

## REVIEW ON TRADITIONAL HERB *MORINGA OLIFERA* FOR MEDICINAL AND PROMISING USES

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### ABSTRACT

Medicinal plants have several uses from ancient of human civilization. In rural area herbal medicines have several uses and considered as best healthcare products and other promising uses. *Moringa olifera* have several medicinal uses like anti-oxidant, anti-inflammatory, hyperlipidemia, anti-depressant, antifungal antiulcer, detoxification. It suppresses appetite, improve vision, wound healing, reduce wrinkle, strengthen immune system and enhance skin health. Apart from medicinal uses it is also used as plant growth enhancer, Biodiesel, Bio pesticide, Biogas and Tissue culture.

**Keywords:** *Moringa Olifera*, Tissue culture, anti-oxidant, Biopesticide

### INTRODUCTION

*Moringa Olifera* is the most widely cultivated species of monogeneric family the moringeaceae. That is nature to the sub-himalayan tract of northern India but now distributed worldwide in the tropic and subtropics. <sup>1,2,3</sup> *Moringa Olifera* is a kind of herbaceous plant science ancient africa communities to overcome malnutrition. It is a kind that moringa's fresh leaves contain Vitamin-C seven times more than oranges., Vitamin-A four times more than carrot, Calcium four times more than milk, potassium three times more than bananas and protein two times more than yogurts. It is traditionally used for anaemia, anxiety. Asthma, blackheads, bronchitis, cholera, conjunctivitis, cough, diarrhea, eye and ear infections, fever, swollen glands, headache, abnormal blood pressure hysteria, pain in the joints, acne and psoriasis. *Moringa olifera* has been reported to have antimicrobial spasmodic and antiulcera activity<sup>4,5,6</sup>.

**Taxonomical Classification:**<sup>7</sup>

- Kingdom – Plantae
- Sub kingdom – Tracheobionta
- Super Division – Spermatophyta
- Division – Magnoliophyta
- Class – Magnoliopsida
- Sub class – Dilleniidae
- Order – Capparales
- Family – Moringaceae
- Genus – Moringa
- Species – oleifera



**Synonyms:** The plant *Moringa oleifera* is known by several names throughout the world. The synonyms are given below.

- Latin – *Moringa oleifera*
- Sanskrit – Subhanjana,
- Hindi – Saguna, Sainjna
- Gujarati – Suragavo
- Tamil – Mulaga , Munaga
- Malayalam – Murinna, Sigru
- Punjabi – Sainjna, Soanjna
- Unani – Sahajan
- Ayurvedic – Haritashaaka, Raktaka, Akshiva
- Arabian – Rawag
- French – Morungue
- Spanish – Angela, Ben, Moringa
- Chinese – La ken
- English - Drumstick tree, Horseradish tree

## USES:

### 1. Anti-Fibrotic:

*Moringa Oenoplia* extract exhibit antifibrotic effect on liver fibrosis in rat. It shows protective effect against CC14 induced fibrosis in rats <sup>8</sup>

### 2. Hypoglycemic activity:

Hypoglycemic activity of *Moringa oleifera* with significant blood glucose lowering activities has been confirmed. Methanol extract of its dried food powder has produced N-Benzyl thiocarbamates, N-benzyl carbamates, benzyl nitriles and a benzyl; which prove to trigger insulin release significantly from the rodant pancreatic  $\beta$  cells, and have cyclo-oxygenase enzyme and lipid peroxidation inhibitory activities hypoglycemic and anti-hyperglycemic activity of the leaves of *Moringa oleifera* may be probably due to the presence of terpenoids, which appears to be involved in the stimulation of  $\beta$  cells and the subsequent secretion of preformed insulin<sup>9</sup>.

### 3. Hepato-protective:

Treatment with moringa was found to stimulate Hepatoprotective effect against hepatocellular injury by blocking the increase of two serum, Aspartate amino transferase (AST) and alanine transferase (ALT) which are indicates of liver health conditions<sup>10</sup>.

### 4. Anti –asthmatic:

*Moringa Oleifera* revealed significant increase in FVC (Forced vital capacity), FEV 1 (Forced expiratory volume in one second), PEFr (Peak expiratory flow rate), MVV (Maximum ventilatory volume) and a decrease in its variability. *Moringa Oleifera* considered as a useful drug for bronchial asthma <sup>11</sup>.

