ABSTRACT

The hydrographic conditions (temperature, pH, transparency, dissolved oxygen and chlorosity) and inorganic salts (alkalinity, nitrate, nitrite, ammonia and phosphate) were measured monthly in the lake's water. Primary (phytoplankton) and secondary (zooplankton) producers were also identified and quantified. Some heavy metals (Zn, Cu, Fe, Cd and Pb) were detected seasonally in water and sediment samples as well as in fish organs (muscle, gills and liver) of three cichlid species (*Oreochromis niloticus, Oreochromis aureus* and *Sarotherodon galilaeus*) inhabiting three different ecological habitats in Lake Borollus. Also, the present study deals with a comprehensive investigation on the length-weight analysis, condition factor (K) and hepato-somatic index (HSI) of the same fishes.

The present study showed that, the concentrations of nutrients have higher values than that recorded previously. The phytoplankton standing stock consists mainly of Chlorophyceae, Bacillariophyceae, Cyanophyceae and to less extent Euglenophyceae, while zooplankton population is mainly represented by Cladocera, Rotifera, Copepoda and Ostracoda the minor one.

The metal concentrations in water (mg/L) followed an abundance of Fe > Zn> Pb> Cu> Cd with an annual average of 0.345, 0.057, 0.044, 0.039 and 0.004 mg/L, respectively. On the other hand, the order of abundance of the same metals in sediment and fish tissues was as follow: Fe> Zn> Cu> Pb> Cd with an annual average of 27.6 (mg/g), 110.9 (µg/g), 67.6 (µg/g), 43.3 (µg/g) and 1.6 (µg/g), respectively in sediment and 14.94, 4.83, 37.3, 0.044 and 1.71 µg/g. dry wt. in muscle

tissues, whereas in gills tissues they attained 35.58, 9.61, 164.21, 0.35 and 4.30 µg/g. dry wt. The liver tissues recorded the maximum concentrations; 47.18, 22.45, 260.89, 0.53 and 7.06 µg/g. dry wt *O. aureus* concentrated more heavy metals than *O. niloticus* and *S. galilaeus*. The liver and gills had tendency to accumulate heavy metals higher than muscle tissue. The levels of metals were less than the maximum world permissible limits. *O. niloticus* had better conditions than *O. aureus* and *S. galilaeus*, however all species meet a good conditions in the lake.

From this study it could be concluded that Lake Borollus as a whole is suitable for fish and primary productivity but the western region is the most suitable one.

Contents

List of abbreviations

AOAC	Association of Official Analytical Chemists
APHA	American Public Health Association
GAFRD	General Authority for Fishery Resources Develolpment
CAPMS	Central Agency for Public Mobilization and Statistics
NWRP	National Water Resources Plan for Egypt.
DO	Dissolved oxygen
mg/L	milligram per Liter
µg/g	microgram per gram
St. No.	Station number
Av.	Average
A.A.	Annual average
T.A.A.	Total annual average
O. nil.	*Oreochromis niloticus*
O. aur.	*Oreochromis aureus*
S. gal.	*Sarotherodon galilaeus*