



Keteleeria evelyniana Mast

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Keteleeria evelyniana Mast.

Taxonomy and nomenclature

Family: Pinaceae

Synonyms: *Keteleeria roulettii* Flous.

Vernacular/common names: ngo tung (Vietnam)

The genus consists of 3 (-7) species all distributed in China-Indochina area. The species is closely related to and resembles *K. davidiana* (Bertrand) Beissner.

Distribution and habitat

High altitude species found in mountainous provinces of S. China (Yunnan and Hainan Island) Laos (Xiang Khuang (Plain of Jars) and Kham Xai provinces) and Vietnam (in the North Son La, Lai Chau, and in the Central Highland Lam Dong and Kon Tum). It occurs mainly on mountains > 600 m.a.s.l. but rarely above 2000 m. Often in pure stands or mixed with other highland species in relatively open stands. Also coloniser in secondary forests of mixed deciduous - dry evergreen forest. It grows on neutral and limestone, often shallow soil. Because of its light demanding habit it is often found on poor soil where competition from shading trees is low. Mean annual temperature 19-20°C, mean annual rainfall 1500 mm with up to 6 dry months.

Uses

The species is a highly valued and much sought after softwood timber species in the highland. The wood is light but usually considered better quality than pines. Wood used for construction, poles and household implements. It is reported relatively resistant to insect attack. The seed has a high oil content, which is used locally for manufacture of soap. Also used in traditional medicine.

Botanical description

An evergreen tree up to 25-30 (-40) m high and up to two meter in diameter. Bole straight; old trees with broad crown. Bark grey and longitudinally fissured. Needles spirally arranged at the end of the twigs, narrowly lanceolate with sharp tip; 2.5-5 cm long, 0.3-0.4 cm wide. Upper surface glabrous, lower surface pale with two pairs of stomata.

Male cones in terminal or axillary umbels. Female cones erect in the upper part of the tree.

The cone scales are distinctly longer than wide. This distinguishes the species from *K. davidiana* that has cone scales slightly longer or as long as their width.

Fruit and seed description

Fruit: dehiscent cones, 12-20 occasionally up to up to 25 cm tall, light brown - yellow-brown when mature, turning dark brown with age. Cone scales largely ovoid, thin margin, at tip slightly curved outwards, entire or divided.

Seed: 6-7 mm long, 2-3 mm wide with yellow wing, wider at the middle There are approximately 10-11000 seeds per kg.



Mature cone. Xieng Khuang, Laos. Photo: Lars Schmidt

Flowering and fruiting habit

The trees are monoecious, i.e. male and female flowers are on the same tree. Fruiting in Central Laos and Vietnam from October to February. Low temperature (frost) during flower initiation believed to promote flowering and subsequent seed production

Harvest

The cones will start opening when they turn from green to yellowish brown, and the seeds will disperse shortly after. The best time for collection is when the cones have changed colour and the first cones start to open. Cones should be collected by climbing and stripping off the mature cones with long handled tools. If the cones have started opening it is advisable to collect in early morning or in moist weather when the cones are most closed.

Processing and handling

Cones which are still partly green should be after-ripened in the shade for some days until they take mature colour. Thereafter they can be dried in the sun as mature cones until they open. Seeds are released by gently raking or tumbling. Artificial hot air blowing may be necessary in humid climates.

Storage and viability

The seeds are oil rich. Fresh seed typically contains 12-15% water. Desiccation reduces viability and storability, but the seeds tolerate low temperature (5°C) which will prolong storability for up to 6 months.

Dormancy and pretreatment

There is no dormancy and seeds need no pretreatment.

Sowing and germination

Germination epigeal. Seeds are sown as soon as possible after collection in January or February in seedbeds and transplanted into polythene tubes. Planting out in July-August next year, i.e. after about 20 months in the nursery.

Vegetative propagation

There is some natural regeneration by root suckers, which can be used as vegetative propagation material. Rooting of cuttings of related species *K. davidiana* shows reasonable rooting ability for cuttings from young trees treated with IBA powder, or with a solution of IBA, NAA and thiamine. The species possess, as other conifers, a strong tendency of dimorphic branching (plagiotropic–orthotropic branching).



Keteleeria evelyniana. Fruiting tree. Xieng Kuan, Laos.
Photo: Lars Schmidt

Selected readings

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