



Antimicrobial and Wound Healing Activity of *P. Marsupium* in Animal Model

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ABSTRACT

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Pterocarpus Marsupium is known for varied medicative uses and it's conjointly standard because it helps in lowering glucose level. the utilization of *Pterocarpus* within the Ayurveda system of ancient medication is thousands of years old. The aerial seeds are the foremost unremarkably used components of the tree, together with the wood, flowers, and leaves. Practitioners of the Ayurveda system typically use a cup made of the wood of *Pterocarpus*. This study was designed to research application and foundational organization of plant product concentrate of the leaf of *Pterocarpus Marsupium* for large injury healing activity and the study of plant to open injury in society medication

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Introductions:

The *Pterocarpus marsupium* is understood by totally different names in numerous regions, like Piasal in Malabar in Bengal and Bijiyasal in the western Asian nation. The leaves, bark, and gum of Indian kino are employed for the set variety of ailments owing to its healthful properties. The wound is that the interruption of the continuity in tissue ensuing from the gap or break of the skin. The wound could arise thanks to physical, chemical or microorganism agents. The healing of the wound is crucial so as for the restoration of the tissue continuity and disturbed skin standing ^[1]. Plants area unit indispensable to man for his life. The history of flavorer medication is as precious as human civilization. The wealth of Asian country is held on within the huge natural flora that has been talented to her. endued with a good diversity of agro-climatic conditions, Asian country is just about herbarium of the globe. The importance of healthful and aromatic plants has been emphasized from time to time. it's believed that the medication of natural origin shall play a vital role in attention significantly within the rural areas of India ^[2]. *P. marsupium* Roxb is big in deciduous and evergreen forests of central, western and southern regions of an Asian country. it's found largely within the states of Gujrat, Madhya Pradesh, and Bihar ^[3,4]. it's of moderate size to a massive tree. the peak ranges from fifteen to thirty m. The stem is stout and crooked with wide spreading branches. The bark is thick and dark brown to gray in color. Leaves are compound and imparipinnate. Leaflets are five to seven, coriaceous, oblong, obtuse, emarginated or maybe bilobed at the apex and glabrous on each surface. The flowers area unit terribly varied, white, with the little tinge of yellow. Seeds area unit single and unsubdivided ^[5]. historically, the stuff has been used as a cooling external application for a headache, inflammations, as antipyretic, antihelminthic, aphrodisiac, mental aberrations, and ulcers. The bark is employed for the treatment of stomach ache, cholera, dysentery, urinary complaints, tongue diseases and ache ^[6]. The wood and bark of *P. pouch* area unit renowned for his or her antidiabetic drug activity ^[7]. a spread of flavonoids and their derivatives are isolated

from totally different components of the plant. It additionally showed its antimicrobial activity against bacteria genus aeruginosa, staphylococci aureus and enteric bacteria respiratory illness [8]. The literature survey discovered that general analysis of this plant remains lacking. Therefore, the current analysis work was aimed to judge the wound healing activity of the *P. marsupium*. leaves.

Materials and Methods:

Plant assortment and Authentication: The plant was known, confirmed and genuine with the assistance of systematist. when authentication leaves were collected in bulk and washed beneath running water to get rid of adhering dirt. Then the leaves were shade-dried. The dried materials were created into coarse powder by grinding in the mechanical grinder and hold on in an exceedingly closed airtight container for additional use.

Preparation of Extracts: The coarse powder was taken in Soxhlet equipment and extracted in turn with ethyl alcohol, petroleum ether as solvents. a complete quantity of 250 g coarse powder was extracted with five hundred milliliters of every solvent. for every solvent, ten cycles were run to get the thick suspension. every suspension was then focused beneath reduced pressure to get the crude extract. All crude extracts were unbroken in closed airtight containers beneath cool and dark place for additional study [7,8].

Evaluation of Wound healing activity:

Animal: Healthy adult Wister strain of anomaly rats weighing approximately 180 to 250 g were used. They were housed in normal conditions of temperature of 25 ± 2 °C at 12 h light-weight per day cycle, ratio of 45 to 55 you curious about animal house. They were fed with normal pellets of food and water. Animals were unbroken and every one operation on animals was worn out sterile condition.

Experimental protocol: Animals were chosen, weighed and divided into 3 gatherings (n=6), to be specific management, normal medication and 3 gatherings having an area with four distinctive concentrate of *P. marsupium*.

Ointment preparation: associate ethanolic concentrate of *P. marsupium* leave was utilised for the look of the treatment for topical application. Concentrate primarily based treatment was found out in convergence of 10 % utilizing affordable salve base, additive and place away in refrigerator till the purpose once in addition utilize.

