

RAW DRUG IDENTIFICATION AND PHYSICO-CHEMICAL PARAMETERS OF MASHADI TAILA

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ABSTRACT

Mashadi Taila is popularly known by the ayurvedic fraternity for its therapeutic properties on *Kampavata* correlated as Parkinson's disease. It is a widely used Ayurvedic formulation containing the drugs like *Masha*, *Yava*, *Kantakari*, *Kapikacchu* etc. In classics, this formulation is described with different composition. Quality of final product mainly depends on genuinity of raw material. This can be possible through pharmacognosy of raw ingredients by proper identification of material. Pharmacognostical evaluation of raw drugs of *Mashadi Taila* was carried out followed by the physico-chemical analysis of *Mashadi Taila* as no pharmacognostical and physico-chemical analysis has been carried out till date. Preliminary organoleptic features and results of powder microscopy reveal presence of tannin contents, large amount of fibres, oil globules, prismatic crystal etc. In preliminary physico-chemical analysis, acid value, refractive index, specific gravity, iodine value and saponification value were assessed which were within the standard range and HPTLC results of *Mashadi Taila* showed that 8 spots at 254 nm and 3 spots at 366 nm.

Keywords: *Mashadi Taila*, *Kampavata*, Pharmacognosy

INTRODUCTION

Ayurveda is an ancient medical system widely used in Indian subcontinent since ages. Various dosage forms were prescribed for treatment of various pathological manifestations in Ayurveda and medicated oil is one amongst them. *Mashadi Taila* (MT) is an important Ayurvedic formulation containing the drugs like *Masha*, *Yava*, *Kantakari*, *Kapikacchu* etc. as its main ingredients and is used for the many ailments caused especially due to *Vata* vitiation (neurological disorders) like *Hastakampa* (tremors in hands), *Shirahkampa*, [1][2][3] (tremors in head), *Shakhashirahkampa*[4] (Tremors in extremities and head). In classics, this formulation is described with different composition.[5][6] Quality of final product

mainly depends on genuinity of raw material. This can be possible through pharmacognosy of raw ingredients by proper identification of material. Analytical procedure helps in determination of trace elements or compounds in the test drug. It is commonly used in chemical, clinical and pharmaceutical research laboratories as a part of quality control measures. This is first attempt to evaluate pharmacognostical characters, physico-chemical and HPTLC analysis of raw ingredients of *Mashadi Taila*. Test drug was prepared by using classical guidelines as described in *Sharangdhara Samhita*. [7]

Materials and Methods-

Collection of the drugs: The ingredients of *Mashadi Taila* have been collected from

pharmacy of Gujarat Ayurved University and the drugs that were not available in the pharmacy were purchased from the local market of Jamnagar.

The ingredients of *Mashadi Taila* are listed in Table 1, 2 and 3.

Pharmacognostical Evaluation: As per API, raw drugs were identified and authenticated by the Pharmacognosy laboratory, IPGT & RA, Jamnagar.[8] The identification was carried out based on the organoleptic features and powder microscopy of the individual drugs. Later, pharmacognostic evaluation of each drug of *Mashadi Taila* was carried out. For this Carl Zeiss Trinocular microscope attached with camera was used. The microphotographs were also taken under the microscope.

Preparation of Mashadi Taila: *Yavakuta* (coarse powder) of all above drugs were soaked overnight in water before preparing the decoction. Firstly the decoction of first 8 drugs i.e. from *Masha* to *Shyonaka* [Table no.1] was prepared by adding 4 times water and reducing it 1/4th. Then, the decoction of drugs from no.9 up to 12 i.e. from *Karpasaasthi* to *Kulattha* [Table no.1] was prepared separately by adding 4 times the water and reducing it to 1/4th. Then *Mamsarasa* was prepared by adding 4 times water to *Ajamamsa* (Goat Meat) and heated till it reduced to 1/4th. *Kalka* (paste) of drugs from no.13 to 24 i.e. from *Guduchi* upto *Kutaki* [Table no.2] was prepared. Lastly, the above mentioned decoction, *Mamsarasa* and *Kalka* were added to *Teela Taila*. [Table no. 3] and the oil was prepared by *Mrudupaka* method. In place of *Bala*, *Atibala* was used in the preparation of *Mashadi Taila* due to non-availability of *Bala* in the local market.

