



ORIGINAL RESEARCH ARTICLE

PHARMACOGNOSTICAL AND PHYTOCHEMICAL EVALUATION OF AGASTYA HARITAKI RASAYANA - A COMPOUND AYURVEDIC FORMULATION

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ABSTRACT:

Agastya Haritaki Rasayana (AHR) is an important Ayurvedic confectionary formulation (*Avaleha*) containing *Dashamoola*, *Pippali* (*Piper longum* Linn), *Bharangi* (*Clerodendrum serratum* Spreng), *Kapikacchu* (*Mucuna pruriens* Bek), *Haritaki* (*Terminalia chebula* Retz) etc as main ingredients. Though A H R is very effective for disorders of Respiratory tract, but till date no work has been carried out to standardize this formulation. Hence the present study was undertaken to standardize the Poly Herbal formulation (AHR) through pharmacognostical and pharmaceutical evaluations. The sample was subjected for various physicochemical parameters like water soluble extractive (71.10%w/w), alcohol soluble extractive (44.93%w/w), ash value (2.95% w/w), acid insoluble ash (0.39%w/w), loss on drying (9.07% w/w), the pH(5), dextrose value, HPTLC. Thus, the physicochemical and microscopic characters achieved may provide guideline for standardization of formulation A H R.

Key Words: *Agastya Haritaki Rasayana*, HPTLC, Pharmacognosy, Physicochemical evaluation.

INTRODUCTION

Agastya Haritaki Rasayana (AHR) is an Ayurvedic formulation useful in the management of various types of *Pranavaha Sroto Vikaras*¹ (Respiratory disorders) like *Kasa* (cough), *Swasa* (asthma), *Hikka* (hiccough) etc. AHR contains *Haritaki*² (*Terminalia chebula* Retz) as one of the main ingredient which has *ushna* (hot in potency), *ruksha* (dryness), *rasayana* (rejuvenative) and *vata-kaphahara* (pacifies *VataKapha*) properties. It is also proved for its immunomodulatory³,

cytoprotective⁴, anticaries⁵, antispasmodic and hypolipidemic properties.⁶ Hydrolysable tannins present in *T. chebula* shows antimutagenicity in *Salmonella typhimurium*.⁷

During past decades herbal medicines mentioned in *Ayurveda* are getting recognition globally. Maintaining the quality standard of a poly herbal formulation is a challenging task. Till date there is no available information regarding scientific evaluation of AHR. In the present study AHR was subjected to pharmacognostical (microscopic), HPTLC

Densitogram and pharmaceutical (evaluation of various physicochemical parameters) evaluation in order to prepare a preliminary profile of the formulation.

MATERIALS AND METHODS

Method of preparation of *Agastya Haritaki Rasayana* as per A.H

For the present study the *Agastya Haritaki Rasayana* (AHR) was procured from Arya Vaidya Sala Kottakal, Kerala, which was prepared as per the reference of Astanaga Hridayam.⁸The ingredients are mentioned in the table 1

Table 1: Ingredients *Agastya Haritaki Rasayana*

Sr.No.	Drug	Botanical name (family)	Part used	Quantity of Drug
1	BILVA	<i>Aegle marmelos</i> Carr. (Rutaceae)	Stem bark of the plants	96 g
2	AGNIMANTHA	<i>Premna corimbosa</i> Roxb (Verbenaceae)		96 g
3	SHYONAKA	<i>Oroxylum indicum</i> Vent. (Bignoniaceae)		96 g
4	PATALA	<i>Stereospermum suaveolens</i> DC. (Bignoniaceae)		96 g
5	GAMBHARI	<i>Gmelina arborea</i> Roxb. (Verbenaceae)		96 g
6	SHALAPARNI	<i>Pseudarthria viscida</i> W &A. (Fabaceae)		96 g
7	PRUSHNIPARNI	<i>Desmodium gangeticum</i> DC. (Fabaceae)		96 g
8	BRIHATI	<i>Solanum indicum</i> Linn. (Solanaceae)		96 g
9	KANTAKARI	<i>Solanum xanthocarpum</i> Schrad & Wendl (Solanaceae)		96 g
10	GOKSHURA	<i>Tribulus terrestris</i> Linn. (Zygophyllaceae)		96 g
11	KAPIKACCHU	<i>Mucuna pruriens</i> Bek (Fabaceae)	Seed	96 g
12	SHANKA PUSHPI	<i>Clitoria ternatea</i> L (Convolvulaceae)	Whole plant	96 g
13	SHATI	<i>Kaempferia galanga</i> L (Zingiberaceae)	Rhizome	96 g
14	BALA	<i>Sida rhombifolia</i> L (Malvaceae)	Whole plant	96 g
15	GAJAPIPLI	<i>Scindapsus officinalis</i> Schott (Araceae)	Fruits	96 g
16	APAMARGA	<i>Achyranthes aspera</i> Linn (Amaranthaceae)	Whole plant	96 g
17	PIPPALI MOOLA	<i>Piper longum</i> Linn (Piperaceae)	Root	96 g
18	CHITRAKA	<i>Plumbago indica</i> L (Plumbaginaceae)	Root	96 g
19	BHARNGI	<i>Clerodendrum serratum</i> Spreng (Verbenaceae)	Root	96 g
20	PUSHKAR MOOLA	<i>Inula recemosa</i> Hook. f.(Asteraceae)	Root	96 g

