NOTE

# First record of a cirrate octopus (Cephalopoda: Cirroteuthidae) in the Argentine Basin (Uruguay)

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**ABSTRACT.** We report live observations of *Cirrothauma* cf. *murrayi*, the unique 'blind cirrate octopus' at a depth of 3,122 m depth during a SuBastian dive aboard RV 'Falkor (too)' in the Economic Exclusive Zone of Uruguay. The observed specimen exhibited an elongated body shape, distinct from a compressed form, with a gelatinous and fragile structure. Notable features include reduced or degenerate eyes, lightly pigmented skin, a deep web with a secondary web, long conspicuous cirri, elongate stalks with minute suckers, and large, wide fins that exceed the width of the head. The oceanographic setting indicates the presence of a mixing layer between the North Atlantic Deep Water (NADW) and the Lower Circumpolar Deep Water (LCDW). This record enhances the limited knowledge of Cirroteuthidae distribution in this region, with previous records restricted to Brazil and the Southern Ocean (South Sandwich Islands), being the first one for the Argentine Basin.

**Key words:** Deep sea, Río de la Plata Canyon, Octopoda.

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**Primer registro de un pulpo cirrado (Cephalopoda: Cirroteuthidae) en la Cuenca Argentina (Uruguay)**

**RESUMEN.** Se reporta una observación en vivo de *Cirrothauma* cf. *murrayi*, el único "pulpo cirrado ciego", a una profundidad de 3.122 m durante un descenso del VOR SuBastian a bordo del RV "Falkor (too)" en la Zona Económica Exclusiva de Uruguay. El ejemplar observado presentaba una forma corporal alargada, no comprimida, con una estructura gelatinosa y frágil. Entre sus características notables se incluyen ojos reducidos o degenerados, piel ligeramente pigmentada, una membrana profunda con una membrana secundaria, largos cirros conspicuos, pedúnculos con minúsculas ventosas y aletas grandes y anchas que superan el ancho de la cabeza. El entorno oceanográfico indica la presencia de una capa de mezcla entre el Agua Profunda del Atlántico Norte (NADW) y el Agua Profunda Circumpolar Inferior (LCDW). Este registro mejora nuestro limitado conocimiento sobre la distribución de Cirroteuthidae en esta región, con registros previos en Brasil y en el Océano Austral (Islas Sandwich del Sur), siendo el primero en la Cuenca Argentina.

**Palabras clave:** Mar profundo, Cañón del Río de la Plata, Octopoda.

Cirroteuthidae Keferstein, 1866 is a family of meso- to bathypelagic finned octopods (cirrate octopods) found worldwide. Key characteristics include fins used for locomotion, extensive webs between their arms (primary and inflatable secondary webs), long finger-like projections called cirri (much longer than in other cirrate octopods), sepioid gills, fragile gelatinous bodies, and an internal saddle-like or butterfly-like shell. These deep-sea dwellers are pelagic, exhibiting fin-swimming and using peristaltic waves along their webs for movement, achieving a fusiform shape. The family includes three extant genera, *Cirroteuthis* Eschricht, 1836, *Cirrothauma* Chun, 1911, and *Inopinoteuthis* (Verhoeff and O'Shea 2025).

In the Southern Hemisphere, sporadic records of *Cirroteuthis* have been made from off New Zealand (O'Shea 1999), southeastern and northwestern Australia, off New Caledonia (Verhoeff 2022; Verhoeff and O'Shea 2025), and southwestern Australia (Naturaliste Plateau) (Nesis 1987). The exclusively meso- to abyssopelagic *Cirrothauma* (encompassing the 'blind cirrate' *C. murrayi* Chun, 1911 and a possible undescribed species as suggested by molecular data (Verhoeff and O'Shea 2025)) has been reported sporadically from locations around the world, including the Arctic, North Atlantic, North Pacific and southeastern Pacific (Aldred et al. 1983).

