



PROMINENT SOURCE OF NUTRIENTS & HEALTH BENEFIT - *SAHJAN*

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Abstract-

Now a day, the socioeconomic status has been changed a lot so people are now aware and more concerned about their health. They have knowledge about the detrimental effects of synthetic products. That is why they are interested in natural product. Utilization of natural product of plant origin having fewer side effects has gained popularity over the years. There is immense scope for natural products that can intimate health benefits beyond traditional nutrients. *Sahjan* has been used for centuries due to its medicinal properties and health benefits. *Sahjan* leaves have been found to contain the majority of essential nutrients required to maintain good health. *Sahjan* leaf is rich in multiple minerals and vitamins including iron, vitamin A and vitamin C. moreover *Sahjan* may help to resolve multiple malnutrition problems as it contains all essential amino acids, the building block for the protein crucial to cell growth and metabolism. Especially infant and children are benefitted more through high nutrient content of leaves.

Advanced modern medical science has no doubt extended the life span of the human, but the new upcoming health problems are also awaiting their solution. Humans have to suffer many problems related with health in day to day life. To overcome these problems he has to keep his body and mind strong and healthy. The nutritional requirement of human body reflects the nutritional intake necessary to maintain optimal body function and to meet the body daily energy needs.

Need to study- Every part of *Sahjan* has useful properties which can serve mankind and it can be one of the promising plants for further research activities. I aimed to explore and evaluate the effect of

consumptions of Sahjan (moringa) across disciplines for its medicinal value and deals with nutrition and prominent pharmacological properties of this “Miracle Tree” along with a regular diet.

KEYWORDS- Nutrition, life span, insufficient, balance of body, *Sahjan*.

Introduction-

Moringa (*Moringa oleifera*) is a type of local medicinal Indian herb. *Sahjan* (Moringa) is an Angiospermic plant commonly known as the ‘drumstick’ or ‘horseradish’ tree. The other terms used for Moringa are Mulangay, Mlonge, Benzolive, Sajna, Kelor, Saijihan and Marango. It belongs to genus Moringa (*Sahjan*) having 13 different species. Among them, *Sahjan* (Moringa) is the most widely cultivated species native to tropical and sub-tropical region of world [1].

In fact *sahjan* is provide 7 times more vitamin C than oranges, 9 times more protein than yoghurt, 10 times more vitamin A than carrots, 17 times more calcium than milk, 15 times more potassium than bananas and 25 times more iron than spinach [2].

Sahjan (Moringa) is a small native tree of the sub-Himalayan regions of North West India, which is now indigenous to many regions in Africa, Arabia, south east Asia, the pacific, Carrabin Islands and South America. Traditionally, besides being a daily used vegetable among people of these regions, the *Sahjan* (Moringa) is also widely known and used for its health benefits. Among commoners, it has earned its name as “the miracle tree” due to its amazing healing abilities for various ailments and even some chronic diseases [3].

Scientific Plant classification- [4]

Kingdom: Plantae,

Division: Magnoliphyta,

Class: Magnoliopsida,

Order: Brassicales,

Family: Moringaceae,

Genus: Moringa,

Species: *M. oleifera*



Figure-1

Origin and distribution

Sahjan (Moringa) is native of the western and sub - Himalayan, India, Pakistan, Asia Minor, Africa and Arabia. *Sahjan* (Moringa) is bisexual and highly cross-pollinated plant due to heteromorphism, so it is now distributed all over world. It is a graceful, deciduous tree with sparse foliage, belonging to family Moringaceae. The tree ranges from 5 to 10 meter in height. The **Leaves** are alternate, the old ones soon fall off and each leaf large up to about 90 cm long, with opposite pinnae. They are 5cm away from the central stalk of the plant. *Sahjan* (Moringa) contains slightly larger terminal leaflets with leaflets in opposite pairs. **Leaflets** are dark green above and pale on the under surface and variable in size and shape, but often rounded-elliptic, as much as 2.5 cm long.

