

DIVERSITY OF PELAGIC TUNICATES (APPENDICULARIA AND THALIACEA) FROM CUBA: A REVIEW

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Introduction

Pelagic tunicates (classes Appendicularia and Thaliacea) play a critical role in marine ecosystems, contributing to food webs and oceanic carbon cycling (Suárez-Morales and Gasca 1996; Henschke et al. 2016). However, their diversity in the Cuban Exclusive Economic Zone (EEZ) remains understudied. Establishing biodiversity baselines is vital for detecting broad-scale changes (Luskow et al. 2021). This study reviews pelagic tunicate diversity in Cuban waters and assesses whether these assemblages act as an ecotone between the Gulf of Mexico (GoM) and the Caribbean Sea (CS).

Objectives

- To assess the diversity of pelagic tunicates (Appendicularia and Thaliacea) in Cuban EEZ waters.
- To determine whether the Cuban EEZ acts as an ecotone between GoM and CS faunas.
- To compare the species richness between northern and southern Cuban EEZ waters.

Materials & Methods

Study Area

The Cuban EEZ covers a vast marine area between the GoM and the CS, offering a unique mix of oceanographic conditions. Northern waters are influenced by the dynamic GoM currents, while southern waters experience Caribbean influences (Fig. 1).

Data Collection

- Literature Review:** We conducted an extensive review of scientific publications, citizen science repositories (e.g., iNaturalist), and biodiversity databases (GBIF, OBIS).
- Data Analysis:** Species richness and composition were compared across regions, and similarity indices (Sørensen, Jaccard, and Simpson) were calculated using R statistical software.

Results

Pelagic Tunicate Diversity

- 28 species of pelagic tunicates were recorded in the Cuban EEZ, including:
 - 15 Appendicularia species (Oikopleuridae being the most diverse).
 - 13 Thaliacea species (Salpidae being the most diverse; Fig. 2).

Geographic Distribution

- The northern EEZ harbors more appendicularian species, while the southern EEZ has a higher presence of thaliaceans (Fig. 3).

Ecotone Hypothesis

- Cuban pelagic tunicate assemblages are more similar to those in the GoM than in the CS, indicating that Cuba's EEZ does not act as an ecotone.

Venn Diagrams of Species Overlap

- Show the Venn diagrams comparing species overlap between the Cuban EEZ, GoM, and CS for both classes (Appendicularia and Thaliacea) (Fig. 4).



Fig. 2 Salpidea family individuals from Guantanamo's bay. Photo by Robin White.

