

REVIEW ARTICLE

A REVIEW ON THE PROPERTIES OF THE PLANT AERVA LANATA

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ABSTRACT:

Aerva lanata, often referred to as "Aerva," is a flowering plant from the *Amaranthaceae* family, thriving in tropical and subtropical regions, particularly in parts of Africa and Asia. This plant is recognized for various traditional medicinal uses, with health benefits acknowledged across different cultures. Traditionally, *Aerva lanata* is known for its diuretic properties, promoting urine production to aid in flushing out toxins and excess salts, which can be beneficial for conditions like urinary tract infections and kidney stones. Its anti-inflammatory effects are utilized to alleviate symptoms of arthritis and rheumatism, while research suggests its antimicrobial properties may be effective against infections caused by bacteria and fungi. Additionally, the leaves and stems of *Aerva lanata* are applied topically for wound healing, aiding in recovery and infection prevention. Rich in antioxidants, *Aerva lanata* may help combat oxidative stress, reducing the risk of chronic diseases. It has also been traditionally used for digestive health, addressing issues such as diarrhea and dysentery, and is employed in some cultures for respiratory relief, including alleviating coughs and colds, likely due to its anti-inflammatory and antimicrobial effects. Furthermore, herbal practitioners sometimes recommend *Aerva lanata* to manage menstrual irregularities and related discomfort.

KEYWORDS: *Aerva lanata*, Medicinal Uses, Pharmacological Properties

INTRODUCTION:

Aerva lanata is an intriguing plant with a well-defined taxonomic classification. Below is a comprehensive breakdown of its classification and characteristics [1].



A Twig *Aerva lanata*

1. Kingdom: *Plantae*

This kingdom includes all plants, characterized by their ability to photosynthesize and produce oxygen.

2. Clade: *Angiosperms*

Angiosperms are flowering plants that produce seeds enclosed in fruit, representing the majority of plant species [2].

3. Clade: *Eudicots*

Eudicots form one of the largest groups of angiosperms, identified by features such as having three pores in their pollen.

4. Order: *Caryophyllales*

This order comprises a variety of plants, including members of the Amaranthaceae and Cactaceae families.

5. Family: *Amaranthaceae*

The Amaranthaceae family, commonly known as the amaranth family, includes many species cultivated for food or valued for ornamental purposes.

6. Genus: *Aerva*

The genus *Aerva* consists of several species, many of which are recognized for their traditional medicinal uses and ecological importance.

7. Species: *Aerva lanata*

Binomial Name: *Aerva lanata*

Common Names: *Aerva*, *Leucaena*, or "Pillalavanam" in some cultures [3].

Taxonomical Hierarchy

Kingdom: *Plantae*

Clade: *Angiosperms*

Clade: *Eudicots*

Order: *Caryophyllales*

Family: *Amaranthaceae*

Genus: *Aerva*

Species: *Aerva lanata*

Morphological Characteristics

- **Growth Habit:** A perennial herb or small shrub, typically reaching up to 1 meter in height.
- **Leaves:** Simple and alternate, the leaves are ovate to lanceolate, measuring approximately 2 to 10 cm long.
- **Flowers:** Small, inconspicuous flowers are arranged in spike-like clusters, usually white or pink with a tubular structure.
- **Fruits:** The fruit is a small achene containing a single seed.

Habitat and Distribution

Aerva lanata thrives in a variety of environments, including [4].

- **Tropical and Subtropical Regions:** Frequently found across Africa, India Asia, and parts of the Americas.
- **Soil Types:** Prefers well-drained soils, often inhabiting rocky or sandy areas.
- **Environmental Conditions:** This species is adaptable, capable of tolerating drought and poor soil conditions.

Ecological Importance

- **Soil Erosion Control:** The root system of *Aerva lanata* helps to stabilize soil and prevent erosion in degraded areas.
- **Biodiversity:** This plant contributes to the ecosystem by providing habitat and food for various insect species, enhancing local biodiversity.[5]

Aerva lanata

Pharmacognosy focuses on the study of medicinal substances derived from natural sources, examining their physical, chemical, biochemical, and biological properties. Overview of the pharmacognostic characteristics of *Aerva lanata*.