Physico-chemical analysis: *Mashadi Taila* was analyzed with appropriate protocols for standard physiochemical parameters such as acid value, refractive index,

specific gravity, iodine value, and saponification value as per CCRAS recommendations at the Pharmaceutical chemistry laboratory, IPGT & RA.[9][10] as shown in table 4.

HPTLC study: High performance thin layer chromatography (HPTLC) is a sophisticated and automated form of TLC. H.P.T.L.C is quality assessment tool for the evaluation of botanical materials. It allows for the analysis of a broad number of compounds both efficiently and cost effectively. Additionally, numerous samples can be run in a single analysis thereby dramatically reducing analytical time. With HPTLC, the same analysis can be viewed using different wave-lengths of light thereby providing a more complete profile of the plant than is typically observed with more specific types of analyses. The details of HPTLC done on alcoholic extract of *Mashadi Taila* are as follow:

Mobile phase: Toluene: Ethyl acetate: Acetic acid (7:2:1) v/v.

Chromatographic conditions

Application mode: Camag Linomat V

Development Chamber: Camag Twin trough Chamber.

Plates: Pre coated Silica Gel GF254 Plates

Chamber Saturation: 30 minutes

Development Time: 30 minutes

Scanner: Camag Scanner III

Detection: Deuterium lamp, Tungsten Lamp

Data System: Win cats software

Methanolic extract of finished product was spotted on pre-coated silica gel GF 60254 aluminium plates by means of Camag Linomat V sample applicator fitted with a 100 µL Hamilton syringe. Toluene: Ethyl acetate: Acetic acid (7:2:1) was used as the mobile phase. After development, densitometric scan was performed with a Camag TLC scanner III in reflectance ab-

sorbance mode at UV detection as 254 nm and 366 nm under the control of Win CATS Software (V 1.2.1. Camag).[11]

RESULTS

Pharmacognostical Evaluation

Organoleptic Characters: Organoleptic characters of *Mashadi Taila* like appearance, colour, odour and taste are as shown in (Table 4)

Microscopical characters: Diagnostic characters of ingredients of *Mashadi Taila* under the microscope are as per shown in Table 5.

Preliminary physico-chemical parameters: Preliminary physico-chemical parameters i.e. acid value, refractive index, specific gravity, iodine value and saponification value were properly studied and results are depicted in the Table 6.

HPTLC Results: On performing HPTLC, visual observation under UV light showed few spots but on analyzing under densitometer at 254nm and 366nm it resulted into 8 & 3 spots respectively. (Table 7)

DISCUSSION

The physico-chemical parameters showed acid value of 14.024 which indicates the amount of free fatty acids present in it. Refractive index was 1.4750 which is measure of total solids in a solution. Specific gravity of MT was found to be 0.9112 which is less than water indicating density less than water which may help in quick absorption in the body. Iodine value found was 15.108. Iodine value indicates the unsaturation in organic compounds present in the drug formulations. The saponification value of MT found on analysis was 235.07 which indicates the fat content in the formulation.

HPTLC showed a difference of results when the sample scanned at two wavelengths i.e. 254 nm and 366 nm having 8 and 3 spots respectively (Table 7). This shows presence of certain constituents and

is helpful for the easy separation of these constituents.

