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PHARMACOGNOSTICAL AND PHARMACEUTICAL STUDY ON EFFECT OF *AMALAKI BHAVANA* ON *NISHA* –A COMPOUND AYURVEDIC FORMULATION

Vasundhara Sharma*[1], L. P. Dei[2], D. H. Pandya[3], Harisha C. R.[4], Shukla V. J.[5], Sachin Kumar Sharma[6]

[1]MD Scholar *Rog Vigyana* & *Vikriti Vigyana* Department.

[2]I/C Director and Dean.

[3]Asst. Professor *Rog Vigyana* & *Vikriti Vigyana* Department.

[4]Head Pharmacognosy Lab.

[5]Head Pharmaceutical Lab.

[6]MD Scholar *Kayachikitsa* Department, IPGT & RA, Gujarat Ayurved University, Jamnagar, Gujarat, India-361001.

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***Corresponding Author**
Dr. Vasundhara Sharma
MD Scholar Rog Vigyana & Vikriti Vigyana Department.

ABSTRACT

Nisha Amalaki is one of the *Ayurvedic* formulation widely used in the management of *Madhumeha* (Diabetes Mellitus). In the present study 7 *Bhavna (*trituration*)* of *Amlaki* (*Emblica officinalis*) swaras (juice) have been given to *Haridra Choorna* (*Curcuma longa*). To overcome the problems of palatability, feasibility, shelf life with the powder form of drug, *Amalaki bhavit Nisha* is converted in to *Vati* form after *Bhavna*. Till date no scientific work has been reported on effect of *Bhavna* on *Haridra choorna* by *Amlaki swaras.* The present research paper is made to screen the differences in pharmocognostical profile of *Nisha Choorna* before and after *Bhavna* and to standardize the formulation through Pharmacognostical and Pharmaceuticals measures. Pharmacognostical measures like lignified scleroid of *Amalaki*, mesocarp cells of *Amalaki*, oil globule of *Haridra* etc. were seen. HPTLC was done in appropriate solvent system in which 9 and 7 spots were distinguished at 254 nm and 366 nm respectively.

KEYWORDS: *Amalakibhavita Nisha*, Pharmaceuticals, Pharmacognostical, Trituration.

INTRODUCTION

Diabetes mellitus is a clinical syndrome characterised by hyperglycaemia caused by absolute or relative deficiency of insulin. Hyperglycaemia, or raised blood sugar, is a common effect of uncontrolled diabetes and over time leads to serious damage to many of the body's systems, especially the nerves and blood vessels.[1] In *Ayurveda* disease diabetes mellitus can be correlated with *Prameha /Madhumeha*. It is *Tridoshaja*in origin with predominance of *Kapha***.** *Nisha Amalaki* is very effective formulation mentioned in *Ashtanga Hridaya*.[2] *Amalaki* (*Emblica officinalis*), family Euphorbiacae, is sweet, sour, astringent, pungent and bitter in taste. The other ingredient is *Haridra* (*Curcuma longa*), family Zingebearaceae, it is *tridoshsamak.*[3] *Haridra* due to bitter taste pacifies *Pitta* and because of hot potency pacifies *Vata and Kaphadosha*.[4] Till date no scientific work has been reported on effect of *Bhavna* on *Haridra choorna* by *Amlaki swaras.* The present research paper is made to screen the differences in pharmocognostical profile of *Amlakibhavit Nisha* before and after *Bhavna* and to standardize the formulation through Pharmacognostical and Pharmaceuticals measures.

MATERIALS AND METHODS

Plant material

Raw drug materials were collected from the pharmacy of IPGT & RA, Gujarat Ayurved University, Jamnagar. The ingredients are mentioned in table 1.

