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A REVIEW ARTICLE ON MOOLAK (RAPHANUS SATIVUS LINN) IN AYURVEDIC LITERATURE AS WELL AS MODERN

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ABSTRACT

Moolak is *Raphanus sativus* Linn. botanically of family Cruciferae (Brasicaceae) which is a larger group of vegetables. In Ayurvedic literatures *moolak* is categorized mainly in *Shakavarga* and *katuskandha*. *Moolak* is a very important drug as *Ahara* dravya as well as *Ausadha* Dravya. It is mentioned as *Pathya* in *Vatatvyadhi, Vrani, Timira, Gulma* and as *Apathya* in *Raktapitta, Kushtha, Arsha, Vatarakta* as Ahardravya but in many formulations like *Hajaralyahud Bhasma, Kshar Taila, Swarjika Kshar Taila, Shothari churna moolak* is used as ingredient in different diseases by different acharyas. By this Article Ayurvedic as well as modern research of *Moolak* (*Raphanus sativus* Linn.) is summarized.

KEYWORDS:- *Moolak, Raphanus sativus, Aharadravya.*

INTRODUCTION

According to different Nighantus *Moolak* is *Raphanus sativus* Linn. The plants of Brassicaceae contains many important vegetables of economic importance. *Raphanus sativus* Linn. is known as radish which is widely available throughout the world. *Raphanus sativus* Linn. is originated from Europe and Asia. It is harvested in temperate climate at altitude between190-1240 meter. Its length is average 30-90 cm and its root are thick and of various sizes, forms and colors. They are edible for their pungent taste. *Moolak* - root has been used in folk medicines as a natural drug against many toxicants. According to Bhavaprakash *moolak* root is mentioned in *Kanda shaka* and according to Susrut Sutrasthan 46/313 Mature root is ideal but in special case of *moolak Balmoolak* is used in most of the places.

Variety of *moolak*

- According to Acharya Bhavmishra (Bhavprakash Nighantu) two types of *moolak*:

1. *Laghu moolak*
2. *Mahat moolak (Nepalmoolak)*

- Depending on the period of cultivation, the length of the cycle and the characteristics of the root radish are grouped as follows:

1. Year round varities - Small root and very short cycle (4 week), Roots - rounded, semilarge and long.
2. Summer autumn varities - Larger cycle (6 week), Root - more voluminous.
3. Winter varities - Very short cycle (upto 100 days), Root – Large.

- In countries with harsh winters, the cultivars of small radish or radish are grouped in:

1. Outdoor spring culture
2. Outdoor summer culture
3. Outdoor autumn culture
4. Greenhouse culture

- Another classification for radish, this time botanical according to liebster (1990) is:

1. **Raphanus sativus var. sativus**: Small size, elongate or round white, pink or red.
2. **Raphanus sativus var. niger:** larger hypocotil usually elongated, white or red, although there are also black and roundcultivars.
3. **Raphanus sativus var. longipinnatus:** (Grown in the southest of Asia.), Long and thick hypocotil (30-50cm.), Smoother taste than the previous group and they are also called "Diakon radish.

GANA

S.N.	Samhita	*Varga*
1.	Charak Samhita	*Haritavarga*
2.	Susruta samhita	*Shaakavarga*
3.	Ashtang samgraha	*Shaakavarga*
4.	Ashtang Hridaya	*Shaakavarga*
5.	Dhanwantari Nighantu	*Karviradi varga*
6.	Raj Nighantu	*Mulakadi varga*
7.	Kaidev Nighantu	*Aausadhi varga*
8.	Shaligram Nighantu	*Shakavarga*
9.	Bhavaprakash Nighantu	*Shaakavarga*
10.	Madanpal Nighantu	*Shaakavarga*

11.	Madhava Dravyaguna	*Shaakavarga*
12.	Sodhal Nighantu	*Karviradi Varga*
13.	Raj Vallabha Nighantu	*Madhyahnik Pariccheda*

