

Effect of Hydro-Alcoholic Foliar Extract of Aroeira (*Schinus terebinthifolius* RADDI) In Rats Skin Wound Healing

Abstract

Schinus terebinthifolius Raddi (Anacardiaceae), popularly known as Brazilian pepper, is an evergreen, pioneer and indigenous plant from Brazil, and it is used as food condiment. Stem bark is used to fight inflammations of various origins, especially those of the female genital system, since they have, among others, anti-inflammatory and healing properties. The objective of the present work was to observe the effect of Aroeira hydro-alcoholic foliar extract in open wounds in the dorso-costal region of rats. Aroeira leaves were collected from Bach Site, in Ibiúna, SP- Brazil, and transported to the Uninove laboratory in Styrofoam boxes for drying, grinding and extraction. 10 g of leaf powder were extracted with 70% of ethanol and gave equivalent of 39.85mg of SAB as proteins and, equivalent of 11.25mg of chlorogenic acid as phenols. 10% of the extract was mixed in gel. After approval by the Ethics Committee, 24 Wistar rats, male, adult (weighting about 200-250g) were divided into three groups and in all animals one skin fragment was removed, with four centimeters in diameter and treated. The animals of the first group were treated with aroeira gel, those of the second group with gel-10% of ethanol (70%), and those of the third group with Fibrinase (commercial), this group being the positive control, on further days. The evaluation of the wound was done macroscopically in the predetermined periods (0, 5, 7, 14 and 21 days). Macroscopic analysis of the evolution of the lesion aspect and measurement of wound was performed by digital planimetry. Partial results indicated a better healing process in the wounds areas treated using gel-Aroeira when compared to gel-alcohol and fibrinase control. It is possible to conclude that hydroalcoholic aroeira gel is effective in the healing of wounds in the skin of rats and can be used as herbal medicine.

Keywords: Aroeira Leaves; Hydroalcoholic Extract; Healing of Wounds

Introduction

Schinus terebinthifolius, native to various plant formations in the northeast, central-west, southeast and south of Brazil, is known by different popular names, such as aroeira, aroeira-mansa, aroeira-vermelha, aroeira-precoce, aroeira-pimenteira, aroeira- sertão, cambuí, coração-de-bugre e fruto-de-sabiá [1]. Our interest in the species is due to its secondary metabolism that produces several active compounds among others.

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Short Communication

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Phytochemical studies of *S. terebinthifolius* detected the presence of simple phenolic compounds, flavonoids and tannins, essential oils, steroids, triterpenes, anthraquinones and saponins in the species [2-4]. Already developed studies have found that both bark and leaves have been found to be equally rich in tannins and essential oils. The only substantial difference between the chemical composition of both is the presence of flavonoids and saponins, which have been highlighted in the shells [2]. There are few studies with aroeira leaves and healing. Thus, the objective of the present study was to evaluate the healing of open cutaneous wounds in rats, treated with topical gel containing hydro-alcohol extract of the aroeira, by macroscopic analysis of the cicatricial process.

Materials and Methods

Leaves of Aroeira plants were collected from Sitio Bach, in Ibiúna, SP, and transported to the Uninove laboratory in Styrofoam boxes for drying, grinding and extraction. 10 g of leaf powder were extracted using 70% of ethanol in one week by percolation. The gel was prepared adding 10% of extract. Tests were run for quantification of proteins [5], phenols [6] and evaluated by HPLC as polyphenols [7]. Male 4-week-old Wistar rats weighing between 250-280g were obtained from UNINOVE (Ethics Committee AN 37/2014). The animals were kept in polypropylene cages (three animals per cage) covered with metallic grids in a room maintained at 23C, 55+10% humidity, 12h light and 12h dark cycles and fed ad libitum for two weeks before the start of the study.

The rats were then randomly divided into three different groups (N=5) with two repetitions. Animals in group 1 were treated with 1mL of gel containing Aroeira 10% extract; group 2 with 1mL of gel-10% ethanol (equivalent to 70%) and group 3 with

fibrinase. Daily application was performed over the wound, 4cm² of total area in dorsal region of each animal. The wound evaluation was made macroscopically in time of 0, 5, 7, 14 and 21 days, and skin healing retraction measures evaluated by digital planimetry. Statistical analysis was performed using Assistat-2012 program (Anova, T student test, Turkey).

Results and Discussion

The extract from aroeira leaves presented equivalent of 39.85mg of SAB (Soro albumin bovin) as proteins and, equivalent of 11.25mg of chlorogenic acid as phenols. In HPLC was determined presence of chlorogenic acid and quercetin. In animals, after 21 days in the group treated with gel+extract was observed the wound healed about 82.61% compared to control group, while with fibrinase corresponded to 59.57% compared to control group (*Figure 1*). Fibrinase is the positive control, that is, it has proven healing action, but when compared to gel + extract from aroeira leaves the healing was 23.04% more effective with the gel. The polyphenols can assist in the healing because they can form a thin layer and protect against external agents that may damage the tissue [7].

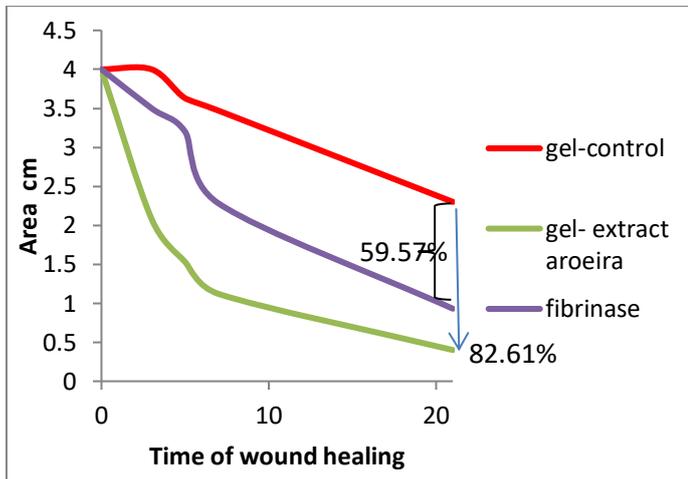


Figure 1: Graphic showing time of wound healing of rats treated with Aroeira leaves-gel, gel-ethanol and fibrinase. Percentage of healing wound included on same graphic.

Conclusion

It is possible to conclude that gel with *Aroeira* hydro-alcoholic extract is effective in rats skin healing.

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