Acacia nilotica subsp nilotica

(L.) Del.

Fabaceae - Mimosoideae

babul

LOCAL NAMES
Afrikaans (lekkerruikpeul,ruikpeul); Amharic (cheba); Arabic (garad,sunut,sunt); English (prickly acacia,Egyptian thorn,babul acacia,Arabic gum tree,scented thorn,scented-pod acacia); French (gommier rouge,Acacia de Cayenne,Acacia d'Arabie,acacia a gomme); German (Gummi- Akazie,Arabische Akazie); Hindi (dauria,babla,kauria,godi,babul,telia,kikar,godi babul); Italian (Acacia d'Egitto); Ndebele (isanqawe,umtshanga); Somali (tuger); Swahili (mgunga); Tamil (karuvelum); Tigrigna (chea,gered chea,ghered); Tongan (nombe,mungnombie,mukoka); Trade name (babul); Tswana (motlabokgosi); Urdu (babar)

BOTANIC DESCRIPTION
Acacia nilotica ssp. nilotica is an evergreen, usually moderate-sized (2.5-25 m) tree with a short, thick and cylindrical trunk; bark is grey, reddish-brown or black, rough, furrowed.

Leaves are alternate, bipinately compound, 5-15 cm long; axis fairly hairy, with 3-8 pairs of side axes (pinnae) 1-4 cm long; leaflets 10-30 pairs on each side axis, small, narrowly oblong, 3-6 mm long, blunt at the ends with tiny hairs along edges, grey-green.

Flowers many, crowded, stalkless, 6-8 mm long, composed of 5-toothed corolla 3 mm long; many yellow, threadlike stamens, 6 mm long, united at base, with yellow, dotlike anthers and pistil with slender ovary and threadlike style.

Pods long, narrow, flattened, 8-17 x 1-2 cm, straight, mostly narrowed between seeds, stalked at the base, short, pointed grey or black, mostly aromatic, not splitting open, breaking in segments; seeds 8-15, beanlike, 7-9 mm in diameter, rounded, flattened, blackish-brown.

It has considerable variation with nine subspecies presently recognized, three occurring in the Indian subcontinent and six throughout Africa. They are distinguished by the shape and pubescense of pods and the habit of the tree. The species is similar to other A. nilotica subspecies, but is distinguished by its glabrous fruits. The generic name ‘acacia’ comes from the Greek word ‘akis’, meaning a point or a barb. The typical A. nilotica is native to the Nile countries, hence the specific name.

BIOLOGY
The yellow sweetly scented flowers are nectarless and found in round heads. Most flowers are functionally male with a few hermaphrodites and are mainly bee-pollinated. Leaf production and fall are affected by rainfall whereas temperature affect flowering and fruiting. In Sudan A. nilotica flowers irregularly but generally between June and September and seed fall takes place from March to May. In Australia trees flower from March to June and green pods are produced within four months but ripe pods fall from November to February. Most of the leaf fall occurs during the dry period when the tree bears green pods.

A. nilotica is one of the most widely planted and used trees in northern India for tannin from bark (foreground), firewood (middle) and charcoal(background), as here in the Punjab. (Colin E. Hughes)

Typical tree of A. nilotica, being lopped for livestock fodder in Rajasthan, India. (Colin E. Hughes)

A. nilotica var cupressiformis, valued for its fastigiate branching and narrow columnar crown suggesting unusual agroforestry potential, here in trials at the Central Arid Zone Research Institute, Rajasthan, India. (Colin E. Hughes)

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ECOLOGY
A. nilotica ssp. nilotica has a strong light requirement. Severe frost affects small seedlings as well as large trees. It is drought resistant and occurs in plain, flat or gently undulating ground and ravines. Trees grow best on alluvial soils in ravine areas subject to periodic inundation. It is considered a serious weed in South Africa. The tree is widespread in the northern savannah regions, and its range extends from Mali to Sudan and Egypt.

