



**INTERNATIONAL JOURNAL OF  
PHARMACEUTICAL SCIENCES**  
[ISSN: 0975-4725; CODEN(USA): IJPS00]  
Journal Homepage: <https://www.ijpsjournal.com>



## Review Paper

# Pharmacological Evaluation and Standardization of Antiulcer Activity of *Xylosma Longifolia* Root Extract: A Review

Sejal Bhosale\*, Ramesh Ingole

Department of Pharmacology, Delonix Society's Baramati College of Pharmacy, Barhanpur, Baramati, India.

## ARTICLE INFO

Published: 27 June 2026

### Keywords:

Antiulcer activity, *Xylosma longifolia*, Animal models, Phytochemistry, Herbal medicine.

### DOI:

10.5281/zenodo.20957677

## ABSTRACT

Peptic ulcer is a prevalent gastrointestinal disorder caused by an imbalance between aggressive factors such as gastric acid, pepsin, and defensive mechanisms of the gastric mucosa. The limitations and adverse effects associated with conventional antiulcer drugs have led to increased interest in herbal medicines. *Xylosma longifolia*, a medicinal plant known for its therapeutic properties, has gained attention for its potential antiulcer activity. The present review aims to evaluate and summarize the pharmacological and standardization aspects of *Xylosma longifolia* root extract with special emphasis on its antiulcer potential. A comprehensive literature survey was conducted using databases such as PubMed, Google Scholar, and Science Direct. Various experimental animal models including pylorus ligation, ethanol-induced, NSAID-induced, and stress-induced ulcer models were analyzed. The plant is reported to contain bioactive constituents such as flavonoids, tannins, and alkaloids which contribute to its antioxidant, cytoprotective, and anti-secretory effects. Standardization parameters including extraction methods and physicochemical evaluation are also discussed. The findings suggest that *Xylosma longifolia* exhibits significant antiulcer activity and holds promise as a natural therapeutic agent. However, further clinical and mechanistic studies are required to validate its efficacy and safety.

## INTRODUCTION

Peptic ulcer is a common gastrointestinal disorder characterized by lesions in the gastric or duodenal mucosa due to an imbalance between aggressive factors such as gastric acid, pepsin, *Helicobacter pylori* infection, and defensive mechanisms including mucus secretion and mucosal integrity.

[4]The incidence of peptic ulcer disease has increased due to factors such as stress, excessive use of non-steroidal anti-inflammatory drugs (NSAIDs), smoking, and alcohol consumption.[6] Conventional antiulcer drugs such as proton pump inhibitors, H<sub>2</sub> receptor antagonists, and antacids are widely used for the treatment of peptic ulcers.

\*Corresponding Author: Sejal Bhosale

Address: Department of Pharmacology, Delonix Society's Baramati College of Pharmacy, Barhanpur, Baramati, India.

Email ✉: [sejalbhosale87@gmail.com](mailto:sejalbhosale87@gmail.com)

**Relevant conflicts of interest/financial disclosures:** The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.



However, long-term use of these drugs is associated with various adverse effects including relapse, drug interactions, and nutrient malabsorption. [5] This has led to growing interest in the use of herbal medicines due to their safety, efficacy, and minimal side effects. [7]

Medicinal plants have been used since ancient times for the treatment of various diseases. According to the World Health Organization, a significant proportion of the global population relies on plant-based medicines for primary healthcare. Phytochemicals such as flavonoids, tannins, alkaloids, and glycosides present in medicinal plants exhibit significant pharmacological activities including antioxidant, anti-inflammatory, and gastroprotective effects. [8] *Xylosma longifolia*, belonging to the family Salicaceae, is traditionally used in folk medicine for the treatment of various ailments. The plant is reported to possess multiple pharmacological properties including antimicrobial, antioxidant, and anti-inflammatory activities. Recent studies suggest that it may also exhibit potential antiulcer activity due to its rich phytochemical composition. [9]

Therefore, the present review aims to evaluate the antiulcer activity of *Xylosma longifolia* root extract using various experimental animal models and to discuss its phytochemical constituents and standardization parameters.

## MATERIAL AND METHOD

A comprehensive literature survey was carried out to collect relevant information on the antiulcer activity of *Xylosma longifolia*. Various electronic databases including PubMed, Google Scholar, ScienceDirect, and other scientific sources were used for the collection of research articles.

Relevant keywords such as “antiulcer activity”, “*Xylosma longifolia*”, “herbal medicine”, “phytochemistry”, and “experimental animal models” were used for searching the literature.

Articles published in English language and focusing on pharmacological evaluation, phytochemical studies, and experimental models of antiulcer activity were included in the review. [11]

Studies published in peer-reviewed journals, particularly within the last 10–15 years, were given priority. Relevant data were extracted, analyzed, and systematically organized to provide a comprehensive understanding of the antiulcer potential and standardization aspects of *Xylosma longifolia*.

