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PHARMACOGNOSTICAL AND PHARMACEUTICAL ANALYSIS OF *MUSTADI GHANA* IN THE MANAGEMENT OF DYSLIPIDEMIA

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ABSTRACT

Now-a-days people have accepted globalization and have become more efficient and productive in work with the cost of their health. In today's era people want fast work and for that they do not follow any proper lifestyle along with improper diet pattern. That's why, non-communicable disease has been noted 53% of mortality rate worldwide. Cardiovascular diseases (CVD) are one of them. Dyslipidemia is major cause of CVD, can co-relate with *Santarpanothha vikara*. Mustadi Ghana is herbal compound formulation mentioned in *Charak Samhita* for the management of *Santarpanottha vyadhi*. **Methods**: *Mustadi Ghana* was subjected to Pharmacognostical and physico-chemical analysis such as microscopic study, loss on drying, ash value etc. **Results**: The Pharmacognostical study showed the presence of contents such as; annular vessels of *Haridra*, cluster crystal of *Patha*, cork cells of *Nimba* etc. The Pharmaceutical analysis showed that the loss on drying value 8.70%, pH Value 6.5, Acid insoluble Ash value 1.25% etc. HPTLC study of *Mustadi Ghana* revealed 7 spots at 254 nm and 5 spots at 366 nm. **Conclusion**: The present work was carried out to standardize the finished product *Mustadi Ghana* in terms of its identity, quality and purity. Pharmacognostical and Physico-chemical observations revealed the specific characters of all active constituents used in the preparation.

KEYWORDS: *Mustadi Ghana*, Dyslipidemia.

INTRODUCTION

In present era, globalization of unhealthy lifestyles may show up in individuals as raised blood pressure, increased blood glucose, elevated blood lipids, and obesity. These are called 'intermediate risk factors' which can lead to cardiovascular disease, a type of non-communicable disease (NCD). The 4 main types of NCDs are CVD, cancer, respiratory disease & diabetes.[1] In India 53% all deaths are because of NCDs. An estimated 17.5 million people died from CVDs in 2012, representing 31% of all global deaths.[2] Dyslipidemia is the main reason which causes cardiovascular diseases i.e. ischemic heart disease. It is a condition in which the levels of lipids (cholesterol, triglycerides or both) are raised in plasma, which can be correlated to raised '*Sneha*' or '*Meda*' in body. It's relatively silent as far as what patient can notice on his/her own, hence is a '**silent killer**'. Raised cholesterol is a major cause of disease burden in both developed and developing countries as a risk factor for IHD and stroke.

Dyslipidemia is contributed by high fat diet, sedentary lifestyle etc. These *Nidans* can be correlated with '***Santarpanothavikara***' mentioned in *Charaksamhita, Sutrasthan 23*. These arise due to excessive use of *Snigdha* (unctuous), *Guru* (heavy), *Pichhila* (slimy) property food and sedentary lifestyle. Hence dyslipidemia can be stated under broad umbrella of *santarpanjanya vyadhis.*[3] As drugs used in modern science to treat dyslipidemia, has several side effects. They include myopathy, increase in serum transaminase levels leading to liver damage, nausea, bowel upset, feeling sick, muscle and joint pain, increased risk of diabetes, etc.

Mustadi Ghana is herbal compound formulation mentioned in *Charak Samhita* for the management of *Santarpanottha vyadhi*.[4] *Mustadi Ghana* has 13 herbal contents in equal proportion – *musta, aargvadha, patha, trifala, devdaru, gokshur, khadira, neemba, haridra, daruharidra* and *vtsaktvak*. These all ingredients are helpful in dyslipidemia due to *kashaya* and *tikta rasa, laghu guna, ushna virya*. Most of these drugs have been proved antidyslipidemic activity i.e. *musta, patha, trifala*.

In the present study, the formulation is subjected to Pharmacognostical and pharmaceutical analysis. Preliminary organoleptic features and results of microscopy were verified and all the ingredients were proved to be authentic.

