

Mustard and its uses in *Ayurveda*

Ram Manohar P*, Reshmi Pushpan & Rohini S

AVT Institute for Advanced Research, Arya Vaidya Pharmacy, 136-137 Trichy Road, Ramanathapuram,
Coimbatore 641 045, Tamil Nadu

Received 17 October 2008 revised 17 April 2009

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. The paper attempts to carefully review the ancient and contemporary uses of mustard as food and medicine with reference to the *Ayurvedic* tradition. It will give an outline of the varieties of mustard described in the ancient *Ayurvedic* writings, comparing *Ayurvedic* and modern medical information regarding their properties and applications for health as well as other ways in which mustard has been used for betterment of human life.

Keywords: Traditional knowledge, *Ayurveda*, Mustard

IPC Int. Cl.⁸: A61K36/00, A61P17/00, A61P17/02, A61P17/10, A61P19/00, A61P25/00, A61P29/00, A61P31/00, A61P31/02

Known variously as *sarṣapa*, *siddhārthaka*, *rājikā* and *āsūrī*, mustard is well documented in the classical *Ayurvedic* literature like *Caraka Saṃhitā*, *Suśruta Saṃhitā*, *Bhela Saṃhitā* and *Kāśyapa Saṃhitā*. Scholars opine that the term *āsūrī*, which occurs twice in both the *Śaunaka*ⁱ and the *Paippalāda*ⁱⁱ recensions of the *Atharva Veda* denotes the mustard plant extending its historicity even farther into the past. This assumption is based on the comments of *Sāyaṇa*ⁱⁱⁱ and the medicinal properties ascribed to it in the *Atharva Veda*. However, in the later period and right up to contemporary times, the applications of mustard in diet and medicine got indisputably established in *Ayurvedic* practice. Needless to say, mustard has a long history of use in the *Ayurvedic* tradition. Mustard is referred to in *Ayurvedic* literature by various synonyms and this makes the task of identifying the plant and its varieties as it was understood in ancient times quite difficult. Two varieties of mustard are alluded to as *siddhārthakayugma*^{iv} albeit many more varieties are mentioned on the basis of colour. There are the *śveta* (white)^v, *gaura* (yellowish white)^{vi}, *pīta* (yellow)^{vii}, *asita* (black)^{viii} and *rakta* (red)^{ix} varieties of mustard mentioned variously in the works of *Caraka*, *Suśruta* and *Vāgbhaṭa*. Obviously, these terms do not suggest that six varieties of mustard were known to the

ancients. In these early writings on *Ayurveda*, only two varieties of mustard are recognized and it therefore seems that the six terms denoting coloured varieties of mustard can be resolved under two categories. It appears that the ancient authors generally recognized two shades of seed colour of the mustard plant viz., the light (*sita* or *śveta*) and dark (*asita*) colored seeds. *Gaura* and *pīta* are probably synonyms of the *śveta* variety of mustard and *rakta* is a synonym of the *asita* variety. The *Suśruta Saṃhitā* distinguishes *Sarṣapa* and *Rājikā* as the two varieties of mustard^x.

At a later period, the *Nighaṅṭus* (medical lexicons) distinguish three or four varieties of mustard. The *Dhanvantari Nighaṅṭu*^{xi} distinguishes between *Gaura Sarṣapa*, *Rakta Sarṣapa* (equated to *Siddhārthaka*) and *Āsurī*. The *Kayyadeva Nighaṅṭu*^{xiii} lists *Sarṣapa*, *Śveta Sarṣapa*, *Rakta Sarṣapa* and *Kṛṣṇa Sarṣapa*. On the other hand, the *Rāja Nighaṅṭu*^{xiii} mentions about *Āsurī*, (equated to *Raktasarṣapa*) *Rājakaṣavaka* (equated to *Kṛṣṇa Sarṣapa*) and *Tīkṣṇaka* (equated to *Sita Sarṣapa* or *Siddhārthaka*) types of mustard. The *Bhāvaprakāśa Nighaṅṭu*^{xiv} considers *Rājikā* to be *Kṛṣṇa Sarṣapa* and specifies that *Gaura Sarṣapa* is known by the term *Siddhārtha*. From these classifications, a correspondence with four varieties of mustard widely recognized today as brown mustard (*Brassica campestris*), black mustard (*Brassica nigra*)

*Corresponding author

white mustard (*Brassica alba*) and Indian mustard (*Brassica juncea*) can be discerned. Nevertheless, it is important to realize that the varieties described in the *Ayurvedic* texts could be sometimes referring to seed color variations in the same species of mustard. Careful analysis of literary evidence suggests that *Brassica juncea*, known as Indian mustard is a definite botanical source for one of the mustards documented in *Ayurvedic* literature. Further studies are required to authentically establish the botanical identity of the other varieties of mustard known to ancient Indians.

