

MARINE UNDERWATER CAVES OF TARKHANKUT PENINSULA (BLACK SEA, UKRAINE), ITS BIOTA WITH EMPHASIS ON SPONGES FAUNA

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Abstract

A detailed geomorphological description of five submarine shallow semi-submerged caves from peninsula Tarkhankut, Crimea (Black Sea) realized. Investigated their biological characteristics with special attention to sponges species composition and distribution. It was detected seven sponge species (class Demospongiae). These species are tolerant to different hydrological conditions, and some of them have wide geographical distribution.

Keywords: Biodiversity, Black Sea

In recent decades, systematic surveys of littoral submarine caves have received particular attention from the scientific community. The particular environmental conditions of these habitats (absence of light, oligotrophy, and reduced hydrodynamic action) make submarine caves enclave mesocosms of the deep aphotic zone in shallow coastal areas [1]. Due to their relatively small size and ease of accessibility, environmental stability, and presence of communities of endemic and specialized species, dark submarine caves are excellent model habitats to address important ecological and evolutionary questions such as the influence of life cycle and habitat fragmentation on gene flow. In addition, all the information gathered on such habitats can be interpreted in the context of global climate change and can help increase awareness of the related pertinent issues. A special attention in the last decade is given to the submarine caves in the north-western Mediterranean [2]. However, information on the biodiversity of the underwater caves of the Black Sea is extremely fragmentary. The reduced salinity is the most important environmental factor influencing marine biodiversity in the Black Sea. Two to five times fewer species in various taxa of benthic animals live in the Black Sea as compared to the neighboring Mediterranean [3]. A good example of this pattern is the phylum Porifera (sponges): the Black Sea inhabited by 29 species of sponges (about 4.5% of Mediterranean). The main objectives of this study were (1) a detailed geomorphological description of several submarine shallow-water semi-submerged caves from peninsula Tarkhankut, Crimea, and (2) their biological characteristics with special attention (3) to study the species composition and distribution of sponges habitat in these caves. It was investigated 5 caves: three semi-submerged and two submerged with length from 9 to 131 m and volume from 61 m³ to 3060 m³ (Fig. 1).

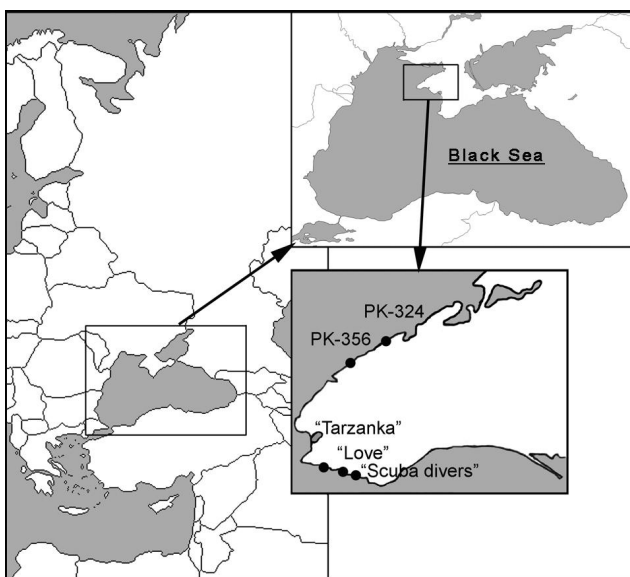


Fig. 1.

Figure 1. Map of investigated caves.

All of them have karst-abrasive or karst origin. Our research of some caves in SW of Crimea has shown a number of new and very rare troglobiont species, which confirms the existence in the Black Sea marine caves little-known communities. In investigated caves we have detected seven sponge species (all from the class Demospongiae) (Table 1).

Table 1. Sponges from underwater caves from Tarkhankut (Crimea) and their distribution in relation to the entrance

Tab. 1.

Sponges	Caves				
	«Scuba divers»	«The love»	PK 356	«Tarzanka»	PK-324
<i>Dysidea fragilis</i> (Montagu, 1818)	0 - 3 m	0 - 4 m	0 - 6 m	0 - 4 m	0 - 4 m
<i>Fiona vasitica</i> (Hancock, 1849)	0 - 67 m	0 - 40 m	0 - 15 m	0 - 20 m	0 - 9 m
<i>Haliclona flavescens</i> (Topsent, 1893)	0 - 92 m	0 - 40 m	6 - 22 m	2 - 20 m	9 m
<i>Haliclona</i> sp. 2 (branches)	12 - 46 m	6 - 55 m	No	2 - 20 m	No
<i>Geodia stillosa</i> (Czerniavsky, 1880)	24, 36 m	6 - 55 m	No	20 m	4-5 m
<i>Suberites prototypus</i> Czerniavsky, 1880	24 - 36 m	24 - 36 m	10 - 15 m	No	No
<i>Clathria cleistochela</i> (Topsent, 1925)	24 - 30 m	24 - 40 m	No	20 - 25 m	No

All these species have been described by previous authors from the adjacent open sea waters. These species are tolerant to different hydrological conditions, mostly temperature and salinity. Some of them have wide geographical distribution. Our study confirmed the dominance of sponges in the caves of Tarkhankut. However, the community structure of sponges, their abundance and biomass vary from caves. The species composition of sponges from the caves of Crimea is quite different from the sponges composition in Mediterranean caves. This is primarily because the geographical isolation of the Black Sea and the differences in the hydro-chemical parameters of the milieu (water salinity in Tarkhankut is 18-21‰).

References

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