Rev. Mus. Argentino Cienc. Nat., n.s.
27(1): 183-195, 2025
ISSN 1514-5158 (impresa)
ISSN 1853-0400 (en línea)

Hidden biodiversity in the Southwestern Atlantic Ocean: ophiuroids from the Mar del Plata Submarine Canyon, Argentina

Daniela HUENTEN[1], Ariana B. ALARCÓN SAAVEDRA[1], M. Carla DE ARANZAMENDI[2, 3], Timothy D. O'HARA[4] & Martín I. BROGGER[1]

[1] Laboratorio de Reproducción y Biología Integrativa de Invertebrados Marinos, Instituto de Biología de Organismos Marinos (IBIOMAR- CONICET), Bvd. Brown 2915, U9120ACD, Puerto Madryn, Chubut, Argentina. [2] Universidad Nacional de Córdoba, Facultad de Ciencias Exactas, Físicas y Naturales. Cátedra de Ecología Marina. Av. Vélez Sarsfield 299 (X5000JJC), Córdoba, Argentina. [3] Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), Instituto de Diversidad y Ecología Animal (IDEA). Av. Vélez Sarsfield 299 (X5000JJC), Córdoba, Argentina. [4] Museum Victoria, 11 Nicholson St., Melbourne, Victoria 3001, Australia. Corresponding author: *Daniela Huenten, danhuenten@gmail.com

Abstract: Among the phylum Echinodermata, the class Ophiuroidea is the most diverse, with ophiuroids being widely distributed across benthic environments worldwide. However, this trend is not consistently observed in the Southwestern Atlantic, where other echinoderm classes are reported to be more prevalent. The apparent low biodiversity may be due to insufficient studies and sampling in the deep sea, particularly in small and localized environments like submarine canyons. These geomorphic features of the continental margins are known to support unique marine communities and high biodiversity, as evidenced by oceanographic expeditions to the Argentine continental slope on the research vessel Puerto Deseado (CONICET) conducted over a decade ago. These expeditions significantly expanded our knowledge of benthic fauna diversity in the Southwest Atlantic. Subsequent studies have reported new fauna records and species, revealing a complex and largely uncharacterized environment, particularly with regard to ophiuroids, a topic still pending thorough study in this area. This study aims to enhance our understanding of ophiuroid species richness in deep-sea environments, providing essential data for broader and biogeographic studies globally. The study area encompasses the Argentine Continental Slope, including the Mar del Plata Submarine Canyon in the Southwestern Atlantic Ocean. We examined samples from 64 stations at depths ranging from 200 to 3,447 meters. Ophiuroids were identified in 81% of the surveys, with approximately 6,000 specimens collected. The study area reveals a potential richness of 56 ophiuroid species, including 28 validly recognized species (12 new records for the Argentine Sea) and 28 unidentified or partially identified species. These data more than doubles the known ophiuroid species in the region, underscoring the importance of deep-sea environments as biodiversity hotspots and suggesting that the ophiuroid diversity in the Southwestern Atlantic Ocean is underestimated and may be significantly diverse as in other regions.

Key words: Ophiuroidea, deep sea, South Atlantic, submarine canyons, new records

Resumen: Biodiversidad oculta en el Océano Atlántico Suroccidental: ofiuroideos del Cañón Submarino de Mar del Plata, Argentina. Dentro del filo Echinodermata, la clase Ophiuroidea es la más diversa, con las estrellas frágiles ampliamente distribuidas en los ambientes bentónicos de todo el mundo. Sin embargo, esta tendencia no se observa consistentemente en el Atlántico Sudoccidental, donde se ha reportado a otras clases de equinodermos como más prevalentes. Esta aparente baja biodiversidad puede deberse en realidad a la escasez de estudios y de muestreos para aguas profundas, particularmente en entornos pequeños y localizados como los cañones submarinos. Estas características geomorfológicas de los márgenes continentales son conocidas por dar soporte a comunidades marinas únicas y de alta biodiversidad, como se demostró en las expediciones oceanográficas al Talud Continental de Argentina a bordo del buque de investigación Puerto Deseado (CONICET), realizados hace más de una década. Los resultados de estas exploraciones expandieron significativamente nuestro conocimiento de la diversidad de la fauna bentónica en el Atlántico Sudoccidental. Estudios posteriores han reportado nuevos registros de fauna y nuevas especies, revelando un entorno complejo y en gran medida poco caracterizado, especialmente en lo que respecta a las estrellas frágiles, un tema que aún está pendiente de un estudio exhaustivo en esta área. El presente estudio tiene como objetivo mejorar nuestra comprensión de la riqueza de especies de ofiuroideos en este entorno de mar profundo, proporcionando datos esenciales para estudios más amplios y de biogeografía a nivel global. El área de estudio abarcó el Talud Continental Argentino, incluido el Cañón Submarino de Mar del Plata en el Océano Atlántico Sudoccidental. Examinamos muestras de 64 estaciones que cubren un rango de profundidad de 200 a 3.447 metros. Los ofiuroideos estuvieron presentes en el 81% de los muestreos (52 de 64), con aproximadamente 6.000 especímenes recolectados. En total, el área de estudio soporta una riqueza potencial de 56 especies de ofiuroideos, incluyendo 28 especies válidamente reconocidas (12 de las cuales son nuevos registros para el Mar Argentino) y 28 especies no identificadas o identificadas sólo a nivel de género o familia. Estos datos duplican con creces las especies de ofiuroideos conocidas en la región, lo que pone de manifiesto que los entornos de aguas profundas son puntos clave de biodiversidad y sugiere que la diversidad de ofiuroideos en el Océano Atlántico Sudoccidental está subestimada y puede ser tan diversa como en otras regiones.

Palabras clave: Ophiuroidea, mar profundo, Atlántico Sur, cañones submarinos, nuevos registros

INTRODUCTION

In benthic communities, echinoderms stand out for their prevalence in terms of both biomass and diversity. They inhabit all oceans around the world, from shallow waters to abyssal depths (Hendler 2005; Pawson 2007), and play a fundamental role in the structure and functioning of marine ecosystems (McClintock 1994; Josefson & Conley 1997). The most diverse class within this phylum is Ophiuroidea (Stöhr *et al*. 2012), commonly known as brittle stars, basket stars, and snake stars, with more than 2,100 valid species currently recognized (Stöhr *et al*. 2024). Despite the existence of numerous studies that have reported high ophiuroid species richness in various regions and ecosystems around the world (O'Hara & Poore 2000; Chiantore *et al*. 2006; O'Hara 2007; Alvarado *et al*. 2010; Alvarado 2011; Ventura *et al*. 2013; Solís-Marín *et al*. 2014; Granja-Fernandez *et al*. 2016), it has been generally presumed that this biodiversity is rather underestimated than overestimated (Stöhr *et al*. 2012; Boissin *et al*. 2017). A comprehensive understanding of biodiversity and species richness is crucial for global assessments, the delineation of biogeographical regions, and the study of the evolutionary processes involved in the current distribution of species (Granja-Fernández *et al*. 2024; Victorero *et al*. 2023). To date, only 32 species of Ophiuroidea have been documented in the Argentine Sea, with the majority of records from intertidal areas and to the continental shelf, at depths not exceeding 200 meters (Bernasconi & D'Agostino 1977; Brogger *et al*. 2013; Brogger & O'Hara 2015). Notwithstanding their success and significant representation in both benthic and benthopelagic deep-sea fauna (Gage & Tyler 1991), species inhabiting the deep sea remain understudied.

Considering the limited amount of sampling conducted in deep sea habitats in relation to their vast extent (Ramirez-Llodra & Billet 2006), it is probable that the number of species is significantly underestimated. The deep sea is home to a vast array of habitats, including expansive abyssal plains and numerous smaller, more localized environments such as submarine canyons. These are major geomorphic features of the continental margins (Harris *et al*. 2014), supporting unique marine communities (De Leo *et al*. 2010; Bianchelli & Danovaro 2019). Further investigation is essential to comprehend their influence on deep-sea ecosystem structure and productivity, as well as to provide scientific knowledge necessary for effective management and conservation (Fernandez-Arcaya *et al*. 2017).