Synonyms

S. N.	Synonyms	D. N.	So. N.	M. N.	R. N.	K. N.	B. N.	Shali. N.
1.	*Hariparna*	+	-	-	+	-	-	+
2.	*Mritika-kshar*	+	-	-	-	-	-	+
3.	*Neelkanda*	+	-	-	-	-	-	-
4.	*Mahakanda*	+	-	-	+	+	-	+
5.	*Ruchishya*	+	-	-	+	+	-	+
6.	*Hastidantaka*	+	-	+	+	-	+	+
7.	*Vishra*	-	-	+	-	-	+	-
8.	*Marusambhav*	-	-	+	+	-	+	+
9.	*Teekshna*	-	-	+	-	+	+	-
10.	*Shalaamkarkat*	-	-	+	+	+	+	+
11.	*Shaleya*	-	-	+	+	-	+	
12.	*Chankyamoolak*	-	-	+	+	-	+	-
13.	*Moolkapotika*	-	-	+	-	-	+	-
14.	*Nepalmoolak*	-	-	+	-	-	+	-
15.	*Nilakantha*	-	-	-	-	+	-	+
16.	*Mulahvam*	-	-	-	+	-	-	-
17.	*Dirghamulakam*	-	-	-	+	-	-	-
18	*Bhuksharam*	-	-	-	+	-	-	-
19.	*Kandamulam*	-	-	-	+	-	-	-
20.	*Sitam*	-	-	-	+	-	-	-
21.	*Shankhmulam*	-	-	-	+	-	-	-
22.	*Deerghakandam*	-	-	-	+	-	-	-
23.	*Kunjar-Kshar-Mula*	-	-	-	+	-	-	-
24.	*Visnuguptakam*	-	-	-	+	-	-	+
25.	*Sthulamulam*	-	-	-	+	-	-	+
26.	*Kautilyam*	-	-	-	+	-	-	+
27.	*Mishram*	-	-	-	+	-	-	+
28.	*Swastik*	-	-	-	-	+	-	-
29.	*Hastikandak*	-	-	-	-	+	-	-
30.	*Mishrahastik*	-	-	-	-	+	-	-
31.	*Ksharsewita*	-	-	-	-	+	-	-
32.	*Awadansh-Kshama*	-	-	-	-	+	-	-
33.	*Laghumoolak*	-	-	-	-	-	-	+
34.	*Vaaneya*	-	-	-	-	-	-	+

Vernacular names

1.	Assamese	Mula
2.	English	Garden radish, Diakon, Radish
3.	Hindi	Mulo, Mooli, Muli
4.	Kannada	Moolangi, Maguni gedde
5.	Marathi	Moolaa
6.	Sanskrit	*Mulakam, Mulaka*
7.	Tamil	Cetakketanam, Attitantum
8.	Telugu	Mullangi
9.	Urdu	Tukhm, Muli, Mulkekebija

Botanical classification

Kingdom	Plantae (Plants)
Subkingdom	Tracheobionta (Vascular Plant)
Infrakingdom	Streptophyta
Superdivision	Spermatophyta (Seed plant)
Division	Magnoliophyta (Flowering plant)
Subdivision	Spermatophyta
Class	Magnoliopsida (Dicotyledons)
Subclass	Dilleniidae
Superorder	Rosanae
Order	Capparales / Brassicales
Family	Brassicacae (Mustard family)
Genus	Raphanus L.
Species	Raphanus sativus L. (cultivated radish)

Botanical characters of brassicaecea (Cruciferae)[4]

- Mustard family of flowering plant.
- Genera - 338
- Species - 3700
- Usually herb (Annual, Biennials or perenials)

Leaves - Mostly simple alternately arranged, peppery flavoured usually. **Flower** - Cruciform (in the form of cross) with 4 petals and 4 sepals. (The plants are commonly referred to as cruciferae and cruciferous for that reason) White, yellow or lavender. **Stamen** - 2 long + 2 short = 4. **Gynaecium** - 2 Chambered ovary, superior [positioned above the other flower parts]. **Fruit** - Partition between the halves. Long thin fruits-Siliques, Short rounded fruits-Silicles. **Seed** - Produced in dry pod like fruits.

