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MEDITERRANEAN MARINE CAVES AS BIODIVERSITY RESERVOIRS: A PRELIMINARY OVERVIEW

Abstract

Marine caves constitute a typical feature of the Mediterranean coastline, yet knowledge on their biodiversity is scattered and geographically fragmented. In order to assess the overall diversity of the Mediterranean cave biota, an overview of 307 studies was combined with data obtained from previously unexplored marine caves of the Aegean Sea. A total of 2167 taxa were recorded from 350 caves in 15 countries. Our analyses showed that research has mainly taken place in semi-submerged and shallow caves from the northern Mediterranean. Species richness varied among areas, reflecting variability in research effort and in the number of caves, which are more abundant on the rocky coasts of the northern basin. The Tyrrhenian Sea (822 taxa), Ionian Sea (696), and French coasts (650) presented the highest species richness and research effort. The biodiversity overview revealed that marine caves harbour a considerable proportion of the total Mediterranean fauna for particular phyla, especially for brachiopods, bryozoans and sponges. However, gaps of knowledge emerged regarding certain areas, groups of biota, assemblages, and cave types. It is suggested that Mediterranean marine caves constitute significant biodiversity reservoirs deserving further scientific research and conservation actions.

Key-words: Marine caves, habitat, biodiversity reservoir, biodiversity hotspot, Mediterranean Sea

Introduction

Marine cave communities are widely acknowledged for their rich biodiversity and have attracted increasing scientific interest soon after the pioneer studies, which took place in the middle of the last century (e.g. Laborel & Vacelet, 1958; Pérès & Picard, 1949). The first large-scale expedition that surveyed the Mediterranean marine cave biodiversity, the “Tyrrhenia-Expedition”, was organized by Rupert Riedl in 1952, yielding 529 taxa and several publications (e.g. Russ & Rützler 1959). Later on, in his monograph “*Biologie der Meereshöhlen*”, Riedl (1966) compiled all available data, reporting 905 taxa from Mediterranean marine caves, while he estimated that the total species richness might approach 2000 species. More recently, in a review of sponge diversity recorded in Mediterranean marine caves, Gerovasileiou & Voultsiadou (2012) cited 311 taxa, which represented 45.7% of the Mediterranean Porifera. The latter researchers also highlighted the upward trend in marine cave research (4 papers per year), accompanied by the addition of new records including several cave-exclusive species.

Approximately 3000 marine caves have been recorded until today on the rocky coasts of the Mediterranean Sea (Giakoumi *et al.*, 2013). These ecosystems harbour a variety of sciaphilic communities, ranging from coralligenous to semi- and entirely-dark cave assemblages (Pérès & Picard, 1964), which are protected by the EU Habitats Directive (92/43/EEC) and have been included in two Action Plans by UNEP/MAP-RAC/SPA (2008; 2013).

Most researchers having worked on marine cave biota recognize in general the significance of this habitat for marine biodiversity and its conservation. However, as