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EXTENSION OF THE DISTRIBUTION RANGE OF *Mnemiopsis leidyi* A. Agassiz, 1865 (CTENOPHORA: LOBATA) IN COLOMBIA

AMPLIACIÓN DEL RANGO DE DISTRIBUCIÓN DE *Mnemiopsis leidyi* A. Agassiz, 1865 (CTENOPHORA: LOBATA) EN COLOMBIA

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Abstract

This article reports for the first time the presence of the ctenophore species *Mnemiopsis leidyi* in the southern Gulf of Morrosquillo, Colombian Caribbean, based on specimens collected in April and May 2024 through surface trawls using a conical zooplankton net, in the Navío marsh, part of the Cispatá lagoon system in San Antero, Córdoba. This finding contributes to the understanding of marine invertebrates in Colombia and provides a foundation for future research, considering their significant ecological role in local ecosystems.

Keywords: Cispatá bay, Ctenophore, Geographic distribution, Zooplankton.

Resumen

Este artículo documenta por primera vez la presencia de la especie de ctenóforo *Mnemiopsis leidyi* en el Sur del Golfo de Morrosquillo, Caribe colombiano, en base a especímenes recolectados durante los meses de abril y mayo de 2024, mediante arrastres superficiales con una red cónica de zooplancton, en la ciénaga de Navío perteneciente al sistema lagunar de Cispatá, San Antero, Córdoba. Este hallazgo representa un aporte al estado del conocimiento de los invertebrados marinos en Colombia y sienta las bases para el planteamiento de futuras investigaciones dado a su importante rol ecológico en los ecosistemas locales.

Palabras claves: Bahía de Cispatá, Ctenóforo, Distribución geográfica, Zooplancton

INTRODUCTION

The phylum Ctenophora encompasses gelatinous, translucent, and fragile marine organisms, primarily characterized by the presence of eight longitudinal rows of ctenes, which are composed of juxtaposed cilia used for locomotion. This is why they are commonly referred to as "sea combs" (Oliveira et al., 2007; Moroz et al., 2024). Ctenophores are widely distributed across the world's oceans and play crucial roles in marine ecosystems, serving as predators, prey, and symbionts for diverse taxa, including crustaceans, fish larvae, some cnidarians, and other ctenophores (Gasca & Browne,

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2018; Schiariti et al., 2020; Shiganova & Abyzova, 2022).

The phylum Ctenophora includes 184 extant species, classified into the classes Nuda Chun, 1879 (30 species) and Tentaculata Eschscholtz, 1825 (154 species), which encompass nine orders, 35 families, and 49 genera (WoRMS, 2025). Additionally, there are 14 extinct species, classified in the class Scleroctenophora †, comprising six genera (Moroz et al., 2024). Ctenophore records in Colombia are scarce and inconsistent, with no reference materials available due to the lack of methods for their long-term preservation (Engell-Sørensen et al., 2009; Schiariti et al., 2020). As noted by Durán-Fuentes & Gracia (2020), "a historical account of the presence of ctenophores in the Colombian Caribbean is unavailable, and impossible to recreate based on the lack of available data". Consequently, the state of knowledge is limited to the work of Moncaleano & Niño (1976), Mianzan (1999), Oliveira et al. (2016), and Durán-Fuentes & Gracia (2020).

Mnemiopsis leidyi A. Agassiz, 1865 is considered an invasive species in various regions around the world (Costello et al., 2012; Jaspers et al., 2012; Jaspers et al., 2018). Its rapid growth and high reproductive rate enable it to produce population explosions that can negatively impact the food web due to its role as a predator (Purcell & Decker, 2005; Tiselius & Møller, 2017). Furthermore, it has the potential to accelerate eutrophication processes in coastal systems by ingesting and excreting nutrients and organic material (Pitt, 2009; Schiariti et al., 2020).

In this study, we extend the known distribution range of *M. leidyi* based on specimens collected from a coastal lagoon in the southern Gulf of Morrosquillo. Our findings underscore the need for future research to enhance the understanding of the population dynamics and ecological impact of this group of organisms in the study area.

