

MORPHOTYPES DIFFERENTIATION AS AN ADAPTIVE STRATEGY : AN EXAMPLE IN A CORALLIGENOUS COMMUNITY

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Studies of biodiversity, as the expression of complexity of a biological structure both at the community and species level (COGNETTI G. & CURINI-GALLETTI M., 1993), has received increasing interest in recent years. Among the hard bottom marine communities coralligenous formations (*sensu* PERES & PICARD, 1964) exhibit such a high degree of complexity and diversity as to be considered a polybiocenotic species assemblage (PICARD, 1985).

Investigations on zonation and morpho-functional aspects of coralligenous communities on a rocky shoal in the Ligurian Sea (COCITO *et al.*, 1994), showed the existence of peculiar environmental conditions, mainly hydrodynamics, which have yielded diversification in microhabitats. Among surface-dependent organisms an array of growth forms was identified as adaptive structural fitness.

This study emphasizes the presence of two zoarial types for a bryozoan species (*Pentapora fascialis*, Pallas, 1766), clearly distinguished in shape, size, pattern of growth and distribution. Visual surveys and *in situ* measurements were carried out in the summer of 1991 by SCUBA diving along radial transects on the shoal.

The first typology (fig. 1) was exhibited by *Pentapora fascialis* zoaria, small in size and with slender branches giving a reticulate appearance; these were common in the shallower zone, near the top of the shoal (16 m deep) and almost absent on the channel cliffs. The second form, identified as *Pentapora fascialis* f. *foliacea*, was the predominant component of the benthos on the rocky, current swept bottoms (from 18 to 26 m), which in turn terminate close to the muddy bottom. The colonies, composed of thick, robust foliaceous laminae, were of spectacular size (Ø 82 cm max.).

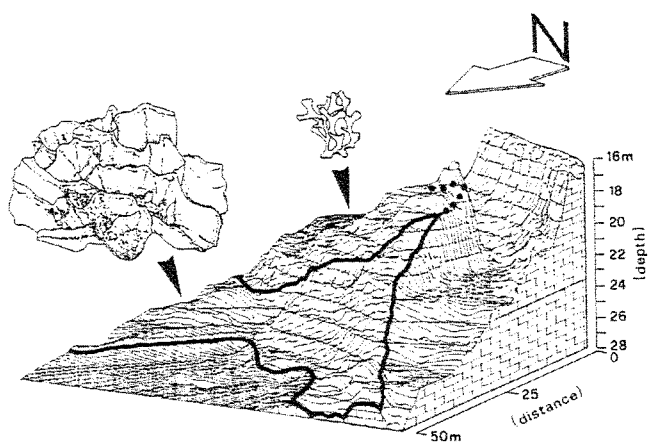


Fig. 1: Distribution of the two zoarial types.

Discussions as to whether the two types belong to different species (GAUTIER, 1962) or if they represent a case of ecotype (ZABALA, 1986) have already been dealt with. Traditional taxonomic procedure utilized to distinguish bryozoan species are not always exhaustive because of numerous modifications of skeletal properties taking place during growth of the colony.

In any case, morphological and ecological characteristics evidenced in the study area indicate the presence of two forms, whose trophic capacity strictly depends upon food capture surface (JACKSON, 1977), adapted to different environmental conditions.

We conclude that colony shape is affected as much by interaction with the biological environment, in particular food availability, as by physical causes that are in this case water movement and siltation. In these terms, morphological differentiation could be interpreted as an index of environmental diversity.

Although the study area represents a small scale biotope, it can be used to verify correlation between biological diversity and the flexibility of response to different environmental conditions.

REFERENCES

- COCCITO S., SGORBINI S. & BIANCHI C.N., (submitted). The suspension-feeder community of a temperate rocky shoal : zonation and morpho-functional aspects.
COGNETTI G. & CURINI-GALLETTI M., 1993. Biodiversity conservation problems in the marine environment. *Mar. Pollut. Bull.* 26 (4) : 179-183.
GAUTIER Y.V., 1962. Recherches écologiques sur les Bryozoaires Cheilostomes en Méditerranée occidentale. *Rec. Trav. Stat. mar. Endoume*, 38 (24) : 1-434.
HARMELIN J.G., 1975. Relations entre la forme zoariale et l'habitat chez les bryozoaires cyclostomes : conséquences taxonomiques. *Bryozoa* 1974. Docums lab. Géol. Fac. Sci. Lyon. 2 : 329-384.
JACKSON J.B.C., 1977. Competition on marine hard substrata : the adaptive significance of solitary and colonial strategies. *Am. Nat.*, 111 : 743-767.
PERES J. & PICARD J., 1964. Nouveau manuel de bionomie benthique de la mer Méditerranée. *Rec. Trav. Stat. mar. Endoume*, 31 (47) : 1-137.
PICARD J., 1985. Réflexions sur les écosystèmes marins benthiques : hiérarchisations, dynamique spatio-temporelle. *Téthys*, Fr., 11 (3-4) : 230-242.
ZABALA M., 1986. Fauna dels Briozous dels Països Catalans. Inst. Est. Cat., Ed. Barcelona: 1-834.