Table-1: *Amalakibhavit Nisha.*

Drug	Latinname	Part used
Nisha (*Haridra*)	*Curcumalonga* Linn.	Rhizome
Amlaki	*Emblica officinale* Gaertn.	Fruit Juice

Pharmacognostical study

Both the raw drugs were identified and authenticated by the Pharmacognosy department, IPGT & RA, Gujarat Ayurved University, Jamnagar. The identification were carried out on the basis of organoleptic features, morphological features and powder microscopy of drug. Pharmacognostical evaluation of prepared *Vati* was also carried out. *Vati* dissolved in small quantity of distilled water, filtered through filter paper, filtrate studied under the microscope attached with camera, with and without stain. The microphotographs were also taken under the microscope.[5]

Method of preparation of *Amlakibhavit Nisha*

*Bhavna samskar (*trituration*)* was done by triturating the *Nisha* powder with the freshly prepared juice of *Amlaki*.7 *Bhavna* of *Amlaki swaras* had been given to *Haridra Choorna.*

PHARMACEUTICAL EVALUATION

Physicochemical parameter

Amlakibhavit Nisha was analysed by using qualitative and quantitative parameters at Pharmaceutical Laboratory, IPGT & RA, Gujarat Ayurved University, Jamnagar. The common parameters mentioned for compressed tablets in Ayurvedic Pharmacopia of India[6]and CCRAS[7] guidelines i.e. total ash, pH value, water and alcohol soluble extractives were taken. Presence of more moisture content in a sample can create preservation problem. Hence loss on drying was also selected as one of the parameters.[8]

High Performance Thin Layer Chromatography Study (HPTLC)

Methanol extract of *Amlakibhavit Nisha* were spotted on precoated silica gel GF 60_{254} aluminium plate as 5mm bands, 5 mm apart and 1 cm from the edge of the plates, by means of a Camag Linomate V sample applicator fitted with a 100 µL Hamilton syringe. Toluene (7 ml), Ethyl acetate (2 ml), Acetic acid (1 ml) was used as mobile phase. After Development, Densitometric scanning was performed with a Camag TLC scanner III in reflectance absorbance mode at 254 nm and 366 nm under control of win CATS software (V 1.2.1 Camag).[9],[10] The slit dimensions were 6 mm x 0.45 mm and the scanning speed was 20 mm s-1.

RESULTS AND DISCUSSION

Pharmacognostic study

The initial purpose of the study was to confirm the authenticity of the drugs used in the preparation of *Amlakibhavit Nisha*. For that, powder of *Haridra and Amlakibhavit Nisha* were subjected to organoleptic and microscopic evaluation.

Organoleptic evaluation:

Organoleptic features like colour, odour and taste of *Haridra choorna* and *Amlakibhavit Nisha* were recorded and are placed at table 2.

Table-2: Organoleptic features of *Amlakibhavit Nisha*

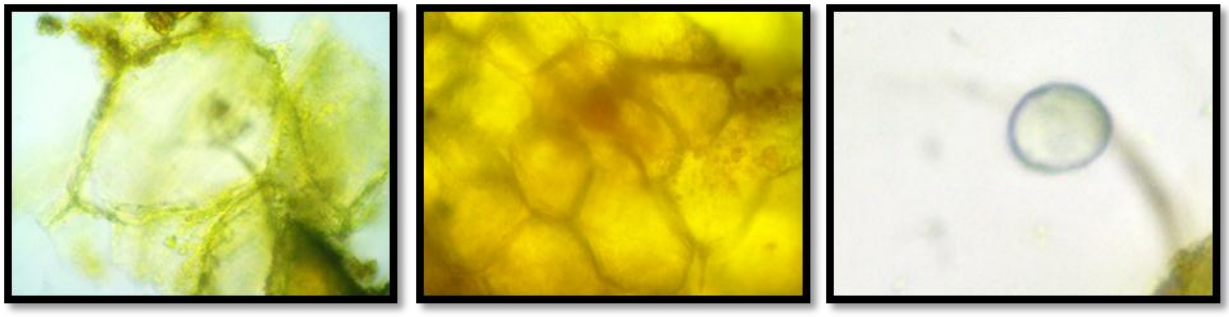
SI. No.	Characters	Observed	
		***Haridra* Powder plain**	***Amlakibhavit Nisha* tablets**
1.	Colour	Yellow	Blackish-Yellow
2.	Odour	Aromatic	Slightly Aromatic
3.	Taste	Astringent	Astringent followed by sour
4.	Touch	Fine	Coarse

