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Review Article

The Shy Healer: Exploring the Ethnopharmacology, Phytochemicals, and Biomedical Applications of Mimosa Pudica L.

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ABSTRACT

Background: Mimosa pudica L., commonly known as the “touch-me-not” plant, is a creeping, herbaceous species noted for its rapid thigmotactic movement in response to tactile stimuli. Traditionally employed in systems like Ayurveda, Unani, and folk medicine across Asia, Africa, and South America, the plant has been used to manage conditions such as wounds, gastrointestinal disturbances, inflammatory disorders, and reproductive ailments. Its medicinal potential is primarily attributed to a broad array of bioactive phytochemicals. **Objective:** This review aims to consolidate existing literature on the ethnomedicinal relevance, phytochemical profile, pharmacological activities, cultivation practices, marketed formulations, and patents associated with Mimosa pudica, and to evaluate its scope for future therapeutic applications. **Method:** A comprehensive search of published articles, patents, and ethnobotanical data was conducted using scientific databases including PubMed, Scopus, and Google Scholar. Information was critically reviewed and categorized under botanical description, traditional use, bioactive constituents, pharmacological activities, and experimental evidence from preclinical studies. **Results:** Phytochemical screening has identified key compounds such as flavonoids, alkaloids, glycosides, and tannins. Experimental models demonstrated anti-inflammatory, antioxidant, hepatoprotective, wound-healing, and antidiabetic effects using different extracts and plant parts. Several marketed herbal formulations and patented products have incorporated M. pudica, affirming its translational value. **Conclusion:** Mimosa pudica exhibits diverse pharmacological activities supported by both traditional knowledge and modern scientific validation. Future research should focus on clinical trials, molecular mechanism elucidation, and standardized formulation development to harness its full therapeutic potential.

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INTRODUCTION

Mimosa pudica L., belonging to the Fabaceae family, is a creeping, herbaceous plant recognized for its rapid response to physical stimuli a unique characteristic that has fascinated botanists for centuries¹. It is believed to have originated in tropical South and Central America but has since spread widely, becoming naturalized in diverse regions of Asia, Africa, Australia, and the Pacific Islands². In India, *M. pudica* is commonly found in gardens, along roadsides, on wastelands, and in tropical forests. It thrives particularly well in moist, nitrogen-rich soils and disturbed areas, indicating its adaptability to various climatic and soil conditions³. This widespread availability has made the plant easily accessible for use in traditional remedies by rural communities. Botanically, *Mimosa pudica* is a small, low-growing, thorny shrub that may extend as a ground cover. It typically grows up to 30–50 cm in height. The plant has bipinnate leaves, which fold inward when touched due to a rapid loss of turgor pressure in the pulvini⁴. Its flowers are small, pink to purplish, and globular, appearing in axillary clusters. It bears small, flat seed pods that break into one-seeded segments when mature. The plant's pharmacological potential is linked to its rich and diverse phytochemical profile. Various parts of *M. pudica* including the leaves, roots, and stems have been found to contain alkaloids, flavonoids (such as quercetin), tannins, saponins, terpenoids, glycosides, and steroids⁵. These bioactive constituents contribute to the plant's antimicrobial, anti-inflammatory, antioxidant, hepatoprotective, and wound-healing properties⁶. In terms of harvesting, *Mimosa pudica* is typically collected manually during its flowering season, which varies by region but often occurs in the monsoon months in tropical areas. Leaves and roots are the most commonly harvested parts for medicinal use. After collection, plant materials are

cleaned, shade-dried, and stored in airtight containers to preserve their phytochemical content⁷. The plant's adaptability to a wide range of environments, ease of propagation through seeds, and low maintenance requirements make it an attractive resource for both traditional use and research-based cultivation. Given its therapeutic promise and ecological abundance, *M. pudica* holds considerable potential for integration into herbal medicine, nutraceuticals, and even as a model in plant physiology studies.

Taxonomy and Botanical Description

Taxonomy of *Mimosa pudica* L.

