



A REVIEW ON A STUDY OF COMPARATIVE ANTIOXIDANT PROPERTIES OF MIMOSA PUDICA L. AQUEOUS AND ALCOHOLIC PLANT EXTRACT

Nimit Singh^{*1}, Dr. Paras Kumar Prajapati², Dr. Pushendra Kannoja³, Ms. Megha Pandey⁴

¹M. Pharm (Pharmacology) Research Scholar, BIU College of Pharmacy, Bareilly International University, Pilibhit Bypass Road, Bareilly, Uttar Pradesh (U.P.)-243006.

²Associate Professor, BIU College of Pharmacy, Bareilly International University, Pilibhit Bypass Road, Bareilly, Uttar Pradesh (U.P.)-243006.

³Professor & Principal, BIU College of Pharmacy, Bareilly International University, Bareilly, Uttar Pradesh (U.P.)-243006.

⁴Assistant Professor, BIU, Bareilly International University, Bareilly, Uttar Pradesh (U.P.)- 243006.

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<p>Article Info</p> <p>Article Received: 02 April 2026, Article Revised: 22 April 2026, Article Accepted: 12 May 2026.</p> <p>DOI: https://doi.org/10.5281/zenodo.20465124</p>	<p>ABSTRACT</p> <p>The "touch-me-not" plant, <i>Mimosa pudica</i> Linn., is a creeping perennial herb that folds its leaves quickly in reaction to touch. The botanical, phytochemical, pharmacological, and medicinal qualities of <i>M. pudica</i> are all examined in this review. The plant's many medicinal properties are attributed to a variety of bioactive compounds, such as alkaloids, flavonoids, tannins, saponins, and glycosides. In the past, it was used to treat inflammation, diarrhea, wounds, and skin issues. It has antioxidant, antibacterial, anti-inflammatory, analgesic, antidiabetic, and hepatoprotective qualities, according to recent pharmacological studies. Researchers studying plant physiology and environmental adaptation have taken notice of its unique thigmonastic response. These results imply that <i>Mimosa pudica</i> may be a useful natural source for creating antioxidants and anti-hypolipidemic drugs that are both safe and effective. To confirm and improve the bioactive compounds' therapeutic potential, more studies concentrating on their separation, purification, and structural characterization, as well as in vivo pharmacological tests, are advised.</p> <p>KEYWORDS: <i>Mimosa pudica</i>, Touch-me-not plant, Sensitive plant, Thigmonastic movement.</p>
<p>*Corresponding author:</p> <p>Nimit Singh</p> <p>M. Pharm (Pharmacology) Research Scholar, BIU College of Pharmacy, Bareilly International University, Pilibhit Bypass Road, Bareilly, Uttar Pradesh (U.P.)-243006.</p>	

1. INTRODUCTION

People of all ages were drawn to "*Mimosa pudica*" because it was unique. "Pudica" means "shy, bashful, or shrinking" in Latin. Other names for plants include sensitive, drowsy, action, touch-me-not, shame, zombie, and shy. This creeping annual or perennial flowering plant is a member of the Fabaceae family. *Mimosa pudica* was initially found by the scientist Carl Linnaeus in 1753. It belongs to the species *Planatarum*. When it comes into contact with the outside world, it shrinks. *M.*

pudica reduces the toxicity of contaminated soil by extracting and bioaccumulating elements such as lead, zinc, arsenic, tin, and copper.

When *M. pudica* seeds come into contact with liquid, they swell and turn into a gel. When consumed, these mucilaginous seeds turn into a sticky gel in the digestive system and attach themselves to dangerous parasites, heavy metals, and chemical poisons. This mixture of toxic substances and jelly mass passes through the

stomach and is eliminated as feces. Because the digestive tract lacks the enzyme needed to break down mucilage, *M. pudica* mucilage travels through the gut and performs its purifying function. It's a powerful gut scrubber as a result. Additionally, plants are frequently used to alleviate anxiety and as antidepressants. Extract from *M. pudica* may aid in sciatic nerve regeneration.

When the extract was administered every four days for three months to mice with sciatic nerve injuries, the sciatic nerve regenerated 40% better than when hydrocortisone, a steroid, was administered. The whole plant extract exhibits anti-plasmodial activity against *P. berghei* and functions as an antiviral, preventing this virus from multiplying. Plant is hence a powerful antimalarial agent.

Mimosa pudica, sometimes known as the "sensitive plant" or "touch-me-not," is a creeping herb that lives for a full year. In Ayurveda, it is referred to as "lajjalu" and is used to alleviate pain, improve sexual health, treat mood problems, and treat asthma.

