



Exploring the Medicinal Applications and Nutritive Significance of the Drumstick Tree

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Drumstick tree *Moringa oleifera* belonging to the family of Moringaceae and known as the Ben oil tree or the horse radish tree. It is native to the foothills of northwestern India and is now cultivated around the world as a valuable, drought-resistant, multi-purpose crop. Moringa is rich in nutrition owing to the presence of a variety of essential phytochemicals present in its leaves, pods and seeds. In fact, moringa is said to provide 7 times more vitamin C than oranges, 10 times more vitamin A than carrots, 17 times more calcium than milk, 9 times more protein than yoghurt, 15 times more potassium than bananas and 25 times more iron than spinach. The fact that moringa is easily cultivable makes it a sustainable remedy for malnutrition. Countries like Senegal and Benin treat children with moringa. Children deprived of breast milk tend to show symptoms of malnutrition. Lactogogues are generally prescribed to lactating mothers to augment milk production. The lactogogue, made of phytosterols, acts as a precursor for hormones required for reproductive growth. Moringa is rich in phytosterols like stigmasterol, sitosterol and kampesterol which are precursors for hormones. These compounds increase the estrogen production, which in turn stimulates the proliferation of the mammary gland ducts to produce milk. It is used to treat malnutrition in children younger than 3 years. About 6 spoonfuls of leaf powder can meet a woman's daily iron and calcium requirements, during pregnancy. Every part of *M. oleifera* is a storehouse of important nutrients and antinutrients. The leaves of *M. oleifera* are rich in minerals like calcium, potassium, zinc, magnesium, iron and copper.

Vitamins like beta-carotene of vitamin A, vitamin B such as folic acid, pyridoxine and nicotinic acid, vitamin C, D and E also present in *M. oleifera*, Moringa leaves also have a low calorific value and can be used in the diet of the obese. The pods are fibrous and are valuable to treat digestive problems and thwart colon cancer. A research shows that immature pods contain around 46.78% fiber and around 20.66% protein content. Pods have 30% of amino acid content, the leaves have 44% and flowers have 31%. The immature pods and flowers showed similar amounts of palmitic, linolenic, linoleic and oleic acids Moringa has lot of minerals that are essential for growth and development among which, calcium is considered as one of the important minerals for human growth. While 8 ounces of milk can provide 300–400 mg, moringa leaves can provide 1000 mg and moringa powder can provide more than 4000 mg. Moringa powder can be used as a substitute for iron tablets, hence as a treatment for anemia. Beef has only 2 mg of iron while moringa leaf powder has 28 mg of iron. It has been reported that moringa contains more iron than spinach. A good dietary intake of zinc is essential for proper growth of sperm cells and is also necessary for the synthesis of DNA and RNA. *M. oleifera* leaves show around 25.5–31.03 mg of zinc/kg, which is the daily requirement of zinc in the diet

Medicinal properties

M. oleifera is often referred as a panacea and can be used to cure more than 300 diseases. Moringa has long been used in herbal medicine by Indians and Africans. The presence of phytochemicals makes it a good medicinal agent.

Anticancer properties: Cancer is a common disease and one in seven deaths is attributed due to improper medication. Around 2.4 million cases are prevalent in India, while there are no specific reasons for cancer to develop. Several factors like smoking, lack of exercise and radiation exposure can lead to the disease. Cancer treatments like surgery, chemotherapy and radiation are expensive and have side effects. *M. oleifera* can be used as an anticancer agent as it is natural, reliable and safe, at established concentrations. Studies have shown that moringa can be used as an anti-neoproliferative agent, thereby inhibiting the growth of cancer cells. Soluble and solvent extracts of leaves have been proven effective as anticancer agents.

Benefits of moringa

Moringa is believed to have many benefits and its uses range from health and beauty to helping prevent and cure diseases.

Protecting and nourishing skin and hair: Moringa seed oil is beneficial for protecting hair against free radicals and keeps it clean and healthy. Moringa also contains protein, which means it is helpful in protecting skin cells from damage. It also contains hydrating and detoxifying elements, which also boost the skin and hair. It can be successful in curing skin infections and sores.

Treating edema: Edema is a painful condition where fluid builds up in specific tissues in the body. The anti-inflammatory properties of moringa may be effective in preventing edema from developing.

Protecting the liver: Moringa appears to protect the liver against damage caused by anti-tubercular drugs and can quicken its repair process.

Preventing and treating cancer: Moringa extracts contain properties that might help prevent cancer developing. It also contains niazimicin, which is a compound that suppresses the development of cancer cells.

Treating stomach complaints: Moringa extracts might help treat some stomach disorders, such as constipation, gastritis, and ulcerative colitis. The antibiotic and antibacterial properties of moringa may help inhibit the growth of various pathogens, and its high vitamin B content helps with digestion.

Fighting against bacterial diseases: Due to its antibacterial, antifungal, and antimicrobial properties, moringa extracts might combat infections caused by *Salmonella*, *Rhizopus*, and *E. coli*.

Making bones healthier: Moringa also contains calcium and phosphorous, which help keep bones healthy and strong. Along with its anti-inflammatory properties moringa extract might help to treat conditions such as arthritis and may also heal damaged bones.

Treating mood disorders: Moringa is thought to be helpful in treating depression, anxiety, and fatigue.

Protecting the cardiovascular system: The powerful antioxidants found in Moringa extract might help prevent cardiac damage and has also been shown to maintain a healthy heart.

Helping wounds to heal: Extract of moringa has been shown to help wounds close as well as reduce the appearance of scars.

Treating diabetes: Moringa helps to reduce the amount of glucose in the blood, as well as sugar and protein in the urine. This improved the hemoglobin levels and overall protein content in those tested.

Treating asthma: Moringa may help reduce the severity of some asthma attacks and protect against bronchial constrictions. It has also been shown to assist with better lung function and breathing overall.

Protecting against kidney disorders: People may be less likely to develop stones in the kidneys, bladder or uterus if they ingest moringa extract. Moringa contains high levels of antioxidants that might aid toxicity levels in the kidneys.

Reducing high blood pressure: Moringa contains isothiocyanate and niaziminin, compounds that help to stop arteries from thickening, which can cause blood pressure to rise.

Improving eye health: Moringa contains eyesight-improving properties thanks to its high antioxidant levels. Moringa may stop the dilation of retinal vessels, prevent the thickening of capillary membranes, and inhibit retinal dysfunction.

Treating anemia and sickle cell disease: Moringa might help a person's body absorb more iron, therefore increasing their red blood cell count. It is thought the plant extract is very helpful in treating and preventing anemia and sickle cell disease.

