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Comparative Review Of Herbal Plants With Lithotropic Effect: An Ayurvedic Correlation And Analytical Validation

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Abstract

Urolithiasis, known as *Ashmari* in Ayurveda, is a common urinary disorder characterized by stone formation due to metabolic and dietary factors. Ayurveda describes *Ashmari* as a result of *Dosha* imbalance, predominantly *Kapha*, and recommends the use of *Ashmarighna*, *Mutrala*, *Lekhana*, and *Bhedana* drugs for its management. India has a rich tradition of using medicinal plants for urinary stone disorders, many of which are widely available and traditionally validated. In recent years, experimental studies have provided scientific support for the lithotropic activity of these plants. This narrative and analytical review was conducted using classical Ayurvedic texts, the Ayurvedic Pharmacopoeia of India, and peer-reviewed scientific literature to comparatively evaluate selected herbal drugs. Plants such as *Bergenia ligulata*, *Aerva lanata*, *Rotula aquatica*, *Tribulus terrestris*, and *Crataevanurvala* demonstrated significant anti-urolithiatic activity. Their Ayurvedic attributes showed strong correlation with modern pharmacological mechanisms, including inhibition of calcium oxalate crystallization, increased diuresis, nephroprotection, and anti-inflammatory effects. The study highlights convergence between Ayurvedic principles and modern scientific validation, supporting the potential of these herbs in evidence-based management of urolithiasis.

Keywords: *Ashmari*, Lithotropic activity, Antiurolithiatic herbs, *Ayurveda*, *Pashanabheda*

INTRODUCTION :

Urolithiasis is a recurrent disorder affecting the urinary system, marked by the formation of calculi composed mainly of calcium oxalate, phosphate, or uric acid. In Ayurveda, this condition is described as *Ashmari*, caused by vitiation of *Kapha* along with *Vata* and *Pitta*, leading to obstruction in *Mutravaha Srotas*. Classical Ayurvedic texts emphasize herbal management as a primary therapeutic approach.

India's vast medicinal flora provides numerous herbal drugs traditionally used in *Ashmari*, many of which are distributed across the country. While these drugs are described based on functional attributes in Ayurveda, modern research has begun validating their anti-urolithiatic mechanisms. A comparative analysis integrating both perspectives is necessary for scientific standardization and rational use.

MATERIALS AND METHODS :

Study Design

This study is a **comparative narrative review**.

Data Sources

- Classical Ayurvedic texts (*Charaka Samhita*, *Sushruta Samhita*, *Bhavaprakasha Nighantu*)
- Ayurvedic Pharmacopoeia of India
- Peer-reviewed journals indexed in PubMed, Scopus, and Google Scholar

Selection Criteria

Plants were included based on:

- Availability across large regions of India
- Traditional indication in *Ashmari* or urinary disorders
- Experimentally proven lithotropic or anti-urolithiatic activity

Parameters of Analysis

- Ayurvedic properties (*Rasa*, *Guna*, *Virya*, *Vipaka*, *Karma*)
- Pharmacological mechanisms
- Experimental and analytical validation

RESULTS :

1.*Bergenia ligulate(Pashanabheda)* : Classically described as *Ashmari bhedana* and *Mutrala*. Experimental studies demonstrate inhibition of calcium oxalate crystallization, reduction of renal inflammation, and enhanced diuresis. Presence of bergenin is considered a key marker compound.

2. *Aerva lanata* : Widely distributed throughout India and used as a regional substitute for *Pashanabheda*. Experimental models show reduced urinary oxalate levels, inhibition of crystal nucleation, and nephroprotective activity.

3. *Rotula aquatic:* Traditionally used in South India. Animal studies confirm anti-lithic activity through increased urine output and reduced crystal deposition.

4 .*Tribulus terrestris* (Gokshura) : Described as *Mutrala* and *Bastishodhana*. Pharmacological studies validate its diuretic, renal protective, and stone-preventive effects, particularly useful in recurrence prevention.

5. *Crataevanurvala* (Varuna) : Mentioned as *Ashmarighna* and *Lekhana* in Ayurveda. Modern research supports its role in reducing stone size, preventing crystal retention, and relieving urinary obstruction.

DISCUSSION :

The comparative evaluation indicates a strong correlation between Ayurvedic drug attributes and modern pharmacological actions. Drugs possessing *Tikta–Kashaya Rasa*, *Laghu–Ruksha Guna*, and *Ushna Virya* exhibit enhanced anti-urolithiatic activity. These properties align with mechanisms such as crystal growth inhibition, enhanced diuresis, and anti-inflammatory effects.

The Ayurvedic concept of *Bhedana* and *Lekhana* is substantiated by experimental evidence showing dissolution and prevention of stone formation. The existence of multiple effective plants reflects Ayurveda's action-based therapeutic framework rather than strict botanical specificity.

CONCLUSION :

Herbal plants widely available in India demonstrate significant lithotropic activity supported by both Ayurvedic literature and modern scientific validation. *Bergenia ligulata*, *Aerva lanata*, and *Crataevanurvala* show the most consistent evidence. Integration of classical Ayurvedic concepts with analytical validation can contribute to standardized and evidence-based management of urolithiasis.

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