












Echinodermata Collection from the Museu Paraense Emílio Goeldi: new research on the Amazonian biodiversity heritage

Coleção de Echinodermata do Museu Paraense Emílio Goeldi: uma nova pesquisa sobre o patrimônio da biodiversidade amazônica

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Abstract: Natural history museums play a vital role in biodiversity research and conservation by preserving the natural heritage and documenting historical and current biodiversity. The *Museu Paraense Emílio Goeldi* (MPEG) is the oldest scientific institution in the Amazon, and one of its main focuses is the maintenance of scientific collections with a strong regional character. This study introduces the first data on echinoderms from the MPEG scientific collection, including valuable information for the northern region of Brazil. In preparing the checklist, a thorough inventory of all echinoderms specimens in the collection was conducted. The taxonomy was reviewed, and specimens were identified at the lowest possible taxonomic level. The survey recorded 281 specimens belonging to five classes, 13 orders, 20 families, 24 genera, and 32 species, with 15 new records for the Amazon. Specimens were recorded from a variety of habitats, ranging from the intertidal zone of sandy beaches to the Great Amazon Reef System. The taxonomic list (including images for each identified species) and ecological information provided on echinoderms are an important base for future research in the Atlantic Amazon, representing the first catalogue in this biome, which is a strategic area for conservation of global marine biodiversity.

Keywords: Amazon coast. Catalogue. Checklist. Marine invertebrates. Mouth of the Amazon. Echinoderms.

Resumo: Os museus de história natural desempenham um papel vital na pesquisa e conservação da biodiversidade, preservando o patrimônio natural e documentando a biodiversidade histórica e atual. O Museu Paraense Emílio Goeldi (MPEG) é a instituição científica mais antiga da Amazônia e um de seus principais focos é a manutenção de coleções científicas de forte caráter regional. Este estudo apresenta os primeiros dados sobre equinodermos da coleção científica do MPEG, representando o primeiro inventário oficial de espécies para a região Norte do Brasil. Para a elaboração da lista, foi realizado um levantamento completo de todos os espécimes de equinodermos da coleção. A taxonomia foi revisada, e os espécimes foram identificados no nível taxonômico mais baixo possível. O levantamento registrou 281 espécimes pertencentes a cinco classes, 13 ordens, 20 famílias, 24 gêneros e 32 espécies, com 15 novos registros para a Amazônia. Os espécimes foram registrados em uma variedade de *habitats*, que vão desde a zona entre-marés de praias arenosas até o Grande Sistema Recifal da Amazônia. A lista taxonômica (incluindo imagens para cada espécie identificada) e as informações ecológicas fornecidas sobre os equinodermos são uma base importante para futuras pesquisas no Atlântico amazônico, representando o primeiro catálogo neste bioma, que é uma área estratégica para a conservação da biodiversidade marinha global.

Palavras-chave: Costa amazônica. Catálogo. *Checklist*. Invertebrados marinhos. Foz do Amazonas. Equinodermos.

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INTRODUCTION

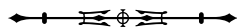
The phylum Echinodermata (from the Greek echino = spine and derma = skin) comprises coelomate, non-segmented, deuterostome, and exclusively marine invertebrates (Giribet & Edgecombe, 2020; Pawson, 2007). The synapomorphies of the group include calcareous endoskeleton, pentaradial symmetry in adults, water vascular system, and the presence of mutable connective tissue (Benavides-Serrato et al., 2011; Pawson, 2007). This phylum is a diverse and cosmopolitan group of marine animals, widely distributed across various latitudinal and depth gradients, and are classified as benthic fauna (Pawson, 2007). They inhabit a variety of substrates and many species live on rocky coasts, beaches, bays, and subtidal zones, including the deep-sea. Small species are usually found associated with algae, rhodolith beds, and coral reefs, where young and adult specimens can coexist (Silva et al., 2025; Stevenson et al., 2025).

Echinodermata has about 7,300 extant species and 15,000 extinct species (Appeltans et al., 2012; WoRMS Editorial Board, 2025). Living echinoderms are classified into the classes Crinoidea (sea lilies and feather stars), Asteroidea (sea stars), Ophiuroidea (brittle stars and basket stars), Echinoidea (sea urchins, sand dollars and heart urchins), and Holothuroidea (sea cucumbers) (Pawson, 2007; WoRMS Editorial Board, 2025). Along the Brazilian coast, about 380 species occur (R. B. Moura et al., 2025), most of them reported for the Southeastern coast and the eastern coast of the Northeastern region (Barboza & Borges, 2012; R. B. Moura et al., 2025; Ventura et al., 2013), whereas information on species from the northern region remains scarce. Overall, the number of echinoderm species recorded in Brazil is relatively low considering the extent of the country's coastline, which may be attributed to the limited number of specialists as well as to the insufficient knowledge regarding species occurrence and distribution.

Few studies have been conducted addressing the distribution of echinoderms from Brazil; this is partly because there is a dearth of trustworthy data on taxonomy and distribution ranges (Ventura et al., 2013). Some inventories with a broad taxonomic scope, along with initiatives aimed at developing reliable databases supported by specialists in the group, such as the *Catálogo Taxonômico da Fauna Brasileira* [Taxonomic Catalog of the Brazilian Fauna] (CTFB) (Boeger et al., 2024) and the *Banco de Dados da Biodiversidade de Equinodermos da Paraíba* [Echinoderm Biodiversity Database of Paraíba] (DataPB – *Biodiversidade da Paraíba*) (Prata et al., 2025), may soon change this scenario. Nonetheless, there is no research specifically focused on echinoderms from the Amazon coast.

Natural history museums and their biological collections are essential for biodiversity research and conservation (Costa et al., 2021). They serve as repositories of taxonomic, genetic, and biogeographical knowledge, documenting the natural heritage and evolution of species (Andreone et al., 2024; Schmid et al., 2025). When well-organized, these collections provide valuable data for a variety of studies, from taxonomy and the conservation of endangered species to predicting the spread of invasive species and the impact of climate change on biodiversity (Sigwart et al., 2025; Suarez & Tsutsui, 2004; Vilović et al., 2020). Furthermore, technical advances allow samples collected in the past to be reanalysed, answering new scientific questions and reaching a wider audience (Keklikoglou et al., 2019; Schmid et al., 2025).

The *Museu Paraense Emílio Goeldi* (MPEG), founded in 1866, is the oldest museum in the Amazon region and the second oldest in Brazil. It is a Brazilian research institution, dependent to the Ministry of Science, Technology, Innovations, and Communications (MCTI) that focuses on studying the natural and sociocultural systems of the Amazon, while also sharing knowledge and collections related to the



region (Santos et al., 2019). The Zoological Collections of the MPEG cover all major groups of vertebrates and invertebrates, totalling more than one million records (Santos et al., 2019). Despite the MPEG having a large collection of invertebrates, about 95% of these records correspond to terrestrial insects (Santos et al., 2019). In particular, the collections of marine invertebrates are recent and still lack greater taxonomic accuracy, since there are few specialists in the region (Santos et al., 2019), a reality that is repeated across most of Brazil (Marinoni et al., 2024).

This study introduces the first data on echinoderms from the *Museu Paraense Emílio Goeldi's* scientific collection, in which specimens were identified at the lowest possible taxonomic level, based on the Brazilian Amazon coast, mainly including records from the Great Amazon Reef System (GARS).

MATERIAL AND METHODS

The samples in this study come from the MPEG Echinodermata scientific collection, voucher numbers 0001 to 0065, including the acronym MPEG.ECH (in the internal database, the labels have this designation). The Scientific Biological Collections of the MPEG are subdivided into several collections and, as it is one of the Brazilian institutions with the largest amount of computerised and published data on biodiversity platforms, with more than 844,000 records (SiBBR, 2026). It has an organisational structure in its database that uses three letters after the institutional acronym when it is necessary to distinguish between collections. In this case, the Echinodermata Collection is registered with the acronym 'MPEG' followed by '.ECH' which will not be used throughout this study as it is the only collection being analysed.

The specimens are stored in sliding steel cabinets, separated by class, arranged in alphabetical order. The organisms are preserved in 70% ethanol, except for one specimen (MPEG.ECH 0055) which is preserved dry.

The Echinodermata specimens in the MPEG collection were collected in the northern region of Brazil, especially from the Great Amazon Reef System (GARS) (Figure 1). Additionally, some specimens have been recorded from the intertidal zones of sandy beaches and estuaries. Specimens from the continental shelf were captured as bycatch during fishing for pink shrimp [*Penaeus (Farfantepenaeus) subtilis* Pérez Farfante, 1967] between the years 2015 and 2017, and the fish red snapper (*Lutjanus* spp.) in 2022. Other records are from the samplings of the PIATAM-Oceano Project (*Potenciais Impactos Ambientais da Exploração, Produção e Transporte do Petróleo e Derivados na Região Oceânica Equatorial Brasileira*) that had expeditions carried out in 2008.

The specimens were identified at the lowest possible taxonomic level. Inaccuracies in the specimen data were corrected, new labels were prepared, and the collection was systematically organized. The list of Echinodermata at the MPEG was organized by the systematic arrangements of World Register of Marine Species database (WoRMS Editorial Board, 2025), with genera and species following alphabetical order.

RESULTS

The collection of Echinodermata at the MPEG comprises 281 catalogued specimens (65 records), representing 32 species across the five extant classes of echinoderms: Crinoidea, Asteroidea, Ophiuroidea, Echinoidea, and Holothuroidea (Table 1). The class Ophiuroidea (121 specimens; 26 records, and 13 species), Echinoidea (134 specimens, 17 records, and 5 species), and Asteroidea (15 specimens, 13 records, and 9 species) are the most represented. Most Echinodermata records in the MPEG collection (~75%; 49 records) come from the continental shelf, notably off the Amapá and Pará coastlines. Regarding species richness, 22 species were recorded off the coast of Amapá, followed by 12 species in Pará, and nine species in Maranhão (Table 1).

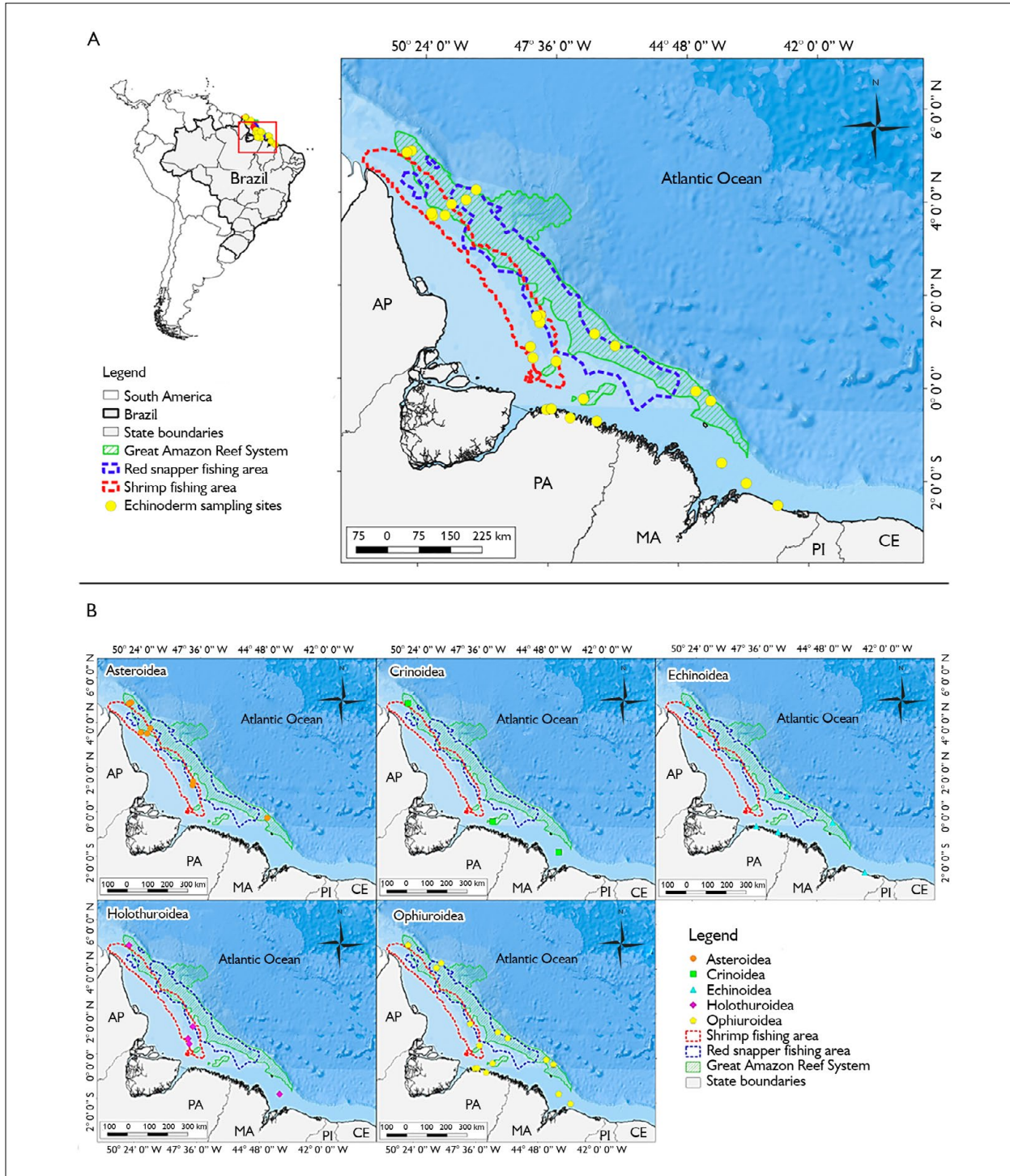


Figure 1. Map of the Brazilian Amazonian Coast, showing the locations of echinoderms sampling stations from the MPEG scientific collection: A) general overview of sampling stations; B) sampling stations identified by taxonomic class. Brazilian states are represented by acronyms: AP = Amapá, PA = Pará, MA = Maranhão. Source: Authors (2025).

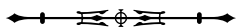
Table 1. Species catalogued in the Echinodermata collection of MPEG. Information is provided on specimen counts (N° ind.), collection records (N. records), *habitat*, and occurrence (x) across the states of the Brazilian Amazon coast (AP = Amapá; PA = Pará; MA = Maranhão). Source: Author (2025). (Continue)

<i>Taxa</i>	N° ind.	N° records	Habitat informations	AP	PA	MA
CLASS CRINOIDEA						
Comatulidae						
<i>Comactinia echinoptera</i> (Müller, 1840)	3	2	Continental shelf, biogenic substrates (rhodoliths), at 31 and 122 meters	x		x
Tropiometridae						
<i>Tropiometra carinata</i> (Lamarck, 1816)	1	1	Continental shelf, at 27 meters		x	
CLASS ASTEROIDEA						
Luidiidae						
<i>Luidia alternata</i> (Say, 1825)	1	1	Continental shelf, biogenic substrates (rhodoliths), at 122 meters	x		
<i>Luidia clathrata</i> (Say, 1825)	2	2	Continental shelf, muddy bottom, biogenic substrates (rhodoliths), at 122 meters	x		
<i>Luidia senegalensis</i> (Lamarck, 1816)	1	1	Continental shelf, muddy bottom	x		
Astropectinidae						
<i>Astropecten brasiliensis</i> Müller & Troschel, 1842	1	1	Continental shelf, muddy bottom	x		
<i>Astropecten marginatus</i> Gray, 1840	1	1	Continental shelf, muddy bottom		x	
Goniasteridae						
<i>Goniaster tessellatus</i> (Lamarck, 1816)	3	2	Continental shelf, muddy bottom, biogenic substrates (rhodoliths), at 122 meters	x		
Ophidiasteridae						
<i>Narcissia trigonaria</i> Sladen, 1889	2	1	Continental shelf, biogenic substrates (rhodoliths), at 80 meters	x		
Echinasteridae						
<i>Echinaster (Othilia) guyanensis</i> A. M. Clark, 1987	2	2	Continental shelf, muddy bottom, biogenic substrates (rhodoliths), at 80 meters	x	x	
<i>Echinaster (Othilia) spinulosus</i> Verrill, 186	1	1	Continental shelf, muddy bottom; biogenic substrates (rhodoliths), at 80 meters	x		
CLASS OPHIUROIDEA						
Gorgonocephalidae						
<i>Asteroporpa (Asteroporpa) annulata</i> Örsted & Lütken, 1856	4	1	Continental shelf, biogenic substrates (rhodoliths), at 122 meters	x		
<i>Asteroporpa</i> sp.	1	1	Continental shelf, biogenic substrates (rhodoliths), at 122 meters	x		
<i>Astrophyton muricatum</i> (Lamarck, 1816)	2	2	Continental shelf, biogenic substrates (rhodoliths), at 122 meters	x		
<i>Gorgonocephalidae</i> sp.	1	1	Continental shelf, muddy bottom	x		
Ophiomyxidae						
<i>Ophiomyxa</i> sp.	1	1	Continental shelf, biogenic substrates (rhodoliths), at 122 meters	x		



Table 1. (Conclusion)

<i>Taxa</i>	Nº ind.	Nº records	Habitat informations	AP	PA	MA
Amphiuridae						
<i>Amphiodia planispina</i> (von Martens, 1867)	1	1	Continental shelf, at 63 meters		x	
<i>Ophiocnida scabriuscula</i> (Lütken, 1859)	1	1	Continental shelf, at 27 meters		x	
<i>Ophiostigma isocanthum</i> (Say, 1825)	1	1	Continental shelf, at 50 meters			x
Ophiactidae						
<i>Ophiactis lymani</i> Ljungman, 1872	21	2	Continental shelf, muddy bottom; intertidal zone (Sabellariidae reef)	x	x	
<i>Ophiactis savignyi</i> (Müller & Troschel, 1842)	10	2	Continental shelf, biogenic substrates (rhodoliths), at 31 and 122 meters	x		x
<i>Ophiactis</i> sp.	2	2	Continental shelf, at 63 meters		x	
Ophiotrichidae						
<i>Ophiotrix tommasii</i> Santana, Manso, Almeida & Alves, 2020	66	5	Estuaries; continental shelf, muddy bottom, at 31 meters		x	x
Ophiodermatidae						
<i>Ophioderma cinereum</i> Müller & Troschel, 1842	9	5	Estuaries; continental shelf, muddy bottom, biogenic substrates (rhodoliths), at 55 and 122 meters	x	x	x
CLASS ECHINOIDEA						
Cidaridae						
<i>Eucidaris tribuloides</i> (Lamarck, 1816)	3	3	Estuaries; continental shelf, muddy bottom, biogenic substrates (rhodoliths), at 55 and 122 meters	x		x
Toxopneustidae						
<i>Lytechinus variegatus</i> (Lamarck, 1816)	1	1	Continental shelf, biogenic substrates (rhodoliths), at 122 meters	x		
Mellitidae						
<i>Encope michelini</i> Agassiz, 1841	123	6	Intertidal zone of sandy beach; continental shelf, at 63 meters		x	x
<i>Mellita quinquiesperforata</i> (Leske, 1778)	6	6	Intertidal zone of sandy beaches		x	x
Brissidae						
<i>Meoma ventricosa</i> (Lamarck, 1816)	1	1	Continental shelf, biogenic substrates (rhodoliths), at 122 meters	x		
CLASS HOLOTHUROIDEA						
Cucumariidae						
<i>Thyonella pervicax</i> (Théel, 1886)	4	3	Continental shelf, biogenic substrates (rhodoliths), at 122 meters	x	x	
Phylloporidae						
<i>Stolus pseudofusus</i> (Deichmann, 1930)	1	1	Continental shelf, at 31 meters			x
Synaptidae						
<i>Protankyra</i> sp.	1	1	Continental shelf, muddy bottom	x		



ECHINODERMATA SPECIMENS REGISTERED IN THE MPEG COLLECTION

Phylum Echinodermata Klein, 1778
Class Crinoidea Miller, 1821
Order Comatulida Clark, 1908
Family Comatulidae Fleming, 1828
Genus *Comactinia* Clark, 1909

Comactinia echinopectera (Müller, 1840)
(Figure 2)

Original designation: *Alecto echinopectera* Müller, 1840.

Material examined: Amazon continental shelf (Amapá), 04° 52,668' N, 50° 46,916' W, XI.2022, CEPNOR-ICMBio, collected as bycatch from a red snapper (*Lutjanus* spp.) fishery, 122 meters, biogenic substrates (rhodoliths), 2 ind., MPEG 0013; Continental shelf (Maranhão), 01° 40,687' S, 43° 54,572' W, XI.2008, PIATAM-Oceano Project (#305), NHOc Amorim do Valle, sandy bottom, 31 meters, 1 ind., MPEG 0065.

Distribution: New Caledonia, Indonesia and the Philippines, and the Western Atlantic Ocean, from the USA (at least as far as North Carolina) to Brazil (from the North to the Southeast).

