

PHARMACEUTICAL STANDARDIZATION AND ANALYTICAL STUDY OF
DASHMOOL TAIL BY THREE DIFFERENT METHODSPrashansa Singh Baghel¹, Sachin Chouhan², Akhilesh Srivastava³, Sourabh Khare⁴

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**ABSTRACT**

Introduction: In *Ayurveda*, different methods are described for *Sneha Kalpana* of *Ayurvedic* preparation of *Dashmool tail*. Although many methods of *Sneha Kalpana* are mentioned in various texts, complete physiochemical standardization is needed to obtain a pure form, to assure the quality of the product, and also, it is important to know the variation in chemical properties which occur during *Ayurvedic* preparation. **Aims and Objectives:** This research involves 1. Procurement of *Dashmool* from the local market and its chemical analysis. 2. Preparation of *Dashmool tail I* and its physiochemical analysis. 3. Preparation of *Dashmool tail II* and its physiochemical analysis. 4. Preparation of *Dashmool tail III* and its physiochemical analysis. **Material and Methods:** The raw *Dashmool* is first dried and pulverized to use in the *Kwath* and *Kalka* form. The *Dashmool tail* is then prepared by three different methods, and they are named *Dashmool tail I*, *Dashmool tail II* and *Dashmool tail III*. **Results and Conclusion:** 1. The changes in physiochemical properties are observed during the preparation

of the *Dashmool tail*. It occurred due to thermal decomposition as it gets heated. 2. The organoleptic characteristics of *Dashmool tail* like colour, appearance, and odor comply with the standard form. 3. The physiochemical analysis of the prepared *Dashmool tail* shows no difference in chemical composition and the parameters are found in the required range. 4. The microbial test performed on the prepared *tail* indicates the number of bacterial and fungal counts is in the standard range. 5. The Thin Layer Chromatography (TLC) test performed on the prepared *tail* complies. The three methods described in this paper are standardized and can be used to prepare *Dashmool tail*. The test conducted on three *Dashmool tails* shows no significant changes in its parameter values.

Keywords: *Dashmool tail*, Standardization, *Sneha Kalpana*, Pharmaceutical, Physiochemical parameters.

INTRODUCTION

Ayurveda has given substantial emphasis to a comprehensive knowledge of drugs including identification, procurement, processing, preservation, and dispensing of the prepared drug under a broad heading known as *Bhaishajya Kalpana*. The primary processing techniques of *Bhaishajya Kalpana* are explained in detail in *Charak Samhita* [1]. They are called *Panchavidha Kashaya Kalpana*. Acharya *Charak* believed that the drug having the quality to produce *Arogya* is the best drug. Keeping this view in mind a number of secondary preparations have been derived from five basic preparations namely *Asav Arishta* (fermentation), *Lepa* (paste), *Churna* (powder), *Sneha Kalpana* (fatty preparation), and *Vati* (pills) [1].

Sneha Kalpana is one among the several highly established *Kalpana* of the ayurvedic system of medicine. Here *Sneha* means fat or fatty material and *Kalpana* stands for the pharmaceutical process of standardization. It is of two types: *Ghrita* and *Tail Kalpana*. *Tail* means oily portion extracted from the drugs. *Tail Kalpana* takes a Lion-share among *Sneha* formulations [2]. *Tail* alleviates *Vata* and does not aggravate *Kapha*. It promotes body strength and is beneficial for the skin. It is *Ushna*, provides firmness, and cleans the female genital passage [3].

Dashmool (also spelled as *Dashmoola*, *Dashamula*, and *Dashamul*) is a name given to ten roots of certain plants. The combination of these ten roots is used widely in *Ayurveda* for many health conditions related to nerves, muscles, bones, and joints. *Dashmool* pacifies *Vata* aggravation and also normalizes *Kapha Dosh* functions. It works as an anti-inflammatory,

neuroprotective, analgesic, and anti-rheumatic agent. *Dashmool* is advised therapeutically in many forms like *Arishta*, *Kashay*, decoction, decoction with oil (*Dashmool tail*). Among these forms, the *Dashmool tail* is the most common form of medicine [4].

Dashmool tail is mentioned in *Bhaishajya Ratnavali* and *Dhanvantri Sangrah* [5],[6]. *Dashmool tail* preparations have occupied an important place among the *Sneha Kalpanas* and other *Kalpanas* mentioned in *Ayurveda*. These preparations are more popular and appreciated because of their quick action and high preservative quality. Usually, herbal remedies lose their potential after some time duration. Hence ancient *Ayurvedic* scholars mentioned these *Kalpanas* by which the active principle of the medicinal drugs can be preserved for a longer duration. These preparations on account of their very long shelf-life, quick absorption property, are considered highly effective in therapeutic uses. *Dashmool tail* is used to treat headaches and helps treat diseases associated with the nose, ear, and throat. It is often used to aid oil pulling treatment [5].

