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FORMULATION AND EVALUATION OF MASHI- AN OVERVIEW

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ABSTRACT

Mashi is a black-colored powder that is made by burning plant or animal-based ingredients. It is prepared by either using an open vessel or a closed vessel. During the preparation of Mashi, a certain amount of energy is applied to the raw material, which reduces its bulk and helps to bring out the hidden chemical constituents. This process can also lead to the formation of new therapeutic chemical compounds. Mashi is an affordable and easy-to-prepare formulation. This review aims to highlight different Mashi formulations mentioned in Ayurvedic texts and also introduce formulations used by Ayurvedic practitioners that are not mentioned in the texts. Researchers should study Mashi in detail to establish its identity, purity, and therapeutic activity.

KEYWORDS: Mashi, Formulation, Ayurveda, herbal.

INTRODUCTION

Mashi is an important dosage form of medicine in Ayurveda. The term ‘Mashi Kalpana’ is often used to signify a partially burned or roasted black-colored powdery formulation of a plant (Kalpana refers to the ideology behind the method of manufacture/process).

Whenever any herbal or animal product is heated slowly, it undergoes combustion, when the specific temperature is attained. The smoke appears at the beginning of the process and the material starts blackening. Then, the typical odor of combustion is identified. Ultimately, when the whole material turns black and the smoke is completely removed, the process of formation of Mashi is assumed to be completed. This material is made into a fine powder, which should be perfectly black like charcoal powder.

If we further heat the Mashi after this stage, it gets converted into a white or grey-colored ash and is said to have lost its 'Sendriyatva' (organic content). This form is unpalatable for the body and is referred to as the drug's 'carbon form'. Mashi has a wide range of applications with some articles even claiming that it can even be used for water purification. The Bhasmikaran process is different from the Mashi Kalpana process. Bhasmikarana involves shodhana (purification), marana (powdering), chalana (stirring), dhavana (washing), galana (filtering), putan (heating), and bhavana (coating) with the herbal extract. The selection of these steps depends on the specific metal or mineral; whereas, in Mashi preparation, the substance is cleaned and heated either in an open vessel or closed vessel as per the Ayurvedic literature.

Types of Mashi

1. According to use (Hussain, 2015)

I. Bahya

Bahya means 'Outer', it is the type of Mashi that is formulated for external use.

ex. Hastidanta masi, Triphala mashi

II. Abhyantara

Abhyantara Mashi is the type of Mashi that is used internally or as a formulation that is intended for internal use.

ex. Vajeegandha, Svaavida mashi

2. Based on method (Joshi *et al*., 2021)

Broadly, there are two methods of preparation of Mashi formulation. These methods are called 'padhati' which stands for a 'traditional method for preparing medicine'.

I. Open Method/Bahirdhum Padhati Mashi (BPM)

In this method, the solid mixture to be burned is kept in an open vessel (so the name 'Bahirdhum', where 'Bahir' means 'outside'). Combustion is carried out slowly, at a temperature of 140e150 C with continuous agitation. The vessel used for burning is made up of iron or is earthen.

II. Closed method/Anterdhum Padhati Mashi (APM)

The APM method packs the plant/animal material between two 'Sharav Samputs' (earthen pots). The two pots are joined with each other using Fuller's earth (multani mitti). This assembly is then subjected to the process of puta Puta is a pit here; two earthen pots containing the material to be heated by placing the earthen pot on heaps of cow dung cakes and setting them on fire. Once the cow dung cakes are burnt completely, the assembly is left to cool, after which, the pots are retrieved and Mashi gets collected.

3. Based on material

Mashi can be prepared from plant material as well as animal material

I. Plant Mashi

As plant Mashi formulations are available from plant material, which in turn is available more freely and can be extracted more efficiently, much research has been done on these Mashi formulations. Another reason for this is that the plants can be easily cultivated, and hence, collecting a large number of materials for testing and/or manufacturing Mashi never really threatens the species's survival. Both BPM and APM can make these Mashi formulations. (Joshi et al., 2021).

A. Coconut husk Mashi
B. Toor dal Mashi (Pigeon peas Mashi)
C. Latakaranj Mashi
D. Vibheetakyadi Mashi
E. Amalaki Mashi
F. Triphala Mashi
G. Ashwagandha Mashi

II. Animal Mashi

These Mashi formulations are derived from endangered animal species; nevertheless, their usage is strongly forbidden, and little to no study into their efficacy has been conducted. Since ancient times, animals, their parts, and their products have constituted part of the

inventory of medicinal substances used in various cultures. In India, nearly 15e20 percent of Ayurvedic medicine is based on animal-derived substances. There are references to nearly 380 types of animal substances in Charaka Samhita. Mostly, animal by-products are used in traditional health care systems without any animal loss; however, some Mashi formulations are prepared from animal body parts or whole animals such as Hastidant Mashi is made up of elephant ivory, Kurmakapal Mashi is made up of tortoiseshell, Chatuspaad Mashi is prepared from horns, bones or hooves of animals. As such Mashi is made from animal parts that damage animals, and strong rules are in place to ensure that no one exploits or kills them. The APM method is commonly used to produce this Mashi (Joshi et al., 2021).

A. Hastidant Mashi
B. Mayurpiccha Mashi
C. Kurmakapal Mashi
D. Sarpa Mashi
E. Svaavida Mashi
F. Meshadi Mashi
G. Chatuspaad Mashi
H. Keshanjana or kesh Mashi
I. Kurmakapal Mashi

Table 1: Different types of plant mashi and uses.

