

EVALUATION OF THE ANTINOCICEPTIVE, ANTIPYRETIC AND ANTI-INFLAMMATORY PROPERTIES OF METHANOLIC BARK EXTRACTS OF *Terminalia brownii* IN WISTAR RATS



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DECLARATION

I, Mbiri Jane Wanja, declare that this thesis is my original work and has not been presented for the award of a degree in any other university or any other award.

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We confirm that the work reported in this thesis was carried out by the candidate under our supervision and has been submitted with our approval as University supervisors.

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ABSTRACT

Pain, pyrexia and inflammation cause unnecessary discomfort, suffering and also lower productivity of the victims. Conventional drugs for these conditions are expensive, not easily available and have adverse side effects. There is therefore need to develop alternative therapeutic agents, such as medicinal plant derivatives, that are cheaper and have lesser side effects. *Terminalia brownii* is used in traditional medicine to treat pain, pyrexia, inflammation but there is no scientific evidence to confirm these ethno-medicinal claims. The present study therefore tested for the anti-nociceptive, antipyretic and anti-inflammatory properties of methanolic bark extracts of *T. brownii* in *Rattus novvegicus*. The plant samples sourced from Kitui County, Kenya were dried and milled at Kenyatta University Biochemistry department laboratory. Adult male Wistar rats (*R. novvegicus*), 2-3 months old, weighing 140-180g were divided into six groups of 5 rats each scheduled for different treatments; normal, negative and positive controls and three experimental groups (50, 100 and 150mg/kg bw extract). Formalin-induced pain, turpentine oil-induced pyrexia and carrageenan-induced paw edema were used to assess the antinociceptive, antipyretic and anti-inflammatory properties of the extract, respectively. The antinociceptive and anti-inflammatory activities of the extract were compared to those of diclofenac while the antipyretic activity of the extract was compared to that of aspirin. The phytochemical secondary metabolites tested for include alkaloids, cardiac glycosides, flavonoids, phenols, saponins, steroids and terpenoids. *T. brownii* methanolic bark extract demonstrated significant antinociceptive, antipyretic and anti-inflammatory effects in a dose-dependent manner. The extract at the dose level of 150mg/kg bw exhibited the highest antinociceptive, antipyretic and anti-inflammatory activities and its activities were comparable to those of the respective reference drugs. The methanolic bark extracts of *T. brownii* reduced the paw licking time by between 4.62%-44.96% ($p \leq 0.05$) in the early phase and 35.77%-58.89% ($p \leq 0.05$) in the late phase. Diclofenac on the other hand reduced the paw licking time by 44.79% in the early phase and 55.33% in the late phase. The extract reduced the elevated rectal temperatures by between 1.15%-4.38% ($p \leq 0.05$) while aspirin reduced by between 0.00%-4.85%. The extract reduced the inflamed paw diameter by between 1.57%-20.41% ($p \leq 0.05$) while diclofenac reduced by between 11.12%-25.33%. Phytochemical screening of the extract indicated the presence of alkaloids, cardiac glycosides, flavonoids, phenols, saponins, steroids and terpenoids. The present study therefore demonstrated the antinociceptive, antipyretic and anti-inflammatory properties of methanolic bark extracts of *T. brownii* hence providing a basis for further research that may result in pure compounds that can be advanced into drug discovery.