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JWARP > Vol. 4 No. 10, October 2012

OPEN ACCESS

Seasonality in Abundance, Biomass and Production of the Phytoplankton of Welala and Shesher Wetlands, Lake Tana Sub-Basin (Ethiopia)

PDF (Size: 589KB) PP. 877-884 DOI : 10.4236/jwarp.2012.410103

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ABSTRACT

The species composition and production of the phytoplankton community of the Shesher and Welala floodplain Wetlands, on the eastern side of Lake Tana, were studied during four seasons from July 2009 to May 2010. We investigated the spatial and temporal dynamics of phytoplankton, densities, biomass, in relation to physico-chemical conditions. Gross and net primary production was studied at one site in each Wetland. Temperature, dissolved oxygen, conductivity, Secchi-disc depth, nitrate, phosphate and silicate concentrations showed significant temporal variation ($p < 0.05$), whereas none of these parameters showed significant spatial variation ($p > 0.05$). Thirty six phytoplankton genera/species, belonging to 7 higher taxa were identified. The Chlorophyta dominated the phytoplankton community and contributed 42% - 53 % of the total observed phytoplankton numbers. Average phytoplankton biomass (chlorophyll a content) over four seasons ranged from 9 - 121 $\mu\text{g.l}^{-1}$ in Shesher and from 27 - 206 $\mu\text{g.l}^{-1}$ in Welala, whereas the average gross primary production over three seasons was 10.5 in Shesher and 7.7 $\text{mg.O}_2\text{l}^{-1}\text{d}^{-1}$ in Welala. The peak concentration of chlorophyll a was observed in the pre-rainy season, which coincided with a bloom of *Microcystis* spp. Both Shesher and Welala Wetlands are very productive and have a good water quality but they are threatened by low water inputs since in the summer of 2009 the construction of a dam by local people and facilitated by local officials prevented overflow from Ribb River into the Wetlands. We conclude that the good water quality, the relative high water temperature and high primary productivity make the two Wetlands suitable for culture based fisheries and/or aquaculture, but a wise water resource management is crucially important.

KEYWORDS

Biodiversity; Phytoplankton Biomass; Spatial and Temporal Dynamics; Water Resource Management; Wise Use, Fogera Floodplain

Cite this paper

T. Wondmagegne, A. Wondie, M. Mingist and J. ijverberg, "Seasonality in Abundance, Biomass and Production of the Phytoplankton of Welala and Shesher Wetlands, Lake Tana Sub-Basin (Ethiopia)," *Journal of Water Resource and Protection*, Vol. 4 No. 10, 2012, pp. 877-884. doi: 10.4236/jwarp.2012.410103.

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