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A Review on Nutritive and Medicinal Importance of *Shigru* (*Moringa Oleifera Lam.*).

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ABSTRACT:

Ayurveda seeks to promote total health. Ayurveda prioritises maintaining health before treating diseases by reducing their symptoms. Additionally, it has been described as the science of age protection (ayu.). Diet, sleep, and brahmacharya(abstinence) are the three sub-pillars of health. *Aahar*, in our opinion, is crucial for maintaining both a healthy body and mind. *Shigru* (*Moringa oleifera*) is an anti-oxidant herb. It guards against numerous infections and shields the body from free radicals. *Shigru* is a plant with a wide variety of therapeutic applications and great nutritional value. At various locations, the various portions of this plant are used as food. It is used to treat conditions like high blood pressure, diabetes, malnutrition, arthritis, and joint diseases. This article has reviewed and explained the different health advantages of using *shigru* as well as how to use it as *Aahar*.

Keywords: *Moringa oleifera*, *Aahar*, Health, *Shigru*

INTRODUCTION

Moringa oleifera is a small, fast-growing tree found in all tropical regions. *Moringa* tree leaves are among the world's richest vegetables. *Moringa oleifera* tree is a plant food of high nutritional value, ecologically and economically beneficial and readily available in the countries hardest hit by the food crisis. All tropical areas include the tiny, quickly-propagating *Moringa oleifera* tree. The world's wealthiest veggies include the leaves of the *moringa* tree. The *moringa oleifera* tree is a plant food with great nutritional content that is also advantageous for the environment and the economy and is widely available in the nations that are most affected by the food crisis. The name "The Miracle tree" refers to the unique combination of vitamins, minerals, and amino acids found

in *moringa*. Because the tree produces immature pods, it is frequently referred to as the "Drumstick tree." Due to the flavour of its root, it is also known as the "horseradish tree" and "the benzoyl tree" in other locales (because of the oil that its seeds produce).

Dried leaves from the *Moringa oleifera* tree are easily kept and useful.¹ A child can consume 30 grammes of *Moringa oleifera* tree leaf powder everyday and meet all of his needs for vitamin A, 80% of his needs for calcium, 60% of his needs for iron, and almost 40% of his needs for protein. Local resources like the *Moringa oleifera* tree must be used. One family just requires two or three *Moringa oleifera* trees in a courtyard.¹

Moringa oleifera is frequently called the "wonder tree"



because of the wide range of nutritional, therapeutic, and cleansing qualities it possesses. The "superfood" moringa has the extraordinary potential to drastically enhance health and end hunger worldwide. The *Moringa oleifera* tree is rich in phytonutrients and other potent disease-fighting antioxidants, as well as high levels of protein, all eight necessary amino acids, a full range of vitamins, and minerals. The *Moringa oleifera* tree is swiftly becoming a go-to plant for preventing infection, reducing inflammation, encouraging healthy blood flow, and combatting malnutrition due to its many beneficial uses and ease of growth in semi-arid, tropical, and subtropical regions. Every component of the *Moringa oleifera* tree, including the bark, leaves, blossoms, and roots, has a special function in enhancing human health, which makes it extremely special. Rich in amino acids - The *Moringa oleifera* tree's leaves contain 18 amino acids, eight of which are necessary amino acids, making them a "complete" protein, which is unusual for plants². As a matter of fact, the protein content of the *Moringa oleifera* tree is comparable to that of meat, making it a superior source of protein for vegetarians and vegans. Of course, protein is necessary for the synthesis of enzymes and hormones as well as for the maintenance and growth of blood, skin, bone, cartilage, and muscle.

Calcium and magnesium from the *Moringa oleifera* tree - one serving of *Moringa oleifera* tree leaves contains about 125 percent of our RDI for calcium and 61 percent of our RDI for magnesium.³ While calcium is necessary to develop strong bones and teeth, we also need magnesium to aid in calcium absorption. These two trace minerals complement one another. The abundance of both in *Moringa oleifera* makes it particularly effective at protecting us against bone diseases like osteoporosis. The *Moringa oleifera* tree nourishes the skin: Dried and powdered *Moringa oleifera* leaves are excellent for nourishing the skin since they contain trace minerals. For this reason, extracts from the *Moringa oleifera* tree are starting to appear in the products of an increasing number of cosmetic enterprises. Applying creams and lotions made from the *moringa oleifera* tree topically to the desired regions will allow the nutrients to penetrate the skin and renew it. As a result of their high fibre content and low fat and calorie content, *Moringa oleifera* tree leaves have also been associated to reduced blood pressure, better digestion, mood, and immune-boosting effects.

There are two so-called "Moringine" alkaloids found in the root bark that have an impact on the nervous system.⁴ The root of *shigru* contains pterygospermin, an antibiotic that is

both antifungal and antibacterial. Numerous phytoconstituents are present in various *Moringa* species, including alkaloids, saponins, tannins, steroids, flavonoids, and terpenes.

