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Review Article

A Detailed Pythopharmacological And Biochemical Review On Mimosa Pudica (Laajvanti): A Potent Medicinal Plant

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ABSTRACT

Background:

Mimosa pudica plant also called sensitive plant, is a creeping annual and perennial herb. This plant which folds itself when touched and spreads its leaves once again after a while. The primary habitats of Mimosa pudica include park, cultivated land, waste area, garden. Mimosa pudica, also known as Lajjalu in Ayurveda, is widely used as an antidepressant and anti-asthmatic in the treatment of various kind of ailments. In addition it is used in the treatment of leprosy, diarrhea, jaundice, inflammation, burning, leukoderma, urinary infection, blood disease and etc. Decoction of root is also used as gargle to reduce toothache. There are various types of pharmacological actions like anti-ulcer, anti diabetic, anti-inflammatory, antivenom, wound healing, anti-microbial activity. Since it is a rich source of flavonoids, tannins, plant hormones, amino acids, glycosides. The whole plant of Mimosa pudica is very useful for various pharmacological and biological activities. Mostly roots and leaves of Mimosa pudica are shown maximum pharmacological activity.

Purpose:

Needs of the review has been occurred due to inadequacy of summarized data in regards to medicinal activities of Mimosa Pudica and their efficacy reports. Also, owing to deficiency of in-depth knowledge and lack of information about its pharmacological potential even after the rigorous activities in the field of Mimosa Pudica research.

Material and Methods:

In this review, search various search engine namely Google scholar, PubMed Central, Science direct, ResearchGate were employed and research publications and review articles during 1969-2017 to the period were utilized to discussed the different pharmacological activities of Mimosa Pudica.

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Summary:

Play a various role in the treatment of different pathological condition, in addition their active parts, and relevant chemical constituents are presented in tabulation manner. Furthermore, its various therapeutic uses according to different medical systems and their side effects has been also summarized. The turgor changes occur in thin-walled cells of pulvinus, causing folding and drooping of the compound leaves. Such movements occur in response to touch movements are very quick and are best seen in response to touch *Mimosa Pudica* (touch-me-not plant).[8]

INTRODUCTION

The name “*Mimosa pudica*” comes from the Latin “mimic,” which means “to allude” or “hint,” and the word “*Pudica*,” which means “to retire or shrink.” Through various research studies it has been discovered that *Mimosa Pudica* have anti-asthmatic, analgesic, and antidepressant qualities. In Ayurveda, it is known as *lajjalu*. [1] It has been traditionally used to treat a wide range of illnesses, such as urinary tract infections, tumors, jaundice, sleeplessness, diarrhea, and ulcers. [2] *Mimosa pudica* is a diffusely spreading, half-woody herb, with branching stems up to 1 meter long, sparingly

prickly with many deflexed, glandular hairs. The stems are well-branched and upright. [3] In the evening, the petal will fold together, causing the entire leaf to collapse. It contains tiny spherical pink flower puffs and complex leaves. [4] It is said to include tannins, phenolics, alkaloids, glycosides, flavonoids, and fixed oil. It is used to treat wounds, blood coagulation, and control the pitta and kapha energies as well as sexual weakness. [5] *Mimosa pudica* as a whole plant is used to treat epilepsy, cancer, and edema. Asthma, smallpox, urinary tract infections, and sleep disturbances can all be treated with a decoction of leaves. The primary habitats of *Mimosa pudica* include parks, cultivated land, and gardens. Propagation of *mimosa pudica* using seeds and vegetative technique. A widespread, prickly shrub in the mimosaceae family is called *Mimosa pudica*. Other names for *Mimosa pudica* include *Lajavanti*, *chui-mui*, *touch-me-not*, and *sensitive plant*. [6,7]

Table 1: Chemical constituents of *Mimosa Pudica*:

