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Review Article

A DRUG REVIEW ON TRYUSHANADYA LAUHA YOGA (FORMULATION) IN THE MANAGEMENT OF MADHUMEHA (DIABETES MELLITUS TYPE - II)

Dr. Vishvamitra Pandey¹, Dr. Rajesh Kumar Shrivastva²

1. Assistant Professor, Department of Kayachikitsa, Dr. Vijay Ayurvedic Medical College, Hospital & Research Centre, Kaithi, Varanasi, Uttar Pradesh, India.
2. Professor & Head, Department of Kayachikitsa, S.G.M.P.G. Ayurvedic College and Hospital Saheri, Ghazipur, Uttar Pradesh, India.

Address for correspondence:

Dr. Vishvamitra Pandey Assistant Professor, Department of Kayachikitsa, Dr. Vijay Ayurvedic Medical College, Hospital & Research Centre, Kaithi, Varanasi, Uttar Pradesh, India. Pin code: 221116

Email: drvmp94@gmail.com

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ABSTRACT

Background: India known as the diabetes capital of the world and by 2025, the country's diabetes population will have risen to 69.9 million, and by 2030, it will have risen to 80 million. *Tryushanadya Lauha* is a formulation consists of herbal drugs as mentioned in *Bhaishaja Ratanavali* with the applicability in *Medumeha* (Diabetes mellitus Type - II). **Material and Methods:** Ayurvedic texts, as well as the data-bases web-based search engines, journal, were used to search for relevant literature and information. **Result:** *Tryushanadya Lauha* referred in *Bhaishaja Ratanavali* was reviewed, analysed in detail and *Kapha-vatadosha* and *Abadhamedha* are the key factors in pathogenesis of *Madhumeha* therefore the treatment requires combating the *Kaphavata dosha* and *Meda*. *Katu rasa* and *Ushna Virya* of *Pippali*, *Maricha* and *Shunthi* alleviates *Kapha-vatadosha* and *meda* which corrected *Medo Dhatu Dushti* and having *Pramehara* property directly acting on etiopathogenesis of *Madhumeha*. **Conclusion:** *Tryushanadya lauha* appear to be as beneficial as traditional anti-diabetic medications in lowering HbA1c levels.

KEYWORDS: Diabetes mellitus Type - II, *Madhumeha*, *Tryushanadya Lauha*.

1. INTRODUCTION

Ayurveda, the most ancient medical science, has given *Trisutras*, namely *Hetu* (causative factors), *Linga* (signs and symptoms), and *Aushadha* (treatment). The last part of this trio has been given equal importance as the former two. By the knowledge of these three *sutras* every disease can be approached and treated very well.

The success of *Chikitsa* depends totally upon four factors which are known as *Chikitsa Chatushpada*. These *Chatushpada* includes *Bhishak*, *Dravya*, *Upasthata* and *Rogi*. These *Chatushpada* endowed with their proper qualities, are responsible for the cure of any kind of diseases. But these factors can succeed in the cure of diseases, only when they are actively engaged in the fulfillment of the objects.ⁱ

Among four basic factors of treatment, the *Vaidya* occupies the most important place; therefore, has been enumerated first. Then in the order of merit, second place has been given to *Dravya* (medicine).ⁱⁱ

The *Bheshaja* which to be administered to the patient should possess the following four ideal qualities viz.

1. *Bahuta* (It should be available in abundant quantity)

2. *Yogyata* (It should be effective)
3. *Anekavidha kalpana* (Various pharmaceutical forms or multiple uses)
4. *Sampat* (Richness in efficacy or potency)ⁱⁱⁱ

Selection of the medicine with opposite properties to the cause of disease is helpful in the management of the disease. *Medhumeha* (Diabetes mellitus Type – II) is a *Santarpanajanya Vyadhi*. According to the references in classics, there are many effective drugs for treatment of *Madhumeha*. In *Ayurveda*, *Ahara* (diet), *Vyayama* (exercise) & *Shamana chikitsa* (medicine therapy) has been given to control the disease and avoid its fatal complication. Contents of *Tryushanadya Lauha* has properties of *Katu*, *Kashaya* & *Tikta Rasa*, *Laghu* and *Ruksha Guna*, *Ushna Virya* and *Katu Vipaka*. So, it is able to control *Kapha dosha*, *Medodushti* & works as *Deepana*, *Pachana*, *Kaphaghna*, *Medoghna*, *Lekhaniya*, *Vrushya*, *Rasayana* and *Anulomaniya*. One of the main content (11 parts) in this *Yoga* is *Laghu*. It acts also on *mutravaha srotas*.

