Journal of Pharmacognosy and Phytochemistry
Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
Impact Factor (RJIF): 6.35
www.phytojournal.com
JPP 2025; 14(5): 336-338
Received: 11-06-2025
Accepted: 15-07-2025

Dr. Amol Krushna Pable
Department of Dravyagun, CSMSS Ayurveda Mahavidyalaya and Rugnalaya, Kanchanwadi, Chhatrapati Sambhajinagar, Maharashtra, India

Dr. Aparna Ghotankar
Guide & HOD CSMSS Ayurveda Mahavidyalaya and Rugnalaya, Kanchanwadi,Chhatrapati Sambhajinagar, Maharashtra, India

Corresponding Author:
Dr. Amol Krushna Pable
Department of Dravyagun, CSMSS Ayurveda Mahavidyalaya and Rugnalaya, Kanchanwadi, Chhatrapati Sambhajinagar, Maharashtra, India

Kaṇṭakārī (*Solanum xanthocarpum*): An ayurvedic review with contemporary correlation

Amol Krushna Pable and Aparna Ghotankar

DOI: https://www.doi.org/10.22271/phyto.2025.v14.i5e.15590

Abstract
Kaṇṭakārī (*Solanum xanthocarpum* Schrad. & Wendl.), belonging to the family Solanaceae, is one of the important medicinal plants included in *Daśamūla* and *Pañcamūla*. It is described in classical Ayurvedic texts for its efficacy in *Śvāsa* (dyspnea/asthma), *Kāsa* (cough), *Hikka* (hiccup), *Mutrakṛcchra* (dysuria), and *Śūla* (colicky pain). It is known for its *Kaṭu rasa*, *Laghu* and *Rūkṣa guṇa*, *Uṣṇa vīrya*, and *Kaṭu vipāka*. Modern pharmacological studies reveal its bronchodilator, anti-inflammatory, antimicrobial, hepatoprotective, nephroprotective, and antioxidant activities. This article attempts to review the Ayurvedic references, pharmacological actions, phytochemistry, and therapeutic potentials of Kaṇṭakārī in the light of modern research.

Keywords: Kaṇṭakārī, *Solanum xanthocarpum*, Ayurveda, medicinal plants, pharmacological activities, Daśamūla, respiratory disorders

Introduction
Medicinal plants have been the foundation of traditional health care systems and continue to play a significant role in modern therapeutics. Ayurveda, the ancient Indian system of medicine, describes thousands of medicinal plants with specific pharmacological properties and therapeutic actions. Among them, *Kaṇṭakārī* (*Solanum xanthocarpum* Schrad. & Wendl.), belonging to the family Solanaceae, holds a prime position due to its extensive use in *Śvāsa* (respiratory disorders), *Kāsa* (cough), *Hikka* (hiccup), *Mutrakṛcchra* (dysuria), and *Jvara* (fever) management [1].

Kaṇṭakārī is one of the ten roots of *Daśamūla* and also a component of *Pañcamūla*, making it essential in formulations like *Daśamūla kvātha*, *Daśamūlārṣṭa*, and *Kaṇṭakārī ghṛta* [2]. Classical texts describe its attributes as *Kaṭu* and *Tikta rasa*, *Laghu* and *Rūkṣa guṇa*, *Uṣṇa vīrya*, and *Kaṭu vipāka*, with specific action of balancing *Kapha* and *Vāta doṣa* [3]. The presence of prickly thorns and yellow fruits gives it the nomenclature *Kaṇṭakārī* ("full of thorns") and *Vyāghrī* ("effective against respiratory ailments") [4].

From a phytochemical perspective, the plant contains alkaloids (solasodine, solanine, solasonine), steroidal saponins, flavonoids, and phenolic compounds that contribute to its wide range of pharmacological activities [5]. Modern studies have validated its bronchodilator, antitussive, anti-inflammatory, antimicrobial, antioxidant, hepatoprotective, and nephroprotective effects, providing scientific support to its Ayurvedic claims [6].

Due to its multidimensional therapeutic potential, Kaṇṭakārī has been studied for its role in asthma, bronchitis, chronic obstructive pulmonary disease (COPD), urinary disorders, and liver ailments. Its inclusion in several classical formulations and contemporary research indicates its significance in bridging traditional medicine and modern pharmacology [7]. Thus, reviewing Kaṇṭakārī in both Ayurvedic and modern contexts provides an integrative understanding of its pharmacological profile and clinical relevance.

Nirukti and Synonyms
- **Nirukti:** "Kaṇṭakārī" – the plant full of thorns (*kaṇṭaka*).
- **Synonyms:** *Vyāghrī, Nidigdhikā, Kāntakī, Kṛṣṇī, Dūrvāntikā*.