Sr. No.	Parts	Chemical Constituents	References
1.	Root	It contains a flavonoid, alkaloids, amino acid, glycosides, stearic acids, palmitic acid	23, 36, 38
2.	Stem	It contains a mimosine, α -amino propionic acid	32
3.	Leaves	It contains a tannin, flavonoids, phenols, glycosides, terpenoids, tyrosine, phenolic ketone, D-pinitol	29, 31, 39, 35, 21
4.	Seed	It contains a phenolic ketone, Tubulin, D-xylose, buffadienolide	35, 30, 35
5.	Plant	It contains a mimosinicacid, tyrosine, thiamin, Norepinephrine, crocetin, dimethyl esters	33, 28, 37, 34

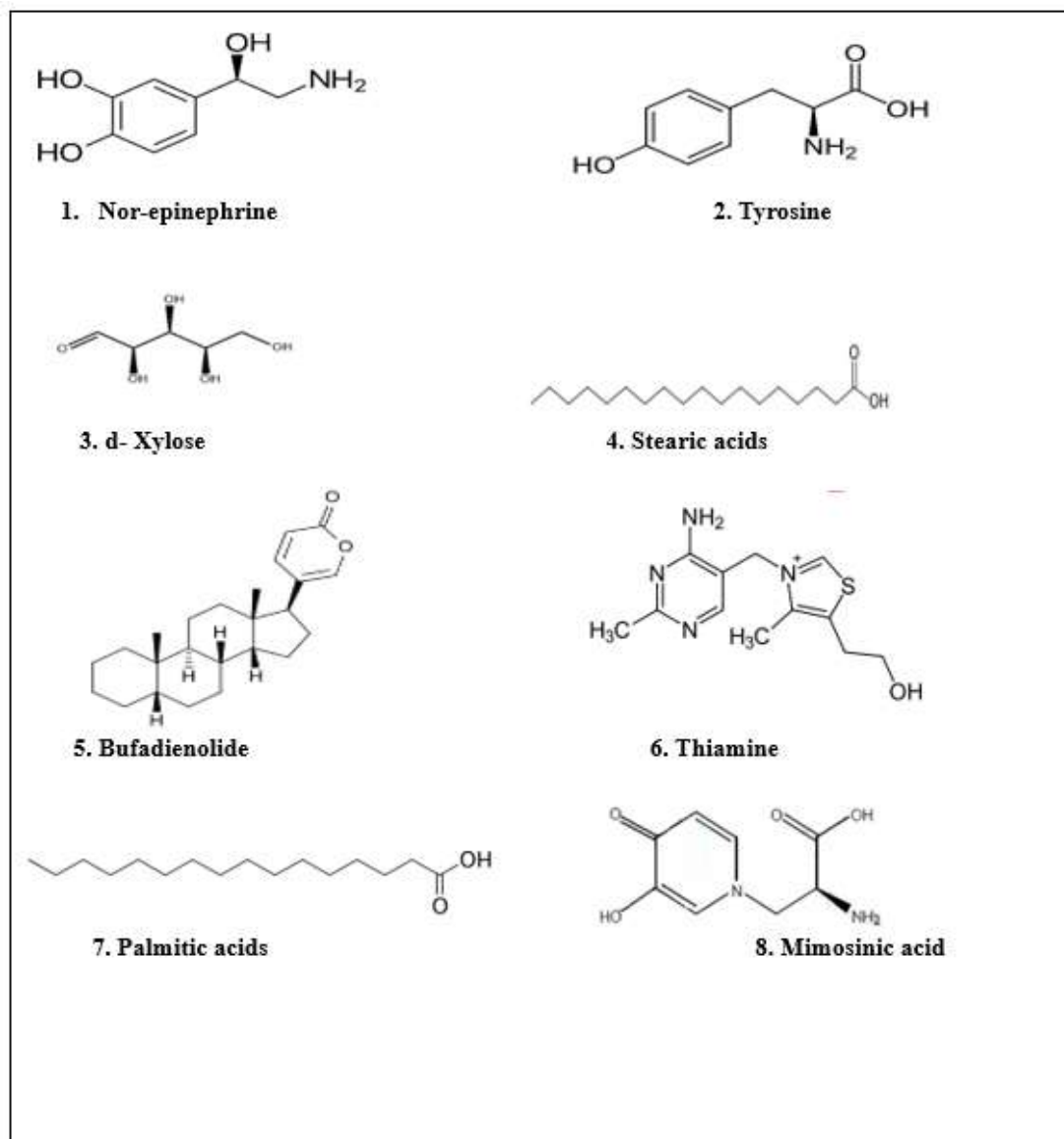


Fig. 1: Chemical Structures of various Phytoconstituents chiefly found in Mimosa Pudica

