Trema orientalis (L.) Blume

Ulmaceae

LOCAL NAMES
Bemba (mutumpu); Bengali (chikan,jibon,jiban,chickan); English (charcoal tree,pigeon wood,Indian nettle tree,Indian charcoal tree); Filipino (anabiong,anadgong,pitidan); Gujarati (gol); Hindi (gorklu,gol,chikan,kakammusti,phakdema,gio); Igbo (telemukwu); Indonesian (kuray,anggerung,lenggung); Japanese (urajiroenoki); Javanese (anggerung); Khmer (srô:l); Lao (Sino-Tibetan) (po: hu:); Luganda (kasisa); Malay (menarong,mengkirai,randagong); Nyanja (mchende); Sanskrit (jivanti); Swahili (msasa,mzunguzungu,mpesi,mgendagenda); Tamil (oma,oman,chenkolam,ambaratthi); Thai (padang,po-haek,takhai); Tongan (mululwe); Vietnamese (hu dai,hu l[as] nh[or],hu las nhor); Yoruba (afefe)

BOTANIC DESCRIPTION
Trema orientalis is an evergreen shrub or tree up to 18 m in height. A short basally swollen bole, heavy branching and rounded to spreading crown. The slender branchlets are covered with white velvety hairs. Bark grey or brown, smooth but marked with parallel longitudinal lines and corky spots; slash creamy-white to light yellow, fibrous, bright green immediately beneath the bark. It has an extensive root system that enables it to survive long periods of drought.

Leaves simple, alternate, stipulate, along drooping branches, to 14 cm long, papery, rough to the touch and dull above, short grey hairs below, the edge finely toothed all round, blade unequal sided.

Flowers small, green or greenish-white, unisexual, borne in a crowded inflorescence consisting mainly of male flowers with a few female ones at the top.

Fruit small, round and fleshy, glossy black when ripe, 4-6 mm, containing 1 dull black seed embedded in bright green flesh.

The name Trema is based on the Greek word for a hole and alludes to the pitted seeds. The specific name, ‘orientalis’ is Latin for eastern-'of the orient.'

BIOLOGY
T. orientalis flowers from February to April in Assam India, flowers unisexual. Fruit ripening varies with the locality, but in most places in India, occurs from December-May. Birds are very fond of the fruit and disperse the fleshy drupes.

The leaves of the pigeonwood tree are alternately arranged along drooping branches. (Ellis RP.)

The berries are small, round, fleshy and black when ripe. (Ellis RP)

A large specimen of the pigeonwood tree which has been spared during forest clearing. (Ellis RP)

ECOLOGY
T. orientalis is found in the lowland humid tropics. It is among the first trees to establish in clearings, on flood-damaged riverbanks, and also colonizes denuded poor soils. The species is intolerant of fire.

BIOPHYSICAL LIMITS
Altitude: 0-2500m
Mean annual temperature: 20-27 deg. C
Mean annual rainfall: 1000-2000 mm
Soil type: Grows on a wide range of soils from heavy clay to light sand; it tolerates moderate alkalinity and salinity, but does not withstand waterlogging.

DOCUMENTED SPECIES DISTRIBUTION

Native: Angola, Australia, Bangladesh, Brunei, Cambodia, Cameroon, Central African Republic, Chad, China, Cote d'Ivoire, Democratic Republic of Congo, Ethiopia, India, Indonesia, Japan, Kenya, Laos, Madagascar, Malaysia, Mali, Myanmar, Nepal, Niger, Nigeria, Philippines, Saudi Arabia, Senegal, Sierra Leone, South Africa, Sudan, Tanzania, Uganda, Vietnam, 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.

PRODUCTS
Food: The leaves and fruit are reported to be eaten in the Democratic Republic of Congo.

Fodder: The leaves, pods and seeds are used for fodder. Silage made from the foliage has a crude protein content 18.9 g/100 g dry matter, and in the Philippines is fed to cattle, buffaloes and goats. The high fibre content and toxins usually limit the use of leaf meal in feeds. However, these limitations can be overcome by extracting protein from the leaves.

Apiculture: T. orientalis makes good bee forage.

