



A REVIEW ON SHIGRU (MORINGA OLEIFERA LAM) SEEDS

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ABSTRACT

Introduction: Ayurveda is a treasure trove of various natural herbs and regimens for the treatment of various diseases. It believes in prevention and root cause cure of disease by regaining homeostasis. *Shigru* (*Moringa oleifera* Lam.), is a versatile Ayurvedic medicinal plant, referred worldwide as a 'Miracle tree'. Every part of this plant has medicinal value. In this review, an attempt is made to study the medicinal uses of *Shigru* seeds. The present review highlights the traditional medicinal uses of *Shigru* (*Moringa oleifera* Lam) seeds. It is traditionally used as an anti-inflammatory agent, antipruritic, abortifacient, carminative, anthelmintic, antimicrobial, antitoxic and eye tonic. This provides the scope for researchers to conduct experimental studies proving the efficacy of it. Further, phytochemical analysis of *Shigru* seed extract can be done to know specific phytoconstituents responsible for its therapeutic activities.

Keywords: *Shigru*, *Moringa oleifera* Lam, Therapeutic uses, Miracle tree, Ayurveda, *Shwetha maricha*.

INTRODUCTION

Medicinal plants have great importance in human tradition to meet primary health care needs since the time immemorial. According to a WHO report, up to

80% of world population relies on traditional medical systems for primary health care management. Ayurveda is one of the such ancient system of medicine, which is defined as the science of life. *Dravyaguna*

Vijnana is the branch of Ayurveda which deals with medicinal plants, their properties and therapeutic actions. Charaka samhita and Sushruta samhita have mentioned nearly 3500 plants. *Shigru* (*Moringa oleifera* Lam), commonly known as Drumstick, is a versatile Ayurvedic medicinal tree which is used for nutritional and medicinal purposes. It belongs to the family Moringaceae (also referred as 'horseradish tree family').¹ The name "Horseradish tree" is the other name for *Shigru*, which is based on its roots that taste like horseradish.² Moringaceae, a monogenetic family, with the single genus *Moringa* is characterized by 13 species of dicotyledonous tropical and sub-tropical flowering trees. The genus name 'Moringa' is derived from murungai, the Tamil name for drumstick, meaning "twisted pod", alluding to the young fruit. The species name 'oleifera' is derived from the Latin word's oleum "oil" and ferre "to bear".^{3,2} Each part of the medicinal plant possesses different properties based on which it is used for the treatment of specific diseases. The foremost objective of this review study is to explore medicinal properties and therapeutic indications of *Shigru* seeds for betterment of human health.

Taxonomical position of plant⁴

Kingdom -Plantae
Subkingdom – Tracheobionta
Superdivision – Spermatophyta
Division - Magnoli-ophyta
Class – Magnoliopsida
Subclass – Dilleniidae
Order – Capparales
Family – Moringaceae
Genus - *Moringa*
Species - *Moringa oleifera* Lam

Vernacular Names

Hindi - Sahijan, Munaga, Shajna
Sanskrit – Shobhanjana, Shigru
Tamil - Murungai
English - Drumstick plant, *Moringa*, Horse radish tree
Kannada - Nugge mara, Nugge kayi
Malayalam – Murinna, Sigru

Marathi - Achajhada, Shevgi
Gujarati – Midhosaragavo, Saragavo
Konkani – Maissang, *Moringa*, Moxing
Tamil – *Moringa*, Murungai
Telugu – Mulaga, Munaga, TellamunagaUrdu – Sahajna
Bengali – Sajina Arabic – Rawag
Assamese – Saijna, Sohjna
Burmese – Daintha, Dandalonbin
Chinese – La ken
French – *Moringa* A Graine Ailre, Morungue
Nepali – Shobhanjan, Sohijan
Oriya – Sajina
Portuguese – *Moringa*, Moringueiro
Punjabi – Sainjna, Soanjna
Sinhalese – Murunga
Spanish – Angela, Ben, *Moringa*

Botanical Description⁵

Habitat: *Moringa oleifera* is found throughout India.

Habit: A small / medium sized tree growing up to 10 meters in height.

Leaves: Leaves are about 30 to 75 cms long, tripinnate in structure with petiole sheathing at base. Pinnate are 4-6 in pairs in which the upper most pinnate are opposite to each other. Foliate, hairy glands are present between each pair of pinnae and pinnulae. Ultimate leaflets are opposite to each other about 0.85 to 1.7 cms long, entirely obovate or elliptical in nature, membranous and pale from beneath.