Microscopic evaluation

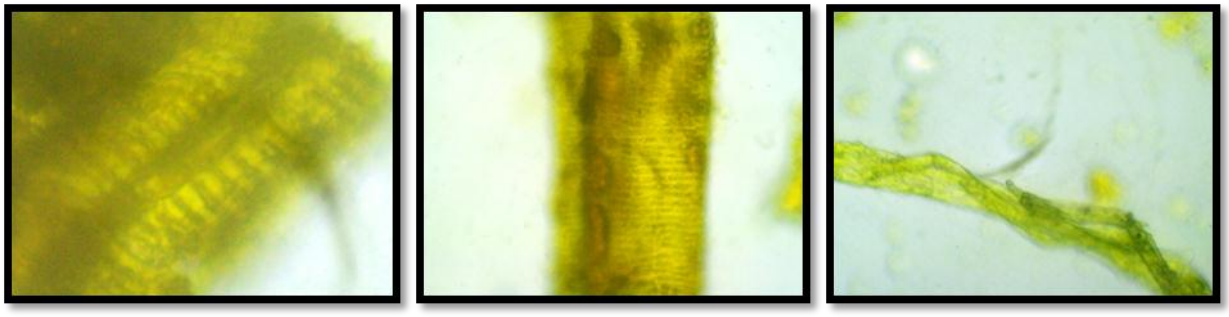
Microscopic characters of *Haridra* are parenchyma cells, oleoresin content, oil globule, scalriform vessels, annular vessels, simple fibres, group of starch grains, simple starch grains, cork in surface view, cork in tangential view (Plate 1 Fig 1-10).

Microscopic characters of *Amlakibhavit Nisha* Tablets are fibre of *Haridra*, fibres of *Amalaki*, lignified scleroid of *Amalaki*, mesocarp cells of *Amalaki*, oil globule of *Amalaki*, oil globule of *Haridra*, parenchyma cells of *Haridra*, scalariform vessels of *Haridra*, silica deposition of *Amalaki* (Plate 2 Fig 1-9).

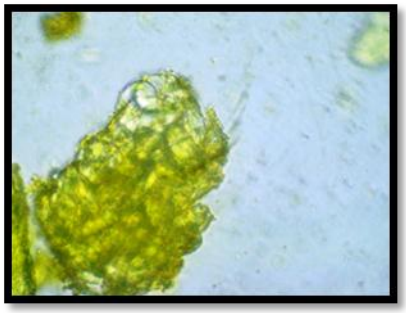
Plate 1: Microscopic characters of *Haridra*



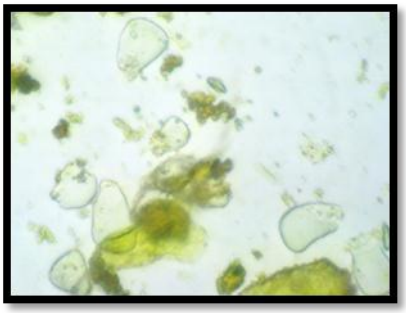
1.Parenchyma cells **2.Oleoresin content** **3.Oil globule**



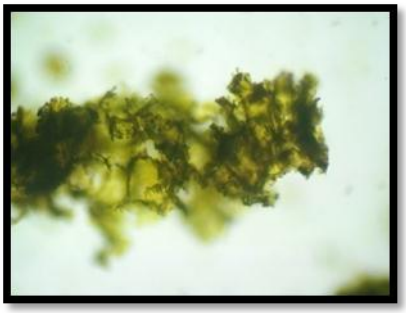
4.Scalriform vessels **5.Annular vessels** **6.Simple fibres**