In addition to its well-known calming qualities, the plant has long been used to treat a wide range of illnesses, such as tumours, diarrhoea, dysentery, hair loss, and infections of the reproductive and urinary systems. Numerous beneficial compounds, including tannins, fatty acids, terpenoids (found in essential oils), flavonoids, alkaloids, and mimosine, a non-protein amino acid, have been found in *Mimosa pudica*, according to research. These compounds reinforce its therapeutic properties.

Scientific classification

Kingdom: Plantae
Division: Magnoliophyta
Class: Magnoliopsida
Order: Fabales
Family: Fabaceae
Subfamily: Mimosoideae
Genus: <i>Mimosa</i>
Species: <i>M. pudica</i> Linn.



(Alternative Titles for Plant Family- Leguminosae)

Mimosa pudica is a single plant that functions as a form of natural pharmacy. Ayurveda, a holistic medical system that has its roots in ancient India, has long used this herb. Ayurvedic practitioners have utilised *Mimosa pudica* to treat a wide range of conditions, including diarrhea, wound healing, and mental disorders. Research is being done on the plant's possible health advantages. Traditionally, all plant parts—seeds, stems, leaves, roots, and shoots—have been utilised to treat illnesses and ailments.

Mimosa pudica, sometimes known as touch-me-not, sleeping grass, or the sensitive plant, is an interesting houseplant with peculiar behaviours. The name "Mimosa" comes from the words "pudica," which means shy or shrinking, and "mimic," which describes how the plant's leaves respond to touch and other stimuli. The reddish-brown stems of this little shrub may bear tiny, curled prickles. It may extend horizontally over two meters or reach a height of one meter when supported. Each pair of leaves on the plant consists of one or two pairs of small, 3–12 mm long leaflets. The plant produces small, spherical clusters of pink flowers as well as tiny, bristly pods that contain seeds. The most interesting feature of the sensitive plant is how it reacts to touch. Perhaps to protect itself from insects or other dangers, the plant droops and immediately folds its leaves. The leaves also close at night, when it's hot outside, or when it rains. *Mimosa pudica* is referred to by several different names in different cultures. These include dormidera or morivivi in different languages, namaskari in Sanskrit, and lajjalu in Ayurveda. People are captivated by this plant because of its shy, open demeanor. The fragile leaves of **Mimosa pudica** can learn to stop closing when repeatedly caressed or frightened.

If the shock or touch is severe or happens over a lengthy period of time, it takes longer for the leaves to learn to remain open. Even if the leaves are used to one type of stimulation, such as touch, they can still close in response to a novel stimulus, such as an electric shock.^[1,16]

1.1 Botany of plants

The term "Mimosa botany" refers to a broad genus of over 400–600 species in the mimosoid group of the pea family (Fabaceae). The Silk Tree (*Albizia julibrissin*) and Silver Wattle (*Acacia dealbata*) are two examples of plants that are commonly referred to as "mimosa," but the *Mimosa pudica* (Sensitive Plant) is the most well-known member of the actual botanical genus *Mimosa*.

Taxonomical classification of the Plant-Medicinal value of various parts of *Mimosa pudica*

Plant part	Medicinal value
Leaf	Antidepressant, anti-inflammatory, hemostatic, Anticonvulsant, antiasthmatic
Root	Antifertility, antivenom, diuretic, antidiarrheal, aphrodisiac
Seed	Antimicrobial, anti-inflammatory, antioxidant, drug delivery, urogenital issues
Flower	Antioxidant, antimicrobial, anti-inflammatory, analgesic, astringent
Stem	Wound healing, anti-inflammatory, antimicrobial, analgesic

Justification of the reported work

- 1. Leaf:** Leaves contain flavonoids, alkaloids, tannins, and phenolics which help reduce inflammation, stabilize the nervous system, and exhibit CNS depressant effects. Tannins support blood clotting (hemostatic), while bronchodilatory and anti-allergic effects justify antiasthmatic use.^[26,29,44]
- 2. Root:** Roots are rich in tannins, alkaloids, and glycosides. Experimental studies show influence on reproductive hormones supporting antifertility activity. Tannins bind venom proteins (antivenom). Astringent action reduces diarrhea, while certain phytochemicals stimulate urinary flow and reproductive vitality.^[24,26,35]
- 3. Seed:** Seeds contain mucilage, polysaccharides, proteins, and phenolics. Mucilage is useful as a natural binder and controlled-release agent in drug delivery. Antioxidant phenolics reduce oxidative stress, while antimicrobial compounds help in urinary/urogenital infections.
- 4. Flower:** Flowers possess pigments, flavonoids, and volatile compounds that scavenge free radicals and inhibit microbes. Polyphenols reduce inflammation and pain. Tannins contribute astringent properties useful in wound care and minor bleeding.
- 5. Stem:** Stem extracts contain tannins, phenolics, and fiber-associated compounds. These promote tissue repair, inhibit microbial growth, reduce swelling, and relieve pain, making stems useful in wound healing preparations.

