

PRELIMINARY PHARMACOGNOSTIC EVALUATIONS AND PHYTOCHEMICAL STUDIES ON ROOTS OF *MIMOSA PUDICA* (LAJVANTI)

Milind Pande*, Anupam Pathak#

*NRI Institute of Pharmaceutical Sciences, 3 Sajjansingh Nagar, Raisen Road, Bhopal (MP) 462022

#Department of Pharmacy, Barkatullah University, Hoshangabad Road, Bhopal (MP) 462026

Email: milindpandey2006@rediffmail.com

ABSTRACT

The roots of *Mimosa pudica* Linn (Mimosae) are reported to have great medicinal value. Pharmacognostic evaluation including examinations of morphological and microscopic characters, ash value, powder analysis, and extractive values were carried out. Phytochemical screening including qualitative chemical examinations was also carried out.

Keywords: mimosa pudica, pharmacognostic, lajvanti, phytoconstituents.

INTRODUCTION

Mimosa pudica Linn known as sensitive plant in English and lajvanthi or chuimui in local Hindi language. The plant is distributed through out in India in moist locality. A diffuse prickly under shrub, 45 - 90 cm in height. Leaves bipinnately compound, pinnate 2-4, digitately arranged with 10 -20 pairs of leaflets, rachis clothed with ascending bristles. Flowers pink, in globose heads, peduncles prickly, usually in auxiliary pairs all along the branches. Fruits bristly pods, flat, straw coloured, consisting of 3-5 one – seeded segments. The roots and leaves are commonly used in treatment. The roots are bitter, astringent, acrid, cooling vulnerary, alexipharmic, resolvent, diuretic, antispasmodic, emetic, constipating, and febrifuge. They are useful in vitiated conditions of *pitta*, leucoderma, vaginopathy, metropathy, ulcers, dysentery, inflammations, burning sensation, hemorrhoids, jaundice, asthma, fistula, small pox, strangury, spasmodic, affections and fevers.¹ The leaves are bitter, sudorific and tonic, and are useful in hydrocele, hemorrhoids, fistula, scrofula, conjunctivitis, cuts and wounds and hemorrhages. The whole plant is used internally for vesicle calculi and externally for odema, rheumatism, myalgia and tumors of the uterus.²

Literature survey on *Mimosa pudica* suggest various therapeutic use of plant reported such as urolithiasis³, ovulation⁴, vibriocidal⁵, antidepressant⁶, estrogenic and antiestrogenic activities⁷, anti implantation and antiestrogenic activity⁸, effects on oestrous cycle and ovulation⁹, hyperglycemic¹⁰, anticonvulsant activity¹¹, hyaluronidase and protease activities¹². The biomolecules isolated from *Mimosa pudica* were isolation of tubulin¹³, isolation of C-glycosylflavones¹⁴, phenolic ketone¹⁵, a novel buffadienolide¹⁶, analysis of 27 aromatic amino acids¹⁷ and chemical constituents of C-glycosylflavones.¹⁸

MATERIALS AND METHODS

The roots of *Mimosa pudica* collected in and around Bhopal were identified in Department of Pharmacy, Barkatullah University, Bhopal. A voucher specimen (No BUPH/4041 A) was deposited in the department. The plant was morphologically examined for shape of leaves, apex, base, margin etc. A TS of boiled root in water was

prepared and mounted in glycerin on glass slide for identification of internal structures like vascular bundles, pith, cortex and other parts using with iodine and safranin solution. Powder of the dried root was used for the observation of powder microscopic characters. The powder drug was separately treated with phloroglucinol – HCL solution, glycerin and iodine solution to determine the presence of lignified cells, calcium oxalate crystals and starch grains as a part of quantitative microscopy.¹⁹

Total ash, water and alcohol soluble ash, sulphated ash was also determined. Alcohol and water-soluble extractive values were determined.²⁰

Preliminary Phytochemical studies

The powder of dried roots was subjected to continuous soxhlet extraction with various organic solvents such as petroleum ether (60-80⁰ c), chloroform, benzene, methanol & ethanol respectively. After concentration and drying of each extract in vacuum desicator identification of phytoconstituents was carried out using thin layer chromatography method by different detecting reagents.²¹

RESULTS AND DISCUSSION

The morphological studies revealed the shape of roots of *Mimosa pudica* roots occurs in entire condition with secondary and tertiary roots attached. The shape of the root is more or less cylindrical, slightly tapering with branching on all sides. Colour dull reddish brown with rough surface.

