

A Review Article on Traditional Uses of Various Parts of *Mimosa pudica* plant

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Abstract

Mimosa Pudica (family: Mimosaceae) also popular by name like; touch me not, live and die, shame plant. It is native to South America, North America, and Central America. According to Ayurveda, its root is acrid, bitter, and vulnerary. Leaves, roots, flowers head of *Mimosa Pudica* used by those who practice Ayurveda. Traditionally, *Mimosa Pudica* is used for treatment of various diseases like dysentery with blood, mucus, piles, inflammation, burning sensation, asthma, leucoderma, fatigue, and blood disease. It is also convenient for amoebic dysentery (raktaatisaara), bleeding piles and urinary infections. Decoction of root is convenient for gargle to remove toothache. It has also anti diabetic, antimicrobial, antiulcer, and antidepressant properties. The plant has 'seimonastic movement' i.e. the leaflets close after touching, warming, blowing, shaking. The green leaflets has tendency to fold and droop at night or when touched and cooled. This movement is unique and that why plant also known by the name of 'curiosity plant'.

Keywords: leucoderma, asthma, *Mimosa Pudica*, amoebic dysentery, burning sensation.

INTRODUCTION

Medicinal plants have been used to treat the disease; *Mimosa Pudica* is one of them. It attracts the researcher worldwide for its pharmaceutical activities like wound healing activity, anti diabetic, antitoxin, and antioxidant. It also contains alkaloids, glycosides, flavonoid, and tannin. ^[1] It is one of the largest genera in legume family which distribute more than 500 species. Extraction of active constituent use for health improvement and it attracts due to its true relief. It flowers and fruits in August and September in India. Active constituents extracted from this plant are alkaloid mimosine, mucilage, tannins, non-protein amino acid (mimosin), flavonoid-C glycoside, sterols, terpenoids, tannins, and fatty acids. ^[2]

Mimosa Pudica is first trace by Carl Linnaeus in Plantarum species in 1753. It is sulky plant and frequently found in waste land, lawns, pastures and road sides. In small ages its stem is erect and on further growth it become creeping. It is popular for its speedy gesture. Its foliage close in dark and reopens in light. On the time of cultivation, it is commonly grown as indoor plant. ^[3]

There is excellent medicinal value of root of this plant. Their outcomes are established by various pharmacognostic and phytochemical studies covers qualitative chemical examination on plant root. The consequences of outcome show the presence of flavonoids, phytosterol, alkaloids, amino acids, tannins, glycosides, and fatty acids. ^[4]

DESCRIPTION:**Figure: 1 Flower and leaf of mimosa pudica**

Mimosa Pudica is creeping Plant which can very low and become floppy. Its stem is branching, cylindrical and thinly distributed to density prickly, and grows to the length of 1.5m. Its seeds contain hard seeds coat which limit germination and form osmotic pressure and soil acidity formal smaller obstacle. The root of *Mimosa Pudica* produces carbon disulfide, which limits various pathogenic and mycorrhizal fungi to multiply in plant. It is a tetraploid plant with bipinnate leaves and petioles are prickly. [5]

SCIENTIFIC CLASSIFICATION: [6]

Kingdom: Plantae
Division: Magnoliophyta
Class: Magnoliopsida
Order: Fabales
Family: Fabaceae
Subfamily: Mimosioideae
Genus: Mimosa
Species: *M. pudica*

VERNACULAR NAMES: [7]

Hindi: Chuimui, Lajaalu, Lajjavanthi
Punjabi: Lajan
Bengali: Laajak, Lajjabati
Sanskrit: Namaskar, Samanga, Lajjalu
German: Gemeine Momose, Sinnpflanze
Malyalam: Tintarmani

PLANT MOVEMENT:

The plant get attention of researcher since 18th century for its electrical phenomenon and plant have also mechanical phenomenon, both phenomenon leads to closing of pinna and falling down of the petioles. [8] The plant leaves are capable to show thigmonasty (touch induce movement). The leaves of the plant show movement after touch, shaken, heated, or fasten cool. The rate of movement based on the magnitude of the stimulus. [9] When the leaves of mimosa being touch then it shows siesmonasty movement and it shows nyctinasty movement (sleep movement) which occurs by relative changes in cell size on the opposite sides of leaf called as pulvinus. [10] The pulvinus is “hinge-like” area where the leaflets attach to the midrib, and the midrib attach to the stem. The activity of folding of leaf requires 4-5 seconds after this unfolding procedure requires 10 seconds to up to 10 minutes. [11] The activity of closing and reopening of leaflets are shown in below picture.