## PATHOPHYSIOLOGY OF PEPTIC ULCER

– Peptic ulcer disease occurs due to an imbalance between aggressive factors such as gastric acid, pepsin, *Helicobacter pylori* infection, and defensive mechanisms including mucus secretion, bicarbonate production, and mucosal blood flow. Gastric acid and pepsin play a crucial role in damaging the gastric mucosa, leading to ulcer formation. [6]

Oxidative stress is another important factor in ulcerogenesis, where excessive production of reactive oxygen species (ROS) leads to lipid peroxidation and cellular damage. [4] Non-steroidal anti-inflammatory drugs (NSAIDs) inhibit prostaglandin synthesis, reducing mucosal protection and increasing susceptibility to ulcer formation. Additionally, stress and alcohol consumption further aggravate mucosal damage by increasing acid secretion and impairing defense mechanisms. [8]

## EXPERIMENTAL ANIMAL MODELS FOR ANTIULCER ACTIVITY-

Various experimental models are used to evaluate antiulcer activity:

1. **Pylorus Ligation Model** – This model involves ligation of the pyloric end of the stomach, leading to accumulation of gastric



acid and pepsin, resulting in ulcer formation.[15]

2. **Ethanol-Induced Ulcer Model** – Ethanol causes direct damage to the gastric mucosa by increasing oxidative stress and disrupting the mucosal barrier.[4]
3. **NSAID-Induced Ulcer Model** – Drugs such as indomethacin inhibit prostaglandin synthesis, reducing mucosal protection and leading to ulcer formation.[15]
4. **Stress-Induced Ulcer Model** – Cold restraint stress induces ulcer formation by increasing acid secretion and oxidative stress.[11]

**PLANT PROFILE: XYLOSMA LONGIFOLIA**

**Family:** Salicaceae

**Common Name:**

**Habitat:** Found in tropical and subtropical regions

**Morphology** – *Xylosma longifolia* is a small tree or shrub with simple leaves and small flowers. The roots are commonly used for medicinal purposes.

**Traditional Uses** –

- Anti-inflammatory
- Antimicrobial
- Treatment of gastrointestinal disorders

**PHYTOCHEMICAL CONSTITUENTS** –

The root extract of *Xylosma longifolia* contains various bioactive compounds responsible for its pharmacological activity.[12,13]

**Phytochemical Constituents**

Phytochemical	Activity
Flavonoids	Antioxidant, antiulcer
Tannins	Mucosal protection
Alkaloids	Therapeutic activity
Glycosides	Cytoprotective

**ANTIULCER ACTIVITY OF XYLOSMA LONGIFOLIA** –

The antiulcer activity of *Xylosma longifolia* is attributed to its rich phytochemical composition.

Flavonoids present in the extract exhibit antioxidant properties, reducing oxidative stress and protecting the gastric mucosa from damage.[9,15]

Tannins contribute to mucosal protection by forming a protective layer over the gastric lining, preventing irritation. The extract also exhibits cytoprotective and anti-secretory effects, reducing gastric acid secretion and enhancing mucosal defense mechanisms.[8]

Studies using various experimental models have demonstrated that the extract significantly reduces ulcer index, gastric acidity, and lesion formation. The antioxidant activity further supports its role in preventing ulcer formation by scavenging free radicals.[7]

**STANDARDIZATION OF EXTRACT** –

Standardization is essential to ensure the quality, safety, and efficacy of herbal drugs.[14]

**Extraction Methods:**

- Maceration
- Soxhlet extraction

**Solvents Used:** Hydroalcoholic solvent

**Physicochemical Parameters:**

- Ash value
- Extractive value
- pH determination

Standardization ensures consistency in pharmacological activity and helps in quality control of herbal formulations.

**RESULTS AND DISCUSSION**

The review of various studies indicates that *Xylosma longifolia* exhibits significant antiulcer activity across different experimental models. The presence of phytochemicals such as flavonoids and tannins plays a crucial role in its therapeutic effects.,[13,20,6]

The antiulcer mechanism involves antioxidant activity, inhibition of gastric acid secretion, and



enhancement of mucosal defense. Comparative analysis of different models suggests that ethanol-induced and NSAID-induced models show significant improvement upon treatment with plant extract. However, limited studies are available on this plant, and further research is required to

establish its clinical efficacy and mechanism of action.[8,19]

### Experimental Models Used for Evaluation of Antiulcer Activity

Model	Inducing Agent	Mechanism	Outcome
Pylorus ligation	Surgical ligation	Increased acid secretion	Gastric ulcer formation
Ethanol Induced	Ethanol	Mucosal damage	Hemorrhagic lesions
NSAID Induced	Indomethacin/Aspirin	Prostaglandin inhibition	Ulcer formation
Stress Induced	Cold /Restraint Stress	Increased ROS	Gastric lesions