Mimosa pudica L. belongs to the Fabaceae family (also known as Leguminosae), which includes many plants with significant ecological and medicinal value. It is placed under the Mimosoideae subfamily, recognized for its compound leaves and characteristic inflorescence types. The plant's taxonomic position is outlined below:

Table No. 01 - Taxonomic Classification of *Mimosa Pudica* L.

Taxonomic Rank	Classification
Kingdom	Plantae
Subkingdom	Tracheobionta (Vascular plants)
Superdivision	Spermatophyta (Seed plants)
Division	Magnoliophyta (Flowering plants)
Class	Magnoliopsida (Dicotyledons)
Order	Fabales
Family	Fabaceae (Leguminosae)
Subfamily	Mimosoideae
Genus	<i>Mimosa</i>
Species	<i>Mimosa pudica</i> L.

The genus name “*Mimosa*” derives from the Greek word “mimos” meaning mimic, referencing the plant's ability to react to touch, while “*pudica*” is Latin for “shy” or “bashful,” reflecting its sensitive nature⁸



Botanical Description

Mimosa pudica is a small, trailing or low-growing perennial herb, though it often behaves as an annual in temperate climates due to its sensitivity

to frost⁹. It is most notable for its rapid plant movement leaves fold inward and droop when touched or shaken, a defense mechanism known as thigmonasty or seismonasty¹⁰.

Table No-02 Summarized Morphological Description

Plant Part	Description	Reference
Habit	Prostrate to ascending herb or subshrub; often forms ground cover	[8]
Height	Typically, 30–50 cm, but can extend longer in creeping form	[8]
Stems	Slender, branching, and often armed with small prickles	[9]
Leaves	Bipinnately compound with 1–2 pairs of pinnae; 10–26 leaflets per pinna; sensitive to touch	[10]
Flowers	Pink to purplish, globular heads; axillary or terminal inflorescences	[9]
Fruit (Pods)	Flat, linear, 1–2 cm long pods with constrictions between seeds	[11]
Seeds	Small, brown, and hard; dispersed via fragmentation of the pod	[11]

The plant prefers sunny to semi-shaded conditions and grows well in moist, well-drained soils. It is commonly found in roadsides, fields, waste areas, and disturbed sites, particularly in tropical and subtropical climates⁸. Its ability to grow aggressively in open areas and disturbed lands has made it both valuable and, in some areas, invasive. However, this widespread distribution has also contributed to its use in traditional medicine across various regions.

Ethnomedicinal Uses of *Mimosa pudica* L.

Mimosa pudica L. has been deeply integrated into the traditional medicinal practices of several cultures for centuries. Its use is widespread in Ayurveda, Unani, Siddha, and indigenous healing systems, especially in tropical and subtropical regions where the plant is naturally available⁷. In

Ayurvedic medicine, it is referred to as *Lajjalu* or *Lajjavanti*, and is considered to have tikta (bitter) and kashaya (astringent) rasa, with cold potency and kapha-pitta pacifying properties⁸. The plant is used to address disorders such as dysentery, hemorrhoids, urinary infections, wounds, and female reproductive issues. In folk medicine, *M. pudica* is frequently used externally as a paste for skin infections, cuts, and insect bites, and internally for gastrointestinal and genitourinary complaints⁹. Decoctions of the roots or leaves are commonly prepared and consumed orally. Different parts of the plant are utilized for various health conditions, often tailored to the specific cultural or regional medical knowledge. The most commonly used parts include leaves, roots, and seeds, which are used in the form of pastes, decoctions, juices, or powders¹⁰.

Table No-03 Ethnomedicinal Uses of *Mimosa pudica* L.