21	HARITAKI	<i>Terminalia chebula</i> Retz (Combretaceae)	Fruit rind	1.200 kg
22	YAVA	<i>Hordeum vulgare</i> Linn (Gramineae)	Seed	3.072 kg
23	GUDA	Jaggery		4.800 kg
24	GHRITA	Ghee		192 g
25	TAILA	Sesame oil		192 g
26	PIPPALI CHURNA	<i>Piper longum</i> Linn (Piperaceae)	Fruit	192 g
27	MADHU	Honey		192 g
28	Water for decoction			15.360 l. Reduced to 3.840 l.

Pharmacognostical evaluation:

Microscopic studies of *Avaleha* were done at Pharmacognosy Lab, I.P.G.T and R.A, Jamnagar.

5gms of *Avaleha* was suspended in the distilled water for 10 min and it was placed on slide by adding small quantity of water and observed under the microscope to get the microscopic characters of the ingredients of the *Avaleha*, then stained with phloroglucinol and concentrated HCl. Microphotographs were taken under the Carl Zeiss Trinocular microscope attached with camera.⁹

Organoleptic Characteristics:

Colour, Odour, Consistency and Taste were done as per standard procedures^{10,11}.

Physico-chemical evaluation of A H R:

Agastya Haritaki Rasayana (Avaleha) was subjected to physicochemical study in order to develop analytical profiles. In this phase following parameter were carried out -Loss on drying at 110°C, p^H value, ash value, acid insoluble ash, water soluble extractive, alcohol soluble extractive, determination of sugar.¹²

High Performance Thin Layer Chromatography.¹³

In HPTLC study of A H R, methanol extract of AHR was spotted on pre-coated silica gel GF 60₂₅₄ Aluminium plate by mean of Camag Linomate V sample applicator fitted with a 100µl Hamilton syringe. The mobile phase consisted of Chloroform: Methanol in a ratio of 9:1 v/v. After development, densitometric scan was performed with a Camag TLC scanner III in reflectance in absorbance mode at 254 and 366 nm under control of Win CATS Software (V1.2.1.Camag). Then, the plate was sprayed with Vanillin Sulphuric acid followed by heating and then visualized in daylight. Densitogram curve of HPTLC of A H R is given in figure A and B.

RESULTS AND DISCUSSION:

Pharmacognostical study

Microscopic Characters of A H R:

Diagnostic characters shows oil globules, group of sclereids, sclereids with narrow lumen, brown contents, simple starch grain, black debris epicarp of *Pippali*, parenchyma cells with brown content, micro prismatic crystals, pitted vessels, fragment of pitted vessels, simple starch grain with hilum, compound starch, prismatic crystal, mesocarp cell, rosette crystals, stone cells with lumen, spiral vessel and scalariform vessels,

epicarp cell of *Haritaki*, fibers, tannin content, pollen grain, group of stone cell with wide lumen, lignified vessel, lignified stone cell of *Pippali* fruit, simple trichome of *Haritaki*, rod shaped crystal, tracheid, oleoresin content of *Shati*, colouring content of *Chitraka* (PLATE NO 1 and 2)

Organoleptic Characters: Blackish brown in colour, sweet and astringent in taste, sweetish aromatic in odour and semisolid in consistency (Table 2)

Table 2 Organoleptic character:

Parameters	A H R
<i>Rupa</i> (Colour)	Blackish Brown
<i>Rasa</i> (Taste)	Initially sweetish ends in astringent.
<i>Gandha</i> (odour)	Sweetish aromatic
<i>Sparsha</i> (Consistency)	Semisolid

Physico-chemical Analysis :

Result of **Physico-chemical** analysis is placed at Table 3

Table 3 Physico-chemical Analysis

S N	Tests	A H R
1	Loss on drying	9.0746% w/w
2	Water soluble extract	71.1067% w/w
3	Alcohol soluble extract	44.93% w/w
4	PH	5
5	Ash Value	2.95% w/w
6	Acid insoluble Ash	0.39% w/w
7	Total Sugar	37.45% w/w
8	Reducing Sugar	15.05% w/w
9	Non-Reducing Sugar	22.4% w/w

