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High-resolution mapping of the seafloor offshore Marzamemi village (southeastern Sicily, Ionian Sea): extent and distribution of coralligenous reefs

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Coralligenous (C) habitat consists of calcareous formations of biogenic origin characteristic of subtidal systems in the Mediterranean Sea. It develops only specific environmental conditions, and its growth is controlled by the delicate balance between bioconstruction and bioerosion processes. C outcrops typify specific areas of the Mediterranean continental shelves. Offshore Marzamemi village (southeastern Sicily, Ionian Sea) peculiar columnar-shaped C outcrops were documented in 2001. Nevertheless, an in depth study of their extension and distribution in the area is still missing. Indeed, this is one of the main goals of the project CRESCIBLUREEF - Grown in the blue: new technologies for knowledge and conservation of Mediterranean reefs .

A new 17 km^2 high-resolution morpho-bathymetric map was produced using a R2-Sonic2022 MBES system, ground-truthed by ROV surveys. The combination of bathymetric and backscattering data, together with the ROV videos, allowed us to identify five main habitats. From a geomorphological point of view, it was possible to divide the area into four main marine terraces. These terraced landforms are probably the result of eustatic sea-level variations coupled with tectonic processes. Of relevant importance is the correlation between C reefs distribution with this geomorphological layout. Indeed, C build-ups result to be more widely spread over the shallowest and deeper terraces at selected depth ranges, from 36 to 42 m and from 82 to 102 m of water depth, respectively.

This study represents a starting point for the understanding of such a complex habitat, which is among the most important in the Mediterranean Sea and under protection by several legal instruments. Further investigations are needed to better understand the C settling in respect to this inherited continental shelf landscape. This is valid under both the biological and geomorhological point of view, as C habitat is a hotspot of biodiversity, and the outcrops affect present-day continental shelf landforms and landscapes.

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