PREMNACORYMBOSA (Burm. F.) ROTTL. AND WILLD LEAVES FOR WOUND HEALING: In Experimental Animals

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Background: Premnacorymbosa (Burm.F.) Rottl and Wild is a small tree used in traditional system of medicine for various disorders. The aim of the present study is to investigate the wound healing property of the Premnacorymbosa ethanol extract (PCEE) in experimental animals. Methods: In excision wound model, the PCEE at a doses of 1% and 2%, applied topically on the wound for 16 days. Results: The PCEE produced significant constricted the wound area in dose depended manner. Hence the PCEE possess a wound healing activity compared to control and standard group.

Keywords: wound, healing, leaves, Premnacorymbosa, excision-model.

INTRODUCTION

The natural products are used in the traditional medicine in India and in other countries. Many medicinal plants provide relief of symptoms comparable to that obtained from allopathic medicines. The majority of clinically important medicines in allopathy has various and severe side effects. Herbal medicine contains hundreds of chemicals and which are potentially active. Herbs and herbal medicine can cause toxic adverse effects has been reported. Therefore agents of natural origin with little side effects are required to as substitute for chemical therapeutic agents. The alternative medicine for treatment of various diseases is getting more popular.

Premnacorymbosa (Burm.f.) Rottl and Wild Syn-Cornutiacorymbosa (Burm.f.) (Verbenaceae) are a small-sized tree or large shrub with a comparatively short trunk and numerous branches, bearing simple, opposite, dark green, broad, elliptic, obtuse, very shortly acuminate and cymose panicles of small inconspicuous flowers. The roots light brown or yellowish brown, woody aromatic; Leaves elliptic ovate, sometimes pubescent; flowers greenish or greenish white, with a strong disagreeable odour, terminal corymbose cymes, drupes globose广泛的分布在印度各个地区。它常被称为 comparatively to that obtained from allopathic medicines. The majority of clinically important medicines in allopathy has various and severe side exchange.

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of *Premnacorymbosa* in excision wound models in Wister albino rats.

**MATERIALS AND METHODS**

**Collection of Specimen**

The plant species for the proposed study was collected from Chennai, Tamilnadu India. It was identified and authenticated by Dr. Jayaraman, Ph.D, Director of Plant Anatomy Research Centre (PARC), Sakti Nagar, West Tambaram, Chennai-India. The collected leaves were first dried in shade and then using hot air oven at a temperature not exceeded than 70°C. Then the size of leaves were reduced and powdered to a coarse form with the help of a blender.

**Preparation of the ethanol extract**

The leaves of the tree were washed well with water, dried under shade and powdered to fine grade by using laboratory scale mill. A batch of 500 g of powdered material was subjected to extraction in a soxhlet apparatus at 50 to 60°C for 36 hours of 6 cycles (6 hours per cycles) in 99 % (v/v) of 2 liters absolute ethanol. The extracted material was concentrated over a heating mantle maintained at 50°C until greenish semi solid masses were obtained. The yield of the product was approximately 2.5 g (w/w) of the dry leaves of *Premnacorymbosa* (Burm. F.) Rottl.and Willd. The final product was stored in vacuum desiccators at room temperature until analysis. For administration, the extract was suspended in 2 % of tween-80 to required concentrations.

**Animals**

The animals used in the experiment were wistar albino rats of both sexes (150-220g). They were housed in well ventilated polypropylene cages at controlled temperature of 24± 1°C, with a 12 h light / 12 h dark cycle and they had been provided with standard pellet diet and water ad libitum. The mice were assimilated to laboratory conditions for 7 days. Animals were kept under fasting for overnight, but allowed for free access of water before commencement of experiments. The experiments were conducted according to the guidelines and ethical norms, approved by ministry of social justice and empowerment, Government of India and the study was got approved from the Institutional Animal Ethical Committee (IAEC) of Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA).

**Acute toxicity studies**

Acute toxicity studies were carried out using acute toxic class limit test dose guidelines 425 of Organization for Economic Co-operation and Development (OECD). Acute toxicity of the plant extract was carried out, using groups of three Swiss albino mice, by administering a dose of 2000 mg kg -1 body weight, p.o., and the control group received normal saline. The toxicological effects were assessed on the basis of mortality and behavioral changes occurs during 48 hours.