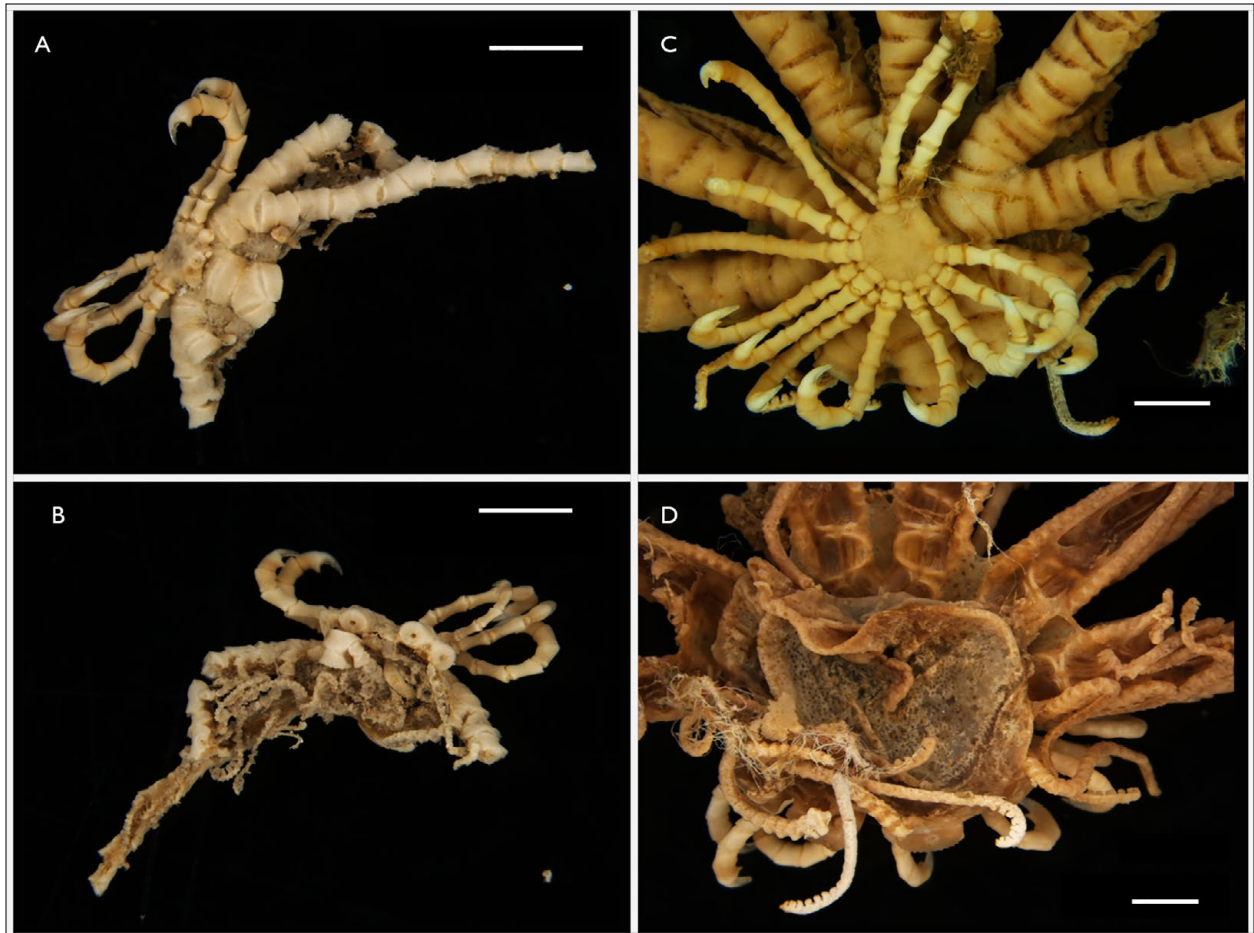


Figure 2. Crinoidea, *Comactinia echinopectera* (A, B: MPEG 0065; C, D: MPEG 0013). General aboral view (A); oral view (B); view of the centrodorsal plate (C); oral view of the central disk (D). Scale bars: 2 mm (A, B); 1 mm (C, D). Source: Authors (2025).

Family Tropiometridae Clark, 1908

Genus *Tropiometra* Clark, 1907

Tropiometra carinata (Lamarck, 1816)

(Figure 3)

Original designation: *Comatula carinata* Lamarck, 1816.

Material examined: Continental shelf (Pará), 0° 21,242' S, 46° 53,949' W, X.2008, PIATAM-Oceano Project (#310), NHOc Amorim do Valle, sandy bottom, 27 meters, 1 ind., MPEG 0060.

Distribution: Indian Ocean, North Coast of South Africa, Egypt, India, from Sri Lanka to South Ninopin Island. Western Atlantic Ocean, Dominican Republic, Lesser Antilles Trinidad and Tobago, Venezuela, North Coast of Brazil (from Amapá to São Paulo, Santa Catarina).

Class Asterozoa De Blainville, 1830

Order Paxillosida Perrier, 1884

Family Luidiidae Sladen, 1889

Genus *Luidia* Forbes, 1839

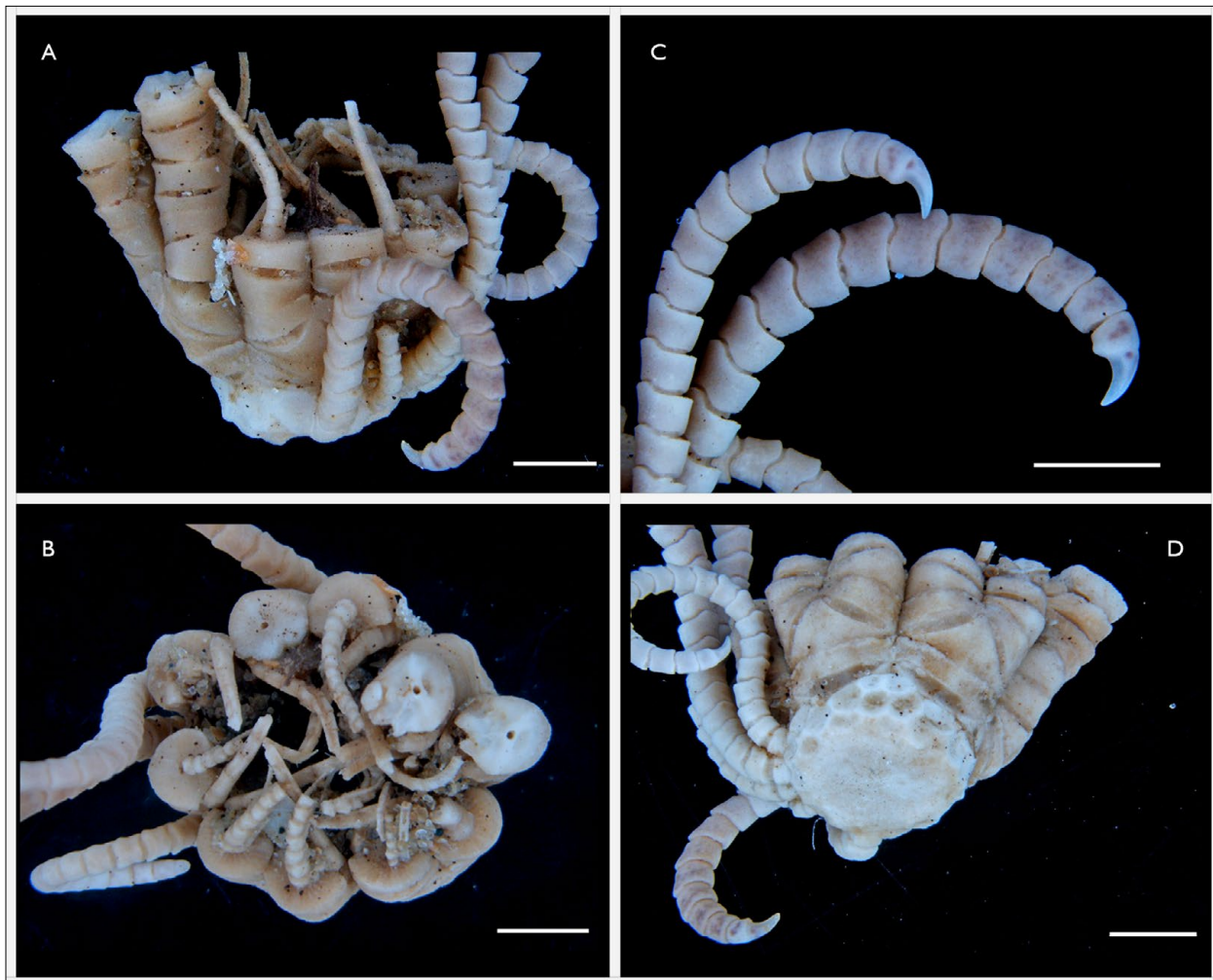


Figure 3. Crinoidea, *Tropiometra carinata* (MPEG 0060). Lateral general view (A); oral view; aboral view (D); detail of the peripheral cirrus (C). Scale bars: 2 mm (A, B); 1 mm (C, D). Source: Authors (2025).

Luidia alternata (Say, 1825)
(Figure 4)

Original designation: *Asterias alternata* Say, 1825.

Material examined: Amazon continental shelf (Amapá), 04°52,668' N, 50° 46,916' W, 01.XI.2022, CEPNOR-ICMBio, collected as bycatch from a red

snapper (*Lutjanus* spp.) fishery, 122 m, biogenic substrate (rhodoliths), 1 ind., MPEG 0054.

Distribution: Vietnam. Western Atlantic from North Carolina, and the Gulf of Mexico to at least Venezuela, Guyana, Suriname, Brazil (Amapá, Rio de Janeiro, Espírito Santo, Bahia), Uruguay (Coastal region, near Castellanos), and Argentina (Mar del Plata, Bahía Blanca).

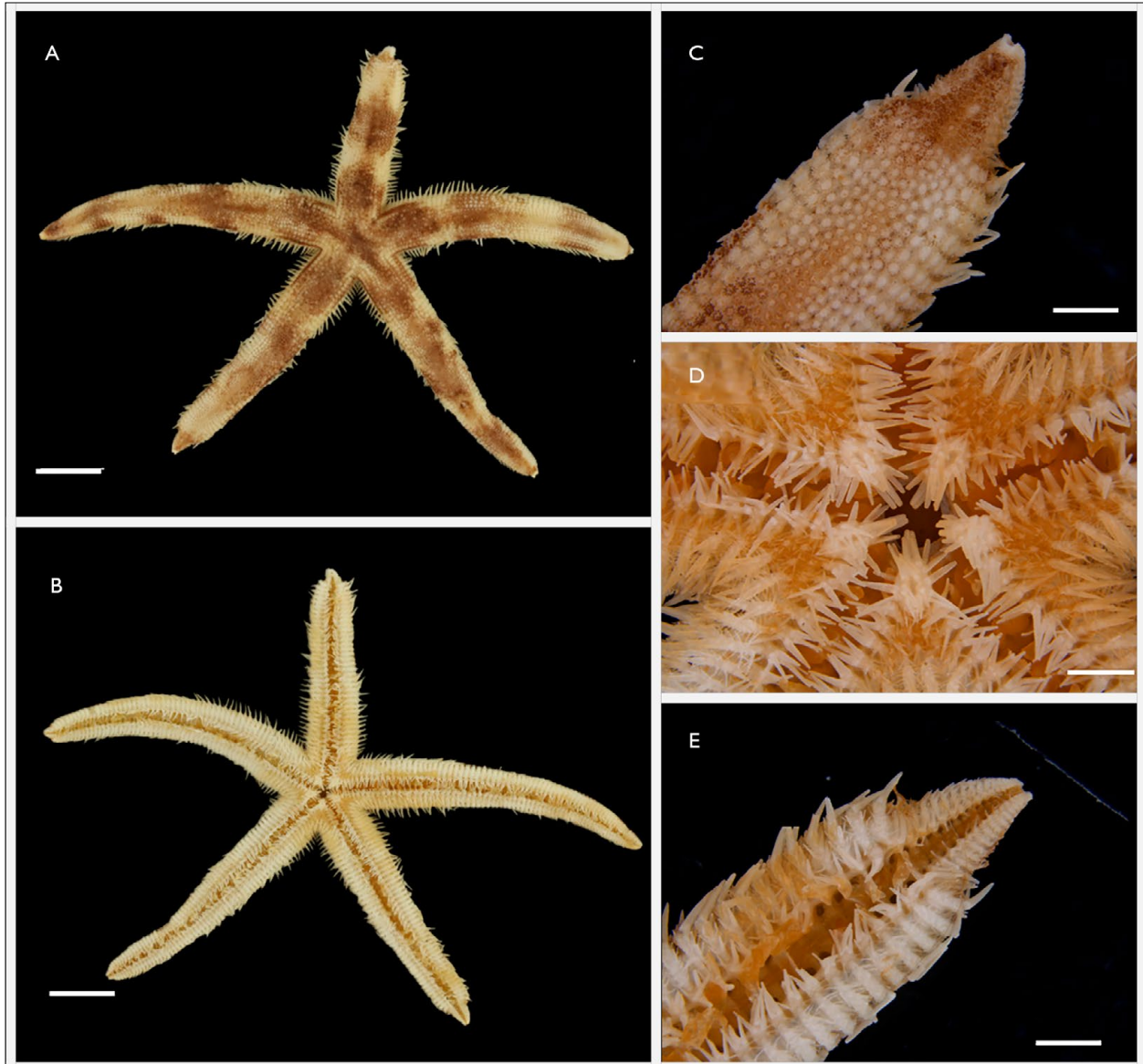


Figure 4. Asteroidea, *Luidia alternata* (MPEG 0054). Abactinal general view (A, C); actinal general view (B); abactinal view of the arm (C); actinal view of the arm (E); in detail the mouth (D). Scale bars: 10 mm (A, B); 2 mm (C-E). Source: Authors (2025).

Luidia clathrata (Say, 1825)
(Figure 5)

Original designation: *Asterias clathrata* Say, 1825.

Material examined: Amazon continental shelf (Amapá), 03° 32,230' N, 49° 56,438' W, 04.VII.2016, Muniz, M., collected as bycatch during pink shrimp (*P. subtilis*), muddy bottom, 1 ind., MPEG 0010; Continental shelf (Amapá), 04° 52,668' N, 50° 46,916' W, 01.XI.2022, CEPNOR-ICMBio, collected as bycatch from a red snapper

(*Lutjanus* spp.) fishery, 122 meters, biogenic substrates (rhodoliths), 1 ind., MPEG 0051.

Distribution: Pacific Ocean, near Teraina Island, and Nha Trang. Western Atlantic Ocean, from Morocco to Gabon, North Carolina (USA) to surrounding the Gulf of Mexico. Venezuela, and Brazil (from the North to the South).

Luidia senegalensis (Lamarck, 1816)
(Figure 6)

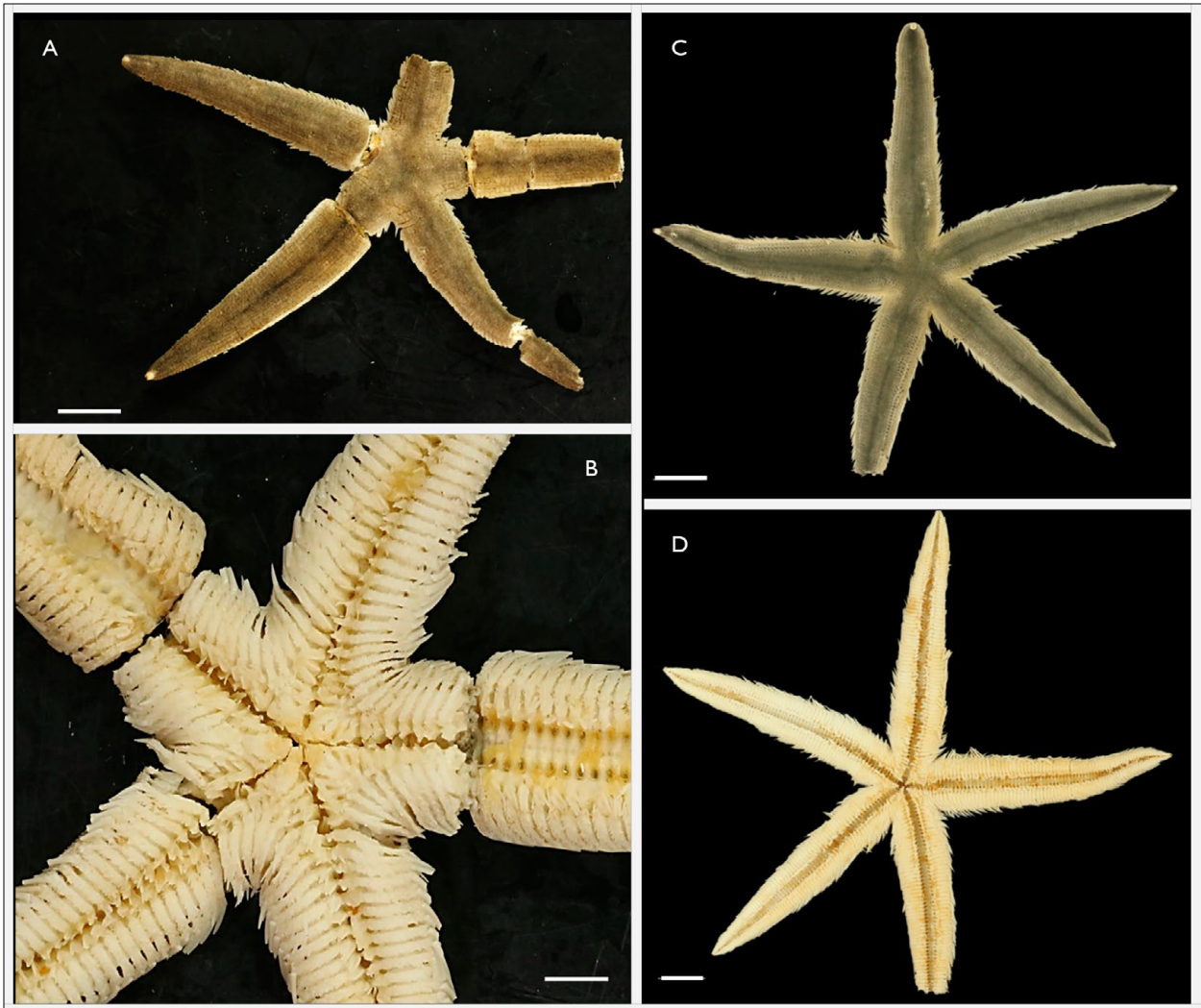
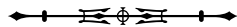


Figure 5. Asteroidea, *Luidia clathrata* (A, B: MPEG 0010; C, D: MPEG 0051). Abactinal general view (A); actinal view, in detail the mouth (B); abactinal general view (C); actinal general view (D). Scale bars: 10 mm (A, C, D); 1 mm (B). Source: Authors (2025).



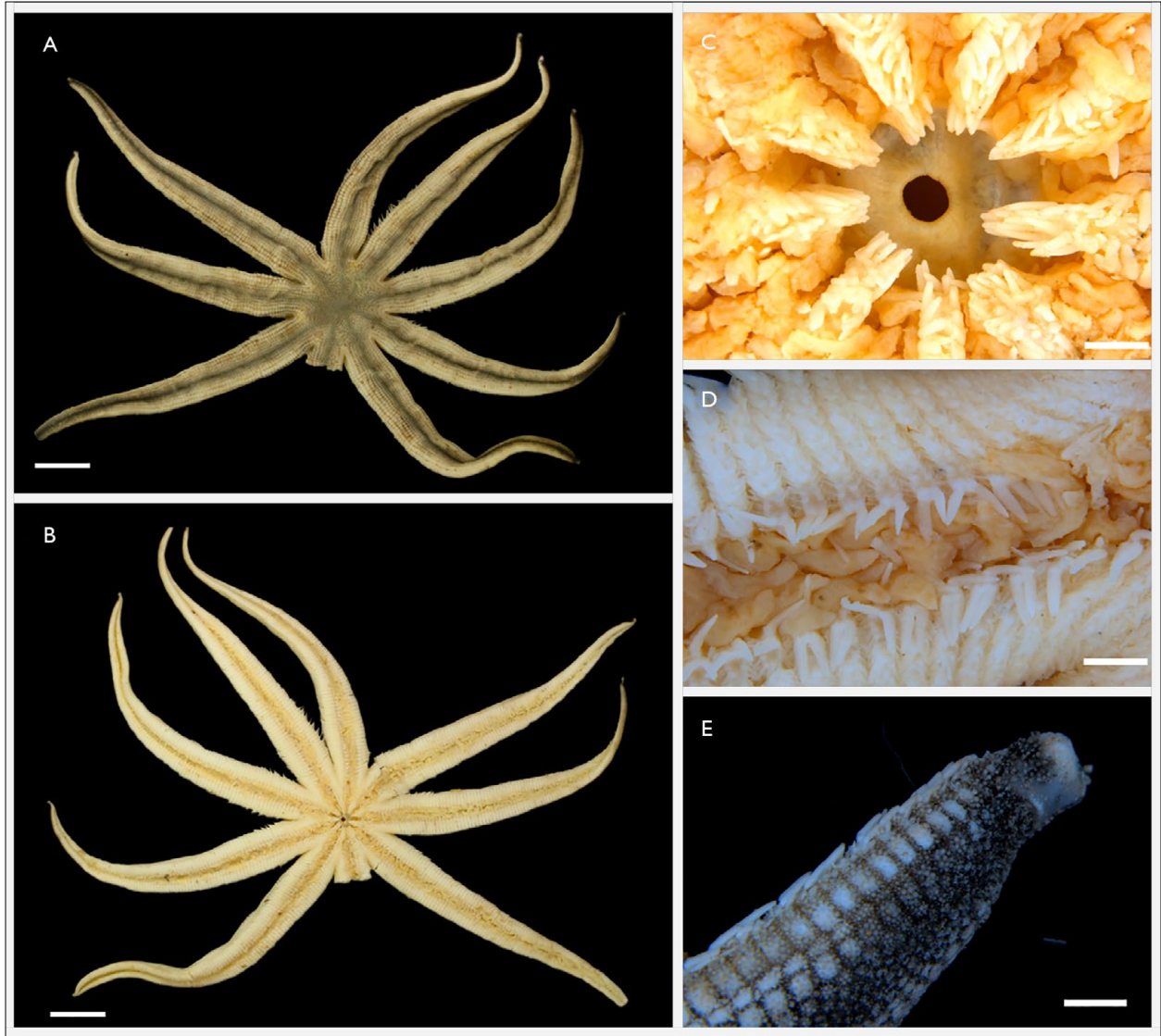


Figure 6. Asteroidea, *Luidia senegalensis* (MPEG 0004). Abactinal general view (A); actinal general view (B); in detail the mouth (C); actinal view of the arm (D); abactinal view of the arm (E). Scale bars: 10 mm (A, B); 2 mm (C-E). Source: Authors (2025).

