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Research Article

BOTANICAL BOOST: CANTHARANTHUS ROSEUS LEAF EXTRACT ACCELERATES WOUND HEALING IN WISTAR RATS

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ABSTRACT

This study investigates the wound healing properties of Cantharanthus roseus (Madagascar periwinkle) leaf extract in Wistar rats. The experiment involved inducing standardized wounds on the rats, with a subsequent application of the C. roseus leaf extract to evaluate its impact on the rate and quality of wound healing. The findings provide insights into the potential therapeutic benefits of this botanical extract in promoting accelerated wound recovery.

KEYWORDS

Cantharanthus roseus, Madagascar periwinkle, wound healing, botanical extract, Wistar rats, therapeutic properties, wound recovery, herbal medicine, natural remedies, tissue regeneration.

INTRODUCTION

Wound healing is a complex and dynamic process crucial for the restoration of tissue integrity and functionality. While traditional wound care approaches have focused on pharmaceutical interventions, there is an increasing interest in exploring the potential of botanical extracts in accelerating this intricate regenerative process. Among these botanicals, Cantharanthus roseus, commonly known as Madagascar periwinkle, has garnered attention for its rich chemical composition and reported therapeutic properties.

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Cantharanthus roseus is renowned for its diverse phytochemicals, including alkaloids, flavonoids, and tannins, which have demonstrated various pharmacological activities. In particular, the plant's potential wound healing properties have been a subject of interest, prompting the need for systematic investigations to validate and understand its effects on tissue repair.

This study aims to explore the wound healing potential of Cantharanthus roseus leaf extract in a controlled experimental setting using Wistar rats as a model. By inducing standardized wounds and applying the C. roseus leaf extract, we seek to assess its impact on the rate and quality of wound healing. The choice of Wistar rats allows for a reliable representation of mammalian wound healing processes, facilitating translational insights into potential applications for human health.

As we delve into this investigation, the goal is to contribute to the growing body of knowledge on natural remedies for wound healing. If successful, the use of Cantharanthus roseus leaf extract may offer a botanical boost to conventional wound care strategies, providing an alternative avenue for promoting efficient and effective tissue regeneration. The outcomes of this research hold the potential to bridge traditional herbal medicine with modern wound care, offering novel perspectives for therapeutic interventions in the field of regenerative medicine.

METHOD

The investigation into the wound healing potential of Cantharanthus roseus leaf extract in Wistar rats involved a meticulously designed process. Beginning with the collection and authentication of fresh leaves, a standardized extraction procedure was employed to obtain a concentrated and representative sample of the botanical extract. The choice of Wistar rats as the experimental model allowed for a reliable representation of mammalian wound healing processes, forming the foundation for translational insights into potential applications for human health.

The rats were systematically divided into control and experimental groups, ensuring randomization and minimizing biases. To induce standardized wounds, a carefully controlled procedure was followed, guaranteeing uniformity in the wound creation process across the experimental subjects. The subsequent topical application of Cantharanthus roseus leaf extract on the experimental group's wounds and a placebo or base cream on the control group provided the basis for comparative analyses.

Throughout the study, the progress of wound healing was methodically assessed by measuring wound size, evaluating tissue granulation, and recording any signs of infection or inflammation. Digital imaging and histopathological analyses were employed to quantify changes in the wound area and characterize the healing process at a microscopic level. In addition,

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blood samples were systematically collected to conduct biochemical analyses, focusing on parameters associated with inflammation and antioxidant levels to understand the systemic effects of the Cantharanthus roseus leaf extract on the overall healing process.

The data generated from wound size measurements, histopathological assessments, and biochemical analyses underwent rigorous statistical analysis to evaluate the efficacy of Cantharanthus roseus leaf extract in accelerating wound healing compared to the control group. This systematic and comprehensive process ensured the reliability of the study's outcomes, providing valuable insights into the potential application of this botanical extract in enhancing the wound healing process.

Plant Material and Extraction:

Fresh leaves of Cantharanthus roseus were collected and authenticated. The leaves were subjected to a standardized extraction process using an appropriate solvent. The resulting extract was concentrated to obtain a representative sample for the experimental study.

Animal Model and Grouping:

Wistar rats were selected as the experimental model due to their widespread use in wound healing research. The rats were acclimatized to laboratory conditions and randomly divided into two groups: a control group and an experimental group receiving topical applications of Cantharanthus roseus leaf extract.

Induction of Standardized Wounds:

Standardized wounds were induced on the dorsal area of each rat under anesthesia, ensuring uniformity in the wound creation process. This allowed for a controlled and reproducible experimental setup.

Topical Application of Extract:

The experimental group received topical applications of Cantharanthus roseus leaf extract directly onto the induced wounds, while the control group received a placebo or base cream without the active extract. The application frequency and dosage were carefully standardized to ensure consistency.

Assessment of Wound Healing:

The progress of wound healing was monitored regularly by measuring wound size, assessing tissue granulation, and recording the presence of any signs of infection or inflammation. Digital imaging and histopathological analyses were employed to quantify changes in the wound area and characterize the healing process.

Biochemical Analysis:

Blood samples were collected at specific intervals to analyze biochemical parameters associated with wound healing, such as inflammatory markers and

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antioxidant levels. This provided insights into the systemic effects of Cantharanthus roseus leaf extract on the overall healing process.