Tryushanadya Lauha Yoga consists of herbo-mineral drugs as mentioned in *Bhaishajya Ratanavali*^{iv}. Present review aimed at congregation the information about the details of the constituents of this *Yoga* along with the applicability in the management of *Medumeha* (Diabetes mellitus Type – II).

2. MATERIALS AND METHODS

2.1. Method of review

Ayurvedic texts, modern books as well as the data bases Google scholar, PubMed, Medline, dissertation works from Ayurveda colleges, studies available on Research Gate web-based search engines, journal, were used to search for relevant literature on *Tryushanadya Lauha Yoga* and presented in systematic manner.

2.2. Procurement of Trial Drugs

All the content of trial drugs i.e. *Tryushanadya Lauha* was identified.

2.3. Preparation of Drugs

Tryushanadya Lauha were prepared as per the method of preparation of *Vatikalpana* as mentioned in *Sharangadhara Samhita*^v in Pharmacy of S.G.M.P.G Ayurvedic Medical College and Hospital Saheri, Ghazipur.

2.4. Materials for *Tryushanadya Lauha*

Ingredients of *Tryushanadya Lauha*, with English / Latin name, Part used and its quantities are described as given in Table 1:

Table 1: Ingredients of ‘*Tryushanadya Lauha*’

Sr. No	Name of Drugs	Botanical name/ English Name	Part used	Proportion
1.	<i>Sunthi</i>	<i>Zingiber officinale</i> Roxb.	Rhizome	1 part
2.	<i>Maricha</i>	<i>Piper nigrum</i> Linn.	Fruit	1 Part
3.	<i>Pippali</i>	<i>Piper longum</i> Linn.	Root	1 Part
4.	<i>Vijaya</i>	<i>Cannabis sativa</i> Linn.	Leaves	1 Part
5.	<i>Chavya</i>	<i>Piper retrofractum</i> Vahl.	Root	1 Part
6.	<i>Chitraka</i>	<i>Plumbago Zeylanica</i> Linn.	Root bark	1 Part
7.	<i>Bakuchi</i>	<i>Psoralea corylifolia</i> Linn.	Seed	1 Part
8.	<i>Vida Lavana</i>	----	----	1 Part
9.	<i>Audbhida Lavana</i>	----	----	1 Part
10.	<i>Saindhava</i>	----	----	1 Part
11.	<i>Sauvarchala</i>	----	----	1 Part
12.	<i>Lauha Bhasma</i>	<i>Ferrum</i>	----	11 Part

3. RESULT

The pharmacological properties of the *Tryushanadya Lauha Yoga* (formulation) can be explained on the basis of the individual drug properties as mentioned below:

1. *SUNTHI*^{vi}

Latin Name	<i>Zingiber officinale</i> Roxb.
Family	<i>Zingiberaceae</i>
Synonyms	<i>Kaphari</i> , <i>Vishva</i> , <i>Nagara</i> , <i>Mahausadha</i> , <i>Visvabhesaja</i>
Vernacular Name	<ul style="list-style-type: none"> • English Name: Ginger • Hindi Name: Sonth

