize seed is superior in nutritive value to a mixture of the pod and maize seed (Myburgh 1945, cited in Watt & Breyer-Brandwijk 1962) [1340] .

Pods:

Total digestible organic matter of pods has been estimated at 48 % (Nel, 1983) [5120] .

In Kalahari fodder nutrition survey, acacias were found to have quite high nutrition content, but little browsed by

cattle when grazing conditions were acceptable [940] .

Pods, seeds, protein:

Pods, when crushed with seeds, can contain 10-20% protein [5399] .

Seeds, carbohydrate 5.70 % from 15 - 20 year old trees in Zimbabwe (Barnes, 1996) [5120] .

Seeds, fat:

Yield 3.5 % bright orange fat [5092] [5097] .

Seeds, fibre:

32.05 % Fibre - NDF; 20.91 % Fibre - ADF from 15 - 20 year old trees in Zimbabwe (Barnes, 1996) [5120] .

Seeds, lignin:

4.22 % from 15 - 20 year old trees in Zimbabwe (Barnes, 1996) [5120] .

Seeds, protein:

27.4 % crude protein, seeds from 15 - 20 year old trees in Zimbabwe (Barnes, 1996) [5120] .

Seeds, protein:

Contain up to 33 % crude protein [1413] [5092] [5097] .

Seeds, starch:

26.05 % from 15 - 20 year old trees in Zimbabwe (Barnes, 1996) [5120] .

Seeds:

Moisture 8.0 g/100g; ash 4.2 g/100g; protein 25.8 g/100g; fat 4.6 g/100g; fibre 11.4 g/100g; carbohydrate 46.0 g/100g; energy value 1380 kJ/100g; Ca 385 mg/100g; Mg 275 mg/100g; Fe 4.88 mg/100g; Na 5.85 mg/100g; K 1100 mg/100g; Cu 1.0 mg/100g; Zn 3.48 mg/100g; P 317 mg/100g; thiamin 0.77 mg/100g; riboflavin 0.15 mg/100g; nicotinic acid 1.34 mg/100g [187] .

Seeds:

Very nutritious [2136] .

Stem:

Stem and leaf digestibility about 40 % in the Namib (Nel, 1983) [5120] .

Unspecified plant parts:

Chemical composition of selected browse species from northern Transvaal, South Africa: 12.1 % crude protein; 1.63 % ether extract; 32.0 % crude fibre; Ca 0.99 % and P 0.26 % [1582] .

ANTINUTRITIONAL FACTORS

Infructescences, hydrocyanic acid:

The hydrocyanic acid is present in the form of a cyanogenetic glucoside (Steyn 1935, 1958 cited in Watt & Breyer-Brandwijk 1962) [1340] .

Leaves, pods, hydrocyanic acid:

Fresh leaves yield 77.6 mg/100 g dry weight; fresh immature pods 72.6 - 80 mg/100 g; fresh mature pod (shell and seed) 18 - 25.6 mg/100 g; dry ripe pod 18 mg / 100g (Steyn and Rimington 1941, Steyn 1935, 1936, van der Walt 1939, cited in Watt & Breyer-Brandwijk 1962) [1340] .

Leaves, pods, seeds:

Yield a large amount of hydrocyanic acid which can cause fatal effects on animals (Steyn 1935, 1934, cited in Watt & Breyer-Brandwijk 1962) [1340] .

Pods, hydrocyanic acid:

The pods cannot be fed indiscriminately because of the hydrocyanic acid risk [1340] .

TOXICITY/POISONOUS COMPOUNDS

Fruits, mammals:

Pods can be fed safely to stock provided small dry quantities are fed at a time (Steyn, 1934) [5120] .

Fruits, mammals:

Toxicity of pods can be reduced by boiling the pod or meal before feeding or mixing it with sulphur or molasses (Steyn, 1934) [5120] .

Fruits:

Pods reported to be poisonous at certain seasons of the year [5082] .

Leaves, fruits, hydrocyanic acid:

Both contain small quantities of hydrocyanic (prussic) acid, which is poisonous in large quantities [2136] [5097] .

Leaves, fruits, prussic acid:

Fresh green foliage contains the most prussic acid, ripe pods the least [5097] [5120] .

Stems:

Under stressed conditions such as drought, dangerous levels of prussic acid build up, particularly in the meristems of young specimens and, when browsed, could result in death [5092] .