Botanical character of genus raphanus

Leaves - Lyrate - pinnate or pinnatified. **Flowers** - Large, yellow, white or palelilac, veined with purple, in long ebracteate raceme, Sepals erect, lateral ones sacate at the base. **Pods** -

Indehiscent, elongate, terete, thick, continuous or constricted, with a long tapering pointed beak, continuous within or filledwith pith separating the seeds. **Seeds** - Pendulous, globose. **Cotyledons** - Conduplicate. Distribution species about - 6, European and Asiatic.

Sativus: sativus is a Latin word that means cultivated.

Botanical descriptions of radish

- Roots usually Fleshy, white, pink, red or black, linear, Fusiform, oblong or globose, Taproot, napiform, fleshy and enlarged by storage tissues.
- Stem - Short, elongated at flowering stage. Very short, Simple and branched.
- Leaf - Leaves in rosette, petiolate, basal, long, lyrately devided, coarsly toothed. Upper leaves simple.
- Inflorescence - Terminal panicle, Complete, Actinomorphic, Cruciform.
- Calyx - sepals narrowly ablong 5.5 - 10.0× 1.0 × 2.5nun Glabrous or sparsely pubescent.
- Corolla - Petals purple, pink or something white often with darker veins. Broadly abovate1.2- 2.2× o.3-0.8 cm. apex obtuse oremarginate, claw upto 1.5 cm. long.
- Androcium - Stamen 6, Tetradynamous, filament, slender.
- Gynoecium - Ovary superior, style 1- 4cm. long, stigma entire.
- Fruit - Erect (Siliqua), cylindrical, Greenish or pale purple, spongy, 3-9 cm long, 1-6 seeded, beaked, more or less constricted in seed.
- Seed - globes or ovoid, light brown.

Cultivation

- ***Northern*** - Plains – August to January (Indegious type), Hill – September to March (European type).
- ***South*** - Plains – October to December, Hill – April to June.
- ***Irrigation*** – Just after sowing and is repeated every 5-10 days depending upon the season.
- ***Breeding and varities*** - 'Pusa Chetaki', 'Pusa Desi, 'Japanese White' are male sterile cultivar and can be crossed with any other combiner to produce hybrid seed.

The radish is a root vegetable which is domesticated in Europe. It has numerous varities according to their size, color and duration to take maturity.

- ***Habbit*** - Annual herb.

Properties

Rasa of *Balmoolak* is *Katu, Tikta, Guna Laghu* and *Veerya Ushna* while *Rasa* of *Vriddha moolak* is *Katu, Guna Guru, Veerya Ushna* and *Vipaka Madhur*. All the properties attributed to *Moolak* by different Acharyas have been tabulated in table:

S. N.	Properties		S.S.	A.S.	A.H.	S.N.	R.N.	K.N.	B.P.N.
1.	*Rasa*	*Bal moolak*	K,T	A, Kshar, T	A, K, T	A, Kshar, T, K	K	T, K	K
		Vriddha Moolak	–	K	K	K	K	K, M	_
2.	*Guna*	*Bal moolak*	L	L	L	L	TN, G	L	L
		Vriddha moolak	TN	G	G	G	G	G	G, R
3.	*Veerya*	*Bal moolak*	–	U	U	U	U	U	U
		Vriddha moolak	–	U	U	U	U	U	U
4.	*Vipaka*	*Bal-moolak*	–	–	–	–	–	–	–
		Vriddha Moolak	–	M	M	_	_	_	_

*A - *Avyakta*, K - *Katu*, T - *Tikta*, M - *Madhur*, U - *Ushna*, G - *Guru* L - *Laghu*, R - *Ruksha*, TN - *Teekshna*

- According to Charak samhita *Bal-moolak* is *Tridosh-shaamak.*
- D.N. - Not categorized in *Bal* and *Vridhha.*
- D.G.S. - Categorized in *moolkapotika* and *Mahat moolak.*
- B.P.N. - Categorized in *Laghu* and *Mahat moolak.*
- Shali. N. - Categorized in *Laghu* and *Mahat moolak.*
- M.N. - Properties are not categorized according to *Bal* and *Vriddha*

