



Assessment of Wound Healing Activity of *Petunia integrifolia*

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ABSTRACT

The current study provides a scientific evaluation for the wound healing potential of the crude extract of *Petunia integrifolia* flowers. The crude extraction was carried out using petroleum ether and water. The crude extract was prepared in ointment and evaluated for wound healing activity using excision and incision wound models in swiss albino mice. Aqueous extract ointment significantly reduced period of epithelialization and increased wound contraction rate and tensile strength. These results establish that the crude extract of *Petunia integrifolia* leaves possesses wound healing activities. This defends the traditional claimed use of the plant.

Keywords: Flowers, Wound, Excision, Incision

Introduction

Wounds are corporeal damages that result in an opening of the skin. Proper healing of wounds is essential for the restoration of disrupted anatomical continuity and disturbed functional status of the skin. Many researchers have stated the enhancement in the wound healing process by various plant extracts and isolated compounds in animal models in literature. [1,2]

Herbal medicine has its roots in every philosophy around the world. There are many different systems of traditional medicine, and the attitude and practices of each are influenced by social conditions, environment and geographic location, but these systems all agree on a holistic method to life. Well-known systems of herbal medicine like Traditional Chinese Medicine and Ayurvedic Medicine believe in the central idea that there should be an emphasis on health rather than on disease. By using healing herbs, people can thrive and focus on their overall conditions, rather than on a particular ailment that typically arises from a lack of equilibrium of the mind, body and environment. [3,4] Hence, based on the evidence of such traditional practice as

medicine, the present study was designed to scientifically validate the wound healing efficacy of topical administration of *Petunia integrifolia* flowers extracts in experimental rats.

Experimental Work

Collection & Identification of Plant material

The fresh flowers of *Petunia integrifolia* were collected from the available sources. The species for the proposed study was identified as *Petunia integrifolia* by department of Pharmacognosy, RKDF College of Pharmacy, Bhopal (M.P.)

Preparation of extracts

The powdered plant material (about 200 gm) was defatted with petroleum ether and then extracted with ethanol in a soxhlet apparatus. The solvent was removed under reduced pressure, which obtained a dark brown and brownish black sticky residue with respect to dried plant material. The dried extract was stored in a desicator till further study.

Excision wound model

Animals were anaesthetized prior to and during creation of the wounds. The rats were inflicted with excision wounds as described by Morton and Malon. The dorsal fur of the animals was shaved with an electric clipper and the anticipated area of the wound to be created was outlined on the back of the animals with methylene blue using a circular stainless steel stencil. A full thickness of the excision wound of 2.5 cm (circular area = 300mm²) in length and 0.2 cm depth was created along the markings using toothed forceps, a surgical blade and pointed scissors. The entire wound was left open. The wound closure rate was assessed by tracing the wound on days 4, 8, 12, 16 post-wounding using transparency paper and a permanent marker. The wound areas recorded were measured using a graph paper. Number of days required for falling of eschar without any residual raw wound gave the period of epithelization. [5,6]

Incision wound model

On the depilated backs of the animals, two paravertebral incisions of 6 cm length were made cutting through the full thickness of the skin. Interrupted sutures, 1 cm apart, were placed to approximate the cut edges of the skin 24. The sutures were removed on the 8th post wound day and skin breaking strength was measured on the 10th day by continuous water flow technique. [7,8]

Grouping of experimental animals

Rats were divided into five groups, of six animals in each group.

(Group I) remain untreated which acted as control

(Group II) was topically treated with framycetin sulphate cream

(Group III) was treated with 5% ointment of petroleum ether extract (Group IV) was treated with 5% ointment of aqueous extract

Preparation of formulation and standard used

A 5% (w/w) simple ointment containing the petroleum ether and aqueous extract of *Petunia integrifolia* was prepared by trituration method in a ceramic mortar and pestle using white soft paraffin base. For this, 5 g of extract was incorporated in 100 g of the base. Framycetin sulphate was used as standard drug for comparing the wound healing activity of extract in different animal models.

Results and Discussion

Wound contraction studies

In preliminary wound healing activity 5% ointment prepared with pet ether and aqueous extract was evaluated for wound healing potential in excision and incision wound models. The results revealed that group treated with aqueous extract ointment shows better wound closure and increased tensile strength, thus aqueous extract was further explored with different dose to assess more significant results. The findings were reported in table 1 and 2.

Table 1 Findings of wound contraction studies

→ GROUPS ↓ DAYS	Control (Group I)	Standard (Group II)	Pet ether Extract (Group III)	Aqueous extract (Group IV)
0	282.6 ± 2.08	291.3 ± 2.21	294.8 ± 3.53	295.7 ± 3.34
4	241.3 ± 5.34	188.4 ± 3.42 ^a	210.6 ± 2.61 ^b	204.4 ± 3.79 ^a
8	180.9 ± 3.60	118.2 ± 4.55 ^a	143.6 ± 4.02 ^a	132.4 ± 5.54 ^a
12	122.2 ± 2.67	65.6 ± 3.02 ^a	98.3 ± 3.07 ^a	75.6 ± 3.37 ^a
16	62.2 ± 2.24	0 ^a	18.1 ± 2.68 ^a	2.15 ± 1.18 ^a

a = P > 0.001, b = P > 0.01, c = P > 0.05

Table: 2 Findings of Epithelization period.

Groups	Epithelization period (days)	Tensile strength (g)
Group I	34.15 ± 1.25	138.5 ± 1.20
Group II	17.50 ± 1.15	355.7 ± 1.10
Group III	21.5 ± 1.10	302.6 ± 1.20
Group IV	19.20 ± 1.25	335.4 ± 1.30

Conclusion

These results collectively demonstrate that aqueous extract possesses wound healing activity and this justifies the use of the flowers of *Petunia integrifolia* for treatment of wounds as claimed in the folklore literature.

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