UNIVERSITÀ DEGLI STUDI DI MILANO-BICOCCA

DOTTORATO DI RICERCA IN Tecnologie Convergenti per i Sistemi Biomolecolari – XLII CICLO

Research Topic ID: XLII – 1.11

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Project Supervisor/s: Davide Maggioni

Project Title: The effects of environmental and anthropogenic stressors in non-model animal species

Scientific background & Objectives

The loss of biodiversity is a global phenomenon leading to the decline of species, ecosystems, and ecological functions. Understanding biological responses to environmental and anthropogenic stressors is therefore fundamental to reversing this process and to guiding planning, management, and conservation efforts.
This project aims to define the effects of environmental and anthropogenic factors on functionally important non-model species. The overall objective is to characterize these effects at a multi-omics scale, with the final goal of informing and supporting conservation and sustainability strategies.
The work will address questions including:
1. Assessment of the effects of environmental parameters, habitat fragmentation, and land use on genetic variation, population genetic parameters, and gene flow.
2. Identification of genomic regions under selection in order to assess local adaptation.
3. Assessment of the differential gene expression and identification of stress biomarkers to be further investigated and implemented.

Project's Networks, Sustainability & Mobility

The research group has a consolidated experience in molecular biodiversity analyses on non-model organisms, including for instance population genetics and phylogenetics using both first- and second-generation sequencing techniques [e.g. Maggioni et al. (2020). Mol Phylogenet Evol 151, 106893; Galimberti et al. (2020). Mol Ecol Res 21, 183-200; Maggioni et al. (2024). Cladistics 40, 107-134; Taninaka et al. (2021). Front Mar Sci 8, 714662.]. The group is currently working on projects dealing with the effect of environmental stressors on functionally important invertebrates, using multi-omic approaches.
The research group collaborate with several Italian and foreign institutions, and the candidate will have the chance to spend a period of approximately six months in other laboratories, in order to acquire further multidisciplinary skills. Possible foreign destinations could be the National University of Singapore (Singapore) and Naturalis Biodiversity Center (The Netherlands).