Temporal variation of phytoplankton in a human impacted creek: Case study of Makupa creek, Mombasa Kenya

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Phytoplankton are the primary producers of the oceans and therefore forms the base of oceanic food web and a vital component of oceanic productivity. Whereas a lot of study has been done on the influence of land-based activities on phytoplankton communities, this study examined phytoplankton temporal variation in terms of species diversity, richness and evenness in a human impacted peri-urban Creek. Samples were collected in 5 stations in Makupa creek(39° 38' E, 4° 02' S) for the year 2010, 2011, 2014 and 2016. It was observed that phytoplankton abundance increased over time due sewage discharge into the creek and the developing eutrophic conditions. Species diversity increased from 2010 to 2011 (2.8 - 3.3) while a decline was observed in 2014 (1.9) and 2016 (2.3). Three major taxa were encountered over the study period, this included; dinoflagellates, diatoms and cyanobacteria. This study registered an increase in the number of diatoms from 2011 to 2016 (2011 (60%), 2014, (62%) and 2016 (69%). The dominant species were gambierdiscus spp, chaetoceros spp, pseudonitzschia spp, peridinium spp, alexandrium, pleurosigma, gymnodinium spp and nitzschia spp. This study shows that the increasing discharge of sewage into Makupa creek and the associated development of eutrophic conditions are causing a shift in species structure and distribution. Worth noting is the increasing abundance of harmful algal blooms.