

DISTRIBUTION OF ORGANIC PHOSPHORUS DECOMPOSING  
BACTERIA IN THE CENTRAL ADRIATIC

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Abstract

The results of the studies of density, horizontal and vertical distribution and seasonal fluctuations of the organic phosphorus decomposing bacteria in the central Adriatic are discussed.

Résumé

Dans cette communication l'auteur expose les résultats concernant la densité, la distribution horizontale et verticale et les fluctuations saisonnières des bactéries qui minéralisent le contact organique de phosphore dans l'Adriatique moyen.

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The investigations were carried out at stations: Bay of Kaštela, Pelegrin and Stončica. Samples were collected from three layers (surface, intermediate, interface) and from sediments, seasonally during the year 1975.

This physiological group of bacteria was present in all the samples collected. The relationship between these bacteria and heterotrophs was noted, as the samples containing larger number of heterotrophs contained also larger number organic phosphorus decomposing bacteria and opposite.

Coastal area (Kaštela Bay) was the richest one in organic phosphorus decomposing bacteria what was due to the higher quantity of phosphates. Organic phosphorus decomposing bacteria density averaged 51 colonies/ml at all three layers of sea water and 35550 colonies/g in wet sediments.

The waters of the offshore station (Stončica) with less quantity of nutrients and lower production appeared to contain less quantity of organic phosphorus decomposing bacteria due to the less number of heterotrophs. Density average was 25 colonies/ml in marine environment and 9975 colonies/g in wet sediments.

The results obtained for channel area (Pelegrin) appeared to be very interesting. The area is under the influence of both the coast and the open sea. Sometimes this area was found to be richer in heterotrophs and organic phosphorus decomposing bacteria and sometimes considerably poorer, dependent on the month of collecting samples. These fluctuations could probably be accounted for by the

different influences (coast, open sea) as well as by the sea currents in this area. Organic phosphorus decomposing bacteria averaged 54 colonies/ml for all three sea layers and 20015 colonies/g for wet sediments.

Organic phosphorus decomposing bacteria number varied considerably with depth. In the Kaštela Bay vertical distribution displayed a regular pattern with minima in intermediate layer (20 m), maxima in winter and summer in the surface and in spring and autumn in the interface one (35m).

As a rule, the largest number of organic phosphorus decomposing bacteria was recorded from the interface layer (100 m) at Stončica in all the months of investigations. They appeared to be least in number in the intermediate layer. This was recorded from the Kaštela Bay, as well.

No regular pattern of vertical distribution was noted in the channel area (Pelegrin).

Organic phosphorus decomposing bacteria as well as other heterotrophs showed pronounced summer maximum at all stations; pronounced minimum at Stončica and Pelegrin in April and in the Kaštela Bay in January.

Comparing organic phosphorus decomposing bacteria and heterotrophs to all three sea layers temperature averages, which were lowest in January and highest in October, it was concluded that variations in temperature did not affect their quantity. However, the zooplankton density seemed to be one of the factors influencing dynamics variations in the number of the above mentioned bacteria groups. This was found to be clearly manifested in the channel and offshore area where, together with zooplankton maxima, the minimum values of heterotrophs occurred. This interdependence was not recorded from the coastal area. This could easily be accounted for by the fact that in this area heterotrophic bacteria had available higher quantity of organic matter. So the influence of zooplankton which fed on bacteria was less felt.