

# Woodfordia Fruticosa in Ayurveda: Pharmacological Importance and Traditional Usage across India

Priyadarsini Sahoo<sup>1</sup> & Omprakash Goshain<sup>1\*</sup>

<sup>1-1\*</sup>Department of Pharmacy, Shri Venkateshwara University, Gajraula, Amroha, Uttar Pradesh, India

## ABSTRACT

Woodfordia fruticosa (L.) Kurz, commonly known as Dhataki, is a medicinal shrub widely used in Ayurvedic formulations across India. It occupies a prominent place in traditional medicine due to its diverse therapeutic properties, including astringent, anti-inflammatory, antimicrobial, antioxidant, and wound-healing activities. In Ayurveda, W. fruticosa is extensively employed in the management of gastrointestinal disorders, gynecological ailments, skin diseases, fever, and inflammatory conditions. The flowers of the plant are particularly valued and are an essential ingredient in several classical Ayurvedic preparations such as Asava and Arishta, where they function as a natural fermentation initiator.

Recent pharmacological investigations have validated many of the traditional claims, revealing the presence of bioactive compounds such as flavonoids, tannins, phenolic acids, and glycosides that contribute to its medicinal efficacy. Experimental studies demonstrate its potential in antimicrobial, hepatoprotective, antiulcer, antidiabetic, and anticancer activities, highlighting its relevance in modern drug discovery. This paper aims to comprehensively review the traditional uses of Woodfordia fruticosa in Ayurveda, its ethnomedicinal significance across different regions of India, and its pharmacological importance supported by contemporary scientific research. The integration of traditional knowledge with modern pharmacological evidence emphasizes the therapeutic potential of W. fruticosa and supports its continued exploration as a valuable medicinal resource.

**Keywords;** Woodfordia fruticosa; Dhataki; Ayurveda; Traditional medicine; Pharmacological activity; Ethnomedicine.

## I. INTRODUCTION

Medicinal plants have formed the backbone of traditional healthcare systems since ancient times and continue to play a vital role in global health care. India, recognized as one of the world's richest repositories of medicinal plant diversity, has a long-standing tradition of plant-based medicine deeply rooted in indigenous knowledge systems such as Ayurveda, Siddha, Unani, and folk medicine. Among these, Ayurveda stands out as one of the oldest holistic systems of medicine, emphasizing the balance of body, mind, and spirit through natural remedies derived largely from plants (Sharma, 2018). In recent decades, there has been renewed global interest in traditional medicinal plants due to the limitations of synthetic drugs, including adverse effects, drug resistance, and high treatment costs (WHO, 2022).

Woodfordia fruticosa (L.) Kurz, belonging to the family Lythraceae, is an important medicinal shrub widely distributed across tropical and subtropical regions of India. Commonly known as Dhataki, Fire Flame Bush, or Dhavi, the plant is well known in classical Ayurvedic literature for its extensive therapeutic applications. It grows predominantly in dry deciduous forests, rocky slopes, and hilly regions, and is easily recognized by its bright red flowers, which are the most medicinally valuable part of the plant (Kirtikar & Basu, 2019). The extensive use of W. fruticosa in traditional medicine highlights its ethnopharmacological significance across diverse cultural and geographical regions of India.

In Ayurveda, Woodfordia fruticosa is classified as having Kashaya rasa (astringent taste) and is believed to possess Pitta-shamaka properties, making it useful in disorders associated with inflammation, bleeding, and excessive secretions (Dash & Kashyap, 2016). Classical Ayurvedic texts such as Charaka Samhita, Sushruta Samhita, and Bhavaprakasha Nighantu describe its use in the treatment of diarrhea, dysentery, menorrhagia, leucorrhea, ulcers, wounds, and skin diseases. The flowers are especially valued for their styptic and healing properties and are considered essential in formulations aimed at strengthening digestion and reproductive health (Pandey & Tripathi, 2017).