Pharmacological effect of mimosa pudica:

There are various types of pharmacological activity in mimosa pudica like antiulcer, antidiabetic, hypolipidemic, wound healing, neuropharmacological, antivenom, diuretic, antimicrobial, anti-inflammatory, hepatoprotective, antifungal, anti-asthmatic, hyperglycemic, anticonvulsant, immune modulatory.

Antiulcer activity

An in-vivo study was conducted in albino rats to evaluate the anti-ulcer activity, in which Diethyl

ether, ethanol, methanol and 90 percent chloroform based herbal extract of Mimosa Pudica. At a dose level of 200mg /kg of Mimosa Pudica was administered against the 20mg/kg of ranitidine used as a reference standard drug. Oral administration should comparatively result between test and standard.[10]

Wound healing activity

For this investigation, three distinct rat models, based studying were carried out namely as excision, incision, and estimation of biochemical parameters. Among these studies 5% leaf extract

ointment (topically) as well as orally 200mg/kg dose administration both were should considerable wound healing potential of *Mimosa Pudica*. [11,12] However, another study advocated that both methanolic and aqueous extract of the leaf prepared as (2% W/W) ointment could impart statistically significant ($p < 0.001$) albino rats in wound healing activity.

Antivenom activity

The venom of *Najakauthia* is lethal, but the polyphenols, such as tannins, in *Mimosa pudica* tend to counteract this effect. Mice survival after a 24-hour period was sustained when *Najakauthia* venom was preincubated with *mimosa pudica* tannins. However, in the group lacking preincubation, there was no observed protection against the harmful effects. In the two-dimensional gel electrophoresis of the mice treated with MTP, two protein spots were absent, suggesting that both venom proteins were downregulated. This result at molecular unit proved that *Mimosa Pudica* has the ability to treat *najakauthia* snakebites.[13]

Anti-diabetic activity

A study aimed to investigate the anti-diabetic properties of *mimosa pudica* linn. Whenever the plasma glucose level was determined using the glucose oxidase technique. The blood glucose level was found significantly decreased when the ethanolic extract was used in Wister rat.[14]

Antimicrobial activity

An initial phytochemical analysis of *Mimosa Pudica* plant extract revealed the presence of tannins, steroids, flavonoids, carbs, and saponins.[15] At different level of concentrations including 50, 100, and 200 $\mu\text{g/ml}$, the methanolic extract of *mimosa pudica* leaves was evaluated against bacteria such as *Aspergillus fumigates*, *Citrobacter divergence*, and *Klebsiella pneumonia*. The potential of extract sensitivity was determined against each and every microbe. The extract findings show that, at all concentrations, *mimosa pudica* ethanolic extracts

demonstrated a range of activity against the tested microorganism, from partially active to very active. [15,16]

Diuretic activity

According to a report, the diuretic efficacy of petroleum ether, ethanolic, and aqueous extracts of *Mimosa Pudica* was evaluated by using the Lipschitz test. The test animal excreted water and salt which were compared against those group administration a high dosage of urea. At the dose of 100mg/kg and 200mg/kg, the extract increased the volume of urine discharge overall and the ion concentrations of Na^+ , K^+ , and Cl^- in urine.[17]

