Corso di Dottorato di Ricerca
in Scienze della Vita e dell'Ambiente - Ciclo XXXVII

# Bioerosion as a structuring force for the ecosystem: Allogenic engineers


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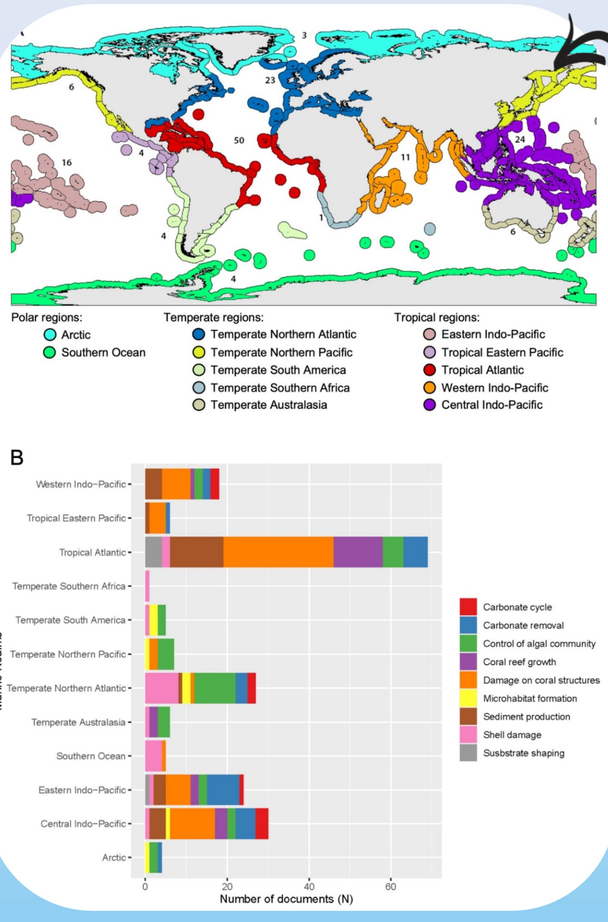
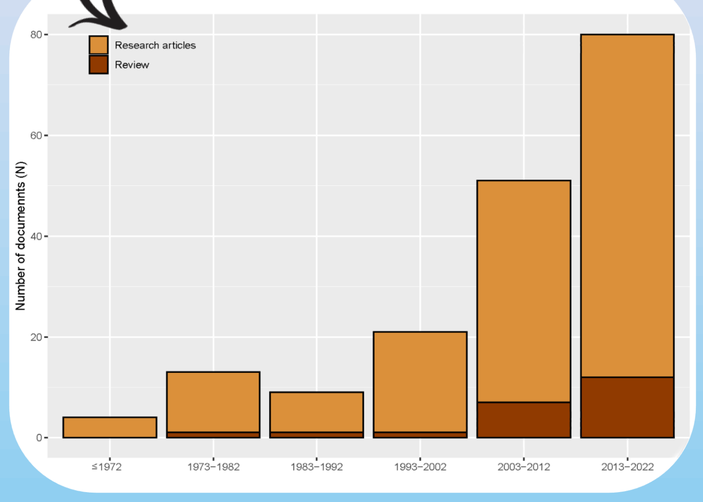
*WP1:*

## What is known about marine bioerosion?

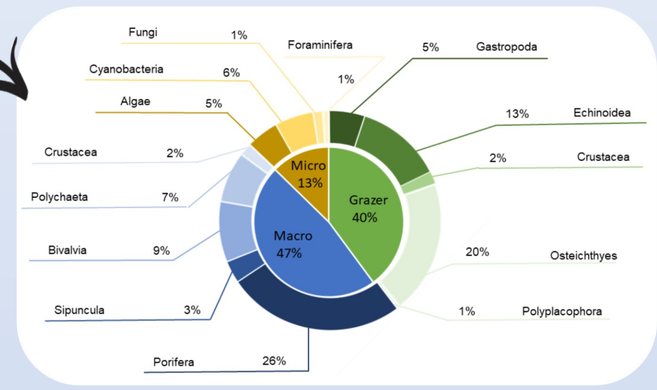



Total distribution of documents (a) and effects (b)