*Inopinoteuthis*, which includes two species formerly listed in genera *Cirroteuthis* or *Cirrothauma* (*I. magna* and *I. hoylei*) is similar to *Cirrothauma*, but has large and well-formed eyes and normal suckers along the arms, among other differences. Species in this genus have been recorded from near Kerguelen and Crozet Islands (Hoyle 1885, 1886), off Heard Island, southern Indian Ocean (Verhoeff 2023), New Zealand (O'Shea 1999), and the southeastern Pacific (Verhoeff and O'Shea 2025). Species attributed to either *Cirrothauma* or *Inopinoteuthis* have been recorded from the Atlantis Bank, southwestern Indian Ocean (Lindsay et al. 2000) and New Caledonia (Roux 1994).

Haimovici et al. (2025) cites two species of the family for Brazil: *Inopinoteuthis magna* (Hoyle, 1885) (formerly *Cirrothauma*), a near-bottom meso-bathypelagic species found in the Indian and Atlantic oceans between 1,300 m and 3,350 m, with large well-developed eyes and arms 3-4 times the mantle length; and putative *Cirroteuthis muelleri* Eschricht, 1838, a near-bottom meso-bathypelagic species originally reported widely from the northeastern Atlantic and Pacific oceans (though now believed to be restricted to the Arctic, with arms approximately 1.5× mantle length and prominent web nodules (absent in other genera of Cirroteuthidae) (Verhoeff and O'Shea 2025). The current knowledge of the distribution of Cirroteuthidae is summarised in Figure 1. Additional not referenced Atlantic records exist for the Northern Hemisphere, from 'Blake Basin', 'Sohm Abyssal Plain', 'Canaries Basin' (Roper and Brundage 1972), and 'Iberic Peninsula' (Guerra 1992).

However, to date, there have been no confirmed records of the family in the southern sector of the southwestern Atlantic. The individual reported here (Figure 2) was observed but not collected during the 'Visualizing the Deep off Uruguay' expedition aboard the RV 'Falkor (too)', during ROV SuBastian dive 832. The survey was conducted using the remotely operated vehicle (ROV) SuBastian (maximum depth rating: 4,500 m), which was equipped with high-resolution video cameras, imaging systems, and environmental sensors for temperature (°C), salinity, and dissolved oxygen (μM). The only specimen was documented at a depth of 3,122 m, at coordinates -37.120982° latitude and -53.054727° longitude (i.e. lower portion of the Río de la Plata Canyon). Environmental measurements at the site included a water temperature of 1.73 °C, conductivity of 3.17 μS $cm^{-1}$, salinity of 34.757, and dissolved oxygen concentration of 197.07 μM. The total deck-to-deck duration of dive 832 was 13 h, 36 min, and 37 s, with on-bottom tracking distance of 2.91 km. The physico-chemical characteristics of the environment suggest that the octopus was associated with a mixing layer between the North Atlantic Deep Water (NADW) and the Lower Cir-