Figure: 2 Movement of leaflets

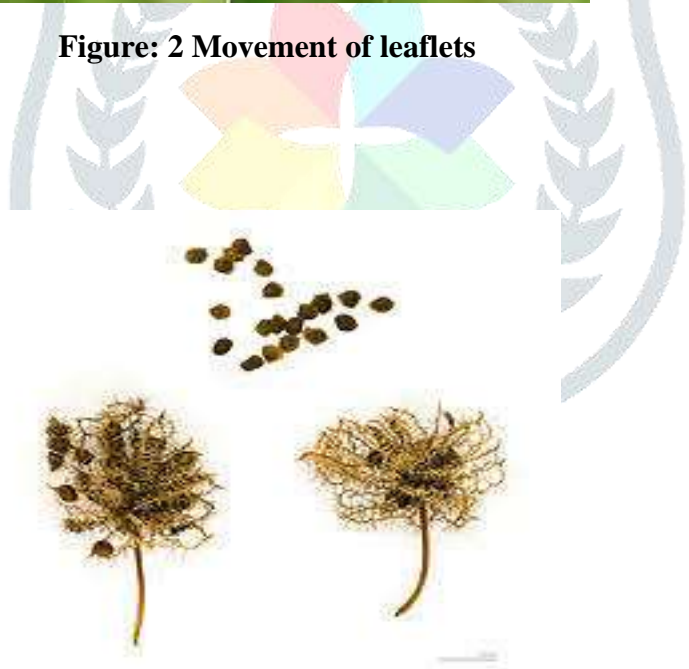


Figure: 3 Mimosa pudica seed

AYURVEDIC USE OF MIMOSA PUDICA:

- The nature of plant in ayurvedic science described as cold but its taste is bitter and astringent. On the authority of Ayurveda texts it own antiashthamic, stimulant, pain killing, and anti-depressant property and stabling kapha and pitta. [12]
- Some herbal doctors suggest it for bronchitis, general weakness, and impotence.
- All the five parts of plant called as PANCHANG – leaves, flowers, stems, roots, and fruits are considered as medicine in traditional healthcare system. [13]

- An Indian state Manipur, it describe that the utilization of the decoction of leaves bubble with water results diuresis, and is used in urinary tract infection.
- Plant also contains hepatoprotective, hypolipidemic, anti fertility, antihapatotoxic, anti convulsion, anti depressant, and wound healing activities. ^[14]
- *Mimosa pudica* has been described to have bioactive components, it also attracts researcher for its pharmacological activities such as anti microbial activities against organism.
- In modern research, the antimicrobial effect of plant extract was also tested against potentially pathogenic microorganism like *Bacillus subtilis*, *staphylococcus aureus*, and *Candida albicans*. ^[15]
- Researcher also stated that *Mimosa pudica* also modify the state of mind, relieves depression, mental distress, irritability and amnesia.
- It also helps to modifies mood and balance circulation of blood. ^[16]
- *Mimosa pudica* Lin. plant species are popular for their medicinal activity. It has been utilize to treat alopecia, diarrhea, dysentery, insomnia, tumor and so many urogenital infections. ^[17]

SIDHA MEDICINAL USES OF MIMOSA PUDICA:

- For diabetes, the juice of this plant is taken and given in the dose of 25-30ml in early morning.
- The leaves and the roots are dried and powdered and given in the dose of 2-5 grams for diabetes.
- The leaves are boiled with water and given fomentation for the pain in hip and pain around the kidney region.
- The juice of plant is mixed in equal quantity of horse urine and externally applied for pterygium.
- The samoolam of this plant is crushed and decoction is prepared. This is used to wash ulcer, diabetic ulcer, skin infections etc.
- For bronchial asthma in children about 10ml of the juice of samoolam of this plant is given daily once for 2-3 days. ^[18]

