The Effect of a *Labiatae* Family Plant Extract on Wound Healing in Male Wistar Rats

Kourosh Sayehmiri, Elaheh Karimi, Sajad Hatami, Kamyar Sayehmiri, Naser Abbasi, Nahid Mahdian, Somayeh Heidarizadi, Monireh Azizi

Ilam University of Medical Sciences, Ilam, Iran

Introduction

Wound healing is a complex process, and finding effective treatments to accelerate it with fewer side effects is a key medical goal. A plant from the *Labiatae* family has been used traditionally in Ilam and Kermanshah provinces of Iran to treat wounds, but its efficacy had not been scientifically validated. This study investigated the antibacterial and wound-healing properties of its extract.

Objective

evaluate the effect of topical application of a *Labiatae* plant extract on bacterial activity and wound healing in male Wistar rats.

Methods

Extract Preparation:** Stems were dried, powdered, and extracted using 70% ethanol in a ** -Soxhlet apparatus. Ointments were prepared at 30%, 60%, and 90% concentrations in a Eucerin base. Animal Study:** 45 male Wistar rats were divided into 5 groups (n=9):

** .1 Control:** Eucerin base

** .2 Positive Control:** Commercial Adib Derm ointment

** .3 Treatment Groups:** Eucerin with 30%, 60%, and 90% extract

-A 1 cm diameter full-thickness wound was created on each rat. Ointments were applied twice daily.

Assessments:**** -

Macroscopic:** Wound area was measured on days 1, 4, 7, 10, 13, and 16.** -

Histological:** Tissue samples were analyzed on days 10, 15, and 21 for epithelialization, ** -angiogenesis, fibroblasts, and inflammatory cells (H&E staining).

Antibacterial:** Disc diffusion assay against *S. aureus*, *P. aeruginosa*, and *A. baumannii*.** -

Key Results

.1**Macroscopic Healing:**

-On **Day 10**, a significant difference in healing was observed between groups (P=0.028).

-The **90% extract group** showed the highest healing rate (**99.1%**), surpassing Adib Derm (93%) and the control (83.6%).

-By Day 13, all extract-treated groups achieved 100% healing.

.2**Histological Findings (Day 10):**

90%** -Extract Group:** Showed superior **epithelialization (++)**, highest **angiogenesis (14±5.3)**, and lowest numbers of **macrophages (14±3.1)** and **neutrophils (11±3.5)**, indicating reduced inflammation.

.3**Antibacterial Activity:**

** -No inhibition zones** were observed for any concentration of the extract against the tested bacteria.

-The wound-healing effect is attributed to **pro-angiogenic and anti-inflammatory mechanisms**, not antimicrobial properties.

Conclusion

The *Labiatae* plant extract, particularly at a **90% concentration**, significantly accelerates wound healing, outperforming the commercial Adib Derm ointment. Its efficacy is driven by:

Enhanced **Angiogenesis** ✓ -

Increased **Fibroblast Proliferation** ✓ -

Reduced **Inflammation** ✓ -

No observed **Antibacterial** effect ✗ -

This study supports the traditional use of this plant and suggests its potential as a highly effective, natural, and accessible wound therapy.

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Contact:kourosh86@gmail.com

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