



AN APPRAISAL OF THERAPEUTIC POTENTIAL AND PHARMACOLOGICAL EVIDENCES OF *BHUDHATRIKADI YOGA* AND ITS INGREDIENTS IN MADHUMEHA(DM2)”

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Abstract

Introduction:

Bhudhatrikadi Yoga is a classical Ayurveda formulation for Madhumeha Roga(DM) described in yogratnakar prameha chikitsa prakarana. Its ingredients include Bhumyاملaki (Phyllanthus niruri) and Marich (piper nigrum). Churna is solid dosage form Kalpana which is the the simplest form of Ayurvedic medicine which can be easily prepared.

Objectives:

To study the Pharmacological evidences of Bhudhatrikadi yoga and its ingredients.

Materials and Methods:

Research literature published in online journals of PubMed, Scopus, Google Scholar, DHARA, and Ayush Research Portal, was searched extensively.

The keywords used were pharmacological evidence or study of Bhudhatrikadi Yoga Bhumyاملaki (Phyllanthus niruri) and Marich (Piper nigrum).

Journals published online in last 20 years were considered. Ayurveda classical texts were also referred.

Observations:

The components of drug, Bhudhatrikadi Yoga have shown several properties as Anti- hepatotoxic, Carminative, Anti-diabetic, anti-oxidant, Appetizer, Anti-inflammatory, Deepana, Pachana. Clinical evidences show significant therapeutic effect of Bhudhatrikadi Yoga.

Conclusion:

The drug, Bhudhatrikadi Yoga has a promising therapeutic potential to be used as a tridosha shamaka, pramehaghana, yakrut uttejaka, nadi uttejaka, deepniya and pachaniya, and balya drug for Madhumeha.

The same needs to be further validated with larger, multicentric, standard controlled and randomized

clinical trials.

Keywords: Madhumeha, Diabetes Mellitus, Bhudhatrikadi Yoga, churna etc

INTRODUCTION

The importance of various dosage forms in Ayurveda is to make it compatible and palatable to the patientⁱⁱⁱ. In order to do this the potency of the drug can also be increased or decreased. It is also used to increase the shelf life of the particular preparation. Ayurvedic churna kalpana retain their potency for 1 year. Churna is defined as totally dried raw material which is powdered very minutely to make their small size and again filtered through cloth's grid and obtained fine powder is called as "Churna". A blend of several herbs and spices make up the powdered mixture known as Churnaⁱⁱⁱ.

Ayurvedic Churna is the simplest form of Ayurvedic medicine which can be easily prepared. The Churna, which we are going to prepare and use, should be first referred from recognized Ayurvedic text or Ayurvedic formulary of India (AFI)^{iv}.

Diabetes is a major health issue; nearly half a billion people are living with diabetes worldwide. It is one of the fastest growing global health emergencies of 21st century. In 2019 it is estimated that 463 million people have diabetes and this number will reach 578 million by 2030 and 700 million by 2045^v

The *Ayurvedic* classics describe a comprehensive concept of the pathogenesis of Madhumeha (Diabetes Mellitus) marked with depletion of *Agni*, disturbance in Fat (*Meda*) metabolism and lowering of *immunesystem* (*Ojas*). Promotion of *Agni* and *Ojas* and correction of *Medas* seems to be the principal approach in this disease along with modified diet and lifestyle.

Bhudhatrayadi Yoga has karma like Strotoshodhana and Chedana, which might clear Doshas from the Strotasa. Bhoomyamalaki is mentioned as Pitta Meha Nashini by Raja Nighantu and Pipasa Hara by Bhava Prakasha. Kashaya, Tikta rasa, Ruksha, Laghu Guna of Bhudhatrayadi Yoga have opposite properties to Bahudrava Shaleshma, Abadha Meda, Mansa and Kleda in Madhumeha. The drugs in Bhudhatrayadi Yoga have Katu Vipaka which acts on Mutravaha Srotasa, Meda, Kaleda and might reduce symptoms like Prabhoot Mutrata. Bhoomyamalaki is Vata-Pitta Shamaka which may help in relieving Kara Pada Daha (burning in hands and feet). Maricha is VataKapha hara which may alleviate symptoms like Karapada Suptata (tingling).

