

CHARACTERISATION OF MARINE MACROFAUNA ON FLOATING PONTOONS IN HARBOURS OF THE CANARY ISLANDS

Marc Martín-Solà(1), Asier Furundarena-Hernández(1), Jesús González-Navarro(1), M^a Belén Caro-Torti(1), Laura Ojeda-Ramírez(1), Leopoldo Moro-Abad(2), Olga Ayza-Mascarell(2), Rogelio Herrera-Pérez(2), Sara Rendal-Freire(1), Maria Daniela-Rocabado(1), Aida Parejo Lazaro-Carrasco(1), Gerardo José Álvarez Gómez-Ogando(1) & Casandra Cabrera García (1)

(1) Gestión y Planeamiento Territorial y Medioambiental S.A. Islas Canarias. España.

Contact: mmarsol@gesplan.es

(2) Servicio de Biodiversidad. Dirección General de Espacios Naturales y Biodiversidad.

Consejería de Transición Ecológica y Energía, Gobierno de Canarias. Islas Canarias. España.

Contact: redpromar.medioambiente@gobiernodecanarias.org



INTRODUCTION

- Urban coastal development has led to the **expansion of artificial structures** such as harbours, which create new habitats for marine species. These artificial habitats differ greatly from natural rocky environments in species composition, diversity, and ecological interactions.
- Harbours have become hotspots for non-native species** due to intense maritime traffic, which facilitates their arrival and secondary spread. Floating pontoons offer permanently submerged surfaces highly susceptible to colonisation.
- This study focuses on the **characterisation of macrofauna on pontoons** in several harbours across the Canary Islands, providing a baseline for biodiversity monitoring and the early detection of invasive species.

METHODOLOGY

- Floating pontoons** in several harbours across Tenerife, Gran Canaria, and El Hierro were selected for sampling.
- Surveys focused on the **internal submerged parts** (Fig. 1), using snorkelling equipment and underwater cameras.
- Observations were recorded on waterproof tablets, and representative specimens were collected for ex situ identification using **taxonomic keys**.
- Additionally, data were complemented with citizen science records from the Canary Islands Marine Environment Observers Network (**RedPROMAR**).