Original designation: *Asterias senegalensis* Lamarck, 1816.

Material examined: Amazon continental shelf (Amapá), 03° 35,304' N, 50° 13,272' W, 02.VIII.2015, collected as bycatch during pink shrimp (*P. subtilis*), muddy bottom, 1 ind., MPEG 0004.

Distribution: Eastern Atlantic Ocean, Cabinda, Democratic Republic of Congo (near Kibati). Western Atlantic Ocean, from Salt Run, Jacksonville, Gulf of Mexico

to at least French Guiana, Brazil (Amapá, Maranhão, Santa Catarina).

Family Astropectinidae Gray, 1840

Genus *Astropecten* Gray, 1840

Astropecten brasiliensis Müller & Troschel, 1842

(Figure 7)

Original designation: *Astropecten brasiliensis* Müller & Troschel, 1842.

Material examined: Amazon continental shelf (Amapá), 03° 46,80' N, 49° 48,240' W, 05.IX.2016, collected as bycatch during pink shrimp (*P. subtilis*), muddy bottom, 1 ind., MPEG 0008.

Distribution: Antarctica (South Orkney Islands). South Pacific Ocean (Peru). Western Atlantic Ocean, USA (Gulf of California (San Catalina and Monterey Bay), Panama, Mexico, French Guiana, Venezuela (Boca de Aroa), Brazil (Amapá, Ceará, Rio Grande do Norte, Fernando de Noronha, Alagoas, Bahia,

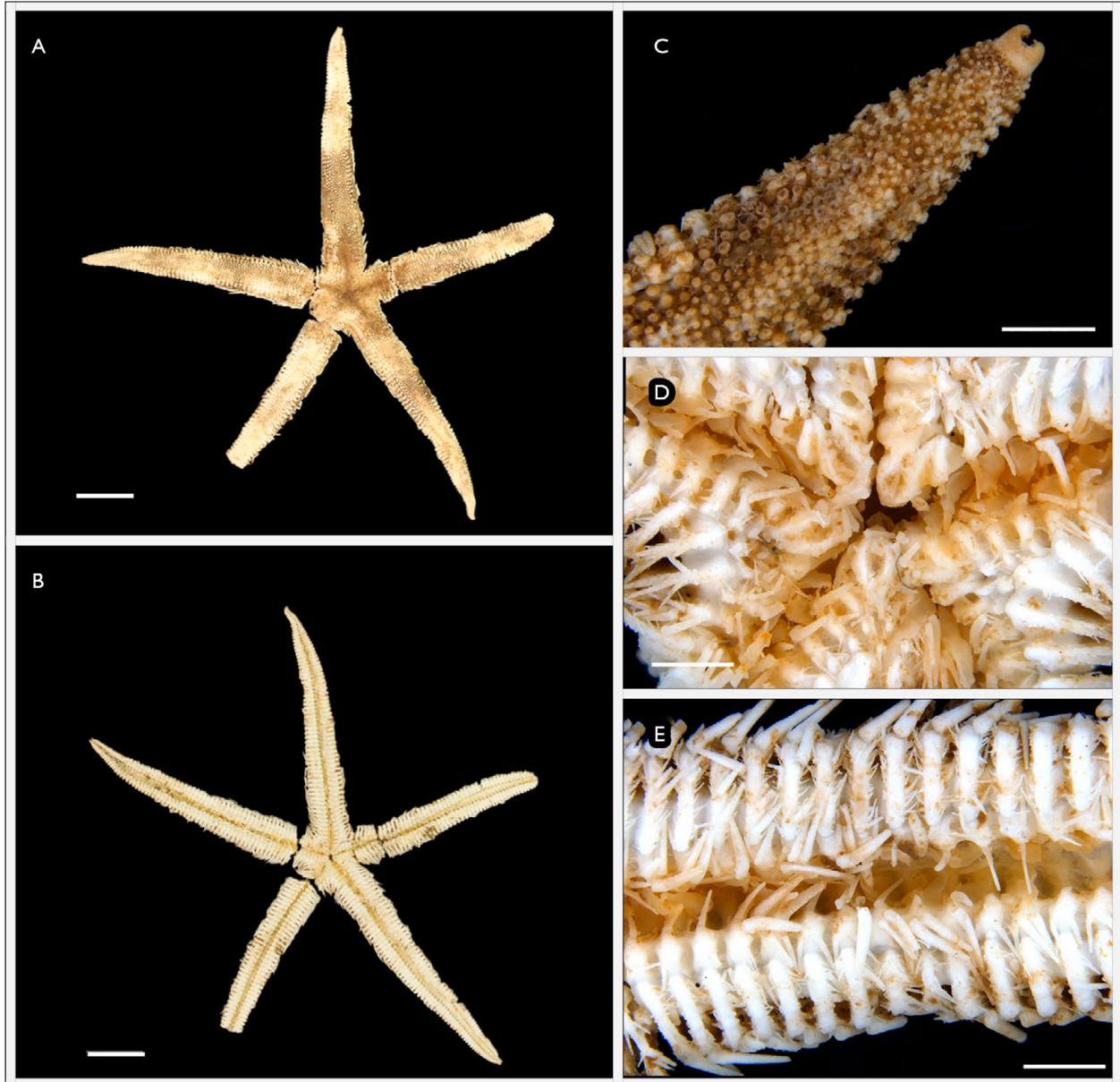


Figure 7. Asteroidea, *Astropecten brasiliensis* (MPEG 0008). Abactinal general view (A); actinal general view (B); in detail the mouth (D); abactinal view of the arm (C); actinal view of the arm (E). Scale bars: 10 mm (A, B); 2 mm (C-E). Source: Authors (2025).

Trindade Island, Rio de Janeiro, São Paulo, Santa Catarina and Rio Grande do Sul), Uruguay (coastal region, Juan Lacaze), and Argentina (Mar del Plata, Costa Bonita, Rio Quequén Grande).

Remark: This is the first record of *Astropecten brasiliensis* on the Amazonian coast.

Astropecten marginatus Gray, 1840
(Figure 8)

Original designation: *Astropecten marginatus* Gray, 1840.

Material examined: Amazon continental shelf (Pará), 01° 15,678' N, 47° 51,923' W, 22.II.2017, collected as

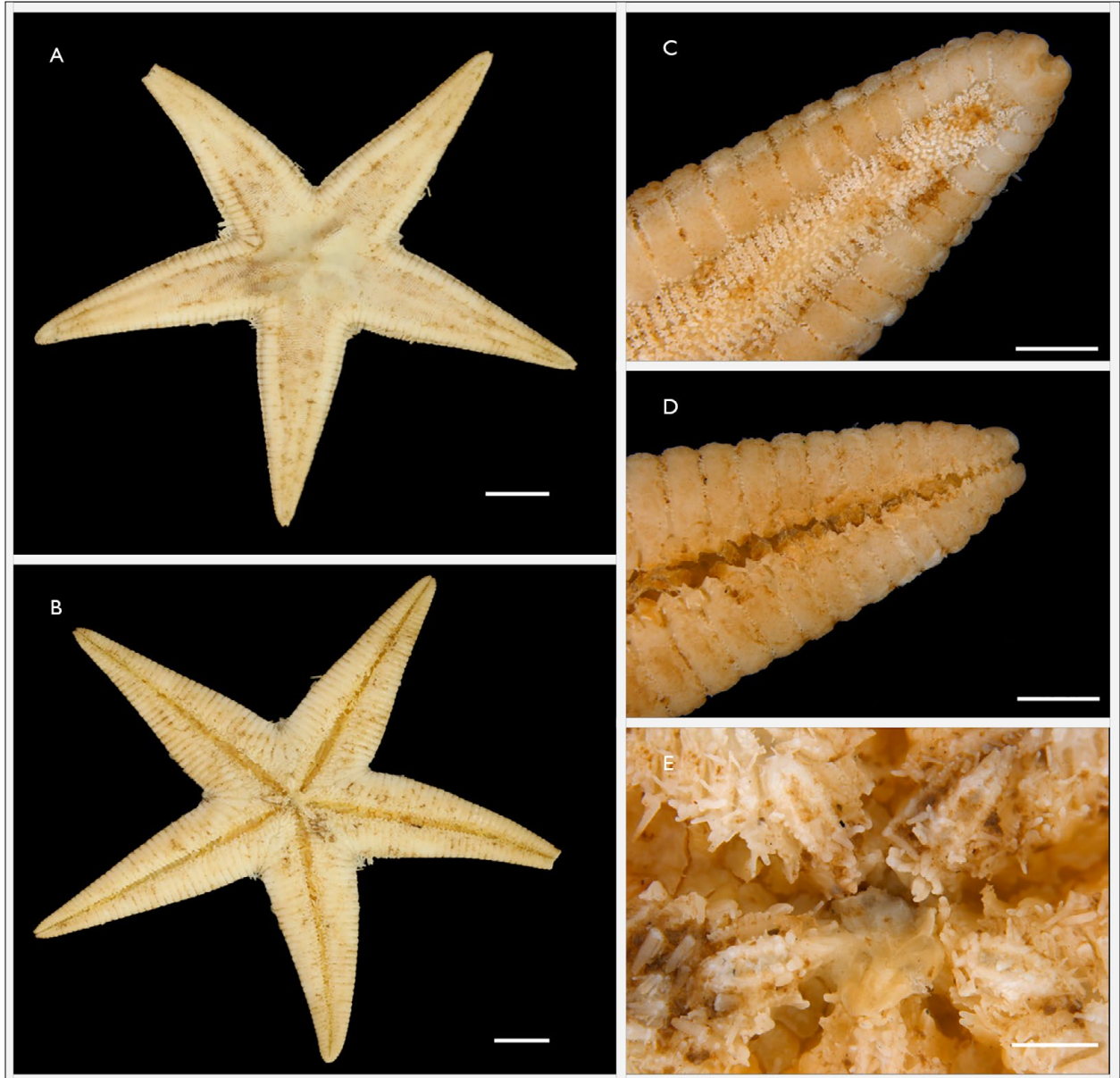


Figure 8. Asteroidea, *Astropecten marginatus* (MPEG 0012). Abactinal general view (A); actinal general view (B); in detail the mouth (E); abactinal view of the arm (C); actinal view of the arm (D). Scale bars: 10 mm (A, B); 2 mm (C-E). Source: Authors (2025).

bycatch during pink shrimp (*P. subtilis*), muddy bottom, 1 ind., MPEG 00012.

Distribution: Indian Ocean (Rwanda). Western Atlantic Ocean, USA (California), North Gulf of Mexico from Suriname, Brazil (Amapá, Pará, from Fortaleza to Santa Catarina), and Uruguay.

Order Valvatida Perrier, 1884
Family Goniasteridae Forbes, 1841

Genus *Goniaster* Agassiz, 1836

Goniaster tessellatus (Lamarck, 1816)

(Figure 9)

Original designation: *Asterias tessellata* Lamarck, 1816.

Material examined: Amazon continental shelf (Amapá), 03° 34,800' N, 50° 14,016' W, 30.VII.2015, collected as bycatch during pink shrimp (*P. subtilis*),

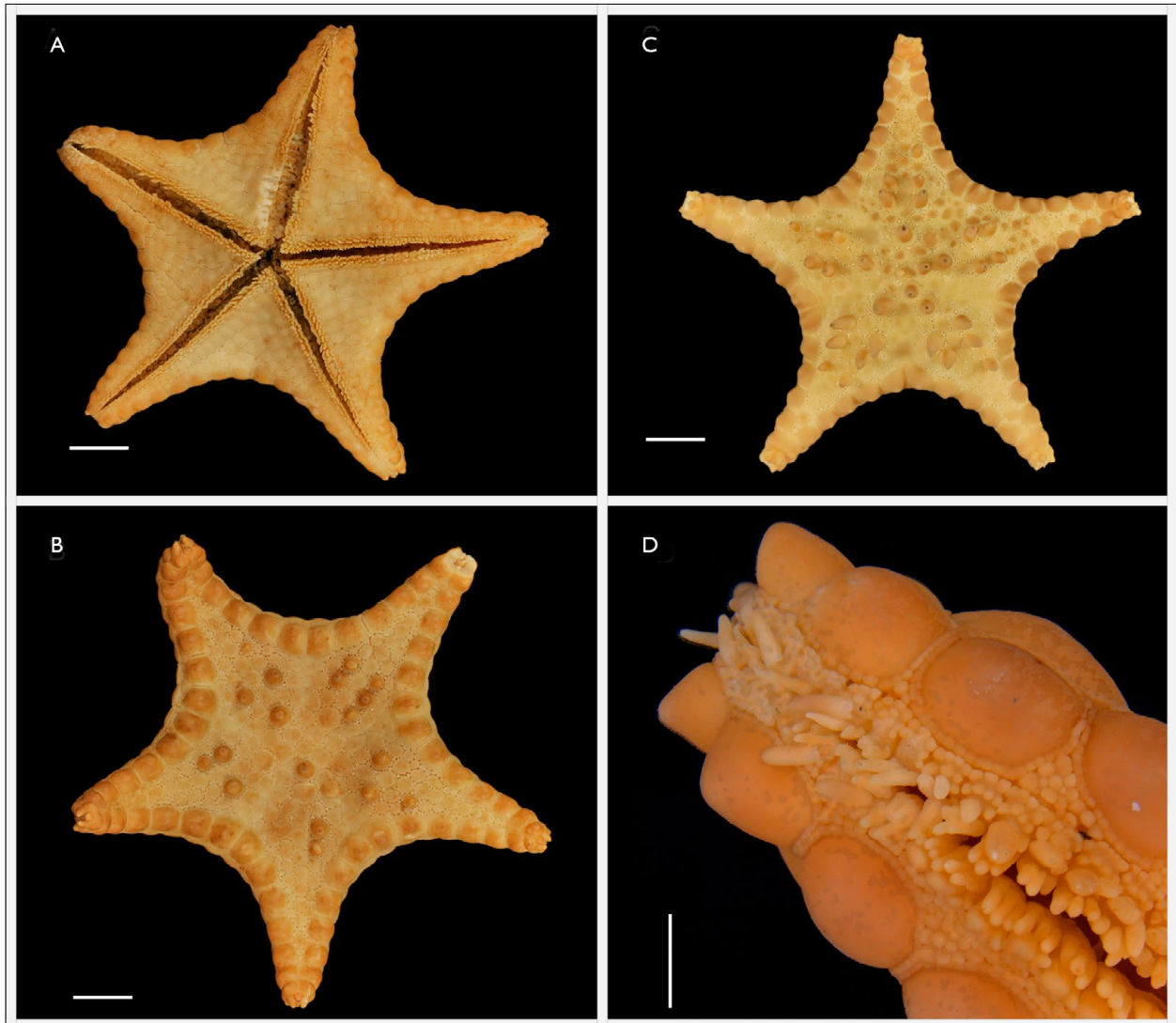


Figure 9. Asteroidea, *Goniaster tessellatus* (A, B: MPEG 0009; C, D: MPEG 0052). Actinal general view (A); abactinal general view (B, C); actinal view of the arm (D). Scale bars: 10 mm (A-B); 2 mm (D). Source: Authors (2025).

muddy bottom, 1 ind., MPEG 00009; Amazon continental shelf (Amapá), 04° 52,668' N, 50° 46,916' W, 01.XI.2022, CEPNOR-ICMBio, collected as bycatch from a red snapper (*Lutjanus* spp.) fishery, 122 meters, biogenic substrates (rhodoliths), 2 ind., MPEG 0052.

Distribution: Eastern Atlantic, Madeira Island, Mauritania to at least Gabon, South Africa. Western Atlantic, from North Carolina to Brazil (Amapá), including the West Indies and Gulf of Mexico.

Family Ophidiasteridae Verrill, 1870

Genus *Narcissia* Gray, 1840

Narcissia trigonaria Sladen, 1889

(Figure 10)

Original designation: *Narcissia trigonaria* Sladen, 1889.

Material examined: Amazon continental shelf (Amapá), 04° 54,894' N, 50° 40,887' W, 06.XI.2022,

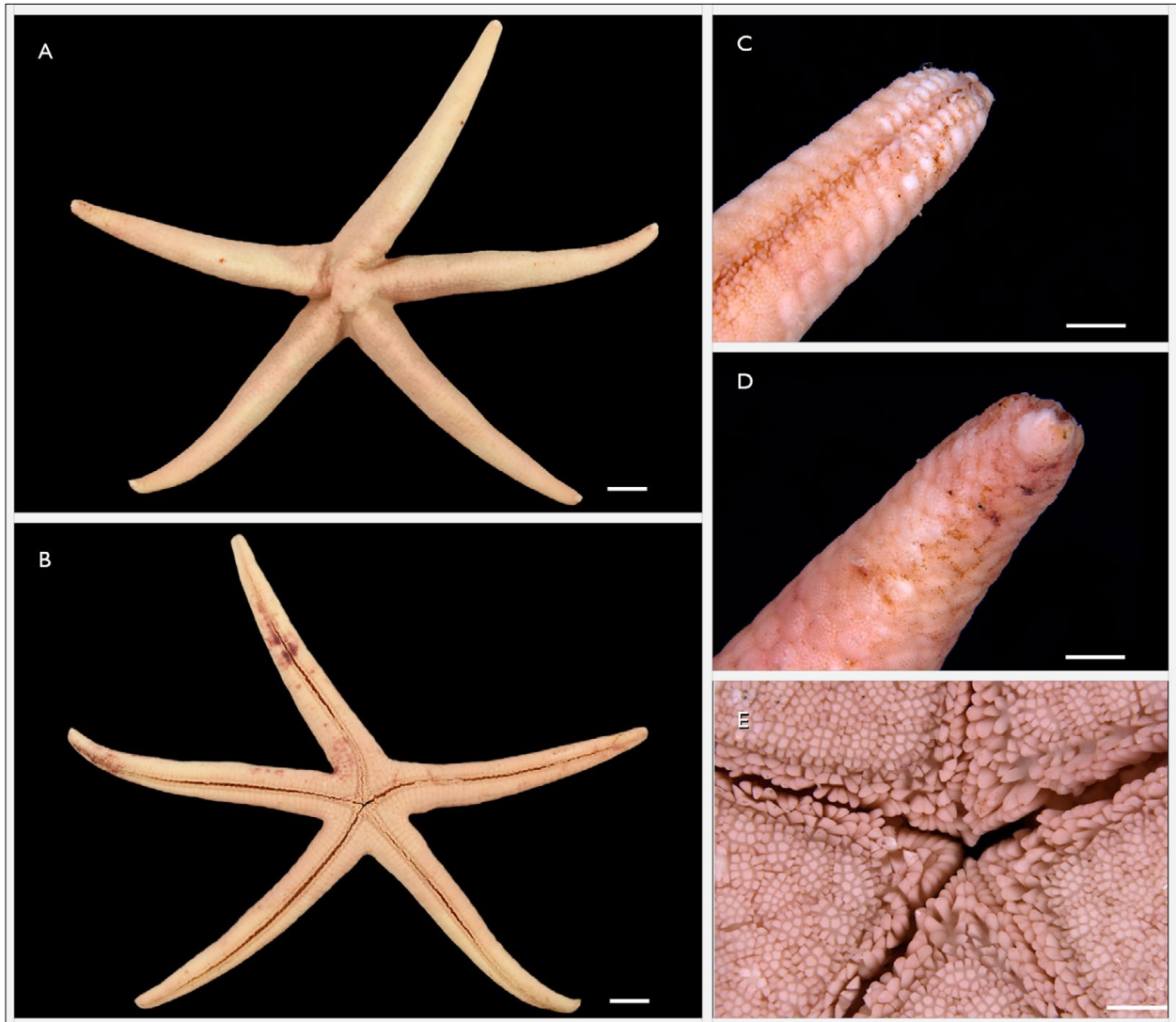


Figure 10. Asteroidea, *Narcissia trigonaria* (MPEG 0048). Abactinal general view (A); actinal general view (B); in detail the mouth (E); actinal view of the arm (C); abactinal view of the arm (D). Scale bars: 10 mm (A, B); 2 mm (C-E). Source: Authors (2025).

CEPNOR-ICMBio, collected as bycatch from a red snapper (*Lutjanus* spp.) fishery, 80 meters, biogenic substrates (rhodoliths), 2 ind., MPEG 0048.

Distribution: Eastern Atlantic Ocean, from Gabon to South Africa (São Tomé and Príncipe). Western Atlantic Ocean, from North Carolina (USA) to the Gulf of Mexico, and Brazil (Amapá, Pará, from Bahia to São Paulo).

Order Spinulosida Perrier, 1884

Family Echinasteridae Verrill, 1867

Genus *Echinaster* Müller
& Troschel, 1840

Echinaster (Othilia) guyanensis A.M Clark, 1987
(Figure 11)

Original designation: *Echinaster (Othilia) guyanensis* A.M. Clark, 1987.

