

MORINGA OLEIFERA: MORPHOLOGY AND MEDICINAL USE

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ABSTRACT

Moringa oleifera tree is referred to as a miracle tree due to its rich source of certain macro and micro nutrients of great importance in human nutrition. The chemical composition of the different parts of the Moringa tree may vary depending on cultivar and source. M. oleifera leaf, seed and flower have found numerous applications in food. In this review we firstly summarized the present knowledge on the use of M. oleifera as a food fortificant in amala (stiff dough), ogi (maizegruel), bread, biscuits, yoghurt, cheese and in making soups. Moringa oleifera (M. oleifera) Lam or "kelor", a common name amongst Indonesian, belongs to the Moringaceae family. It is widely cultivated in India and known as nutritional herbs. Every part of these plants possess a valuable medicinal property. Universally known with the name "horseradish plant" or "drumstick plant" consists of biological exertion such as anticancer, antidiabetic, antihypertensive, treat malnutrition, and beneficial as concentration enhancer and as well as wound healing enterprise. So, the aim of the present review is to present comprehensive information on the traditional uses, phytochemical compound, and pharmacology activities of the medicinal plant, M. oleifera, from recognized sources. In the effort in future studies to develop a novel therapeutic medicine, This review explores the use of moringa across disciplines for its medicinal value and as well as food the information provided in this review will be useful.

Keywords: *Moringa oleifera; Miracle Tree; Antidiabetic; Anticancer; Coagulant, Antimicrobial activity etc.*

1. INTRODUCTION

In Indian system of medicine, a large number of drugs of either herbal or mineral origin have been advocated for various types of diseases and other different unwanted conditions in humans. Ayurveda is one of the traditional systems of medicine practiced in India and Sri Lanka and can be traced back to 6000 B.C. Ayurvedic medicines are largely based upon herbal and herbomineral preparations and have specific diagnostic and therapeutic principles.[1] Moringa oleifera belonging to the family of Moringaceae is an effective remedy for malnutrition. 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 .[2] M. oleifera Lam encompass a single rubric "Moringa" along with thirteen species belongs to the Moringaceae family and among them, the most common is M. oleifera Lam tree [3]. Indeed, Moringaceae is known as monogeneric family including single rubric Moringa[4] M.oleifera veritably well known as Sanjana, Horseradish tree, and forelimb, and the name Moringa derived from a Tamil word, murungai has the meaning of crooked cover[5] presently, the factory is cultivated for colorful purposes in agreement with its

high nutritive values and has an excellent range of medicinal uses[6] *M. oleifera* Lam frequently suggesting a leguminous species at a distance; nonetheless, it's a evanescent tree with meager leafage and graceful ,specifically when in flower but incontinently honored when in fruit. The tree expands averagely 10-12m high[7].*M.oleifera* can be distributed into seven orders, videlicet drug, food, wood, fodder, fencing, goo, and coagulant[8].

2. SCIENTIFIC CLASSIFICATIO:

Kingdom : Plantae

Division : Magnoliophyta

Class : Magnoliopsida

Order : Viales

Family : Moringaceae

Genus : Moringa

Species : Pterygosperma

3. MORPHOLOGY:

A small or medium- sized tree up to 10 m altitudinous, with thick, soft, corky, deeply fissured dinghy and tomentose outgrowths. Roots Acrid, bitter, pungent, thermogenic Leaves generally tripinnate, 45 cm long; pinnate and pinnules opposite, evanescent; circulars - 2 cm long and 0.6- 1 cm. wide. The side elliptic, the terminal obviates. Flowers White, ambrosial, in large panicles. Fruits (capsules) Pendulous, green, 22- 50 cm

or further in length, triangular, 9 roasted. Seeds Trigonous, the bodies angled. Flowers and fruits formerly or doubl y each time, depending on position; in central India, where trees remain waterless between December- January and January- February, flowering occurs substantially between November and March, and regenerating from February to June[9-13]



3.1 Chemical Constituents

Leaf: Carotene, nicotinic acid and ascorbic acid, oxidase sulphur, and a prolamin. The essential amino acids present in the total proteins are arginine, histidine, lysine, tryptophan, phenylalanine, methionine, threonine, leucine, isoleucine, and valine. The essential amino acids present in the splint proteins are arginine, histidine, lysine, tryptophan, phenylalanine, methionine, threonine, leucine, isoleucine, and valine.