Flowers: Flowers are about 2.5 cms in diameter, strongly honey scented, linear lanceolate in nature with sepals reflexed. The petals are about 1.7-2.5 cms long, linear sapulated, white in color with yellow dots near base. Whereas ovaries are hairy in structure.

Fruit: Fruits or drumsticks are 23 × 58 × 1.3-1.7 cms in size, trigonous with linear peduncle and longitudinally ribbed with slight constriction between seeds

Seeds: Seeds are three cornered, winged, about 2 cms long and with corky testa, non-endospermic having straight embryo, convex cotyledons, superior radicle and many leaved plumule.

Roots and Bark: Roots and bark are grayish brown in colour, reticulated marked with tumid projections of discontinuous transverse rows of transversely ex-

tended lenticles about 2-8 mm long. Dents may show tears of reddish gum. The outer skin is corky and papery. The tissue inside is cream or rose in colour. The portion nearest to wood is whitish in colour. Wood is very soft, porous and yellow in colours.

Flowering and fruiting: *Moringa oleifera* flowers from January to March and fruiting in April-June.

Chemical composition⁶ *Shigru (Moringa oleifera Lam)* seeds contain 4 (alpha-L-Rhamnosyloxy) benzyl isothiocyanate, 4(-Lrhamnosyloxy) phenylacetoneitrile, 4- hydroxyphenylacetoneitrile, and 4-hydroxyphenylacetamide, 4-(alpha-l-rhamnopyranosyloxy)-benzylglucosinolate Roridin E, Veridiflorol, 9-Octadecenoic acid, O-ethyl-4-(alpha-L- rhamnosyloxy) benzyl carbamate, niazimicin, niazirin, beta- sitosterol, glycerol-1-(9-octadecanoate), 3-O- (6'-O oleoyl- beta-D-glucopyranosyl)-beta-sitosterol and beta-sitosterol-3- O-beta-Dglucopyranoside.

Nutritional Value⁷

Shigru (Moringa oleifera Lam) seeds are sources of proteins, lipids, carbohydrates, vitamins A and B1, minerals such as potassium, phosphorus, sodium, zinc, magnesium, and calcium.

Roasted Shigru seeds⁷

Shigru seeds when roasted increases calcium, zinc, lipids, carbohydrate, fiber and ash contents. Its percentage increases as the roasting time increases. There will be an increase in protein content after roasting it for 20 minutes. Vitamin A and B1 levels decrease significantly after roasting.

Classical review of Shigru seeds

Definition and Synonyms of Shigru⁸: *Shigru* – With pungent smell and taste. शिनोति तीक्ष्णतां विदधाति, शिञ् निशाने ।

Synonyms

Akshiva – Used as anti-narcotic. न क्षीवो मदयुक्तः, मदनाशक इत्यर्थः । *Krishnagandha* - With pungent smell and taste. कृष्णं मरिचं, तद्वत्तीक्ष्णो गन्धो अस्य; तीक्ष्णगन्धः (अ) इत्यस्यापि स एवार्थः । *Ghanachhhada* – Having dense and luxuriant foliage. घनाः संहताश्छदा अस्य । ' बहलपल्लवः' (अ.ह्) इत्यपि पट्यते अस्मिन्नेवार्थे । *Tikshnamula* - With pungent smell and taste. तीक्ष्णं मूलमस्य । *Bahumula* – It has many roots. बहूनि

मूलान्यस्य । *Murangi* – Known as *murangi*. लौकिकी संज्ञा । *Mulakaparni* – With pungent smell. मूलकस्येव तीक्ष्णानि पर्णान्यस्य । *Mochaka* – It is useful in many disorders. मोचयति रोगेभ्य इति; मुञ्चति निर्यासं वा । *Vidradhighna* – Possesses anti-biotic property and is useful in infective disorders like abscess. विद्रधिं हन्तीति । *Shobhanjana* – It is a beautiful tree. शोभामन्क्ति, शोभमान इत्यर्थः । *Haritashaka* – Leaves and also fruits are used as green vegetable. हरितशाके प्रयोज्यः ।

Shigru seed – Pharmacodynamic⁹:

Rasa (Taste) – *Katu* (pungent), *Tiktha* (bitter)

Guna (Qualities) – *Laghu* (Light to digest), *Ruksha* (dry), *Teekshna* (penetrating in nature)

Virya (Potency) – *Ushna* (hot)

Vipaka (Taste after digestion) - *Katu* (pungent)

