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Santalum album L.

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FOREST & LANDSCAPE

SEED LEAFLET

No. 116 July 2007

Santalum album L.

Taxonomy and nomenclature

Family: Santalaceae
Synonyms: *Sirium myrtifolium L.*, *Santalum ovatum* R. Br., *Santalum myrtifolium* (L) Rpxb.
Vernacular/common name: sandalwood (English), cendana (Indonesia), ai nitu (Sumba), hau meni (Timor), chendana (Malaysia).

Distribution and habitat

Natural distribution obscured by cultivation and naturalisation. There are two centres of distribution viz. South India (Mysore) and Indonesia particularly Central Sulawesi, and Nusa Tengare and the Maluccan Islands. Introduced into cultivation in many parts of India, Indonesia and North Australia. It grows well in infertile and stony sites, and non-acidic clay soils. Grows on sites with (600-) 850-1350 (-2000) mm annual rainfall, temperature 25-35ºC with a distinct dry season and 2-3 months wet season. From sea level to 1800 masl.

Uses

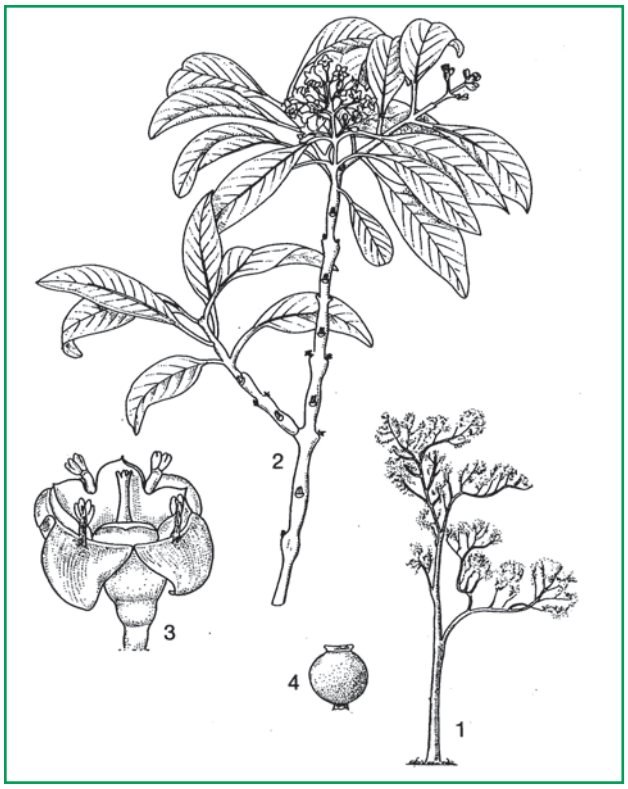
The most valuable product of *S. album* is sandal oil distilled from the heartwood. The distilled oil (atsiri) is a raw material for traditional and modern cosmetic and medical products. The aromatic wood is also used for fine handicraft and incense in religious rituals. The wood is valuable and traded by weight. Leaves are used as green manure and fodder. The fruit is edible.

Botanical Description

The trees can grow 20-22 m tall with diameter up to 40 cm. The form of crown is flat or dome. Bark is greyish (-reddish) brown, thinly furrowed, semi-coarse. Trunk w/o buttress. Leaves simple, opposite or decussate; petiole 5-15 mm; blade elliptical, 1½-4 cm wide, 2.5-8 cm long. Inflorescence terminal or axillary panicle or raceme. Flowers are uni-sexual or hermaphrodites, small, white or yellowish, 4 (-5)-merous; perianth tube campanulate.

Fruit and Seed Description

Fruit: Ellipsoidal 1-seeded drupe, diameter 5-8 mm, smooth, blue to blackish-red with small apical collar.
Seed: Functional seed is the pyrene. It is light brown - yellowish, globous, 3-5 mm diameter, weight around 0.16 gr. There are 5,000-8,000 seeds per kg.



