

Balanites aegyptiaca

heglig berries (in the sudan), egyptian myrobalan, desert date (dri

(L.) Del.

Balanitaceae

LOCAL NAMES

Amharic (kudkuda,jemo,bedeno); Arabic (zachun,zaccone,heglig (tree),zacon,kuge,lalob (fruit)); Bemba (katikayengele,mubambwangoma); Bengali (hin); English (soap berry tree,simple-thorned torchwood,simple thorned torch tree,Jericho balsam,lalob tree,heglig,Egyptian myrobalan,desert date,torch wood); French (myrobalou d'Egypte,dattier sauvage,dattier du desert,myrobalou d' Egypte); Hindi (engua,ingudi,betu,hingan,hingn,hingot,hongot,hingota); Lozi (mwlabwe); Luganda (musongole); Mandinka (sumpo); Nyanja (nkuyu); Sanskrit (ingudi); Swahili (mjunju,mwambangoma); Tamil (nanjunda); Tigrigna (indrur,mekie); Tongan (mulyanzovu,mwalabwe); Trade name (desert date (dried fruit),heglig berries (in the sudan),egyptian myrobalan)

BOTANIC DESCRIPTION

Balanites aegyptiaca is a multibranched, spiny shrub or tree up to 10 m high. Crown rounded, dense (but still seen through) with long stout branchlets. Trunk and bark grey, deeply fissured longitudinally.

Leaves compound and spirally arranged on the shoots, dark green with 2 firm coriaceous leaflets; dimensions and shapes varying widely. Petiole canaliculate, from 5 mm to 20 mm with a short rachis. Most accounts indicate a maximum length of 8 mm for Uganda. Margin of each leaflet entire; lamina generally up to 6 cm long, 4 cm broad, although apparently smaller (1-3 x 0.3-1.5 cm) in the Sahara and in Palestine.

Inflorescence a sessile or shortly pedunculate fascicle of a few flowers. Flower buds ovoid and tomentose. Individual flowers hermaphroditic, pentamerous an actinomorphic, 8-14 mm in diameter and generally greenish-yellow. Pedicels densely greyish, pubescent and rarely reaching 10 mm in length, although 15 mm is reported for Zambia and Zimbabwe. The usual length is about 8 mm.

Fruit ellipsoid, up to 4 cm long, green. Ripe fruit brown or pale brown with a brittle coat enclosing a brown or brown-green sticky pulp and a hard stone seed.

The name *Balanites* (from the Greek for acorn, referring to the fruit) was given in 1813 by Alire Delile and replaced *Agialid* (derived from the Arabic name for the tree, 'heglig').

BIOLOGY

Flowering behaviour varies. There is no definite time for flowering in the Sahel, although flowering most likely takes place in the dry season. Flowering in Nigeria varies between November and April with ripe fruits becoming available in December and January and occasionally later, from March to July. Elsewhere, fruiting and foliage production occur at the height of the dry season. Pollination is presumably by insects as flowers are scented, and flower structure facilitates insect activity. The 1st fruiting is at 5-8 years, yields increasing until 25 years of age for the tree.

The fruit apparently takes at least 1 year to mature and ripen. Birds and mammals eat the fleshy and edible fruit, discarding, regurgitating or evacuating the stone.



Detail of leaves, thorns and flowers. (USAID)



Tree in Machakos, Kenya. (Fernandes E.C.M)



Detail of unripe fruits. (Fernandes E.C.M)

Balanites aegyptiaca

(L.) Del.

Balanitaceae

heglig berries (in the sudan), egyptian myrobalan, desert date (dri

ECOLOGY

B. aegyptiaca has wide ecological distribution; however, it reaches its maximum development as an individual tree on low-lying, level alluvial sites with deep sandy loam and uninterrupted access to water such as valley floors, riverbanks or the foot of rocky slopes. It is intolerant to shade after the seedling stage and therefore prefers open woodland or savannah for natural regeneration.

BIOPHYSICAL LIMITS

Altitude: 0-2 000 m, Mean annual temperature: 20 -30 deg. C, Mean annual rainfall: 250-1200 mm

Soil type: The soils in its range tend to be deep sands, sandy clay loams, sandy loams or clays.