Fuel: A fast-growing species which coppices well, it can provide plenty of firewood and excellent charcoal which is even suitable for making gunpowder and fireworks.

Fibre: An appropriate tropical hardwood for paper and pulp production. Paper made from T. orientalis has good tensile strength and folding endurance. The bark is made into ropes, which are also employed as waterproof fishing lines in Tanzania.

Timber: Wood is off-white or tinged with pink and fine grained but of low durability. Used in manufacturing panel products, poles and drumsticks.

Tannin or dyestuff: The bark yields a black dye and the leaves a coffee-coloured one. The bark and leaves contain a saponin and tannin.

Lipids: The seed contains a dark green fixed oil.

Medicine: Both bark and leaf decoctions are used as a gargle, inhalation, drink, lotion, bath or vapour bath for coughs, sore throat, asthma, bronchitis, gonorrhoea, yellow fever, toothache, as a vermifuge, and it is known to have anti plasmodium properties. The leaves are reported to be a general antidote to poisons and a bark infusion is drunk to control dysentery. A leaf decoction is used to deworm dogs.

Other uses: The inner bark is rubbed on ropes to blacken and preserve them.

SERVICES
Erosion control: T. orientalis rapidly grows on disturbed soil so helps in soil conservation.

Shade or shelter: Often planted as a shade tree in coffee and cocoa plantations and also in other crops in Asia and Africa.

Reclamation: A common pioneer species, it is one of the first to become established on poor soils to reforest denuded or disturbed areas. Seeds germinate readily and growth is rapid so it is widely planted for soil reclamation.

Soil improver: The mulch is used to improve the soil. The tree is common as a fallow species in shifting cultivation.

Ornamental: It is often planted as a garden tree. Its fast growth makes it a popular choice for a new garden.

TREE MANAGEMENT
T. orientalis is very fast growing, attaining a harvestable size for pulpwood in 3-4 years. It coppices well and its extensive root system enables it to withstand dry periods. The tree regenerates profusely through its numerous seeds and is a common colonizer of disturbed rainforest areas.

GERMPLASM MANAGEMENT
Germination rate is about 30%. Seed storage behaviour is uncertain; viability can be maintained for 6 months in hermetic storage at room temperature, after which viability reduces rapidly. There are up to 370 000 seeds/kg.

PESTS AND DISEASES
No serious diseases and pests are known. Larvae of Sahyadrassus malabaricus, a sapling borer, causes some damage in India, but it can be controlled completely with insecticides. A powdery mildew fungus (Oidium udaiyanii) is also known to infect the species.

FURTHER READNG

Anon. 1986. The useful plants of India. Publications & Information Directorate, CSIR, New Delhi, India.

Bappammal M, Hosagoudar VB. 1992. A new powdery mildew fungus from Tamil Nadu, India. New Botanist. 19(1-4):161-162.

Beentje HJ. 1994. Kenya trees, shrubs and lianas. National Museums of Kenya.

FAO. 1986. Some medicinal plants of Africa and Latin America. FAO Forestry Paper. 67. Rome.

Faridah Hanum I, van der Maesen LJG (eds.). 1997. Plant Resources of South-East Asia No 11. Auxillary Plants. Backhuys Publishers, Leiden, the Netherlands.

Hamilton A.C. 1981. A field guide to Uganda forest trees.

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.

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).

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.

Perry LM. 1980. Medicinal plants of East and South East Asia : attributed properties and uses. MIT Press. South East Asia.

Singh RV. 1982. Fodder trees of India. Oxford & IBH Co. New Delhi, India.

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

Vazquez-Yanes C. 1977. Germination of a pioneer tree (Trema guineensis Ficalho) from Equatorial Africa. Turrialba. 27(3):301-302.

Whitmore TC (ed). 1983. Tree Flora of Malaya: A manual for Foresters. Vol. 2. Forest Department, Ministry of Primary Industries. Malaysia.

SUGGESTED CITATION

Orwa C, A Mutua, Kindt R , Jamnadass R, S Anthony. 2009 Agroforestree Database:a tree reference and selection guide version 4.0 (http://www.worldagroforestry.org/sites/treedbs/treedatabases.asp)