



## A REVIEW ON ETHNOMEDICAL AND TRADITIONAL USES OF *MIMOSA PUDICA* (CHUI-MUI)

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### ABSTRACT

*Mimosa pudica* (from Latin: Pudica "shy, shrinking" also called sensitive plant and touch me not), is a creeping annual and perennial herb. The species is native to South America and Central America. *Mimosa* belongs to the taxonomic group Magnoliopsida and family Mimosaceae. It has been described as "sparshaat sankochataam yaati punashcha prasruta bhavet" - a plant which folds itself when touched and spreads its leaves once again after a while. The roots, leaves and flower heads of *Mimosa pudica* may be used by those who practice ayurveda. The sensitive plant is commonly used for bleeding disorders like menorrhagia, dysentery with blood, mucus and piles. It is due to the specific characteristics of its leaves that mimosa is regarded as a plant of high ornamental value. Since it has an ability of fixing atmospheric nitrogen, it grows well even in nutrient deficient soils. It is mainly used in herbal preparation for gynecological disorders. Recent researches show that the extract of this plant can be used for checking child birth. Some herbal doctors recommend it for bronchitis, general weakness and impotence. All five parts of the plant (that is the panchang) - leaves, flowers, stems, roots and fruits are used as medicines in the traditional health care system.

**KEYWORDS** *Mimosa pudica*, Mimosaceae, Bleeding disorder, Bronchitis, Traditional.

### INTRODUCTION

*Mimosa pudica* was first formally described by the Carl Linnaeus in Species Plantarum in 1753. *Mimosa* is usually a short prickly plant with its branched growing close to ground. Holm et al. (1977) have reported that *Mimosa pudica* is a weed in about 22 crops in 38 countries. It is commonly seen in waste lands, lawns, pastures and along road side<sup>1</sup>. Other common names of *Mimosa pudica* Linn. are 'chui-mui' in hindi, 'bashful mimosa' in English<sup>2</sup>. Its synonyms are *Mimosa tetrandra* Humb and Bonpl. ex Willd., *Mimosa pudica* L. var. *Tetrandra* (Willd.) DC. Its life form is herb. *Mimosa pudica* habitat requirements are:-

Altitude - less than 1300m above sea level.

Light- full sun or light shade.

Temperature- intolerant to frost

Annual rainfall- 1000 to over 2000mm

Soil- can grow on poor soils due to its ability to fix nitrogen, prefers well drained soils<sup>3</sup>.

The stem is erect in young plants but become creeping or trailing with age. *Mimosa pudica* is well known for its rapid plant movement. Like a number of other plant species, it undergoes changes in leaf orientation termed, sleep or nyctinastic movement. The foliage closed during darkness and reopens in light<sup>4</sup>.

According to ayurveda, root is bitter, acrid, cooling, vulnerary, alexipharmic and used in the treatment of biliousness, leprosy, dysentery, vaginal and uterine complaints, inflammations, burning sensation, fatigue, asthma, leucoderma, blood diseases etc.

According to Unani system of medicines root is resolvent, alternative, useful in disease arising from blood impurities and bile, bilious fevers, piles, jaundice, leprosy etc<sup>5</sup>. Other uses are it can grown as garden herbs, useful for green manuring, fixes nitrogen, can be used as fodder, suitable for growing in wastelands, seen yield an oil like soyabean oil with similar properties<sup>6</sup>. Shrubs or herbs, rarely trees or climbers, usually armed. About 500 species: mostly in tropical America, these species *Mimosa pudica*, *Mimosa bimucronata*, *Mimosa diplotricha*<sup>7</sup>. *Mimosa pudica* can form nodules that are inhabitable by nitrogen fixing bacteria. The

bacteria are able to convert atmospheric nitrogen. In cultivation, this plant is most often grown as an indoor annual, but also grown for ground cover. Propagation is generally by seeds. Its extract immobilizes the filari-form larvae of *strongyloides stercoralis* in less than one hour<sup>8</sup>.

