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Pharmacognostical and Pharmaceutical Analysis of Haritakyadi Vataka: An Ayurvedic Herbomineral Formulation for Amajirna

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Abstract

Background: *Haritakyadi Vataka* is mentioned by Acharya Bhavprakash as a drug for the management of *Amajirna.*[1]So, for initialization of standardization and assurance of the quality of herbal compounds pharmacognostical and pharmaceutical analysis should be done.

Methods: *Haritaki* and *Sunthi Churna* were subjected to microscopic evaluation for pharmacognostical and physicochemical analysis like Loss on drying, Specific gravity, Saponification, Refractive index, Acid value and High-performance Thin Layer Chromatography (HPTLC).

Results: Pharmacognostical study showed the presence of certain identifying characters of the ingredients of *Haritakyadi Vataka* like *Haritaki, Sunthi*. In pharmaceutical study, preliminary physiochemical analysis showed that loss on drying in *Haritaki* and *Sunthi Churna* was 3.25 and 4.07%w/w, ash value 3.07%w/w and 5.76%w/w, water soluble extract 24.1% and 10.44%, alcohol soluble extract 19.7% and 7.6% and Ph value 5 and 6.5 respectively.

Conclusions: Pharmacognostical and physico-chemical observations revealed the specific characteristics of all active constituents of *Haritakyadi Vataka* and confirmed the purity and genuinity of the drug.

Keywords: *Haritakyadi Vataka*, *Amajirna* Pharmacognosy, Pharmaceutical analysis

Introduction:

Ajirna means indigestion is the most common complaint in day-to-day life. In Ayurveda classics *Agni* has been given prior importance and it is one of the most important fundamental principles. The nomenclature of *Ajirna* is done based on causative *Dosha*. That is why the nomenclature of *Vatika* and *Pittaja Ajirna* is done by using words *Vistambha and Vidagdha* presents the pathogenesis of respective types of *Ajirna* similarly the *Ama* word represents that, the *Ama* and *Sleshma* comprises similar *Guna* which generates large amount of *Sleshma Pradhana Ama* through *Sammurcchana* which is responsible for the *Amajirna.* Therefore, *Ajirna* which possesses *Ama* as a main entity in the generation of pathology is termed as *Amajirna.* Due to the hypo-functioning of the *Ushma (Agni),* the first *Dhatu* i.e., the *Rasa* is not properly formed. Instead, the *Annarasa* (taken food) undergoes *Dustatva* (fermentation or putrefaction) being retained in the *Amashaya* (small intestine). It is the state of *Rasa* which is called *Ama* and it is responsible for the manifestation of many major and chronic diseases.[2]

Due to excessive drinking of water, irregular taking food, irregular sleeping habits and suppression of the natural urges, the food do not get digested even if taken at a proper time, is wholesome or is light.[3] The long-term indulgence of etiological factors generates initially *Jatharagnimandhya*. The *Dosha-Dushya Sammurchana* for *Ajirna* is takes place in mostly in *Amashaya* as it is the *Vikara Adhisthana* for *Ajirna*. Along with that *Kledaka Kapha*, *Pachaka Pitta*, *Samana Vata* and *Apana Vata* have impact on *Agni*. Due to *Nidana Sevana* these *Doshas* get vitiated, this condition leads to indigestion, which generates abundant amount of undigested food material. Thus, vitiated *Agni*, does not digest even light food. This undigested food becomes sour in taste and (because of which) it works like poison. This *Dushita Agni* vitiates all three types of *Doshas*. As a result of these systemic symptoms occurs like *Angamarda*, *Aruchi*, *Alasya* etc.[4]

In the present era, due to lifestyle of Urban society there is large number of populations suffering from *Agnimandhya* which can result into *Amajirna*. Unawareness of proper diet and dietary habits is one of the causes for impairment in functioning of *Agni*. Fasting, over eating, diet taken at irregular timing, excessive heavy, oily, spicy and repeatedly fried items, junkfood, meals taken at irregular timings are the primary causes leading to hampering *Agni* which can further cause digestive disturbances. Belchings immediately after taking food, nausea, vomiting, puffy face and swelling of eyes, heaviness of abdomen are the common symptoms of *Amajirna*[5]. The drugs which are helpful to increase appetite and improves digestion are helpful for the treatment of *Amajirna*. If not treated in early stage it becomes more complicated and further leads to chronic diseases.

