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Mitragyna parvifolia (Roxb.) Korth.

Taxonomy and Nomenclature

Species Name: *Mitragyna parvifolia* (Roxb.) Korth.
Synonym: *Stephegyne parvifolia* (Roxb.) Korth., *Nauclea parvifolia* Roxb.
Family: Rubiaceae
Vernacular (Common name): Mundi, Kaim (India).

Distribution and habitat

The tree is distributed in tropical dry deciduous and moist deciduous forests and ravine areas of India, Sri Lanka, Bangladesh and Myanmar up to an elevation of 1200 masl. The absolute maximum shade temperature of its habitat is 38°-39°C and minimum -1°-13°C. Annual rainfall ranges from 875-3250 mm. The species can grow on a well-drained and deep soil, as well as on stiff and poorly drained soil. It is found in low-lying clayey soil, black cotton soil (vertisols) and alluvial soil along the streams and rivers. The mature tree is light-demander and fairly drought-tolerant.

Botanical description

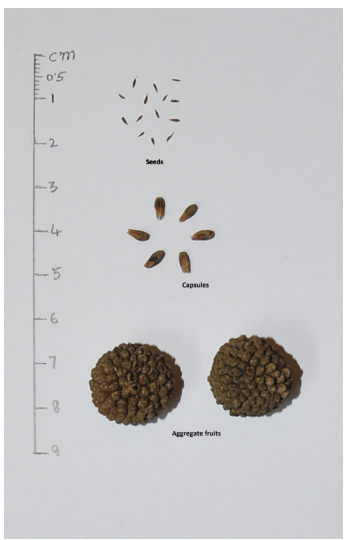
Mitragyna parvifolia is a medium to large deciduous tree with a rounded crown attaining a height up to 25 m and a dbh of up to 3 m. The bole is often short, fluted and buttressed. The bark is 20-25 mm thick; light grey and exfoliating in thick woody plates leaving well-marked depressions on the trunk. Blaze is soft, pink turning to orange-brown on exposure. Leaves are simple, opposite, decussate, stipules foliaceous with keeled back, interpetiolar and caduceus; petioles glabrous; lamina variable in size and shape (5-16 cm long and 2.5-10 cm wide), ovate, elliptic-obovate to orbiculate, apex abruptly acuminate with blunt tip, base acute to attenuate to subcordate, margin entire. Flowers are bisexual, creamy white or greenish yellow, fragrant, in globose heads of 8-15 mm diameter, on up to 12 mm long peduncle; head singly or in cluster of up to 5, each subtended by two bract-like leaves. Calyx lobes minute with ciliate margin; corolla tube funnel shaped, villous inside, lobes 4-5 oblong, whitish green, reflexed, stamens 5, ovary 2-celled, inferior; ovules many; style filiform; stigma mitriform.

Use

The wood is strong, hard and moderately heavy, easy to saw and work, takes a fine polish and stains easily. The timber is used for building construction agricultural implements, furniture, cooperages, utility brushes, boot-lasts, carved articles like frames, toys, table tops, walking sticks, mathematical instruments. It is also suitable for match boxes, splints, calico printing blocks. The bark and root are used for fevers and colic, leaves for wounds and skin diseases. The bark produces a cordage fiber.

Fruit and seed description

Fruits: An aggregate fruit composed of 100-150 woody capsules (each 0.2-0.5 cm long) aggregated in globose heads, 1.3-1.7 cm in diam., oblong, ribbed with blunt rounded tip, each capsule splitting into two cocci, brown; 4-6 seeds in each coccus.
Seeds: Seeds are minute (0.2-0.3 cm), smooth, light brown, flat, pointed at both ends and winged. 5000-12000 seeds weigh one gram.



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Phenology, flowering and fruiting habit

The old leaves chiefly shed in February-March. The trees remain leafless until the new leaves appear in May. The flower heads appear in May-July and the fruit heads become fully formed by October. Bees, butterflies, thrips, and beetles are the effective pollinators. The fruits mature in April-May of the following year and seeds are dispersed by wind.

Seed collection

The fruits are collected before dispersal of seeds when the color of the fruits turn brown and the moisture content of fruit is 30-35%. As the fruit heads are attached to the tree for several months after dispersal of seeds, it should be assured that collection takes place before fruits open. The collection method is to spread a tarpaulin under the tree and collect the fruits lopping the branches or plucking.

Processing and handling

After collection fruits are dried in shade. They are then pounded by a thin piece of wooden board to break the capsules and release the seeds. The light brown seeds are then separated from chaff and other fruit parts by sieving and winnowing.

Dormancy and pretreatment

Seeds have no dormancy and do not need any pretreatment.

Storage and viability

Seeds are orthodox and can tolerate 3-5% moisture content and freezing temperature. Seeds should be stored with moisture content below 6% to maintain viability at any temperature. Initial viability can be maintained for up to one year if stored at 3-5% moisture content at ambient temperature and can be extended up to more than five years if stored at low temperatures (15 °C to -20°C). Cleaning the seeds for husk and other non-seed parts of the fruit prolongs storability, as moisture content of stored seeds may increase due to hygroscopic nature of the husk.

Sowing and germination

Germination is epigeal. Seeds are spread on raised beds, boxes or polythene bags using well-pulverised sandy loam soil after one or two spells of pre-monsoon rain. The diurnal temperature should not exceed 35°C. Seeds are mixed with sand or ash in the ratio of 1:50 (v/v) to ease uniform sowing and covered with thin layer of soil. Light spray of water, and shade is necessary for germination and initial growth of the seedlings. Germination starts in 5-7days and completes in 3 weeks. Germination percentage is usually 40-70%. About 2-3 months old seedlings are transferred to nursery beds at a spacing of 20x 10cm. Fertilizer is applied after 15 days. Seedlings are outplanted in the month of July of the following year.

Phytosanitary problem

Spodoptera litura is the defoliator of the species. *Spodoptera* NPV (Nuclear Polyhydrosis virus) is effective against this insect. Pheromone baited traps and light trap can be used to attract them.

Selected readings

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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