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IN VIVO WOUND HEALING ACTIVITYON LEAF EXTRACT OF *CHLOROXYLON SWIETENIA* DC

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ABSTRACT

The present research work has been undertaken with an objective to screen the wound healing activity of the methanolic extract of *Chloroxylon swietenia.*Wound healing data were expressed as mean ± S.E.M and evaluated by one-way ANOVA. The data were considered significant at $p < 0.05$The results of the excision wound model are shown in Table 3 and Table 4 and the graphs were plotted Fig 1 and Fig 2. The methanolic extract 10% w/w possessed more wound healing activity compared to 2.5% and 10%. Thus the present study offers pharmacological evidence of the folk use of chloroxylon swietenia for wound healing.

Keywords: *Chloroxylon swietenia,* Excision wound model

INTRODUCTION

A wound may be defined as a break in the epithelial integrity of the skin or may also be defined as a loss or breaking of cellular and anatomic or functional continuity of living tissue. Wounds are physical injuries that result in an opening or break of the skin. Proper healing of wounds is essential for the restoration of disrupted anatomical continuity and disturbed functional status of the skin. Healing is a complex and intricate process initiated in response to an injury that restores the function and integrity of damaged tissues. Wound healing involves continuous cell–cell and cell–matrix interactions that allow the process to proceed in three overlapping phases Viz. inflammation (0–3 days), cellular proliferation (3–12 days) and remodeling (3–6 months)[1]. Healing requires the collaborative efforts of many different tissues and cell lineages. It involves platelet aggregation and blood clotting, formation of fibrin, an inflammatory response to injury, alteration in the ground substances, angiogenesis and reepithelialization. Healing is not complete until the disrupted surfaces are firmly knit by collagen[2].

The basic principle of optimal wound healing is to minimize tissue damage and provide adequate tissue perfusion and oxygenation, proper nutrition and moist wound healing environment to restore the anatomical continuity and function of the affected part [3].

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Cutaneous wound repair is accompanied by an ordered and definable sequence of biological events starting with wound closure and progressing to the repair and remodeling of damaged tissue. In spite of tremendous advances in the pharmaceutical drug industry, the availability of drugs capable of stimulating the process of wound repair is still limited. Moreover, the management of chronic wounds is another major problem due to the high cost of therapy and the presence of unwanted side effects.

MATERIALS AND METHODS

DRUGS AND CHEMICALS:

Crude methanolic extract, hard paraffin, cetostearyl alcohol, white soft paraffin, wool fat.

ANIMALS: Healthy and adult male albino wistar rats weighing between 180-250g were used in this investigation and divided in to 5 groups each consisting of 5 animals. They were maintained under standard conditions (room temperature at 22±3˚C, 12 h light/dark period) and allowed free access to water along with standard pellet diet for one week before the experiment.

STATISTICAL ANALYSIS

Wound healing data were expressed as mean ± S.E.M and evaluated by one-way ANOVA. The data were considered significant at $p < 0.05$.

EXPERIMENTAL DESIGN

The present research work has been undertaken with an objective to screen the wound healing activity of the methanolic extract of *Chloroxylon swietenia* . The preparation of the extract of this herbal drug was described earlier in this thesis.

Table 1: Preparation of Simple Ointment Base Bp 1988

Hard paraffin	5g
Cetostearyl alcohol	5g
White soft paraffin	85g
Wool fat	5g

Ointment base was prepared by mixing the ingredients (Hard paraffin, cetostearyl alcohol, white soft paraffin, wool fat) as per British Pharmacopoeia (1988) in a beaker at 65^0cwater bath. The mixture was removed from the water bath and stired until congealed. This was stored in a well closed container.

PREPARATION OF HERBAL FORMULATION

2.5% Crude methanolic extract ointment: 2.5grams of cude methanolic extract was incorporated in to 100grams of simple ointment base and triturated uniformly get homogenous ointment.

5% Crude methanolic extract ointment: 5grams of crude methanolic extract was incorporated in to 100grams of simple ointment base and triturated uniformly to get homogenous ointment.

10% Crude methanolic extract ointment: 10grams of crude methanolic extract was incorporated in to 100grams of simple ointment base and triturated uniformly to get homogenous ointment.

