A Review Article on Shigru: A Boon of Nature

Dr. Archana Prajapati*1

1 Assistant Professor, Department of Dravyaguna, Ishan Ayurvedic Medical College and Research Centre, Greater Noida, U.P.

Abstract

Shigru is very common and wellknown herbal medicine. The plant is botanically identified as Moringa oleifera Lam. which is distributed in many countries of the tropics and subtropics. It is fast-growing and most widely cultivated species. Different parts of *Shigru* like leaves, fruit, flower, seed, bark, root bark etc are used as *Aushadi* (medicine) and *Ahara* (food). It has an impressive range of medicinal uses with high nutritional value. *Shigru* can be utilized in treating the malnutrition in a local and cost-effective manner. Different parts of this plant are being employed for the treatment of different ailments in the indigenous system of medicine. The leaves are an excellent source of vitamins (especially Vitamin A, B and C), minerals (calcium, iron) and protein. The plant is bitter, anti-bacterial, antifungal, anti-gastric, analgesic, anti- inflammatory, cardio protective, wound healing etc. There are several herbs in nature which helps in restoring the balance of body and maintaining good health. But a single *Shigru* tree can give various benefits for us like leaf and flowers are used for malnutrition. The various health and nutritional benefits acquired by the use of *Shigru* have been reviewed and discussed in this article.

Key words: Shigru, Malnourishment, Aushadhi, Ahara

Introduction

Ayurveda has been in existence right from the dawn of human creation. It is a store house of knowledge of both the art and science of life by which one can attain real positive health. *Shigru,* botanically identified as *Moringa oliefera* Lam. is a tree growing all over the tropical places of world.

Moringa oleifera Lam. (*Shigru*) (*Moringaceae* family) is a traditional medicine used for control of diabetes, obesity, asthma, cardiac, liver, gastrointestinal, infective, and brain disorders, such as depression and Alzheimer's disease. In Ayurvedic literature, *Shigru* is among few drugs having *Balya* (nourishing) as well as *Medohara* (antiobesity) property. This review

Ayurvedic Health Care Journal | Volume -1

focuses on valid connections between the properties documented in ancient literature and current pharmacological knowledge of *Shigru*, including pharmacological actions, phytochemistry, botanical description, and how *Shigru* can tackle malnutrition in India, virtually every part of the tree is beneficial in some way and both rural and urban people depend on it for their livelihood.

Classical review of Shigru

Samhita period

So many *samhita Granthas* are mentioned in *Ayurveda* but most of these are not available such as *Harita, Bhela* etc, among the *samhitas* three of the important available *samhitas* are *Charak samhita, Sushruta samhita and Astang hridaya*.

These three are collectively called 'Brihatrayi'. References of the Shigru in Brihatrayi are mentioned.

Charaka Samhita

In *Charak Samhita*, *Shigru* has been described in 40 places ^[1]. Which are tabulated as followed.

Table 1: Shigru in charak Samhita

S. no.	Group /Formulation	Action /Indication	References
1.	Sirovirechana dravya	Sirovirechana	Cha.su. 2/3
2.	Yavagu	Krimighana	Cha.su. 2/23
3.	Lepa	Kusth	Cha.su.3/8
4.	Dashemani	Sirovirechanopag	Cha.su.4/27
5.	Sthavar sneha	-	Cha.su.13/10
6.	Nadi sweda dravya	-	Cha.su.14/31
7.	Vyoshadi saktu	-	Cha.su.23/19

8.	Harita varga	-	Cha.su.27/170
9.	Raktapitta hetu	-	Cha. Ni.2/4
10.	Asthapana basti	-	Cha. Vi.7/17
11.	Katuskandha	-	Cha.vi.8/142
12.	Sirovirechana dravya	-	Cha.vi.8/151
13.	Arguvadi tail	Jvara	Cha.chi.3/267
14.	Tail	Kustha	Cha.chi.7/106
15.	Tiktekshvakadi tail	Kustha	Cha.chi.8/108-9
16.	Kanak kshiri tail	Kustha	Cha.chi.8/113
17.	Katbhyadi tail	Apasmara	Cha.chi.10/38
18.	Snana	Swyathu	Cha.chi.12/70
19.	Pralepa	Swyathu	Cha.chi.12/70
20.	Lepa	Udar roga	Cha.chi.13/108
21.	Tail	Vatodara	Cha.chi.13/155
22.	Pippalyadi Lavan	Udar roga	Cha.chi.13/158
23.	Avagahana	Arsha	Cha.chi.14/55
24.	Kiratadha churna	Grihani	Cha.chi.15/139
25.	Yush	Hikka swash	Cha.chi.17/98
26.	Pipplyadi anjan	Vish chikitsa	Cha.chi.23/183
27.	Yush	Ashmari	Cha.chi.26/66-67