ACCORDING TO UNANI HEATHCARE SYSTEM:

- As said by Unani healthcare system, its root is alternative and beneficial in the treatment of disease which originates from blood impurities and biles, bilious fevers, piles, jaundice, and leprosy etc.
- Decoction of root is beneficial with water to gargle that lower toothache.
- It is also beneficial in diarrhea and urinary infections, amoebic dysentery and bleeding piles.
- It is mainly significant in the herbal preparations for gynecological disorders.
- It is also stated that it have medicinal properties to treat skin disease.
- It is also beneficial in bronchitis, general weakness and impotence.
- It is also beneficial to treat neurological problems.

In INDIA, distinct parts of plant have been in widely used to cure much illness since long. Modern analysis indicate that the extracts of the plants are significant for examine child birth. As claimed by many investigation done so far, *Mimosa pudica* bark is beneficial for relaxation of mind, improve depression, mental distress, and amnesia. It improve mood and enhance circulation of the blood. It is also claimed that it decrease beginning of baldness. It is capable to promote healthy cell growth; Tepzcohuite is utilizing in shampoos, creams, capsules, and soaps.

Root of *Mimosa Pudica* is beneficial to cure bilious fever, piles, jaundice, leprosy, dysentery, vaginal and uterine complaints, inflammations, burning sensation, fatigue, asthma, leucoderma, and blood disease. [19]

Mimosa pudica also have the toxic alkaloids mimosine, which has been found to have beneficial in ant proliferative and apoptotic effects. Seeds of *Mimosa pudica* give rise mucilage which is made up of D-glucuronic acid and D-xylose. [20]

PHARMACOLOGICAL ACTIVITY:

Anti diarrheal activity: The state of three or more liquid bowl movements in a day is called as diarrhea. The anti-diarrheal capability of ethanolic extract of leaves of *mimosa pudica* has been assess using various experimental models in Wistar albino rats. The antidiarrhoeal activity may be related to tannin and flavonoids which is available in the extract. [21]

Hyperglycemic effect: The ethanol extracted from *Mimosa pudica* leaves transfer to mice by oral route at a dose 250 mg/kg indicates a notable hyperglycemic effect. [22]

Anti ulcer activity: On the extraction of *Mimosa pudica*, the aqueous extract of plant leaves were orally taken (200 & 400 mg/kg), on gastric ulcerations experimentally induce by pylorus ligation, aspirin and alcohol models. [23]

Anti microbial activity: The action of chlorophyll in which is extracted from the leaf of *Mimosa pudica* have antimicrobial activity which are used against human pathogenic bacteria and fungi viz. two gram-negative bacteria: *Pseudomonas aeruginosa* and *Escherichia coli* and two gram-positive bacteria: *Staphylococcus aureus* and *Klebsiella pneumoniae*, and once fungal pathogen, *Candida albicans*. [24]

Anti malarial activity: Draw out ethanol from *Mimosa pudica* leaves was explored for ant malarial activity against Plasmodium infection in mice. Withdrawal of *Mimosa pudica* leaf reveals notable antiplasmodial activity in all the three models of the ant malarial evaluations. [25]

Wound healing activity: The metabolic extract of root of *Mimosa pudica* gives very good wound healing activity when compare to standard drug *Gentamicin*. [26]. its root shows good healing property because of the phenol constituent present in it. [27]

Analgesic and anti-inflammatory activity: On the extraction of *Mimosa pudica*, the ethanols were obtained which are given on the dose of 200 and 400 mg/kg was tried out for anti-inflammatory and analgesic activity. The extract give rises to dose dependent and remarkable inhibition of carrageenan persuade paw edema. The analgesic property was found to be more notable on the acetic acid induced writhing model than the tail flick model. [28]