Karma (Action) table of *moolak*

S.N.	Action	S.S.	A.H.	A.S.	D.N.	S.N.	M.N.	R.N.	K.N.	B.P.N.	Shali. N.
1.	*Tridosh-Shaamak*	+	+	+	+	+	+	-	+	+	+
2.	*Vatashaamak*	+	-	-	-	-	-	+	-	-	-
3.	*Hridya*	+	-	-	-	-	-	-	+	-	
4.	*Ruchikarak*	+	-	-	-	-	-	+	+	+	+
5.	*Agnideepak*	+	-	-	-	-	-	-	-	-	-
6.	*Kanthya*	+	-	-	-	-	-		-	-	-
7.	*Aamdosh- nashak*	-	-	-	+	-	-	-	-	-	-
8.	*Vatala*	-	-	-	-	-	+	-	-	-	-
9.	*Swarya*	-	+	-	-	-	+	-	+	+	-

10.	*Paachan*	-	-	-	-	-	+	-	-	+	+
11.	*Deepana*	-	-	-	-	-	-	-	+	-	+
12.	*Grahi*	-	-	-	-	-	-	-	-	-	+
13.	*Krimighna*	-	-	-	-	-	-	-	-	-	+
14.	*Kapha-vata-roga*	-	-	-	-	-	-	-	-	-	+

Karma (Action) table of vriddha *moolak*

S.N.	Action	S.S.	A.H.	A.S.	D.N.	S.N.	M.N.	R.N.	K.N.	B.P.N.	Shali N.
1.	*Tridoshjanak*	+	+	-	-	-	-	-	+	+	-
2.	*Vistambh-Karak*	+	-	-	-	-	-	-	-	-	-
3.	*Abhishyandi*	-	+	-	-	-	-	-	-	-	-

Action according to modern

S. N.	Part Used	Uses
1.	Leaf juice	Diuretic and laxative
2.	Seeds	Expectorant, peptic Diuretic and laxative, carminative
3.	Root	Urinary complaints, piles and gastrodynic pains.

***Prayoga* (uses)**

S.N.	Action	A.H.	A.S.	D.N.	S.N.	M.N.	R.N.	K.N.	B.P. N.	Shali. N.
1.	*Gulma*	+	+	-	-	-	+	+	-	+
2.	*Kasa*	+	+	-	-	-	-	+	-	-
3.	*Kshaya*	+	+	-	-	-	-	+	-	-
4.	*Shwas*	+	+	-	-	+	-	+	+	-
5.	*Vrana*	+	+	-	-	-	-	+	-	-
6.	*Netravikar*	+	+	-	+	+	-	+	+	-
7.	*Kanthavikar*	+	+	-	+	+	-	+	+	-
8.	*Jwararoga*	+	-	-	-	-	-	-	+	-
9.	*Agnimandya*	+	-	-	-	-	-	-	-	-
10.	*Udavarta*	+	+	-	-	-	-	+	-	-
11.	*Peenasa roga*	+	+	-	-	+	-	+	-	-
12.	*Nasikaroga*	-	-	-	-	-	-	+	+	-
13.	*Dadru*	-	-	-	-	-	-	+	-	-
14.	*Shoola*	-	-	-	-	-	-	+	-	-
15.	*Aamdosh*	-	-	-	-	-	-	+	-	-
16.	*Kotha*	-	-	-	-	-	-	+	-	-
17.	*Hridaroga*	-	-	-	-	-	+	-	-	+
18.	*Arsh*	-	-	-	-	-	+	-	-	+
19.	*Krimiroga*	-	-	-	-	-	+	-	-	-

Action of *moolak* on *doshas:* *Vatashaamak*

Action and Uses

Appetiser, Digestive, Stomachic, Laxative, Depurative, Anti-inflammatory, Anodyne, Refreshing, Neuralgia, Cephalgia, Juice of fresh leaves juice – Diuretic and laxative, Nausea,

Dyspepsia, Colic, Flatulence, Urinary complaints, Leprosy, Skin disease, Erisepelas, Inflammation, Liver Disorders, Gastrodynic pain, Root- piles, Syphilitic diseases, Gastrodyne pain, Juice-earache, Seed-Antidote to snake venom, Good for spleen and paralysis, Flowers-Bechic and cholagogue.