Uses	Plant Part Used	Mode of Application	Traditional System/Region	Reference
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Wound healing, cuts	Leaves, roots	Paste applied topically	Ayurveda, rural India	[8]
Diarrhea, dysentery	Leaves	Decoction taken orally	Ayurveda, Unani	[7], [10]
Piles and hemorrhoids	Whole plant	Decoction or powder	Siddha, tribal medicine	[9]
Menstrual disorders	Roots, leaves	Juice or decoction	Folk medicine (India, Nepal)	[11]
Antivenom (snake, scorpion bite)	Roots	Root extract applied orally	Tribal communities (Jharkhand, Odisha)	[12]
Insomnia and anxiety	Whole plant	Decoction before sleep	Ayurveda	[8]
Leucorrhea and urinary issues	Leaves	Infusion or decoction	Unani, rural folk medicine	[13]
Toothache	Leaves	Chewed directly	Traditional Amazonian use	[14]

Thigmonastic Sensitivity in *Mimosa pudica*: The “Touch-Me-Not” Response

One of the most remarkable features of *Mimosa pudica* L. is its ability to respond rapidly to touch, vibration, heat, or even sudden darkness. This reaction, commonly referred to as the “touch-me-not” effect, is a type of nastic movement, specifically thigmonasty, which is independent of the direction of the stimulus¹⁵. When the leaflets of *M. pudica* are touched, they fold inward and the entire petiole may droop within seconds. This response is thought to be an evolved defensive mechanism, protecting the plant from herbivores or physical damage by making it appear less appealing or alive¹⁶. The movement originates in specialized structures called pulvini swollen, joint-like regions at the base of leaflets and petioles. These pulvini act like tiny biological motors. Upon stimulation, action potentials (electrical signals) are generated and transmitted rapidly through the plant tissue, particularly along the phloem¹⁷. These action potentials cause a sudden efflux of potassium (K^+) and chloride (Cl^-) ions from the pulvinar motor cells into the intercellular spaces. This ionic shift triggers osmotic water loss, resulting in a loss of turgor pressure in the extensor

cells, which causes the leaf to fold downward¹⁸. The entire process happens within 2–3 seconds and resets after a few minutes once the turgor is restored. Interestingly, this touch response can propagate from one leaflet to another and even across multiple branches, making the plant appear “alive” in a reactive sense. The mechanism is considered energy-efficient and is mediated by ATP-dependent ion pumps, although the process does temporarily increase the plant's respiration rate¹⁹. While this phenomenon is mostly seen in *M. pudica*, other species within the Mimosoideae subfamily also exhibit similar, though less dramatic, nastic movements. The traditional use of *Mimosa pudica* has prompted numerous pharmacological investigations, many of which have validated its therapeutic potential. One of the most frequently reported activities is its antimicrobial effect, which has been observed in extracts from leaves, roots, and stems. These extracts have demonstrated inhibitory effects against both Gram-positive and Gram-negative bacterial strains, including *Staphylococcus aureus* and *Escherichia coli*, likely due to the presence of flavonoids and tannins.^[27] In addition to antimicrobial activity, *M. pudica* has shown significant anti-inflammatory properties in animal

models, particularly in reducing edema and inflammation induced by agents such as carrageenan.^[28] The anti-inflammatory response is believed to be mediated through suppression of pro-inflammatory mediators like prostaglandins and cytokines^[29]. Moreover, *M. pudica* possesses antioxidant properties, primarily attributed to its rich flavonoid and polyphenol content. These compounds scavenge free radicals and reduce oxidative stress, which could potentially explain the plant's protective effect in liver and cardiovascular tissues [30]. Supporting this, hepatoprotective effects have been demonstrated in rodent models where *M. pudica* extracts significantly restored biochemical markers of liver function following toxin-induced injury^[31]. Another important area of pharmacological interest is the plant's wound healing ability, which has been substantiated in topical application studies. Leaf paste or extract formulations have promoted faster closure of wounds, enhanced epithelialization, and increased collagen deposition, possibly due to the presence of bioactive saponins and alkaloids [32]. Furthermore, recent studies have explored the anxiolytic and sedative potential of the plant, indicating its possible role in central nervous system modulation. Extracts administered orally have been shown to reduce anxiety-like behavior and prolong sleep in experimental animals, suggesting modulation of GABAergic pathways^[33]. Emerging evidence also points to antidiabetic and antinociceptive effects of the plant, although more detailed mechanistic and clinical studies are required to confirm these findings. Overall, the breadth of pharmacological activities reported in preclinical studies highlights *Mimosa pudica* as a multipotent herb with potential applications in modern medicine^[34]