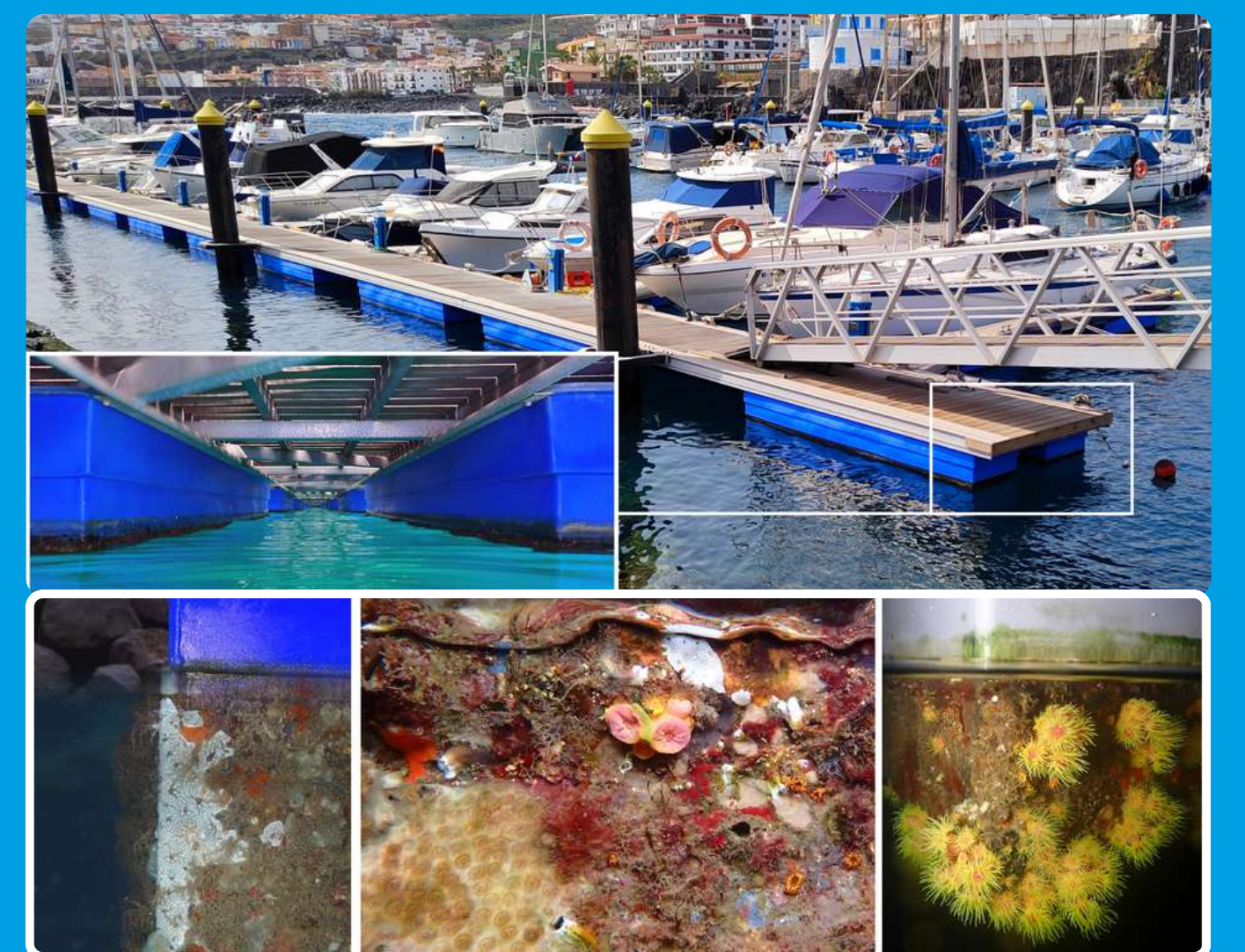


Figure 1. Submerged part of floating pontoons of typical harbour in Canary Islands.

RESULTS

- A total of **152 species** belonging to 12 phyla were recorded (Fig. 2).
- The **most represented** groups were Tunicata (Ascidacea), Cnidaria, and Mollusca.
- At least 20 species were identified as **non-native** (Fig. 3), including several classified as invasive. However, classification remains challenging for certain **cryptogenic taxa** (Fig. 4).
- Several **new records** of potentially introduced species have been reported for the Canary Islands (Fig. 5).
- Additionally, **native species** (Fig. 6), organisms with deep-water affinities (Fig. 7) and specimens still **pending taxonomic identification** (Fig. 8) were also documented.