Mustard has been used as both food and medicine in *Ayurveda*. Mustard leaf is considered a vegetable, while the seeds are used as a condiment and constitute the source of mustard oil. References to mustard are seen scattered in *Ayurvedic* literature and a systematic account of its properties and uses are seen only in the later period. All the ancient authorities unequivocally proclaim that the leaves of mustard are the most condemned amongst vegetables. Nevertheless, mustard leaves are an ingredient of the decoction for steam fomentation^{xv} and is also recommended for cleansing the cranial cavity^{xvi} in the *Caraka Saṃhitā*. *Kāśyapa* specifies that mustard leaf is not a galactagogue unlike other leafy vegetables^{xvii}. It is *sakṣāra* (slightly alkaline), *madhura* (sweet), *nātyuṣṇa* (not so hot in potency) or *uṣṇa* (hot in potency), *tīkṣṇa* (penetrating), *guru* (heavy), *rūkṣa* (drying) or *snigdha* (unctuous), *vidāhi* (triggers inflammation), *grāhi* (astringent), *baddhaviṇmūtra* (reduces output of urine and feces) and reduces *kapha* and *vāta*^{xviii}. It is mentioned in the group of leafy vegetables by *Suśruta* and *Vāgbhaṭa*^{xix}. According to *Kaṣyadeva Nighaṇṭu*, the leaves of *sarṣapa* (light) variety of mustard have a salty taste^{xx} and the *Bhāvaprakāśa Nighaṇṭu* mentions that it actually increases urine output and is a laxative as well^{xxi}. According to *Rāja Nighaṇṭu*, the leaves of the *Rājikā* variety of mustard improve digestion^{xxii}. It is pertinent to note that the *Suśruta Saṃhitā*^{xxiii} and the *Nighaṇṭus* make a clear distinction in the properties of the leaves of the two varieties of mustard suggesting that two different species of mustard were known to the ancient physicians of India from a very early period. *Suśruta Saṃhitā*^{xxiv} mentions that mustard leaves cause inflammation, constipation and reduced urinary output. It is hot in potency, sharp in action and deranges all the three *doṣas*. The leaves of *Rājikā* variety^{xxv} (black mustard) are also hot and pungent,

but can improve appetite and pacify *Vāta* and *Kapha*. The *Kaṣyadeva Nighaṇṭu*^{xxvi} elaborates on these distinctions further while agreeing with the observations of *Suśruta*. Mustard leaves have a salty, pungent, sweet and alkaline taste and that the leaves of the *Rājikā* variety^{xxvii} are anthelmintic but harmful for the eyes and deranges blood and pitta, causing inflammation as well.

For medicinal purposes, the seeds and oil of mustard are used singly and in various formulations in *Ayurveda*, while mustard leaves are used sparingly. Mustard seed is included in the group of drugs that cleanse the cranial cavity (*Śīrṣavirecana Gaṇa*)^{xxviii}, are used for decoction enema (*Āsthāpanopaga Gaṇa*)^{xxix}, have anti-prurient activity (*Kaṇḍūghna Gaṇa*)^{xxx}, induce emesis (*Chardana Gaṇa*)^{xxxi} and have a pungent taste (*Kaṣu Skandha*)^{xxxii}. Mustard seeds are most commonly used and the references to external uses far outnumber the internal uses. Common modalities of external use of mustard seed are as paste (*pradeha*)^{xxxiii}, fumigant (*dhūpana*)^{xxxiv}, diaphoretic (*svedana*)^{xxxv}, massage powder (*udvartana*)^{xxxvi}, scraping agent (*pragharṣaṇa*)^{xxxvii}, poultice (*upanāha*)^{xxxviii} and for gargling (*gaṇḍūṣa*)^{xxxix}. The applications are seen indicated in diseases like leucoderma, cracked skin, fever, leprosy, wasting, insanity, epilepsy, swelling, rheumatoid arthritis, neurological disorders, gynecological disorders, breast milk disorders earache, wounds, acne vulgaris, eruptions in oral cavity and retention of placenta^{xl}.

