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WOUND HEALING ACTIVITY OF *MIMUSOPS ELENGI* LINN.

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Mimusops elengi, wound healing, Betadine, methanolic extract.

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ABSTRACT: the present study of wound healing activity of *mimusops elengi* linn was aimed to evaluate this activity of extract of leaves of *mimusops elengi*. On the basis of traditional use and literature reference, this plant was selected for wound healing activity. A meathanolic extract of leaves of *mimusops elengi* was examined for wound healing activity in the form of ointment in form of ointment in excision wound model. the ointment of extract of ointment showed considerable response in excision wound model in comparision of a standard drug Betadine ointment in terms of wound contract ability, wound closure time, tensile strength, dry granuloma weight, histological analysis also showed that *mimusops elengi* leaves extract exhibits significant wound healing.

INTRODUCTION: A wound is a break in the epithelial integrity of the skin or breaking of cellular and anatomic or functional continuity of living tissues. Wounds are physical injuries that result in an opening or break of the skin that cause disturbance in the normal skin anatomy and function. They result in the loss of underlying connective tissues.

Plant Profile:

Botanical Name: *Mimusops elengi*.

Synonyms: Bakul, Maulsari, Bullet wood, Indian medlar Bolsari.

Origin and Geographical Distribution:
Mimusops elengi tree is the native of western peninsula.

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The tree is found in south India in dry evergreen forests from the Krishna southwards and in ravines in the hills up to 20 mtrs along western coast and lower ghats in moist evergreen forests.

It is distributed in Andaman, Burma and western in ghats. It is mostly found in north western Himalayas, Central deccan Plateau, East Coast, West coast and Outlying Island. [1]

Scientific Classification:

Kingdom : Plantae

Phylum : Tracheophyta

Class : Mangoliopsida

Order : Ericales

Family : Spotaceae

Genus : Mimusops

Species : elengi

Parts Used:

Leaves, fruits, bark, stem, shoot, seed, and flower.

Chemical Constituents:

Bark: alkaloids, starch, tannins, saponins

Flower: volatile oil, quercitol, lupeol

Seed: quercitol, dihydroquercetin, quercetin, and ursolic acid.

Leaves: quercitol, hentriacontane, B-carotene, D-mannnitol, B-sitosterol, B-sitosterol-B-Dglucoside and quercetin. [2]

Medicinal uses:
The bark, flowers, fruits and seeds are astringents, cooling, anthelmintic, tonic and febrifuge.

It is mainly use in dental ailments like bleeding gums, pyorrhea, dental caries and loose teeth. [3] Extract of flowers used against heart diseases, leucorrhoea, menorrhagia and act as antidiuretic in polyurea and antitoxin.

The snuff made from the dried and powered flowers used in a disease called away in which strong fever, headache and pain in the neck, shoulders and other parts of the body occurs. [4] Ripened fruits facilitates in burning urination.

The ripe fruit pounded and mixed with water is given to promote delivery in childbirth. Powder of dry flowers is a brain tonic and useful as a snuff to relief cephalagia. Decoction of the bark is used to wash the wounds. [5]

MATERIAL AND METHODS:

Mimusops elengi Linn Leaves were collected from Jhansi (U.P.) during the month of September 2012, the plant material was identified and authenticated by Dr. Neelima Sharma, National Vrakshayurveda Research institute Gwalior road Jhansi with reference no. 21246.

Animals:
Healthy albino mice (40-50 gm) of either sex (breed in D.R.D.O. Gwalior, M.P.) Were used the animals were obtained from animal house of the institute of pharmacy B.U. Jhansi; India. The animals were housed in standard cages with free access of food and water. The animals house temperature was maintained at 23 +_ 3.0c with a 12 hrs light/dark cycle. All the experimental procedures and protocols used in this study were reviewed by the institutional animal ethics Committee (IAEC) of the institute with reference no. BU/PHARM/IAEC/12/017 (Approved by CPCSEA Regd no.716/02/a/CPCSEA).

Preparation of extract:
The leaves of *Mimusops elengi* were air dried, and then these were made in to coarsely powdered form. the powdered drug about 150 gm was packed in soxhlet apparatus and continuously extracted with methanol (25-30^{0}C) till complete extraction, after complete of extraction, the solvent was removed by distillation and conc. Extract was dried under reduced pressure using rotator evaporator. A dark green extract obtained from crude extract was 20.71 gm. The percentage yield of dark green extract was

Phytochemical screening:
The extract was tested for its content of different classes of compounds. Phytochemical test on extract give positive reactions for Saponin, carbohydrate, glycosides, flavonoids, tannin and phenolic compounds.