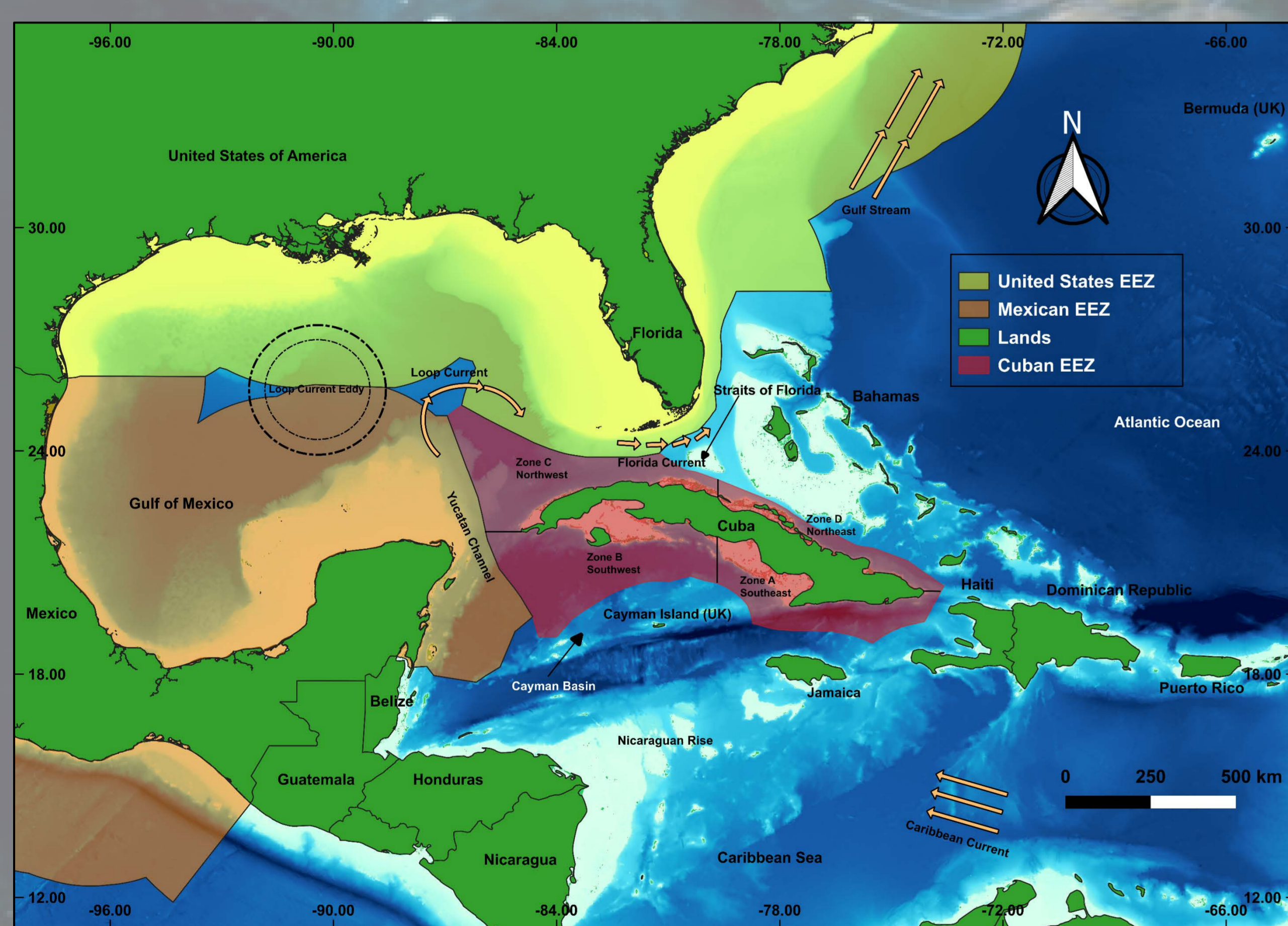


Fig. 1 The geographic location of the Exclusive Economic Zone (EEZ) of Cuba. The Cuban EEZ (red-shaded area) lies at the interface between the Gulf of Mexico, the Caribbean Sea and the Atlantic Ocean. Bathymetry is obtained from the Geographic Information System software QGIS 3.28.



Fig. 4 Venn diagram of a: appendicularian and b: thaliacean assemblages in the Gulf of Mexico, Caribbean Sea and Cuban Exclusive Economic Zone (EEZ)

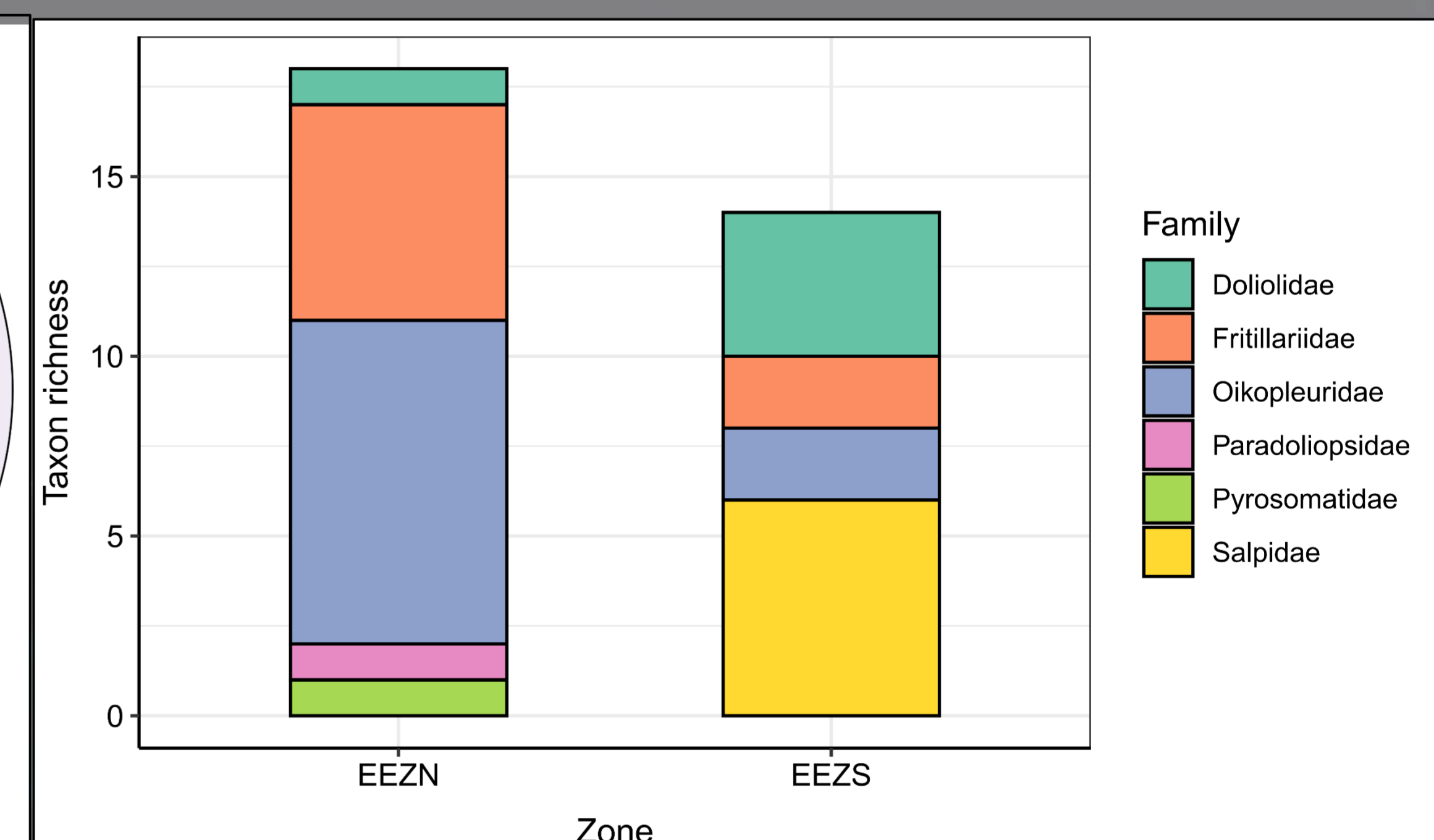


Fig. 3 Comparison between pelagic tunicate assemblages in the Cuban northern External Economic Zone (EEZN) and southern Exclusive Economic Zone (EEZS).

Discussion and Conclusions

Species Composition:

Cuba's waters are not as rich in pelagic tunicate diversity compared to the GoM and CS, possibly due to smaller sampling areas and lack of long-term studies.

Ecotone:

The data do not support the hypothesis that the Cuban EEZ is an ecotone. Rather, its pelagic tunicate fauna closely resembles that of the GoM.

Importance of Further Research:

Long-term studies and systematic monitoring are essential for understanding pelagic tunicate dynamics and their ecological roles in Cuba's waters.

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Supplemental Material in:

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