

## Michelia champaca

L.

Magnoliaceae

### LOCAL NAMES

Bengali (champaka,champa); Burmese (mawk-sam-lung); Cantonese (sampige); English (golden champa,yellow champa,fragrant champaca,orange chempaka); Filipino (champaca); French (ilang-ilang); Gujarati (rae-champo); Hindi (chempaka); Indonesian (cempaka kuning,capaka,cempak); Lao (Sino-Tibetan) (cham pa); Malay (chempaka merah,chempaka,champaka); Sanskrit (champaka); Sinhala (sapu); Spanish (champaca); Tamil (chambugam,sempangan,chembuga); Thai (champa pa,champa khao,champa); Vietnamese (ng[o]c lan)

### BOTANIC DESCRIPTION

*Michelia champaca* is an evergreen or semi-deciduous, small to medium-sized tree up to 50 m tall; bole straight, cylindrical, up to 200 cm in diameter, without buttresses; bark surface smooth, grey to greyish-white, inner bark fibrous, yellow to brown, crown conical to cylindrical.

Leaves simple, entire, arranged spirally; stipules adnate to or free from the petiole.

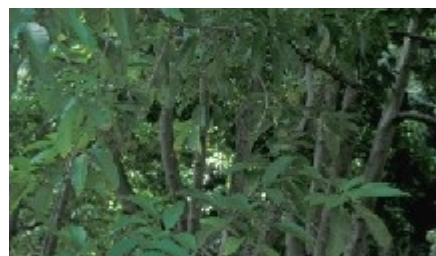
Flowers on short, axillary brachyblast, solitary or rarely in pairs, large, tepals 6-21, in 3-6 usually subequal whorls, white to yellow; stamens many, anthers with a short to prominently elongated connective; gynoecium stipitate, with spirally arranged, free or connate carpels containing many ovules.

Fruiting carpels dehiscent along the dorsal suture when free or fused and forming a fleshy or woody syncarp. Seed hanging from its funicle.

The genus is named after Italian botanist Peter A. Michel (1679-1737); the specific epithet after the Hindu name.

### BIOLOGY

The tree flowers and fruits throughout the year. The flowers are protogynous and are pollinated by beetles, which feed on the stigmas, pollen, nectar and secretion from the petals. This species is thought to hybridize with *M. montana* giving rise to *M. alba* which rarely produces fruits and is unknown in the wild.



Habit at Kepaniwai, Maui, Hawaii. (Forest & Kim Starr (USGS))

**ECOLOGY**

M. champaca is found scattered in primary lowland to montane rain forest, up to 2 100 m altitude. The absolute maximum temperature is 35-40 deg C, the absolute minimum temperature 3-10 deg C.

**BIOPHYSICAL LIMITS**

Altitude: 600-2 000 m

Mean annual temperature: 7-38 deg C

Soil type: M. champaca requires moist, deep and fertile soils.

**DOCUMENTED SPECIES DISTRIBUTION**

Native: India

Exotic: Indonesia, Laos, Malaysia, Myanmar, Nepal, Sri Lanka, Thailand, Vietnam



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**

Fodder: Leaves are fed to silkworms.

Fuel: The gross energy value of the heartwood is about 21 070 kJ/kg and the tree is used as fuelwood.

Timber: Heartwood, olive-brown turning to dark brown with a greenish tinge upon exposure, is clearly differentiated from the pale brown, up to 8 cm wide sapwood. Grain straight or slightly interlocked, texture fine to moderately fine and even. Michelia wood is nicely figured and is used for furniture, cabinetwork, carvings, turnery and pattern making; it has also been used for cement-bonded wood-wool board.

In India it has been recommended to ring girdle trees about 3 years before felling to prevent possible warping and checking of the wood.

Essential oil: Flowers yield an essential oil used in perfumery. Analyses of seeds showed low (20%) kernel contents but high oil contents of kernel (32.2%) and 6.44% of seed. It has potential for commercial exploitation for oil production for various uses.

Poison: Leaf extract is toxic to the rice fungus, *Pyricularia oryzae*. Fatty oils extracted from the seeds show antibacterial activity against *Bacillus pumilus*, *B. subtilis*, *Salmonella typhosa*, *S. paratyphi*, *Micrococcus pyogenes* var. *albus* and *Staphylococcus aureus*.

Medicine: A decoction of the bark and leaves is given after childbirth; the bark is used as a febrifuge. In Myanmar the flowers are used to treat leprosy and leaves used against colic.

Other products: Five sesquiterpene lactones were isolated from the root bark of *M. champaca*. One of these, michampanolide (2,7-dihydroxy-3,7-dimethyl-11-methylene-13-oxatricyclo[8,3,0,0,3,b]tridecan-12-one), possessed a new skeleton, while 2 others, 8-acetoxyparthenolide and magnograndiolide, were isolated for the first time.

**SERVICES**

Reclamation: The tree is used to reforest badly eroded areas in Java.

Nitrogen fixing: Vesicular-arbuscular mycorrhizae have been observed on the roots.

Soil improver: Soil under tree cover shows an increase in pH, soil organic carbon and available phosphorus.

Ornamental: *M. champaca* is planted as a wayside tree, and near temples for ornamental.

**TREE MANAGEMENT**

Trees propagated from seed take 8-10 years to flower whereas asexually propagated trees flower in 2-3 years. In Java the mean annual increment of 10-27-year-old trees is 1-1.8 m in height and 1.5-2 cm diameter, annual increment of 20-25 cu m/ha during the 1st 10 years are possible. It is planted at 3 m x 2.5-3 m but the open canopy makes weed control necessary. A rotation of 50 years is recommended to produce sawn timber. The tree is a light demander and is susceptible to fire; it coppices well.

**GERMPLASM MANAGEMENT**

There are 10 000-29 500 seeds/kg. Seed storage behavior probably orthodox. Seed viability can be maintained by moist storage at 5 deg C for about 7 months or in pits at 13 deg C for about 4 months.

**PESTS AND DISEASES**

Prociphilus micheliae causes leaf curling in trees and Phomopsis micheliae causes a leaf spot disease.

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**SUGGESTED CITATION**

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