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Published in:
Seed Leaflet

Publication date:
2018

Document version
Publisher's PDF, also known as Version of record

Document license:
Unspecified

Citation for published version (APA):
Kundu, M., & Schmidt, L. H. (Ed.) (2018). *Desmodium oojeinense* (Roxb.) H. Ohashi. *Seed Leaflet*, (168).

Download date: 13. Nov. 2026

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No. 168 May 2018

Desmodium oojeinense (Roxb.) H. Ohashi

Taxonomy and Nomenclature

Species Name: *Desmodium oojeinense* (Roxb.) H. Ohashi
Synonym: *Ougeinia oojeinensis* (Roxb.) Hochr., *Ougeinia dalbergioides* Benth.
Family: Fabaceae-Papilionoideae
Vernacular (Common name): Tinsa, Sandan (Hindi), Mokke, Kallu (Tamil)

Distribution and habitat

The species is endemic to India distributed in northern and central tropical dry deciduous and moist deciduous forest and also in sub-tropical pine forests at an altitude of 300-1800 masl. The tree thrives in the area with maximum temperature from 38°C to 48°C and minimum -3°C to 15°C. The optimum rainfall of its habitat is 750-1900 mm. It is the characteristic species of slope, riverbanks, dry exposed lands and eroded hills. It grows on a variety of geological formations including shale, gneiss, trap, lateritic, sandstone, limestone, quartzite, and on a variety of soils including black cotton soil (vertisols), red clay and alluvium. Good drainage is necessary for its growth. The tree is drought-resistant and frost-hardy, though the seedlings are susceptible to both.

Botanical description

Desmodium oojeinense is a deciduous tree, 7-14 m in height and 30-40 cm dbh. In very dry sites, it may remain a shrub or small tree often with cork-screw like stem, whereas in favorable place, it grows larger with straight clean bole up to 7m. Bark is ash grey, with regular longitudinal and horizontal cracks and exfoliates in irregular thin soft scales. Leaves are pinnately trifoliate; leaflets are 6-15 cm long and 2-15 cm wide, coriaceous, broadly ovate, entire, terminal one is larger, and laterals are smaller. Flowers are white or pink, present in short fascicled racemes, lightly fragrant; pedicel 1.2-2 cm long, filiform; bracts 1.3 cm long, ovate, acuminate; bracteoles one; calyx 0.4-0.6 cm long, pubescent; corolla 1-1.3 cm long, the anterior petal suborbicular, emarginated, keel beaked.

Uses

The wood is grayish-brown to golden-brown, heavy, strong, coarse-textured and highly durable not requiring preservative treatment. It yields a valuable timber that is superior to teak in terms of shock resistance, shear strength and hardness. The timber is used as tool handles, oars, shaft of carts, agricultural implements, for constructional works chiefly for posts, rafters, beams, door and window frames, where strength and toughness are necessary. It is a useful timber for marine plywood. The leaves are lopped for fodder. The bark yields a bast fiber for cordage. The tree is considered as a host for the lac insect. Root and bark have medicinal value. It increases soil fertility by fixing atmospheric nitrogen.

Fruit and seed description

Fruit: Pods are indehiscent, 5-10 cm long, linear-oblong, light brown, flat, 2-5 seeded; sometimes segmented.
Seed: Seeds are about 1 cm long, smooth, brown, flat, reniform, with thin testa. 1000 pure seed weight is 30-35 grams.

Phenology, flowering and fruiting habit

The old leaves fall in January-February, the new copper-red leaves appear in March-June. The flowers appear in cluster in leafless branches during February to May. Pods are formed soon after and ripen in May-June. Pods are generally indehiscent. The tree does not produce seed abundantly every year. Root-suckers start bearing flowers and fertile fruits at a comparatively young age. Pods are dispersed by wind.

Seed collection

Since maturation period is short and seeds disperse within a short time after maturation, regular monitoring is needed during maturation time for collection of seed. The pods can be collected when the color of the pod turns brownish green and seed color is brownish white with moisture content as high as 50-55% to avoid seed loss by dispersal. Collection can be done by lopping the branches or plucking the fruits. A tarpaulin sheet may be spread under the tree. Brownish green pods are dried in shade with proper aeration by spreading in one layer on cement floor or table-top till the moisture content reach 3-5%.

Processing and handling

Seeds should be extracted from fruits before storage, as moisture content of stored seeds tends to increase due to hygroscopic nature of the fruit coat. Fruit coat around the pod is trimmed off to ease sowing. Seeds can be extracted from the pods by thrashing and subsequent cleaning by winnowing or by seed blower.

Dormancy and pretreatment

Seeds have no dormancy and do not need any pretreatment. Fresh seeds have 60-70% germination, as some of them are insect-affected. But extracted sound seeds may have 100% germination..

Storage and viability

Seeds of *Desmodium oojeinense* are of orthodox type and can tolerate drying to 3-5% moisture content, and freezing temperature. Viability can be maintained for more than five years if stored at low temperatures (15°C to -20°C) and 3-5% moisture content and in ambient condition the seeds can be viable for two years, if moisture content is maintained at 4-5%.

Sowing and germination

Germination is epigeal. Sowing is done in the nursery during April-May. Fresh one-seeded pod fragments are soaked in water for 24 hours before sowing. Germination takes place within 3-8 days. Sowing is done at a depth not more than 1 cm in lines about 20-25 cm apart. Light shade, irrigation and weeding are necessary for growth. The seedling may attain 50-60 cm in the first season. 2-3 months old seedlings are pulled out with balls of earth with great care so that the tap root is not damaged as the seedlings develop long tap root (as long as 60 cm) within 2-3 months. Seedlings can be raised in long polythene bags. In direct sowing, seeds are sown in furrows or in dug-up lines, where the soil is worked up to 30 cm wide strips along the lines spaced 3m apart. The tree requires a certain amount of shade in the early stages, but once established, full overhead light is necessary for the growth.

Phytosanitary problems

The species is susceptible to various fungi such as heart rot (*Fomes caryophylli*), buff brown pocket rot (*Polystictus nilgheriensis*) and white spongy rot (*Asterostromella rhodospora*). A number of borers and defoliators also damage the tree and the logs.

Selected readings

Anon. 1959. The wealth of India: Raw Materials (eds. B. N. Sastri). Council of Scientific & Industrial Research, New Delhi, India.

Luna, R.K. 1996. Plantation trees. International Book Distributors. Dehra Dun, India.

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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