



## Madhuca latifolia - An overview

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*Madhuca indica* commonly known as Mahua, belong to family Sapotaceae. It is an economically important tropical forest species. Mahua trees have been an integral part of human life and a vital component of biodiversity of Bundelkhand sub-region areas of Banda, Hamirpur, Datia, Jhansi and Lalitpur. It is life line of the tribal peoples or villagers of Bundelkhand region.

**Habit:** *Madhuca indica* is a large, much branched deciduous tree upto 18 m high and 80 cm dbh. Bole short, crown rounded, bark grey to black with vertical cracks, exfoliating in thin scales. Leaves oblong-shaped, rigid, clustered at the end of branches, 6-9 cm x 13-23 cm, thick and firm, exuding a milky sap when broken. Young leaves pinkish and wooly underneath (WAC).

**Distribution:** *Madhuca indica* is a tree of dry tropical and subtropical climate. In its natural habitat, the absolute maximum shade temperature varies from about 41°C to 48°C, the absolute minimum temperature from about 1°C to 8°C. The normal annual rainfall from about 750 to 1875 mm. The relative humidity in its natural range varies from about 40 to 80% in January and from about 60 to 90% in July (TNAU agritech portal). The mahua tree can grow on all type of soil mainly on sandy soils in Indo-Gangetic plains it grows on alluvial soils whereas, in Sal forests, it grows in high clay and even calcareous soils. It is common in deciduous forests of the southern Western Ghats of India as well as northern and central India. It is a lifeline of tribal belt in central India. It is abundantly distributed in Jharkhand, Chhattisgarh, Madhya Pradesh, Orissa and Bihar and parts of Gujarat, Andhra Pradesh, Rajasthan and Tamil Nadu.

**Nursery and tree management :** Flowering of Mahua observed in the month of March-April. Fleshy corolla falls off before or with the appearance of new leaves. About 10-year-old trees start flowering. One to two good seed years may be expected every three years. It is a strong light demander and get suppressed under shade. The trees coppices well if felled in hot season. It has better taproot system.

Seed collection is mainly done in the month of August and September. Mature fruits should collect from tree



vicinity simply by shaking branches. Fruits are rubbed and washed to obtain clean seeds. About 450 seeds weigh one kg. Fresh seeds have high germination capacity, which however is soon lost on storage. Fungi and insects readily attach the seeds (TNAU agriportal).

Seeds of mahua should sown in the 1.5 to 2.5 cm hole. The germination percentage is about 90 % under favourable climatic and edaphic condition (TNAU Agritech portal). Viability of seed is less than 3 months as the seeds of mahua are recalcitrant in nature. One-month-old seedlings are transplanted in nursery beds. One-year-old seedlings are used for planting in main field. Seedlings can also be containerized. In that case, one-month-old seedlings are pricked into containers. Planting is one in 30 cm<sup>3</sup> pits at a spacing of 4 x 4 m. Planting of stumps is done in crow bar holes or 30 cm<sup>3</sup> pits. Shading is necessary at the nursery stage.

Mahua of 25-30-year can produce a mean annual increment of 3-5 cu. m/ha. Fire tracing and fencing of plantations are essential in the early stages along with clean weeding and soil working around seedlings. The tree is a light demander, drought resistant and frost hardy. It coppices well if felled in the hot season (WAC).

**Uses:** Mahua is very important source some valuable non-timber products like fruit, flower and timber. The sweet, fleshy corolla is eaten fresh or dried, powdered and cooked with flour. The fruit contains valuable oil that is sometimes used for cooking by the locals. Outer fruit coat is eaten as a vegetable and the fleshy cotyledons are dried and ground into a meal. Ripe fruits are used for fermenting liquor.



**Nutritional uses :** The fruit is non-edible, obtained from the tree in 4–7 years and contains one to two kidney-shaped kernels (Mohibbeazam *et al.*, 2005). According Patel and Naik literature review in 2010 major constituents reported in mahua flowers are sugars (reducing and non-reducing sugar), polysaccharide, fibre, protein, fat, minerals, vitamins, enzymes and organic acid.

**Medicinal uses :** Mahua flowers are used to brew alcohol and the whole tree is considered to possess medicinal properties (Kureel *et al.*, 2009). The flowers are used to cooling, aphrodisiac, galactagogue, expectorant and carminative. Flowers are also beneficial in heart disease, burning sensation, biliousness and ear complaint. The flowers fried in ghee are eaten by people suffering from piles.

**Industrial uses :** Major quantity of flower used for liquor preparation. Dried mahua flowers are important source of fermented liquor as it has high sugar content.

Mahua is one such non-edible tree-based seed oil, which has an estimated annual production potential of 181 thousand metric tonnes in India (Kaul *et al.*, 2003). The seed oil of the Mahua is can be converted into biodiesel by transesterification and blending method.

The oil obtained from the seeds is used for making soap products and seed cakes are used as fertilizer (Talbot, 1976).

Leaves are used as fodder. Flowers and fruits can also be fed to cattle. Leaves contain crude protein 9.8%, crude fibre 20.3%; N free extract 60.7%; ether extract 4.1%; total ash 7.8%, calcium 1.6%, phosphorus 0.2%. Seed cake is also fed to cattle. It also makes a good manure.

The government India also confirms the minimum support price is to support tribal in the situation. The

minimum support price of mahua for seed sale in 2019 is 29 / kg and Mahua dried flower minimum support price is 30 / kg. In a season of good flowers, each person can collect around 70 kg dried flower. Flowering occurred for 4-6 weeks in the month of March to May. However, for the duration of the collection is only 15-20 days. Farmers who do not take irrigated crops after harvesting *Kharif* crop. In such situation, Mahua can be source of extra income.

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