Medicinal Plant Review: *Shigru* (*Moringa oleifera Lam.*)

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Abstract:

Now a day's lifestyle and diet of common people has been changed drastically which leads to imbalance of *Doshavatha* leading to various diseases formation in human body including Non Communicable Diseases. Among diseases present, there are many diseases which doesn't has drugs or related treatments available for complete cure.

Ayurveda is a complete & holistic system in which a number of drugs with multiple beneficial actions are available though a massive research is required to prove the beneficial effects of the drugs.

Shigru (Moringa oleifera Lam.) is a well known drug mentioned in Ayurveda used for various purposes by *Acharya Charaka*, *Acharya Sushruta*, *Acarya Vagbhata* and most of *Nighantus* in Ayurvedic literature also some *Nighantus* has specifically mentioned uses of parts of *Shigru*.

Hence, plant *Shigru* is been selected for complete Medicinal Plant Review a step towards standardization Ayurvedic Medicinal Plant.

Index Terms: *Shigru*, *Moringa oleifera Lam.*, Ayurveda, Medicinal Plant

Introduction:

Shigru (*Moringa oleifera Lam.*.) commonly known as Drumstick plant, also known as Horse Raddish Tree, Ben Tree; is a small to medium sized, evergreen or deciduous tree belonging to family *moringaceae*. The plant is indigenous in Subhimalayan tract commonly cultivated throughout India. It grows and found throughout the India up to lower elevations in the hilly region[1].

It is of two types on basis of color of the flowers viz. *Shweta* and *Rakta*, specially known as *KatuShigru* and Madhu*Shigru* based on taste as bitter and sweet respectively.

Because of white colored seed and its resemblance to *Maricha (Piper nigrum)* it is also known as a *Shweta maricha.*

The action of *Shigru* is *Swedopaga* (helps in *swedana*), *Krimi*ghna (Killing pathogens), *Shirovirechana* and *Vedanasthapana* (subsides pain). Pterigospermin has been isolated from roots of *Shigru* which is high antibacterial in action.

Literature Review:

Literature review of *Shigru* (*Moringa oleifera Lam.*) was done from *Vedas* up to recent works to obtain thorough knowledge about *Shigru*.

Brihatrayis:

In *Charaka Samhita*[2] it is mentioned in *Krimighna*, *Swedopaga* and *Shiroverechana varga* and used in Erisepelas, Piles, Oedema and Skin diseases (Su.1/117). Roots of *Shigru* are used for calculus (*Chi*.26/66-67). Seeds of *Shigru* in soup of, leaves of *Kasamarda*, *Shigru* and Dry Raddish relives hiccough and asthama (*Chi*.14/99).

In *Susruta Samhita*[3] *Shigru* is mentioned in *Pachana gana*, *Varunadi gana* and *Shiroverechana gana* and used for wound in leprosy (*Chi*.9/53), Ascites(*Chi*.14/13). Soup of *Shigru* mixed with *pippali*, rocksalt and *Chi*trak and mixed with oil is useful in udarroga (*Chi.*14/13). The seeds of *Shigru* should be taken as pressed snuff in scrofula (*Chi*.18/23). *Acharya Sushruta* has mentioned *Guna* of *Shigru* in *Samhita* (*Su*.46/237).

In *Ashtanga Hridaya*[4], it is mentioned in *Nasya Gana* and *Shyamadi Varga* and used for various diseases. Warm paste of *Shigru*, *Karnja* bark and *Bibhitaka* should be applied in erysipelas (*Chi*.18/25). Paste of *Shigru* roots is used in calculus (*Chi*.11/31). Juice of leaves of *Shigru* is used in eye diseases (*U*.16/37). *Acharya Vagbhata* has explained *Shigru Guna* in *Sutrasthana* (*Su*.6/106-107).

Acharya Chakrapani[5] has mentioned *Shigru* as a content of *Pranada Gutika* for Piles (6/28-37), *Trikatvadi Taila Nasya* (58/6), *Bilvamuladi Churna* in Hernia (40/22). *Kwatha* of *Shigru* should be used for Ascites (37/44).

Laghutrayis:

Sharangadhara Samhita[6] has mentioned role of *Shigru* in different forms as *Kwatha* in Abscess (*M.K.*2/128), *Churna* in Sudarshana *Churna* for fever (*M.K.*6/29), *sneha* in *Ksharataila* used in Ear diseases (*M.K.*9/175), *swedana* as a content of *Mahashalvana Lavana* (*U.K.*2/25), *Lepa* for oedema (*U.K.*11/3) and a *varti* as a content of *Samudrafenadi Varti* (*U.K.*13/79).

