

FURTHER NOTES ON THE DEVELOPMENT OF BENTHIC COMMUNITIES ON THE
ARTIFICIAL REEF OFF TERRASINI (NORTHWESTERN SICILY).

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Resumé - Données sur le développement des communautés benthiques sur le récif artificiel au large de Terrasini (Sicile Nordoccidentale). Deux ans après son immersion, le récif artificiel de Terrasini, près de Palerme, a été colonisé par 312 espèces benthiques, dont 137 sont des algues et 175 sont des invertébrés. La recherche bionomique montre une succession qui débute avec des taxa à large repartition écologique, telle l'algue rouge *Lophocladia lallemandii* et de Serpulidae, et tend à la stabilisation avec les faciès bionomiques des *Rhodymenietalia* et des *Cystoseiretalia*, dominé par *C. sauvageauana*. Les groupes animaux les plus représentés sont respectivement les Polychètes, les Bryozoaires, les Mollusques Gastropodes et les Crustacés. Les espèces des suspensivores sont plutôt rares. On observe d'importantes différences entre les peuplements des surfaces d'un même élément cubique de la pyramide. En particulier, les Polychètes et les algues sont constamment dominants sur les surfaces verticales libres, tandis que les Gastropodes sont nettement plus représentés sur les surfaces horizontales supérieures et les Bryozoaires dominant sur les surfaces à l'intérieur de la pyramide. Le Gastropode *Bittium reticulatum* est l'espèce la plus fréquente et représente très vraisemblablement un chaînon fondamental de la structure trophique du récif.

The onset and development of a benthic community on the small artificial reef off Terrasini is surveyed since its submergence in the autumn 1981 (PROVENZANO e RIGGIO, 1981; RIGGIO, 1982). A comprehensive study of the community dynamics is carried out on seasonal samples 20x20cm in area, collected from the centre of the free surfaces of concrete cubes lying at different situations and heights in the pyramid.

The results of our observations can be summarized as follows: after about two years' submergence, in the early summer 1983, 312 species were censused, 137 of which were algae and 175 sessile or sedentary invertebra-

tes. In comparison to the previous survey performed in October 1982, the number of species was more than threefold higher; the diversity value \bar{H} according to Shannon's index, however showed a rather low rise, and it was nearly asymptotic if the ongly algal component was considered. Such a phenomenon is partly dependent on the fast increase of surface cover by the single taxa which overcompensated for the recruitment of new species. A great variability in the diversity values was found as a consequence of the exposition and slope of each cube wall. The highest diversities were typical of the vertical sides facing the open sea, whereas the lowest values characterized the upper horizontal surfaces and the inner walls in shade.

The most frequent algal species were in the autumn samples: *Lophocladia lallemandii* (Mont.) Schm., *Halopteris filicina* (Gratel.) Kütz. and *Dictyopteris membranacea* (Stack.) Batt. The most frequent invertebrate groups were: Polychaeta, Bryozoa, Gastropod Molluscs, Peracarid and Decapod Crustacea. Polychaete worms and Polyzoa were by far dominant on the vertical walls in light, whereas the Gastropoda constantly prevailed on the top horizontal surfaces. A major ecological role was indeed played by the presence of thick algal tufts on the vertical walls and by a sediment layer on the horizontal surfaces. Polyzoa and Serpulid Polychaeta were especially frequent on the inner sides in shade.

The tunnels dug in the concrete boulders were mainly settled by branching Polyzoan colonies, as well as by Hydroids, Serpulids and Sedentary Polychaete worms. The Bivalve Molluscs were infrequent and the filter-feeders were represented by few species, mostly concentrated inside the tunnels. Small oysters were observed, together with *Spirographis spallanzani* Viv., protruding from the threads of ropes and nets left by fishermen, which are also a cause of strong disturbance to the reef community.

The Gastropod *Bittium reticulatum* Brug. was the most frequent species, and it accounted for a large share of the total biomass; very likely it is a major link in the food web supporting the fish community established inside and around the reef. Seaweeds and organic debris are the prime source of energy to the system, and therefore the reef off Terrasini is characterized by an energy flow quite different from the one outlined for the artificial reefs in the Adriatic as well as in the Mid Tyrrhenian (ARDIZZONE e CHIMENZ, 1981; BOMBACE, 1982). The common lobster, *Palinurus vulgaris* Latr., has definitively settled in the small holes and crevices between the boulders.

The latest observations have shown a progressive replacement of the first settlers, characterized by opportunistic habits and negative phototactism, by newcomers with opposite life strategies. It is remarkable the appearance and fast growth of the brown alga *Cystoseira sawageauana* Ham., pilot species of the *Cystoseiretalia*, which are becoming the dominant biological feature.

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