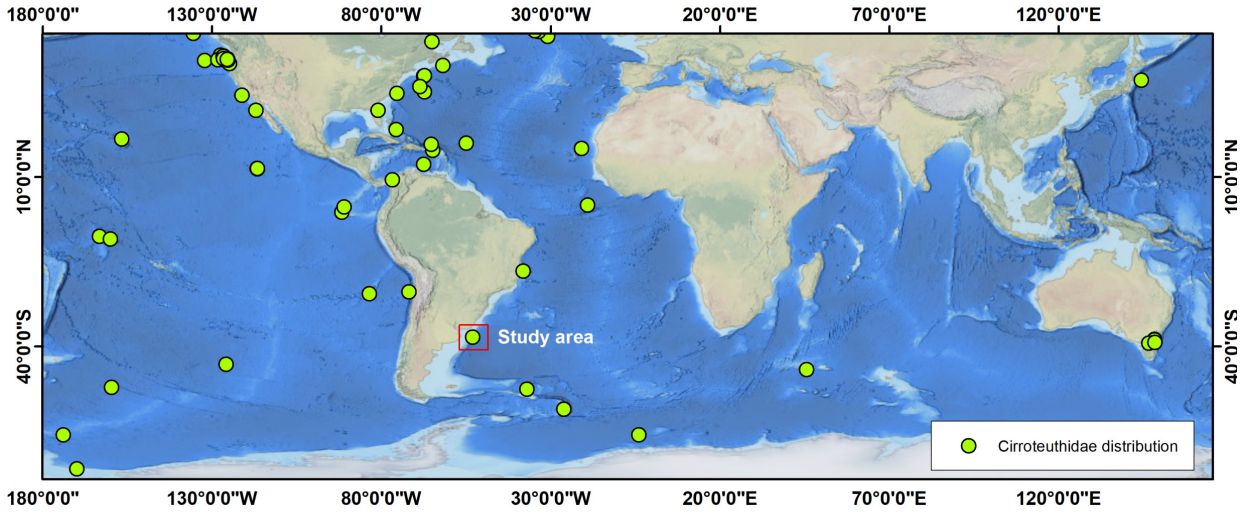


Figure 1. Known distribution of Cirroteuthidae, with particular emphasis on their locations in the Southern Hemisphere. Data compiled from Verhoeff (2022, 2023), GBIF (2023), Haimovici et al. (2025), Verhoeff and O'Shea (2025), and the FKt240708 (Southeast Pacific) and FKt250220-Ocean Census expeditions (South Sandwich Island) oceanographic campaigns.

cumpolar Deep Water (LCDW). The LCDW flows northward along the western boundary of the Argentine Basin, occupying the abyssal layers, while the NADW originates in the Northern Hemisphere and flows southward (Manta et al. 2022). Further research is needed to determine whether the association of the octopus with the mixing layer between NADW and LCDW highlights specific ecological features of this hydrographic interface.

This Cirroteuthidae specimen exhibited a gelatinous, elongated body with translucent features (Figure 2 A and 2 B). Arms were elongate (3-4× mantle length), connected by both primary and secondary webs (Figure 2 C and 2 E), forming an extensive umbrella-like structure. Web nodules were absent. Arms bearing distinctive elongate and fleshy stalks with minute suckers, ~ 30 suckers countable per arm (+ handful nearer the mouth, giving a count ~ 35 per arm); long, conspicuous cirri flanked the cirri and extended along the arms (Figure 2 E). Large lateral fins inserted dorsally on the mantle (Figure 2 D), presumably provided for fin-based locomotion. The head region displayed strongly reduced eyes which were covered with skin (Figure 2 F) and a small funnel (Figure 2 F). Video footage is available here: https://www.youtube.com/live/xjtyz-u9FK4?t=27812s (timestamp: 2025-08-29 03:28:43 UTC).

The combination of elongate arms (3-4× mantle length), and lack of web nodules, enables genus *Cirroteuthis* to be ruled out, thus leaving genera *Cirrothauma* and *Inopinoteuthis*. Out of these two genera, the highly reduced eyes which are covered with skin, and the elongate fleshy stalks bearing minute (presumably vestigial) suckers, enable a confident identification to genus *Cirrothauma* and species *Cirrothauma murrayi*, the 'blind cirrate'. *Inopinoteuthis* taxa (currently *I. magna* and *I. hoylei*) possess large, clearly functional eyes and well-formed suckers on, at most, very short stalks, which unambiguously rules out these species (Verhoeff and O'Shea 2025). The genus *Cirrothauma*, as currently recognized, is monotypic, containing only the species *Cirrothauma murrayi*. However, molecular and morphological data suggest the existence of two species (Verhoeff and O'Shea 2025), which are presumably similar. Nonetheless, differences in sucker count may help distinguish between these species. Aldred et al. (1983) identified two morphotypes, one with a low suck-

