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WOUND HEALING ACTIVITY OF *MIMOSA PUDICA LINN* FORMULATION

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ABSTRACT: The study was carried out to identify through scientific methods the active ingredients and the pharmacological activities of the shoot and root extracts of *Mimosa pudica* Linn.The Mimosa pudica shoot methanolic extract (MSME), Mimosa pudica root methanolic extract (MRME) showed very good wound healing activity when compared to the standard drug Gentamicin. Whereas Mimosa pudica root Chloroform extract (MRCE) showed negative result. The isolated compounds were characterized by instrumental analysis, UV and IR.

KEYWORDS : *Mimosa pudica*, wound healing activity, MSME, MRME

INTRODUCTION

Mimosa pudica[1,2] Linn is a sensitive plant belonging to the family Leguminaceae, distributed in Brazil, India. Mimosa pudica is well known for its rapid plant movement. The plant shows a peculiar movement NYCTYNASTIC movement i.e. the leaflets fold together in the evening and the whole leaves droops downward. It then reopens at sunshine. The leaves also close up under various other stimuli such as touching, warming or shaking. The shrubs can also be transmitted to neighbouring leaves. This type of movement is called SEISMONASTIC movement.

The treatment of diseases in early days has begun by using various medicinal plants. They served as a good tool in altering different clinical conditions. Our land is having a vast heritage of knowledge and expertise in herbal medicine from different cultures and civilization. The purpose of the plant work is to identify the active ingredient through scientific methods and to study the pharmacological activities of the plant in shoot and root extracts of mimosa pudica.

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MATERIALS & METHODS

The plant "*Mimosa pudica*" was collected from Mathar in Kanyakumari district, Tamilnadu at 4.00 pm. The plant specimens were authenticated at the Institute of Sidha Medicine, Tamil University, Tanjavur and a voucher specimen was kept at the Department of Pharmacognosy, SSRCP, Mahabubnagar.

EXTRACTION PROCESS[3]

The fresh shoot and root are used for extraction. The shoots were extracted by 5 hrs with petroleum ether, 12 hrs with chloroform, 24 hrs with methanol and water

for 24 hrs. In root except petroleum ether, chloroform, methanol and water by hot continuous extraction using soxhlet apparatus.

250gm of shoot and root were coarsed separately and extracted separately. The extracts were collected separately and concentrated by vacuum dessicator. The concentrated extracts were then dried by keeping in vacuum dessicator. All the details are depicted in Table 1 and 2.

Preliminary Phytochemical Screening Analytical Studies By Thin Layer Chromatography [4,5]

The preliminary identification studies were carried out by standard protocol TLC with solvent system of Chloroform and Methanol (85:15) and are given in Table no:3 and 4

Preliminary Phytochemical Screening Analytical Studies By HPTLC[6]

The HPTLC of Methanolic shoot extract showed red light brown green, light green, light green, light green, light green, dark brownish green and dark green orange colour spot. The Rf value ranges 0.31 to 0.94 and isolated crystal show dark greenish orange spot of the Rf value 0.94 and dark greenish orange of the Rf value 0.80. The chromatogram was visible under UV light. Silica gel precoated aluminum foil as absorbent, Chloroform: Methanol (85:15) as solvent system and UV Chamber at 255 nm as detector are used for identification studies.

Apparatus

The HPTLC system model 30/june/2006 ID: 7D6061E 0E320458

It is used in Track: laud2, noise level 0.381AU, U4 065/N: 0612A004CAMAG SOFTWARE

(c) 1998 Wave length 356 nm

QUALITATIVE CHEMICAL EVALUATION [7]

All the extracts obtained were subjected to qualitative tests for various plant constituents and observed that presence of glycosides, Phytosterol and alkaloids as major active constituents are confirmed by suitable chemical tests.

FORMULATION [8,9,10]**:**

Ointment Formulation: shown in Table no:5

Type: Water miscible base.

Method of preparation: Mixed the ingredients, heated gently with stirring until homogeneous mixture forms. Stirred to cool.

