

**PHARMACOLOGICAL STUDY OF SHIGRU WITH RESPECT TO ITS
HRIDYA, SHOTHAR, KRIMIHAR KARMA WITH SPECIAL
REFERENCE TO ITS CARDIOPROTECTIVE, ANTIINFLAMATORY
AND ANTIMICROBIAL ACTIONS**

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ABSTRACT

Moringa Oleifera known as Shigru in India and Horse radish tree, Drumstick Plant in English belongs to family Moringaceae. Shigru is known for its beneficial qualities and nutritive value, Its Sanskrit names are Shobhanjan means beautiful tree, Teekshangandha for its sharp smell, shigru for its sharp qualities, Mochak for its capabilities to remove diseases. It is found in almost all India. It was earlier known to contain Carbohydrate, Protein, Carotene and Ascorbic acid as its active ingredients. Its leaves and bark paste are used on skin to reduce inflammation. The powder of the seeds was used for nasya purpose.

The plant has been studied for antioxidant, hypolipidaemic, hepatoprotective, antihyperglycemic, hypotensive and anticancerous effects. The current review is to summarize Description, Phytochemistry, Therapeutic Activity, Pharmacological Activity of *Moringa Oleifera*, which may be helpful to establish a Standard Natural drug as an cardioprotective antiinflammatory antimicrobial.

KEYWORDS: Shigru, moringa, Vedanahar, Shothhar, Krimihar, analgesic, antiinflammatory, antimicrobial.

INTRODUCTION

Moringa, native to parts of Africa and Asia, is the sole genus in the flowering plant family Moringaceae. The name is derived from *murungai*, the Tamil word for drumstick, and the plant is commonly referred to as the drumstick tree. It contains 13

species from tropical and subtropical climates that range in size from tiny herbs to massive trees. *Moringa* species grow quickly in many types of environments.

The most widely cultivated species is *Moringa oleifera*, native to the foothills of the Himalayas in northwestern India, a multipurpose tree cultivated throughout the tropics and marketed as a superfood, health food, and medicinal plant. *M. stenopetala*, an African species, is also widely grown, but to a much lesser extent than *M. oleifera*.^[1]

VERNACULAR NAMES^[2,3]

Sanskrit : Shobhanjana, Teekshanagandha, Aksheeva, Mocaka, **Bengali** : Sajina, Sajna, Sajne, **English** : Horse Radish Tree, Drum Stick Tree, **Gujrati** : Sargavo, Sekato, Saragavo Parna, **Hindi** : Shajoma, Mungna, **Kannada** : Neegge, Nugge ele, **Malayalam** : Murinna, Tishnagandha, Muringa, Muringa Elai, **Marathi** : Sevaga, Segata, Segata pana, Shewgachi pane, **Oriya** : Sajana, Munga, Munika, **Punjabi** : Sohanjana, **Tamil** : Murungai, Murungai Ilai, **Telugu** : Munaga Aku.

MORPHOLOGY

Shigru consists of dried seed of *Moringa oleifera* Lam. Syn. *M. pterygosperma* Gaertn. (Fam. Moringaceae), a small or medium sized tree.^[2]

TAXONOMY^[4]

Kingdom: Plantae

Order: Brassicales

Family: Moringaceae

Genus: *Moringa*

Species: *M. Oleifera*.

Distribution

It is found wild in sub Himalayan tract, commonly cultivated throughout the country.^[2]

Description

a) Macroscopic: Seeds hard, trigonous, having short wings; size 0.5 to 1.0 cm long and 0.3 to 0.5 cm wide; colour greyish-cream; odour, not characteristic; taste; slightly bitter.

b) Microscopic: Seed shows 10 to 15 layered, tangentially elongated, thin-walled cells of the testa, followed by a wide zone of cells of cotyledons consisting of round to oval, thin walled, parenchymatous cells with intercellular spaces and containing mucilage and oil globules.

Powder- Cream colored; shows groups of elongated, round to oval, parenchymatous cells; oval to elongated, thin-walled cells of testa showing striations in surface view and oil globules.^[2,3]

Properties and action

Rasa: Katu, Tikta

Guna: Laghu, Ruksha, Teekshna

Virya: Ushna,

Vipaka: Katu^[5]

Karma: Cakshusya, Dipana, Hridya, Kaphahara, Sangrahi, Vatahara.^[6]

CHEMICAL COMPOSITION

Five chemical constituents were identified in methanolic seed extract and they are oleic acid (84%), L-(+) - ascorbic acid- 2, 6-dihexadecanoate (9.80%), 9-octadecenoic acid (1.88%), methyl ester-hexadecanoic acid (1.31%) and 9- octadecenamide (0.78%).^[7] *M. oleifera* seed oil is characterized by a high tocopherol content, consisting of α -, γ - and δ -tocopherols.^[8]