MATERIALS AND METHODS

Collection, identification and authentification of raw drug

The raw drugs for the preparation of Mustadi Ghana were procured from the Pharmacy, Gujarat Ayurved University, Jamnagar. The ingredients & parts used in the preparation of the final product are listed in the table 1.

Preparation of drug

The final product i.e. *Mustadi Ghana* was prepared in the pharmacy, Gujarat Ayurved University, Jamnagar. Firstly Kwath was prepared from the raw drugs and it was dried for making *Ghana*. After making of *Ghana* it was powdered and filled in the capsule for clinical study.

Pharmacognostical study

The Pharmacognostical study comprises of organoleptic study and microscopic study of finished product.

Organoleptic Study

The Organoleptic characters of Ayurvedic drugs are very important and give the general idea regarding the genuinity of the sample. Organoleptic parameters like Taste, Colour, odour and touch were scientifically studied in Pharmacognosy laboratory, I.P.G.T. & R.A., Gujarat Ayurved University, Jamnagar, Gujarat, India.[5]

Microscopic Study

Mustadi Ghana was dissolved with water and microscopy of the sample was done without stain and after staining with Phloroglucinol + HCl. Microphotographs of *Mustadi Ghana* was also taken under Corl-zeiss trinocular microscope.[6]

Physico-chemical analysis

Mustadi Ghana was analyzed using various standard physico-chemical parameters such as Loss on drying, water soluble extract, alcohol soluble extract etc.[7]

High Performance Thin Layer Chromatography (HPTLC)

HPTLC was performed as per the guideline provided by API. Methanolic extract of drug sample was used for the spotting. HPTLC was performed using Toluene + Ethyl acetate + Acetic acid (14:4:2) solvent system and observed under visible light. The colour and R_f values of resolved spots were noted.[8]

RESULTS AND DISCUSSION

Organoleptic characters of *Mustadi Ghana*

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

Microscopic characters of *Mustadi Ghana*

Diagnostic characters of *Mustadi Ghana* were observed under the microscope and presence of all ingredients showed their different characters which are depicted in Plate 1. Fig.1-14.

Physicochemical parameters of *Mustadi Ghana*

Physicochemical parameters of *Mustadi Ghana* such as ash value, water soluble extract, alcohol soluble extract, pH etc. results are shown in Table 3.

HPTLC Study

Chromatogram shows 7 prominent spots at 254nm with maximum R_f value 0.02, 0.32, 0.43, 0.62, 0.72, 0.75, 0.93 and 5 spots at 366nm with maximum R_f value 0.02, 0.33, 0.49, 0.71, 0.73. (Plate 2, Fig. 1-2) and three dimensional densitogram is also shown. (Plate 3, Fig. 1-2).

Table 1: **Contents of *Mustadi Ghana*.**

Sr. No.	*Drugs*	Botanical Name	Part to be used	Proportion
1	*Musta*	*Cypeus rotundus*	*Kanda*	1 Part
2	*Aaragvadha*	*Cassia fistula*	*Phalamajja*	1 Part
3	*Patha*	*Cissampelospareira*	*Panchang*	1 Part
4	*Haritaki*	*Terminaliachebula*	*Phala*	1 Part
5	*Bibhitak*	*Terminaliabellarica*	*Phala*	1 Part
6	*Aamalaki*	*Emblicaofficianalis*	*Phala*	1 Part
7	*Devdaru*	*Cedrusdeodara*	*Kandsara*	1 Part
8	*Gokshur*	*Tribulasterrestris*	*Phala,mula*	1 Part
9	*Khadira*	*Acacia catechu*	*Sara*	1 Part
10	*Nimba*	*Azadirechtaindica*	*Tvak*	1 Part
11	*Haridra*	*Curcuma longa*	*Kanda*	1 Part
12	*Daruharidra*	*Berberisaristata*	*Mula,phala,kand*	1 Part
13	*Vatsak*	*Holarrhenaantidysentrica*	*Tvak*	1 Part