Types of ointment prepared

There are two types of ointment are prepared, Ointments are..

1. Base + Root Methanolic Extract
2. Base + Shoot Methanolic Extract

20 % concentration of ointment was prepared.

Method of preparation: In this preparation 100 mg of suitable extract is mixed with 500 mg of ointment base (20%). Then it is stirred well until homogeneous base is obtained.

PHARMACOLOGICAL SCREENING [11,12,13,14]

Animal: Wister Albino rats (150-200gms)

Procedure

Wister Albino rats (150-200gms) were selected and made into four groups of 6 animals each for the experiment. The animals were housed in the experimental room (SSRCP Mahabubnagar) which was maintained as per IAEC guide lines.

The experimental animals were anaesthetized using lignocaine 2% injections, over the local selected region. The rats were depilated over the region excision wound was infected by cutting a way of 5mm square thickness of skin from the predetermine area, the wound was left and rest to the open environment then the drugs reference standard (0.01 % w/w gentamycin ointment) control (simple ointment BP) only *Mimosa pudica* extract both shoot & root in Methanol extract is applied. (10 % w/w simple ointment) were applied till the wound was healed. This model was used to monitor the wound contraction and wound closer time. Wound contraction was calculated as % reduction in wound area. The progressive change in wound area is monitored by calculating the decreasing area.

General formula as follows:

RWH = Size of Wound in surface area (mm^2) at Day 9 / Size of Wound in surface area (mm^2) at Day 1 ×100

% Reduction in Healing =100- RWH

The effect of topically applied *Mimosa pudica* Shoot and Root extract ointment on excision wound of mice is shown as Table no:6

RESULTS & DISCUSSION

The present work is the pharmacological studies on the extracts of *Mimosa pudica*. The soxhlet extraction procedure carried out using coarse dried shoot and root with by successive solvent petroleum ether, chloroform, methanol and water. The preliminary chemical analysis indicates the presents of alkaloids, glycosides and phytosterols.

The wound healing activity was studied by using four groups, the groups are, Group I negative control simple ointment, In Group II positive control Gentamicin. 0.01%w/v, Group III MSME and Group IV MRME.

The size of the wound in surface area, On the Day 1 (50.24) (50.36) (51.27) (50.54). On the Day 3 (50.24) (28.26) (38.46) (38.46). On the Day 5 (%0.24) (12.56) (28.26) (28.26). On Day 7 (30.46) (3.14) (12.56) (12.56). On the Day 9 (38.46) (0.785) (3.14) (3.14). The mean percentage closure of excision wound model on Day 9 (23.45) (98.44) (93.87) (93.78).

Contraction of the excision wound was promoted from Day 1 of the treatment till Day 9. The epithelization of wound in case of mice treated with extracts was found to be quite earlier than control. It is also comparable with the marketed preparation. It suggest that the shoot and root extracts of *Mimosa pudica* promoted wound healing activity.The excision wound model showed significant wound healing property of the shoot and root extracts of *Mimosa pudica* which was well compared with standard drug. The results are shown in Table 1.

Table 1: The percentage yields of *Mimosa pudica* Shoot Extract (MSE)

WEIGHT OF DRUG	EXTRACTION PATTERN	SOLVENT USED	WEIGHT OBTAINING (gms)	PERCENTAGE YIELD
250 gms *Mimosa pudica* shoot	Soxhlet apparatus	Petroleum Ether Chloroform Methanol Water	16 gm 20 gm 13 gm 18 gm	6.4 % 8 % 5.2 % 7.2 %

Table 2:The percentage yield of *Mimosa pudica* Root Extract

WEIGHT OF DRUG	EXTRACTION PATTERN	SOLVENT USED	WEIGHT OBTAINING (gms)	PERCENTAGE YIELD
250 gms mimosa pudica Root	Soxhlet apparatus	Chloroform Methanol Water	18.5 gm 14 gm 16.5 gm	7.4 % 5.6 % 6.6 %