The plant *moringa* is one that has been used to increase breastmilk production. *Moringa* leaves offer a boost in prolactin levels as well as essential nutrients. *Moringa* leaves, which also provide essential nutrients to support nursing, raise prolactin.

Ayurveda uses the plant *shigru* to treat a variety of conditions, including *Krimi* (wormicidal), *Kustha* (skin problems), *Kandu* (itching), *Ashmari* (stone), and *Sopha* (inflammation).⁵

Moringa has a pungent and bitter flavour to its juice (taste). It has *katu vipaka* (pungent taste conversion after digestion), *ushna virya* (hot potency), and *laghu* (light), *rooksha* (dryness), and *teekshna* (strong piercing) in *guna* (qualities). It also balances *kapha* and *vata*.

MATERIAL AND METHODS

Material related to *Moringa oleifera* is collected from Bhavprakash Nighantu, Dhanvantri Nighantu, Nighantu Aadarsha, Kaiyadeva Nighantu, many other classical Ayurvedic literatures, textbooks and from various scientific published journals. The available commentaries of the Ayurvedic Samhitas has also referred to collect relevant matter.

Nutritional value of Moringa:

Every part of *M. oleifera* is a storehouse of important nutrients and antinutrients. The leaves of *M. oleifera* are rich in minerals like calcium, potassium, zinc, magnesium, iron and copper.⁵ Vitamins like beta-carotene of vitamin A, vitamin B such as folic acid, pyridoxine and nicotinic acid, vitamin C, D and E also present in *M. oleifera*.⁶ Phytochemicals such as tannins, sterols, terpenoids, flavonoids, saponins, anthraquinones, alkaloids and reducing sugar present along with anti-cancerous agents like glucosinolates, isothiocyanates, glycoside compounds and glycerol-1-9-octadecanoate.⁷

A research shows that that immature pods contain around 46.78% fiber and around 20.66% protein content. Pods have 30% of amino acid content, the leaves have 44% and flowers have 31%. The immature pods and flowers showed similar amounts of palmitic, linolenic, linoleic and oleic acids.⁸

Moringa has lot of minerals that are essential for growth and development among which, calcium is considered as

one of the important minerals for human growth. While 8 ounces of milk can provide 300–400 mg, moringa leaves can provide 1000 mg and moringa powder can provide more than 4000 mg. Moringa powder can be used as a substitute for iron tablets, hence as a treatment for anemia. It has been reported that moringa contains more iron than spinach.⁹ 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. *M. oleifera* leaves show around 25.5– 31.03 mg of zinc/kg, which is the daily requirement of zinc in the diet.¹⁰

A point to note is that the nutrient composition varies depending on the location. Fuglie.¹¹ revealed that seasons influence the nutrient content. It was shown that vitamin A was found abundantly in the hot-wet season, while vitamin C and iron were more in the cool-dry season.¹¹ The difference in results can be attributed to the fact that the location, climate and the environmental factors significantly influence nutrient content of the tree.¹² A complete list of nutrients available in leaves, pods and seeds are shown in Table

The nutrient compositions of leaves, leaf powder, seeds and pods. Table 1

A 2g teaspoon of Moringa Harvest dried Moringa leaf powder contains:

Phytoconstituents of plant moringa oleifera^{11,12} Table 2

Rasa-Panchaka:¹

- *Rasa: Katu, Tikta*
- *Guna: Laghu, Ruksha, Teekshna*
- *Veerya: Ushna*
- *Vipaka: Katu*
- *Doshaghnata: Vaata, Kapha*
- *Karma: Deepana, Hrudya, Vidahakruta, Vishgna, Shukrala, Chakushya, Vaataghna*

Medicinal uses:^{1,14}

External uses: Bark and leaf paste causes burning, is anti-inflammatory, and works on abscesses. On inflammation, it is topically applied, and abscess. The best *shirovirechan nasya* is seed powder, which is administered nasally for headaches and head heaviness brought on by *kapha*. Because seed oil is analgesic, it is used to treat painful conditions like rheumatoid arthritis.

Internal Uses:¹⁵

Nervous system: It stimulates the nerves since it is *tikshna* and *ushna*. The bark's non-crystalline part has a potent

effect and activates the body's afferent neurons. Blood vessel contractions, hypertension, and a quicker heartbeat are the outcomes of this. It performs better than the muscles of the digestive and respiratory systems. The pupil expands, similar to how ephedrine and adrenaline do. Tender plant roots can help people with epilepsy.

Digestive system: It possesses a variety of digestive qualities, including *vidahi*, *grahi*, analgesic, antibacterial, and deworming capabilities because of its pungency and *tikshna* character. *Madhu Shigru* has a purgative effect because it is thick and sweet. Ascites, *gulma*, tastelessness, loss of appetite, and worms are all alleviated by it.