AIMS AND OBJECTIVES

1. Procurement of *Dashmool* from the local market and its chemical analysis.
2. Preparation of *Dashmool tail* I and its physiochemical analysis.
3. Preparation of *Dashmool tail* II and its physiochemical analysis.
4. Preparation of *Dashmool tail* III and its physiochemical analysis.

MATERIAL AND METHODS

The ten ingredients of dried *Dashmool*, i.e., *Bilwa*, *Agnimantha*, *Shayonak*, *Patala*, *Gambhari*, *Shalparni*, *Prashnaparni*, *Brahati*, *Kantakari*, and *Gokshur* were collected from the local market (5 kg). Equal amounts of the ten ingredients were taken and made into *Yavakuta* (crude powder) form (4kg 480gm). Microscopic examination of the powder showed the presence of root as well as stem bark of the plants. Preparation of *Dashmool tail* was done in the department of Rasashashtra and Bhaisajya *Kalpna*, Shubhdeep Ayurved Medical College, Indore, M.P.

Table 1: Ingredients of *Dashmool tail I*

S.No.	Drugs	Quantity
1.	<i>Til tail</i>	1.5 liters
2.	<i>Dashmool Kwath</i>	3 kg
3.	<i>Dashmool Kalka</i>	365 gm
4.	Cow milk	6 liters

The *Dashmool Yavkuta* (3 kg) is soaked in the water overnight. On the next day, the soaked *Dashmool Yavkuta* is mixed with 24 liters of water and boiled until 1/4th of *Kwath* remains. The *Murchhana* of *Til tail* is then performed. The prepared *Kwath* and *Dashmool Kalka* are added to *Til tail* and boiled in a big pot of stainless steel in medium flame (*Mandagni*). After some time, the cow milk (6 liters) is added and boiled until it dries out. The prepared *Snehpaka* is examined, and the temperature is found to be 117 °C (*Mandagni*). The oil pot from the burner

Table 2: Ingredients of *Dashmool tail II*

S.No.	Drugs	Botanical Name	Part Used	Quantity
1.	<i>Dashmool</i>	-----	Roots	500 gm
2.	<i>Karanj</i>	<i>Millettia pinnata</i>	Seed	500 gm
3.	<i>Nirgundi</i>	<i>Vitex negundo</i>	Leaf	500 gm
4.	<i>Jayanti</i>	<i>Sesbania sesban</i>	Leaf	500 gm
5.	<i>Dhtaura</i>	<i>Datura stramonium</i>	<i>Panchang</i>	500 gm
6.	<i>Sarson tail</i>	Brassicaceae	-----	2 liters

The *Kwath* is prepared using *Dashmool* along with four *Dravya* (*Karanj*, *Nirgundi*, *Jayanti*, and *Dhatu-*ra**), each having quantity of 500 gm. It is mixed with

Pharmaceutical preparation

The *Dashmool tail* is prepared by three different methods named as *Dashmool tail I*, *Dashmool tail II*, and *Dashmool tail III*. These three *tails* are prepared by the classical method of *Tailpaka*.

1. *Dashmool tail I*

According to *Bhaisajya Ratnavali* ^[7], it is prepared by *Til tail*, *Dashmool Kwath*, *Dashmool Kalka*, and cow milk. The ingredients of *Dashmool tail I* are given in table 1.

is removed and the *tail* is filtered out with the cloth. The quantity of *Dashmool tail* is found to be 1.32 liters. After cooling the pot, the prepared *tail* is preserved in the beaker.

2. *Dashmool tail II*

According to *Dhanvantri Sangrah* ^{[6], [7]}, it is prepared by *Kwath* (*Dashmool*, *Karanj*, *Nirgundi*, *Jayanti*, *Dhatu-*ra**) and *Kalka* (*Katu tail* and *Kwath*). The ingredients of *Dashmool tail II* are given in table 2.

24 liters of water and boiled until 1/8th of *Kwath* remains. The *Kalka* is then prepared by taking 120 gm each of *Dashmool*, *Nirgundi*, *Karanj*, *Dhatu-*ra**, and

Jayanti. The *Murchhana* of Sarson tail (2 liters) is performed. The *Kwath*, *Kalka*, and *Murchhit tail* are taken in iron *Kadai* and boiled in medium flame. After drying of *Kwath*, the *Tailpak* is examined, and the temperature is found to be 121°C (*Mandagni*). The *Tailpatra* is removed from the burner and the *tail* is filtered out with a cloth. The quantity of *Dashmool tail* is found to be 1.7 liters.

