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Pharmacognostical Study of Dhanvayasa (*Fagonia cretica* Linn.)



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ABSTRACT

Dhanvayasa (*Fagonia cretica* Linn.) is a small spiny woody perennial undershrub, mostly found in the dry regions of North-west India. *Fagonia Cretica* Linn. belongs to family Zygophyllacea, commonly known as *Dhamaso* in Gujarati and *Duralabha* in Bengali. *Dhanvayasa* and its compound formulations are widely used in Ayurvedic classics to treat vitiated conditions. It possesses *Tikta-Kashaya-Madhura Rasa* (taste), *Laghu-Sara Guna* (properties) and *Sheeta Virya* (potency). *Sarjika Kshara* is prepared by processing the ash of *Dhanvayasa Panchanga* and it is used as main ingredients in many Ayurvedic formulations e.g. *Chitrakadi Vati*, *Duralabhadi kwath*, and *Ushirasava*. In present study, Macroscopic study, Microscopic study and Powder microscopic study was done to collect information regarding Dhanvayasa. *Dhanvayasa Panchanga powder* was also analyzed for Organoleptic, Physicochemical and Phytochemical analysis. Alkaloid, Carbohydrates, proteins, amino acids, steroids, Tannins and flavonoids were found to be present in *Dhanvayasa Panchanga powder*.



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INTRODUCTION

Pharmacognosy is formed by combination of two Greek words viz. Pharmakon = A drug and Gnosis = to acquire knowledge. Hence, Pharmacognosy can be defined as a branch of biosciences that deals with the knowledge and authentication of medicinal and related products of crude or primary type originated from both plants and animals in the detailed form.ⁱ Pharmacognostical evaluation helps in identification of genuine material which includes study of morphological system, study of the cell structures and organization and study of the tissue system, which still holds a key in identification and the better understanding of the correct species of the plant and also helps us to differentiate between closely resembled species of the same genus. In the era of increasing demand for indigenous medicines, maintaining quality standards is the need of the hour.

Ayurveda emphasis proper identification of a drug with proper quantity through that we can get expected results. Without knowing name, form and properties of drug or despite having knowledge of it, if we shouldn't administer it properly it will result in bad consequences.ⁱⁱ

Dhanvayasa (Fagonia cretica Linn.) is a small spiny woody perennial undershrub, mostly found in the dry regions of North-west India.ⁱⁱⁱ *Fagonia cretica* Linn. belongs to family Zygophyllaceae, commonly known as *Dhamaso* in Gujarati and *Duralabha* in Bengali.^{iv} *Sarjika Kshara* is prepared by processing the ash of this plant^v and it is used as main ingredients in many Ayurvedic formulations e.g *Chitrakadi Vati*, *Duralabhadi kwath*, and *Ushirasava*. The present study deals with Pharmacognostical, Analytical and preliminary phytochemical studies on *Dhanvayasa Panchanga (Fagonia cretica* Linn.).

AIMS AND OBJECTIVES

To identify and authenticate dry *Panchanga* of *Dhanvayasa (Fagonia cretica* Linn.).

COLLECTION OF RAW DRUG

The dry *Dhanvayasa panchanga* was collected from Sundar Ayurved Pharmacy, J.S. Ayurved Mahavidyalaya, Nadiad with due permission from Concern authorities.

MATERIALS AND METHODS

Material

The dry *Panchanga* of *Dhanvayasa* was used as material for the present study.

Pharmacognostical study:

Conventional pharmacognostical method was used for the study of macroscopic, microscopic characters of the *Dhanvayasa Panchanga*.

Method of macroscopic study:

Macroscopic characters of all parts were studied by observing under the dissecting microscope.

Method of microscopic study:

Material: Dry *Dhanvayasa Panchanga*

Equipments: Compound microscope, eyepiece, glass slide, coverslip, watch glass, hairbrush, mountain brush, blotting paper, blades *etc.*

Chemical: Phloroglucinol, Conc. HCl, Iodine sol. Chloral hydrate and Glycerine.