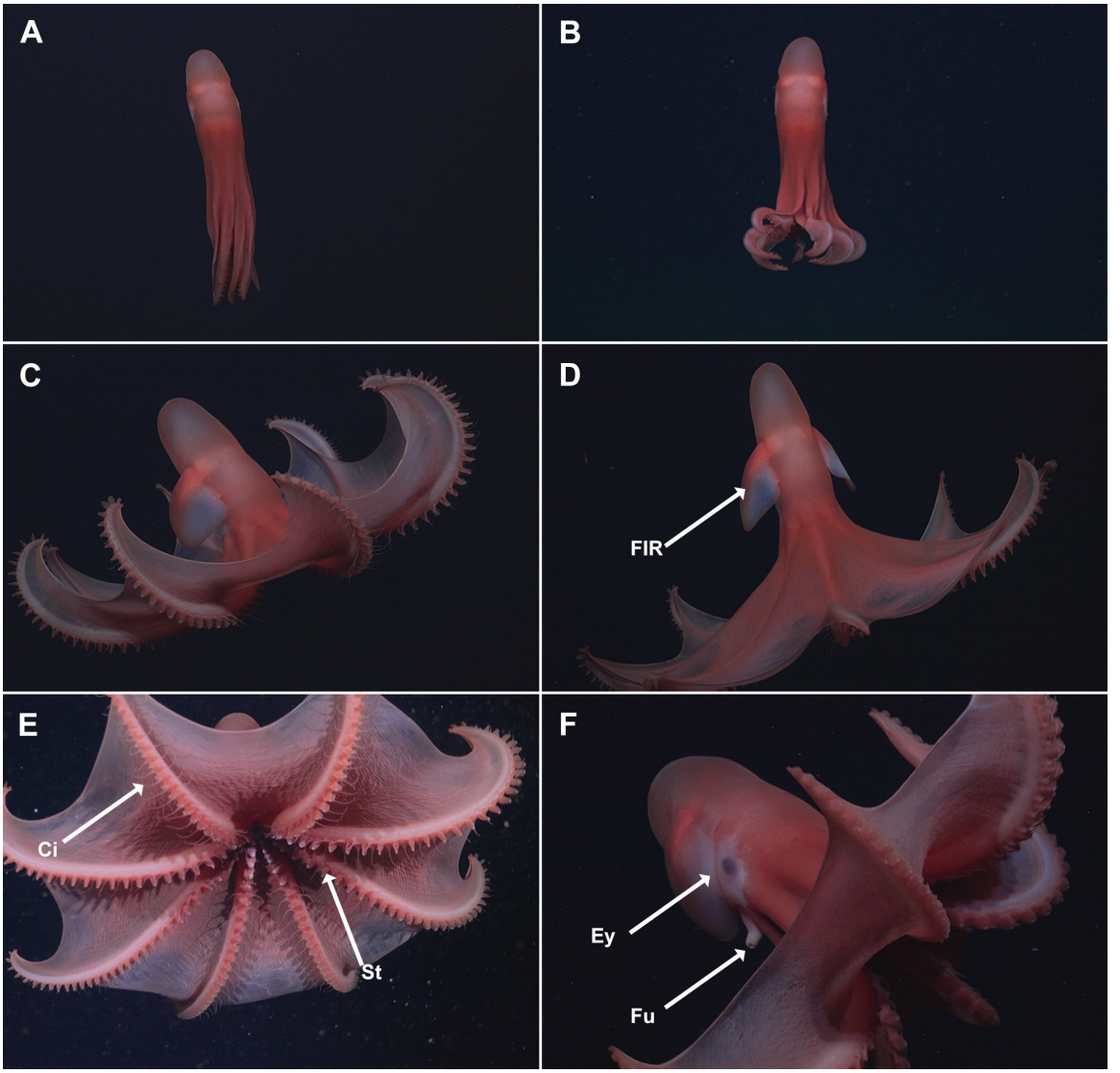


Figure 2. High-resolution images of a *Cirrothauma murrayi* displaying unique morphological features. A) Full body view showcasing the gelatinous body and extended arms. B) Frontal view highlighting the primary and secondary web structures. C) Lateral view emphasizing the fin-based locomotion. D) Dorsal view with focus on fin insertion region (FIR). E) Close-up of the arm structure, highlighting the cirri (Ci) and the fleshy sucker bearing stalks (St). F) Detail of the head area, illustrating the skin covered and vestigial eyes (Ey) and small funnel (Fu).

