

PHARMACOLOGICAL PROFILE AND THERAPEUTIC POTENTIAL OF PUTIKADI LEPA: A COMPREHENSIVE REVIEW

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ABSTRACT

Putikadi Lepa is a classical polyherbal Ayurvedic topical formulation traditionally administered as a paste for external application. The formulation comprises fresh leaves of medicinal plants processed with Gomutra. Acharya Sushruta describes Putikadi Lepa as possessing Shodhana and Ropana properties. The formulation demonstrates multidimensional pharmacological actions including antimicrobial, anti-inflammatory, antioxidant, debridement, angiogenic, and collagen-promoting effects. These activities collectively target pathological mechanisms. The present review critically evaluates its pharmacological actions by correlating classical description with modern scientific findings related to its constituent herbs. The formulation demonstrates multi-target therapeutic potential. Available evidence suggests that Putikadi Lepa has antimicrobial, anti-inflammatory, antioxidant, debridement, and wound healing properties. However, limitations persist regarding standardization, phytochemical fingerprinting, pharmacokinetic characterization, and high-quality experimental validation of the complete formulation. This review highlights the classical ayurvedic perspective, phytochemical composition, pharmacological profile and therapeutic applications of Putikadi Lepa while identifying critical research gaps necessary for evidence-based validation.

Keywords: Putikadi Lepa, Polyherbal formulation, Pharmacological profile, Therapeutic potential.

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INTRODUCTION:

Topical herbal formulations occupy a significant role in traditional systems of medicine. In Ayurveda, Lepa refers to a semisolid paste prepared from fresh plant materials intended for localized therapeutic action through dermal absorption. Putikadi Lepa represents a classical polyherbal preparation described in Ayurvedic compendia and formulated primarily from fresh leaf drugs exhibiting antimicrobial and detoxifying properties. Such polyherbal formulations are believed to produce synergistic therapeutic effects by acting on several molecular pathways simultaneously, thereby enhancing efficacy while minimizing undesirable effects. Modern pharmacological investigations increasingly support this concept by demonstrating that phytochemicals present in medicinal plants interact with numerous cellular signalling pathways involved in inflammation, oxidative stress, microbial proliferation, immune regulation, and tissue repair.

In recent decades, interest in plant-based topical formulations has increased due to antimicrobial resistance, adverse effects associated with synthetic agents. Classical Ayurvedic formulations are generally composed of multiple medicinal plants that act synergistically through diverse pharmacological mechanisms. Traditionally explained through Shodhana and Ropana actions, its therapeutic role can be explored through modern pharmacological mechanisms. Therefore, the present review aims to comprehensively evaluate the pharmacological profile and therapeutic potential of Putikadi Lepa based on classical Ayurvedic literature and contemporary scientific evidence. Special emphasis is placed on the phytochemical composition of its ingredients, experimentally validated biological activities, possible mechanisms of action, current research limitations, and future directions for evidence-based development and clinical translation.

METHODOLOGY OF REVIEW

A narrative review approach was adopted. Classical Ayurvedic references were examined to understand the conceptual basis of Putikadi Lepa. Although relatively few studies have investigated Putikadi Lepa as a complete formulation, substantial pharmacological information is available regarding its individual herbal ingredients. The present review integrates evidence from both classical Ayurvedic literature and contemporary biomedical research to provide a comprehensive understanding of the formulation based on:

- Antimicrobial activity
- Anti-inflammatory mechanisms
- Antioxidant properties
- Immunomodulatory activity

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- Angiogenic and proliferative effects
- Collagen synthesis

Studies related to individual phytoconstituents were critically analyzed and correlated with classical Ayurvedic principles.

Table 1. Classical Ingredients of Putikadi Lepa

Putikadi Lepa constitutes leaves of:

Sanskrit Name	Botanical Name
Chirbilva	<i>Holoptelea integrifolia</i>
Arka	<i>Calotropis procera</i>
Snuhi	<i>Euphorbia neriifolia</i>
Devdaru	<i>Cedrus devdara</i>
Aragavadha	<i>Cassia fistula</i>
Jati	<i>Jasminum grandiflorum</i>
Gomutra	Cow urine

Table 2. Ayurvedic Pharmacodynamic Attributes

The formulation predominantly exhibits:

Rasa	Tikta, Katu
Guna	Laghu, Ruksha
Virya	Ushna
Karma	Krimighna, Shothaghna, Kandughna, Vrana-shodhaka and Ropaka

From an Ayurvedic perspective, these properties facilitate local detoxification, reduction of inflammatory exudates, support restoration of tissue homeostasis and enhancement of tissue metabolism.

