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INGREDIENTS IDENTIFICATION AND PHARMACEUTICAL ANALYSIS OF *MAHATRIPHALADI GHRITA*-A COMPOUND AYURVEDIC FORMULATION

Hemant Kumar Nagar[1*], Dr. D. B. Vaghela[2] and Harisha C. R.[3]

[1]P.G. 2nd Scholar of Department of Shalakya Tantra, Gujarat Ayurved University, Jamnagar, Gujarat, India.

[2]I/C HOD & Associate Professor of Department of Shalakya Tantra, Gujarat Ayurved University, Jamnagar, Gujarat, India.

[3]Head, Pharmacognosy, Institute of Postgraduate Teaching and Research in Ayurveda, Gujarat Ayurved University, Jamnagar, Gujarat, India.

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***Corresponding Author**
Dr. Hemant Kumar Nagar
P.G. 2nd Scholar of Department of Shalakya Tantra, Gujarat Ayurved University, Jamnagar, Gujarat, India.

ABSTRACT

Myopia is one of the most prevalent eye diseases and a worldwide public health burden. Globally, there are approximately 1950 million (28.3% of the global population) with myopia. Myopia is a highly significant diseases because of its high prevalence rate and it can increase the risk for vision threatening conditions. A clinical study was conducted on this problem with *Mahatriphaladi ghrita*. It was inferred from the results that it has encouraging results in the treatment of Myopia. It was aimed to develop the pharmacognostical and phytochemical profile of *Mahatriphaladi ghrita*. The pharmacognostical study of ingredients of *Mahatriphaladi ghrita* shows the presence of Rosette crystal, sclereids, stone cells etc. Pharmaceutical analysis of *Mahatriphaladi ghrita* showed that loss on drying 0.012%, Saponification value 262.2%, Specific gravity 0.094% Refractive index 1.4%, Iodine value 5.9% and High-Performance Thin Layer Chromatography at 254 nm resulted into 10 spots and at 366 nm resulted into 4 spot respectively. These parameters of pharmacognosy and pharmaceutical analysis can be used as baseline for future

KEYWORDS: *Mahatriphaladi ghrita,* HPTLC, Pharmacognosy, Physicochemical.

INTRODUCTION

Vision is indisputably the most important of the five senses, Good vision is decisive for general and psychological development of a person. In healthy state, parallel light rays coming from infinity focus at the sensitive layer of retina with the accommodation at the rest, but in the condition of myopia focus anterior to it so myopia is referred to as short sightedness .[1] Myopia is a highly significant diseases because of its high prevalence rate and it can increase the risk for vision threatening conditions. Myopia currently is widely recognized as a significant public health issue causing significant visual loss and a risk factor for a range of other serious ocular conditions.[2] The clinical correlates of myopia include blurred distance of vision, eye rubbing, and squinting. Globally, there are approximately 1950 million (28.3% of the global population) with myopia. Refractive Error Study in Children surveys of 12-year-old children have shown that the prevalence of myopia is higher in urban Asian cities. Myopia can be correlated with *prathama* and *dvitiya Patalagata Timira*[3] on the basis of clinical symptoms. *Akshi tarpana* is mentioned in the treatment of *Timira.*[4] *Tarpana* is special method of drug administration, locally into the eye for the eye diseases, also provide *Vatashamaka* effect, nourishment to eyes and improves visual acuity. According to *Acharyas Mahatriphaladi ghrita* has *tridoshashamak* and *chaksushya* properties.[5] According to *Charaka Ghrita* is effective in subsiding *Pittaja* and *Vataja* disorders, it improves *Dhatus* and is over all boosters for improving *Ojas*. According to *Sushruta* along with above said properties it provides strength to eye sight. *Bhavaprakasha* has also described *Ghtira* as *Rasayana*, good for the eyes and protects body from various diseases.

Lack of standardization of polyherbal formulations creates difficulty in validating the efficacy and maintaining quality standards of the product. Therefore, proper identification of raw materials at the basic level with the help of microscopic and morphological characteristics and adequate analytical methods are essential to ensure the quality and standardize the prepared medicine. With this background, *Mahatriphala ghrita* was subjected for pharmacognostical and pharmaceutical analysis.