In transverse section, roots are characterized by the presence of thick brownish continuous layer of cork cells. The cork cells are mostly uniform in shape and in tangential section appear polygonal and more or less isodimetric flattened. Below this single flattened layer of endodermis were seen with further converting in medulary rays. The phloem was characterized by the presence of thick walled oval shape cells. Then horizontal tracks of cambium were observed followed by double walled polygonal cells of xylem. At center the small circular pith was seen with dark brown coloured outer covering. Rhomboid crystals of calcium oxalate were also present with simple or compound starch grains. Fig 1

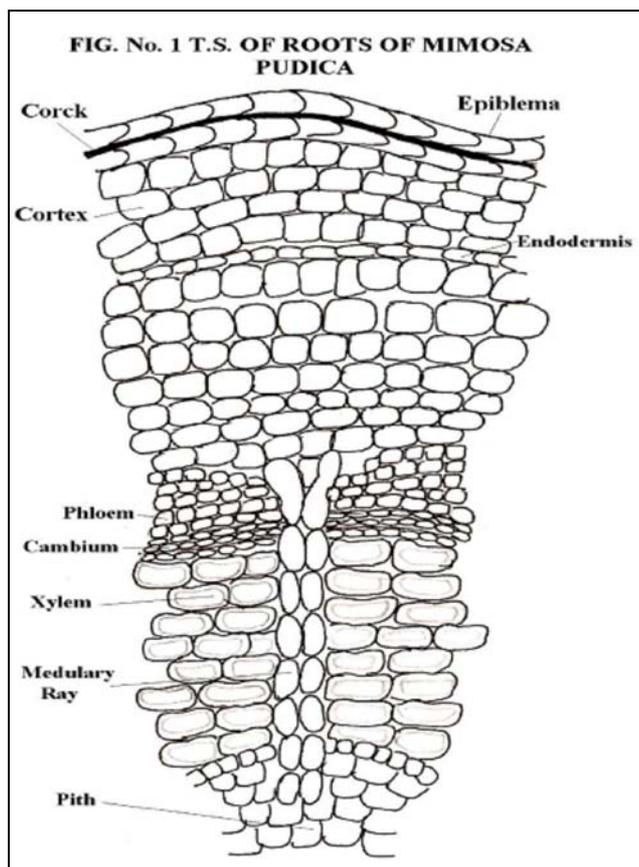
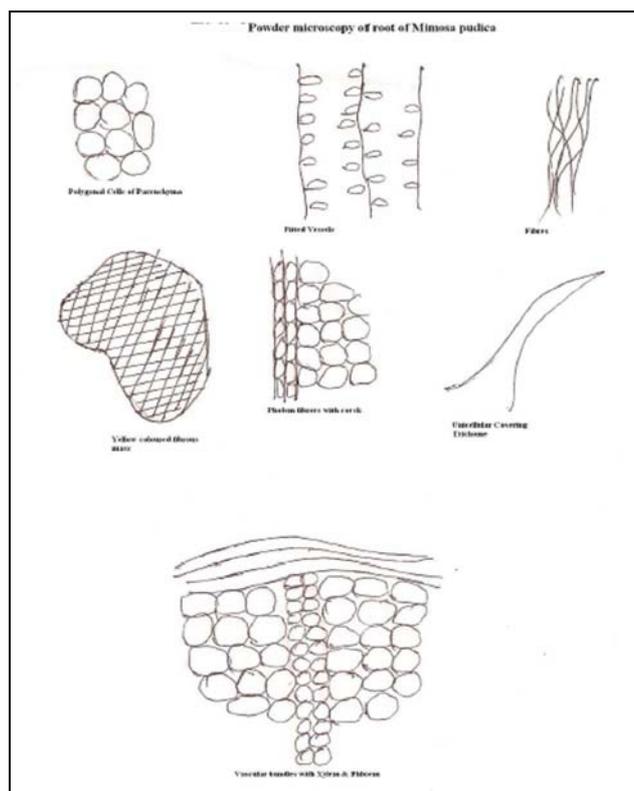