The toxicity of any plant containing prussic acid depends on the rate at which it is consumed because it is a gas and is rapidly eliminated by the lungs. Moistened plants are more dangerous than dry plants [5120] .

Seeds, prussic acid, mammals:

Reputed to contain prussic acid and cause poisoning in livestock. [1413] .

CHEMICAL ANALYSES - MISCELLANEOUS

Contains acacipetalin (Secor et al, 1976) [5120] .

Contains proacacipetalin (Sieger and Conn, 1982) [5120] .

Gum, protein:

53 - 56 % [5120] .

Heartwood, tannin:

Very high tannin content (Malan and Roux, 1975) [5120] .

Fruits, protein:

Crude protein content of milled pods plus seeds 16.54 % (Barnes et al, 1996) [5120] .

Fruits, fibre:

44.9 % Fibre - NDF; 34.3 % Fibre - ADF from 15 - 20 year old trees in Zimbabwe (Barnes, 1996) [5120] .

Fruits, lignin:

4.33 % from 15 - 20 year old trees in Zimbabwe (Barnes, 1996) [5120] .

Fruits, protein:

11.4 % crude protein [5120] .

Seeds, fibre:

32.05 % Fibre - NDF; 20.91 % Fibre - ADF from 15 - 20 year old trees in Zimbabwe (Barnes, 1996) [5120] .

Seeds, lignin:

4.22 % from 15 - 20 year old trees in Zimbabwe (Barnes, 1996) [5120] .

Leaves, stem:

Stem and leaf digestibility about 40 % in the Namib (Nel, 1983) [5120] .

May be allelopathic, explaining the absence of bush-encroachment species immediately beneath their crowns [5120] .

Pods, seeds, protein:

Up to 6 % crude protein in pods and 33 % in seeds during April/May (E. Botswana sandveld) [1413] .

Fruits, carbohydrate:

10.86 % from 15 - 20 year old trees in Zimbabwe (Barnes, 1996) [5120] .

Fruits, fat:

Shell of pods yields 1.2 % of a dark green fat [5092] [5097] .

Stem:

Stem and leaf digestibility about 40% in the Namib (Nel, 1983) [5120] .

Fruits, protein:

10 - 16 % crude protein (Nel, 1983) [5120] .

Fruits, protein:

12 % crude protein (Steyn 1943) [5120] .

Fruits, protein:

6 % crude protein [1413] .

Fruits, protein:

9.9 % from 15 - 20 year old trees in Zimbabwe (Barnes, 1996) [5120] .

Fruits, starch:

25.82 % from 15 - 20 year old trees in Zimbabwe (Barnes, 1996) [5120] .

Fruits:

Pods collected in Hwange National Park, Zimbabwe contained 9.4 % water; 3.3 % acid-soluble ash; 1.6 % ether extract; 31.0 % fibre; 11.4 % crude protein; 0.9 % calcium; 0.24 % phosphoric acid; 1.3 % potassium (Henkel, 1931) [5120] .

Fruits:

Total digestible organic matter of pods has been estimated at 48 % (Nel, 1983) [5120] .

Infructescences, protein:

11.4% crude protein (Henkel 1931, cited by Watt & Breyer-Brandwijk 1962) [1340] .

Pods, fat:

The shell of the pods yields 1.2 % of a dark green fat with a not unpleasant herb-like odour (Harrison 1951, 1952, cited in Watt & Breyer-Brandwijk 1962) [1340] .

Fruits, protein:

11.4% crude protein (Henkel 1931, cited by Watt & Breyer-Brandwijk 1962) [1340] .

Infructescences:

An analysis of the dietetic value of the pod is available (Imperial Bureau of Animal Nutrition 1936, cited in Watt & Breyer-Brandwijk 1962) [1340] .

Seeds, fat:

The seed yields 3.5% of a bright orange-coloured fat, liquid at 40 °C but separating out some solid on cooling to 25 °C (Harrison 1951, 1952, cited in Watt & Breyer-Brandwijk 1962) [1340] .

Seeds, carbohydrate:

5.70 % from 15 - 20 year old trees in Zimbabwe (Barnes, 1996) [5120] .

Seeds, fat:

Yield 3.5 % of a bright orange coloured fat [5092] [5097] .

