

Dual Role of *Argyrea speciosa* in Gastric Ulcer Management: A Study on Gastric Ulcer Protective and Healing action in Albino Mice.

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ABSTRACT

The rasayana herb *Argyrea speciosa* (Convolvulaceae), also referred to as Vruddhadaruka, is utilized in numerous ayurvedic treatments within the Indian medical system. The roots of *A. speciosa* are employed in Ayurveda as a tonic for general ability, aphrodisiac, nervine tonic, brain tonic, intellect boosting, and in hepatomegaly. According to reports, the plant contains anti-inflammatory, antibacterial, immunomodulatory, wound-healing, and nootropic effects.

Argyrea speciosa (Convolvulaceae) was tested for its ability to prevent and treat ethanol-induced stomach ulcers in rats. For five days before or after ulceration, ethanolic versions of the apical plant tissues (200 mg/kg of body weight) was administered orally every day. An oral dose of 1 mL pure ethanol was given on 24-hour empty stomachs. Three groups of mice were created. The control group was Group 1. Each extract was given into groups 2 and 3. Measurements of ulcer indices, such as acidity of the stomach and volume and lesion counts, were used for the evaluation. To ascertain the stomach's histological evaluation, the work was prolonged. The ulcer index was significantly elevated in cases of gastric ulcer. The medicinal efficacy of the ethanol extract was higher. To sum up, *A. speciosa* had antiulcer properties. To determine which chemicals are causing the pharmacological impact, further thorough research is needed.

Keywords: *Gastric Ulcer, Ethanol, therapeutic potency, lesion count, argyrea speciose*

INTRODUCTION

Retinal diseases such as diabetic retinopathy (DR), glaucoma, and age-related macular degeneration (AMD) are leading A disturbance of the mucosal integrity of the stomach and duodenum is known as an ulcer, which causes a localized defect or exhumation due to dynamic irritation. Both the stomach and the duodenum can develop ulcers, which are often chronic in character¹.

Open wounds in the upper portion of the stomach generate peptic ulcers, which can lead to internal biting of the particles and stomach discomfort².

Ulcer classification - In Duodenum duodenal ulcer, In Stomach stomach ulcer, In Esophagus Esophageal ulcer.

Ulcers normal between one-quarter and one-half inch in measurement. They create when stomach related juices delivered in the stomach, digestion tracts, and stomach related organs harm the covering of the stomach or duodenum³.

Argyrea speciosa (Convolvulaceae), commonly known as Vruddhadaruka is a rasayana herb used in many Ayurveda preparations in Indian system of medicine. Roots of *A. speciosa* are used in Ayurveda as aphrodisiac, rejuvenating, intellect promoting, brain tonic, nervine tonic, in hepatomegaly, and tonic for general ability⁴. Aryl esters, coumarin glucoside, phydroxycinnamate, and scopoletin were identified as significant phytoconstituents in *A. speciosa* roots by earlier research. According to reports, the plant contains anti-inflammatory, antibacterial, wound-healing, immunomodulatory, and nootropic properties.

Botanical Description -Scientific name: *Argyrea speciosa* (syn. *Argyrea nervosa*) Common names: Elephant creeper, Woolly morning glory Family: Convolvulaceae Habitat: Commonly found in tropical and subtropical regions of India; grows in forests, along roadsides, and in gardens⁵.

Morphological Features - Leaves: Large, heart-shaped, and woolly on the underside Flowers: Attractive, trumpet-shaped, pink to purple with a darker center, Fruits: Round capsules with seeds inside; the seeds are known for containing psychoactive alkaloids.

Traditional and Medicinal Uses - *Argyreia speciosa* is revered in Ayurveda and folk medicine for various therapeutic applications. Acts as a nervine tonic and aphrodisiac. Used in the treatment of sexual disorders, diabetes, rheumatism, and neurological conditions, Leaves and roots are used for wound healing, anti-inflammatory, and analgesic purposes⁶.

Phytochemicals- It contains a variety of bioactive compounds such as, Alkaloids (like ergoline derivatives), Flavonoids, Glycosides, Steroids and resins.

Materials and Methods:

Plant collection and Authentication – *Argeryia sepeciosa* plant collected from sarnath, Varanasi and authenticated from department of Botany, Banaras Hindu University, Varanasi, Uttar Pradesh, India.

Extraction

For 48 hours, the 500 g of dry powdered plant material was extracted completely using 90% methanol in a Soxhlet device. In a Soxhlet system, 500 g more were extracted over 48 hours using double-distilled water. The semi solid pure methanol and water extraction residues (7 and 15% of dry weight, accordingly) were obtained by vacuum-evaporating the solvents to dryness at 40 °C after full extraction.

Chemical tests

A.Speciosa leaves extract were evaluated on different test parameters for confirming the presence of phytochemicals. *Argyreia Speciosa* Extract was tested for sterols, flavonoids, carbohydrates, amino acids, tannins, alkaloids, and saponins⁷ and results were shown in Table I.

