

Lifestyle & Culture

Moringa – The Miracle Tree



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Over 5,000 years ago, the Moringa oleifera (MO) tree, which is native to the Northern Indian Himalayan Mountains, was discovered and has since then been considered God's gift to humanity since it is brimming with a plateau of amino acids, minerals, vitamins, fatty acids and so much more which is rare to observe in a single plant.

While MO, which is also known as the Miracle Tree, has gained a vital role in the medical and commercial industries, several monarchs had used it to perpetuate their heedfulness and health since herbal medicine is one of the oldest forms of therapy known to humankind. In fact, it is believed that MO was fed to the valiant soldiers that gallantly defeated Alexander the Great, to replenish their strength and attenuate their pain and stress.

Nowadays, MO has become naturalised in several countries among them Southwest Asia, Madagascar, Sri Lanka, Pakistan, Afghanistan, Bangladesh and Southwest and Northwest Africa. It thrives when grown under direct sunlight at temperatures between 25-35°C in marginally acidic or neutral soil. It can grow up to 10m and is identified by its characteristic green pinnate leaves and white scented flowers.

MO leaves have four times the amount of calcium to that found in milk, seven times more vitamin C when compared to oranges, triple the amount of iron than in spinach and four times the amount of vitamin A than in carrots. Thus, since MO is very nutritious including all the essential amino acids, fatty acids and vitamins too, it is no surprise that when amalgamated into the diet of malnourished individuals their health is improved. In fact, as a result, pregnant women delivered higher-weight babies, breastfeeding mothers experienced an increase in lactation due to Moringa's galactagogic effect and infants achieved a healthier weight when supplemented with MO. Furthermore, pregnant women are advised to take MO due to its particular high folate, omega-3 and omega-6 content which can help prevent birth defects, especially those concerning the nervous system.

Although each part of the tree – the leaves, pods, flowers, roots and bark – are consumable, due to the toxic alkaloid and spirochin content present in the roots (commonly substituted for horseradish), roots should be avoided. Furthermore, the tree's leaves are recognised as the safest edible part and are consequently the most consumed. Nevertheless, unlike most vegetables which lose some of their nutrient content



when cooked, Moringa leaves, whether cooked, ground or not, are an exception to this. However, while Moringa can be used to remedy mild to moderate malnourishment, severe malnourishment cannot be medicated using it.

While medicinal drugs aid one's immune system to recover from or manage an illness, they do have their limitations such as adverse drug reactions, drug-drug interactions, patient compliance, availability and affordability, especially if treating a chronic disease. Thus, the thirst for new alternatives that offer maximal benefits with minimal harm has shed light on folklore medicine. Luckily, MO's phytochemistry and bioactive chemical content allow it to target many diseases like hyperglycaemia, hypertension, migraine, cancer, infectious diseases and more. It must be noted that the tree's outstanding potential all boils down to its two main properties as an antioxidant and an anti-inflammatory agent.

While chemotherapy is easily the gold standard treatment for advanced neoplasms, the adverse effects and multi-drug resistance seen in neoplasms have brought their challenges in the battle against cancer. Fortunately, tumours exhibit little resistance to MO and its extracts show minimal unwanted reactions and low toxicity, unlike many chemotherapeutic agents. Furthermore, it exerts a protective property against cell damage to non-cancerous cells while also preventing genetic mutations, angiogenesis (that is, the growth of new blood vessels to aid tumour growth), metastases of tumours and aids in the killing of neoplastic cells.

Furthermore, apart from the plant's cardioprotective characteristics against hypertension, atherosclerosis and other cardiovascular diseases, it can help control one's blood glucose levels. In

fact, when type 2 diabetics were treated with MO leaves, their post-prandial (that is, after eating) and fasting glucose levels dropped by 26%. Since MO can prevent the accumulation of white adipose tissue and maintain a healthy plasma lipid profile, it promotes weight loss too.

The miracle tree is also known to help alleviate the symptoms of neurodegenerative and neuroinflammatory diseases like Alzheimer's Disease and Parkinson's Disease while improving the symptoms seen in patients having multiple sclerosis and delaying the progression of amyotrophic lateral sclerosis (ALS). Apart from improving one's memory and cognition, it can be used to treat migraines, anxiety and depression.

In conjunction with the above, Moringa has countless health benefits where it can act as an antimicrobial agent to combat diseases like human immunodeficiency virus (HIV), herpes simplex virus type 1 (HSV-1), Covid-19 and urinary tract infections. Apart from boosting the immune system, it can remedy gastric ulcers, asthma and several chronic inflammatory diseases like colitis, arthritis, rheumatism and gout. Interestingly, while Moringa has the potential to treat infertility in males, it may also be used to develop a plant-based contraceptive for females. In saying this, it is no wonder that this tree has attained the rightfully earned name, Nature's Gold.

Unsurprisingly, MO's beneficial applications do not stop here. The miracle tree can be used in a broad spectrum of industries from producing biodiesel to cosmetics to water purification. In agriculture, this tree has been known to act as a biopesticide, a fertiliser and when added to the diets of livestock their overall health is enhanced while also increasing the

yield and quality of produce. Furthermore, Moringa can be used to produce dyes, biodegradable cutlery, cooking oil (ben oil), aid in construction and fortify and preserve food. The industrial applications of this miraculous tree are endless.

Nowadays people are trying to adopt a healthier lifestyle including more nutritious food in their diet, thus inevitably herbal medicine is increasing globally. However, despite the assumption that all herbs and plants are safe, one needs to have a basic understanding of the toxicity and adverse effects that medicinal plants may have. Overconsumption of Moringa can result in nerve paralysis, tachycardia (that is, increased heart rate), liver failure, alterations in haematological parameters and spleen hypertrophy. Similarly, consuming roasted MO seeds can be harmful due to the potential presence of mutagens. Likewise, although it can ameliorate thyroid performance in hypothyroidism and alleviate thyrotoxicity, high doses of the MO leaf extract may not be safe since it lowers plasma triiodothyronine (T3) and increases plasma thyroxine (T4) levels. Therefore, low doses should be used when managing hyperthyroidism.

Additionally, specific MO leaf extracts at particular doses have an inhibitory effect on CYP3A4, CYP2D6, and CYP2E1 which are vital cytochrome enzymes responsible for drug metabolism. Thus, one should not take drugs that are metabolised by these enzymes when consuming MO simultaneously.

Furthermore, when the plant is to be used for consumption or medicinal use it is vital to consider the environment in which the tree was grown. This is because the seeds, leaves and bark of MO, are able to absorb and take up heavy metals like zinc, arsenic, lead, cop-

per and chromium from their surroundings. Thus, in polluted areas, the plant can accumulate great concentrations of these heavy metals which can easily be passed to other organisms upon digestion. The consequences can be detrimental to one's health.

Sadly, despite one's eagerness to become healthier, food inequality and the current economic inflation have hindered society's progress to living a healthier life, especially in poor regions. As the cost of living is exponentially surging and food is becoming more expensive, particularly fruits and vegetables, low-income individuals would have to deviate to cheaper sources of food, like fast food.

Fortunately, MO can be the first step to solving this global problem since it is an inexpensive, easily cultivated and adaptable plant that can be applied in several industries due to its constituents.

However, to do this, more awareness of the properties, benefits and applications of MO must be raised on a global scale where more research is funded towards cementing the exact mechanisms that are responsible for MO's health benefits and the pharmacotherapy potential and safety of MO. Finally, doctors practising Western medicine have to be educated on the implications and benefits of Moringa oleifera and encouraged to incorporate it in the management of their patients where applicable.

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