Methods:

1. Selection Method

2. Staining Method

1. Selection Method:

In order to soften sample use for taking sections.

With the help of new blade thin transverse section were taken.

Thick, oblique sections were rejected.

With help of mountain hairbrush, selected sections were transferred to watch glass containing water.

2. Staining Method:

A thin transverse section of the sample was taken & transferred on a glass slide with help of mountain hairbrush.

A drop of water was added.

Few drops of chloral hydrate & 2 drops of glycerine were added heated for two minutes.

Equal proportion of phloroglucinol and conc. HCl was added gently, warmed and allowed to cool and covered the section with coverslip avoiding air bubbles. The section was focused under microscope and arrangement of cells was studied.

The photographs of the T.S. were taken.

Method of Powder Study:

Organoleptic characters of the powder like color, odour, taste *etc.* were studied for microscopical characters, slides were prepared by using water, chloral hydrate as a clearing agent, stained with phloroglucinol and HCl for lignified tissues and glycerine as mounts.

RESULTS AND OBSERVATIONS:

DHANVAYASA

Botanical Name : *Fagonia cretica* Linn.

Sanskrit Name : *Dhanvayasa*

Family : Zygophyllaceae

Local Name : *Dhamaso*

Part Used : *Panchanga*

MACROSCOPIC STUDY OF *DHANVAYASA* (Fig.1)

ROOT- Tap root externally brownish green, rough, with longitudinal striations, core yellowish-green; fracture, fibrous.

STEM - Stem pieces 0.5 to 1.5 cm thick, of variable lengths; young green, mature brown; spiny, two pairs of spines present at each node, spines sharp, slender, 1.5 to 2 cm in length; external surface of stem green, whitish brown when dry, striated; transversely smoothed surface showing a thin bark and prominent wood, bark peeling from stem; fracture, short.

LEAF - Small, sessile, linear, oblong, leaflets entire, green or blackish brown, 0.5 to 1.5 cm in length and 0.05 to 0.1 cm in width, without any prominent midrib region projected above the level of lamina.

FRUIT- Pentagonous schizocarp, composed of five compressed two valve cocci.

MICROSCOPIC STUDY OF T.S. OF STEM: Characters Identified (Fig.2)

- A. Epidermis
- B. Xylem Vessels
- C. Xylem fibers
- D. Medullary rays
- E. Stone cells
- F. Cortex
- G. Pericyclic fibers
- H. Phloem



POWDER MICROSCOPY OF *DHNAVAYASA PANCHANGA*

Light green coloured powder was mounted on slide and analyzed microscopically for its characteristics.

Diagnostic Character of Powder: (Fig.3)

- A. Stomata
- B. Stone cells from stem and root are seen.
- C. Group of fibers from root and stem.

D. Pollen grains.

E. Trichomes from fruit.

Analytical study

Dhanvayasa panchanga powder was analysed for

Organoleptic characters

Colour, Touch, Taste, Odor

Physico-chemical parameters

1 Loss on drying at 105°C^{vi}.

2 Ash value ^{vii}.

3 Acid insoluble ash ^{viii}.

4 Alcohol soluble extractive.

5 Water soluble extractive: ^{ix}



Preliminary Phytochemical Screening/ Chemical tests^x

Table No.1 - Organoleptic parameters of *Dhanvayasa* Powder

Parameters	<i>Dhanvayasa</i> Powder
Colour	Light green
Touch	Rough
Taste	Bitter&Astirngent
Odour	Characteristic

Table No. 2 – Physico-chemical parameters of *Dhanvayasa* powder

Sr. No.	Parameters	<i>Dhanvayasa</i> Powder			
		Batch I	Batch II	Batch III	Avg.
1	Loss on drying 105°C (%w/w)	6.27	6.39	6.61	6.42
2	Ash value (%w/w)	6.91	6.65	6.78	6.78
3	Acid insoluble ash (%w/w)	0.3	0.5	0.4	0.4
4	W.S.E (%w/w)	10.4	10.4	12	10.93
5	A.S.E (%w/w)	8.4	6.4	7.2	7.33

