

Pharmacognostic, Physico-Chemical and Therapeutic Potential of *Woodfordia fruticosa* (L.) Kurz

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Abstract

Woodfordia fruticosa (L.) Kurz commonly known as Dhawa or Dhataki, is an important medicinal plant that has been traditionally used in various systems of medicine for its therapeutic properties such as dysentery, leprosy, leucorrhoea, menorrhagia, toothache. It has been used as astringent to treat dysentery and also for the treatment of bowel complaint and rheumatism.

Pharmacognostical studies encompass the macroscopic and microscopic evolution of the plant material, including its botanical description, organoleptic properties and anatomical features, which aid in the identification and authentication of the plant.

Physicochemical studies involve the determination of various physicochemical parameters such as foreign matter, ash values, extractive values. These parameters provide valuable information regarding the chemical composition and quality standards of *Woodfordia fruticosa*, facilitating its standardization and quality control in herbal drug.

Overall, the Pharmacognostical and Physicochemical studies outlined in this study serve as a comprehensive reference for researchers and organizations engaged in further exploration of medicinal potential of *Woodfordia fruticosa*, paving the way for the development of therapeutic agents and herbal drugs.

Keywords: *Woodfordia fruticosa*; menorrhagia; Pharmacognostic; Physico-chemical

1. Introduction

Woodfordia fruticosa of family Lythraceae is an important drug of Ayurvedic and Unani system of medicine. It is known as Dhawa in Hindi, Gul-e-Dhawa in Unani and Dhataki and Agnijwala in Sanskrit. The original Sanskrit name Agnijwala or Tamra-pushpi appears to be derived from the bright red colour of the flower and the bark. In India, a few popularly known names are Dhataki, Dawi, Jargi, Dhai, Harwari, Phulsatti, Dhavdi, etc. (Shome *et al.*, 1981; Khare, 2004). *Woodfordia fruticosa* is found in Tanzania, Madagascar, Comoros, Saudi Arabia, Oman, Myanmar [Burma], Bhutan, Indonesia, China (Guangdong, Guangxi, Yunnan), India, Sri Lanka, Nepal, Pakistan and Vietnam.^{16 17,18}

It is a stimulant and astringent and is used for treatment of dysentery, diarrhoea and other bowel complaints as well as internal hemorrhages, leucorrhoea and menorrhagia (Anonymous 1976;

Ahuja 1965; Bhavmisra 1949; Biswas and Ghosh 1951; Charak 15-112~114 1/2; 30-78; 90-95 1/2; Chopra, Nayar and Chopra 1956; Dymock *et al* 1891; Dastur 1951; Dutt 1922; Kirtikar and Basu 1933; Nadkarni 1954; Watt 1972). The plant *Woodfordia fruticosa* as a potential candidate for peptic ulcer diseases (Goswami *et al.*, 2005; Das *et al.*, 2006). A survey of the literature revealed that the plant has been recommended for use in various traditional systems of medicine for the treatment, among others, of bowel disorders (Sharma, 1956; Shome *et al.*, 1981).^{2,3,4,5,6,7,8,9,10, 12,13,14,15,21,22,23}

Present research paper deals with the macroscopy, powder microscopy, physicochemical studies and therapeutic uses of *Woodfordia fruticosa*. Similar study has been published for other Unani drugs.^{13,14,15,19,20}

2. Materials and methods

2.1. Crude drug collection and authentication: The crude drug sample was procured from PCIM&H, Ghaziabad and identified by the botanist using pharmacognostical method.¹

2.2. Powder Microscopy: 5 grams of powdered drug sample was taken in a watch glass then stained with safranin, mounted with glycerine in a slide and different characters were observed under the microscope.¹¹