3. Dashmool tail III

According to *Bhaisajya Ratnavali* ^[8], it is prepared by *Kwath* (*Bilwatwak*, *Agnimanthwak*, *Sonapathatwak*, *Gambhar mool-twak*, *Patla*, *Kanthkari*, *Brahti panchang*, *Shalparni*, *Prashinparni*, *Gokshur*) and *Kalka* (*Trikatu*, *Panchkol*, *Jeera*, *Shyahjeera*, *Sarso*, *Sendhav*, *Yavkshar*, *Nisoth*, *Haldi*, *Daruhaldi*), and *Adrakswaras*, *Nirgundiswaras*. The ingredients of *Dashmool tail III* are given in table 3.

Table 3: Ingredients of *Dashmool tail III*

S.No.	Drugs	Botanical Name	Part Used	Quantity
1.	<i>Bilwa</i>	Agele marmelos	<i>Twak</i>	90 gm
2.	<i>Agnimanth</i>	Clerodendrum phlomidis	<i>Twak</i>	90 gm
3.	<i>Sonapatha</i>	Oroxylum indicum	<i>Twak</i>	90 gm
4.	<i>Gambhar</i>	Gmelina arborea	<i>Mool-Twak</i>	90 gm
5.	<i>Patla</i>	Stereospermum suaveolens	<i>Mool-twak</i>	90 gm
6.	<i>Kanthkari</i>	Solanum virginianum	<i>Mool</i>	90 gm
7.	<i>Brahti</i>	Solanum indicum	<i>panchang</i>	90 gm
8.	<i>Shalparni</i>	Desmodium gangeticum	<i>Mool</i>	90 gm
9.	<i>Prashinparni</i>	Uraria picta	<i>Mool</i>	90 gm
10.	<i>Gokshur</i>	Tribulus terrestris	<i>Mool</i>	90 gm
11.	<i>Trikatu</i>	-----	-----	50 gm
12.	<i>Panchkol</i>	-----	-----	120 gm
13.	<i>Jeera</i>	Cuminum cyminum	-----	20 gm
14.	<i>Shyah jeera</i>	Bunium bulbocastanum	-----	20 gm
15.	<i>Sarson</i>	Brassica	-----	20 gm
16.	<i>Saindhav</i>	Rock salt	-----	20 gm
17.	<i>Yavkshar</i>	Hordeum vulgare	-----	20 gm
18.	<i>Nisoth</i>	Operculina turpethum	-----	20 gm
19.	<i>Haldi</i>	Curcuma longa	-----	20 gm
20.	<i>Daruhaldi</i>	Berbis aristata	-----	20 gm

The *Kwath* is prepared by grinding 900 gm of *Dashmool* and 120 gm of *Panchkol* and mixing it with 25 liters of water. It is then boiled until 1/8th *Kwath* remains. The *Kalka* is then prepared by taking 50 gm of *Trikatu*, 120 gm of *Panchkol*, and 20 gm each of *Jeera*, *Shyah Jeera*, *Sarson*, *Saindhav*, *Yavkshar*, *Nisoth*, *Haldi*, and *Daruhaldi*. The *Murchhana* of *Til tail* (1.7 liters) is then performed. The *Kwath*, *Kalka*, *Adrakswaras* (1.5 liters), *Nirgundi Swaras* (1.5 liters) are boiled in medium flame in *Tailpatra*. After drying of *Kwath*, the *Tailpak* is ex-

amined, and the temperature is found to be 115°C (*Mandagni*). The *Tailpatra* is removed from the burner and the *tail* is filtered out. The quantity of prepared *tail* is found to be 1.5 liters.

DISCUSSION

Analytical study of three samples is done by classical methods (*Tail Pariksha*) for colour (*Varna*), odour (*Gandha*), and taste (*Rasa*). The physiochemical study of the *Dashmool tail* is used to analyse its parameters such as refractive index, specific gravity,

acidic value, iodine value, peroxide value, saponification value.

The testing of *Dashmool tail* prepared by three different methods is carried out at Anusandhan Analytical and Biochemical Research laboratory, Indore. The

Thin Layer Chromatograph (TLC), Organoleptic Character, Physiochemical Parameter, and Microbial test are performed for three *Dashmool* samples. The test results for *Dashmool tail I*, *Dashmool tail II*, and *Dashmool tail III* are given in table 4.

