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ORIGINAL RESEARCH ARTICLE

Pharmacognostical and Pharmaceutical Assay of *Treesa Haritaki (Terminalia chebula* Retz.)

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ABSTRACT

Context: Ayurveda has abundant collection of effective single and poly herbal formulations against diseases. In the era of increasing demand for traditional medicines, maintaining quality standards is must. *Haritaki* (*Terminalia chebula* Retz.) is one of vastly used drug in various ayurvedic formulations.

Aims: The present study was aimed at setting a standard pharmacognostical and pharmaceutical profile of *Treesa Haritaki*.

Materials and Methods: *Treesa Haritaki* (*Terminalia chebula* Retz.) was subjected to pharmacognostical, physicochemical, phytochemical and HPTLC analysis as per standard protocols.

Results: Pharmacognostical findings of the drug are yellowish brown tannin contain, starch grain, simple and lignified scleroids etc. Physico-chemical parameters are as per API standard protocol. HPTLC gave the fingerprint of the drug with thirteen and eight spots on short and long UV, respectively.

Conclusions: The quality of *Haritaki Churna* can be tested by series of pharmacognostical, physicochemical, phytochemical and HPTLC screening for its authenticity as per finding of the present study.

Key words: *Treesa Haritaki* (*Terminalia chebula* Retz.), HPTLC, pharmacognosy, physicochemical, phytochemical,

INTRODUCTION

Acharya Charaka described *Haritaki* primarily in first Chapter of *Chikitsa Sthana*.[1] It is mentioned as *Pathyanama*[2] and most useful in *Vata-Kaphaja* diseases.[3]

Tree of *Haritaki* is moderate sized, much-branched. Leaves are 2.5-6 by 1.5-3 cm in length, not clustered, alternate or subopposite, elliptic–oblong, acute, penninerved, clothed when young with silky hairs, glabrous or nearly so when mature, rounded or cordate at the base; petioles ½-1 in long, pubescent, usually with 2 glands near their summit. Flowers all hermaphrodite, in terminal (often panicled) spikes, bracteoles exceeding the flowers, linear, acute, hairy, conspicuous among the buds but soon deciduous. Drupe is pendulous, ¾-1.5 cm in. Long, ellipsoid or obovoid from a broad base, glabrous, more or less 5-ribbed when dry, yellowish-green; stone oblong, bony, very thick or obscurely angled.[4]

Haritaki(*Terminalia chebula* Retz.) is one of vastly used drug in various ayurvedic formulations. Some of *Amayika prayoga* (Therapeutic usage) of *Haritaki* are mentioned. *Haritaki* almost alleviates disorders caused by oversaturation.[5] *Haritaki* taken with salt, *Ghee* and *Sunthi* pacifies *Vata*, *Pitta* and *Kapha* respectively. However, with *Guda*(jaggary) it destroys all diseases.[6] *Haritaki* taken with *Guda*(Jaggary) is useful in *Gulma*.[7]*Haritaki* mixed with *Guda*(Jaggary) pacifies *Pitta* and

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Kapha, removes scabies, itching and destroys piles.[8] In Hiccup, one should take *Haritaki* with warm water.[9] In difficulty elimination of impurity, *Haritaki* should be given to expel it.[10] while in *chhardi*(vommiting) one should take *Haritaki* with honey.[11] As per *Vriddha Vagbhatt*, *Haritaki* with honey should be taken in *Prameha*.[12] *Haritaki* impregnated with and suspended in cows urine should be given in *Kaphaja Pandu*.[13] patients who are suffering from *Vatavyadhi* should use *Haritaki*, *Guggulu* and *Shilajatu*.[14] In defects of semen caused by *Pitta*, *Abhaya-Amalaki Rasayana* is indicated.[15] In case of foul smell of breast milk the women should take *Haritaki* powder with *Trikatu* and honey.[16] *Haritaki* is an important ingredient in *Vaishwanara Churna*[17], *Abhayarista*[18], *Haritaki Leha*[19], *Agatsya Haritaki*[20],*Pathya Grita*[21]

Selection of *Haritaki* is based on weight of drug in *Ratala* (1 *Ratala*= 466 gm). Name of *Haritaki* in market are *Visa*, *Trisa*, *Chalisa Haritaki* etc. *Haritaki Visa* means that in 466 gm of weight, number of *Haritaki* are 20. In *Haritaki*(*Trisa*), 466gm of weight, number of *Haritaki* are 30. In 1 kilogram, it may contain total 70 pieces of *Haritaki* approximately.

In the present study, *Treesa Haritaki*(*Terminalia chebula* Retz.) was subjected to pharmacognostical (powder microscopy), pharmaceutical (evaluation of various physicochemical and phytochemical parameters) and HPTLC evaluation in order to prepare profile of the drug.