Internally, mustard seeds are used for purging the body of toxins^{xli}. Mustard seed is an ingredient of formulations that induce emesis, cleanse the cranial cavity and for giving decoction enema. These procedures are indicated in diseases like vomiting, insanity, flatulence, pallor, jaundice and rhinitis^{xlii}. In tumour of the thyroid gland as well as lymphadenitis, a paste of mustard seeds with other herbs is indicated for external application^{xliii}. The *Kāśyapa Saṃhitā* mentions about offering mustard grains into fire to prevent seeing inauspicious dreams^{xliv}. The same text also includes mustard seed as an ingredient in a linctus indicated for improving the intellect^{xlv}. The *Rāja Nighaṇṭu* recommends its use in splenomegaly^{xlvi} and *Kaṣyadeva Nighaṇṭu* in cardiac disorders^{xlvii}. In some contexts, a specific type of mustard is specified for use. For anointment in people who have been emaciated by trauma, the white variety of mustard is indicated^{xlviii}. So also as ointment in skin

diseases and fistula in ano^{xlix}. Unlike the early texts, the medical lexicons of the later period spell out the differences in the properties of varieties of mustard seeds. The *Dhanvantari Nighaṅṭu* explains that white mustard pacifies *Kapha* and *Vāta* and is useful for diseases of ear, head and *Vāta*^l. The red mustard is bitter and unctuous while black mustard increases *Pitta* and harms the eyes as well as the urinary system^{li}. According to the *Madanapāla Nighaṅṭu*, mustard seeds pacify *Vāta* and *Kapha*, is sharp, hot, dry, increases the digestive fire and aggravates blood and *Pitta*. It is indicated in management of itching, skin diseases and intestinal worms. This text does not distinguish between the properties of varieties of mustard seeds^{lii}.

In the *Bhāvaprakāśa Nighaṅṭu*, white mustard is pungent, bitter, unctuous, sharp, hot, pacifies *Kapha* and *Vāta*, increases digestive power, has antimicrobial properties and is useful in management of itching, skin diseases and intestinal worms. The red mustard also has similar properties but the white mustard is said to be superior. The black mustard is said to be having an acute potency compared to the other two varieties and pacifies *Kapha* and *Pitta* while exhibiting similar properties as the other types of mustard^{liii}. *Rāja Nighaṅṭu* proclaims that the *Āsurī* type of mustard pacifies *Vāta*, splenomegaly and colicky pain. It is useful in management of abdominal swellings, intestinal worms and wounds. However, it increases burning sensation and *Pitta*^{liv}. The black mustard also has similar properties and uses while the white variety is useful in rheumatoid arthritis, seizures, skin diseases, anorexia, poisoning, wounds and possession by evil spirits^{lv}. The *Kayyadeva Nighaṅṭu* summarizes in general the properties of all types of mustard seeds specifying that red mustard is especially hot, heavy and alkaline. Mustard is said to be useful in cardiac disorders but can derange blood and *Pitta*^{lvi}. The fact that these texts distinguish between the properties of leaves, seeds and oil derived from varieties of mustard suggests that different species of mustard were used in ancient India. Nevertheless, the classification varies slightly from text to text making it difficult to establish the exact identity of the plants.

