JEP> Vol.2 No.3, May 2011

OPEN ACCESS

Plankton- Based Assessment of the Trophic State of Three Tropical Lakes

PDF (Size:594KB) PP. 304-315 DOI: 10.4236/jep.2011.23034

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ABSTRACT

In developing countries, lakes being important sources of water supply and fishing are vulnerable to anthropogenic impact, yet knowledge of their trophic state in relation to changes in species composition, and environmental variables, are limited. This study is aimed at assessing the trophic status of lakes by monthly sampling of three lakes located along the floodplain of Cross River, Nigeria between January 2008 and December 2009. Samples were analyzed for water quality parameters, zooplankton and phytoplankton composition and distribution. Results were subjected to community structure analysis using trophic state index, species richness and diversity indexes. Essential primary productivity nutrients, nitrates, sulphates and phosphates were highest in Ejagham Lake, and lowest in Ikot Okpora Lake. Dominant phytoplankton species Oscillatoria lacustria (Cyanophyceae), Cyclotella operculata (Bacilliarophyceae) and zooplankton Keratella tropica, Keratella quadrata, Filinia longiseta, Branchionus anguillaris and Trichocerca pusilla (rotifers) all typical of eutrophic communities were recorded in high densities in Ejagham Lake in both dry and wet seasons while Cladocerans, Bosmina longirostris and Moina micrura and copepods considered indicators of oligotrophy and mesotrophy were recorded in large numbers in Ikot Okpora and Obubra Lakes respectively. Higher values of species richness, Evenness and Shannon-Wiener diversity index for both phytoplankton and zooplankton, were recorded in Ejagham Lake during the dry season than wet. Also values of the Trophic state index were generally highest at the Ejagham Lake in the savanna region of the floodplain and lowest at Ikot Okpora in the forest region of the floodplain. Forest region is therefore a limiting factor in the productivity of lakes in the tropics.

KEYWORDS

Zooplankton, Phytoplankton, Trophic State Index, Diversity Indices, Species Richness

Cite this paper

B. Offem, E. Ayotunde, G. Ikpi, F. Ada and S. Ochang, "Plankton- Based Assessment of the Trophic State of Three Tropical Lakes," *Journal of Environmental Protection*, Vol. 2 No. 3, 2011, pp. 304-315. doi: 10.4236/jep.2011.23034.

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