

## The Dynamics of Planktonic Crustacean Populations in an Open Access Lagoon, Bordered by Heavy Industry, Southwest, Nigeria

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**Abstract :** Aims: The study is aimed at establishing the influence of some physical and chemical parameters on the abundance, distribution pattern and seasonal variations of the planktonic crustacean populations. Place and Duration of Study: A premier investigation into the dynamics of planktonic crustacean populations in Ologe lagoon was carried out from January 2011 to December 2012. Study Design: The study covered identification, temporal abundance, spatial distribution and diversity of the planktonic crustacea. Methodology: Standard techniques were used to collect samples from eleven stations covering five proximal satellite towns (Idoluwo, Oto, Ibiye, Obele, and Gbanko) bordering the lagoon. Data obtained were statistically analyzed using linear regression and hierarchical clustering. Results:Thirteen (13) planktonic crustacean populations were identified. Total percentage abundance was highest for *Bosmina* species (20%) and lowest for *Polyphemus* species (0.8%). The Pearson's correlation coefficient ("r" values) between total planktonic crustacean population and some physical and chemical parameters showed that positive correlations having low level of significance occurred with salinity ( $r = 0.042$ ) (sig = 0.184) and with surface water dissolved oxygen ( $r = 0.299$ ) (sig = 0.155). Linear regression plots indicated that, the total population of planktonic crustacea were mainly influenced and only increased with an increase in value of surface water temperature ( $Rsq = 0.791$ ) and conductivity ( $Rsq = 0.589$ ). The total population of planktonic crustacea had a near neutral (zero correlation) with the surface water dissolved oxygen and thus, does not significantly change with the level of the surface water dissolved oxygen. The correlations were positive with  $NO_3-N$  (midstream) at Ibiye ( $Rsq = 0.022$ ) and (downstream) Gbanko ( $Rsq = 0.013$ ),  $PO_4-P$  at Ibiye ( $Rsq = 0.258$ ),  $K$  at Idoluwo ( $Rsq = 0.295$ ) and  $SO_4-S$  at Oto ( $Rsq = 0.094$ ) and Gbanko ( $Rsq = 0.457$ ). The Berger-Parker Dominance Index (BPDI) showed that the most dominant species was *Bosmina* species (BPDI = 1.000), followed by *Calanus* species (BPDI = 1.254). Clusters by squared Euclidan distances using average linkage between groups showed proximities, transcending the borders of genera. Conclusion: The results revealed that planktonic crustacean population in Ologe lagoon undergo seasonal perturbations, were highly influenced by nutrient, metal and organic matter inputs from river Owoh, Agbara industrial estate and surrounding farmlands and were patchy in spatial distribution.

**Keywords :** diversity, dominance, perturbations, richness, crustacea, lagoon

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