

SEASONAL DISPARITY IN BIOTIC INDICES OF AQUATIC INVERTEBRATE'S POPULATION OF RIVER BENUE AT MAKURDI AS A MEASURE OF ECOLOGICAL INTEGRITY

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ABSTRACT

The dumping of wastes into rivers without recourse to the damage of the waste on the biodiversity is very common in the developing nations of the World as it is noticed in River Benue at Makurdi. To evaluate the ecological integrity of River Benue at Makurdi, sediments samples collected for two years (from July 2011-June 2013) monthly from five different stations on the shoreline of River Benue at Makurdi. A perusal at result of the biodiversity of benthic fauna in River Benue indicate that a total of 4,451 macro benthic fauna individuals comprising of 4 phyla and 21 taxa were obtained. More individuals were recorded during the dry seasons as compared to the rainy seasons. Benue brewery (570 individuals/m²) and Mikap Nigeria Ltd (649 individuals/m²) recorded low population as compared to the other locations: Coca cola (1,177), Wadata market (1,043 individuals/m²) and Wurukum abattoir (1,012 individuals/m²). Athropoda had the highest population of individuals as compared to the other phyla. The population of the benthic fauna were subject to six biotic indices to ascertain the ecological status of River Benue at Makurdi. Across the seasons the result of the ecological model showed that Shannon diversity varied from 2.06-3.25, Margelef diversity 2.98-4.36, Simpson diversity varied from 0.87-0.96 and Menhinick diversity ranged from 0.95-2.80. Similarly there mean values were 2.65, 3.61, 0.92 and 1.68 respectively during the 24 months across the seasons. All the same the Pielou evenness index varied from 0.81-1.00 and the Simpson dominance varied from 0.00-0.31 with the mean values of 0.91 and 0.41 respectively. At the studied location Shannon diversity varied from 1.81-3.00, Margelef diversity 2.10-4.44, Simpson diversity varied from 0.80-0.95 and Menhinick diversity ranged from 2.20-2.61. Similarly there mean values were 2.45, 3.44, 0.89 and 2.47 respectively during the 24 months across the seasons. The Pielou evenness and Simpson dominance ranged from 0.62-0.94 and Simpson dominance ranged from 0.28-0.47 in the course of the study. The biotic indices of river Benue at Benue brewery and Mikap Nigeria Ltd showed clearly that these location were impact by the anthropogenic activities and compromised the ecological integrity which indicate the perturbed nature of the study area. It is recommended that indiscriminate dumping of effluents and waste in the river should be discouraged.

Keywords: Biotic indices, River Benue, Aquatic Invertebrates.