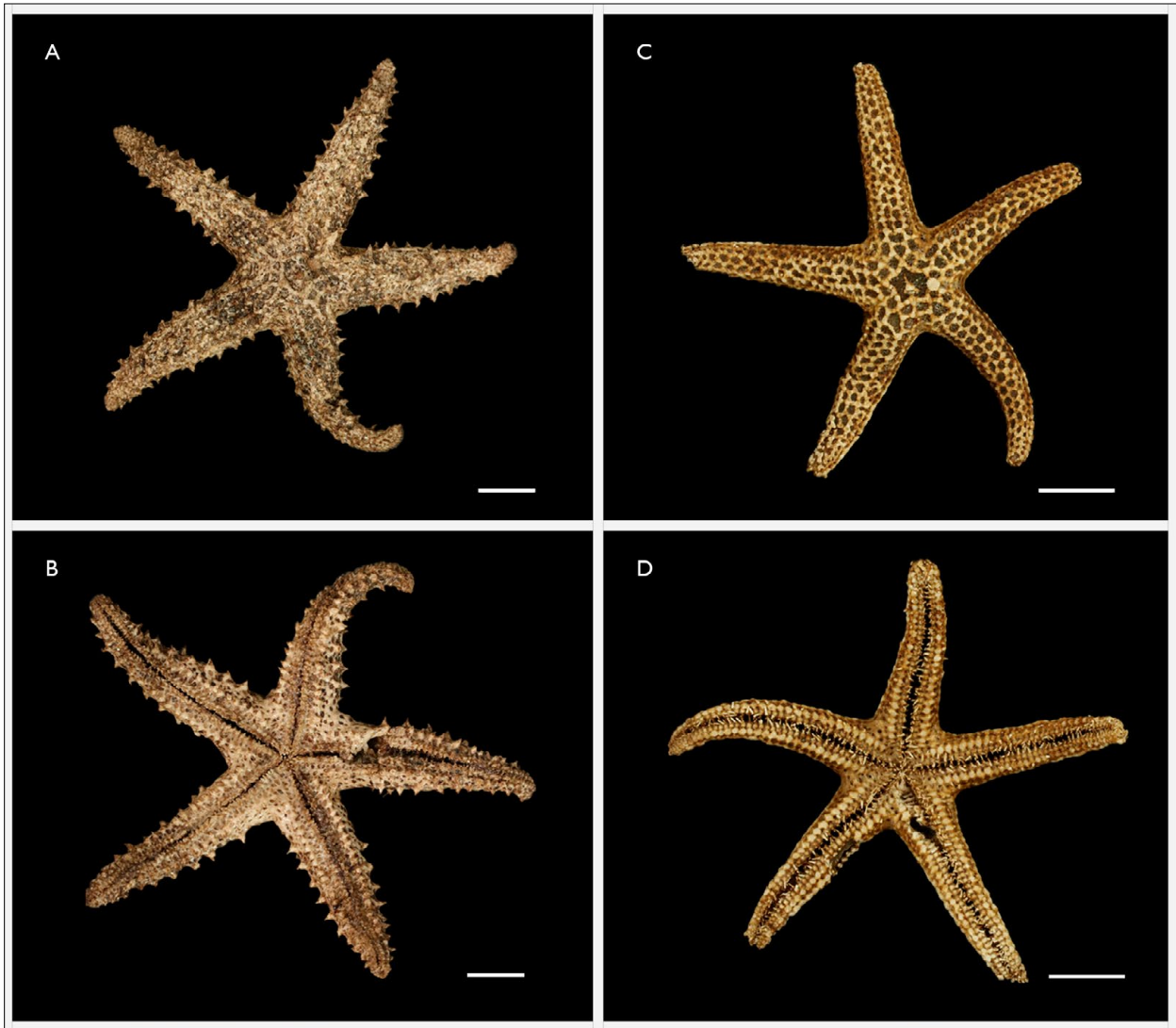


Figure 11. Asteroidea, *Echinaster (Othilia) guyanensis* (A, B: MPEG 0006; C, D: MPEG 0046). Abactinal general view (A, C); actinal general view (B, D). Scale bars: 10 mm. Source: Authors (2025).

Material examined: Amazon continental shelf (Pará), 01° 25,800' N, 47° 51,000' W, 04.III.2017, collected as bycatch during pink shrimp (*P. subtilis*), muddy bottom, 1 ind., MPEG 00006; Continental shelf (Amapá), 04° 54,894' N, 50° 40,887' W, 06.XI.2022, CEPNOR-ICMBio, collected as bycatch from a red snapper (*Lutjanus* spp.) fishery, 80 meters, biogenic substrates (rhodoliths), 1 ind., MPEG 0046.

Distribution: Western Atlantic Ocean, from Central America to Brazil (Amapá, Pará, from Espírito Santos to Rio de Janeiro), Uruguay, and Argentina.

Remark: This is the first record of *Echinaster guyanensis* on the Amazonian coast.

Echinaster (Othilia) spinulosus Verrill, 1869
(Figure 12)

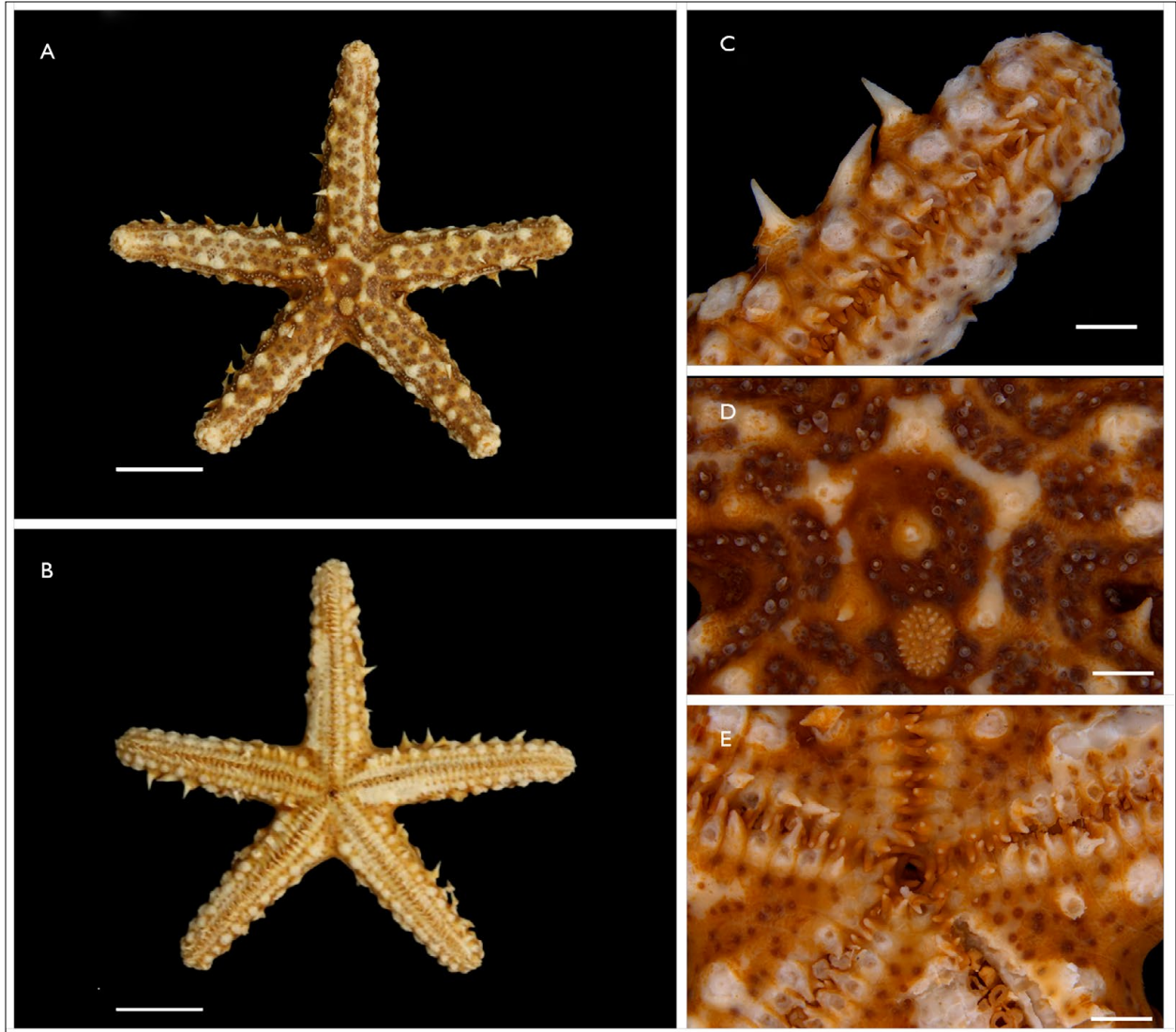


Figure 12. Asteroidea, *Echinaster (Othilia) spinulosus* (MPEG 0042). Abactinal general view (A); actinal general view (B); abactinal view of the arm (C); detailed view of the abactinal surface of the disk (D); detail of the mouth (E). Scale bars: 10 mm (A, B); 2 mm (C-E). Source: Authors (2025).

Original designation: *Echinaster (Othilia) spinulosus* Verrill, 1869.

Material examined: Continental shelf (Amapá), 04° 54,894' N, 50° 40,887' W, 06.XI.2022, CEPNOR-ICMBio, collected as bycatch from a red snapper (*Lutjanus* spp.) fishery, at 80 meters, biogenic substrates (rhodoliths), 1 ind., MPEG 0042.

Distribution: Western Atlantic Ocean, the Caribbean Sea and Gulf of Mexico. Brazil (Amapá, Rio de Janeiro).

Remark: This is the first record of *Echinaster (Othilia) spinulosus* on the Amazonian coast.

Class Ophiuroidea Gray, 1840

Order Euryalida Lamarck, 1816

Family Gorgonocephalidae Ljungman, 1867

Genus *Asteroporpa* Örsted & Lütken, 1856

Asteroporpa (Asteroporpa) annulata Örsted & Lütken, 1856
(Figure 13)

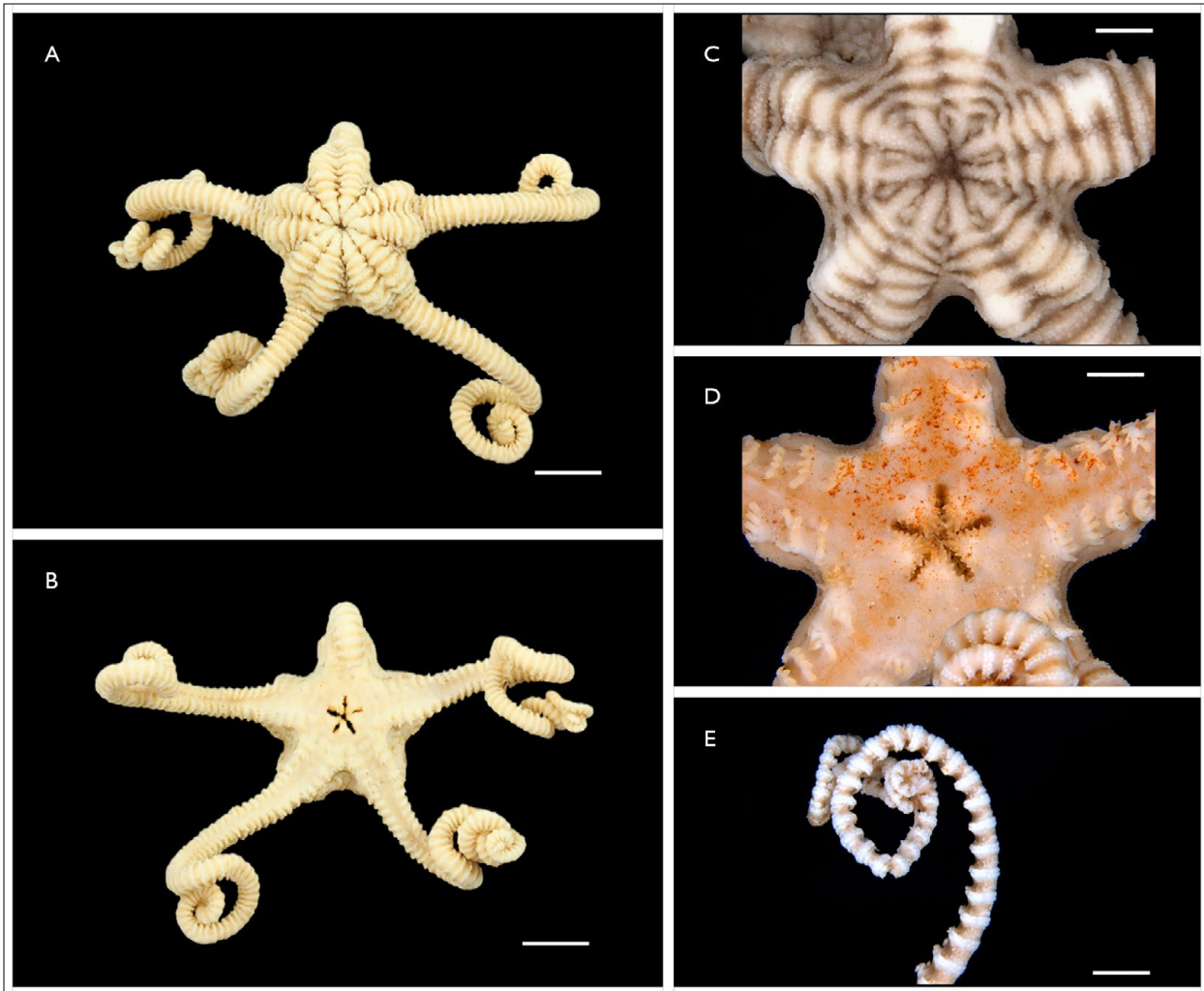


Figure 13. Ophiuroidea, *Asteroporpa (Asteroporpa) annulata* (MPEG 0044). Dorsal general view (A); ventral general view (B); detailed view of the dorsal surface of the disk (C); detail of the mouth (D); lateral view of the arm (E). Scale bars: 10 mm (A, B); 2 mm (C-E). Source: Authors (2025).

Original designation: *Asteroporpa annulata* Örsted & Lütken in Lütken, 1856.

Material examined: Amazon continental shelf (Amapá), 04° 52,668' N, 50° 46,916' W, XI.2022, CEPNOR-ICMBio, collected as bycatch from a red snapper (*Lutjanus* spp.) fishery, 122 meters, biogenic substrates (rhodoliths), 4 ind., MPEG 0044.

Distribution: North Carolina (USA), Bermuda, Bahamas, Gulf of Mexico, Caribbean Sea (Mexican Caribbean, Cuba, Puerto Rico, Panama, Colombia), and Brazil (Amapá, Pará, Rio Grande do Norte).

Asteroporpa sp.
(Figure 14)

Material examined: Amazon continental shelf (Amapá), 04° 52,668' N, 50° 46,916' W, XI.2022, CEPNOR-ICMBio, collected as bycatch from a red snapper (*Lutjanus* spp.) fishery, 122 meters, biogenic substrates (rhodoliths), 1 ind., MPEG 0043.

Genus *Astrophyton* Fleming, 1828

Astrophyton muricatum (Lamarck, 1816)
(Figure 15)

Original designation: *Euryale muricatum* Lamarck, 1816.

Material examined: Amazon continental shelf (Amapá), 04° 52,668' N, 50° 46,916' W, XI.2022,

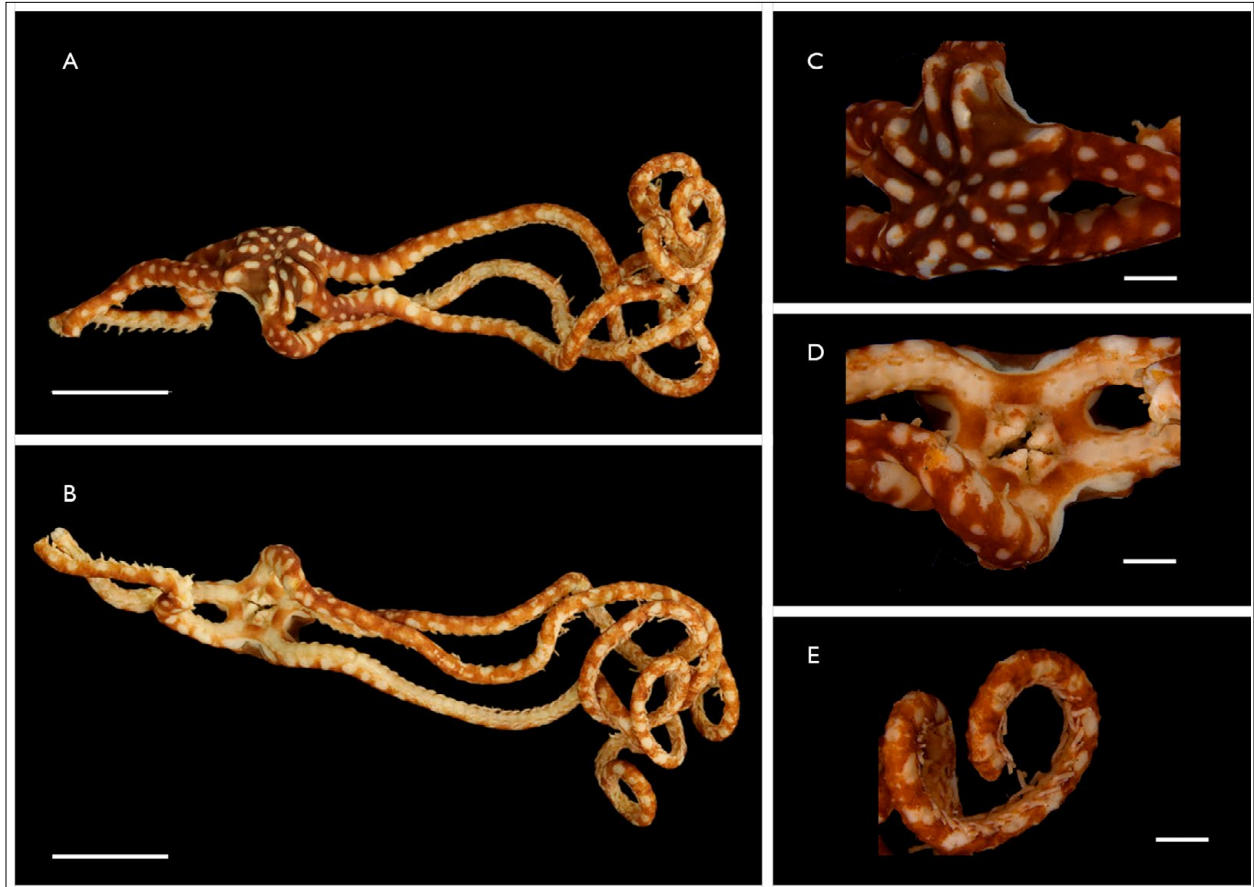


Figure 14. Ophiuroidea, *Asteroporpa* sp. (MPEG 0043). Dorsal general view (A); ventral view (B); detailed view of the dorsal surface of the disk (C); detail of the mouth (D); lateral view of the arm (E). Scale bars: 10 mm (A, B); 2 mm (C-E). Source: Authors (2025).

CEPNOR-ICMBio, collected as bycatch from a red snapper (*Lutjanus* spp.) fishery, 122 meters, biogenic substrates (rhodoliths), 2 ind., MPEG 0045 and MPEG 0053.

Distribution: Red Sea, Egypt. Pacific Ocean, Crescent City (USA). Eastern Atlantic Ocean, France (Roscoff). Western Atlantic Ocean, from North Carolina (USA) to the

Gulf of Mexico, and Brazil (Amapá, Pará, Espírito Santo).

Gorgonocephalidae sp.

(Figure 16)

Material examined: Amazon continental shelf (Amapá),

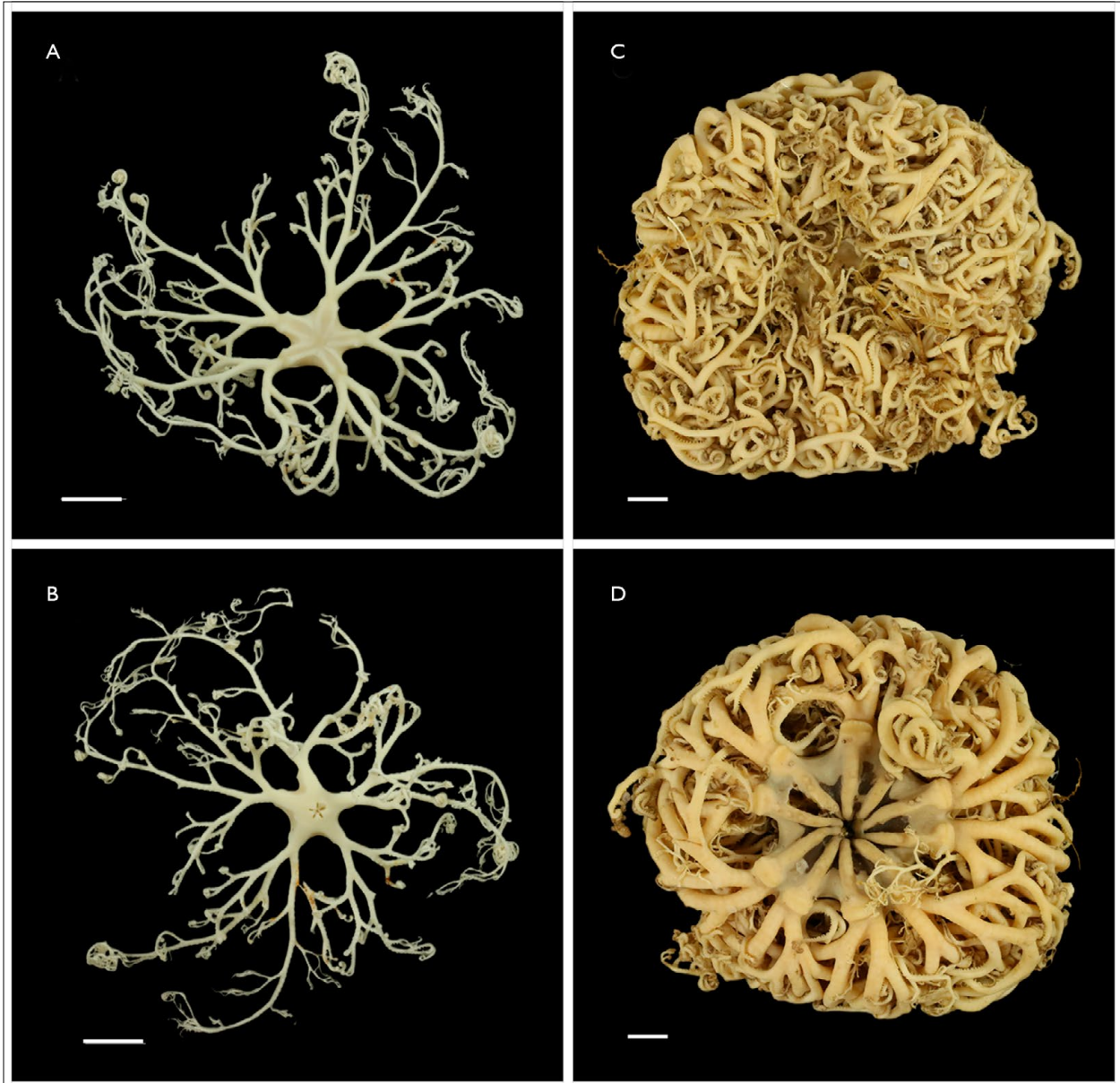


Figure 15. Ophiuroidea, *Astrophyton muricatum* (A, B: MPEG 0045; C, D: MPEG 0053). Dorsal general view (A, C); ventral view (B, D). Scale bars: 10 mm. Source: Authors (2025).