*Mimosa* belongs to the taxonomic group Magnoliopsida and family Mimosaceae. In Latin it is called *Mimosa pudica* are very important for their traditional and medicinal uses. *Mimosa pudica* known as "Touch- me- not" in English and "chui-mui" in Hindi is a creeping perennial herb<sup>9</sup>. Makahiya is a diffusely spreading, half woody herb with branch upto 1m long, bristly hairs. The leaves are very sensitive; pods are often spread by floating in water. Seeds are brown and round with a diameter of 2 or 3mm. Seeds are viable for many years<sup>10</sup>.

### Origin and Distribution

*Mimosa pudica* is native to South America and Central America. IT HAS been introduced to many other regions and is regarded as an invasive species in Tanzania, south asia and many pacific Islands<sup>11</sup>. And found in tropical and subtropical parts of India. Commonly weed widely distributed in the philipines in open, moist, waste places, open grass land and open thickets. In are pantropic weeds<sup>12</sup>.

### General morphology of plant

*Mimosa pudica*- Diffuse under shrubs, 50-90 cm high

Stem - Rachis are clothed with prickles.

Leaves – Bipillate, pinnae 2-4, digitatively arranged with 10-20 pairs of leaflets.

Flowers - Pinkish globose heads. The flower is pollinated by the winds and insects. The petioles are also prickly.

Pods- Small, flate, straw colored with many bristles.

Seed- 3-5

Fruits- Cluster of 2-8 pods from 1-2 cm long each; these are prickly margins<sup>13,14</sup>.

Roots – Characteristics 6-8 layer of cork cells. The secondary cortex consists of thin walled parenchyma filled with granules. The cells of cortex contains both tannin and calcium oxalate crystals. Flowering occurs from august to October in Indian condition. It grows upto a height of about

0.5m and spreads upto 0.3m. Mimosa is usually a short prickly plant with its branches growing close to brown<sup>15</sup>.

#### Constituents

*Mimosa pudica* contains toxic alkaloids, mimosin identical with leucenine from *lecaena glauca* (q.v). Stems and roots contain alkaloids; in leaves adrenaline like substance has been identified. Crocetin dimethyl ester is present in plants, root also contains tannis. Seed mucilage composed of d-xylose and d-glucuronic acid<sup>16</sup>.

#### Different Species of Mimosa

***Mimosa pudica* Linnaeus, Sp. Pl. 1: 518. 1753.**, diffuse, shrubby, to 1 m tall. Stems cylindric, branched, with reflexed bristles and scattered, curved prickles. Stipules lanceolate, 5–10 mm, bristly; pinnae and leaflets sensitive; pinnae usually 2 pairs, digitate, 3–8 cm; leaflets 10–20 pairs, linear-lanceolate, 6–15 × 1.5–3 mm, abaxially slightly hispid, adaxially glabrous, margin ciliate, apex acute. Heads solitary or 2, axillary, globose, ca. 1 cm in diam.; peduncle long; bracts linear. Flowers numerous, pink, small. Calyx minute. Corolla campanulate; lobes outside pubescent. Stamens 4, exserted. Ovary shortly stipitate, glabrous; ovules 3 or 4; style filiform; stigma small. Legumes arranged in a star, slightly recurved, flat, oblong, 1–2 cm × ca. 5 mm, consisting of 3–5 1-seeded segments which fall away from persistent, bristly sutures. Seeds light brown, ovoid, ca. 3.5 mm. Fl. Mar–Oct, fr. May–Nov.  $2n = 52^*$ . Wilderness tracts, wastelands, or cultivated; sea level to 1500 m. Fujian, Guangdong, Guangxi, Hainan, Jiangsu, Taiwan, Yunnan, Zhejiang [native to tropical America; naturalized in tropical regions of the world]. This plant is grown as an ornamental and used medicinally as a sedative and sleep aid.

***Mimosa bimucronata* (Candolle) O. Kuntze, Revis. Gen. Pl. 1: 198. 1891.** Guang jia han xiu cao *Acacia bimucronata* Candolle, Prodr. 2: 469. 1825; *Mimosa sepiaria* Bentham. Shrubs, deciduous, 3–6 m tall. Branchlets unarmed in distal parts, in lower parts armed by recurved prickles to 1 cm, densely yellow tomentose. Pinnae 4–9 pairs, 1.5–8 cm; rachis unarmed, pubescent; leaflets 12–16 pairs, linear, 5–7 × 1–1.5 mm, leathery, glabrous to puberulent with ciliate margin, main vein near upper side, apex mucronate. Heads globose, forming a spreading panicle with compound, spreading lower branches. Flowers white, scented. Calyx cup-shaped, minute. Petals oblong, 2.5–4 mm, connate at base. Stamens 8; filaments 4–5 mm. Ovary initially glabrous. Legume brown, straight, strap-shaped, 3.5–4.5 × ca. 0.6 cm, unarmed, finely reticulate veined, usually with 4–8 segments. Seeds olivaceous, ovoid, compressed, ca. 4.5 mm.  $2n = 26^*$ . Introduced in Guangdong, escaped in thin forests [native to South America (NE Argentina and E Brazil)].