Table 1 Successive solvent Extraction of roots of *Mimosa pudica*

Solvents used	Colour & Consistency	Average extractive values in % w/w on dry weight basis
Petroleum Ether 40-60	Black green oily mass	3.25
Benzene	Black Green sticky mass	5.49
Chloroform	Light green residue	2.95
Acetone	Yellow	5.51
Methanol	Yellow blackish mass	7.90
Water	Brown dry mass	2.33



Chemical tests indicate presence of flavonoids, phytosterol, alkaloids, amino acids, tannins, glycoside, fatty acids, were prominently observed.

Powder analysis of *Mimosa pudica* showed that polygonal cells of parenchyma, pitted type of vessels, unicellular covering trichomes, electric cable like bunches of fibers with yellow thick mass of tissues along with mesh like structure was observed. Fig 2

Successive solvent extraction values in various organic solvent were observed as petroleum ether 3.25%, benzene 5.49%, chloroform 2.95%, acetone 5.51%, and methanol 7.90% as shown in (Table 1). The preliminary phytochemical studies with help of Thin Layer Chromatography method revealed that petroleum ether fraction contains flavonoids, phytosterol, alkaloids, amino acids were prominently observed. Acetone fraction has confirmed the presence of flavonoids. The chloroform fraction showed presence of alkaloids. The essential oils and fatty acids in benzene extract respectively. (Table 2)

The proximate analysis revealed that total ash 17.365, water soluble ash 9.65%, alcohol soluble ash 4.55%, loss on drying 2.55, moisture content 0.58-5, foreign organic matter 0.5% and sulphated ash 3.78 values were observed (Table 3).

Table 2 Thin layer chromatography scheme used to detect various extracts of roots of *Mimosa pudica*

Solvent system used	Detection Reagent	Observation	Inference	P	B	C	A	M	E
Ethyl acetate : Methanol: Water (75.5:13.5:10)	KOH	Red. (Vis) Yellow	Anthraquinone Anthrone	-	-	-	-	-	-
	Vanillin sulphuric acid	Red/ yellow/brown/blue-green	Bitter principle	-	-	-	-	-	-
	Dragendorffs reagent	Orange Red (vis)	Alkaloid	+	-	+	-	-	-
	NP/PEG and UV	Yellow/green/orange	Flavonoid	+	-	-	+	-	+
	VS reagent	Blue (vis)	Saponin	-	-	-	-	-	-
Toluene : ethyl acetate (93: 7)	VS reagent	Red/ yellow/brown/blue-green	Essential oil	+	+	-	-	-	-
	Hcl/Acetic acid	Blue brown	Valepotriate	-	-	-	-	-	-
	NH3 / KOH	Light Blue brown	Coumarin	-	-	-	-	-	-

P petroleum ether, B benzene, C chloroform, A acetone, M methanol, E ethanol

Table 3 Evaluation of roots of *Mimosa pudica*

S. No	Parameters	Values obtained w/w on dry weight basis
1	Ash value	17.36
2	Water soluble ash	9.65
3	Acid Insoluble ash	9.11
4	Alcohol soluble ash	4.55
5	Sulphated ash	3.78
6	Loss on drying	2.5
7	Moisture content	0.58-1.00
8	Foreign organic matter	0.5

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