

240001 - ARMS-MBON: long-term genetic monitoring of marine hard-bottom communities

Christina Pavloudi¹, Christos Arvanitidis², Piotr Balazy³, Maciej Chetchowski³, Piotr Kukliński³, Magdalena Małachowicz³, Anita Poćwierz-Kotus³, Małgorzata Zbawicka³, Ibon Cancio⁴, Oihane Diaz de Cerio⁴, Giorgos Chatzigeorgiou⁵, Eva Chatzinikolaou⁵, Thanos Dailianis⁵, Jon Bent Kristoffersen⁵, Georgia Sarafidou⁵, Grigorios Skouradakis⁵, Emmanouela Vernadou⁵, Nathan Christmas⁶, Thierry Comtet⁷, Nauras Daraghme⁸, Klaas Deneudt⁹, Katrina Exter⁹, Jonas Mortelmans⁹, Markos Digenis¹⁰, Vasilis Gerovasileiou¹⁰, Amatzia Genin¹¹, Jose González¹², Laura Kauppi¹³, Rafal Lasota¹⁴, Levy Liraz¹⁵, Borut Mavric¹⁶, Estefania Paredes¹⁷, Jesús Troncoso¹⁷, Henning Reiss¹⁸, Ioulia Santi¹⁹, Jostein Solbakken¹³, Peter Staehr²⁰, Jakob Thyrring²⁰, Frederique Viard²¹, Haris Zafeiropoulos²², Matthias Obst²³

¹PSL Research University: EPHE-UPVD-CNRS, UAR CNRS 3278 Centre de Recherche Insulaire et Observatoire de l'Environnement (CRIOBE), France & Laboratoire d'Excellence "CORAIL", Centre de Recherche Insulaire et Observatoire de l'Environnement (CRIOBE), French Polynesia,

²LifeWatch ERIC, ³Institute of Oceanology Polish Academy of Sciences, ⁴Plentzia Marine Station (PiE-UPV/EHU), University of the Basque Country, ⁵Hellenic Centre for Marine Research (HCMR), Institute of Marine Biology, Biotechnology and Aquaculture (IMBBC), ⁶Marine Biological Association, ⁷Sorbonne Université, ⁸King Abdullah University of Science and Technology, ⁹Flanders Marine Institute (VLIZ), ¹⁰Ionian University, ¹¹Hebrew University of Jerusalem, ¹²Estación de Ciencias Mariñas de Toralla (ECIMAT), ¹³University of Helsinki, ¹⁴University of Gdansk, ¹⁵The Interuniversity Institute of Marine Sciences in Eilat, ¹⁶National Institute of Biology, Marine Biology Station Piran, ¹⁷Universidade de Vigo, ¹⁸Faculty of Biosciences and Aquaculture, Nord University, ¹⁹EMBRC-ERIC, ²⁰Department of Bioscience, Aarhus University, ²¹Station Biologique of Roscoff & Institute for Evolutionary Sciences of Montpellier (ISE-M), ²²KU Leuven, Department of Microbiology, Immunology and Transplantation, Rega Institute for Medical Research, Laboratory of Molecular Bacteriology, ²³University of Gothenburg

To understand global shifting trends in marine biodiversity it is essential to apply cost-efficient biomonitoring approaches in a coordinated and standardized manner, to generate comparable data across geographical regions and countries. In this context, DNA metabarcoding is particularly useful to document biodiversity over larger spatiotemporal scales and in habitats with limited access, such as marine hard substrata which are difficult to sample for quantitative ecological studies; for this reason, we have established the Autonomous Reef Monitoring Structures Marine Biodiversity Observation Network (ARMS-MBON). ARMS-MBON deploys ARMS in ports, marinas, and nature reserves along the European coastline, including polar regions and the Red Sea. The network maintains 25 observatory sites deploying ARMS on a regular basis. Using metabarcoding data and associated (meta)data (e.g., pictures, voucher specimens), the community composition is analyzed through a dedicated workflow hosted at the Tesseract Virtual Research Environment and built under the Internal Joint and Collaborative Initiative of LifeWatch ERIC. ARMS MBON has now become part of the European Marine Omics Biodiversity Observation Network (EMO BON), a larger European initiative for the observation of genomic biodiversity. The first sampling campaigns (2018 and 2019 deployments) produced 567

physical samples from 56 ARMS across 15 observatories. Preliminary results show the robustness and sensitivity of ARMS in detecting rare, alien, and key species. They also document a significantly increased species richness in marine protected areas, as compared to the other study sites. We suggest that the ARMS-MBON data and protocols should be used in biological monitoring programs and long-term ecological research.

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Affiliation

PSL Research University: EPHE-UPVD-CNRS, UAR CNRS 3278 Centre de Recherche Insulaire et Observatoire de l'Environnement (CRIOBE), France & Laboratoire d'Excellence "CORAIL", Centre de Recherche Insulaire et Observatoire de l'Environnement (CRIOBE), French Polynesia

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