Pentaclethra macrophylla

Benth.

Fabaceae - Mimosoideae

LOCAL NAMES
English (oil of bean tree); Fula (atawa,ataa); Wolof (atawa,ataa)

Pentaclethra macrophylla (Paul Latham)

BOTANIC DESCRIPTION
Pentaclethra macrophylla trees grow to about 21 m in height and about 60 cm girth. Have a characteristic low branching habit and an open crown, which allows substantial light under its canopy. The bole produces a reddish-orange coloration after a slash is made. Stem form is usually crooked and buttressed. Some are straight-stemmed and less buttressed trees, which can pass for good timber, are occasionally seen in the forests. Bark is greyish to dark reddish brown, thin and patchy with irregular pieces flaking off.

Leaves possess a stout angular petiole. The compound leaves are usually about 20-45 cm long and covered with rusty hairs giving a scurry effect particularly along the upper surface but this eventually falls off. There are 10-12 pairs of stout opposite pinnae. The middle pairs are 7-13 cm long and also have rusty hairs along the central grove. There are usually 12-15 pairs of opposite stalkless pinnules (leaflets), each 12-15 cm long, 5-10 mm broad, with the middle pairs longest. Leaflets often have a rounded tip but are sometimes notched; the base is unequal.

The inflorescences are spicate and the flowers pentamerous, creamy-yellow or pinkish-white and sweet smelling. In addition to the 5 stamens are 10-15 staminodes.

The pods are 40-50 cm long and 5-10 cm wide. Fruit splits open explosively with the valves curling up. This is the form in which they appear on most trees. Usually, pods contain between 6-10 flat glossy brown seeds, which may vary in site. The seeds are up to 7 cm long.

BIOLOGY
Flowering commences at variable periods within West Africa. The main flowering seasons is between March-April with smaller flushes in June and November. Fruits are available at most periods of the year because the large woody pods are persistent.

ECOLOGY
P. macrophylla occurs from Senegal to Angola and also to the Islands of Principe and Sao Tome. This multipurpose tree is endemic to the humid and some parts of the sub-humid zones of West Africa. It is more common in the Rain forest and in the Lophira-Triplochiton association but individuals are found elsewhere in the high forest zone. Often it occurs near the streams and on the edges of damp depressions and frequently seen as a small tree of untidy habit and large crown on roadsides and farms. In such places it is usually a relic, having been left on account of its hard wood. It does not occur in the highlands although; growth can be good where rainfall is adequate.

BIOPHYSICAL LIMITS
Mean annual temperature: Not less than 18 deg. C.
Mean annual rainfall: 1 000-2 000 mm

Soil type: The natural distribution of P. macrophylla suggests that it is endemic to relatively acid soils. The species will also tolerate water logging as in the low altitudinal riverine areas of south-east Nigeria, Togo and Cameroon.

DOCUMENTED SPECIES DISTRIBUTION

Native: Cameroon, Cote d'Ivoire, Democratic Republic of Congo, Ghana, Niger, Nigeria, Togo
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.

PRODUCTS
Food: P. macrophylla is planted on the fringes of compound farms mainly for its edible seed and is a major component of this agroforestry system.

Fuel: Its empty dry fruit pods are used as fuelwood for cooking. The wood is highly suitable for fuelwood and charcoal making.

Timber: Wood is used in carving bowls and other household utensils in Nigeria and Ghana.

Tannin or dyestuff: In Ghana, the ashes from burnt pods are made into a mordant dye.

Lipids: The seed is a source of edible oil, 'the oil bean'.

Medicine: Crushed seeds taken in case of abortion; leaf and stem decoctions are taken against diarrhoea.

Other products: Seeds are decorative and useful in beads, necklaces and rosaries.

SERVICES
Nitrogen fixing: P. macrophylla was not known to nodulate until recently.

Soil improver: Leaves are shed during the dry season and farmers believe this contributes to soil fertility within the home garden.

Ornamental: In Niger, the tree is a popular ornamental.

Intercropping: Farmers protect this species on farms because of its open crown form that allows substantial light and does not inhibit crop plants grown under its canopy. This accounts for the trees use in combination with food crops on farms and particularly in home gardens in south east Nigeria.

TREE MANAGEMENT
After about 2-years growth in the forest, trees become relatively fire resistant and re-sprout readily when lopped. The unusual feature of leaf loss during the wet seasons has been observed in the field on some individual trees of P. macrophylla and could be an important trait for selection for farmers. The species is relatively fast growing and seedlings will achieve a height of 1.5 m in the first year on good sites.

GERMPLASM MANAGEMENT
Seed storage behaviour is recalcitrant; storage at 15 deg. C can extend longevity for about 3 months. There are approximately 50-80 seeds/kg. A seed pre-treatment (mechanical scarification and soaking in water for 24 hours) enhances germination. Germination takes place in 14-16 days and is about 87%.

PESTS AND DISEASES
No serious pest and disease problems are known but stem borers have been recorded on some old trees and mild defoliation of juvenile seedlings is not uncommon. The species is reported to be termite resistant.

FURTHER READNG

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SUGGESTED CITATION

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