MATERIALS AND METHOD

Plant material

The raw drug materials were collected from the pharmacy department, IPGT & RA, GAU, Jamnagar.

INGREDIENTS OF *MAHATRIPHALADI GHRITA*

• ***Kwatha Drugs***

Triphala, Bhringaraja, Vasa, Shatavari, Guduchi, Amalaki.

• ***Kalka* Drugs**

Pippali, Mishri, Draksha, Triphala, Neelakamala, Yashtimadhu, Kshirakakoli, Gambhari, Kantakari.

• **Others**

Go Ghrita, Goat's milk

METHOD OF PREPARATION OF *MAHATRIPHALADI GHRITA*[6]

Equal part each of the following: *Murchhita* Cow *Ghrita*, Decoction of *Triphala*, Juice of *Bhringaraja*, Juice of *Vasa* leaves, Decoction or Juice of *Satavari*, Goats Milk, Juice of *Guduchi*, Decoction or Juice of *Amalaki*. *Kalka* out of the following in equal parts: *Pippali*, raw sugar, *Draksha*, *Triphala*, *Nilakamal*, *Madhuka*, *Kshirakakoli*, *Madhuparni* and *Kantkari*. *Ghrita* will be taken in a stainless-steel vessel and heated mildly to remove any moisture. Then ingredients of *Kalka* added. Then thoroughly stirred while adding *Kwatha*. Then it will be heated. The temperature maintain will be in between 50ºC to 90ºC during the first hour of heating. Heating will be continuing for three hours and then stopped. Allow to stand overnight. Heating will be again started on next day while keeping a watch over the subsidence of froth (*Phena Shanti*) and the *Kalka* will be constantly checked for formation of *Varti (Madhyama Paka Lakshana).* Heating will be stop when *Varti* will be formed and froth subside. *Ghrita* will be filter while still hot (approx. 80º) through a muslin cloth and allowed to cool. After that, the *Ghrita* will be pack tightly in glass containers to protect from light and moisture.

PHARMACOGNOSTICAL EVALUATION

Morphological, organoleptic and microscopic evaluation on Raw drugs which are used in *Mahariphaladi ghrita* were conducted at Pharmacognostical laboratory of institute. The *ghrita* dissolve in small quantity of distilled water and studied with and without staining. Micro photographs of the slides were taken with Carl Zeiss trinocular microscope attached with camera.[7,8]

ORGANOLEPTIC STUDY

Contents of *Mahatriphaladi ghrita* was evaluated for organoleptic characters like taste, odour and colour etc. (Table 1).

PHARMACEUTICAL EVALUATION

Physico-chemical analysis

Physico-chemical Parameters of *Mahariphaladi ghrita* like loss on drying, Specific gravity etc. were determined as per the API guideline. *Mahatriphaladi ghrita* was further subjected to High Performance Thin Layer Chromatography (HPTLC) study.[9]

HPTLC method

High Performance Thin layer chromatography (HPTLC) studies were carried out with acid hydrolysed methanolic extract on pre-coated silica gel GF 60254 aluminium plate as 5mm bands, 5mm apart and 1cm from the edge of the plates, by means of a Camag Linomate V sample applicator fitted with a 100 µL Hamilton syringe. The mobile phase used was Toluene: Ethyl acetate: Glacial acetic acid: Formic acid (5:5:1:0.5). The plates were developed in Camag twin trough chamber (20 x 10 cm2) and spots were detected in short U.V. (254 nm), Long U.V (366nm). Camag Scanner II (Ver. 3.14) and Cats software (Ver. 3.17) were used for documentation.[10]

RESULTS AND DISCUSSION

The *Mahatriphaladi ghrita,* used in this study showed very encouraging results, has been analysed for pharmagnostical and analytical parameters, which is a step towards standardization of the drugs.