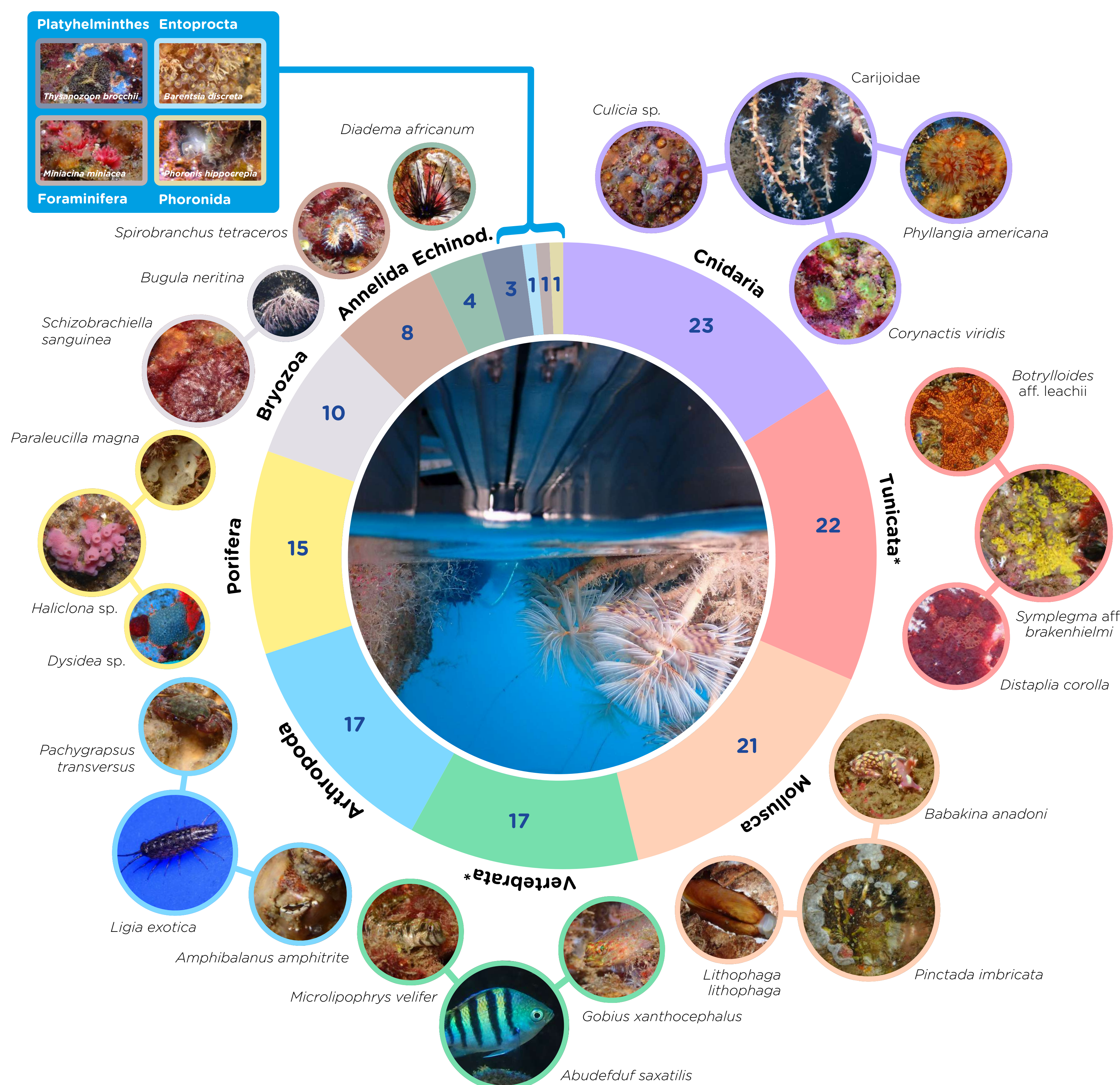


Figure 2. Number of species recorded per phylum on floating pontoons in Canary Islands harbours, with examples from each group.

