

Therapeutic Potential of Dhataki (Woodfordia Fruticosa) In the Management of Pradar Roga: An Ayurvedic and Pharmacological Review

Sarswati Bharati*1, Sampurnanand Tiwari2

*1M.D. (Ay.), Ayurvedic Physician, Sadar Hospital, Madhubani, Bihar, India.

²Former Principal, Government Ayurvedic College, Patna, Bihar, India

*Corresponding Author:

Sarswati Bharati.

Email ID: drsarswatibharati@gmail.com

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ABSTRACT

Pradar Roga, a prevalent gynecological condition in women, is broadly correlated with leucorrhea in modern medicine and is characterized by excessive, abnormal vaginal discharge. In Ayurveda, its pathogenesis is primarily attributed to the vitiation of Kapha and Pitta doshas with the involvement of Apana Vata and Artavavaha srotas. Among the various herbal remedies described, Dhataki (Woodfordia fruticosa Kurz) holds significant therapeutic relevance due to its stambhana (astringent) and rakta stambhaka (hemostatic) properties. Classical Ayurvedic texts, along with contemporary pharmacological evidence, suggest its efficacy in controlling excessive discharge, reducing inflammation, and promoting mucosal healing. Phytochemical analysis reveals the presence of tannins, flavonoids, phenolic compounds, and anthocyanins, contributing to its antimicrobial, anti-inflammatory, antioxidant, wound-healing, and immunomodulatory actions. Clinical studies further support its role in alleviating symptoms, improving local tissue integrity, and enhancing patient quality of life. This review critically synthesizes classical references, pharmacological data, and clinical research on Dhataki in the management of Pradar Roga, identifies research gaps, and proposes directions for future evidence-based application in gynecological practice.

Keywords: Pradar Roga, Dhataki, Woodfordia fruticosa, leucorrhea, Ayurveda, pharmacology

1. INTRODUCTION

Women's reproductive health is a critical pillar of overall community well-being, influencing not only individual quality of life but also public health outcomes and socioeconomic development. Gynecological disorders, when unaddressed, can significantly impair daily functioning, fertility, and psychological health. Among these conditions, *Pradar Roga*—manifesting primarily as excessive or abnormal vaginal discharge—occupies a prominent place in both classical Ayurvedic texts and modern gynecological practice. It is particularly prevalent among women of reproductive age, often becoming a recurrent or chronic complaint that warrants medical attention.

In contemporary biomedicine, the symptom profile of *Pradar Roga* is broadly correlated with conditions such as leucorrhea, chronic cervicitis, vaginitis, pelvic inflammatory disease, and certain hormonal imbalances [1]. Leucorrhea is generally characterized as a whitish or yellowish mucoid vaginal discharge, which may be physiological in some life stages but is pathological when excessive, foul-smelling, or associated with itching, pelvic pain, or systemic malaise. Pathological leucorrhea may arise from bacterial, fungal, or protozoal infections, inflammatory changes in the cervix or vagina, and metabolic or endocrine disturbances. From the Ayurvedic perspective, *Pradar* literally means "discharge," and the classical descriptions divide it into two principal categories: *Shweta Pradar* (white discharge) and *Rakta Pradar* (excessive or abnormal uterine bleeding, akin to menorrhagia or metrorrhagia) [2]. The pathogenesis (*samprapti*) involves primarily the derangement of *Kapha* and *Pitta doshas*, with secondary involvement of *Vata dosha*, particularly *Apana Vata*. Aggravated *Kapha* leads to excessive *kleda* (pathological moisture) and mucous secretions, while aggravated *Pitta* contributes to inflammation, ulceration, or bleeding. The pathological changes occur in the *Artavavaha srotas* (channels carrying menstrual blood and reproductive fluids) and sometimes the *Mutravaha srotas* (urinary channels), resulting in *srotodushti* (vitiation of channels) marked by *atisrava* (excessive discharge).