Microscopic study

Diagnostic microscopic characters of ingredients of *Mahatriphaladi ghrita* showed that sclereids, stone cells and Rosette crystals of *Haritaki.* Stone cells, Rosette crystal and brownish coloured matter and Pitted sclereids of *Bhibhitaki,* Sillica deposition and Groups of fibres of *Amlaki,* Watery trichomes with base and Pollen grain of *Bhringaraja,* Multicellular trichome and Anular vessels of *Vasa,* Corkin surface and Acicular cells of *Shatavari,* Cork cells and stone cells of *Guduchi,* Oil globule of *Pippali,* Acicular crystals and lignified parenchymal cells of *Draksha,* Simple trichome of *Neelkamal,* Rhomboidal crystal of *Yastimadhu,* prismatic crystals and epidermal cells of *Kshirakakoli* substitute,lignified cork of *Gambhari,* Stellate trichome of *Kantakari* (Plate 1).

Physicochemical tests

Pharmaceutical analysis of *Mahariphaladi ghrita* showed that loss on drying 0.012%, Acid value 6.6%, Iodine value 5.9%, Saponification value 262.2%, Specific gravity 0.094% Refractive index 1.4%. (Table-2).

HPTLC study results

Chromatographic study (HPTLC) was carried out under 254 and 366 nm UV to establish fingerprinting profile. *Mahariphaladi ghrita* showed 12 of spots at 254 nm with Rf values were recorded which may be responsible for expression of its pharmacological and clinical actions. Table 3. (Plate 2.).

Table 1: Organoleptic characters of *Mahatriphaladi ghrita.*

Various parameters	*Mahatriphaladi ghrita*
Colour	Yellow
Odour	Aromatic
Taste	*Kashaya, Tikta*
Touch	Smooth
Texture	Soft

Table 2: Physico-chemical parameters of *Mahatriphaladi ghrita.*

Analytical Parameter	*Mahatriphaladi ghrita*
Loss on Drying	0.012%,
Acid value	6.6%,
Iodine value	5.9%
Saponification value	262.2%
Specific gravity	0.094%
Refractive index	1.4%

Table 3: High performance thin layer chromatography (HPTLC)

Sample	No. of spot		Rf value
Mahatriphaladi ghrita	10	Observed under short UV Light (254 nm)	0.01,0.16,0.30,0.40,0.63,0.73, 0.95,1.23,1.51,1.58
Mahatriphaladi ghrita	4	Observed under short UV Light (366 nm)	0.00, 1.25, 1.52, 1.58

[Plate-1]