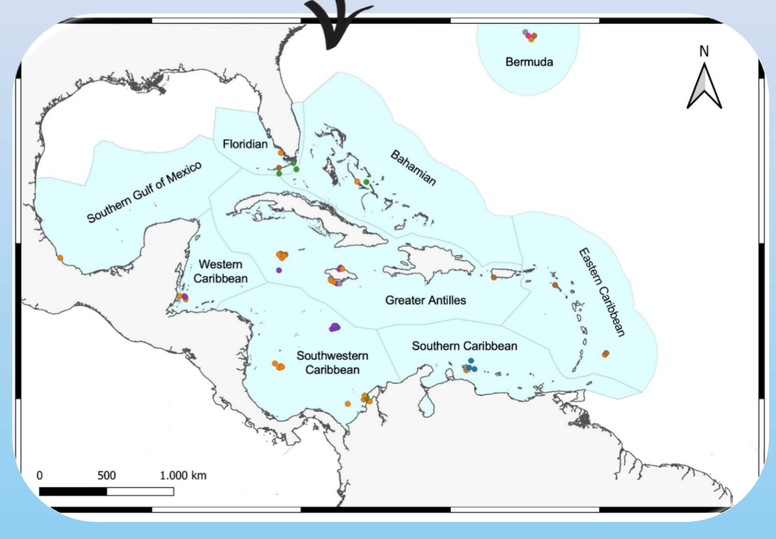
Total number of publications on bioerosion topic




Percentage of taxa studied in the retrieved documents




Distribution of bioerosion effects in the Caribbean Sea




*WP1:* **Benthic community assemblages related to *Pholas dactylus* and *Lithophaga lithophaga* boreholes**

## What is the ecological role of vacant boreholes? Is there any circadian rythm in their exploitation?

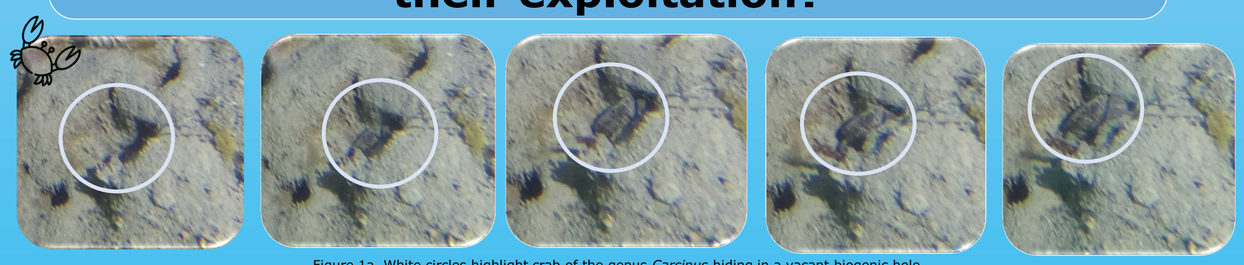


Figure 1a. White circles highlight crab of the genus *Carcinus* hiding in a vacant biogenic hole

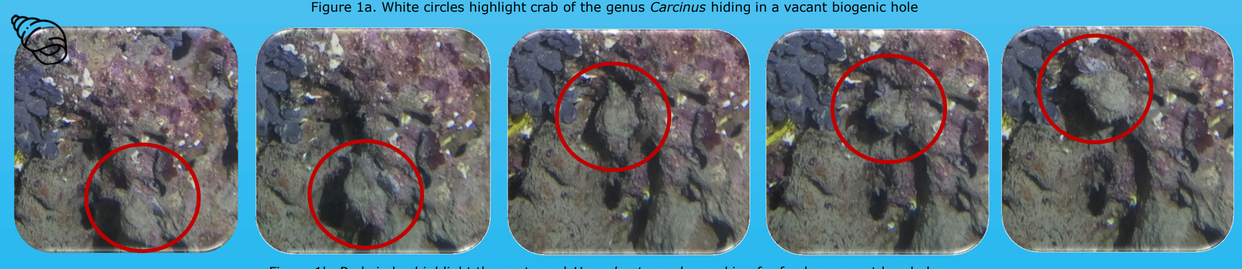
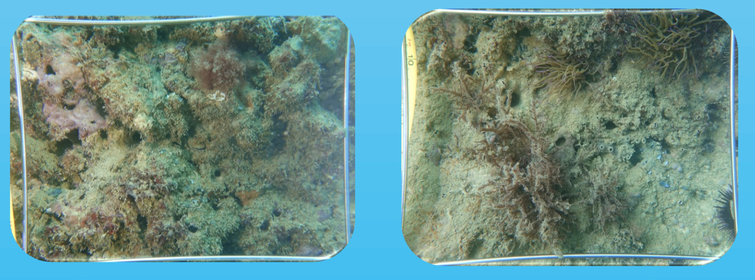


Figure 1b. Red circles highlight the gastropod *Hexaplex trunculus* seeking for food on vacant boreholes

- Bioerosion activity can **deeply modify the substrate** and create crevices and microhabitat.
- Time-lapse technique allows to understand the **community shift** between day and night.
- Many organisms, such as crustaceans, fishes, and gastropods, can **use the boreholes to hide or seek for food**.