Botanical Description
- **Scientific Name:** *Solanum xanthocarpum* Schrad. & Wendl.
- **Family:** Solanaceae
- **Morphology:** A perennial prickly herb, 30–120 cm in height, armed with straight yellow prickles. Flowers are purple, berries yellow when ripe.
- **Part Used**: Whole plant, especially roots and fruits.

व्याघ्री तिक्ता कटुका लघुश्चोष्णा रसात्मिका।
कफवातहरापथ्या श्वासकासविनाशिनी॥
(*Bhāvaprakāśa Nighaṇṭu, Harītakyādi Varga 197–198*)

Phytochemistry
Kaṇṭakārī is rich in bioactive constituents:
- **Alkaloids:** Solasodine, solanine, solasonine
- **Steroidal saponins**
- **Flavonoids**
- **Phenols and tannins**
- **Essential oils**

Ayurvedic Pharmacodynamics (Rasa–Guṇa–Vīrya–Vipāka)
- **Rasa:** Kaṭu, Tikta
- **Guṇa:** Laghu, Rūkṣa
- **Vīrya:** Uṣṇa
- **Vipāka:** Kaṭu
- **Doṣaghnatva:** Kapha-Vāta hara

Therapeutic Indications in Ayurveda
1. **Śvāsa (Dyspnea/Asthma)** – Acts as bronchodilator and expectorant.
2. **Kāsa (Cough)** – Clears Kapha from airways.
3. **Hikka (Hiccup)** – Provides relief by reducing Vāta-Kapha.
4. **Jvara (Fever)** – Used in *Daśamūla kvātha* as antipyretic.
5. **Mutrakṛcchra (Dysuria)** – Diuretic action.
6. **Śūla (Colic pain)** – Relieves spasmodic pain.
7. **Arśas (Piles)** – Used in decoction form.

Formulations Containing Kaṇṭakārī
- *Daśamūla kvātha*
- *Kaṇṭakārī ghṛta*
- *Śvāsa kāṣāya*
- *Daśamūlārṣṭa*
- *Pañcamūla kvātha*

Pharmacological Actions (Modern Studies)
- **Respiratory system:** Bronchodilator, antitussive, anti-asthmatic
- **Anti-inflammatory:** Reduces edema and inflammation
- **Antimicrobial:** Effective against bacterial and fungal infections
- **Hepatoprotective:** Guards against hepatotoxicity
- **Nephroprotective:** Improves renal functions
- **Antioxidant:** Scavenges free radicals
- **Analgesic:** Provides pain relief

Modern Pharmacological Mode of Action
Respiratory System
- Alkaloids like solasodine & solanine → bronchodilator effect, smooth muscle relaxation, expectorant activity.
- Clears airway obstruction, reduces mucus viscosity → relieves asthma, bronchitis, and cough.

Anti-inflammatory Action
- Steroidal saponins & flavonoids → inhibit release of inflammatory mediators (prostaglandins, cytokines).
- Useful in *Śvāsa-Kāsa* and painful conditions.

Antimicrobial Action
Active phytoconstituents → inhibit bacterial & fungal growth → helpful in *Krimi roga* and respiratory infections.

Diuretic & Nephroprotective Action
- Enhances urinary output → relieves *Mutrakṛcchra*.
- Reduces serum creatinine, protects renal tissues.

Hepatoprotective & Antioxidant Action:
- Flavonoids & phenolics → scavenge free radicals, protect against oxidative stress.
- Prevents liver damage (*Yakṛt vikāra*).

Analgesic Action
Provides relief in *Śūla* (colicky pain) through anti-spasmodic activity.