Seeds, protein:

27.4 % from 15 - 20 year old trees in Zimbabwe (Barnes, 1996) [5120] .

Seeds, protein:

Contain up to 33 % [1413] [5092] [5097] .

Seeds, starch:

26.05 % from 15 - 20 year old trees in Zimbabwe (Barnes, 1996) [5120] .

Seeds:

Moisture 8.0 g/100g; ash 4.2 g/100g; protein 25.8 g/100g; fat 4.6 g/100g; fibre 11.4 g/100g; carbohydrate 46.0 g/100g; energy value 1380 kJ/100g; Ca 385 mg/100g; Mg 275 mg/100g; Fe 4.88 mg/100g; Na 5.85 mg/100g; K 1100 mg/100g; Cu 1.0 mg/100g; Zn 3.48 mg/100g; P 317 mg/100g; thiamin 0.77 mg/100g; riboflavin 0.15 mg/100g; nicotinic acid 1.34 mg/100g [187] .

Leaves:

Up to 17% protein (February) with 35% digestibility (Ncojane, Botswana) [1413] [5092] .

Unspecified plant parts:

Chemical composition of selected browse species from northern Transvaal, South Africa: 12.1 % crude protein; 1.63 % ether extract; 32.0 % crude fibre; Ca 0.99 % and P 0.26 % [1582] .

WEED PROBLEMS CAUSED

Cattle pass large quantities of seed in their dung. This facilitates bush encroachment by *A. erioloba* and other acacias with indehiscent pods. However it is highly valued throughout its range for its pod crops and shade and is rarely the subject of eradication measures or even control [5120] .

Namibia:

Although not regarded as an invasive species, *A. erioloba* was recorded encroaching along the road (1918DA) and forming thickets (2018CD) [5121] .

CONSTRAINTS - MISCELLANEOUS

Difficult to transplant due to very long tap-roots [5082] [5092] [5097] .

RAINFALL

In the most arid areas of its occurrence, mean annual rainfall can be < 50 mm. Where rainfall is less than 250 mm, the presence of *A. erioloba* is said to indicate that there is underground water [1413] .

TEMPERATURE

Mean annual temperature:

(15.4) 20.8 to 23.2 °C [628] .

Mean daily minimum of the coldest month:

1.9 to 8.4 °C [628] .

Months with absolute minimum $<0^{\circ}\text{C}$ is (0) 1 to 6 [628] .

Months with mean daily minimum $<0^{\circ}\text{C}$ is 0 [628] .

Absolute minimum temperature:

-6.7 to -0.6 (1.3) $^{\circ}\text{C}$ [628] .

SOILS

On sandy loams and deep Kalahari sand [5097] .

Throughout its range, invariably confined to the wind-blown sandy soils on the Kalahari sand sheet [5120] .

VEGETATION

Pioneers:

Dense stands of saplings develop in abandoned ploughed land (Milton and Dean, 1995) and in abandoned stock pens (Hoffman et al, 1995) [5120] .

Dry woodland along dry river beds where underground water is present [5097] .

Vegetation types:

One of the major species of desert regions [5082] [5120] .

ENVIRONMENTAL FACTORS - MISCELLANEOUS

Fruits:

Relatively resistant to damage e.g. from storms, which is one reason for *A. erioloba* producing good pod crops compared with other *Acacia* species [5120] .

POLLINATION

Insect pollinated [5120] .

FLOWERING/FRUITING/SEED SET

Flowering, Namibia:

August to May, with the main peak in September and a second, smaller peak in March/April; in some years the second peak was as early as January [5121] .

Flowering:

August - October [5120] .

Flowering, southern Africa:

July - September [5082] [5097] .

Flowering, Namibia:

September - October [5111] .

Flowering:

Usually starts to flower at about 10 years and by 20 years can be producing regular large pod crops [5120] .

Fruiting, Namibia:

In the Kuiseb River valley, trees produce no pods until they are 3 m in height and develop spreading canopies (van Wyk et al, 1985) [5120] .

Fruiting, Namibia:

Present all year, peaks in January, fewest in September/October. Young fruit mostly October to December, ripe fruit January to July [5121] .

Fruiting:

December - April [5097] .

Fruiting, southern Africa:

December - March [5082] .

In West Bushmanland, Namibia seeds are ripe from mid May onwards [5111] .

