

Processing of Moringa Oleifera Leaves to Develop Powder for Consumption: A Review

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Abstract: *Moringa Oleifera* is one of the most useful tropical trees. Its leaves are extremely valuable source of nutrition for people of all ages. Nutritional analysis indicates that *Moringa* leaves contain affluence of essential, disease preventing nutrients. The young leaves are edible and are commonly cooked and eaten like spinach or used to make soups and salads. *Moringa*, is a natural as well as cultivated variety of the genus *Moringa* belonging to family Moringaceae. It is one of the richest plant sources of Vitamins, Calcium, Copper, Iron, Potassium, Magnesium, Manganese and Zinc. It has more than 40 natural anti-oxidants. The leaves, pods, seeds, gums, bark and flowers of *Moringa* are used to relieve mineral and vitamin deficiencies, support a healthy cardiovascular system, promote normal blood-glucose levels, neutralize free radicals, provide excellent support of the body's anti-inflammatory mechanisms, enrich anemic blood and support immune system. It also improves eyesight, mental alertness and bone strength. It has potential benefit in malnutrition, general weakness, lactating mothers, menopause, depression and osteoporosis. We need to explore therapeutic, nutritional and benefit of this gift of nature reported to be one of the world's most useful trees.

Keywords: Moringa, benefits, nutritional value, therapeutic use

1. Introduction

Moringa is an easily propagated plant which thrives well in harsh environmental conditions. It is increasingly gaining global attention due to an excellent profile of nutrients and antioxidants. *Moringa* leaf is rich in minerals, amino acids, vitamins and -carotene. It also contains a rare combination of health-promoting antioxidants: zeatin, quercetin, sitosterol, caffeoylquinic acid and kaempferol. Currently, there is growing interest in the use of *Moringa* leaves as an ingredient in the preparation of herb tea.

“The Miracle Tree” owing to their multipurpose applications including as a source of food, medicine, edible oils, biofuel and applications for water sanitations. While the chemistry and pharmacology of the Indian *Moringa* along with its usage have been exhaustively studied, the scientific evidence to justify the multipurpose usage, The message of *Moringa* utilisation also appeared to be well received by consumers, and both fresh and dried powdered leaves of *M. stenopetala* are now widely sold in cities of Ethiopia and abroad as nutritional supplements.

Moringa has been used as a traditional medicine around the world, for anemia, skin infections, blackheads, anxiety, bronchitis, catarrh, chest congestion, asthma, blood impurities, cholera, glandular, swelling, headaches, conjunctivitis, cough, diarrhea, eye and ear infections, fever, abnormal blood pressure, hysteria, pain in joints, pimples, psoriasis, respiratory disorders, scurvy, semen deficiency, sore throat, sprain, tuberculosis, for intestinal worms, lactation, diabetes and pregnancy. The healing properties of *Moringa* oil have been documented by ancient cultures. *Moringa* oil has tremendous cosmetic value and is used in body and hair care as a moisturizer and skin conditioner. *Moringa* oil has been used in skin preparations and ointments since Egyptian times. The leaves possess

remarkable nutritional and medicinal qualities. They contain high amount of vitamin C, which fights a host of illnesses including colds and flu; vitamin A, which acts as a shield against eye disease, skin disease, heart ailments, diarrhea, and many other diseases; Calcium, which builds strong bones and teeth and helps prevent osteoporosis; Potassium, which is essential for the functioning of the brain and nerves, and Proteins, the basic building blocks of all our body cells. Another important point is that *Moringa* leaves contain all of the essential amino acids in a good proportion, which are the building blocks of proteins. These leaves could be a great boon to people who do not get protein from meat.

The moringa poses several health benefits.

Health Benefits of Moringa Powder:

- 1) Protect the eyes
- 2) Keep bones strong and healthy
- 3) Stimulate nervous system
- 4) Help to prevent heart disease
- 5) Boost immune system
- 6) Prevent growth of cancer cells
- 7) Prevent anemia in pregnant women
- 8) Helps in fetal bone & teeth development
- 9) Acts as detoxifying agent
- 10) Control the blood sugar level in diabetes

2. Material and Methods

Selection of raw material: Raw material for preparation of Herbal powder was fresh *Moringa* Leaves from the different yard of the Allahabad.

Processing equipment: Sieve, Electronic weighing balance, grinder (mixer), LDPE bags

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Washing: Collected leaves are washed in running tap water till the removal of dirt. After this leaves are soaked in 1% saline solution (NaCl) for 5 minutes to remove microbes. Leaves are further washed with 70 % ethanol followed by twice washing with distilled water. This step plays a substantial role in removal of dust, pathogens as well as microbes present on the surface of leaves.

Draining: The excess water can be removed by spreading the leaves in sunlight for a brief period till the removal of water present on the leaf surface.

Drying: The leaves are further dried in shade drying and also by tray drying to obtain complete removal of moisture.

Grinding: Dried leaves are grinded in grinder to obtain fine powder to utilize it for further use and consumption.

Packaging: The powder is been packed or stored in the polythene bags and air tight containers at ambient temperature.

3. Results and Discussion

On this regard, in the present investigation, efforts have been made to develop the herbal powder from *Moringa Oleifera* procument from different fields. The efforts were also made to develop technology for formation of herbal powder by utilizing *Moringa Oleifera* as a novel ingredient in formulation of herbal powder. Furthermore, the formulated product was evaluated for storage and microbial characteristics in order to predict the shelf life. Leaves can be eaten fresh, cooked, or stored as dried powder for many months without refrigeration, and reportedly without loss of nutritional value. *Moringa* is especially promising as a food source in the tropics because the tree is in full leaf at the end of the dry season when other foods are typically scarce. Leaves were also used for food fortification .Spoonful of the powder can then be added to baby food, soups, and vegetables, adding nutrition but not changing the taste. This powder can be used in place of fresh leaves to make lead sauces, or few spoonful of the powder can be added to other sauces just before serving.



Chemical Analysis of Final Product (Moringa Herbal Powder)

Parameters	Values (%)	
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Fat%	14	13.1
Protien%	12.3	5.8
Ash%	4	7.5
Ca(mg/100g)	19.6	14.8

Sensory Evaluation

The judgement was made by rating product on a 9-point hedonic scale with corresponding descriptive term ranging from 9 “like extremely” to “dislike extremely” to determine the pleasurable and unpleasurable feel of Moringa herbal powder. 10 untrained panellists aged between 18-35 years participated in the consumer test conducted. The sensory evaluation test was done on the basis of parameters as follow:

Organoleptic characteristics

Sample	Colour	Taste	Flavor	Appearance	Overall Acceptability	Mean
749	7.1	6.9	7	7.1	7	7.02
613	8.2	7.6	7.8	8	8	7.92

4. Conclusion

- *Moringa* powder has more appealing characteristics.
- The result of the chemical analysis showed the *moringa* could potentially exert the strongest influence on the sensory character of incorporating the powder in any product development.

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