3. Observation and Result

3.1. Macro-morphology: Flowers numerous 1.2 cm long; occurs as single or in bunches. pedicels short, glandular-pubescent. Calyx of a flower is 1 to 1.6 cm long, ridged, glabrous, bright red when fresh and fades on drying. calyx with campanulate base and oblique apex. Apex of a calyx is having 6 triangular and acute teeth. Calyx tooth is attached with very minute accessory sepals. Petals pale rose or whitish, thin and papery attached inside the mouth of calyx tube. Stamens 12, united at the base. Anthers are dorsifixed; brown almost rounded or broadly ovate. Ovary is superior, with filiform style. (fig A-B)



Fresh Plant **fig-A**

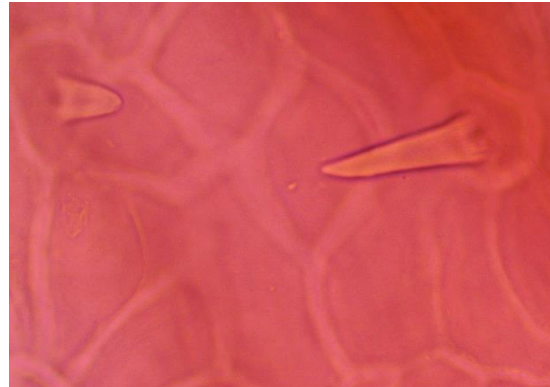
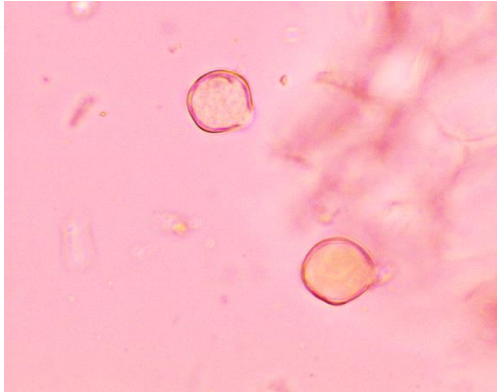


Dried Plant **fig-B**

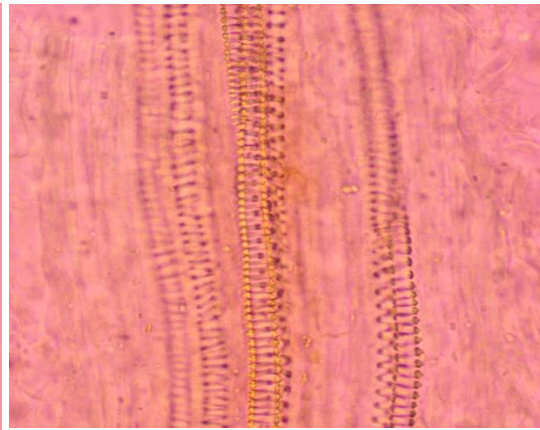
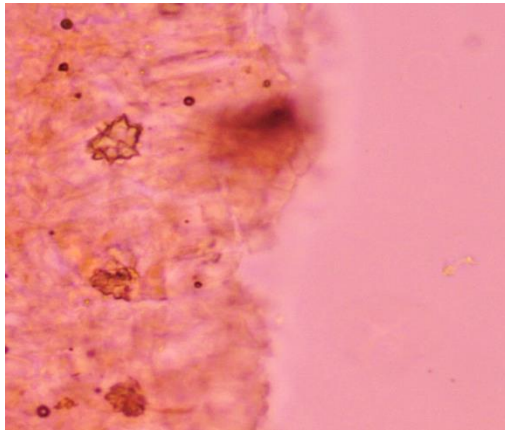
(fig A-B)

3.2. Powdered Microscopy: Light brown in color, slightly bitter and astringent in taste and has a smell like henna powder. The microscopic examination of powder revealed the following characters: - Pollen grains either in groups or single, many unicellular trichomes, many rosette crystals of calcium oxalate, vessels having spiral thickenings, fibers, epidermal cells. (Fig c-h)