DISPERSAL

Botswana:

Cattle eat the pods and deposit seeds at least 2-3 km away (Ernst and Tolsma, 1990) [5120] .

Cattle pass large quantities of seed in their dung [5120] .

Viable seeds are found in the dung of eland, cattle, goats and elephant [5120] .

GERMINATION

Passage through an elephant's digestive system greatly increased scarification. Ingestion by elephants significantly increased the germination percentage and establishment rates. Ingestion by elephants may also protect the seed from bruchid attack (Austmyr, 1994) [5120] .

Seedlings germinate and survive more abundantly in high than in low rainfall years [5120] .

Viable seeds are found in the dung of eland, cattle, goats and elephant [5120] .

VEGETATIVE GROWTH

Growth rate:

300 - 500 mm per year [5097] .

Growth rate:

Two specimens (Botswana) were carbon-dated at ages 102 and 87 years for a 78 and 73 cm trunk diameter, respectively [5092] .

Growth rate:

On sandy soil saplings reach 1 m height in their first year, but grow more slowly on heavier soils [5120] .

Growth rate:

Very slow growing and does not regenerate rapidly [5121] .

Growth rate:

Growth starts as soon as flowering ends in about September. The branchlets can grow more than 1 m in length in the following 6 weeks after which the stem and spines thicken [5120] .

Growth rate:

Very slow growing above ground for first 4 or 5 years while it develops a deep root system. After this it can grow quite rapidly and attain a stem diameter at ankle height of around 30 cm and a height of about 7 m after another 15 to 20 years (Barnes et al 1996) [5120] .

LONGEVITY

Reputed to reach ages of 300 years [1413] .

Two specimens (Botswana) were carbon-dated at ages 102 and 87 years for a 78 and 73 cm trunk diameter, respectively [5092] .

CYTOLOGY

Reported as having both diploid $2n=26$ (Robbertse and van der Schijff, 1971) and polyploid $2n=52$ (Hamant et al, 1975) chromosomes [5120] .

HYBRIDISATION

Hybrids between *A. erioloba* and *A. haematoxylon* collected in Cape Province in 1940s (Ross, 1971) [5120] .

Hybridises with *A. haematoxylon* [1120] [1413] [3045] [5120] .

NITROGEN FIXATION/NODULATION

Barnes et al (1996) compared efficiency of leaves from 6 species of *Acacia* in fixing atmospheric nitrogen and in ground water usage. *A. erioloba* seems to obtain most of its nitrogen from ground water rather than from the atmosphere, thereby bringing into circulation nitrogen in ground water that is not available to any other plant in the community [5120] .

Corby (1988) recorded nodules on *A. erioloba*, classifying them as a Caesalpinoid type [5120] .

Although it was reported to nodulate under greenhouse conditions when inoculant was provided, camelthorn has not been observed to nodulate naturally. Research suggests that the species gets most of its nitrogen from groundwater, not from biological nitrogen fixation [5399] .

Soils beneath living *A. erioloba* trees in the Kalahari had higher concentrations of organic carbon, nitrogen and phosphorus than soil from surrounding grasslands and scrubland. Fleshy-fruited shrubs were significantly more frequent beneath the trees than in intervening desert grassland. Animal activities focussed around large trees also served to enrich the soil beneath them, improving soil condition (Milton and Dean, 1995) [5120] . Two out of 240 seedlings germinated experimentally had nodules (Gwaze et al, 1988) [5120] .

PHYSIOLOGICAL TOLERANCES

Frost tolerance:

Can probably withstand temperatures as low as -15 to -20 degrees C although flower initials may be damaged by less extreme temperatures [5120] .

Frost tolerance:

Well adapted to very dry and heavy frost conditions [5097] .

ASSOCIATED MAMMALS

The holes in the trunk and cavities under the bark are used by a wide range of small animals including birds. Fruit bats and monitor lizards have been recorded sheltering in these trees in Ongwediva, Namibia [5121] .

Tree rat (*Thallomys paedulus*) feeds mainly on *A. erioloba* gum, leaves and seeds and nests in the hollows and branches [5092] .

ASSOCIATED BIRDS

In Namibia, birds recorded nesting in the tree include Sociable Weaver, White-browed Sparrow-weaver, Red-billed Buffalo-weaver, Tawny Eagle and various owls [5121] .