Vernacular name of *Mimosa pudica*

Marathi	Lajwanti
Hindi	Chhui mui
Sanskrit	Lajalu
English	Sensitive plant
Telugu	Atta-patti
Kannada	Muttidare
Malayalam	Thottavadi

2. PLANT DESCRIPTION

Mimosa pudica is a sprawling, low-growing perennial that usually grows to a height of 15 to 50 cm, but when it is supported by nearby vegetation, it can scramble up to a meter. It has reddish-brown stems with tiny, curled prickles and a creeping, branching habit. The plant's

unique spherical, pinkish-purple flower "puffballs" and delicate, bipinnate compound leaves that fan out like fern fronds characterise its appearance. When the plant reaches maturity, it changes from an erect seedling to a ground cover that spreads widely and frequently reaches a width of more than a meter.^[14]

3. GEOGRAPHICAL DISTRIBUTION

The plant has spread throughout the tropical and subtropical regions of India since its origin in tropical America. Habitat is typically found in open regions, such as wastelands, cultivated land, and roadside places. Carl Linnaeus provided the first official description of *Mimosa pudica* in *Species Plantarum* (1753). *Mimosa* is often a tiny, prickly plant with branches that grow close to the ground. It can grow up to around 0.5 meters in height and 0.3 meters in breadth. The mimosa has an erect, thin, prickly, and well-branched stem. The pale green, fern-like, bipinnate leaves have a propensity to close when disturbed. These are quadri-pinnate, often reddish, and have 15 to 25 pairs of spiky, bristly leaflets that are 1.5 mm wide and 9 to 12 mm long. This plant typically has globose heads and axillary flowers that are lilac pink in hue. Companulate calyxes with crenate petals at the base. Flowering takes place in India between August and October. *Mimosa* fruits are falcate, prickly pods that range in length from 1.5 to 2.5 cm.

Botanical description of *M. pudica*

Character	<i>Mimosa</i>
Plant	Short prickly branches, hairs glandular
Leaves	Bipinnate, sensitive to touch
Flowers	Axillary, globose head, lilac pink in colour
Stem	Erect, slender, prickly and well branched
Calyxes	Companulate
Petals	Petals crenate towards base
Pods	1.5 to 2.5 cm long, Closely prickly on the structures and falcate flowering and august to october in indian conditions fruiting time.

4. PHYTOCHEMICAL ANALYSIS

Flavonoids, tannins, alkaloids, terpenoids, saponins, and steroids are the main bioactive substances found in *Mimosa pudica*, a sensitive plant. These components are important in traditional medicine because they have potent antioxidant, antibacterial, and anthelmintic properties. They are especially found in high concentrations in leaves and roots.^[43]

4.1 Phytoconstituents

Endophytes, which are found in roots, create secondary metabolites that shield plants from a variety of diseases, including tannins, phenols, steroids, terpenoids, and alkaloids.

Key Phytochemical Components

Phenols & Flavonoids

Major antioxidant agents found include quercetin, luteolin, fisetin, apigenin, and naringenin.^[21]

Alkaloids & Steroids

Common in many extracts, they contribute to the plant's pharmacological effects.

Tannins

Present and often associated with treating ulcerated tissues.^[5,6,9,10,11,13]

Other Compounds

Phytochemical analysis has also identified fatty acids, coumarins, and cardiac glycosides.

