Biol. Mar. Mediterr. (2011), 18 (1): 258-259

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BIODIVERSITY OF SARDINIAN MARINE CAVES: SPONGE FAUNA

BIODIVERSITÀ DELLE GROTTE MARINE DELLA SARDEGNA: LA FAUNA A PORIFERI

Abstract *- This paper focuses on a faunistic study on sponges from three submerged caves of the Marine Protected Area of Capo Caccia-Isola Piana. Results contribute to the assessment of biodiversity of the scarcely known Sardinian Sea.*

Key-words: *sponges, biodiversity, marine caves, endemicity, Mediterranean Sea.*

Introduction - The cave-dwelling sponge fauna of Sardinia is scarcely known although the few existing data suggest a notable taxonomic richness for the north-western karstic area of the island. This paper focuses on a faunistic study on W-Sardinian sponges of some submerged marine caves in a Marine Protected Area (MPA) aiming to increase data that can fill gaps in knowledge and to provide an inventory at species level.

Materials and methods - Three submerged caves of the Capo Caccia-Isola Piana MPA, namely Galatea Cave, Falco Cave and Bisbe Cave were surveyed in June 2009. The Galatea cave is located in the Zone A of the MPA, while the other two caves are situated in the Zone B.

Sponge assemblages were sampled within each cave, by scraping from the substratum and photographs, along five sectors identified in relation to the cave morphology. Specimens for sponge identification were photographed *in vivo*, sorted according to the sampling site, preserved (dry and/or ethanol) and registered in a reference collection. A first examination for macroscopic morphology was carried out on each sample by stereomicroscope. Specimens were dissected to obtain representative fragments to be processed for the preparation of skeleton and spicule slides by standard methods. Morphological analysis of diagnostic traits was carried out by optical microscopy with transmitted light on 141 preparations and by image analysis of 182 *in vivo* photographs.

Results - The faunistic census in the three submerged karstic caves revealed the presence of a remarkably diverse sponge assemblage. In total 79 species were censused. The Galatea Cave harbours 47 species belonging to 36 genera and 26 families ascribed to 12 orders. Twelve species are Mediterranean endemics with a value of endemicity of 25.5%. The Falco Cave harbours 37 species belonging to 28 genera and 22 families ascribed to 10 orders. Eleven species are Mediterranean endemics with a value of endemicity of 29.7%. The Bisbe Cave harbours 35 species belonging to 26 genera and 19 families ascribed to 11 orders. Eleven species are Mediterranean endemics with a value of endemicity of 31.4%.

The sponge fauna survey within the Sardinian marine caves highlighted the presence of four species listed as protected by the SPA/BIO protocol of the Barcelona Convention (Pronzato, 2003; Relini & Tunesi, 2009), namely *Petrobiona massiliana* Vacelet & Lévi, 1958, *Spongia lamella* (Schulze, 1879), *Spongia officinalis* Linnaeus, 1759 and *Spongia zimocca* Schmidt, 1862. In particular all of the four protected sponge species were recorded from the Bisbe Cave.

Conclusions - These data bridge, in part, the gap of knowledge on the sponge fauna of the Sardinian Sea, highlighted by Pansini & Longo (2003). Indeed Porifera from Sardinia have been reported until now, in surveys of cave-dwelling benthos (Bianchi & Morri, 1994) and in descriptions of new and rare species from these cryptic habitats (Manconi *et al.*, 2006, 2009; Manconi & Serusi, 2008). Marine caves are fragile and peculiar environments that have been recently listed in EU Habitat Directive. This work is a contribution to the assessment and inventory of biological diversity of Mediterranean marine caves, an instrument of primary relevance for the correct conservation and management of these habitats and their wildlife.

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Research supported by Italian Ministero dell'Ambiente (MATTM, Studio degli ambienti di grotte marine sommerse (Codice Habitat 8330) nelle Aree Marine Protette di Pelagie, Plemmirio e Capo Caccia), Ministero dell'Università e della Ricerca Scientifica e Tecnologica (MIUR-PRIN), EU Interreg III Sardinia-Corsica-Tuscany, Fondazione Banco di Sardegna and Regione Autonoma Sardegna.