

SUSAK ISLAND (NORTH ADRIATIC SEA): POSSIBLE PROTECTED MARINE AREA

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Abstract

The program encompasses environmental research of the submarine zone of Susak Island (Kvarner bay of the Northern Adriatic Sea), with the aim of proposing the establishment of a protected area. The submarine zone of Susak Island should be proposed as a protected area for the following reasons: the morphogenesis and geological composition of Susak island and the shallow surrounding submarine plateau are unique among the islands of the Northern Adriatic Sea; 3 biocenoses, 4 floral species and 15 invertebrate species found are, according to the Mediterranean Action Plan, of conservation interest; this area is surrounded by sea-grass *Posidonia oceanica* community; the submarine zone of Susak Island complements geographically previously proposed marine protected areas in the Kvarner region.

Keywords : *Adriatic Sea, Biodiversity, Geomorphology, Marine Parks.*

Susak Island is situated in the open sea of the Kvarner area, to the west of the Cres-Lošinj archipelago. There are no published data about the benthic communities of Susak Island local waters. Only summarized data about the flora and fauna for the Cres-Lošinj archipelago, which includes Susak Island, were published [1].

Methodology

Biological researches of this area were carried out in the period from 6-12 October, 2006. The research of benthic biocenoses was carried out by using the method of direct observation and photodocumentation by means of SCUBA-diving equipment. On the basis of field notes and material analyses we determined the benthic communities according to standard classification [2]. The decapod crustaceans were researched by direct underwater visual examination and caught by special baited traps during day and night time. The composition of the fish assemblage was investigated by using the visual census method.

Geology of investigated area

Susak Island has a relatively low-lying irregular shape with NW-SE orientation. The surface of the island is 3.76 km². A relatively flat loess plateau bordered by steep slopes around the greater part of the island is the characteristic feature of Susak. The Quaternary loess and loess-like sediments with maximum thickness of 90 m cover Upper Cretaceous limestones [3]. Limestone bedrock is partially visible on the coast. Shallow and narrow submarine plateau has depth range between 5 and 15 m. Steep submarine slopes are situated along the north-eastern and south-western coast of Susak Island. These submerged relief forms separate the narrow submarine plateau from almost flat sea bottom at the depth of 40 to 50 m. The shallow submarine plateau around the island is mostly covered by sand, and silty sand prevails on deeper sea bottom [4].

Results and discussion

A total of 6 hardbed biocenoses were determined: the biocenosis of upper mediolittoral rock, biocenosis of lower mediolittoral rock, biocenosis of infralittoral algae, precoralligenous aspect of a coralligenous biocenosis, coralligenous biocenosis and biocenosis of semi-dark caves. Furthermore, two biocenoses of movable bottoms were determined: the biocenosis of the *Posidonia oceanica* meadows and the biocenosis of littoral detritic bottom. The island of Susak is surrounded by sea-grass community of *Posidonia oceanica*, which appears on sandy seabed at the depths of 1 to 25 m. Communities of infralittoral algae are mostly limited to the narrow zone of rocky bottom up to 2 m deep, where, due to the pronounced sea dynamics, the algae of low taluses predominate. The biocenosis of semi dark caves, precoralligenous aspect of a coralligenous biocenosis and facies with *Eunicella cavolinii* of the coralligenous biocenosis were mostly observed at the steep rocky bottom of the south-eastern side of Susak Island. In the area of investigation 62 species of macroflora (Cyanophyta 1, Rhodophyta 35, Phaeophyta 13, Chlorophyta 11, Angiospermae 2) and 218 species of macrofauna (Porifera 24, Cnidaria 21, Placophora 2, Gastropoda 12, Bivalvia 23, Cephalopoda 2, Echiura 1, Sipuncula 1, Polychaeta 9, Crustacea 36, Bryozoa 8, Echinodermata 14, Tunicata 6, Pisces 55) were determined. Three biocenoses, 4 floral species, 6 species of Porifera, 1 species of Echinodermata, 4 species of Mollusca and 3 species of Crustacea found are, according to the Mediterranean Action Plan, of conservation interest. The characteristics of the benthic communities of the Susak submarine area differ from benthic communities of other previously investigated submarine areas whose aim is establishing protected

areas in the Kvarner region (the Islands Ćutin mali and Ćutin Veli, the Kostrena municipality aquatorium and the Prvić, Grgur and Goli islands) [5, 6, 7]. While the most important feature of benthic communities of the Susak submarine area are well developed meadows of *Posidonia oceanica*, the most important value of other investigated areas are well developed biocenoses of hard bottom (biocenosis of upper mediolittoral rock, association with *Nemalion helminthoides*; biocenosis of lower mediolittoral rock, association with *Lithophyllum tortuosum*; biocenosis of infralittoral algae, associations with *Cystoseira* spp.; coralligenous biocenosis, facieses with gorgonarians (*Eunicella cavolinii*, *Paramuricea clavata*) [5, 6, 7]. The submarine zone of Susak Island should be proposed for a protected area for the following reasons: 1) Due to its morphology and geological fabric, Susak island and the surrounding shallow submarine plateau is unique among the islands of the Northern Adriatic Sea channel zone; 2) The present limited research revealed 3 biocenoses, 4 floral species and 15 invertebrate species that are, according to the Mediterranean Action Plan, of conservation interest. It could be expected that future more extensive researches would increase the known biodiversity and conservation interest of this area; 3) The submarine zone of Susak island is unique among the islands of the Northern Adriatic Sea by the wide spread of *Posidonia oceanica* meadows, a community of particular conservation interest; 4) This area, with its position in the open Northern Adriatic Sea (west of the Cres-Lošinj archipelago), complements previously researched marine zones in the Kvarner area with the aim of proposing the establishment a protected area. The other previously investigated and possibly protected areas are situated in the channel zone of Kvarner area: Ćutin veli and Ćuti mali islands in Kvarnerić aquatorium, near the eastern coast of Cres Island and Prvić, Grgur and Goli islands are situated in Velebit Channel, and Konstrena area, which is near the northeastern coast of Rijeka Bay.

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