5. TRADITIONAL USE

In the ancient medical system, all five plant parts—leaves, flowers, stems, roots, and fruits—have been utilised as medicines. Different plant parts have traditionally been used in India to treat a variety of ailments. To lessen tooth pain, the root decoction is gargled with water. Because it stops bleeding and speeds up the healing of wounds, it is especially helpful in cases of diarrhea, amoebic disorders, bleeding piles, and urinary infections. It is mostly utilised in herbal remedies for gynecological disorders and is believed to have therapeutic qualities to treat skin conditions. Additionally, it is used to treat impotence, bronchitis, general weakness, and neurological diseases. This herb has been used as a mood booster, anxiolytic, and antidepressant. *Mimosa pudica* roots exhibit encouraging menorrhagia activity, hence reducing excessive uterine bleeding. According to some research, plants may be useful in reducing rheumatoid arthritis symptoms. Leprosy, piles, jaundice, bilious fever, and disorders resulting from blood and bile impurities can all be treated using plant roots in the Unani medical system. The plant is used in the Siddha health care system to cure and cleanse diabetes and diabetic ulcers, kidney and hip pain, skin infections and itching, children's bronchial asthma, and Pterygium.^[3,4,50]

6. PHARMACOLOGICAL ACTIVITIES

6.1 Hepatoprotective Activity

The hepatoprotective effects of *Mimosa pudica* Linn leaves on liver damage caused by carbon tetrachloride in albino rats were examined. The extract enhanced hepatic architecture and dramatically decreased CCl₄-induced serum SGOT, SGPT, and ALP levels. There was no discernible additive effect, and the outcomes were similar to those of Silymarin. *Mimosa pudica* can shield the liver from harm caused by carbon tetrachloride.^[31]

6.2 Antimicrobial Activity

The antibacterial effectiveness of *Mimosa pudica* leaf extracts against bacteria and fungi was evaluated. At several concentrations (25, 50, 75, and 100 µl/disc), the activity was assessed against *Bacillus subtilis*, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, *Aspergillus flavus*, and *Trichophyton rubrum*. The findings are displayed. Phytochemical study has shown that active components like tannins and alkaloids are responsible for the extract's antibacterial qualities.^[27]

6.3 Healing Activity

Significant wound healing was achieved by using an ointment containing 2% (w/w) methanolic and 2% (w/w) total aqueous extract (P < 0.001). Total phenols, which are equivalent to gallic acid, were measured in the methanolic and entire aqueous extracts. The methanolic extract had a total phenol concentration of 11% (w/w), while the total aqueous extract had a concentration of 17% (w/w). The phenolic content of the methanolic extract was probably responsible for its ability to heal wounds.^[24]

6.4 Analgesic and anti-inflammatory activity

The anti-inflammatory and analgesic effects of an ethanolic extract of *M. pudica* leaves at doses of 200 and 400 mg/kg were examined. In a dose-dependent way, the extract dramatically decreased paw oedema caused by carrageenan. Compared to the tail flick paradigm, the acetic acid-induced writhing model showed greater analgesic efficacy. The ethanolic extract's analgesic and anti-inflammatory qualities may be attributed to the presence of flavonoids.^[48]

6.5 Anti-Diabetic Activity

The anti-diabetic qualities of the leaves of *Mimosa pudica* Linn, a member of the *Mimosa* family, were investigated in this study. *Mimosa pudica* Linn ethanolic and petroleum ether extracts were contrasted with the standard drug Metformin (500 mg/kg). Alloxan (150 mg/kg) was administered to Wistar strains of either sex in order to cause diabetes. Plasma glucose levels were measured using the Glucose Oxidase/Peroxidase method. Blood glucose levels were considerably reduced by the ethanolic extract.^[32]

6.6 Hypocholesterolemic Activity

Three groups of male albino rabbits were used in the study to examine the hypocholesterolemic effects of *Biophytum sensitivum* leaves. After a week of receiving 100 mg/kg body weight/day of cholesterol, the rabbits were given 200 mg/kg body weight/day of the plant extract. Triglycerides, total cholesterol to high-density lipoprotein cholesterol ratios, and serum total cholesterol were all considerably lowered by the extract. Blood glucose levels did not significantly change, suggesting that the extract dramatically reduces cholesterol.

6.7 Antifertility Activity

Using pharmacological tests, the study assessed the antifertility effects of *Mimosa pudica*, a well-known antifertility herb in India. Swiss albino mice were administered the root extract orally for 21 days while the litter size, reproductive hormones, and estrous cycle were monitored. The extract affected gonadotropin release and estradiol production by lengthening the estrous cycle, lengthening the diestrous phase, and reducing litter size.

6.8 Antivenom Activity

The efficacy of commercially manufactured tannins and *Mimosa pudica* tannins (MPT) in reducing the lethality of *Naja kaouthia* venom is compared in this study. In mice, MPT demonstrated 100% survival after 24 hours, whereas commercial tannic acid did not. Two protein spots in the 2-DE analysis vanished, indicating that MPT therapy also decreased the expression of venom proteins.