More than 70 canyons have been identified along the slope of the Argentine continental margin (Lonardi & Ewing 1971), which can be grouped into five major submarine canyon systems: Río de la Plata, Bahía Blanca, Ameghino, Patagonian, and Tierra del Fuego (Lonardi & Ewing 1971; Hernández-Molina *et al*. 2009; Bozzano *et al*. 2021). The Mar del Plata Submarine Canyon (MPSC) is the largest of the Río de la Plata Canyon System (Lonardi & Ewing 1971), starting at 900 meters depth and extending to 3,900 meters (Krastel *et al*. 2011). Before the CONICET Talud Continental surveys of the MPSC and its surroundings, conducted in 2012 and 2013, the marine fauna of MPSC had not been studied. This exploration resulted in a notable expansion of our knowledge regarding benthic fauna diversity in the Southwest Atlantic. Numerous studies have been published since the aforementioned campaigns, reporting new fauna records and their reproductive traits (Ocampo *et al*. 2014; Penchaszadeh *et al*. 2019; Doti *et al*. 2020; Rumbold *et al*. 2022; Chiesa *et al*. 2024) and describing new species across various taxonomic groups (Sganga & Roccatagliata 2016; Maggioni *et al*. 2018; Bernal *et al*. 2019; Lauretta & Martinez 2019; Pereira *et al*. 2019; Lauretta *et al*. 2020; Risaro *et al*. 2020; Siegwald *et al*. 2020; Pereira *et al*. 2021). Echinoderms were also the subject of extensive study, resulting in new data for all classes (Berecoechea *et al*. 2017; Martinez & Penchaszadeh 2017; Rivadeneira *et al*. 2017, 2020; Martinez *et al*. 2018, 2019, 2020; Flores *et al*. 2019, 2021; Pertossi *et al*. 2019; Pertossi & Martinez 2022). Despite this, the diversity of ophiuroids has not yet been studied in this area. Therefore, the aim of this study was to enhance our understanding of ophiuroid species richness in the Argentine Continental Slope (ACS), including the MPSC deep-sea environment.

MATERIALS AND METHODS

The study area included the ACS, with particular focus on the MPSC, located in the southwestern Atlantic Ocean. The MPSC is situated on the northern margin of the ACS, at a distance of over 250 km from the coast. Sedimentation in MPSC is shaped by the interaction of ocean currents, which drive erosion, transport, and deposition processes, influencing canyon geomorphology (Violante *et al*. 2017; Warratz *et al*. 2019; Steinmann *et al*. 2020). In particular, ocean circulation in this area is strongly influenced by the Brazil-Malvinas Oceanic Confluence Zone where the convergence of Malvinas Current and Brazil Current creates optimal conditions for phytoplankton proliferation, making the waters in their confluence zone the most productive along the continental slope (Brandini *et al*. 2000; Rivas *et al*. 2006).

Sampling was conducted during the oceanographic expeditions "Talud Continental I, II, and III" on board the research vessel Puerto Deseado (CONICET) in 2012 and 2013. The sampling followed a transect perpendicular to the ACS, between 37°52'S and 38°8'S, and 53°4'W and 55°9'W (Fig. 1). The study encompassed 64 stations at depths ranging from 200 meters to 3,447 meters (Table 1). Marine benthic samples were collected using different sampling devices, including fishing nets and a dredge trawls carrying two joint fishing nets with two different pore-size: an external one of 3x3 cm (large), and an internal one of 1x1 cm (small).

The ophiuroids were separated and manually collected from each sampler, and were initially sorted by morphotypes. Some specimens were initially fixed in a 5% formalin-seawater solution, while others were fixed in 96% alcohol. In the laboratory, the formalin-fixed specimens were transferred to 70% ethanol for long-term storage.

Taxonomic determinations were based on the examination of external morphological characters of the adult stages by comparison to original descriptions and using identification keys (Mortensen 1927; Bernasconi & D'Agostino 1971; Clark & Rowe 1971; Paterson 1985; Goharimanesh *et al.* 2021). The most recent revisions and new descriptions were also considered (Okanishi *et al.* 2011; Baker 2016; O'Hara *et al.* 2018). Ophiuroid taxa were identified to the lowest possible taxonomic level and quantified. The classifications were arranged according to the records in the World Register of Marine Species (WoRMS, 2024).

RESULTS

We examined samples from 64 stations covering a depth range of 200 meters to 3,447 meters. Ophiuroids were present in 81% (52 out of 64; Table 1) of the samples, with approximately 6,000 specimens collected in total. The species were classified into five orders, 12 families, and 25 genera (Table 2). In total, the study area potentially hosts 56 species of ophiuroids, including 28 validly recognized species and 28 unidentified or genus- or family level identified species.

The identified orders included Amphilepidida, Euryalida, Ophiacanthida, Ophioscolecida, and Ophiurida. The Ophiurida order was the most well-represented, both in terms of the number of families (four) and the number of individuals (4,843). Within this order, the families with the highest frequency of occurrence were Ophiuridae and Ophiopyrgidae (Fig. 2), present primarily at depths exceeding 700 meters. In contrast, Ophioscolecida exhibited the lowest representation, with a single family (Ophioscolecidae) and one species, *Ophiolycus nutrix*, present at 852 meters depth.

Regarding the generic and specific richness of each of the 12 ophiuroid families present in the study area, three families accounted for 52% of the diversity of genera (Ophiacanthidae with six genera, Ophiopyrgidae with four, and Amphiuridae with three). These families also represented 66% of the total number of recorded species, with 15 species, 13 species, and nine species, respectively (Fig. 3).

A significant proportion of the genera (80%) were represented by genera comprising one or two species each, collectively accounting for nearly 44.6% of the species diversity. The remaining 55.4% was attributed to five genera that are particularly species-rich: *Amphiura*, *Ophiacantha*, *Ophioplinthus*, *Ophiura*, and *Ophiuroglypha*.

Twenty-two species, including *Amphioplus* sp., *Amphipholis squamata*, *Amphiura belgicae*, *Amphiura (Amphiura) magellanica*, *Astrodia* sp., *Astrophiura* sp., *Ophiacantha* cf. *inconspicua*, *Ophiacantha frigida*, *Ophiacantha opulenta*, *Ophiacantha* sp. 1, *Ophiacantha* sp. 2,

