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Schima wallichii Choisy

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Schima wallichii Choisy

Taxonomy and nomenclature

Family: Theaceae

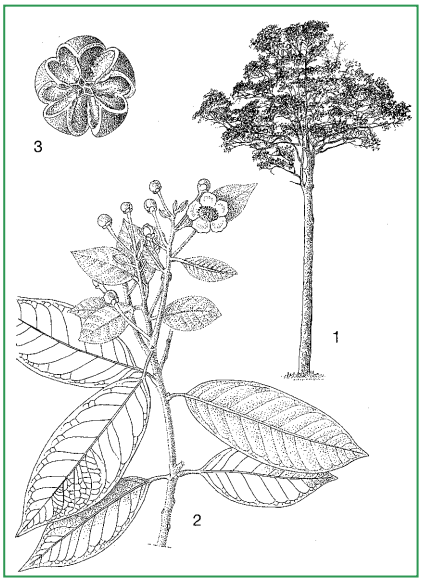
Synonyms: *Shima bancana* Miq., *S. crenata* Korth., *S. noronhae* Reinw. ex Blume.

Vernacular/common names: needle wood, schima (English); puspa (Indonesia); voi thuoc (Vietnam), bunnak (Thailand, ½Laos).

There is only one species in the genus; formerly described *Schima* species are now considered varieties of *S. wallichii*.

Distribution and habitat

Wide distribution in South and Southeast Asia and the Pacific ranging from Northeast India through Indochina (Myanmar, Thailand, Laos, Vietnam, Cambodia) and southern China, to Peninsular Malaysia, Sumatra, Java, Borneo, and the Philippines (Palawan). Rapidly spreading and naturalising in many border areas, e.g. Nepal, due to e.g. shifting cultivation. Grows in evergreen closed forest at 400-1000 m.a.s.l., sometimes extending up to 2000 m.a.s.l., often growing together with *Keteleeria*, *Betula alnoides*, *Castanopsis, Quercus* and *Lithocarpus* species. As a pioneer species often colonising open land after burning, e.g. after shifting cultivation. Prefers moist clay or deep humus soil with pH 5-6.5. Tolerant to drought and cold.



1. tree habit; 2, flowering twig; 3, dehisced fruit. From: Plant Resources of SE Asia 5(3).

Uses

Medium strong, durable wood, not particularly decorative. Used for construction and utility furniture, e.g. window and door frames, floor, farm equipment, ox carts, boxes, crates, boat building. Also used for bridges in mountainous areas. Often planted after burning fields, as a road-shading tree and occasionally as a shading tree for crops, e.g. coffee. The flowers have a medical use in some countries.

Botanical description

Usually a relatively small tree rarely more than 10-15 m in height; where protected against overgrowth by large shading trees it can grow up to 30 (-45) meters high. Usually straight bole with no buttresses, and regular canopy. Bark splitting into thick irregular pieces; young branches are covered with yellowish wool. Leaves spirally arranged, simple 6-20 cm long and 3-8 cm wide, oval with acuminate apex and with entire margins. Flowers hermaphroditic, white, quite large (2-5 cm diam), solitary with persistent sepals, 5 white petals and many yellow-orange stamens. Ovule 5 locular with 2-5 ovules in each cell.

Fruit and seed description

Fruits: globose, woody, dehiscent capsule, with persistent calyx and style, 1-1.6 cm diameter, pedicel stout 1.3-2 cm long. Grey-brown when mature, splitting into 5 parts at maturity. There are about 555 fruits per kg and 470 fruits per litre. Each fruit normally contains 10-12 seeds.

Seed: 3-5 mm long including wing, kidney shaped, grey-brown, thin yellowish wing all around. 1 kg contains 220,000 - 260,000 seeds. 1000 pure seed weight is about 3.5-4.5 g at 12% mc.

Flowering and fruiting habit

Flowering starts at the age of 5-8 years, depending on growth site. Flowers and fruits may occur throughout the year, but with a pronounced peak in seasonal climates. Flowering in both India and Vietnam is in April-June with most seed maturing in January to March next year. Development from flower to fruit thus takes about 9 months. In northern Vietnam good fruiting seasons occur every two to three years. In Indonesia fruiting is most abundant from August to November. Seeds are wind dispersed.

Harvest

Seeds are mature when fruits turn from green to yellow-brown, seed grey-brown, seed wing yellowish and embryo turns firm and white. Fruits are collected by climbing in stands of >10 years. Harvest should be when the first fruits start to open to disperse their seeds. Hot, dry, windy weather can easily cause loss of most of the seed crop in short time.

Processing and handling

Early, greenish fruits may be after-ripened in 2-3 days. Mature fruits are dried in the sun or, in humid or moist weather, by artificial heat such as hot air blowing, until they open. Open capsules normally easily release their seed by gentle mechanical treatment such as raking or tumbling. The seeds are small and easily blown away. Seeds are normally not de-winged. Experiments from Vietnam shows that seed lots typically contains about 50% empty seed (seed without embryo), which are practically undistinguishable from filled seed.

Storage and viability

Seeds are orthodox but often have high moisture content at seed dispersal (typically around 15%). Seeds with such high moisture content quickly lose viability. Viability can be prolonged by drying and cool storage. A trial in Vietnam showed that after 5 months at 8% mc and 8°C there was 82% germination (which was about the same as fresh seed). At 12% mc and 15°C germination was still over 70% after 5 months.

Dormancy and pretreatment

No dormancy is reported. Seeds sown immediately after collection germinate freely. Stored seed germinate slowly and seeds occasionally accumulate under the trees suggesting photo-dormancy (light requirement for germination). Soaking in warm water, 35-40°C for 12 hours speed up germination.

Sowing and germination

Germination epigeal with emergent cotyledons. First germination after 7 days, germination continues up to about 20 days. Seeds may be sown immediately after harvest and grown in the nursery for 3-4 months. Height of planting-out seedlings 30-40 cm. The pioneer character of this species may suggest it to be suitable for direct sowing.

Fruit bearing branch. Photo: Lars Schmidt

Selected readings

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