The management of *Pradar Roga* in Ayurveda focuses on breaking this pathophysiological cycle through *stambhana* (astringent/hemostatic measures), *shodhana* (purification), and *rasayana* (rejuvenation) therapies. Numerous herbal remedies are documented for this purpose, among which *Dhataki* (*Woodfordia fruticosa* Kurz) holds a special place. This medium-sized shrub, belonging to the family Lythraceae, is described in *Charaka Samhita*, *Sushruta Samhita*, and *Bhavaprakasha Nighantu* as possessing *stambhana* (astringent), *raktastambhaka* (hemostatic), and *vrana ropana* (woundhealing) properties [3]. In addition, *Dhataki pushpa* (flowers) are widely recognized as a fermentation initiator in classical *asava-arishta* preparations due to their natural yeast and microbial content. Ayurvedic physicians have traditionally employed *Dhataki* in *Pradar Roga* for its capacity to reduce excessive mucosal secretions, arrest abnormal bleeding, and restore local tissue tone. Formulations such as *Pushyanuga Churna*, *Ashokarishta*, and *Lodhrasava* incorporate *Dhataki* either as a principal ingredient or as a fermentation substrate, thereby enhancing both therapeutic efficacy and shelf life [4]. These compound preparations target multiple aspects of *Pradar Roga*, including antimicrobial action, reduction of inflammation, and strengthening of the uterine and vaginal musculature.

Modern pharmacological studies have increasingly validated the traditional claims surrounding *Dhataki*. Phytochemical investigations reveal a rich profile of bioactive constituents such as tannins, flavonoids, anthocyanins, phenolic acids, and saponins. Tannins contribute significantly to the plant's astringent action, aiding in mucosal contraction and reduction of secretions, while flavonoids and phenolics impart anti-inflammatory, antioxidant, and antimicrobial properties. Experimental studies have demonstrated inhibitory effects of *Dhataki* extracts on common vaginal pathogens, along with measurable anti-inflammatory and wound-healing potential in animal models. The relevance of *Dhataki* in *Pradar Roga* is thus multidimensional. From an Ayurvedic viewpoint, it corrects *dosha* imbalance, alleviates *kleda*, and promotes *srotas* integrity. From a modern biomedical perspective, it addresses microbial etiology, local inflammation, oxidative stress, and mucosal healing. This dual relevance offers fertile ground for integrative research, where classical insights can be systematically evaluated and optimized through contemporary clinical trial methodology.

Despite its promising profile, there remain significant gaps in the scientific literature. Most modern studies on *Dhataki* are limited to in-vitro or small-scale in-vivo models, with few robust clinical trials in human subjects. There is also a need for standardization of extraction methods, dosage, and formulation protocols to ensure reproducibility and efficacy. Moreover, while the plant's safety profile appears favorable in traditional usage, systematic toxicological evaluations are required to confirm safety parameters for prolonged use, especially in women of reproductive age. This review aims to synthesize available evidence from classical Ayurvedic literature, pharmacognostical studies, phytochemical analyses, and modern pharmacological and clinical research to provide a comprehensive understanding of the role of *Dhataki* in *Pradar Roga*. By bridging these knowledge systems, the article seeks to inform both Ayurvedic practitioners and modern researchers, paving the way for future integrative therapeutic strategies.

2. AYURVEDIC PERSPECTIVE OF PRADAR ROGA

Definition and Classification

Pradar Roga refers to pathological discharges from the female genital tract, which may be white (Shweta Pradar) or blood-stained/menstrual in nature (Rakta Pradar). The term "Pradar" literally denotes 'flow' or 'discharge,' and in Ayurvedic parlance, it signifies an abnormal, excessive, and pathological exudation from the vagina or uterus due to vitiation of doshas and dhatus, especially in the reproductive system [5].

- 1. **Shweta Pradar (Leucorrhoea)** Characterized by excessive white or mucoid discharge per vaginam. This condition is predominantly Kapha-dominant, often associated with Kleda (pathological moisture) formation in the reproductive tract. Due to increased *picchila* (sliminess) and *guru guna* of Kapha, there is excessive secretion from the vaginal mucosa. It may be idiopathic or secondary to infections, poor hygiene, or systemic disorders.
- 2. **Rakta Pradar (Menorrhagia** / **Metrorrhagia**) Denotes excessive or irregular menstrual bleeding unrelated to the normal physiological cycle. This is usually Pitta-dominant, involving vitiation of *rakta dhatu* and *artavavaha srotas*. Pitta's *ushna* and *tikshna* qualities cause tissue irritation, vasodilation, and breakdown, leading to excessive bleeding. In some cases, *Vata* involvement causes irregularity in the cycle.

3. ETIOPATHOGENESIS (NIDANA PANCHAKA)

1. Nidana (Causative Factors)

The classical and modern descriptions point toward the following causative factors:

- **Ahara (Dietary)** Excessive consumption of *katu* (pungent), *amla* (sour), and *lavana* (salty) foods; heavy, oily, or excessively moist foods increasing *Kapha*; frequent intake of fermented or stale foods.
- Vihara (Lifestyle) Overexertion, excessive coitus, suppression of natural urges, irregular sleep, or sedentary lifestyle.

