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ANTIMICROBIAL ACTION AND SCARING OF 10% GREEN BANANA SHELL IN CHRONIC WOUNDS

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ABSTRACT

Currently, it is estimated that, in the Brazilian population, 3% of individuals are carriers of different types of skin lesions; This percentage increases to 10% in the case of diabetic patients who may even be contaminated. Several benefits have been found in studies with herbal medicines such as banana peel, mango, cashew, cashew, among others. Antioxidant and antifungal activities were observed in these studies, leading to a greater acceptance and use of phytotherapies to evaluate the antimicrobial action and evolution of diabetic and venous wounds. Five patients were included in the study, three patients with venous ulcers and two patients with diabetic wounds. During the whole experiment, the patients attended the UAPS located in a city in the south of Minas Gerais every 3 days for the conventional treatment, and later the application of the gel based on extract of the bark of the green banana species *Musa sapientum* to 10% in patients' wounds. Wound samples were also collected weekly during dressing exchange to analyze the antimicrobial action of the gel. The reduction of the lesion area was monitored weekly during the experiment by measuring the contour of the wound, and the values were recorded in centimeters. There was a reduction of microorganisms against the use of gel in patients with a median of 53.57%, and reduction of wound areas on average of 48.1% with a significant improvement of the picture.

Keywords: *Musa sapientum*, Phytotherapy, Products with antimicrobial action, Healing.

INTRODUCTION

The use of food and medicinal plants in the treatment of diseases has been increasing every day around the world. In Brazil it is not different, both in the big commercial centers and in the interior, the commerce and the use of medicinal plants are very widespread activities, which are attributed diverse medical, social, cultural, economic or philosophical causes. Such use was built on experience and transmitted orally.⁶Some of these foods are rich in bioactive compounds, widely recognized for their health promoting properties and in technological

applications, such as the mango bark (*Mangifera indica* L.) of the Tommy Atkins variety, in which the results demonstrated relevant activity Antimicrobial activity against strains of *Escherichia coli*, *Salmonella* sp., *Pseudomonas aeruginosa*, *Staphylococcus aureus* [1]. As the *Mangifera* bark indicates L. Tommy Atkins variety, other plant extracts such as cinnamon essential oils, cashew tree bark, cocoa, pepper rosemary, propolis, citrus grass and jaboticaba leave [2]

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The antimicrobial activity of the antimicrobial agent was similar to that of the antimicrobial agent, and the antimicrobial activity of the antimicrobial agent And economically feasible becomes an important event in the promotion of population health [3].

Banana (*Musa spp.*) Is one of the most cultivated fruits in tropical countries, being the 2nd fruit of the world in terms of production, with an annual production of 106 million tons. Brazil ranks 4th in the world, with about 6.9 million tons per year [4]. The major chemical constituents of *Musa* are steroids, flavonoids and tannins [5]. Studies have shown that different extracts of banana peel in different stages of maturation have antioxidant potential, mainly due to the presence of phenolic compounds. In addition, by comparing the ripening stages, the green banana peel has higher antioxidant activity. One of the antioxidant components determined was galocatechin, as it showed its maximum extraction in a non-polar solvent. This work suggests that banana peel is a potential product for the preparation of nutraceuticals because of its antioxidant potency [6]

In addition to its highly antioxidant power, this fruit also presents other important functions such as the gel to 4% of its bark, which promoted a great area of epithelialization in wound healing with second intention in rats [7]. The use of the 4% banana gel in surgical incisions in rats also has repercussion in reducing the area of the lesion, reducing vascular proliferation and increasing collagen concentration in the wound [8]. Currently, it is estimated that in the Brazilian population 3% of the individuals are carriers of different skin wounds; This percentage increases to 10% in the case of diabetic patients who may even have lesions contaminated with microorganisms such as *Staphylococcus aureus* [9]. which stimulates the search for new resources and technologies for a lower cost solution, greater efficiency And to which the population is more accessible.

The objective of the present study was to evaluate the antimicrobial action of the gel on 10% of *Musa sapientum* green peel in microorganisms isolated from chronic wounds and the gel repercussion in the reduction of wound areas in patients with diabetic and venous wounds In the São João Ambulatory, in a city in the south of Minas Gerais.

