DISSOLVED INORGANIC MATTER AND NUTRIENT ENRICHMENT BIOASSAY IN THE GERENCE BAY, (TURKEY)

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Abstract
The Gerence Bay is the enclosed bay of .Izmir. Excess nutrient inputs from aquaculture fish farms and domestic wastewater are the main antropogenic pollution source. In this study temperature, salinity, $NH_4{}^+$-N, $NO_3{}^-$N, $PO_4{}^{-3}$-P, Si, Chl- *a* are measured. To determine the variation of the parameters and to assess the dynamics between the nutrients and the microplankton of the Gerence Bay, nutrient enrichment bioassays were performed. During the summer of 2006 two exceptional blooms and one cladoceran swarming were observed. The first one appears as bloom of *Rhizosolenia* mats. The second growth was the increasing of filamentous algae. The thirth one was the cladocer *Penilia avirostris*. Then the members of ctenophora were seen.
Keywords : Aegean Sea, Phytoplankton, Growth, Pollution, Coastal Processes.

Introduction
The aquaculture fish productions are generally initiated in the closed basins in Türkiye. Gerence Bay is a well known fish production area of .Izmir. The Gerence Bay is the enclosed bay of .Izmir subjected to a variety of human influences such as tourism, aquaculture, and fisheries, together with agriculture and farming practice in the surrounding area.

In this study temperature, salinity, $NH_4{}^+$-N, NO_3-N, $PO_4{}^{-3}$-P, Si, Chl- *a* are measured of this area. To assess the dynamics between the nutrients and the microplankton of the Gerence Bay, nutrient enrichment bioassays were performed. Nutrients were added as known concentrations to find out growth curves and kinetic parameters. The obtained data were ploted as growth curves and chl- *a* based exponential growth rates were calculated.

Materials and Methods
Water for nutrient samples were collected in 100 ml polyethylene. (Nitrate+Nitrite)-Nitrogen (NO_3+NO_2)-N, Reactive Phosphorus (RP), reactive silicate (RSi) were measured spectrophotometrically according to Strickland and Parsons, 1972 [1]. During the sampling periods bioassay samples were collected from Gerence Bay station were transported to the laboratory by 20 L PET Carboys covered by wet white cloths to reduce light intensity to keep their temperature. Water samples in pet carboys were filtered from 300 micrometer (μm) plankton net to remove mesozooplankton and distributed to the experimental bottles.

In situ conditions were simulated in the laboratory by using constant temperature and light room.(600 ft-Cd light intensity). Experiments were performed October 2005 and April 2006 to find out nutrient limitation and to asses phytoplankton community. Nutrients such as N, RP, RSi were added to the one liter bottles contained seawater sample. This known nutrient concentration enrichments help to find out growth rate. The obtained data were plotted as growth curves and chl- *a* based exponential growth rates were calculated. Growth rates as a function of nutrient concentrations were fitted to monod equations.

Result and Discussion
The surface waters of the main station are poor in chl- *a* for most of the year. In October 2005, the depth-averaged values were 8.76 μM for (NO_3-N + NO_2-N) and 0 μM for RP. The values ranged in (μM) for the analyses of this main station sample were as follows: (NO_3-N + NO_2-N (10.18 - 14.39), RP (0-1.68), RSi (3.79-5.76) μgat/l. The values ranged in (μM) for the analyses in May 2006 (NO_3-N + NO_2-N(6.41 - 12.27), RP (0), RSi (1.19-9.83). The surface molar ratios ofnitrogen to phosphate (N/P) were calculated as 24.65 in October. Thismolar ratios not calculated because lack of the RP in May 2006.Temperature values ranged 16.3-18°C in October 2005 and May 2006.Salinity values ranged 37- and 39.6 psu in October and May respectively.

During the summer of 2006 two exceptional blooms and one cladoceran swarming were observed. The first one appears as bloom of *Rhizosolenia* mats. The second growth was the increasing of filamentous algae. The thirth one was the cladocer *Penilia avirostris*. After all of these observations the members of ctenophora was seen in the bay.

Bioassays experiments can be summarized as followed. Phytoplankton of mostof the experimental bottles reached exponential phase immediately,while some of bottles stayed in lag phase (for RP up to 0.3 μM) .Variation of Chl- a_{max} concentrations consistent withRP concentrations. Growth rate and the carrying capacity werecalculated by respectively; μ = μ_{max} extperiodcentered S /(S+K_s) and Chl- a_{max} =P[Chl- a_{max}] extperiodcentered S /(S+K_s)

Results of the growh rate and potansiyel chl- a_{max} for RP were calculated as μ = 0.07 d^{-1} and Chl- $a_{max\ in\ situ}$= 0.05 μg/L. Minimum growth rate was calculated by RP. Growth andbiomass accumulation were low, similar to the control, then it waslikely that RP was limiting phytoplankton growth. The results of thelimiting factor shows that the watermass of the bay is similar toMediterranean Sea [2]. Data are presented for water column from surface(0.1 m) to bottom waters (60 m) from 0, 5, 10, 20,40, 60 m monitoring.Chl- a_{max} values ranged from 37.1 to 0.14 μg/L for the period of this study. The chlorophyll *a*concentrations at that time of the experiments were generally in thelow. Total inorganic nitrogen values ranged 6.2 to 21.79 μM.

Thisstudy is not complicated yet. We are planning to take more biochemicaldata from pollutant sources as well as sediment samples. Also modellingstudy will be help to find out the effects of loading.

References
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