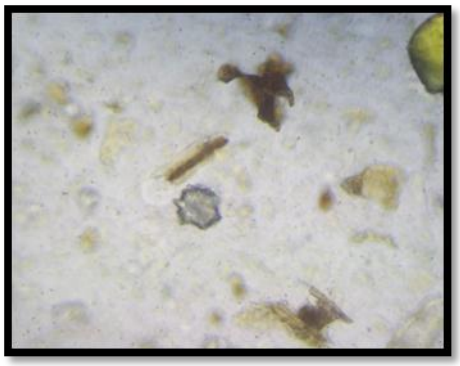
Table 2: Organoleptic characters of *Mustadi Ghana*.

Sr. No.	Characters	Results
1	Colour	Dark brown
2	Odour	Fragrant
3	Taste	Astringent bitter
4	Touch	Fine course
5	Weight of Each *capsule*	500 mg

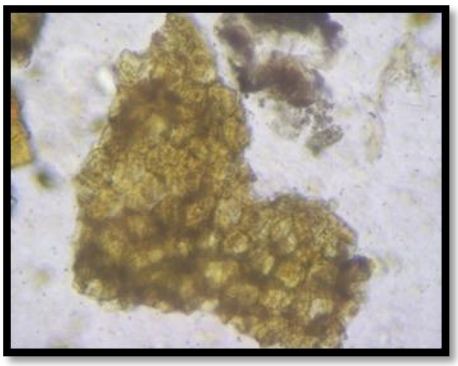
Table 3: Physicochemical parameters of *Mustadi Ghana capsule.*

Sr. No.	Test	Result
1	Weight Variation	
	Mean Weight	0.473 gm
	Highest Weight	0.652 gm
	Lowest Weight	0.269 gm
2	Loss on Drying	8.7 % w/w
3	Ash Value	11.35 % w/w
4	Acid insoluble ash	1.25 %
5	Water soluble extract	45.2 % w/w
6	Methanol soluble extract	28.08 %w/w
7	pH	6.5