The main action of this formulation is due to drugs like *Masha & Kapikachhu* which has *Vrishya, Vatahara, Santarpana, Balaprada* properties,[12][13] *Kapikachhu* is also the natural source of dopamine and its anti-parkinson activity is already been proved. *Guduchi* which has *Rasayana, Balya, Agnidipana, Tridoshaghna* properties etc [14], *Sunthi* which has *Kapha-Vataghna, Pachana, Shulahara* properties,etc [15], *Jatamansi* which has *Medhya, Balya, Tridoshaghna* properties,etc [16]. *Mamsarasa* which has *Shramahara, Prinana, Vata-Pittaghna, Smriti-Oja-Balavardhana* properties etc. [17] Majority of the drugs used in *Mashadi Taila* has *Vata-Kaphahara, Rasayana, Balya, Brimhana, Dipana-Pachana* and *Shramahara* properties. Due to all these properties it becomes important formulation in *Vata* disorders.

CONCLUSION

Preliminary organoleptic features and results of powder microscopy reveal presence of tannin contents, large amount of fibres, oil globules, prismatic crystal, etc. In preliminary physico-chemical analysis, acid value, refractive index, specific gravity, iodine value and saponification value were assessed which were within the standard range and HPTLC results of *Mashadi Taila* showed that 8 spots at 254 nm and 3 spots at 366 nm. As no published information is available on pharmacognostical and physico-chemical profile of *Mashadi Taila*, this preliminary information can be used for reference in future.

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[Table No.1] Ingredients for preparation of decoction of Mashadi Taila.

Sr.no	Name of Drug	Botanical Name	Quantity required for 768 ml Taila.		
			Parts	Classical measurement	Wt. in gms
1.	Masha	<i>Phaseolus radiatus.</i>	1 part	7 palas	336 gms.
2.	Yava	<i>Hordeum vulgare.</i>	1 part	7 palas	336 gms.
3.	Atasi	<i>Linum usitasitimum.</i>	1 part	7 palas	336 gms.
4.	Kantakari	<i>Solanum xanthocarpum.</i>	1 part	7 palas	336 gms.
5.	Kapikachhu	<i>Mucuna pruriens.</i>	1 part	7 palas	336 gms.
6.	Sahachar	<i>Baulerias trigosa.</i>	1 part	7 palas	336 gms.
7.	Gokshoor	<i>Tribulus terrestris.</i>	1 part	7 palas	336 gms.
8.	Shyonak	<i>Oroxylum indicum.</i>	1 part	7 palas	336 gms.
9.	Karpasa	<i>Gossypium herbaceum.</i>	2 parts	14 palas	672 gms.
10.	Badara	<i>Zizypus jujuba.</i>	2 parts	14 palas	672 gms.
11.	Shanabeeja	<i>Crotolaria juncea.</i>	2 parts	14 palas	672 gms.
12.	Kulattha	<i>Dolichos biflorus.</i>	2 parts	14 palas	672 gms.

[Table No.2] Ingredients for preparation of Kalka (Paste) of Mashadi Taila.

Sr.No	Name of Drug	Botanical Name	Parts
13.	Guduchi	<i>Tinospora cordifolia.</i>	1 part
14.	Kustha	<i>Saussurea lappa.</i>	1 part
15.	Sunthi	<i>Zingiber officinale.</i>	1 part
16.	Rasna	<i>Vanda roxburghai.</i>	1 part
17.	Punarnava	<i>Boerhavia diffusa.</i>	1 part
18.	Erandamoola	<i>Ricinus communis.</i>	1 part
19.	Pippali	<i>Piper longum.</i>	1 part
20.	Shatpushpa	<i>Anethum sova.</i>	1 part
21.	Atibala	<i>Abuliton indicum.</i>	1 part
22.	Gandhaprasarini	<i>Paederia foetida.</i>	1 part
23.	Jatamansi	<i>Nordostachys jatamansi.</i>	1 part

24.	Kutaki	Picrorrhiza kurroa.	1 part
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[Table No.3] Liquid media for preparation of Mashadi Taila.

Sr.No	Name of Drug	Botanical Name	Parts
1.	Aja Mansa	Meat soup (Goat).	1 prastha.
2.	Teel taila	Sesamum indicum.	1 prastha.