Evidenced based medicine is the need of the era. Probable efficacy of a drug needs to be discussed in light of pharmacological evidences. Also, the authors are planning a clinical study to determine the efficacy of Bhudhatrikadi yoga in madhumeha. So, before starting the clinical study, a literature review was done. This article attempts to critically appraise the drug Bhudhatrikadi yoga and its components to study its possible therapeutic effects and adverse effects, if any.

Aims and Objective

1. To study the Pharmacological evidences of Bhudhatrikadi yoga and its ingredients.

MATERIALS AND METHODS

Research literature published in online journals of PubMed, Scopus, Google Scholar, DHARA, and Ayush Research Portal, was searched extensively.

The keywords used were pharmacological evidence or study of Bhudhatrikadi Yoga Bhoomyamalaki (*Phyllanthus niruri*) and Marich (*Piper nigrum*).

Journals published online in last 20 years were considered. Ayurveda classical texts were also referred.

REVIEW OBSERVATIONS

Bhudhatrikadi Yoga

भूधत्री च त्रगद्याणंमररचानांच त्रिन्शत्रिः ।

असाध्यान्साधयेन्मेहान्स्फुरात्रान्न संशयः ॥ (योगरत्नाकर उत्तरार्ध-प्रमेह चिकित्सा)

The present drug was taken from Prameha Chikitsa mentioned in Yogaratanakara^{vi}.

Properties of Bhudhatrayadi Yoga

1. Bhoomayamlaki Madhur, Tikta, Kashaya rasa Laghu Sheeta guna madhur vipaka Kapha-Pitta shamaka doshghnata.

2. Maricha Katu, Tikta Laghu, Tikshana, Ruksha Ushna Katu Kapha-Vata shamaka.

भूधत्री िुकषायाम्ला त्रिमेहत्रिनाशनी ॥

त्रशत्रशरा मूत्ररोगात्रि-शमनी दाहनाशनी ॥ (राज.चिघंटु./पपधटाचि वगध61-63) ^{vii}

It is made by churna kalpana methods with 1 part of bhumyamlaki (*Phyllanthus niruri*) panchanga churna and 1/18 part of Marich (*Piper nigrum*) seeds were taken.

1. Bhumyamalaki

It belongs to family Euphorbiaceae, it is a tropical plant commonly found in coastal regions in India, China and islands of north and central America. Known by the common name gale of the wind, stonebreaker or seed under leaf. It grows 50-70 cm tall and bears ascending herbaceous branches with small, thin, elliptical leaves arranged alternately, stemming from smooth, light-green bark. The bark is smooth and light green. It bears numerous pale green flowers which are often flushed with red. The fruits are tiny, smooth capsules containing seeds.

Classically according to Acharya Charaka, it is categories under Kasahara, Shwasahara, according to Acharya Dhanvantari nighantu chandanadi varga, according to Bhavaprakasha, guduchyadi varga.^{viii} It is chemically composed of ligans, glycosides, flavanoids, alkaloids, ellagitans, phenyl, propanoids, amarin, gernanin, corilagin.

According to Ayurveda pharmacology, the drug has *Tikta Kashaya* and *Madhura Rasa*, is *Laghu* and *Ruksha* with *Sheeta Virya* and *Madhura Vipaka*. It shows *Kapha-Pitta Shamaka*, *Pramehagna*, *Yakrut Uttejaka*, *Deepana*, *Pachana*.

It helps in managing liver disorders due to hepatoprotective, antioxidant and antiviral activities, ulcers by reducing gastric juices secretions, kidney stones due to diuretic properties and diabetes due to its tikta (bitter) property.

2. Marich (*Piper nigrum*)

Belongs to the family Piperaceae, it is a stout climber plant that grows to a height of 10 meters or more. The stem of this plant knots where its leaves, adventitious roots and fruits emerge. Leaves are almond shaped, leathery textured about 6 to 10 cm long and alternately arranged on the stem, having shiny dark green color on upper side and pale-green colored found in clusters along stalk. Fruits are round in form and there are about 40 to 60 fruits on each spike which are green in colour which turns to red when they ripen, each fruit contain single seed.