Table 4: Test results of *Dashmool tail I*, *Dashmool tail II*, and *Dashmool tail III*

S.No.	Test	<i>Dashmool Tail I</i>	<i>Dashmool Tail II</i>	<i>Dashmool Tail III</i>	Specification
1.	Identification (By TLC)	Complies	Complies	Complies	-----
2.	Organoleptic characters				
	(I) Color	Yellow color oil	Yellow color oil	Yellow color oil	
	(II) Odor	Agreeable	Agreeable	Agreeable	
	(III) Texture	Smooth, slippery in texture, and oily	Smooth, slippery in texture, and oily	Smooth, slippery in texture, and oily	
3.	Physiochemical parameters				
	(I) Refractive index at 30°C	1.4717	1.4728	1.4725	1.4642-1.4776
	(II) Specific gravity	0.9114	0.9115	0.9113	0.9042-0.9135
	(III) Saponification value	185.37	187.16	186.05	173.11-194.55
	(IV) Iodine value	86.75	80.66	86.46	79.05-98.01
	(V) Acid value	3.36	3.30	3.14	1.92-4.26
	(VI) Peroxide value	3.79	4.19	3.59	2.90-4.64
	(VII) Viscosity	38.46	39.47	42.51	35.67-48.75
4.	Microbial test				
	(I) Total bacterial count	20 cfu/ml	15 cfu/ml	20 cfu/ml	-----
	(II) Total fungal count	< 10 cfu/ml	< 10 cfu/ml	10 cfu/ml	-----

The comparison of physiochemical parameters of three *Dashmool tails* prepared by three different methods is shown in table 5.

Table 7: Comparative analysis of physiochemical parameters of three *Dashmool tail*

Test	<i>Dashmool tail I</i>	<i>Dashmool tail II</i>	<i>Dashmool tail III</i>	Standard Deviation
(I) Refractive index at 30°C	1.4717	1.4728	1.4725	0.0005
(II) Specific gravity	0.9114	0.9115	0.9113	0.0001
(III) Saponification value	185.37	187.16	186.05	0.9035
(IV) Iodine value	86.75	80.66	86.46	3.4354
(V) Acid value	3.36	3.30	3.14	0.1137
(VI) Peroxide value	3.79	4.19	3.59	0.3055
(VII) Viscosity	38.46	39.47	42.51	2.1080

The TLC test, organoleptic character, physiochemical parameter, and microbial test performed on three *Dashmool tails* do not show any significant variation in the parameter's value. The low value of standard

deviation shows the consistency of different parameter values. This implies the process described in this paper for *Dashmool tail* preparation by three different

methods can be standardized. There are several methods for the preparation of *Dashmool tail* as mentioned by many *Acharyas*. But the three methods described above are among the best method according to *Bhaisajya Ratnavali*. The ideal temperature for preparation of *Dashmool tail I* is in the range of 117°C (*Mandagni*), for *Dashmool tail II* the ideal temperature is in the range of 121°C (*Mandagni*) and for *Dashmool tail III* it is in the range of 115 °C (*Mandagni*). The correct process in preparation of all three *Dashmool tails* is strictly followed according to GMP standards, and variations are noted after every step starting from pulverization of raw material to the finished product. The prepared *Dashmool tail* by three methods is validated by both classical methods as well as modern physiochemical analysis to verify the product quality.

Mode of action of Dashamool Tail:

According to the concept of *Viryasamkranti* (transformation of potency) described by *Acharya Charaka*, the potency of *Dashamool* is already transferred in *Dashamool Kwatha*, and the potency of *Dashamool* in the *Kalka* form, on processing with oil, further causes the *Viryasamkranti* into the *tail*. Thus, the *tail* carries the full strength of the drug in it. *Madhura, Tikta, Kashaya Rasa, Guru, Snighda guna, Ushna, Veerya, Madhura Katu, Vipaka, and Tridoshanashaka Karma* of *Dashamool tail* acts on *Kashtartava* by its *Dravya, Guna, and Prabhava*.

CONCLUSION

The pharmaceutical standardization and analytical study of *Dashmool tail* by three different methods are conducted in this paper. Also, it is verified by classical techniques as well as modern physiochemical analysis. The three methods described in this paper are standardized and can be used to prepare *Dashmool tail*. The test conducted on three *Dashmool tails* shows no significant changes in its parameter. The *Dashmool tail* is prepared by three methods to meet the quality parameter. The *Dashmool tail I* can be used to reduce severe inflammation, taking in *Nasya* reduces greying of hair (*Palitya*). *Abhyanga*

(massage) of *Dashmool tail II* alleviates *Shiro roga, Karna roga, Netra roga, Manyastambha*. The *Dashmool tail III* is used in the treatment of all types of *Shiro roga* and *Urdhavajatrugata roga*.

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