Bhavaprakasha *Samhita*[7] has used *Shigru* in fever as a content of *Sudarshana Churna* (*M.K.*1/125-134), Ascites as a content of *Lashuna taila* (*M.K.*44/34-39). *Shigru beej Churna* is used in *krimaja shiroroga* (*M.K.*62/40), *Shigru patra pinda* is used in eye infection (*M.K.*63/155-158), juice of roots of *Shigru* is in earache (*M.K.*64/29-30) whereas *Shigru taila* is used in nasal diseases (*M.K.*65/41).

Other *Samhita*:

Vaidyamanorama[8] has mentioned role of *Shigru* in fresh wound (16/117) and measles (11/20).

Shodhala Samhita[9] has mentioned curative use of *Shigru* in Coryza and eye diseases.

In *Vangasena Samhita*[10], it is mentioned to use *Yagavu* of *Shigru* in *Krimi* (P1.11/20), *kwatha* should be used in *Urograha* (P1.38/5) and external application should be done in Vata*Rakta* (P1.29/68).

In *Harita Samhita*[11] *Shigru* is used for pain and fever.

Nighantu

Bhavaprakasha Nighantu[12] has mentioned *Shigru* in *Guduchtadi varga* and mention its uses in diseases like abscess, oedema, *Krimi* and wound.

Priya Nighantu[13] has mentioned *Shigru* in *Haritakyadi varga* and mentioned its uses in abscess, oedema, *Krimi* and wound.

Dhanvantari Nighantu[14] has mentioned *Shigru* in *Karviradi Chaturtha varga* and mentioned its uses in abscess, oedema, *Krimi*.

Madanpal Nighantu[15] has mentioned its uses in abscess, oedema, *Krimi* and wound.

Raj Nighantu[16] has mentioned *Shigru* in *Mulakadi varga* and mentioned its types as *Shweta*, *Rakta* and *Nila*.

Kaiyadeva Nighantu[17] has mentioned *Shigru* in *Aushadhi varga* and mentioned its uses in abscess, oedema, *Krimi* and wound. It has specifiacally mentioned karma of flower, fruit and seed of *Shigru*.

Shaligram Nighantu[18] has mentioned *Shigru* in *Guduchyadi varga* and mentioned specifically uses of seed, leaves, fruits and flowers.

Synonyms:

- *Haritashaka* - Green leaves of *Shigru* are used in diet as vegetables.
- *Dirghaka* – *Shigru* has tripinnate, long, compound leaves.
- *Laghupatraka* – Leaflets are small.
- *Shobhanjana* – It is beautiful plant with flowers.
- *Tikshanagandha* – Has sharp odour.
- *Mukhabhanga* – Bitter taste gives bad fascial expressions.
- *Saubhanjana* - Bitter taste gives bad fascial expressions.
- *Shigru* - It is beautiful plant with flowers.
- *Shigruka* – contains tikshna gandha.
- *Ghnacchada* – full of leaves.
- *Mochaka* – relieves many diseases.
- *Vidradighna* – relieves vidradhi.
- *ShwetwShigru* – flowers are white in colour.
- *Sitahvaya* – madhura taste.

Vernacular names[19]:

Language	**Names**
Latin	*Moringa oleifera Lam.*
English	Horse Reddish Tree, Drum stick Tree
Bengali	*Saint, Sauna, Sajne*
Gujrathi	*Sargavo, Sekato*
Hindi	*Sajoma, Mungna*
Marathi	*Shevaga, Segata*
Orrisi	*Sajana, Munga, Munika*
Punjabi	*Sohanjana*
Tamil	*Murunga*
Telagu	*Munuga*
Urdu	*Sehjan*
Kannada	*Neegge*
Malayalam	*Murrina, Tishnagandha, Muringa*

Types:

Samhita	**Types**		
	1	**2**	**3**
Sushruta Samhita	*Shigru*	*MadhuShigru*	
Ashtang Hridayam	*MadhuShigru*	*Shigru*	
Dhanvantari Nighantu	*Shweta*	*Rakta*	
Madanpal Nighantu	*Shweta*	*Rakta*	
Raj Nighantu	*Shweta*	*Rakta*	*Neela*
Kaiyadeva Nighantu	*Shweta*	*Rakta*	
Bhavaprakasha Nighantu	*Shyama*	*Shweta*	*Rakta*

Shaligram Nighantu	*Shweta*	*Rakta*	
Nighantu Aadarsha	*MadhuShigru*	*KatuShigru*	

Pharmacodunamics:

- *Rasa : katu, Tikta*
- *Veerya : Ushna*
- *Vipaka : Katu*
- *Guna : Tikshna, Ruksha, Laghu, Grahi, Ushna, Picchila.*

Scientific Classification[20]:

Kingdom	Plantae
Division	Angiosperms
Class	Eudicots
Series	Rosids
Order	Brassicales
Family	*Moringaceae*
Genus	Moringa
Species	Oleifera

Botanical Description:

The plant *Shigru* is fairly large tree with a corky bark and soft, white and spongy wood.