MATERIALS AND METHODS

Collection and Authentication of Raw Drugs

Treesa type of *Haritaki* (*Terminalia chebula* Retz.) was collected from raw drug market, Rajkot (Gujarat). Pharmacognostical authentication of drug was done based on the morphological features (**Plate 1**), organoleptic characters and powder microscopy of *Haritaki*. The API standards were used for authentication.[22]

Method of Preparation of *Haritaki Churna*(Powder)

The fruits of *Haritaki* were washed, shade dried, powdered, sieved through 80 mesh and preserved in an air-tight glass vessel.

Pharmacognostical Analysis

Pharmacognostical analysis of *Treesa Haritaki* based on organoleptic characters, i.e., colour, odour, taste and texture were recorded. Microscopic studies, i.e., dissolving *Haritaki Churna* (Powder) in small quantity of distilled water, filtering through filter paper and the precipitate treated with and without stain to find out the lignified materials along with other cellular constituents. The micro photographs were taken under Carl Zeiss Binocular microscope attached with camera. [23-25]

Pharmaceutical Analysis

Haritaki was analysed with appropriate protocols for standard physicochemical parameters such as aqueous extractive, alcohol extractive, pH, total ash, acid insoluble ash, loss on drying as per Ayurvedic Pharmacopoeia of India at the Pharmaceutical Chemistry Lab, IPGT&RA. [26]

In the HPTLC study, Methanol extract of *Treesa Haritaki* was spotted on pre-coated silica gel GF 60_{254} aluminium plates by means of Camang Linomate V sample applicator fitted with a 100 µL Hamilton syringe. The mobile phase consisted of Chloroform:Methanolin a ratio of 9:1 v/v. After development, densitometric scan was performed with a Camag T. L. C. scanner III in reflectance absorbance mode at 254 and 366 nm under control of Win CATS Software (V 1.2.1. Camag). Then, the plate was sprayed with Vanillin sulphuric acid followed by heating and then visualised in daylight. [27]

RESULTS

Pharmacognostical

Organoleptic Characters

The sample [powdered *Treesa Haritaki*] was a yellowish powder with predominant *Kashaya* (Astringent) taste and Pungent smell (**Table 1**).

Microscopic Characters

Powder microscopy of *Treesa Haritaki* showed epicarp cell, mesocarp cell, fibers, group of scleroids (**Plate 2**), simple and compound scleroids, yellowish brown tannin contain (**Plate 3**).

Pharmaceutical

Treesa Haritaki was analysed using various standard physicochemical parameters at the pharmaceutical chemistry lab. The pharmaceutical parameters such as aqueous extractive, alcohol extractive, pH, total ash, acid-insoluble ash, and loss on drying were found within the permissible limits (**Table 2**). Phytochemical parameters such as Steroidal terpanoids, Glycosides, Flavanoid, Tannin- phenolic compound, Molisch test were

found positive while Alkaloids, Saponine, Protein test were found negative (**Table 3**).

HPTLC

On performing HPTLC, the chromatogram showed thirteen peaks with R_f values 0.00, 0.03, 0.08, 0.13, 0.17, 0.25, 0.37, 0.45, 0.49, 0.65, 0.70, 0.75, and 0.94 at 254nm; while at 366 nm, the chromatogram showed eight spots with R_f values 0.01, 0.03, 0.08, 0.16, 0.25, 0.37, 0.45 and 0.64 (**Table 4, Plate 4 & 5**) 0.03, 0.08, 0.25, 0.37 and 0.45 were commonly seen R_f values at both 254 nm and 366 nm.

Table 1: Organoleptic characters of *Treesa Haritaki*

Characteristic	Result
Colour	Yellowish (*Pittabha*)
Odour	Pungent
Taste	Astringent (*Kashaya*)
Consistency	Fine

Table 2: Phytochemical parameters of *Treesa Haritaki*

S. No	Investigation	*Treesa Haritaki*
1	Loss of drying	7.34 % %
2	Ash value	2.201%
3	Acid insoluble ash value	0.45% w/w
4	pH	3.0
5	Water soluble extract	55.6%
6	Alcohol soluble extract	66.5 %

Table 3: Physicochemical parameters of *Treesa haritaki*

S. No	Investigation	*Treesa Haritaki*
1	Steroidal terpanoids	Positive
2	Glycosides	Positive
3	Flavanoid	Positive
4	Tannin- Phenolic compound	Positive
5	Alkaloids	Negative
6	Saponins	Negative
7	Protein test	Negative
8	Molisch test	Positive

Table 4: Rf values of *Treesa haritaki*

HPTLC	R_f Values at 254 nm	0.00, 0.03, 0.08, 0.13, 0.17, 0.25, 0.37, 0.45, 0.49, 0.65, 0.70, 0.75 and 0.94
	R_f Values at 366 nm	0.01, 0.03, 0.08, 0.16, 0.25, 0.37, 0.45 and 0.64

HPTLC = High performance thin-layer chromatogram phy; hR_f = (R_f value) × (100)

Plate 1

Morphological characters of *Terminalia chebua* Retz.