METHODOLOGY

A clinical trial was conducted with 5 patients ranging from 45-70 years old, with venous or diabetic wounds attending the São João Outpatient Clinic, a city in the south of Minas Gerais. Throughout the experiment, patients attended the UAPS to perform conventional treatment consisting of tap water lavage and wound debridement. The debridement was performed manually, with the aid of a forceps, scalpel sheets 13 or 15 and gauze, for the removal of sloughs and devitalized tissue if necessary. The wounds were irrigated with tap water abundantly. Also the application of the 10% green banana peel gel was carried out. The wounds were treated every three days for 4 weeks, evaluated and measured. The gel was applied to patients with the aid of an individualized sterile dressing kit. The amount of gel was evenly distributed throughout the wound to full coverage of the wound. Transpore® Johnson & Johnson (São Paulo, SP) tape, 15cm by 10m coil, and then made a secondary dressing of Micropore®, made specifically for the experiment, were then wrapped in the patient.

In addition, wound samples were collected. The collection was performed weekly during dressing changes over a period of 4 weeks. During dressing change, the sample was collected after cleaning the affected area with sterile swab in an area of 3cm² and transported in test tubes containing one ml of sterile saline solution. The lesion was washed according to protocol established by the São João ambulatory. At each exchange the dressing was applied and the treatment with the banana gel was applied and the antimicrobial action of the gel was analyzed during this period. Total counts of bacteria were performed by PCA (Plate Count Agar). The reading was performed after 24 hours and 48 hours of incubation at 37 ° C.

The reduction of the area of the lesion was monitored weekly during the experiment by measuring the contour drawing of the wound in sterile acetate, tracing a vertical and a horizontal line, in order to obtain a 90° angle between them; Values were recorded in centimeters.

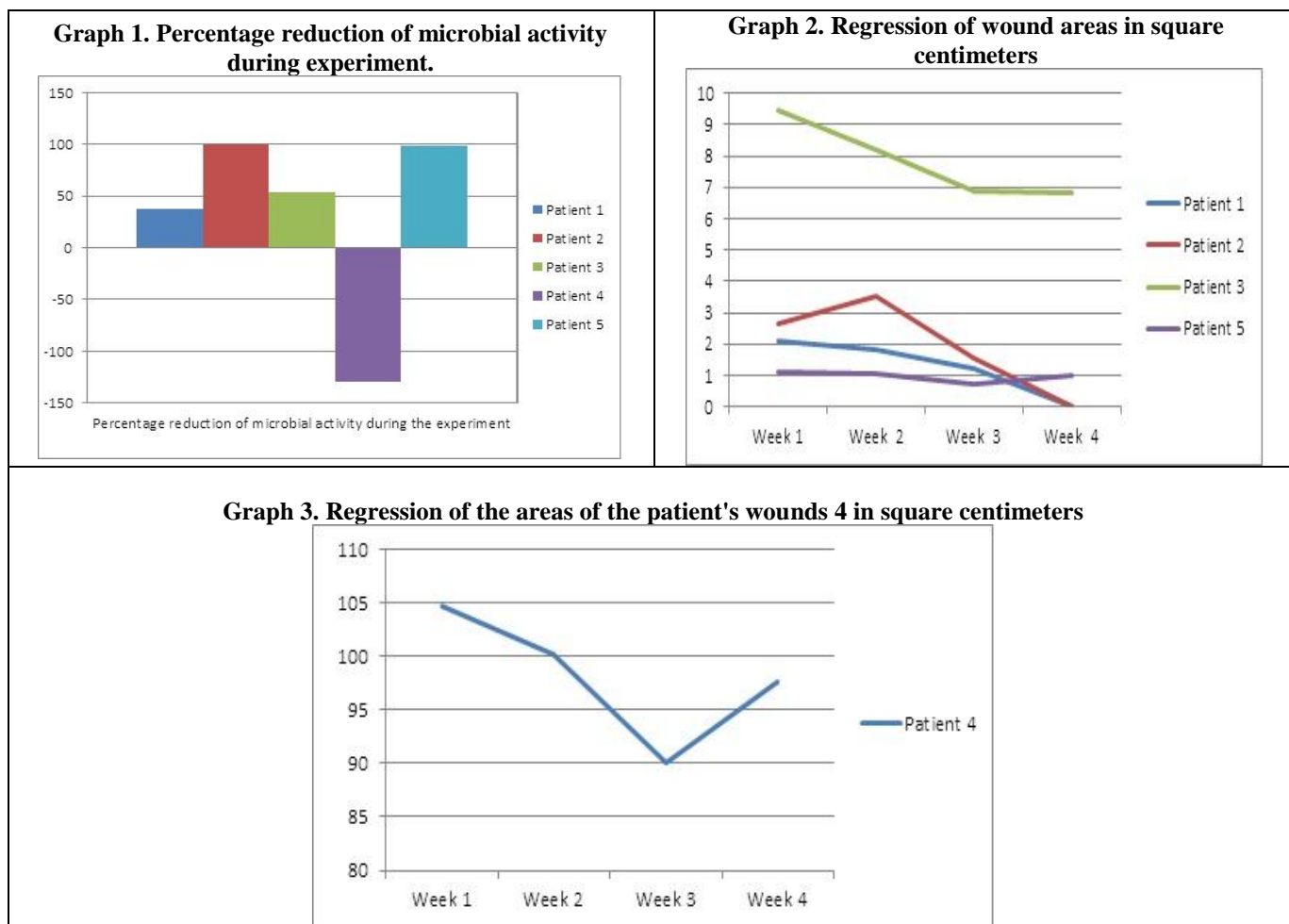
The comparison between the values obtained provided the actual size of the wound in order to evaluate the healing by digital planimetry with the use of the software Auto CAD 14®.