Mustard oil is mentioned in the group of oils (*Taila Varga*)^{lvii}. Mustard oil is indicated for external use in management of abdominal swelling, skin diseases, epilepsy, insanity and frozen thigh. It is considered to be a lipid lowering agent, anthelminitic, and used in

diseases affecting the head, hemorrhoids and wounds^{lviii}. Internally, mustard oil is used to season food and recommended in diabetes, skin diseases, frozen thigh, elephantiasis and retention of placenta. It is also used for urethral infiltration^{lix}. In filariasis, mustard oil is recommended for internal use with the juice of the leaves of *Pongamia glabra*. Mustard oil is also an ingredient of *Aṣṭakaṭvara Taila*, which is used in the management of frozen thigh. It appears in many formulations for treating skin diseases (*Siddhārthaka Tailaṃ*, *Maricādyam Tailaṃ*, *Kuṣṭhakālānalam Tailaṃ*) and lymphadenitis (*Ajamodādyatailaṃ*). Mustard oil in general is pungent in taste, light and warm on touch. It improves digestion, has a scraping action and is useful in management of diseases caused by *Kapha*, build up of fat, derangement of *Vāta*, haemorrhoids, diabetes, diseases of ear and head, itching, eruptions, intestinal worms, vitiligo and chronic diseases^{lx}. It causes emaciation, is harmful for the eyes and deranges blood and *Pitta*^{lxi}. It is specifically contraindicated for enema. The oil from *Rājikā* variety of mustard is said to be a hair tonic and is useful in skin diseases but causes impotency and reduced urine output^{lxii}.

Depending on the variety of mustard, there are differences in the properties of leaf, seed and oil. Mustard leaves can derange all the *doṣas* and specifically blood and *pitta*. Hence, it is not recommended for regular use as a vegetable. The *Madanapāla Nighaṅṭu* specifies that mustard leaf pacifies all the *doṣas*^{lxiii} while the *Kayyadeva Nighaṅṭu* specifies that it is the leaves of the *rājikā* (dark) variety of mustard that deranges blood and *pitta*^{lxiv}. The *Rāja Nighaṅṭu* points out that leaves of the *sarṣapa* variety of mustard can decrease the quantity of semen even as it triggers inflammation^{lxv}. According to the *Bhāvaprakāśa Nighaṅṭu*, mustard oil can harm the eyes on long term use^{lxvi}. Interestingly enough, mustard oil is contraindicated for use with turmeric as it will aggravate *pitta*^{lxvii}. Pigeon meat, leaves of *Inula racemosa* and *Soymida febrifuga* if cooked with mustard oil spoils blood, blocks arteries, induces seizures, causes severe headache, swelling as well as obstruction of the throat^{lxviii}. The *Bhāvaprakāśa Nighaṅṭu* mentions that though the red and white varieties of mustard have similar properties, the white variety is preferred for internal use.

Isothiocyanates, which are found in mustard seeds, can inhibit carcinogenesis and tumorigenesis in breast, colon, lung and skin tissue in animals^{lxix}. A related

compound, allyl isothiocyanate, seen in mustard has antimicrobial and antifungal activity^{lxx}. Mustard leaf has exhibited antioxidant effects in *invitro* and *invivo* studies^{lxxi}. Mustard seeds have demonstrated hypoglycemic effect in rats and usage of mustard oil has been found to be associated with good outcomes in cardiovascular disease^{lxxii}. These research findings corroborate well with the *Ayurvedic* indications of mustard in swellings and growths, elevated lipid levels, cardiac disorders, diabetes, skin diseases and infections. The safety issues surrounding the usage of the leaves, seeds and oil of mustard as described in *Ayurvedic* texts can be subjected to scientific investigation. The *Ayurvedic* tradition has discovered mustard as a valuable herb that has both desirable and undesirable properties but which can yet be favorably used to our advantage^{lxxiii}. Scientific studies can help us to exploit this potential in a very productive way.

Mustard has become part and parcel of the Indian cultural milieu. People put mustard seeds into the fire to ward off the evil eye. It is considered to be antimicrobial and supposedly has the ability to drive away spirits. The *Rāja Nighaṇṭu* observes that the white variety of mustard has a well established utility (*Siddhaprayojanaḥ*)^{lxxiv}. Although this text does not explain what this special utility is, it mentions another synonym *Siddhārthaka*, which means almost the same. *Siddhārthaka* mainly refers to the white variety of mustard and sometimes the red and means that it is an unfailing instrument to achieve a coveted goal, perhaps related to some ritual. Cultivation of mustard has been an indispensable activity of Indian agriculture. People anoint mustard oil on their bodies to fight cold weather, season food with paste of mustard seeds, use its leaves as a vegetable and cook food articles in mustard oil. It is also used as a mosquito repellent in some places and can continue to be an important source of edible oil that is easy to harvest and gives a very good yield of oil through simple processing methods.