Flowers are produced throughout the year, in loose axillary panicles up to 15cm long. **Fruit** large and distinctive, up to 90 cm long and 12 mm broad, slightly constricted at intervals, gradually tapering to a point, with 2 grooves on each face and they are light brown in color. In order to expose the rows of rounded blackish oily **seeds**, each with 3 papery wings, it splits along each angle. The tree shape is forked from the base area. **Bark** is smooth, dark grey slash thin and yellowish [5]. The **Twigs** and shoots of the tree are short which have dense hair. The Crown is made up of single stem wide, open, and typically umbrella shaped. The tree is deep rooted and wood is soft.



Figure -2

Nutritional properties

Sahjan (Moringa) is called a ‘Miracle Tree’ due to its multipurpose nutritional uses and capacity to cure many diseases. Through research, every part of plant has found to contain many essential and reserved nutrients. The Leaves of *Sahjan* (Moringa) are rich source of minerals like calcium, potassium, zinc, magnesium, iron and copper. The Leaves has low calorific value so can be used in the diet of obese. The leaves also contain all essential amino acids and are rich in protein and minerals. A Pod contains around 46.78% fiber, 20.66% protein and are highly valued for curing digestive problem and colon cancer. Vitamins like vitamin A, Vitamin B, Beta-carotene, pyridoxine, omega 3 & 6, fatty acid, nicotinic acid, vitamin C, Vitamin D and E also present in abundant amount in *Sahjan* (Moringa) [6].



Figure-3

Sahjan has abundant amount of calcium which is considered as one of the important minerals for human growth. While 8 ounces of milk can provide 300–400 mg, *Sahjan* leaves can provide 1000 mg and *Sahjan* powder can provide more than 4000 mg. Hence, it can be used as a substitute of anemia. It has been reported that higher amount of iron is present in *Sahjan* than spinach [26]. A good dietary intake of zinc is essential for proper growth of sperm cells and is also necessary for the synthesis of DNA and RNA. *Sahjan* (Moringa) leaves show around 25.5–31.03 mg of zinc/kg, which is the daily requirement of zinc in the diet [7].

Medicinal properties

Sahjan (Moringa) has several medicinal properties and has potentiality to cure many diseases. It is used to treat diseases such as diabetes, heart disease, anemia, arthritis, respiratory problems, skin, liver problems, paralysis, sterility, rheumatism, digestive disorders and many more. In India, it was named the 'plant of the year' in 2008 by the National Institute of Health and Family Care [8]. Several other countries like Africa; it is also used for the treatment of ascites, pneumonia and venomous bites. According to various researches, the leaves are said to be anti-fungal, anti-viral, anti-abortion, and act as flocculating agent and stimulants. *Sahjan* powder can be used as a substitute for iron tablet, hence a treatment for anemia. The health benefits of this wonderful tree appear to be boundless.

Anti-inflammatory

The most promising uses of *Sahjan* (Moringa) extract is in the treatment of many types of chronic and acute inflammations. Inflammation can lead to chronic diseases like diabetes, respiratory problems, cardiovascular disease, arthritis, and obesity. *Sahjan* reduces inflammation by suppressing inflammatory enzymes and proteins in the body, and leaf concentrate can significantly lower inflammation in the cells [9].

Analgesic Activity

Different parts of *Sahjan* trees (leaves, pod, roots, etc.) showed analgesic activity. The alcoholic extract of *Sahjan* (Moringa) leaves showed identical analgesic activity which was found through tail immersion method [10]. In another study, methanol extract of *Sahjan* (Moringa) was tested in frog and guinea pig which showed that the plant (root bark) in both animals has produced significant local anesthetic activity [11].

Antipyretic Activity

The antipyretic activity of *Sahjan* (Moringa) was assessed in rats using different extracts (ethanol, petroleum ether, and ethyl acetate etc.) where seed extracts (ethanol and ethyl) showed significant activity [12].

Wound Healing Activity-

Sahjan has blood-clotting properties in its leaves, roots, and seeds that benefit wound healing and can reduce clotting time, which means it reduces the time it takes for scratches, cuts, or wounds to stop bleeding. Antipyretic and wound healing properties from the ethyl acetate and ethanolic extracts of *Sahjan* (Moringa) leaves were described by V.I. Hukkeri. The extracts (aqueous) from *Sahjan* showed significant pro-healing actions and a perfect wound healing characteristic [13].