One of the most distinctive traditional uses of *W. fruticosa* is its role as a natural fermentation initiator in Ayurvedic liquid formulations known as Asava and Arishta. These fermented preparations are widely prescribed for digestive disorders, anemia, respiratory ailments, and metabolic conditions. The flowers of *W. fruticosa* facilitate controlled fermentation due to their natural yeast and sugar content, enhancing the bioavailability and therapeutic efficacy of the final product (Kulkarni et al., 2020). This unique application underscores the sophisticated pharmaceutical knowledge embedded in traditional Ayurvedic practices.

Beyond classical Ayurveda, *Woodfordia fruticosa* holds considerable importance in folk and ethnomedicinal systems across different regions of India. Tribal communities utilize various parts of the plant to treat fever, wounds, urinary disorders, and infections. Decoctions and pastes prepared from the flowers and leaves are commonly applied for wound healing and skin conditions, while oral preparations are used for gastrointestinal ailments (Jain & Singh, 2018). The widespread traditional usage across diverse communities suggests a strong empirical basis for its therapeutic effectiveness.

Modern scientific investigations have increasingly focused on validating the traditional claims associated with *W. fruticosa*. Phytochemical studies reveal that the plant is rich in biologically active compounds such as flavonoids, tannins, phenolic acids, glycosides, and triterpenoids, which are known to contribute to various pharmacological activities (Thakur et al., 2021). Tannins, in particular, are responsible for the plant's astringent and antimicrobial properties, supporting its traditional use in diarrhea, wound healing, and gynecological disorders.

Pharmacological studies have demonstrated a wide range of biological activities of *Woodfordia fruticosa*, including antimicrobial, anti-inflammatory, antioxidant, antiulcer, hepatoprotective, antidiabetic, and anticancer effects. Experimental models have shown that extracts of *W. fruticosa* can inhibit the growth of pathogenic bacteria and fungi, thereby validating its traditional role as an anti-infective agent (Parameshwari et al., 2020). Additionally, its antioxidant potential helps neutralize free radicals, which may contribute to its protective effects against chronic diseases and oxidative stress-related disorders.

The growing interest in plant-based therapeutics and natural products has further emphasized the importance of integrating traditional knowledge with modern pharmacological research. *Woodfordia fruticosa* represents a promising medicinal plant where centuries-old Ayurvedic wisdom aligns closely with contemporary scientific findings. However, despite its extensive traditional usage and emerging pharmacological evidence, systematic documentation and comprehensive reviews focusing on its Ayurvedic relevance and regional usage patterns remain limited.

Therefore, the present paper aims to provide an in-depth overview of *Woodfordia fruticosa* with special emphasis on its traditional usage in Ayurveda, ethnomedicinal practices across India, and pharmacological importance supported by modern scientific studies. By bridging traditional knowledge and contemporary research, this study seeks to highlight the therapeutic potential of *W. fruticosa* and encourage further exploration for its development as a safe, effective, and sustainable medicinal resource.

### **Woodfordia fruticosa (Dhataki) as a Medicinal Plant**

*Woodfordia fruticosa* (L.) Kurz, a member of the family Lythraceae, is a well-established medicinal plant in the Indian subcontinent and neighboring Asian regions. The plant is commonly referred to as Dhataki in Ayurveda and is recognized for its vibrant red flowers, which constitute the most pharmacologically important part. Classical Ayurvedic literature, as well as modern ethnobotanical surveys, consistently report the extensive use of this plant in traditional healthcare systems (Kirtikar & Basu, 2019). The long history of its medicinal use positions *W. fruticosa* as a significant example of how traditional plant knowledge has contributed to contemporary herbal medicine.

India's reliance on medicinal plants remains substantial, particularly in rural and tribal communities where plant-based remedies continue to serve as primary healthcare resources. Within this context, *W. fruticosa* is frequently cited as a multipurpose medicinal shrub, reflecting both its therapeutic versatility and cultural importance (Jain & Singh, 2018). The sustained use of Dhataki across centuries indicates not only its availability but also its perceived efficacy in treating a wide range of ailments.

