

Pterocarpus angolensis

muninga, mukwa, kiaat

LOCAL NAMES

Afrikaans (kiaat,lakboom,greinhout,kehatenhout); Bemba (mulombwa); English (sealing-wax tree,Rhodesian teak,Transvaal teak,bloodwood,wild teak,African teak); Lozi (mukwa,mulombe); Lunda (mukula); Ndebele (umvagazi); Nyanja (mlombwa,mlombe); Shona (kiaat,mubvamaropa,mukwa); Swahili (mninga); Tongan (mukula); Trade name (kiaat,mukwa,muninga); Tswana (mokwa,morotomadi); Zulu (inGozina,inDlandlovu,umBilo,umVangazi)

BOTANIC DESCRIPTION

Pterocarpus angolensis is a medium-size to large, deciduous tree that grows up to 30 m tall; bark on young twigs is smooth, grey and covered with hairs, and on the older branches and stems it is dark grey and rough to fissured.

Leaves with 5-9 pairs of subopposite to alternate leaflets; leaflets elliptic-lanceolate to obovate, 2.5-7 x 2-4.5 cm, top surface without hairs, underside hairy when young, losing these by maturity; apex tapering to a narrow point, bristle-tipped; base rounded; margin entire, wavy, tightly rolled under petiolules, and petiole velvety; stipules narrow, up to 8 mm long, velvety, falling early.

The pealike flowers abundant, orange-yellow in colour, very sweetly scented and borne in large, branched sprays 10-20 cm long.

Fruit a very distinctive, indehiscent, circular pod with a diameter of 8-10 cm. The seed case, which is densely covered with harsh bristles up to 1.3 cm in length, is surrounded by a broad, membranous, light, wavy wing up to 3 cm in width, which adds to its buoyancy. There are usually 1-2 small seeds in the pod.

All members of the genus have once-compound leaves made up of several or many pairs of leaves, and a terminal leaflet, often with beautifully distinct veining. Pea flowers in racemes or panicles, and the winged or rigid pods give the genus its name. *Pterocarpus* is based on the Greek words 'pteran' meaning 'a wing' and 'karpos' meaning 'fruit'. The specific name means 'from Angola'. The common name 'kiaat' is derived from 'kajaten', the old Dutch name for teak, because the wood of the South African trees was thought to resemble teak. When the bark is slashed, a blood-red juice oozes out and congeals, and for this reason *P. angolensis* is sometimes called the bloodwood tree.

BIOLOGY

In southern Africa, the flowers open in spring, from September to November, and at the same time the leaf buds start to shoot. *P. angolensis* begins to produce fruit at about 20 years of age, but fruiting is light until it is 35 years old; trees will continue to produce fruit until they die.

DC.

Fabaceae - Papilionoideae



Pterocarpus angolensis is a medium to large (up to 30 m tall) deciduous tree with an open, spreading crown. The heartwood is very attractive, moderately dense, easily worked and widely used for high-quality furniture and ornaments. (Botha AD)



The leaves of *Pterocarpus angolensis* are compound; 9 - 25 pairs of leaflets plus a terminal one; tip tapering to a narrow bristle-tipped point, base rounded, margins entire; side veins parallel and prominent above; leaves hairless at maturity. The petiolules and petiole are velvety. (Botha AD)



The fruit of *Pterocarpus angolensis* is a very distinctive, large circular pod (up to 150 mm in diameter); central seed case indehiscent, densely covered with coarse bristles, surrounded by a broad, thin, wavy wing. Young pods fresh green, turning light brown when ripe and remain on the tree long after the leaves have fallen. (Botha AD)

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ECOLOGY

P. angolensis occurs in woodlands and sometimes as stunted trees in wooded grassland on mountain tops. In South Africa, it is usually found in the lowveld in woodland and bushveld in deep sandy soil and sometimes on hillsides. It is regarded as an indicator of well-drained soils. It is sensitive to frost and is reputed to be fire tolerant, making it an important species for enrichment planting in areas where fire cannot be excluded completely.