er count (~ 30-40 suckers per arm) and one with high sucker count (~ 60 suckers per arm). The low sucker count form is consistent with the original description of *C. murrayi*, which had 36 suckers per arm (Chun 1911), while the high sucker count form is considered a putative, undescribed taxon. The species observed here, with approximately 35 suckers per arm, is almost certainly *Cirrothauma murrayi*. Considering all data and the fact that the specimen was not collected, we thus refer to it as *C.* cf. *murrayi*. While identifiable to putative species, the record of the family in Uruguayan waters

warrants sufficient novelty for this current communication and adds significantly to the inventory of Cephalopoda (Scarabino 2003; Vélez-Rubio et al. 2014) for that country as well as for the southern Southwestern Atlantic.

Determining which of the existing biogeographical systems is most useful for characterizing our observations is complicated. For example, the Temperate Western Atlantic Province largely relies on shelf taxa and does not accurately reflect deep-sea patterns. Alternative schemes, such as deep-sea basin biogeographic classifications –like the Argentine Basin, a key region for water exchange between the Atlantic and Southern Oceans– are more relevant (e.g. Weijer et al. 2020). The location can also be related to O'Hara et al. (2025) Southern America biome, characterized by a eurybathic, polar-related fauna, mixed with shallow water lineages, primarily for benthic taxa such as ophiuroids, which are derived from tropical clades. This biome is more appropriately viewed as subpolar rather than strictly temperate. However, the applicability of these classifications to active pelagic swimmers in bathy- to mesopelagic zones remains uncertain.

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**Author contributions**

Alvar Carranza: investigation; conceptualization; project chief scientist; writing-original draft; writing-review and editing. Javier Sellanes: investigation; conceptualization; supervision; writing-review and figures. Fabrizio Scarabino: investigation; conceptualization; supervision; writing-review and figures. Romina Trinchin: investigation; conceptualization; supervision; writing-review and figures. Jan M. Tapia-Guerra: investigation; conceptualization; supervision; writing-review and figures. Reviewer 2: Provide species-level identification, improved morphological description, provide additional records.

## REFERENCES

Aldred RG, Nixon M, Young JZ. 1983. *Cirrothauma murrayi* chun, a finned octopod. Phil Trans R Soc Ser B. 301 (1103): 1-54. DOI: https://doi.org/10.1098/rstb.1983.0021

Chun C. 1911. Cephalopoda. In: Report on the scientific results of the "Michael Sars" North Atlantic deep-sea expedition 1910, carried out under the auspices of the Norwegian government and the superintendence of Sir John Murray KCB and Dr. Johan Hjort. 3 (1): 1-21. https://www.molluscabase.org/aphia.php?p=sourcedetails&id=172868.

[GBIF] Global Biodiversity Information Facility. 2023. Cirroteuthidae. GBIF Backbone Taxonomy. Checklist dataset. [accessed 2025 Nov 13]. DOI: https://doi.org/10.15468/39omei

Guerra A. 1992. Fauna ibérica. Vol. 1. Mollusca Cephalopoda. Madrid: Museo Nacional de Ciencias Naturales, Consejo Superior de Investigaciones Científicas. 328 p.

