

DISTRIBUTION OF HETEROTROPHIC BACTERIA IN THE NORTHERN ADRIATIC SEA.

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RESUME

Dans ce travail sont discutés les résultats de recherches sur la distribution des bactéries hétérotrophes.

In the years since 1946, when Zobell published his seminal book on marine microbiology, it has become evident that heterotrophic bacteria play an important role in nutrient cycling in the sea and that they are also basic members of the food web.

The aim of microbiological examinations, undertaken as a part of complex oceanographic investigations, was to find out the distribution and density of the microbial population (heterotrophs) in sea water of the Northern Adriatic Sea.

Monthly samplings (February 1982-October 1983) of heterotrophic bacteria for their distribution studies were carried out at six stations (RV-I, 5, 6, 7, 8, 9) on the Rovinj-Po River cross-section. Samples were taken at four depths (0, 10, 20 and 30m). The spread plate method, by cultivation at Zobell 2216 agar, was used for detection of the number of heterotrophic bacteria.

The density of heterotrophic bacteria registered in water at the Rovinj-Po River cross-section, both in horizontal and vertical sense, varied from 10^2 to 10^5 CFU/ml. A slight decrease of bacteria was noticed from the surface to the bottom layer at all stations. The registered numbers of heterotrophs in the Northern Adriatic Sea were up to three levels of magnitude higher compared to the density of heterotrophic bacteria in the Middle and Southern Adriatic Sea (Cviic, 1963; Krstulovic Sobot, 1983)

Regular seasonal variations of heterotrophic bacteria were registered at stations N° 5, 6, 7 and RV-I, but not at stations N° 8 and 9. The maximum of bacteria appeared during the summer season (August-September), while the minimum was registered from December to March. During the warmer months, when the water temperature raised over 15°C , the density of bacteria followed the variations of chlorophyll registered at stations N° 5, 6, 7 and RV-I. At stations N° 8 and 9, the closest to the Po River, the high number of heterotrophic bacteria corresponded to the high level of chlorophyll and to the low salinity during March, both for 1982 and 1983. Even if the sea temperature was low ($< 10^\circ\text{C}$), the large amount of organic material entering by Po River waters in the Northern Adriatic Sea induced the activity and the multiplication of heterotrophic bacteria. The differences in the horizontal distribution of heterotrophic bacteria were the result of distribution and quantity of particulated and dissolved organic matter as well as for the population of microzooplankton in the sea water.

Although the number of heterotrophic bacteria do not reflect exactly the bacterial activity in the sea it could be concluded that :

1. so many bacteria are at least available as food for filter-feeding animals capable of catching them, and
2. if suitable organic nutrients are supplied, those cells at least are capable of metabolizing them and of using some of their carbon and energy for growth and multiplication.

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