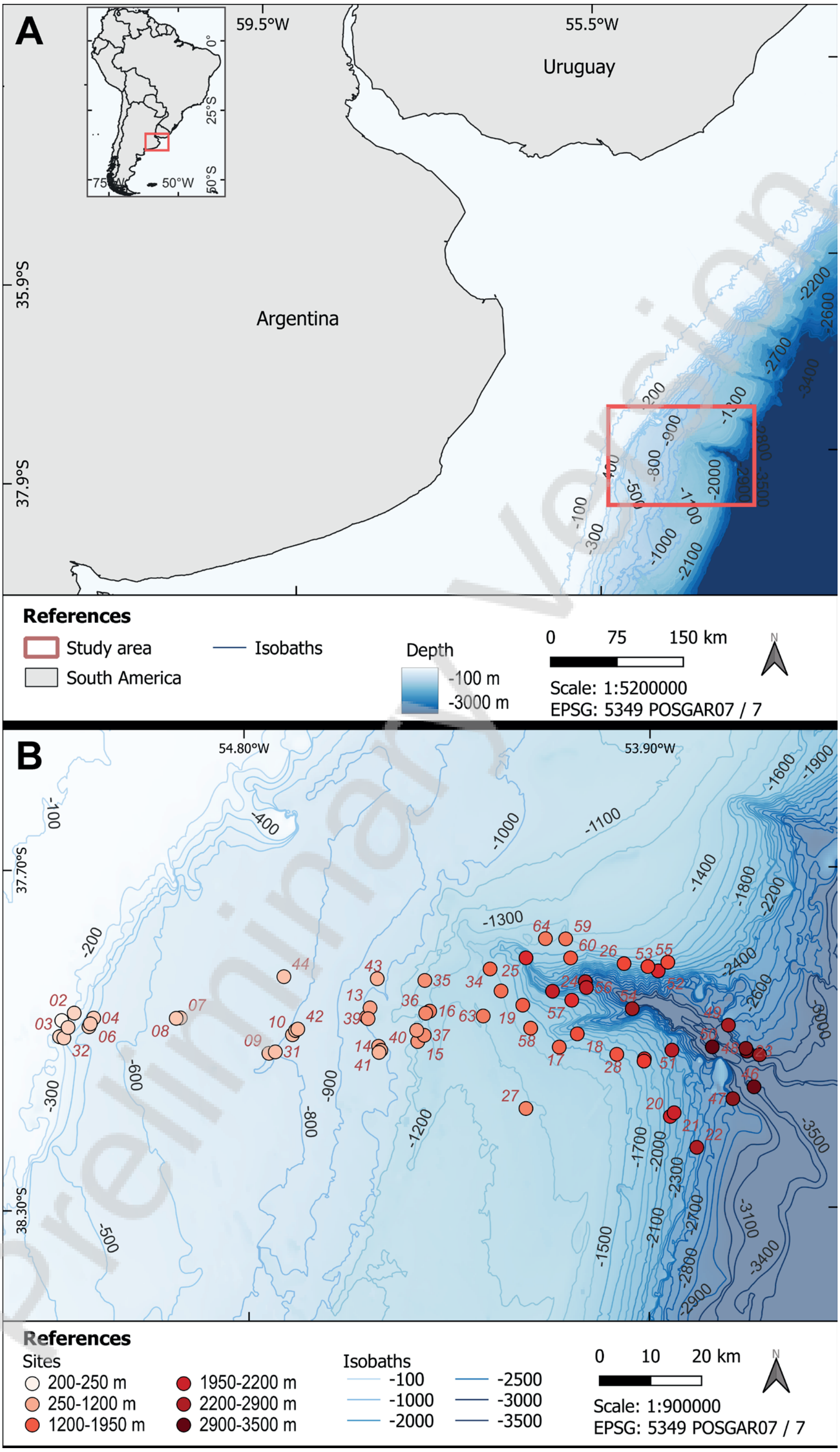

Fig. 1: Argentine Continental Slope and the Mar del Plata Submarine Canyon in the Southwestern Atlantic Ocean. (A) Location of the Mar del Plata Submarine Canyon study area (red square). (B) Detailed bathymetric map of the Mar del Plata Submarine Canyon area with the 64 stations analyzed in this study.

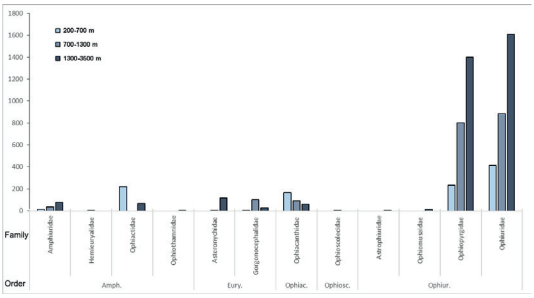

Fig. 2: Number of specimens recorded for each family, according to their different bathymetric ranges. Orders abbreviations: Amph., Amphilepidida; Eury., Euryalida; Ophiac., Ophiacanthida; Ophiosc., Ophioscolecida; and Ophiur., Ophiurida.

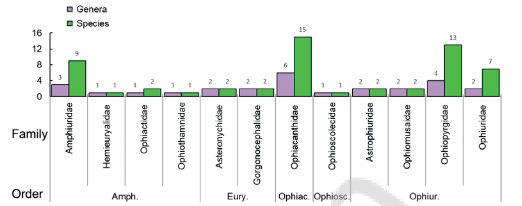

Fig. 3: Generic and specific richness within each of the 12 ophiuroid families registered in the present study. Orders abbreviations: Amph., Amphilepidida; Eury., Euryalida; Ophiac., Ophiacanthida; Ophiosc., Ophioscolecida; and Ophiur., Ophiurida.

Ophiacantha sp. 3, *Ophiacantha* sp. 4, *Ophiogona doederleini*, *Ophiolebes* sp., *Ophiolycus nutrix*, *Ophiomusa constricta*, *Ophiophycis* sp., *Ophiophyllum umbonatum*, *Ophiozonella hexactis*, *Ophiura* sp. 2, and *Ophiuroglypha irrorata irrorata* were found at specific locations, with records at only one or two stations and a limited number of specimens (Table 2). In contrast, *Ophiocten amitinum* was the most frequently observed species, recorded at 44% of the sampled stations and found across a wide bathymetric range (201 to 2,420 meters depth). This was followed by *Astrotoma agassizii*, recorded at 19% of the sampled stations (528 to 1,398 meters depth), and *Ophiosabine vivipara,* recorded at 12.5% of the sampled stations (201 to 1,308 meters depth). Despite its restricted distribution to shallower stations, *Ophiactis asperula* exhibited a higher frequency of occurrence than other species (Table 2).

The following eight genera were recorded for the first time in the study area: *Asteronyx*, *Astrodia*, *Astrophiura*, *Ophiogona*, *Ophiolebes*, *Ophiolimna*, *Ophiophycis*, and *Ophiophyllum*. At the species level, 12 were identified as new records for the Argentine Sea: *Asteronyx loveni*, *Ophiacantha frigida*, *Ophiacantha opulenta*, *Ophiactis amator*, *Ophiogona doederleini*, *Ophiolimna antarctica*, *Ophiomusa lymani*, *Ophiophyllum umbonatum*, *Ophioplinthus scissa*, *Ophiozonella hexactis*, *Ophiura ljungmani*, and *Ophiuroglypha irrorata irrorata*.

DISCUSSION

Surveys conducted in the Argentine Sea have typically been restricted to areas of the extensive continental shelf, where depths do not exceed 200 meters. In general, the focus of these surveys has been on characterizing benthic assemblages (Olivier *et al*. 1968; Roux *et al.* 1987; Bastida *et al*. 1992) or on groups of organisms of commercial importance (Roux *et al.* 1995; Schejter & Bremec 2007; Escolar & Bremec 2015). Consequently, the presence of ophiuroids has generally been observed incidentally or as a secondary finding. Few studies have investigated the composition of benthic species in the deep- sea habitats of Argentina (Bremec & Schejter 2010; Hurtado-García & Manjón- Cabeza 2022). Our study was the first to focus on the diversity of a previously little-explored group, spanning a wide bathymetric range (200 to 3,447 meters) within the deep marine environment of the Argentine continental margin.

In this study, ophiuroids were collected in 81% of the sampled stations, with only 12 out of 64 stations showing no occurrence. Although studies were not conducted to determine whether there is a relationship between the sampling method and the presence of ophiuroids in our study, previous research have demonstrated that the choice of sampling methodology and the measurement of species diversity influence our understanding of biodiversity (Gage & Tyler 1991, Granja-Fernández *et al.* 2016). On the other hand, the absence of ophiuroids at these 12 stations may reflect localized environmental factors, such as unsuitable substrate types, hydrodynamic conditions or ecological interactions, which may limit their distribution.

A total of 56 species were recorded in ACS and MPSC, with 12 representing new records for the Argentine Sea. This increases the number of known species in the Argentine Sea from 32 to 44. Including the 28 newly registered but unidentified species suggests that the potential number of species in the area may reach 72, approximately 3.4% of the total species described worldwide (Stöhr *et al.* 2024). This notable increase in recorded species may be attributed to the taxonomic examination of samples from previously unexplored depths, as well as the unique geomorphological, oceanographic, and ecological characteristics of submarine canyon systems. These systems are known to support diverse and highly abundant invertebrate communities (De Leo *et al.* 2010; Fernandez-Arcaya *et al.* 2017; Bianchelli & Danovaro 2019) due to their complex topography, which creates microhabitats with varying environmental conditions, such as temperature, salinity, and substrate type (Callow *et al*. 2014). Additionally, submarine canyons act as conduits for organic matter and nutrients, enhancing productivity and serving as hotspots for benthic and pelagic biodiversity (Demopoulos *et al*. 2017; Robertson *et al*. 2020). Studies of submarine canyons worldwide have revealed high concentrations of filter feeders alongside motile invertebrates, such as crustaceans and echinoderms (Vetter 1995; Vetter & Dayton 1999). The new records from the Argentine Sea suggest an emerging alignment with global trends, where the class Ophiuroidea is recognized as the most speciose group within Echinodermata (Stöhr *et al.* 2012). However, further studies focusing on the other echinoderm classes in the region are still necessary to comprehensively understand the diversity and distribution patterns of the phylum in the Argentine Sea.

In accordance with global patterns of ophiuroids diversity reported by Stöhr *et al*. (2012), the most speciose families are Amphiuridae, Ophiacanthidae, and Ophiuridae. Several factors may contribute to these results. Firstly, the high species richness in Amphiuridae and Ophiacanthidae may be attributed to their broad ecological adaptability, as these families inhabit diverse substrates and depth ranges. Additionally, their reproductive strategies, which include a mix of planktotrophic and lecithotrophic larval development, likely enhance their dispersal potential and facilitate colonization across various habitats. Furthermore, it has been documented that shelf and bathyal habitats collectively support a comparable number of species, although their specific composition differs (O'Hara *et al.* 2011).