BIOPHYSICAL LIMITS

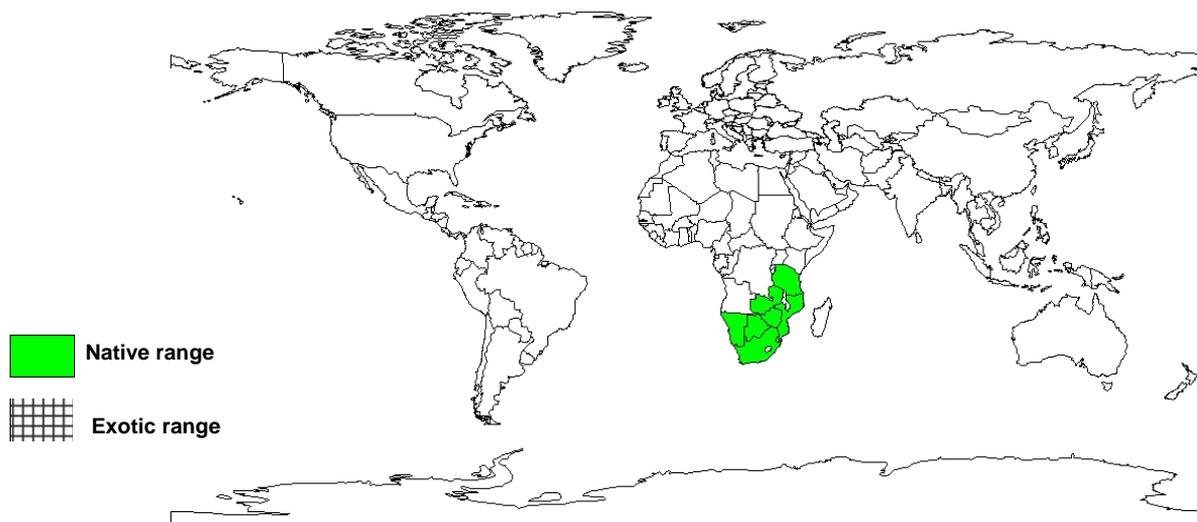
Altitude: 0-1 650 m, Mean annual rainfall: 700-1 500 mm

Soil type: Adaptable to red loams and deep sandy soils, but not coastal sands or black clays. Prefers soils whose physical characteristic permit water to rapidly drain down the soil profile, at least through the top 30 cm.

DOCUMENTED SPECIES DISTRIBUTION

Native: Botswana, Democratic Republic of Congo, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia, Zimbabwe

Exotic:



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.

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PRODUCTS

Fodder: Elephant and kudu browse the leaves of *P. angolensis*.

Apiculture: Popular with beekeepers, as it is good source of pollen for honeybees.

Timber: The heartwood makes high-quality furniture, as it is easily worked, glues and screws well and takes a fine polish. It shrinks very little when drying from the green condition, and this quality, together with its high durability, makes it particularly suitable for boat building, canoes and bathroom floors. It makes most handsome furniture and shelving, floors, panels, doors and window frames. Locally used for dishes, mortars and drums, and is one of the few woods favoured for canoe paddles and game and fish spears.

It varies greatly in colour and weight. Sapwood is yellow. Heartwood ranges from light brown to dark reddish-brown, with purplish or golden wavy streaks often blended in the same piece of wood. Heartwood is resistant to both borers and termites, although sapwood is susceptible to borer attack and should be treated with an insecticide. When worked it has a pleasant pungent smell but can cause irritation and asthma.

Tannin or dyestuff: The red gummy sap contains 77% tannin. When cut, it exudes a red, sticky and bloodlike sap; this leaves a permanent stain on cloth and therefore makes it an effective dye.