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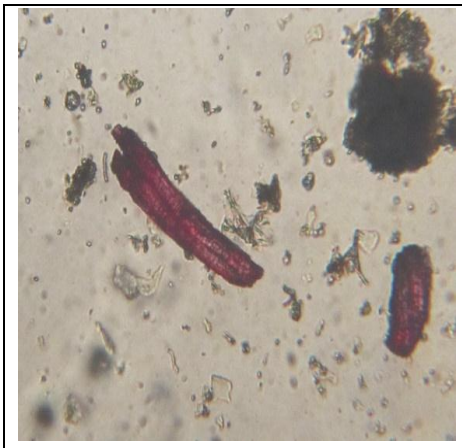
<td> 
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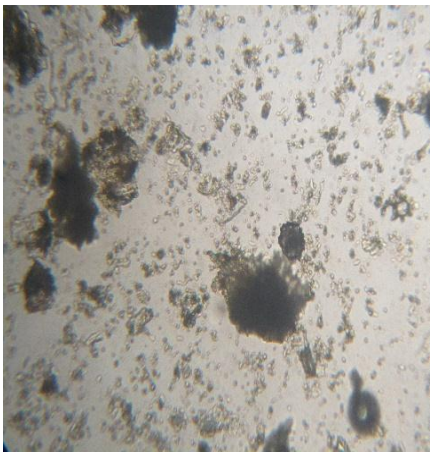
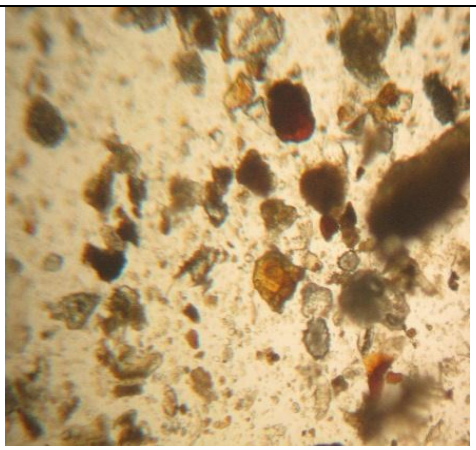
<td> 
2.Rosette crystals of haritaki</td>
<td> 
3.Rosette crystal and brownish coloured matter of Bhibhitaki</td>
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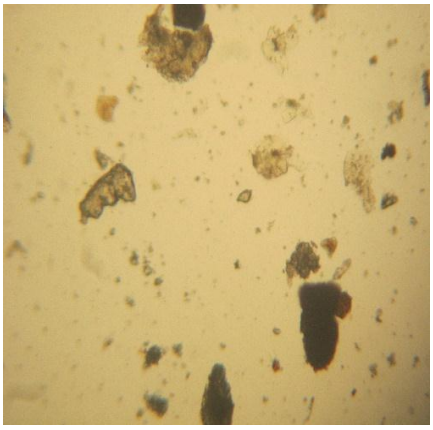
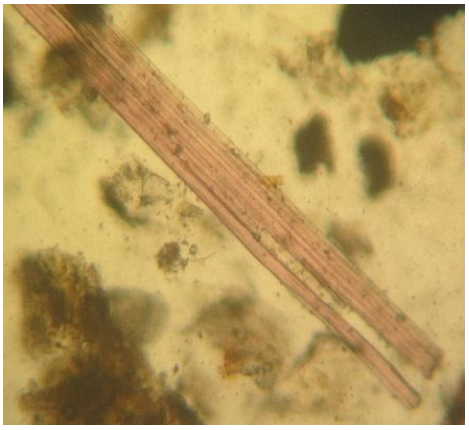
<td> 
4. Pitted sclereids of Bhibhitaki</td>
<td> 
