

## Toona ciliata

tun, toon, red cedar

M. Roemer

Meliaceae

### LOCAL NAMES

Bengali (lud,mahanim,tuni,tun); Burmese (mai yom horm,taw thamgo,thit kador,taung-tama); English (moulmein cedar,Australian red cedar,Indian cedar,Indian mahogany,Queensland red cedar,red cedar,Australian toon,Burma toon,Burma cedar,toon tree,toona tree,Indian toon); Filipino (danupra); French (cedre rouge); German (Australisches mahagoni); Hindi (maha nim,tuni,lim,tun); Indonesian (malapoga,suren mal,kukoru,suren kapar); Javanese (suren mal,suren kapar); Khmer (chomcha); Lao (Sino-Tibetan) (mai-yom-horm); Malay (ranggoh,surian limpaga); Sanskrit (nandivriksha,nandichettu); Spanish (cedro); Tamil (tunumaram,thevetharem,cevvagil,santhana-vembu,agil,mala-vembu,thevatharam); Thai (yom-hom); Trade name (red cedar,toon,tun); Urdu (tun); Vietnamese ([las]t kh[es]t)

### BOTANIC DESCRIPTION

*Toona ciliata* is a large deciduous tree with a spreading crown, commonly attaining a height of 20-30 m and a girth of 1.8-3 m. Bark dark grey or reddish-brown, smooth up to middle age, afterwards rough, with shallow reticulate cracks exfoliating in irregular woody scales. Blaze 1.3-1.5 m, fibrous throughout, pink or pinkish-brown, sometimes with just a few white bands towards the outside, turning brown on exposure, bitter to the taste, juice turning purple on the blade of a knife.

Leaves 30-50 cm long, on young trees up to 90 cm long, usually imparipinnate, sometimes paripinnate by the abortion of the terminal leaflet; leaflets 11-29, opposite or alternate, 5-15 x 2-6 cm, lanceolate or ovate-lanceolate, acuminate, glabrous, pubescent, margin entire or wavy, base oblique; petiolules 0.3-1.3 cm long.

Flowers small, honey scented, cream coloured, in drooping or sub-erect terminal panicles, usually shorter than the leaves. Calyx divided nearly to the base. Petals 5 mm long, ovate-oblong, sub-acute, with ciliate margins.

Capsule dark brown, 1.8-2.5 x 0.5-0.8 cm, oblong, usually smooth outside, sometimes sparsely lenticellate. Seeds pale brown, very light, winged at both ends, 1.3-1.5 cm long including the wing.

The synonymous name 'cedrela' is from the Latin 'cedrus', the cedar, the name given on account of its scented wood.

### BIOLOGY

In areas with a marked dry season all the foliage is shed for a part of the year. The flowers are functionally unisexual but usually with well-formed vestiges of the opposite sex present. In female flowers, the anthers do not open and are shrivelled; in male flowers the ovary has vestigial ovules. *T. ciliata* is reported to bear ripe fruit throughout the year. The seeds are released from the capsules at intervals. Seeds are light and wind dispersed.



(Greig, D. ANBG Photo No.: a.12299)



Flowers at Makawao Forest Reserve Maui, Hawaii (Forest & Kim Starr)



Fruit at Hana Hwy Maui, Hawaii (Forest & Kim Starr)

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### ECOLOGY

A tree of subtropical climates, *T. ciliata* grows in moist localities such as ravines, banks of streams and even swamps. It grows best in fire-protected savannah, abandoned cultivation and in small gaps in forest, and does not do well on dry hillslopes.

### BIOPHYSICAL LIMITS

Altitude: 0-1500 m, Mean annual temperature: -1 - deg. C Mean annual rainfall: 750-4000 mm

Soil type: Prefers well-drained, deep, fertile soils and does not do well on wet, compacted or poor sandy ones.

### DOCUMENTED SPECIES DISTRIBUTION

Native: Bangladesh, Cambodia, China, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Pakistan, Papua New Guinea, Philippines, Thailand, Vietnam

Exotic: Australia, Kenya, Mauritania, Sierra Leone, South Africa, Tanzania, Uganda, United States of America, Zambia, Zimbabwe



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

Food: In Southeast Asia the leaves are used as a vegetable.

