

New insights on microbial diversity in the seamount systems of the Cape Palinuro area (Salerno, Italy)

Francesco Fabiano^{1,2,3}, Erika Arcadi⁴, Elvira Oliveri⁵, Mario Sprovieri⁶, Salvatore Passaro⁷, Valentina Costa⁸, Carmen Rizzo^{3,9}, Teresa Romeo^{4,10}

¹ Department of Earth and Marine Sciences, University of Palermo, Italy; ² NBFC, National biodiversity future centre, Palermo, Italy; ³ Department Ecosustainable Marine Biotechnology, Stazione Zoologica Anton Dohrn, Sicily Marine Centre, Contrada Porticattello, 29, 98167 Messina, Italy; ⁴ Department of Biology and Evolution of Marine Organisms, Stazione Zoologica Anton Dohrn, Sicily Marine Centre, Contrada Porticattello, 29, 98167 Messina, Italy; ⁵ National Research Council- Institute for the Study of Anthropogenic Impacts and Sustainability in the Marine Environment (CNR-IAS), Lungomare Cristoforo Colombo 4521, Loc. Addaura, 90149, Palermo, Italy; ⁶ National Research Council - Institute of Marine Sciences (CNR-ISMAR), Arsenale-Tesa 104, Castello 2337/F 30122 Venezia, Italy; ⁷ National Research Council - Institute of Marine Sciences (CNR-ISMAR), Calata Porta di Massa Porto di Napoli, 80, 80133 Napoli, Italy; ⁸ Department of Integrative Marine Ecology, Stazione Zoologica Anton Dohrn, Calabria Marine Centre, Amendolara (CS), Italy; ⁹ Institute of Polar Sciences, National Research Council (CNR-ISP), Spianata S. Raineri 86, 98122 Messina, Italy; ¹⁰ National Institute for Environmental Protection and Research, Via dei Mille 46, 98057 Milazzo, Italy.3568

Presenting Author: Francesco Fabiano

Corresponding authors: francesco.fabiano@szn.it

Marine seamount systems are undersea mountains that arise from the ocean floor without reaching the surface and are widely distributed on our planet (¹). Because of their topography, marine seamounts provide various habitats and diversified environmental conditions for marine living communities, from planktonic to benthic forms (²). Moreover, seamounts significantly influence global ocean circulation patterns and facilitate seawater mixing, providing more nutrients for marine primary producers. For this reason, they are considered hotspots of biodiversity, known as the ‘seamount effect’. (^{3;4}). To delineate the level of biodiversity in these peculiar systems, it is important to start with in-depth studies of the taxonomic structure of microbial communities, which form the basis of all ecosystems. This proposed study investigated the biodiversity of water and sediment microbial communities in the area of Cape Palinuro (Salerno, Italy) by employing a metagenomic approach. Water and sediment samples showed different microbial and archaeal communities. Water microbial population were mainly dominated by *Proteobacteria*, *Cyanobacteria* and *Chloroflexi*, but in some sites, there was also a predominance of *Marinimicrobia* (SAR406 clade) and *Planctomycetota*. In contrast, sediment communities were mainly represented by *Proteobacteria* and *Plancomycetota*, with high representation also of the groups *Acidobacteriota* and *Actinobacteriota*. While the water archaeal communities were dominated by *Thermoplasmatota* members, the sediment communities were represented by *Crenarchaeota*, *Nanoarchaeota* and *Thermoplasmatota*. Overall, the study provided interesting insight into the microbial ecology of marine seamounts.

References:

- 1-Yesson C., Clark, M. R., Taylor, M. L., and Rogers A. D. (2011). The global distribution of seamounts based on 30 arc seconds bathymetry data. *Deep-Sea Res. Part I-Oceanographic Res. Papers* 58 (4), 442–453. doi: 10.1016/j.dsr.2011.02.004
- 2-Liu N. H., Ma J., Lin S. Q., Xu K.D., Zhang Y. Z., Qin Q. L. and Zhang X.Y. (2023). Biogeographic distribution patterns of the bacterial and archaeal communities in two seamounts in the Pacific Ocean. *Front. Mar. Sci.* 10:1160321. doi: 10.3389/fmars.2023.1160321
- 3-Rogers A. D. (2018). The biology of seamounts: 25 years on. *Adv. Mar. Biol.* 79, 137–224. doi: 10.1016/bs.amb.2018.06.001
- 4-Voosen P. (2022). Undersea mountains help stir up oceans. *Science* 375 (6587), 1324–1325. doi: 10.1126/science.abq.1703