



Research note

Occurrence of the tripodfish *Bathypterois ventralis* (Aulopiformes: Ipnopidae) in the Pacific coast of Costa Rica

*Presencia del pez trípode Bathypterois ventralis (Aulopiformes: Ipnopidae) en la costa pacífica de Costa Rica*

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**Abstract**

Between 1990 and 1992, 2 adult specimens of the ventrad spiderfish, *Bathypterois ventralis* Garman 1899, were collected at depths between 637 and 880 m off the Pacific coast of Costa Rica. These specimens constitute the first record of the species, the genus, and the family in Costa Rican waters. A brief description of specimens, as well as comparative morphometric data and distributional information are provided and discussed herein.

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**Keywords:** First record; Spiderfishes; Central America; Eastern Pacific

**Resumen**

Entre 1990 y 1992, 2 ejemplares adultos del pez trípode, *Bathypterois ventralis* Garman 1899, fueron recolectados a profundidades entre los 637 y 880 m frente a la costa pacífica de Costa Rica. Estos especímenes constituyen el primer registro de la especie, el género y la familia para Costa Rica. Se presenta una breve descripción de los mismos, así como información comparativa morfométrica y ecológica.

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**Palabras clave:** Primer registro; Peces trípode; América Central; Pacífico Oriental

The genus *Bathypterois* Günther, 1878 comprises about 19 species of benthic deep-sea fishes commonly known as tripodfishes or spiderfishes (Davis & Chakrabarty, 2011; Eschmeyer & Fong, 2014). These fishes are distributed worldwide in both temperate and tropical oceans and are found at depths up to 6000 m (Sulak, 1977).

The Atlantic Ocean, with at least 9 valid species, appears to exhibit the highest diversity of tripodfishes (Davis &

Chakrabarty, 2011; Eschmeyer & Fong, 2014; Franco, Braga, Nunan, & Costa, 2009). In contrast, in the Eastern Pacific Ocean only 4 species of the genus have been formerly recorded (Castellanos-Galindo, Rubio-Rincón, Beltrán-Léon, & Baldwin, 2006; Castro-Aguirre & Balart, 1996; Eschmeyer & Fong, 2014; McCosker & Rosenblatt, 2010; Parin & Makushok, 1973; Pequeño, 1989, 1997, 2000; Sulak, 1977). The Eastern Pacific species are: (1) the attenuated spiderfish, *B. atricolor* Alcock, 1896, known from the gulf of California to Chile; (2) the abyssal spiderfish, *B. longipes* Günther, 1878, restricted to the Gulf of Panama; (3) the Southeastern Pacific spiderfish, *B. pectinatus* Mead, 1959, known from the Gulf of Panama to Chile; and (4) the ventrad spiderfish, *B. ventralis* Garman,

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Figure 1. *Bathypterois ventralis*, 110.3 mm in SL (UCR 2199-001; A) and 128.3 mm in SL (UCR 2290-03; B), caught off Costa Rica ( $10^{\circ}40'38.77''$  N,  $86^{\circ}30'30.48''$  W and  $9^{\circ}27'3.02''$  N,  $85^{\circ}6'33.44''$  W, respectively). Scale bar: 10 mm.

1899, known from the mouth of the Gulf of California to Chile (Castellanos-Galindo et al., 2006; Castro-Aguirre & Balart, 1996; Eschmeyer & Fong, 2014; McCosker & Rosenblatt, 2010; Parin & Makushok, 1973; Pequeño, 1989, 1997, 2000; Sato, 2009; Sulak, 1977). Despite the wide distribution of some of these species in Eastern Pacific waters, to date none of them have been formally listed among the Costa Rican Pacific ichthyofauna (Bussing & López, 1994, 2005, 2009, 2011).

Between 1990 and 1992, 2 adult tripodfishes (110.3 and 128.3 mm in standard length [SL]; Fig. 1) were captured, independently, by commercial fishers from off the Pacific coast of Costa Rica ( $10^{\circ}40'$  N,  $86^{\circ}30'$  W and  $9^{\circ}27'$  N,  $85^{\circ}06'$  W), at depths between 825 and 880 m and 637 and 665 m, respectively. These specimens were donated and deposited in the fish collection of the Museo de Zoología of the Universidad de Costa Rica (UCR) with the following catalog numbers: UCR 2199-001 and UCR 2290-03, respectively. Recently, both specimens were revised and identified as *Bathypterois ventralis*. In this contribution, we formally report this new record, the first for the species, the genus, and the family Ipnopidae in Costa Rican waters (Bussing & López, 1994, 2005, 2009, 2011).

Identification of specimens was carried out on the basis of the following distinctive characters: body long and compressed, its depth 12.0–12.6% SL, dark brown, darker in the head, lighter at the margins of the scales and the lateral line; head moderately depressed and pointed at the snout; snout length 30.4–32.2% of head length (HL); lower jaw prominent; premaxilla and dentary each provided with a band of small conical pointed teeth; vomer with a patch of similar teeth on each knob; mouth wide and horizontal; eyes minute, its length 7.3–7.4% of HL; interorbital space moderate, 35.1–35.3% of HL; opercles thin, membranous, covered with scales; gill rakers long and blade-like, 45–46 on the first gill arch; scales deciduous, 58–59 in the lateral line; gular folds unscaled; pale brown fins; prepectoral length moderate, 23.9–25.0% of SL; pectoral, pelvic, and caudal fins with stiffened produced rays; the 2 produced pectoral rays (third and fourth rays) united at their base, but separate behind middle of the dorsal fin base; lower portion of pectoral fins with 14 rays; no pectinate scales behind the base of the pectoral fin; pelvic fins with 9 rays; dorsal fin inserted behind origin