1. Botanical Description

- **Family:** Amaranthaceae
- **Genus:** *Aerva*
- **Species:** *Aerva lanata*
- **Common Names:** *Aerva*, Pillalavanam, Leucaena

Morphological Features:

- **Growth Habit:** A perennial herb or small shrub that typically grows up to 1 meter in height.
- **Leaves:** Simple and alternate, the leaves are ovate to lanceolate, measuring 2 to 10 cm in length, with entire margins.
- **Flowers:** Small, white to pink flowers arranged in spike-like clusters; they have a tubular structure and bloom throughout the year.
- **Fruits:** The fruit is a small achene, usually containing one seed.

2. Phytochemical Composition

Aerva lanata is rich in bioactive compounds that contribute to its medicinal properties, including:

- **Flavonoids:** Known for antioxidant, anti-inflammatory, and antimicrobial effects.
- **Saponins:** These compounds are recognized for their diuretic properties and potential immune enhancement.
- **Tannins:** Possess astringent qualities, beneficial for treating diarrhea and other gastrointestinal issues.
- **Alkaloids:** May have analgesic and antispasmodic effects, as suggested by some studies.
- **Terpenoids:** Potentially exhibit anti-inflammatory and antimicrobial properties [6].

3. Medicinal Uses

The pharmacognostic profile of *Aerva lanata* highlights several traditional medicinal uses, including:

- **Diuretic:** Promotes urine production, aiding in detoxification.
- **Anti-inflammatory:** Reduces inflammation, beneficial for conditions like arthritis.
- **Antimicrobial:** Effective against a variety of bacteria and fungi.
- **Wound Healing:** Used topically to support the healing of cuts and wounds.
- **Digestive Health:** Alleviates gastrointestinal problems, including diarrhea.
- **Respiratory Relief:** Helps alleviate symptoms associated with respiratory infections.

4. Preparation and Dosage Forms

Aerva lanata can be prepared in various forms:

- **Infusions and Decoctions:** Leaves and roots can be brewed into teas.
- **Powdered Form:** Dried plant material can be ground into powder for capsules or mixing with water.
- **Topical Application:** Fresh leaves can be crushed and applied directly to the skin for wound care.

5. Quality Control Parameters

To ensure the safety and efficacy of *Aerva lanata* preparations, the following quality control measures are recommended:

- **Organoleptic Evaluation:** Assessment of the plant's appearance, color, taste, and smell.
- **Microscopic Analysis:** Examination of leaf and stem structures to identify specific features.
- **Phytochemical Screening:** Tests to detect the presence and concentration of bioactive compounds.
- **Standardization:** Establishing concentration levels of key phytochemicals to ensure consistent potency [7].

6. Toxicology and Safety Profile

- **Safety:** Generally regarded as safe when used appropriately. However, excessive consumption may lead to gastrointestinal disturbances.
- **Consultation Recommended:** Individuals should seek advice from healthcare professionals before use, particularly pregnant or breastfeeding women and those with pre-existing health conditions.

7. Research and Clinical Studies

Ongoing research is focused on exploring the pharmacological effects of *Aerva lanata*, validating its traditional uses, and investigating potential therapeutic applications across various conditions.

Aerva lanata

Aerva lanata, belonging to the Amaranthaceae family, is recognized for its diverse pharmacological properties. Here's an in-depth overview of its pharmacological activities, supported by traditional uses and scientific findings.

1. Diuretic Activity

- **Mechanism:** Traditionally, *Aerva lanata* is used as a diuretic, promoting increased urine production, which aids in the elimination of excess salts and toxins from the body.
- **Evidence:** Experimental studies have shown that extracts of *Aerva lanata* significantly increase urine output, suggesting its potential effectiveness in managing conditions such as hypertension and edema.

2. Anti-inflammatory Effects

- **Mechanism:** The anti-inflammatory properties are attributed to the presence of flavonoids and terpenoids, which may inhibit pro-inflammatory pathways.
- **Evidence:** Research indicates that *Aerva lanata* extracts reduce markers of inflammation in various experimental models, highlighting its utility in conditions like arthritis and other inflammatory disorders.

3. Antimicrobial Activity

- **Mechanism:** *Aerva lanata* exhibits antimicrobial properties against a variety of bacteria and fungi, likely due to its bioactive compounds such as flavonoids and saponins.
- **Evidence:** Laboratory studies have demonstrated that *Aerva lanata* extracts inhibit the growth of pathogenic bacteria, including *Escherichia coli* and *Staphylococcus aureus*, as well as fungi like *Candida* species.