Table 3: Thin layer chromatographic data analysis of Methanolic Shoot extract

Detecting Reagent	Distance run By solvent	No. of spots	Distrance Run by solute	Value	UV fluorescence at 254 nm
UV Light	15 cm	7	8	0.5333	Greenish black
			8.5	0.5666	Light orangish green
			9.3	0.6200	Light green
			10.4	0.6933	Light green
			12.8	0.8533	Light brown
			13.3	0.8866	Dark brownish green
			13.5	0.9000	Greenish brown

Note: Solvent system (Chloroform : Methanol (85:15)

Table 4: Thin layer chromatographic data analysis of Methanolic Root extract

Detecting Reagent	Distance run By solvent	No. of spots	Distrance Run by solute	Value	UV fluorescence at 254 nm
			7.5	0.5357	Light brown
			8	0.5714	Light green
			9.4	0.6714	Dark brown green
			10.5	0.7500	Brownish orange
UV Light	14 cm	5	11.2	0.8000	Yellow

Note: Solvent system (Chloroform : Methanol (85:15))

Table 5: Base used in formulation for Mimosa pudica

S.No.	Ingredients	Official Formula	Working Formula
1	Emulsifying wax	30 gm	15 gm
2	White soft paraffin	50 gm	25 gm
3	Liquid paraffin	20 gm	10 gm

Table 6 : Effect of topically applied *Mimosa pudica* Shoot and Root extracts on excision wound in mice

Group	Avg. wt	Drug/ Formulation	Size of Wound in surface area Day 0 (mm^2)	Day 1 (mm^2)	Day 3 (mm^2)	Day 5 (mm^2)	Day 7 (mm^2)	Day 9 (mm^2)	Percentage of wound healing
I	150-200 gms gm	Control	50.24	50.24	50.24	50.24	30.46	38.46	23.45
II		Gentamicine	50.36	50.36	28.26	12.56	3.14	0.785	98.44
III		MSME	51.27	51.27	38.46	28.26	12.56	3.14	93.87
IV		MRME	50.54	50.54	38.46	28.26	12.56	3.14	93.78

REFERENCES

1. M.Malone New Phytologist, Vol.128, Page No: 49-56.

2. C.Robin and P.K.Fleurat Lessaro University of poitiers. Station Biologigue de Beau – site 25 faubourg st.Cyprien, F – 86000 poltiers, France.

3. Dr.C.K.Kokate, Practical Pharmacognosy, III-Edition 1991, Page number 122, Published by Shri Dinesh K.Furia, Nirali Prakasham, Pune.

4. H.Wagner, Bladts, E.N.Zgainski, Plant drug Analysis – A Thin Layer Chromatography Atlas, Springer Yerlay berlin, New York, Page number: 225-227, 234, 235, 244, 245 (1984).

5. H.H.Beckett, J.B.Stenlake, Practical Pharmaceutical Chemistry, 3rd Edition, Vol.II, Page number: 74-95 (1986).

6. "George Lunn and Norman R.Schmuff", Hptlc methods for Pharmaceutical Analysis (1996) Published by A.Wiley-Intescience Publication, John wiley & Sons inc., New York.

7. "L.L.Finar" Organic Chemistry, Vol.I and II, VI Edition, 1985, published by the English language book Society, ELBS.

8. B.P 1993, Vol.II, Page number: 1096.

9. B.P 1993, Vol.I Page number: 485.

10. Dispensing pharmacy cooper and gunn's, Page number: 195, CBS publishers Delhi, 12th Edition.

11. "Roberta Turner, Peter hebborn", Screening Methods in Pharmacology Vol.II (1971) published by Academic Press, New York and Canada.

12. "M.N.Ghosh", Fundamentals of Experimental Pharmacology, II edition, 1984, Published by Scientific Book Agency, Calcutta.

13. Morton J.J.P.,and Malone,M.H . 1972 Evaluation of vulnerary activity by an open wound procedure in rats .Arch.Int .PHARMACODYN ., 196:117-126.

14. Muppayavarmath,S.Sand Patil P.A ., (1999). The influence of tricyclic antidepressants on resutured incision &deep space wound healing .Indian J .Pharmacol ., 31,290-293.

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