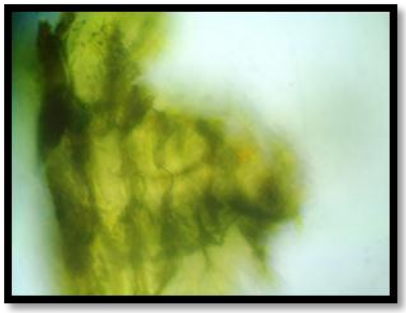
7.Group of Starch grains



8.Simple starch grains

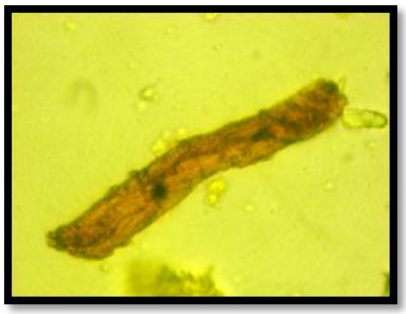


09.Cork in surface view

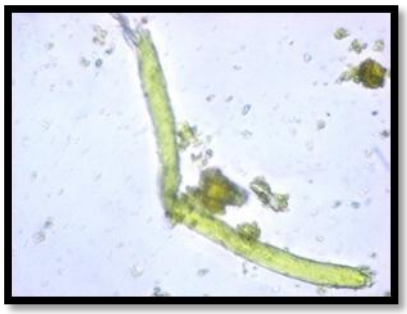


10.Cork in tangential view

Plate 2: Microscopic characters of *Amlakibhavit Nisha*

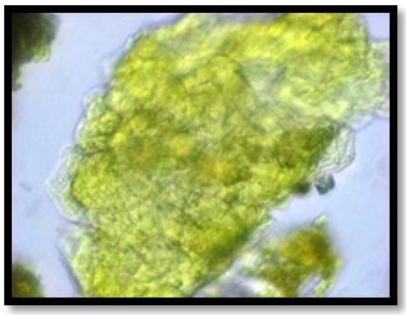


1.Fibre of *Haridra*

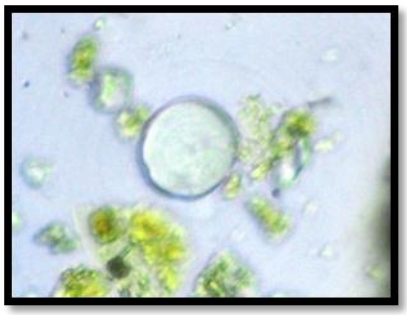


2.Fibres of *Amalaki*

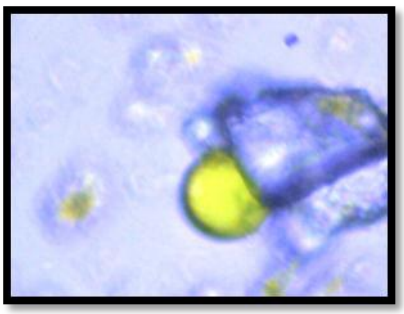
3.Lignified scleroid of *Amalaki*



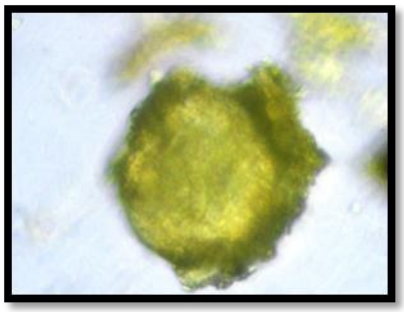
4.Mesocarp cells of *Amalaki*



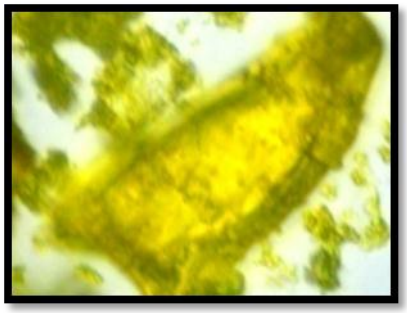
5.Oil globule of *Amalaki*



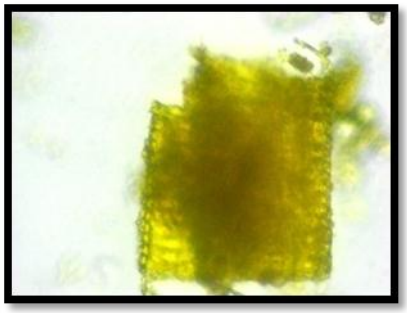
6.Oil globule of *Haridra*



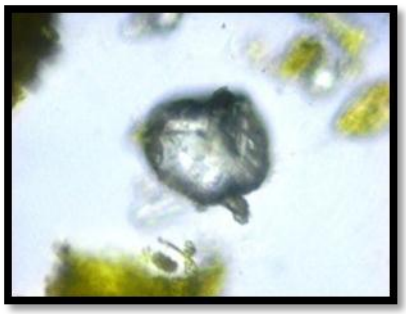
7.Oleoresin content of *Haridra*



8.Parenchyma cells of *Haridra*



9.Scalariform vessels of *Haridra*



9.Silica deposition of *Amalaki*

PHARMACEUTICAL STUDY

Physicochemical parameters