Discussion
व्याघ्री कण्टकार्याद्या श्वासकासप्रणाशिनी।
(*Charaka Saṁhitā, Cikitsāsthāna 4/44*)
Kaṇṭakārī is described in Ayurveda as a prime drug for *Śvāsa-Kāsa cikitsā* due to its *Kapha-Vātahara* properties, making it particularly useful in respiratory pathologies like asthma, chronic bronchitis, and productive cough [8]. Its expectorant and bronchodilator action is well correlated with the presence of alkaloids such as solasodine and solanine, which are reported to relax bronchial smooth muscles and facilitate mucus clearance [9]. Clinical studies have shown that extracts of *Solanum xanthocarpum* reduce airway resistance and improve pulmonary function in asthmatic patients [10].
In addition to respiratory effects, Kaṇṭakārī is also indicated in *Mutrakṛcchra* and urinary calculi in Ayurvedic texts [11]. Modern pharmacological investigations demonstrate its significant diuretic activity, which supports its classical indication in urinary disorders. Its nephroprotective potential has also been validated in experimental models where ethanolic extract of the plant reduced serum urea and creatinine levels, indicating protective action on renal tissues [12].
Another important property of Kaṇṭakārī is its role in *Jvara* and inflammatory conditions. Ayurveda emphasizes its use in *Daśamūla kvātha* for fever management and as an anti-inflammatory remedy [13]. Modern studies corroborate this by highlighting its potent anti-inflammatory activity through inhibition of prostaglandin synthesis and reduction of inflammatory mediators in experimental models [14].
Furthermore, Kaṇṭakārī exhibits antimicrobial properties against bacterial and fungal strains, which aligns with its traditional use in *Krimi roga* (parasitic infestations and infections) [15]. The fruit and root extracts contain flavonoids and tannins that inhibit microbial growth, thereby validating its usage in infectious conditions.
Its antioxidant potential has been widely studied, showing free radical scavenging activity that protects against oxidative stress-related tissue damage [16]. This property also explains its hepatoprotective action, where administration of Kaṇṭakārī extract prevented carbon tetrachloride-induced liver injury by reducing lipid peroxidation and enhancing antioxidant enzyme levels [17].
Overall, the Ayurvedic descriptions of Kaṇṭakārī as *Śvāsa-Kāsa hara, Mutrala, Jvaraghna,* and *Śūlahara* are well supported by modern pharmacological evidence. Its broad-spectrum activity—covering respiratory, urinary, hepatic, and inflammatory disorders—establishes it as a multipurpose drug with integrative clinical relevance [18]. However, despite substantial preclinical evidence, more controlled clinical studies are needed to standardize dosage, assess long-term safety, and confirm its efficacy in diverse clinical settings [19].

Conclusion

Kaṇṭakārī (*Solanum xanthocarpum*) is a multipotent medicinal plant described in Ayurveda for its efficacy in *Śvāsa-Kāsa* and *Mutrakṛcchra*. Modern studies validate its bronchodilator, antimicrobial, and antioxidant activities, justifying its traditional use. Its inclusion in *Daśamūla* emphasizes its role as a systemic healer. More clinical trials are required to establish standardized formulations and therapeutic dosages.

References

1. Sharma PV. *Dravyaguna Vigyana*, Vol II. Chaukhambha Bharati Academy; 2005. p. 222-225.
2. Dash B, Kashyap L. Materia Medica of Ayurveda. Concept Publishing; 1980. p. 143-146.
3. Agnivesha. Charaka Samhita, Chikitsa Sthana, 4/44. Chaukhambha Sanskrit Sansthan; 2017.
4. Bhavamishra. Bhavaprakasha Nighantu. Chaukhambha Orientalia; 2010. p. 397.
5. Nadkarni KM. *Indian Materia Medica*. Bombay Popular Prakashan; 2005. p. 1147-1149.
6. Hussain A, *et al*. Pharmacological and phytochemical review on *Solanum xanthocarpum*. J Pharmacogn Phytochem. 2012;1(1):44-51.
7. Warrier PK, Nambiar VPK, Ramankutty C. *Indian Medicinal Plants: A Compendium of 500 Species*, Vol 5. Orient Longman; 2002.
8. Sharma PV. *Charaka Samhita of Agnivesha, Chikitsa Sthana* (Commentary). Chaukhambha Orientalia; 2012. p. 287-288.
9. Kirtikar KR, Basu BD. Indian Medicinal Plants, Vol 3. International Book Distributors; 2006. p. 1761-1764.
10. Singh V, *et al*. Clinical evaluation of *Solanum xanthocarpum* in bronchial asthma. Anc Sci Life. 1983;3(2):73-78.
11. Vagbhata. Ashtanga Hridaya, Sutrasthana 15/15. Chaukhambha Krishnadas Academy; 2015.
12. Verma P, *et al*. Nephroprotective effect of *Solanum xanthocarpum* against cisplatin-induced nephrotoxicity in rats. Pharmacogn Mag. 2015;11(44):556-562.
13. Sushruta. *Sushruta Samhita*, Chikitsa Sthana 33/29. Chaukhambha Sanskrit Sansthan; 2016.
14. Khan N, *et al*. Anti-inflammatory activity of *Solanum xanthocarpum* fruit extract. J Ethnopharmacol. 2011;135(2):365-372.
15. Arora DS, Kaur J. Antimicrobial activity of medicinal plant extracts. Int J Antimicrob Agents. 1999;12(3):257-262.
16. Bairwa K, *et al*. Antioxidant activity of *Solanum xanthocarpum* root extracts. Free Radic Res. 2012;46(4):456-463.
17. Gupta RK, *et al*. Hepatoprotective activity of *Solanum xanthocarpum* against CCl4-induced hepatotoxicity. Indian J Exp Biol. 2009;47(5):372-378.
18. Warrier PK, Nambiar VPK, Ramankutty C. Indian Medicinal Plants: A Compendium of 500 Species, Vol 5. Orient Longman; 2002.
19. Hussain A, *et al*. Pharmacological and phytochemical review on *Solanum xanthocarpum*. J Pharmacogn Phytochem. 2012;1(1):44-51.