DOCUMENTED SPECIES DISTRIBUTION

Native: Algeria, Angola, Benin, Burkina Faso, Burundi, Cameroon, Chad, Cote d'Ivoire, Democratic Republic of Congo, Djibouti, Egypt, Eritrea, Ethiopia, Gambia, Ghana, Guinea, India, Israel, Kenya, Libyan Arab Jamahiriya, Morocco, Myanmar, Nigeria, Saudi Arabia, Senegal, Somalia, Sudan, Tanzania, Uganda, Yemen, Republic of, Zambia, Zimbabwe

Exotic: Cape Verde, Dominican Republic, Puerto Rico



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.

Balanites aegyptiaca

(L.) Del.

Balanitaceae

heglic berries (in the sudan), egyptian myrobalan, desert date (dri

PRODUCTS

Food: The fleshy pulp of both unripe and ripe fruit is edible and eaten dried or fresh. The fruit is processed into a drink and sweetmeats in Ghana, an alcoholic liquor in Nigeria, a soup ingredient in Sudan. Young leaves and tender shoots are used as a vegetable, which is boiled, pounded, then fried or fat added to prepare it. The flowers are a supplementary food in West Africa and an ingredient of 'dawa dawa' flavouring in Nigeria. Flowers are sucked to obtain nectar.

Fodder: The fresh and dried leaves, fruit and sprouts are all eaten by livestock. As shown in an experiment in Burkina Faso, *B. aegyptiaca* contributed up to 38% of the dry-matter intake of goats in the dry season. Kernel meal, the residue remaining after oil extraction, is widely used in Senegal, Sudan and Uganda as a stock feed. The tree is lopped for fodder in India (Maharashtra, Madhya Pradesh, Tamil Nadu and Rajasthan).

Fuel: The wood is good firewood; it produces considerable heat and very little smoke, making it particularly suitable for indoor use. It produces high-quality charcoal, and it has been suggested that the nutshell is suitable for industrial activated charcoal. The calorific value is estimated at 4600 kcal/kg.

Fibre: A strong fibre is obtained from the bark.

Timber: The wood is pale yellow or yellowish-brown. Heartwood and sapwood are not clearly differentiated. The wood is hard, durable, worked easily and made into yokes, wooden spoons, pestles, mortars, handles, stools and combs. It shows no serious seasoning defects and no tendency towards surface checking or splitting. The wood saws cleanly and easily, planes without difficulty to a smooth finish and is easy to chisel. It glues firmly and takes a clear varnish. The timber has traditionally been a minor product. The usually small log size and the prevalence of stem fluting makes sawmill processing difficult.

Gum or resin: A greenish-yellow to orange-red resin is produced from the stems. It is sucked and chewed when fresh. It is used as a glue for sticking feathers onto arrow shafts and spearheads and in the repair of handle cracks and arrows.

Lipids: The kernels produce edible oil used for cooking. The oil remains stable when heated and has a high smoking point, and therefore its free fatty acid content is low. Its scent and taste are acceptable.

Alcohol: The fruit of *B. aegyptiaca* may be used to brew an alcoholic drink.

Poison: An emulsion made from the fruit or bark is lethal to the freshwater snails that are the host of miracidia and cercaria stages of bilharzia and to a water flea that acts as a host to the guinea worm. A fish poison can be obtained from the fruit, root and the bark. The active agent of the poison is saponin. The compound is toxic to fish but does not affect mammals and rapidly becomes inert, so that fish retrieved are edible. However, in the Fada region of Cote d'Ivoire, the poison is reported to damage the sight of fishermen after they have used it for 5-6 years.

Medicine: Decoction of root is used to treat malaria. Roots boiled in soup are used against oedema and stomach pains. Roots are used as an emetic; bark infusion is used to treat heartburn. Wood gum mixed with maize meal porridge is used to treat chest pains. The bark is used to deworm cattle in Rajasthan.

Other products: The seeds are used for rosary beads, necklaces and in the game of warri played in Sudan.

SERVICES

Shade or shelter: The usually evergreen behaviour potentially makes *B. aegyptiaca* an attractive element to introduce into shelterbelts, although because of its slow growth, it is not suitable as a principal species.

Boundary or barrier or support: As a thorny tree, *B. aegyptiaca* is useful for fencing. Boundary and amenity plantings are widespread in Africa. Cut branches are used to make livestock enclosures.

Balanites aegyptiaca

(L.) Del.

Balanitaceae

heglig berries (in the sudan), egyptian myrobalan, desert date (dri

TREE MANAGEMENT

Coppices and pollards well and can regenerate after lopping and heavy browsing. Where fruit is the principal interest, pollarding and coppicing for obtaining fodder are seldom employed.

