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Clinical Evaluation of *Calotropis Gigantea* and *Balanites Aegyptiaca* on Wound Healing in Bovine

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Abstract

The study was conducted to compare the efficacy of *Calotropis gigantea* leaves extract ointment and *Balanites aegyptiaca* roots extract ointment in management of wound healing in bovine. The study was undertaken on the clinical cases of wounds presented at Veterinary Clinic, PGIVAS, Akola. A total 12 clinical cases of bovine with lacerated wounds were divided into two groups, comprising of six animals each. Ethanolic extract ointments of *C. gigantea* and *B. aegyptiaca* 10% w/w were clinically evaluated for wound healing activity. Clinical observations such as hemorrhages, swelling, colour of wound, exudation, pain, pus formation and irritation were recorded on every alternate day. Wound contraction was measured on 0, 7th, 14th and 21st day. The quality of wound healing was measured on the basis of percent wound contraction. From the observation of clinical study *C. gigantea* leaf extract ointment showed better wound contraction than *B. aegyptiaca* roots extract ointment.

Key Words: Wound, Bovine, *Calotropis gigantea, Balanites aegyptiaca*

Introduction

Phytomicrobial compounds from plants can be used to control infectious diseases and wounds infected by various micro-organisms. Wound is a discontinuity of skin or tissue surface caused by physical, chemical or biological insult (Singh and Singh, 2001). Wound healing is a physiological process by which the body replaces and restores the function of damaged tissue (Flanagan, 2010). From ancient times Indian folk practitioners are known to use herbs for treating wounds in bovines. However, very few reports are available on wound healing activities of herbs in bovines. *Calotropis gigantea* known as Milkweed, Rui (madar) is a common shrub of wasteland and roadside. The leaves are used for treating wound and boils, flowers of this plant along with jaggery are useful against cough and improving appetite and it has been reported to possess antidiarrhoeal, CNS depressant, antipyretic, anti-inflammatory and analgesic properties (Kumar *et al.,* 2011). *Balanites aegyptiaca* (Hindi-Hinganbet) is a common shrub of wasteland, reported to have insecticidal, anthelmintic, antimicrobial and wound healing properties (Chothani and Vaghasia, 2011). As per literature cited no substantial work has been reported on wound healing properties of these plants, therefore, this study was undertaken to determine the wound healing effect of *C. gigantea* and *B. aegyptiaca* in bovine.

Materials and Methods

The whole leaves of *C. gigantea* and roots of *B. aegyptiaca* were collected from the campus of PGIVAS, Akola and the plants were identified by expert taxonomist, Dr. S. P. Rothe, Professor and Head, Dept. of Botany, Shri Shivaji Science College, Akola. The plant materials were shade dried, powdered and 100 g powder immersed in 400 ml of hydro-ethanolic solution (60% ethanol) in a flask stoppered tightly with cotton plug and was kept at 150 rpm on orbital shaker for 48 hr. The filtrate obtained was passed through Whatman No. 1 filter paper and concentrated to solid mass. For ointment preparation (10% w/w), 10 g. of extract, 85 g. of wax and 5 g. of glycerin were mixed and stirred several times to prepare a homogenous mixture. The wound healing study was undertaken on the clinical cases of wounds in bovine presented to Teaching Veterinary Clinical Complex, PGIVAS, Akola. A total 12 cases of lacerated wounds in bovine were taken for the study. These cases were divided into two groups of six animals each irrespective of type of wound, age, sex and breed. The wound area was cleaned, shaved and washed with distilled water. The wounds of group A and Group B animals were treated topically with extract ointment of *C. gigantea* and *Balanites aegyptiaca* respectively, till the complete wound healing. Clinical observations such as hemorrhages, swelling, colour, exudation, pain, pus formation and irritation were recorded on every alternate day. Locations of wound are considered to be one of the factor responsible for wound healing. Wounds on or adjacent to joints, wounds on or adjacent to ribs and the wounds coming in contact with ground took long time for healing. Length and size of the wound was traced with permanent marker on transparent cellophane paper on 0 day and thereafter this measurement was carried out on 7^{th}, 14^{th} and 21^{st} day for studying the wound contraction i.e. wound healing. The per cent wound healing was calculated by the method described by Parhizakar *et al*. (2008) given by following formula.

$$\text{Percent wound healing} = \frac{L2-L1}{L2} \times 100$$

Where, L2 = maximum wound length on 0 day

L1=maximum wound length on any other day

Results and Discussion

In the present study comparative evaluation of wound healing was carried out on twelve clinical cases of about one to six years of age. All the wounds of group A and group B animals were treated as open wounds on different parts of body. Mild edematous swelling at the periphery of the wounds was observed up to 3^{rd}day and subsided thereafter in Group A and B. In Group A no exudation was observed during the study period, except in one case of Group B, there was serum exudation seen during first 24 hours which subsides thereafter. In both group of animals, moderate pain was observed up to 3^{rd} day and mild pain was noticed in most of the animals up to 5^{th}day which subsides thereafter. Animals from both the groups did not reveal presence of any pus. In all animals complication like traumatic bleeding was not observed during complete healing of wounds.

The quality of wound healing was measured on the basis of per cent wound contraction. The wound contraction per cent in groups A and group B are presented in Table1.

Table 1. Per cent Wound contraction during treatment in bovine

Treatment Interval (Day)	Group-A	Group-B
0	0	0
7	25.103±4.63	38.536±5.64
14	56.410±2.87	64.496±7.53
21	82.823±2.71	76.693±6.76

Remarkable increase in wound contraction was observed during treatment in wound healing in both the groups. The presence of phytoconstituents like flavonoides, saponines, tannins and alkaloids in these plants might be responsible for wound healing activity; moreover, theses plants have anti-inflammatory and antimicrobial properties (Sharma *et al.* 2015 and Tesfaye, 2015) which must be contributing to wound healing. It was observed that *C. gigantea* extract ointment showed better wound contraction than *B. aegyptiaca* ointment. The cases of both groups were observed till complete healing in which duration of wound healing was more than 21 days in all animals. In Group B it took 28 to 30 days to attain complete wound healing. Where as in Group A the duration of complete wound healing was ranged between 24 to 28 days. From the observations it is also noticed that both the ointment have a fly repellant activity. On the basis of results and observations it is concluded that *C. gigantea* and *B. aegyptiaca* showed remarkable wound healing activity which could be used in treating wounds in bovines.

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Conflict of Interest: All authors declare no conflict of interest.

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