Circulatory system: *Ushna guna* promotes hypertension, stimulates the heart, and has anti-inflammatory qualities. It aids in reducing inflammation and heart deterioration.

Respiratory system: *Kaphaghna* beneficial for *kaphaj kasa*. Seed powder is advantageous for *Shodhan Nasya*.

Reproductive system: It accelerates menstruation and helps with dysmenorrhea and blocked menstruation because it is *ushna* and anti-inflammatory.

Urinary system: The kidneys are stimulated and produce more pee since it is *Ushna, tikshna*. Dysuria is alleviated by it. Calculi can be aided by its decoction. It is not utilised in cases of hydronephrosis since it irritates and inflames the kidneys.

Skin: *Ushna and Tikshna* cause perspiration. Therefore, skin problems are treated with its hot infusion. Fresh bark paste is put to the incision and bandaged if there are maggots there. All maggots start off smelling bad.

Aamayika prayoga:

- According to Acharya Charaka, *shigru* decoction is helpful for tub baths when treating *shushkarsha* (haemorrhoids).^[15] *Granthivisarpa* can also benefit from *Shigru* bark paste.¹⁶ *Hikka* and *Shwasa vydhi* (Respiratory illnesses) are treated by administering a *shigru* leaf decoction internally.¹⁷
- In *Kustha kshata*, *shigru* oil was used, according to Acharya Sushruta (Leprosy).¹⁸ *Apachi* uses powdered moringa seed to make *nasya*.¹⁹
- Acharya Vagbhata uses *Madhu Shigru* for external application, as well as in food and beverage preparation.²⁰
- According to Acharya Harita, jaggery and moringa root juice can relieve headaches.
- If *Shigru* decoction is administered alongside *Madhu, Krimiroga* (Microbial illnesses) will quickly disappear.
- *Shigrumool twak* is applied externally in cases of *Dadru vyadhi* (Skin disorder).

Pharmaceutical effects:

Antiepileptic activity: Methanolic extract of Moringa

oleifera leaves shown effective anti-convulsant efficacy against pentylenetetrazole at dose levels of 200 mg/kg and 400 mg/kg given intraperitoneally, and maximum electroshock induced convulsions. Phenytoin and diazepam were utilised as a baseline. Methanolic extract significantly reduced the length of limb extension in MES test and significantly slowed down the onset of seizures in Ptz-induced convulsions at both dose levels.²¹

This could be as a result of the extract's alkaloids, flavonoids, and tannins content.

Antioxidant activity: Aqueous and alcoholic extracts of *Moringa oleifera* leaves and roots (methanolic and ethanolic) demonstrated significant in-vitro antioxidant and radical scavenging activities. Its leaves may protect animals from illnesses brought on by oxidative stress as they are a rich source of antioxidant compounds. The oxidative damage brought on by a high-fat diet appears to be stopped by administering an extract from *Moringa oleifera* leaves.²²

Anticonvulsant activity:

Studies were conducted on Swiss albino mice to find out the in-vivo anti-convulsant impact of an ethanolic extract of *Moringa concanensis* leaves (200 mg/kg, i.p). Observation revealed inhibition of tonic limb extension and MES seizures. In PTZ seizures, the convulsions disappeared.

Given that it eliminated both the hind limb extension caused by MES and the seizures brought on by PTZ, the ethanolic extract of *Moringa concanensis* leaves may exert its anti-convulsant actions through a number of different routes.²³

Anti-diabetic activity:

The aqueous extract of *Moringa oleifera* leaves exhibits glycemic control and has anti-diabetic properties.²⁴

In streptozotocin (STZ)-induced diabetic albino rats, the effects of methanol extracts of *Moringa oleifera* pods on antioxidant and antidiabetic activity were examined. After administering 150 or 300 mg/kg of extract to diabetic rats for 21 days, the antidiabetic effects were assessed by observing changes in serum and pancreatic tissue biochemical parameters.

Following treatment with the extract, the progression of diabetes was greatly slowed down. Both doses of the extract significantly decreased the levels of serum glucose and gas in the treated rats while simultaneously raising the levels of serum insulin and protein.²⁵

On male STZ-induced diabetic rats, the antidiabetic effect

of two dosages of *Moringa* seed powder, 50 and 100 mg/kg, was examined. In comparison to the negative control group, the diabetic positive control group's blood and kidney tissue homogenate had higher levels of IL-6, higher levels of lipid peroxide, and lower levels of an antioxidant enzyme.²⁶

Anti-fertility activity:

An aqueous extract of *Moringa oleifera* roots was successful as an anti-fertility agent both with and without estradiol dipropionate and progesterone. In order to examine the effect on the uterine histoarchitecture both before and after implantation, aqueous extract was used in the in-vivo antifertility activity and histopathology study.²⁷

Cardiovascular activity:

Moringa oleifera leaf ethanolic extract shown strong anti-hypertensive or hypotensive action. Thiocarbamate and isothiocyanate glycosides were shown to be responsible for this potent hypotensive effect during in-vivo testing on animal hearts.²⁸

Anti urolithiatic activity:

The *Moringa oleifera* bark extract was used to perform the in-vitro anti-urolithiatic activity. It demonstrated a decrease in the weight of stones created by glycol-induced urolithiasis. Furthermore, it has curative and preventative properties.²⁹

Anti-asthmatic activity:

The effectiveness of *Moringa oleifera* seed kernel in bronchial asthma patients was examined in a study. Three grammes of finely powdered dried seed kernels were administered to patients of either sex who had mild-to-moderate asthma for three weeks.