Formulations with references

S.N.	Formulations	*Rogadhikar*	References	A.F.I.
1.	*Chandan-laksha-baladi Taila*	*Jwaradhikar*	*Yoga Ratnakar*	Part -1, 8:15
2.	*Sushkmoolak Taila*	*Shothadhikar*	*Bhavprakash*	Part -1, 8:57
3.	*Moolak Kshar*	-	*Sushrut samhita uttarsthan*	Part -1, 10:10
4.	*Sarsap Lepa (Moolakbeej)*	*Galgandarogadhikar*	*Bhaisajya Ratnavali* 7	Part -1, 11:11
5.	*Gandhak Vati (Moolak kshar)*	*Agnimandyarogadhikar*	*Bhaisajya Ratnavali* -143 -144.5	Part -1, 12:8
6.	*Hajral Yahud Bhasma*	*Ashmari*	*Siddha Yoga Sangraha*	Part -2
7.	*Swedan (Parada)*	-	*Ras Hridaya Tantra, Awabodh* 2;3	Part -3

Formulations and Preparations

- *Hajaralyahud Bhasma*
- *Kshar Taila*
- *Swarjika Kshar Taila*
- *Shothari churna*
- *Punarnavasa*
- *Shushkamulkadya taila*
- *Brihat Shushkamulakadya taila*

Phytochemicals

Alkaloid and Nitrogen compound, Coumarins – Hydroxycoumarins, aesculetin and scopoletin, Enzymes, Gibberellins, Glucosinolates, Organic Acids, Phenolic Compounds, Pigments, Polysaccharides, Proteoglycon, Sulpher Compounds and Other Cnstituents.

Composition

Caffeic acid and ferulic acid (hepatotropic and cholerectic/ cholagogue properties- Lower

cholesterol and increase bile secretion, improve liver function, correct liver dysfunction, Ascorbic acid, Butyl crotonyl isothiocyanates (mustard oil - volatile isothiocyanates), Enzyme - phosphatase, catalase, sucrose, amylase, alcohol dehydrogenase, pyruvic, carboxylase, Thermostable antithiamine factor, S- mthyl-L-cysteine sulfoxide., Trace element- aluminium, lithium, barium, magnecium, silicon, titanium, fluorine, Iodine, Calcium pectate (starch absent), P- comaric, Phenyl pyruvic gentistic, p- hydroxybenzoic acid., Calcium, Phosphorus, Vit. A, Potassium Oxalic acid.

RESULTS AND DISCUSSIONS

On the basis of literature study Drug review is discussed on the following points:

Vedic period

- In Garud Puran *Sushkmoolak yoga* is mentioned in *Vividha Ausadhi* Prakaran for treatment of *Ajirna*, *Visuchika*, *Arbuda* and *Varti* for *Netra-roga*, *Sushk Kshar* and *Sunthi Kshar* are the ingredient of this prepration.
- In Brahman-puran *moolak* (*Vanya* and flower) is used in *Shraaddha kalpa.*

Samhita period

Moolak related description found in different Samhitas are mentioned below:

- Charak samhita - 46
- Susruta Samhita - 23
- Ashtang Samgraha - 42
- Ashtang Hridayam - 29
- Gada Nigraha - 43
- Sharangdhar Samhita - 9
- Bhel samhita - 8
- Kashyapa Samhita - 22
- Harita Samhita - 2
- Yogaratnakar - 54
- Vangasen samhita - 56
- Bhaisajya ratnawali – 60

