EVOLUTIONARY HISTORY AND DIVERSITY OF MEDITERRANEAN CORALLINE ALGAE: HOW MUCH DO WE KNOW?

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In the Mediterranean Sea coralline red algae play a particularly important role, as their calcified thalli provide hard substratum in several benthic biocenoses covering large portions of rocky bottom (i.e. coralligenous concretions, rims of *Lithophyllum byssoides*, rims of articulated corallines). Since its opening 250 Myr ago, the Mediterranean has undergone a complex oceanographic history, due to geological and climatic events such as the Atlantic opening, the isolation from the Indian Ocean, and the Messinian Salinity Crisis, which determined phases of connection and separation from the adjacent oceans. These events profoundly affected the evolutionary history of Mediterranean marine organisms, fueling a high biological diversity. Paleontological evidence indicates that corallines have been major bioconstructors in the Mediterranean for a long time and that some common species have occurred in the basin for at least 10-11 Myr (*Lithophyllum dentatum*, *L. incrustans*, *L. pustulatum*). The limited amount of molecular data available has hindered our understanding of the evolution and diversity of this group, but recent studies shed major insights in these topics. The recent discovery of *Pneophyllum cetinaensis* shows that the Mediterranean is the only geographical region in which coralline algae have successfully crossed the border between sea and freshwater, a transition that probably took place during the last glaciation. *Lithophyllum byssoides*, one of the few genuinely intertidal Mediterranean seaweeds, has a high haplotypic diversity and Mediterranean populations probably represent a different species from Atlantic populations, a pattern observed for many animal species. Similarly sharp haplotypic differentiation between Mediterranean and Atlantic populations has been documented for species of *Mesophyllum* and *Corallina*. *Lithophyllum cabiochiae*, the main bioconstructor of coralligenous concretions, represents a highly diverse complex of species, rather than a single species. These studies suggest that Mediterranean corallines represent a more evolutionarily complex group than believed so far, worthy of further detailed investigation.