

Benthic Community Settled on an Artificial Reef in the Western Adriatic Sea (Italy)

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Abstract: The present study has the aim of describing the benthic communities settled on the concrete structures of the Senigallia artificial reef (western Adriatic Sea) after ten years by its deployment.

The artificial reef is placed 1.5 nm offshore, on a sandy-muddy bottom at a depth of about 12 m, far from natural and artificial hard substrates and it is affected by the Cesano river's inflow. It was deployed in 1987 and consists of 29 pyramids, each made of five concrete blocks (4 at the bottom and 1 at the top) with side of 2 m. The pyramids are placed on a stone bed and deployed in a rectangular arrangement at about 15 m from each other. Twelve concrete cages (4x5x6 m) for shellfish culture are also placed among the pyramids.

The benthic community was investigated for two years, from April 1997 to March 1999. The horizontal surfaces of pyramids were sampled through a suction-sampler on a standard area of 40x40 cm, whereas the scraping technique was utilised for the vertical ones on an area of the same size (40x40 cm). Two replicates for both horizontal and vertical surfaces were carried out at each sampling.

The epifauna settled on the artificial modules was dominated by filter-feeders. Crustaceans (amphipods) and polychaetes represented the most important groups on all surfaces. In particular, crustaceans (i.e. *Corophium*

acherusicum) were more abundant on the top of pyramids, the second ones (*Polydora ciliata*) were more numerous on the bottom blocks.

Regardless of the concrete cubes' level, the vertical walls were characterised by hard-substrate species, especially filter-feeders like bivalves (*Mytilus galloprovincialis*, *Ostrea edulis*, *Crassostrea gigas*), hydroids (*Obelia dichotoma*, *Bougainvillia ramosa*) and barnacles (i.e. *Balanus trigonus*, *Balanus perforatus*).

These species were associated to deposit and suspending-feeders organisms typical of soft bottom (gastropods and small bivalves) on the horizontal surfaces that were covered by a thin layer of sandy-muddy sediment.

The settlement of different community's structures on vertical and horizontal surfaces was induced by environmental conditions that characterised the walls. In fact, on the horizontal ones there was a more intense sedimentation linked to Cesano river's inflow and very fine mud suspended by wave motion; on the other hand, on the vertical surfaces an high hydrodynamism produced a continuous turn-over and a reduced accumulation of suspended material.