Brain health activity

Sahjan strongly support for brain health and boost cognitive power due to its antioxidant and neuro-enhancer activities. It has shown several preliminary results as a treatment of Alzheimer's disease. The high amount of vitamin C and E helps to improve brain function and also normalize the neurotransmitters serotonin, dopamine and noradrenalin in the brain which play a key role in memory, mood, organ function, responses to stimulus such as stress and pleasure, and mental health like depression and psychosis [14].

Ocular health & disease activity-

The major cause of blindness, which ranges from impaired dark adaptation to night blindness, is vitamin A deficiency. *Sahjan* (Moringa) leaves, pods and leaf powder contain high concentrations of vitamin A, which can help to prevent night blindness and eye problems. Also, consumption of leaves with oils improved vitamin A nutrition and delayed the development of cataracts [15].

Cardiovascular system Effects

Sahjan leaf powder has heart-healthy benefits, particularly to control blood lipid, the prevention of plaque formation in the arteries, and reduced cholesterol levels. *Sahjan* leaf juice has very important role on stabilizing blood pressure. Mustard oil glycosides and thiocarbamate glycosides have been isolated from *Sahjan* (Moringa) leaves, which had been observed to be responsible for lowering of blood pressure [16].

Anti-diabetic Activity-

Sahjan is reported as an important element in controlling diabetes. *Sahjan* leaves are reported as a significant agent in reducing blood glucose level immediately after taken [17]. *Sahjan* has a huge role as an anti-diabetic [18]. Its leaf powder is very effective at reducing lipid and glucose levels as well as regulating oxidative stress in diabetic patients, which means it lowers blood sugar and cholesterol level and improves protection against cell damage. *Sahjan* has been presented to cure both Type 1 and Type 2 diabetes patients. Several studies have been proven that, *Sahjan* (Moringa) can act as an anti-diabetic agent [19, 20].

Hepato-protective Activity

Sahjan play very crucial role to protect liver against damage, oxidation, toxicity due to high concentrations of polyphenols in its leaves and flowers. *Sahjan* (Moringa) oil can also restore liver enzymes to normal levels, reducing oxidative stress, and increasing protein content in the liver [20]. The liver is responsible for blood detoxification, bile production, fructose metabolism, fat metabolism, and nutrient processing, and it can only fulfill these functions with the aid of liver enzymes, so it's vital they stay at normal levels. For instance, lower levels of hepatic enzymes can impair its ability to filter the blood. The characteristics of protection against liver damage are reported about *Sahjan* leaf extracts, and they also help in reducing liver fibrosis [21].

Antispasmodic and Antiulcer activity-

Because of the spasmolytic activity of *Sahjan*, it is used traditionally to treat gastrointestinal motility disorder [22]. The root bark of *Sahjan* has potential to cure gastric ulcers and gastric mucosal lesions. It also decreases the acidity and increases the pH of gastric juice. Hence, *Sahjan* (Moringa) possesses antiulcer and anti-secretary activity and hence, can be used as a source for antiulcer drugs [23].

Use in malnutrition

Sahjan (Moringa), an edible tree found worldwide in the dry tropics, is increasingly being used for nutritional supplementation. The Food and Agriculture Organization describes Moringa as a very useful plant with lots of health benefits. Some research articles have shown that *Sahjan* is a plant that can help in reducing malnutrition among children and women [24]. So, *Sahjan* could be a best option to reduce malnutrition problem.

Sahjan contains various essential phytochemicals in its leaves, seeds and pods and it is one of the effective remedy for malnutrition. Over 148 million children under the age of five in developing countries were undernourished in 2023 [25]. Food insecurity, lack of access to health care social, cultural, and economic class, all play a major role in explaining the prevalence of under-nutrition. *Sahjan*, can be one of the best option to reduce malnutrition. *Sahjan* plant is also considered as important famine food because of its high resistance to drought and arid conditions owing to their tuberous roots [26]. Due to the incredible character of *Sahjan* to solve the hunger problem many international humanitarian organization and world health organization (WHO) have used it to combat malnutrition in many parts of the world [27].

