

Dynamics of the limnological features and diversity of zooplankton populations of the Cross River System SE Nigeria



Physico-chemical factors and zooplankton diversity were investigated over a two year period in three regions along the 200 km length of Cross River. The objective of the study was to quantify the relative importance of local environmental conditions and diversity of the principal zooplankton species within sampling sites. Mean conductivity, TDS and chlorides were highest upriver with values $289 \pm 198 \mu\text{s}\cdot\text{cm}^{-1}$, $322.9 \pm 101 \text{ mg}\cdot\text{L}^{-1}$, and $105.8 \pm 77.3 \text{ mg}\cdot\text{L}^{-1}$ and lowest downriver with $123.5 \pm 78.9 \text{ mg}\cdot\text{L}^{-1}$, $45.8 \pm 23.7 \text{ mg}\cdot\text{L}^{-1}$ and $109 \pm 89 \mu\text{s}\cdot\text{cm}^{-1}$ respectively. Values of wet season water conductivity ($406 \pm 178 \mu\text{s}\cdot\text{cm}^{-1}$), TDS ($420.4 \pm 267 \text{ mg}\cdot\text{L}^{-1}$), alkalinity (289.9 ± 34.7), total hardness ($205.8 \pm 37 \text{ mg}\cdot\text{L}^{-1}$), BOD (1.7 ± 0.2), chlorides (205.8 ± 37) and ammonium ions ($0.2 \pm 0.1 \text{ mg}\cdot\text{L}^{-1}$) were significantly higher than dry season values of $156 \pm 78.5 \mu\text{s}\cdot\text{cm}^{-1}$, 0.2 ± 0.1 , 123.8 ± 15 , 101.4 ± 87.9 , 0.2 ± 0.1 , 78.1 ± 34.8 and $0.1 \pm 0.1 \text{ mg}\cdot\text{L}^{-1}$ respectively. Out of twenty seven (27) zooplankton species identified Cladocerans (Ceriodaphnia, Evadne, Alona sp.) and Decapods (Lucifer, Penaeid nauplius, and Hermit crab larva) were the most diverse taxonomic group, while Tintinnopsis was the only Ciliate. Rainfall value was positively correlated with hydrological characteristics (size of river,

flow velocity, water level, and transparency), which in turn determined values of physico-chemical properties and explained the observed seasonal and spatial changes in zooplankton diversity. Though water quality parameters were within the limits set by the World Health Organization (WHO) and European Economic Community (EEC) for good water, the changes in hydrological features of Cross River could be suspected to provide highly unstable aquatic habitat that could subsequently affect the stability of zooplankton and other aquatic organisms.

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