- Manasika (Psychological) Mental stress, grief, fear, and emotional instability leading to *Vata-Pitta* aggravation.
- Aupasargika (Infective/Contagious) Unhygienic conditions, poor menstrual hygiene, sexual transmission of infections.

2. Samprapti (Pathogenesis)

The pathogenesis differs slightly for Shweta and Rakta Pradar, though the fundamental mechanism involves dosha vitiation, dhatu kshaya, and srotodushti.

- Shweta Pradar Predominantly Kapha vitiation with Kleda accumulation. The picchila guna (sliminess) and guru guna (heaviness) of Kapha vitiate the artavavaha srotas and apana vata. Excess kleda in the vaginal tract leads to non-foul-smelling, mucoid white discharge. In chronic cases, agni mandya (digestive impairment) further aggravates Kapha and ama formation, contributing to persistent secretions.
- Rakta Pradar Primarily *Pitta* vitiation, where *ushna guna* and *tikshna guna* cause *rakta dhatu* duṣṭi. Vitiated Pitta dilates uterine blood vessels and increases endometrial fragility, leading to heavy or irregular bleeding. *Vata* association can disturb menstrual rhythm, causing metrorrhagia.

3. Srotas Involved

- **Artavavaha Srotas** The reproductive channels responsible for menstruation and ovulation. Vitiation leads to either excessive bleeding or abnormal discharge.
- **Apana Vata Dysfunction** Governs downward movement of menstrual blood and excretions. Its derangement can cause irregularity, stagnation, or excessive flow.

4. CHIKITSA SIDDHANTA (PRINCIPLES OF MANAGEMENT)

1. Shodhana (Purificatory Therapy)

- Yoni Prakshalana (Vaginal Douche) Using decoctions (kashaya) of kashaya rasa (astringent) and tikta rasa (bitter) herbs helps reduce Kapha and kleda, improves local hygiene, and prevents microbial growth. Examples: Triphaladi kwatha, Nyagrodhadi kwatha, Lodhra churna in decoction.
- **Virechana** In *Rakta Pradar* with strong Pitta association, mild purgation with *trivrit* or *draksha* preparations to eliminate excess Pitta.

2. Shamana (Palliative Therapy)

- For Shweta Pradar
 - o Dhataki (Woodfordia fruticosa): Astringent, stambhana (styptic), antimicrobial.
 - Lodhra (Symplocos racemosa): Astringent, reduces Kapha and kleda, tones uterine muscles.
 - Musta (Cyperus rotundus): Deepana (improves digestion), grahi (absorbent), reduces discharge.

• For Rakta Pradar –

- o Mochrasa (Bombax malabaricum gum): Cooling, haemostatic.
- o Nagakesara (Mesua ferrea): Astringent, rakta-stambhaka.
- o Shatavari (Asparagus racemosus): Pitta-shamaka, rasayana for reproductive health.

Formulations: Pushyanuga churna, Pradarantaka lauha, Ashokarishta, Lodhrasava.

3. Rasayana (Rejuvenative Therapy)

Aims to strengthen artavavaha dhatu and restore normal vaginal/uterine function:

- Shatavari Balances Pitta, nourishes reproductive tissues.
- Amalaki Antioxidant, improves tissue repair.
- Guduchi Immunomodulator, detoxifier.

5. PATHYA-APATHYA (DIET AND LIFESTYLE)

Pathya: Easily digestible food, *mudga* (green gram), pomegranate, rice, milk, ghee in moderation, cumin, coriander. **Apathya:** Avoid excessive spicy, sour, and salty food, fast food, fermented items, day sleep, night awakening, excessive coitus during illness.

DHATAKI IN AYURVEDIC LITERATURE

Aspect	Details
Sanskrit name	Dhataki
Botanical name	Woodfordia fruticosa Kurz
Family	Lythraceae
Rasa	Kashaya, Madhura
Guna	Laghu, Ruksha
Veerya	Sheeta
Vipaka	Katu
Karma	Stambhana, Rakta stambhaka, Vrana ropana, Tridoshaghna
Part used	Flowers (Pushpa)

Classical References

- Charaka Samhita listed under stambhana dravyas [3].
- Sushruta Samhita indicated in rakta pradar and wound healing [6].
- Bhavaprakasha mentioned for gynecological bleeding and excessive discharges [7].

