

THE COMPARISON OF K_s VALUES OF *CHAETOCEROS GRACILIS* ISOLATED FROM THE BAY OF IZMIR AND HOMA LAGOON

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Abstract

Diatoms contribute to the global carbon cycle and they have an important role in regulating climates by using 40 percent of carbon in oceans [1]. *Chaetoceros gracilis* were exposed to various concentrations of NH_4^+ -N based on f/2 medium in order to determine which nutrients have a limited effect on the growth of *C. gracilis*. As a result, while μ_{max} values of the *C. gracilis* isolated from two different medium are approximate, their K_s values are different. This may be related to the water's nutrient value.

Keywords: *Algae, Biokinetics, Chlorophyll-a*

Introduction

Unicellular marine algae are used as food for marine organisms which have commercial value. *Chaetoceros* sp, in particular, have good nutritional value because of their small cell structures and unsaturated fatty acids. They are widely used as food for crustaceans, mollusks and fish in larval stage in aquaculture.

Materials and methods

Izmir Bay: The bay of Izmir is located in the Western part of Turkey and surrounded by a densely populated community. The bay is divided into the Inner, the Middle and the Outer Bay from the standpoint of topographical and hydrographical characteristics. The Inner bay occupies a small area and is shallow in depth. Homa Lagoon: This study was conducted in the Homa (Sufa) Lagoon area located at the outer part of Izmir Bay. Microalgal Culture: For this study *C. gracilis* was isolated from Izmir Bay (Aegean Sea) and Homa lagoon. At the time of the study, cultures of *C. gracilis* were unialgal but non-axenic. *C. gracilis* cultures were grown in 21 Erlenmeyer flasks containing 1.5 l of sterile f/2 medium [2]. Experiments were conducted at a constant room temperature at 28 °C and irradiated at 52 $\mu\text{mol}/\text{m}^2\text{s}$ by daylight fluorescent lamps. Specific-growth rates: chlorophyll a specific growth rates were calculated from chlorophyll a concentrations during experimental growth. The specific growth rate was obtained from each growth curve calculating the following equation. $\mu = 1 / (t_2 - t_1) * \log 2(N_2/N_1)$

Result and discussion

Another parameter, without doubt, is nutrients which have an effect on the growth of algae that have been taken from two different environments after they were isolated. *Chaetoceros gracilis* were exposed to various concentrations of NH_4^+ -N on f/2 medium in order to determine which nutrients have a limited effect on the growth of *C. gracilis*. K_s , which is regarded as the affinity of *C. gracilis* in terms of nutrient in two regions, is used as the index of species' potential survival capacity in low density food concentrations [3]. The value is $> 1 \mu\text{g}/\text{L}$ and it indicates that the waters of the Bay of Izmir and Homa lagoon aren't very poor in terms of NH_4^+ -N. But this value is greater in Homa lagoon. The difference of the calculated K_s value (3.86) can be explained by the fact that the aforementioned species may be showing environmental adaptation to the lagoon. Besides, the maximum growth rates of the cells grown in ammonium are greater than those grown in nitrate and this may be originating from the cells of species, which go into the other phases of life. μ_{max} values of Homa lagoon and Bay of Izmir are the same [4]. Found the K_s values of *C. gracilis* species, which have been isolated from waters poor in nutrients, as 0.1 μM . As a result, while μ_{max} values of the *C. gracilis* isolated from two different medium are approximate, their K_s values are different. This may be related to the water's nutrient value.

References

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