A spirometer was used to measure the clinical efficacy before and after the treatment.

The majority of patients had higher haemoglobin levels. Erythrocyte sedimentation rate decrease and (Hb) values (ESR). Additionally, improvements were seen in the intensity of asthmatic attacks and the symptom score. Following a three-week course of treatment, asthmatic participants showed a considerable improvement in their forced capacity, forced expiratory volume in one second, and peak expiratory flow rate, with respective improvements of 32.97 6.03%, 30.05 8.12%, and 32.09 11.75%.³⁰

Acetylcholine, histamine, Bac12, and 5HT-induced bronchospasms were found to be spasmolytic in alcoholic

extracts of *Moringa oleifera* seed kernels.³¹

Hepatoprotective activity: *Moringa oleifera*'s ethanolic leaf extract and alcoholic seed extract were tested in vivo for their ability to prevent liver damage brought on by the drugs isoniazid, rifampicin, and pyrizinamide.

The effects of dosages of the crude extract (CE) on the liver and kidney functions, as well as hemological and hepatorenal functions of the methanolic extract of *Moringa oleifera* roots, were also reported.³²

Anti-inflammatory activity:

There is anti-inflammatory action in the methanolic and aqueous extract of the root and bark, the methanolic extract of the leaves and flowers, and the ethanolic extract of the seeds of *Moringa oleifera*. Pharmacological testing was done on the extract and the in-vitro anti inflammatory activity of hot water infusions of *Moringa oleifera* flowers, leaves, roots, seeds, and stalks or bark.³³

Anti-cancer activity:

Ethanolic extracts of *Moringa oleifera*'s leaves and seeds exhibit strong anti-tumor action. Isolated substances that are linked to thiocarbamate and isothiocyanate and which serve as tumour promoter inhibitors. Interestingly, three recognised thiocarbamate and isothiocyanate related compounds that function as inhibitors of tumour promoter teleocidin B-4-induced Epstein-barr virus were present, which contributed to the in-vivo anticancer potential.³⁴

CNS activity: Extract from *moringa oleifera* leaves raises monoamine levels in the brain, which is beneficial for treating Alzheimer's disease. The aqueous extract of *Moringa oleifera* roots and the ethanolic extract of the leaves were tested and evaluated for their in-vitro anticonvulsant efficacy on penicillin-induced convulsion, locomotor behaviour, brain serotonin (5-HT), dopamine, and norepinephrine levels.³⁵

Moringa oleifera seeds, roots, bark, and leaves exhibit anti-bacterial and anti-fungal properties. By using the disc-diffusion method, the plant has in vitro action against bacteria, yeast, dermatophytes, and helminths. *Pseudomonas aeruginosa* and *staphylococcus aureus* are unable to thrive when the seeds and fresh leaves are used.³⁶

Anthelmintic activity:

An in-vitro study evaluated the effectiveness of fresh *Moringa oleifera* versus macerated and infused aqueous extract and ethanolic extract.

Haemonchus contortus eggs, embryonated eggs, L1 and L2 larvae. Five distinct extract concentrations (0.625, 1.25, 2.5, 3.75, and 5 mg/mL) were created. While embryonated eggs and larvae were exposed for six and twenty-four hours correspondingly, fresh eggs were exposed for forty-eight hours.

As a negative control, distilled water and 1.5% DMSO were utilised. The outcomes showed that the *Moringa oleifera* ethanolic leaf extract was more effective on eggs, inhibiting egg embryonation by 60.3% 8.2% and 92.8% 6.2% at 3.75 and 5 mg/mL, respectively³⁷

The anti helmentic activity of ethanolic extracts of *Vitex negundo* and *Moringa oleifera* against *Pheritima posthuma* was tested at various doses.

Water served as the impact group, and piperazine citrate (10 mg/mL) was employed as the reference standard. The results were expressed in terms of the length of your paralysis and the length of time until the worms died. In a dose-dependent way, *Moringa oleifera* exhibits higher activity compared to *Vitex negundo*.³⁸

Different parts of moringa used as food:-

Various parts of moringa are edible:

- Immature seed pods, called "drumsticks"
- Leaves
- Mature seeds
- Flowers
- Roots

Moringa fresh leaves:

➤ Being a large source of vitamins B, vitamin C, provitamin A in the form of beta-carotene, vitamin K, manganese, and protein, the leaves constitute the plant's most nutrient-dense component.^{40,41} Cooked moringa leaves are significant providers of specific nutrients when compared to regular meals that are particularly high in these nutrients per 100 g fresh weight.