5.Sillica deposition of Amlaki</td>
<td> 
6.Groups of fibres of Amlaki</td>
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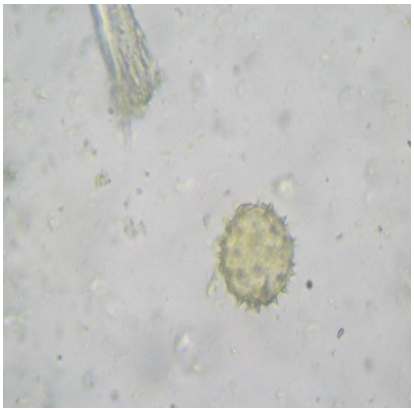
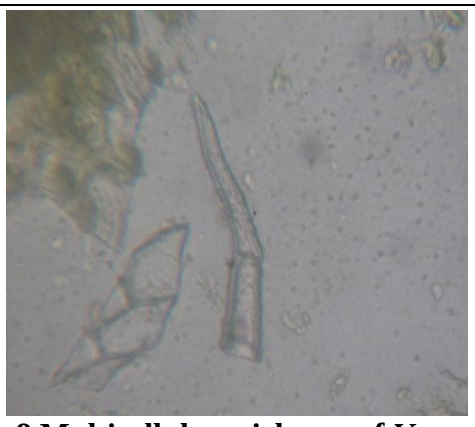
<td> 
6.Watery tricome of bhriangraja</td>
<td> 
7.Pollen grain of Bhriangraja</td>
<td> 
8.Multicellular trichome of Vasa</td>
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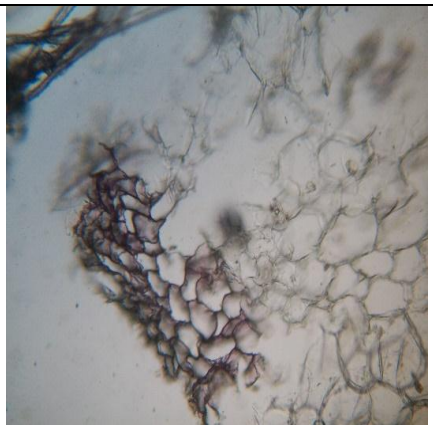
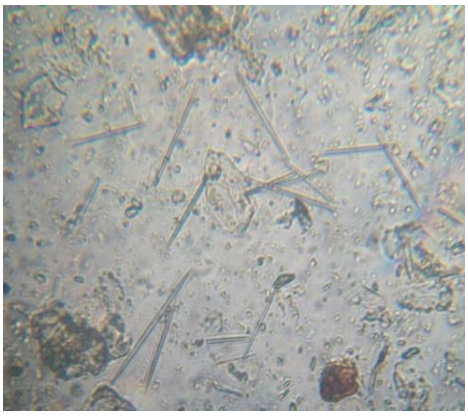
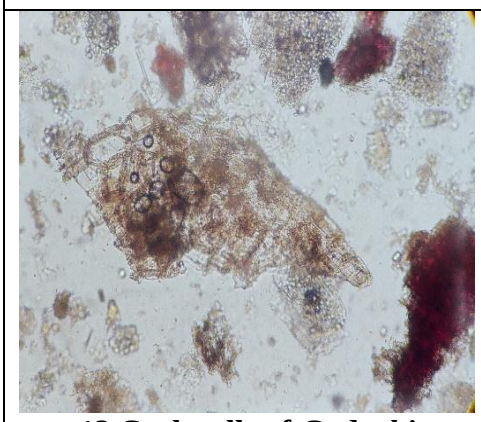
9.Anular vessels of *Vasa*