TEBLE 1: PHYTOCHEMICAL SCREENING

S.no.	Chemical tests	Methanolic extract
1.	Tannin and phenolic compounds	+
2.	Protein.	
	1.Biuret test.	+
	2.Millon,s test.	+
3.	Carbohydrates.	
	1.Molish test.	+
	2. Fehling test.	+

4.	Saponins.	
	1.Foam test.	+
5.	Alkaloids.	
	1.Mayer,s test.	-
	2.Hager,s test.	+
	3.Wagner,s test	-
6.	Steroids.	
	1.Salkowaski Reaction.	+
7.	Glycosides.	
	1.Legal test.	+
	2.Keller killani test.	+

Pharmacological screening:

For the assessment of wound healing activity, the animals were divided into three groups of eight animal each healthy albino mice.

Group 1 received Simple ointment base.

Group 2 received Betadine ointment (10% w/w).

Group 3 received methanolic extract of Mimusops elengi (10%W/W).

Experimental procedure:

Excision wound model:

Circular wounds of approximately 500 mm^2 area and 0.2 cm depth were inflicted on the cleared skin by cutting under mild xylocain 4% topical anesthesia. The areas of the wounds was measured (sq. mm) immediately by using vernier calipers. This was taken as the initial wound area reading. Group-1 animals served as negative control, which received ointment I.P. Group-2 served as positive control to which Betadine (10% w/w) in a similar manner. All the test samples were applied once daily. The wound area of each animal would be measured on 4^{th}, 8^{th}, 12^{th}, 16^{th} and 18^{th} post wounding days. The wound closure will be measured at regular intervals of time to see the percentage of wound closure and epitheliazation time that indicates the formation of new epithelial tissue to cover the wound. The number of days required for falling of the scar without any residual of the raw wound would give the period of epithelialization. [6]

Wound contraction and epithelization time:

An excision wound margin was traced after wound creation by using transparent paper and area measured by vernier calipers. Wound contraction was measured in each 3 days interval, until complete wound healing and expressed in percentage of healed wound area. the epithelization time was measured from initial day.

$$\% \text{ of wound contraction} = \frac{\text{wound area on day 0 --- wound area on day n}}{\text{Wound area on day 0}} \times 100$$

Where n = number of days 4^{th} , 8^{th}, 12^{th}, 16^{th} and 18^{th} day.

Histopathological studies:

The healing tissues obtained on the day 18^{th} from all three groups of animals of the excision wound model were processed for histological study. Sections were qualitatively assessed under the light microscope and observed in respect of fibroblast proliferation, collagen formation, epithelization and blood vessels.

TABLE1: EFFECT OF *MIMUSOPS ELENGI* EXTRACT ON EXCISION WOUND MODEL IN MICE

S. no.	Group	4^{th} days	8^{th} days	12^{th} days	16^{th} days	18^{th} days	Epithelization time
1	control	425.33 ±1.33 (15.55%)	338 ±1.15 (32.89%)	211.66 ±1.2 (57.97%)	77.33±1.76(84.64)	13.03 ±1.23 (97.52%)	21.5 ±0.34
2	Betadine	390.12± 13.3 (22.69%)	280.6±1.42** (44.38%)	105±1.20** (62.58%)	9.66 ±1.10** (98.08%)	5.74±0.10** (98.86%)	19.4 ±0.2**
3	MEME(10%w/w)	366±2.78** (27.61%)	268.6 ±1.7 (46.9%)	125±1.34** (75.25%)	7.34 ±1.24** (98.54%)	4.85±1.02** (99.04%)	17.16±0.166***

RESULT AND DISCUSSION:

The effect of methanolic extract of *mimusops elengi* was screened on excision wound model with the control and reference standard Betadine treated animals. The epithelization of excision wound was observed in 4^{th}, 8^{th}, 12^{th}, 16^{th} and 18^{th} days in table. The complete epithelization was observed in Betadine treated animals noticed on 16^{th} day while in methanolic extract treated animals, complete epithelization was observed on 18^{th} day. In control animal the duration of epithelization was extend up to 25 days.

REFERENCES:

1. Kirtikar KR, Basu BD. Indian medicinal Plants with illustrations. Uttaranchal, India. Oriantal enterprise 1999,343.
2. Akhtar N, Ali M, Alam Ms. Pentacyclic triterpenes from the stem bark of *Mimusops elengi* linn. Acta Pol Pharm. 2009; 66(5): 549-552.
3. Basavaraj CK, Purnima A, Diuretic activity of extract of *Mimusops elengi* Linn. Bark. Int, J Green Pharma. 2010; 90- 92.
4. Bharat G, Parabia MH. Pharmacognostic evaluation of bark and seed of *Mimusops elengi* Linn. Int, J Pharm Sci 2010; 2(4); 110-113.
5. Sakshi S, Vineet G, Rajiv G, Shubhini AS. Analgesic and antipyretic activity of *Mimusops elengi* linn leaves. Pharmacologyonline 2011; 3: 1-6.
6. Gupta N, Jain UK. Investigation of wound healing activity of methanolic extract of stem bark of *Mimusops elengi* linn. Afr. J. Trad. Compl & Alt Med 2011; 8(2): 98-103.

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