➤ In the leaves of the moringa plant, some of the calcium is crystallised as calcium oxalate.⁴² Compared to spinach, which contains an average of 750 mg/100g oxalate⁴³, in contrast to spinach's typical oxalate content of 750 mg/100g.⁴⁴

There are many ways to consume moringa leaves, including: *Moringa* leaves can be consumed raw in salads or cooked with rice or other foods. The list goes on and on. *Moringa* leaves can be juiced, steamed or fried in any dish, baked in treats, or added to smoothies and infant milk.⁴⁵

- You can make a tea out of moringa leaf powder, add it to drinks, sprinkle it on food, or take capsules of it. Any recipe, even soups, can use it.
- Moringa can be consumed in countless ways. Start with a salad made of moringa. Wash the new Moringa leaves with water after cutting off the stalks (add salt to it). Take away from the stalk. Add extra salad components like carrots, cabbage, and cucumbers. You can proceed after adding moringa oil.
- Be aware that cooking with too much heat will completely destroy the enzymes and some of the vitamins in moringa leaves or powder. Never overcook the fresh moringa powder or leaves! The general guideline for using moringa powder or leaves in any dish is as follows.

How many moringa leaves are edible and usable?

- You can get the same amount of protein as an egg, calcium as a large glass of milk, iron as a 200-gram beef steak, vitamin A as a carrot, and vitamin C as an orange by eating 100 grammes of fresh Moringa oleifera leaves.
- It is recommended to eat fresh Moringa leaves as soon as they are harvested and to cook them for a little period of time (a few minutes at most), or even to eat them raw if they are young and sensitive, in order to maximise nutrient retention. Your daily requirement for vitamins A and C is satisfied by a half cup of cooked moringa leaves.

Moringa Pods:

- The seed pods are a good source of dietary fibre, potassium, magnesium, and manganese. They also retain a high level of vitamin C, which can vary in how it is degraded after cooking, even after being cooked by boiling.
- In South Asia, the young, slender fruits—also called "drumsticks"—are frequently served as a culinary vegetable. They are cooked till soft in a curry or soup after being parboiled and frequently sliced into shorter lengths.⁴⁶ Because of the immature seeds inside, the flavour is said to taste like asparagus with a hint of green beans, but sweeter.^{47,48}
- Drumstick curries are frequently made in India and Bangladesh by cooking immature pods until they reach the required level of tenderness in a mixture of coconut milk and spices (such as poppy or mustard seeds).⁴⁹ The fruit is frequently used in dals and lentil soups like drumstick dal and sambar. It is first pulped, then it is boiled with other vegetables and spices like turmeric and cumin. A typical ingredient in bhurta, a concoction of lightly fried or curried vegetables, is mashed drumstick pulp.⁴⁵

- Drumsticks are frequently chewed to release the fluids and nutrients while discarding the fibrous outer peel because it is rough and fibrous. Others describe a somewhat different technique for removing the sensitive seeds and flesh by sucking it out, then discarding the tube of skin.⁴⁸
- The nutrient-dense moringa pods can be cooked and consumed in a variety of ways. They can be prepared and consumed in the same manner as green beans, including boiling, steaming, and frying.
- When the pods are young and fragile, they are the tastiest to eat. They turn woody and fibrous when they are too old. Bend the pod to test it; if it snaps and splits in two, it is safe to eat. It is probably too old if it does not break.

Moringa Seeds:^{45,50,51}

- Mature pods can have their seeds extracted, sliced, and cooked for food. The seeds are renowned in Nigeria for their bitter flavour; typically added to sauces or consumed as a fried snack. The edible seed oil can be added to sauces or condiments. The protein, iron, and calcium content of wheat flours can be increased by adding ground, debittered moringa seed to the mix.
- When the moringa seeds are extremely young, they can be eaten. Although they can be eaten when they are fully grown, we much like the little baby ones. You can use them like green peas, but you should be careful when eating them since the seeds have a great capacity to purify water. They also have a fantastic capacity to remove pollutants from your bloodstream. A lot of waste is taken out quite quickly when too many are done at once, which can be unpleasant and upset your stomach.
- The seeds can be "popped" like popcorn with salt, oil, or butter, and eaten that way, but only a few at a time! Moringa is a highly potent plant, and your body needs time to adjust to any new diet that is given to it.

Moringa powder:

- When cooking, moringa powder can be added to stews and soups, although adding it toward the end or right before serving releases more nutrients. Fresh leaves of the moringa are the same.
- The amount that is tolerable may vary depending on how flavourful the soup or stew is because the powder has a strong flavour. Some flavours, like lemon or peanut, don't appear to go well with moringa powder. Finding out what tastes nice and what doesn't still requires experimentation.
- Moringa powder, which is packed with potent antioxidants like Quercetin and Chlorogenic Acid, works to shield your

body from oxidative stress, which can cause chronic diseases.