Seed: The seed contain a recently developed glycoside moringine.4(nascence-LRhamnoloxo) Benzylisothiocynate in seed. Alanine, arginine, glycine, serine¹⁶. Acidic, stearic, palmitic, linoleic[14-15].

3.2 Plantation And Soil Condition:

M. oleifera can be grown in any tropical and tropical regions of the world with a temperature around 25 – 35 °C. It requires flaxen or earthy soil with a slightly acidic to slightly alkaline pH and a net downfall of 250 – 3000 mm[16] The direct sowing system is followed as it has high germination rates. Since moringa seeds are anticipated to germinate within 5 – 12 days after sowing and can be implanted at a depth of 2 cm in the soil. Moringa can also be propagated using holders. The saplings are placed Iplastic bags containing flaxen or earthy soil. After it grows to about 30 cm, it can be scattered. still, utmost care has to be taken while broadcasting as the valve roots are tender and tend to get affected. The tree can also be cultivated from slices with 1 m length and 4 – 5 cm in periphery, but these shop not have a good deep root system. similar shops tendto be sensitive to failure and winds. For marketable purposes large scale ferocious andsemi-intensive colony of moringa may be followed. In marketable civilization, distance is important as it helps in factory operation and crop. *M. oleifera* differs in nutrient composition at different locales[17].

4. MEDICINAL USE

Plant contain colorful chemical composites like phenolic acids, isothiocyanates, tannins, flavonoids, and saponins, which are physiologically active and employed in food accoutrements . These composition therapeutically active or inactive. They're synthesized by shops to combat environmental and physiological stresses similar as ultraviolet radiation and microbial attack. The *Moringa oleifera* is an important factory with several bioactive bioactive composites present in its leaves, similar as flavonoids, saponins, tannins, catechol tannins, anthraquinones, alkaloids. These parcels make moringa leaves salutary for nutritive and remedial operations, as well as a water purifying agent[18-19]

The *M. oleifera* tree has a wide range of remedial operations, including Both forestallment and remedy. Its dinghy, seeds, oil painting, tire, leaves, roots, and flowers are used in conventional drug. It provides an immediate remedy for stomach, catarrh, malice, cancer, ulcer, blood sugar, whim-whams, cramps, hemorrhoids, cerebral pangs, sore epoxies, stomach related conditions, respiratory, gastric, and resistant fabrics It also boosts bone viscosity by adding calcium situations. Flowers act as cholagogue, goad, alcohol, and diuretic that can help to enhance corrosiveness inflow. The factory is antibacterial as well and aids in the medication of heart circulatory alcohol[20-22]

5. THERAPEUTICAL USE:

Antioxidant	Decrease metal chelation and active detoxifying enzymes Increase reactive oxygen species
Antimicrobial	Disrupt cell membrane synthesis Disrupt synthesis of essential enzymes
Anticancer	DNA damage viability of cancer cells Apoptosis of cancerous cell
Antidibetic	Lower blood glucose levels Decrease reactive oxygen species
Anti-inflammanatory	Inhibit monocytes infiltration fibroblasts proliferation Nitric oxide inhibition in macrophage cells

6. CONCLUSION

M. Oleifera plant is indeed a miracle plant with enormous potentials yet to be fully explored in food application. The use of M. Oleifera leaf powder, M. Oleifera seed powder, M. Oleifera flower powder in various food applications such as in fortifying amala (stiff dough), ogi (maize gruel), bread, biscuits, yoghurt, cheese and in making soups was reviewed. Many of the studies summarized in this paper need further validation to substantiate their findings. For instance M. Oleifera leave powder was reported to reduce tendency for retrogradation in stiff dough prepared from plantain flour as shown by the low set back viscosity values. However, the study did not how retrogradation was actually affected when the stiff dough was prepared. Further, experimental designs should be such that variables such as mixing time and speed are well documented in research papers. In-vivo and in-vitro digestibility properties of fortified products must be determined. Nutrient bioavailability and phytochemical contents of M. Oleifera fortified products also need to be determined in future research. Although, many of the reviewed studies reported improvement in the nutritional value of foods fortified with M. Oleifera, none of the study showed the digestibility (in-vivo or in-vitro) and availability of these nutrients. Also very limited studies assessed the shelf stability of the fortified samples. Lastly, more sophisticated techniques such as the use of SEM, DSC, FTIR, XRD, RVA, and NMR techniques should be applied in future research..

7. REFERENCE

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