The green fruits are dried until the flesh around the single hard seed is wrinkled and grayish black, then it can be ground into black pepper or kept as a whole seed.

Chemical constituents are Piperine, Piperidine, Pipretine, Chavicine.

Pharmacological properties and actions:

Guna- Laghu, TikshnaRasa- Katu Vipaka- Katu Virya- Sheeta

Karma- Kapha-Vata Shamaka, Lekhana, Nadi Uttejaka, Balya.

Chemical constituents– Piperine, Piperidine, Pipretine, Chavicine. Piperide, Trichostachine, Methylendioxy-cinnamic, Piperettine, Citronellol, Cryptone, Piperonal, Camphene, Pipecolic acid, Cryptone, Piperonal, Threonine, Ascorbic acid, Carotene.

Pharmacological action - Anti-inflammatory, Hepato-protective, Deepana, Pachana, Insecticidal property. The dry fruit of Marich (*Piper nigrum* L.) is an ingredient of more than 3500 Ayurvedic formulations. Its bioavailability enhancing activity on accompanying ingredients and its imperative 'pharmacological actions rationalize this. *Piper nigrum* has been proved to possess bioavailability-enhancing activity with various structurally and therapeutically diverse drugs.

Various mechanisms responsible for the action are reviewed in this paper. Taking into consideration the exclusive principles behind Ayurvedic pharmaceuticals; the significance of its pharmacokinetics and pharmacodynamics as a part of a formulation is immense. It is possible to carry out the bioavailability study of an Ayurvedic formulation containing Marich using piperine as a marker. Various researchers have elaborated important its pharmacological actions viz anti-inflammatory, anti-metastatic, anti-peroxidative [cancer preventing], anti-oxidant, anti-depressant, anti-diarrheal actions. This supports the rationale of its being a part of most rejuvenating, anti-inflammatory, digestive, and anti-diarrheal Ayurvedic formulations.

The chief activity of Marich is of being pramathi. This means that it has a potential to clear congestion in the body channels [srotas] by penetration into the congestion itself. Essential oil of black pepper or Maricha helps in enhancing blood circulation.

DISCUSSION

Probable Mode of Action of *Bhudhatrayadiyog Samprapti Ghatak* of Prameha are

- 1) Durbalagni (Mandagni]
- 2) Vitiated Kapha Dosha
- 3) Involvement of 7 Dushya's like Meda, Lasika, etc.
- 4) Hetu's of Prameha like Atimadhur, Guru, Snigdha Ahara, Atinidra, Sukhasana also vitiates the Kapha dosha. Hence, dravya (medicines) having properties opposite to these are used for Sampraptibhanga of Prameha.

Bhudhatryadiyog (*Bhumyamalaki* & *Maricha*) is having 'Katu-Tikta' Rasa, which is known for its 'Kledashoshana', Medoghana and Lekhana karyas. *Bhumyamalaki* having 'Tikta' Rasa will do absorption i.e. Shoshana of Kleda, Meda, Vasa, Majja, Pitta and Kapha^{ix}.

Due to Tikshana, Ushna and Deepan Guna, it works as a 'Agnideepan' Dravya and helps in relieving Agnimandya. Ayurveda has described Agnimandya as the root cause of all the Vyadhi's (Diseases) in the body, hence Agnideepan is very must for Samprapti bhanga.

In addition, 'Predominant Madhur Vipaka' plays a role in rejuvenation by Rasayan karma, nourishes Dhatu's and increases Deha Bala. Due to Tikta, Katu and Ushna Guna, it expels the Kaphadi Dosha from Srotas. Thus, removes the obstructive vitiated Dosha from each and every Srotas of the body. Overall, properties of *Bhudhatryadiyog* have a very important role in Samprapti bhanga of Prameha. It possesses qualities opposite to Meda Dhatu and Tikshna (most potent) in nature, predominant for

increasing the ability of Jatharagni. This will increase the strength of Pachakagni leading to metabolism of Meda by Lekhana (scraping) action because of which Prasarana of Meda will be restricted.