In the present study, 16 of the 56 recorded species had been previously reported in works from nearby areas of the continental shelf (Bastida *et al.* 1992; Bremec & Schejter 2010). Among these, the most frequently reported species were *Astrotoma agassizii*, *Gorgonocephalus chilensis*, *Ophiactis asperula*, *Ophiosabine vivipara*, and *Ophiuroglypha lymani* (Bremec & Schejter 2010; Escolar *et al*. 2013; Souto *et al*. 2014; Escolar & Bremec 2015). These similarities likely reflect the wide distribution and ecological adaptability of these species across different benthic environments. However, some species reported in previous studies were not observed in our work, which may be attributed to differences in sampling methodologies, geographic coverage, or specific environmental conditions in the surveyed areas. In contrast, the discovery of additional species not previously reported highlights the importance of expanding sampling efforts to less-explored regions and utilizing a broader range of collection techniques to better capture local biodiversity.

At shallow stations, *Ophiactis asperula* was the dominant species, a finding consistent with those of Escolar *et al*. (2013), who identified it as the most widespread species in the Patagonian scallop fishing grounds between 80 and 140 meters depth. Additionally, the authors report *Ophiosabine vivipara* as another relevant species in the Argentine continental shelf, which aligns with our findings where it was observed with the highest frequency. At depths exceeding 700 meters, the species with the highest frequency of occurrence was *Ophiocten amitinum* in our study. In accordance with the present results, previous studies have demonstrated a wide bathymetric range and high abundance for this species (Manso 2010).

The species recorded in the present study, *Gorgonocephalus chilensis*, *Ophiuroglypha lymani*, *Ophiocten amitinum* and *Astrotoma agassizii*, appear to have a wide distribution, as they have also been reported in the Southern Ocean (Martín-Ledo & López-Gonzalez 2014) and the Pacific Ocean (Manso 2010). However, at least *Ophiuroglypha lymani* and *Astrotoma agassizii* have been proposed as cryptic species (Hunter & Halanych 2008, 2010; Sands *et al*. 2015), highlighting the Importance of integrating both morphological and molecular taxonomy in diversity studies. This is further supported by an increasing number of studies demonstrating the existence of numerous cryptic species and species complexes within this class (Stöhr *et al*. 2009; Boissin *et al*. 2010; Okanishi *et al*. 2018; Stöhr *et al*. 2020).

Although the results reported here are preliminary, additional taxonomic work is needed on certain specimens to determine if their discovery constitutes new scientific information. Among the unidentified specimens were individuals that were too damaged to allow for reliable identification, those exhibiting morphological characteristics that did not clearly align with known species descriptions, and specimens with features that suggest they may represent species not yet described. Ambiguous characteristics include inconsistencies in key diagnostic traits, such as arm structure or skeletal elements, which could not be confidently matched to existing taxonomic keys. These challenges highlight the need for further detailed morphological and genetic analyses to resolve their taxonomic status and evaluate their potential novelty.

The total number of potentially new ophiuroid records for Argentina, including 12 new records and 28 yet unidentified species, stands at 40. The number of ophiuroid species recorded in Argentina would reach a total of 72. This number more than doubles the known ophiuroid diversity in the Argentine Sea (32 species), offering significant new insights into benthic biodiversity in deep waters. Future studies with enhanced sampling efforts in this and other canyon systems are likely to uncover even more invertebrate taxa, further enriching our understanding of deep-sea and strengthening the baseline for future research.

Table 1: Sampling stations information collected aboard the research vessel Puerto Deseado in the Mar del Plata Canyon area. Lat.: latitude; Long.: longitude. Stations where no ophiuroids were collected are shown in bold font (stations: 9, 13, 17, 27, 28, 30, 35, 40, 52, 54, 56 and 57).

Sampling stations	Lat. (S)	Long. (W)	Depth (m)	Date	Collecting method
1	37° 57.953’	55° 12.731’	201	8-10-2012	Dredge trawl (large)
2	37° 57.182’	55° 11.060’	291	8-10-2012	Dredge trawl (large)
3	37° 59.657’	55° 13.050’	250	8-10-2012	Fishing net
4	37° 57.736’	55° 8.456’	529	8-10-2012	Dredge trawl (large)
5	37° 58.651’	55° 9.104’	528	8-10-2012	Fishing net
6	37° 58.337’	55° 8.915’	530	8-10-2012	Dredge trawl (small)
7	37° 57.815’	54° 56.848’	652	8-10-2012	Dredge trawl (large)
8	37° 57.857’	54° 57.406’	647	8-10-2012	Fishing net
9	**38° 1.648’**	**54° 45.032’**	**823**	**8-11-2012**	**Dredge trawl (large)**
10	37° 59.706’	54° 41.854’	852	8-11-2012	Fishing net
11	37° 59.258’	54° 41.436’	854	8-11-2012	Dredge trawl (large)
12	37° 57.907’	54° 31.921’	1144	8-11-2012	Dredge trawl (small)
13	**37° 56.917’**	**54° 31.441’**	**1025**	**8-11-2012**	**Dredge trawl (large)**
14	38° 0.984’	54° 30.326’	1006	8-11-2012	Fishing net
15	38° 0.500’	54° 25.069’	1200	8-12-2012	Dredge trawl (large)
16	37° 57.288’	54° 23.456’	1308	8-12-2012	Fishing net
17	**38° 1.129’**	**54° 6.116’**	**1498**	**8-12-2012**	**Dredge trawl (small)**
18	37° 59.734’	54° 3.694’	1650	8-13-2012	Dredge trawl (large)
19	37° 56.688’	54° 10.997’	1508	8-13-2012	Fishing net
20	38° 8.460’	53° 51.218’	2010	8-13-2012	Dredge trawl (large)
21	38° 8.07’	53° 50.702’	2082	8-13-2012	Fishing net
22	38° 11.730’	53° 47.647’	2503	8-14-2012	Fishing net
23	38° 1.549’	53° 40.967’	3006	8-14-2012	Dredge trawl (large)
24	37° 54.206’	54° 2.616’	2420	8-14-2012	Fishing net
25	37° 51.688’	54° 10.550’	1950	8-15-2012	Dredge trawl (large)
26	37° 52.303’	53° 57.433’	1738	8-15-2012	Fishing net
27	**38° 7.619’**	**54° 10.595’**	**1301**	**8-15-2012**	**Dredge trawl (large)**
28	**38° 1.899’**	**53° 58.404’**	**1601**	**8-16-2012**	**Fishing net**
29	38° 2.366’	53° 54.700’	1783	8-16-2012	Fishing net
30	**38° 2.615’**	**53° 54.757’**	**1770**	**8-16-2012**	**Dredge trawl (large)**
31	38° 1.499’	54° 44.171’	819	8-16-2012	Fishing net
32	37° 59.800’	55° 12.479’	319	8-17-2012	Dredge trawl (large)
33	37° 58.698’	55° 11.899’	308	8-17-2012	Fishing net
34	37° 52.852’	54° 15.352’	1451	5-25-2013	Fishing net
35	**37° 54.045’**	**54° 24.091’**	**1245**	**5-25-2013**	**Dredge trawl (large)**
36	37° 57.508’	54° 23.989’	1289	5-25-2013	Fishing net
37	37° 59.848’	54° 24.206’	1275	5-25-2013	Dredge trawl (small)
38	37° 59.308’	54° 25.207’	1099	5-25-2013	Fishing net