### 5. Anti-oxidant Activity:

*Moringa oleifera* had the most potent antioxidant activity. These antioxidant properties are attributable to the ability of its phenolic constituents to quench reactive oxygen species. The compounds identified in the flower extract relate their application as a valuable source for drug discovery. *Moringa oleifera* flowers stimulate both cellular and humoral immune responses and play plausible role in therapeutic potential as a candidate for immunomodulation which may be attributed to the presence of flavonoids and minerals in the extract <sup>12</sup>.

## 6. Hyperlipedemia:

*Moringa olifera* has beneficial effect on lipid lowering profile through cholesterol lowering effect, *Moringa olifera* is the good source of  $\beta$ -sitosterol.  $\beta$ -sitosterol is a structure, similar to that of cholesterol except for the substitution of an ethyl group at C-24 of its side chain. This compound has the ability to lower cholesterol by lowering plasma concentration of LDL-C with consequent increase in HDL level<sup>13</sup>.

## 7. Cosmetic Use:

*Moringa olifera* seed oil known as Behen oil is widely used as a carrier oil in cosmetic preparation. *Moringa olifera* is light and spread easily on the skin. It is good oil for use in massage and aromatherapy applications. It can be used in body and hair care as moisturizer and skin conditioner. Other uses include soap making and for use in cosmetic preparation such as lip balm and creams<sup>14</sup>.

*Moringa olifera* butter a semisolid fraction of Moringa Oil is used in baby product to contribute a free radical resistant emollient with exceptionally long lasting skin softening and smoothening effect<sup>14</sup>.

*Moringa olifera* protects the human skin from environmental influences and combats premature skin aging with dual activity, antipollution and conditioning /strengthening of hair, the *Moringa Oenoplia* seed extracts is a globally acceptable innovative solution for hair care<sup>15</sup>.

## 8. Reduce Cadmium Toxicity:

Cadmium is a toxic metal occurring in the environment naturally and as a pollutant originating from Industrial and agricultural sources. Tobacco leaves accumulate high levels of cadmium from the soil. Cadmium is mostly used in production of batteries, pigments, coating and plating, stabilizers for plastics, nonferrous alloys and photovoltaics devices.

The leaves extract of *Moringa olifera* have antioxidant properties which facilitates it to combat cadmium induced toxicities on kidney, liver, blood, testis and also on lipid profile like HDL and LDL level<sup>16</sup>.

## 9. As Gelling Agent:

Zinc oxide suspension were prepared with gum of *Moringa olifera*. There sedimentation profile, Degree of flocculation, Redispersibility and rheological behavior were compared. The result reveals that the suspending properties of *Moringa olifera* gum are comparable with that of gum tragacanth. Better gel characteristic was observed at the concentration of 8%. It is also reported that because the pH of the gum

below 5.77 and viscosity of the formulation with 8.5% w/w gum is  $4.6 \times 10^6$  cps. It is ideal for topical application<sup>17</sup>.

### **Chemical constituents:**

*Moringa Oenoplia* leaves are rich source of omega -3- and omega -6 polyunsaturated fatty acids in the form of a Linolenic acid and linoleic acids. Palmatic acid is recorded is the major saturated fatty acid accounting for 16-18% of the total fatty acids.

Immature pods and flowers are characterized by a higher content of total monosaturated fatty acids and low in polyunsaturated fatty acids compared to the leaves.

In contrast the seeds and seed oil have a high content of oleic, palmitoleic, stearic and arachidonic acid and lower content of Linoleic and linolenic acid<sup>18, 19,20,21,22</sup>.

### **10. Mitigation of Climatic Change:**

The ability of the tree to mitigate the effects of climate change is also impressive. According to the study<sup>31</sup> the rate of Moringa tree to absorb carbon dioxide (CO<sub>2</sub>) is fifty times (50x) higher when compared to the Japanese cedar tree and also twenty times (20x) higher than that of general vegetation. Study on Moringa and global warming revealed that, 1 person emits 320kg of CO<sub>2</sub>/year; it takes 23 Japanese Cedar trees takes 50 years to absorb this amount of CO<sub>2</sub>; it takes 2 Moringa trees 2 years to absorb this amount and 1 family car emits 2300kg of CO<sub>2</sub>/year; it takes 160 Japanese Cedar trees 50 years to absorb this amount of CO<sub>2</sub>; it takes 10 Moringa trees 2 years. Therefore, Moringa tree is useful tool in the prevention of global warming; because it sequesters more carbon with its all parts. Therefore, planting such important tree in different parts of the country will mitigate the impacts of climate change<sup>23,24</sup>.