03° 52,833' N, 49° 29,600' W, 25.VIII.2016, Muniz-Mairink, collected as bycatch during pink shrimp (*P. subtilis*), muddy bottom, 1 ind., MPEG 0007.

Remark: The specimen is quite damaged with only the disc remaining.

Family Ophiomyxidae Ljungman, 1867
Genus *Ophiomyxa* Müller & Troschel, 1840

Ophiomyxa sp.
(Figure 17)

Material examined: Amazon continental shelf (Amapá), 04° 52,668' N, 50° 46,916' W, XI.2022, CEPNOR-ICMBio, collected as bycatch from a red snapper (*Lutjanus* spp.) fishery, 122 meters, biogenic substrates (rhodoliths), 1 ind., MPEG 0062.



Figure 16. Ophiuroidea, Gorgonocephalidae sp. (MPEG 0007). Dorsal general view (A); ventral general view (B). Scale bars: 10 mm. Source: Authors (2025).

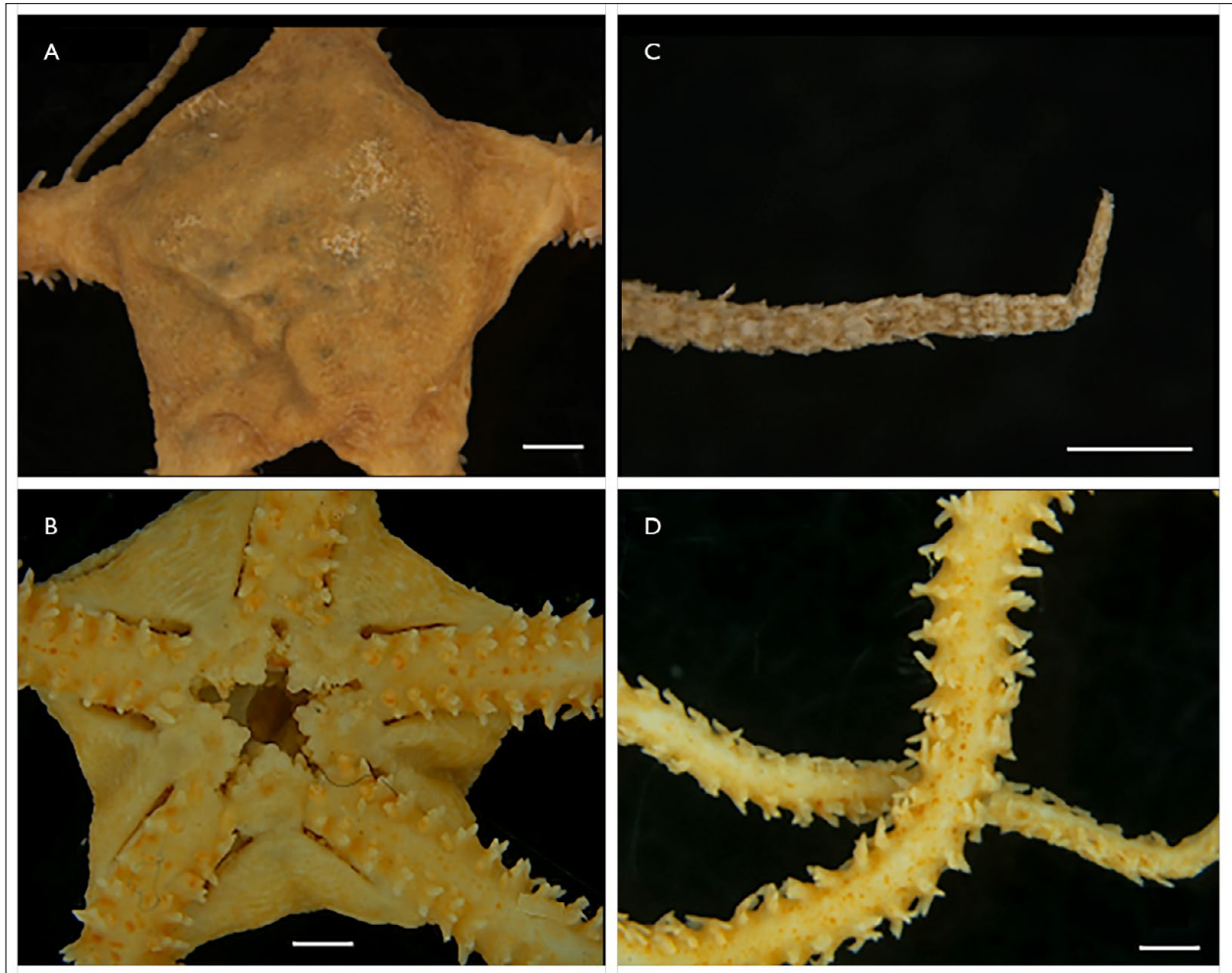


Figure 17. Ophiuroidea, *Ophiomyxa* sp. (MPEG 0062). Dorsal view of the disk (A); ventral view of the disk (B); lateral view of the arm (C); ventral of the arm (D). Scale bars: 1 mm. Source: Authors (2025).

Order Amphilepidida O'Hara, Hugall,
Thuy, Stöhr & Martynov, 2017
Family Amphiuridae Ljungman, 1867
Genus *Amphiodia* Verrill, 1899

Amphiodia planispina
(von Martens, 1867)
(Figure 18)

Original designation: *Amphiura planispina* von Martens,
1867.

Material examined: Continental shelf (Pará), 01°
02,932' N, 46° 41,139' W, XI.2008, PIATAM-Oceano
Project (#206), NHOc Amorim do Valle, at 63 meters,
sandy bottom, 1 ind., MPEG 0027.

Distribution: Western Atlantic Ocean, Florida, the
islands off southern Florida, the Antilles, Panama, Brazil
(Pará, Maranhão, Ceará, Rio Grande do Norte, Paraíba,
Rio de Janeiro, São Paulo, Rio Grande do Sul) and off Mar
del Plata, Argentina.

Remark: This is the first record of *Amphiodia*
planispina on the Amazonian coast.

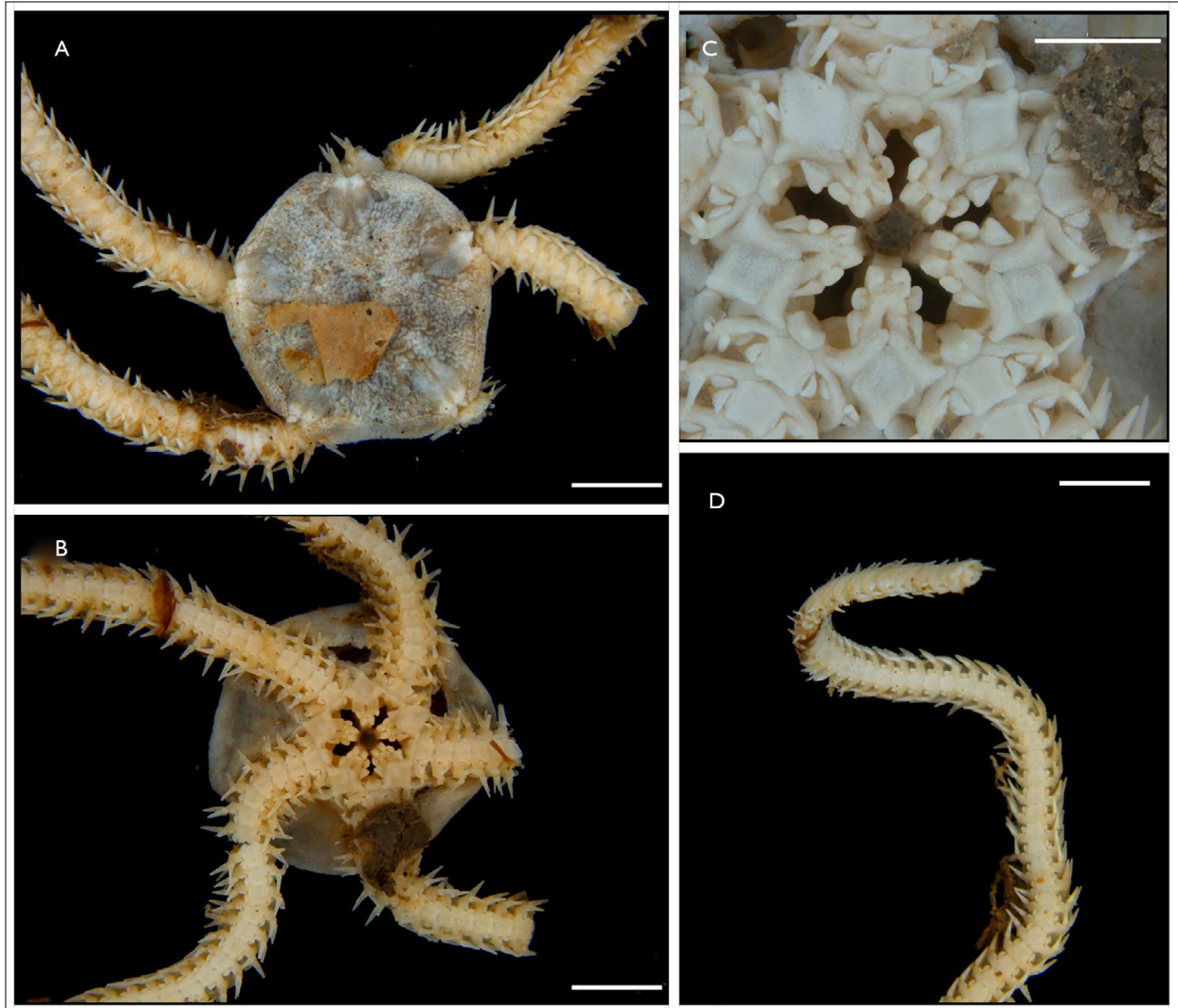


Figure 18. Ophiuroidea, *Amphiodia planispina* (MPEG 0027). Dorsal view of the disk (A); ventral view of the disk (B); in detail the mouth and jaws (C); ventral view of the arm (D). Scale bars: 2 mm. Source: Authors (2025).

Genus *Ophiocnida* Lyman, 1865
Ophiocnida scabriuscula (Lütken, 1859)
(Figure 19)

Original designation: *Amphiura scabriuscula* Lütken, 1859.

Material examined: Continental shelf (Pará), 0° 21,242' S, 46° 53,949' W, XI.2008, PIATAM-Oceanographic Project (#310), NHOc Amorim do Valle, 27 meters, 1 ind., MPEG 0003.

Remark: The specimens are quite damaged with only the disc remaining.

Distribution: Western Atlantic Ocean, Bermuda, Florida (USA), the islands off southern Florida, the Antilles, Mexican Caribbean, Panama, Colombia, Venezuela, and Brazil (Pará, Maranhão, Paraíba, Pernambuco, Alagoas, Bahia, Rio de Janeiro, São Paulo, Paraná).

Remark: This is the first record of *Ophiocnida scabriuscula* on the Amazonian coast.

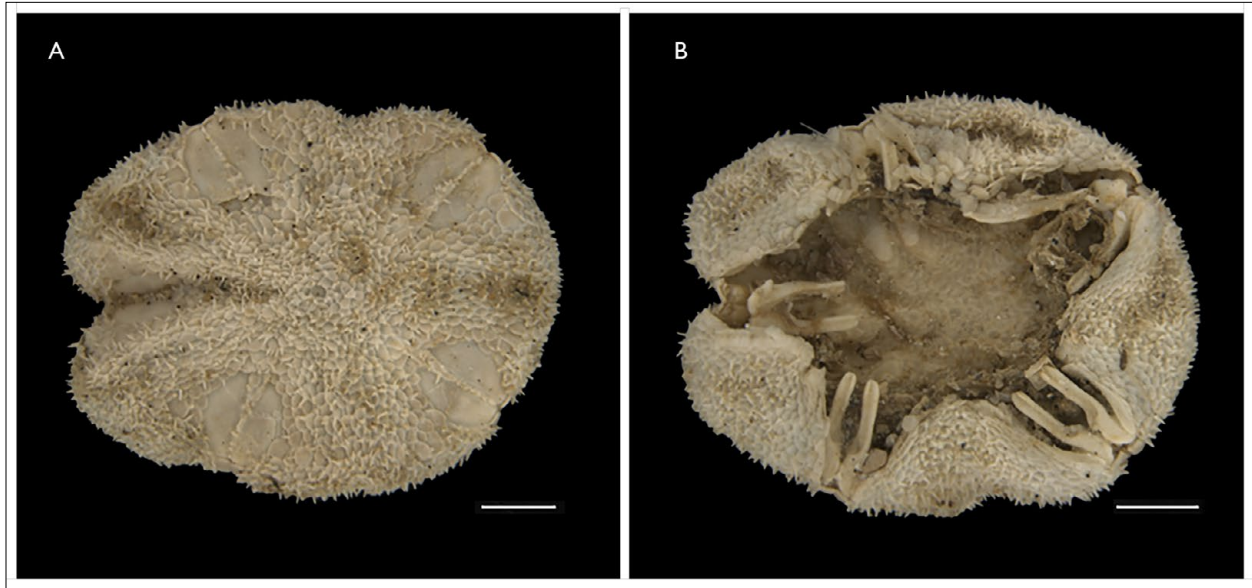


Figure 19. Ophiuroidea, *Ophiocnida scabriuscula* (MPEG 0003). Dorsal view of the disk (A); ventral view of the disk (B). Scale bars: 1 mm. Source: Authors (2025).

Genus *Ophiostigma* Lütken, 1856

Ophiostigma isocanthum (Say, 1825)
(Figure 20)

Original designation: *Ophiura isocantha* Say, 1825.

Material examined: Continental shelf (Maranhão), 0° 08,871' S, 44° 29,454' W, XI.2008, PIATAM-Oceano Project (#103), NHOc Amorim do Valle, 50 meters, 1 ind., MPEG 0002.

Distribution: Western Atlantic Ocean, Bermudas, USA, North Carolina to Florida and the island off southern Florida, Texas offshore reefs, Bahamas, Antilles, islands off Caribbean, Colombia, Venezuela, and Brazil (Maranhão, Ceará, Paraíba, Pernambuco, Alagoas, Bahia, and Rio de Janeiro).

Remark: The specimens are quite damaged with only the disc remaining. This is the first record of *Ophiostigma isocanthum* on the Amazonian coast.

Family Ophiactidae Matsumoto, 1915
Genus *Ophiactis* Lütken, 1856

Ophiactis lymani Ljungman, 1872
(Figure 21)

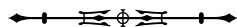
Original designation: *Ophiactis lymani* Ljungman, 1872.

Material examined: Amazon continental shelf (Amapá), 04° 05,900' N, 49° 16,909' W, 02.IX.2016, collected as bycatch during pink shrimp (*P. subtilis*), muddy bottom, 20 ind., MPEG 0014; Algodual Island, Maracanã (Pará), 0° 34,663' S, 47° 35,270' W, associated with Sabellariidae reefs from sandy beach intertidal zone, 1 ind., MPEG 0037.

Distribution: Indian Ocean, Madagascar and Mozambique; Eastern Atlantic Ocean, southern part of the African continent. Western Atlantic Ocean, Trinidad and Tobago, Caribbean Sea, and Brazil (Amapá, Pará, Paraíba, Pernambuco, Alagoas, and Bahia).

Remark: This is the first record of *Ophiactis lymani* on the Amazonian coast.

Ophiactis savignyi (Müller & Troschel, 1842)
(Figure 22)



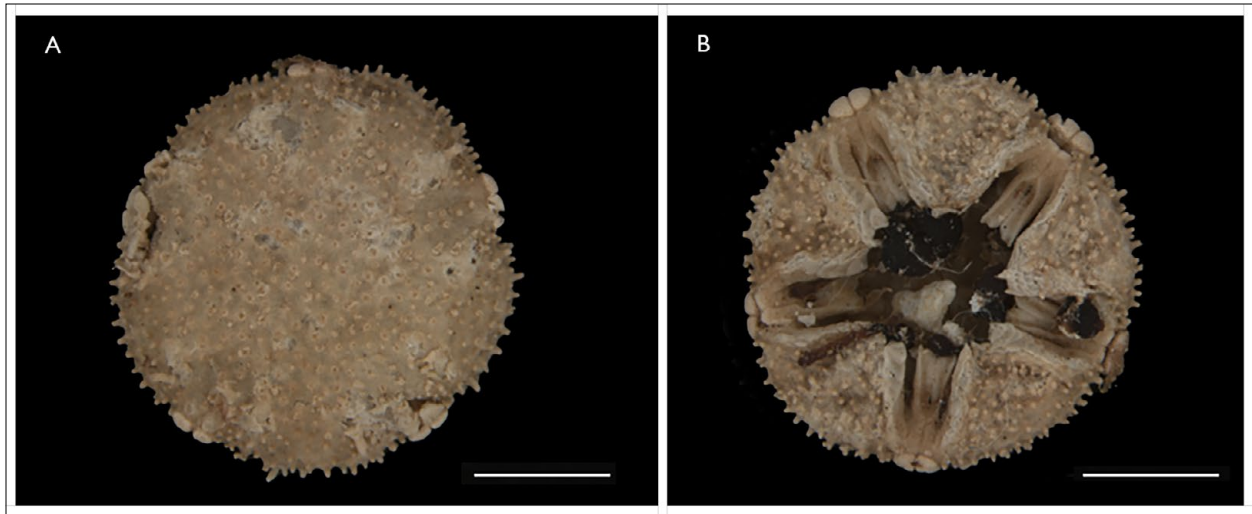


Figure 20. Ophiuroidea, *Ophiostigma isocanthum* (MPEG 0002). Dorsal view of the disk (A); ventral view of the disk (B). Scale bars: 1 mm. Source: Authors (2025).

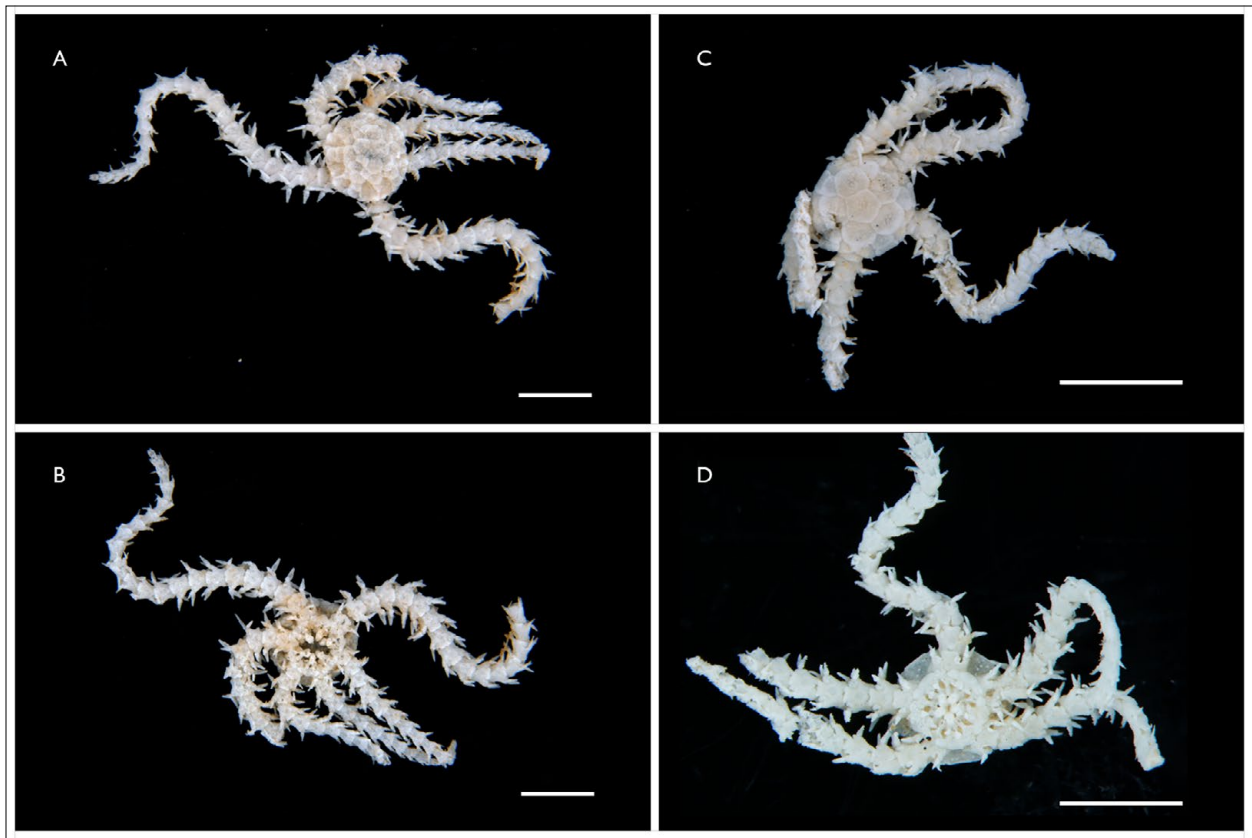


Figure 21. Ophiuroidea, *Ophiactis lymani* (A, B: MPEG 0014; C, D: MPEG 0037). Dorsal general view (A, C); ventral general view (B, D). Scale bars: 2 mm. Source: Authors (2026).