Marketed Formulations and Approved Patents

A growing body of commercial interest has emerged around *Mimosa pudica*, with several formulations now available, particularly in dermo-cosmetic and pharmaceutical markets. One notable example is a topical cream developed by Pierre Fabre in 2021 (US Patent #10,954,488), which utilizes extracts from undifferentiated *Mimosa pudica* cells grown in vitro. Proprietary formulations including creams, gels, and emulsions target inflammatory skin conditions, anti-aging, and antioxidant effects for use in polluted environments, with clinical focus on atopic dermatitis, pruritus, eczema, and psoriasis^{[35][36]}. In pharmaceutical excipient applications, the seed mucilage of *M. pudica* is patented and marketed for its utility in controlled drug delivery systems. Studies have demonstrated its effectiveness as a natural tablet binder and disintegrant in formulations such as hydrochlorothiazide and paracetamol. Specifically, its hydrophilic and swelling properties allow formulation teams to adjust release profiles, making it a powerful agent in sustained-release drug delivery systems^{[37][38]}. Emerging patents expand the plant's utility in biotech and nanotechnology. For instance, a review highlights the functional applications of chemically modified *M. pudica* mucilage acetylated, succinylated, or cross-linked for use in stimuli-responsive systems, wound dressings, emulsifiers, and nanoparticle synthesis^[39]. These innovations position *M. pudica* as both a bioactive source and a versatile excipient in modern drug formulation.

Table No. 04 - Marketed and Patented Applications of *Mimosa pudica* L.

Application Area	Formulation Type	Key Features / Uses	Patent/Market Details	Reference
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Dermatology & Cosmetics	Topical cream, emulsion	Anti-inflammatory, antioxidant, anti-aging; used for eczema, dermatitis, pruritus	US Patent #10,954,488 by Pierre Fabre; also WO2017216274A2	[35,36]
Pharmaceutical Excipients	Natural binder/disintegrant (tablet)	Used in direct compression tablets; enhances disintegration and drug release	Commercial use in HCTZ and paracetamol tablets	[37]
Sustained Drug Delivery	Matrix tablet (oral SR)	Swelling property controls release rate; suitable for NSAIDs like diclofenac	Preclinical evaluations and pharma-grade applications	[38]
Nanotechnology & Biotech	Modified mucilage (acetylated/succinylated)	Bioadhesive film, wound dressing, nanoparticle stabilizer	Structural modification for smart drug delivery systems	[39]

Mimosa pudica has found diverse applications in modern healthcare and pharmaceutical technology beyond its traditional use. In dermatology and cosmetics, its anti-inflammatory and antioxidant properties are utilized in patented topical formulations for conditions like eczema and dermatitis [35,36] As a pharmaceutical excipient, its natural mucilage serves as an effective binder and disintegrant in tablet formulations, enhancing drug

dissolution in products like HCTZ and paracetamol [37] Its swelling behavior also supports the development of sustained-release matrix tablets, particularly for NSAIDs [38] Furthermore, advancements in nanotechnology have enabled the use of chemically modified mucilage from *M. pudica* in bioadhesive films and nanoparticle delivery systems, showcasing its versatility in innovative drug delivery platforms [39]

Table 05: Experimental Evidence of Pharmacological Activities of *Mimosa pudica* L.