28.	Avapeeda nasya and	-	Cha.chi.28/186
	kaval		
29.	Kshar tail	-	Cha.chi.26/226
30.	Aschyotan	Vatic netra roga	Cha.chi.26/237
31.	Varti	-	Cha.chi.26/240
32.	Lepa	Urusthambha	Cha.chi.27/52
33.	Lepa	-	Cha.chi.27/56
34.	Moolakdha tail	Vat vyadhi	Cha.chi.28/168
35.	Moolak tail	Vat vyadhi	Cha.chi.28/176
36.	Lepa	Vat shodita	Cha.chi.29/158
37.	Niruh basti	-	Cha.si.3/62
38.	Shata prasratik basti	-	Cha.si.8/9
39.	Sirovirechana nasya	-	Cha.si.9/17
40.	Basti dravya	-	Cha.si.11/24

Sushruta Samhita

In *Sushruta Samhita, Shigru* has been described in 28 places ^[2]. Which are tabulated as followed.

Table 2: Shigru in Sushruta Samhita

s.no.	Group /Fomulation	Action /Indication	References	
1.	-	Uttput rog	Su.su.16/37	

2.	Pachana drvya	Vrana shoph	Su.su.36/9
3.	Varunadi gana	-	Su.su.38/8
4.	Sirovirechana dravya	-	Su.su.39/6
5.	Katu varga	-	Su.su.42/21
6.	-	-	Su.su.45/115
7.	Shak	-	Su.su.46/221
8.	-	-	Su.su.46/237
9.	Sneha lavan	Vat vyadhi	Su.chi.4/31
10.	-	Kusth chikitsa	Su.chi.9/10
11.	-	-	Su.chi.9/53
12.	-	Pakva vidradhi	Su.chi.16/36
13.	-	Apache chikitsa	Su.chi.18/23
14.	-	Vataj galgand	Su.chi.18/45
15.	Sanjeevani agad	Sarpadasta chikitsa	Su.ka.5/73
16.	Pathya-apathya	For vishatura	Su.ka.6/30
17.	Kumkumadi agad	Satapadi vish	Su.ka.8/49
18.	-	Garbhini	
		masanumasik	
		krima	
19.	Anjan varti	Sleshma	Su.u.19/9
		abhisyanda	

20.	Phala	Abhishyand	Su.u.11/15
21.	Shak	Dristi hitakar	Su.u.17/51
22.	Nadi swed dravya	Karna roga	Su.u.21/6
23.	-	Karna shool	Su.u.21/17
24.	Sechan dravya	Jwara	Su.u.39/272
25.	Churna	Gulma	Su.u.42/94
26.	Balashigru yog	Pandu	Su.u.44/29
27.	Pushpa	Raktapitta	Su.u.45/37
28.	ShigruadiTail	Apasmara	Su.u.61/24

Astang Hridaya

Astang Hridaya, Shigru has been described in 37 places ^[3]. Which are tabulated as followed.