Sampling stations	Lat. (S)	Long. (W)	Depth (m)	Date	Collecting method
39	37° 58.054’	54° 31.715’	1144	5-25-2013	Dredge trawl (small)
40	**38° 01.412’**	**54° 30.026’**	**1002**	**5-26-2013**	**Fishing net**
41	38° 01.631’	54° 30.275’	997	5-26-2013	Fishing net
42	37° 59.110’	54° 41.136’	877	5-26-2013	Dredge trawl (large)
43	37° 53.837’	54° 30.458’	998	5-26-2013	Fishing net
44	37° 53.557’	54° 42.941’	780	5-26-2013	Fishing net
45	38° 1.913’	53° 39.268’	2934	9-05-2013	Fishing net
46	38° 5.310’	53° 39.988’	3282	9-05-2013	Dredge trawl (small)
47	38° 6.571’	53° 42.827’	2950	9-06-2013	Fishing net
48	38° 1.243’	53° 41.108’	2958	9-06-2013	Dredge trawl (large)
49	37° 58.795’	53° 43.458’	2711	9-06-2013	Dredge trawl (small)
50	38° 1.098’	53° 45.601’	3447	9-07-2013	Dredge trawl (large)
51	38° 1.447’	53° 51.011’	2212	9-07-2013	Fishing net
52	**37° 53.071’**	**53° 52.868’**	**1970**	**9-07-2013**	**Fishing net**
53	37° 52.614’	53° 54.246’	1763	9-08-2013	Fishing net
54	**37° 57.073’**	**53° 56.330’**	**2845**	**9-08-2013**	**Dredge trawl (small)**
55	37° 52.154’	53° 51.582’	1712	9-08-2013	Fishing net
56	**37° 54.840’**	**54° 2.470’**	**2204**	**9-09-2013**	**Dredge trawl (large)**
57	**37° 56.177’**	**54° 4.430’**	**1853**	**9-09-2013**	**Dredge trawl (small)**
58	37° 59.128’	54° 9.942’	1444	9-09-2013	Fishing net
59	37° 49.688’	54° 5.236’	1398	9-10-2013	Fishing net
60	37° 51.700’	54° 4.583’	1584	9-10-2013	Dredge trawl (large)
61	37° 55.219’	54° 7.010’	2161	9-10-2013	Dredge trawl (large)
62	37° 55.184’	54° 13.895’	1404	9-11-2013	Fishing net
63	37° 57.830’	54° 16.292’	1310	9-11-2013	Dredge trawl (small)
64	37° 49.661’	54° 7.943’	1395	9-11-2013	Dredge trawl (large)

Table 2: Ophiuroid species found at each sampling station during the 2012 and 2013 research cruises to the Argentine Continental Slope and the Mar del Plata Submarine Canyon in the Southwestern Atlantic Ocean.

Order	Family	n	Species	Sampling stations
Amphilepidida	Amphiuridae	10	*Amphioplus* sp.	64
		4	*Amphipholis squamata* (Delle Chiaje, 1828)	12, 49
		1	*Amphiura belgicae* Koehler, 1900	12
		9	*Amphiura eugeniae* Ljungman, 1867	6, 12, 59
		2	*Amphiura (Amphiura) magellanica* Ljungman, 1867	2
		12	*Amphiura* sp.1	1, 5, 6, 8, 12
		8	*Amphiura* sp.2	12, 16
		55	*Amphiura* sp.3	25, 38, 43, 26, 51, 53, 55, 59, 61
		14	Amphiuridae sp.	2, 64
	Hemieuryalidae	2	*Ophiozonella hexactis* Stöhr, 2011	12
	Ophiactidae	66	*Ophiactis amator* Koehler, 1922	24, 26, 45, 46, 47, 49, 50, 55
		350	*Ophiactis asperula* (Philippi, 1858)	1, 2, 3, 5, 32, 33
	Ophiothamnidae	1	cf. *Ophiothamnus*	59
Euryalida	Asteronychidae	130	*Asteronyx loveni* Müller & Troschel, 1842	20, 21, 26, 29, 45, 53, 55, 61
		2	*Astrodia* sp.	46
	Gorgonocephalidae	132	*Astrotoma agassizii* Lyman, 1875	5, 10, 11, 14, 15, 16, 31, 37, 38, 41, 42, 59
		3	*Gorgonocephalus chilensis* (Philippi, 1858)	3, 33, 59

Order	Family	n	Species	Sampling stations
Ophiacanthida	Ophiacanthidae	3	*Ophiacantha* cf. *inconspicua* Lütken & Mortensen, 1899	47
		3	*Ophiacantha frigida* Koehler, 1907	45, 50
		8	*Ophiacantha* cf. *frigida* sp.2	22
		2	*Ophiacantha opulenta* Koehler, 1907	45, 50
		3	*Ophiacantha* sp.1	49, 47
		2	*Ophiacantha* sp.2	49, 47
		1	*Ophiacantha* sp.3	5
		3	*Ophiacantha* sp.4	15
		58	*Ophiacantha* sp.5	25, 31, 38, 41, 47, 48
		9	*Ophiochondrus stelliger* Lyman, 1879	5, 10, 12, 31, 38, 42, 51, 59
		1	*Ophiolebes* sp.	11
		11	*Ophiolimna antarctica* (Lyman, 1879)	11, 38
		7	*Ophiosabine densispina* (Mortensen, 1936)	5, 16, 41
		190	*Ophiosabine vivipara* (Ljungman, 1871)	1, 2, 3, 5, 11, 16, 31, 33
		30	*Ophiosemnotes* cf.*pachybactra* (H.L. Clark, 1911)	5, 26
Ophioscolescida	Ophioscolecidae	3	*Ophiolycus nutrix* (Mortensen, 1936)	10
Ophiurida	Astrophiuridae	1	*Astrophiura* sp.	47
		2	*Ophiophycis* sp.	59
	Ophiomusaidae	4	*Ophiomusa constricta* (Mortensen, 1936)	24, 53
		9	*Ophiomusa lymani* (Wyville Thomson, 1873)	18, 22, 51
	Ophiopyrgidae	4	*Ophiogona doederleini* (Koehler, 1901)	14
		1	*Ophiophyllum umbonatum* Okanishi & Mah, 2020	47
		250	*Ophioplinthus inornata* (Lyman, 1878)	5, 7, 10, 14, 19, 22, 31
		26	*Ophioplinthus martensi* (Studer, 1885)	8
		389	*Ophioplinthus scissa* (Koehler, 1907)	24
		600	*Ophioplinthus* sp.1	42, 44, 51, 53, 55, 59, 62
		44	*Ophioplinthus* sp.2	4, 5
		70	*Ophioplinthus* sp.3	38, 49, 64
		183	*Ophioplinthus* sp.4	25, 41, 42, 43, 44, 45, 53, 55
		405	*Ophiuroglypha* cf.*migrans* (Hertz M, 1927)	5, 24, 45, 49, 50
		2	*Ophiuroglypha irrorata irrorata* (Lyman, 1878)	45, 50
		120	*Ophiuroglypha lymani* (Ljungman, 1871)	3, 4, 5, 6, 8, 33, 41, 43, 44
		24	*Ophiuroglypha* sp.	19, 25, 48, 53, 64
	Ophiuridae	1500	*Ophiocten amitinum* Lyman, 1878	1, 3, 4, 10, 12, 14, 15, 19, 24, 26, 31, 32, 33, 34, 36, 37, 38, 41, 42, 43, 44, 51, 53, 55, 58, 59, 62, 63, 64
		481	*Ophiura* cf. *fraterna*(Lyman, 1878)	24
		447	*Ophiura ljungmani* (Lyman, 1878)	45, 47, 50
		253	*Ophiura* sp.1	12, 19, 45, 46, 47
		2	*Ophiura* sp.2	10
		27	*Ophiura* sp.3	21, 22

ACKNOWLEDGEMENTS

The authors thank the crew of the R/V "Puerto Deseado" (CONICET) and the scientific staff involved in the oceanographic expeditions "Talud Continental I, II, and III" in 2012 and 2013 for their invaluable assistance during sampling. We also acknowledge Laura Patricia Zalazar (IDEA-CONICET, Universidad Nacional de Córdoba) for designing Figure 1. We are grateful to both anonymous reviewers for their careful reading and constructive comments, which significantly improved this manuscript. This work was supported by the "Agencia Nacional de Promoción de la Investigación, el Desarrollo Tecnológico y la Innovación" under Grant PICT 2019-2549-BID. This is contribution N° 202 of the Laboratorio de Reproducción y Biología Integrativa de Invertebrados Marinos (LARBIM).

REFERENCES

Alvarado, J.J., Solís-Marín, F.A., & Ahearn, C.G. (2010). Echinoderm (Echinodermata) diversity in the Pacific coast of Central America. *Marine Biodiversity*, 40: 45–56.

Alvarado, J.J. (2011). Echinoderm diversity in the Caribbean Sea. *Marine Biodiversity*, 41: 261–285.

Baker, A.N. (2016). An illustrated catalogue of type specimens of the bathyal brittlestar genera *Ophiomusium* Lyman and *Ophiosphalma* H.L. Clark (Echinodermata: Ophiuroidea). *Zootaxa*, 4097: 1–40.

