

BENTHIC COMMUNITIES OF ROCKY OUTCROPS IN THE NORTHERN ADRIATIC SEA: A QUANTITATIVE SURVEY

S. Soresi, A. Cristofoli, L. Masiero, S. Casellato *

Benthos Ecology Laboratory, Dipartimento di Biologia, Università di Padova, Italia - * sandra.casellato@unipd.it

Abstract

A total of 12 samplings, carried out between August 2002 and May 2003, by SCUBA diving, produced much data regarding the physical-chemical environment and the benthic communities of two rocky outcrops, 20 m deep, opposite Chioggia in the Gulf of Venice, Italy. Little data has been available regarding the floral and faunal communities of this environment. The richness of the community, and the high population density observed in the explored areas, highlight their importance as biodiversity oases in the northern Adriatic Sea.

Keywords: Adriatic, rocky outcrops, benthos, composition

Introduction

The northwestern Adriatic seabed is characterized by soft sediments, from mud and silt to sand. Even though reports of rocky outcrops have been made since 1792 (1), their underwater exploration begun only in 1967 (2-6). The numerous outcrops differ from the rocky matrix of the continental plate, and vary in size, distance from coast, and depth, ranging from 10 to 40 m. They may have originated by the cementing of the pebbly foreshore sediments in the waterline, between 3000 and 4000 years ago (7), or through methane surfacing through sediments (8). The erosion processes uncovered these outcrops, which were subsequently colonized by marine organisms. The encrusting biota incorporates sediment and shells, and itself becomes a substrate for other organisms. Thus complex coralligenous structures evolve, overgrowing the rocky matrix and simulating reefs. The ecological role of these coralligenous structures in the northern Adriatic is extraordinary, because, in addition to providing a solid substratum for benthic organisms, they introduce environmental gradients in the monotony of the Adriatic's soft bottoms, generating different ecological niches. Till now, these environments have been only partially studied (9).

Results and Discussion

270 species have been identified from our seasonal samples. Some are new records for the Mediterranean, and one species is new to science; their population density varied between 479 and 3022 ind/m² (Fig. 1). Marked differences were observed between the two outcrops, related both to different water turbidity, and the distance from the coast, and to the different origin. The filter feeders and suspension feeders (Fig. 2) predominate; the algae are restricted to few species of Rodophyceae and Corallinaceae. The Shannon-Index values, between 3,44 and 3,57, are much higher than those reported for neighbouring communities on soft sediments (10).

These outcrops represent a high diversity "oasis" in the North Adriatic, and their peculiar communities present characteristics intermediate between the biocenosis of coralligenous platforms (11) and the biocenosis of shelf edge rock (12).

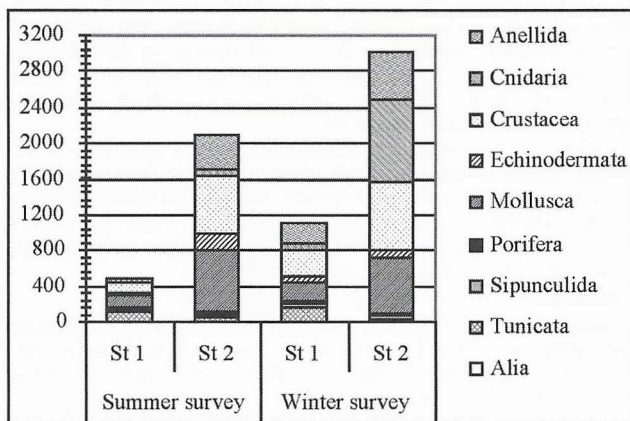


Fig. 1. Quantitative faunistic composition of the two outcrops.

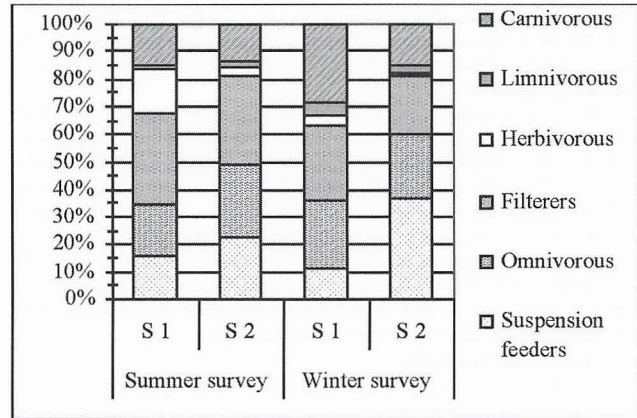


Fig. 2. Feeding guilds composition of the benthic communities of the two outcrops.

References

- 1 - Olivi G., 1792. Zoologia Adriatica, Bassano.
- 2 - Stefanon A., 1969. First notes on the discovery of outcrops of beach rocks in the Gulf of Venice (Italy). *Rapp. Comm. Int. Mer Médit.*, 19 (4): 649.
- 3 - Stefanon A., 1970. The role of beachrock in the study of evolution of the North Adriatic Sea. *Mem. Biogeog. Adriat.*, 8: 79-99.
- 4 - Stefanon A., 1972. Beach rocks and Paleogeography in North Adriatic Sea. *Rapp. Comm. Int. Mer Médit.* (4): 606-608.
- 5 - Newton R.S. and Stefanon A., 1975a. The "Tegnue de Ciosa" area: patch reefs in the Northern Adriatic Sea. *Marine Geology*, 19: 27-33.
- 6 - Newton R.S. and Stefanon A., 1975b. Application of Side-scan Sonar in Marine Biology *Mar. Biol.*, 31: 287-291.
- 7 - Braga G. and Stefanon A., 1969. Beachrock e Alto Adriatico: aspetti paleogeografici, climatici, morfologici ed ecologici del problema. *Atti Ist. Veneto Sci. Let. Ed Arti*, 127: 352-361.
- 8 - Stefanon A. and Zuppi G.M., 2000. Recent carbonate rock formation in the Northern Adriatic Sea: hydrogeological and geotechnical implications. *Hidrogeologie*, 4: 3-10.
- 9 - Gabriele M, Bellot. M., Gallotti D., and Brunetti R., 1999. Sublittoral hard substrate communities of the Northern Adriatic Sea. *Cash. Biol. Mar.*, 40: 65-76.
- 10 - Casellato S., Masciadri S., Masiero L., Campi G., 2002. Impact of the hydraulic dredge on the benthos community of the North-western Adriatic coasts. *Biol. Mar. Med.*, 9: 170-179.
- 11 - Sarà M., 1971. Le peuplement du coralligène des Pouilles. *Rapp. Comm. Int. Mer Médit.* 30 (3): 235-237.
- 12 - Gamulin Brida H., 1974. Biocenosis benthique de la mer Adriatique. *Acta Adr.*, 15 (9): 1-102.