Table 3: Shigru in Astang Hridaya Samhita

S.no.	Group /Fomulation	Action /Indication	References
1.	Guna	-	A.H.Su.6/106
2.	-	Atisthaulya	A.H.Su.14/25
3.	Shodhanadi gana	Sirovirechan	A.H.Su.15/4
4.	Drava sneha	-	A.H.Su.17/7
5.	Basti	Aparasang	A.H.Sa.1/88
6.	-	Garbhasrava	A.H.Sa.2/56

7.	-	Seta jwara	A.H.Chi.1/138	
8.	Yush	Shwas, hikka	A.H.Chi.4/20	
9.	Lepa	Arsha	A.H.Chi.8/23	
10.	Churna	Pittaj ghrihani	A.H.Chi.10/34	
11.	Qwath	Ashmari	A.H.Chi.11/30	
12.	-	Antah vidhridhi	A.H.Chi.13/10	
13.	-	Dushta vidhridhi	A.H.Chi.13/22	
14.	Pathya	Kapha gulm	A.H.Chi.14/110	
15.	Lepa	Udar roga	A.H.Chi.15/48	
16.	Kshar	Udar roga	A.H.Chi.15/70	
17.	-	Kaphaj shoth	A.H.Chi.17/35	
18.	Udwartan	Kushtha	A.H.Chi.19/65	
19.	Yavagu	Krimi nashak	A.H.Chi.20/25	
20.	-	Vatkaphottar vatrakta	A.H.Chi.22/37	
21.	Sarswata ghrit	Bal rog	A.H.U.1/45	
22.	Parishek avam dhoopan	Bal rog	A.H.U.3/45	
23.	Mahabhootarav ghrit	-	A.H.U.5/20	
24.	-	Pothaki	A.H.U.9/21	
25.	-	Netra peedanashak	A.H.U.16/9	
26.	Parishek	Abhishyand	A.H.U.16/11	

27.	-	-	A.H.U.16/37	
28.	-	Kaphaj karnashool	A.H.U.18/12	
29.	-	Karnanad avam	A.H.U.18/23	
30.	Kshar tail	-	A.H.U.18/27	
31.	Dhroompan	Peenas rog	A.H.U.20/16	
32.	-	Nasapak	A.H.U.20/22	
33.	-	Putinasa	A.H.U.20/25	
34.	-	Vataj galgand	A.H.U.22/66	
35.	-	Arbudaa	A.H.U.30/7(1)	
36.	-	Apachi	A.H.U.30/16	
37.	-	Moosak dansha	A.H.U.38/27	

Nighantu period

A physician without the knowledge of Nighantu, a scholar without the knowledge of grammar and a soldier without the knowledge of weapon all are being laughed at in the world (Narhari 17th century A.D.,).The etymological meaning of the word Nighantu is which shines or looks beautifully (*sabdakalpdruma*). Nighantu is a special kind of work in which synonyms of similar meaning are collectively described ^{[4-9].}

The main purpose of *Nighantus* is that which gives a comprehensive knowledge from all the aspects of a particular subject, specially plants through synonyms. Previously these *Nighantus* were limited to the description of synonyms only e.g. *Astang nighantu. Paryayratnamala* etc. then in due course of time the descriptions of properties, actions and indications were also included from the period of *Dhanvantari Nighantu* onwards.

1. Dhanvantari Nighantu

Dravyas are classified in 7 groups i.e. vargas. The drug is mentioned under Karveeryadi Varga

- 2. Shodhal Nighantu- Dravyas are classified in 27 groups i.e. vargas and drug is mentioned in Karveeradi varga
- 3. *Madanpal Nighantu-*. In this nighantu 494 drugs are mentioned

and the drug is mentioned under Shaka varga.

- 4. Kaideva Nighantu- The drug is described under Oshadhi varga.
- 5. Bhava Prakash Nighantu- The drug is mentioned under the Guduchyadi varga.
- 6. Raj Nighantu- The drug is placed in Mulakadi varga

Table 4: Sanskrita synonyms of drugs according to different nighantus-

<i>Nigantus</i> Synonyms	K.N.	M.N.	S.N.	B.P.	D.N.	R.J.
Shobhanjana	+	+	+	+	+	-
Krishnagandho	+	+	-	-	-	-
Murangi	+	-	-	-	-	-
Shalankshama	+	-	-	-	-	-
Ghanacchada	+	-	-	-	-	-
Teekshnagandho	+	-	+	+	+	-
Mochaka	+	-	+	-	-	-
Bahalcchada	+	+	-	-	-	-