Bibliography

- i AVS 1.24.1-4 ; 7.38.1-2
 ii AVP 1.26.1-4 20.30.7
 iii Sayana's comment on AVS 1.24.1-4 ; is Asuri asurma ayarupa stri and Asuri asurasya maya on AVS 7.38.2
 iv AH.U 5.18
 v S.S.Ci. 5.1
 vi S.S.Ci. 20.17 CS.SU 8.177
 vii A.H.U 37.23
 viii S.S.Su 46.49
- ix S.S.U.3.11
 x S.S.Su 46. 221-222
 xi DN karavirAdi varga 39 - 42
 xii KN dhanya varga 88 - 92
 xiii RN salyadi varga 119 - 124
 xiv BN dhanya varga 69
 xv C S Vi 8.151
 xvi C S Vi 8.151
 xvii K.S.Su 19
 xviii A.S.Su 7.148
 xix S.S.Su 46.221 AH.SU 6.101
 xx KN ousadhi varga 640
 xxi BN Saka varga 47
 xxii RN mulakadi varga 146
 xxiii S.S.Su 46.221,238
 xxiv S.S.Su 46.238
 xxv S.S.Su 46.221
 xxvi KN ousadhi varga 640 - 641
 xxvii KN ousadhi varga 640 - 641
 xxviii C.S.Su 2.3 (sirovirecanopagani), C.S.Su 4.27
 xxix CS.Su 4.25
 xxx CS.Su 4.14
 xxxi AH.Su 15.1
 xxxii CS.V 8.142
 xxxiii CS.Ci 3.237
 xxxiv SS.Su 19.28
 xxxv C.Ci. 5.41
 xxxvi C.Ci. 7.103
 xxxvii C.Ci. 7.104
 xxxviii SS.Ci 14.7
 xxxix Su.S.Ci 22.10
 xl Leucoderma S.S.Ci.9.12,S.S.Ci.9.27
 Cracked skin C.S.Ci.7.119
 Fever C.S.Ci.3.237
 Leprosy S.S.Ci.9.63
 Wasting-C.S.Ci.8.178
 Insanity C.S.Ci.9.65,70.
 Epilepsy C.S.Ci.10.37
 Swelling S.S.Ci.23.15
 Rheumatoid arthritis C.S.Ci.29.136
 Neurological disorders S.S.Ci.5.10
 Breast milk disorders C.S.Ci.30.268
 Earache:C.S.Ci.26.153
 Wounds S.S.Ci.9
 Eruptions in Oral cavity-S.S.Ci.22.11,20
 Retension of Placenta S.S.Sa.10.
 C.S.Ci.15.73,S.S.Ci.38.60,61,C.S.Su.4.25
 C.S.Ci 20.35, C.S.Ci 9.65, C.S.Ci 26.12.13, S.S. Ci 38.60,61, C.S.Ci 26.153
 xlii Bhai. Rat. galagandAdi roga cikitsa 44/8-9
 xliiii K.S.I Ousadha bhesajendriya
 xliv K.S.SU.Lehanadhyayam
 xlv RN salyadi varga .120
 xlvi KN dhanya varga .91
 xlvii K S Ci. Rajayakshma Chikitsa
 xlviii S.S.Ci.8.15
 xlix l DN karavirAdi varga .40
 l DN karavirAdi varga .40
 li MN dhanyagana varga. 56
 liii BN dhanya varga .397
 liv RN salyadi varga .120