Introduced species

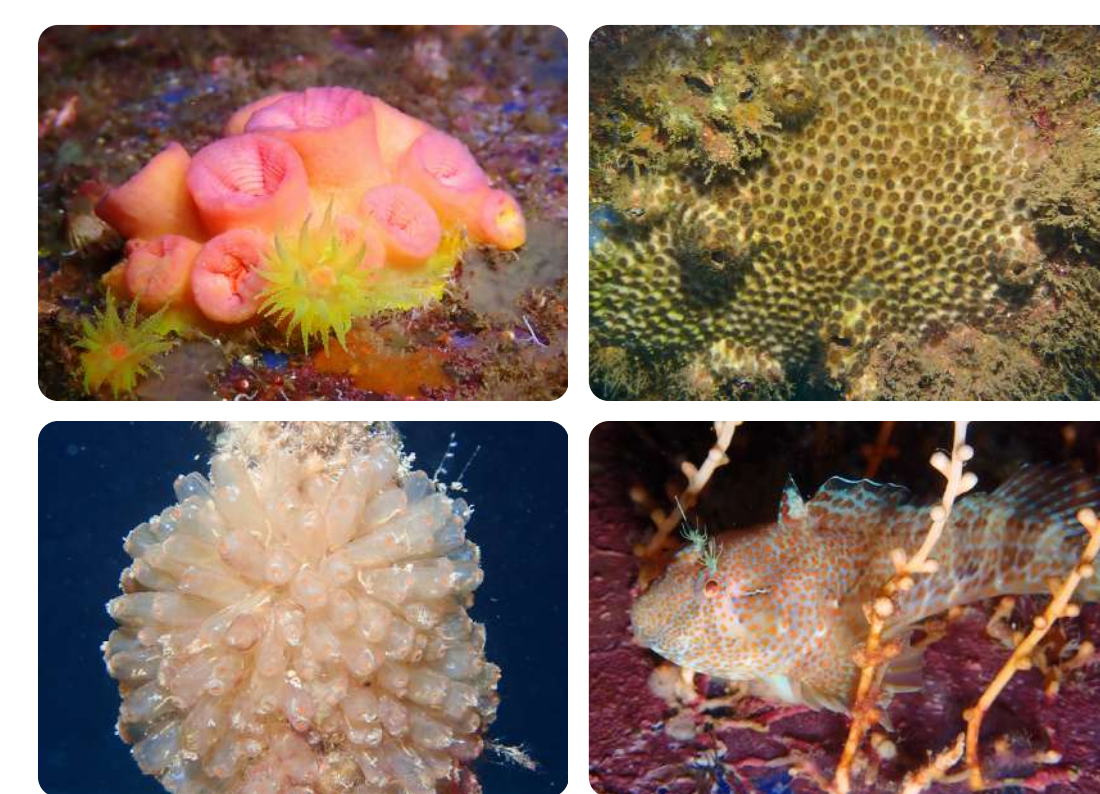


Figure 3. Examples of introduced species found on floating pontoons in the Canary Islands, respectively: *Tubastraea coccinea*, *Oculina patagonica*, *Ecteinascidia turbinate* and *Hypoleurochilus pseudoaequipinnis*.

