

Plankton and Macrophyte Epibiota in the Fish Diet in a Brackish Lagoon near Alexandria

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Earlier investigations have shown the important role of the epiflora and epifauna attached to macrophytes in the ecosystem of the Egyptian delta lakes (Guerguess, 1979). The aim of this work was to investigate the relative importance of the phyto- and zooplankton and of the epibiota in the fish diet in El-Khobeyza basin of Lake Edku, east of Alexandria.

Three positions located at an increasing distance from the feeding inlet of the basin were investigated for 12 months. Quantitative samples were taken from the macrophyte epibiota and the plankton. The chloride content, the pH, dissolved oxygen and phosphate were determined. The gut content of the four common species was sorted to species and their numerical frequency in the gut content determined.

The water characteristics of the basin show a sharp gradient from the feeding inlet (st.1) towards the inner basin (st. 2 and 3). The average chloride content rises from 0.6 to 1.19 g l⁻¹, dissolved oxygen (DO) from a low relative saturation of 34% to 102.1% and phosphate drops from 2.83 to 1.97 µ Ml⁻¹. The rise in DO and the decrease in phosphate are caused by the development of a luxuriant, macrophyte vegetation around the inlet (Potamogeton pectinatus). The phytoplankton standing crops also decrease along the same gradient respectively from an average 195 x 10³ to 52 x 10³ cells l⁻¹ and from 71 x 10³ to 38 x 10³ organisms m⁻³. The macrophytes grow in a massive belt around the inlet, becoming sparse in the inner basin. The potamogeton leaves are densely covered with pinnate diatoms and among them few cyanophytes and chlorophytes, 146x10³ to 14x10³ cell on each cm² : Mastogloia smithii is leading (70-90%) followed by Nitzschia minutissima, N. lanceolata, N. subcohaerens, Bacillaria paradoxa, Navicula spp. and Amphora sp.

The epizoa are more scattered 710 to 18 org. per 100 cm². The rotifer Rotaria sp. is leading (10-75%) followed by Brachionus angularis, B. urceolaris, Horaeala brehmi, Lecane bulla and L. closterocerca, together with nematods, oligochaetes, and occasionally, mosquito larvae and cladocera (Moina micrura, Bosmina longirostris). Epiphyte browsers consist of gastropods : Melania tuberculata, Bulinus truncatus, Planorbis sp. and Lansites boltenianus. Of the four fish species in the basin two are browsers on the epibiota : Tilapia spp. and Mugil spp., the two others, Clarias lazera and Anguilla vulgaris are carnivorous predators. The gut content of Tilapia spp. consists mainly of epiphytic diatoms, Mastogloia smithii, but also epizoa : Brachionus calyciflorus and some cladocera. Mugil capito gut content consists also mainly of Mastogloia sp., Nitzschia spp., Navicula spp., but also of Euglenophytes and chlorophytes, nematoda and mosquito larvae. The exclusively planktonic species such as Cyclotella glomerata, Gymnodinium sp., Thalassiosira sp do not occur in the gut content of either species. The gut content of Clarias is mixed including small fish, shrimp mysis, phytoplankton (Synedra ulna, S. barbatula, Nitzschia punctata, Gyrosigma sp., Campylodiscus sp., and others) and zooplankton (nematods, Cladocera : Bosmina longirostris, mosquito larvae). Anguilla feeds on small fish.

Reference

- Guerguess, Sh.K., 1979. Ecological study of zooplankton & distribution of macrofauna in Lake Menzalah. Ph.D. thesis, Fac. Sci. Alex. Univ. pp. 361.