Sociable weavers (*Philetairus socius*) frequently build nest in the trees [1305] [1413] [5120] [5121] .

The holes in the trunk and cavities under the bark are used by a wide range of small animals including birds [5121] .

White-browed sparrow weaver (*Plocepasser mahali*) builds numerous grass nests on the southwest side of trees that are over 3 m high (South Africa) (Fergusson, 1989) [5120] .

ASSOCIATED INSECTS

Coleoptera:

Bruchidius senegalensis and *Caryedon multinotatus* (bruchid species) were found associated with *A. erioloba* (Van Tonder, 1985) [5120] .

Lepidoptera:

Larvae of the topaz blue butterfly (*Azanus jesous*) feed on the inflorescences [5092] [5097] .

ASSOCIATED ORGANISMS - MISCELLANEOUS

Monitor lizards have been recorded sheltering in these trees in Ongwediva, Namibia [5121] .

INSECT PESTS

Coleoptera:

Bruchus albosparsus (Family Bruchidae) beetle destroys seed (South Africa, Plant Protection Research Institute, Checklist of insects on forest trees and shrubs in South Africa, 1970) [5120] .

Coleoptera:

Prone to attack by bruchid beetles which lay their eggs on ripening pods. The larva bores through the pod wall and burrows into a ripening seed (Southgate, 1978) [5120] .

Lepidoptera:

Gonometa postica (Family Lasiocampidae) is a larval defoliator (South Africa, Plant Protection Research Institute, Checklist of insects on forest trees and shrubs in South Africa, 1970) [5120] .

FUNGAL DISEASES

Bark has reportedly suffered from black spot fungus *Hysteroglyphium acaciae* (von Breitenbach, 1975) [5120] .

PARASITIC PLANTS

Rarely parasitised by *Loranthus* and *Viscum* spp (von Breitenbach, 1975) [5120] .

This species seems to be susceptible to parasites such as *Tapinanthus* and *Plicosepalus* [5121] .

SEED WEIGHT

In Matabeleland, Zimbabwe, trees of around 20 years old had a mean weight of seeds per pod of 3.8 g (1.8 - 9.6 g) (Barnes et al, 1996) [5120] .

Seeds contribute on average 27% of the combined weight of seed plus pod; from 15 - 20 year old trees in Zimbabwe (Barnes, 1996) [5120] .

Seeds from 25 pods from 15 - 20 year old trees in Zimbabwe weighed 94.8 g before grinding, 77.1 g after grinding (Barnes, 1996) [5120] .

SEED STORAGE

Seeds retain viability for many years even at room temperature. Bruchid larvae within seed can continue to be active even after the seed has been extracted and put into store. Storage at temperatures near to 0 degrees C reduces Bruchid activity and sub-zero temperatures of -20 to -30 degrees C may kill the larvae without damaging the seed [5120] .

PROPAGATION FROM SEED

Can be hastened by boiling the seeds briefly in water and then allowing them to soak for two days (Carr, 1976) [5120] .

Germination can be hastened by filing the seed coat on 2 edges or by nicking with a pair of nail clippers. Fastest germination is achieved by nicking the testa at the micropylar end, soaking for 12 hours and placing the seed in a germination cabinet at 32 - 26 ° C. The radicle will appear within about 48 hours and the seed can then be sown in soil. Pretreatment by nicking also allows damaged seed to be identified and discarded; bruchid exit holes can be seen at this stage and unhealthy tissue (brown rather than white) recognised (Barnes et al 1996) [5120] .

Namibia:

Seeds pretreated with sulphuric acid for 30 - 60 minutes achieved 90 % germination (Hoffman et al, 1989) [5120] .

Namibia:

Three seed pre-treatments were tried as follows: (a) soaked for 24 hrs in cold water, boiled for 30 s and removed from water - 74% germination rate; (b) boiled for 30 s and soaked for another 3 min - 65% germination rate; (c) boiled for 30 s and soaked for another 16 hours - 3% germination rate [5111] .

Botswana:

One minute in hot sulphuric acid or 10 minutes in cold sulphuric acid was the recommended treatment in Botswana to achieve 95 - 100 % germination in 12 days (Tietema et al, 1992) [5120] .