Cryptogenic species

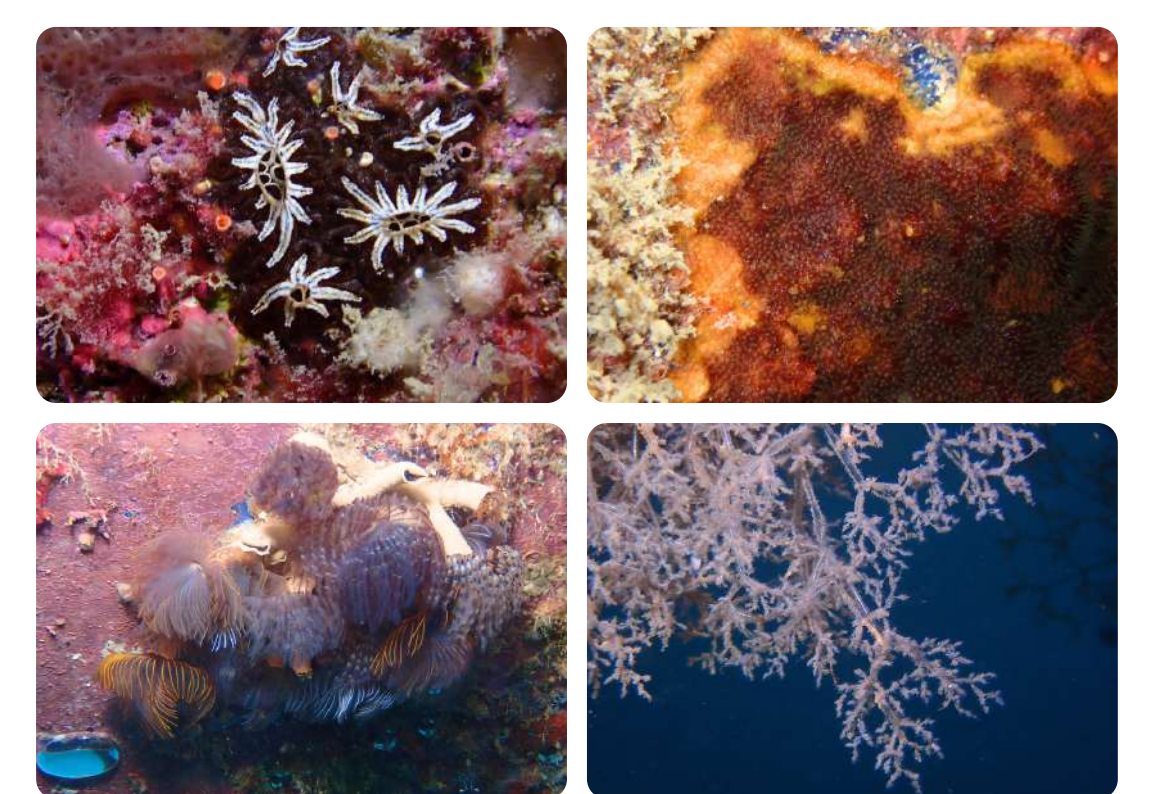


Figure 4. Examples of cryptogenic species found on floating pontoons in the Canary Islands, respectively: *Botryllus schlosseri*, *Schizoporella errata*, *Branchioma luctuosum* and *Branchioma aff. nigromaculatum* and *Amathia verticillata*.

First sightings



Figure 5. Examples of first sightings of species found on floating pontoons in the Canary Islands, respectively: *Tigridobius zebrellus*, *Spirobranchus tetracerus*, *Beania magellanica* and *Eualetes tulipa*.

Native species

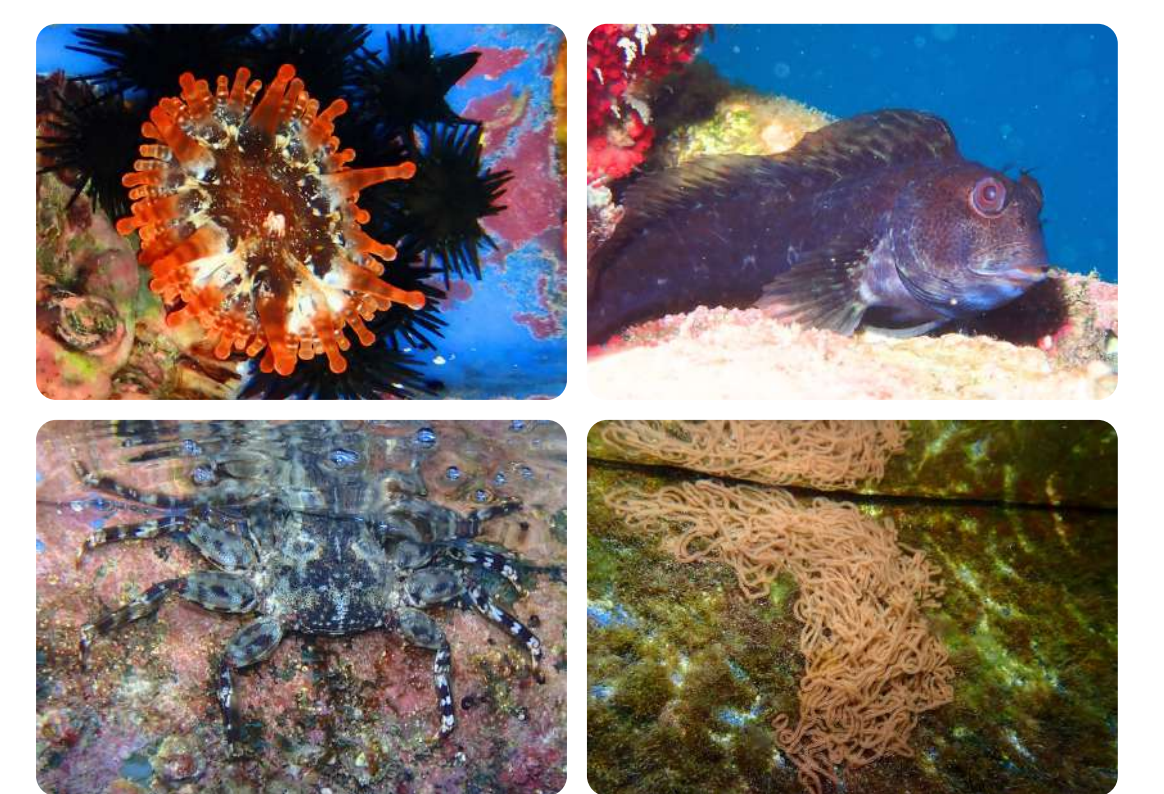


Figure 6. Examples of native species found on floating pontoons in the Canary Islands, respectively: *Telmatactis cricoides*, *Parablennius pilicornis*, *Plagusia depressa* and *Aplysia dactylomela* egg masses.