MATERIALS AND METHODS

Study area

Specimens were collected from surface waters in the Navío sector (9°23'54.62"N, 75°51'8.59"W), located within the Cispatá Bay lagoon complex in San Antero, the former delta of the Sínú River (Fig. 1). The lagoon has flooded soil and is surrounded by a forest composed of five species of mangrove, influenced by the waters of the Sinú River (Torres-Duque et al., 2024). The area is part of the Cispatá-La Balsa-Tinajones Integrated Management District (DMI) and the surrounding ecosystems (CVS-INVEMAR, 2010). The climate is warm sub-humid with a unimodal rainfall regime and two peaks of maximum rainfall in May and September, characterized by a dry season from December to March and a rainy season from April to November (Sánchez-Paéz, 2005; Ballesteros y Linares, 2015). The average temperature ranges from 26.7 °C to 28.6 °C, with an annual average precipitation of 1,425 mm and potential evapotranspiration of 1,826 mm (Patiño & Flórez, 1993; Sánchez-Paéz et al., 2005).

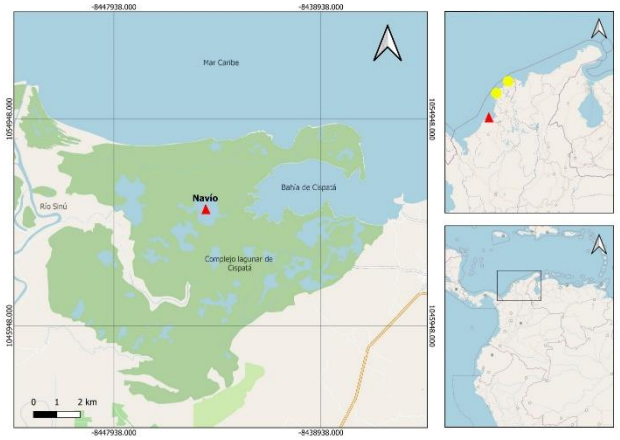

Figure 1. Location of the study area and known distribution of *Mnemiopsis leidyi* A. Agassiz, 1865, with a new record from Córdoba Department, Colombian Caribbean. Yellow circles = previous records; red triangle = new locality in Colombia. Map credits: Map credits: ©OpenMapTiler ©OpenStreetMap contributors.

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Field phase

Specimens were collected using semicircular surface trawls on a boat with an outboard motor, at a speed of 1.5 knots, and with a simple conical zooplankton net with a mesh size of 250 µm, a length of 150 cm, and a mouth diameter of 40 cm. Due to the fragility of ctenophores, no narcotization, fixation, or preservation procedures were performed. The specimens were placed in plastic jars and transported to the Molecular Biology Laboratory at the University of Córdoba, Colombia.

Laboratory phase

The specimens were placed in a fish tank with seawater and photographed using an Olympus Tough TG-4 digital camera. Total length and width were then measured with a Luxeo 6Z stereomicroscope, equipped with a built-in digital camera and Pixel Pro v. 3.1 software. Finally, taxonomic identification was carried out following the key provided by Oliveira et al. (2007).

RESULTS

Taxonomy

Phylum Ctenophora Eschscholtz, 1829
Class Tentaculata Eschscholtz, 1825
Order Lobata Eschscholtz, 1825
Family Bolinopsidae Bigelow, 1912
Genus *Mnemiopsis* L. Agassiz, 1860

Mnemiopsis leidyi A. Agassiz, 1865 (Fig. 2)

Synonymies

Alcinoe rosea Mertens, 1833; *Alcinoe vermicularis* Rang, 1828; *Alcinoe vermiculata* Rang, 1828; *Mnemia schweiggeri* Eschscholtz, 1825; *Mnemiopsis mccradyi* Mayer, 1900.

