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PHARMACEUTICAL AND PHARMACOGNOSTICAL EVALUTION OF *CHITRAKA HARITAKI AVALEHA*-AN AYURVEDIC COMPOUND

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ABSTRACT

In Ayurveda, *Tamaka Shwasa* can corelate with Bronchial Asthma that is a clinical condition. Respiratory tract complaints are experience in higher rate and Bronchial asthma is frequently found in Paediatric OPD. Bronchial Asthma is characterized by Wheezing, Breathlessness, Chest tightness and Coughing. So to treat the disease *Tamaka Shwasa Chitraka Haritaki Avaleha (*CHA*)* was taken from *Bhaishajya Ratnawali*, well known text of Ayurveda. The present work was carried out to standardize the finished product CHA to confirm its identity, quality and purity. The pharmacognostical work reveals the presence of Bordered pitted vessel of *chitraka*, cluster crystal of *chitraka*, Black debris of *Maricha*, collenchyma cells of *Guduchi*, epicarp cells of *Haritaki*, pollen grain of honey, tannin content of *chitraka* and Oleoresin content of *sunthi* etc. Organoleptic features of CHA made out of the crude drugs were with in the standard range mentioned in the classic. The pH value of CHA was 4.5, Water-soluble extract was 79.85%w/w, Loss on drying was 14.258%w/w, Reducing sugar was 27.40%w/w and High Performance Thin Layer Chromatography(HPTLC) at 254nm and 366nm resulted into 3 & 2 spots respectively.

KEYWORDS: HPTLC, Lower Respiratory Disease, *Chitraka haritaki avaleha*, Pharmacognosy, Pharmaceutics.

INTRODUCTION

Asthma is the most common chronic lower respiratory disease in childhood throughout the world and Ayurveda address it as "*Tamaka Shwasa.*" There are five kinds of *Shwasa*: *Kshudra, Tamaka, Chhinna, Maha* and *Urdhava. Tamaka Shwasa* is a type of *Shwasa Roga* affecting the *Pranavaha Srotas. Pranavilomata (*abnormal breathing pattern), *Hridaya Pidana (*chest tightness), *Ruddha Shwaasa (*difficulty in breathing), *Ghurghuratvama (*wheeze) and *Kasa (*cough) are the cardinal features of the disease.[1] The pathophysiology clearly correlates with the *Tamaka shwasa* in Ayurveda explained as-*Vata* moving in the reverse order pervades the channels (of vital breath), afflicts the neck and head, and stimulates *Kapha* (phlegm) to cause *Margavarodha* (blockage of respiratory passage*)* by producing broncho constriction. *Tamaka Shwasa* classified as *Vata Pradhana* and *Kapha Pradhana. Tamaka Shwasa* is a "***Swatantra***" *vyadhi* having its own etiological factors, patho-physiology and management. It is mentioned as ***Yapya Vyadhi***[2] i.e. a disease of chronic nature in ***Charaka Samhita***, while ***Sushruta*** considered it as ***Krichha Sadhya vyadhi***. Asthma is most common lung disease in developing and developed countries affecting 4.5% of population[3], prevalence of asthma in India is 2.05-3.5%.[4] According to WHO Report prevalence of Asthma in India 17-30 million people suffering with asthma. Non-judicious use of Antibiotics, Bronchodilators, antiallergic, inhaler, cough expectorant in contemporary system of medicines during present era has led to iatrogenic suppression of host immunity and birth of multidrug resistant traits of pathogens.[5] *Chitraka Haritaki Avaleha* (CHA) is an Ayurvedic Compound indicated for the disease *Tamaka Shwasa* in text *Bhaishajya Ratnawali.*[6] The present work was carried out to standardize and evaluate the pharmacognostical as well as to analyse the physic-chemical properties of *Chitraka haritaki Avaleha*.

MATERIALS AND METHODS

Drug material

All the raw drug were obtained from Pharmacy of Gujarat Ayurved University, Jamnagar.