In the case of internal administration of herbal drug, it should be safe, effective, and free from adulteration, with appropriate quantity and ingredients. It is difficult to identify the herbal drug in dry or powdered form. So, it is a need of time to set proper parameters for standardization of herbal drugs. Pharmacognostical studies reveal plant identification and set parameters for standardization which can be done in the case of herbal traditional medicine. Generally, the physiochemical and analytical study of drugs helps to interpret the pharmacokinetics and pharmacodynamics involved. With the help of physiochemical analytical studies, it is possible to standardize the drug and differentiate the adulterants. High-performance liquid chromatography (HPLC) and thin-layer chromatography (TLC) are the conventional methods used in the analysis of secondary metabolites originating from plants. It is necessity of time in the field of Ayurveda to go for quality control of the raw drugs as well as final products using modern parameters which provides credibility to Ayurvedic medicines and help in the globalization of Ayurveda. Hence to evaluate the Authenticity of *Haritakyadi Vataka* through various pharmacognostical procedures, and to develop the pharmacognostical and pharmaceutical profile of *Haritakyadi Vataka* the present study was carried out. The drug "*Haritaki+Sunthi+Guda*" has been selected for *Amajirna* treatment due to their *Dipana*, *Anulomana* and *Ama Pachana* properties.

Materials and Method: Collection, identification, and authentication of raw drugs.
The raw materials were procured from the pharmacy of ITRA Jamnagar, outside authentic source and the raw drugs were identified and authenticated in the pharmacognosy laboratory of Institute of teaching and research in Ayurveda, Ministry of Ayush, Gov. Of India, Jamnagar. The ingredients and part used of *Haritakyadi Vataka* they are given in following table.

Table No. 1: Ingredients of *Haritakyadi Vataka*

No,	Name of drug	Botanical/English Name	Part used	Proportion
1	*Haritaki*	*Terminalia Chebula* Retz.	Fruit	1 part
2	*Sunthi*	*Zingiber Officinale* Roscoe.	Rhizome	1 part
3	*Guda*	Jaggery	-	2 part

Method of preparation: The essential ingredients *Haritaki* and *Sunthi Churna* were collected from pharmacy of ITRA, Jamnagar and subjected to test all the parameters regarding safety and efficacy was done. After validation of the same, they were taken in same quantity and *Guda* was added in sufficient quantity of the mixture. Then mixing the ingredients properly, *Vataka* was prepared from that which was round, brownish in colour, smooth in touch and little pungent taste as well as smell and having properties like *Dipana-Pachana*.

Organoleptic study: The genuinity of formulation can be fined with organoleptic characters of the given sample. Organoleptic parameters comprise of color, odour, and touch of *Haritakyadi Vataka* which was scientifically studied as per the standard references.

Microscopic study: The ingredients were taken in powder form and dissolved with water and microscopy of the sample was done without stain and after staining with phloroglucinol and HCl. Microphotographs of all ingredients of the drug were also taken under Corl-zeisstrinocular microscope.[6]

Physico-chemical analysis-With the help of various standard physico-chemical parameters, the ingredients were analyzed. The common parameters mentioned in Ayurvedic Pharmacopeia of India,[7] and CCRAS[8], guidelines are loss on drying, specific gravity, acid value, saponification, and refractive index.

High-Performance Thin Layer Chromatography (HPTLC)- It is a powerful analytical method suitable for the separation and quantitative determination of a considerable number of compounds even from complicated matrix. HPTLC is used for identification of active constituents, identification and determination of impurities and quantitative analysis of active constituents. Principle of HPTLC remains the same as of TLC i.e., absorption. One or more compounds can be spotted in a thin layer of adsorbent coated on a chromatographic plate. The mobile phase solvent flows through because of capillary action against gravitational force. The component with more affinity towards stationary phase travels faster. Thus, the components are separated on a thin layer chromatographic plate based on the affinity of the components towards the stationary phase. For the given drug pre-chromatographic derivatization of oil sample performed on plate using 4% alcoholic KOH.