Deep species



Figure 7. Examples of deep species found on floating pontoons in the Canary Islands, respectively: *Leptogorgia viminalis*, *Stichopathes aff. gracilis*, *Leptogorgia ruberrima* and *Antipathella wollastoni* with *Oxynaspis celata*.

Unidentified species



Figure 8. Examples of unidentified species found on floating pontoons in the Canary Islands, respectively: *Tethya* sponge, bivalve and colonial ascidians.

DISCUSSION

- The results indicate that **floating pontoon communities** in Canary Islands harbours are primarily dominated by tunicates, cnidarians and molluscs. This composition mirrors patterns found in similar **artificial environments worldwide**, suggesting a degree of ecological convergence.
- Ascidians** are particularly successful colonisers of artificial substrates due to their efficient filter-feeding and high tolerance to environmental variability. These same traits also favour **non-native species**, as reflected by the presence of several invasive ones.
- Cryptogenic and unidentified taxa** reveal taxonomic gaps and call for further morphological and genetic study. On the other hand, **deep-water species** in shallow harbours suggest vertical range shifts or overlooked colonisation potential.

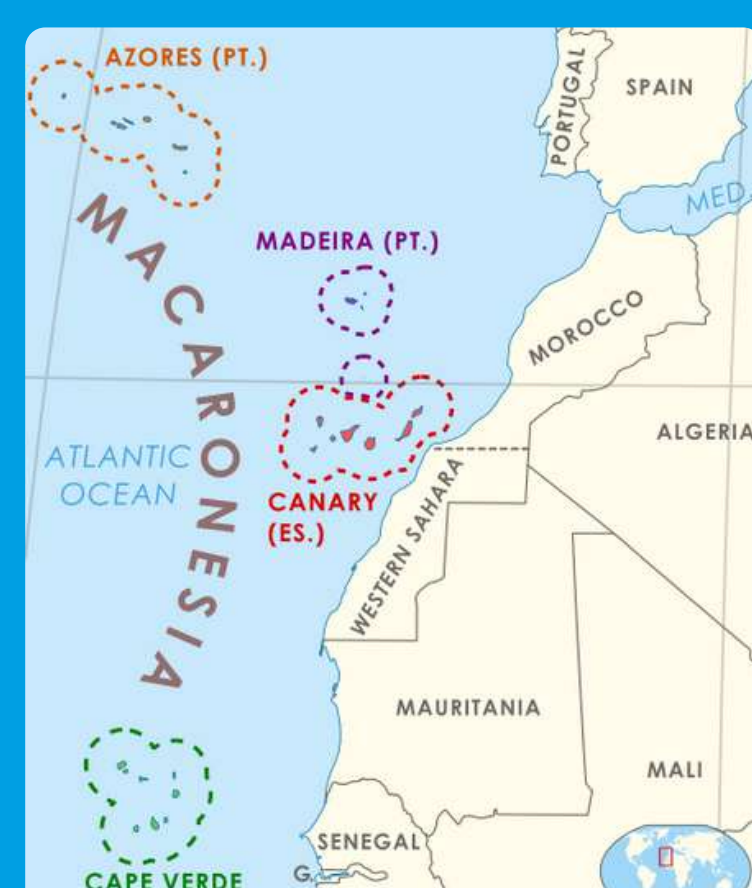


Figure 9. Map of the Macaronesian archipelagos, including the Azores, Madeira, Canary Islands, and Cape Verde. CC BY-SA 3.0

CONCLUSIONS

- Floating pontoons** host diverse marine communities, often dominated by encrusting filter feeders.
- Harbours serve as **strategic observatories** for tracking biological invasions, revealing trends and pathways of species introductions.
- Long-term surveillance is essential for **early detection and management** of non-native species in harbour areas.

ACKNOWLEDGMENTS

Grateful acknowledgment to all users of the RedPROMAR who reported sightings of these species in the archipelago (www.redpromar.org/projects/3)