### **Role of Woodfordia fruticosa in Ayurveda**

In Ayurveda, *Woodfordia fruticosa* is described as having Kashaya rasa (astringent taste) and Sheeta virya (cooling potency), properties that make it particularly useful in disorders associated with inflammation, bleeding, and excessive secretions. Classical texts such as the Charaka Samhita, Sushruta Samhita, and Bhavaprakasha Nighantu document its use in gastrointestinal disorders, gynecological conditions, wound healing, and skin diseases (Sharma, 2018; Pandey & Tripathi, 2017). The flowers, known as Dhataki Pushpa, are emphasized for their styptic, digestive, and healing properties.

A unique and highly significant Ayurvedic application of *W. fruticosa* lies in its use as a natural fermentation initiator in liquid formulations known as Asava and Arishta. These preparations are widely

prescribed for digestive, metabolic, and respiratory disorders. The flowers promote controlled fermentation due to their natural sugar content and microbial flora, thereby enhancing the bioavailability and stability of herbal formulations (Kulkarni et al., 2020). This traditional pharmaceutical role highlights the advanced understanding of bioprocessing embedded in Ayurvedic medicine.

### **Traditional Medicine and Ethnomedicinal Uses**

Beyond classical Ayurveda, *Woodfordia fruticosa* plays a vital role in folk medicine and ethnomedicinal practices across India. Ethnobotanical surveys conducted among tribal and rural populations reveal that different parts of the plant are used to manage fever, diarrhea, dysentery, ulcers, wounds, and urinary disorders (Jain & Singh, 2018). Flower decoctions are commonly administered orally for gastrointestinal complaints, while pastes and poultices are applied externally for wound healing and skin infections.

The widespread ethnomedicinal use of *W. fruticosa* across geographically diverse regions suggests a strong empirical foundation for its therapeutic claims. Traditional healers often rely on the plant for its antimicrobial and anti-inflammatory properties, particularly in areas with limited access to modern healthcare. Such community-based practices underscore the importance of documenting and preserving ethnomedicinal knowledge, which often serves as a starting point for pharmacological research (Bandirala & Sandeep, 2019).

### **Phytochemical Profile and Medicinal Significance**

Phytochemical investigations have revealed that *Woodfordia fruticosa* contains a rich array of bioactive compounds, including hydrolysable tannins, flavonoids, phenolic acids, glycosides, and triterpenoids. These compounds are widely recognized for their therapeutic potential and are responsible for many of the plant's pharmacological effects (Thakur et al., 2021). The high tannin content, in particular, accounts for the astringent and antimicrobial nature of the plant, validating its traditional use in diarrhea, bleeding disorders, and wound management.

Medicinal plants rich in polyphenolic compounds are often associated with strong antioxidant properties, and *W. fruticosa* is no exception. Several studies report significant free-radical scavenging activity in flower and leaf extracts, supporting their protective role against oxidative stress-related disorders (Parameshwari et al., 2020). These findings reinforce the relevance of Dhataki as a medicinal plant with both preventive and therapeutic potential.

### **Pharmacological Activities**

Modern pharmacological research has increasingly focused on validating the traditional claims associated with *Woodfordia fruticosa*. Experimental studies have demonstrated a broad spectrum of biological activities, including antimicrobial, anti-inflammatory, antioxidant, hepatoprotective, antiulcer, antidiabetic, and anticancer effects.

Antimicrobial studies reveal that extracts of *W. fruticosa* exhibit inhibitory activity against several pathogenic bacteria and fungi, supporting its traditional application in treating infections and wounds (Thakur et al., 2021). The wound-healing potential of the plant has been linked to its antimicrobial and antioxidant properties, which promote tissue regeneration and reduce inflammation.

Anti-inflammatory and antioxidant activities have been attributed primarily to flavonoids and phenolic compounds present in the plant. These activities play a crucial role in mitigating chronic inflammatory conditions and oxidative damage, which are underlying factors in many lifestyle-related diseases (Parameshwari et al., 2020). Additionally, preliminary studies suggest that *W. fruticosa* exhibits antidiabetic activity by improving glucose metabolism and reducing oxidative stress, highlighting its potential role in metabolic disorders.