Fodder: The leaves are sometimes lopped for fodder.

Apiculture: An important bee plant; it is one of the species for honey production in Bangladesh.

Timber: Sapwood is pinkish-white or pale yellow-brown and the heartwood pale brown, cedar brown, dark red-brown or brick red when 1st cut. It darkens upon exposure to a rich reddish-brown with darker brown streaks. Grain is generally straight to somewhat interlocked. Texture is moderately close and uneven, and the wood is lustrous. A strong, fragrant, long-lasting spicy odour is usually present. The heartwood is moderately resistant to decay. Material from Australia is reported to finish cleanly and take a high polish. Staining is satisfactory, and the timber takes both water- and oil-based paints well. Timber produced by *T. ciliata* (not a true cedar) has moderate weight, strength and hardness.

The wood has a variety of uses such as for boat building, cabinet making, cigar boxes, matchboxes, decorative plywood and veneer, food containers, furniture, interior trim, joinery, musical instruments, ornamental work, panelling, boxes and crates, building materials, exterior uses, millwork, mouldings. Sawdust from machining operations has been reported to cause dermatitis in some individuals.

Tannin or dyestuff: The flowers contain a red colouring matter and also a sulphur-coloured dye. Cotton and woollen fabric can be dyed a dull yellow by mere immersion in a boiling extract of *T. ciliata* flowers. The flowers are used in conjunction with safflower and turmeric to produce a sulphur-yellow colour. Bark contains tannin, and it has also been used traditionally for twines and the manufacture of string bags.

Essential oil: An aromatic oil can be extracted from the fruit.

Poison: Some extracts from the bark have insect-repellent properties.

Medicine: Various parts of the plant, but especially the bark, are used medicinally, e.g. as an astringent and tonic, to treat dysentery and to heal wounds.

Other products: The wood is used for shiitake mushroom culture.

### SERVICES

Shade or shelter: Trees may be planted as firebreaks.

Reclamation: *T. ciliata* has been planted for reforestation.

Ornamental: A popular avenue tree planted along roadsides in north India.

**TREE MANAGEMENT**

Toona is a moderate light demander; however, the young plants require some side protection from direct sun. Trees growing in such situations develop a tall, clean bole up to a height of 9-12 m; in the open they tend to have a large, spreading crown and short, clean bole 3.6-4.2 m. Seedlings are sensitive to fire, cannot withstand severe drought and are susceptible to suppression by weeds. The tree is frost hardy. It coppices well and produces plentiful root suckers. It has a spreading superficial root system, which may have adverse effects on the growth of agricultural crops. The tendency to become branchy should be controlled by close initial spacing. Thinning is required from the 4th year, and thereafter every 5 years.

If tended and watered in the early stages it is capable of growing in comparatively dry areas, such as those with rainfall as low as 750 mm, and with maximum temperatures as high as 49 deg. C. Good drainage is necessary for optimum development of the seedlings, as excessive moisture restricts root development.

**GERMPLASM MANAGEMENT**

Orthodox seed storage behaviour; 90% germination after 12 months' storage in polythene bags at 5-8 deg. C with 34-12.9% mc; complete loss of viability after 3 months at room temperature. There are 280 000-425 000 seeds/kg.

**PESTS AND DISEASES**

Several species of insect attack and damage forest trees and young plantations. Two main ones are *Hypsipyla robusta* (mahogany collar-borer) and *Pagiophloeus longiclavis* (toon and mahogany shootborer). *T. ciliata* is susceptible to attack by dry-wood termites, *Anobium* borers and *Lyctus*.

In some places, young saplings are attacked and even killed by the parasite *Loranthus scurrula*. Plantation material is reported to have very little natural resistance to attack by decay fungi. The most important are *Ganoderma lucidum*, causing root and butt rot, which may be lethal, *Phellinus* spp., causing white rot of fallen timber or gaining access through wounds exposing dead sapwood, and *Trametes straminea* (white stringy rot), usually saprophytic but also a wound parasite causing trunk rot.

Seedlings and saplings are browsed readily by deer and cattle.

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### FURTHER READING

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### SUGGESTED CITATION

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