Varga according to acharyas

Varga	C.S.	S.S.	A.H.	A.S.	G.N.	K.S.	Y.R.	Vang. S.	B.R.
Harita varga	+	-	-	-	-	-	-	-	-
Katuskandha	+	+	-	-	-	-	-	+	-
Shaka varga	-	+	+	+	-	-	-	-	-
Veerya prakaran	-	+	-	-	-	-	-	-	-
Vipaka prakaran	-	-	-	+	-	-	-	-	-
Shaka-phala- varga	-	-	-	-	-	-	-	+	-

Most of the acharyas categorized *Moola*k in *Katuskandh* and *Shakavarga*

***Pathya* in different diseases**

Disease	S.S.	A.H.	A.S.	G.N.	K.S.	Y.R.	Vang. S	B.R.
Vrani	B.M.	B.M.	-	-	-	-	-	-
Timir	M.K.	-	-	-	-	-	-	-
Gulma	M.	B.M. & S.M.	-	-	-	B.M.	-	B.M.
Leena-garbha	-	M.	-	-	-	-	-	-
Jwara	-	B.M.	-	-	B.M.	B.M.	-	-
Madatya	-	S.M.	-	-	-	-	-	-
Atisar	-	M.K.	-	-	-	-	-	-
Raj-yakshma	-	-	-	-	M.	M.	M.	
Kasa	-	-	-	-	-	B.M.	-	B.M.
Shwasa	-	-	-	-	-	B.M.	-	M.K.
Chardi	-	-	-	-	-	B.M.	-	-
Shotha	-	-	-	B.M.	B.M.	B.M.	-	B.M.
Bhagandar	-	-	-	-	-	B.M.	-	B.M.
Mukha-roga	-	-	-	-	-	B.M.	-	B.M.
Nasa-roga	-	-	B.M.	-	-	B.M.	-	B.M.
Peenas	-	-	-	-	-	B.M.	-	-
Netra-roga	-	-	-	-	-	B.M.	M.K.	N.M.
Arsh	-	-	-	-	-	-	M.	-
Aagantuj-Vrana	-	-	-	-	-	-	M.	-
Agni-mandya	-	-	-	-	--	-	-	B.M.
Vataja Kasa	-	-	-	-	-	-	-	M.
Hikka-roga	-	-	-	-	-	-	-	B.M.
Arochak	-	-	-	-	-	-	-	N.M.
Visham-jwara	-	-	-	B.M.	-	-	-	-
Hrida-roga	-	-	-	-	-	-	-	N.M.
Updamsh	-	-	-	-	-	-	-	N.M.
Shleepad	-	-	-	-	-	-	-	B.M.
Vrana-shotha	-	-	-	-	-	-	-	B.M.
Shuk-dosha	-	-	-	-	-	-	-	B.M.
Bhagna	-	-	-	-	-	-	-	B.M.
Sutika-roga	-	-	-	-	-	-	-	B.M.
Udard	-	-	-	-	-	-	-	M.K.
Sheeta-pitta	-	-	-	-	-	-	-	M.K.
Kotha	-	-	-	-	-	-	-	M.K.

*B. M. - *Balmoolak,* M. K. - *Moola-kapotika,* S. M. - *Sushk moolak,* N. M. - *Nava-moolak,*

M. – *Moolak.*

- *Balmoolak and moolakapotika* are used abundantly as *pathya* in most of diseases by different acharyas while *Vriddha* is not mentioned anywhere as *Pathya*.
- Ashtang, Yogaratnakar and Bhaisajya ratnavali mainly mentioned *Balmoolak* as *pathya* in different diseases.

***Apathya* in different diseases**

Dravya	**C.S.**	**A.S.**	**G.N.**	**K.S.**	**Y.R.**	**Vang. S.**	**B.R.**
Raktadushti	*Moolak*	-	-	-	-	-	-
Raktapitta	*Moolak*	-	-	-	-	*Sushk moolak-beej*	-
Kushtha	*Moolak*	-	-	-	*Moolak*	*Moolak*	*Moolak*
Arsh	*Aam moolak*	-	-	-	-	-	-
Vatarakta	-	-	-	-	*Moolak*	*Moolak*	*Moolak*
Gulma	-	-	*Moolak*	-	-	*Moolak*	*Moolak*
Twag-roga	-	-	-	*Moolak*	-	-	-
Mukharoga	-	*Moolak*	-	-	-	-	-

- Harita Samhita - *Apathya* in *Shotha.*
- According to Charak Samhita, Vangasen Samhita and Bhaisajya ratnavali *Moolak* is *Apathya* in various disease.