- Possibly Anti-Inflammatory- Moringa powder, which is rich in anti-inflammatories, has assisted numerous people in reducing their arthritic symptoms.
- Might Reduce Blood Sugar- Long-term studies have shown that moringa leaf powder lowers blood glucose levels, thereby assisting diabetics.
- Might Reduce Cholesterol-Moringa powder has historically been used to treat excessive cholesterol in herbal medicine and has been shown to have cholesterol-lowering properties.

An indigenous remedy for malnutrition: the Moringa Oleifera Tree

- A significant contributor to the frequently high rates of infant mortality is malnutrition in all of its manifestations, including kwashiorkor, beriberi, anaemia, and scurvy.

Benefits of moringa tea:⁵²

- To make moringa tea, soak dried moringa leaves in boiling water for a few minutes. This revitalising tea boosts health and vitality. The nutrients in the moringa leaves are concentrated and can be retained even after drying.

1. Loss of weight-

With its potent nutrient profile, moringa tea can help enhance energy levels, manage blood sugar levels, speed up digestion, and boost metabolism. For this reason, a cup of moringa tea is a great addition to a diet plan for losing weight.

2. Properties that Reduce Inflammation

Moringa, which is best known as an anti-inflammatory tea, is fantastic for lowering inflammation of the body's tissues and cells, easing pain, pains, and joint diseases, as well as gout, upset stomach, migraines, and fever. This is one of the key causes of moringa's reputation as a universal remedy.

3. Excellent Antioxidant Source

High levels of antioxidants in moringa tea aid in the fight against free radicals. Moringa leaves have 46 natural antioxidants, according to research. These potent bioactive substances support the upkeep, recovery, and repair of human cells.

4. Skin Care

Moringa tea is a very nutritious beverage for the skin due to its high bioflavonoid and vitamin C content. It is a beverage that fights ageing by promoting the creation of collagen, preventing the appearance of fine lines, and enhancing the hydration and youthfulness of the skin. Its anti-inflammatory properties aid in the treatment of acne.

4. Strengthens Immune System

This tea's high antioxidant content makes it a fantastic way to strengthen the immune system and guard against the symptoms of the flu and the common cold. White blood cell production is boosted by vitamin C, which also functions as an antioxidant to reduce oxidative stress and the compromised immune system that it causes.

5. Supports Digestion

This tea's anti-inflammatory properties make it perfect for reducing diarrheal and constipation symptoms, as well as for enhancing overall gastrointestinal health.

6. Enhances Heart Health

This tea's high potassium level makes it a great choice for decreasing blood pressure because potassium can reduce stress in the arteries and blood vessels. Additionally, the relaxing properties of moringa tea aid in bodily and mental relaxation.

7. hormone balancing

Moringa tea, which is rich in antioxidants, supports hormone regulation. It has the potential to treat hormone-imbalance issues that can occur after menopause.

8.Reduces Period Cramps

During the menstrual cycle, a cup of moringa tea can help ease headaches, nausea, bloating, mood swings, and menstrual cramps.

9. manages migraines and depression

As dopamine and serotonin levels are crucial for controlling mood and pain perception, moringa tea can be used as an anti-depressant. A 2012 study found that moringa could effectively treat and control migraines and other types of persistent headaches.

10.Manages Diabetes

For diabetics or those at risk of developing diabetes, moringa tea is significant due to its ability to decrease cholesterol and blood sugar levels. Your risk of acquiring diabetes is decreased by lowering your cholesterol and blood pressure.

11. Heightens Healing Rate

Moringa tea contains vitamin C, which benefits the body's ability to produce new cells in addition to the immune system. In particular for those suffering from an injury or protracted sickness, this leads to speedier healing.

12. increases liver health

Polyphenol-rich moringa tea aids in the body's healing and defence.

13. bacterial and microbial resistance

Because moringa tea has potent antimicrobial and antibacterial characteristics, it may be beneficial against some types of bacteria. Boils, skin infections, typical

digestive issues, blood impurities, and urinary tract infections can all be avoided with the use of the tea.

14. Booster of Energy

Moringa tea can be the solution if you're searching for a non-caffeinated beverage that will enhance your energy. The tea has no sugar or caffeine and helps enhance vitality and general wellness.

15. enhances cognition

A powerful brain booster, moringa tea contains antioxidants in addition to other neuroprotective vitamins and nutrients. This tea can control neurotransmitter levels, which can impact memory and cognitive function, according to research.

Moringa Leaves Stir-Fry (Thorán) with Grate Coconut⁵³

This delicious moringa (drumstick) leaves stir-fry is made with two superfoods - moringa and coconut. This traditional recipe is easy, healthy and tasty!