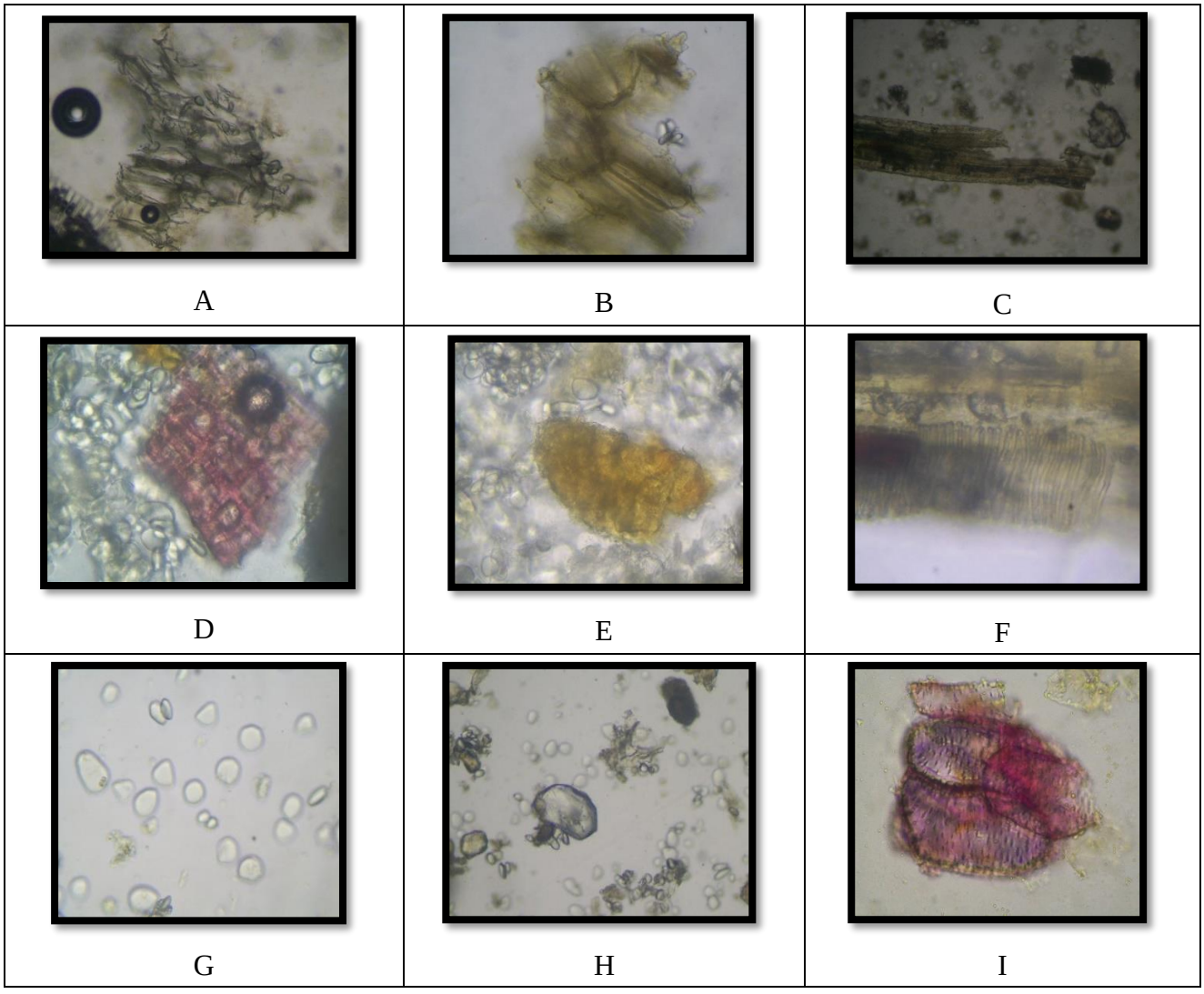
Observation and results: The initial purpose of the study was to confirm the authenticity the drugs used in preparation of *Haritakyadi Vataka*. For this, all ingredients were subjected to organoleptic and microscopic evaluations to confirm the genuineness of all the raw drugs. Later after the preparation of formulation, pharmacognostical evaluation was carried out. **Organoleptic evaluation-** The organoleptic characters of the *Churna* were recorded as below.