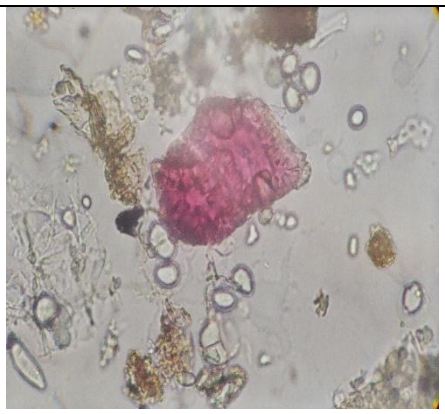
10.Corkin surface of *Shatavari*



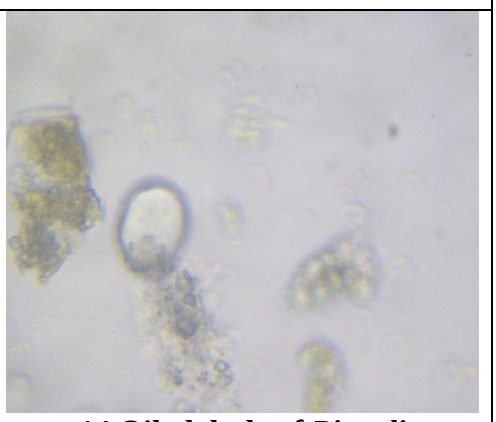
11.Acicular cells of *Shatavari*



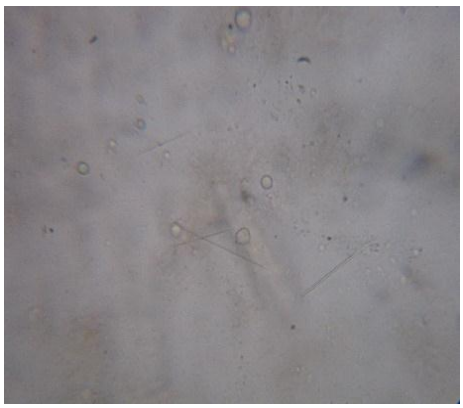
12.Cork cells of *Guduchi*



13.Stone cells of *Guduchi*



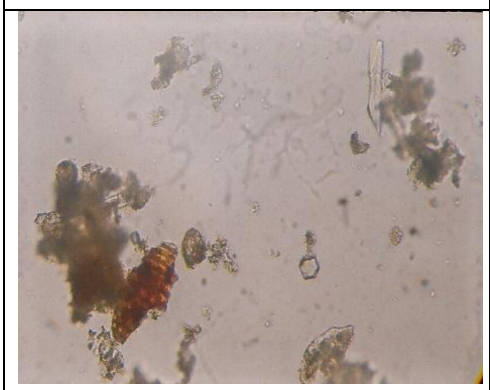
14.Oil globule of *Pippali*



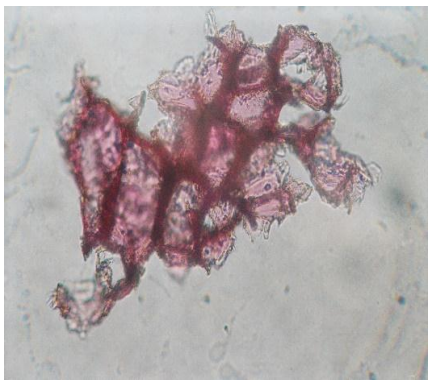
15.Acicular crystals of *Draksha*

16.Simple trichome of *Neelkamal*

17.Rhomboidal crystal of *Yastimadhu*



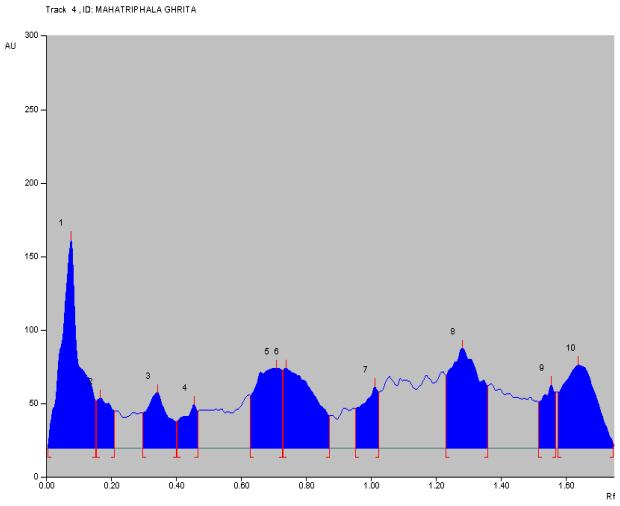
18.Prismatic crystals of *Kshir-kakoli* substitute



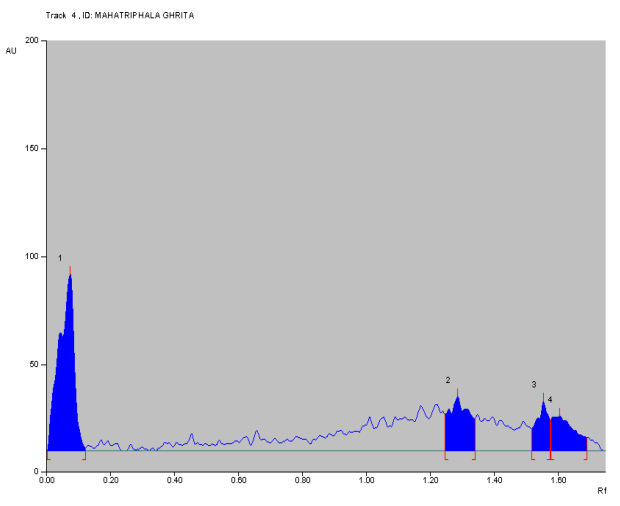
19.lignified cork of *Gambhari*

20.Stellate trichome of *Kantakari*

Plate-2



1.Observed under short UV Light (254nm) ***Mahatriphaladi ghrita***



2.Observed under short UV Light (366nm) ***Mahatriphaladi ghrita***

CONCLUSION

Pharmacognosy and phytochemical evaluation of *Mahatriphala Ghrita* was performed which is a potent medicine in the management of *Myopia.* Preliminary Organoleptic features and results of powder microscopy shows the ingredients which were used confirm the gentility and quality of *Mahatriphala Ghrita*. All the ingredients were proved to be authentic and compared with the parameters mentioned in API (Ayurvedic Pharmacopeia of India). In phytochemical analysis, water soluble & alcohol soluble extract, pH, Ash value was assessed.

Though the groundwork requisites for the standardization of *Mahatriphala Ghrita* are covered in the current study, additional important analysis investigations are required for the identification of all the active chemical constituents of the test drug to substantiate the clinical efficacy.

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