Temporal and Spatial Variations in the Species Composition, Distribution, and Abundance of Copepods and Cladocers in Keban Dam Lake, Elazığ (Turkey)

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Abstract: The composition, distribution and abundance of copepods and cladocers collected from 20 m depth to the surface waters from the Keban Dam Lake were examined. Copepods and cladocers were collected monthly at 6 designated stations from August 2002 to July 2003. In the Keban Dam Lake, 3 species from 2 families of copepods and 4 species from 4 families of cladoceres were recorded. The average abundance of copepods was 14.49x10⁵ individuals/1000 m³, the average abundance of cladocers was 30.49x10⁵ individuals/1000 m³. Cyclops vicinus (67.3%) were the most abundant copepod species. Diaphanosoma mongolianum (44%) and Daphnia cucullata (43.86%) were the most abundant cladoceran species. Two-way ANOVA analysis of total copepod and cladocers showed a significant seasonal effect (F=8717, P<0.001 for copepod; F=22970.98, P<0.001 for cladocer), but not between stations (F=0.437, P>0.05 for copepod; F=0.419, P>0.05 for cladocer).

Key Words: Cladocers, copepods, seasonal variation, Keban Dam Lake

Introduction

One of the most challenging topics in plankton ecology is the question of how large numbers of species can coexist in pelagic environments (McGowan, Walker 1985). Each species is assumed to occupy a unique niche (Grinnell 1917), which has been considered an N-dimensional hyper-volume defined by interactions with the physical environment and with other organisms (Giller 1984).

Although a number of environmental factors can influence the growth, reproduction and survival of zooplankton species, the most important are the quality and the availability of food, and the temperature (Vijverberg 1989). It is well recognized that development time is temperature dependent (Bottrell 1975), whereas fecundity is largely determined by nutritional conditions (Rocha 1983).

The abundance and the biovolume of both phytoplankton and zooplankton are largely regulated by the resource base and tend to increase with the trophic state of the lake (Canfield, Jones 1996).

Eutrophication is one of the best studied processes in limnology. Most lakes in industrial countries have been eutrophicated in the last four decades. In the course of eutrophication, the abundance and the composition of zooplankton communities have changed (Patalas 1972, Pace...