Method of Pharmacognostical evalution

Raw drugs were identified and authenticated by the pharmacognosy lab, IPGT & RA, Jamnagar. The identification were carried out based on the morphological features and organoleptic characters. For Pharmacognostical evalution, drugs studied under the corl zeiss

Trinicular microscope attached with camera, with stain and without stain.[7] The microphotographs were also taken under the microscope.

Method of preparation of *Chitraka Haritaki Avaleha*

All the preauthentic raw drugs were taken for the preparation(Table 1).The classical formulation of the *Chitraka Haritaki Avaleha* is mentioned in the classical text of *Bhaishajya Ratnawali* in *Nasa Rogadhikar Chikitsha*.

Table 1: Ingredients Of *Chitraka Haritaki Avaleha.*

Sr.No.	Drug name	Scientific name/English name	Part used	Ratio
1	***C**hitraka*	*Plumbago zeylanica* Linn.	*Mula*	25part
2	*Amalaki*	*Emblica officinalis* Gaertn.	*Phala*	25part
3	*Guduchi*	*Tinospora cordifolia* Mier ex Hook	*Kanda*	25part
4	*Haritaki*	*Terminalia chebula* Retz.	*Phala*	32part
5	*Bruhti*	*Solanum indicum* Linn.	*Mula*	2.5part
6	*Kantkari*	*Solanum surattense* Burm.	*Mula*	2.5part
7	*Shalparni*	*Desmodium gangeticum* DC.	*Panchanga*	2.5part
8	*Prishnaparni*	*Uraria picta* Desv.	*Mula*	2.5part
9	*Gokshura*	*Tribulus terrestris* Linn.	*Mula*	2.5part
10	*Gambhari*	*Gmelina arborea* Linn.	*Mula*	2.5part
11	*Patla*	*Stereospermum suaveolens*DC.	*Mula*	2.5part
12	*Shyonaka*	*Oroxylum indicum* Vent.	*Mula*	2.5part
13	*Agnimantha*	*Premna mucronata* Roxb.	*Mula*	2.5part
14	*Bilva*	*Aegle marmelos* Corr.	*Mula*	2.5part
15	*Yavakshara*	Alkaline substance of *Hordeum vulgare*	*Water soluble ash of plant*	1/4part
16	*Guda*	Zaggery	-	50part
17	*Madhu*	Honey	-	4part
		PRAKSHEP DRAVYA-		
18	*Sunthi*	*Zingiber officinale* Rosc.	*Kanda*	1part
19	*Maricha*	*Piper nigrum* Linn.	*Phala*	1part
20	*Pippali*	*Piper longum* Linn	*Phala*	1part
21	*Dalchini*	*Cinnamomnm zeylanicum* Breyn	*Twak*	1part
22	*Ela*	*Elettaria cardamomum* Maton.	*Bija*	1part
23	*Tejpatra*	*Cinnamomum tamala* Nees&Eberm	*Patra*	1part

Method of Physio-chemical evalution

Chitraka Haritaki Avaleha was analyzed by using standard qualitative and quantitative parameters, HPTLC was carried out after making appropriate solvent at the Pharmaceutical Chemistry lab, I.P.G.T & R.A. Gujarat Ayurved University, Jamnagar. Presence of more moisture content in a sample may create a preservation problem. Hence Loss on drying[8] was also selected as one of the parameters. Water Soluble Extract[9], Methanol Soluble Extract[10],

pH[11], Reducing, Nonreducing and Total sugar selected as the parameters. Organoleptic parameters, Physiochemical analysis, investigations were carried out by following standard procedure. High thin layer chromatography (HPTLC) studies were carried out with acid hydrolised 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 100µL Hamilton syringe. The moble 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 10cm^2) and spots were detected in short U.V. (254nm), Long U.V.(366nm). Camag Scanner II (Ver. 3.17) were used for documentation.

