

## Sapindus mukorossi

Gaertn.

Sapindaceae

Chinese soap berry

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### LOCAL NAMES

Bengali (ritha); Chinese (wuhuangzi,youzhuzi,feizaojia); English (tree of Northern India,soap-nut tree,Chinese soapberry); Hindi (aritha,dodan,manmar,rithan,thali); Nepali (ritha); Sanskrit (arishtha,phenila); Trade name (Chinese soap berry)

### BOTANIC DESCRIPTION

*Sapindus mukorossi* is a fairly large, deciduous tree, usually up to 12 m in height, sometimes attaining a height of 20 m and a girth of 1.8 m, with a globose crown and rather fine leathery foliage. Bark dark to pale yellow, fairly smooth, with many vertical lines of lenticels and fine fissures exfoliating in irregular wood scales. Blaze 0.8-1.3 cm, hard, not fibrous, pale orange brown, brittle and granular.

Leaves 30-50 cm long, alternate, paripinnate; common petiole very narrowly bordered, glabrous; leaflets 5-10 pairs, opposite or alternate, 5-18 by 2.5-5 cm, lanceolate, acuminate, entire, glabrous, often slightly falcate or oblique; petioles 2-5 m long.

Inflorescence a compound terminal panicle, 30 cm or more in length, with pubescent branches. Flowers about 5 mm across, polygamous, greenish white, subsessile, numerous, mostly bisexual. Sepals 5, each with a woolly scale on either side above the claw.

Fruit a globose, fleshy, 1-seeded drupe, sometimes 2 drupels together, about 1.8-2.5 cm across. Seed 0.8-1.3 cm in diameter, globose, smooth, black, loose in dry fruit.

### BIOLOGY

The leaves turn yellow in December before being shed in December-January. The tree is leafless until March-April when the new leaves appear. The panicles of white or purplish bisexual flowers appear in May-June, with the green fruits ripening in October-November. These remain on the tree till January or later, the bunches of round brown or orange coloured fruits being conspicuous when the tree is leafless.

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### ECOLOGY

The species is native to China and Japan

### BIOPHYSICAL LIMITS

Altitude: 0-1500 m

Mean annual temperature:

Mean annual rainfall: 1750 mm

Soil type: The tree requires deep, well drained soils. It also grows on sandy loams.

### DOCUMENTED SPECIES DISTRIBUTION

Native: China, Japan

Exotic: India, Singapore



The map above shows countries where the species has been planted. It does neither suggest that the species can be planted in every ecological zone within that country, nor that the species can not be planted in other countries than those depicted. Since some tree species are invasive, you need to follow biosafety procedures that apply to your planting site.

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### PRODUCTS

**Food:** The seed kernel cake of *S. Mukorossi* contains 32 % crude protein and 7.9 % total N. The protein is mainly of the globulin type. Aspartic acid, glutamic acid, lysine, serine, glycine, arginine, alanine, valine, leucine/iso-leucine, proline and tryptophan have been identified. However, the kernels lack about 44 % of essential amino acids and are thus inadequate for human nutrition but industrial protein could be prepared from the globulin fraction.

**Fodder:** The leaves are used as fodder for cattle.

**Apiculture:** Honey water-white (also described as light golden), of mild flavour and good aroma.

**Fuel:** The wood is used for charcoal production and as firewood.

**Timber:** The wood is light yellow, compact, close-grained and fairly hard, weighing 750 kg/m<sup>3</sup> at 12 % moisture content.

**Essential oil:** Seeds contain 23 % oil of which 92 % is triglycerides; the triglyceride fraction contained 30 % oleo-palmito-arachidin glyceride, 13.3 % oleo-diarachidin glyceride and 56.7 % di-olein type glycerides such as dioleo-palmitin, dioleo-stearin and dioleo-arachidin.

**Poison:** The fruit pulp is used in northern India and China to control head lice and as fish poison. Powdered seeds are insecticidal.

**Medicine:** The fruit and seeds are regarded as a cure for epilepsy in northern India. A decoction of the fruit is used as an expectorant. Seeds are used in China to stop dental caries. The fruit is considered to be haemolytic.

**Other products:** The chief product of the tree is its fruit, the pulp of which is used as a substitute for soap. The active ingredients are saponins which are extracted by boiling the powdered fruits. Soapnuts are used as detergent for polishing jewelry, and for washing and bleaching cardamoms. The saponins are used as a textile auxiliary and as an emulsifier in insecticides.

### SERVICES

**Reclamation:** The tree has proved successful in the afforestation of eroded hill slopes at elevations below 900 m in the western Himalayas.

**Soil improver:** Seed kernels which are a by-product of the oil extraction from the pericarp and shells can be used as fertilizer

**Ornamental:** *S. mukorossi* is cultivated throughout northern India as an ornamental.

**Pollution control:** A surfactant obtained from the fruit pericarp of *S. mukorossi* has proved effective in the remediation of contaminated soils.

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### **GERMPLASM MANAGEMENT**

There are 700-800 seeds/kg. Fruits are collected from trees or from the ground after falling, sun dried and stored. Gentle cracking of the pericarp releases the seeds. Seeds retain viability for 1-2 years.

### **PESTS AND DISEASES**

Two insect species are known to attack this tree. *Aulacaspis orientalis* and *Lecanium (Eucalymnatus) tessellatum*, which feed on sap of foliage, the latter feeding on foliage of branches as well. Timber is susceptible to attack by insect borers, the powder-post beetle, *Lyctus brunneus* has been identified in Korea. The tree is also attacked by a powdery mildew, *Uncinula sapindi*.

**FURTHER READING**

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**SUGGESTED CITATION**

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