Classical Categorization:	<ul style="list-style-type: none"> • Charakasamhita: <i>Truptighna, Deepaniya, Arshoghna, Shoolaprashamana</i> • Sushrutasamhita: <i>Pippalyadi, Trikatu</i> • Bhavprakash: <i>Panchakola, Shadushana</i>
Part Used	<ul style="list-style-type: none"> • Rhizome
Rasapanchaka	<ul style="list-style-type: none"> • Rasa: <i>Katu</i> • Guna: <i>Laghu, Snigdha</i> • Virya: <i>Ushna</i> • Vipaka: <i>Madhura</i> • Doshaghnata: <i>Vata-Kaphashamaka</i>
Karma	<ul style="list-style-type: none"> • <i>Vedanasthapana, Vatashamaka, Sheetaprashamaka, Rochana, Deepana, Pachana, Triptighna, Vatanulomana, Bhedana, Grahi</i>
Rogaghnata	<ul style="list-style-type: none"> • <i>Aruchi, Chhardi, Agnimandya, Ajirna, Vibandha, Anaha, Gulma, Udarashoola, Arsha, Hridroga, Sheetapita</i>
Chemical constituents	<ul style="list-style-type: none"> • Heptane, isovaloraldehyde, camphene, casinine, myrecene, limonene, gingerol, zingerone, ginger glycolipids A, B, C, gingersols, cysteine, leucine and arginine
Actions & Uses	<ul style="list-style-type: none"> • The dry ginger is emollient, appetizer, laxative, stomachic, stimulant, anthelmintic and carminative. It is useful in dyspepsia, piles, hyperacidity, abdominal pain and vomiting.

2. MARICHA

Latin Name	<i>Piper nigrum</i> Linn.
Family	<i>Piperaceae</i>
Synonyms	<i>Vellaja, Krishna, Ushana, Vruttapahala, Yavanesta</i>
Vernacular Name	<ul style="list-style-type: none"> • English Name: Black pepper • Hindi Name: Kali Mirchi
Classical Categorization:	<ul style="list-style-type: none"> • Charakasamhita: <i>Deepaniya, Krimighna, Shoolaprashamana</i> • Sushrutasamhita: <i>Pippalyadi</i>
Part Used	<ul style="list-style-type: none"> • Fruit
Rasapanchaka	<ul style="list-style-type: none"> • Rasa: <i>Katu</i> • Guna: <i>Laghu, Ruksha, Tikshna</i> • Virya: <i>Ushna</i> • Vipaka: <i>Katu</i> • Doshaghnata: <i>Kapha –Vata shamaka</i>
Karma	<ul style="list-style-type: none"> • <i>Deepana, Pachana, Yakrit Uttejaka, Vatanulomana, Krimighna, Nadi Balya, Kaphaghna and Srotoshodhana</i>
Rogaghnata	<ul style="list-style-type: none"> • <i>Agnimandya, Ajirna, Yakrit Vikara, Adhmana, Shula, Grahani, Krimi, Kasa, Swasa, Hikka, Sthaulya</i>
Chemical constituents	<ul style="list-style-type: none"> • Piperine, piperide, guineensine piperonal, piperoleine, piperettine, citronellol, cryptone piperonal, camphene, arginine, pipercolic acid, serine, threonine, ascorbicacid, carotene, piperine and sitosterol (stem)
Actions & Uses	<ul style="list-style-type: none"> • Its poultice is Ushna, anti-inflammatory and scraping agent. Therefore, it is used in newly formed boils, abscess, scabies. Pepper correct urinary disorders by reducing the viscosity of phlegm.

3. PIPPALI^{vii}

Latin Name	<i>Piper longum</i> Linn.
Family	<i>Piperaceae</i>

Synonyms	<i>Pippali, Maagadhi, Vaidehi, Kanaamula, Katushna, Chapala, Ushna, Upkulya, Tikshnatandula, Chatakshira, Ushna.</i>
Vernacular Name	<ul style="list-style-type: none"> • English Name: Piper • Hindi Name: Pippali
Classical Categorization:	<ul style="list-style-type: none"> • Charakasamhita: Kasahara, Shoolaprashamana • Sushrutasamhita: Pippalyadi, Shirovirechana
Part Used	<ul style="list-style-type: none"> • Fruit
Rasapanchaka	<ul style="list-style-type: none"> • Rasa: Katu • Guna: Laghu, Snigdha, Tikshna • Virya: Anushna Sheeta • Vipaka: Madhura • Doshakarma: Kaphavatashamaka
Karma	<ul style="list-style-type: none"> • <i>Deepana, Vatanulomana, vatahara, Jantughna, Medhya, Balya, Krimighna, Rasayana</i>
Rogaghnata	<ul style="list-style-type: none"> • <i>Agnimandya, Aruchi, Ajirna, Gulma, Krimiroga, Arsha, Pandu, Daurbalya, Pleehavridhhi</i>
Chemical constituents	<ul style="list-style-type: none"> • Two alkaloids piper longumine and piper longuminine, zingiberene, piperine, pipartine, carbonyl compound, alkaloids pipemonanaline, piprude caalidine.
Actions & Uses	<ul style="list-style-type: none"> • Dried spikes are carminative, tonic, laxative, digestive, and antiseptic. They are useful in anorexia, dyspepsia, flatulence, colic, diarrhoea, gastric disorders.