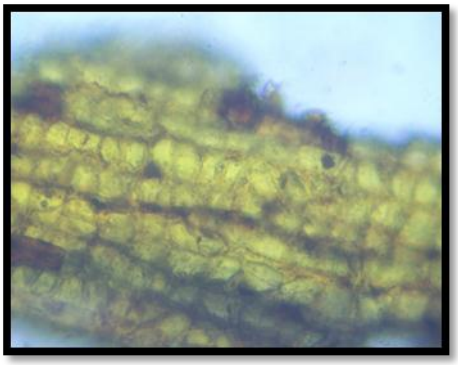
1. Annular vessels of Haridra



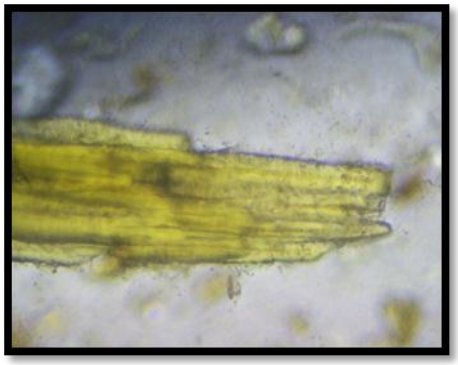
2. Cluster crystals of Patha



3. Cork cells of Nimba



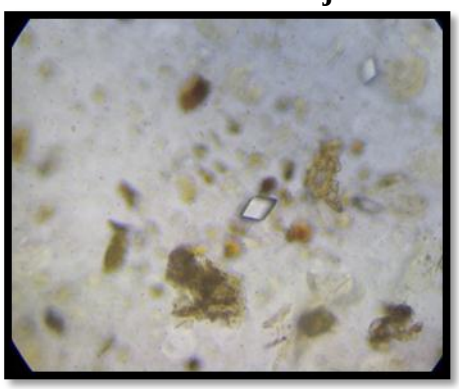
4.Crystal fibre of Daruharidra



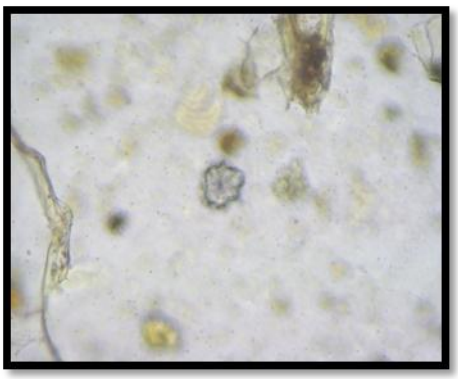
5.Fibres of Kutaja

6.Group of scleroids of Bibhitaki

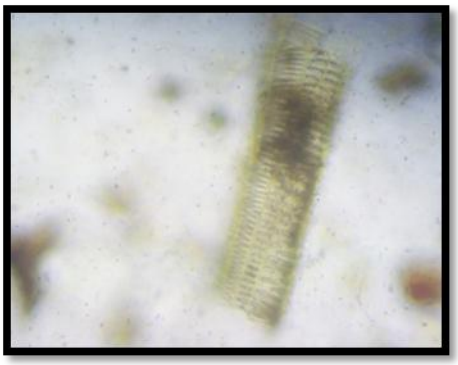
7. Oil globules of Devdaru



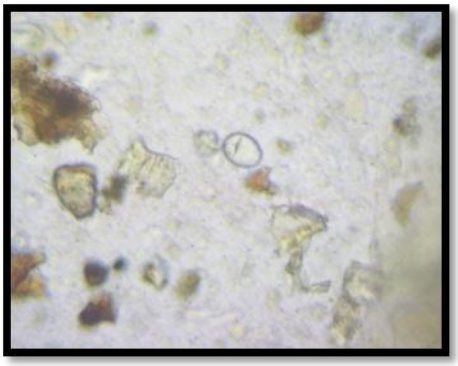
8. Prismatic crystal of Nimba



9. Rosette crystal of Gokshura

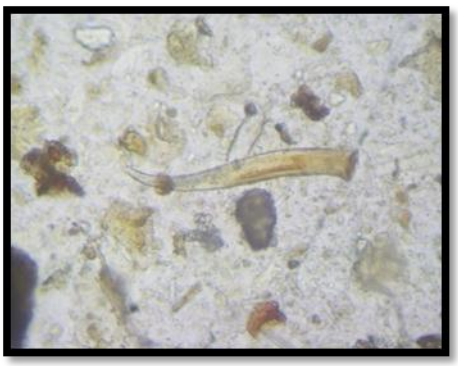


10. Scleriform vessles of Haridra

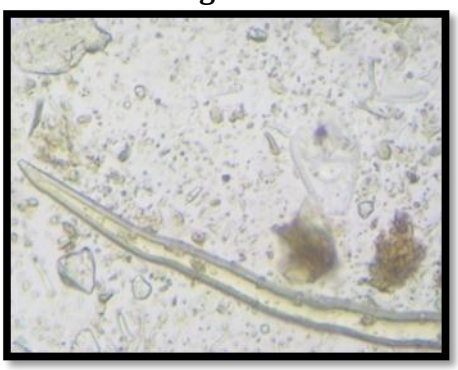


11. Starch grain of Patha

12. Stone cells of Kutaja

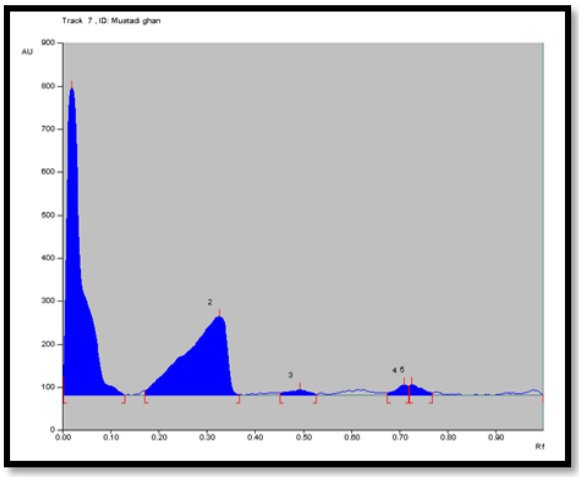


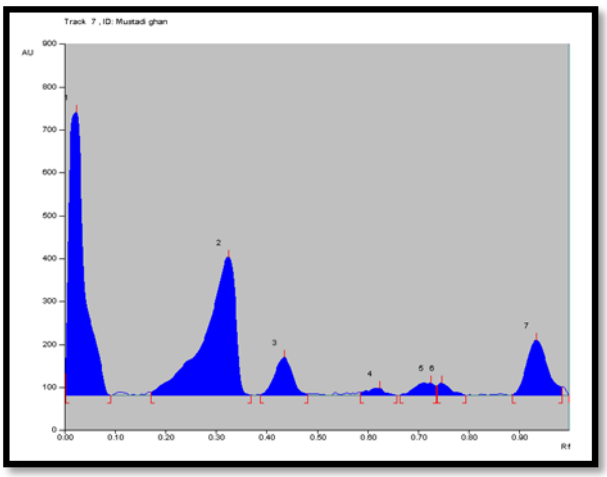
13.Trichome of Bibhitaki



14. Trichome of Gokshura

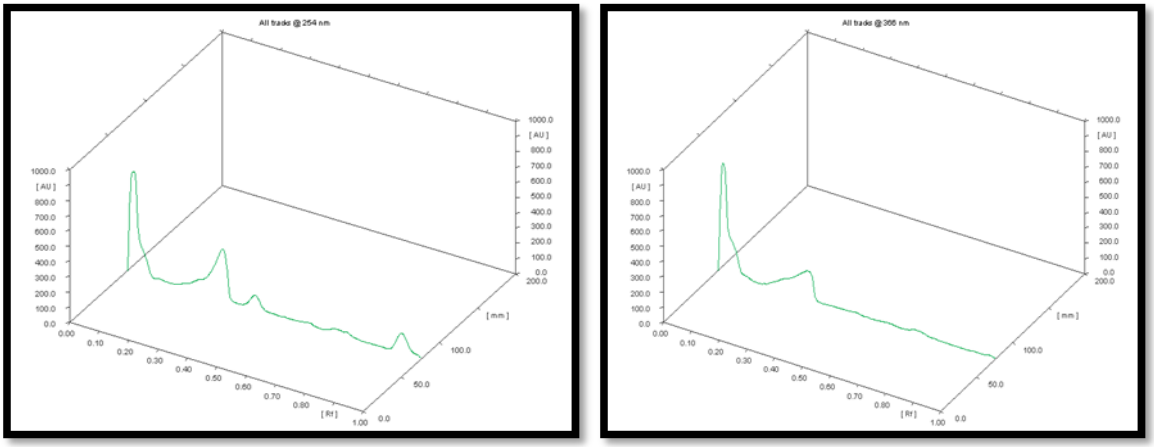
Plate 1: Microscopic characters of *Mustadi Ghana.*





Peak display at 366 nm **Peak display at 254nm**

Plate 2: Densitogram of *Mustadi Ghana at* 254 nm and 366 nm.



254 nm **366 nm**

Plate 3: Three dimensional HPTLC (3D) Densitogram.

CONCLUSION

Quality control analysis of any formulation is very much necessary to assess its safety, purity and universal acceptability for the particular disease. Standardization is a measurement for ensuring the quality control enabling the reproducibility of the formulation. The pharmacognostical and physico chemical analysis of *Mustadi Ghana* confirmed the purity and genuinety of the drug. Further studies may be carried out on this formulation on the basis of observation 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 researchers.

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