1. Tree form, 2. Branch flower, 3. Flower, 4. Fruit. Plant Resources of South-East Asia No.19

Flowering and Fruiting Habit

Flowers uni-sexual or hermaphrodites. Flowering starts at 3-4 year old. In Indonesia, *S. album* flowers throughout the year with a peak in December-January (dry season) and fruit maturation starts from March to June (before rainy season). Flowering process is affected by elevation. At high altitudes, the species will not develop flower. Pollination by a variety of insects including butterflies. Seed dispersal primarily by birds.

Fruit Harvesting

Collection of fruits from the ground after shaking branches. The ground should be cleaned or covered with nets or tarpaulins to ease collection and minimise contamination. Mature fruits are blue or blackish-red in colour; immature and small fruits should be discarded.

Processing and Handling

Fruit pulp is removed by extraction, which should be done immediately to avoid rot, fungal and pest attack. Extraction can be carried out by squeezing the fruit in sand, then rinse with running water or high pressure

water. Seed is then air dried in a proper ventilated room for 2-3 days.

Storage and Viability

The germination rate for fresh seed may reach 90%. It is an orthodox seed. Seed storage requires low initial water content (5-8%), then packed in an airtight container. Kept at room temperature of 18-20ºC, RH 50%, a germination of more than 50% can be maintained after 16 months storage.

Dormancy and pretreatment

Fruit pulp ostensibly contains inhibitors, but extracted clean seed has no known dormancy. Germination rate can be enhanced by soaking the seeds in water for 12-24 hours prior to sowing.

Santalum album L.

Sowing and Germination

The germination is epigeal. Seeds can be sowed directly in polybags in a 1:1 mixture of sand and soil with 3-4 seeds in each Polybag. The seeds should be covered by media. When the first leaves have appeared plants should be exposed to the primer host. When the seedlings reach one year old and are 25-30 cm tall, they are moved to the field and planted with 2.5 x 4 m spacing distance and the secondary host plant is planted. The plant needs shade (secondary host) until 3 years old after which shading is removed to give better light conditions for the plants.

An alternative method is direct seeding on a site with well established secondary host plants. About 5 seeds are sown at each hole near primary host plants.

S. album is a semi-parasite whose growth is dependent on root attachment to a suitable host. In Indonesia the best primer host in the nursery is *Alternanthera* sp., *Deamanthus virgatus* and *Crotalaria juncea*, in India mostly *Mimosa* spp. In the field *Acacia vilosa* is considered one of the best hosts. Some other potential secondary hosts are *Cassia siamea*, *Sesbania grandifolia*, *Casuarina equisetifolia*, *Calotropis gigantea* and *Schleichera oleosa*.

Phytosanitary Problem

In nursery often attacked by fungi species *Fusarium* and *Phytopthora* and species of *Nematoda*. The fungi can be controlled by fungicide.

Vegetative Propagation

The trees often regenerate by root suckers, which can also be used for propagation. Propagation by shoot tip cutting, leaf cutting and root cuttings can also be used successfully.

Selected readings

Ahmad, Salim S., Moh Zanzibar, Djoko Iriantono, 1992. Hasil-hasil Kegiatan Uji Coba Balai Teknologi Perbenihan, Balai Teknologi Perbenihan, Prosiding Seminar Nasional Status Silvikultur di Indonesia Saat Ini. UGM, Yogyakarta.

Balai Teknologi Perbenihan, 1987. Informasi Teknologi Benih Cendana (*S. album* Linn). Dalam Prosiding Diskusi Cendana. Fakultas Kehutanan UGM, Yogyakarta.

Yusuf, R. 1999. *Santalum album L*. In: Oyen, L.P.A & Nguyen Xuan Dung (Eds.). Plant Resources of South-East Asia (PROSEA) No. 19, Essential-oil Plants. Backhuys Publs., Leiden, The Netherlands, pp161-167.

Radomiljac, A.M., H.S. Ananthapadmanabho, R.M. Welbourn and K. Satyanarayana Rao, 1998. Sandal and Its Products. ACIAR 1998

Rudjiman, 1987. *Santalum album L*. Taksonomi dan Model Arsitekturnya. Dalam Prosiding Diskusi Cendana. Fakultas Kehutanan UGM, Yogyakarta.

THIS NOTE WAS PRODUCED IN COLLABORATION BETWEEN BPTH JAVA AND MADURA AND INDONESIA FOREST SEED PROJECT.

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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