Status of phytoplankton community of Kisumu bay, Winam gulf, Lake Victoria, Kenya

Lake Victoria has undergone remarkable and diverse ecological perturbations which are as a result of physical, chemical and biological processes, together with human activities that take place in the watershed area and within the lake itself. The most observed effects include increases in phytoplankton biomass and frequent algal blooms. In this study species composition, abundance, spatial and temporal distribution of phytoplankton as well as total phytoplankton biomass of Kisumu Bay, (Winam Gulf), Lake Victoria, Kenya was studied for six months in the wake of climate change. Sampling was done every two weeks using a Van Dorn Water sampler to take water samples and algal cells were counted under an inverted microscope with the help of a Sedge-Wick Rafter Cell in order to determine density. Phytoplankton biomass indicated by chlorophyll-content was determined through cold extraction in acetone and subsequent quantification by spectrophotometry. Physico-chemical parameters were measured insitu using respective meters, while plant nutrient levels were determined by spectrophotometric methods following standard methods of APHA 1985 and Gems (1992) Handbook. ANOVA test was used to determine any temporal and spatial variability in the biological factors. Regression and Pearson's correlation analyses were done to establish relationships between these factors. LSD test was done to determine means which were significantly different. The results indicated that a total of 36 genera of algae belonging to Cyanophyta, Bacillariophyta, Chlorophyta and Pyrrophyta were present, with dominance of the classes in terms of number of species being in that order. *Chroococcus* species was the most abundant and its density was significantly different from all the others. Most algal species were more or less homogenously distributed in the bay (p=1.0000) and over the study period (p=1.0000), but their densities varied significantly between different species (p<0.0001). From these results, it can be concluded that the phytoplankton community within the bay is becoming very dynamic and could possibly portray the status in the whole lake. Diatoms are becoming increasingly dominant. There is continual increasing trend in physico-chemical factors. The information obtained from this work contributes to the understanding of ecological changes in the bay in response to climate change and variability and thus the threat to biodiversity. This information is therefore important for ecological and management purposes of the lake and understanding effects of climate change on ecosystem structure, functioning and productivity.