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# Drumstick: a miracle & nutraceutical tree

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## *Introduction*

Drumstick (*Moringa oleifera* Lam) is a tropical perennial tree vegetable species which is known by several regional names such as benzolive, drumstick tree, kelor, marango, French Jasmine, acacia, mlonga, mulangay, nebeday, sahijna, sajna Horse-Radish tree. It belongs to family Moringaceae and having large ecological plasticity because of its wider adoptability to diversified soil and climatic conditions. Moringa contains more than 90 nutrients and 46 types of antioxidants in its leaf and fruit helps in avoiding malnutrition, anemia, tuberculosis, asthma, cold, bronchitis, functional sterility etc. The high antioxidant /radical scavenging effects are observed in this plant. Moringa leaf extract could kill 70-86% of abnormal cells harvested from patients with acute lymphoblastic leukemia. Moringa is the most suited tree for traditional agroforestry systems in home gardens/agroforestry systems, since its canopy allows diffusion of light which facilitates intercropping and its deep root system avoids resource competition with under-storey crops. Moringa is a multipurpose tree species (MPT) and plays an important role to alleviate poverty of rural people providing livelihood by selling fruits, leaves, fuelwood, seed, soil, seedcake as manure and biopesticide. Because of its numerous nutraceutical values and most suitable in agroforestry system can be called “MIRACLE TREE”. It is mainly cultivated for fruit (pod) which is a economic part and used in sambhar, vegetable curries and pickles etc. It is also a plant which can be used as wind breaks, green manure, green fodder. The important varieties under cultivation are: annual moringa: PKM-1, PKM-2, Dhanraj., Perennial moringa: Jaffna (Sri Lanka), Chavakancheri, Chemmuurungal, Kodikal murungal, Bhagya (karnataka), etc.

## Nutritional value

Moringa contains more than 90 nutrients and 46 types of antioxidants and is very effective to overcome various physiological disorders. Drum stick leaves contains 7 times more vitamin 'C' than orange, 4 times more 'Ca' than milk, 4 times more vitamin 'A' than carrot, 3 times more 'K' than banana and 2 times more protein than milk of equal quantities and also rich in iron.

Table-1 Nutritional value of fruit and leaves (Per 100 g edible portion)

| Constituents | Fruits(pods) | Leaves |
|---|---|---|
| Energy (Calories) | 26 .0 | 92.0 |
| Moisture (%) | 26.9 | 75.9 |
| Carbohydrates (g) | 3.7 | 12.9 |
| Proteins (g) | 2.5 | 6.7 |
| Fats (g) | 0.1 | 1.7 |
| Vitamin- A (µg) | 110.0 | 6780.0 |
| Vitamin-C (mg) | 120.0 | 220.0 |
| Iron (mg) | 5.3 | 7.0 |
| Calcium (mg) | 30.0 | 440.0 |
| Phosphorus (mg) | 110.0 | 133.5 |

Malnutrition is a serious human health problem which may be extruded by using Moringa leaves to meet nutritional deficiency. Drumstick, a low acid vegetable known for it is high vitamin 'C' content (118 mg/100 gr edible portion) has export potential as a canned product. It retains it's wholesomeness and quality in terms of vitamin – 'C' after canning (Ranjith and Arther 2002). The dried leaves of Moringa can be safely preserved for future use without any loss in it's nutritional

value. The WHO has recommended about 40% leaf powder to be added in children's food in mid-day meal It helps in increasing breast milk as well as reduces blood loss in women.

## Moringa as nutraceutical tree

Moringa is rich in glucasinolates and isothioyanates. Moringa oliefera may have potential for use as source of natural treatment for cancer.

A soup prepared with handful of Moringa oleifera leaves helps in avoiding the malnutrition, anaemia, tuberculosis, asthama, cold, branchitis, functional nervousness and functional sterility.Moringa oliefera contained organic acid, rutin, quercetin, glucoside and kaempferol, rhamnoglucoside, where as in the root and stem barks several procyanidins were detected. The high antioxidant /radical scavenging effects observed, may have impact on the cancer. Consumption of moringa leaves is claimed to cure about 300 ailments of human being.

## Multiple uses

***Food:*** The tender green pods, leaves and flowers are used as vegetable. The leaves contain 38% protein with all essential amino acids which fulfil the diet needs of vegetarians. An ordinary tree can yield about 150 kg leaves and 250-270 fruits/year.

***Fodder:*** Leaves are used as a quality fodder. It helps to increase 30-40% milk in cows, buffaloes and goats.

***Wood:*** Drumstick wood is soft light corkes and perishable and also used for shuttles and picking sticks for textile industry.

***Seed:***

***Seed oil:*** Moringa seed oil is known as 'Benoil' hence the tree is often called 'benoil tree'. This oil is edible and resembles olive oil in it's fatty acid composition and is desirable to replace polyunsaturated vegetable oils with monounsaturated fatty acids which is current trend. Seed oil is also used as lubricant and in perfumes and hair dressing.

***Seed powder:*** is used to clarify turbid, dirty water it is mixed with water for purification. Moringa

seeds and pods are effective sorbets for removal of heavy metal and volatile organic compounds in the aqueous system.

***Seed cake:*** This is used as organic manure which is rich in crude protein (38%).

***Biopesticide:*** Root and seed powder exhibited comparatively lower YVMV disease incidence, white fly population and also recorded high