Ingredients:

- 250 grams moringa (drumstick) leaves.
- 1/4 teaspoon turmeric powder (optional)
- 1/4 cup grated coconut.
- To taste salt.
- 1 tablespoon oil.
- 1/2 teaspoon mustard seeds.
- 1/4 cup shallots.
- 1 tablespoon crushed dry chillies.
- 1 sprig curry leaves (optional)

Directions:

1. Wash and drain the moringa leaves.
2. Take the moringa leaves, grated coconut, turmeric powder and salt in a mixing bowl.
3. Combine well.
4. Heat the oil in a pan, splutter mustard seeds.
5. add crushed chillies and curry leaves (optional).
6. Saute for a couple of minutes on a medium flame.
7. Now add the mixed moringa leaves and combine well.
8. Cook with the lid closed for 10 minutes. Add salt if required. Stir occasionally.
9. Open the lid, stir well and cook for 2 minutes.
10. Switch off.

The Side Effects of Moringa :-

While the leaves are completely healthy, eating a lot of the pulp or bark may be detrimental.

Several adverse effects of moringa include:

- Alkaloids in the plant lower blood pressure and reduce heart rate, and moringa bark causes uterine contractions.

- Cell mutations brought on by a substance derived from roasted moringa seeds
- disruption of fertility
- Laxative characteristics might cause an upset stomach, gas, or diarrhoea.

Other uses:

- Moringa trees have been used to combat malnutrition, especially among infants and nursing mothers.⁵⁵
- When wetted in advance to permit anti-septic and detergent effects from phytochemicals in the leaves, Moringa oleifera leaf powder was as effective as soap for hand washing.⁵⁶ As wastewater conditioners for dewatering and drying faecal sludge, moringa oleifera seeds and press cake have been used.⁵⁷
- When moringa seeds are pressed to make oil, the leftover moringa seed cake is used to filter water using flocculation to create drinkable water for both humans and animals.⁵⁸
- Dimeric cationic proteins found in moringa seeds collect and balance colloidal charges in turbid water, causing the colloidal particles to group together and become easier to remove as sludge by either settling or filtration.⁵⁹
- Most pollutants are removed from water by moringa seed cake. This application is particularly intriguing since, in moringa-growing locations where drinking water is impacted by contaminants, it is harmless and sustainable compared to other materials.

RESULT

Shigru is a plant with a strong nutritional value and a wide range of therapeutic uses. Different parts of this plant are consumed as food in different places. The Moringa oleifera tree is a plant food that has a high nutritional value, is advantageous for the environment and the economy, and is widely available in the nations that are most affected by the food crisis. The Moringa oleifera tree has high quantities of protein, all eight essential amino acids, a wide variety of vitamins, and minerals. It is also a rich source of phytonutrients and other powerful disease-fighting antioxidants. The leaves of the Moringa oleifera tree have a "complete" protein, which is unique for plants. They include 18 amino acids, eight of which are essential amino acids. Calcium and magnesium are found in moringa. While calcium is essential for the growth of healthy bones and teeth, magnesium also helps the body absorb calcium. The two trace minerals here work well together. Moringa oleifera is especially excellent in defending us against bone illnesses like osteoporosis because it contains a lot of both.

Because they contain trace minerals, dried and powdered *Moringa oleifera* leaves are fantastic for nourishing the skin. The leaves of the *Moringa oleifera* tree have also been linked to improvements in digestion, mood, and immunity. One plant that has been utilised to boost breastmilk production is moringa. Prolactin levels are increased by moringa leaves, which also contain vital minerals. Numerous phytoconstituents are present in various *Moringa* species, including alkaloids, saponins, tannins, steroids, flavonoids, and terpenes. The anti-inflammatory, anti-hypertensive, diuretic, anti-microbial, anti-oxidant, anti-diabetic, anti-hyperlipidemic, anti-neoplastic, antipyretic, anti-ulcer, cardio-protective, and hepatoprotective properties of *Moringa oleifera* are employed in various preparations. Various parts of moringa are edible; Immature seed pods, called "drumsticks", leaves, mature seeds, flowers, roots. There are various benefits of drinking moringa tea such as loss of weight, reduce inflammation, good for skin, balances hormones, supports digestion, reduce period cramps etc. Various food preparations are made by different parts of *Moringa*. Thus moringa is of great medicinal use as well as it fulfills nutritional values to a great extent. That's why It should be included in our diet also.

