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Morphometric and histological studies of the effects of aqueous extract of *Costus afer* stem juice on cutaneous wound of adult albino rats

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Statement of the Problem: Skin regeneration is a major challenge of adult mammals that has only been overcome with elaborate and expensive procedures. This calls for the search for cheaper and readily available wound regeneration products. Thus, this study was to investigate the wound healing potential of *Costus afer* stem juice which has been shown to contain pro-healing biomolecules and minerals.

Methodology: Twenty-five adult female albino rats weighing between 243-320 g were used for the study. The rats were divided into 5 groups of group A without treatment; group B, treated only on the first day with iodine ointment; group C, treated for 7 days with iodine ointment; group D, treated only on the first day with *Costus afer* paste; and group E, treated for 7 days with *Costus afer* paste. They were wounded on their dorsum under ketamine hydrochloride anaesthesia and were treated according to their groups upon haemostasis. Rate of contraction and re-epithelialization were evaluated using ruler application. The tensile strength of healed skin was measured using a tensiometer. Samples of the healed tissue were collected for H&E and Masson's trichrome histological assessment.

Findings: Groups D and E wounds treated with *Costus afer* extract maintained an uninfected moist wound environment despite being open to the atmosphere. The rate of re-epithelialization was significantly highest in group D which also had a significantly highest tensile strength of 692.2 g at $p < 0.05$. There was no significant difference in the rate of contraction. H&E and Masson's trichrome sections showed randomly organized collagen fibres in groups D and E. There was also indication of growing hair follicles in group D.

Conclusions: Aqueous extract of *Costus afer* stem prove to be more effective in wound healing than iodine. With advanced investigations, it could provide a convenient, common and affordable wound healing agent that can lead to skin regeneration.

Recent Publications

1. Peter A I and Udoh K P (2015) Histomorphological effects of co-administration of efavirenz and vitamin E on the hippocampus of Wistar rats. *Indo Global Journal of Pharmaceutical Sciences* 5(3):192-198.
2. Peter A I, Udoh K P and Ekanem A U (2017) Histomorphological effect of lamivudine on the cerebellum of Wistar rats. *Histology, Cytology and Embryology* DOI: 10.15761/HCE.1000114.
3. Umoh I U and Ekanem A U (2018) The effect of ethanol extract of *Xylopiya aethiopia* fruits on the histomorphology of the kidney of albino Wistar rats. *Journal of Pharmaceutical Research International* 21(4):1-7.
4. Salami H A, John A I and Ekanem A U (2012) The effect of aqueous preparation of *Allium cepa* (Onion) and *Allium sativa* (garlic) on erythrocyte osmotic fragility in Wistar rats: *in vivo* and *in vitro* studies. *Nigerian Journal of Physiological Sciences* 27(1):29-34.
5. Ekanem A U, Garba S H, Samdi M T and Dare N D (2010) Anthropometric study of the pinna (auricle) among adult Nigerians resident in Maiduguri Metropolis. *Journal of Medical Sciences (Faisalabad)* 10(6):176-180.

Biography

Kudighe Patrick Udoh is a Lecturer in the University of Uyo Teaching Hospital, Nigeria. She obtained her BSc Anatomy and MSc Anatomy from the University of Uyo with her PhD currently in view. She has passion for education and research with research interest in tissue regeneration. Her passion has driven her to acquire knowledge and skills in the area through conferences and workshops. Her present work discovered a plant product that maintains an open moist wound environment and drives the healing process towards skin regeneration. She has publications in many journals and she is open for research collaboration.

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