Biology of *Acanthobrama mirabilis* Ladiges, 1960 in Lake Bafa (Turkey)

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Acanthobrama mirabilis, which is among economically important fish species of Lake Bafa, is one of the inland water fishes endemic in Lake Bafa and Büyük Menderes River. The present study deals with the age composition, growth equations for the length and weight, gonadosomatic indices, condition factors, fecundity of this species.

The present study was performed on 1812 specimens of A.mirabilis caught from different areas of Lake Bafa. The samplings took place each month during the period from September 1986 to August 1987, using different fishing nets of various mesh size (20, 25, 28, 32 mm). From each fish, data on total length, total weight and scale samples were collected. Length weight relationship was computed according to the cubic relation $W=c.L^n$. Length at age were computed from length distribution data (GULLAND, 1964). Condition factor and gonadosomatic indices were computed using the following equations: $k=(W. 100)/L^3$ and GSI=(Gonad weight. 100)/Total weight.

Lake Bafa is an alluvial dam lake with an area of 65 km^2, a maximum depth 19 m and salinity varies from 2.98‰ to 5.62‰ (YARAMAZ et al., 1988). The fish population of Lake Bafa is composed of 14 species (Mugil cephalus, Liza ramada, Chelon labrosus, Dicentrarchus labrax, Anguilla anguilla, Atherina boyeri, Pomatoschistus marmoratus, Lipophrys pavo, Gambusia affinis, Cyprinus carpio, Silurus glanis, Acanthobrama mirabilis, Chondrostoma nasus, Barbus capito)(BALIK and USTAOĞLU, 1988).

Age determination from scale readings revealed the presence of six age groups (II-VII) of A.mirabilis in Lake Bafa. The length frequency data on the collected 1812 specimens is converted into a length composition table from which the following mean lengths at ages were deducted: 11.50; 15.94; 18.18; 18.93; 20.67 and 23.85 cm, respective to age groups II to VII. The values are little higher than those of A.terraesanctae in Lake Tiberias (STEINITZ, 1959).

The percentage occurance of each group shows that among the six age groups represented in the catch, age group V constituted about 52.76%, followed by fishes of age group IV (24.45%) and age group VI (17.77%). The remaining age groups constituted 5.02% of the population.

Linear growth of A.mirabilis in Lake Bafa was found to be expressed mathematically by using the following equation $L_t = 28.10\ (1-e^{-0.26(t+0.0245)})$

The relation between total length (in mm) and total weight (in g) for 1812 specimens of A.mirabilis was found to be curvilinear and was expressed mathematically by the formula log W= 3.09 log L-5.09018 (r=0.964).

The theoretical equation expressing growth in weight could thus be written as: $W_t = 289.53\ (1-e^{-0.26(t+0.0245)})^{3.09}$

In Lake Bafa, the spawning period of A.mirabilis is between April-May, and during this period water temperature changes between 15.5-21.8°C. The average numbers and diameters of the eggs during the spawning period are respectively in April and May: 20129-1179.95 µ and 20271-1217.19 µ.

Gonadosomatic indices (GSI) during the same months are for the females 9.664 - 6.440 and for the males 5.344-1.655 respectively.

Maximum condition factor values of both males and females are observed during May (1.408; 1.524 respectively). It is possible that, this situation has a correlation with gonadal development during the spawning period. In the higher age groups, there are significant increases in the condition factors.

As a result of these investigations data have been gathered as, these are schooling fishes, feeding as omnivorous, having pelagical or semipelagical habits, easily adapting themselves up to 15‰ salinity, become mature in 2-3 years, immigrate to the small streams as big groups during spawning in April-May, having yellowish colored eggs and 1-1.2 mm in diameter, mature females produce about 20000 eggs, living about 7-8 years old and in these ages grow to 27 cm in length and 180 g in weight and Lake Bafa has a suitable habitat for developing of this species.

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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 10^3 to 52 x 10^3 cells l^{-1} and from 71 x 10^3 to 38 x 10^3 organisms m^{-3}. The macrophytes grow in a massive belt around the inlet, becoming sparse in the inner basin. The potamegeton leaves are densely covered with pinnate diatoms and among them few cyanophytes and chlorophytes, 146x10^3 to 14x10^3 cell on each cm^2 : 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 cm^2. The rotifer Rotaria sp. is leading (10-75%) followed by Brachionus angularis, B. urceolaris, Horaela 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., Tholassiosira 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.

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