[Table No.4] Organoleptic properties of Mashadi Taila.

Sr. no.	Organoleptic properties	Findings
01	Appearance	Tailabha (oily).
02	Colour	Greenish brown
03	Odour	Characteristic
04	Taste	Bitter & Astringent.

[Table No. 5] Pharmacognostical evaluation of ingredients of Mashadi Taila.

Sanskrit Name	Part used	Colour	Taste	Odour	Nature	Microscopic Characters
<i>Masha</i>	Seed	Dull white	Astringent	Characteristic	Powder	1. Starch grain. 2. Trichome.
<i>Yava</i>	Seed	Pale greenish yellow	Sweetish-acrid	Not distinct	Coarse powder	1. Starch grains & aleurone grains. 2. Unicellular trichome.
<i>Atasi</i>	Seed	Greyish white	Pungent	Characteristic	Fine powder	Oil globules with Alerone grains. Fragments of hypodermis.
<i>Kan-takari</i>	<i>Pan-changa</i> (Whole plant)	Pale yellow	Astringent, Bitter	Characteristic	Coarse powder	1. Stellate trichome. 2. Sclereids.
<i>Kapikac-pikac-chu</i>	Seed	Off white	Sweetish, mild bitter	Aromatic	Powder	1. Fragments of Epidermal cells. 2. Simple starch grain with concentric lines.
<i>Saha-char</i>	<i>Pan-changa</i> (Whole plant)	Pale greenish	Bitter, Astringent	Not distinct	Coarse powder	1. Stomata. 2. Cystolith.
<i>Gokshoor</i>	<i>Pan-changa</i>	Creamish	Bitter	Not distinct	Fine powder	1. Epidermal cells.

	(Whole plant)					2. Stone cells.
Shyonaka	Root	Brown	Bitter	Characteristic	Coarse powder	1. Lignified cork cell. 2. Lignified parenchymal cell.
Karpasaasthi	Seed	Pale green	Astringent, Bitter	Characteristic	Coarse powder	1. Fixed oil globule. 2. Starch grain with hilum.
Badara	Seed	Greyish white	Bitter, astringent	Characteristic	Coarse powder	1. Parenchymal cell in surface view. 2. Simple starch grain.
Shanabeeja	Seed	Creamish	Sour	Characteristic	Fine powder	1. Acicular crystal. 2. Prismatic crystal.
Kulattha	Seed	Whitish	Astringent	Not distinct	Coarse powder	1. Fragments of pallsade parenchymal cell. 2. Oil globule.
Guduchi	Stem	Brown	Bitter, Astringent	Characteristic	Powder	1. Fragments of Border pitted vessels. 2. Prismatic crystals.
Kustha	Root	Dark brown	Bitter	Characteristic	Coarse powder	1. Oleoresin with crystal. 2. Pitted vessels.
Sunthi	Rhizome	Yellowish White	Agreeable Pungent	Agreeable Aromatic	Fine powder	1. Oleoresin with starch grains. 2. Schelriform vessels.
Rasna	Panchanga (Whole plant)	Greyish green	Astringent, Bitter	Aromatic	Coarse powder	1. Starch grain. 2. Stone cells.
Punar-	Pan-	Brown	Bitter,	Characteristic	Coarse	1. Cork cells in