Anti-inflammatory activity

Male albino rats were used to study the anti-inflammatory properties of *Mimosa Pudica* in which three distinct *mimosa pudica* extracts—petroleum ether, ethanol, and aqueous extracts—were employed. The rats in the experiment had cotton pellet granuloma and paw oedema brought on by carrageenan. In another study, Nair and Bindu observed the anti-inflammatory properties of the entire *Mimosa Pudica* plant using thirty albino rats of both sexes. The findings of both above investigation qualified and support the anti-inflammatory qualities of *Mimosa Pudica*. [18]

Immunomodulatory activity

Immunomodulatory expects some nonspecific effects to provide defense against various pathogens, such as bacteria, fungi, and viruses. Immune system functions are critical to the preservation of health since they are essential for protecting the body against infections and cancerous cells. Therefore, a group of researchers were conducted a study and have been reported that an alcoholic extract of the different aerial portions of *Mimosa pudica* has immunomodulatory effects in which immunomodulatory activity was evaluated using a range of hematological and serological tests. [19]

Anticonvulsant activity

A significant neurological condition, epilepsy affects up to 5% of people worldwide at some point in their lives. About 30% of patients receiving current antiepileptic drug therapy for epilepsy even though experience seizures. Furthermore, antiepileptic drug therapy is usually highly associated with various dose-related side effects and chronic toxicity, as well as teratogenic consequences. It is thought that medicinal plants are a significant source of novel chemicals with possible medical use where *Mimosa Pudica* showing great expectations of researchers in this regard [20].

Hyperglycemic activity

One way to define hyperglycemia is as having too much sugar in the blood. The amount of sugar that is stored and used as fuel is controlled by the endocrine system. D-pinitol, which is only present in the leaves of the *mimosa pudica* plant, has been shown to lower plasma free fatty acid levels and to have anti-hyperglycemic effects in people with Type 1 diabetes. It is therefore applicable to the treatment of Type 1 diabetes as well as other metabolic diseases. [21]

Table2. Presentation of medicinal importance of *Mimosa Pudica* in different medicinal system.

Sr. No.	Medical System	Parts of the plant used	Therapeutic indications	References
1	Sidha Medicine System	Roots	Diarrhea, skin sores, sleeplessness, and irritability before menstruation.	26
		Whole plant	skin infections, diabetic ulcers, and ulcers of the mouth.	
		Leaves	Pain in the heap, and kidney region	
2	Ayurvedic Medicine system	Root	Inflammation, burning sensation, leprosy, asthma,	25
		Whole plant	Bile, ulcer, fever, jaundice, leprosy, small pox	
3	Unani Medicine System	Root	Blood impurities, bile, bilious fever, piles, jaundice etc.	26
4	Traditional uses	Leaf	Diabetes, a sinus dressing, hydrocele, glandular swelling, asthma.	24
		Root	Ulcer, inflammation, jaundice, small pox, fever, toothaches.	24
		Seeds	Wound, ulcer and alternative to coffee.	24

Adverse effects:

There is no doubting that this plant offers a number of health advantages, but it's important to remember that using anything excessively is never a wise always particularly upon injection Similarly, overdosing on the touch-me-not plant might be proven potentially lethal. When consumed in large quantities, the plant's tannins can be harmful. Those who intend to become pregnant should abstain from the use of this herb as it is used to prevent conception. Although *mimosa pudica* is usually safe to eat, even though some people could

have adverse reactions including Restlessness - Drowsiness -Emesis -Irritation of the skin.[27]

Summary

Mimosa pudica is a modest plant that reacts to even the slightest contact. It is also known by the names *lajvanti*, *touch me not plant*, and *sensitive plant*. Historically, *Mimosa Pudica* is used as the primary source of raw materials herbal medicine preparations The *mimosa pudica* plant as a whole has several beneficial biological and pharmacological properties. The *mimosa pudica* plant mostly exhibits its highest pharmacological activity in its roots and leaves. [12]



Mimosa pudica is frequently found in gardens, waste areas, and along the side of the road. On the other hand, mimosa pudica has long been used to cure a variety of illnesses, including leprosy, cholera, edema, ulcers, diarrhea, and cough. The summary supports future investigations. [7]

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