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PHARMACOGNOSTICAL, PHYSICOCHEMICAL AND HIGH PERFORMANCE THIN LAYER CHROMATOGRAPHY EVALUATION OF *MASHABALADIKWATHA*

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ABSTRACT

Background: Maintaining the quality standard of a polyherbal formulation is a challenging task**.** Without establishing proper standards for raw materials, it would be very difficult to evolve standards for Ayurvedic drug formulation.In the era of increasing demand for indigenous medicines, maintaining quality standards is the need of the hour. **Aim**: The present work was carried out to standardize the finished product *MashabaladiKwatha*to confirm its identity, quality and purity.**Material and method:** *Mashabaladikwatha* powder was evaluated for their pharmacognostic and pharmaceutical analysis. **Results:** The presence of Starch grain with hilum of *Masha,* oil globules of *KaunchaBeeja,* Cluster crystal of *Erandmoola,* Spiral vessel of *Bala***,** Lignified border pitted vessel of *Erandmoola,* Group of starch grains with oil globule of *Masha etc*were the characteristic features observed in the microscopy of drug combination. Results found in pharmaceutical parameters of *MashabaladiKwatha* powder like Loss on drying14.19% w/w, Ash value 9.4% w/w, Water soluble extract 38.7 % w/wetc and specific gravity of *Mashabaladi Kwatha* was1.016.Authentification of

*MashabaladiKwatha*was cross verified with standard reference API. All the physico-chemical parameters were found to be within the normal reference range.

KEYWORDS: High performance thin layer chromatography, *MashabaladiKwatha*, Pharmaceutics, Pharmacognosy.

INTRODUCTION

Mashabaladikwatha[1] is mentioned in Ayurvedic classics as a therapeutic formulation to treat *Pakshavadha and vatavyadhi*. Available data concerning the scientific evaluation of *Mashabaladikwatha* are none. It has been reported that there has been an alarming increase in number of diseases and disorders caused by synthetic drugs prompting a switch over to traditional herbal medicine.[2] Standardisation of compound formulations is lagging behind because of absence of reference standards. Therefore, proper identification of raw materials at the basic level with the help of microscopic and morphological characteristics is essential to maintain the 'quality control' of multi-ingredient formulations. Along with developing pharmacognostic standards, adequate analytical methods are essential to ensure the quality and standardize the prepared medicine. So for the standardization purpose as preliminary step raw ingredients of trial drugs in current study were subjected to pharmacognostical and pharmaceutical analysis.

MATERIALS AND METHODS

Collection of raw drug

All the drugs of *Mashbaladikwatha* i.e. seed of *Masha,* root of *Bala,* root of *Erand*and seed of *Kapikachhu*were collect from Pharmacy of Institute for Post Graduate Teaching & Research in Ayurveda, Gujarat Ayurved University, Jamnagar**.** The ingredients were identified and authenticated in the Pharmacognosy Laboratory of institute. The ingredients & parts used in the preparation of *MashbaladiKwatha* are listed in the Table 1.

Preparation of drug: It was prepared in the pharmacy of institute. All collected drugs were dried and then course powdered into mechanical grinder.

Pharmacognostical evaluation of *Mashabaladi Kwatha*

Pharmacognostical Study was carried out in two steps. The contents of the *MashabaladiKwatha*were used in the dry powder form for this study.

1. Organoleptic Study

Indiviual powders were subjected for various sensory characters like colour, taste and odour were carefully noted. Powder characteristics of the sample were identified with the help of Pharmacognosy laboratory, I.P.G.T. & R.A., Gujarat Ayurved University, Jamnagar, Gujarat, India.[3]

2. Powder microscopy

The powders of respective parts of all the ingredients studied separately with and without staining covered with cover slip and observed under the Carl Zeiss Microscope. The microphotographs were taken by using Carl Zeiss binocular attached with camera.[4]

Physico-chemical analysis

MashabaladiKwatha was analyzed using various standard physico-chemical parameters such as Loss on drying, Ash value, Water soluble extract, alcohol soluble extract, Specific gravity.[5]

High Performance Thin Layer Chromatography (HPTLC)

HPTLC was performed as per the guidelines provided by API.[6] A CAMAG (Switzerland) HPTLC system equipped with a sample applicator Linomat V was used for application of samples. The methanol extract of *kwatha* powder was used for spotting. Toluene:ethylacetate:acetic acid (7:2:1 v/v) was selected as the solvent system. CAMAG TLC Scanner 3, Reprostar and Wincats 1.3.4 were used for scanning the plates. CAMAG twin trough glass chamber was used for developing the plates. The developed plate was visualized under visible daylight, short ultraviolet (UV) (254 nm), long UV (366 nm) and after spraying with vanillin-sulfuric acid reagent and again observed in daylight. The reference values were recorded. The colour and R_f values of resolved spots were noted.[7]

OBSERVATIONS AND RESULTS

Organoleptic parameters

Organoleptic characters of *MashabaladiKwatha* such as colour, odour, taste etc. examined by sensory organs and results are shown in Table 2.

