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Dr. Neethu P

PG Scholar, Department of
Agada Tantra, MVR Ayurveda
Medical College,
Parassinikadavu, Kannur,
Kerala, India

Dr. Vijitha Vijayan

PG Scholar, Department of
Agada Tantra, MVR Ayurveda
Medical College,
Parassinikadavu, Kannur,
Kerala, India

Dr. Athulya CM

PG Scholar, Dept. Department
of Agada Tantra, MVR
Ayurveda Medical College,
Parassinikadavu, Kannur,
Kerala, India

Dr. Arathi Rajesh

Associate Professor,
Department of Agada Tantra,
MVR Ayurveda Medical College,
Parassinikadavu, Kannur,
Kerala, India

Correspondence

Dr. Neethu P

PG Scholar, Department of
Agada Tantra, MVR Ayurveda
Medical College,
Parassinikadavu, Kannur,
Kerala, India

A review on anti-toxic effect of sweta sarshapa

Dr. Neethu P, Dr. Vijitha Vijayan, Dr. Athulya CM and Dr. Arathi Rajesh

Abstract

Mustard is a condiment that has been used for culinary, religious and cultural purposes by humanity since time immemorial. Mustard has figured prominently in the Indian tradition and its medicinal properties have been systematically evaluated and documented in the classical Ayurvedic texts. Even though Mustard is used as an emetic, diuretic, as well as a topical treatment for inflammatory conditions such as arthritis and rheumatism are well documented, its uses in visha conditions is not that much explored. Mustard also has potential antitoxic properties. The paper attempts to carefully review the anti-toxic property of Swetha sarshapa and its prayogas in visha conditions.

Keywords: Swetha sarshapa, mustard, visha

Introduction

Swetha sarshapa or Sidharthaka known by the botanical name *Brassica campestris* Linn. is an economically important plant that has been well known in India for centuries for its medicinal and nutritive values. It is well documented in the classical Ayurvedic literatures like charaka samhita, susruta samhita, and also in various nighantus. The broad spectrum of beneficial effects of the seeds perceived with this plant warrants further exploration of swetha sarshapa seeds as a potential source for obtaining pharmacologically standardized phytotherapeutics which could be potentially useful.

Materials & Methods

This review has done with an intention to provide an overview on pharmacological activities of sarshapa. The data were collected from Ayurveda authentic texts, scientific journals and through the electronic media.

Taxonomical Classification ^[1]

Botanical Name: *Brassica campestris*
English Name: White mustard, *Sinapis alba*
Family: cruciferae
Kingdom: Plantae
Phyllum: Phanerogams
Subphyllum: Dicotyledons
Series: Polypeptalae
Order: Parietales
Genus: *Brassica*
Species: *Campestris*

Distribution ^[9].

Plant is extensively cultivated throughout India as an important oil crop. It is likely that this variety was introduced from North west to Punjab, from where it has extended eastwards. It is most commonly grown in central India and north Indian states along with East Bengal. This is an important oil crop seed in India and is commonly grown in Bengal, Bihar, UP and Punjab.

Morphology ^[9].

- The plant is annual herb of about 1-2 ft tall.
- Stem is branched, bristly, usually clearly coarsely hairy.
- Flowers are yellow, about 1.5 cm across, petals are 4, 7-10 mm long. Sepals are 4, spreading. Stamens are 6, of which 4 long and 2 short. Gynoecium fused, a single carpel.
- Leaves are alternate, stalked. Blade is coarsely hairy, irregularly pinnately lobed, terminal

- leaflet large. Uppermost stem leaves clearly lobed.
- Fruit is many-seeded, densely stiff-haired, 3-veined, 2-4 cm long siliqua terminated by a flat, slightly curved, seedless beak the same length as the other siliqua.