High Performance Thin Layer Chromatography

HPTLC of A H R (Methanol extract) at 254 mm showed 5spots at R_f 0.02, 0.19, 0.35, 0.67, 0.72 and at 366 showed 5spots 0.02, 0.19, 0.37, 0.67, 0.94. (Table 4)

Table 4 HPTLC Results

A H R		
Wave length	No of Spots	R_f Value
366	5	0.02, 0.19, 0.37, 0.67, 0.94
254	5	0.02, 0.19, 0.35, 0.67, 0.72

FigA. HPTLC of A H R at 254 nm

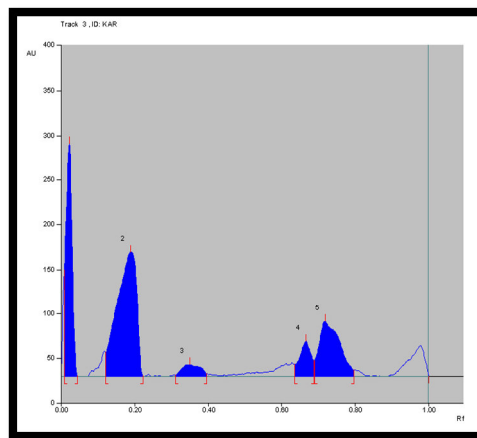
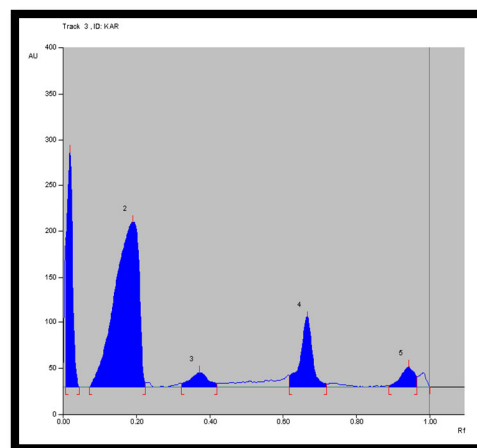


Fig B. HPTLC of A H R at 366nm



DISCUSSION:

Pharmacognostical evaluation showed that organoleptic characters of the sample was blackish brown in colour, sweet and astringent in taste, sweetish aromatic in odour and semisolid in consistency. Astringent taste of sample may be due to presence of *Haritaki* in more proportion in the formulation. Microscopical study showed that presence of epicarp cell of *Haritaki*, simple trichome of *Haritaki*, starch grain with hilum, epicarp cell of *Pippali*, rosette crystal, oleoresin content of *Shati*, group of sclereids, tannin content, prismatic crystals etc. shows that all the ingredients were present in the finished product and also proven that the purity of the finished

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product. Physicochemical values obtained in the present research work for AHR may be useful in similar future research works as till date there is no standard information available. The HPTLC showed that 5 spots at 254nm and 366 nm each. Among them 3 spots were of similar R_f at both 254 and 366nm which shows the chemical moieties composition.

CONCLUSION:

Study on A H R is a step towards pharmacognostical, physico-chemical standardisation of poly herbal formulation in *Avaleha* form. As there is no published information available on pharmacognostical and physico-chemical profiles of A H R, this preliminary information can be used for reference in future for similar research works.

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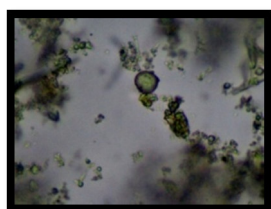
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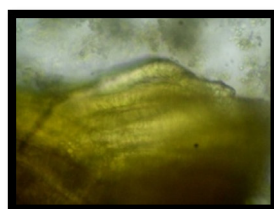
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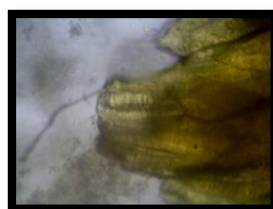
PLATE -1



