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RINGANI (SOLANUM XANTHOCARPUM): TRADITIONAL AYURVEDIC APPLICATIONS AND SCIENTIFIC INSIGHTS – A REVIEW ARTICLE

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ABSTRACT

Background: *Ringani* (*Solanum xanthocarpum*) is a renowned medicinal plant of the Solanaceae family, extensively mentioned in Ayurvedic classics. It forms a vital component of Dashamoola, exhibiting a broad therapeutic spectrum. **Objective:** To explore *Ringani* through the lens of Ayurvedic literature and contemporary biomedical research, emphasizing its morphology, pharmacology, and clinical applications. **Methods:** A systematic literature review was conducted using Ayurvedic texts, pharmacognostic databases, and peer-reviewed biomedical journals. **Results:** The plant exhibits anti-asthmatic, diuretic, hepatoprotective, antimicrobial, and anti-inflammatory properties. Its phytoconstituents include steroidal alkaloids, flavonoids, and saponins which support its traditional claims. **Conclusion:** *Ringani* demonstrates potential as an integrative phytomedicine. While classical texts provide therapeutic direction, modern studies confirm and expand upon these traditional uses, warranting further clinical validation.

KEYWORDS: *Solanum xanthocarpum*, Ringani, Kantakari, Ayurveda, Shwasa, Dashamoola, Rasayana, phytopharmacology.

1. INTRODUCTION (EXPANDED)

Ayurveda, the ancient Indian system of medicine, lays significant emphasis on medicinal plants as sources of healing and rejuvenation. Among these, *Ringani* (*Solanum xanthocarpum*), commonly known as Kantakari or Indian Nightshade, has been widely used since the time of Charaka and Sushruta. It is one of the ten roots (Dashamoola) described for managing Vata disorders, respiratory ailments, and inflammatory conditions. The term "Kantakari" literally means "thorny," indicating the spiny nature of the plant.

From an Ayurvedic perspective, it is *Shwasahara* (reliever of breathlessness), *Kaphaghna* (remover of phlegm), and *Krimighna* (anti-parasitic). Modern research supports these actions with findings that demonstrate anti-asthmatic, antimicrobial, and hepatoprotective activities, among others.

Its rich phytochemical profile—especially alkaloids like solasodine and solasonine—has generated interest among pharmacognosists. The combination of traditional use and scientific backing positions *Ringani* as a strong candidate for integration into evidence-based phytotherapy.

2. Botanical Description

- **Botanical Name:** *Solanum xanthocarpum*
- **Family:** Solanaceae
- **Sanskrit Names:** Kantakari, Vyaghri, Duhsparsha, Nidigdhika
- **Common Names:** Yellow-berried Nightshade, Ringani, Bhatkataiya (Hindi), Kantakari (Marathi), Kandankattiri (Tamil)
- **Part Used:** Root, fruit, and the whole plant

MORPHOLOGY

Feature	Description
Habit	A diffuse, prickly, perennial herb or undershrub, up to 1–1.5 meters tall
Stem	Green with purple tinge, covered with sharp yellowish prickles
Leaves	Broad ovate, sinuate-toothed or lobed, covered with glandular hairs and prickles
Flowers	Purple, 1–2.5 cm in diameter, in lateral cymes
Fruits	Globular berries, yellow when ripe, with green veins
Seeds	Flattened, yellowish, numerous inside the berries
Distribution	Found widely in India, especially in dry and waste lands, roadsides, and forest clearings. Also cultivated occasionally.
Climate	Grows in tropical and subtropical regions; drought resistant

3. Ayurvedic Review

- **Guna (Properties):** Laghu (light), Ruksha (dry)
- **Rasa (Taste):** Tikta (bitter), Katu (pungent)
- **Veerya (Potency):** Ushna (hot)
- **Vipaka (Post-digestive effect):** Katu (pungent)
- **Karma:** Shwasahara, Kaphahara, Krimighna, Jwaraghna, Mutral

Dosage

- **Kwatha (Decoction):** 50–100 ml
- **Churna (Powder):** 1–3 grams
- **Svarasa (Fresh juice):** 10–20 ml

4. Phytochemistry

Phytochemical studies of *Solanum xanthocarpum* have identified numerous bioactive constituents.