6.9 Anticonvulsant Activity

A neurological illness of the central nervous system, epilepsy causes aberrant behaviour, symptoms, and sensations, including loss of consciousness, during a seizure caused by disruptions in brain nerve cell activity. The anti-convulsant efficacy of an alcoholic extract of *Mimosa pudica* (Mimosaceae) against seizures caused by MES was evaluated in this study. Thirty Swiss albino rats were split up into five groups of six. The rats were split into five groups: AEMP 50 mg/kg, 100 mg/kg, 200 mg/kg, standard (phenytoin 25 mg/kg), and control (normal saline 25 ml/kg). Using maximal electroshock seizures (MES) in albino rats, the anticonvulsant potential of *Mimosa pudica*'s alcoholic extract was evaluated. *Mimosa pudica*'s alcoholic extract had notable results. At all tested dosages (50, 100, and 200 mg/kg), the alcoholic extract of *Mimosa pudica* demonstrated significant ($P < 0.00$) dose-dependent protection against the tonic extensor phase, with a maximal effect at 200 mg/kg.^[7]

6.10 Antinociceptive Activity

The purpose of this study was to evaluate the antinociceptive and CNS depressive effects of a methanolic extract from the aerial portions of *Mimosa pudica* (MAMP). Open field and hole cross tests were used to measure the extract's CNS depressive effects (100 and 200 mg/kg, p.o.), while formalin-induced pain and acetic acid writhing were used to measure its antinociceptive activity. In the hole-cross and open-field tests, locomotor activity considerably decreased ($p < 0.05$) at all doses. Acetic acid-induced writhing and formalin-induced inflammatory pain were both successfully ($p < 0.05$) and dose-dependently reduced by the extract. According to this study, *Mimosa pudica* exhibits antinociceptive and CNS depressive qualities that suggest its use in the treatment of neuropsychiatric diseases.

6.11 Hypolipidemic Activity

In rats with hyperlipidemia caused by a high-fat diet, *mimosa pudica* extract showed hypolipidemic effectiveness. High levels of cholesterol, triglycerides, LDL, and VLDL were seen in experimental rats with hyperlipidemia. Like the traditional drug Lovastatin, ethanol extract dramatically decreased serum biochemical indicators such as cholesterol, TG, LDL, and VLDL while raising HDL levels. Phytoconstituents like steroids, flavonoids, glycosides, alkaloids, and phenolic substances were found in preliminary phytochemical studies.^[36, 37, 38, 39, 40]

6.12 Anxiolytic and Antibacterial Activity

The anxiolytic and bactericidal qualities of a methanol extract from *Mimosa pudica* (MEMP) leaves were evaluated in this work. The light-dark box, elevated plus maze, and hole board tests were used to investigate the anxiolytic effect of MEMP on mice. A disc diffusion experiment was used to assess MEMP's antibacterial activity. Reducing sugar, tannin, glycosides, alkaloids, and flavonoids were found during the first phytochemical screening. The Light-dark box and Elevated Plus Maze tests revealed that MEMP at doses of 200 and 400 mg/kg body weight had a significant anxiolytic effect ($p < 0.05$). In a hole-board test, MEMP administration at 200 and 400 mg/kg body weight dramatically decreased mouse movement, indicating a possible anxiolytic effect. In a hole-board test, MEMP administration at 200 and 400 mg/kg body weight dramatically decreased mouse movement, indicating a possible anxiolytic effect. MEMP showed dose-dependent antibacterial activity against a variety of bacterial species, such as *Shigella flexneri*, *Escherichia coli*, *Streptococcus agalactiae*, *Staphylococcus aureus*, and *Staphylococcus epidermidis*.

6.13 Antioxidant Activity

Alkaloids, flavonoids, cardiac glycosides, phenols, and saponins are among the phytoconstituents of *Mimosa pudica* Linn. (Lajwanti) that were examined in this study. Chloroform extract had the highest phenolic content, while the other extracts' phenolic content rose with concentration. Lajwanti extracts showed concentration-dependent increases in superoxide and DPPH radical scavenging, as well as reduction of nitric oxide scavenging. Strong antioxidant activity was also demonstrated by them; the greatest reported reducing power was 80 $\mu\text{g/ml}$.^[22, 23, 45, 49]