Fig 1. 1st Week of Treatment



Fig 2. Last week of treatment





DISCUSSION

The results are consistent with studies that reported the use of a 10% gel was produced from the banana peel extract, analogous to the present study, in incisional lesions in rats, demonstrating as therapeutic action the antimicrobial and healing effect of *Musa sapientum*, as the inhibition of the growth of enterobacteria and pyogenic bacteria. This study also identified, through phytochemical screening, tannins in the green banana extract extract, exhibiting significant antioxidant effects, suggesting that the banana peel extract could be useful to combat free radical-mediated diseases [10]. This study was promoted in rats, showing the pioneering nature of the present study in using *Musa sapientum* bark gel in humans. The banana peel has also a large amount of phenols, measured by the method of sequestration of the stable free radical 2,2-diphenyl-1-picrylhydrazyl (DPPH) and total phenols, which proved the potential of free radical scavenging activity [11] again suggesting the effectiveness of banana peels to combat free radical-related diseases. Another study demonstrates the use of a 4% gel of green banana peel in surgical wounds in rats, resulting in an increase of polymorphonuclear cells in the first week of experiment, and later reduction of the area of the lesion, reduction of vascular proliferation and Concentration of collagen fibers in the third week of study [12]

The present study demonstrated that 80% of the patients presented a great reduction of the microbial activity against the use of the gel based on the extract of the bark of the green banana *Musa sapientum* species to 10%, occurring in 40% of the patients a reduction of

approximately 99% of the activity Microbial This data reaffirms the power of green banana peel to inhibit the growth of microorganisms, such as enterobacteria and pyogenic bacteria, which are prevalent in diabetic wounds and venous ulcers.

Other studies also demonstrate the healing effect of *Musa sapientum* on gastric ulcers, which induced by acetic acid and after treatment with the banana extract had a significant improvement in the condition and other injuries [13]. In another study, skin grafts were performed in 30 patients. The donor area was divided into 2 parts. One was cover with leaves of the banana tree and the other with vaseline gauze. The treatment with the banana tree was less painful, as well as healing occurred in a shorter time, demonstrating as a therapeutic action the healing effect on wounds of the banana leaf in a skin graft donor area [14]. In addition to the banana leaves, the 4% gel of the *Musa sapientum* green bark also promoted a greater epithelization area in wound healing with second intention in rats, [15] showing the diversity of therapeutic actions

that come from Of the banana, its bark, the leaves of the banana tree, and its derivatives.

The present study demonstrated not only the decrease in microbial activity, but also the reduction of the wound area and consequent improvement of the lesion. Observing Figures 1 and 2 we can see the improvement of skin appearance, reducing erythema and edema, and assisting in the healing process of the lesion.

As for the choice of banana maturation, the banana green peel samples have a higher antioxidant action than the mature ones, since fractions from these samples have a higher amount of phenolic compounds [16].

Further studies are needed to ascertain the existence of other effects of green banana peel gel on wound healing, such as toxicity and other forms of administration. Phenolic compounds of plants belong to several categories, among them the most found are flavonoids, coumarins and condensed and hydrolysable tannins. These compounds have received much attention in recent years, since they inhibit lipid peroxidation and lipoxygenase in vitro. The antioxidant activity of phenolic compounds is mainly due to its reducing properties and

chemical structure, which play an important role in the sequestration of free radicals and chelation of transition metals, acting both in the initiation stage and in the propagation of the oxidative process. , And therefore an essential element in the prevention of chronic diseases and wound healing [17]. Research with a larger sample is also necessary in order to confirm the healing pharmacological activity of the green banana peel.

CONCLUSION

Reduction of microorganisms against the use of gel 10% of the green banana peel (*Musa sapientum*) in patients with a median of 53.57%, and reduction of wound areas on average of 48.1% with a significant improvement of the picture.

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Nil

CONFLICT OF INTEREST

No interest

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