



ISSN No: 0975-7384
CODEN(USA): JCPRC5

J. Chem. Pharm. Res., 2011, 3(5):56-60

Wound healing activity of *Mimosa Pudica* in albino wistar rats

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ABSTRACT

The entire wound healing process is a complex series of events that begins at the moment of injury and can continue for months to years. The objective of our study is to investigate wound healing activity of the chloroform leaf extract of mimosa pudica in albino rats using excision and incision wound models. 200 mg/kg/day of leaf extract of mimosa pudica was evaluated for its wound healing activity and compared with Neosporin (Standard). The present investigation may be concluded that the plant mimosa pudica is endowed with significantly as followed the 0, 4th, 8th, 12th, 16th, days i.e 232.21 ± 5.8 (0%), 197.8 ± 4.5(14.85%), 80.7 ± 4.8(65.5%), 15.03 ± 2.9 (91.9%), 2.9 ± 1.04(98.8%) wound healing activity due to the presence active constituents, there by justifying its use in the indigenous system of medicine.

Keywords: *mimosa pudica*, Wound healing, Excision wound, Incision wound, Neosporin ointment.

INTRODUCTION

The wound may be defined as a loss or breaking of cellular and anatomic or functional continuity of living tissues. Healing of wound is a biological process that is initiated by trauma and often terminated by scar formation. In folklore medicine, *mimosa pudica* is used as a wound healing medicine[1]. Traditionally mimosa pudica used as a folklore medicine and used in various diseases. In our country this plant is grown in rainy season and this plant is also called as touch

me not plant at the same it should have a various names in different languages like in English sensitive plant, in Hindi lazonthi, in tamil tottasiningi .remote peoples are used in the treatment of inflammation, diabetic, fever, piles and various diseases[2]. 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. 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[3]. They are useful in vitiated conditions of *pitta*, leucoderma, vaginopathy, metropathy, ulcers, dysentery, inflammations, urning sensation, hemorrhoids, jaundice, asthma, fistula, small pox, strangury, spasmodic, affections . 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. Literature survey on *Mimosa pudica* suggest various therapeutic use of plant reported such as urolithiasis[4], ovulation4, vibriocidal[5], antidepressant[6], estrogenic and antiestrogenic activities[7], anti implantation and antiestrogenic activity[8], effects on oestrous cycle and ovulation[9], hyperglycemic[10], anticonvulsant activity[11], hyaluronidase and protease activities[12]. The mimosa pant also Possess antinflammatory activity [13], and antidepressant action[14].

EXPERIMENTAL SECTION

Collection of Plant Materials

The leaves of *mimosa pudica* were collected from cherlapally village region in Nalgonda District of Andhra Pradesh, India. The plant was authenticated by expert from the Department of Botany, Kakatiya University, Warangal, A.P, India. The collected leaves were dried at room temperature and powdered.

Preparation of Extracts

The extracts of *mimosa pudica* were prepared by maceration with methanol as a solvent. The shade dried leaf powder was kept in the macerator apparatus and extraction was allowed to run successively using the solvent chloroform. Extract was concentrated and were weighed.

Animals used:

Healthy wistar albino rats of either sex and of approximately the same age, weighing about 180-230 g were used for the study. They were fed with standard diet and water ad libitum. They were housed in polypropylene cages maintained under standard conditions like 12 hrs light and 12 hrs dark cycle at $27\pm 3^{\circ}\text{C}$ temperature. Animal experiments were carried out following the guidelines of the animal ethics committee of the institute.