4. VIJAYA

Latin Name	<i>Cannabis sativa</i> Linn.
Family	<i>Cannabinaceae</i>
Synonyms	<i>Bhanga, Ganja, Matulani, Madini, Vijaya, Jaya</i>
Vernacular Name	<ul style="list-style-type: none"> • English Name: Indian hemp • Hindi Name: Ganja
Part Used	<ul style="list-style-type: none"> • Leaves
Rasapanchaka	<ul style="list-style-type: none"> • Rasa: Tikta • Guna: Laghu, Tikshna • Virya: Ushna • Vipaka: Katu • Doshaghnata: Kaphashamaka, Pittala
Karma	<ul style="list-style-type: none"> • <i>Pachana, Grahi</i>
Rogaghnata	<ul style="list-style-type: none"> • <i>Moha, Mada, Vani, Jatharagni.</i>
Chemical constituents	<ul style="list-style-type: none"> • Cannabinone, Cannabinol, Calcium phosphate.
Actions & Uses	<ul style="list-style-type: none"> • It acts as anticonvulsant and antispasmodic action.

5. CHAVYA

Latin Name	<i>Piper retrofractum</i> Vahl.
Family	<i>Piperaceae</i>
Synonyms	<ul style="list-style-type: none"> • <i>Chavika</i>
Vernacular Name	<ul style="list-style-type: none"> • English Name: Java long pepper • Hindi Name: Chava
Classical Categorization:	<ul style="list-style-type: none"> • Charakasamhita: Deepaniya, Arshoghna • Sushrutasamhita: Pippalyadi
Part Used	<ul style="list-style-type: none"> • Fruits
Rasapanchaka	<ul style="list-style-type: none"> • Rasa: Katu

	<ul style="list-style-type: none"> • Guna: Laghu, Ruksha • Virya: Ushna • Vipaka: Katu • Doshaghnata: Kapha-Vata shamaka, Pittavardhaka
Karma	<ul style="list-style-type: none"> • Deepana, Pachana, Shoolaprashamana, Vatanulomana, Krimighna
Rogaghnata	<ul style="list-style-type: none"> • Aruchi, Agnimandhya, Ajirna, Udararoga, Arsha, Krimiroga
Chemical constituents	<ul style="list-style-type: none"> • Piperine, volatile oil, piperine, pipartine, beta sitosterol, glycoside, glucose, fructose, mucilage, lignin, kusunokinin, pellitorine, pellitorine, caryophyllene.
Pharmacological actions	<ul style="list-style-type: none"> • It possess anti-tussive, antifungal, anti-flatulent, gastroprotective activities.

6. CHITRAKA

Latin Name	<i>Plumbago zeylanica</i> Linn.
Family	Plumbaginaceae
Synonyms	<ul style="list-style-type: none"> • Agnika, Analnama, Jarana, Vyala
Vernacular Name	<ul style="list-style-type: none"> • English Name: Leadwort • Hindi Name: Chita
Classical Categorization:	<ul style="list-style-type: none"> • Charakasamhita: Deepaniya, Arshoghna • Sushrutasamhita: Pippalyadi, Mustadi
Part Used	<ul style="list-style-type: none"> • Root bark
Rasapanchaka	<ul style="list-style-type: none"> • Rasa: Katu • Guna: Laghu, Ruksha, Tikshna • Virya: Ushna • Vipaka: Katu • Doshaghnata: Kapha-Vata shamaka, Pittavardhaka
Karma	<ul style="list-style-type: none"> • Deepana, Pachana, Shoolaprashamana, Arshoghna
Rogaghnata	<ul style="list-style-type: none"> • Nasaroga, Arsha, Shotha, Grahani, Gudashotha
Chemical constituents	<ul style="list-style-type: none"> • Plumbagin, chitranone, zeylinone, elliptinone, vanillic acid, plumbagic acid, steroidal glycoside, tannin, plumbagic acid.