Gastric total acidity

After removing the stomach, the gastric contents were gathered and centrifuged for 15 minutes at 3000 x g. Utilizing 2% phenolphthalein for an indicator, the total acidity was ascertained by titrating with 0.1 M NaOH after measuring the supernatant volume (in µL). Molar equivalent (mEq)/L was used to express the results.

Animals

Albino mice were selected for experiment weighing 20 grams to 30 grams⁸. Every animal had access to food and water and was housed in a temperature and air-controlled facility.

Ethics

Animal handling practices and anesthetic techniques according to CCSEA, India's ethical standard (Approval No. PHAR 014)

Doses and route of administration

Absolute ethanol was administered orally at a rate of 0.5 mL/100 g entire body weight on 24-hour empty stomachs. A. speciosa extracts were taken orally daily for a week at a dosage of 200 mg/kg / kilogram of body weight.

Experimental groups

Fifteen healthy albino mice were divided into three groups each containing five animal each,

Group 1 considered as untreated control group.

Group 2 marked as preventive group were A. Speciosa extract mixed in gum xenthane 0.5% suspension given for five days orally on day six oral absolute ethanol 24-hour empty stomach sacrificed after 1 hour.

Group 3 therapeutic group absolute ethanol given 24hour empty stomach after that A. Speciosa was given mixing with gum xenthane 0.5% suspension for five days daily, animals scarified on day 6.

Results

Phytochemical constituents

An A. speciosa water extract's phytochemical screening identified flavonoids, alkaloids, and saponins. Additionally, high levels of amino acids and carbs were found. Alkaloids, flavonoids, tannins, and steroids were all abundant in the ethanol extract. Additionally, there were low levels of amino acids and carbohydrates, as seen in table 1.

Constituent	Methanol extract	Water extract
Steroids	++	+

Flavonoids	++	+
Tannins	++	++
Saponins	-	+
Alkaloids	++	+
Carbohydrates	+	+++
Amino acids	+	++

(+++++) Abundant; (++) rich; (+) present; (-) absent.

Table 1 – Phytochemical screening of Argeryia Speciosa leaves extract.

Ulcer Index

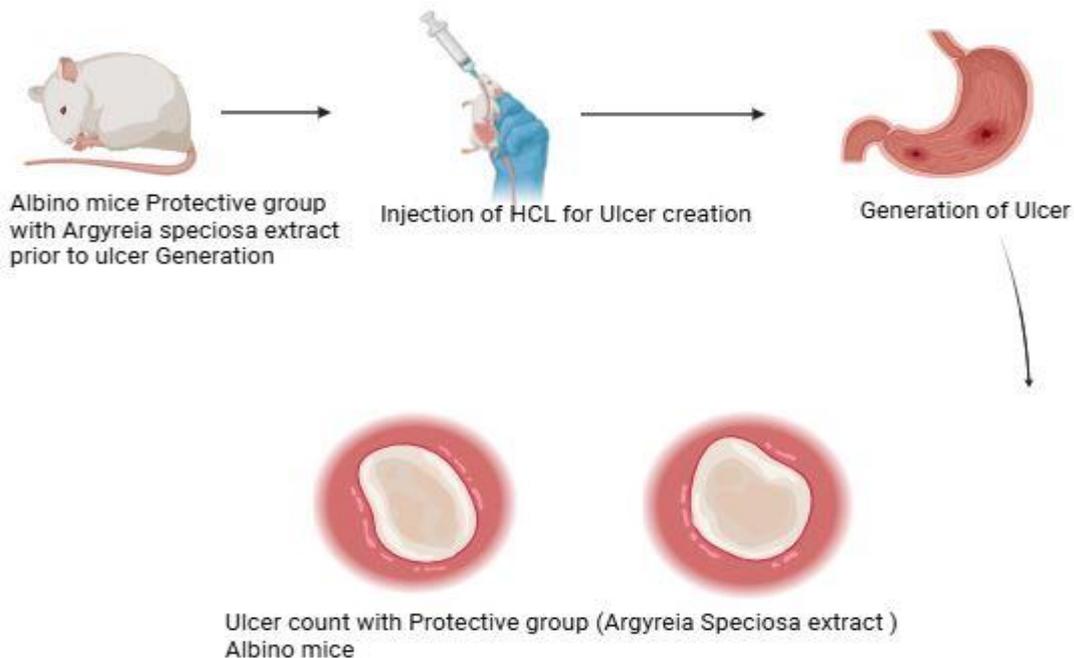
After the animal was specified, the stomach was exposed, cleaned with regular saline, and examined under a dissecting microscope for macroscopically visible mucosal ulcers. Gastric mucosal ulcers manifest like bands of hemorrhagic lesions and inflammation. The severity of gastric lesions was assessed.⁹

