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Opinion

Mediterranean red coral as a spawning ground for cuttlefish

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The Mediterranean red coral (*Corallium rubrum*) is a long-lived and slow-growing gorgonian, which suffered intense exploitation due to its precious calcium carbonate skeleton used in jewelry and traded worldwide [1].

Due to its commercial and ecological value, knowledge of the biology of the species has increased noticeably during the last decades as a support to management; however, evidence of its ecological role is scarce [2]. Demographic studies revealed a shift of *C. rubrum* population structures towards small-sized colonies and raised concern about the risk of the loss of the ecological function of the species [2].

Similarly to other gorgonians, *C. rubrum* can form dense forests [3] which increase structural complexity and serve as feeding, shelter, and foraging grounds for many associated organisms. Furthermore, coral forests provide favorable conditions for the egg deposition of several species [4].

In the framework of a transplanting experiment near the Marine Protected Area of Cérbere-Banyuls (North Western Mediterranean Sea, France), we observed, at the end of May 2019, one egg mass deposition of the European cuttlefish (*Sepia officinalis)* on a transplanted healthy *C. rubrum* colony at 30 m depth (Figure 1). We report some characteristics of the eggs: the diameter of the 9 eggs was comprised between 1.5 and 2 cm, and they presented a swollen and fuller appearance, suggesting that they were at a late stage of embryological development. Moreover, the egg mass contained empty egg capsules indicating that some cuttlefish already hatched (Figure 1) and then suggesting that the *C. rubrum* colony was a viable structure for their embryological development.

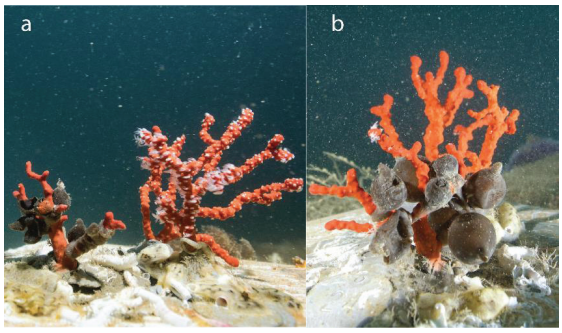

Figure 1: Cuttlefish egg deposition on a *C. rubrum* colony transplanted at 30 m depth in Banyuls sur mer, France. **a**: distant view. **b**: close up on the eggs (photo by B. Hesse).

Cephalopods play a key role in marine food webs, and most of them, such as *S. officinalis* in the Mediterranean and particularly in the area in which the study was performed, are important fishery resources. Cuttlefish egg depositions have been observed on different structures including gorgonians and are not common at depths >25 m [5]. Our observation increased our knowledge of this complex ecological interaction that is difficult to test and demonstrate. In addition, functional linkage among relevant species is a crucial step toward the development of conservation and management strategies. Our observation highlights the importance of Mediterranean red coral habitats as a spawning ground and functional repository for recruits of commercially important species and suggests that small-sized *C. rubrum* colonies may still fulfill some ecological functions. Those results could help re-evaluate the ecological ecosystem services provided by this precious

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octocoral, which have been underestimated with respect to the economical ones.

Ethical approval

All applicable international, national, and/or institutional guidelines for the care and use of animals were followed by the authors.

Sampling and field studies

All necessary permits for sampling and observational field studies have been obtained by the authors from the competent authorities.

Data availability

Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

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