Passage through an elephant's digestive system greatly increased scarification. Ingestion by elephants significantly increased the germination percentage and establishment rates. Ingestion by elephants may also protect the seed from bruchid attack (Austmyr, 1994) [5120] .

Easily raised from seed, especially if collected from cow dung, and is drought and frost resistant but slow growing. Best sown singly in containers; seedlings have to be transplanted soon due to rapid taproot development [1413] .

Pour boiling water over the seed and soak for 24 hours. When dry, plant 2 cm deep. Germination is often poor and farmers claim that the seed needs to go through the digestive tract of a herbivore and then be planted with the dung in which it was found. Saplings should be placed in an open locality and sufficient water provided during the first few months [5092] .

Seed should be sown in May, before temperatures have reached their lowest, for planting out in the following November to January. Seeds should be sown into individual polythene tubes, not bags, ideally 20 cm deep with a diameter of 7 cm. Roots will emerge from the bottom of the tube within a few weeks - these can be pruned. Growth in the nursery is slow. It is important not to overwater and to have free circulation of air in the nursery. The seedlings should be planted out after soaking rains. The pots should be soaked and planted deep with the polythene tube carefully removed. Seedlings are usually very slow growing above ground for the first 3 - 5 years while the root system is developed but after that can grow up to a metre per year and reach 8 - 10 m after 20 years [5120] .

'CROP' MANAGEMENT

Barnes (1996) calculates that *A. erioloba* grown at 15 stems/ha would yield around 2.25 t of pods/ha providing a crude protein yield of 372 kg/ha. This is more than a comparable crop of maize (maximum 360 kg/ha). The metabolisable energy from the acacia pods is only slightly lower (21150 MJ/ha) than the average maize crop (22500 MJ/ha). In addition, the yields from the acacia parkland are produced without input costs of seed and labour, other than for pod collection. The browse value of the foliage, the high yield of nutritious grasses that grow beneath the canopies and the environmental benefits are added and substantial bonuses [5120] .

West (1950) suggested that in Zimbabwe the species could be grown on perennial grassland at 5 - 10 trees per hectare without damage to the grass yield [5120] .

STORAGE

In parts of West Kgalagadi (Botswana) pods are collected and stored to feed livestock in dry season [1413] .

YIELDS

Pods:

Barnes (1996) calculates that *A. erioloba* grown at 15 stems/ha would yield around 2.25 t of pods/ha providing a crude protein yield of 372 kg/ha. This is more than a comparable crop of maize (maximum 360 kg/ha). The metabolisable energy from the acacia pods is only slightly lower (21150 MJ/ha) than the average maize crop (22500 MJ/ha). In addition, the yields from the acacia parkland are produced without input costs of seed and labour, other than for pod collection. The browse value of the foliage, the high yield of nutritious grasses that grow beneath the canopies and the environmental benefits are added and substantial bonuses [5120] .

Pods, Zimbabwe:

In Matabeleland, Zimbabwe, trees of around 20 years old had a mean total number of pods per tree 339 (25 - 1204); pod weight 13.5 g (7.4 - 30.2 g); weight of seeds per pod 3.8 g (1.8 - 9.6 g) (Barnes et al, 1996) [5120] .

Pods, Zimbabwe:

In Matabeleland, Zimbabwe, trees of around 20 years old produced 600 kg of pods per ha (Barnes, 1996) [5120] .

Pods, Namibia:

Large trees with spreading canopies produced pod crops of up to 290 kg/ha/year and younger trees produced up to 145 kg/ha/year (Van Wyk et al, 1985) [5120] .

Pods, Zimbabwe:

Yield of pods can attain 1-2 tonnes/ha/year. A single tree at Umgaza, Zimbabwe has produced 500kg of pods a year [5399] .

Pods:

At a conservative estimate of one crop every two years, the average annual yield of pods from a natural parkland of mature trees has been estimated at 1-2 t/ha (West, 1950) [5120] .

TRADE

South Africa, imports:

Increasing quantities of firewood and charcoal are imported into South Africa from Namibia with a potential danger of over-exploiting the resource [2795] .

Namibia, exports:

Increasing quantities of firewood and charcoal are imported into South Africa from Namibia with a potential danger of over-exploiting the resource [2795] .

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Updated for southern Africa by A. Jarvis, checked by M. Sinkela; SEPASAL Namibia, National Botanical Research Institute, March 2005 .

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