RESULT AND DISCUSSION

Pharmacognostical study

Microscopically evalution is very important in the initial identification of ingredients as well as in the detection of adulterations. Identification of original drug is the first step to maintain the quality of the final product. Microscopically Study of *Chitraka haritaki avaleha* showed black debris of *Maricha,* Bordered pitted vessel of *chitraka,* Cluster crystal of *Chitraka,* Collenchyma cells of *Guduchi*, cork cells of *Twak,* Crystal fibres of *Shyonak,* Epicarp cells of *Haritaki,* Fibre of *Brihati*, Fibre ofA*malaki*, Group scleroids of *Bibitaki*, Lignified cork of *Shyonak,* Mesocarp cells of *Amalaki,* Oil globule of *Ela,* Oil globules of *Tejpatra,* Oleoresin content of *Shunthi,* Pitted vessel of *Agnimatha,* Pollen grain of Honey, Prismatic crystal of *kantakari,* Prismatic crystal of *Gokshura,* Rhomboidal crystal of *Gambhari,* Rhomboidal crystal of *Bilwa,* Rosette crystal crystals of *Bibitaki,* Scleroids of the *Haritaki,* Simple unicellular trichome of *Shalparni*, Spiral vessel of *Prashnaparni*, Stellate trichome of *Kantakari*, Stone cells of *Haritaki,* Stone cells of *Maricha,* Stone cells of *Patla,* Stone cells of *Pippali,* Stone cells of *Twak,* Stone of *Shyonak,* Tannin content of *Chitraka,* Tannin content of *Patla* and Trichome of *Bibitaki* **(Figure 1).** All the ingredients were authenticated with help of characters mentioned in API.

Organoleptic study

Organoleptic features of *Chitraka haritaki avaleha* were observed like semisolid in consistency, Dark brown in colour, Sweetish aromatic in odour, Sweetish sour ends with Astringent in taste are described in the **Table 2.**

Table 2: Results of organoleptic features.

Sr No.	Physical appearance	Group A (*Chitraka haritaki avaleha*)
1.	**Color**	Dark brown
2.	**Odour**	Sweetish Aromatic
3.	**Taste**	Sweetish sour ends with Astringent
4.	**Touch**	Semisolid