Powder Microscopy

Powder microscopy of all the ingredients of *MashabaladiKwatha*was studied and microphotographs were placed at respective figures.[Plate-1 (Fig. 1-11)]Starch grain with

hilum of *Masha*, Spiral vessel of *Bala***,** Lignified border pitted vessel of *Erandmoola*, H-Shaped trichome of *Bala*, Group of starch grains with oil globule of *Masha*, Group of lignified fibers of *Erandmoola*, Group of fibers passing through medullary rays of *Erandmoola*, Group of crystlefibers of *Bala*, Cluster crystal of *Erandmoola*, Border pitted vessel of *Erandmoola*, Stellate trichome of *Bala*.

Physicochemical parameters

Physicochemical parameters of *MashabaladiKwatha*such as Ash value, water soluble extracts, alcohol soluble extract, specific gravity and loss on drying are shown in Table 3.

HPTLC Study

On performing HPTLC, the chromatogram of *MashabaladiKwatha*showed 12 spots at corresponding Rf values 0.00, 0.01, 0.08, 0.09, 0.1, 0.18, 0.2, 0.4, 0.41, 0.75, 0.9, 0.98in short wave UV 254 nm and 08 spots corresponding Rf value 0.01, 0.02, 0.04, 0.12, 0.4, 0.74, 0.9, 0.97obtained in long wave UV 366 nm. Table 4[Plate 2 Fig.1-3]

Table. 1: Ingredients of *Mashabaladi Kwatha.*

S. No.	Drug	Latin Name	Family	Part Used	Ratio
1	*Masha*	*PhaseolusMungo*	Papilionaceae	Seed	1 part
2	*Bala*	*Sidacordifolia* Linn.	Malvaceae	Root	1 part
3	*Erandmoola*	*Ricinuscommunis* Linn.	Euphorbiaceae	Root	1 part
4	*Kapikachhu*	*Mucunaprurita*	Leguminosae	Seed	1 part

Table. 2: Organoleptic characters of *Mashabaladi Kwatha.*

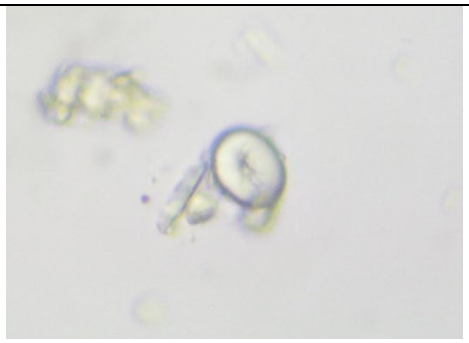
S. No.	Character	Results
1	Colour	Light Brownish
2	Odour	Woody
3	Taste	Woody
4	Touch	Coarse

Table 3: Physico-chemical parameters of *Mashabaladi Kwatha.*

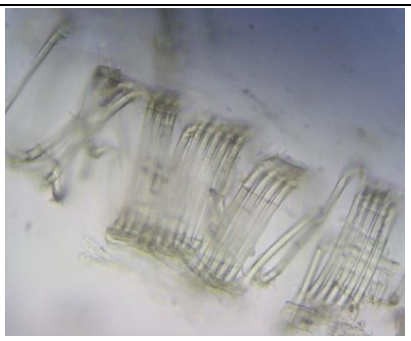
S. No.	Parameters	Results
1.	Loss on drying	14.19% w/w
2.	Water soluble extract	38.7 % w/w
3.	Methanol soluble extract	52.6 % w/w
4.	Ash value	9.4 % w/w
5.	Specific Gravity	1.016

Table 4: Chromatographic results of *Mashabaladi Kwatha.*

S. No.	Conditions	Rf Values
1.	Short ultra violet (254nm)	0.00, 0.01, 0.08, 0.09, 0.1, 0.18, 0.2, 0.4, 0.41, 0.75, 0.9, 0.98
2.	Long Ultra violet (366nm)	0.01, 0.02, 0.04, 0.12, 0.4, 0.74, 0.9, 0.97



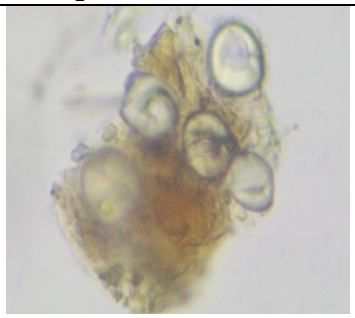
1. Starch grain with hilum-*Masha*



2. Spiral vessel of *Bala*

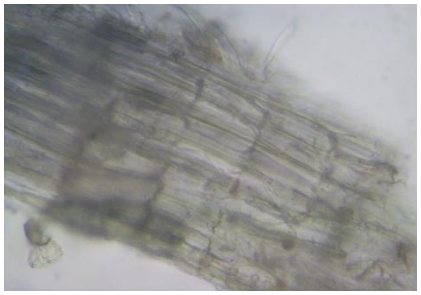
3. Lignified border pitted vessel of *Erandmool*