Haimovici M, Aguilar dos Santos R, Gomes Fischer L, Salcedo Vargas MA, Silva Leite T. 2025. An annotated and illustrated list of Cephalopoda (Mollusca) recorded from Brazil-

ian waters, with an identification key to species. Mar Fish Sci. 38 (3): 425-505. DOI: https://doi.org/10.47193/mafis.3832025010708

Hoyle WE. 1885. XIX.–Diagnoses of new species of Cephalopoda collected during the cruise of H.M.S. 'Challenger.' –Part I. The Octopoda. Ann Mag Nat Hist. 15 (87): 222-236. DOI: https://doi.org/10.1080/00222938509459320

Hoyle WE. 1886. Report on the cephalopods collected by H.M.S. Challenger during the years 1873-76. Report of the scientific results of the exploring voyage of H.M.S. Challenger during the years 1873-76. Zoology. 16: 1-245. DOI: https://doi.org/10.5962/bhl.title.6513

Lindsay DJ, Hunt JC, Hashimoto J, Fujiwara Y, Fujikura K, Miyake H, Tsuchida S. 2000. Submersible observations on the deep-sea fauna of the South-West Indian Ocean: preliminary results for the mesopelagic and near-bottom communities. JAMSTEC J Deep Sea Res. 16: 23-33.

Manta G, Speich S, Barreiro M, Trinchin R, de Mello C, Laxenaire R, Piola AR. 2022. Shelf water export at the Brazil-Malvinas confluence evidenced from combined *in situ* and satellite observations. Front Mar Sci. 9: 857594.

Nesis KN. 1987. Cephalopods of the world, squids, cuttlefishes, octopuses and allies. Neptune City: Tropical Fish Hobbyist Publications. 351 p.

O'Hara TD, Hugall AF, Haines ML, Weber AA-T, Eichsteller A, Brogger MI, Eléaume M, Fujita T, Kongsrud JA, Martinez Arbizu P, et al. 2025. Spatiotemporal faunal connectivity across global sea floors. Nature. 645: 423-428. DOI: https://doi.org/10.1038/s41586-025-09307-1

O'Shea S. 1999. The marine fauna of New Zealand: Octopoda (Mollusca: Cephalopoda). NIWA Biodiversity Memoir. 112: 1-280.

Roper CF, Brundage W. 1972. Cirrate octopods with associated deep-sea organisms: new biological data based on deep benthic photographs (Cephalopoda). Smithson Contrib Zool. 121: 1-46.

Roux MJ. 1994. The CALSUB cruise on the bathyal slopes off New Caledonia. In: Crosnier A, editor. Résultats des Campagnes MUSORSTOM. Mem Mus Natl Hist Nat France. 12: 9-47.

Scarabino F. 2003. Lista sistemática de los Cephalopoda vivientes de Uruguay. Comun Soc Malacol Urug. 8 (79): 197-202.

Verhoeff TJ. 2022. Finned octopus *Cirroteuthis* Eschricht, 1836 (Cephalopoda: Cirrata: Cirroteuthidae) confirmed from Australian waters. Molluscan Res. 42 (3): 205-211. DOI: https://doi.org/10.1080/13235818.2022.2087143

Verhoeff TJ. 2023. A new species of *Stauroteuthis* (Octopoda: Cirrata) and further novel cirrate octopods from Australian waters. Molluscan Res. 43 (3-4): 153-172. DOI: https://doi.org/10.1080/13235818.2023.2232534

Verhoeff TJ, O'Shea S. 2025. A new southern hemisphere species of *Cirroteuthis* (Octopoda: Cirrata: Cirroteuthidae), and re-evaluation of the taxonomic status of *Cirroteuthis hoylei* Robson, 1932. Folia Malacol. 33 (2): 104-131. DOI: https://doi.org/10.12657/folmal.033.003

Weijer W, Barthel A, Veneziani M, Steiner H. 2020. The Zapiola Anticyclone: a Lagrangian study of its kinematics in an eddy-permitting ocean model. Deep Sea Res Pt I. 164: 103308. DOI: https://doi.org/10.1016/j.dsr.2020.103308