DISCUSSION

The various health benefits of consuming *shigru* have been studied and explained in this page, along with how to utilise it as *Aahar*. *Moringa* tree leaves are among the world's richest vegetables. *Moringa oleifera* tree is a plant food of high nutritional value, ecologically and economically beneficial and readily available in the countries hardest hit by the food crisis. The name "The Miracle tree" refers to the unique combination of vitamins, minerals, and amino acids found in moringa. Because the tree produces immature pods, it is frequently referred to as the "Drumstick tree." Due to the flavour of its root, it is also known as the horseradish tree and the benzoyl tree in other locales (because of the oil that its seeds produce). *Moringa oleifera* is frequently called the "wonder tree" because of the wide range of nutritional, therapeutic, and cleansing qualities it possesses. The "superfood" moringa has the extraordinary potential to drastically enhance health and end hunger worldwide. The *Moringa oleifera* tree is rich in phytonutrients and other potent disease-fighting antioxidants, as well as high levels of protein, all eight necessary amino acids, a full range of vitamins, and minerals. The *Moringa oleifera* tree is swiftly becoming a

go-to plant for preventing infection, reducing inflammation, encouraging healthy blood flow, and combatting malnutrition due to its many beneficial uses

CONCLUSION

Moringa oleifera tree is a plant food of high nutritional value, ecologically and economically beneficial and readily available in the countries hardest hit by the food crisis. The *Moringa oleifera* tree is rich in phytonutrients and other potent disease-fighting antioxidants, as well as high levels of protein, all eight necessary amino acids, a full range of vitamins, and minerals. Phytochemicals such as tannins, sterols, terpenoids, flavonoids, saponins, anthraquinones, alkaloids and reducing sugar present along with anticancerous agents like glucosinolates, isothiocyanates, glycoside compounds and glycerol-1-9-octadecanoate. Various parts of moringa are edible, Immature seed pods, leaves, mature seeds, flowers, roots. *Moringa* has a pungent and bitter flavour to its juice (taste). It has *katu vipaka* (pungent taste conversion after digestion), *ushna virya* (hot potency), and *laghu* (light), *rooksha* (dryness), and *teekshna* (strong piercing) in *guna* (qualities). It also balances *kapha* and *vata*. The current review aims to consolidate all prior information on the topic of its phytochemistry, therapeutic benefits and food recipes and pharmacology discussed in earlier articles.

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Table 1 The nutrient compositions of leaves, leaf powder, seeds and pods.

Nutrients	Fresh leaves	Dry leaves	Leaf powder	Seed	Pods
Calories (cal)	92	329	205	-	26
Protein(g)	6.7	29.4	27.1	35.97±0.19	2.5
Fat (g)	1.7	5.2	2.3	38.67±0.03	0.1
Carbohydrate (g)	12.5	41.2	38.2	8.67±0.12	3.7
Fibre(g)	0.9	12.5	19.2	2.87±0.03	4.8
VitaminB1(mg)	0.06	2.02	2.64	0.05	0.05
VitaminB2(mg)	0.05	21.3	20.5	0.06	0.07
VitaminB3(mg)	0.8	7.6	8.2	0.2	0.2
Vitamin C (mg)	220	15.8	17.3	4.5±0.17	120
Vitamin E (mg)	448	10.8	113	751.67±4.41	-
Calcium(mg)	440	2185	2003	45	30
Magnesium(mg)	42	448	368	635±8.66	24
Phosphorus (mg)	70	252	204	75	110
Potassium (mg)	259	1236	1324	-	259
Copper (mg)	0.07	0.49	0.57	5.20±0.15	3.1
Iron (mg)	0.85	25.6	28.2	-	5.3
sulphur(mg)	-	-	870	0.05	137

Table 2 Phytoconstituents of plant moringa oleifera^[11,12]

Sr.No.	Plant Part	Extract	Extract Constituents
1	Leaves	Aqueous and alcoholic	Niazirin and Niazirin – nitrile glycosides, 4-[(4'-O-acetyl-alpha-L-rhamnosyloxy) benzyl isothiocyanate, Niaziminin A, and Niaziminin B, three mustard oil glycosides, niaziminin, a thiocarbamate, 4-(alpha-1-rhamnopyranosyloxy)- benzylglucosinolate, quercetin-3-O-glucoside and quercetin-3-O-(6''-Malonylglucoside), Niazimicin
2	Seeds	Aqueous and Hydro-alcoholic	Methionine, cysteine, 4-(alpha-L-rhamnopyranosyloxy) benzylglucosinolate, Moringine, benzylglucosinolate, niazimicin niazirin.
3	Pods	Hydro-alcoholic	Isothiocyanate, nitrites, thiocarbamates, O-(1heptenyloxy) propyl undecanoate, Oethyl-4-(alpha-L-rhamnosyloxy) benzyl carbamate, methyl- p-hydroxybenzoate, beta- sitosterol .
4	Bark	Alcoholic	4-(alpha-L-rhamnopyranosyloxy) benzylglucosinolate.
5	Flowers	Hydro-alcoholic	D-glucose, quercetin, isoquercetin, kaempferol, kaempferitin and ascorbic acid, protein, D-mannose.
6	Root	Alcoholic	Moringine, moringinine, spirachin, 1,3-dibenzyl urea, alpha-phellandrene, pcymentene, Deoxy-niaz
7	Stem	Aqueous and Hydro-alcoholic	4-hydroxyl mellein, vanillin, octacosonoic acid, beta-sitosterone.