GERMPLASM MANAGEMENT

Seed storage behaviour is orthodox; viability can be maintained for 2 years in air-dry storage at cool temperatures or for several years in hermetic storage at 3 deg. C with 6-10% mc. One kilogram of cleaned, extracted seeds, air-dried to 15% mc, contains 500-1500 seeds.

PESTS AND DISEASES

B. aegyptiaca suffers from repeated locust and beetle attack and a high degree of parasitic infestation (in Gountoure, Burkina Faso, 50% of the population had leaf galls, bugs or scales). Two microfungi, *Phoma balanitis* and *Septoria balanitis*, are the only reported dependent fungi.

Balanites aegyptiaca

(L.) Del.

Balanitaceae

heglic berries (in the sudan), egyptian myrobalan, desert date (dri

FURTHER READNG

- Albrecht J. ed. 1993. Tree seed hand book of Kenya. GTZ Forestry Seed Center Muguga, Nairobi, Kenya.
- Anon. 1986. The useful plants of India. Publications & Information Directorate, CSIR, New Delhi, India.
- Baumer M. 1983. Notes on trees and shrubs in arid and semi-arid regions. Rome FAO. Forestry Division.
- Beentje HJ. 1994. Kenya trees, shrubs and lianas. National Museums of Kenya.
- Bein E. 1996. Useful trees and shrubs in Eritrea. Regional Soil Conservation Unit (RSCU), Nairobi, Kenya.
- Bekele-Tesemma A, Birnie A, Tengnas B. 1993. Useful trees and shrubs for Ethiopia. Regional Soil Conservation Unit (RSCU), Swedish International Development Authority (SIDA).
- Birnie A. 1997. What tree is that? A beginner's guide to 40 trees in Kenya. Jacaranda designs Ltd.
- Booth FEM, Wickens GE. 1988. Non-timber uses of selected arid zone trees and shrubs in Africa. FAO Conservation Guide. No. 19. Rome.
- Coates-Palgrave K. 1988. Trees of southern Africa. C.S. Struik Publishers Cape Town.
- Dale IR, Greenway PJ. 1961. Kenya trees and shrubs. Buchanan's Kenya Estates Ltd.
- Eggeling. 1940. Indigenous trees of Uganda. Govt. of Uganda.
- Hall JB, Walker HD. 1991. *Balanites aegyptiaca*: a monograph. School of Agriculture and Forest Sciences Publication Number: 3. University of Wales, Bangor.
- Hines DA, Eckman K. 1993. Indigenous multipurpose trees for Tanzania: uses and economic benefits to the people. Cultural survival Canada and Development Services Foundation of Tanzania.
- Hocking D. 1993. Trees for Drylands. Oxford & IBH Publishing Co. New Delhi.
- Hong TD, Linington S, Ellis RH. 1996. Seed storage behaviour: a compendium. Handbooks for Genebanks: No. 4. IPGRI.
- IBPGR-Kew. 1984. Forage and browse plants for arid and semi-arid Africa. Rome. IBPGR.
- ICRAF. 1992. A selection of useful trees and shrubs for Kenya: Notes on their identification, propagation and management for use by farming and pastoral communities. ICRAF.
- Katende AB et al. 1995. Useful trees and shrubs for Uganda. Identification, Propagation and Management for Agricultural and Pastoral Communities. Regional Soil Conservation Unit (RSCU), Swedish International Development Authority (SIDA).
- Kitilit JK. 2003. Evaluation of *Acacia seyal* and *Balanites aegyptiaca* as sources of nutrients for ruminants. 78p.
- Mbuya LP et al. 1994. Useful trees and shrubs for Tanzania: Identification, Propagation and Management for Agricultural and Pastoral Communities. Regional Soil Conservation Unit (RSCU), Swedish International Development Authority (SIDA).
- Noad T, Birnie A. 1989. Trees of Kenya. General Printers, Nairobi.
- Sahni KC. 1968. Important trees of the northern Sudan. United Nations and FAO.
- Storrs AEG. 1995. Know your trees: some common trees found in Zambia. Regional Soil Conservation Unit (RSCU).
- Vogt K. 1995. A field guide to the identification, propagation and uses of common trees and shrubs of dryland Sudan. SOS Sahel International (UK).
- Weber F, Stoney C. 1986. Reforestation in arid lands. VITA Arlington, Virginia.

SUGGESTED CITATION

Orwa C, Mutua A, Kindt R, Jamnadass R, Simons A. 2009. Agroforestry Database: a tree reference and selection guide version 4.0 (<http://www.worldagroforestry.org/af/treedb/>)