Bastida, R., Roux, A., & Martínez, D.E. (1992). Benthic communities of the Argentine continental-shelf. *Oceanologica Acta*, 15(6): 687–698.

Berecoechea, J.J., Brogger, M.I., & Penchaszadeh, P.E. (2017). New evidence of brooding in the deep-sea brittle star *Astrotoma agassizii* Lyman, 1876 from a South Western Atlantic Canyon. *Deep-Sea Research Part I*, 127, 105–110.

Bernal, M.C., Cairns, S.D., Penchaszadeh, P.E., & Lauretta, D. (2019). *Errina argentina* sp. nov., a new stylasterid (Hydrozoa: Stylasteridae) from Mar del Plata submarine canyon (Southwest Atlantic). *Marine Biodiversity*, 49: 833–839.

Bernasconi, I., & D'Agostino, M. M. (1971). Ofiuroideos argentinos. Claves para los órdenes, subórdenes, familias, subfamilias y géneros. *Physis*, 30(81): 447–469.

Bernasconi, I., & D'Agostino, M.M. (1977). Ofiuroideos del mar Epicontinental Argentino. *Revista del Museo Argentino de Ciencias Naturales "Bernardino Rivadavia", Hidrobiología*, 5: 65–114.

Bianchelli, S., & Danovaro, R. (2019). Meiofaunal biodiversity in submarine canyons of the Mediterranean Sea: A meta-analysis. *Progress in Oceanography*, 170: 69–80.

Boissin, E., Chenuil, A., & Feral, J.P. (2010). Species of the complex *Amphipholis squamata* (Ophiuroidea) from Marseilles. *Echinoderms: Durham. Balkema, Rotterdam, Durham, New Hampshire*, 135–138.

Boissin, E., Hoareau, T.B., Paulay, G., & Bruggemann, J.H. (2017). DNA barcoding of reef brittle stars (Ophiuroidea, Echinodermata) from the southwestern Indian Ocean evolutionary hot spot of biodiversity. *Ecology and Evolution*, 7(24): 11197–11203.

Bozzano, G., Cerredo, M.E., Remesal, M., Steinmann, L., Hanebuth, T.J., Schwenk, T., Baqués, M., Hebbeln, D., Spoltore, D., Silvestri, O., Acevedo, R.D., Spiess, V., Violante, R.A., & Kasten, S. (2021). Dropstones in the Mar del Plata Canyon Area (SW Atlantic): evidence for provenance, transport, distribution, and oceanographic implications. *Geochemistry, Geophysics, Geosystems*, 22(1): e2020GC009333.

Brandini, F.P., Boltovskoy, D., Piola, A., Kocmur, S., Röttgers, R., Abreu, P.C., & Mendes Lopes, R. (2000). Multiannual trends in fronts and distribution of nutrients and chlorophyll in the southwestern Atlantic (30– 628S). *Deep-Sea Research Part I*, 47: 1015–1033.

Bremec, C., & Schejter, L. (2010). Benthic diversity in a submarine canyon in the Argentine sea. *Revista Chilena de Historia Natural*, 83(3): 453–457.

Brogger, M.I., Gil, D.G., Rubilar, T., Martinez, M.I., Díaz de Vivar, M.E., Escolar, M., & Tablado, A. (2013). Echinoderms from Argentina: biodiversity, distribution and current state of knowledge. In: Alvarado J.J., & Solís-Marín F.A. (Eds.), Echinoderms research and diversity in Latin America. *Springer-Verlag, Berlin*, 359–402.

Brogger, M.I., & O'Hara, T.D. (2015). Revision of some ophiuroid records (Echinodermata: Ophiuroidea) from Argentina. *Zootaxa*, 3972(3): 432–440.

Callow, R.H., Kneller, B., Dykstra, M., & McIlroy, D. (2014). Physical, biological, geochemical and sedimentological controls on the ichnology of submarine canyon and slope channel systems. *Marine and petroleum geology*, 54: 144–166.

Chiantore, M., Guidetti, M., Cavallero, M., De Domenico, F., Albertelli, G., & Cattaneo-Vietti, R. (2006). Sea urchins, sea stars and brittle stars from Terra Nova Bay (Ross Sea, Antarctica). *Polar Biology*, 29: 467–475.

Chiesa, I.L., Pereira, E., & Roccatagliata, D.C. (2024). On the occurrence of the deep-sea barnacle *Tetrachaelasma southwardi* Newman & Ross, 1971 (Cirripedia, Balanomorpha, Bathylasmatidae) in the Mar del Plata Submarine Canyon, Argentina: supplementary description and taxonomic remarks on the genus. *Zoosystematics and Evolution*, 100(2): 603–623.

Clark, A.M., & Rowe, F.W.E. (1971). Monograph of Shallow-Water Indo-West Pacific Echinoderms. *Trustees of the British Museum (Nat. History), London*, 238. 31 p.

Demopoulos, A.W., McClain-Counts, J., Ross, S.W., Brooke, S., & Mienis, F. (2017). Food-web dynamics and isotopic niches in deep-sea communities residing in a submarine canyon and on the adjacent open slopes. *Marine Ecology Progress Series*, 578: 19–33.

De Leo, F.C., Smith, C.R., Rowden, A.A., Bowden, D.A., & Clark, M.R. (2010). Submarine canyons: hotspots of benthic biomass and productivity in the deep sea. *Proceedings of the Royal Society B: Biological Sciences*, 277(1695): 2783–2792.

Doti, B.L., Chiesa, I.L., & Roccatagliata, D. (2020). Biodiversity of the seep-sea isopods, cumaceans, and amphipods (Crustacea: Peracarida) recorded off the Argentine coast. In: Hendrickx, M. E. (ed.) *Deep-Sea Pycnogonids and Crustaceans of the Americas*. *Springer*, Cham.

Escolar, M., Hernández, D.R., & Bremec, C.S. (2013). Latitudinal and bathymetric distribution patterns of ophiuroids (Echinodermata: Ophiuroidea) on scallop fishing grounds at the shelf-break frontal system, South-Western Atlantic. *Marine Biodiversity Records*, 6: e137.

Escolar, M., & Bremec, C.S. (2015). Comunidad de equinodermos en bancos de vieira patagónica asociados al frente de talud en el Mar Argentino. *Revista de Investigación y Desarrollo Pesquero*, 26: 23–36.

Fernandez-Arcaya, U., Ramirez-Llodra, E., Aguzzi, J., Allcock, A.L., Davies, J.S., Dissanayake, A., Harris P., Howell K., Huvenne Veerle A.I., Macmillan-Lawler M., Martín J., Menot L., Nizinski M., Puig P., Rowden A.A., Sanchez F., & Van den Beld, I.M. (2017). Ecological role of submarine canyons and need for canyon conservation: a review. *Frontiers in Marine Science*, 4: 5.

Flores, J.N., Brogger, M.I., & Penchaszadeh, P.E. (2019). Reproduction and development of the brooding sea urchin *Austrocidaris canaliculata* from deep-sea off Argentina. *Deep-Sea Research Part I*, 143, 35–42.

Flores, J.N., Penchaszadeh, P.E., & Brogger, M.I. (2021). Heart urchins from the depths: *Corparva lyrida* gen. et sp. nov. (Palaeotropidae), and new records for the southwestern Atlantic Ocean. *Revista de Biología Tropical*, 69(1): 14–34.

Gage, J.D., & Tyler, P.A. (1991). Deep-sea biology: A natural history of organisms at the deep-sea floor. *Cambridge University Press*.

Goharimanesh, M., Stohr, S., Mirshamsi, O., Ghassemzadeh, F., & Adriaens, D. (2021). Interactive identification key to all brittle star families (Echinodermata; Ophiuroidea) leads to revised morphological descriptions. *European Journal of Taxonomy*, 766: 1–63.

Granja-Fernández, R., Rodríguez-Troncoso, A.P., Herrero-Pérezrul, M.D., Sotelo-Casas, R.C., Flores-Ortega, J.R., Godínez-Domínguez, E., Salazar-Silva, P., Alarcón-Ortega, L.C., Cazares-Salazar, A., & Cupul Magaña, A.L. (2016). Ophiuroidea (Echinodermata) from the Central Mexican Pacific: An updated checklist including new distribution records. *Marine Biodiversity*, 47: 167–177.