Statistical Analysis:

Data obtained from wound size measurements, histopathological assessments, and biochemical analyses were subjected to appropriate statistical tests. Statistical significance was determined to evaluate the efficacy of Cantharanthus roseus leaf extract in accelerating wound healing compared to the control group.

This comprehensive methodology ensured a systematic approach to investigating the wound healing potential of Cantharanthus roseus leaf extract in Wistar rats. The use of standardized procedures and robust analyses aimed to provide reliable and meaningful insights into the efficacy of this botanical extract as a potential agent for enhancing the wound healing process.

RESULTS

The investigation into the wound healing potential of Cantharanthus roseus leaf extract in Wistar rats revealed promising outcomes. Rats treated with the botanical extract exhibited a noticeable acceleration in the healing process compared to the control group. Measurements of wound size indicated a significant reduction in the treated group, accompanied by enhanced tissue granulation and a reduced presence of signs of infection or inflammation. Histopathological analyses further supported these observations, revealing well-organized tissue repair and increased collagen deposition in the Cantharanthus roseus-treated wounds.

Biochemical analysis of blood samples demonstrated a modulation of inflammatory markers, with a decrease in pro-inflammatory factors and an increase in antioxidant levels in the treated group. These findings suggest a systemic effect of Cantharanthus roseus leaf extract, contributing to a favorable wound healing milieu.

DISCUSSION

The observed acceleration in wound healing in the Cantharanthus roseus-treated group aligns with the plant's known pharmacological properties, including anti-inflammatory and antioxidant effects. The bioactive compounds present in the leaf extract may have contributed to enhanced tissue regeneration, collagen synthesis, and modulation of the inflammatory response, collectively promoting a more efficient healing process.

The systemic effects observed in biochemical analyses support the notion that Cantharanthus roseus leaf extract may not only exert localized effects at the wound site but also influence the overall inflammatory and oxidative status of the organism. These findings provide a basis for further exploration of the molecular

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mechanisms underlying the observed effects and potential applications in human wound care.

CONCLUSION

In conclusion, the results of this study strongly suggest that Cantharanthus roseus leaf extract accelerates wound healing in Wistar rats. The observed reduction in wound size, enhanced tissue regeneration, and favorable modulation of inflammatory and antioxidant markers indicate the potential therapeutic efficacy of this botanical extract in promoting efficient wound recovery. These findings open avenues for future research into the specific bioactive compounds responsible for the observed effects and the development of topical formulations for clinical applications. Cantharanthus roseus leaf extract emerges as a promising candidate in the realm of natural remedies for wound healing, offering a botanical boost to conventional wound care strategies.

REFERENCES

1. Singh, A.and Singh, D.K.2001: Molluscicidal activity of Lawsonia inermis and its binary and tertiary combinations with other plant derived molluscicides. Indian J Exp Biol, 39:263-268.
2. Nayak, B.S. 2006: Cecropia peltata L (Cecropiaceae)Has Wound Healing potential-A preclinical study Sprague Dawley Rat model. International Journal of Lower Extremity Wounds, 5:2026.
3. Chattopadhyay, R. R.1999. A comparative evaluation of some blood glucose lowering agents of origin. J Ethnopharmacol, 67:367-372.
4. Eming,S.A., Brachvogel,B.,T., andKoch,M. 2007.Regulation of angiogenesis: wound healing as a model. Prog Histochem Cytochem 42: 115–170.
5. Fujita,N.,Ikuyo,S.,Hiromi,K.I.,Norikazu,I.,Yoshiko,K. , Miki,M.,and Masamitsu,L.2003.An Extractof the Root of Lithospermun erythrorhison Accelerates Wound Healing in Diabetic Mice, Biol. Pharm. Bull.26(3): 329—335.
6. Hindmarch, I., Fuchs,H.H., andErzigkeit,H. 1991.Efficacy and tolerance of vinpocetine in ambulant patients suffering from mild to moderate organic psychosyndromes. Int Clin Psychopharmacol, 6(1):31-43.
7. Kim,L.R., andPomeranz,B. 1999.The sympathomimetic agent, 6-hydoxydopamine, accelerates cutaneous wound healing. Eur J Pharmacol 376: 257–264.
8. Nayak,B.S., Vinutha,B., Geetha,B., andSudha,B.2006.Experimental evaluation of Pentas lanceolata for Wound healing activity in rats. Fitotherapia, 76:671-675.
9. Pullar,C.E, Rizzo,A., andIsseroff,R.R. 2006.Beta-Adrenergic receptor antagonists accelerate skin wound healing: evidence for a catecholamine synthesis network in the epidermis. J Biol Chem 281: 21225–21235.

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10. Seiffert,K.2008.Regualtion of cutaneous immunity by catecholamines. In: Granstein RD, Luger TA, eds. Neuroimmunology of the Skin: Basic Science to Clinical Practice. Berlin Springer : 65–74.
11. Singer,A.J., andClark,R.A. 1999.Cutaneous wound healing. N Engl J Med 341: 738–746.
12. Tonnesen,M.G., Feng,X., andClark,R.A. 2000.Angiogenesis in wound healing. J Investig Dermatol Symp Proc 5: 40–46.
13. Harvey, C. 2005. Wound Healing. Orthopaedic Nursing. 24(2): 143-159.