7. BAKUCHI

Latin Name	<i>Psoralea corylifolia</i> Linn.
Family	Fabaceae
Synonyms	<ul style="list-style-type: none"> • Avalguja, Somaraji, Sasilekha, Soma, Putiphali
Vernacular Name	<ul style="list-style-type: none"> • English Name: Psoralea seed • Hindi Name: Bavachi
Classical Categorization:	<ul style="list-style-type: none"> • Charakasamhita: Tiktakandha
Part Used	<ul style="list-style-type: none"> • Seed
Rasapanchaka	<ul style="list-style-type: none"> • Rasa: Katu, Tikta • Guna: Laghu, Ruksha • Virya: Ushna • Vipaka: Katu • Doshaghnata: Kapha-Vata shamaka
Karma	<ul style="list-style-type: none"> • Rsayana, Keshya, Balya, Ruchya, Raktapittahara, Krimighna
Rogaghnata	<ul style="list-style-type: none"> • Kustha, Switra, Swash, Prameha, Jwara, krimiroga, Pandu
Chemical constituents	<ul style="list-style-type: none"> • Seed: volatile yellow oil, stable oil, resin, alkaloids, albumin, manganese, vermonine • Fruits: Corylin, corylinal.

8. VIDALAVANA

Rasapanchaka	<ul style="list-style-type: none"> • Rasa: Lavana • Guna: Laghu, Ruksha, Tikshna, Vyavayi • Virya: Ushna • Doshaghnata: Kapha-Vata shamaka
Karma	<ul style="list-style-type: none"> • Anulomana
Rogaghnata	<ul style="list-style-type: none"> • Udararoga, Vibandha

9. SAINDHAVA

Rasapanchaka	<ul style="list-style-type: none"> • Rasa: Lavana, Madhura • Guna: Laghu, Snigdha, Sukshma • Virya: Sheeta • Doshaghnata: Tridoshaghna
Karma	<ul style="list-style-type: none"> • Tridoshashamaka
Rogaghnata	<ul style="list-style-type: none"> • Udararoga, Vibandha

10. SAINDHAVA

Rasapanchaka	<ul style="list-style-type: none"> • Rasa: Lavana, Madhura • Guna: Laghu, Snigdha, Sukshma • Virya: Sheeta • Doshaghnata: Tridoshaghna
Karma	<ul style="list-style-type: none"> • Tridoshashamaka
Rogaghnata	<ul style="list-style-type: none"> • Udararoga, Vibandha

11. SAUVARCHALA

Rasapanchaka	<ul style="list-style-type: none"> • Rasa: Lavana, Madhura • Guna: Vishad, Snigdha, Sukshma • Virya: Ushna • Doshaghnata: Vatahara
Karma	<ul style="list-style-type: none"> • Deeapana, Pachana
Rogaghnata	<ul style="list-style-type: none"> • Udararoga, Vibandha, Aruchi, Agnimandhya

12. LAUHA BHASMA

Latin Name	<i>Ferrum.</i>
Rasapanchaka	<ul style="list-style-type: none"> • Rasa: Tikta, Madhura, Kashaya • Guna: Guru, Ruksha • Virya: Sheeta • Vipaka: Madhura • Doshaghnata: Kapha-Pitta shamaka
Karma	<ul style="list-style-type: none"> • Deepana, Lekhana, Balya, Medhya, Vrishya, Rasayana, Sarvavyadhihara
Rogaghnata	<ul style="list-style-type: none"> • Raktapitta, Kasa, Shwas, Palita, Shula, Amlapitta, Pandu, Kamala, Mutrakriccha

