

NEW DEPTH RECORD OF THE PRECIOUS RED CORAL *CORALLIUM RUBRUM* FOR THE MEDITERRANEAN

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Abstract

Live colonies of the precious red coral *Corallium rubrum* have previously been recorded at depths of 600–800 m in the Sicily Channel, but deep-water populations of this species remain poorly known. During a recent research expedition within the 25 nautical mile Fisheries Management Zone around the Maltese Islands, numerous colonies growing deeper than 800 m, down to depths of 1016 m were observed. These colonies were part of a diverse community of habitat-forming species of scleractinians, gorgonians and antipatharians.

Keywords: *Deep sea corals, Malta Channel, Mediterranean Sea, Deep waters*

Introduction

The precious red coral *Corallium rubrum* inhabits a variety of sublittoral hard substratum habitats in the Mediterranean Sea and the Eastern Atlantic Ocean, with live colonies generally reported from depths ranging between 15 m and 300 m [1, 2, 3, 4, 5]. In 2006 and 2007, deep-water colonies of red coral were for the first time observed at depths down to 800 m, living in association with the deep-water stony corals *Madrepora oculata* and *Lophelia pertusa* [6, 7, 8]. Deep-water red coral populations however remain poorly known. Indeed, the remoteness and inaccessibility of the reported bathyal habitats (overhangs, steep escarpments) serves to protect this species from exploitation for the jewellery trade, which shallower water colonies have been subjected to since antiquity [7, 8].

Method

Red coral colonies were visually recorded and documented during a Remotely Operated Vehicle (ROV: Saab Seaeye Falcon DR) survey by the R/V 'Oceana Ranger' as part of the project LIFE BaHAR for N2K ('Benthic Habitat Research for Marine Natura 2000 Site Designation'; <http://lifebahar.org.mt/>). The survey was carried out in June–July 2015 within the 25 nautical mile Fisheries Management Zone (Figure 1) around the Maltese Islands.

Results & Discussion

Living colonies of *Corallium rubrum* were observed at depths ranging from 338 m to a maximum of 1016 m, and in 10 out of a total of 15 ROV dives that surveyed hard bottoms, rocky outcrops, or dead coral frameworks located in waters deeper than 800 m off the south to southwest coasts of the islands (Figure 1). These records represent a further significant extension of the known bathymetric range of red coral populations.

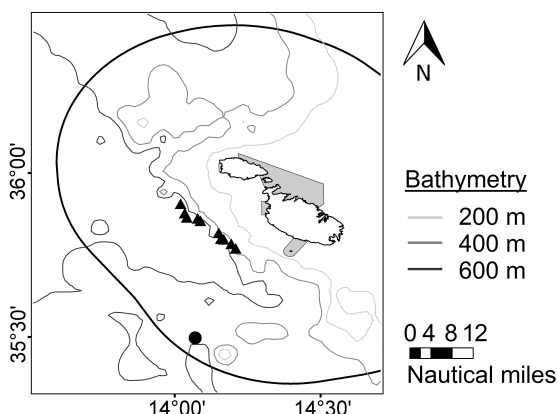


Fig. 1. Map of the Maltese Islands showing the location of sites where live *Corallium rubrum* colonies were located at depths of 800–1016 m (triangles). Previous records of deep-water red coral (circle), the partial extent of the 25 nautical mile Fisheries Management Zone (oval line around the Maltese Islands), and the location of current Marine Protected Areas in Maltese waters (grey shading) are also shown.

Red coral colonies recorded at depths of 800–1016 m were found to be part of a cnidarian-dominated megabenthic community on deep-water hard substrata characterised by a mixture of habitat-forming scleractinians, gorgonians and antipatharians. The most common species associated with the red coral colonies were (in order of abundance): *Callogorgia verticillata*, *Madrepora oculata*, *Placogorgia massiliensis*, *Muriceides lepida*, *Isozoanthus primnoidus*, *Pachastrella monilifera*, *Lophelia pertusa*, *Acanthogorgia hirsuta*, *Desmophyllum dianthus* and *Leiopathes glaberrima*. Habitats where red coral colonies were found included rocky outcrops and slopes, vertical escarpments, overhangs, and in several instances, dead coral frameworks.

The designation of offshore Marine Protected Areas should be considered by the relevant authorities in order to protect these so far unique, deep-sea red coral habitats.

Acknowledgements

The LIFE BaHAR for N2K (LIFE12 NAT/MT/000845) Project is 50% co-financed by the EU LIFE+ Funding Programme and implemented by the Malta Environment and Planning Authority (MEPA), the University of Malta, Fundacion Oceana, the Ministry for Sustainable Development, the Environment and Climate Change (MSDEC), and the Department for Fisheries and Aquaculture within MSDEC. We thank the Malta Environment and Planning Authority - Environment Protection Directorate and the Ministry for Transport and Infrastructure - Continental Shelf Department for granting the permits to undertake this work.

References

- 1 - Weinberg S., 1978. Mediterranean octocorallian communities and the abiotic environment. *Mar. Biol.*, 49: 41–57.
- 2 - Zibrowius H., Montero M. and Grashoff M., 1984. La répartition du *Corallium rubrum* dans l'Atlantique. *Thetys*, 11: 163–170.
- 3 - Chintiroglou H., Dounas C. and Koukouras A., 1989. The presence of *Corallium rubrum* (Linnaeus, 1758) in the Eastern Mediterranean Sea. *Mitt. Zool. Mus. Berlin*, 65: 145–149.
- 4 - Abbiati M., Santangelo G. and Novelli S., 1993. Genetic variation within and between two Tyrrhenian populations of the Mediterranean alcyonarian *Corallium rubrum*. *Mar. Ecol. Prog. Ser.*, 95: 245–250.
- 5 - Rossi S., Tsounis G., Orejas C., Padron T., Gili J. M., Bramanti L., Teixido N. and Gutt J., 2008. Survey of deep-dwelling red coral (*Corallium rubrum*) populations at Cap Creus (NW Mediterranean). *Mar. Biol.*, 154: 533–545.
- 6 - Freiwald A., Beuck L., Rüggeberg A., Taviani M., Hebbeln D. and R/V Meteor M70-1 Participants, 2009. The white coral community in the Central Mediterranean Sea revealed by ROV surveys. *Oceanogr.*, 22: 58–74.
- 7 - Costantini, F., Taviani, M., Remia, A., Pintus, E., Schembri, P. J. and Abbiati, M., 2010. Deep-water *Corallium rubrum* (L., 1758) from the Mediterranean Sea: preliminary genetic characterisation. *Mar. Ecol.*, 31(2): 261–269.
- 8 - Taviani, M., Freiwald, A., Beuck, L., Angeletti, L. and Remia, A., 2010. The deepest known occurrence of the precious red coral *Corallium rubrum* in the Mediterranean Sea. In *Proceedings of the International Workshop on Red Coral Science, Management, Trade: Lessons from the Mediterranean*, pp: 87–93.