W.S.E – Water soluble extractive, A.S.E – Alcohol soluble extractive

Table No. 3 – Qualitative Phytochemical Parameters of *Dhanvayasa* powder

Parameters	Results <i>Dhanvayasa</i> Powder
Alkaloid	Present
Carbohydrates	Present
Glycosides	Present
Amino acids	Present
Proteins	Present
Tannin	Present
Flavanoids	Present
Saponin	Present
Steroids	Present
Starch	Absent

CONCLUSION

The Dry *Dhanvayasa panchanga* was analyzed for Macroscopic, Microscopic and Powder microscopic study and photographs were taken. The study shows characteristics features of *Fagonia cretica* Linn. as mentioned in quality standard of Indian Medicinal Plants, Volume 9, which reveals the authentication of dry *Dhanvayasa panchanga*. Average Loss on drying of *Dhanvayasa* Powder was 6.42, Average acid insoluble ash was value was 0.4 and Average water soluble extractive value was 10.93. Alkaloid, Carbohydrates, Glycosides, Amino acids,

Proteins, Tannin, Flavanoids, Saponin and Starch were found to be present in *Dhanvayasa Panchanga Powder*.

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Fig. 1- Macroscopic characters of *Dhanvayasa*



Fig. 1.1 *Dhanvayasa* Plant



Fig. 1.2 *Dhanvayasa panchanga* Powder

Fig. 2 Microscopic characters of T.S of *Dhanvaysa*

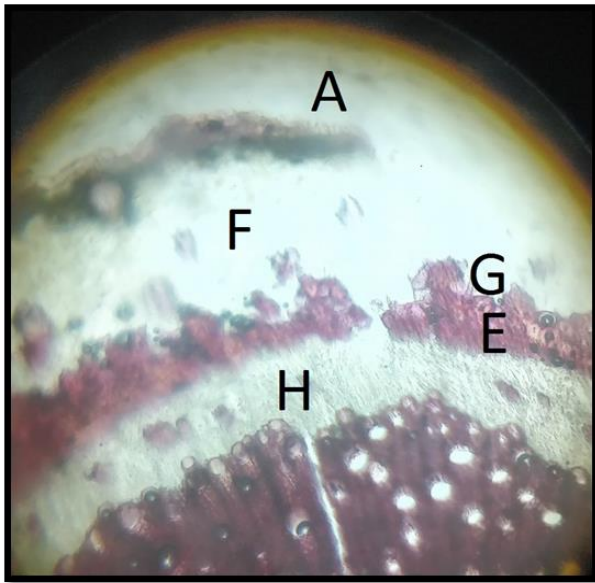


Fig. 2.1
A – Epidermis, E - Stone Cells,
F – Cortex, G - Pericyclic Fibers, H - Phloem