Anti fertility activity: The root of *mimosa pudica* is withdraw out, the extract is taken orally at a dose of 300 mg/kg body weight/day, elongate the length of the estrous cycle with notable increase in the time period of the destroys phase and decrease the number of litters in albino mice. The total no of litters are enlarge in the post treatment period. The examination of the principal hormone (prolactin, progesterone, estradiol, follicle-stimulating hormones, and luteinizing hormones) complex in the regulation of the estrous cycle showed that the root draw out alter gonadotropin release and estradiol production. [29]

Aphrodisiac property: The investigation has goal to examine the extract of ethanol of roots of *Mimosa Pudica* on sexually usual Swiss albino mice. The suspension of the extract was deliver orally at the dose of 100, 250 and 500 mg/kg to discrete groups of male mice (n = 6) at one time in a day for 7 days. The female albino mice require in mating were prepare receptive by hormonal treatment. The usual libido and strength were determined and compared with the standard reference drug sildenafil citrate, an alter in hormonal parameter such as testosterone was assessed. Orally delivered extract remarkably expand the libido and hormonal levels of testosterone. The most considerable effect of the extract was perceived at the dose of 500 mg/kg. The outcome shows that the ethanolic extract of roots of *Mimosa pudica* generate notable and assist increase in the aphrodisiac activity of normal male mice, with no adverse effect. ^[30]

Anti venom activity: On the extraction of *Mimosa Pudica*, aqueous extract of dried roots was examine for inhibitory property on lethality, phospholipids property, edema forming property, fibrinolytic property, and hemorrhagic property of *naja naja* and *Bangarus caeruleus* venoms. The aqueous extract shows a notable inhibitory effect on the lethality, phospholipids property, edema forming property, fibrinolytic property and hemorrhagic property. ^[31]

Anti oxidant activity: On the extraction of *mimosa pudica*, methanol crude extract of aerial part was screened in vitro for anti oxidant property utilizing the 1, 1-diphenyl-2-picrylhydrazyl-hydrate (DPPH) free radical scavenging assay. Menthol crude extract of aerial part gives moderate antioxidant property contrast with ascorbic acid. ^[32]

Anti hepatotoxic activity: On the extraction of *Mimosa pudica* leaves, ethanol extract are obtained which is assessed for its hepatoprotective against carbon tetrachloride (CCl₄) which promote liver damage, in Wistar albino rats. The draw out of ethanol extract from *Mimosa Pudica* leaves (200 mg/kg body weight) was delivered to a rat under experiment for 14 days. The hepatoprotective property was evaluate by use of so many serum biochemical parameters as glutamate oxaloacetate transaminase (SGOT), glutamate pyruvate transaminase (SGPT), alkaline phosphatase (ALP), bilirubin, and total protein, Malondialdehyde level along with property of superoxide dismutase, decrease glutathione and catalase was direct to describe the feasible mechanism of activity. ^[33]

Anti convulsion activity: The decoction of leaves of *Mimosa pudica* administered through the peritoneum at a dose of 1000-4000 mg/kg save mice from pentylenetetrazole and strychnine-induce seizures. *Mimosa pudica* is idle against picrotoxin induced seizures. These properties could describe in *African traditional medicine*. ^[34]

Anti helminthes activity: The modern research is taken on to assess anthelmintic property of different extract of seeds of *Mimosa Pudica*. Various consecutive extract such as petroleum ether, ethanol and water utilizing *Pheretima posthumous* as a test worm to the various concentrations (100, 200, 500 mg/kg) were tried out for bioassay which involved determination of paralysis and death timing of worms. ^[35]

CONCLUSION: The present study indicates the description, plant movement and its medicinal utilization like: traditional uses and Sidha uses. It is usually found in waste land, road sides. ‘chui-mui’ is utilized for the treatment of various diseases like wound healing activity, anti convulsion, anti microbial etc. It is very sensitive plant which shows various movements like thigmonasty (touch induce movement), nyctinasty movements (sleep movement). It have various pharmacological activity and are used in Ayurveda for the treatment of disease but the direct use of *mimosa pudica* is toxic to our body.

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