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Study of Feeding Behavior of Zooplankton-Phytoplankton in Different Seasons in the Southern Caspian Sea Using Multivariate Analysis

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Abstract

The aim of this study was to find the trophic relationship between zooplankton and phytoplankton using multivariate analysis in the southern part of the Caspian Sea during 2009-2010. Sampling was performed in four seasons (spring, summer, autumn and winter) and in eight transects perpendicular to the coast. 384 phytoplankton and 160 zooplankton samples were collected over five different water depths (5, 10, 20, 50 and 100 meters). Multivariate statistical analysis (PCA, CCA and SMRA) showed that high abundance of filamented species of Cyanophyta (*Oscillatoria* sp.), chain form (*Dactyliosolen fragilissima*) and large size (*Pseudosolenia calcar-avis*) of Bacillariophyta had the main role in zooplznkton feeding pattern, particularly in summer and winter. Small size phytoplankton (*Cyclotella meneghiniana*, *Exuviaella cordata*) and relatively short filament (*Binuclearia lauterbornii*) were occasionally eaten by zooplankton. Feeding habits of zooplankton species were not the same in different seasons and was strongly depended on the phytoplankton structure (species diversity and abundance). Low species diversity and abundance of zooplankton which accompanied with high species diversity and abundance of phytoplankton were the main reasons that limited top-down control of zooplankton on phytoplankton abundance reduction through grazing.

Keywords: *Zooplankton, Phytoplankton, Feeding, Caspian Sea.*