6.14 Anti-diarrhoeal activity

Diarrhea is thought to be widespread in many Asian regions and is a major public health concern in developing nations. It is a major contributor to high rates of morbidity and death. Wistar albino rats were used in many experimental settings to evaluate the anti-diarrheal properties of an ethanolic extract of *Mimosa pudica* Linn (Mimosaceae) leaves. The ethanolic extract inhibited PGE2-induced enteropooling and castor oil-induced diarrhea in rats, and it also decreased gastrointestinal motility after charcoal meal delivery. It was discovered

that the ethanolic extract significantly reduced diarrhea at 200 and 400 mg/kg. When compared to the standard medicine, diarrhea was significantly ($P < 0.001$) reduced in all three rat models. The extract's anti-diarrheal qualities may be attributed to the tannin and flavonoids it contains. These findings unequivocally demonstrated the effectiveness of an ethanolic extract of *Mimosa pudica* leaves in preventing diarrhea.^[30]

7. IMPORTANCE OF MIMOSA PUDICA

Because of its many pharmacological, therapeutic, and ecological qualities, *Mimosa pudica* (L.), commonly referred to as the "sensitive plant" or "touch-me-not," is a highly noteworthy medicinal plant in review literature. Its traditional use in treating diabetes, diarrhea, and urogenital problems supports its notable antibacterial, antioxidant, hepatoprotective, antidepressant, and wound-healing characteristics. It is rich in bioactive substances such as mimosine, flavonoids, and tannins. Its promise in contemporary medication development is highlighted by its strong pharmacological value, which includes notable anti-venom activity. *M. pudica*'s significance in research is further demonstrated by its use as an ecological tool for heavy metal phytoremediation outside of medicine.

7.1 Application of Mimosa pudica

In traditional medicine (Ayurveda, Chinese), *Mimosa pudica* (Touch-me-not) is highly prized for its many pharmacological qualities, which include wound-healing, anti-inflammatory, antioxidant, and antibacterial actions. It is frequently used to treat urogenital problems, diarrhea, diabetes, piles, and skin disorders. It also aids in the fixation of nitrogen in the soil and is a decorative plant.

7.2 Key Applications of Mimosa Pudica

Medicinal Uses

Wound Healing: Paste of leaves is applied topically to enhance healing of wounds and skin cuts.

Gastrointestinal Disorders: Treats diarrhoea, dysentery, and piles (hemorrhoids).

Urogenital Health: Used for managing kidney stones, gynecological issues like menorrhagia, and reducing urinary infections.

Anti-inflammatory/Arthritis: Used to alleviate pain and swelling, particularly in rheumatism.

Skin Diseases: Effective against leprosy, sores, and eczema.

Other Uses: Traditionally used for snake bites, insomnia, and diabetes.

7.3 Pharmacological Properties

Studies verify antibacterial and antifungal properties against bacteria such as *E. coli* and *Staphylococcus aureus*.

Flavonoids, tannins, and terpenoids are antioxidants that aid in the prevention of oxidative stress.

Antidepressant: Research indicates that it may lessen, with some trials demonstrating beneficial effects on neurotransmitters that regulate mood.

8. TRADITIONAL MEDICINAL APPLICATIONS

Herbalism, acupuncture, and indigenous therapies are examples of holistic, experience-based medical methods that are employed in traditional medicine (TM), especially in developing nations, to prevent and treat physical and mental illnesses. By providing individualised care, employing more than 7,000 plant species in India alone, and being progressively included in mainstream healthcare for the treatment of chronic conditions, it enhances contemporary medicine.^[4, 34]

8.1 Key Aspects of Traditional Medicinal Application

Systems and Methods: Traditional Chinese Medicine (TCM), Unani, Ayurveda (India), and other native folk medicines are some of the main systems. These frequently focus on using cleansing (shodhana) or rejuvenation (rasayana) to balance the body, mind, and environment.

8.2 Methods of Application

Herbal Remedies: Plant parts (roots, leaves, bark) are ingested, applied as pastes, or inhaled.

Therapeutic Procedures: Techniques like acupuncture, yoga, or Panchakarma (Ayurvedic detox) are used.

External Application: Using poultices, oils, or smoking techniques for local pain and ailments.

8.3 Health Applications

Chronic care: Used to treat pain, manage long-term conditions, and enhance quality of life.

Primary Healthcare: In several Asian and African nations, these approaches provide primary care for more than 80% of the population.

Cosmeceuticals: Traditional, biologically active products are becoming more and more popular as indigenous herbs are utilised in skincare and haircare.

Safety and Standardisation: Despite its long history, there is a global movement to improve safety, regulation, and evidence-based research to support conventional therapies. Traditional products are subject to stringent "phytomedicine" regulations in some areas, such as Germany.