Oil globule



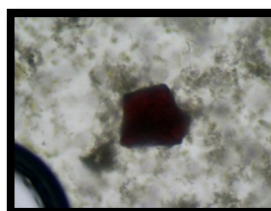
Sclereids



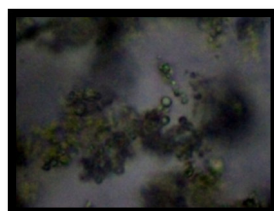
Group of Sclereids



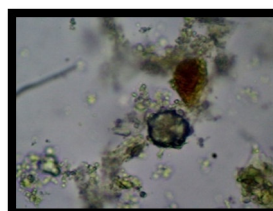
Sclereid with narrow lumen



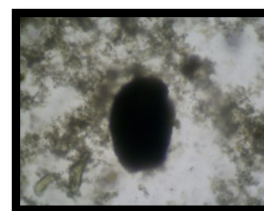
Tannin content



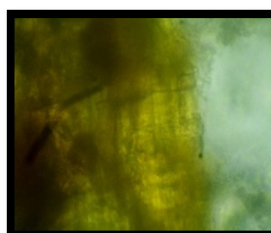
Simple starch granules



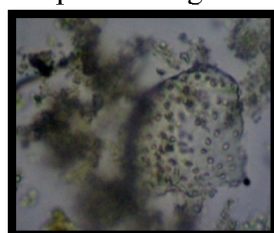
Rosette crystal



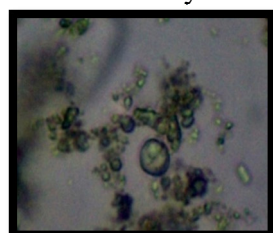
Black debris *Pippali*



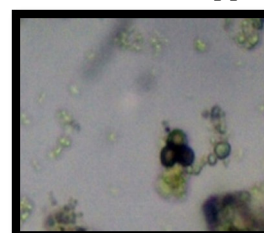
Parenchyma cell with brown content



Pitted vessel



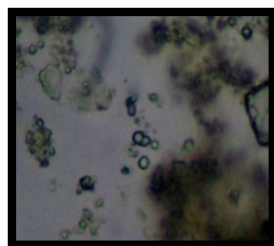
Starch grain with hilum



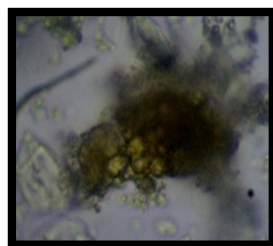
Compound starch grain



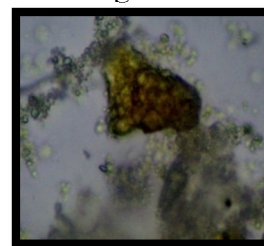
Prismatic crystal



Compound starch grain

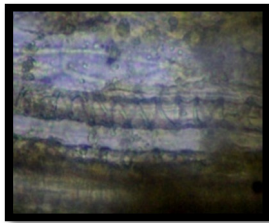


Mesocarp cell



Oleoresin content from *Shati*

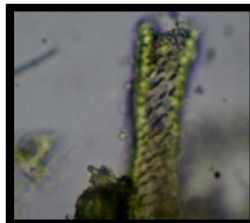
PLATE - 2



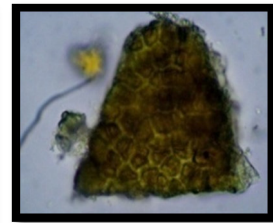
Spiral vessel



Prismatic crystal



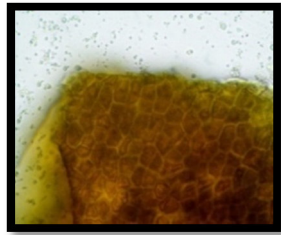
Scalariform vessel



Epicarp cell of *Haritaki*



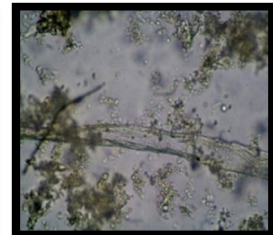
Lignified fibre



Epicarp cell of *Pippali* with tannin content



Pitted collenchymas



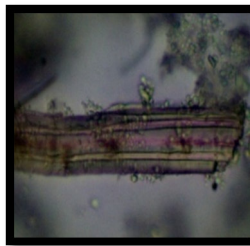
Simple fibre



Stone cell of *Pippali*



Tracheid



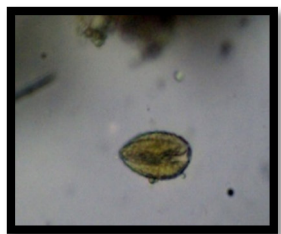
Simple vessel



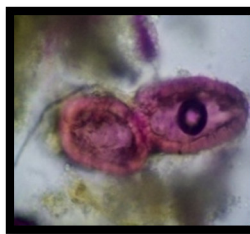
Pitted vessel



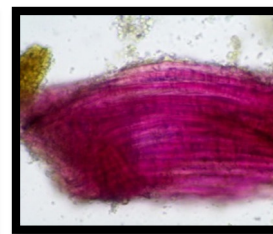
Simple trychome of *Haritaki*



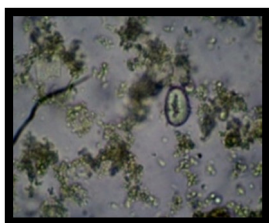
Pollen grain



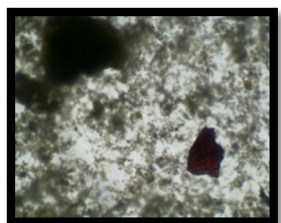
Stone cell with wide lumen



Group of sclereids



Starch grain with hilum



Colouring content from *Chitraka*



Stone cell



Tracheid