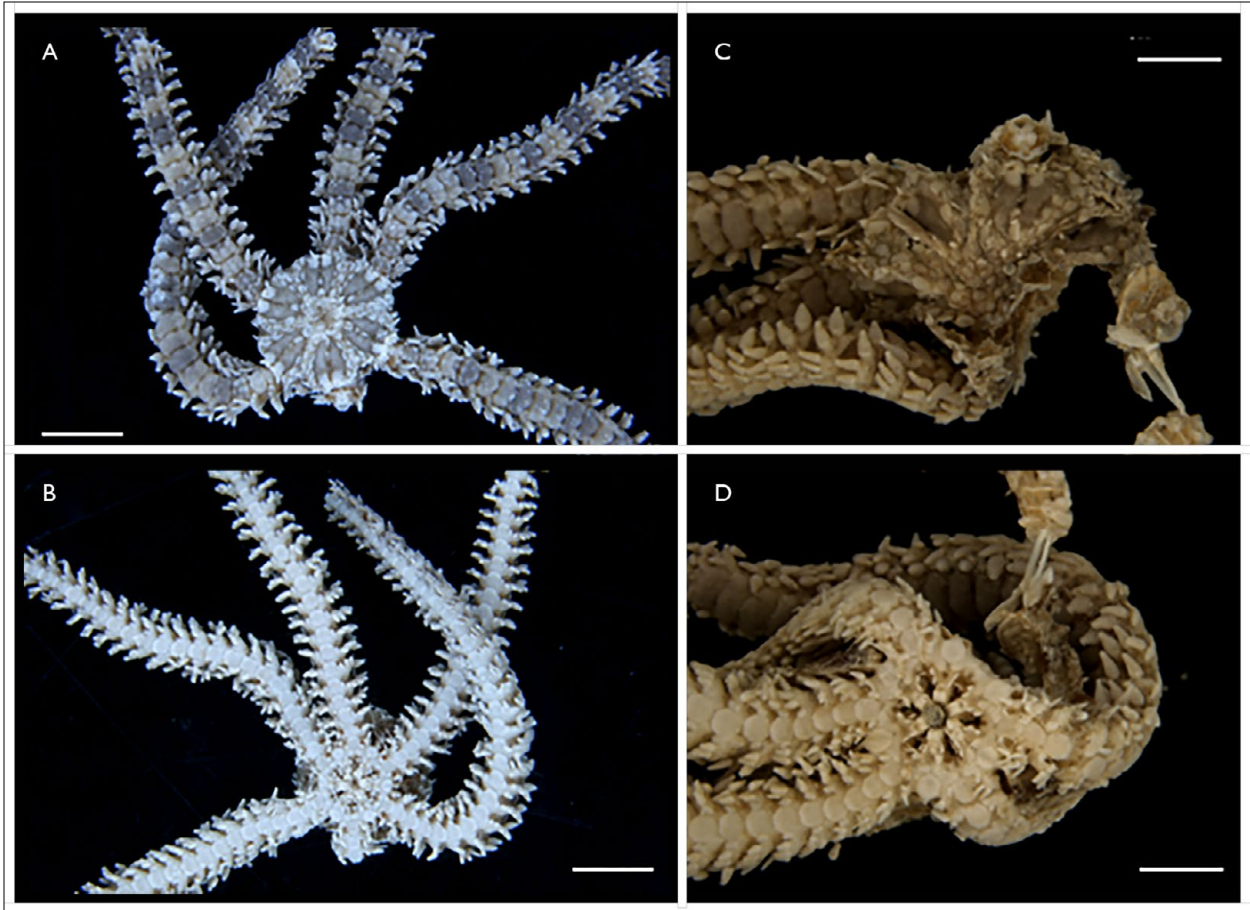


Figure 22. Ophiuroidea, *Ophiactis savignyi* (A, B: MPEG 0040; C, D: MPEG 0063). Dorsal view of the disk (A, C); ventral view of the disk (B, D). Scale bars: 2 mm (A, B), 1 mm (C, D). Source: Authors (2025).

Original designation: *Ophiopsis savignyi* Müller & Troschel, 1842.

Material examined: Continental shelf (Maranhão), 01° 40,687' S, 43° 54,572' W, XI.2008, PIATAM-Oceano Project (#305), NHOc Amorim do Valle, 31 meters, 9 ind., MPEG 0040; Amazon continental shelf (Amapá), 04° 52,668' N, 50° 46,916' W, XI.2022, CEPNOR-ICMBio, collected as bycatch from a red snapper (*Lutjanus* spp.) fishery, 122 meters, biogenic substrates (rhodoliths), 1 ind., MPEG 0063.

Distribution: Western Indo-Pacific, Eastern Pacific, Western Atlantic. South Carolina, Bermuda, Mexican Caribbean, Honduras, and Brazil (Amapá, Pará, Maranhão

Ceará, Paraíba, Pernambuco, Alagoas, Bahia, Abrolhos off southern Bahia, Rio de Janeiro, São Paulo).

Remark: This is the first record of *Ophiactis savignyi* on the Amazonian coast.

Ophiactis sp.
(Figure 23)

Material examined: Continental shelf (Pará), near 0° 47,786' N, 46° 14,378' W, XI.2008, PIATAM-Oceano Project (#101), NHOc Amorim do Valle, 63 meters, 1 ind., MPEG 0034; Continental shelf (Pará), X.2008, PIATAM-Oceano Project (#204), NHOc Amorim do Valle, 1 ind., MPEG 0061.

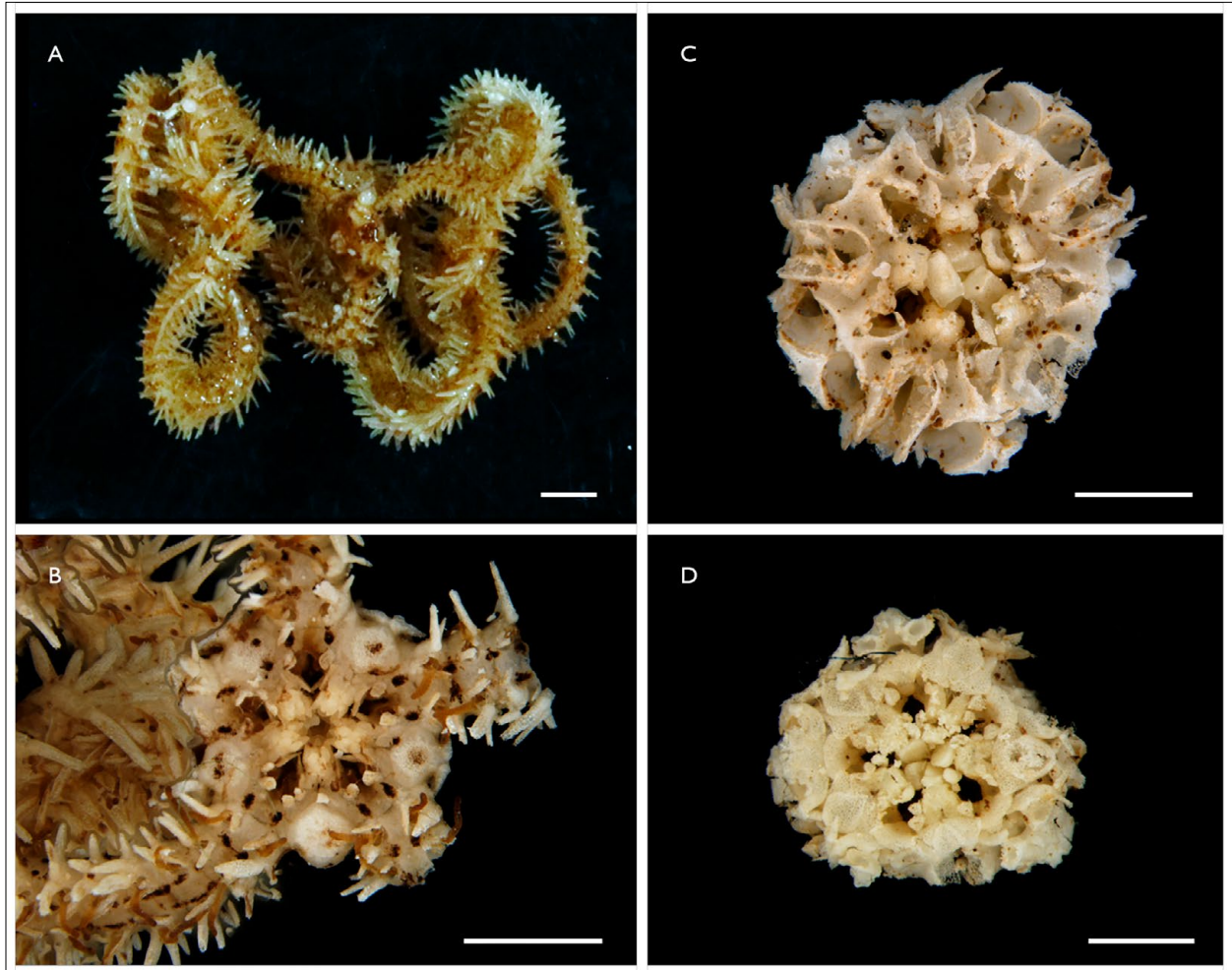


Figure 23. Ophiuroidea, *Ophiactis* sp. (A, B: MPEG 0034; C, D: MPEG 0061). Dorsal general view (A); ventral view of the disk (B, D); dorsal view of the disk (C). Scale bars: 2 mm (A, B); 500 μ m (C, D). Source: Authors (2025).

Family Ophiotrichidae Ljungman, 1867
Genus *Ophiotrix* Müller & Troschel, 1840

Ophiotrix tommasii Santana,
Manso, Almeida & Alves, 2020
(Figure 24)

Original designation: *Ophiotrix tommasii* Santana, Manso, Almeida & Alves, 2020.

Material examined: Camará River Beach (Vista Alegre), Marapanim (Pará), 04.XI.1980, Brigida, M.S. and Rosemiro,

5. ind., MPEG 0016; Camará River Beach (Vista Alegre), Marapanim (Pará), X.1981, Brigida, M.S., 28 ind., MPEG 0017; Amazon continental shelf (Pará), 01° 24,450' N, 47° 56,111' W, 27.II.2017, collected as bycatch during pink shrimp (*P. subtilis*), muddy bottom, 1 ind., MPEG 0021; Fortaleza Island, São João de Pirabas (Pará), 1956, Cunha, 31 ind., MPEG 0026; Continental shelf (Maranhão), 02° 06,369' S, 43° 22,306' W, 14.XI.2008, PIATAM-Oceano Project (#304), NHOc Amorim do Valle, 31 meters, 1 ind., MPEG 0032.

Distribution: Western Atlantic, Brazil (Pará, Maranhão, Piauí, Ceará, Rio Grande do Norte, Paraíba, Pernambuco,

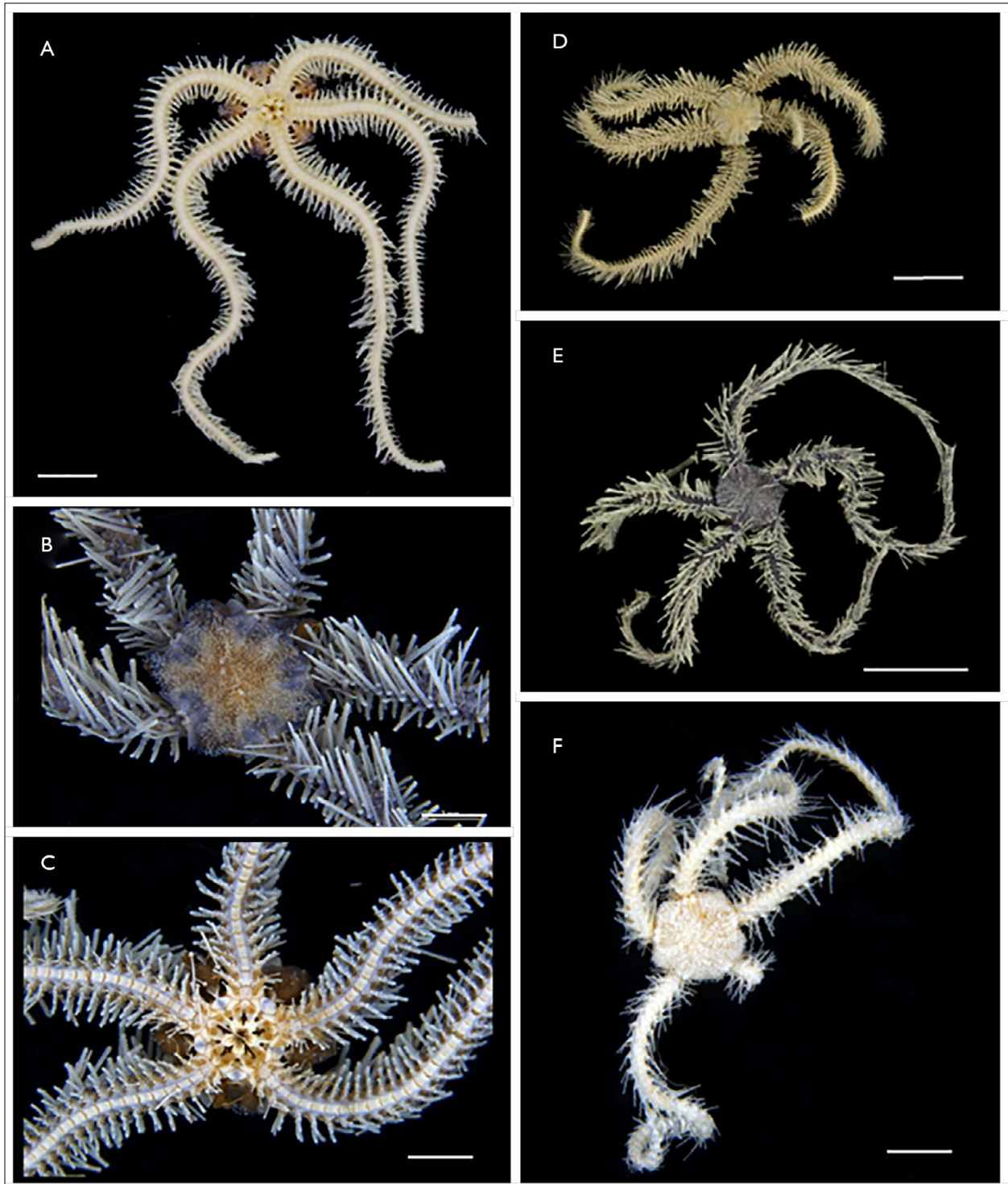


Figure 24. Ophiuroidea, *Ophiothrix tommasii* (A: MPEG 0016; B, C: MPEG 0017; D: MPEG 0021; E: MPEG 0026; F: MPEG 0032). Ventral general view (A); dorsal view of the disc (B); ventral view of the disc (C); dorsal general view (D-F). Scale bars: 2 mm. Source: Authors (2025).

Alagoas, Bahia, Espírito Santo, Rio de Janeiro, São Paulo, Paraná and Santa Catarina).

Remark: This is the first record of *Ophiothrix tommasii* on the Amazonian coast.

Order Ophiacanthida O'Hara, Hugall,
Thuy, Stöhr & Martynov, 2017

Family Ophiodermatidae Ljungman, 1867
Genus *Ophioderma* Müller &
Troschel, 1840

Ophioderma cinereum
Müller & Troschel, 1842
(Figure 25)

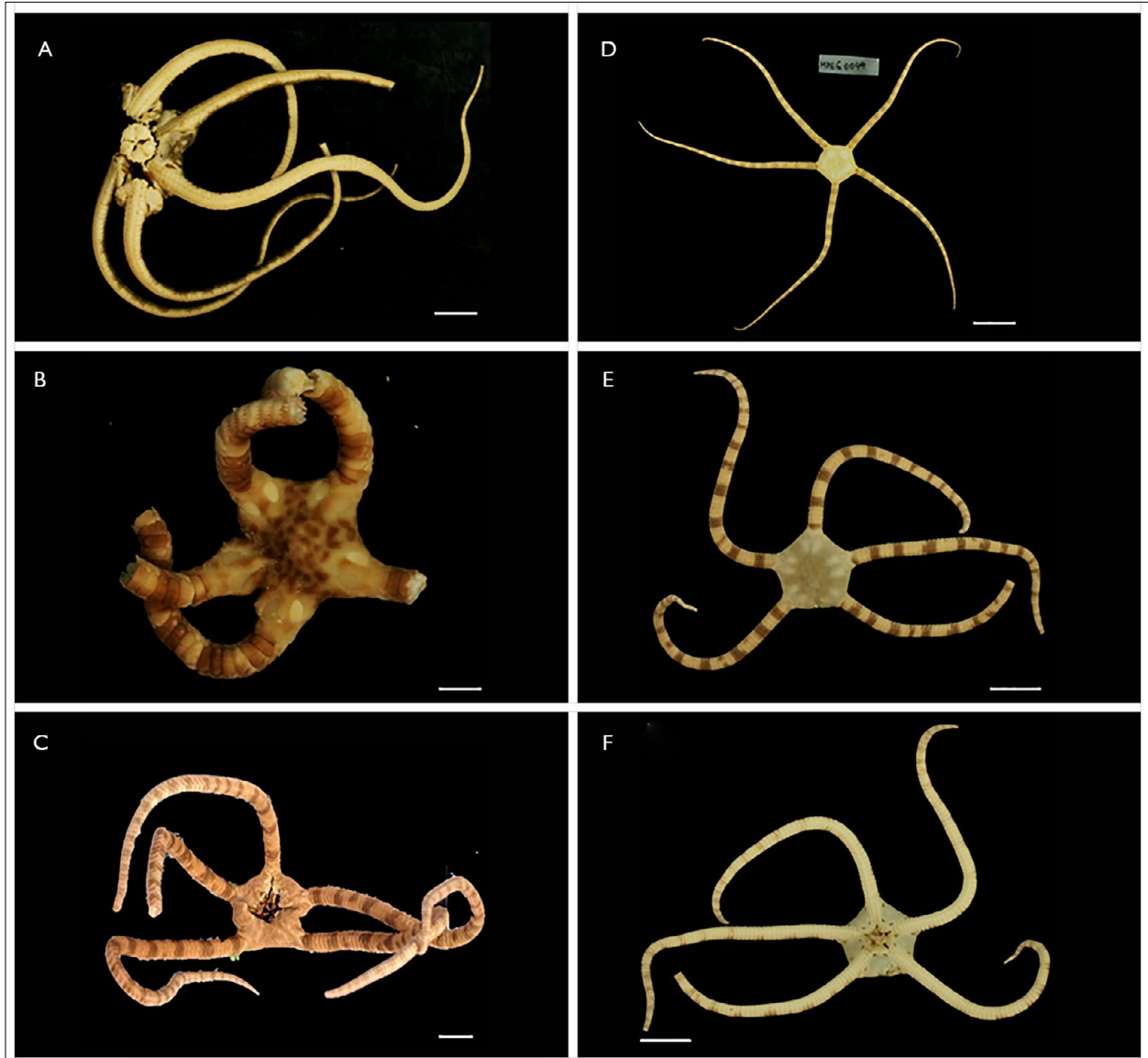


Figure 25. Ophiuroidea, *Ophioderma cinereum* (A: MPEG 0011; B: MPEG 0031; C: MPEG 0047; D: MPEG 0049; E, F: MPEG 0050). Ventral general view (A, F); dorsal general view (B-E). Scale bars: 10 mm. Source: Authors (2025).

Original designation: *Ophioderma cinereum* Müller & Troschel, 1842.

Material examined: Amazon continental shelf (Pará), 01° 24,450' N, 47° 56,111' W, 27.II.2017, Muniz-Mairink, collected as bycatch during pink shrimp (*P. subtilis*), muddy bottom, 1 ind., MPEG 0011; Continental shelf (Maranhão), 00° 21,013' S, 44° 09,848' W, 26.X.2008, PIATAM-Oceano Project (#104), NHOc Amorim do Valle, 55 meters, 3 ind., MPEG 0031; Amazon continental shelf (Amapá), 04° 52,668' N, 50° 46,916' W, XI.2022, CEPNOR-ICMBio, collected as bycatch from a red snapper (*Lutjanus* spp.) fishery, 122 meters, biogenic substrates (rhodoliths), 5 ind., MPEG 0047, MPEG 0049, MPEG 0050.