The seeds, instead, have attracted scientific interest as *M.oleifera* seed kernels contain a significant amount of oil (up to 40%) with a high-quality fatty acid composition (oleic acid > 70%) and, after refining, a notable resistance to oxidative degradation.^[9]

Apart from the oil, the seed has a high protein content, on average 31.4%, whereas carbohydrate, fibre and ash contents are 18.4%, 7.3% and 6.2%, respectively. Furthermore, like the protein fraction, *M. oleifera* seeds have a high content of methionine and cysteine.^[10]

The saturated fatty acid content is 21.18%, with palmitic acid dominating, closely followed by behenic, stearic and arachidic acids. The high behenic acid content is the reason why the oil is known commercially as “Ben” or “Behen” oil. Small traces of cerotic, lignoceric, myristic, margaric and caprylic acids are also reported in *M. oleifera* seed oil. The oil contains a high level of monounsaturated fatty acids, up to an average of 76.73%. Oleic acid is the predominant fatty acid, and accounts for 73.57% of the total fatty acids. Further monounsaturated fatty acids present in the oil are gadoleic and palmitoleic acids. Small traces of erucic acid are reported by some studies. There is a very low content of polyunsaturated fatty acids, on average 1.18%, and the content of linoleic and linolenic acids is 0.76% and 0.46%, respectively.^[11] The sterol fractions of the oil consist mainly of β -sitosterol,

stigmasterol, campesterol and Δ^5 -avenasterol, these accounting for 92% of the total sterols.^[12] The flavonoids are represented by catechin, epicatechin, quercetin and kaempferol.^[13-15]

Pharmacological and biological activities

The Cardioprotective action of the drug can be supported with following research points:

The fatty acid composition shows that *M. oleifera* seed oil falls in the category of high-oleic oils, and contains a high monounsaturated to saturated fatty acids ratio (MUFA/SFA). The MUFA/SFA ratio is characteristic of several oils, particularly olive oil, and has been associated with a reduced risk of all-cause mortality, cardiovascular mortality, cardiovascular events, and stroke.^[16] *M.oleifera* seed oil has a monounsaturated fatty acid content similar to that of olive oil which are good for heart.^[17] Other studies also suggest an antidiabetic potential of β -sitosterol^[18] thus helping the heart. Finally, the extract of *M. oleifera* seeds has also been found to have antidiabetic properties. After inducing type 1 diabetes by injection of streptozotocin (60 mg/kg of body weight), rats simultaneously treated for 4 weeks with *M. oleifera* seed powder had circulating levels of glucose and glycated hemoglobin lower than the diabetic untreated mice. Moreover, after treating diabetic rats with seed powder, histological analysis showed that the pancreatic tissue of diabetic rats was restored to its normal structure, and the histology showed no pathological changes.^[19]

The oral administration of *M. oleifera* seed powder (750 mg/day, 8 weeks) also reduced nocturnal heart rate and improved cardiac diastolic function in spontaneous hypertensive rats. Moreover, left ventricular anterior wall thickness, interseptal thickness during diastole, and relative wall thickness were reduced after treatment with *M. oleifera* seed powder. Furthermore, a significant reduction in fibrosis in the left ventricle was also observed. However, treatment with *M. oleifera* seed powder did not modify blood pressure.^[20]

The seed extract has been found to possess good antimicrobial activity against numerous bacterial and fungal species and many of the phytochemical compounds isolated from the seeds are able to inhibit the growth of certain pathogenic microorganisms responsible for human infections.^[15 & 21-25]

Other studies have reported the ability of *Moringa* seed extract to attenuate the chronic immune-mediated inflammatory responses typical of certain diseases such as asthma^[16] and rheumatoid arthritis.^[27]

Similarly, treatment with the ethanolic extract of *M. oleifera* seeds was found to reduce the paw oedema volume, the serum levels of inflammatory mediators and to protect against lymphocytic infiltration, bone destruction and cartilage erosion in the synovial joint, subsequent to the development of arthritis in rats.^[27]

Therapeutic Uses - Shotha, Gulma, Krimiroga, Medoroga, Mukhajadya, Pliharoga, Vataroga, Vidradhi, Vrana, Netraroga, Apaci, Galaganda, shiroroga, Atinidra.^[28]

Important Formulations - Sudarshana Churan, shothaghna Lepa, Sarsapadi Pralepa, Sarvajvarahara Lauha.^[29]

CONCLUSION

Thus, *Moringa Oleifera* has many rich phytochemical compounds that have the capability to act in different diseases. Several researches support its cardioprotective, antiinflammatory and antimicrobial actions. The richness of nutrients in the plant make it a good nutrient choice. It has many more functions which have supporting research evidence as well.

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