

# MANAGEMENT AND CONSERVATION OF MEDITERRANEAN SEASCAPES: ARE THERE BETTER WAYS TO GO?

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## Abstract

Oceans are exposed to a combination of local and global pressures. Effective conservation measures are urgently needed. Several initiatives focused on Mediterranean seascapes by listing habitats and assemblages on the basis of their putative abundance and ecological importance. Our analyses reveal that these classification schemes are questionable in terms of taxa representativeness and basic ecological knowledge of the selected entries. Past efforts had the merit of creating a conservation framework for Mediterranean seascapes, but it is time to make some steps forward, to better account for the changes occurring at Mediterranean scale and to better fit the world wide accepted marine conservation criteria.

**Keywords:** Biodiversity, Coastal Management, Conservation

## Introduction

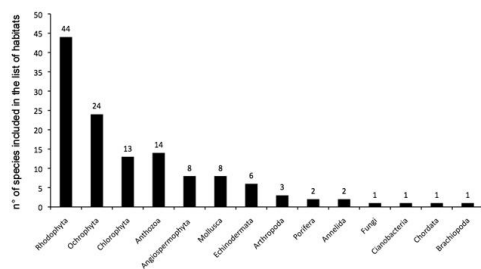
The Mediterranean Sea is a semi-closed basin exposed to interactions of local and global pressures driving rapid biodiversity changes in terms of species life cycles, trophic interactions, composition, abundance and distribution of assemblages (1, 2). The adoption of measures relying on criteria effectively facing the magnitude of these changes is urgently needed. The EU Habitat Directive is one of the main tools for biodiversity protection in Europe. Marine habitats, however, are treated sparingly in these classification schemes. The RAC-SPA at Tunis (3) tried to react to this superficial treatment of marine habitat diversity focusing on Mediterranean seascapes by listing habitats and assemblages on the basis of their putative abundance and ecological importance. This attempt, together with some others (4, 5), had the merit of creating a framework for Mediterranean seascapes, representing the baseline for the conservation and management of this basin. Here, we analyse this classification to highlight criticalities and propose adjustments to improve the available tools for biodiversity management and protection.

## Materials and Methods

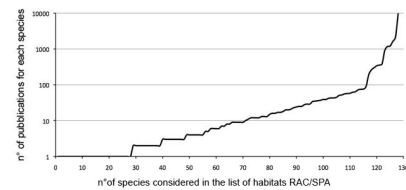
The RAC-SPA classification is featured by a hierarchical structure going from the topographic structure of the substrate to the presence of a series of species-assemblages potentially locally dominant (*i.e. facies* and/or *associations*). We used the ISI Web of Science ([www.isiknowledge.com](http://www.isiknowledge.com)) to search published articles dealing with the species/taxa characterizing the *facies* and the *associations* included in the classification.

## Results

The classification includes 162 entries (with a total of 128 species included in the list). Our analysis reveals that: 1- The classification scheme is mostly algal-oriented, the 63% of the species being algae (Fig. 1). The genus *Cystoseira* spp. is represented by 13 species, while bioconstructors such as vermetids or bryozoans are included only as general groups. 2. The algal bias, in many cases, allows analyses just in spring-summer, whereas the assemblages typical of winter (e.g. large hydroids) are treated insufficiently. 3- The 14 % of the species considered in the list is not covered by ISI journals and the 16% is cited only once or twice. About half of the included species have been cited by less than ten papers (Fig. 2). 4- There is an important lack of proportion between the entries devoted to shallow assemblages in comparison to those devoted to the so-called circalittoral habitats, which are under represented.



**Fig. 1. Number of species for different taxonomic groups in the list of habitats RAC/SPA.**



**Fig. 2. Number of publications for each species included in the list. Species with 0 publications (n=18) were not reported**

## Discussion & Conclusion

Our analyses reveal that these classification schemes are taxonomically biased in favour of algae, lack basic ecological knowledge of several selected entries, privilege shallow assemblages and disregard deeper ones and are applicable in some seasons and not in others. Thus, if the aim of the classification is an inventory of dominant habitats, assemblages and species of the Mediterranean Sea, it is awkward to justify the exclusion of a variety of benthic organisms largely represented in this basin. In case the aim is to focus on conservation and management efforts, the inclusion of entries in available lists should be updated, relying on ecological criteria clearly decided *a priori* for deciding which taxa should be "in" and should be "out", based on a general consensus in the scientific community. Past efforts had the merit of creating a conservation framework for Mediterranean seascapes, but it is time to make some steps forward, to better account for the changes occurring at Mediterranean scale.

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