SEED LEAFLET

No. 44 October 2000

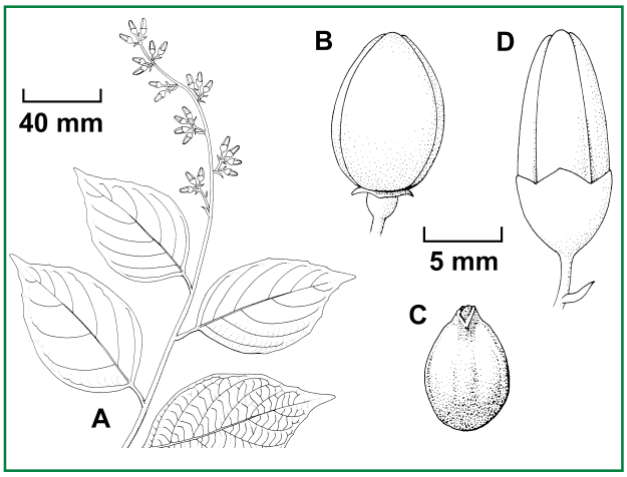
Styrax tonkinensis (Pierre) Hartwich

Taxonomy and nomenclature

Family: Styracaceae

Synonyms: *Anthostyrax tonkinensis* Pierre, *Styrax macrothyrsus* Perkins, *S. hypoglaucus*, *S. subniveus*.

Vernacular/common names: Siam benzoin, gum benjamin (trade names): may nhan (Lao); bo de, canh kien trang (Viet.); an xi xiang (Chin.); kam yaan (Thai); Saigon benzoë (Fr.).



A, Flowering branchlet; B, fruit; C, seed; D, flower bud. From: Pinyopusarerk, 1994.

Distribution and habitat

Natural occurrence in the secondary rainforests of northern Laos and Vietnam. It is normally found at medium to high altitudes, about 150-2100 m but is occasionally seen at altitudes as low as 60 m. In Vietnam it mainly grows below 1000 m, in Laos mainly at 800-1600 m.

The annual rainfall in the area of natural distribution is high, 1500-2200 mm and with no distinct dry season or only a few dry months. In cultivation, however, it performs well with only 1300 mm rain/year and 3-6 dry months.

Within its natural range the mean annual temperatures are 15-26°C but it can survive extreme temperatures of -4° and +45°C for brief periods. It is a light-demanding pioneer species that can quickly invade gaps in the forest. If conditions are favourable it often occurs in the upper storey and can occupy many hectares as almost pure stands.

The species has been introduced to China, Java and French Guinea in west Africa where it is used to restore eroded soils and provide green fire belts.

Uses

The wood is light and soft with a density of 410-450 kg/m^3 (at 15% moisture) and not suitable for construction. In Vietnam it is an important pulpwood species and yield and quality of the pulp is comparable with many commercial pulpwood species.

An important non-wood product is the benzoin resin that is tapped from the trunk. Although the market has decreased, it is still an important contribution to the local economy for people in the highlands of Laos.

Botanical description

Tree up to 25 m tall and 30 cm in diameter with a clear bole for about 2/3 of the height. The leaves are simple, alternate, 4.5-10 cm long and characteristically dark and smooth on the upper surface and hairy and whitish on the lower side. Flowers bisexual, small and white in up to 18 cm long inflorescences.

Fruit and seed description

Fruit: dehiscent, opening with three valves; ovoid, 10-12 mm long, covered with grey, stellate hairs. The pericarp is thin, about 1 mm. There is one, rarely two seeds per fruit.

Seed: three-angled, 6-10 mm long. There are 7000-9000 seeds/kg.

Flowering and fruiting habit

Semi-deciduous tree that sheds many of its leaves during the cool, dry season. Old trees shed more leaves than young trees. Flowering usually occurs during April-June and the fruits mature from July to November. However, flowering and fruiting varies with location. The trees begin to flower when they are 4-5 years old.

Harvest

When the fruits have changed colour from green to yellow and have cracks on the surface and the seedcoat is hard and black and endosperm is white, firm and with a bitter taste, the seeds are ripe and ready for collection. The fruits can be collected from the tree or by shaking the branches over tarpaulins. Collection from the ground of fruits that have been shed naturally is not recommended. A fully mature tree can produce up to 40 kg of fruit in a year.

Processing and handling

To extract the seeds, the fruits are dried slightly in the shade for 2-3 days and then macerated by hand. 2-3 kg of fruits contain 1 kg seed. Seeds that are immature can be afterripened. The fruits are placed in 30-40 cm layer in trays in the shade for 5-6 days and every day turned over for aeration. When the pericarp has turned yellow or grey, the seeds are extracted and then dried in the shade for 4-5 days.

Storage and viability

The studies that have been made so far indicate that the seeds are desiccation intolerant and that the lowest safe moisture content is between 20 and 25% f.w.b. In a recent trial seeds were stored in sealed PE bags at 20°C, with a moisture content on 18-20%. After 1 year there was little loss in viability.

In Vietnam it is standard practice to store the fruit in a mixture of wet sand. The process comprises two steps. The first step is pre-storage where whole fruits are mixed with wet sand and placed in a 10 m x 1,5 m bed to a depth of 15 cm. The mixture is sprayed with 40-50 litres of water every 3 days and remixed gently 2 times every day. The seeds are extracted and separated from the sand when the pericarp has turned soft and gray. This first step can extend to 30-40 days.

In the second step the extracted seeds are mixed with fresh wet sand in a ratio of 1:1 and placed in a bed. Once every month the mixture is gently turned and watered.

The storage procedures are only carried out when seeds are not to be sown in the first spring following collection in autumn.

A nine-year-old tree in a stand established by natural regeneration at Ban Kachet, Luang Prabang, Laos. Photo from CSIRO, Forestry and Forest Products.

Dormancy and pretreatment

Germination of untreated seeds is slow and sporadic, and may last up to 5 months. After suitable storage, germination is normally rapid which indicates that the seeds need afterripening even when they appear ripe at collection.

Sowing and germination

When properly pretreated, germination begins after 2 weeks and is complete after about 5 weeks. Newly emerged seedlings should receive 50% shade and once established 70% of full sunlight is appropriate. In Vietnam the plants are normally kept in the nursery 6-7 months until they reach 50 cm in height while others recommend 3-4 months when the plants are about 25 cm tall.

Vegetative propagation of this species is not common but stump plants from 10-12 months old seedlings are viable. Plantations can be established by both direct sowing and planting containerised stock. For direct sowing, 5-6 seeds per hole is suitable.

Selected readings

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