Dipterocarpus retusus Blume

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Taxonomy and nomenclature

Species name: *Dipterocarpus retusus* Blume
Family: Dipterocarpaceae
Synonym: It has two varieties: *Dipterocarpus retusus* var. *macrocarpus*, *D. retusus* var. *retusus*
Vernacular/Common name: Hollong, Gurjan (India); dong jing, long nao xiang (China)

Distribution and habitat

Dipterocarpus retusus is a tropical evergreen tree species, distributed up to the elevation of 1000 m throughout the South and Southeast Asia extending from China and northeast India to Myanmar, Thailand, Laos, Vietnam, Malayasia and Indonesia. In India it grows in moist evergreen forests of Brahmaputra valley of upper Assam and foothills of Tirap, Changlang and Lohit districts of Arunachal Pradesh and Mokokchung and Tuensang district of Nagaland.

The absolute maximum temperature of its habitat is 38°C and minimum 5°C; the optimum is considered maximum of 32°C and minimum of 12°C. The species predominantly occurs in regions with annual rainfall from 2300-3800 (-4500) mm. The hottest months coincide with the monsoon while the cold months are comparatively dry. It is shade demanding during the early stages but later becomes light demanding. The species requires deep alluvial or sandy loam soils with fine texture and slightly acidic (pH 5.2-5.5). It can grow in forests over metamorphic rocks such as schist, quartzite and gneisses with intrusions of granites, dolerites and limestone. It is not tolerant to water logging; its best growth is found in high table lands or in foothill regions on well drained slopes.

Dipterocarpus retusus - Flower of india

From Koehler's Medicinal-Plants (1887)

Uses

Wood is light red to reddish brown in colour and is comparable to teak in strength and elasticity. The timber is easy to air-season and dries with little degrade. It is a standard constructional timber and can be used as beams, rafters, door and window frames, railway sleepers etc. It is one of the important commercial plywood timbers. The tree yields an oleoresin on blazing with insecticidal properties. The tree is a source of a balsam used for caulking boats.

Botanical description

It is a tree attaining a height of 36-45 m and a diameter of 1.2-1.9 m; clear, straight cylindrical bole of about 31 m to the first branch. The trunk is almost smooth, light grey often with small tubercles at the base of the stem. The bark exfoliates in roundish flakes. Branchlets glabrous or pubescent; leaf buds obtuse, stout, glabrous, setose, or woolly. Stipules green or red, lanceolate, up to 15 cm, glabrous or pubescent outside (stellate pubescent on young trees); petiole glabrous; leaf blade broadly ovate, 16–28 × 10–15 cm, leathery, abaxially sparsely or densely golden-buff stellate pubescent, below initially white stri-

gose, sometimes glabrescent, lateral veins 16–19 pairs conspicuously raised below, base rounded or somewhat cordate, margin entire or sinuate-crenate in distal half, apex acute. Flowers are borne in leaf axils, 8–10 cm, 2–5-flowered. Calyx segments 2 rather long and linear, 3 shorter and triangular. Petals reddish, sweetly scented, narrowly elliptic, 5–6 cm, with dense squamate hairs, margins slightly reflexed, apex obtuse. Stamens 25–30; anthers linear to lanceolate, ca. 5 mm, sagittate at base, coherent; connective appendages aristate; filaments filiform, dilated at base. Ovary narrowly ovoid, 3-loculed, with 2 ovules per locule; style finely terete, with long silky hairs on lower half.

Fruit and seed description

Tube of fruiting calyx encloses the fruit that is ovoid, pointed towards both ends, densely, dun-silky outside, stalk up to 2 mm long, yellowish gray tomentellate, large red longitudinally nerved wings, 15-22 cm by 1.8-4.3 cm, strongly three nerved up to the apex.

Flowering and fruiting habit

The flowers appear from the age of 20-22 years. The flowering takes place from June-July to November and fruits ripen from January to March. The tree produces seed to some extent every year, but good seed year occurs at the interval of three to six years. Winged seeds are dispersed by winds. About 60-70 seeds per kg.

Seed collection

Seeds should be collected after full maturity. In Eastern India, seeds have optimum germination if collected during second week of March. Early collection causes poor viability. Relatively large, heavy seeds tend to have more vigorous germination and early seedling growth. Collection from the crown is difficult because of the tree size. Generally they are collected from the ground after natural seed fall. Seeds germinate or deteriorate fast so ground collection must be done daily; if nets can be placed above the ground, seeds can be collected with 2-5 days' intervals.

Processing and handling

The calyx lobes (wings) are removed manually before sowing or storage.

Dormancy and germination

Seeds have no dormancy and do not need any treatment for better germination. Germination of fresh seeds is 50-80 %. Germination period is 8-21 days. For germination testing the de-winged seed is cut in half and the pericarp removed from the distal half in which the embryonic axis exists, and this half is placed upside down on moist paper in trays. The trays are placed in germinator at 30°C with daily cycle of 8 hrs light, 16 hrs dark.

Storage and viability

The seeds are desiccation sensitive (recalcitrant) and short lived (7-15 days in ambient condition). Reduced germination for seed lots starts if desiccated below 36 % moisture level, and total loss of viability occurs if dried below 23 % moisture content. Optimal conditions for short term storage is at 15°C in sealed polythene bags with shedding moisture content of 50-55 %; this may keep seed viable (50 % against initial 65 % in experiments) up to 7 months. The seeds may be treated by dressing with a fungicide before storage.

Sowing and germination

Germination is hypogeal and starts 8 to 10 days after sowing and continues for about 45 days. The species can be established by direct sowing, entire planting and by stumps. In direct sowing, they have been raised after thorough soil preparation. The seed is oriented with the micropile end (winged end) of seed upwards.

Phytosanitary problems

The seeds are damaged by birds, insects and fungus and incidence of infestation is more on ground collected seeds. The highest percentage of insect infestation of seed (43-77 %) was observed during the latter part of the fruiting season. They are roughly classified as smaller moths, scolytids and weevils. The most important species are *Thamnurgides monoceros*, *Enarmonia pulverula*, and *Alcidodes crassus*. The temperature and relative humidity of its habitat favours the growth of seed and soil borne fungus.

Selected readings

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