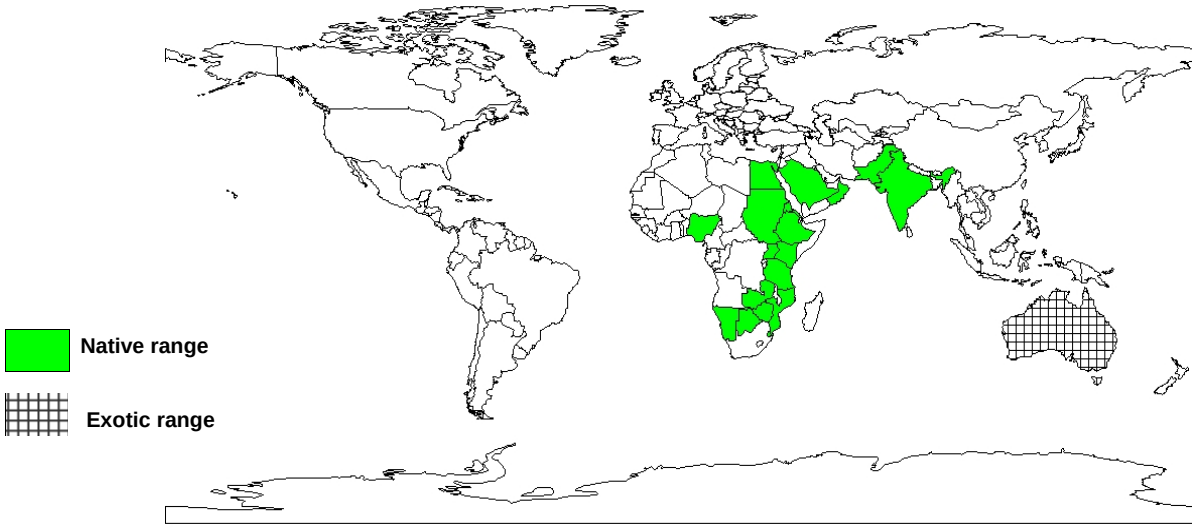
BIOPHYSICAL LIMITS
Altitude: 0-1 340 m, Mean annual temperature: 4-47 deg. C
Mean annual rainfall: 200- 1 270 mm.

Soil type: Grows on a wide variety of soils, seemingly thriving on alluvial soils, black cotton soils, heavy clay soils, and can tolerate poorer soils.

DOCUMENTED SPECIES DISTRIBUTION

Native: Botswana, Egypt, Eritrea, Ethiopia, India, Kenya, Mozambique, Namibia, Nigeria, Oman, Pakistan, Saudi Arabia, Sudan, Swaziland, Tanzania, Uganda, Yemen, Republic of, Zambia, Zimbabwe

Exotic: Antigua and Barbuda, Australia, Bahamas, Barbados, Cape Verde, Cuba, Dominica, Dominican Republic, Grenada, Guadeloupe, Haiti, Iran, Iraq, Jamaica, Martinique, Montserrat, Nepal, Netherlands Antilles, Puerto Rico, South Africa, St Kitts and Nevis, St Lucia, St Vincent and the Grenadines, Trinidad and Tobago, Vietnam, Virgin Islands (US), Zanzibar



The map above shows countries where the species has been planted. It does neither suggest that the species can be planted in every ecological zone within that country, nor that the species can not be planted in other countries than those depicted. Since some tree species are invasive, you need to follow biosafety procedures that apply to your planting site.

PRODUCTS
Food: Tender pods and shoots are used as a vegetable, and roasted seed kernels are sometimes used in Sudan for food flavouring. Air-dried seeds contain crude protein and are eaten raw or roasted in India in time of acute food scarcity.

Fodder: The crude protein content of the leaves is 14-20%, and 11-16 % for the highly palatable pods. Pods and shoots are used as forage for camels, sheep and goats, especially in Sudan, where it is said to improve milk from these animals. In India, it constitutes a chief diet for goats and sheep, and seeds are a valuable cattle food.

Apiculture: The fragrant flowers of A. nilotica ssp. nilotica are popular bee forage.

Fuel: The calorific value of the sapwood is 4500 kcal/kg, while that of the heartwood is 4950 kcal/kg. This valuable source of firewood and charcoal has been used in locomotives, river steamers and small industries. Burning charcoal, however, emits sparks. In India and Pakistan riverine plantations are managed on a 15-20 year rotation for fuel wood and timber.

Fibre: Young bark is used as fibre.

Timber: Since the time of the Pharoahs, large timber trees have been exploited from the riverine forests of the Nile. Sapwood is yellowish-white and heartwood reddish-brown, hard, heavy, durable, difficult to work, although it takes a high polish. Because of its resins, it resists insects and water, and it is harvested for boat making, posts, buildings, water pipes, well planking, ploughs, cabinet work, wheels, tool handles, carts, mallets and other implements. It is an attractive wood, good for carving and turnery. It is the best mining timber in Pakistan. Sudan forests have been managed on a 20-30 year rotation producing termite resistant timber especially suitable for railway sleepers.