Neither *Balmoolak* nor *vriddha moolak* is mentioned as *apathya* in any place but *moolak* and *moolakbeej* and *Aam- moolak* is mentioned.

Nighantu period: Nighantus are collections of words related to Ayurveda particularly *dravyas*, synonym based on their morphology. Except this properties and uses of *dravyas* are also described.

Moolak is mentioned in many nighantus and most of the nighantus categorized moolak into *Laghu* and *Mahat moolak*. Different synonym, properties, action and *rogaghnata* of both *moolak* are specified and along with this *Sushk-moolak*, *Snehasadhit moolak*, *Moolak* seed, *Moolak* Flower and *moolak* Fruit are also mentioned.

According to different nighantus

- Synonyms of *Laghu moolak* are S*halaamkarkata*, *Vishra*, *Shaleya*, *Marusambhava*, *Chankyamoolak*, *Teekshna*, *Moolakapotika.*
- Synonym of *Mahat Moolak* are *Nepalmoolak*, *hastidantwata.* Some of nighantus

mentioned *Hariparna, Mritika - Kshar, Neelkanda, Mahakanda, Ruchishya* and *Hastidantaka* as synonym.

Bal moolak has *Deepana, Paachan* properties due to *Katu rasa Agni+Vayu mahabhuta* and *Vriddha moolak* has also *katu rasa* but less than *Bal-moolak* so it has not the property of *Deepana* and *paachan* but also *Guru* for digestive system.

Modern period: Different standard modern research books described that radish has a hot, sharp, bitter taste, Stomachic, anthelmintic, tumors and all types of inflammation, Juice of radish relieves earache. The roots are used in urinary and syphilitic disease and gastrodynic pain. Pungent flavor of radish is due to volatile isothiocyanates (Mustard oil), pungent odor is due to Butyl crotonyl isothiocyanatessulphide (Chief constituents), disagreeable odor is due to methyl mercaptane. Brassica vegetables are attracting major attention as healthy foods because of their content of glucosinolates (GLs) that release the corresponding isothiocyanates (ITCs) upon myrosinase hydrolysis. This isothiocyanates are chemoprotective agent. Seed of the radish is "Mougri" which has sulpher containing oil raphanin isolated from aqueous extract is active against gram +ve and gram -ve bacteria.

CONCLUSION

Description of *Moolak* is found in Purans, Samhitas, Nighantus and Modern literatures and Pharmacopoeias, except this different research articles also provide information about Radish. Charak Samhita especially mentioned the term *Vriddha moolak* in "C.S.Su. - 27 *Annapan-vidhi Adhyaya Harita Varga*" while in other places *Mahatmoolak* is described which is considered *Vriddha* by commentators. Similar properties of *Vriddha* moolak and *Mahat* moolak are mentioned in literatures. Kasyapa and Shaligram described the property of *Puran moolak*. In ayurvedic literatures *Bal moolak* is *Laghu* and *Tridoshashamak* and *Vriddha* or *Mahat moolak* is *Guru* and has *Tridoshkarak* properties. *Balmoolak* and *Moolak* is mentioned as *pathya* in different disease like *Gulma, Jwara, Rajyakshma* and *Netraroga* and also used in different preparations used for different diseases like *Vatavyadhi, Grahani, Gulma, Shyawathu, Udawarta* and *Karnaroga.*

According to Kashyapa samhita *Puran moolak* is used as *Lepa* in *Shotha* caused by *Vatadosha.* This *Puran moolak* can be considered as *Vriddha moolak.* Modern research shows Hypoglycaemic effect, Hepatoproective effect, Anti-oxidant effect of *moolak* and used as multi potent chemo - protective agent.

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