



SEED LEAFLET

No. 36 September 2000



Pterocarpus angolensis DC.

Taxonomy and nomenclature

Family: Fabaceae, subfam. Papilionoideae

Synonyms : No accepted synonyms

Vernacular/common names: bloodwood, African teak (Eng.), mninga (Swahili), mukwa (S. Africa)

Distribution and habitat

The species is indigenous to East Africa from Tanzania to S. Africa. It occurs in Malawi, Mocambique, Zambia, Zimbabwe and Botswana. Its occurrence in the western parts of southern Africa is uncertain.

It is found in Miombo woodlands but rarely in pure stands and sometimes as stunted trees in wooded grassland on mountain tops. In South Africa, it usually grows in the lowveld in woodland and bushveld in deep sandy soil and sometimes on hillsides.

It prefers well-drained soils, is sensitive to frost and reputed to be resistant to fire. Within the area of natural distribution it is found at 0-1650 m altitude and annual rainfall of 700-1500 mm.

Uses

The heartwood is used for high-quality furniture. It is easy to work, durable and resistant to borers and termites. The tree is nitrogen-fixing and the ability to withstand fire makes it an important species for enrichment planting in areas where there is risk of fire.



Natural stand of *Pterocarpus angolensis*. Tanzania. Photo: Dorthe Jøker, DFSC.

Botanical description

Medium to large tree, up to 16 m tall. Dark grey to brown, rough bark, longitudinally fissured. The bark exudes a blood-red, sticky substance when injured.

Leaves alternate, imparipinnate with 5-9 pairs of subopposite to alternate leaflets. Leaflets elliptic-lanceolate to obovate, 2.5 - 7 cm long, 2-4.5 cm wide. Leaflet margins entire. Inflorescences large, 10-20 cm long, axillary or terminal panicles. Flowers orange-yellow, sweetly scented.

Fruit and seed description

Fruit: large, 8-12 cm diameter circular indehiscent pod (samara), light brown to straw coloured when mature. Central part of the fruit is 2-3 cm in diameter, densely covered with up to 1.3 cm long bristles; the pericarp is very hard. Circular wing, 3-4 cm wide. Normally only one seed per fruit.

Seed: asymmetrical, 10-12 mm long, 7-8 mm wide and 4-5 mm thick; pointed at the micropylar end. Seed-coat red/brown, thin but hard. The cotyledons are large and there is no endosperm.

Seeds are often stored and handled without fully extraction by only removal of wings and bristles. There are 3400-5000 seeds per kg.

Flowering and fruiting habit

Flowering takes place at the onset of the rainy season. The flowers appear after the first event of rain, before the new leaves appear. Flowering in southern Africa occurs August to December. Pollination by insects e.g. honey bees. Fruit development takes about 4-5 months. Fruiting season in southern Africa from January to April. In Tanzania from July-September, but some fruits persist on the tree until November (short rain).

In Tanzania is reported a large fruit production every year, however many pods are empty (in some cases more than 50%). Consequently the seed crop is only moderate.

Harvest

The fruit turns from green to yellow and after drying greyish. The ripe seed is red-brown. The pods are indehiscent and persist on the tree until the rainy season starts and all fruits are shed. The most efficient collection method is by vigorously shaking fruit bearing branches to release fruits.

The trees release their fruits more easily after the first rain. Fruits with brown-patched wings and a green centre can be collected but at this stage the pericarp is already very hard and extraction is not easier than from fruits collected later. Also, the immature fruits are hard to shake down; fruits must in this case be stripped off the branches or collected individually. Seeds from fully green fruits have a low germination percentage and should not be collected although some afterripening is possible.

Processing and handling

If fruits are collected during moist weather, they should be sundried before storage in hessian bags or other ventilated container. The fruit is very bulky as compared to the seed and some initial dewinging in a mobile thresher may be applicable. One kilo of fruits has a volume of about 12.5 litres and contains only about 20 grams of seed. Afterripening of immature fruits is possible; green/yellow pods are dried in the shade until they turn grey.

Processing implies removal of wings and bristles and (usually) extraction from the pod. Extraction may be postponed until after storage. Removal of wings and bristles can be done mechanically in a flailing thresher. Brushing machines with very hard brushes may be applicable. The hard pericarp is very resistant to mechanical damage. The dewinged fruits are cleaned by sifting and winnowing. Manual extraction, either prior to storage or just before sowing, is done with secateurs. Extraction is facilitated by soaking the (dewinged) pods in water. Soaked pods must be extracted the same day, or the seeds will start to germinate. Manual extraction is tedious but experience has shown that nursery emergence of non-extracted seeds was poor. A large proportion of pods are empty and it cannot be told from exterior examination whether a pod is empty.

Extracted seed can be cleaned by air-screen cleaner followed by manual removal of seeds damaged during extraction. Seeds should be dried before storage.

Storage and viability

The seed is orthodox and can be stored with low moisture content 4-6% for at least three years in cold store. Seeds stored at ambient conditions should be treated against attack by bruchids, e.g. by storage in CO₂.

Dormancy and pretreatment

Seeds not extracted from the pod have a low germination possibly because of physical or mechanical dormancy exerted by the pericarp. The seed itself has only slight physical dormancy. Germination is improved by scarification but even without pretreatment high germination can be expected.

Sowing and germination

Seeds can be sown in seedbeds and seedlings transplanted into pots, or sown directly in pots. For testing, germination in sand is recommended. The species has both rhizobium and mycorrhizal associations. Inoculation is applicable where these microsymbionts are absent from the nursery soil or planting site.

Phytosanitary problems

The seeds are often attacked by bruchid beetles.

Selected readings

Palgrave, K., 1988. *Trees of southern Africa*. C S Struik Publishers. Cape Town.

National Tree Seed Programme, Tanzania. *Pterocarpus angolensis*. Technical Note.



Ripe pods collected early while the centre is still green. Tanzania. Photo: Dorthe Jøker, DFSC.

THIS NOTE WAS PREPARED IN COLLABORATION WITH THE NATIONAL TREE SEED PROGRAMME, TANZANIA

Authors: Dorthe Jøker, DFSC
H.P. Msanga, NTSP
Lars Schmidt, DFSC

Danida Forest Seed Centre	Phone: +45-49190500
Krogerupvej 21	Fax: +45-49160258
DK-3050 Humlebaek	Email: dfsc@sns.dk
Denmark	Website: www.dfsc.dk