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 are about 2.5 cms in diameter, strongly honey scented, linear lanceolate in nature with sepals reflexed. Petals are about 1.7-2.5 cms long, linear sapulated, white in color with yellow dot near base. Whereas ovary is hairy in structure.

Fruits or drum sticks are 23 × 58 × 1.3-1.7 cms in size, trigonous with linear peduncle and longitudinally ribbed with slight constriction between 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 are grayish brown in colour, reticulated marked with tumid projections of discontinuous transverse rows of transversely extended lenticles about 2-8 mm long. Dents may show tears of reddish gum. Outer skin is corky and papery. Tissue inside is cream or rose in colour. Portion nearest to wood is whitish in colour. Wood is very soft, porous and yellow in colour[21].

Figure No.1 *Shigru*

Distribution:-

Drumstick tree, also known as horseradish tree and ben tree in English, is a small to medium-sized, evergreen or deciduous tree native to northern India, Pakistan and Nepal. It is cultivated and has become naturalized well beyond its native range, including throughout South Asia, and in many countries of Southeast Asia, the Arabian Peninsula, tropical Africa, Central America, the Caribbean and tropical South America. The tree usually grows to 10 or 12 m in height, with a spreading, open crown of drooping, brittle branches, feathery foliage of tripinnate leaves, and thick, corky, deeply fissured whitish bark. It is valued mainly for its edible fruits, leaves, flowers, roots, and seed oil, and is used extensively in traditional medicine throughout its native and introduced range.

Drumstick tree is indigenous to the Himalayan foothills of South Asia from northeastern Pakistan (33 °N, 73 °E) to northern West Bengal State in India and northeastern Bangladesh where it is commonly found from sea level to 1,400 m on recent alluvial land or near riverbeds and streams. It grows at elevations from sealevel to 1400 m.

It is cultivated and has become naturalized in other parts of Pakistan, India, and Nepal, as well as in Afghanistan, Bangladesh, Sri Lanka, Southeast Asia, West Asia, the Arabian peninsula, East and West Africa, throughout the West Indies and southern Florida, in Central and South America from Mexico to Peru, as well as in Brazil and Paraguay[22].

Plant is indigenous in sub Himalayan tract. It is commonly cultivated through out the country. It grows and found throughout the India up to lower elevations in hilly region[21].

Chemical composition:-

The plant *Shigru* contains 4 - hydroxymellein, vanillin, moringine, moringinine, bayrenol, indole acetic acid, indole acetonitrile, benzylisothiocyanate, pterygospermin, cartotene, known flavonoids, polysacchride, protein components, various essential amino acids, minerals and vitamins, fatty acids and spiro*Chi*n. Pterygospermin was found to be an antibiotic principle[23].

The root bark of *Shigru* contains moringine alkaloids and the roots contain antibiotic principle pterygospermin. Seed yield fixed oil 36.6%. Bark yields a gum resin.

The pods of *Shigru* contains moisture 86.9%, protein 2.5%, fat 4.8% and minerals matter 2.0%,calcium 30, phosphorous 1.10 and iron 5.3 mg/100 gms, copper 3.1 ug/gm, iodine 18 ug/kg and oxalic acid 0.01. Pods also contain carotene as vitamin 185 IU, nicotinic acid 0.2 mg and ascorbic acid 120 mg/ 100 gms. Pressed juice of pods contains ascorbic acid oxidase. Pods also contains a globulin (N 15.6, sulphur 1.58%) and prolamin (N 14.02 and sulphur 14.2%). Pods are remarkably rich in leucine.

The leaves of *Shigru* are remarkably rich in carotene and ascorbic acid. Analysis gave the following values:-

Moisture 75.0, protein 6.7, fat (eather extract) 1.7, carbohydrates 13.4, fibre 0.9 and material matter 2.3, calcium 440, phosphorous 70 and iron 700 mg/ 100 gms, copper 1.1 ug/ gm and iodine 51 ug/ kg[24].

