

Review: Different Activities of Moringa Oleifera Tree

Sonawane Harshad B., Atpadkar Akshay U., Jadhav Aniket R.

Abstract:- This abstract provides a comprehensive overview of *Moringa oleifera*, a versatile plant with various beneficial properties. *Moringa oleifera*, commonly known as the "drumstick tree" or "horseradish tree," has gained significant attention in recent years due to its remarkable nutritional and medicinal value. This review summarizes the key aspects of *Moringa oleifera*, including its botanical characteristics, traditional uses, phytochemical composition, nutritional profile, and potential health benefits. The plant is native to tropical and subtropical regions, and its adaptability to diverse climatic conditions makes it highly favourable for cultivation in various parts of the world. The review delves into the traditional uses of *Moringa oleifera* in different cultures, ranging from culinary applications to medicinal purposes. The plant's leaves, seeds, flowers, and roots have been utilized for their therapeutic properties for centuries.

In terms of phytochemical composition, *Moringa oleifera* is known to contain a wide array of bioactive compounds, such as flavonoids, phenolic acids, alkaloids, and glucosinolates. These compounds contribute to its antioxidant, anti-inflammatory, antimicrobial, and anticancer properties. Moreover, the high nutritional value of *Moringa oleifera* is highlighted, as it is an excellent source of vitamins, minerals, essential amino acids, and dietary fiber. This review provides an overall assessment of *Moringa oleifera*, emphasizing its botanical characteristics, traditional uses, phytochemical composition, nutritional profile, and potential health benefits. The information presented underscores the significance of *Moringa oleifera* as a versatile plant with immense value in nutrition, medicine, and various industries. Further research is warranted to fully explore its potential and to unlock new avenues for its utilization.

I. INTRODUCTION

Moringa (*moringa oleifera*) is a large Indian herbal plant. It has become commonplace in tropical and subtropical areas. Horseradish tree, mulangay, mlonge, benzolive, sanja drumstick tree, and kelor are some of the names used (Fahey, 2005). *Moringa* is the only family in the Moringaceae, with *Moringa oleifera* being the most researched and planted species.¹

- Kingdom-plantae
- Super kingdom-Tracheobionata
- Super division- spermatophyta
- Division-Magnoliophyta

- Class-Magnoliophyta
- Subclass-Dilleniidae
- Order-capparales
- Family-Moringaceae
- Genus-Moringa
- Special-oleifera

Moringa oleifera is a native tree of the sub-himalayan region of North,west india,which is now indigenous to many regions in islands and south America. Apart from being a commonly consumed vegetable in these areas, it is also well-known and used for its health advantages. These plants contains different properties against the disease of anti cancer, anti diabetic and other diseases.

II. NUTRITIONAL COMPOSITION

Moringa incredible medicinal benefits, as recorded by numerous civilizations and ethnicities and supported by evidence. *Moringa* has been discovered to contain several necessary elements, such as vitamins and minerals, as a result of research papers.² Nutritional properties every part of *Moringa ol.* is use from ancient time storehouse of important nutrients and antinutrients. Calcium, potassium, zinc, magnesium, iron and copper these different ions were isolate from leaves of plant.³ Beta-carotene of vitamin A, vitamin B such as folic acid, pyridoxine and nicotinic acid, vitamin C, D and E such vitamins present⁴. Anti-cancerous agents which including glucosinolates, isothiocyanates, glycoside metabolites, and glycerol-1-9-octadecanoate are present, as are phytonutrients such as sterols, tannins, terpenoids, flavonoids, saponins, anthraquinones, alkaloids, and reducing sugar.⁵

➤ *Various components and uses of various parts of moringa oleifera as follows:*

- *Leaves :*

The leaves of MO are mostly used for medicinal purposes as well as for human nutrition, since they are rich in antioxidants and other nutrients. Other countries than India use and cultivate MO plant for its beneficial use and medicinal use.⁶

The high number bioactive compounds explain the pharmacological properties of leaves quercetin and kaempferol. Many studies, in vitro and in vivo, have confirmed these pharmacological properties.⁷MO leaves have been used for the treatment of various diseases from malaria and typhoid fever to hypertension and diabetes.⁸ MO leaves

also protect against oxidative stress⁹, inflammation¹⁰, hepatic fibrosis¹¹, liver damage,¹² hypercholesterolemia,¹³ bacterial

activity¹⁴, cancer¹⁵ and liver injury¹⁶.