***Mimosa diplotricha* C. Wright ex Sauvalle, Anales Acad. Ci. Med. Habana 5: 405. 1868.** ba xi han xiu cao Subshrubs or perennial herbs. Stems scandent or prostrate, to 5 m, 4-angulate, hirsute, with or without prickles along angles. Leaves 10–15 cm; petiole and rachis with 4 rows of recurved prickles; pinnae (3–)7 or 10 pairs, 2–4.5 cm; leaflets (11–)20–30 pairs per pinna, linear-oblong, 3–5 × 1–2 mm, both surfaces white villous. Heads 1 or 2, axillary, ca. 1 cm in diam. (including filaments); peduncles 5–10 mm. Flowers bisexual. Calyx inconspicuous, ca. 0.4 mm. Corolla narrowly funnelshaped, ca. 2.5 mm, 4-lobed, outside slightly pubescent. Stamens 8; filaments pale purple-pink. Ovary ca. 1 mm. Legumes in clusters, slightly curved, oblong, 1.5–3.5 × 0.4–0.5 cm, with or without prickly bristles. Seeds yellow-brown, ca. 3.5 mm.  $2n = 26^*$ . Cultivated or naturalized in

Fujian, Guangdong, Hainan, Taiwan, and Yunnan [native to tropical America; introduced throughout the tropics]<sup>7</sup>.

#### Pharmacology

It has been observed that in rats with experimental injury of sciatic nerve, the process of degeneration of the nerve was 30–40% higher in rats treated with *mimosa pudica* extract, as compared to hydrocortisone treated group. The extract was given parentally (1.6mg/100gm) every 4<sup>th</sup> day upto 120 days<sup>17</sup>.

#### Traditional uses of *Mimosa pudica*

Ayurveda has declared that its root is bitter, acrid, cooling, vulnerary, alexipharmic, and used in the treatment of leprosy, dysentery, vaginal and uterine complaints, inflammations, burning sensation, asthma, leucoderma, and fatigue and blood diseases. Unani Healthcare System its root is resolvent, alternative, and useful in the treatment of diseases arising from blood impurities and bile, bilious fevers, piles, jaundice, and leprosy etc. Decoction of root is used with water to gargle to reduce toothache. It is very useful in diarrhea (athisaara), amoebic dysentery (raktaatisaara), bleeding piles and urinary infections. It arrests bleeding and fastens the wound healing process. It is mainly used in herbal preparations for gynecological disorders. It has been said to have medicinal properties to cure skin diseases. It is also used in conditions like bronchitis, general weakness and impotence. It is also used to treat neurological problems. The content of *M.pudica* has a capacity of arresting bleeding and it fastens the process of healing of wounds. It is recommended in diarrhea, amoebic dysentery and bleeding piles. It is also used in herbal preparations of gynecological disorders. Its extract can cure skin diseases. Some herbal doctors recommend it for bronchitis, general weakness and impotence. All the five parts of the plant (that is the PANCHANG) - leaves, flowers, stems, roots, and fruits are used as medicines in the traditional healthcare systems. In India, different parts of the plant have been in popular use for treating various ailments since long. Recent researches show that the extract of this plant can be used for checking child birth. Some authors have reported that this herb can replace contraceptive pills if researches are done properly.

