

MALAYSIA INTERNATIONAL BIOLOGY SYMPOSIUM 2016 | 26th – 27th OCTOBER 2016 | PICC, PUTRAJAYA**Topical application of *Acacia nilotica* pods' water extract enhances wound healing in Sprague-Dawley rats by alleviating oxidative stress and suppressing pro-inflammatory cytokines**Sulaiman Sani Kankara^{a,b}, Dahiru Sani^c, Muskhazli Mustafa^b, Mohd Hafiz Ibrahim^b and Rusea Gob^{b,*}^aDepartment of Biology, Faculty of Natural and Applied Sciences, Umaru Musa Yar'adua University, P.M.B. 2218 Katsina State, Nigeria.^bDepartment of Biology, Faculty of Science, Universiti Putra Malaysia 43400 Serdang, Selangor Darul-Ehsan Malaysia.^cPharmacology Laboratory, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor Darul-Ehsan Malaysia.**Abstract**

This study was conducted to validate the folkloric use of *Acacia nilotica* pods as wound healing agent. Full thickness excision wounds of 6mm diameter were created on Sprague-Dawley rats. Prior to the wound healing assessment, the antioxidant activity of the extract was determined *in vitro* using 2,2'-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging activity. Six groups of 6 wounded rats were formed. In each group, the wounds were topically treated with either petroleum jelly (vehicle control), silver sulfadiazine (positive control), 0.5%, 1% or 2% *Acacia nilotica* cream (treatment groups) prepared by mixing appropriate quantity of *A. nilotica* pods' aqueous extract with petroleum jelly. The negative control group received no treatment. The wound healing parameters assessed include wound contraction rate, level of pro-inflammatory cytokines Interleukin1 β (IL-1 β) and Tumor Necrosis Factor- α (TNF- α) and histopathological analysis of the wound area. Wounds were assessed on 7th and 14th post wounding days. The extract showed a good, dose dependent DPPH-radical scavenging activity comparable to trolox. Topical application of *A. nilotica* cream significantly ($P < 0.05$) enhances wound contraction rate compared to the control groups in both 7th and 14th days of evaluation. The extract also significantly suppressed the expression of both IL-1 β and TNF- α in dose dependent manner throughout the study period. The histological analysis revealed that the extract treatment enhanced cellular proliferation as evident by the increased capillary vessels, re-epithelization and dermal tissues regeneration. Overall study suggest that *A. nilotica* pods' water extract promotes wound healing in Sprague-Dawley rats by ameliorating oxidative stress and suppression of pro-inflammatory cytokines. This study validates the folkloric use of *A. nilotica* pods for postpartum wound healing for the first time. Further studies aimed at identifying and isolating active principles from this plant is recommended.

Keywords: *Acacia nilotica*, wound healing, oxidative stress, pro-inflammatory cytokines.

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