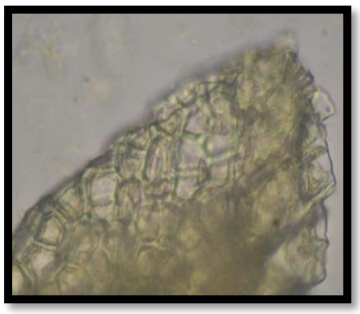
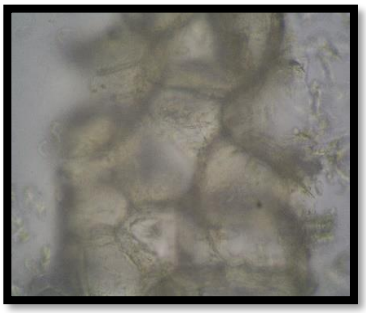
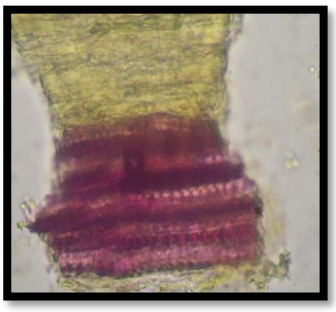
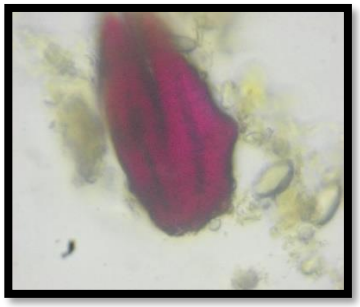
Table No. 2- Organoleptic Characters

Sr. No.	Characters	*Haritaki Churna*	*Sunthi Churna*
1	Colour	Creamish Yellow	Greenish
2	Odour	Pungent	Astringent
3	Taste	Strong Pungent	Astringent
4	Touch	Very fine	Very fine

Microscopic evaluation: The microscopic evaluation was conducted by dissolving the ingredients of *Haritakyadi Vataka* in the distilled water and studied under microscope for the presence of characteristics of ingredient drugs. The diagnostic characters of *Sunthi* shows cork cells(Figure 1 A), cork in surface view(Figure 1 B), group of fibres(Figure 1 C), lignified elements(Figure 1 D),olioresin(Figure 1 E), scariform vessels(Figure 1 F)simple starch grains(Figure 1 G), silica deposition(Figure 1 H),Characters of Haritaki shows group of stone cells(Figure 1 I),epicarp cells(Figure 1 J),mesocarp cells(Figure 1 K),group of scleroids(Figure 1L),scleroid(Figure 1M),stone cell(Figure 1N).

Figure 1



 J	 K	 L
 M	 N	

Physio-chemical parameters: Physio-chemical parameters like Loss on drying, Specific gravity were found within the normal range. Details is shown in the Table 3.

