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Anisoptera costata Korth.

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Anisoptera costata Korth.

Taxonomy and nomenclature

Family: Dipterocarpaceae

Synonyms: *Anisoptera chinchinensis* Pierre; *Anisopetera manginatoides* Heim; *A. mindanensis* Foxw; *A. robusta* Pierre; *Shorea nervosa* Kurz.

Vernacular/common names: ven ven (Vietnam); Mai bak (Laos); phdic, phdiek kraham, phdic sa (Cambodia); mindanao palosopis (Philippines).

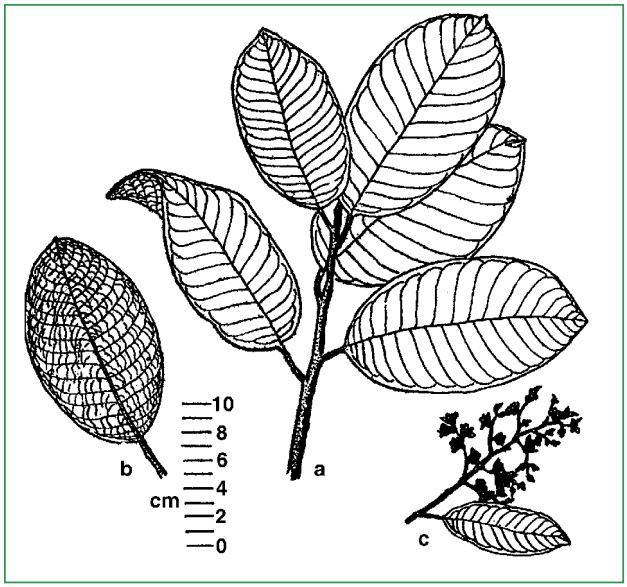
The genus *Anisoptera* consists of 11 species all distributed in SE Asia and Pacific.

Distribution and habitat

Distributed in Vietnam (South – central provinces) Laos, Cambodia, Myanmar, Thailand, Malaysia (Peninsula, Sarawak and Sabah), Brunei, Indonesia (Sumatra, W. Java, S.E. Kalimantan), and the Philippines (Zamboanga and Naganaga in Mindanao). Distribution much affected by logging and by destruction and conversion of habitats.

Grown in evergreen to semi-evergreen moist or slightly dry lowland forest, up to 700 m. altitude. Usually in mixed forests, but sometimes gregariously growing in pure stands, often along streams and rivers.

Rainfall 1500-2500 mm. Average annual temperature 27.5°C with small annual variation. Grows on deep sandy soils, pH 4-5.



Leaves and inflorescence. a, leafy twig; b, leaf; c, flowering twig. From Guzman *et al*.

Uses

High quality wood (mersawa) used for furniture, veneer, plywood, construction, ship planking, etc. Wood is easy to saw. The resin has good odour and is used in e.g. ship painting. Occasionally used as shade tree along streets.

Botanical description

Large tree up to 40-50 (65) m high and 150 cm diameter. Straight round bole with few buttresses up to 4 m high. Good pruning ability, occasionally branchless up to 20 (-35) m. Bark thin dark grey, and smooth; old bark shedding off into rectangular patches. Leaves alternate, simple, entire, 6-18 cm long and 7-11 cm wide, oblong to obovate; densely covered with hairs, undersurface grey-green to golden or chocolate. Secondary veins curved. Stipules long and narrow. Inflorescence 17-20 cm long, slender panicle, 2-3 x branched with up to 5 flowers on each branchlet. Flowers white, 1.5 cm in diameter, 5-merous with long tube, 25-30 stamens.

Fruit and seed description

Fruit: winged nut, nearly spherical in shape and 1 cm in diameter. The fruit has 2 big wings, 10-12 cm long with 3 clear longitudinal veins. About 1200 fruits per kg.

Seed: seed (de-winged fruit) about 10-11 mm in diameter; 1500-2000 seeds per kg.

Flowering and fruiting habit

Flowering may start as early as 8-9 years when the tree is growing under open exposed conditions. In Vietnam flowering in December-February (-March) with fruiting in March-May. In Mindanao (Philippines) flowering in May. Pollination by insects. Development from flowering to fruit maturity takes about 3 months.

Harvest

In April-May when fruit wings turn from green to brown. Seeds which fail to germinate immediately after fall rapidly lose viability, so seeds collected from the ground generally have low germination (30%). However, collection of newly fallen fruits, e.g. from nets or tarpaulins after shaking fruit-bearing branches can yield a high quality seed lot. The best quality seed is collected from stands >15 years old.

Processing and handling

To reduce bulk and ease handling, it is recommended to break off the wings before sowing or short term storage.

Storage and viability

Oil content of embryo approx. 33% (dry weight basis). Moisture content of de-winged seeds about 42%. Seeds are recalcitrant. A storage experiment showed optimal temperature 18°C and moisture content 42%; germination was 44% after 30 days. Results from Vietnam suggested that seed can be dried to 20-25% m.c. stored in plastic bags at 5-10°C and maintain >30% viability up to 3 months.

Dormancy and pretreatment

There is no dormancy, but germination of stored seed may be enhanced by soaking in warm water 30-35°C for 6-8 hours.

Anisoptera costata Korth. Mature fruits. Photo: Lars Schmidt

Sowing and germination

Optimum temperature for germination 26°C. In an experiment there was 50% germination after 5 days. Germination percentage for fresh seed should be > 80%. Because of recalcitrance, seeds are normally sown immediately after collection during the rainy season and kept in the nursery until the beginning of next rainy season, i.e. 8 months to1 year. Germination epigeal with unequal green cotyledons; first leaves paired, subsequent spirally arranged.

Phytosanitary problems

Seeds are often attacked by insects after dispersal.

Vegetative propagation

No information on species level but techniques on rooting cuttings used for other dipterocarps including *Anisoptera* species will most likely work on *A. costata*.

Selected readings

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