Shubhanjana	+	-	-	-	-	-
Avadansho	+	-	-	-	-	-
Mulaparni	+	-	-	-	+	-
Mukhabhango	+	-	-	-	-	-
Haricchada	+	-	-	-	-	-
Shigru	+	+	+	+	+	+
Shubhanjano	+	-	-	-	-	-
Vidridhighna	+	-	-	-	-	-
Akshiva	+	-	+	+	-	-
Mulakshada	+	-	-	-	-	-
Raktoanya	+	+	-	-	-	-
Swadugandhi	+	-	-	-	-	-
Grinjanak	+	-	-	-	-	-
Sheeghraka	+	-	-	-	-	-
Singhakesari	+	-	-	-	-	-
Haritashak	+	-	+	+	+	+
Sweta	+	-	-	-	-	-
Deerghako	-	-	-	-	+	-
Laghupatrka	-	-	-	-	+	-
Avadansha	-	-	-	-	+	-

Kshamadansha	-	-	-	-	+	+
Mukhabhanga	-	-	-	-	+	-
Shak patra	-	-	-	-	-	+
Supatrka	-	-	-	-	-	+
Upadansha	-	-	-	-	-	+
Geya	-	-	-	-	-	+
Komalpatraka	-	-	-	-	-	+
Bahumula	-	-	-	-	-	+
Danshamula	-	-	-	-	-	+
Dashahvaya	-	-	-	-	-	+

Botanical description

Botanical name- Moringa oleifera

Natural order- Moringaceae

Classical names- Shigru, Sobhanjana, Tikshnagandha, Mochaka.

Vernacular names

Beng.	- Sajina, Sajne
Eng.	- Drumstick, Indian horse radish tree
Guj.	- Suragava, Midhosaragavo
Hindi.	- Sahjana, Sahijana
Kan.	- Nugge, Nuggemara, NuggeKoimara
Mal.	- Muringya, Murinna
Mar.	- Shevya

	Ayurvedic Health Care Journal Volume -1
Oriya.	- Sajana, Munga, Munika
Punj.	- Sohajana
Tam.	- Murangai
Tel.	- Mumaga, Chettu, Mulaya Chetta
Taxonomy	
Kingdom:	Plantae
Division:	Magnoliophyta
Class:	Magnoliopsida
Order:	Capparales
Family:	Moringaceae
Genus:	Moringa
Species:	oleifera

Distribution and Habitat

Plant is indigenous in sub-Himalayan tract. It is commonly cultivated throughout country.

Description

Fairly large tree, bark corky, wood soft white spongy. Leaves 30-76 cm. long, three pinnate, petiole scathing at base, pinnate 4-6 pairs opposite the uppermost pair, foliate, hairy gland present between each pair of pinnate and pinnula, ultimate leaflets opposite .85-1.7 cm long obovate or elliptic entire membranous, pale beneath.

Flowers 2.5 cm. diam. strongly honey scented, sepals reflexed, linear lanceolate, petals reflexed, linear lanceolate, patels 1.7- 2.5cm. linear spathulate, white with yellow dots near base, filament villous at base, ovary hairy.

Capsule 23x50.8x1.3-1.7 cm. trigonous, linear peduncles longitudinally ribbed with slight constrictions between seeds, seeds three cornered winged, about 2 cm. long and corky testa; non endospermic, having straight embryo convex cotyledons; superior radical and many leaved plumule.

Root bark- greyish brown reticulated marked with tumid projections of discontinuous

transverse rows of transversely extended lenticles 2.8 mm long. Dents may show tears of reddish of reddish gum. Slightly succulent other skin is corky and papery. Tissue inside is cream or rose portion nearest to wood is white. Wood is very soft porous and yellow in colour.

Flowering and fruiting time

Plant flowers from January to March and fruiting in April- June.

Kinds and variety

There are two kinds of *Shigru* in classical text of medicine on the bases of flower colour viz. white (*Sweta*) and red (*Rakta*) which are bitter and sweet in taste and they are specifically known as *Katu Shigru* (Moringa oleifera) and *Madhu Shigru* (*moringa concanensis*)

Ayurvedic properties

Rasa -		Katu, Tikta
Guna -		Laghu, Ruksha, Tikshna
Virya -		Ushna
Vipaka -		Katu
Doshaghnata -	-	Kaphavatashamaka
Karma -	S	vedopaga Nadvutteiaka l

Karma - Svedopaga, Nadyuttejaka, Deepan, Pachana, Rechana, Vidahi, Ghrahi, Shool Prashamana, Hridya Uttejaka, Krimighna, Artavajanana, Vishghna, Swadajanana, Kusthaghna, Jvaraghna, Lekhana, Chakshushy.