Granja-Fernández, R., Ramírez-Chávez, E.J., Rodríguez-Zaragoza, F.A., & López-Pérez, A. (2024). Ophiuroidea Gray, 1840 potential species richness across the eastern Pacific: An approach using species distribution modelling. *Journal of Biogeography*, 51(12): 2369–2382.

Harris, P., Macmillan-Lawler, M., Rupp, J., & Baker, E. (2014). Geomorphology of the oceans. *Mar. Geol*, 352: 4–24.

Hendler, G.L. (2005). Two new brittle star species of the genus *Ophiothrix* (Echinodermata: Ophiuroidea: Ophiotrichidae) from coral reefs in the southern Caribbean Sea, with notes on their biology. *Caribbean Journal of Science*, 41 (3): 583–599.

Hernández-Molina, F.J., Paterlini, M., Violante, R., Marshall, P., de Isasi, M., Somoza, L., & Rebesco, M. (2009). Contourite depositional system on the Argentine Slope: An exceptional record of the influence of Antarctic water masses. *Geology*, 37(6): 507–510.

Hunter, R.L., & Halanych, K.M. (2008). Evaluating connectivity in the brooding brittle star Astrotoma agassizii across the Drake Passage in the Southern Ocean. *Journal of Heredity*, 99(2): 137–148.

Hunter, R.L., & Halanych, K.M. (2010). Phylogeography of the Antarctic planktotrophic brittle star Ophionotus victoriae reveals genetic structure inconsistent with early life history. *Marine Biology*, 157: 1693–1704.

Hurtado-García, J., & Manjón-Cabeza, M.E. (2022). Species composition of sea stars (Echinodermata: Asteroidea) in the Patagonian Argentinian deep sea, including seven new records: Connectivity with sub-Antarctic and Antarctic fauna. *Polar Biology*, 45(7): 1211–1228.

Josefson, A.B., & Conley, D.J. (1997). Benthic response to a pelagic front. *Marine Ecology Progress Series*, 147: 49–62.

Krastel, S., Wefer, G., Hanebuth, T.J., Antobreh, A.A., Freudenthal, T., Preu, B., Schwenk, T., Strasser, M., Violante, R., & Winkelmann, D. (2011). Sediment dynamics and geohazards off Uruguay and the de la Plata River region (northern Argentina and Uruguay). *Geo-Marine Letters*, 31: 7–18.

Lauretta, D., & Martinez, M. I. (2019). Corallimorpharians (Anthozoa: Corallimorpharia) from the Argentinean Sea. *Zootaxa*, 4688(2): 249–263.

Lauretta, D., Vidos, C., Martinez, M. I., & Penchaszadeh, P. E. (2020). Brooding in the deep-sea anemone *Actinostola crassicornis* (Hertwig, 1882) (Cnidaria: Anthozoa: Actinaria) from the southwestern Atlantic Ocean. *Polar Biology*, 43, 1353–1361.

Lonardi, A.G., & Ewing, M. (1971). Sediment transport and distribution in the Argentine Basin. 4. Bathymetry of the continental margin, Argentine Basin and other related provinces. Canyons and sources of sediments. *Physics and Chemistry of the Earth*, 8: 81–121.

Maggioni, T., Taverna, A.J., Reyna, P.B., Alurralde, R.G., Rimondino, C.M., & Tatian, M. (2018). Deep-sea ascidians (Chordata, Tunicata) from the SW Atlantic: Species richness with descriptions of two new species. *Magnolia Press; Zootaxa*, 4526: 1.

Manso, C.L.D.C. (2010). Deep-water Ophiuroidea (Echinodermata) from off Chile in the eastern south Pacific. *Biota Neotropica*, 10: 185–199.

Martín-Ledo, R., & López-González, P.J. (2014). Brittle stars from Southern Ocean (Echinodermata: Ophiuroidea). *Polar biology*, 37: 73–88.

Martinez, M.I., & Penchaszadeh, P.E. (2017). A new species of brooding Psolidae (Echinodermata: Holothuroidea) from deep-sea off Argentina, Southwestern Atlantic Ocean. *Deep-Sea Research Part II*, 146: 13–17.

Martinez, M.I., Alba-Posse, E.J., Lauretta, D., & Penchaszadeh, P.E. (2018). Developmental stages in the brooding sea cucumber *Cladodactyla crocea* (Lesson, 1830) in the southwestern Atlantic Ocean. *Polar Biology*, 41, 1237–1244.

Martinez, M.I., Solís-Marín, F.A., & Penchaszadeh, P.E. (2019). First report of *Paelopatides* (Synallactida, Synallactidae) for the SW Atlantic, with description of a new species from the deep-sea off Argentina. *Zoologischer Anzeiger*, 278: 21–27.

Martinez, M.I., Alba-Posse, E.J., Lauretta, D., & Penchaszadeh, P.E. (2020). Reproductive features in the sea cucumber *Pentactella perrieri* (Ekman, 1927) (Holothuroidea: Cucumariidae): a brooding hermaphrodite species from the southwestern Atlantic Ocean. *Polar Biology*, 43: 1383–1389.

McClintock, J.B. (1994). Trophic biology of Antarctic shallow-water echinoderms. *Marine Ecology Progress Series*, 111(1/2): 191–202.

Mortensen, T. (1927). Handbook of the Echinoderms of the British Isles. *Oxford University Press*.

Ocampo, E.H., Farías, N.E., & Luppi, T.A. (2014). New record of the deep-sea crab *Ethusina abyssicola* from the Mar del Plata Canyon, Argentina. *New Zealand Journal of Zoology*, 41(3): 218–221.

O'Hara, T.D. (2007). Seamounts: Centres of endemism or species-richness for ophiuroids? *Global Ecology and Biogeography*, 16: 720–732.

O'Hara, T.D., & Poore, G.C. (2000). Patterns of distribution for southern Australian marine echinoderms and decapods. *Journal of Biogeography*, 27(6): 1321–1335.

O'Hara, T.D., Rowden, A.A., & Bax, N.J. (2011). A southern hemisphere bathyal fauna is distributed in latitudinal bands. *Current Biology*, 21: 226–230.

O'Hara, T.D., Stöhr, S., Hugall, A.F., Thuy, B., & Martynov, A. (2018). Morphological diagnoses of higher taxa in Ophiuroidea (Echinodermata) in support of a new classification. *European Journal of Taxonomy*, (416).

Okanishi, M., O'Hara, T.D., & Fujita, T. (2011). Molecular phylogeny of the order Euryalida (Echinodermata: Ophiuroidea), based on mitochondrial and nuclear ribosomal genes. *Molecular Phylogenetics and Evolution*, 61: 392–399.

Okanishi, M., Sentoku, A., Martynov, A., & Fujita, T. (2018). A new cryptic species of *Asteronyx* Müller and Troschel, 1842 (Echinodermata: Ophiuroidea), based on molecular phylogeny and morphology, from off Pacific Coast of Japan. *Zoologischer Anzeiger*, 274: 14–33.

Olivier, S.R., Bastida, R.O., & Torti, M.R. (1968). Resultados de las campañas oceanográficas Mar del Plata IV. Contribución al trazado de una carta bionómica del área de Mar del Plata. Las asociaciones del sistema litoral entre 12 y 70 m. de profundidad. *Boletín del Instituto de Biología Marina*, 16: 1–85.

Paterson, G.L.J. (1985). The deep-sea Ophiuroidea of the North Atlantic Ocean. *Bulletin of the British Museum (Natural History), Zoology Series*, 49: 1–162.

Pawson, D. L. (2007). Phylum Echinodermata. *Zootaxa*, 1668(1): 749–764.

Penchaszadeh, P.E., Pastorino, G., Martinez, M.I., & Miloslavich, P. (2019). Spawn and development of the gastropod *Americominella longisetosa* (Castellanos and Fernández, 1972) (Mollusca: Buccinidae) from the Southwestern Atlantic deep sea. *Deep-Sea Research Part I*, 143: 43–49.

Pereira, E., Roccatagliata, D., & Doti, B. (2019). *Xiphoarcturus*-a new genus and two new species of the family Antarcturidae (Isopoda: Valvifera) from the Mar del Plata submarine canyon and its phylogenetic relationships. *Arthropod Systematics & Phylogeny*, 77: 303–323.

