Schima wallichii

(DC.) Korth.

Theaceae

simartolu, schima, samak, needlewood, mang tan, Chinese guger

LOCAL NAMES

Bengali (cheloni,mukria sal,makrisal); Burmese (laukya); Chinese (he,muhe,heshu,hemu,haozi haozi,gaobei,Chinese guger tree); English (needlewood,schima); Hindi (makusal,kanak,dieng-shyr-nagan,chilauni,nogabhe); Indonesian (seru,madang gatal,puspa); Javanese (medang gatal,seru); Lao (Sino-Tibetan) (‘mi,boun nak,‘khai sou); Malay (kelinchi padi,gegatal,medang gatal,gatal-gatal,samak); Nepali (sule-chilauni,aule-chilaune,chilaune,goe-chassi); Thai (thalo,champa dong,bunnak); Trade name (simartolu,Chinese guger tree,samak,needlewood,schima,mang tan,chilauni); Vietnamese (v[oos]i thu[oos]c)

BOTANIC DESCRIPTION

Schima wallichii is an evergreen, medium-sized to large tree growing to 47 m in height; bole cylindrical, branchless for up to 25 m, diameter up to 125 (max. 250) cm, with a steep buttresses rarely up to 1.8 m high; bark surface ruggedly cracked into small, thick, angular pieces, red-brown to dark grey; inner bark with skin-irritating fibres, bright red in colour.

Leaves spiral, oblong to broadly elliptic, 6-13 x 3-5 cm; base wedge shaped; apex acute to acuminate; margin toothed; secondary veins 6-8 pairs; petioles about 3 mm long.

Flowers solitary in axils at the apices of twigs, with 2 bracteoles, pentamerous; sepals subequal, persistent in fruit; petals connate at base, white, with a rosy flush; stamens many, adnate to the corolla base; anthers versatile; ovary superior, 5-locular with 2-6 ovules in each cell; style simple.

Fruit a woody subglobose capsule, 2-3 cm in diameter, silky, opening by 5 valves; seeds winged all around.

The genus name is derived from the Greek word skiasma-‘shadow’, probably referring to the dense crown.

BIOLOGY

Trees may flower and fruit after 4 years. Flowering and fruiting occur throughout the year, but flowers are usually more abundant around the periods when seasons change. In India trees bear flowers in April-June, and the 1st fruits are observed from May to July. The seeds are shed in next January to March of the following year. In Indonesia, fruiting is reported to be most abundant in August to November. Seeds are light and are dispersed by wind.

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ECOLOGY
S. wallichii is a common tree that can grow in a wide range of climates, habitats and soils. Its light requirements are moderate. It often occurs gregariously in primary lowland to montane forest, but is particularly common in disturbed and secondary forests, scrub and grassland and even in areas inundated with brackish water.

BIOPHYSICAL LIMITS
Altitude: Up to 2400 (max. 3900) m, Mean annual temperature: 0-5 to 37-45 deg. C, Mean annual rainfall: 1400-5000 mm

Soil type: S. wallichii can grow in a wide range of soils. It usually prefers well-drained soils but has been observed in swamps and along rivers, and is not choosy about soil texture or fertility.

DOCUMENTED SPECIES DISTRIBUTION

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

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.

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PRODUCTS
Fodder: In Nepal, the leaves are used for fodder.

Fuel: S. wallichii produces good firewood. The energy value of the sapwood is about 19 980 kJ/kg.

Fibre: Wood is suitable for paper pulp.

Timber: S. wallichii yields a medium-weight to heavy hardwood with a density of 450-920 kg/cubic cm at 15% mc. Heartwood is pink-brown, red-brown or grey-brown, but is sometimes dark red-brown; it is not clearly differentiated from the pale grey sapwood; grain is straight or interlocked, frequently irregular; texture moderately fine or fine and even. Shrinkage is moderate to very high, and the timber seasons fairly rapidly; in Malaysia, boards 13 mm and 38 mm thick were observed to take about 2.5 months and 3 months, respectively, to air-dry. The wood is moderately durable and hard and is fairly strong. It is easy to work with hand and machine tools and polishes satisfactorily. Wood is relatively resistant to dry-wood termites.

Used for medium-heavy construction that is under cover, such as columns and beams, for flooring, interior fitting, panelling, door and window frames, joinery, utility furniture, ship and boat building (ribs, decks), vehicle bodies, agricultural implements, pallets, boxes and crates, poles, toys, turnery and, when treated, for railway sleepers. It has been used for bridge building in mountain areas, and young trees have been used as rafters. Good-quality plywood can be manufactured from the wood, and it is suitable for the production of wood-wool boards.

Tannin or dyestuff: Bark is used for dyeing and its tannin is used in processing skins. Leaves also contain tannin but not in quantity enough for economic use in tanning.

Lipids: Seed of S. wallichii from India contains 19% oil.

Poison: The bark contains an alkaloid used as a fish poison.

Medicine: The astringent corollas are used to treat uterine disorders and hysteria. The crude drug is called ‘buah cangkok’ in Indonesia, and ‘changkoh’ in peninsular Malaysia.

SERVICES
Erosion control: In the northeastern regions of India, planting cardamon and S. wallichii are some of the ideal agroforestry systems for conserving soil and water.

Shade or shelter: In India, S. wallichii has been used as a shade tree in coffee plantations.

Reclamation: S. wallichii is useful for reforestation and in water conservation in catchment areas.

Intercropping: In Indonesia, S. wallichii has been used a cover crop in plantations of Pinus merkusii and Agathis dammara.

TREE MANAGEMENT
Survival of planted out seedlings is almost 100%. In peninsular Malaysia, they are planted out at a spacing of 1.8 x 1.2 m or 3.6 x 1.8 m; resulting in almost double diameter increments for the wider spacing. Early growth is comparatively slow, accelerating later. S. wallichii coppices easily; it is fairly resistant to fire from the age of 5 years, when it can reproduce by coppice shoots.

GERMPLASM MANAGEMENT
Seed storage behaviour is recalcitrant; seeds cannot be stored and are short-lived in open storage at room temperature. Dried fruits or seeds can be stored for up to 3 months, although 1 record in Nepal shows that they can be stored for a long time without problems. There are 196 000-267 000 dry seeds/kg.

PESTS AND DISEASES
In Java, the borer Trachylophus approximator has been observed tunnelling in stem bases, enhancing secondary diseases and pests. Logs are liable to attack by Rhadinomerus malsae, Platypus indicus and white ants. The timber is prone to attack by wood-rotting fungi that cause honeycomb rot and white rot.

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SUGGESTED CITATION

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