Part used- root, bark, leaf, seeds

Chemical constituents

The plant contains 4- hydroxymellein, vanillin, moringine, moringinine, bayrenol, indole acetic acid, indolr acetonitrile, benzylisothiocyanate, pterygospermin, cartotene, β-sitosterol known flavanoids, polysaccharide, protein components, various essential amino acids, minerals and vitamins, fatty acids and spirochin, pterygospermin was found to be an antibiotic principle.

The leaves of Moringa Oleifera provides an excellent source of several essential vitamins, minerals and other nutrients including proteins, vitamin B6, riboflavin, vitamin C, and iron. One cup (approximately 21 grams) of the fresh leaves of this plant contains the following compounds:

Propagation and cultivation

It grows in all types of soils, except stiff clays and thrives best under the tropical insular climate of South India. The tree can be propagated by seeds or from cuttings. Plants raised from seeds produce fruits of inferior quality. Further, cutting of fairly large size, planted in moist soil, strike roots readily and grow to sizable trees within few months. It can be micro propagated in vitro by mature nodal segment explants on woody plant medium supplemented with 2% sucrose + 1 mg./ 1 BAP developing multiple shoots. Rooting can be achieved on MS + 0.5 mg./ 1 NAA.

Nutritional importance

In developing tropical countries, *Shigru* tree have been used to stand with malnutrition, especially among infants and nursing mothers. Three non-governmental organizations in particular - Trees for Life, Church World Service and Educational Concerns for Hunger Organization - advocated *Shigru* as "natural nutrition for the tropics." The pods are extremely nutritious, containing all the essential amino acids along with many vitamins and other nutrients, edible oil known as Ben Oil. This oil is clear, sweet and odourless, and never becomes rancid. Overall, its nutritional value most closely resembles olive oil. The leaves of the *Shigru* tree are an excellent source of vitamin. The raw leaves are rich in vitamin C (seven times the amount in oranges), and they are also a good source of vitamin B and other minerals. Vitamins and Minerals are required for everything from building our physical bodies to blood coagulation and energy production. As a source of nutrients and vitamins, *Shigru* leaves rank among the best of perennial tropical vegetables

Shigru tree are known to overcome protein deficiency in developing countries as the leaves and other parts of the tree contain high number of crude proteins and amino acids. *Shigru* is an excellent nonanimal source of protein for vegetarian. *Shigru* leaves could be a great boon to people who do not get protein from meat.

Part	Protein	Fat	Mineral	Fibers	Carb.	Energy	Ca	Р	Fe
S	(gm)	(gm)	(gm)	(gm)	(gm)	(Kcal)	(mg)	(mg)	(mg)

Lea f	6.7	1.7	2.3	0.9	12.5	93	440	70	0.85
Frui t	2.5	0.1	2.0	4.8	3.7	26	30	110	0.18
flow er	3.6	0.8	1.3	1.3	7.1	50	51	90	-

Table No. 6: Vitamin contents as per 100 gm of edible portion

Parts	Vit-A	Vit-B1	Vit-B2	Vit-B3	Vit-B6	Folic acid	Vit-C
	(µg)	(mg)	(mg)	(mg)	(mg)	(µg)	
Leaf	6780	0.06	0.05	0.8	-	-	220
Fruit	110	0.05	0.07	0.2	-	-	120

Table No. 7: Mineral and trace element as per 100 gm of edible portion

Parts	Mg	Na	к	Cu	Mn	Zn	S	CI
Leaf	42	-	259	0.07	0.37	0.16	137	423
Fruit	28	-	259	0.01	0.05	0.16	137	423

Pharmacological activities

Hypolipidemic / Antihyperlipidemic: *Shigru* has been considered to be *Medohar* (antilipidemic) in Ayurveda treatises. Animal studies have proved its hypolipidemic potential. [10,11,13] **Anti-inflammatory activity**: *Shigru* has been indicated in the treatment of oedema by *Acharya Charaka* (CS.Su.1.117). Its anti-inflammatory potential has been accepted by almost all classical texts. Animal study has shown that *Shigru* is potent anti-inflammatory drug ^[14, 15]

