

April 16-17, 2018
Amsterdam, Netherlands

Rahul Chandran et al., Am J Ethnomed 2018, Volume 5
DOI: 10.21767/2348-9502-C1-005

WOUND HEALING PROPERTY OF SYZYGIIUM MUNDAGAM BARK METHANOL EXTRACT IN DIABETIC RATS

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Statement of the Problem: Diabetic foot ulcers are one of the major complications among diabetic patients. Wounds, under diabetic conditions show delayed healing due to microbial infection, generation of reactive oxygen species and reduced blood flow. A control over the blood glucose along with alternative therapies would be an ideal measure to treat diabetic foot ulcers and wounds. The search for cost-effective medication with maximum healing properties and minimal to no side effect has led scientists to investigate plants as an alternative source of medicinal products.

Methodology & Theoretical Orientation: This study features the use of *Syzygium mundagum* bark methanol (SMBM) extract in the treatment of wounds in streptozotocin-nicotinamide induced diabetic rats. The extract ointment base, at 1 and 2%, respectively, was applied to the wounded areas on the rats and monitored for 21 days. The wound closure, epithelialization period and histopathology of the wounds were evaluated during the study.

Findings: Both the concentrations of the extract (1% and 2%) healed the wounds even under diabetic conditions induced in rats on day 21 (99.69% and 100%, respectively). The 2% SMBM treated animals showed a higher rate of epithelialization of the wound (15±0.49 days). The histopathology of the wounded skin on 10th day revealed that the rats treated with SMBM extract could initiate the healing and re-epithelialization. This was evident from the migration of neutrophils and proliferation of fibroblasts. On the 21st day, complete healing of the skin could be observed in the rats treated with 2% extract which was evident from the newly formed epidermis, collagen fibres and fibroblast. The results compared well with those treated with betadine (5%).

Conclusion & Significance: The results of this study will support the use of this plant extract for diabetic healing over the use of commercially available synthetic drugs.

Recent Publications

1. Saikumar S, Chandran R, Sajeesh T, Abrahamse H and Parimelazhagan T (2018) Phytochemical composition, antioxidant and anti-bacterial activity of wild edible fruit *Syzygium calophyllifolium* Walp. Journal of Food Science and Technology 55(1):341–350.
2. Chandran R, George B P, Abrahamse H and Parimelazhagan T (2017) Therapeutic effects of *Syzygium mundagum* bark methanol extracts on Type-2 diabetic complications in rats. Biomedicine and Pharmacotherapy 95:167–174.
3. Chandran R, Abrahamse H, Parimelazhagan T and Gowtham D (2017) *Syzygium mundagum* bark methanol extract restores skin to normal in diabetic wounded rats. Biomedicine and Pharmacotherapy 94:781–786.
4. Chandran R, Parimelazhagan T and George B P (2017) Anti-hyperglycemic activity of the bark methanolic extract of *Syzygium mundagum* in diabetic rats. Alexandria Journal of Medicine 53(4):317–324.
5. Chandran R, Saravanan S, Sajeesh T and Parimelazhagan T (2016) Antidiabetic activity of *Syzygium calophyllifolium* in streptozotocin-nicotinamide induced Type-2 diabetic rats. Biomedicine and Pharmacotherapy 82:547–554.

Biography

Rahul Chandran is currently doing Post-doctoral Research under the supervision of Prof. Heidi Abrahamse in Laser Research Centre, Faculty of Health Sciences, University of Johannesburg, South Africa. His research focus is on the differentiation of stem cells to insulin producing cells for diabetic therapy. He has published 22 research articles in the field of Pharmacology and Nutritional Sciences in peer reviewed international journals. He has filed patent for the novel compounds isolated during Doctoral research. During his PhD in Botany, he was awarded with DST-INSPIRE fellowship from the Ministry of Science and Technology, Govt. of India and worked as Junior and Senior Research Fellow for the period of five years.

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