By offering easily accessible care and serving as a possible source for new pharmacological advances, traditional medicine serves as a link between traditional knowledge and contemporary well-being.

9. CURRENT TREND OF MIMOSA PUDICA

Mimosa pudica, sometimes known as the "sensitive plant" or "touch-me-not," is currently popular as an interactive indoor houseplant and is the subject of extensive scientific investigation into its potential uses in medicine, pharmaceuticals, and bio-inspired engineering.

Key Trends of *Mimosa pudica*

9.1 Houseplant Popularity

Known as a "curiosity plant," its fast, thigmonastic leaf movement—folding inward when touched—makes it fashionable. Although it needs intense sunlight and high humidity, it is popular for windowsill gardening and home terrariums, especially for educational purposes.

9.2 Pharmaceutical and Medicinal Research

In 2025 and 2026, research is being conducted on its bioactive components as a natural antioxidant and to treat sadness and anxiety. Potential anti-diabetic, anti-hepatotoxin, and wound-healing qualities are being investigated.

9.3 Bio-inspired Engineering (Biomimetics)

In order to create soft robotics, actuators, and sophisticated materials that can alter their shape in response to external stimuli, *mimosa pudica* movement is being studied.

9.4 Plant Intelligence Research

New research into non-neuronal plant intelligence is being prompted by recent findings (2025–2026) that suggest that plants can acquire and maintain memory, such as differentiating between harmful and benign stimuli.

9.5 Pharmaceutical Formulations

Because of its high swelling index, the plant's seed mucilage is being investigated for use in drug release formulations.

10. Marketed formulation of *Mimosa pudica*

Mimosa pudica, also known as Lajjalu, is mostly sold as herbal powder, tablets, and specialty topical formulations, such as gels and lotions for skin conditions and wound healing. Topical gels (using Carbopol 940), medicated vanishing creams for hyperpigmentation, and oral sustained-release tablets utilising seed mucilage are examples of formulations supported by research.

10.1 Marketed/Developed Formulations of *Mimosa pudica*

- **Powder & Raw Material:** Available on IndiaMART as *Mimosa pudica* powder/Thotta Sinungi powder (1 kg).
- **Topical Gel/Creams:** Formulated using root extracts for wound healing and as a vanishing cream (Oil-in-Water type) for hyperpigmentation.
- **Herbal Toothpaste:** Formulated using an extract along with Calcium Carbonate, Sorbitol, and Sodium Lauryl Sulphate.
- **Transdermal Patch:** Developed to test anti-inflammatory activity.
- **Tablet Excipient:** Seed mucilage is used as a binder for tablets, such as in Q-Sartan studies.

10.2 Key Formulation Characteristics

- **Gel Ingredients:** Carbopol 940, Propylene glycol, Methylparaben, and Triethanolamine.
- **Cream Base:** Vanishing cream base with an O/W type emulsion (pH 6.5).
- **Wound Healing Application:** Effective due to phytochemicals like mimosine and turgorin.^[8]

11. RESEARCH GAP

There are still a number of important study gaps regarding the antioxidant activity of aqueous and alcoholic extracts, despite the fact that *Mimosa pudica* L. has been extensively studied for its therapeutic qualities. Prior research mostly concentrated on phytochemical analysis and basic antioxidant screening, leaving some topics unexplored.

Using tests like DPPH, FRAP, and total phenolic content estimation, several investigations have shown the antioxidant activity of *Mimosa pudica* extracts. For example, a study found that the high phenolic and flavonoid content of ethyl acetate extract contributed to its increased antioxidant activity when compared to other solvent extracts. Nonetheless, there is still little and conflicting research comparing alcoholic and aqueous extracts.

Additionally, extraction conditions significantly influence antioxidant activity. A recent study showed that ethanol concentration affects antioxidant potency, with 100% ethanol producing stronger antioxidant activity compared to diluted solvents. However, systematic comparison between aqueous and alcoholic extracts under standardised conditions is still lacking.

Despite these findings, the following research gaps remain:

11.1 Limited Comparative Studies

Most published research evaluates individual extracts rather than directly comparing aqueous vs alcoholic extracts of *Mimosa pudica*. There is a lack of standardised comparative studies using identical experimental conditions.

11.2 Lack of Standardised Extraction Protocols

Different research employs different plant sections, temperatures, extraction techniques, and solvents. Comparing the antioxidant capacity of alcoholic and aqueous extracts is challenging due to this discrepancy.