Gum or resin: A. nilotica ssp. nilotica is probably the earliest source of gum arabic, although this now comes mainly from A. senegal. The gum tapped from the bark is used in manufacturing matches, inks, paints and confectionery.

Tannin or dyestuff: The pods of ssp. nilotica have been used for tanning in Egypt for over
6 000 years. The inner bark contains 18-23% tannin, which is used for tanning and dyeing leather black. Young pods produce a very pale tint in leather, notably goat hides. Extracts from the bark, leaves and pods are used for dyeing cotton, silk and leather. Roasted seed kernels, when crushed, provide a dye for the black strings worn by Nankani women of Sudan.

Poison: The aqueous extract of the fruit, rich in tannin (18-23%), has shown algicidal activity against Chroccoccus, Closteruim, Coelastrum, Cosmarium, Cyclotella, Euglena, Microcystis, Oscillatoria, Pediastrum, Rivularia, Spirogyra and Spirulina.

Medicine: The Zulu of South Africa take the bark for cough. The Maasai of East Africa use a bark decoction as a nerve stimulant, and the root is said to cure impotence. An astringent from the bark is used for diarrhoea, dysentery and leprosy. Bruised leaves are poulticed onto ulcers. The gum or bark is used for cancers and tumours of the ear, eye or testicles and indurations of the liver and spleen, condylomas and excess flesh. Other ailments treated by these products include colds, congestion, fever, gallbladder, haemorrhage, haemorrhoids, leucorrhoea, ophthalmia, sclerosis and smallpox. Bark, gum, leaves and pods are used medicinally in West Africa. Sap or bark, leaves and young pods are strongly astringent because of the tannin the possess, and in Senegal are chewed as an antiscorbutic, and in Ethiopia as a lactogogue. A bark decoction is drunk for intestinal pains. Other preparations are used for, gargle, toothache, ophthalmia and syphilitic ulcers. In Tonga, the root is used to treat tuberculosis. In Lebanon, the resin is mixed with an orange-flower infusion for typhoid convalescence. In Somalia, the wood is used to treat smallpox. Egyptian Nubians believe that diabetics may eat unlimited carbohydrates without any consequences as long as they also consume the pods in powder form. Extracts are inhibitory to at least 4 species of pathogenic fungi.

SERVICES
Reclamation: In India, this species is used on degraded saline and alkaline soils. It grows well when irrigated with tannery effluent and colonizes coal mine waste heaps. Over 50 % of the Chambal ravines in India have been revegetated with A. n. ssp. nilotica.

Soil improver: Probably nitrogen fixing.

Boundary or barrier or support: This subspecies makes an ideal windbreak surrounding fields; its narrow crown shades less than other windbreak species.

Intercropping: When intercropped with A. nilotica ssp. nilotica in semi-arid Nigeria, sorghum showed heavily depressed yields.

TREE MANAGEMENT
Young seedlings are said to require full sun and frequent weeding. A. nilotica ssp. nilotica coppices very weakly.

GERMPLASM MANAGEMENT
Seed storage behaviour is orthodox. Viability can be maintained for several years in airtight, moisture-proof conditions at 10 deg. C. with 4.5-9% mc. There are 5000-10 000 seeds/kg.

PESTS AND DISEASES
In a survey of phytophagous insects, 43 species of pests were recorded in Pakistan. Of these, 16 appeared stenophagous. Those for which biological control methods might work were Anarsia spp. cf. acaciae, Pseudosterrha paulula, Azanus ubaldus and Ceutholopha isidis, which feed on flowers; Bruchidius sahlbergi and Sulcobruchus spp., which damage the seeds; Ascalenia callynella, Gisilia stereodoxa and an unidentified gracillariid, which bored into shoots; and Cydia spp., which makes stem galls.

Wood borers may afflict the stems, and bruchids may afflict the seeds. The following fungi have been reported on this plant: Ctyospora acaciae, Diatryphe acaciae, Diplodia acaciae, Fomes badius, F. endotheius, F. fastuosus, F. rimosus, Fusicoccum indicum, Phyllactinia acaciae, Ravenelia acaciae-arabicae, Septogloeum acaciae, Septoria mortolensis, and Sphaerostilbe acaciae. The trees are also parasitized by Dendrophthoe falcata and Loranthus globiferus var. verrucosus.

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SUGGESTED CITATION

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