Table No. 3- Physico-chemical parameters

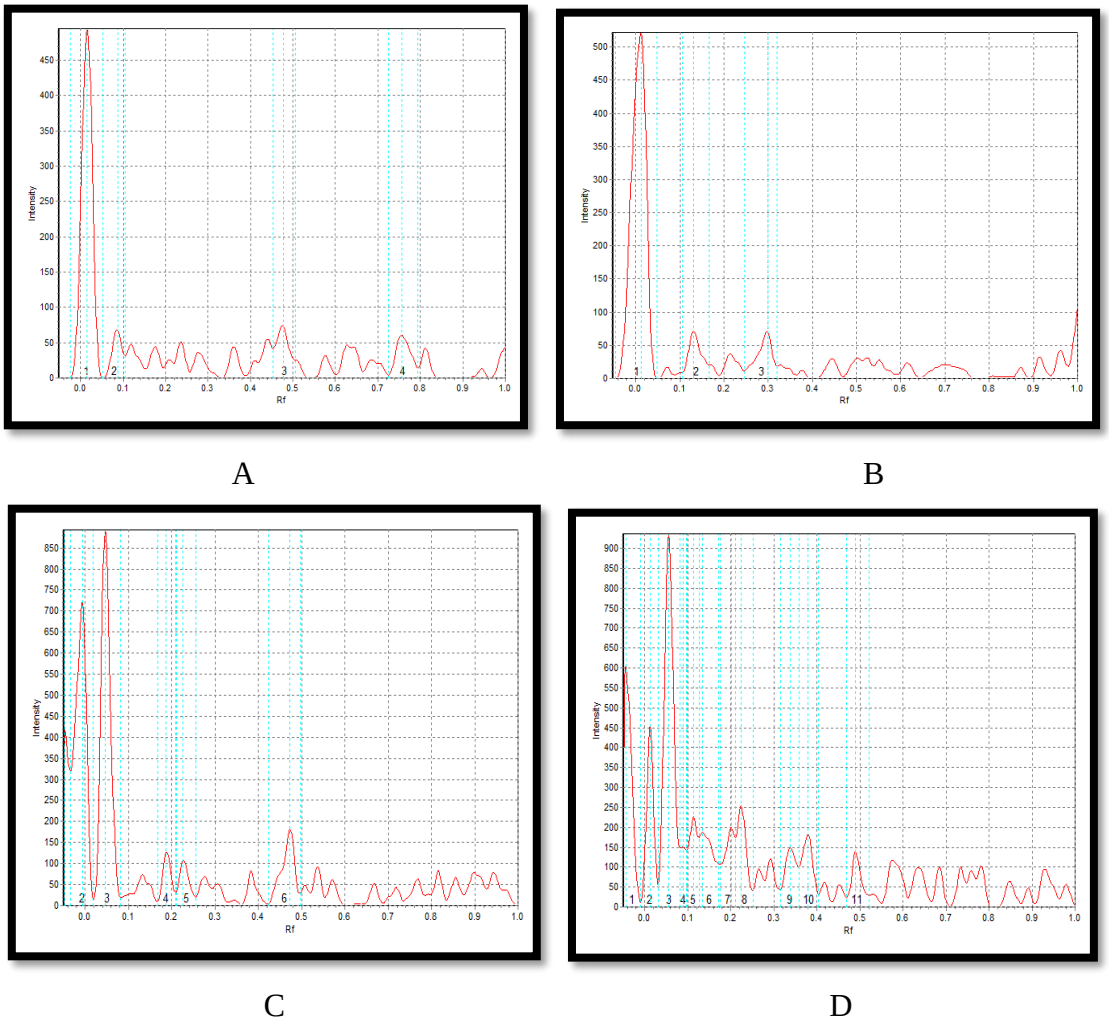
Sr. No.	**Test**	*Haritaki Churna*	*Sunthi Churna*
1	Loss on drying (%W/W)	3.25	4.07
2	Ash Value (%W/W)	3.07	5.76
3	Water soluble extract (%)	24.1	10.44
4	Alcohol soluble extract (%)	19.7	7.6
5	pH value (Hydro extract)	5	6.5

High-performance thin layer: Densitometry scanning of the HPTLC pattern of *Sunthi Churna* showed 4 spots (Figure 2 A) at corresponding R_f values 0.01,0.09,0.48,0.76 in short wave UV 254 nm and in *Haritaki Churna* at 0.01,0.13,0.3Figure 2 B) 6 spots at corresponding R_f values 0.05, 0.01,0.05,0.19,0.23,0.47 obtained in long wave UV 366 nm of *Sunthi Churna* (Figure 2C) & R_f values 0.22,0.34,0.38,0.49 obtained for *Haritaki Churna*.(Figure 2 D). Though it is not possible to identify chemical constituent from the spot obtained, the pattern may be used as a reference standard for further quality control researches.