Physicochemical Parameters of the tablet like Uniformity, Disintegration time, Hardness, Loss on Drying were all found to be within the normal range. The water soluble extractive and methanol soluble extractive values were found to be 28.5% w/w and 13.28% w/w respectively. Details are placed at table 3.

Table-3: Physicochemical parameters of *Amalakibhavit Nisha.*

Test		Results
Uniformity of Tablet	Average	472 mg
	Highest	543 mg
	Lowest	446 mg
Hardness		2.5 kg/cm^2
Loss on Drying		12.93 % w/w
Ash value		14.64 % w/w
Water soluble extract		28.5 % w/w
Methanol soluble extract		13.28 % w/w
pH value (5% aqueous solution)		6

High Performance Thin Layer Chromatography Study

Densitometric scanning of the HPTLC pattern showed 9 spots corresponding to hR_f values 03, 35, 44, 50, 69, 75, 80, 87, 95 in short wave UV 254 nm and 7 spot corresponding to hR_f values 14, 41, 55, 79, 90,98 obtained in long wave UV 366nm (Table 4, Plate 3- 3A & 3B).

Table-4: HPTLC of *Amlakibhavit Nisha.*

254 nm		366 nm	
Peak	**Rf**	**Peak**	**Rf**
1	0.03	1	0.15
2	0.35	2	0.41
3	0.44	3	0.55
4	0.50	4	0.79
5	0.69	5	0.84
6	0.75	6	0.90
7	0.80	7	0.98
8	0.87		
9	0.95		

