

## ***Moringa oleifera* (Drumstick Tree): A Multipurpose 'Miracle Tree' of Indian Subcontinent**

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### **INTRODUCTION**

*Moringa oleifera* Lam. (Moringaceae) vern. 'Drumstick Tree', 'Horseradish Tree', 'Sahjan', 'Saijihan', 'Mulangay', 'Benzolive', 'Kelor', 'Mlonge', 'Sajna' and 'Marango' is a multipurpose fast growing tree which is native of Indian subcontinent including India, Malaysia, Saudi Arabia, Oman, Yemen and Qatar. Its origin was reported from Himalayan regions and it was introduced to many tropical & subtropical areas by asian migrants. It grows better at average temperature ranging from 25 to 30°C and annual rainfall 1000-2000 mm. It can tolerate drought conditions but get killed under frost and waterlogged conditions. It can grow well in different types of soils having pH from 4.5 to 9 and as has salt-tolerance capacity also.

*Moringa* is a medium sized tree of 10-12 m height with umbrella shaped open crown. Stem is covered with corky grey bark and its drooped branches have feathery foliage appearance. Leaves are alternate and tripinnate compound having 4-6 pairs of alternate dark green elliptical leaflets at each pinnate. Its panicle inflorescence bears white coloured pentamerous and zygomorphic flowers which resemble the flowers of family leguminosae. The fruit is 10-60 cm long tri-lobed capsule, often called 'pod' which looks like a 'drumstick', hence the tree is named as 'drumstick tree'. Immature pods are green coloured which later turned into brown colour on maturity. Each triangular pod has around 20-26 oily seeds which are dispersed due to spilt of mature pod along each angle.

### USES OF DRUMSTICK TREE

*Moringa oleifera* has multiple uses like medicines, food, fodder, fuelwood and other biological importance.

**Medicinal Uses:** *Moringa* tree is being used as herbal medicine in India and Africa to cure around 300 diseases since ancient times. Its leaves are used to cure asthma, headaches, hyperglycemia, malaria, pneumonia, flu, bronchitis, heart burn & skin diseases. Leaves are reported having antimicrobial, antioxidant, anticancer, antidiabetic properties and they can reduce blood pressure & blood cholesterol also. Its seeds are used to treat rheumatism, epilepsy, hyperthyroidism & gout diseases. Bark of roots have anti-inflammatory, anti-cancer and cardiac-stimulant properties. Flowers have been reported to cure urinary infections while its pods have been used in treatment of liver, spleen and joint ailments.

**Nutritional Value:** Leaves of *Moringa* contain protein, fibres, minerals (Ca, Mg, P, K, Cu, Fe & S), vitamins (Beta-Carotene, B-Choline, B<sub>1</sub>-Thiamine & Riboflavin) and many essential amino acids. Its leaves are a good source of anti-oxidants like chlorogenic acids and quercetin. Its seeds, root bark, flowers and pods also been reported having good amount of minerals, vitamins, fatty acids & other nutritional constituents. Mature seeds of 'drumstick tree' contain important edible oil called 'Benoil' which can resist the rancidity of food articles.

**Supplementation of Animal Feed:** It has been reported that if *Moringa* leaves are supplemented with animal feed, the animal will gain its weight. Supplementation of 3 kg dry matter with drumstick leaves can enhance the milk production in livestock by 65%.

**Purification of Water:** 2 gram of *Moringa* seed powder can purify 20 litre dirty water and 90-99% bacteria can be killed. Impurities sink in the bottom by action of positively charged poly-electrolytes present in seed powder of drumstick.

**Biological Importance:** Seed extract of *Moringa* have been reported as a good insect repellent and act as bio-pesticide. Seed oil of

the plant can be used to produce bio-diesel. The extract of its leaves has growth enhancement properties like other phyto-hormones. Plant debris are important to be used in production of biogas. Its twigs, stem and other parts are used as fuelwood in India.

### CONCLUSION

*Moringa oleifera* is a highly valuable multipurpose tree and regarded as 'Miracle Tree' and 'Wonder Tree' because of its indispensable nutritional value and therapeutic uses. The tree is gifted having anti-microbial, anti-inflammatory, anti-tumour, anti-epileptic, anti-asthmatic, anti-diabetic, anti-urolithiatic, anti-helminthic and analgesic properties. All parts of the 'drumstick tree' are useful and research is continued to extract much about it. Its biological importance in production of biopesticide, biodiesel & biogas have been recognized by researchers. In conclusion, *Moringa oleifera* is a 'Nature's Gift' to human being and there is a good scope for researchers to explore its properties extensively in future.

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*Moringa oleifera* tree with ‘drumstick’ like pods