Table No. 4: R_f Values of *Haritaki &Sunthi Churna*

Variable	**R_f value at 254 nm**	**R_f value at 366 nm**
HPTLC (*Sunthi Churna*)	0.01,0.09,0.48,0.76	0.05,0.01,0.05,0.19,0.23,0.47
HPTLC (*Haritaki Churna*)	0.01,0.13,0.3	0.22,0.34,0.38,0.49

Figure 2



A B

C D

DISCUSSION:

Study on *Haritakyadi Vataka* was a step towards pharmacognostical and pharmaceutical standardization of the drug. The pharmacognostical study revealed the presence of the diagnostic characters of *Sunthi Churna* are cork cells, group of fibres, lignified elements,olioresin, scariform vessels, simple starch grains, silica deposition and epicarp cells, mesocarp cells, group of scleroids, scleroid, stone cell are there of *Haritaki Churna*.This confirms the presence of all ingredients of raw drugs in the final product and there is no major change in the microscopic structure of raw drug during the preparation of *Vataka* , This showed the genuinity of the final product. All the physio-chemical parameters, Specific gravity, Saponification, Loss on drying and Refractive index were analyzed and found to be in normal referential range. In this, acid value gives the level of fatty acid in oil, saponification value gives the level of saponifiable matter. Refractive index, Specific gravity are the attributes which are specific to oil. Unsaponifiable matter is then used for HPTLC. In HPTLC study aluminum plates precoated with silica gel as the stationary phase and the mixture of hexane:toluene:acetic acid (3:7:1 v/v/v) was used as the mobile phase. Then densitometric analysis was carried out and the result was obtained as shown in table no.4 indicating its possible components of matrix which may possess its therapeutic effect. Hence used for standardization purpose.

Conclusion: The pharmacognostical and physico-chemical analysis of ingredients of *Haritakyadi Vataka* confirmed the purity and genuinity of the drug. As no standard fingerprint is available for this formulation,

an attempt has been made to evolve pharmacognostical and physico-chemical profiles of *Haritakyadi Vataka.* Information acquired from this study may be beneficial for further research work and can be used as a reference standard for quality control researches.

Reference

1. Bhavamishra, Bhavaprakasha of Shree Bhava Mishra, edited with Vidyotini Hindi commentary by Pandit shri Brahma Shankara Mishra Vol. II, Madhyama Khanda 6. Chaukhambha Sanskrita Bhavana 2018 pg.183
2. Brahmanand Tripathi, Ashtanga Hridaya of Srimadvagbhatta Reprint edition, Sutrasthana 13/25 Varanasi:Chaukhambha Orientelia;2016 pg.188
3. Acharya Y.T, Acharya NR, Sushruta Samhita, Chaukhambha Reprint Edition, Sutrasthana 46/501 Varanasi:Chaukhambha Orientelia;2014 pg.254
4. Acharya Y.T. Charaka Samhita, Chakrapani Commentary, reprint edition, Chikitsasthana 15/44, Chaukhambha Orientalia, Varanasi,2020, pg-517
5. Brahmanand Tripathi, Ashtanga Hridaya of Srimadvagbhatta Reprint edition, Sutrasthana 8/25 Varanasi:Chaukhambha Orientelia;2016 pg.139
6. Wallis TE, Text book of Pharmacognosy, 5th edition, New Delhi: CBS Publisher & Distributors, 2002; 123-132, 210-215.
7. Anonymous, Protocol for testing of Ayurveda, Siddha & Unani medicines, Pharmacopoeial laboratory for Indian medicines, Ghaziabad, Ministry of AYUSH, Government of India
8. Anonymous, Parameters for qualitative assessment of Ayurveda, Siddha drugs, CCRAS, New Delhi, 2005.