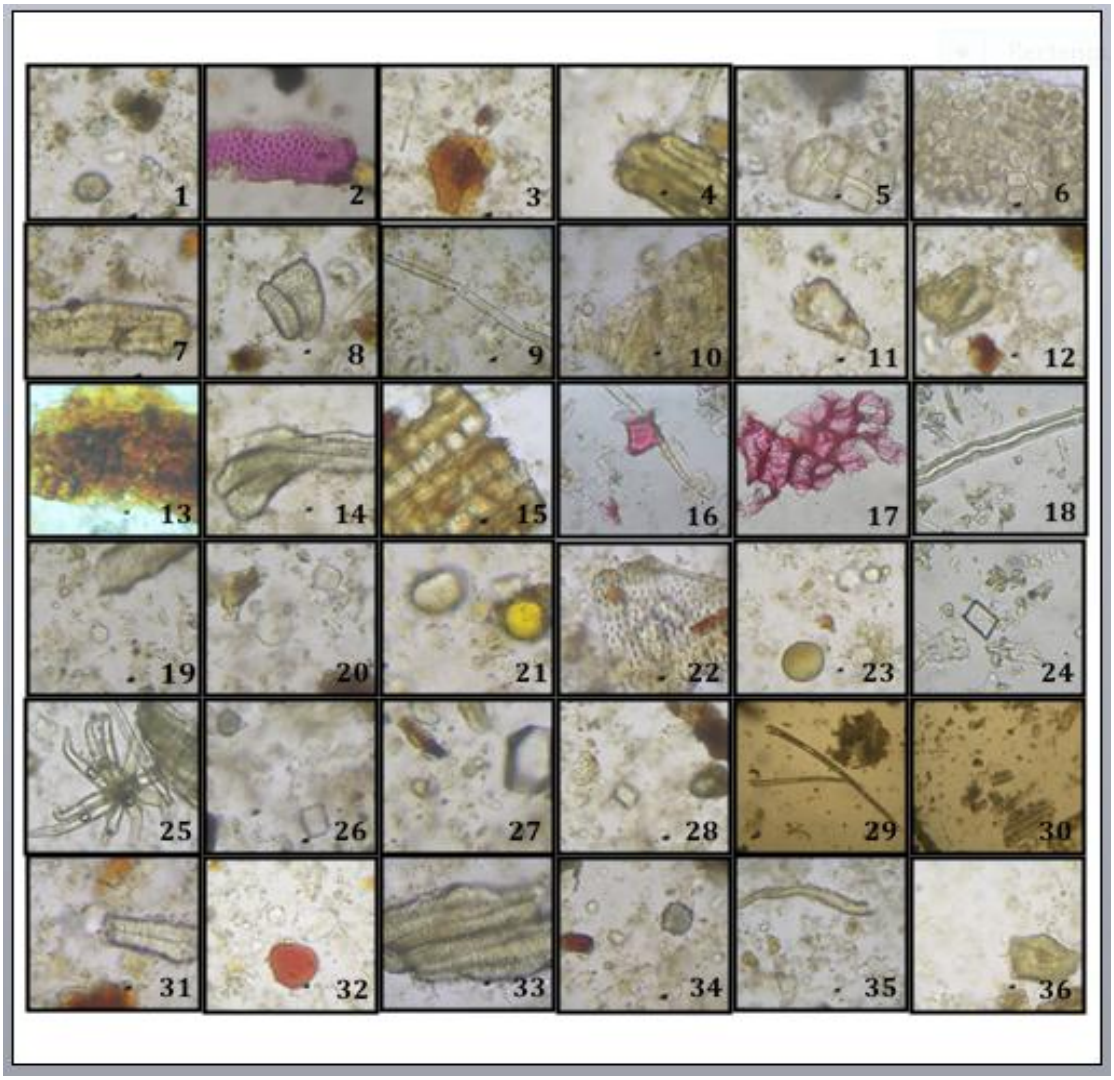

Figure 1: Organoleptic characters of *Chitraka haritaki avaleha*

(1) Cluster crystal of *Chitraka*, (2)Bordered pitted vessel of *Chitraka*, (3)Tannin content of *Chitraka*, (4)Scleroids of *Chitraka*, (5)Collenchyma cells of *Guduchi*, (6)Epicarp cells of *Haritaki*, (7)Scleroids of *Haritaki*, (8)Stone cells of *Haritaki*, (9)Fibres of *Amalaki*, (10)Mesocarp cells of *Haritaki*, (11)Black debris of *Maricha*, (12)Stone cells of *Maricha*, (13)Cork cells of *Twak*, (14)Stone cells of *Twak*, (15)Crystal fibre of *Shyonak*, (16)Stone of *Shyonak*, (17)Lignified cork of *Shyonak*, (18)Fibre of *Bruhati*, (19)Oil globule of *Ela*, (20)Oil

globule of *Tejpatra*, (21)Oleoresin content of *Shunthi*, (22)Pitted vessel of *Agnimantha*, (23)Pollen grain of Honey, (24)Prismatic crystal of *Kantakari*, (25)Stellate trichome of *Kantakari*, (26)Prismatic crystal of *Gokshura*, (27)Rhomboidal crystal of *Gambhari*, (28)Rhomboidal crystal of *Bilva*, (29)Simple unicellular trichome of *Shalaparni*, (30)Spiral vessel of *Prishnaparni*, (31)Stone cells of *Patla*, (32)Tannin content of *Patla*, (33)Group scleroid of *Bibhitaki*, (34)Rosette crystal of *Bibhitaki*, (35)Trichome of *Bibhitaki*, (36)Stone cells of *Pippali*

Phsyico-chemical parameters

Chitraka haritaki avaleha was analyzed using various standard physio-chemical parameters such as loss on drying, ash value ,water soluble extract, methanol soluble extract, Reducing, Nonreducing, Total Sugar and pH value[12]**(Table 3).** Loss on drying parameter was 14.258%w/w, pH found 4.5%,Ash value were found .787%w/w, Water soluble extract was 79.85%w/w, Methanol Soluble extract was found 89.2%w/w. Reducing sugar, nonreducing sugar and Total parameters were found 27.40%w/w, 7.12%, 37.02% respectively.