Distribution: Florida (USA), Caribe Sea, Bahamas, Bermudas, and Brazil (Amapá, Pará, Maranhão, Alagoas, Bahia and Paraíba).

Remark: This is the first record of *Ophioderma cinereum* on the Amazonian coast.

Class Echinoidea Schumacher, 1817
Order Cidaroida Claus, 1880
Family Cidaridae Gray, 1825
Genus *Eucidaris* Pomel, 1883

Eucidaris tribuloides (Lamarck, 1816)
(Figure 26)



Figure 26. Echinoidea, *Eucidaris tribuloides* (A: MPEG 0005; B-D: MPEG 0030). Oral general view (A); aboral general view (B); detail of the peristome (C); details of the spines (D). Scale bars: 10 mm (A, B); 1 mm (C, D). Source: Authors (2025).

Original designation: *Cidarites tribuloides* Lamarck, 1816.

Material examined: Amazon continental shelf (Amapá), 03° 31,424' N, 50° 12,288' W, 28.VII.2015, Romão, J., collected as bycatch during pink shrimp (*P. subtilis*), muddy bottom, 1 ind., MPEG 0005; Continental shelf (Maranhão), 00° 21,013' S, 44° 09,848' W, 26.X.2008, PIATAM-Oceano Project (#104), NHOc Amorim do Valle, 55 meters, 1 ind., MPEG 0030; Amazon continental shelf (Amapá), 04° 52,668' N, 50° 46,916' W, XI.2022, CEPNOR-ICMBio, collected as bycatch from a red snapper

(*Lutjanus* spp.) fishery, 122 meters, biogenic substrates (rhodoliths), 1 ind., MPEG 0056.

Distribution: Western Atlantic Ocean, USA (North Carolina and Florida), Caribbean Sea, and Brazil (from the North Coast to the South).

Order Camarodonta Jackson, 1912
Family Toxopneustidae Troschel, 1872
Genus *Lytechinus* Agassiz, 1863

Lytechinus variegatus (Lamarck, 1816)
(Figure 27)

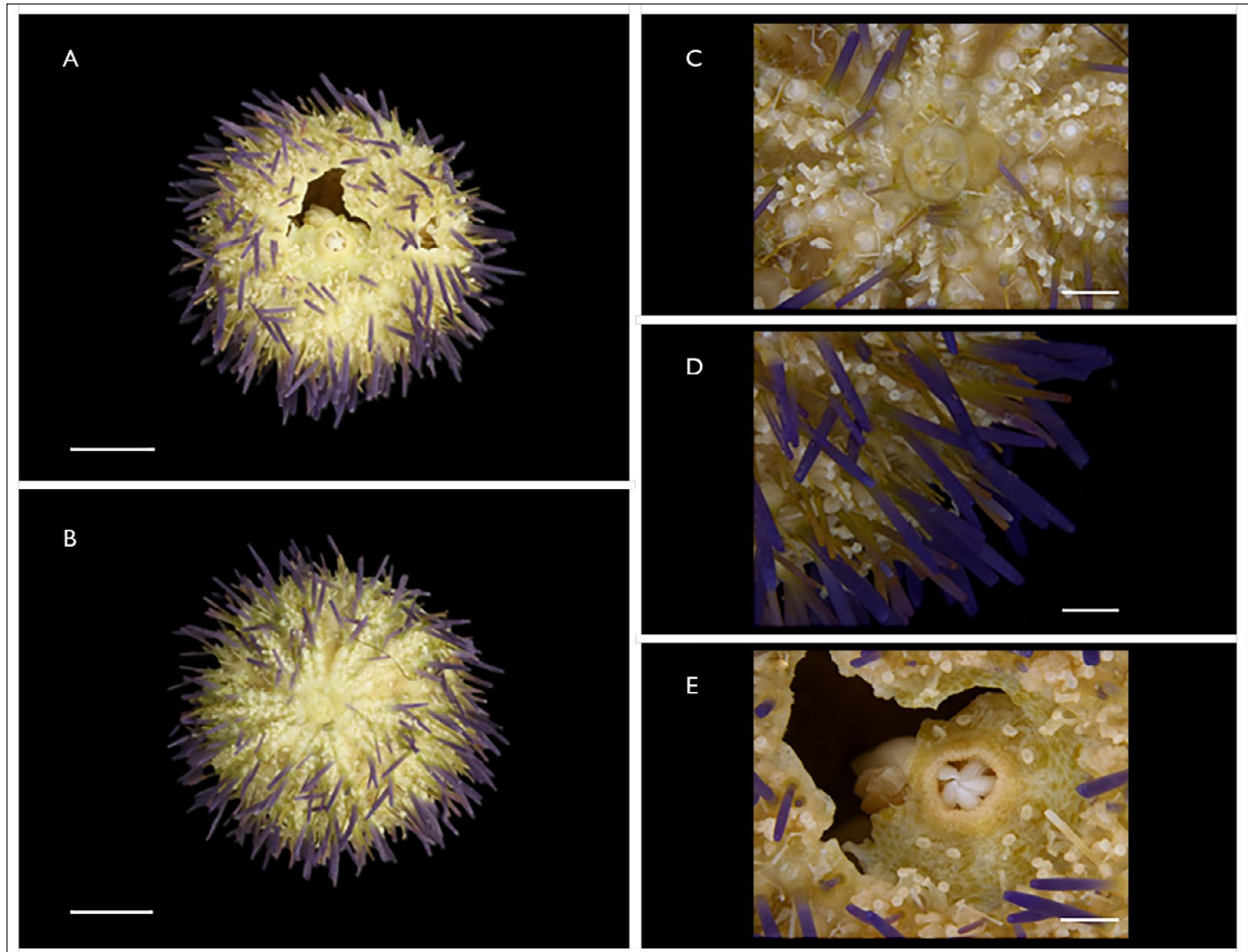


Figure 27. Echinoidea, *Lytechinus variegatus* (MPEG 0041). Oral general view (A); aboral view (B); view of the periproctal plates (C); details of the spines (D); and detail of the peristome (E). Scale bars: 10 mm (A, B); 2 mm (C-E). Source: Authors (2025).

Original designation: *Echinus variegatus* Lamarck, 1816.

Material examined: Amazon continental shelf (Amapá), 04° 52,668' N, 50° 46,916' W, XI.2022, CEPNOR-ICMBio, collected as bycatch from a red snapper (*Lutjanus* spp.) fishery, 122 meters, biogenic substrates (rhodoliths), 1 ind., MPEG 0041.

Distribution: Western Atlantic Ocean, occurring from North Carolina (USA) and the Gulf of Mexico, throughout the Caribbean, to Brazil (Amapá, Bahia, Southeast and South).

Remark: This is the first record of *Lytechinus variegatus* on the Amazonian coast.

Order Echinolampadacea Mongiardino Koch et al., 2018

Family Mellitidae Stefanini, 1912

Genus *Encope* Agassiz, 1840

Encope michelini Agassiz, 1841

(Figure 28)

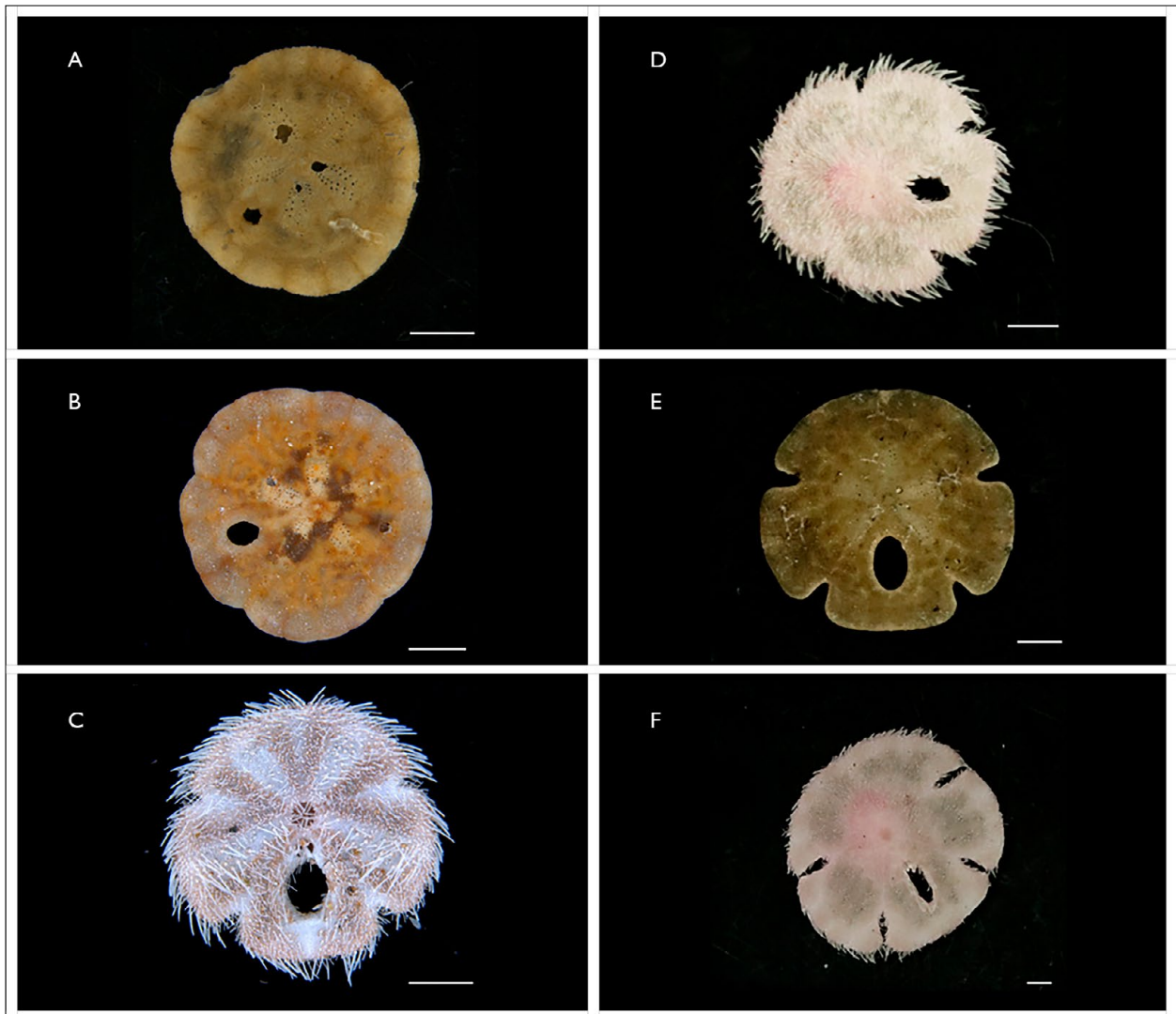


Figure 28. Echinoidea, *Encope michelini* (A: MPEG 0001; B: MPEG 0023; C: MPEG 0024; D: MPEG 0028; E: MPEG 0033; F: MPEG 0036). Aboral view (A-F). Scale bars: 2 mm. Source: Authors (2025).

Original designation: *Encope michelini* Agassiz, 1841.

Material examined: Continental shelf (Pará), 01° 02.932' N, 46° 41.139' W, XI.2008, PIATAM-Oceano Project (#206), NHOc Amorim do Valle, 63 meters, 3 ind., MPEG 0001; Continental shelf (Pará), XI.2008, PIATAM-Oceano Project (#204), NHOc Amorim do Valle, 112 ind., MPEG 0023; Continental shelf (Pará), near 0° 47,786' N, 46° 14.378' W, XI.2008, PIATAM-Oceano Project (#101), NHOc Amorim do Valle, 63 meters, 5 ind., MPEG 0033; Caburé Beach, Barreirinhas (Maranhão), 02° 34,116' S, 42° 41,105' W, IV.2014,

Carvalho, V. and Alves, I., 4 ind., MPEG 0024, MPEG 0028, MPEG 0036.

Distribution: Western Atlantic Ocean, Southeastern United States, Gulf of Mexico, Caribbean Sea, and Brazil (Pará, Maranhão, Rio de Janeiro).

Remark: This is the first record of *Encope michelini* on the Amazonian coast.

Genus *Mellita* Agassiz, 1841

Mellita quinquesperforata (Leske, 1778)
(Figure 29)

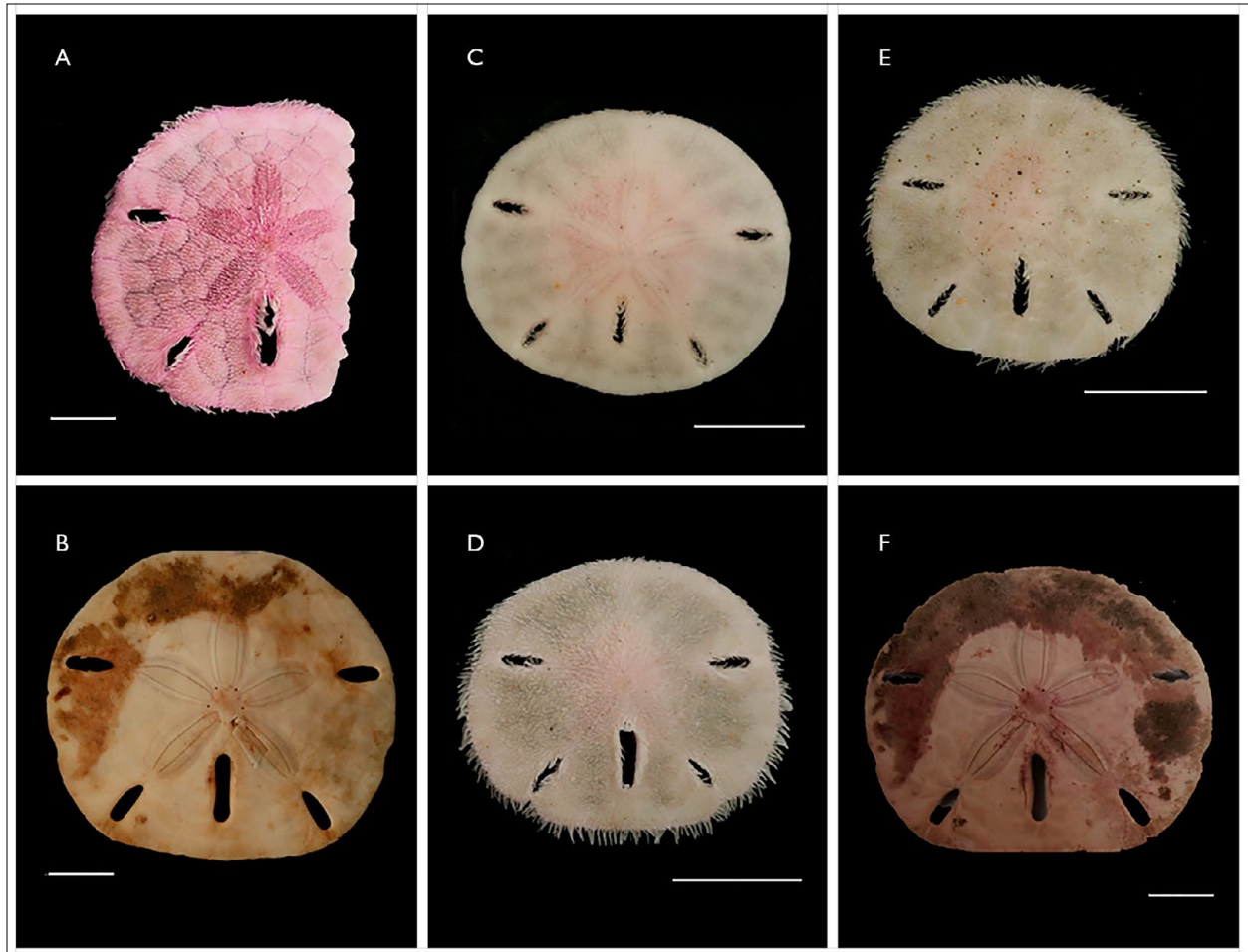


Figure 29. Echinoidea, *Mellita quinquesperforata* (A: MPEG 0015; B: MPEG 0022; C: MPEG 0029; D: MPEG 0035; E: MPEG 0058; F: MPEG 0064). Aboral view (A-F). Scar bar: 10 mm. Source: Authors (2025).

Original designation: *Echinodiscus quinquiesperforata* Leske, 1778.

Material examined: Caburé Beach, Barreirinhas (Maranhão), 02° 34,116' S, 42° 41,105' W, IV.2014, Carvalho, V. and Alves, I., 3 ind., MPEG 0015, MPEG 0035, MPEG 0058; Ajuruteua Beach, Bragança (Pará), 0° 49,548' S, 46° 36,357' W, III.2004, LOB-UFPA, 1 ind., MPEG 0022; Ajuruteua Beach, Bragança (Pará), 0° 49,548' S, 46° 36,357' W, XII.2003, LOB-UFPA, 1 ind., MPEG 0029; Princesa Beach, Algodual Island, Maracanã (Pará), III.2013, LOB-UFPA, MPEG 0064.

Distribution: Western Atlantic Ocean, Mexico, Cuba, Dominican Republic, Puerto Rico, Honduras, Nicaragua,

Costa Rica, Panama, Colombia, Brazil (from the North to the South) and Uruguay.

Order Spatangoida Agassiz, 1840

Family Brissidae Gray, 1855

Genus *Meoma* Gray, 1851

Meoma ventricosa (Lamarck, 1816)

(Figure 30)

Original designation: *Spatangus ventricosus* Lamarck, 1816.

Material examined: Amazon continental shelf (Amapá), 04° 52,668' N, 50° 46,916' W, XI.2022, CEPNOR-ICMBio, collected as bycatch from a red snapper (*Lutjanus* spp.) fishery, 122 meters, biogenic substrates (rhodoliths), 1 ind., MPEG 0055.

Distribution: Western Atlantic Ocean, Florida, Bahamas, Mexico, Panama, Colombia and Brazil (Amapá, Rio de Janeiro).

Remark: This is the first record of *Meoma ventricosa* on the Amazonian coast.

Class Holothuroidea De Blainville, 1834

Order Dendrochirotida Grube, 1840

Family Cucumariidae Ludwig, 1894

Genus *Thyonella* Verrill, 1872

Thyonella pervicax (Théel, 1886)

(Figure 31)

Original designation: *Thyone pervicax* Théel, 1886.

Material examined: Amazon River Estuary, adjacent to Marajó Island (Pará), 0° 45.02' N, 48° 3.46' W, 15.III.1997, Barthem, R., 2 ind., MPEG 0018, MPEG 0019; Amazon continental shelf (Amapá), 04° 52,668' N, 50° 46,916' W, XI.2022, CEPNOR-ICMBio, collected as bycatch from a red snapper (*Lutjanus* spp.) fishery, 122 meters, biogenic substrates (rhodoliths), 2 ind., MPEG 0057.

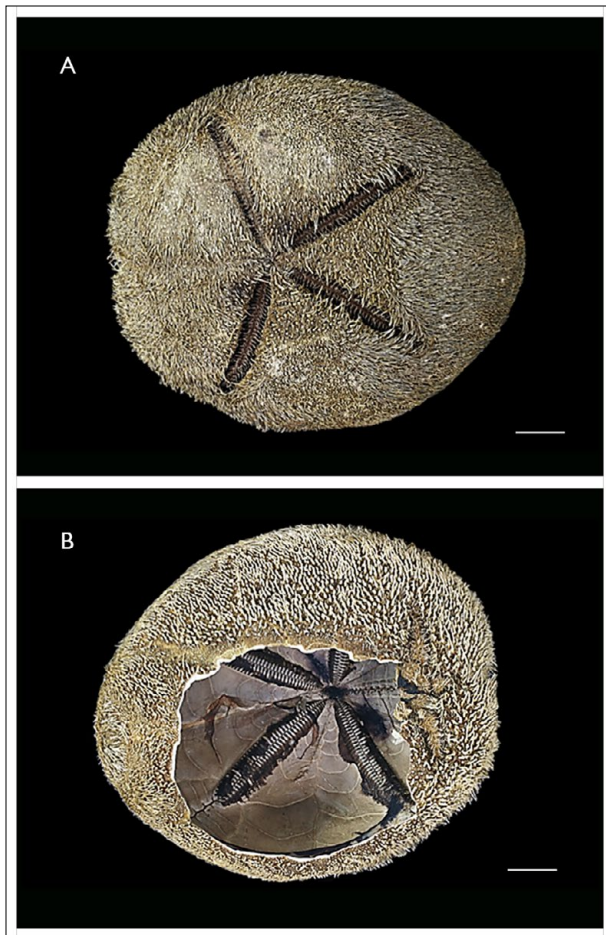


Figure 30. Echinoidea, *Meoma ventricosa* (MPEG 0055). Aboral view (A); oral view (B); Scar bar: 10 mm. Source: Authors (2025).