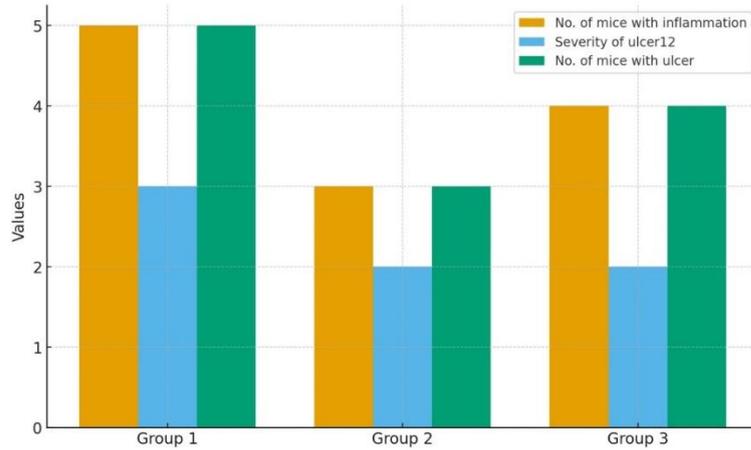
depending on the extent of every single lesion, assigning a score between 0 and 3. The extent of the lesions was used to determine the severity factor: Lesions are classified as follows: 0 mean no lesions, 1 mean less than 1 mm in length, 2 mean between 2 and 4 mm, and 3 mean more than 4 mm.¹⁰

Particulars	Group 1 (Untreated) n=5 Albino mice	Group 2 (Protective) n=5 Albino mice	Group 3 (Therapeutic) n= 5 Albino mice
Presence of inflammation ¹¹	+++	++	+
No. of mice with inflammation	5	3	4
Severity of ulcer ¹²	3	2	2
No. of mice with ulcer	5	3	4
Ulcer index ¹¹	3	2	2

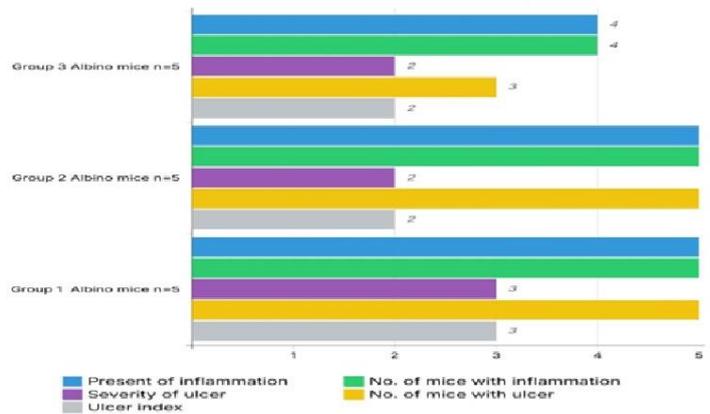
(+++++) Abundant; (++) rich; (+) present; (-)

Table 2- Representation of ulcer in Experimental animal group¹³.





Graph 1-Representation of different Parameters with Control (Group1), Protective (Group 2) and therapeutic group (Group3)



Graph 2- Representation of all Parameters with Control (Group1), Protective (Group 2) and therapeutic group (Group3)



Figure 1- (a) Protective treatment

(b) Therapeutic treatment



Figure 2- (a) Control group (b) Therapeutic group

Gastric total acidity evaluation gastric of all three group animals content acidity expressed in mole¹⁵ after titration with sodium hydroxide standard solution in below table 3

Sl no.	Group Name	Particulars	Molarity in moles (Gastric content)
1	Control group	Group1 (n=5)	5.3 M
2	Preventive Group	Group 2 (n=5)	3.5 M
3	Treatment group	Group 3 (n=5)	3.2 M

Table 3 – Evaluation of acidity in experimental animals.

CONCLUSION AND DISCUSSION

The present study demonstrated that *Argyrea speciosa* treatment produced a significant reduction in ulcer formation when compared with both the protective and control groups, as evidenced by decreased ulcer scores and lowered gastric acidity levels. In the current investigation, administration of ethanol in the control group led to pronounced gastric ulceration, characterized by a marked increase in gastric volume and total acidity, indicating severe mucosal damage.

However, treatment with *A. speciosa* extract markedly attenuated these effects, suggesting a potent gastro protective and curative activity against ethanol-induced ulceration in mice. The extract appeared to stabilize the gastric mucosa, reduce acid secretion, and promote mucosal healing, thereby restoring the integrity of the stomach lining.

In conclusion, the findings of this study confirm that *Argyrea speciosa* possesses both protective and therapeutic potential against ethanol-induced gastric ulcers. The observed pharmacological effects may be attributed to the presence of bioactive phytoconstituents such as flavonoids, alkaloids, tannins, and phenolic compounds known for their antioxidant and cytoprotective actions. Nevertheless, further investigations are essential to isolate and characterize the specific compounds responsible for these beneficial effects and to explore their possible clinical and pharmaceutical applications in the management of peptic ulcer disease.

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Area of conflict

Author has no area of conflict in this study..

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