Michelia champaca L.

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MAGNOLIACEAE (MAGNOLIA FAMILY)

Michelia aurantiaca Wall. Champak. Ver.

Champ, champa, champaca, champagam, champaka, champakam, champakamu, champige, chapa, chempaka, Rac-champo, sampige, sempangan, shamba, shembuga, tita-sopa (Balfour 1983, Brandis 1921, Gamble 1922, Troup 1921)

Michelia champaca occurs naturally in the eastern Sub-Himalayan tract (Zabala 1990c). It is a member of a genus with at least a dozen representatives in India and Myanmar (Burma) (Bor 1953). The species is fairly common in Bangladesh, Assam (a province of India), Myanmar, and southern India. It is found from Nepal eastward, including West Bengal (a province of India) and Assam. It is also found on the west coast from Karnataka to Kerala (province of India) (Negi and Gupta 1987). In Bangladesh this species occurs naturally in the tropical wet evergreen forests and tropical semievergreen forests of Chittagong Hill Tracts and Sylhet.

Michelia champaca is a large evergreen tree with a long straight bole (Negi and Gupta 1987) of 18 to 21 m with a close tapering crown composed of ascending branches. It is a medium-growing tree, attaining a height of 33 m or more and under ordinary forest conditions a girth of 2.4 to 3.7 m or more. The bark is light gray, smooth, and about 2 cm thick. Leaves are generally 13 to 25 cm long, 5 to 9 cm wide, lanceolate, sometimes ovate, finely acuminate, glabrous and more or less shining above, glabrescent underneath; the petiole is 1.8 to 3.0 cm long, slightly channeled, and usually pubescent; the old leaves are yellow (Troup 1921). In general it grows in moist, deep, well-drained, good quality soil. It grows in deep valleys and some grow best in foothills (Zabala 1990c). In the Kalimpong Division, it is mixed with other species in gneiss, slates, quartzite, and schist, which weather to a rich, sandy loam soil (Troup 1921). In its natural habitat, *M. champaca* grows in areas where temperatures are 0 to 47.5 °C and annual precipitation is 2250 to 5000 mm or more. It thrives in a damp climate.

Michelia champaca is basically a timber tree. The wood is soft and even-grained. The sapwood is white; the heartwood is light yellowish-brown to olive-brown and somewhat lustrous, without characteristic odor or taste (Anonymous 1976). The heartwood of this species is strong, durable, and capable of taking a high polish (Bor 1953). The wood is light (specific gravity 0.53) and straight grained; even- and medium-textured growth rings are distinct, being delimited by light lines of terminal parenchyma (Troup 1921). The timber is moderately refractory but can be air- or kiln-seasoned without difficulty or degradation, if properly handled. However, the wood discolors slightly and is inclined to become dull. It is also liable to crack with improper care (Troup 1921). The *Michelia* are generally not very durable woods although they have been known to last for fairly long periods when used as posts or under water. The heartwood of *Michelia* sp. is refractory to treatment; side or end penetration is almost nil (Indian Standards Institution 1955). The species is used for packing cases, crates, carriages, furniture, carving, bentwood articles, toys, bobbins, battery separators, pencils, tea chests, and plywood and in ship and boat building (Anonymous 1980b). In India the species is grown as an ornamental and the leaves, flowers, seeds, and fruits are used for essential oils and medicine (Nalawadi and others 1988). The sweetly scented flowers are used in India for hair adornment and for essential oil extraction.

The yellow-flowered variety produces new leaves in March; the white-flowered variety, later in the hot season (Troup 1921). The large, scented, yellow flowers grow singly, each from the base of a leaf. In West Bengal, trees 6 to 12 years old produce flowers and viable seeds, especially in the moister regions of the forest (Troup 1921). The fruit ripens in August or later. Seeds are dark brown and angular, covered with pink fleshy anillus (Zabala 1990c). Seed-year records from the Kurseog and Tista Divisions in West Bengal (India) show a good seed crop almost every year (Troup 1921).

Fruits should be collected in early September. Fruits should be dried in the shade until the seeds are released. If the seeds must be transported, the ripe fruits should be packed in charcoal dust to help keep them fresh (Troup 1921). The pulp is washed from the seeds in water; the floating nonviable seeds are discarded and the clean viable seeds are sown within 2 weeks of collection (Troup 1921, Zabala 1990c).

