**TITLE**: **TOXICITY EFFECTS OF** *Erythrophleum suaveolens* **EXTRACTS ON SUB-ADULT** *Clarias gariepinus* **(BURCHELL,** 1882**)**

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**ABSTRACT**

Phytochemicals which are natural biocides have the ability to replace synthetic biocides which can be persistent with a potential to impair the health of aquatic organisms. This study investigated the toxic effects of *Erythrophleum* *suaveolens* extracts on sub-adult *Clarias* *gariepinus*. Three hundred sub-adult C. *gariepinus* (121.94 ± 0.31 g), mean standard length 24.45 ± 0.89 cm were exposed to aqueous stem bark extract (ASBE) of *E. suaveolens* 3.00, 2.25, 1.50, 0.75 g/L and aqueous leaf extract (ALE) of *E. suaveolens* 3.50, 2.63, 1.75, 0.88 g/L with 0.00 g/L as control. A static non-renewal bio-assay test was used to determine the 96-hr acute toxicity of the extracts from which the 50% lethal concentrations (LC50) were obtained. For the sub-lethal tests, the fish were exposed to the LC50 for 28 days. Qualitative phytochemical screening of both extracts revealed the presence of phenols, alkaloids, flavanoids, oxalate, tanins, cyanogenic glycosides, and saponins. Quantitative analysis showed that tanins, saponins and oxalate were more in the stem bark than in the leaf, while phenols and flavonoids were more in the leaf. LC50 for the ASBE was 2.30 g/L and ALE was 2.56 g/L. Behavioural signs such as air gulping, erratic swimming, scratching on the wall of the container were evident among the fish with increasing concentration, while Barbel deformation was pronounced in fish exposed to ALE (3.50 g/L). ASBE and ALE affected water quality parameters; there were significant (p<0.05) differences in Dissolved Oxygen, Electrical Conductivity, pH, and Total dissolved solids, compared to the control. Haematological parameters of exposed fish during the 28 days showed significant (p< 0.05) difference in the Parked cell volume (PCV), Haemoglobin (HB), Erythrocyte count (RBC) of ASBE and ALE at 7, 14 and 21 post exposure days when compared with the control. However, on day 28, there were significant (p<0.05) differences in RBC, Mean corpuscular haemoglobin concentration (MCHC) and Monocyte (MON). There was also a significant (p<0.05) difference in the Leucocyte count (WBC) of the exposed fish when compared to the control on day 14 of exposure. WBC values decreased during the exposure, while the RBC, HB, PCV increased during the exposure period. Presence of ASBE and ALE had no significant effect on fish weight at the end of 28days. However, those exposed to ALE had superior growth response (30.00 ± 7.03 g), ASBE (27.32 ± 2.25 g) and control (24.60 ± 1.26 g). Histopathological changes in the gills of fish exposed to ASBE and ALE revealed signs of severe erosion of the entire gill mucosa and severely eroded mucosa of the secondary lamellae respectively. Liver of fish exposed to ASBE and ALE showed a severe diffuse vacuolation and necrotic hepatocyte, with mild to moderate cellular infiltration and a severe diffuse vacuolation of hepatocytes, with several hepatocytes necrotic respectively. Higher and lower concentrations of the aqueous stem bark and leaf extracts had toxic effects on the exposed fish as they both caused polycythemia in fish and hypoxic condition in the water.

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