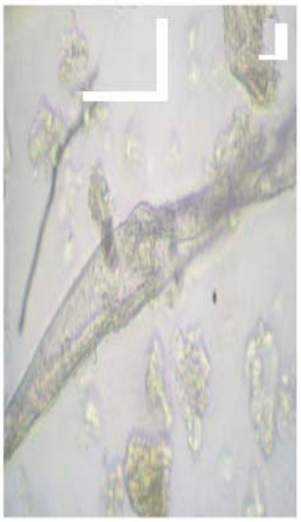
a. Fruit morphology

b. Powder of fruit of *Haritaki*

Plate 2

Powder microscopy of fruit of *Terminalia chebula* Retz.

a. Epicarp cell



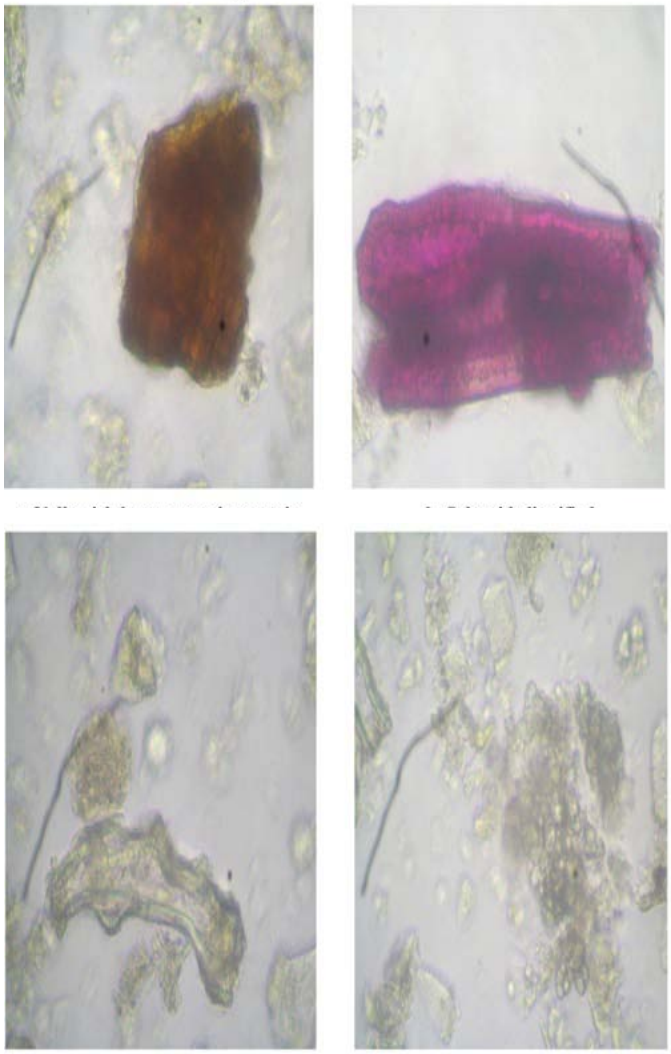
b. Fibers

c. Mesocarp cell

d. Scleroids in group

Plate 3

Powder microscopy of fruit of *Terminalia chebula* Retz.



c. Simple scleroids d. Starch grains in group

DISCUSSION AND CONCLUSION

Taste of the *Haritaki* was *Kashaya* (astringent). In present study, Powder microscopy of *Treesa Haritaki* showed epicarp cell, mesocarp cell, fibers, group of scleroids, simple and compound scleroids, yellowish brown tannin contain. All the pharmaceutical parameters analysed showed values within permissible limit. As per API [26], total ash and acid insoluble ash should not more than 5, in present study it was 2.201 % and 0.45% w/w respectively. As per standard, Alcohol and water soluble extract was not less than 40% and 60% respectively. In present study alcohol soluble extract was 66.5% which is within limit but water soluble extract was 55.6%. HPTLC study of the drug has yielded a standard fingerprint of the formulation consisting of thirteen and eight peaks on short and long UV, respectively. The result of the present study can be considered as the reference values for *Treesa Haritaki* in similar research works in future.

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