Hypoglycaemic activity: *Shigru* has been said to pacify *Vaat* and *Kapha* in Ayurvedic classical texts. Diabetes mellitus has been considered a disease caused due to vitiation of *Vaat* Dosha. Anti-diabetic potential of various parts of plant has been demonstrated in animal pharmacology. ^[16, 17]

Cardioprotective: It has been considered to be Cardiotonic. Preclinical studies have proved it to be having cardioprotective activity^[19]

Hepatoprotective *Shigru* is being used as *Deepana* (Useful for stimulating digestive power). Its leaves are bitter in taste and bitterness is considered to be hepato-stimulant and cholagogue. The decoction of leaves of *Shigru* has been used in haemorrhoids as a sitz bath^[20]

Bronchodilator/Antiasthmatic: Soup of the leaves of *Shigru* with some other drugs has been indicated to alleviate hiccough and asthma. (CS.Ci.17.99) Soup of *Shigru* fruits with *Maricha*, salt and *Vavakşara* checks hiccough and asthma, (CS.Ci. 17.98). Smoke of *Shigru* root mixed with ghee and oil should be taken. It alleviates coryza, cough and hiccough. Classical claims have been authenticated in animal studies^[21]

Antiarthritic *Shigru* has been considered as a potent analgesic, anti-inflammatory, hypolipidemic and weight reducing drug. Pre-clinical studies have authenticated claims described in texts of Ayurveda. Many studies have proven its anti-arthritic activity^[22]

Immunomodulatory: Classical texts of Ayureda have considered *Shigru* to increase digestive power and improve capacity of body to fight against various diseases. In some parts of country, fruits and leaves are used as vegetable and considered to enhance immunity. The 95 per cent ethanolic extract of the seeds (50, 100 and 200 mg/kg, orally for 7 days) showed immunosuppressive activity in Swiss albino mice by inhibiting both the nonspecific and specific immunity. It also decreased the total lymphocyte count, spleen weight and number of splenic lymphocytes^[23]

Conclusion

Shigru plant is widely available and it is used in various kinds of diseases traditionally as well

Ayurvedic Health Care Journal | Volume -1

as in modern medicine. It was also observed that a lot of research work has been done on the pharmacological activity of different part of *Shigru* it is easily available and cost effective also and hence can be used affordably to treat various diseases. A large number of reports on the nutritional qualities of Shigru now exist in literature. *Shigru* has been in use since centuries for nutritional as well medicinal purposes. *Shigru* Leaves are full of essential disease-preventing nutrients. *Shigru* is a natural, whole-food source for vitamins, minerals, protein, antioxidants, and other important compounds that your body relies on to stay healthy. Micronutrient deficiencies are now recognized as an important contributor to the global burden of disease. *Shigru* is an alternative to imported food supplies to treat malnutrition in poor countries. *Shigru* tree have been used to stand with malnutrition, especially among infants and nursing mothers. Its use in diet as well as drug has the potential to alleviate number of tough ailments. There is an urgent need to advocate its inclusion in diet as vegetable as well as dietary supplement among masses. The *Shigru* tree is the most inexpensive and credible alternative to providing good nutrition. It is really a wonderful and miraculous tree. It is a gift of Mother Nature.

References

- 1. KashiNatha Shastri P & Chaturvedi GaurakhaNatha, editor(2015 ed.) Charaka Samhita of agnivesha:Chaukhamba Bharti Academy Varanasi, Revised edition 2015
- Shastri Ambika Dutta, editor (2008 ed.) Sushruta Samhita :Chaukhamba Sanskrit Sansthana Varanasi, Edition Reprint 2008
- 3. Gupta Atrideva, editor (2012 ed.) Astang Hridaya of Vagbhatta : Chaukhamba Prakashana Varanasi, Edition Reprint 2012
- Sharma P V & Sharma Guru Prasad, editor (2013 ed.) Kaideva Nighantu : Chaukhamba Orientelia Publucation, Reprint and Edition 2013
- Pandey Gyanendra, editor (first edition 2012 ed.) MadanPal NIghantu : Chaukhamba Orientelia Publication, Edition 1st 2012
- Pandey Gyanendra, Dwivedi R R, editor(first edition 2009 ed.) Shodhala Nighantu : Chaukhamba KrishnaDas Academy Varanasi, Edition First 2009
- Chunekar K C Edited by Pandey G S, editor (2010 ed.) BhavaPrakasha Nighantu : Chaukhamba Bharti Academy, Revised & Enlarged Edition 2010