Pharmacological Activity	Plant Part	Extract / Isolate	Dose / Route	Bioactive Dose	Positive Control	Negative Control	Animals	Experimental Model & Parameters	Mechanism of Action	Inference	Reference
Aphrodisiac	Roots	Ethanol extract	100–500 mg/kg p.o., 7 days	500 mg/kg	Sildenafil citrate	Vehicle	Swiss albino male mice (n=6/group)	Libido scoring, testosterone levels	Hormonal modulation (↑ testosterone)	Effective libido enhancer at 500 mg/kg with no adverse effect	[40]
Anticonvulsant	Roots	Ethanol extract	1000, 2000 mg/kg p.o.	2000 mg/kg	Valproate	Vehicle	Swiss albino mice	MES & PTZ models : seizure latency, tonic hind-	CNS depression; raises seizure threshold	Significant anticonvulsant activity demonstrated	[41]

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Antidepressant	Leaves	Ethanol ic extract	4– 8 mg/ kg i.p.; also 100– 400 mg/kg p.o.	6 mg/ kg (i.p.), 200 mg/kg p.o.	Imipr amine	Saline	Swiss albino mice (n=6/g roup)	TST & FST immob ility duratio n	Modulati on of central neurotra nsmissio n	Demonst rated compara ble antidepressant effect to imipramine	[42]
Anti-inflamm atory	Whole plant	Hydroal coholic extract	200– 800 mg/kg p.o.	400 mg/kg	Aspirin	Vehicle	Albin o rats (n=6/g roup)	Carrageenan- induced paw edema volume	Inhibition of inflamm atory mediator s	Significa nt anti- inflamm atory activity confirme d	[43]
Wound- healing & Antidiabetic	Seeds	Ethyl acetate & ethanol ic extracts	100– 400 mg/kg p.o. daily	400 mg/kg	—	Vehicle	STZ-i nduced diabetic rats	Wound contrac tion rate, blood glucose, histopa thology on day 15	Blood glucose reductio n, collagen depositio n, antioxida nt effects	Marked wound healing and glucose- lowering in diabetic rats	[44]
Antidiabetic & Renoprotective	Leaves (fraction)	Ethyl-a cetate fraction	50 & 100 mg/kg p.o. for 60 days	100 mg/kg	—	Vehicle	STZ-i nduced diabetic mice	OGTT, lipid profile, kidney histology, antioxidant enzymes, cytokine levels	↑ SOD/CA T/GPx, ↓ MDA, IL-1β, TNF-α; improved nephron integrity	Demonst rated antihyper glycemic and kidney- protectiv e effects	[45]
Antifertility	Roots	Methanol extract	300 mg/kg p.o. daily for 21 days	300 mg/kg	—	Vehicle	Swiss albino female mice	Estrous cycle monito ring, hormone assays, litter count	Hormonal disruptio n: ↓ FSH, altered estrous cycle	Significa nt antifertility potential demonstr ated	[46]

Mimosa pudica has been extensively studied in various experimental models to validate its traditional uses and reveal its pharmacological potential. Recent studies have demonstrated significant activities across several therapeutic domains, highlighting its promise as a source of bioactive compounds.

Aphrodisiac Activity: The root extract of Mimosa pudica has been shown to enhance sexual behavior in male mice, indicating aphrodisiac properties. Sharma et al. (2010) reported that administration of the root extract increased mount frequency and penile reflexes, suggesting a positive modulation of reproductive functions likely mediated through androgenic pathways [40]

Anticonvulsant Activity: Chatterjee et al. (2011) evaluated the anticonvulsant effects of the root extract using chemically induced seizure models in Swiss albino mice. The extract significantly delayed the onset of seizures and reduced their severity, comparable to standard anticonvulsant drugs. This suggests that phytoconstituents of M. pudica may modulate neurotransmitter systems or ion channels involved in seizure activity [41]

Antidepressant-like Effects: Rathor and Mehta (2016) explored the antidepressant potential of Mimosa pudica leaf extracts in rodent behavioral models such as the forced swim and tail suspension tests. The extracts produced a significant reduction in immobility time, indicative of antidepressant-like activity. This effect may be linked to the modulation of monoaminergic neurotransmission [42]

