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Kundu, Maitreyee; Schmidt, Lars Holger

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SEED LEAFLET

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Pterocarpus marsupium Roxb

Taxonomy and Nomenclature

Species Name: *Pterocarpus marsupium* Roxb.
Family: Fabaceae (Papilionaceae)
Vernacular (Common name): Indian Kino tree or Malabar Kino tree (English), Bija sal, Venga (India)

Distribution and habitat:

The species is distributed in tropical moist and dry deciduous forests of most of the Indian peninsula including the states Gujarat, Uttar Pradesh, Bihar, Orissa, West Bengal, Madhya Pradesh, Western Ghats, Karnataka, and Kerala of peninsular India, Sri Lanka and Nepal. It grows generally on hills or undulating lands or rocky grounds up to an altitude of 150 to 1100m. The average rainfall of its habitat ranges from 750 to 2000 mm even more in southern India. The maximum temperature ranges from 35°C to 48°C and the minimum 0°C to 18°C. It can thrive in wide variety of soils and geographical conditions such as, gneiss, quartzite, shale, conglomerates, sandstone and lateritic. It prefers well-drained alluvial and sandy loam to loamy soil. The species is moderate light demander and the young seedlings are frost-tender.

Uses

The timber is moderately heavy, strong hard, durable and easy to saw. It is mostly used for constructional and furniture purposes after teak and rosewood. Favourite items include doors and windows, frames, beams, posts, boats, building, agricultural implements, and parts of textile-looms. The bark, wood, leaves and flowers have medicinal properties. The bark is used as an astringent and in toothache. The leaves are used externally for the treatment of boils, sores and certain types of skin diseases. The flowers are used for the treatment of fever. The aqueous infusion of the wood is said to have anti-diabetic properties. The heartwood contains two glycosides i.e., marsupin and pterostilbene, those have better effect than metformin, a potent medicine for diabetes. The bark yields blood-red or ruby colored gum, known as kino or Malabar kino that is used for tanning, printing and dyeing industry. The leaves are used as fodder. The tree is also used as shade tree for coffee and tea plantation.

Botanical description

It is a moderate to large deciduous tree, up to 30m high and a girth of 2.5 m (~80 cm DBH) with a straight clean bole, spreading branches and large, rounded crown. Bark is grey, rough 1.2-1.8cm thick, longitudinally fissured, scaly, blaze pink with whitish markings. Older trees exude a blood-red gum-resin. Leaves are 15-30 cm long, imparipinnate, alternate; stipules small, lateral, rachis long, slender, leaflets 5-7, alternate, lamina elliptic-oblong, oblong-ovate or oblong, margin entire, glabrous, coriaceous; lateral nerves 9-20 pairs. Inflorescence terminal and axillary panicles. Flowers are fragrant, yellow, bisexual, bracts small, corolla exerted; petals 5, all long-clawed, crisped along the margins; wings oblique, obovate, auricled; keel petals oblique, small, slightly connate; stamens 10, anthers uniform; ovary shortly stalked, 1-celled, ovules 2.

Fruit and seed description

Fruits: Pods are brown, orbicular, glabrous, flat, winged, 3-6 cm diameter, usually one seeded, indehiscent, and convexly curved. Wings are veined. There are 1500-2000 pods per kg.

Seeds: Seeds are kidney-shaped, 1-1.3 cm long, reddish-brown, fairly hard with a smooth shiny leathery testa.

Department of Geosciences and Natural Resource Management • University of Copenhagen
Email: SL-International@life.ku.dk • Website: www.SL.ku.dk

Flowering and fruiting habits.

Golden yellow flowers appear from June-November and the pods ripen from December to March depending on the location. The ripe pods hang in clusters on the tree, and disseminates far and wide by hot wind. Good seed years occur at intervals of 2-3 years. Profuse seed production is observed in the exploited forests having isolated trees.

Seed collection

To avoid loss to natural dispersal, collection must be done before natural shedding. The best collection time is when the pods turn to brownish white colour and pod moisture content is about 20-25%. Collection can be done by lopping the branches or plucking the pods. A tarpaulin sheet may be spread under the tree. After collection pods should be spread in shade in one layer or cement floor for drying till the moisture content reach 4-6%.

Processing and handling

Seeds are often not extracted from pods due to hardness of the cover, which makes extraction difficult without damaging the seed. If not extracted, the seed wings can be clipped off the fruits with the help of scissor to facilitate sowing operation.

Dormancy and germination

Though the fruit coat is very hard, it is hygroscopic and seeds have no dormancy. Therefore no pretreatment is required. However, germination capacity varies from 60 to 95% due to empty or malformation of seeds inside the pods. Extracted sound seeds show 100% germination.

Storage and viability

The seed of *P. marsupium* are orthodox. Seeds remain viable if dried up to 4-5% moisture content. Viability can be maintained up to one year at ambient temperature (with annual variation 15-35°C) if moisture content is below 10%, and more than three years at low temperatures (15°C to -10°C) at 4-5% moisture content. Under ambient conditions, it is better to store extracted seeds instead of pods since pods tend to re-absorb moisture.

Sowing and germination

The tree can be propagated through direct sowing or by transplanting nursery-raised seedlings. In direct sowing seeds are sown in lines 3 m apart or patches of 3mx3m. Seeds are spread in one layer on the surface of the soil and a thin layer of sand or dry leaves are spread over

them with the commencement of rains. Simultaneous sowing of field crops is beneficial as such crops provide protection against the hot sun. Planting design should leave about 0.6m wide strip for sowing *P. marsupium*. Germination starts in about two weeks and generally completes in 8 weeks. One year old plants are transplanted during the following rainy season with ball of earth. Planting of older seedlings becomes difficult due to development of long tap root. Seedlings can also be raised in containers, such as polythene bags or bamboo baskets filled with pulverized and sieved soil mixed with compost.

Phytosanitary problems

The species is attacked mainly by defoliators. The beetle *Xylotrechus subscutellatus* bores sap- wood of standing dying trees. The seedlings are liable to the browsed by wild animals. It is also susceptible to fire-damage which is the main cause for dying back.

Selected readings

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Author: Maitreyee Kundu, E-mail: spalliwest@yahoo.co.in
Ed: Lars Schmidt
For further information: Director, Tropical Forest Research Institute, P.O. R.F.R.C., Mandla Road, Jabalpur 482021, India.

Seedleaflets are a series of species wise extension leaflets for tropical forest species with special emphasis on seed technology. Leaflets are compiled from existing literature and research available at the time of writing. In order to currently improve recommendations, IGN encourage feedback from users and researchers who have experience with the species. Comments, corrections, improvements and amendments will be incorporated into future edited leaflets. Please write your comments to lsc@ign.ku.dk