EXCISION WOUND MODEL

Animals were anaesthetized (light ether) prior to and during creation of the wounds according to the method of Morton and Malone, 1972 [4]. The hairs on the skin of back surface of the animals were removed by wiping with a suitable depilatory (Anne-French hair removing cream) with the help of a cotton swab. Under light ether anesthesia an impression of 500 sq. mm was made on the shaved back of the rat as described in Morton and Malone, 1972. The skin of the impressed area was excised carefully. Animals are kept in separate cages. The day on which wound was made consider as day'0' (Zero). Animals divided into five groups of each with 5 animals. Group A is considered as standard and treated with 5% w/w Povidone iodine ointment, group B is considered as control and treated with simple ointment (e.g. Bees wax, Cetosteryl alcohol etc.), group C, group D and group E, are *Chloroxylon swietenia* treated groups and applied ointment 2.5%, 5% and 10% respectively (Table 2). The percentage of wound closure was recorded on day 4, 8, 12 and 16. Wound area was traced and measured with the help of mm^2 graph paper. Number of days required for falling of the eschar without any residual raw wound gave the period of Epithelization.

Table 2: Treatment

S. No.	Group	Treatment	
1	Group A	Standard	Received povidone-iodine ointment 5% w/w topically.
2	Group B	Control	Received simple ointment base (vehicle) topically.
3	Group C	2.5% w/w	Received 2.5% w/w crude methanolic extract ointment topically.
4	Group D	5% w/w	Received 5% w/w crude methanolic extract ointment topically.
5	Group E	10% w/w	Received 10% w/w crude methanolic extract ointment topically.

RESULTS

Table 3: Measurement of wound Area (in mm^2)

Post wounding days	Wound area (mm^2) (mean ± SEM)				
	A	B	C	D	E
4^{th} day	454 ± 1.83	499.4 ± 0.4	489 ± 1	476 ± 2.6	465 ± 1.93
8^{th} day	303.6 ± 1.86	455.6 ± 1.9	364 ± 1.4	345 ± 1.8	330 ± 2.9
12^{th} day	202.2 ± 1.11	353.6 ± 1.7	258.2 ± 0.8	236 ± 1.67	220 ± 2.8
16^{th} day	52 ± 1.09	205.4 ± 1.6	92 ± 1.41	77.2 ± 1.01	66.8 ± 0.58

Table 4: Percent wound contraction and Epithelisation Time

GROUP	% WOUND CONTRACTION				EPITHELIZATION TIME
	4^{th} day	8^{th} day	12^{th} day	16^{th} day	DAYS
A	9.2	39.28	59.56	89.6	18
B	0.12	8.88	29.28	58.92	24
C	2.28	27.2	48.36	81.6	22
D	4.8	30.92	52.8	84.4	22
E	6.88	34	56	86.64	20

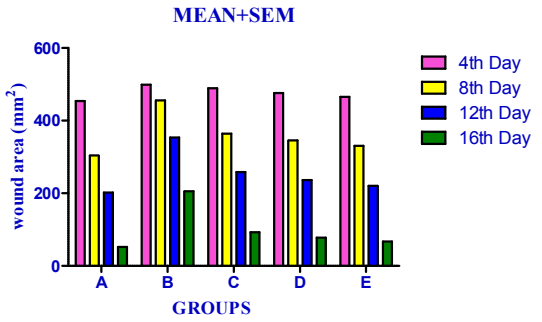

Fig 1: Measurement of Wound Area (in mm^2)

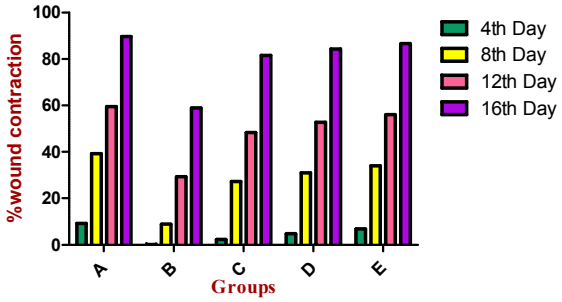

Fig 2: Percent Wound Contraction

DISCSSION

The results of the excision wound model are shown in Table 3 and Table 4 and the graphs were plotted Fig 1 and Fig 2. The methanolic extract 10% w/w possessed more wound healing activity compared to 2.5% and 10%. Thus the present study offers pharmacological evidence of the folk use of chloroxylon swietenia for wound healing.

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