

COMPARISON BETWEEN TWO PERIODS OF OBSERVATIONS ON THE SOFT-BOTTOM  
POLYCHAETE DISTRIBUTION IN AUGUSTA BAY (SICILY, ITALY)

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Resumé

*Les peuplements à Polychètes des fonds meubles de la rade d'Augusta (Sicile) de 1976 et de 1981 ont été comparés. L'analyse qualitative et quantitative des espèces au cours des deux périodes a été effectuée et les raisons possibles de la différence des distributions ont été examinées.*

*La distribution des Polychètes est influencée surtout par les dragages effectués après le premier échantillonnage et qui ont changé les conditions du fond de la rade et aussi par l'effet des différentes saisons du pré-lèvement. On peut considérer donc les Polychètes des efficaces descripteurs aussi des milieux instables tel que la rade d'Augusta.*

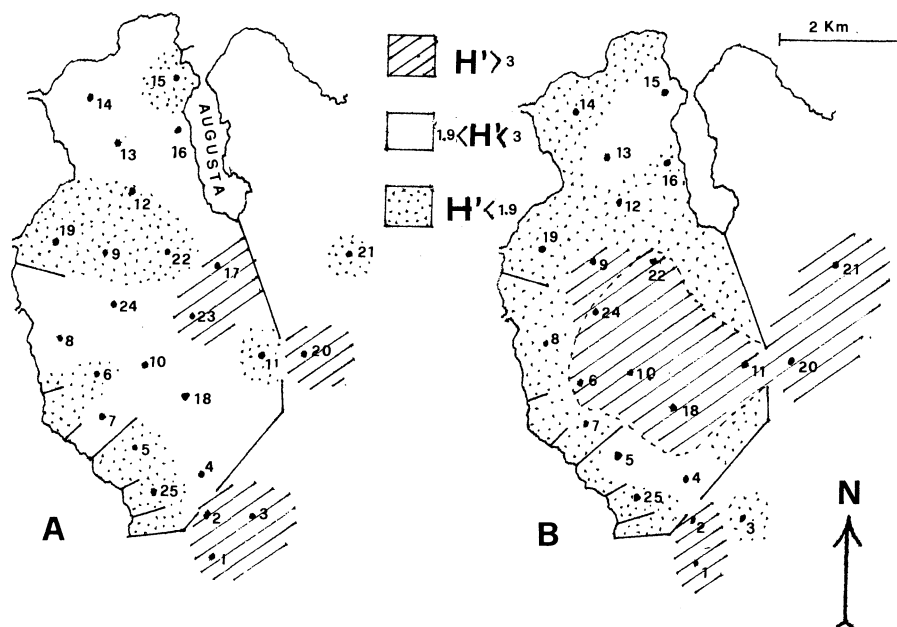
Studies on soft-bottom Polychaete distribution in the bay of Augusta were carried out in 1976 by CANTONE and PILATO (1980) and in 1981 by GIANGRANDE and GAMBI (1982). This paper presents a comparison of distribution for 25 stations selected from the 43 sampled in 1976 and 28 in 1981 for similarity of siting and depth (from 6 to 50m), the object being to find out what changes had taken place over a 5-year period in an environment subjected to various kinds of stress (industrial and organic pollution, dredging, etc.). It should be noted that prior to the 1981 sampling, dredging had taken place in the centre of the bay to permit the passage of oil-tankers.

The Polychaete community was richer and more diversified in 1976 than in 1981 (155 species and 33,793 individuals compared to 64 species and 1,925 individuals). The higher abundances in 1976 were largely due to the redundancy of species typical of polluted areas or lagoons, such as *Capitella capitata*, *Polydora antennata*, *Prionospio malmgreni* and *Malacoceros fuliginosa* which were present almost all over the bay, being particularly abundant on the western side but absent from the areas beyond the port.

In 1981 no species was dominant to another, *C. capitata* and *M. fuliginosa* had disappeared completely, while *P. antennata* and *Heteromastus filiformis* still survived, although with few individuals, the former along the western shoreline and the latter in the central area.

The diversity index ( $H'$ , Shannon-Weaver) showed similar values comparing the same stations of the two periods and almost equal average values by station. On the basis of the diversity values, the stations can be arranged into three groups with different distribution in the two periods (Fig. 1a and 1b). Such distribution was irregular (in patches) in 1976 with higher diversity around the outer limits of the bay (excepting st. 21) and at the inner stations 17 and 23, while the samples with lower diversity were those along the coastline (excepting st. 11 and 21). In 1981, a gradient of diversity

Fig. 1: Maps of Augusta Bay indicating the sampling sites and the distribution of the station-groups with same diversity index ( $H'$ ) intervals; a= in 1976; b= in 1981.



was recognizable with higher diversity in the outer and central areas (those which had been dredged) and lower diversity still along the coast. Anyway, the general trend of the diversity, in both periods, was a decrease from outer to inner areas of the bay.

The differences found may be accounted for the different times of sampling (April in 1976 and July in 1981) and for the different types of pollution and changes in hydrological conditions (before and after dredging). The soft-bottom excavation in the central area of the bay (1981) favoured circulation and exchange with the open sea, thus creating a re-colonization area, as clearly shown by the high diversity values therein. By contrast, the conditions along the coastline of the bay seemed to be worse in 1981 than in 1976. This fact should be due to an increase in pollutant inputs between the two periods and to the seasonality. In fact, in July 1981, a month after the sampling, a strong anoxia crisis occurred.

Polychaetes ,then, can be considered good indicators not only of pollution but also of the changes which take place in stressed environments which do not mantain stability during the time.

#### References

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