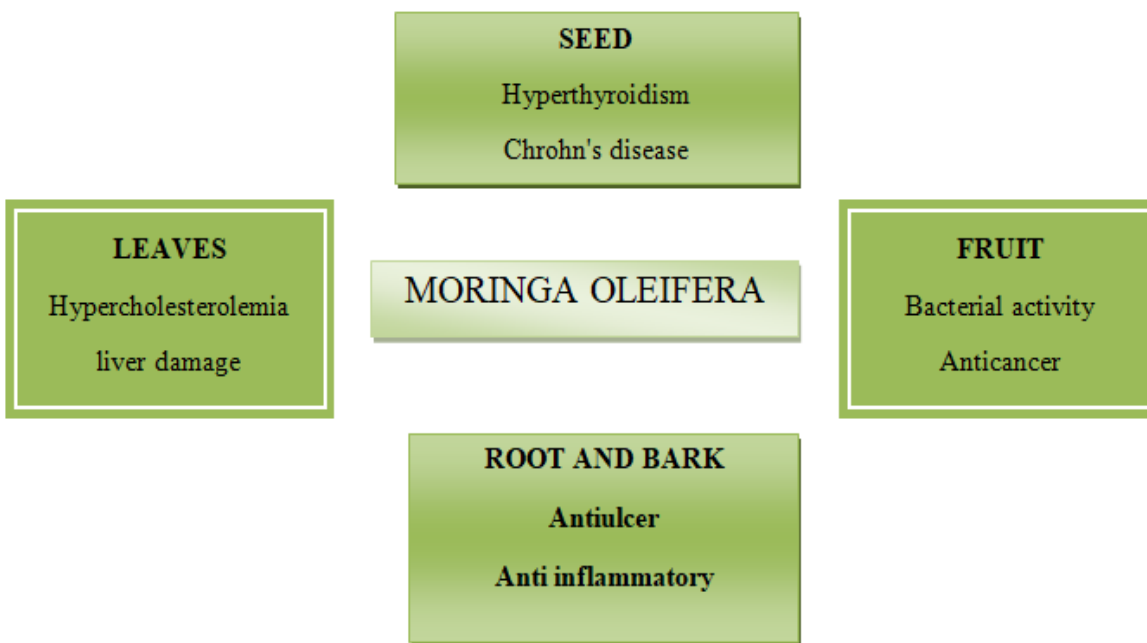


Fig 1 Moringa Oleifera

• *Seed*

Seeds of moringa help in treating hyperthyroidism, Chrohn's disease, antiherpes-simplex virus arthritis, rheumatism, gout, cramp, epilepsy and sexually transmitted diseases, can act as antimicrobial and anti-inflammatory agents.¹⁷ Seeds of mongira olifera act as a natural absorbents and antimicrobial agent.¹⁸ Seeds of moringa plants basically used now a days for softning of water.¹⁹

• *Bark*

Moringa oleifera plant contains different activities from its parts such as pods, seed, root and leaves but bark produce support to the whole plant and it is heat generating inside. Bark was used in Ayurveda for the increase the body heat and remove fat from the body.

• *Root*

Roots of Moringa oleifera was used for the antiulcer, antisecretory, and cytoprotective.²⁰ Also useful in the anti inflammatory activity, Antioxidant activity found in the MO roots.