Dosakarma (Effect on Doshas) – *Kaphavaatagna* (balances aggravated *Kapha* and *Vaata Doshas*)

Karma (Action) – *Kaphavaatagna*, *Chakshusya* (good for eyes), *Vishanaashanam* (anti-poison), *Avrishya* (non-aphrodisiac), *Shiroartinuth* (relieves headache)

Dose: Seed Powder – 1- 3 grams

Vargaas/ganas mentioned in classics:

Charaka Samhita - *Swedopaga*, *Krimighna gana*, *Shirovirechanopaga*, *Katuka skandha dravyas*, *Sthavarasnehana yoni*. **Susrutha Samhita** – *Shirovirechana dravyas*, *Vranapachana darvyas*, *Varunadi gana*, *Katu rasa varga*, *Shiororogahara dravyas* **Astanga Sangraha** - *Swedopaga*, *Krimighna gana*, *Shirovirechana dravyas*, *Varunadi gana*, *Katu rasa varga*, *Haritaka varga*, *Vamanopayogi dravyas* **Astanga Hridaya** - *Shirovirechanadravyas*, *Varunadigana*, *Haritakavarga* **Raja Nighantu** - *Moolakaadi varga* **Bhavaprakasa Nighantu** - *Guduchyaadi varga* **Madanapaala Nighantu** - *Shaaka varga* **Kaiyadeva Nighantu** - *Oushadi varga*

Description of Shigru seeds as per various Nighantus:

Bhavaprakasha Nighantu¹⁰ – *Shigru* seeds are termed as '*Shwetha maricha*'. They possess *Ushna* and *Tikshna guna*. They do the action of *Kaphavaatagna*, *Vishanaashana* and *Shiroarthinuth*. They are

Avrishya and *Chakshushya*. Seeds yield oil, which is used for external application in *Sandhivata* (Osteoarthritis), *Aamavata* (Rheumatoid arthritis) and *Vata-rakta* (Gout). In *Murcha* (Syncope), seed powder is used as *Nasya* (Nasal drops).

Kaiyadeva Nighantu¹¹ – *Shigru* seeds are known as 'Shwetha maricha'. Seeds yield oil called *Shigru taila*. *Guna* and *karma* of *Shigru* seeds described are same as that mentioned in *Bhavaprakasha Nighantu*.

Raja Nighantu¹² – There is no specific description given about *Shigru* seeds. In *Kshiraadi varga*, qualities and uses of *Shigru* oil is mentioned as below-*Katu rasa*, *ushna virya*, *Pichhila* (sliminess), *Vaatajith* (reduces excess *Vaata dosha*), *Kaphanaashanam* (reduces excess *Kapha dosha*). It is applied in *Twak dosha* (Skin diseases), *Vrana* (Ulcers/wound), *Kandu* (Itching) and *Shopha* (Oedema).

Madanapaala Nighantu¹³ – *Shigru* seeds are described as *Teekshna*, *Ushna* and *Chakshushe hitam* (good for eyes).

Side effects

- *Ushna guna* of *Shigru* seeds causes *Pitta vriddhi* (increases *Pitta dosha*). Hence, it needs to be used carefully in people with gastritis, burning sensation, & sensitive stomach.
- *Shigru* seeds has got *Avrishya* (non-aphrodisiac) effect, so need to be used in less quantities or its long-term usage is best avoided in those with infertility problems.

Therapeutic uses according to various classical text

Vrinda Madhava

1. *Shigru* seeds are used for the treatment of *Vataja Galaganda* (Goitre of *Vaata dosha* origin) and *Gandamala* (Cervical adenitis). (V.M 41/2,5)
2. In *Varti* (medicated wick) formulation, *Shigru* seeds are used for treatment of *Sukragni* (V.M 61/11)
3. In *Krimija* (parasitic) *shiroroga* (diseases related to head), it is used in *Navana nasya* (V.M 62/34)

Chakradatta

1. *Shigru* seeds in the form of *Pralepa* (paste) is applied in *Galaganda* and *Granthi* (Tumor). (C.D 41/3)
2. In *Pratishaya* (Rhinitis), it is used in the form of *Churna avapida* (C.D 58/23)
3. In *Shukra vrana*, seeds of *Shigru* are used in *Varti* form (C.D 59/65)
4. In *Krimija shiroroga*, it is used in the form of *Kalka* (C.D 60/35)