Plate 3: Densitogram curve of Methanol extract of *Amlakibhat Nisha*

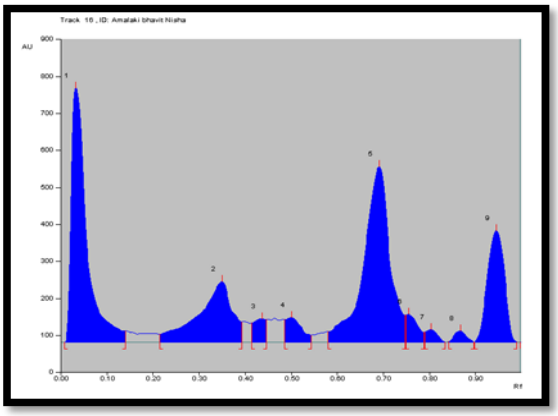


Figure 3-A at 254 nm

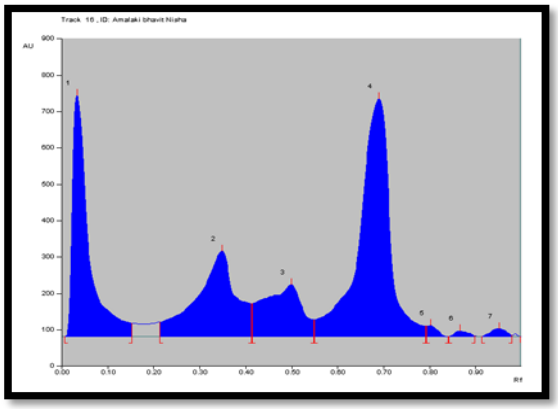


Figure 3-B at 366 nm

Plate 4: 3-D graph of Methanol extract of *Amlakibhavit Nisha*

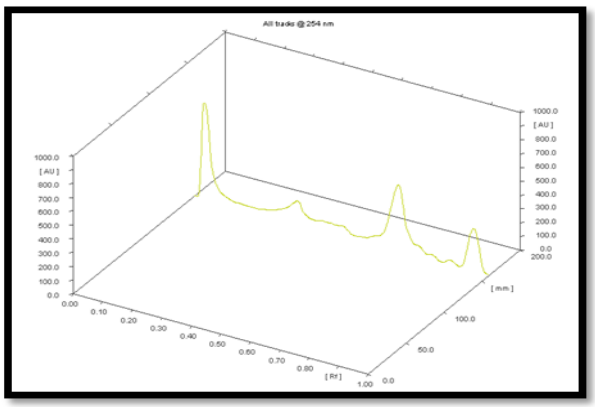


Figure 4-A (at 254 nm)

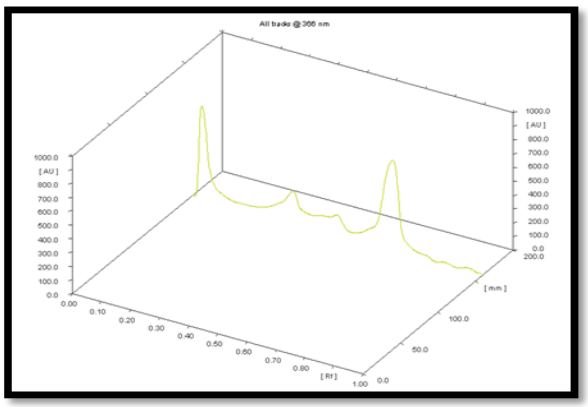


Figure 4-B (at 366 nm)

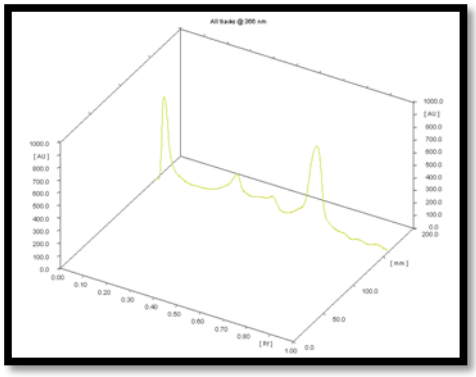


Figure 4-C (MWL)

CONCLUSION

The ingredients were identified and authenticated pharmacognostically and were used for the preparation. The formulation was subjected to pharmacognostical, physicochemical, HPTLC studies. There is marked difference in pharmacognostical and phytochemical characters of *Nisha* before and after *Bhavna*. Most of the cellular constituents i.e. oleoresin, oil globule disturbed parenchyma cells are freely distributed due to the *Bhavana* process. So seven *Bhavna* of *Amalaki swaras* in *Nisha choorna* may increase the potency of drug. It is inferred that the formulation meets the minimum qualitative standards as reported in the API at a preliminary level. The inference from this study may be used as reference standard in the further quality control researches. Further clinical evaluation of the compound is in progress.

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