

D. VINCI^o, P. LANERA^o, N. PLASTINA^o, G. PROCACCINI^{oo}, M. SCARDI^{oo}, P. SORDINO^{oo}
and L.M. VALIANTE^o

^oBioservice S.C.R.L., NAPOLI (Italy)
^{oo}Stazione Zoologica di NAPOLI (Italy)

Among the studies on the effects of pollutants on marine ecosystems, little information is available about the influence of thermic pollution on benthic communities. BELLAN-SANTINI and DESROSIERS (1977) investigated a Mediterranean area affected by strong industrial pollution in addition to a thermic one; BONVICINI PAGLIAI *et al.*, (1979) carried out a qualitative analysis of the macrozoobenthos near the power plant this paper refers to.

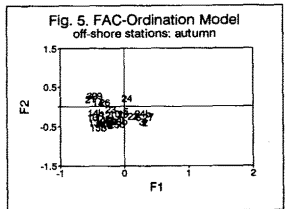
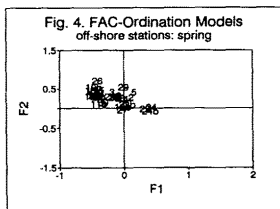
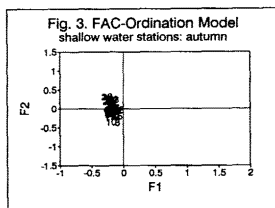
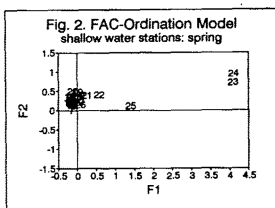
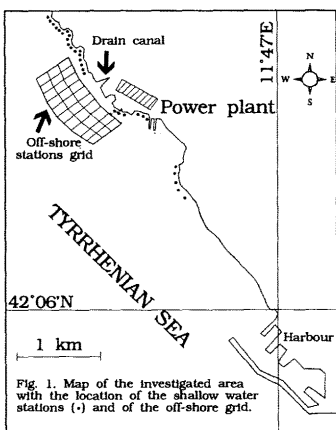
This research was performed in order to investigate the influence of power plant waste warm water on the marine benthic community near the Torre Valdaliga Nord power station (Civitavecchia, Italy), in the eastern part of central Tyrrhenian Sea. The station has a peak power of 2640 MW; it gives back up to 90 cubic metres per second of water 8°C warmer.

Sampling was carried out in spring and autumn 1989. Two areas were chosen: the shallow water (as far deep as 2 m) bottom along the coast at both sides of the drain canal, and the area off the power plant, centred on the drain canal (Fig. 1). The latter was divided into 30 sectors; in each sector a station-point was located. In the aim of comparing homologous coenotic units, all the sampling sites of both areas were placed on the *Corallina* spp. *facies*, very important in that part of the coast, characteristic of the AP (*Algae Photophiles*) biocoenosis; furthermore, the shallow water stations had the same exposure. An area of 0.4 square meters (20x20 cm) was scraped in each station.

The study of *Polychaeta*, *Anisopoda*, *Isopoda*, *Amphipoda*, and *Echinodermata* syntaxa was performed both by descriptive and statistical analysis, the latter by ordination techniques (FAC, Factorial Analysis of Correspondences).

A very homogeneous distribution arises from the data, both in the shallow water sample area (Fig. 2 and 3) and in the off shore grid stations (Fig. 4 and 5), in spring (Fig. 2 and 4) as well as in autumn (Fig. 3 and 5). The sole particularity in the peuplements' structure was found in spring in the group of shallow water stations about 500 m south-east of the drain canal (Fig. 1; Fig. 2). Species generally present in harbours and/or in other biotopes characterized by low hydrodynamic energy and moderate pollution (*Cirriformia tentaculata*, *Naineris laevigata*, *Protoarcia oerstedii*, *Jassa marmorata*, *Elasmopus* spp., *Dynamene edwardsi*) have high dominance values in those samples, where, moreover, lower H' values were recorded. Due to the prevailing NW current, this difference is not referable to thermic pollution, but probably to the proximity of the harbour of Civitavecchia.

The results seem to show that the benthic community is not directly affected by waste warm water; on the other side, the organic pollution from the harbour and from the city has a clear influence on the structure of the shallow water community. These data are consistent with the observations of BELLAN-SANTINI and DESROSIERS (1977) on the benthic community of the Gulf of Fos (France).



REFERENCES

- BELLAN-SANTINI D. & DESROSIERS G., 1977.- Action du rejet thermique de l'usine de Martigues-Pontau sur les peuplements de substrat durs à dominance de Zoobenthos dans la partie supérieure de l'étage infralittoral. *Thetys*, 8 : 83-92.
BONVICINI PAGLIAI A.M., CREMA R., IOANNILLI E., BERTONATI M., CIRONI R. & VITALI R., 1979.- Caratteristiche strutturali del macrobenthos della fascia infralittorale antistante la centrale di Torre Valdaliga (Civitavecchia). *Atti Soc. Tosc. Sci. Nat., Mem., ser. B*, 86 (suppl.) : 1979.

Research supported by ENEL (Ente Nazionale per l'Energia Elettrica).