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Ayurvedic Substitution Logic in Vatarakta: Probable Mechanisms of Suranjan and Langali Through Rasa Panchaka Based Approach

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Abstract:
Vatarakta, a Vata-dominant Tridoshaja Vyadhi with Rakta as the principal Dushya, closely parallels gout in modern medicine, both presenting with pain and inflammation in the metatarsophalangeal joint. Gout's rising global burden, with prevalence ranging from 0.1% to 10% and incidence between 0.3 and 6 per 1,000 person-years, underscores the need for effective and accessible therapies. Colchicine, historically derived from Colchicum species, remains a cornerstone in gout management. In Ayurveda and Unani medicine, Suranjan (Colchicum luteum Baker) has long been employed in Vata rakta, supported by its Rasa Panchaka profile and textual references. However, its limited availability and high cost necessitate exploration of alternatives. Ayurveda permits substitution when drugs are scarce, provided similarity in Rasa Panchaka and therapeutic indications. Langali (Gloriosa superba Linn.) emerges as a promising candidate, textually indicated in Vatarakta and phytochemically validated by colchicine content, while being widely available and affordable. This review synthesizes classical Ayurvedic principles and modern pharmacological evidence to analyze the probable mechanisms of Suranjan and Langali in Vatarakta. Suranjan appears to act primarily on Rakta dushti and early stages of Samprapti, while Langali, may exert broader influence across multiple stages, offering a wider therapeutic window. The findings highlight the integrative potential of Rasa Panchaka-based substitution logic, positioning Langali as a validated, ecological, and cost-effective alternative to Suranjan in Vatarakta management.

Keywords: Vatarakta, Suranjan, Langali, Gout, Colchicine

1. Introduction

Background.

Vatarakta is classified among the disorders arising from the Sammurchhna of Vata and Rakta. It is primarily a Vata-dominant Tridoshaja Vyadhi, with Rakta serving as the principal Dushya.[1] The pathological interplay of these two factors leads to the manifestation of Vatarakta, which closely resembles gout in modern medicine. Clinically, both conditions characteristically present with pain, tenderness, and inflammation, most often beginning in the metatarsophalangeal joint of the great toe.[2]

Rationale of the study

Gout is a growing global health concern, with prevalence ranging from 0.1% to 10% and incidence between 0.3 and 6 cases per 1,000 person-years. This rising burden underscores the need for effective and accessible therapies[3].

Colchicine remains a cornerstone in the management of gout due to its anti-inflammatory and uric acid-modulating properties. Historically, it has been extracted from Colchicum species, linking modern pharmacology with traditional plant-based medicine.[4] In Ayurvedic and Unani medicine, Suranjan (Colchicum luteum Baker) has been used for centuries in the treatment of Vatarakta. Its Rasa Panchaka profile and textual references support its therapeutic relevance. However, its limited availability and high-cost pose challenges for widespread use. Ayurveda allows substitution when a drug is scarce, provided the alternative shares similar Rasa Panchaka attributes and therapeutic indications.[5] Thus, identifying a plant that is textually indicated in Vatarakta and contains colchicine as an active marker becomes crucial.

Langali (Gloriosa superba Linn.) emerges as a promising alternative in the management of Vatarakta. Classical Ayurvedic texts provide clear indications for its use in this condition, thereby supporting its relevance within the traditional framework. Modern phytochemical studies further validate its potential, revealing the presence of colchicine and related alkaloids that contribute to anti-inflammatory and anti-gout activity. In addition to textual authority and pharmacological evidence, Langali offers practical advantages like wide availability and affordability as compared to Suranjan, and thus represents a cost-effective substitute. This convergence of classical indications, phytochemical validation, and accessibility underscores its suitability as an integrative candidate for Vatarakta therapy.

Aim

The aim of this article is to undertake a comprehensive review of Suranjan (Colchicum luteum Baker) and Langali (Gloriosa superba Linn.) in the context of Vatarakta, correlating classical Ayurvedic principles with modern pharmacological insights. Specifically, the article seeks to analyze their probable modes of action through a Rasa Panchaka-based approach, and the rationale for substitution.

By integrating textual authority, Rasa Panchaka attributes and colchicine-mediated pharmacology, this review aims to highlight the comparative roles of Suranjan and Langali in Vatarakta management, and to evaluate the potential of Langali as an alternative to suranjan.

2. Methods (Review Methodology)

This article is structured as narrative review synthesizing evidence from classical Ayurvedic texts and modern pharmacological literature to evaluate the probable mechanisms of Suranjan (Colchicum luteum Baker) and Langali (Gloriosa superba Linn.) in the context of Vatarakta.

Sources of Literature

Classical Ayurvedic compendia including Charaka Samhita, Sushruta Samhita, Madhava Nidana, and Bhavaprakasha were consulted to identify textual references to Suranjan and Langali, their indications in Vatarakta, and their Rasa Panchaka attributes. In addition, Unani literature was reviewed for Suranjan's therapeutic relevance. Modern scientific databases such as PubMed, Scopus, AYUSH Research Portal, and Google Scholar were searched using keywords including "Colchicum luteum," "Gloriosa superba," "colchicine," "gout," "Vatarakta," and "Ayurveda."