11.3 Insufficient In-Vivo Antioxidant Studies

Most studies focus on in-vitro antioxidant assays such as DPPH and FRAP. Very few studies evaluate in vivo antioxidant activity, oxidative stress markers, or therapeutic relevance.

11.4 Limited Phytochemical Correlation Studies

Although phenolics and flavonoids are known to contribute to antioxidant activity, limited studies

correlate specific phytochemicals with antioxidant potential in aqueous versus alcoholic extracts.

11.5 Lack of Dose-Dependent Comparative Analysis

Few studies compare the dose-dependent antioxidant activity of aqueous and alcoholic extracts in a systematic manner.

11.6 Lack of Standardisation for Drug Development

Despite promising antioxidant activity, there is limited work on:

- Standardization
- Formulation development
- Stability studies
- Bioavailability

12. DISCUSSION

Mimosa pudica, commonly known as the sensitive plant, shame plant, or touch-me-not, is a creeping, tropical plant famous for its rapid, seismonastic movement, closing its leaves upon stimulation. It acts as an ornamental, a medicinal herb in Ayurveda and folk medicine for conditions like diarrhoea, skin issues, and piles, and is often regarded as a weed in warm climates.

12.1 Key Characteristics and Biology

- **Rapid Movement (Thigmonasty/Seismonasty):** The leaves close and petioles droop in a matter of seconds when handled, shaken, or exposed to heat; this is probably a protective mechanism against predators. After a few minutes, they reopen.
- **Sleep Movement (Nyctinasty):** The plant automatically folds its leaves at night.
- **Mechanism:** The movement is caused by a rapid change in water pressure within specialised cells (pulvini) at the base of the leaf.
- **Appearance:** A short-lived creeping subshrub with thorny stems, compound leaves, and fluffy, pink, or mauve globular flowers.

12.2 Medicinal and Traditional Uses

- **Traditional Medicine:** Used in Ayurveda for ailments including diarrhoea, hemorrhoids, insomnia, and urogenital disorders.
- **Pharmacological Potential:** Research indicates the plant has antibacterial, anti-inflammatory, antioxidant, and sedative properties.
- **Phytochemicals:** It contains alkaloids (mimosine), flavonoids, terpenoids, and tannins.

12.3 Care and Cultivation

- **Lighting:** Thrives in bright conditions, including direct morning sunlight or bright, indirect light.
- **Watering:** Requires moist soil during the growing season (spring/summer), but less water in winter, allowing the topsoil to dry.
- **Humidity:** Benefits from high humidity, making them suitable for greenhouses or regular misting.

- **Soil:** Thrives in well-draining soil mixes (e.g., potting soil with perlite).
- **Pests:** Susceptible to spider mites; treat with neem oil or insecticidal soap.

12.4 Status and Other Names

- **Names:** Known as Shame Plant, Touch-Me-Not, Humble Plant, Sleepy Grass, and Chuimui.
- **Invasiveness:** Native to Central and South America, it is considered a weed or invasive in many tropical regions.
- **Etymology:** *Pudica* is, Latin for "bashful" or "shrinking," highlighting its sensitive nature.

Graph Representation (%)

□ Whole Plant	100%
□ Leaf	80%
□ Root	70%
□ Stem	50%
□ Seed	40%
□ Flower	20%

Research Focus / Reported Work

□ Whole Plant	10
□ Leaf	8
□ Root	7
□ Stem	5
□ Seed	4
□ Flower	2

13. CONCLUSION

The significant medicinal plant *Mimosa pudica* L. is well-known for a variety of pharmacological characteristics, most notably its potential as an antioxidant. Its ability to scavenge free radicals is greatly enhanced by the presence of phytochemicals such as flavonoids, phenolics, tannins, and alkaloids. Both aqueous and alcoholic extracts of *Mimosa pudica* have significant antioxidant activity, according to the reviewed literature; however, alcoholic extracts frequently demonstrate greater efficacy because of better extraction of bioactive chemicals.

Mimosa pudica's antioxidant potential is supported by a number of in-vitro antioxidant tests, such as DPPH, reducing power, and total phenolic content. However, different plant sections, extraction techniques, and experimental settings lead to different results. The need for more research is further highlighted by the paucity of in-vivo investigations and the absence of defined methodologies.

In conclusion, both alcoholic and aqueous extracts of *Mimosa pudica* L. show encouraging antioxidant qualities. To determine its therapeutic potential and promote its use in pharmaceutical and nutraceutical applications, more thorough research is needed, including phytochemical characterisation, toxicity assessment, and in vivo validation.

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