10. CHANGES IN THE ECHINODERM FAUNA IN A POLLUTED AREA ON THE COAST OF BRAZIL

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SUMMARY

The purpose of this research was to compare the changes in echinoderm fauna in a region under increasing eutrophication.

A preliminary survey of the fauna was conducted by Tommasi in 1964; such results here served as a baseline for comparison with the data obtained during a more thorough investigation made from 1974 to 1976 by a team from the Institute of Oceanography.

The animals were identified to species and their distributions correlated to environmental parameters like type of sediment, water temperature, salinity, depth and dissolved oxygen, as well as parameters indicative of pollution, mostly nutrients and turbidity.

The results for 1974 to 1976 period indicate a lower diversity as well as the disappearance of a number of species when compared to the 1964 period.

INTRODUCTION

The echinoderm fauna of the coast of the State of São Paulo, Brazil, has been studied by Bernasconi (1956) and by Tommasi (1957, 1958, 1965 and 1966). In 1964 Tommasi studied the distribution of these animals as part of a more thorough investigation of the benthic assemblages of the Bay of Santos (24°00'S, 46°20'W), his results were published in 1967, at which time considerable concern had already been aroused by drastic changes which had occurred as the result of sewage, dredgings as well as the installation of smelters and other industrial plants.

As pointed out by Isaacs (1973) the discharge of sewage as well as of industrial effluents in estuarine regions can affect the communities of benthonic invertebrates in two ways: (a) a great influx of organic matter tends to have a deleterious effect on filter feeders, detritus feeders and also on their predators; (b) the change in consistency of sediments, the increase in the level of heavy metals and toxic organic compounds, the reduction in dissolved oxygen as well as the increase in sulphides as a result of the deposition and decomposition of organic matter, may inhibit larval attachment or may have toxic effects directly on already attached larvae or on adults which may be sensitive to such pollutants.

From 1964 onwards the Santos region has suffered a considerable increase in eutrophication levels as a result of its development as a summer resort, accommodating during the summer months more than one million people, as well as the increase of its docking facilities and installation of new industrial plants.

In 1974 a joint programme was established between the Institute of Oceanography of the University of São Paulo and the State Centre for Basic Monitoring of Environment (CETESB) in order to investigate the present status of the animal assemblages and environmental conditions in the region. As part of this programme, a study was carried out on the distribution of the echinoderm fauna, similar to that carried out by Tommasi (1967). As much as possible, the echinoderm distribution and abundance has been considered in relation to environmental parameters such as nutrient content, temperature, salinity, type of sediment, dissolved oxygen and depth.

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