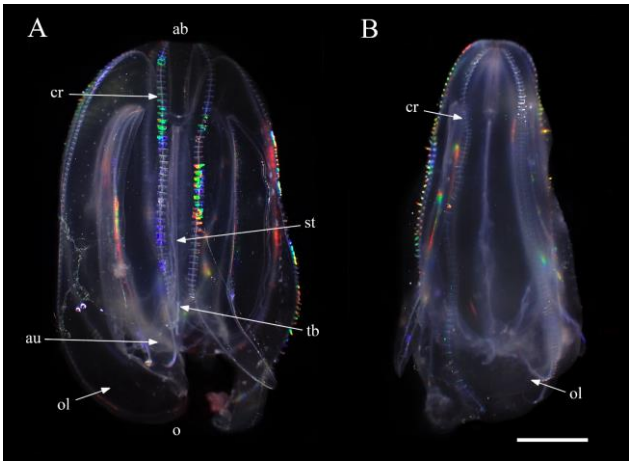

Figure 2. *Mnemiopsis leidyi* A. Agassiz, 1865. A view of the stomodeal plane. B lateral view. Abbreviations: ab = ab: aboral extremity; au = auricle; cr = comb row; o = oral extremity; ol = oral lobe; st = stomodeum; tb = tentacular lobe. Scale bar: 20 mm. Pictures by Jorge L. Llorente Vega.

Material examined

Twelve adult specimens, Navío, San Antero, Córdoba, Colombia, (0.5–3 m depth - 9°23'54.62"N 75°51'8.59"W), Llorente-Vega J.L. coll. (02-IV-2024); seven adul specimens, Navío, San Antero, Córdoba, Colombia (0.5–3 m depth - 9°23'54.62"N 75°51'8.59"W), Llorente-Vega J.L. coll. (19-V-2024).

Description

The analyzed specimens exhibited a whitish to transparent coloration, with a smooth surface and eight rows of ctenes. The body was flattened along the tentacular axis, with lateral projections in the form of lobes originating from the apical organ and forming a prominent auricular groove. Oral tentacles were present. The apical organ was located in a depression near the aboral end. Specimen length ranged from 26.1 to 95.4 mm, and width from 15.8 to 48.8 mm.

Remarks

A total of 19 specimens of *M. leidyi* were collected, with an average length of 83 ± 12.3 mm and an average width of 42 ± 10.1 mm. Three specimens, measuring no more

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than 41 mm in length and 20 mm in width, were considered potential juveniles.

DISCUSSION

M. leidyi has been recorded in the western Atlantic, from Massachusetts (USA) to Argentina (Ghabooli et al., 2013; Oliveira et al., 2016), as well as in the Caspian Sea and various Eurasian seas (Shiganova, 2020; Verwimp et al., 2020; Budiša et al., 2021; Marchessaux & Belloni, 2021; Stoltenberg et al., 2021; Lüskow & Knudsen, 2024; Abadijoo et al., 2025; Oesterwind et al., 2025). In Colombia, it was documented by Moncaleano & Niño (1976) in their graduate research in the bay of Cartagena, Department of Bolívar, and by Durán-Fuentes & Gracia (2020) in Mallorquín Lagoon, Department of Atlántico. In the present study, we extend its distribution range to the southern Gulf of Morrosquillo, located in the southwestern Colombian Caribbean (Fig. 1).

Previous studies on ctenophores in Colombia have documented the species *Beroe ovata* Chamisso & Eysenhardt, 1821, *Cestum veneris* Lesueur, 1813, in addition to *M. leidyi* (Moncaleano & Niño, 1976; Mianzan, 1999; Oliveira et al., 2016; Durán-Fuentes & Gracia, 2020). It should be noted that the records made by Moncaleano & Niño (1976) are not considered valid in national inventories (Durán-Fuentes & Gracia, 2020); however, they were included in the revisions by Mianzan (1999) and Oliveira et al. (2016).

M. leidyi is considered an invasive species in numerous regions, such as the Eurasian seas, due to its association with the collapse of local fisheries. As a predator, it limits food availability for commercially important fish species (Brodeur et al., 2002; Jaspers et al., 2018). Although native to the coastal waters of eastern America, its populations can undergo demographic explosions under favorable environmental conditions, leading to similar challenges in fisheries, as well as adverse impacts on the dynamics of local ecosystems (Durán-Fuentes & Gracia, 2020; Ciglenečki et al., 2021; Schroeder et al., 2023; Piccardi et al., 2024). Therefore, further studies are needed to assess the ecology of this species in the study area.

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