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Diospyros celebica Bakh.

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FOREST & LANDSCAPE

SEED LEAFLET

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Diospyros celebica Bakh.

Taxonomy and nomenclature

Family: Ebenaceae

Synonym: *Sirium myrtifolium L., Santalum ovatum* R. Br., *Santalum myrtifolium* (L) Roxb.

Vernacular/common name: Trade name ebony used for all dark-wooded *Diospyros* species throughout the tropics. Ebony is thus locally used for different local species. Other local names for *D. celebica* in Indonesia are Kayu Hitam, Toe (Donggala, Poso and Manado), Limara (Luwu), Sora (Malili), and Ayu Maitong (Parigi).

Distribution and habitat

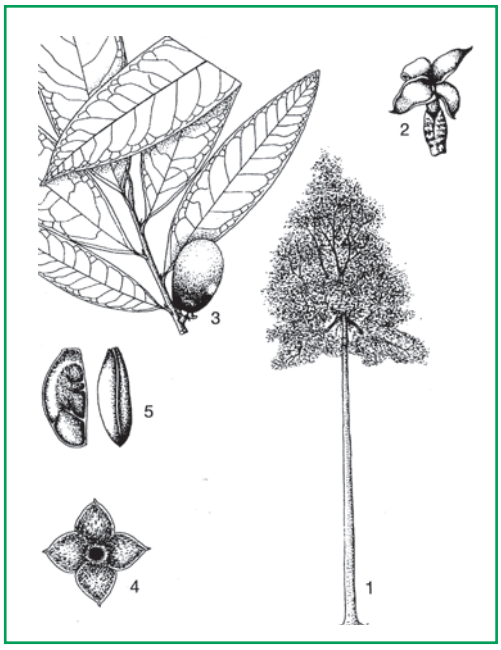
Diospyros celebica Bakh. is endemic to the eastern part of Indonesia, occuring naturally in Sulawesi and possibly the Maluku. In Sulawesi it grows particularly in North Sulawesi (Minahasa, Bolaang Mongondow), Central Sulawesi (Parigi, Poso, Donggala, Toli-toli, Kolonodale, and Luwuk), and South Sulawesi (Maros, Barru, Luwu, and Mamuju). *D. celebica* grows naturally in the humid area with a distinct seasonality, in rain forest and monsoon forest. It occurs from lowland to 540 masl. The optimal rainfall range from 2,000-2,500 mm/ year and temperature between 22 and 28°C. *D. celebica* grows on various soil types, both calcarious soil, clay and shallow stony soil. It prefers relatively nutrient rich soil and is sensitive to water-logging.

Uses

Very hard wood, basic colour is black with brown lines, soft fiber and naturally shiny. Ebony is a luxurious wood with high decorative and commercial value, commonly used for wood carving, furniture, house utensils, interior accessories, and building material. The fruit is edible.

Botanical Description

Trees up to 40 m tall, 10–26 m clear bole. 150 cm diameter, and butresses reaching up to 4 m above the ground. Stem form cylindrical. Old bark with scaly surface and black colour. Leaves simple, alternate, long elliptical, 12-35 cm long, 2.5-7 cm wide, base obtuse, tips pointed, leafs veins distinct, petioles short. Flowers white and small, 1.2-1.4 cm long, 0.7-0.9 cm wide. 4-merous, 1.0-1.2 cm long. Stamen 8-12, 0.6-0.8 cm long. Each twig bears are 5-19 flowers. Normally, flowers are borne in the middle section of the crown.



1. Tree habit, 2. flower, 3. fruiting twig, 4. fruiting calyx, 5. seed. PROSEA No. 5(2).

Fruit and Seed Description

Fruit

Berry, oval or egg-formed, 3.5-5 cm long, 2.5-3 cm diameter. Mature fruit yellowish dark green with brown spots, and silky hairs. Each fruit contain 3-11 seed.

Seed

Mature seed is brownish black, long rounded. Mean weight of one seed is 0.5-2 gram. There are about 800-1100 seed in one kilogram.

Healthy seed of ebony is marked by the colour, blackish brown, sinking when put in water, radicle brownish yellow, and not furrowed.

Flowering and Fruiting Habit

Ebony starts flowering and fruiting at age 5-7 years. Flowering season normally in March-May and fruit ripen in Septemer-November with some local variation: In South Sulawesi flowering season starts in January-March and fruit ripen in July-September; in Mamuju and Luwu flowering season is in March-May and fruit ripen in September-November; the same phenology is found in Poso and Donggala, Central Sulawesi. Development from flower to fruit takes about 6 months.

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Fruit Harvesting

Fruits are collected from the tree by climbing or are collected on nets so that they will not drop to the forest floor. Collection from the forest floor is avoided because seeds quickly deteriorate, e.g. attacked by the fungus *Peniulliopsis clavariaeformis*.

Processing and Handling

A short after-ripening for about 24 hours eases removal of the fruit pulp. After extraction, seeds are rinsed using clean water to remove the remaining flesh. High pressure water eases extraction.

Storage and Viability

The seeds are desiccation sensitive and recalcitrant; they rapidly lose viability and cannot be successfully stored for long periods.

Seed tests in Indonesia showed that fresh seed sown one day after collection had a germination percentage of about 85% with germination length 17-65 days. Seeds dried for 3 days did not germinate. Seeds which were not dried but stored in wet charcoal powder maintained a germination of 70% after 12 days' storage prior to sowing; after 20 days' storage germination potential was reduced to 28%. Another simple storage technique for ebony seeds is by keeping them in the wet gunny bags at high humidity (80-90% humidity) so that seed will not dry out. Using this technique, germination percentage was maintained to 50-60% after 2-3 weeks.

Dormancy and Pretreatment

As all fleshy fruits, the pulp contains germination inhibitors. These are removed by normal extraction, and the seeds do not exhibit any other type of dormancy

Sowing and Germination

Ebony is a semi-tolerant species, hence it needs shading during early growth in the nursery.

Sowing media for ebony uses soil and fine sand, 3:1. Seed is planted horizontally or vertically with radicle end down, with a sowing depth of 1-1½ times the thickness of seed. Distance between seeds is 3-5 cm. Seeds are very sensitive to desiccation during germination and must be regularly watered during germination and nursery period. Normally the seed will germinate after one week. Germination is hypogeal.

Seedlings of ebonies have long hypocotyl and heavy and big cotyledon, which are easily damaged during mechanical handling.

References and selected readings

Lemmens, R.H.J.M., Soerianegara, I. and Wong, W.C. (eds.) 1995. Plant resources of Southeast Asia (PROSEA) No. 5(2), Timber trees: Minor commercial timbers. Page 191 Backhuys Publshers, Leiden.

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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, FLD 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: SL-International@life.ku.dk