

NOTE**Wound Healing Activity of *Evolvulus numularius* Linn.**

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The methanol and aqueous extract of the plant *Evolvulus numularius* Linn. (Convolvulaceae), were screened for wound healing property on excision, incision wound models in Wistar albino rats. Both the extract showed significant wound healing activity. However, the rats of wound contraction and epithelialization was faster in methanol extract groups.

Key Words: Wound Healing, *Evolvulus numularius* Linn.

Plant *Evolvulus numularius* Linn. belonging to family Convolvulaceae, is a prostrate or procumbent herb with trailing puberulous branches found as a common weed in lawns, roadsides, grasslands, etc. especially in moist places in India, Madagascar and tropical Africa¹. The hot aqueous extract of the plant is reported to use as a sedative and for treating various gastric disorders by the various tribes in India². The paste of the whole plant is used as for treatment of helminthiasis in children. The plant is reported to contain flavonoids, viz. evolvuside A and B, luteolin, alkanes viz. N-hentriacontane and N-triacontanebe, respectively^{2,3}. The traditional medical practitioner uses the paste of the leaves for the healing of wounds and as an antibacterial agent. In this direction the present study with the wound healing activity of whole plant using a standard drug nitrofurazone.

The whole plant of *Evolvulus numularius* Linn. was collected in the month of July from the rural areas of Salipur District, Cuttak (Orissa). The collected whole plant were shade dried for one week, powdered and packed in Soxhlet apparatus⁵. Extraction was done by continuous hot percolation method using the solvents, methanol and water for 72 h each. The extracts were evaporated under the reduced pressure. The percentage yields of methanol and water extracts were found to be 7.2 and 4.8 % w/w, respectively.

Drug formulation: Oral suspension of the crude extracts were prepared in 1 % sodium CMC so as to obtain the dosage forms in the concentration of 25 mg/mL⁴. For topical administration, 5 % w/w ointment gels of the extracts were prepared in 2 % sodium alginate.

Animals: Male Wistar albino rats weighing 150-200 g were obtained from the B.R. Nahata College of Pharmacy, Mandsaur, India. They were maintained at standard housing conditions and fed with commercial diet Hindustan Lever Ltd., Bangalore and watered *ad libitum* during the experiment. The institutional animal ethical committee permitted the study.

Wound healing activity: Four groups of animals containing six each were used for each of the excision and incision wound models. The animals of group I were considered as the control, the animals of group II served as the reference standard and treated with 0.2 % w/w nitrofurazone ointment Eskeyef, Mumbai. The animals of group III and IV were treated with methanol and aqueous extract of *Evolvulus numularius* Linn.

Excision wound model: The excision wounds were made as described by Morton and Malone⁶ under light anesthesia. The skin of the impressed area was excised to full thickness on the dorsal thoracic region of the rats to obtain a wound area of about 500 sq.mm. The ointment gel of the extract was applied locally everyday till epithelialization was complete. The wounds were traced on mm² graph paper on the days of 4th, 8th, 12th and 16th and thereafter on alternate days until healing was complete. The percentage of wound closure and the period of epithelialization were recorded.

Incision wound: In incision wound model⁷ para vertebral incisions of 6 cm long were made on either side of the vertebral column of the rat. Care was taken to see that incision was at least 1 cm lateral to vertebral column⁸. The wounds were closed with interrupted sutures of 1 cm apart. The animals were caged individually. The sutures were removed on 8th post wounding day. The tensile strength of the wounds was measured on 10th post wounding day⁸.

Stastical analysis: The results of these experiments are expressed as mean \pm SE of six animals in each.

The effect of methanol and aqueous extract of *Evolvulus numularius* Linn. was screened on excision, incision wound models concurrently with the control and reference standard nitrofurazone treated animals. Both the extracts showed significant wound healing activity but the effect was pronounced in methanol extract treated animals. The rate of wound contraction was faster in these and complete epithelialization of the excision wound was observed on 18th day. In nitrofurazone treated animals complete epithelialization was noticed on 17th day. While, in aqueous extract treated animals epithelialization was delayed by 3 d. In control animals the duration was delayed by 3 d. In control animals the duration of epithelialization was exceeded up to 22 d. The results of percentage wound contraction and period of complete epithelialization are shown in Table-1.

In incision wounds significant increase in the tensile strength was observed in the methanol treated animals 523.66 g. While in aqueous and control animals tensile strength was 460.33 and 423.16 g, respectively as shown in Table-2.

TABLE-I
EFFECT OF *Evolvulus numularius* LINN. WHOLE PLANT EXTRACTS ON
PERCENTAGE CLOSURE OF EXCISION WOUND AREA (SQ.MM \pm SE)

Group (N)	4th day	8th day	12th day	16th day	Mean time of epithelialization in days
Control	13.65 \pm 0.153	27.30 \pm 0.156	57.69 \pm 0.197	77.21 \pm 0.147	22.00 \pm 0.060
Nitrofurazone	39.01 \pm 0.199	73.92 \pm 0.231	83.81 \pm 0.212*	96.20 \pm 0.215*	17.00 \pm 0.060*
Methanol ext.	36.61 \pm 0.241	71.89 \pm 0.186	80.33 \pm 0.165*	92.66 \pm 0.265*	17.66 \pm 0.066*
Aqueous ext.	31.34 \pm 0.231	64.61 \pm 0.315	72.46 \pm 0.266*	90.13 \pm 0.212*	19.16 \pm 0.094*

N = 6 animals in each group *p < 0.001 indicates significant compared to control; Values are expressed as mean \pm SE

TABLE-2
EFFECT OF TOPICAL APPLICATION OF *Evolvulus numularius* LINN.
WHOLE PLANT EXTRACTS ON HEALING OF INCISION WOUND

Group (N)	Tensile strength (g)
Control	423.16 \pm 0.608
Nitrofurazone	559.95 \pm 1.495
Methanol ext.	523.66 \pm 2.681*
Aqueous ext.	460.33 \pm 2.890*

N = 6 animals in each group; *p < 0.001 indicates significant compared to control; Values are expressed as mean \pm SE

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