- White mustard seeds are hard round seeds, usually around 1 to 1.5 mm in diameter, with a color ranging from beige or yellow to light brown

Synonym

Table 1: Synonyms according to various nighantus

Synonyms	B.P [2]	KAL.NI [3]	RA.NI [4]	S.N [5]	M.N [6]	D.N [7]	N.A [8]
Sarshapa	+			+	+	+	+
Katuka	+				+	+	
Sneha	+				+		
Tantubhi	+	+			+		
Kadambaka	+						
Sidhartha	+	+		+	+	+	+
Swetha		+					
Kandughna		+		+		+	
Rajikaphala		+		+			
Teekshnaka			+	+			
Duragharsha			+	+			
Kushta Nasana			+	+			
Sidhasadana			+				
Sidha Prayogana			+				
Sita Sarshapa			+				
Grahaghna				+		+	
Taruka				+		+	
Bhuta Nasana				+		+	
Gaura				+		+	
Katu Sneha				+	+	+	+
Raghshoghna				+	+		
Bhutaghna					+		+
Rakshitaphala						+	

Parts Used [9]: Seeds, Oil, Leaves.

Macroscopic Description

Seeds are small, slightly oblong, pale or reddish brown, bright, smooth, 1.2-1.5mm in diameter under a magnifying glass it is seen to be minutely reticulated. Taste is bitter and sharp.

Microscopic Description

Seeds show single layered colourless testa followed by 3-4 layer, non-lignified, hexagonal, thick walled cells filled with yellowish brown contents, embryo and endosperm consist of hexagonal, thin walled parenchymatous cells containing oil globules.

Chemical Constituents

Mustard seeds contain numerous chemical constituents which alkaloids like sinapine and cheirine found in the seeds.

phytoatoxins which are involved with the plant defence mechanisms such as antibacterial and antifungal activity. Sinalexin and sinalbin A and B has been isolated from its seeds. Glucosides like glucocheirolin, Glucotropeolin, singrin are found in seeds. The free and esterified seeds in Brassica and Sinapin species primarily contain sitosterol and campesterol. The seeds from Brassica species also contain small amounts of Gama avenasterol. Flavonoids assist in plant defence mechanism and play an important role in microb interaction. Enzyme myrosine is present in seeds of white mustard. Alkaline substance like Pottasium, calcium, magnesium are also present in seeds. The volatile oil is derived from steam distillation. Sinigrin is hydrolysed by the enzyme myrosinase to yield the volatile allyl isocyanates, which are responsible for the pungent ouder.

Classification by Various Classics

Table 2: Classification of Sarshapa by various classics

Opinion of different authors	No. of varities	Varities of sarshapa
SU.S	2	Sita (gaura), Asita (Rakta)
DN	2	Pita (gaura), Rakta
RN	3	Rakta, Krishna, Swetha
BP	2	Pita, Raktha
S.N	3	Sidharthaka, Rajika, Raja sarshapa

Ganas or Vargas

BP.N: Dhanya varga
K.N: Dhanya varga
R.N: Salyadi varga

D.N: Karaveeradi varga

M.N: Dhanya varga

C.S: Asthapanopaga gana, Kandughna gana

S.S: Dhanya varga, Pipalyadi varga, Sthavara sneha varga

Pharmacological Properties of Sarshapa According to Ayurveda [2, 3, 4, 6, 7, 12].**Table 3:** Pharmacological properties

Rasa Panchakas	B.P	KA.NI	RA.NI	D.N	M.N	S.S
Rasa	Katu, Tikta	Katu, Tikta	Katu, Tikta	Katu, Tikta	Katu	Katu
Guna	Snigdha, Teeksha	Ruksha, Teekshna, Ushna	Ushna	Snigdha, Ushna	Tikhna, Ushna	Ruksha, Tikshna, Ushna
Veerya	Ushna	Ushna	Ushna	Ushna	Ushna	Ushna
Vipaka	Katu	Katu	Katu	Katu	Katu	Katu
Karma	Kapha vatahara	Kapha vata hara	Vatahara, Raktahara	Kapha vatahara	Kapha vata hara	Kapha vata hara

Karmas and Rogagnata [2, 3, 4, 5, 6, 7, 12].**Table 4:** Karmas and Rogagnata

C.S	Kandughna, kotaghna
D.N	Agnimandhyahara, Amavataghna, Dantapuyaghna, Kandughna, Krimighna, Kushtaghna, Pleehavridhighna, Sruthi sheersha anilajit
M.N	Kandughna, Krimighna, Kushtaghna, Pramehaghna, Sruthisheersha anilajit
R.N	Bhutaghna, Graharogapaha, Kushtaghna, Ruchya, Twakdosahara, Vishapaha, Vranaghna
K.N	Dipana, Graharogapaha, Kandughna, Kotaghna, Krimighna, Kushtaghna
BP.N	Rakshoghna, Koshtakrimighna, Kandughna, Graharogapaha, Dipana
S.N	Arshoghna, Graharogapaha, Kandughna, Krimighna, Kushtaghna, Shotaghna, Twakdosahara, Vranaghna.