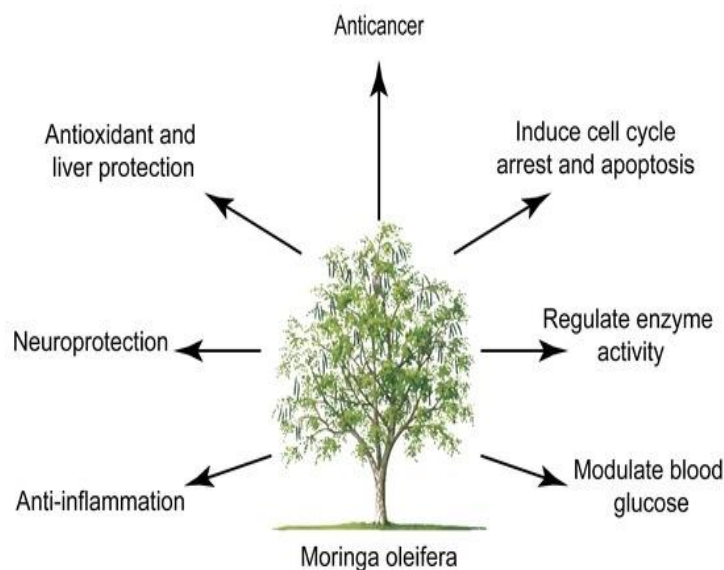


Fig 2 Moringa Oleifera

➤ *Moringa Oleifera plant applications:*

- Mongira oleifera whole plants have the medicinal values.
- Microbial elimination with Moringa seeds
- Moringa seeds as coagulant
- Moringa seeds as biosorbent
- Water purifying seed
- Antibacterial and antifungal activities
- Antitumor and anticancer activities
- Antispasmodic, antiulcer and hepatoprotective activities

- Antihypertensive, diuretic and cholesterol lowering activities

III. DISCUSSION

In exploring the different activities of *Moringa oleifera*, it becomes evident that this plant possesses a remarkable range of beneficial properties. Its nutritional value, medicinal properties, antioxidant and anti-inflammatory activities, nutraceutical potential, culinary uses, and sustainable agriculture aspects make it a versatile and valuable resource.

Comparative analysis reveals that *Moringa oleifera* stands out among similar plants or supplements, offering a rich nutritional profile and a diverse array of bioactive compounds. Its mechanisms of action, although requiring further investigation, show promising interactions within the body, potentially contributing to its positive effects.

Safety considerations are important when incorporating *Moringa oleifera* into one's diet or wellness routine. Adherence to recommended dosages and consultation with healthcare professionals are essential, especially for individuals with pre-existing medical conditions or those taking medications.

IV. CONCLUSION

In conclusion, *Moringa oleifera* truly lives up to its reputation as a "miracle tree." Its activities encompass its nutritional value, medicinal properties, antioxidant and anti-inflammatory activities, nutraceutical potential, culinary uses, and sustainable agriculture aspects. While more research is needed to fully understand its mechanisms of action, the available evidence suggests its potential for promoting health and well-being.

Considering its versatility, incorporating *Moringa oleifera* into one's diet or exploring its medicinal applications may be beneficial. However, individuals should exercise caution, adhere to recommended guidelines, and consult healthcare professionals to ensure safe and appropriate usage.

Overall, *Moringa oleifera* presents a remarkable natural resource with multifaceted activities that warrant further exploration and utilization.

ACKNOWLEDGEMENT

The authors express their sense of gratitude towards management of Padmini College of Pharmacy, Dighanchi for providing all obligatory facilities necessary to carry out present work. Also Principal Dr, A. N. Panaskar, deserve a special mention for their timely suggestions.