Formulations Containing Dhataki for Pradar Roga

- Pushyanuga Churna
- Ashokarishta (as fermentation initiator and active ingredient)
- Lodhrasava
- Patrangasava

Pharmacognosy and Phytochemistry

- Macroscopic features: Brick-red flowers, tubular, calyx persistent.
- Microscopic features: Presence of glandular trichomes, tannin-rich cells.
- **Phytoconstituents:** Tannins (ellagitannins, gallotannins), flavonoids (quercetin, kaempferol), anthraquinones, phenolic acids, sterols [8,9].

Tannins provide astringent action by precipitating proteins, reducing mucosal secretions, and forming a protective layer, thus reducing discharge in *Pradar Roga*.

PHARMACOLOGICAL ACTIONS

Action	Evidence
Antimicrobial	Effective against Candida albicans, E. coli, Staphylococcus aureus, Gardnerella vaginalis [10,11]
Anti-inflammatory	Inhibition of cyclooxygenase pathway, reduction in prostaglandin synthesis [12]
Astringent	Tannins contract mucosal membranes, reducing exudate [8]
Wound healing	Enhances fibroblast proliferation and collagen synthesis [13]
Antioxidant	Scavenges free radicals, protects reproductive tissues [14]

CLINICAL EVIDENCE

Several clinical studies have evaluated *Dhataki*-containing formulations in *Pradar Roga*.

- **Pushyanuga Churna Trial:** A randomized clinical trial on 60 women with *Shweta Pradar* showed significant reduction in discharge, itching, and foul smell within 21 days [15].
- **Ashokarishta Trial:** Combination with *Dhataki* improved symptoms of *Rakta Pradar* by normalizing menstrual flow and reducing pelvic pain [16].
- **Topical Yoni Prakshalana:** Decoction of *Dhataki* flowers reduced microbial load and improved vaginal pH in recurrent leucorrhea cases [17].

6. DISCUSSION

The therapeutic role of *Dhataki* (*Woodfordia fruticosa*) in Pradar Roga can be interpreted through both Ayurvedic and modern biomedical perspectives, revealing a strong convergence between traditional wisdom and contemporary pharmacological findings.

Ayurvedic Perspective

In Ayurvedic classics, *Dhataki* is described as having Kashaya Rasa (astringent taste), Sheeta Veerya (cool potency), and Madhura Vipaka (sweet post-digestive effect), with specific Stambhana Karma (ability to arrest abnormal secretions) and Raktaprasadana (blood-purifying) actions. These properties directly address the pathophysiology of *Pradar Roga*, which is primarily associated with the vitiation of Kapha and Pitta doshas along with Artava-vaha Srotas dushti (impairment of the reproductive channel).

The Kashaya Rasa exerts a drying and astringent effect on the vaginal mucosa, reducing excessive secretions, while the Sheeta Veerya alleviates Pitta-induced burning, inflammation, and irritation. Its Stambhana property arrests abnormal vaginal discharge, thereby controlling one of the cardinal symptoms of Pradar. Additionally, *Dhataki* is mentioned as Shonitasthapaka (hemostatic), which can be beneficial in cases where leucorrhea is accompanied by spotting or minor bleeding.

In formulations like Ashokarishta, *Dhataki* serves both as a therapeutic ingredient and as a Sandhana Dravya (fermenting agent), enhancing bioavailability and potency of the combined herbal preparation. Its synergistic role in such polyherbal formulations aligns with the Ayurvedic principle of *Yogavahi*, where one ingredient potentiates the effect of others without losing its own therapeutic identity.

Modern Pharmacological Perspective

From a biomedical standpoint, *Dhataki* is rich in tannins, flavonoids, anthraquinones, and phenolic compounds, all of which possess significant antimicrobial, anti-inflammatory, antioxidant, and mucosal protective activities.

- Antimicrobial Activity: Studies demonstrate that *Dhataki* extracts inhibit the growth of common pathogens implicated in leucorrhea, such as *Candida albicans*, *Gardnerella vaginalis*, and *Escherichia coli*. This activity can be attributed to the high tannin content, which binds to microbial proteins, disrupting their enzymatic activity and structural integrity.
- Anti-inflammatory Action: Flavonoids in *Dhataki* suppress pro-inflammatory mediators like prostaglandins and cytokines, thereby reducing vaginal mucosal irritation and edema.
- **Astringent Effect:** Tannins induce protein precipitation on the mucosal surface, forming a protective layer that reduces discharge and prevents microbial adherence.
- Wound-Healing Property: The phenolic content facilitates collagen synthesis and epithelial regeneration, aiding in the repair of inflamed or eroded vaginal mucosa.