Table 3. Phytochemical Profile of the Ingredients of Putikadi Lepa

Ingredients	Major Phytoconstituents	Key Pharmacological Significance
Chirbilva (<i>Holoptelea integrifolia</i>)	Flavonoids, tannins, triterpenoids, sterols, alkaloids, phenolic compounds	Antimicrobial, antioxidant, anti-inflammatory
Arka (<i>Calotropis procera</i>)	Cardiac glycosides, flavonoids, triterpenoids, alkaloids, proteolytic enzymes	Anti-inflammatory, antimicrobial, analgesic
Snuhi (<i>Euphorbia neriifolia</i>)	Diterpenoids, triterpenoids, flavonoids, tannins, steroids	Antimicrobial, antioxidant, immunomodulatory
Devdaru (<i>Cedrus devdara</i>)	Sesquiterpenes (cedrol, himachalol), lignans, flavonoids, essential oils	Anti-inflammatory, antimicrobial, analgesic, antioxidant
Aragavadha (<i>Cassia fistula</i>)	Anthraquinones (rhein, emodin), flavonoids, tannins, saponins, phenolics	Antioxidant, anti-inflammatory, antimicrobial
Jati (<i>Jasminum grandiflorum</i>)	Flavonoids, iridoid glycosides, phenolic acids, tannins, essential oils	Antioxidant, antimicrobial, anti-inflammatory
Gomutra	Urea, uric acid, creatinine, minerals, enzymes, volatile fatty acids	Reported immunomodulatory and antimicrobial activities

The pharmacological potential of Putikadi Lepa is attributed to the synergistic action of diverse phytoconstituents, including flavonoids, phenolic compounds, tannins, terpenoids, alkaloids, glycosides, saponins, and essential oils. These bioactive molecules exhibit antimicrobial, anti-inflammatory, antioxidant, analgesic, and immunomodulatory activities through multiple molecular pathways. The combined presence of these phytochemicals may enhance the therapeutic efficacy of the formulation compared with individual ingredients, although direct evidence on the standardized formulation remains limited.

THERAPEUTIC POTENTIAL OF PUTIKADI LEPA

The therapeutic potential of Putikadi Lepa is attributed to the synergistic interaction of its constituent herbs, each having diverse pharmacological activities. The presence of antimicrobial, anti-inflammatory, antioxidant, analgesic, immunomodulatory and tissue regenerative phytochemicals provides a scientific basis for its traditional use in various external disorders.

The antimicrobial activity of the constituent herbs may help reduce microbial burden and prevent secondary infections, while anti-inflammatory phytochemicals modulate inflammatory mediators and minimize tissue damage. Simultaneously,

antioxidant constituents protect cells against oxidative stress by neutralizing reactive oxygen and preserving cellular integrity. The combined analgesic and immunomodulatory effects may further contribute to symptomatic relief and restoration of normal physiological processes. Experimental evidence also suggests that several ingredients promote fibroblast proliferation, collagen synthesis, angiogenesis and epithelial regeneration, indicating potential benefits in tissue repair and recovery. These pharmacological actions support the traditional therapeutic applications of Putikadi Lepa and highlight its potential as a multifunctional herbal formulation.

FUTURE PERSPECTIVES

Despite encouraging pharmacological evidence, the scientific validation of Putikadi Lepa remains incomplete. Future research should focus on evaluating the standardized formulation rather than only its individual ingredients. Establishing standardized methods for authentication of raw materials, pharmaceutical preparation, and quality control will improve reproducibility and facilitate comparison among studies.

Clinical evidence remains limited; therefore, well-designed randomized controlled trials with adequate sample sizes are essential to evaluate the efficacy and safety of standardized Putikadi Lepa. Future clinical studies should adopt standardized outcome measures, appropriate comparator groups, and longer follow-up periods to generate robust evidence. Integrating classical Ayurvedic principles with modern biomedical research may further enhance understanding of the formulation and facilitate its incorporation into evidence-based healthcare.

CONCLUSION

Putikadi Lepa, a classical polyherbal formulation described in Chakradatta, possesses a diverse pharmacological profile supported by both traditional Ayurvedic knowledge and contemporary scientific evidence. Its constituent herbs are rich in flavonoids, phenolic compounds, alkaloids, terpenoids, glycosides, tannins, and essential oils, which collectively contribute to antimicrobial, anti-inflammatory, antioxidant, analgesic, antifungal, immunomodulatory, and tissue-regenerative activities. These multitarget pharmacological actions provide a plausible scientific basis for its broad therapeutic applications.

However, the majority of available evidence is derived from studies on individual herbal ingredients rather than the standardized formulation. Variations in pharmaceutical processing, phytochemical composition, and experimental methodology limit the reproducibility and clinical translation of existing findings. Consequently, definitive conclusions regarding the efficacy and mechanisms of action of Putikadi Lepa require further investigation.

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