- lv RN salyadi varga .124
 lvi KN dhanya varga .92
 lvii SS.Su 45.115
 lviii K.N.Taila varga.317-318
 lix diabetes C.S.Ci.6.20
 skin diseases,S.S.Ci.9.5
 frozen thigh C.S.Ci.27.43
 elephantiasis S.S.Ci.19.59
 retention of placenta:A.H.Sa.2.88
 Urethral infiltration S.S.SA.10
 lx BN taila varga . 10 - 12
 lxi KN taila varga. 318
 lxii RN ksheeravadhi varga. 122
 lxiii MN saka varga .61
 lxiv KN ousadhi varga. 641
 lxv RN salyadi varga .123
 lxvi RN taila varga .110
 lxvii C.S.SU.26.84
 lxviii C.S.SU.26.84
 lxix Tseng E, Kamath A & Morris ME, Effect of organic isothiocyanates on the P-glycoprotein-and MRP1-mediated transport of daunomycin and vinblastine. *Pharm Res* . 19 (2002) 1509-1515.
 lxx Oliver C ,Vaughn S,MizubutiE & Loria R, Variation in allyl isothiocyanate production within Brassica species and correlation with fungicidal activity, *J Chem Ecol*, 25 (1999) 2687-2701.
 lxxi Sujatha R & Srinivas L, Modulation of lipid peroxidation by dietary components, *Toxicol In Vitro*, 9 (1995) 231-236.
 lxxii Yadav SP, Vats V, Ammini AC & Grover JK, Brassica juncea (Rai) significantly prevented the development of insulin resistance in rats fed fructose –enriched diet. *J Ethnopharmacol*, 93 (2004) 113-116.
 lxxiii Singh RB, Niaz MA, Sharma JP, KumarR, Rastogi V & Moshiri M, Randomized,double-blind, placebo-controlled trial of fish oil and mustard oil in patients with suspected acute myocardial infarction : the Indian experiment of infarct survival-Cardiovasc Drugs Ther, 11 (1997) 485-491.
 lxxiv http://findarticles.com/p/articles/mi_m2465/is_ai_7628/5485 - Vandana Shiva. The Mustard Oil Conspiracy, *The Ecologist*, June 21.
 lxxv RN salyadi varga 123.

References

- 1 Bhisagacharya Sahjapal, *Kasyapa Samhita*, 7th edn, (Chaukhambha Sanskrit Sansthan, Varanasi), 2000,
- 2 Ojha Jharkhandle & Misra Umapathi, *Dhanwantari Nighantu*, 2nd edn, (Chaukhambha Vidyabhavan, Varanasi), 1996.
- 3 Ram Prasad Vaidyopadhyaya, Commentary in Hindi, *Madanapala's Madanapala Nighantu*, Edn, (Shri Venkateshwar Press, Mumbai), 1998.
- 4 Sastri Viswanath Dwivedi, Translated in Hindi, *Bhavaprakasa Nighantu*, 9th edn – Reprint, (Motilal Banarasidas, Delhi), 1998.
- 5 Sharma PV, *History of Medicine in India (From Antiquity to 1000 AD)*, (Indian National Science Academy, New Delhi), 1992.
- 6 Sharma PV & Sharma GP, Translated in Hindi, *Kaiyadeva – Nighantu*, 1st edn, (Chaukhambha Orientalia, Varanasi), 1979.
- 7 Sreekumari KP, *Vagbhataa's Ashtanga Samgraha Sutrasthana with Sasilekha*, Commentary by Indu, (Ayurveda College, Thiruvananthapuram, Kerala), 1982
- 8 Srikantha Murthy KR, *Vagbhataa's Astanga Hridaya, Sustrsthana*, (Chaukhamba Krishnadas Academy, Varanasi), 2004.
- 9 Tripathi Indradeo, Hindi Commentary, *Raja Nighantu of Pandit Narahari*, IInd Edition, (Chaukhamba Krishnadas Academy, Varanasi), 1998.
- 10 Yadavji Trikamji Acharya & Narayan Ram Acharya, *Susruta Samhita of Susruta with Nibandha sangraha*, Commentary and *Nyayachandrika Panjika*, 4th edn, (Chaukhambha Orientalia, Varanasi), 1980.
- 11 Tripathi Indradeo, *Chakradatta of Sri Chakrapanidatta*, 1991.
- 12 Pulinkrishna SK, *Bhaishajya Ratnavalli*, Reprint, (Krishnadas Academy, Varanasi), 2001.
- 13 Pandeya GS, *Gadanigraha of Sri Vaidya Sodhala with Vidyotini* Hindi Commentary, by Indradeva Tripathi, Part 1, 4th edn; Part II, 1999, 3rd edn, (Chaukhambha Sanskrit Sansthan, Varanasi), 2003.
- 14 Yadavji Trikamji Acharya, *Caraka Samhita*, (Chaukhambha Surabharati, Varanasi), 2002.