HPTLC Results

On performing HPTLC, visual observation under UV light showed few spots but on analyzing under densitometer much more was observed and at 254nm the chromatogram showed 3 peaks and at 366nm the chromatogram showed 3 peaks**(Figure 2).** 3 peaks were found at Rf value .02,.10, and .87 in 254nm wavelength while at 366 nm wavelength 2 peaks were found at Rf value .02 and .92**(Table 4).**

Table 3: Results of physio-chemical parameters.

Sr No.	Test name	Group A results (*Chitraka haritaki avaleha*)
1.	**Loss on drying**	14.258%w/w
2.	**Water soluble extracts**	79.85%w/w
3.	**Methanol soluble extracts**	89.2%w/w
4.	**Ash value**	.787%w/w
5.	**pH value**	4.5
6.	**Reducing sugar**	27.4%
7.	**Nonreducing sugar**	7.12%
8.	**Total sugar**	37.02%

Table 4: Results of HPTLC Study.

Rf values	254nm	366nm
	.02,.10,.87	.02,.92

Results of HPTLC

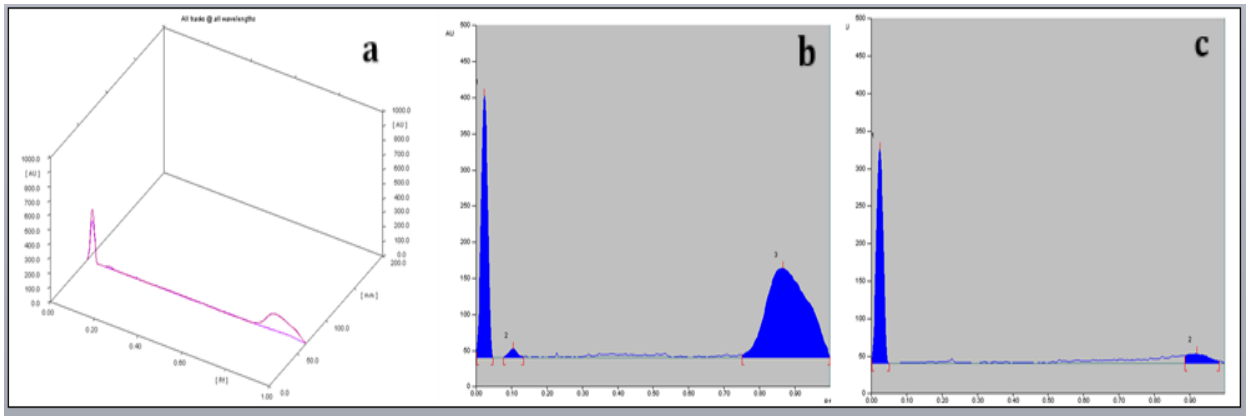

Figure 2: Results of HPTLC

(a) 3D Graph: 254nm & 366nm of *Chitraka haritaki avaleha,* (b) Chromatographic results (Peak display) of Short ultra violet (254nm), (c) Chromatographic results (Peak display) of *Chitraka haritaki avaleha* Long ultra violet (366nm)

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CONCLUSION

Chitraka haritaki avaleha is a potent drug in the management of disease *Tamaka Shwasa.* Organoleptic features and transverse section microscopy of the individual drugs results confirm the genuisity and no adulteration were found. For Authentication, All the ingredients were compared with the parameters mentioned in API(Ayurvedic Pharmacopia of India). No major changes were found during Pharmaceutical Study. The Results of this Study may be used as the refence standard in further research undertaking of its kind.

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