EPIPHYTIC DIATOM COMMUNITIES ON ULVA LACTUCA LINNAEUS IN HOME LAGOON, AEGEAN SEA

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Abstract
The taxonomical composition of epiphytic diatoms was investigated at four stations in Homa Lagoon during June 2006 and June 2007. In total, 79 taxa belonging to 23 genera were identified. Cocconeis scutellum, Ctenophora pulchella, Grammatophora oceanica, Synedra affinis var. parva and Tryblionella acuminata were dominant at all stations. The collected seasonal samples at each station constituted three separate groups in the MDS plot, which were correlated with a combination of environmental variables such as the concentrations of silicate and pH (p<0.19).

Keywords: Algae, Diatoms, Lagoons, Izmir Bay, Aegean Sea

Introduction
Diatoms are the major contributors markedly to primary production in estuarine ecosystems and play an important role in food webs in waters. Coastal lagoon ecosystems are a particular type of estuarine systems which varies from freshwater media to excessive salty water media. Homa Lagoon, where the present study is carried out, has both marine, brackish water and fresh water forms in the region due to its wide spectrum of ecologically different biotopes. Studies conducted in this area have been focussed on the physical and chemical properties of the lagoon [1], bivalve culture [2], but microphytobenthic surveys have been conducted recently [3; 4]. The objectives of this work were to describe the species composition of diatom assemblages, to determine which environmental factors explain the composition of epiphytic diatoms and to make a contribution to the largely unknown algal flora of Turkey.

Material and Methods
Homa Lagoon (38°33'10"N, 26°49'50"E) is located 25 km to the northwest of the Gulf of Izmir and within the borders of the town of Menemen (Fig. 1). The lagoon has a surface area of 1800 hectares and the depth of the fish trap is maximum 1.5 meters and its depth mostly varies between 0.5 and 1 meter.

Fig. 1. Location of stations in the Homa Lagoon

For the collection of epiphytic diatom samples, the macroalgae Ulva lactuca Linnaeus was chosen in the research region. Samples were processed by standard methods, including 10% HCl, 30% H2SO4, KMnO4 and oxalic acid [5]. Cleaned diatoms were mounted permanently on slides with Naphrax and identified at 1000× magnification by means of phase-contrast optics with OLYMPUS × 100 Plan-apochromatic oil immersion objectives. Identification at species level was made following descriptions of [6]. In order to determine the temporal distribution patterns, the qualitative data of all stations in each sampling period were analyzed using the cluster and multidimensional scaling (MDS) techniques, based on the Bray-Curtis similarity, using the PRIMER package. Patterns in community structure identified by cluster and MDS analysed were linked to the environmental variables using the BIOENV procedure of Primer.

Results and Discussion
During study periods, total of 79 taxa belonging to 23 genera were identified to the genus or species level. Cocconeis scutellum, Ctenophora pulchella, Grammatophora oceanica, Synedra affinis var. parva and Tryblionella acuminata were dominant among the epiphytic diatom species. When the taxa composition was examined, maximum number of species with 18 taxa were found at station 2 and station 3 in September 2006, minimum number of species with 4 taxa was found at station 1 in March 2007. Based on Bray-Curtis similarity values higher than 40%, three groups of stations can be recognized. The stress value for the two-dimensional MDS plot was 0.15, indicating a proper group separation. According to the results of the BIOENV analysis, best matching parameters were the concentration of silicate and pH (p<0.19), but effective parameters on species composition in this study area had stated lagoon water temperature, the concentration of nitrogen and silicate [3]. On the other hand as our study was a qualitative study, it was difficult to infer the possible environmental factors which affected the species occurrence and the seasonal fluctuations in the assemblages without quantitative data. Since the distribution of benthic diatoms is not only controlled by the substratum but also by biotic and abiotic factors, the species defined in lagoonal systems are usually quite mixed and often difficult to interpret.

References