### **11. Cyanobacteria Removal:**

*Moringa olifera* Lam. Is non-toxic and biodegradable. Sluge and indicator of health hazard have led to the search for other coagulants that are less harmful to the environment and to human health. In conventional water-treatment processes, the clarification stage involves the addition of chemical coagulants and flocculants to remove colour, turbidity, and organic matter. Regarding cyanobacteria removal by coagulation, good results have been reported, depending on the characteristics of organic matter present in water<sup>25</sup>.

### **12. Moringa as plant growth enhancers:**

The extract obtained from the *Moringa* leaves in 80% ethanol contains growth enhancing principles like cytokinin. The extract can be used in the form of a foliar spray to accelerate the growth of young plants. Use of the growth hormone spray will also cause the plants to be firmer and more resistant to pests and disease. Plants that are treated with this growth hormone spray will also produce more and larger fruit and will consequently have a higher yield <sup>26</sup>.

### **13. *Moringa* as a source of biogas:**

*Moringa* plants (approximately 30 days old) were milled together with water. The fibre was separated by filtration through a mesh with 5 mm pores and the liquid fraction produced was then added to a biogas reactor. With an average feed of 5.7 g of volatile solids the gas production was 580 liters of gas per 1 kg of volatile solids. The average methane content of the gas was eighty-one percent <sup>26</sup>.

### **14. A great fodder for cattle:**

*Moringa* tree has been of great use not only to the human beings in terms of their health in one form or the other but also for their livestock. *Moringa* makes a great fodder for cattle. The weight of livestock increased up to 32 per cent through *Moringa* feed and their milk yield of cows increased by 43 percent. The dried leaves appear to be much more effective. One agriculturist fed his cows with just 2 kg of dry matter of *Moringa* per day in addition to the normal food he had been feeding them with and the milk production increased by 58 percent. Then he increased it to 3 kg per day, and the milk production increased by 65 percent.<sup>27,28</sup>

### **15. Industrial uses:**

The seed oil is used in arts and for lubricating watches and other delicate machinery, and useful in the manufacture of perfumes and hair- dressings. The pressed cake obtained after oil extraction may be used as a fertilizer. The industrial uses of the drumstick tree include the use of its wood in paper and textile industries, bark in the tanning industry, and the seeds in water purification <sup>27,28</sup>.

### **16. Reduce Metal toxicity:**

The seed powder of *M. oleifera* India plant was fed to rat. In the blood of arsenic treated rat showed decrease of d-aminolevulinic acid dehydratase (ALAD) activity, reduced glutathione (GSH) level but increase in reactive oxygen species (ROS) in blood. In the liver was also found decrease in ALAD, but

increase in d-aminolevulinic acid synthetase (ALAS) and thiobarbituric acid reactive substances (TBARS). Activities of liver, kidney and brain superoxide dismutase (SOD) and catalase also showed a decrease on arsenic exposure. Administration of *M. oleifera* seed powder post arsenic exposure, exhibited recovery in blood ALAD activity, it restored blood GSH and ROS levels. A protection in the altered ALAD and ALAS activities of liver and TBARS<sup>29,30</sup>.

## CONCLUSION:

We concluded that *Moringa oleifera* is multipurpose used plant of miracle in plant kingdom. *Moringa oleifera* is a nature gift to mankind having several nutritive value like vitamin C and vitamin-A supplement. *Moringa oleifera* provide several medicinal and pharmacological uses and in near future it promising a good source of biodesal and biogas. Government and mankind about *Moringa oleifera* for their biodiversity, ethanobotanical, dietary and pharmacological prospective. *Moringa oleifera* is an extra ordinary plant because the all parts of the tree are edible medicinally and nutritionally important. *Moringa oleifera* seeds are very effective for coagulation, adsorbant and pesticide also. In near future it is very effective application in biotechnology.

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