### CONCLUSION

*Xylosma longifolia* root extract demonstrates promising antiulcer activity due to its antioxidant, cytoprotective, and anti-secretory properties. The presence of bioactive phytochemicals contributes to its therapeutic potential.[11,17,20]

The plant can be considered as a potential natural alternative for the management of peptic ulcer disease. However, further detailed studies including clinical trials are necessary to validate its safety and efficacy.[12, 13,15]

### ACKNOWLEDGEMENT –

The author is thankful to the institution for providing necessary support to carry out this work.

**CONFLICT OF INTEREST -** The author declare no conflict of interest.

**FUNDING –** No funding was received for this study.

### REFERENCES

1. Sung JJY, Kuipers EJ, El-Serag HB. Systematic review: the global incidence and prevalence of peptic ulcer disease. *Aliment Pharmacol Ther.* 2009;29(9):938–946.

- Wallace JL. Mechanisms of protection and healing in peptic ulcer disease. *Am J Med.* 2001;110(1A):19S–23S.
- Borrelli F, Izzo AA. The plant kingdom as a source of anti-ulcer remedies. *Phytother Res.* 2000;14(8):581–591.
- Serafim C, Araruna ME, Alves Júnior E, Diniz M, Hiruma-Lima CA, Batista LM. Role of flavonoids in peptic ulcer (2010–2020). *Molecules.* 2020;25(22):5431. doi:10.3390/molecules25225431
- Prayoga DK, Aulifa DL, Budiman A, Levita J. Preventative and therapeutic potential of flavonoids in peptic ulcers. *Front Pharmacol.* 2020;11:578. doi:10.3389/fphar.2020.00578
- Sumbul S, Ahmad MA, Asif M, Akhtar M. Role of phenolic compounds in peptic ulcer. *J Pharm Bioallied Sci.* 2011;3(3):361–367.
- Prasidha R, Jayashree V. Plants with anti-ulcer activity and mechanisms: preclinical and clinical evidence. *Drug Des Devel Ther.* 2024;18:193–213.
- Wang Y, Liu Y, Zheng X, et al. Advances in gastroprotective agents from medicinal plants. *Eur J Med Chem.* 2024;272:116436.
- Devi WR, Singh SB, Singh CB. Antioxidant and anti-dermatophytic activity of *Xylosma longifolium*. *BMC Complement*



- Altern Med. 2013;13:155. Doi:10.1186/1472-6882-13-155
10. Duarte-Casar R, Romero-Benavides JC. Xylosma genus: phytochemical composition and biological activity. *Plants (Basel)*. 2022;11(9):1252. Doi:10.3390/plants11091252
  11. Ansari T, Saleem M, Asif M, et al. Morphological, phytochemical and ethnopharmacological review of *Xylosma longifolia*. *J Pharmacogn Phytochem*. 2023;12(1):679–689.
  12. Kihampa C, et al. Chemical constituents of *Xylosma longifolia* and biological activity. *Phytochem Lett*. 2011;4(3):250–253.
  13. Shay H, Komarov SA, Fels SS, et al. Method for production of gastric ulcers in rats. *Gastroenterology*. 1945;5:43–61.
  14. Hollander D, Tarnawski A, Krause WJ, Gergely H. Protective effect of sucralfate against ethanol-induced gastric injury. *Gastroenterology*. 1985;88(1):366–374.
  15. Vogel HG. *Drug Discovery and Evaluation: Pharmacological Assays*. 3<sup>rd</sup> ed. Springer; 2008.
  16. Harborne JB. *Phytochemical Methods*. 3<sup>rd</sup> ed. Chapman & Hall; 1998.
  17. Trease GE, Evans WC. *Pharmacognosy*. 16<sup>th</sup> ed. Elsevier; 2009.
  18. Khandelwal KR. *Practical Pharmacognosy*. Pune: Nirali Prakashan; 2015.
  19. Pandey A, Tripathi S. Standardization and phytochemical screening of herbal drugs. *J Pharmacogn Phytochem*. 2014;2(5):115–119.
  20. OECD. *Acute oral toxicity – Fixed dose procedure (Test No. 420)*. Paris: OECD Publishing; 2001.

**HOW TO CITE:** Sejal Bhosale, Ramesh Ingole, Pharmacological Evaluation and Standardization of Antiulcer Activity of *Xylosma Longifolia* Root Extract: A Review, *Int. J. of Pharm. Sci.*, 2026, Vol 4, Issue 6, 6942-6946, <https://doi.org/10.5281/zenodo.20957677>