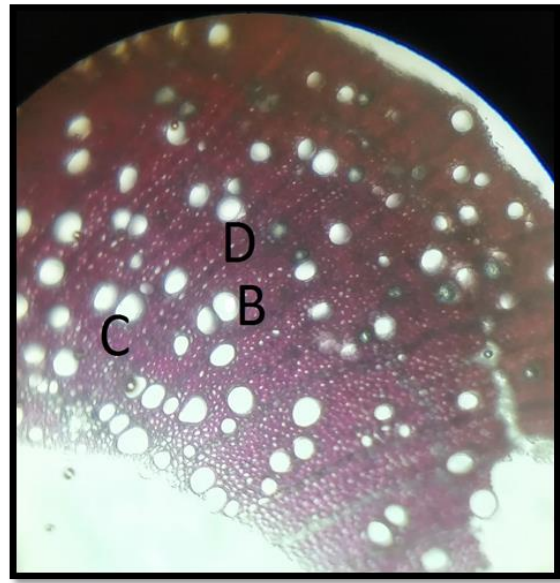


Fig. 2.2
B- Xylem Vessels
C- Xylem Fibers
D- Medullary Rays

Fig. 3 - Powder Microscopic Characters of *Dhanvayasa*

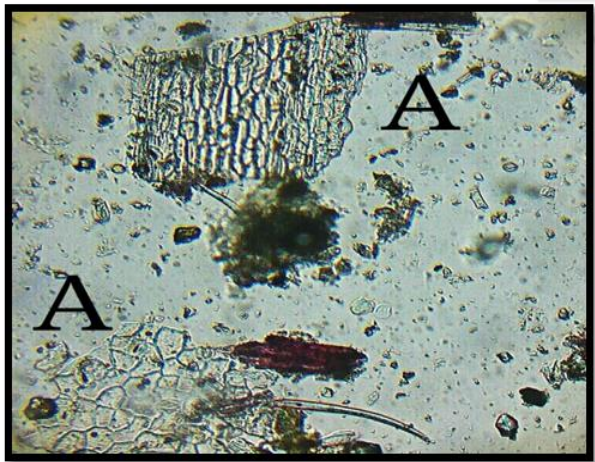


Fig. 3.1 A – Stomata

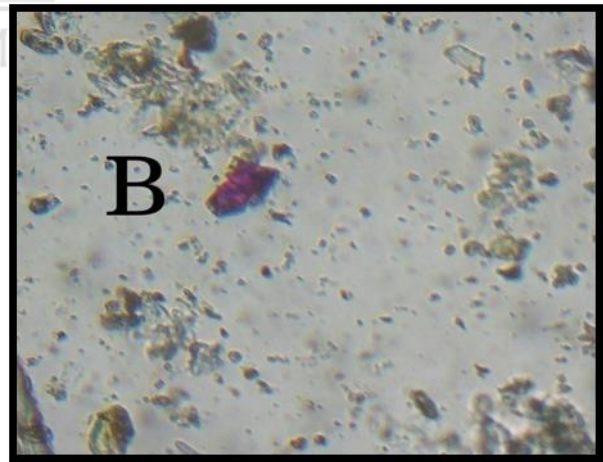


Fig. 3.2 B- Stone cells from stem and root

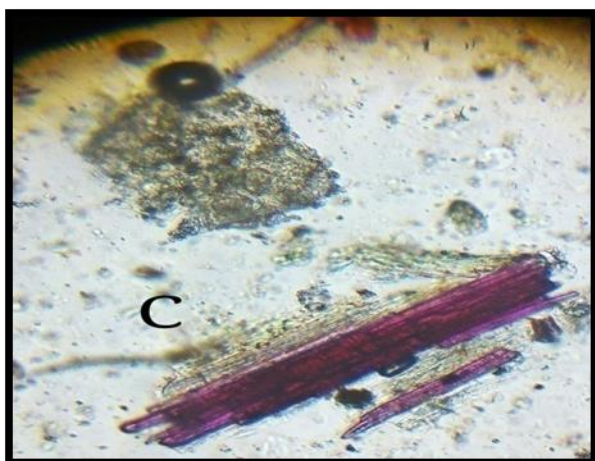


Fig. 3.3 C- Group of fibres from root and stem.



Fig. 3.4 D - Pollen grains.

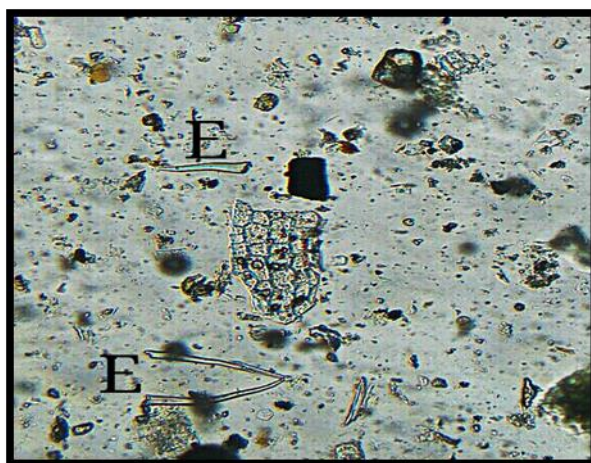


Fig. 3.5 E - Trichomes from fruit

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