Medicine: The bark has several uses; heated in water and mixed with figs it is massaged on the breast to stimulate lactation; a cold infusion from the bark alone provides a remedy for nettle rash. A decoction of the bark is also taken orally for piles, and a cold infusion made from the bark is taken to relieve stomach disorders, headaches, blood in the urine, earache and mouth ulcers. Bark or roots, boiled with fresh meat, is used as a preliminary accelerator in the treatment of gonorrhoea. A decoction of the root is believed to be a cure for malaria and blackwater fever. An infusion made from the roots is taken orally for the treatment of diarrhoea, bilharzia and abdominal pains. Roots are burnt and the ashes drunk in water to treat asthma and tuberculosis. Corneal ulcers are bathed in an eyewash obtained when roots of the tree are 1st cleaned and then left to soak in water for 6 hours. In the follow-up treatment of this ailment, flowers are placed in boiling water over which the patient holds the face, allowing the steam to fill the eyes; dropping sap into the eyes treats cataracts and sore eyes. The bark is boiled and the resulting red fluid is used in treating skin lesions and ringworm. Ripe seeds are burnt and the ashes applied to inflamed areas of the skin and to bleeding gums. The sap is reputed to heal sores, including ringworm sores and stab wounds, and to treat various other ailments.

SERVICES

Erosion control: Used for soil conservation and dune fixation.

Nitrogen fixing: *P. angolensis* is capable of fixing atmospheric nitrogen.

Ornamental: The dark branches of *P. angolensis* covered with orange flowers are a striking sight, but unfortunately the flowering time is short, no more than 2 weeks. It makes good bonsai material, reaching an adult shape in 3-4 years, with leaves much reduced in size.

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TREE MANAGEMENT

Site preparation requires clear cutting, control of fire and of competition for the 1st 10 years of the plantation. Spacing in a pure stand should not be closer than 5 x 5 m. In the seedling stage, the aboveground parts of the plant die back each year until the root system has grown sufficiently to support a shoot capable of surviving the dry season. Shoots rarely grow more than 15 cm. This makes the species difficult in plantation forestry.

Although the trees are very resistant to fire, repeated heavy burning produces a 'staghead' appearance, which also occurs if the tree is stressed as a result of unfavourable conditions such as shallow or stony soil, or too much water. It is always better to protect young plants from cold winds for the 1st 2 years. The tree has a rotation of 40-70 years and a life expectancy of 60-90 years. Under favourable conditions, the growth rate is 500-700 mm/year.

Farmers in suitable warm areas can consider planting woodlots or small plantations of *P. angolensis* as a viable option. Such plantations have been successfully planted in Mozambique. Up to 20 trees can be grouped in camps where shade is needed during the hot summer months.

GERMPLASM MANAGEMENT

Seed storage behaviour is orthodox. There are about 4 200 seeds/kg.

PESTS AND DISEASES

The white sapwood is susceptible to borer attack. Young seedlings may be susceptible to termites and crickets. The larvae of the bushveld charaxes (*Charaxes achaemenes* *achaemenes*) feed on the leaves of this tree.

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FURTHER READING

Coates-Palgrave K. 1988. Trees of southern Africa. C.S. Struik Publishers Cape Town.

Drummond BR. 1981. Common trees of the Central Watershed Woodlands of Zimbabwe. National Resources Board.

Erkkila A, Harri S. 1992. *Silva Carelica* Forestry in Namibia 1850-1990. University of Joensuu.

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.

Hong TD, Linington S, Ellis RH. 1996. Seed storage behaviour: a compendium. Handbooks for Genebanks: No. 4. IPGRI.

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).

Palmer E, Pitman N. 1972. Trees of Southern Africa Vol. 2. A.A. Balkema Cape Town.

Storrs AEG. 1995. Know your trees: some common trees found in Zambia. Regional Soil Conservation Unit (RSCU).

Tietema T, Merkesdal E and Schroten J. 1992. Seed germination of indigenous trees in Botswana. Acts Press.

Venter F, Venter J-A. 1996. Making the most of Indigenous trees. Briza Publications.

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/>)