REFERENCES

- [1]. Fahey, JW (2005). *Moringa oleifera*: A review of the medicinal evidence for its nutritional, therapeutic, and prophylactic properties. Part 1. *Trees Life J*, 1, 5.
- [2]. Hsu R, Midcap S, Arbainsyah DWL(2006). *Moringa oleifera*: Medicinal and Socio-Economical Uses. International Course on Economic Botany, National Herbarium Leiden, the Netherlands.
- [3]. J.N. Kasolo, G.S. Bimenya, L. Ojok, J. Ochieng, J.W. Ogwal-okeng, *Phytochemicals and uses of Moringa oleifera* leaves in Ugandan rural communities, *J. Med. Plants Res.* 4(2010) 753–757.
- [4]. M. Mbikay, Therapeutic potential of *Moringa oleifera* leaves in chronic hyperglycemia and dyslipidemia: A review, *Front. Pharmacol.* 3 (2012) 1–12.
- [5]. Gopalakrishnan L, Doriya K, Kumar DS. *Moringa oleifera*: A review on nutritive importance and its medicinal application. *Food science and human wellness.* 2016 Jun 1;5(2):49-56.
- [6]. Leone A, Spada A, Battezzati A, Schiraldi A, Aristil J, Bertoli S. Cultivation, genetic, ethnopharmacology, phytochemistry and pharmacology of *Moringa oleifera* leaves: An overview. *International journal of molecular sciences.* 2015 Jun;16(6):12791-835.
- [7]. Sivasankari B, Anandharaj M, Gunasekaran P. An ethnobotanical study of indigenous knowledge on medicinal plants used by the village peoples of Thoppampatti, Dindigul district, Tamilnadu, India. *Journal of Ethnopharmacology.* 2014 Apr 28;153(2):408-23.
- [8]. Prabhu K, Murugan K, Nareshkumar A, Ramasubramanian N, Bragadeeswaran S. Larvicidal and repellent potential of *Moringa oleifera* against malarial vector, *Anopheles stephensi* Liston (Insecta: Diptera: Culicidae). *Asian Pacific journal of tropical biomedicine.* 2011 Apr 1;1(2):124-9.
- [9]. Jaiswal D, Rai PK, Mehta S, Chatterji S, Shukla S, Rai DK, Sharma G, Sharma B, Watal G. Role of *Moringa oleifera* in regulation of diabetes-induced oxidative stress. *Asian Pacific journal of tropical medicine.* 2013 Jun 1;6(6):426-32.
- [10]. Waterman C, Cheng DM, Rojas-Silva P, Poulev A, Dreifus J, Lila MA, Raskin I. Stable, water extractable isothiocyanates from *Moringa oleifera* leaves attenuate inflammation in vitro. *Phytochemistry.* 2014 Jul 1;103:114-22.
- [11]. Al-Attar AM, Al-Rethea HA. Chemoprotective effect of omega-3 fatty acids on thioacetamide induced hepatic fibrosis in male rats. *Saudi journal of biological sciences.* 2017 May 1;24(4):956-65.
- [12]. Sharifudin SA, Fakurazi S, Hidayat MT, Hairuszah I, Aris Mohd Moklas M, Arulselvan P. Therapeutic potential of *Moringa oleifera* extracts against acetaminophen-induced hepatotoxicity in rats. *Pharmaceutical Biology.* 2013 Mar 1;51(3):279-88.

- [13]. Ghasi S, Nwobodo E, Ofili JO. Hypcholesterolemic effects of crude extract of leaf of *Moringa oleifera* Lam in high-fat diet fed Wistar rats. *Journal of ethnopharmacology*. 2000 Jan 1;69(1):21-5.
- [14]. Al_husnan LA, Alkahtani MD. Impact of *Moringa* aqueous extract on pathogenic bacteria and fungi in vitro. *Annals of Agricultural Sciences*. 2016 Dec 1;61(2):247-50.
- [15]. Sreelatha S, Jeyachitra A, Padma PR. Antiproliferation and induction of apoptosis by *Moringa oleifera* leaf extract on human cancer cells. *Food and Chemical Toxicology*. 2011 Jun 1;49(6):1270-5
- [16]. Fakurazi S, Hairuszah I, Nanthini U. *Moringa oleifera* Lam prevents acetaminophen induced liver injury through restoration of glutathione level. *Food and chemical toxicology*. 2008 Aug 1;46(8):2611-5.
- [17]. Kumari B, Kumar V, Awasthi N. *Moringa* Production and its Importance in Human Being.
- [18]. Saa RW, Fombang EN, Ndjantou EB, Njintang NY. Treatments and uses of *Moringa oleifera* seeds in human nutrition: A review. *Food science & nutrition*. 2019 Jun;7(6):1911-9.
- [19]. Muyibi SA, Evison LM. *Moringa oleifera* seeds for softening hardwater. *Water Research*. 1995 Apr 1;29(4):1099-104.
- [20]. Choudhary MK, Bodakhe SH, Gupta SK. Assessment of the antiulcer potential of *Moringa oleifera* root-bark extract in rats. *Journal of acupuncture and meridian studies*. 2013 Aug 1;6(4):214-20.