Pereira, E., Doti, B., & Roccatagliata, D. (2021). A new species of *Pseudione sensu lato* (Isopoda: Bopyridae) on a squat lobster host from the deep South-West Atlantic. *Zootaxa*, 4996(2): 363–373.

Pertossi, R.M., Brogger, M.I., Penchaszadeh, P.E., & Martinez, M.I. (2019). Reproduction and developmental stages in the crinoid *Isometra vivipara* Mortensen, 1917 from the southwestern Atlantic. *Polar Biology*, 42(1): 807–816.

Pertossi, R.M., & Martinez, M.I. (2022). Reproductive biology of the brooding feather star *Phrixometra nutrix*, from the southwestern Atlantic. *Deep-Sea Research Part I*, 189: 103874.

Ramirez-Llodra, E., & Billet, D.S.M. (2006). Deep-sea ecosystems: pristine biodiversity reservoir and technological challenges. In: C. M. Duarte (Ed.), The Exploration of Marine Biodiversity: Scientific and Technological Challenges, 63–92. Bilbao: Fundación BBVA.

Risaro, J.A., Williams, G., Pereyra Villaurreta, M.D.R., Renée, M.D., & Lauretta, D.M. (2020). *Umbellula pomona sp. nov*., a new sea pen from Mar del Plata Submarine Canyon (Cnidaria: Octocorallia: Pennatulacea). *Museum National d'Histoire Naturelle; European Journal of Taxonomy*, 720: 121–143.

Rivadeneira, P.R., Brogger, M.I., & Penchaszadeh, P.E. (2017). Aboral brooding in the deep water sea star *Ctenodiscus australis* Lütken, 1871 (Asteroidea) from the Southwestern Atlantic. *Deep-Sea Research Part I*, 123: 105–109.

Rivadeneira, P.R., Martinez, M. I., Penchaszadeh, P.E., & Brogger, M.I. (2020). Reproduction and description of a new genus and species of deep-sea asteriid sea star (Echinodermata; Asteroidea) from the southwestern Atlantic. *Deep Sea Research Part I: Oceanographic Research Papers*, 163: 103348.

Rivas, A.L., Dogliotti, A.I., & Gagliardini, D.A. (2006). Seasonal variability in satellite-measured surface chlorophyll in the Patagonian Shelf. *Continental Shelf Research*, 26(6): 703–720.

Robertson, C. M., Demopoulos, A. W., Bourque, J. R., Mienis, F., Duineveld, G. C., Lavaleye, M. S., Koivisto, R.K., Brooke, S.D., Ross, S.W., Rhode, M., & Davies, A. J. (2020). Submarine canyons influence macrofaunal diversity and density patterns in the deep-sea benthos. *Deep Sea Research Part I: Oceanographic Research Papers*, 159: 103249.

Roux, A., Bastida, R., & Bremec, C. (1987). Comunidades bentónicas de la plataforma continental argentina. Campañas transección BIP" Oca Balda 1987/88/89. *Boletim do Instituto Oceanográfico*, 41: 81–94.

Roux, A.M., Bremec, C.S., & Fernández, M. (1995). Estudio preliminar de las comunidades bentónicas de los fondos de pesca de langostino patagónico del Golfo San Jorge (Argentina*). Ciencias Marinas*, 21(3): 295–310.

Rumbold, C.E., Chiesa, I.L., & Farías, N.E. (2022). New epibiotic association in the deep-sea: the amphipod *Caprella ungulina* and the Patagonian lobsterette *Thymops birsteini* in the South-western Atlantic. *Journal of the Marine Biological Association of the United Kingdom*, 101(8): 1171–1179.

Sands, C. J., O'Hara, T.D., Barnes, D.K., & Martin-Ledo, R. (2015). Against the flow: evidence of multiple recent invasions of warmer continental shelf waters by a Southern Ocean brittle star. *Frontiers in Ecology and Evolution*, 3 (63): 1–13.

Schejter, L., & Bremec, C. (2007). Benthic richness in the Argentine continental shelf: the role of *Zygochlamys patagonica* (Mollusca: Bivalvia: Pectinidae) as settlement substrate. *Journal of the Marine Biological Association of the United Kingdom*, 87(4): 917–925.

Sganga, D.E., & Roccatagliata, D. (2016). A new genus and species of *Apseudomorpha* (Crustacea: Tanaidacea) from the Mar del Plata submarine Canyon, South West Atlantic, and replacement of the preoccupied name *Hoplomachus* Guţu 2002. *Marine Biodiversity*, 46: 687–698.

Siegwald, J., Pastorino, G., Oskars, T., & Malaquias, M.A.E. (2020). A new species of the deep-sea genus *Scaphander* (Gastropoda, Cephalaspidea) from the Mar del Plata submarine canyon off Argentina. *Bulletin of Marine Science*, 96(1): 111–126.

Solís-Marín, F.A., Laguarda-Figueras, A., & Honey-Escandón, M. (2014). Biodiversidad de equinodermos (Echinodermata) en México. *Revista Mexicana de Biodiversidad*, 85: 441–449.

Souto, V., Escolar, M., Genzano, G., & Bremec, C. (2014). Species richness and distribution patterns of echinoderms in the southwestern Atlantic Ocean (34-56 S). *Scientia Marina*, 78(2): 269–280.

Steinmann, L., Baques, M., Wenau, S., Schwenk, T., Spiess, V., Piola, A.R., Bozzano, G., Violante, R., & Kasten, S. (2020). Discovery of a giant cold-water coral mound province along the northern Argentine margin and its link to the regional Contourite Depositional System and oceanographic setting. *Marine Geology*, 427: 106223.

Stöhr, S., Boissin, E., & Chenuil, A. (2009). Potential cryptic speciation in Mediterranean populations of *Ophioderma* (Echinodermata: Ophiuroidea). *Zootaxa*, 2071(1): 1–20.

Stöhr, S., O'Hara, T. D., & Thuy, B. (2012). Global diversity of brittle stars (Echinodermata: Ophiuroidea). *PloS ONE*, 7(3): e31940.

Stöhr, S., Weber, A.A.T., Boissin, E., & Chenuil, A. (2020). Resolving the *Ophioderma longicauda* (Echinodermata: Ophiuroidea) cryptic species complex: five sisters, three of them new. *European Journal of Taxonomy*, (600): 1–37.

Stöhr, S., O'Hara, T., & Thuy, B. (Eds) (2024). World Ophiuroidea Database. Accessed at https://www.marinespecies.org/ophiuroidea on 2024-07-06. doi:10.14284/358.

Ventura, C.R., Borges, M., Campos, L.S., Costa-Lotufo, L.V., Freire, C.A., Hadel, V.F., Cynthia L. C. Manso, C.L.C., Silva, J.R.M.C., Tavares, Y., & Tiago, C.G. (2013). Echinoderm from Brazil: Historical research and the current state of biodiversity knowledge. In: Alvarado J.J., & Solís-Marín F.A. (Eds.), Echinoderms research and diversity in Latin America. *Springer-Verlag, Berlin*, 301–344.

Vetter, E.W. (1995). Detritus-based patches of high secondary productivity in the nearshore benthos. *Marine Ecology Progress Series* 120 : 251–262.

Vetter, E. W., & Dayton, P. K. (1999). Organic enrichment by macrophyte detritus, and abundance patterns of megafaunal populations in submarine canyons. *Marine Ecology Progress Series*, 186 : 137–148.

Victorero, L., Samadi, S., O'Hara, T. D., Mouchet, M., Delavenne, J., Leprieur, F., & Leroy, B. (2023). Global benthic biogeographical regions and macroecological drivers for ophiuroids. *Ecography*, 2023(9): e06627.

Violante, R.A., Cavallotto, J.L., Bozzano, G., & Spoltore, D.V. (2017). Sedimentación marina profunda en el margen Continental Argentino: revisión y estado del conocimiento. *Latin American Journal of Sedimentology and Basin Analysis*, 24(1): 7–29.

Warratz, G., Schwenk, T., Voigt, I., Bozzano, G., Henrich, R., Violante, R., & Lantzsch, H. (2019). Interaction of a deep-sea current with a blind submarine canyon (Mar del Plata Canyon, Argentina). *Marine Geology*, 417: 106002.

WoRMS Editorial Board. (2024). World Register of Marine Species. Available from https://www.marinespecies.org at VLIZ. Accessed 2024-06-21. doi:10.14284/170.

Doi: 10.22179/REVMACN.27.879

Recibido: 2-VIII-2024
Aceptado: 31-I-2025