Prabhuta Mootrata is Mootravahasrotas, Medovahasrotasvikriti Lakshana. It can be understood as increase in Kapha, Abadhamedas, Kledamsha. Bhudhatryadi Yoga has Tikta-Kashaya Rasa and Rukshaguna which are Kledo-Upashoshaka and helps in pacifying this symptom.

Bhudhatryadi Yoga showed significant result in Udakavhasrotasdusti due to its Tikta, Madhura, Kashaya Rasa and Trishnanigrahana property of Bhumyاملaki .Kshudhaadhikya occurs due to Avarana of Abadhamedas over Koshtaagni which causes vitiation of Vata and leads to Kshudhaadhikya. Maricha has Katu Rasa, Ushnaveerya, Deepana Pachana and Srotoshodhaka properties which acts at level of Dhatwaagni, leads to proper formation of rasa dhatu and removes the Avarana of Abadhamedas at level of Koshtaagni and thus specify the symptom.

Bhudhatri has Tikta, Kashaya, Laghu, Ruksha Guna acts as Pitta-KaphaShamaka, Grahi, Kleda Medo upashoshaka. Sheetha Virya, Madhura Vipaka of Bhudhatri is Kapha-Pithashamaka. Maricha is Katu Rasa Pradhana which has Deepana- Pachana, property. Katu Rasa has Sneha-Meda Kleda upashoshana property. Katu Rasa also causes Srotoshodhanam. Hexane extract of Bhudhatri has α -amylase & α -glucosidase inhibitory properties. α -amylase & α -glucosidase aid the production of glucose from the catabolism of starches and^x Phytoconstituent of Maricha, Piperine is found to have antidiabetic action^{xi}. The leaves of Phyllanthus Niruri are rich in pottasium which is considered responsible for their powerful diuretic effect. Stem contains saponin. Phyllanthus niruri has shown its beneficial effects on various Diseases like Hepatitis, Urinary Tract infections and Diabetes Mellitus.

Bhudhatryadi Yoga is mentioned in the treatment of Prameha. It has two ingredients, Bhudhatri and Maricha. Bhudhatri has Tikta, Kashaya Rasa, Sheeta Veerya & Pitta Kapha hara properties. Maricha has Katu Rasa, Ushna Veerya, Deepana & Kapha Vata hara properties. Hexane extract of Bhudhatri is found to have α amylase inhibitory properties which shows hypoglycemic effect by inhibiting starch converts into glucose. Piperine, one of the phytoconstituent is found to have antidiabetic action.

CONCLUSION

The drug *Bhudhatrikadi Yoga* has a composition which gives relief in symptoms of *Prameha* and decreases the blood sugar levels. Currently available researches show promising results of this drug in type-2 Diabetes Mellitus. Further multicentric clinical researches need to be done with a larger sample size, a greater number of objective outcome measures and standard control drug to establish this drug as a treatment modality in Diabetes Mellitus.

Bhudhatryadi Yoga is mentioned for the treatment of Prameha. Bhudhatryadi Yoga has Tikta Rasa, Laghu-Ruksha Guna, Sheeta Veerya. Katu Rasa of Maricha is Deepana and Pachana. It does Kleda Shoshana, Meda Shoshana and Kapha Harana. It removes Sroto Rodha and thereby helps in alleviating Kapha Prakopa. The effect of methanol extract of aerial parts of Bhumymlaki has α -amylase & α -glucosidase enzyme inhibitory properties. α -amylase & α -glucosidase aid the production of glucose from the catabolism of starches and oligosaccharides^{xii}

A safety profile and pharmaceutical standards also need to be developed forth is drug for its wider acceptance and usage.

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Conflicts Of Interest

There are no conflicts of interest.

Authors contribution

Literature search and manuscript preparation concept was done by Dr. Shweta Gyanendra Shukla. The design, the definition of intellectual content, manuscript editing and manuscript review was done by both Dr. Shweta Gyanendra Shukla and Dr. Om Prakash Singh.

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