**Wound Healing Evaluation**

Healthy albino rats of either sex weighing between 150-200 g were taken for study. They were individually housed and maintained on normal diet, water and vitamin b tablets. Screening for wound healing activity was performed by excision wound model. The hair on the skin of back surface of animals was removed by using a suitable depilatory. The selected animals were divided into four groups of six in each. All the test samples were applied topically. Excision Wound Model: For excision wound model 7, the animals were starved for 12 h prior to wounding. A circular wound of about 2 cm. (200 mm2) diameter was made on the dorsal thoracic region of rats under light ether anesthesia in semi aseptic condition and observed throughout the study. The animals were housed individually and all the test samples were applied once daily. The wound area of each animal was measured on 4th, 8th, 12th and 16th post wounding day. The percentage of wound contraction was calculated from the days of measurement of wound areas.

**RESULTS**

Effect of *Premnacorymbosa* on wound healing can be seen in Figure 1.
Histopathological Studies

Figure 2A
Control rat wound on zero day shows more fibroblasts with inflammatory area. Blood vessels were damaged and dilated. Neutrophils were present.

Figure 2B
Control rat on 16th day shows more inflamed tissue with fibroblasts and neutrophils. Blood vessels were dilated and damaged.

Figure 2C:
Test 2 showing regeneration of injured tissue, nearer to normal cell architecture. More organized collagen fibers with fibroblasts and restored blood vessels were observed.

Figure 2D
Test 1 shows less inflammatory tissue with fewer fibroblast. Moderate collagen fibers were found.

Figure 2E
Standard shows increased collagen fibers, less fibroblasts and well-developed blood vessels were observed.

DISCUSSION
The function of skin is to serve as a protective barrier against the environment. Wounds are physical injuries that result in an opening or break of the skin. Wound healing is a natural process of regenerating dermal and epidermal tissue, and may be categorized into four phases: an inflammatory phase, a migratory phase, a proliferative phase, and a maturation phase. During the inflammatory phase, a blood clot forms in the wound and loosely unites the wound edges. The vasodilation and increased permeability of blood vessels associated with inflammation enhance delivery of helpful cells. These include phagocytic white blood cells called neutrophils; monocytes, which develop into macrophages that phagocytize microbes; and mesenchymal cells, which develop into fibroblasts. In the migratory phase, the clot becomes a scab, and epithelial cells migrate beneath the scab to bridge the wound. Fibroblasts migrate along fibrin threads and begin synthesizing scar tissue (collagen.
fibers and glycoproteins), and damaged blood vessels begin to re-grow. During this phase, the tissue filling the wound called granulation tissue. The proliferative phase is characterized by extensive growth of epithelial cells beneath the scab, deposition by fibroblasts of collagen fibers in random patterns, and continued growth of blood vessels. Finally, during the maturation phase, the scab sloughs off once the epidermis has been restored to normal thickness. Collagen fibers become more organized, fibroblasts decrease in number, and blood vessels are restored to normal and the wound become contracted. A therapeutic agent selected for the treatments of wound should ideally improve one or more phases of healing without producing side effects.

In the present study *Premnacorymbosa* ethanol extract ointment (1% and 2%) was topically applied on the wound of rats once daily for 16 days and the extract showed dose dependent wound contraction as compare to the control group.

In the tissue repair process inflammatory cells promote migration and proliferation endothelial cells, leading to neovascularization of connective tissue cells which synthesize collagen and keratinosides resulting to re-epithelialization of the wound tissue. In the wound healing process, collagen formation peaks at day 7 and epithelialization occurs in 48 h under optimal condition. The present result also indicated significant decrease in wound area from day 8 onwards and up to 16 day study indicating early healing. The wound healing effect of *Premnacorymbosa* was also supported with our histopathological studies.

CONCLUSION
The present study clearly indicates that *Premnacorymbosa* possess potent wound healing effect. Further studies are sought to explore the active compound(s) and the molecular mechanism of wound healing effect.

REFERENCES

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