<i>nava</i>	<i>changa</i> (Whole plant)		Sweetish	tic	powder	tangential view. 2. Raphides & acicular crystals.
<i>Eran-damoola</i>	Root	Brown	Bitter, Astringent	Not distinct	Fine powder	1. Border pitted vessels. 2. Compound starch grain.
<i>Pippali</i>	Fruit	Dark greenish	Pungent, Bitter	Characteristic	Fine powder`	1. Bottle shaped stone cells. 2. Simple fibre.
<i>Shat-pushpa</i>	Seed	Dark brown	Pungent	Aromatic	Fine powder	1. Parenchymal cell with oil globule. 2. Stratified fibres.
<i>Atibala</i>	<i>Panchanga</i> (Whole plant)	Brown	Bitter	Characteristic	Coarse powder	1. Border pitted vessels. 2. Simple & Compound starch grains.
<i>Gandha prasarini</i>	Root	Brown	Astringent	Characteristic	Fine powder	1. Cigar shaped crystals. 2. Cork cells in surface view.
<i>Jatamansi</i>	Root	Black	Bitter, astringent	Aromatic	Fine powder	1. Prismatic crystals. 2. Scleriform vessels.
<i>Katuki</i>	Rhizome	Brown	Pungent, Bitter	Characteristic	Fine powder	1. Trichome & spiral pitted vessels. 2. Cork cells.
<i>Tila</i>	Seed	Creamish	Bitter, Sweetish	Characteristic	Coarse powder	1. Endosperm fragments. 2. Oil globule.

[Table No.6] Physico-chemical analysis of *Mashadi Taila*.

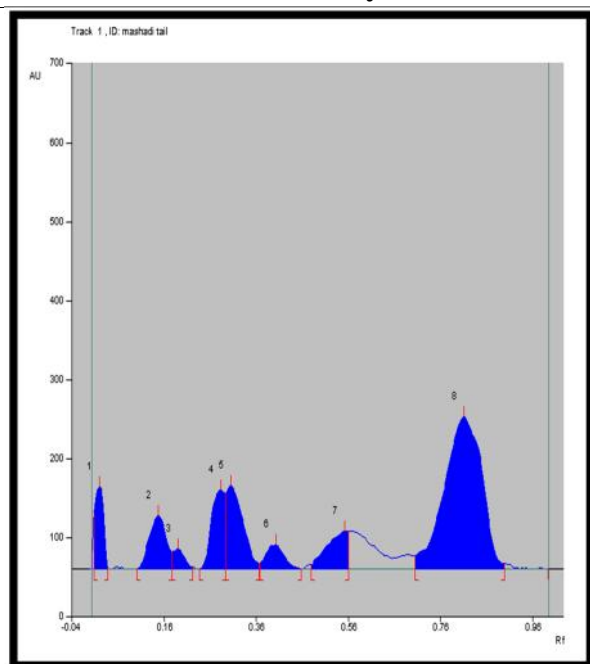
No.	Name of the Analyses	Results/Values
01	Acid Value	14.024
02	Refractive Index	1.4750
03	Specific Gravity	0.9112
04	Iodine Value	15.108

05

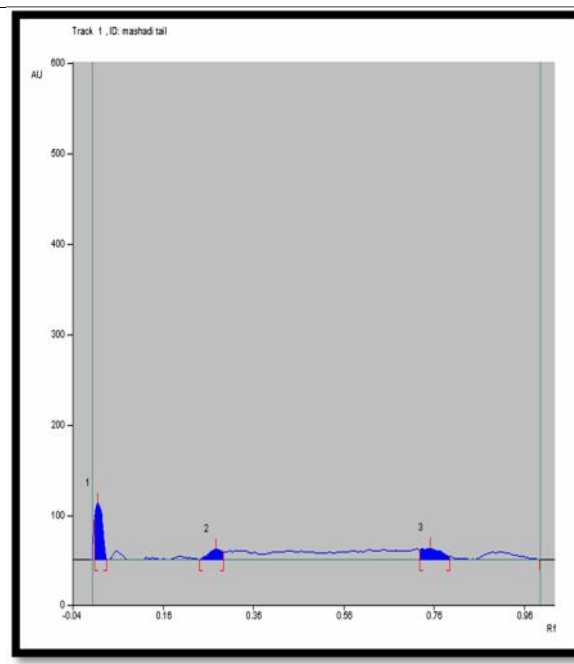
Saponification Value

235.07

[Table No.7] HPTLC analysis of Mashadi Taila.



254 nm



366 nm

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