Anti-inflammatory Activity: Anti-inflammatory properties of Mimosa pudica have been validated by Mehta et al. (2014), who demonstrated that hydroalcoholic leaf extracts reduce paw edema induced by carrageenan in albino rats. The extract inhibited the release of pro-inflammatory

mediators, possibly through suppression of cyclooxygenase and lipoxygenase pathways [43] Wound Healing and Antidiabetic Effects: Maurya et al. (2015) assessed the wound healing and antidiabetic potential of Mimosa pudica seed extract in streptozotocin-induced diabetic rats. The extract accelerated wound contraction and epithelialization, while also improving glycemic control and antioxidant status. These dual effects suggest its use in managing diabetic wounds through combined metabolic and tissue repair mechanisms [44].

Renoprotective and Antioxidant Effects: Khandelwal et al. (2018) investigated the leaf fraction's effect on kidney function in diabetic mice. Treatment with the extract improved renal biomarkers and reduced oxidative stress markers, indicating a protective effect against diabetic nephropathy. The antioxidant properties are attributed to flavonoids and phenolic compounds present in the plant [45]

Cultivation, Seeding, and Harvesting of Mimosa pudica

Mimosa pudica is a hardy, fast-growing herbaceous plant that adapts well to diverse environmental conditions, making its cultivation relatively straightforward. Understanding proper cultivation practices is essential to ensure the availability of quality plant material for medicinal and research uses.

Seed Propagation and Germination

The primary propagation method of Mimosa pudica is through seeds, which are small, brown, and enclosed in linear pods that fragment upon maturity to facilitate dispersal. To improve germination rates, seeds are often scarified or soaked in water for 12–24 hours to soften the hard seed coat and break dormancy. Under optimal



conditions, seeds typically germinate within 7 to 14 days [47] Seeds are sown directly into well-prepared seedbeds or nursery trays filled with light, well-drained soil enriched with organic matter. The ideal soil pH ranges between 5.5 and 7.5, and consistent moisture is maintained to support healthy seedling emergence [48]

Soil and Climatic Requirements

Mimosa pudica thrives in tropical and subtropical climates with warm temperatures ranging from 20–35°C and moderate to high humidity. It prefers sunny to semi-shaded environments and grows well in disturbed, nitrogen-rich soils such as loamy, sandy, or clay soils, provided they are well-drained. While drought tolerant once established, regular irrigation during dry spells promotes optimal growth [49]

Transplanting and Field Cultivation

Seedlings are typically transplanted to the main field after 3 to 4 weeks in the nursery, when they reach 5–7 cm in height. Recommended plant spacing is 30–50 cm to allow adequate growth and air circulation, minimizing disease incidence. Due to its creeping habit, *Mimosa pudica* can serve as

effective ground cover and helps in soil erosion control (50)

Nutrient Management and Pest Control

Although the plant can grow in nutrient-poor soils, applying organic compost or balanced fertilizers rich in nitrogen, phosphorus, and potassium enhances biomass and phytochemical production. The plant is relatively resistant to pests but may occasionally be affected by aphids, mites, or fungal pathogens. Use of integrated pest management (IPM) with minimal chemical intervention is advised to preserve the plant's medicinal quality [51]

Harvesting Practices

Harvesting is usually done during the flowering phase, which coincides with monsoon or post-monsoon months in tropical regions. Leaves and aerial parts are collected by hand early in the morning when phytochemical levels are highest. Roots are harvested carefully from mature plants when required. Post-harvest, plant materials are cleaned, shade-dried under ambient conditions, and stored in airtight containers protected from light and moisture to maintain their pharmacological potency [52]



Fig No. 01 - Cultivating Mimosa pudica L. Step by step Guide

Future Prospects of Mimosa pudica L.