- Sharma Guruprasad, editor (2012 ed.) Dhanvantari Nighantu : Chaukhamba Orientelia Publication, Reprint Edition 2012
- Tripathi Indradeva , editor (5th edition ed.) Raj Nighantu : Chaukhamba Krishnadas Academy Varanasi, Edition 5th 2010
- 10. "A Study of Anti Hypolipidaemic Effect Of Trifala w.s.r. To Medoroga (Obesity"), By Dr. Bali Chauhan ,P.G.-2008, P.G. Dept Of Dravyaguna Vigyan, National Institute Of Ayurveda Jaipur.
- 11. "Evaluation Of Hypolipidaemic Effect Of Certain Herbo-Mineral drugs w.s.r. To Obesity" By Seema Jain Bhadora- Ph.D.-2006, P.G. Department Of Kaya Chikitsa, NIA Jaipur.
- 12. Data base of medicinal plants used in ayurveda, Vol. 2,8
- 13. Udupa, S. L., Udupa, A. L. and Kulkarni, D. R. Studies on the anti-inflammatory and wound healing properties of Moringa oleifera marmelos. Fitoterapia, 1994; 65: 119-123.
- Mehta, K. L., Balaraman, R., Amin, A. H., Bafna, P. A. and Gulati, O. D. Effect of fruits of Moringa oleifera on the lipid profile of normal and hypercholesterolaemic rabbits. J Ethnopharmacol, 2003; 86: 191-195.
- 15. Rao, K. N. V, Gopalakrishnan, V., Loganathan, V and Nathan, S. S. Anti inflammatory activily of Moringa oleifera Lam. Ancient Sei Life., 1999; 18(3-4): 195-198.
- 16. Prakash, D., Kumar, P and Kumar, N. Antioxidant and hypoglycemic activity of some Indian medicinal plants. Pharmacologyonline, 2009; 3: 513-521.
- 17.Gupta, R., Mathur, M., Bajaj, V. K., Katariya, P, Yadav, S., Kamal, R. and Gupta, R. S. Evaluation of antidiabetic and antioxidant activity of Moringa oleifera in experimental diabetes. J Diabetes, 2012; 4: 164-171
- Article Received on 27 November 2020, Revised on 17 Dec. 2020, Accepted on 07 Jan.
 2021 DOI: https://doi.org/10.17605/OSF.IO/K89JZ
- Nandave, M., Oiha, S. K., Joshi, S., Kumari, S. and Arya, D. S. Moringa oleifera leaf extract prevents isoproterenol-induced myocardial damage in rats: Evidence for an antioxidant antiperoxidative and cardioprotective intervention. J Med Food., 2009; 12: 47-55

- 20. Kumar, P, Singh, K. and Kumar, A. Hepatoprotective studies on acrial parts of Moringa oleifera Lam on carbon tetrachloride induced liver cell damage in albino rats. Ann Biol Res., 2010a; 1(1): 27-35.
- 21. Mehta, A. and Agrawal, B. Investigation into the mechanism of action of Moringa oleifera for its anti-asthmatic activity. Orient Pharm Exp Med., 2008; 8: 24-31.
- 22. Mahajan, S G. and Mehta, A. A. Anti-arthritic activity of hydroalcoholic extract of flowers of Moringa oleifera Lam. in Wistar rats, J Herb Spices Med Plant., 2009; 15: 149-163.
- 23. Mahajan, S. G. and Mehta, A. Immunosuppressive activity of ethanolic extract of seeds of Moringa oleifera Lam in experimental immune inflammation J Ethnopharmacol., 2010; 130: 183-186.