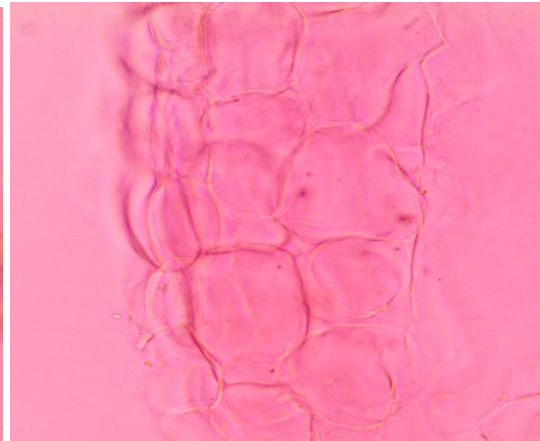
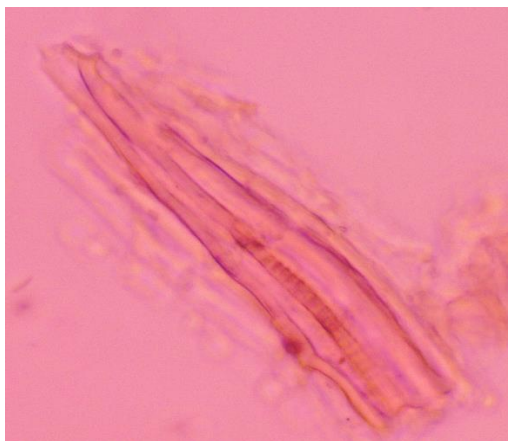
Powdered Microscopy:



Pollen grains **Fig-c** 40x Trichomes **Fig-d** 40 x



Rosette crystals **fig-e** 40x Spiral Vessels **Fig-f** 40x



Fibers **Fig-g** 40x irregular shaped cells **Fig-h** 40x

Physicochemical analysis: Table 1

S. No.	Parameter	Values
1.	Foreign matter (%)	Not more than 2 %
2.	Total ash (% w/w)	Not more than 10 %
3.	Acid insoluble ash (% w/w)	Not more than 1%
4.	Ethanol soluble Extractive (%)	Not less than 7 %

5.	Water soluble matter (% w/w)	Not less than 28%
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3.3. Therapeutic Uses: This flower is useful in thirst, dysentery, leprosy, blood diseases, leucorrhoea, menorrhagia and toothache. It is considered as ‘*Kapha*’ (mucilage type body secretion) and ‘*Pitta*’ (energy-dependent metabolic activity) suppressant in the Ayurvedic concepts of medicine (Sharma,1956). Many marketed drugs comprise flowers, fruits, leaves and buds mixed with pedicels and thinner twigs of the plant (Dutt,1922; Nadkarni, 1954; Chopra et al., 1956; Ahuja, 1965). The flowers are being used in the preparation of Ayurvedic fermented drugs called ‘*Aristha*’s and ‘*Asava*’s (Atal et al., 1982).^{3,8,10,18,21}

It has been used as an astringent to treat dysentery and sprue, and also for the treatment of bowel complaint, rheumatism, dysuria and haematuria in many South East Asian countries. It is also an ingredient of a preparation used to make barren women fertile (Burkill, 1966; Dey, 1984).^{6,9}

Conclusion:

The comprehensive exploration of *Woodfordia fruticosa* (L.) Kurz presented in this research paper highlights its significant pharmacognostic attributes, physico-chemical properties, and therapeutic potential. Furthermore, the detailed physico-chemical analysis provides valuable insights into the botanical characteristics and chemical composition, essential for quality control and standardization in pharmaceutical formulations. The therapeutic potential of *Woodfordia fruticosa* extends across various ailments, ranging from its traditional use in Ayurvedic and unani medicine to modern pharmacotherapeutic applications, emphasizing its promising role in healthcare. Overall, this research underscores the importance of further exploration and utilization of *Woodfordia fruticosa* as a valuable resource in drug discovery and development, contributing to the advancement of natural product-based medicines and enhancing healthcare practices globally.

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