Table No. 2: Average of Pharmacodynamics of Tryushanadya Lauha

Properties	Observations in Tryushanadya Lauha	
	Total No. of Drugs	Percentage%
Rasa		
Madhura	0/12	0.00
Amla	0/12	0.00
Lavana	0/12	0.00
Katu	4/12	33.3
Tikta	2/12	16.6

<i>Kashaya</i>	0/12	0.00
<i>Guna</i>		
<i>Guru</i>	0/12	0.00
<i>Laghu</i>	5/12	41.66
<i>Ruksha</i>	4/12	33.33
<i>Snigdha</i>	2/12	16.66
<i>Sara</i>	0/12	0.00
<i>Tikshna</i>	1/12	8.33
<i>Vipaka</i>		
<i>Madhura</i>	3/12	25.00
<i>Katu</i>	4/12	33.33
<i>Virya</i>		
<i>Ushna</i>	7/12	58.33
<i>Sheeta</i>	0/12	00.00
<i>Doshaghnata</i>		
<i>Tridoshahara</i>	1/12	8.33
<i>Kapha-Vatahara</i>	6/12	50.00
<i>Kapha-Pittahara</i>	1/12	8.33
<i>Karma</i>		
<i>Dipana</i>	5/12	41.66
<i>Pachana</i>	1/12	25
<i>Rasayana</i>	1/12	8.33
<i>Chakshushya</i>	1/12	8.33
<i>Anulomana</i>	2/12	16.66
<i>Medonashaka</i>	1/12	8.33
<i>Yakrutvikara</i>	1/12	8.33
<i>Vrushya</i>	2/12	16.33

4. DISCUSSION

Madhumeha is a *Tridoshaja vyadhi* with *Abadhashlesma* considered to be particular *Dosha* in all types of *Prameha*. Treatment of *Madhumeha* is difficult due to contradictory treatment of *Vata* (predominant *Dosha*) and *Meda* (predominant *Dushya*). Polyherbalism, a natural-based alternative therapy for a variety of ailments, has been mentioned since the period of *Charaka*, for the treatment of type 2 diabetes mellitus (T2DM) and its consequences, herbal-based combination therapy plays a critical role^{viii}.

In *Tryushanadya Lauha* consists of *sunthi*, *maricha*, *pippali*, *vijaya*, *chavya*, *chitraka*, *vidalavana*, *bakuchi*, *audhbbhida lavana*, *sindhava lavana*, *sauvarchala lavana* and *Lauha Bhasma*. It has mainly *katu-tikta rasa*, *laghu-ruksha guna*. So, it is able to control *kapha dosha* with *Medodhatu dushti* which is main *Dushyas* in *Madhumeha*. It has *Ushna Virya* so ultimately it can control *Vata*.

Vipaka wise dominancy in the preparation is of *katu-madhura*. *Katu Vipaka* is *Amahara*. Pharmacodynamics in *Ayurveda* mainly based on the fundamental doctrines of *panchamahabhuta* and *Tridosha*, which govern the physiochemical and biological phenomena respectively.

On assessing the ingredient of *Tryushanadya Lauha* including simple water for *anupana*. Drugs are having *Kapha Vata Shamaka* property and also *anulomana*, *srotovishodhaka*, *deepana* and *Pachana* etc. In it *Deepana dravya* helps to improve disturbed metabolism i.e. *Dhatvagnimandya* *Tryushanadya* effective drug of *Madhumeha*.

Piperine present in *P. longum* and *P. nigrum* has been shown to enhance the bio-availability of structurally and therapeutically diverse drugs, possibly by modulating membrane dynamics, due to its easy portioning and increasing permeability^{ix}.

5. CONCLUSION

It can be concluded from the study that the Ayurvedic management of *Madhumeha* is better achieved by following the proper dietary habits, lifestyle, and oral medication *Tryushanadya Lauha*. The comprehensive

approach of *Ayurveda* can lead the path not only to better glycemic control, but also to improving the quality of life of diabetics and lowering the economic, national, and global burden of diabetes.

CONSENT

It is not applicable.

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COMPETING INTEREST

Authors have declared that no competing interest exist.

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