Nutritional information[25]:

Table No.1

***Moringa oleifera Lam.* leaf raw (per 100 gms)**

Sr. No.	Content	Value	Percentage

1.	Energy	64 kcal (270 kJ)	
2.	Carbohydrate	8.28 gm	
3.	Dietary fiber	2.0 gm	
4.	Fat	1.40 gm	
5.	Protein	9. 40 gm	
Vitamin			
6.	Vitamin_A equiv.	378 ug	47%
7.	Thiamine (B1)	0.257 mg	22%
8.	Riboflavin (B2)	0.660 mg	55%
9.	Niacin (B3)	2.220 mg	15%
10.	Pantothenic acid (B5)	0.125 mg	3%
11.	Vitamin B6	1.200 mg	92%
12.	Folate (B9)	40 µg	10%
13.	Vitamin C	51.7 mg	62%
Minerals			
14.	Calcium	185 mg	19%
15.	Iron	4.00 mg	31%
16.	Magnesium	147 mg	41%
17.	Manganese	0.36 mg	17%
18.	Phosphorus	112 mg	16%
19.	Potassium	337 mg	7%
20.	Sodium	9 mg	1%
21.	Zinc	0.6 mg	6%
Other constituents			
22.	Water	78.66 gm	

Medicinal Uses[26]:

Vrana, Vipaka, Granthi, Gulma, Karnashula, Medoroga, Vidradhi, Visarpa, Shopha, Krimiroga, Pliharoga, Galaganda, Mukhajadya, Ashamari, Mutrasharkara, Kushta, Kshata, Antavidradhi.

Doses[26]:

Root Powder: 25- 30 Grams
Stem bark powder: 2 – 5 Grams
Stem bark juice: 10 – 20 Ml
Seed Powder: 5 – 10 Grams

Pharmacological studies:

- *Moringa oleifera* provides a rare combination of zeatin (a potent antioxidant), quercetin (a flavonoid known for its ability to neutralize free radicals and relieve inflammation), beta-sitosterol (a nutrient superstar that blocks cholesterol formation or build-up and is an anti-inflammatory agent for the body), caffeoylquinic acid (another powerful anti-inflammatory compound), and kaempferol (a key nutrient that promotes healthy body cellular function)[27].
- *Moringa oleifera* provides 36 natural anti-inflammatory agents[28].
- Free radical damage caused by electron-seeking, highly reactive, oxidative molecules has been identified as the source of many maladies through mechanisms such as inhibition of telomerase, changes to cellular permeability and DNA damage[29].
- *Moringa oleifera* contains 46 different antioxidants[30].
- In vitro and animal studies indicate that the leaf, seed, and root extracts of *Moringa oleifera* have anticancer, hepatoprotective, hypoglycemic, anti-inflammatory, antibacterial, antifungal, antiviral, and antisickling effects. They may also protect against Alzheimer's disease, stomach ulcers, help lower cholesterol level, and promote wound healing[31].
- This miracle tree is able to provide all of the amino acids required by the human body. Protein is needed not only for the structural components such as muscle and tissues, but also for neurotransmitters, hormones, enzymes and immunoglobulins[32].
- There are various nutrients that can have a beneficial effect on enhancing immune system function and *Moringa oleifera* certainly qualifies in this category due to the ability to provide several of these phytonutrients[33].
- *Moringa oleifera* has been shown to be anti-bacterial, anti-fungal, anti-viral and antibiotic, which will certainly lighten the load on the immune system[34].
- In addition, *Moringa oleifera* demonstrates the ability to be a potent detoxifying agent[35].

Conclusion:

On comprehensive review of *Shigru* it is found that *Shigru* is described in Vedas, Brihatrayies & Laghutraies. Various synonyma like *Mochaka, Bahumula, Shobhanjana, Tikshnagandha, Ghanacchada* are described in various *Nigantus*. *Shigru* (*Moringa oleifera Lam.*) belongs to family *Moringaceae* and commonly known as Horse raddish tree or Ben tree or Drum stick plant. It is used in traditional ayurvedic medicine as antihelminthic, antiseptic, carminative, abortificient and anti-histaminic.

Shigru is having *Tikshna, Ruksha, Laghu, Grahi, Ushna, PicChila Gunas, Tikta - Katu rasa, Ushan Veerya and Katu Vipaka*. On account of above properties it is *Kaphavatashamaka, Granthihara, Gulmahara, Medorogahara, Visarpaghna, Shothara, Galagandahara, Ashamarighna, Kushtahara* and *Kshatahara*.

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