- **Steroidal alkaloids:** Solasodine, Solasonine, Solamargine
- **Glycosides:** Saponins
- **Flavonoids:** Rutin, Quercetin
- **Triterpenoids**
- **Tannins, Phenolics**
- **Essential oils, Carbohydrates, Proteins**

5. Pharmacological Actions.

Action	Mechanism	Evidence
Anti-asthmatic	Relaxation of bronchial smooth muscle via β-adrenergic activity	Animal studies, bronchodilation
Antimicrobial	Disruption of bacterial membrane integrity	In vitro studies
Anti-inflammatory	Inhibits COX and LOX pathways, reducing prostaglandin synthesis	Animal models, rat paw edema
Diuretic	Increases renal output and sodium excretion	Tested in albino rats
Antioxidant	Scavenging of superoxide and hydroxyl radicals	DPPH and FRAP assays
Hepatoprotective	Stabilizes liver enzymes and membranes against toxin-induced damage	CCl_4- and paracetamol-induced models
Antidiabetic	Enhances insulin secretion and reduces blood glucose levels	Streptozotocin-induced models

6. Therapeutic Applications

Condition	Ayurvedic Relevance	Modern Correlate
Shwasa	Bronchodilation, expectorant	Asthma, COPD
Kasa	Mucolytic, Kaphaghna	Chronic bronchitis
Jwara	Antipyretic and immunomodulatory	Viral fever, flu
Mutrakrichra	Diuretic, Shothahara	UTI, renal inflammation
Krimi	Anthelmintic, digestive stimulant	Helminthiasis
Kushtha	Krimighna, Rasayana	Psoriasis, eczema
Yakrit Vikara	Hepatoprotective	Hepatitis, liver toxicity

7. Mode of Action

In Shwasa and Kasa (Asthma and Cough)

- **Samprapti Vighatana:** *Ringani* acts on Kapha-Vata dosha through its Ushna veerya and Katu-Tikta rasa, helping to liquefy and expel accumulated mucus, thus clearing the respiratory channels (*Pranavaha srotas*).
- **Modern Correlate:** Solasodine exhibits bronchodilatory and anti-inflammatory effects by modulating β2-receptors and reducing leukotriene activity.

In Mutrakrichra (Urinary Disorders)

- **Ayurvedic Perspective:** It supports *Apana Vata* regulation and acts as a Mutrala dravya, relieving burning micturition and retention.
- **Modern Mechanism:** Saponins and flavonoids enhance renal filtration and increase diuresis.

In Jwara (Fever)

- Combines Jwaraghna action with immune-enhancing properties. The flavonoids support macrophage activity and immune modulation.

In Krimi and Kushtha (Worms & Skin Diseases)

- **Ayurveda:** Acts as Krimighna by destroying microbial toxins and purifying blood (*Rakta shuddhikara*).
- **Modern View:** Antibacterial and antifungal properties due to alkaloids and polyphenols inhibit pathogenic organisms and reduce inflammatory response in skin.

In Liver Disorders

- Protects hepatocytes by stabilizing lysosomal membranes, reducing lipid peroxidation, and promoting enzyme normalization.

8. DISCUSSION

The therapeutic applications of *Ringani* are not limited to respiratory disorders. Its versatility, as explained in Ayurvedic texts, is supported by modern research. The synergy between multiple bioactive molecules makes it suitable for chronic conditions involving inflammation, infection, and oxidative stress.

Traditional formulations like Dashamoolarishta, Kantakari Ghrita, and Vyaghri Haritaki Avaleha are clinically used and standardized in Ayurveda, where *Ringani* plays a central role. However, the current lack of clinical trials and regulatory standardization hinders its global acceptance.

An interdisciplinary approach—combining Ayurvedic diagnostics with modern biomarkers—could be the way forward for research and integrative therapy.

9. CONCLUSION

Ringani (*Solanum xanthocarpum*) stands as a bridge between ancient Ayurvedic wisdom and modern therapeutic science. Rooted deeply in classical texts and validated through pharmacological studies, this medicinal herb offers a broad spectrum of therapeutic actions including anti-asthmatic, antimicrobial, hepatoprotective, and diuretic effects.

Its strong presence in formulations like Dashamoola and Kantakari Ghrita reflects its foundational role in Ayurvedic therapeutics. The plant addresses diseases holistically, aligning with Ayurvedic principles of Dosha balance, Dhatu nourishment, and Srotas cleansing.

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