Excision wound model: Excision wound model was utilized for the investigation of rate of constriction of wound and epithelization. Creatures were daintily anesthetized with diethyl ether and therefore the back hairs of the creatures were depilated by shaving. a control was created on the dorsal body part district 1 cm far from vertebral section and 5 cm aloof from ear on the anesthetized gnawing animal. Extraction wounds calculable 200 millimetre² and a pair of mm profundity were created by removing layer of skin from the shaven zone. hemostasis was accomplished by blotching the injury with cotton swab absorbed typical saline. the full twisted was left open. The examination enclosed 3 distinct gatherings of six creatures in each gathering as takes when and therefore the treatment was done locally in all of the cases as cluster – I. was controlled as management creatures that got harm for wound development. Gathering II was controlled normal creatures that got harm for wound development and treatment with povidone iodine balm (10 % w/w). Gathering III was controlled tried or tranquilize treated creatures that got harm for wound arrangement and treatment with leave of *P. marsupium* ethanolic separate treatment (10 % w/w) [9].

Table 1. Wound healing activity data of *P. marsupium* leave extract for 5 and 10 days.

Groups Wound area (mm²)

Day	Day 0	Day 5	Day 10
I	200	183.5±6.4	157.1±12.2*
II	200	137.1±11.7	83±14.7*

III	200	143.5±14.1*	77.3±16.17*
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Mean number (mm²) ± SD of wound contraction. p<0.05 compared to control (n=6 in each group). Groups I II and III are normal, standard and test control.

Table 2. Wound healing activity data of P. marsupium leave extract for 15 and 20 days

Groups Wound area (mm²)

Day	Day 0	Day 5	Day 10
I	200	107.5±7.5*	31.1±8.8
II	200	23.1±10.9*	0.0±0.00*
III	200	33.5±9.2*	0.0±0.00*

Mean number (mm²) ± SD of wound contraction. p<0.05 compared to control (n=6 in each group). Groups I II and III are normal, standard and test control.

Estimation of wound Area: The dynamic changes in wound zone were checked on foreordained days i.e., 0, 5, 10, 15 and multi day. Later on, wound region was estimated.

Estimation of wound Contraction: Wound withdrawal was computed as level of the lessening in unique injury zone measure. It was ascertained by utilizing following equation;

$$\text{Wound withdrawal (\%)} = [(A_i - A_{nth}) / A_i] \times 100 \dots (1)$$

Where, A_i is introductory region of wound and A_{nth} is Nth day region of wound.

Statistical Examination:

The outcomes are accounted for as Mean and standard deviation. Whenever likelihood (p) was under 0.05 was considered as noteworthy .

Results and Discussions:

The balm planned with *P. marsupium* leave separate connected on test group has demonstrated injury healing impact, as contrast and the standard Povidone iodine salve to the untreated control assemble as it advances wound constriction and abbreviates epithelialization period. The rate exhibited in Table 1, 2 and Fig 1, demonstrated the healing nature with the recuperating length are parallel with capability of twisted mending of *P. marsupium* leave concentrate and it has demonstrated its noteworthy fast wound healing related with impressive and powerful antimicrobial impact. The dynamic constituents exhibit in *P. marsupium* leave are alkaloids, flavanoids, saponins, phenols, steroids, glycosides, tar and tannins. Tannins, phenols and flavanoids are the real constituents that are in charge of wound healing.

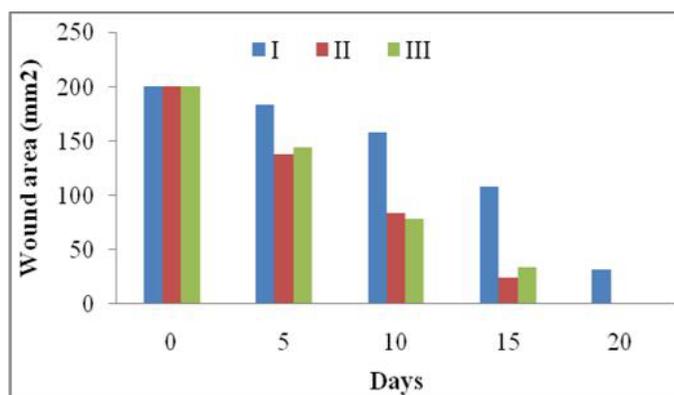


Fig 1. Percentage wound healing closure of *P. marsupium* leave extract.
Groups I, II and III are normal, standard and test control.

Conclusion:

The result of the present investigation recommend that nearby application and foundational organization of ethanol concentrate of the leaf of *Pterocarpus marsupium* has demonstrated more huge injury healing activity in excision wound models and bolster the mainstream utilization of plant to open injury in society medication. The injury recuperating property of *Pterocarpus marsupium* has been credited to its antimicrobial impacts.

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