Wound healing activity:

Screening for wound healing activity was performed by excision wound model[15,16]. Adult albino rats of either sex were divided into three groups, each containing six animals. They were depilated at the desired site and wounding was performed under light ether anesthesia. A circular wound of approximately 2.5 cm diameter was impressed on the skin from the demarked area. The skin was excised to get a wound measuring approximately 300 mm^2 and 2 mm depth. After

achieving full haemostasis by blotting the wound with cotton swabs soaked in saline, the animals were placed in their individual cages. The animals were treated daily as follows, from 0 to 16th post – wounding day. Group I was treated with control (ointment base), group II with standard (Neosporin ointment) and groups III were treated with 5% ointments of leaf extracts (200mg/kg). The wound contraction rate was monitored by planimetric measurement of wound area of each animal on 0, 4th, 8th, 12th and 16th post wounding day. This was achieved by tracing the wound area on a graph paper. Reduction in the wound area was expressed as percentage of the original wound size.

$$\text{Percentage of wound closure} = \frac{\text{Initial area of wound} - \text{N}^{\text{th}} \text{ day area of wound}}{\text{Initial area of wound}} \times 100$$

Incision wound model[17]

The incision wound model was studied under light ether anesthesia. The animal was secured to operation table in its natural position. Paravertebral straight incision of approximately 6 cm diameter was made on either side of the vertebral column with the help of scalpel blade. Wounds were cleaned with 70% alcohol soaked with cotton swabs. They were kept in separate cages. Group I was treated with control (ointment base), group II with standard (Neosporin ointment) and groups III were treated with ---% ointments of leaf extracts (200mg/kg) for 10 days. The sutures were removed after 8 days, on tenth day the tensile strength was measured by continuous constant water supply technique.

Statistical Analysis:

The means of wound area measurement and wound breaking strength between groups at different time intervals were compared using Values are Mean \pm SEM of six animals in each group. Results are expressed as percentage of wound contraction from 6 animals. Statistical significance tested with control group and done by student t-test.

RESULTS AND DISCUSSION

The chloroform extract of leaf of *mimosa pudica* were selected for wound healing activity. For initial screening, all the extracts were prepared as 5% simple ointment by using hydrocarbon base. The table 19 shows the results of the wound healing activity of leaf chloroform extract ointment. The results are expressed as mean percentage closure of excision wound area. The studies on excision wound healing model reveal that all the tested groups showed a decrease in wound area from 1st day to 16th day as shown table 1 on 16th day complete healing of wound was observed with standard marketed ointment and ointment of chloroform extract of leaf plant. The chloroform extract treated animals showed faster epitheliasation of wounds (2.9 ± 1.04) than the animals treated other remaining. Chloroform extract of leaf plant produced **98.8%** healing of wound as compared to control (ointment base) has shown **64.8%** healing. In incision model, the tensile strength of the animals were measured on the 10th wounding day. the extracts showed better wound healing property compared to control. The tensile strength of Chloroform extract treated groups (740 ± 7.8).

Wound healing activity Excision model:**Table1 .Wound healing activity of ointment of *mimosa pudica* extract**

GROUPS	Wound area (mm ²) ± SEM and (% of wound contraction) post wounding days				
	0 day	4 th day	8 th day	12 th day	16 th day
Control	236.84 ± 4.11 (0%)	225.90 ± 9.81 (4.66%)	149.06 ± 5.68 (36.86%)	129.54 ± 1.02 (45.33%)	83.81 ± 2.11 (64.8%)
Standard (Neosporin)	236.02 ± 5.9 (0%)	210.6 ± 3.89 (10.76%)	85.36 ± 5.4 (63.98%)	24.4 ± 0.88 (89.83%)	4.50 ± 1.23 (98.48%)
Chloroform extract	232.21 ± 5.8 (0%)	197.8 ± 4.5 (14.85%)	80.7 ± 4.8 (65.5%)	15.03 ± 2.9 (91.9%)	2.9 ± 1.04(98.8%)

**control treated group****standard drug treated group****Plant extract(chloroform extract)treated group****CONCLUSION**

It may be concluded that the plant *P.pinnata* is endowed with significant wound healing activity due to the presence active constituents, there by justifying its use in the indigenous system of medicine.

Acknowledgement

This research work done at Moon Ray Institute of Pharmaceutical Sciences and for this encouragement and financial support of this work thankful to management and principal, Raikal ,Shadnagar, Mahabubnagar.

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