

## Nutritional and Medicinal Properties of *Moringa oleifera*

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### INTRODUCTION

Dependency on chemical drugs to fulfil nutritional requirements and to cure various diseases of humans and animals is increasing with time. There is need of hour to minimize use of chemical drugs and increase use of plant-based products to cure diseases and deficiencies to avoid side effects of chemical drugs. There is long list of medicinal plants but nowadays Moringa plant has gained a respectful position in this list due to its high nutritional and medical properties. Moringa is also known by different names like *Moonga*, *Sahjan*, drumstick tree and *Moorunga* in different locations and it is native to Northern India. This plant is rich source of micronutrients, vitamins, antioxidants, antibiotics, carotenoids, essential and non-essential amino acids, protein, carbohydrate and lipid. It is perennial tree and every part of this tree is used for curing different diseases. Since ancient time, different parts of this tree are being used to cure impurity of blood, skin diseases, anemia etc.

**Nutritional value:** Each part (root, stem, leaves, pods, bark, seed) of the Moringa tree have beneficial properties that can serve humanity. It contains more than 90 nutritional chemical compounds in huge quantities. Leaves, pods and seeds are rich source of essential amino acids like Arginine, Histidine, Leucine, Lysine, Methionine, Phenylalanine, Threonine, Tryptophan and Valine and non-essential amino acids like Alanine, Cysteine, Glycine, Proline, Serine and Tyrosine. Availability of these vitamins makes it a useful food source for humans. Different micronutrients like Ca, Mg, S, Na, K, P, Fe, Zn, and Cu are present in leaves and pods of plant. Leaves also contain Vitamin A, Vitamin B2, Vitamin B3, Vitamin B7, Vitamin B12, Vitamin C and Vitamin E. Moringa seeds contains phytoconstituents like  $\beta$ -sitosterol, Niazinin, Quercetin, Niazimicin, Glycerol-1-(9-octadecanote).

Except seeds, other parts of plant like root, leaves, stem and flowers also contains phytoconstituents like kaempferol, 4-O-

glucopyranosyl-caffeoylquinic acid, 4-( $\alpha$ -L-rhamnosyloxy-benzyl) isothiocyanate etc.

**Table 1: Quantity of different constitutes in plant parts**

Constitutes	Leaves	Pods	Seeds
Macronutrients (g/100g of plant part)			
Proteins	25-30	6-43	29-38
Carbohydrate	0.1-44	0.1-38	0.1-21
Lipids	0.1-10	0.1-5	30-41
Fiber	0.1-28	0.1-27	0.1-7
Micronutrients (mg/100g of plant part)			
Calcium	440	30-240	260
Magnesium	25-1000	10-80	80
Iron	1-125	4-16	45
Sodium	160-270	200	Not determined
Potassium	260	250	Not determined
Phosphorus	70-300	110-195	Not determined
Vitamins (mg/100g of plant part)			
A	6-18	ND	ND
B2	0.05-20	ND	ND
B3	0.8-8	ND	ND
B7	425	ND	ND
B12	0.06-2.64	ND	ND
E	75	ND	ND
C	15-220	ND	ND
Essential amino acids (g/100g of plant part)			
Arginine	0.4-1.8	0.36	4.5
Histidine	0.1-0.7	0.11	2.3
Leucine	0.4-2.2	0.65	6.7
Lysine	0.3-1.4	0.15	1.5
Methionine	0.1-0.5	0.15	2.4
Phenylalanine	0.3-1.6	0.43	4.0
Threonine	0.1-1.3	0.39	3.1
Tryptophan	0.1-5.2	ND	1.6
Valine	0.4-1.4	0.54	4.3

**Uses and products:** Different plant parts of moringa are used to prepare food items. Young pods are consumed raw or cooked in many developing countries to fulfil demand of nutrition. Seeds are also consumed raw or cooked and powder of seeds is also prepared which is consumed with main food items. Antioxidant compounds are available in abundant quantity in seed powder which are

helpful in heart related diseases. Excessive use of seed powder can cause stomach-ache. Pregnant ladies should avoid use of seed powder without consult of doctor but leaf powder of moringa plant is beneficial for pregnant ladies.

**Medicinal properties:** Moringa plants possesses anti-pyretic, anti-ulcer, anti-epileptic, diuretic, cholesterol lowering, anti-

diabetic, and hepatoprotective properties. Different parts of plant are being used to cure diseases like anemia, asthma, blood impurities, bronchitis, catarrh, chest congestion, cholera etc.

- Extracted oil from moringa seeds are used to cure liver related disease and insomnia.
- Red blood cells in blood is increased by consumption of seeds.
- Blood sugar and cholesterol level could be reduced by consumption of seed powder due to availability of niaziminin and isothiocyanate.
- Seed oil is helpful in reducing hair fall and to increase skin glow. Skin diseases could be cured with moringa products.

- Anti-inflammatory properties of moringa is helpful in treatment of edema.
- Moringa extracts reduces development of cancer cells.
- It is helpful in arthritis due to availability of calcium and phosphorus.
- Moringa is supportive in treating depression, anxiety, and fatigue.
- Consumption of moringa products increases eyesight.
- Anemia and sickle cell disease is reduced by moringa products due to availability of iron mineral.

Plant parts	Properties
Leaves	Antiatherosclerotic, Anti-inflammatory, Anti-cancer, Antimicrobial, Antioxidant, Hepatoprotective, Hypocholesterolemic, Hypoglycaemic, Hypolipidaemic, Immunomodulatory, Nephroprotective, Neuroprotective
Roots	Anti-inflammatory, Antimicrobial, Hepatoprotective, Nephroprotective
Flowers	Antimicrobial, Hepatoprotective, Nephroprotective
Pods	Anti-cancer, Anti-inflammatory, Antimicrobial, Antioxidant
Seeds	Anti-inflammatory, Anti-cancer, Antimicrobial, Antioxidant, Antitumor