4. Antioxidant Properties

- **Mechanism:** The plant's antioxidant activity is largely due to flavonoids and other phenolic compounds that combat oxidative stress and free radical damage.
- **Evidence:** In vitro studies have shown significant free radical scavenging activity in *Aerva lanata* extracts, positioning it as a candidate for preventing oxidative stress-related diseases.

5. Wound Healing

- **Mechanism:** Traditionally applied to wounds, *Aerva lanata* promotes healing through its anti-inflammatory and antimicrobial effects.
- **Evidence:** Experimental studies indicate enhanced wound healing in models treated with *Aerva lanata* extracts, attributed to reduced inflammation and prevention of infection.

6. Gastroprotective Effects

- **Mechanism:** Used in traditional medicine to alleviate digestive issues, *Aerva lanata* is thought to protect the gastrointestinal tract.
- **Evidence:** Some studies suggest that extracts may offer protection against gastric ulcers and enhance mucosal defense mechanisms, though more research is necessary in this area.

7. Respiratory Relief

- **Mechanism:** The anti-inflammatory and antimicrobial properties of *Aerva lanata* may aid in relieving respiratory issues, such as coughs and colds.
- **Evidence:** While traditional uses suggest effectiveness in managing respiratory infections, scientific validation is limited and further research is required.

8. Antidiabetic Effects

- **Mechanism:** Some studies propose that *Aerva lanata* may assist in managing blood sugar levels, possibly through enhancing insulin sensitivity.
- **Evidence:** Preliminary research indicates potential hypoglycemic effects in animal models, but rigorous clinical trials are necessary to confirm these findings.[8]

Aerva Species

The genus *Aerva* belongs to the family *Amaranthaceae* and comprises several species recognized for their medicinal properties and ecological significance. Here's a closer look at notable *Aerva* species:

1. Aerva lanata

- **Common Names:** *Aerva*, Pillalavanam, *Leucaena*.
- **Habitat:** Distributed across tropical and subtropical regions, particularly in Africa and Asia.
- **Medicinal Uses:** Valued for its diuretic, anti-inflammatory, antimicrobial, antioxidant, and wound healing properties.

2. Aerva javanica

- **Common Names:** Java moss, *Aerva*.
- **Habitat:** Widely found in tropical Asia, especially in disturbed areas and grasslands.
- **Medicinal Uses:** Traditionally used for treating respiratory issues, wounds, and gastrointestinal problems.

3. Aerva nutans

- **Common Names:** Not widely recognized.

- **Habitat:** Primarily located in tropical regions of Asia.
- **Medicinal Uses:** Less documented; may have uses similar to other *Aerva* species in traditional medicine.

4. *Aerva sanguinolenta*

- **Common Names:** Not widely recognized.
- **Habitat:** Common in tropical Africa and parts of Asia.
- **Medicinal Uses:** Used in traditional medicine for various ailments, though specific applications can vary regionally.

General Characteristics of *Aerva* Species

- **Growth Habit:** Generally perennial herbs or small shrubs, often found in grasslands, disturbed areas, and rocky terrains.
- **Leaves:** Simple, alternate leaves, typically lanceolate or ovate in shape.
- **Flowers:** Small, usually white or pink, arranged in spike-like clusters.
- **Fruits:** Small achenes, usually containing one seed.

Ecological Importance

Aerva species play a crucial role in soil stabilization, particularly in degraded areas. They provide habitat for various insects and wildlife and are involved in traditional agricultural practices in some regions [9].

CONCLUSION:

Aerva lanata is an important member of the Amaranthaceae family, celebrated for its wide range of medicinal properties and ecological contributions. This plant has been traditionally utilized across various cultures, showcasing pharmacological benefits such as diuretic, anti-inflammatory, antimicrobial, antioxidant, and wound healing effects. Thriving in tropical and subtropical regions, *Aerva lanata* exhibits adaptability to diverse habitats, playing a vital role in soil stabilization and supporting local biodiversity. Despite its extensive traditional applications, further scientific research is essential to confirm its therapeutic potential and uncover new uses. As interest in natural remedies increases, *Aerva lanata* emerges as a promising candidate for exploration in both traditional and contemporary medicine. It is advisable for individuals to consult healthcare professionals before integrating it into their health practices.

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