*WP2:* **Patterns of distribution of *Pholas dactylus* and *Lithophaga lithophaga***

## Can the inclination and geomorphology of the substrates affect the distribution of *L. lithophaga* and *P. dactylus*?



Using **photo-transect,** the distribution of *P. dactylus* and *L. lithophaga* was assessed


With the same transect, data of seafloor inclination were obtained to built the **geomorphological profile** of the monitored site

Figure 2. Belt-transect of 20 meters of length. The nearest point to the shore was at 2 meters of depth and the farest one was at 6 meters of depth.

*WP3:* **Artificial substrates to assess the refuge hypothesis**

## Does the complexity of the substrates affect the associated biodiversity?

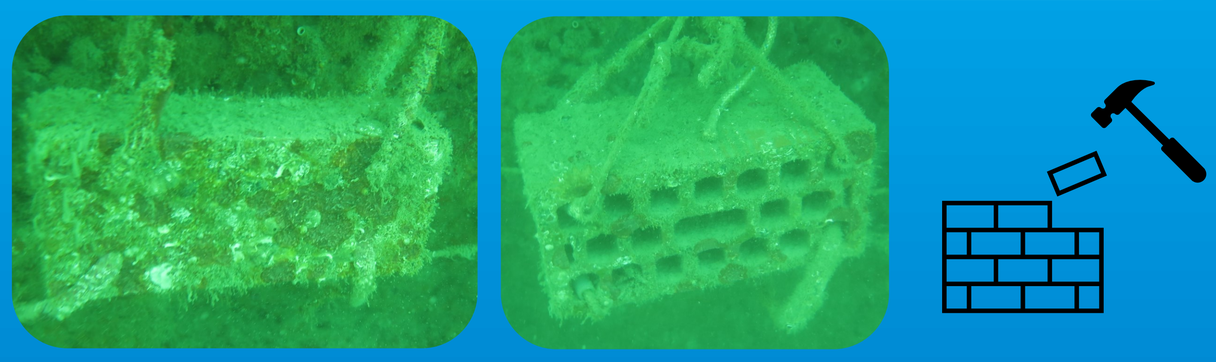
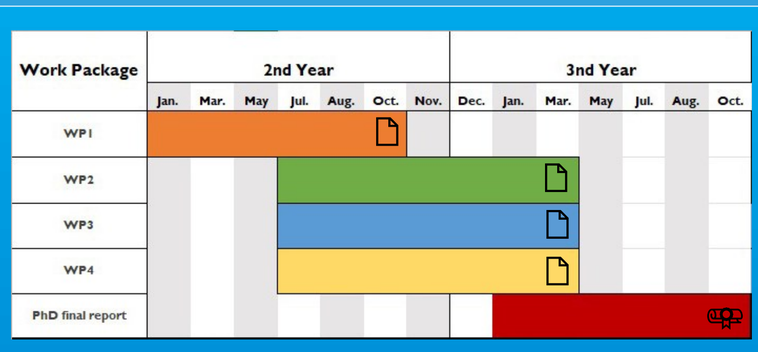


Figure 3. Artificial substrates to emulate the natural biogenic holes of *L.lithophaga:* solid substrate on the left and hollowed susbtrate on the right.

- The deployment of artificial structure allows to get data on the benthic community taking advantages on **vacant boreholes**.
- The comparison of these data with the one on substrates with no holes allows to **compare the biodiversity** in terms of square meter colonized by vagile and sessile species.

## PhD development plan




## Extra-PhD curriculum publications


Roveta, C., Coppari, M., Calcinai, B., Di Camillo, C. G., **Marrocco, T.**, Pulido Mantas, T., Puce, S., & Cerrano, C. (2023). What's the key for success? Translocation, growth and thermal stress mitigation in the Mediterranean coral *Cladocora caespitosa* (Linnaeus, 1767). *Frontiers in Marine Science*, *10*, 876.

Pulido Mantas, T., Roveta, C., Calcinai, B., Coppari, M., Di Camillo, C. G., Marchesi, V., **Marrocco, T.**, Puce, S., & Cerrano, C. (2023). Photogrammetry as a promising tool to unveil marine caves' benthic assemblages. *Scientific Reports*, *13*(1), 7587.



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