Mimosa pudica holds considerable promise for future research and development due to its unique biological properties, wide-ranging pharmacological activities, and ecological adaptability. Several avenues present themselves for further exploration and application:

1. Phytochemical and Pharmacological Exploration

While many bioactive compounds like flavonoids, alkaloids, tannins, and terpenoids have been identified, advanced techniques such as metabolomics, proteomics, and genomics could uncover novel phytochemicals with potent therapeutic effects. Isolating and characterizing these compounds may lead to new drug candidates for antimicrobial, anti-inflammatory, antioxidant, and neuroprotective applications. Furthermore, detailed mechanism of action studies at the molecular and cellular levels can enhance understanding of how *M. pudica* extracts exert

their biological effects, potentially improving efficacy and safety profiles in clinical contexts.

2. Development of Standardized Herbal Formulations

To facilitate mainstream acceptance, efforts must be made to develop standardized, quality-controlled herbal products derived from *M. pudica*. This includes establishing robust cultivation protocols, optimizing extraction methods, and validating bioactive marker compounds for quality assurance. Such standardized formulations could be incorporated into nutraceuticals, topical agents for wound healing, or adjunct therapies for gastrointestinal and inflammatory disorders.

3. Biotechnological and Agronomic Advances

Biotechnological approaches such as tissue culture, genetic engineering, and molecular breeding may improve the yield, phytochemical content, and stress resistance of *M. pudica*. This could enable large-scale, sustainable production

with consistent quality. Additionally, agronomic studies focused on optimizing growth conditions, pest management, and post-harvest processing will support commercial cultivation efforts.

4. Environmental and Ecological Applications

Given its rapid growth and soil-binding capabilities, *Mimosa pudica* could be further explored for use in soil erosion control, land reclamation, and phytoremediation projects. Its resilience in disturbed environments makes it a candidate for ecological restoration initiatives in degraded landscapes.

5. Clinical Research and Therapeutic Validation

Currently, most evidence for *M. pudica*'s medicinal properties is preclinical. Conducting well-designed clinical trials is essential to validate safety and efficacy in humans, establish dosage regimens, and explore potential drug interactions. Such research could pave the way for formal approval and incorporation of *M. pudica* derivatives into conventional medicine.

CONCLUSION

Mimosa pudica L., widely known as the “touch-me-not” plant, stands out not only for its remarkable thigmonastic movements but also for its significant therapeutic potential recognized across traditional medicinal systems worldwide. The plant's adaptability to diverse climatic conditions and its ease of propagation contribute to its accessibility and sustainable use in various regions, especially tropical and subtropical areas. Phytochemical investigations have revealed a rich spectrum of bioactive compounds in *M. pudica*, including alkaloids, flavonoids, tannins, terpenoids, and glycosides, which underpin its broad pharmacological profile. Experimental

studies validate its antimicrobial, anti-inflammatory, antioxidant, hepatoprotective, and wound healing properties, among others, supporting its traditional applications for gastrointestinal disorders, skin infections, reproductive health, and neurological conditions. The integration of *M. pudica* in ethnomedicine is extensive, reflecting centuries of accumulated indigenous knowledge. However, modern scientific scrutiny has only begun to unravel the molecular mechanisms governing its pharmacological actions. Studies indicate that the plant's bioactive constituents exert effects through multiple pathways, including modulation of oxidative stress, inflammatory mediators, and microbial inhibition. From an agronomic perspective, *M. pudica* is a resilient species that thrives in disturbed soils and can be cultivated with relatively simple techniques. Proper seed treatment, optimal soil management, and timely harvesting are essential to maintain the quality and efficacy of the plant material used for medicinal purposes. Marketed herbal formulations based on *Mimosa pudica* and emerging patented products underscore its commercial and therapeutic potential. Nonetheless, gaps remain in standardization, quality control, and comprehensive clinical evaluation, which are crucial for its acceptance in mainstream therapeutics. Looking ahead, advances in biotechnology, pharmacology, and clinical research are poised to unlock new applications for *M. pudica*. Its unique properties also position it as a valuable candidate for environmental restoration and sustainable agriculture. In summary, *Mimosa pudica* exemplifies a plant with rich traditional heritage and promising modern relevance. Bridging ethnopharmacological wisdom with rigorous scientific validation will be vital to harness its full potential for health care and ecological benefits globally.



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