Pharmacological Activities and Medicinal Properties Proven By Modern Research Findings [14].

Anti-oxidant activity: Aqueous extract of the mustard at 300 mcg/ml inhibited lipid per oxidation induced Feso₄ ascorbate or human erythrocyte membrane. The aqueous extract of the mustard also inhibited the formation of diene, triene, tetraene conjugates in human erythrocyte membrane.

Anti-inflammatory activity: Sarshapa shows *in vitro* and *in vivo* anti-inflammatory activities. From phyto chemical study, it was observed that Flavonoids were present in the plant extracts. Universally it is established that flavonoids have anti-inflammatory effect. The anti-inflammatory effect of flavonoids are due to the effect on blood vessels, inflammatory cells, inflammatory mediators.

Wound healing activity: Chemical constituent Sinigrin has the potential to cure wounds. The *in vitro* wound healing activity was tested on normal human keratinocytes.

Chemo protective activity: Dietary organic Isothiocyanate inhibited P-Glyco protien and Multi Drug resistant associated protien which are involved in the bio availability, distribution and elimination of many drugs thereby enhance the efficacy of cancer chemotherapy.

Hypo glyceic effect: The effect was documented in rats fed with mustard diet for 60 days. Mechanism of action of the hypoglycemic effect was related to the stimulation of glycogen synthetase will lead to an increase in hepatic glycogen content and suppression of glycogen phosphorylase and other gluconeogenic enzymes.

Anti-microbial activity: Allyl isothio cynate has antimicrobial and anti-fungal activity which helps to provide resistance against the pathogen of economic importance.

Exploration of Sarshapa and Its Formulations in Visha Chikitsa

- According to Astanga hrudaya seed churna with human hair and purana guda (old jaggery) is used for fumigation purpose in keeta visha (insect bite) [15].
- According to Yoga ratnakara, Burnt oil of the seeds are

used for external application to cure the severe pain caused by the centipede venom [16]

- In Prayoga samucchaya panchama paricheda Kochunni Tamburan had described a gutika preparation as follows purana kitta is mixed with 3 prasta of tender coconut water, then it is reduced, dried and powderd and is placed over folded 7 layered cotton cloth which is then made to potali. After that this potali is kept in chitraka swarasa, then reduced and made to bolus and is kept inside a musha, then puta is given for 4 yamas. then musha is removed and diped in gomutra and after that bhasma is taken out. This bhasma is again tricturated in gomutra and is rolled into pills.

This is used for nasya in sarshapa swarasa for pain, diarrhoea and delusion caused due to poisoning [17].

- Tanduliyaka and sarshapa are taken in equal quantity along with navaneetha as lepa in the sophia caused by bhallataka [18].
- Musta, sarshapa, and devadaru are taken in equal quantity and applied as lepa along with navaneetha sophia caused by bhallataka [18].
- In Rajila visha chikitsa (krait poisoning) when visha reaches asthi dhatu sarshapa churna along with honey is administered [19].

Some of the Formulations Containing Sarshapa Other Than Used In Visha.

- Sidharthakadi ghrta: unmada
- Sidharthaka agada: Apasmara, jwara, unmada
- Visha taila: Switra, Dusta vrana
- Hinguvadi Taila: Nasa roga
- Brihatmarichadi Taila: Kushta
- Mahayogaraja guggulu: Vatavyadhi
- Arka taila: Kushta, kachu, vicharchika
- Dhatura taila: Apasmara

Discussion and Conclusion

Swetha sarshapa has been considered as a plant of great medicinal importance. The usage of sarshapa in various disease conditions like kushta, vata vyadhi, Apasmara, jwara etc has very elaborately explained in the classics also modern

pharmacological research findings like anti inflammatory, anti-diabetic, anti-microbial like studies has also been taken up. Here we can see various prayogas of sarshapa used in visha. As most of the properties of sarshapa is similar to visha and as per Astanga sangraha Vishopayogiya chapter sarshapa can be used as a safe counter poison, since it posses snigdha, guru and ghana property. Hence more researches should be taken up to explore the action of sarshapa in poisoning conditions.

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