Vangasena Samhita

1. *Shigru* seeds are added as one of the ingredients in *Tilvaka ghritha* used in *Vatavyadhi* (*Vata dosha* related diseases), *Gulma* (Abdominal tumor) (V.S 28/191)
2. It is used in *Lepa* (paste) formulation for the treatment of *Galaganda*. (V.S 46/10)
3. In *Pratishyaya*, it is used in *Avapida nasya* formulation. (V.S 70/80)
4. In *Shukra*, *Shigru* seeds are used in the form of *Varti*. (V.S 71/174)
5. Used for *Nasya* in *Krimija shiroroga* (V.M 72/84)

Sharangadhara Samhitha

1. *Shigru* seeds are used as one of the ingredients in *Sudarshana churna* for the treatment of *Sarva jwara* (All types of fever) (SA.S.M.Kh. 6/29)
2. In *Gandamala*, *Ganda (goitre)*, *Arbuda* (tumor) it is used in the *Lepa* formulation (SA.S.U.Kh. 11/99)
3. In *Sukra roga*, *Shigru* seeds are used in a *Varti* formulation (SA.S.U.Kh 13/76)
4. In *Varti* formulation, *Shigru* seeds are used in *Tandra* (Drowsiness) (SA.S.U.Kh 13/81)

Yogaratanakara¹⁴

1. *Shigru* seeds are used as one of the ingredients in *Sudarshana Churna* used in the treatment of *Dhatuja Vishama Jvara Eka-hika* (recurrent fever).
2. *Shigru* seeds are used in the decoction form for the treatment of *Krimi* (Anthelmintic).

Bhaisajyaratnavali

1. *Shigru* seeds are used in *Jvara*, *Jirna vishama jvara* (B.R 5/467)

2. In *Vishama jwara, Pliha* (Spleen) and *Yakrth roga* (liver disorders), *Shigru* seeds are made used in Oil formulation. (B.R 5/1374)
3. In *Vataraktha*, *Shigru* seeds are used in *Taila* formulation. (B.R 27/167)
4. In *Urustambha* (Stiffness of thighs), it is made used in *Pralepa* form. (B.R 28/18)
5. In *Netra kandu* (itchy eyes) and *Timira* (blindness), *Shigru* seeds are used in *Varti* formulation. (B.R 64/193)

Research

- The research study conducted to investigate the anticolitis effect of *Moringa oleifera* seeds hydroalcoholic extract (MSHE) and its chloroform fraction (MCF) on acetic acid-induced colitis in rats by Mohsen Minaiyan, Gholamreza Asghari, Diana Taheri, Mozghan Saeidi, and Salar Nasr-Esfahani in 2014 showed that MSHE and MCF were both effective to treat experimental colitis.
- The effect of *M. oleifera* seed oil (MOSO) in animal models for inflammatory and hyperproliferative skin conditions showed that MOSO can be used as a topical anti-inflammatory agent in inflammatory skin diseases. The study was conducted by Ananda Beatriz Munhoz Cretella MD, Bruna da Silva Soley PhD, Priscila Lúcia Pawloskia, Rebecca Marquini Ruziska, Dilamara Riva Scharf, Jociani Ascari, Daniela Almeida Cabrini, Michel Fleith Otuki in 2020.
- The use of *Moringa oleifera* seed powder as coagulant to improve the quality of wastewater and ground water was studied by Hendrawati, Indra Rani Yuliasri, Nurhasni, Eti Rohaeti, Hefni Efferendi, Latifah K Darusman. The result proved that *Moringa oleifera* is a natural coagulant and used for textile wastewater treatment and purification of groundwater.

CONCLUSION

The properties and therapeutic uses of *Shigru* seeds have been mentioned in Nighantus and various classical textbooks. Many classical formulations have included *Shigru* seeds in their formulations such as *Tilvaka ghritha* and *Sudarshana churna*. *Shigru* seeds

are termed '*Shwetha maricha*' (white pepper) as its properties are similar to that of white pepper. It possesses *Teekshna* and *Ushna guna*, due to which it is *Kaphavaata shaamaka*, *Chakshushya*, *Avrishya* and *Shiroarthinuth*. The oil procured from *Shigru* seeds possess *Katu rasa*, *Ushna veerya* and *Pichhila guna* due to which it is useful in relieving *Vata* and *Kapha dosha*, *Vrana*, *Twak dosha*, *Kandu* and *Shopha*. It is used in traditional Ayurvedic medicine as an anti-inflammatory agent, antipruritic, abortifacient, carminative, anthelmintic, antimicrobial, antitoxic and eye tonic.

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