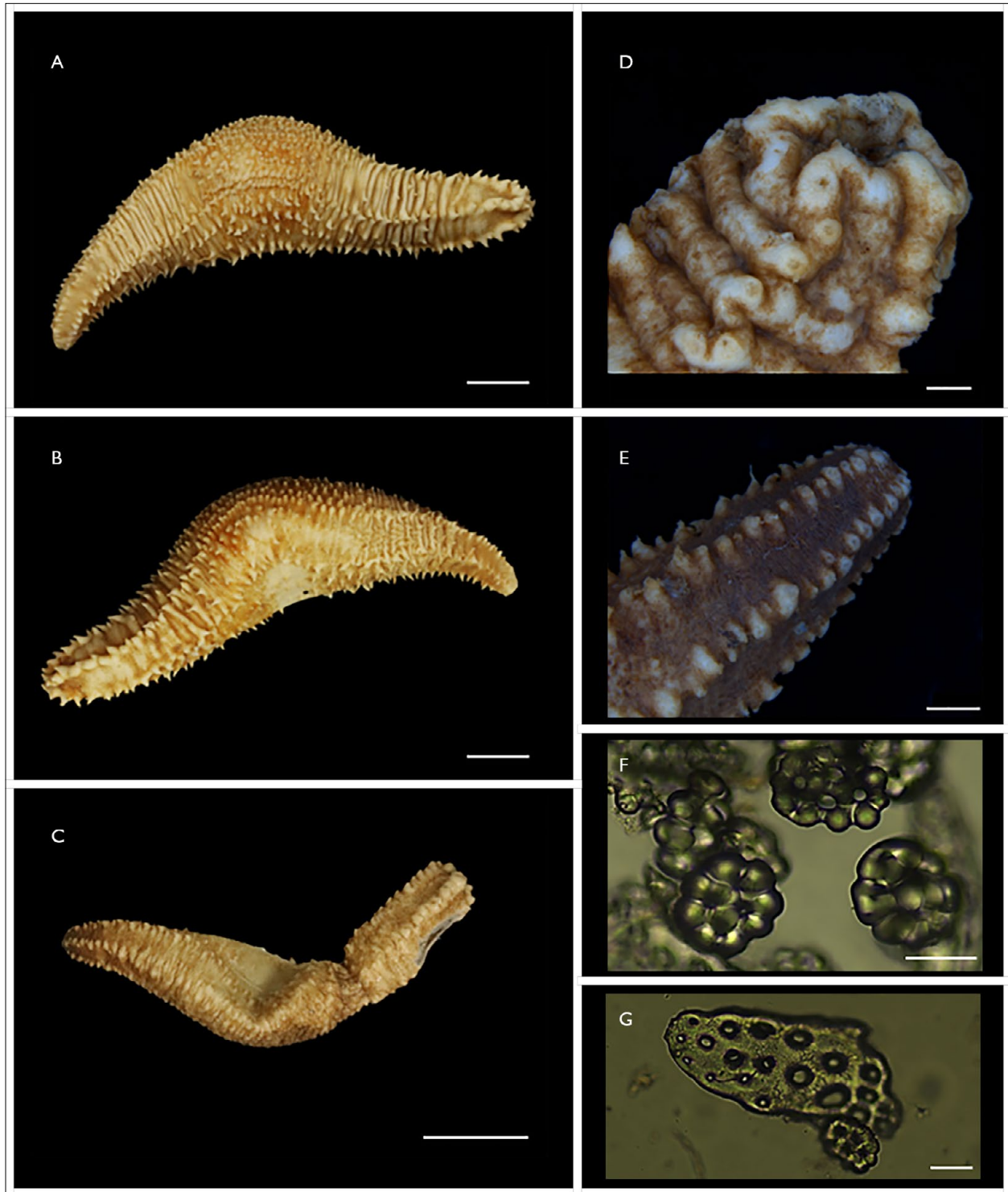


Figure 31. Holothuroidea, *Thyonella pervicax* (A, F, G: MPEG 0018; B, D, E: MPEG 0019; C: MPEG 0057). Lateral general view (A-C); ossicles of the body wall (F, G); oral extremity (D); anal extremity (E). Scar bar: 10 mm (A-C); 2 mm (D, E); 50 μ m (F, G). Source: Authors (2025).

Distribution: Western Atlantic Ocean, USA (Massachusetts, Texas, and Florida), Mexico Gulf of Mexico, Brazil (Pará, Amapá, Bahia, Espírito Santos, São Paulo).

Remark: This is the first record of *Thyonella pervicax* on the Amazonian coast.

Family Phyllophoridae Östergren, 1907
Genus *Stolus* Selenka, 1867

Stolus pseudofusus (Deichmann, 1930)
(Figure 32)

Original designation: *Thyone pseudofusus* Deichmann, 1930.
Material examined: Continental shelf (Maranhão), 01° 40,687' S, 43° 54,572' W, XI.2008, PIATAM-Oceano Project (#305), NHOc Amorim do Valle, 31 meters, 1 ind., MPEG 0039.

Distribution: Western Atlantic Ocean, Florida (USA), Mexico, from Sea Caribe to the coast of Brazil (Pará, Paraíba, Abrolhos Archipelago, Bahia).

Remark: This is the first record of *Stolus pseudofusus* on the Amazonian coast.

Order Apodida Brandt, 1835
Family Synaptidae Burmeister, 1837
Genus *Protankyra* Östergren, 1898

Protankyra sp.
(Figure 33)

Material examined: Amazon continental shelf (Amapá), 01° 17,180' N, 47° 51,500' W, 22.II.2017, Muniz, M., collected as bycatch during pink shrimp (*P. subtilis*), muddy bottom, 1 ind., MPEG 0020.

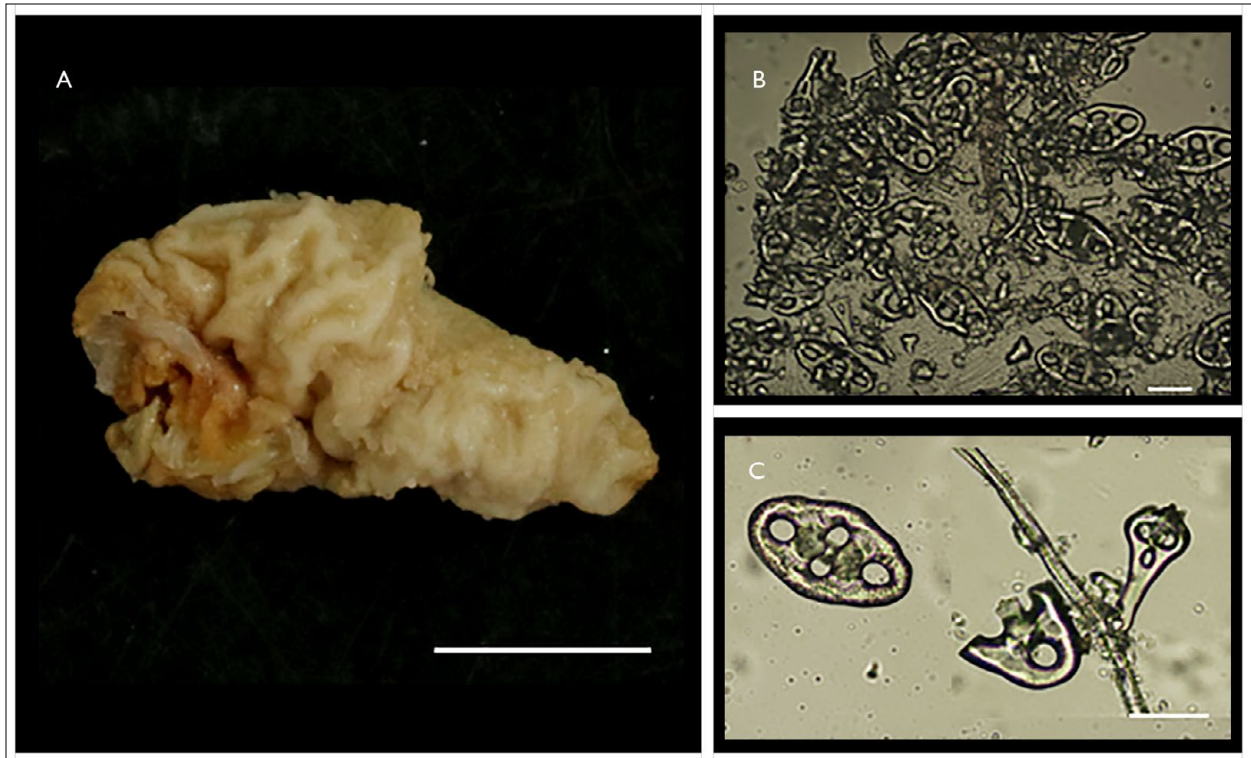


Figure 32. Holothuroidea, *Stolus pseudofusus* (MPEG 0039). Lateral general view (A); ossicles of the body wall (B, C). Scale bar: 5 mm (A); 50 μ m (B, C). Source: Authors (2025).

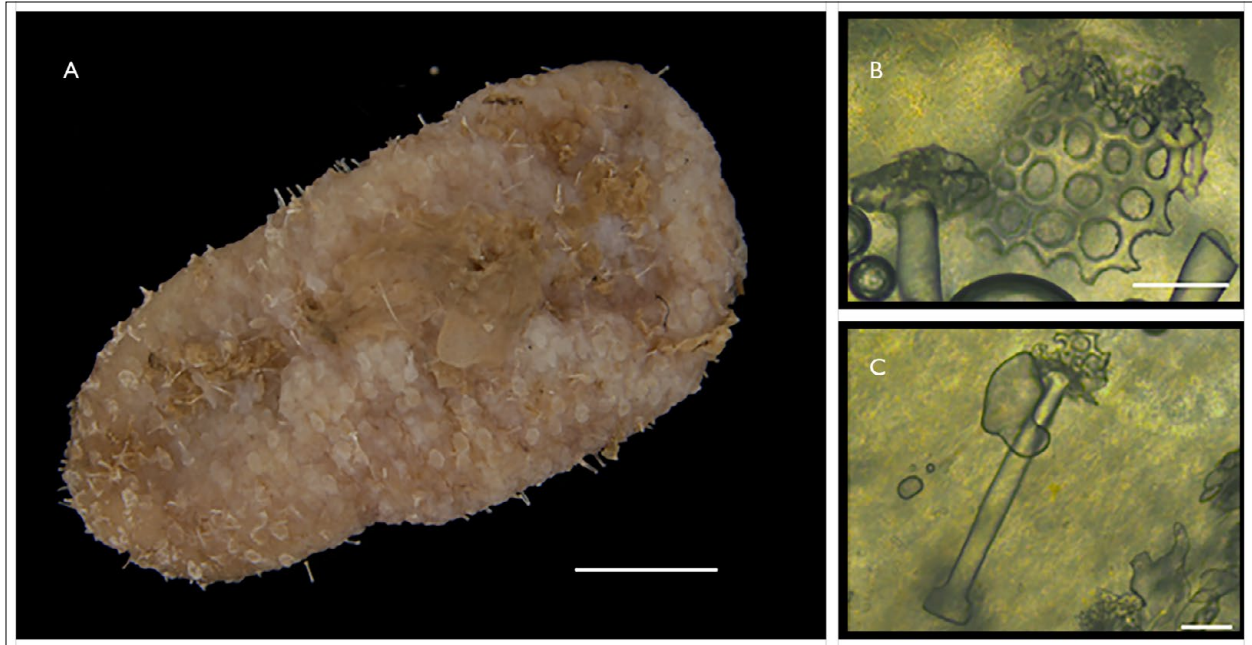


Figure 33. Holothuroidea, *Protankyra* sp. (MPEG 0020). General view (A); ossicles of the body wall (B, C). Scar bar: 2 mm (A); 100 μ m (B, C). Source: Authors (2025).

DISCUSSION

The MPEG is a pioneering institution for scientific studies of the Amazon's natural systems, as well as for the dissemination of knowledge and the organization and maintenance of world-class collections related to the region's biodiversity. The MPEG houses several unique biological collections, including those related to Amazonian marine environments. In fact, the Echinodermata collection of the MPEG (MPEG.ECH) is the only one dedicated to the phylum in northern Brazil. This collection is relatively recent, started in 2016, although its oldest record dates back to 1956, referring to ophiuroids (*Ophiothrix tommasii* Santana, Manso, Almeida & Alves, 2020) sampling from estuarine areas in the northeastern of Pará State.

In recent years, the collections of the MPEG have received valuable material from the outer continental shelf, especially from bycatch of pink shrimp (*Penaeus (Farfantepenaeus) subtilis* Pérez Farfante, 1967) and red snapper (*Lutjanus* spp.) fisheries. This material helps fill

gaps in the sampling of Amazonian marine invertebrates, as it covers a wide area and various bottom types in the coastal zone. For example, bottom trawling for capturing pink shrimps occurs on soft substrates (muddy, sandy, or gravel), while the fishery of red snappers predominantly occurs on consolidated substrates of the Great Amazon Reef System (GARS) (Marceniuk et al., 2025). Despite recent efforts to characterize biodiversity in this macrohabitat in the world, the macrobenthic fauna remains unstudied, despite being key to the functioning of this reef system. This lack of basic biological knowledge, and specific conservation and management plans, pave the way for the unregulated fisheries, as well as the expansion of mining, oil and gas exploration (Francini-Filho et al., 2018; Banha et al., 2022; Oliveira Silva et al., 2025).

The MPEG collection comprises 32 deposited echinoderm species, a number similar to that of the didactic collection of PUC-Campinas, which includes 23 species (Alitto et al., 2025), and to the type-species collection of the Museum of Zoology of the University of São Paulo (MZUSP),

with 22 deposited type species (Martins et al., 2022). More diverse collections are found in the Northeast region, such as those of the Federal University of Alagoas, with 50 catalogued species (Miranda et al., 2012), the Federal University of Ceará, which records 59 species (Barroso et al., 2022), the Federal University of Sergipe, with 121 species (Oliveira et al., 2011), and the Paulo Young Invertebrate Collection (CIPY/UFPB), which holds 128 species (J. Prata, personal communication, 2025); and in the Southeast region, such as the collection of the National Museum/UFRJ, which has 86 deposited species according to SiBBr data (MN/UFRJ, n.d.). Although numerically smaller, the MPEG is the first collection in the Northern region and has significant value for taxonomic, biogeographic, genetic, and evolutionary studies, contributing to the understanding of Western Atlantic echinoderms.

In Brazil, some studies are noteworthy, such as the pioneering research “A list of the Brazilian echinoderms” by Richard Rathbun, which reported 64 species from the Asteroidea (13 species), Crinoidea (four species), Echinoidea (11 species), Holothuroidea (four species), and Ophiuroidea classes (32 species), catalogued across all Brazilian coast (Rathbun, 1879). Subsequently, Luiz Roberto Tommasi published many studies on the Brazilian coast, including new species and new occurrences (e.g. Tommasi, 1971), as well as on other Atlantic coastal areas (Tommasi, 1972), significantly contributing for taxonomic characterization.

Based on the literature review of extant Brazilian echinoderm species by Ventura et al. (2013) there are a total of 347 species, including 77 of Asteroidea, 16 of Crinoidea, 52 of Echinoidea, 49 of Holothuroidea, and 153 of Ophiuroidea, occurring mainly in the Northeast, Southeast and South regions of Brazil (Ventura et al., 2013). In addition, other studies have been conducted, such as from the northeastern Brazil (Martins et al., 2012; Martins & Souto, 2018; Gondim et al., 2018; Prata et al., 2014, 2017, 2020; Silva et al., 2025), southeastern Brazil (Alitto et al., 2018, 2019; Chagas et al., 2020), and southern

Brazil (Bueno et al., 2018; Slivak et al., 2022), increasing the number of species recorded from the Brazilian coast.

In the Northern region of Brazil, research in echinoderms was mainly targeted at the Pirabas Miocene Formation along the equatorial margin (Ventura et al., 2013), highlighting the Crinoidea, Ophiuroidea (Távora et al., 2015) and Echinoidea classes (Bencomo et al., 2021; Ventura et al., 2013). This geological feature was influenced by the former Amazon delta and natural littoral drainages during the late Miocene, which is distinguished by a shallow-marine carbonate platform with great diversity in micro- and macrofossil remnants (Aguilera et al., 2020). In addition, crinoids were recorded for the Ererê Devonian-Formation of the Amazon basin (Scheffler et al., 2014).

Nonetheless, until this study, no taxonomic studies have been performed on the Amazon shelf, representing a significant gap in echinoderm knowledge, remarkably for holothurians (Prata & Christoffersen, 2024). Despite this, some record insights were catalogued, such as the sand dollar *Encope emarginata* (Leske, 1778), and the sea urchin *Eucidaris tribuloides* (Lamarck, 1816) from the Amapá continental shelf (Tommasi, 1972), as well as the sea cucumber species *Molpadia oolitica* (Pourtalès, 1851) and echinoid *Cidaris rugosa* (Clark, 1907) from the Guianas region – French Guiana and Suriname continental shelves, respectively (Tommasi, 1972). In addition, the occurrence of the Pacific-exotic-brittle-star *Ophiothela mirabilis* (Verrill, 1867) in association with the octocoral *Leptogorgia miniata* (Milne Edwards & Haime, 1857) was registered for Amazonian reefs – GARS (Moura et al., 2016). Recently, Oliveira Silva et al. (2025) catalogued 35 echinoderm species/morphospecies for the GARS region, collected by incidental fishing on the Amazon shelf, including two species of Crinoidea, 19 species of the Asteroidea, seven species of the Ophiuroidea, five of the Echinoidea, and two of the Holothuroidea.

If we compile previous records (Moura et al., 2016; Oliveira Silva et al., 2025; Tommasi, 1972) with the present study, we recognize 45 species (specific epithet) and 41 genera of echinoderms from the Brazilian Amazon coast.



Notably, 15 species are recorded exclusively in the Echinodermata collection of the MPEG, thus representing their first official (based on taxonomic study) occurrence on the Amazon coast – Echinoidea: *Astropecten brasiliensis* Müller & Troschel, 1842, *Echinaster (Othilia) guyanensis* Clark, 1987, *Echinaster (Othilia) spinulosus* Verrill, 1869, *Encope michelini* Agassiz, 1841, *Lytechinus variegatus* (Lamarck, 1816), and *Meoma ventricosa* (Lamarck, 1816); Ophiuroidea: *Amphiodia planispina* (von Martens, 1867), *Ophiactis lymani* Ljungman, 1872, *Ophiactis savignyi* (Müller & Troschel, 1842), *Ophiocnida scabruscula* (Lütken, 1859), *Ophioderma cinereum* Müller & Troschel, 1842, *Ophiostigma isocanthum* (Say, 1825) and *Ophiothrix tommasii* Santana, Manso, Almeida & Alves, 2020; Holothuroidea: *Stolus pseudofusus* (Deichmann, 1930) and *Thyonella pervicax* (Théel, 1886).

Another important point is that the species recorded by Oliveira Silva et al. (2025) have no specimens vouchered in any collection in the Amazon region, i.e. *Comactinea echinoptera* (Müller, 1840), *Tropiometra carinata* (Lamarck, 1816), *Asterina* sp., *Astropecten alligator* Perrier, 1881, *Astropecten marginatus* Gray, 1840, *Astropecten* sp., *Chaetaster nodosus* Perrier, 1875, *Acanthaster* sp., *Echinaster* sp., *Goniaster tessellatus* (Lamarck, 1816), *Henricia antillarum* Perrier, 1881, *Henricia* sp., *Linckia guildingi* Gray, 1840, *Linckia nodosa* Perrier, 1875, *Luidia alternata* (Say, 1825), *Luidia clathrata* (Say, 1825), *Luidia ludwigi scotti* Bell, 1917, *Luidia senegalensis* (Lamarck, 1816), *Mithrodia clavigera* (Lamarck, 1816), *Narcissia trigonaria* Sladen, 1889, *Tethyaster vestitus* (Say, 1825), *Astrophyton muricatum* (Lamarck, 1816), *Hemieuryale pustulata* von Martens, 1867, *Ophioderma januarii* Lütken, 1856, *Ophiomastix wendtii* (Müller & Troschel, 1842), *Ophiothrix* sp., *O. mirabilis* (Verrill, 1867), *Asteroporpa (Asteroporpa) annulata* Örsted & Lütken, 1856, *Astropyga magnifica* Clark, 1934, *Coelopleurus floridanus* Agassiz, 1872, *E. tribuloides* (Lamarck, 1816), *Salenocidaris* sp., *Stylocidaris affinis* (Philippi, 1845), *Isostichopus badiotus* (Selenka, 1867) and *Ocnus* sp. Therefore, we emphasise that better-preserved-specimens collected in the Amazon region should be

primarily deposited at the MPEG, representing the main Brazilian Amazon scientific collection. Additionally, duplicate specimens may be deposited in local collections, serving as support for the preservation of Amazonian biodiversity.

The present study reveals a diverse echinoderm fauna and expands the knowledge of these animals in the Northern Brazilian region, filling a gap in our understanding of an ecologically and economically important area, the Amazon. In addition, the findings highlight the importance role of zoological collections in biodiversity studies, underscoring the importance of the MPEG as a definitive repository for specimens collected from studies in the Amazonian region.

CONCLUSION

This is the first catalogue of Echinodermata species from the MPEG, representing a novel contribution to the Eastern Amazon context, in which specimens were identified at the lowest possible taxonomic level and were mainly collected from the Great Amazon Reef System. Taxonomic characterization of Amazonian invertebrates is revealing to be promising for further studies on this notable biome, a global biodiversity heritage site.

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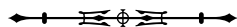
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AUTHOR'S CONTRIBUTION

D. A. Costa contributed with conceptualization, data curation, formal analysis, methodology, project administration; supervision; validation, writing (original draft, review and editing); K. Rocha contributed with methodology and writing (original draft, review and editing); N. C. M. Guimarães contributed with methodology and writing (original draft, review and editing); Paulo A. B. Beltrão contributed with methodology and writing (original draft); D. B. Pires contributed with methodology and writing (original draft); J. Prata contributed with data curation, methodology, validation and writing (original draft, review and editing); C. R. M. dos Santos contributed with data curation, validation and writing (review and editing); R. A. das Chagas contributed with methodology and writing (review and editing); W. C. R. dos Santos contributed with methodology and writing (review and editing); F. de A. Alves-Júnior contributed with writing (original draft, review and editing); and D. Aviz contributed with formal analysis, methodology, supervision and writing (original draft, review and editing).