Table 1: Medicinal uses of different parts of the Sahjan (Moringa)

Part	Uses
Leaves	Generally used for the treatment of asthma, bronchitis, hyperglycemia, dyslipidemia, flu, heart burn, syphilis, malaria, pneumonia, diarrhea, headaches, scurvy, skin diseases, eye and ear infections. Also it reduces, blood pressure and cholesterol, and it has anticancer, antimicrobial, antioxidant, anti-diabetic, and anti-atherosclerotic properties and it acts as a neuro-protectant agent.
Seeds	<i>Sahjan</i> seeds used for treating hyperthyroidism, Crohn's disease, anti-herpes-simplex virus, arthritis, rheumatism, gout, cramp, epilepsy, sexually transmitted diseases, and they also act as antimicrobial and anti-inflammatory agents.
Root bark	Used as a cardiac stimulant, antiulcer, and anti-inflammatory agent.
Flower	Used as a hypo-cholesterol emic, anti-arthritic agents and can cure urinary problems.
Pods	Had a potential role for the treatment of diarrhea, liver & spleen problems and joint pain.

Why Is *Sahjan* known as the Miracle Tree?

The *Sahjan* grows quickly and they grow from seeds or cuttings of branch of trees. The tree leaves are something more than amazing though they grow quickly in poor soil within a very short period. Moreover, the tree is sustainable at dry and hot climates and is resistant to drought. The leaves, fruits, flowers, and immature pods of this tree are edible, and they form a part of traditional diets in India with many countries of the tropics and subtropics [28, 29].

Sahjan is rich in nutrition owing to the presence of a variety of essential phytochemicals present in its leaves, pods, and seeds. The small leaves of *Sahjan* pack a full punch of nutrients which contain more protein than eggs, more iron than spinach, more vitamin A than carrots, and more calcium than milk. The *Sahjan* is found as a good source of energy with potential as pharmaceuticals and cosmetics (oils from seeds for hair and skin care) benefits. *Sahjan* seeds are also rich in vitamins and minerals. Seed extracts show antibacterial activity and are also used as a water purifying agent [30]. People suffering from malnutrition and poverty found *Sahjan* (Moringa) as a super food because of its nutritional alternatives.

Table-2, Nutrient compositions (All values 100 g per material) of leaves, leaf powder, seeds & pods [30]

Nutrients	Fresh leave	Dry leaves	Leaf powder	Seed	Pods
Calories (cal)	92	329	205	-	26
Protein (g)	6.7	29.4	27.1	36	2.5
Fat (g)	1.7	5.2	2.3	39	.01
Carbohydrate (g)	12.5	41.2	38.2	8.7	3.7
Fiber (g)	0.9	12.5	19.2	2.8	4.8
Vitamin B1 (mg)	0.06	2.02	2.64	0.05	0.05
Vitamin B2 (mg)	0.05	21.3	20.5	0.06	0.07
Vitamin B3 (mg)	0.8	7.6	8.2	0.2	0.2
Vitamin C (mg)	220	15.8	17.3	4.6	120
Vitamin E (mg)	448	10.8	113	752	-
Calcium (mg)	440	2185	2003	45	30
Magnesium (mg)	42	448	368	636	24
Phosphorus (mg)	70	252	204	75	110
Potassium (mg)	259	1236	1324	-	259
Copper (mg)	0.07	0.49	0.57	5.30	3.1
Iron (mg)	0.85	25.6	28.2	-	5.3
Sulphur (mg)	-	-	870	0.05	137

Conclusion

In recent times, people are aware about health-related issues, and they are very much interested in taking healthy and nutritious food. While annually under nutrition kills or disable millions of children. It often causes disease and disability in the survivors and prevents millions more from reaching their full intellectual and productive potential. Maternal and child under nutrition is the underlying cause of 3-5 million deaths, and 35% of disease burden in children younger than 5 year. For instance, food which has a wide range of health benefits may prevent or cure various chronic diseases. This kind of extraordinary food is also termed as super food and nutritious food. It is proven in numerous cases that the *Sahjan* (Moringa) possesses a wide range of medicinal and therapeutic properties. For instance, in this paper, it views the general nutrition contents of the *Sahjan* up to several specific remedial properties including its

anti-fibrotic, effect on brain health, anti-inflammatory, anti-microbial, anti-hyperglycemic, anti-oxidant, hepato-protective activity and wound healing etc. properties. Further studies for the mechanism of action and constituents of the *Sahjan* may provide incredible capabilities to develop pharmacological products. In conclusion, *Sahjan* (Moringa) has numerous applications in medicinal field.

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