Methodology

The review employed a dual lens of analysis:

A. Ayurvedic perspective: Comparative evaluation of Suranjan and Langali based on Rasa Panchaka.

B. Pharmacological perspective: Analysis of mechanism of action of colchicine in gout.

A. Ayurvedic perspective: Rasa Panchaka Based Approach

Suranjan (Colchicum luteum Baker), widely recognized in both Ayurvedic and Unani systems of medicine, is traditionally employed in the management of Vatarakta. In contrast, Langali (Gloriosa superba Linn.),

though mentioned in classical texts in the context of Vatarakta, is not commonly employed in practice. The Rasa Panchaka of both the drugs are defined as follows:

Rasa Panchaka	**Suranjan**[6]	**Langali**[7]
Rasa	Katu, Tikta	Katu, Tikta, Kashaya
Guna	Laghu, Ruksha	Sara, Teekshna, Laghu
Virya	Ushna	Ushna
Vipaka	Katu	Katu
Prabhava	….	Garbhapatana
Doshaghanata	Kapha-vatahara, Rakta Prasadhana	Kaphavatahara, Pittala
Karma	Vranashodhana, Vranaropana	Amanashana

B. Pharmacological Perspective[8,9,10]

Since, both these plants contain colchicine as their principle active marker which is an alkaloid used in the treatment of acute gout flares. Colchicine exerts its therapeutic effect in gout primarily by targeting the inflammatory cascade triggered by monosodium urate crystal deposition. It binds to tubulin and disrupts microtubule polymerization, thereby inhibiting neutrophil migration, chemotaxis, and phagocytosis at the site of crystal accumulation. This suppression of neutrophil activity reduces the release of pro-inflammatory mediators and prevents amplification of the inflammatory response. In addition, colchicine interferes with activation of the NLRP3 inflammasome, leading to decreased secretion of interleukin-1β, a key cytokine in gouty inflammation. Collectively, these actions attenuate pain, swelling, and joint inflammation during acute gout attacks.

3. Results (Synthesized Findings)

Probable Mode of Action

The therapeutic relevance of Suranjan (Colchicum luteum) and Langali (Gloriosa superba) in Vatarakta can be understood through both modern pharmacology and Ayurvedic principles. Modern science attributes their efficacy to colchicine, while Ayurveda explains their action via Rasa Panchaka and Karma. Both drugs share Katu Vipaka and Ushna Virya, supporting Deepana and Pachana activities that resolve Ama. However, their Rasa and Guna differ, Suranjan (Katu, Tikta; Laghu, Ruksha) acts more prominently on Rakta dushti and early stages of Samprapti such as Sanchaya and Prakopa. Langali (Katu, Tikta, Kashaya; Sara, Teekshna, Laghu) may exert broader influence, with Teekshna Guna intensifying Ama resolution and Sara Guna facilitating dosha movement, potentially acting across later stages including Sthanasamshraya and Bheda.

Thus, while Suranjan primarily intervenes at earlier stages, Langali may offer a wider therapeutic window, highlighting how differences in Rasa and Guna translate into distinct yet complementary profiles within the Ayurvedic six-stage model of disease progression.

4. Discussion

The comparative evaluation of Suranjan (Colchicum luteum Baker) and Langali (Gloriosa superba Linn.) highlights the integrative potential of combining Ayurvedic principles with modern pharmacological evidence. Suranjan, long established in both Ayurveda and Unani medicine, remains the classical reference

drug for Vatarakta, validated by its colchicine content and well-documented anti-inflammatory activity. However, its limited availability and high cost restrict its widespread use.

Langali, though less commonly employed in practice, demonstrates strong textual authority in Ayurvedic literature and contains colchicine and related alkaloids that parallel pharmacological profile of Suranjan. Its Rasa Panchaka attributes, particularly Kashaya Rasa and Teekshna Guna, suggest a broader therapeutic window, potentially allowing intervention across multiple stages of Samprapti. This aligns with modern pharmacological findings that support its anti-inflammatory and anti-gout potential.

The discussion underscores the relevance of Ayurveda's substitution principle (Abhava Pratinidhi Dravya), which permits alternatives when the primary drug is scarce, provided similarity in Rasa Panchaka and therapeutic indications. In this case, Langali emerges as a logical substitute for Suranjan, bridging classical wisdom with modern validation. Beyond therapeutic equivalence, Langali offers ecological and economic advantages, making it a sustainable option for contemporary practice.

5. Conclusion

This integrative review demonstrates that both Suranjan and Langali hold significant relevance in the management of Vatarakta. Suranjan remains the classical gold standard, supported by centuries of use and modern pharmacological validation. Langali, however, offers a compelling alternative: it is textually indicated, phytochemically validated, widely available, and cost-effective.

By analyzing their probable modes of action through Rasa Panchaka and correlating these with colchicine-mediated pharmacology, the review highlights how differences in Rasa and Guna translate into distinct therapeutic profiles. Suranjan appears to act primarily at earlier stages of Samprapti, while Langali may exert influence across multiple stages, offering a wider therapeutic window.

The findings reinforce the value of Ayurveda's substitution logic, demonstrating its compatibility with modern pharmacological reasoning. Ultimately, Langali can be considered a validated, ecological, and affordable substitute for Suranjan in Vatarakta management, exemplifying how classical principles and modern science can converge to enrich integrative medicine.

6. Future Directions

While this review highlights the comparative relevance of Suranjan (Colchicum luteum Baker) and Langali (Gloriosa superba Linn.) in Vatarakta, several areas warrant further exploration:

- Clinical Validation: Controlled clinical trials are needed to evaluate the safety, efficacy, and dosage of Langali in Vatarakta, and to compare its outcomes directly with Suranjan and standard colchicine therapy.
- Integrative Medicine Pathways: Future research should explore how Rasa Panchaka-based substitution logic can be systematically aligned with modern pharmacological validation, creating frameworks for integrative drug discovery.

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