Name of mashi	Source of raw material	Method of preparation	Use
Ashwagandha mashi	Ashwagandha roots	APM and BPM	Adaptogenic, immunity booster
Triphala Mashi	Fruits of amala, baheda, and hirda	APM and BPM	Antioxidants, adaptogens, chemopreventives, and anti hypercholesterolemic
Amalaki mashi	Amala fruit	APM and BPM	Anti-ulcer
Vibhitakiydai mashi	Bahera fruit	BPM	Ophthalmic diseases, anti-ulcer
Coconut husk mashi	Coconut husk	APM and BPM	uretic, antimicrobial, antinociceptive antiemetic
Latakaranaj mashi	*Caesalpinia bondoc* seeds	APM	Treatment of polycystic ovarian syndrome
Udumber mashi	*Ficus glomerata* bark	APM	Hiccup
Tailwak mashi	*Terminalia arjuna* bark	APM	Hiccup

Table 2: Different types of plant mashi and uses.

Name of mashi	Source of raw material	Method of preparation	Use
Hastidanta mashi	Ivory	APM	Hair growth
Mayurpiccha mashi	Peacock feathers	APM	Hiccup, asthma
Sarpa mashi	Black Cobra	APM	
Chatuspaad mashi	Skin, hooves (khura), horns (shrunga), and bones (asthi) of the four legs of the animal	APM	Hiccup, asthma
Meshadi mashi	Fleece	APM	Hiccup
Svaavida mashi	Porcupine quails	APM	Antibacterial

Characteristics and Preservation

Masi Kalpas when kept in air-tight containers can be used indefinitely. As they are carbonized forms of drugs chances of decomposition are less. (Hussain, 2015)

Standardization of Mashi (Joshi et al., 2021)

A monograph of each Mashi is required as it will help to standardize the Mashi. Presently, no official data is available for the standardization of Mashi and researchers are required to establish the parameters. The identity and purity of Mashi can be achieved by following standardization parameters

1. Morphological evaluation: Colour, odor, and taste
2. Physical evaluation: Loss on drying, total ash value, acid insoluble ash value, water soluble ash value, extractive values, and fluorescence study
3. Chemical evaluation: Preliminary phytochemical study, qualitative and quantitative analysis of inorganic radicals, determination of organic contents, Fourier Transform Infrared Spectroscopy (FTIR), Powder X-ray diffraction (PXRD), Differential Scanning Calorimetry (DSC), and Atomic Absorption Spectroscopy.

PRECAUTIONS (Panchpor & Inamdar, 2020)

1. Puta (Antardhooma/Bahirdhooma) should be performed well.
2. In the Antardhooma method sharava-samputa should be closed properly.
3. The mashi should be kept in airtight glass containers as they are in the carbonized form of drugs chances of decomposition are less.

Mashi Kalpana is mentioned in Sushruta Samhita in some instances. Mashi Kalpana is a product that is similar to calx or carbon & used in different diseases both internally and externally.

The predominance of carbon particles in this preparation may attribute this Kalpana to the following benefits

- The absorptive properties of carbon are utilized in the treatment of aliment of the stomach due to hyperacidity.
- It removes toxic amines, and organic acids of decomposed food & bacteria from the intestinal tract.
- It has also got anti-poisonous activity

By the process of heat treatment (open/closed method) hidden chemical constituents become prominent and/or new chemical moieties are formed which are therapeutically active. The black color indicates a higher percentage of carbon & oxides. Preliminary phytochemical screening of both Triphala and Triphala Mashi indicates the presence of tannins & ascorbic acid. The antimicrobial activity of Triphala Mashi was checked by the agar gel diffusion method. The aqueous & ethanolic extract of Triphala & Triphala Mashi exhibited a broad spectrum antimicrobial activity against all the micro-organisms. It inhibited the growth of all gram+ve and gram-ve bacteria. No signs of toxicity were observed in a short-term study at the dose of 500mg/kg in toxicity study conducted (Yogesh S. Biradar *et.al*, 2008).

PHARMACOLOGICAL ASPECT

Medicinal charcoal is prepared by carbonizing wood, cellulose residues, or coconut shells out of contact with air. Carbonizing dense wood produces the most effective gas-absorbing charcoals in particular log wood, lignum vitae & coconut shells. Charcoal made by burning wood, coconut shell, or even in an atmosphere containing minimum oxygen acquired good adsorbent properties. Absorbents are used in medicine to remove gases, toxins & poisons (Kastumi Naka *et.al* 2001)

CONCLUSION

The main objective of this article is to dispel any misconceptions surrounding the Mashi formulation and provide a clear understanding of the different types available, their efficacy, and areas where further research is required. Among animal-based Mashi formulations, the most commonly used ones are Mayurpiccha Mashi and Kesh Mashi. While a significant

amount of research has been conducted on Kesh Mashi, there is a need for more studies on Mayurpiccha Mashi. The use of other Mashi formulations made from animal sources, such as Hastidant Mashi, is strongly discouraged as it promotes poaching of endangered animals and poses a significant threat to biodiversity. Moreover, there is no research work available on the efficacy of Hastidant Mashi. Mashi is a simple but unique formulation that requires further research to identify its constituents, isolate them, and evaluate its pharmacological activity. Masi Kalpana is a significant pharmaceutical preparation mentioned in Ayurveda Pharmaceutics, with references found in Samhita, Nighantus, and other texts. While mostly used for external applications, references to internal administration are also found for lesser-used drugs. Pharmaceutical modifications can be attempted on this dosage form with different bases to evaluate the most effective one.

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