4. H-Shaped trichome of *Bala*



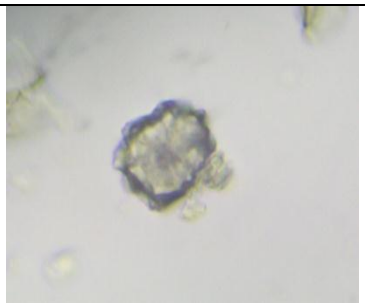
5. Group of starch grains with oil globule of *Masha*

6. Group of lignified fibers of *Erandmoola*



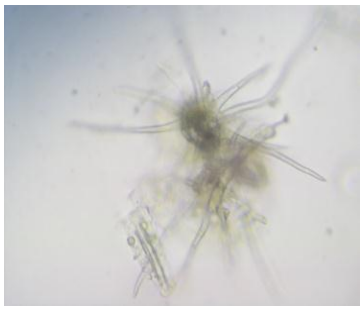
7. Group of fibers passing through medullary rays of *Erandmoola*

8. Group of crystal fibers of *Bala*



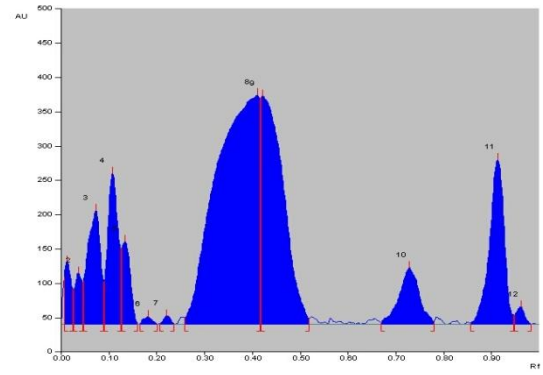
9. Cluster crystal of *Erandmoola*

10. Border pitted vessel of *Erandmoola*

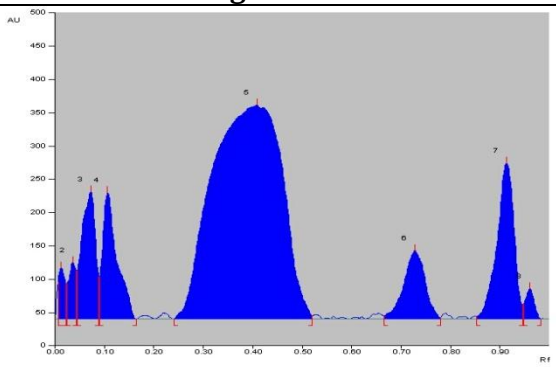


11. Stellate trichome of *Bala*

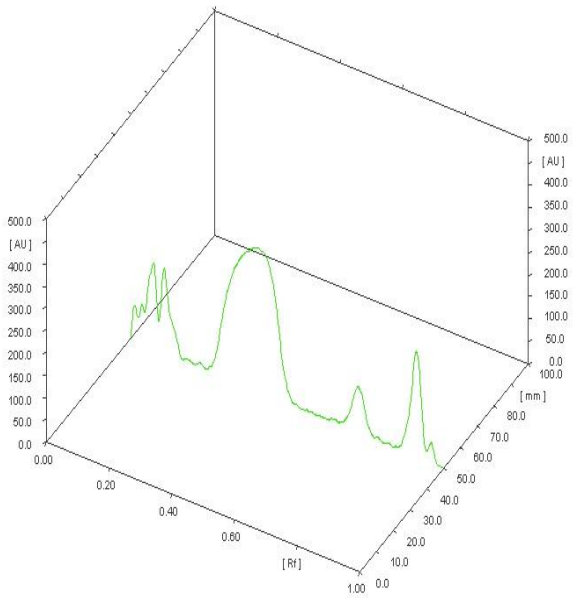
Plate-1: Microscopic characters of *Mashabaladi Kwatha*.



1. **Densitogram at 254nm.**



2. **Densitogram at 366nm.**



3. 3D comparator graph.

Plate. 2: Densitogram of MashabaladiKwathaChoorna at 254nm & 366nm and 3D comparator.

DISCUSSION

Pharmacognostical findings confirm the ingredients present in the finished product which were present in the microscopically observed characters, this reflects the purity and quality of the product. The endosperm fragment, oil globule, cotyledon surface, rossette crystal, simple fibre, prismatic crystal, lignified branched trichome, pollen grain, simple trichome, stone cell, parenchyma cell are observed in the ingredients. All Physico-chemical parameters of *MashabaladiKwatha*are normal in limit and shows the product is of good quality and may provide better results for the desired indication used. HPTLC results showed the presence of 12 spots at 254 nm and 8 spot at 366 nm. On the basis of observations made and results of experimental studies, this study may be beneficial for future researchers and can be used as a reference standard in the further quality control researches.

CONCLUSION

It is concluded that the formulation meets maximum qualitative standards based on physico-chemical parameters. The separation pattern of Masha baladikashaya is documented with help of prechromatographic derivative method in context of R_f&densitogram. The findings

from this study will provide systemic evaluation and also serve as a master document to control the quality of *Masha Baladikashaya*formulation. The study results may be used as the reference standard in further research undertakings of its kind.

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