### **Ethnomedicine and Modern Drug Discovery**

The integration of ethnomedicine with modern pharmacological research has become an important strategy in natural drug discovery. *Woodfordia fruticosa* represents a promising candidate in this regard, as its traditional uses align closely with experimentally validated pharmacological activities. Reviews emphasize that medicinal plants with a long history of traditional use often offer safer and more effective therapeutic leads compared to synthetic compounds (WHO, 2022).

Despite growing scientific interest, further studies are required to isolate active constituents, elucidate mechanisms of action, and establish standardized dosage forms. Clinical validation and toxicological assessments are also necessary to ensure safety and efficacy. Nevertheless, the convergence of Ayurvedic wisdom, ethnomedicinal practices, and modern pharmacology positions *W. fruticosa* as a valuable medicinal resource with significant future potential.

## II. CONCLUSION

*Woodfordia fruticosa* (L.) Kurz, commonly known as Dhataki, is an important medicinal plant with extensive use in Ayurveda and traditional medicine across India. Its long-standing application in gastrointestinal, gynecological, inflammatory, and wound-healing disorders highlights its therapeutic versatility. The unique role of *W. fruticosa* flowers as natural fermentation agents in Ayurvedic Asava and Arishta preparations further emphasizes its pharmaceutical significance in classical medicine. Phytochemical and pharmacological studies have validated many traditional claims, attributing its biological activities to the presence of tannins, flavonoids, and phenolic compounds. These constituents contribute to its antimicrobial, antioxidant, anti-inflammatory, and healing properties. Although existing experimental evidence supports its medicinal potential, further clinical studies and standardization are required to establish its safety and efficacy. Overall, *Woodfordia fruticosa* represents a promising link between traditional knowledge and modern herbal drug development.

## REFERENCES

- [1]. Bandirala, S., & Sandeep, B. (2019). A comprehensive review of *Woodfordia fruticosa* (L.) Kurz: Traditional uses, phytochemistry, and pharmacological activities. *Accent Journal of Economics, Ecology & Engineering*.
- [2]. Dash, B., & Kashyap, L. (2016). *Materia medica of Ayurveda: Based on classical Ayurvedic texts*. B. Jain Publishers.
- [3]. Jain, S. K., & Singh, A. (2018). Ethnobotanical survey of medicinal plants used by tribal communities of India. *Journal of Ethnopharmacology*, 214, 45–56. <https://doi.org/10.1016/j.jep.2017.12.015>
- [4]. Kirtikar, K. R., & Basu, B. D. (2019). *Indian medicinal plants (Vol. 2)*. International Book Distributors. (Original work published 1935)
- [5]. Kulkarni, R. R., Patil, V. S., & Kadam, V. J. (2020). Role of *Woodfordia fruticosa* flowers in fermentation of Ayurvedic Asava and Arishta preparations. *Journal of Ayurveda and Integrative Medicine*, 11(3), 350–356. <https://doi.org/10.1016/j.jaim.2019.06.004>
- [6]. Pandey, G. S., & Tripathi, R. D. (2017). *Bhavaprakasha Nighantu*. Chaukhambha Bharati Academy.
- [7]. Parameshwari, S., Suresh, K., & Kumar, R. (2020). Pharmacological evaluation of *Woodfordia fruticosa*: A review. *International Journal of Pharmaceutical Sciences and Research*, 11(9), 4312–4320.
- [8]. Sharma, P. V. (2018). *Charaka Samhita (Text with English translation)*. Chaukhambha Orientalia.
- [9]. Thakur, M., Asrani, R. K., & Thakur, S. (2021). Phytochemistry and pharmacological potential of *Woodfordia fruticosa* (L.) Kurz: A comprehensive review. *Phytotherapy Research*, 35(4), 1915–1930. <https://doi.org/10.1002/ptr.6934>
- [10]. World Health Organization. (2022). *WHO global report on traditional and complementary medicine*. WHO.