Seeds are oily and quickly lose viability. Regeneration is poor because the number of seeds that germinate is low (Zabala 1990c). In Dehra Dun, India, fruits were collected in September and spread in the sun to dry. Seeds were released within 3 days and were depulped and dried at room temperature for 1 day. Initial germination of seed lots was 68 percent, and moisture content was 21.2 percent (Bahuguna and others 1987). Germination percentage dropped markedly during storage at 5 °C.

Germination takes from 5 weeks to 4 months. The seedlings are pricked into plastic tubes with a soil and cow dung (3:1) medium when 2 to 4 cm high and left to grow for 1 year in the nursery. Seedlings can be outplanted when they are 30 to 40 cm in height (Zabala 1990c).

In vegetative propagation the Forkert method shows 46.5 percent success, the T-method 44.4 percent, and the Patch method 37 percent, whereas the side veneer method was unsuccessful (Rashid and others 1986). When 8- to 10-month-old seedlings were decapitated 25 to 30 cm from the ground and previously defoliated scions were grafted in early August, 40 percent success was obtained (Nalawadi and others 1988). Extracts of girdled and etiolated shoots contained a higher level of root-promoting substances than shoots that were only girdled or fresh shoots (Gowdam and Jayanthi 1988). *Michelia champaca* can also be propagated by treating fresh or pregirdled and etiolated layers with indole butyric acid. The best rooting (93.3 percent) and survival of rooted layers (92.1 percent) were obtained with pregirdled and etiolated layers treated with indole butyric acid at 5000 ppm (Channaveerappa and Gowda 1984). Roots of 1-year-old *M. champaca* exhibited vesicular-arbuscular mycorrhizas (Thapar and others 1992).

The disease caused by *Rhizoctonia solani* appears in late July (after the monsoon rains set in) and damage may be 70 to 100 percent. Controlling this disease by using appropriate sanitation and cultural methods is recommended. Seedlings can be raised in polypots rather than beds; diseased seedlings can be segregated; infected leaf litter can be removed; and plantations can be weeded during humid months (Mehrotra 1992).

ADDITIONAL INFORMATION

In Lawachara, Bangladesh, *M. champaca* grows well in plantations with *Hopea odarata, Xylia dolabriformis* Benth., and *Artocarpus chaplasha* (Zabala 1990). In West Bengal, India, the species mixed with *Bischofia javanica* Blume and planted under fast-growing deciduous *Chukrasia velutina* Roem. succeeded, and in Assam, India, planting *M. champaca* under *Terminalia myriocarpa* Van Heurok & Müll. Arg. in older plantations also succeeded (Troup 1921).

In the Northern Circle of West Bengal, which includes the Kurseong, Darjeeling, Buxa, Jalpaiguri, Cooch Behar, and Baihunthapur Divisions, *M. champaca* was raised in mixed-taungya plantations (Troup 1921). In *Shorea robusta* (common name Sal) plantations, usually nine lines (1.9 m apart) of sal alternate with *M. champaca, Chikrassia tabularis, Schima,* and other species. *Michelia champaca* and its associates, such as *Exbucklandia populnea, Acer campbellii, Schima, Machilus* spp., and *Cryptomeria* D. Don, were also used in afforestation work in the hills of the Kurseong Division (Troup 1921).

According to Homfray (1936) and De (1940), *M. champaca* does not stand waterlogging; it prefers a well-drained soil. However, in Hugaon Division, Assam (India), in areas too waterlogged for *Shorea robusta*, plantations of *M. champaca* are doing quite well (Troup 1921). According to Homfray (1936) *M. champaca* is sensitive to fire; severe fires may even kill it outright. Even large trees died after exposure to a low ground fire (Bor 1953). *Phomopsis micheliae* causes leaf spot diseases on *Michelia champaca* (Sankaram and others 1987). *Urotylis punctigera*, the *M. champaca* bug, causes appreciable damage in pure plantations. Growing *M. champaca* with other nonsusceptible species prevents intrusion and facilitates direct remedial measures. If necessary, a suitable mixture, such as 1 part nicotine sulfate and 1.8 kg soap in 450 L water, can be sprayed. Dieldrin and DDT water emulsion in very low concentrations can also be used (Troup 1921). Another pest identified as *Rynchothrips champakae* attacks the leaves of *M. champaca*, resulting in the browning and dying of leaves and twigs. The damage, however, is only slight and the plants usually recover (Mathur and Sing 1957).


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