Integration of Systemic and Local Therapy

The therapeutic potential of *Dhataki* in Pradar Roga is maximized when both systemic administration (e.g., Ashokarishta orally) and local application (e.g., vaginal douche or pessary) are employed. Oral administration targets systemic doshic imbalance, enhances immunity, and addresses associated symptoms like pelvic discomfort and general debility. Local application, on the other hand, delivers antimicrobial and mucosal-protective agents directly to the site of pathology, ensuring faster symptomatic relief.

This dual-route approach reflects the Ayurvedic concept of Sthanika and Sarvadehika Chikitsa (local and systemic treatment), ensuring comprehensive management.

Evidence from Clinical Studies

Several clinical studies have shown improvement in the symptoms of leucorrhea with *Dhataki*-based interventions, particularly when combined with other stambhana and prajasthapana drugs like *Ashoka* (*Saraca asoca*) and *Lodhra* (*Symplocos racemosa*). Reports indicate significant reductions in discharge quantity, odor, and associated pruritus. However, most available studies are small-scale, non-randomized, and lack standardized outcome measures, making it difficult to generalize findings to larger populations.

Furthermore, variations in extraction methods, dosage forms, and treatment duration across studies limit direct comparability. This highlights a critical research gap: the need for large-scale, multi-center, randomized controlled trials with clearly defined inclusion criteria and standardized dosing regimens. Such studies could validate efficacy, clarify mechanisms, and establish *Dhataki* as a recognized herbal option in gynecological care.

Challenges and Future Prospects

While traditional use and preliminary scientific evidence strongly support the efficacy of *Dhataki*, several challenges remain:

- 1. **Standardization of Raw Material:** Variability in phytochemical content due to geographical and seasonal factors can affect potency.
- 2. **Dosage Optimization:** The optimal dose, frequency, and duration for both oral and local applications remain to be standardized.
- 3. Safety Profile: Although generally regarded as safe, long-term toxicity studies are limited.
- 4. **Integration in Modern Gynecology:** For broader acceptance, *Dhataki*-based therapies need to be evaluated alongside standard biomedical treatments in comparative studies.

Future research should focus on phytochemical standardization, mechanistic studies, and clinical validation. The use of advanced delivery systems such as phytosomal formulations or bio-adhesive gels may further enhance local bioavailability and therapeutic outcomes.

7. CONCLUSION

Dhataki (Woodfordia fruticosa) is an important medicinal plant in Ayurveda, particularly valued in the management of Pradar Roga (leucorrhea and related vaginal discharge disorders). Its mention in authoritative Ayurvedic texts such as Charaka Samhita and Sushruta Samhita underscores its therapeutic relevance. Traditionally, it is recognized for its kashaya rasa (astringent taste), stambhana (styptic), rakta-stambhana (anti-hemorrhagic), and yonishodhana (vaginal cleansing) properties. Pharmacological studies corroborate these classical claims, revealing significant antimicrobial, anti-inflammatory, antioxidant, and wound-healing activities. These actions target both the underlying infectious etiologies and the inflammatory responses associated with Pradar Roga. The astringent tannins present in Dhataki help reduce excessive mucosal secretions, while flavonoids and phenolic compounds contribute to tissue repair and improved local immunity. Clinically, Dhataki is used in various forms—powders, decoctions, vaginal douches, and as a key ingredient in formulations like *Pushyanuga* Churna and Patoladi Kwatha. Both internal administration and external application have shown positive outcomes in reducing discharge, alleviating associated symptoms such as itching and foul odor, and restoring normal vaginal health.Despite its strong traditional and experimental support, there is still a need for standardized pharmacognostical profiling, precise dosage determination, safety evaluation, and large-scale randomized controlled clinical trials. Integration of Dhataki-based therapies with modern diagnostic and treatment protocols in gynecology can help enhance patient outcomes. Thus, Dhataki stands as a promising herbal intervention for Pradar Roga, bridging classical Ayurvedic wisdom and modern scientific validation, with significant potential for inclusion in integrative women's healthcare strategies.

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