According to different researches done so far, *Mimosa tenuiflora* bark is used to relax the mind, and relieve depression, mental distress, irritability, severe palpitations, and amnesia. It is a mood enhancer and improves circulation of the blood. Some believe *Mimosa* can reduce the onset of baldness. Due to its ability to promote healthy cell growth, Tepezcohuite is used in shampoos, creams, capsules, and soaps. In Ayurvedic and Unani medicine, *Mimosa pudica* root is used to treat bilious fevers, piles, jaundice, leprosy, dysentery, vaginal and uterine complaints, inflammations, burning sensation, fatigue, asthma, leucoderma, and blood diseases. In Western medicine, *Mimosa* root is used for treating insomnia, irritability, premenstrual syndrome (PMS), ↑↑menorrhagia, hemorrhoids, skin wounds, and diarrhea. It is also used to treat whooping cough and fevers in children, and there is some evidence to suggest that *Mimosa* is effective in relieving the symptoms of rheumatoid arthritis. All parts of the *Mimosa* plant are reportedly toxic if taken directly. Its consumption is not recommended to pregnant or nursing ladies. Due to these reports, it seems to be best to consult a physician before using *Mimosa* internally. Researches regarding safety in young children or those with severe liver or kidney disease have not been found<sup>1,9</sup>.

**Sidha medicinal uses of *Mimosa pudica***

- For diabetes, the juice of samoolam 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 the plant is mixed in equal quantity of horse urine and externally applied for Pterygium.
- For bronchial asthma in children about 10ml of the juice of samoolam of this plant is given daily once for 2-3 days.
- For itching over the skin and other skin infection, one part of the juice of this plant is boiled with 1/4 of gingely oil. The prepared oil is externally applied over the affected area.
- The samoolam of this plant is crushed and decoction is prepared. This is used to wash ulcers, diabetic ulcers, skin infections etc.
- Note: Siddha treatment is based on complete physical examination of the patient, Naadi diagnosis, and other diagnostic criteria of the disease. The content given in this article is purely meant for information and education purpose only<sup>18, 19, 20</sup>.

**Folkloric uses and studies**

In the Philippines, roots are used as diuretic, and are used in dysentery and dysmenorrhea.

- Entire plant in decoction used as alterant and antiasthmatic.
- Root considered aphrodisiac, and used for bladder gravel and similar urinary complaints.
- Decoction or infusion of leaves used in asthma; expectorant.
- Used for hypertension, menorrhagia, glandular swelling, sore throat and hoarseness.
- Powdered seeds applied to wounds and sores.
- Bruised leaves applied to bruises.
- Decoction of leaves used for diabetes.
- Powdered roots and leaves taken with milk for piles and fistula.
- Juice applied externally to fistulous sores.
- Poultice of leaves for glandular swellings.
- Used as antifertility agent in some parts of India.
- 1:1 ethanol water extract used for pain relief.
- Seeds used a coffee substitute
- In China, used for treatment of anxiety and depression.
- In Ayurveda, used as antiasthmatic, aphrodisiac, analgesic and antidepressant.
- In India, used for birth control.
- In the Antiles, Guiana, and La Reunion, roots used vomitive.
- In Indo-China, seeds used as emetic.
- In Mexico, used to alleviate depression.
- In Punjab and Cashmere, seeds used for sore throat.
- In Concan, paste of leaves applied to hydrocoeles and glandular swellings.
- Infusion of leaves used for dysentery; also as bitter tonic.
- Roots used for leucoderma, vaginopathy, metropathy, ulcers, dysentery, inflammations, jaundice, asthma, small pox, strangury, fevers.
- Leaves used for hydrocoele, hemorrhoids, fistula, scrofula, conjunctivitis, wounds and hemorrhages.
- Whole plants used for bladder calculi; externally, for edema, rheumatism, myalgia and uterine tumors.

- Whole plant, crushed, used for itching and scabies<sup>21-45</sup>.

**CONCLUSION**

The present study shows the morphology, constituent and its uses in various medicinal patterns like – traditional uses, sidha uses and folkloric studies. It is commonly seen in waste lands, lawns, pastures and along roadside. The sensitive plant ‘chui-mui’ is commonly used for bleeding disorders like menorrhagia, dysentery, jaundice, leprosy etc. *Mimosa* is regarded as a plant of high ornamental value because of its leaves. Since, it has an ability of fixing nitrogen. In pharmacology the process of regeneration of the nerve was higher in rats treated with the *M.Pudica* as compared to hydrocortisone treated group. Furthermore clinical and pathological studies should be conducted to isolate the characterize bioactive compounds present in this plant.

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