Figure 2. Records of *Bathypterois ventralis* in the Eastern Pacific Ocean; stars = the present records (UCR 2199-001 and UCR 2290-03), squares = previous literature and museum records. Adapted from <http://www.gbif.org>.

of pelvic fin; a very small adipose dorsal fin present; ventral procurrent rays modified to form a subcaudal notch; and caudal fin wide and deeply forked. All these characters agree with the diagnosis of the species and match well descriptions of specimens by Garman (1899), Sulak (1977) and Sato (2009). Other morphometric and meristic data from examined specimens and comparative information from all Eastern Pacific species of the genus are summarized in Table 1.

The biology of *B. ventralis*, a denizen of relatively great depths (637–1735 m), is poorly known, due almost certainly to scarcity of specimens and field observations. At the present time, according to Sulak (1977), and to the FishBase (Froese & Pauly, 2014), the Global Biodiversity Information Facility (GBIF: <http://www.gbif.org/>) and the FishNet2 (<http://fishnet2.net/>) online databases, less than 50 specimens of this species have been caught. Notably, all these specimens came from only 13 localities, 6 of them in Eastern Pacific waters (Fig. 2): (1) the mouth of the Gulf of California; (2) the central coast of México (Sulak, 1977; Castro-Aguirre & Balart, 1996); (3) the gulf of Panama (Castellanos-Galindo et al., 2006; Sulak, 1977); (4) the southern coast of Peru (Sulak, 1977; Sato, 2009); (5) the northern, and (6) central coasts of Chile (Pequeño, 1989, 1997, 2000; Sulak, 1977).

In recent years, an important number of fish species have been recorded for the first time in Costa Rican waters, mainly on the

Table 1

Morphometric and meristic data of *Bathypterois ventralis* from Costa Rica (UCR 2199-001 and UCR 2290-03) and comparative material; data from Garman (1899), Sulak (1977) and Sato (2009). Morphometric data expressed as percentages of standar length.

Character	Costa Rican specimens	<i>B. atricolor</i>	<i>B. longipes</i>	<i>B. pectinatus</i>	<i>B. ventralis</i>
Standar length (mm)	110.3–128.2	69–204	66–249	71–143	85–150
Head length	23.3–23.8	20.0–25.2	20.7–25.6	18.7–22.8	20.6–24.4
Prepelvic length	37.8–38.8	35.4–42.2	35.8–38.4	34.2–35.7	35.2–39.6
Predorsal length	44.2–44.5	40.5–46.3	40.8–46.6	39.7–40.6	42.8–46.8
Preanal length	58.3–60.9	56.7–63.6	56.5–59.7	54.5–54.8	54.2–62.9
Length of longest produced pectoral fin ray	–	81.4–189.0	89.9–107.0	96.8–111.0	101.0–103.0
Length of longest produced pelvic fin ray	39.7–51.6	24.5–57.8	30.4–54.4	22.0–32.2	39.1–59.4
Length of longest lower caudal fin ray	–	14.8–33.3	27.2–30.4	17.4–21.1	32.7–44.6
Pectoral fin rays (lower portion)	14	10–11	9–11	8–10	14–16
Pelvic fin rays	9	9	8–9	8–9	9–10
Dorsal fin rays	12	13–16	12–14	13–14	12–14
Anal fin rays	9	8–10	9–10	7–9	9–10
Gill rakers on first gill arch	46–47	40–48	40–42	43–44	43–47
Branchiostegal rays	13	12–14	11–13	13	13
Dentary lateral-line pore	8–9	6–8	6–7	7–9	7–9
Lateral line scales	58–59	57–62	54–58	60–65	56–59

Measurements unavailable (i.e. structure broken or incomplete) are represented with an en-dash (–).

Pacific coast (Angulo, López, Bussing, & Murase 2014; Angulo, Naranjo-Elizondo, Corrales-Ugalde, & Cortés, 2014; Angulo, 2014a, 2014b; Bussing & López, 2011; Cortés, Sánchez-Jiménez, Rodríguez-Arrieta, Quirós-Barrantes, González, & Blum, 2012; López-Garro, Zanella, Golfín-Duarte, & Pérez-Montero, 2012; Starr, Green, & Sala, 2012). Some of these species are probably residents in these areas, undetected due to intrinsic rarity or difficulty of access to these specific habitats (e.g. deep sea), as in this case; others could be considered “vagrant” (i.e. they have arrived from the other areas), see López-Garro et al. (2012). The presence of these previously unrecorded species indicates that the Costa Rican marine ichthyofauna is considerably richer and a reliable estimation of number, composition and distribution of species is still not available.

The expansion of fisheries into deeper waters and the development of new fisheries for new deepwater target species in this area (Wehrtmann & Nielsen-Muñoz, 2009, for an overview) will likely bring new captures of unexpected species. As a result, some species currently considered rare, such as the one reported here, may turn out to be common or abundant at certain depths or habitats.

Finally, the discovery of these specimens of *B. ventralis* in Costa Rican waters increases the knowledge of our marine ichthyofauna and provides evidence of a broader distributional pattern for this species in the Eastern Pacific region, filling a gap of about 2600 km.

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## References

- Angulo, A. (2014a). First record, and range extension, of the Mocosa ruff *Schedophilus haedrichi* (Perciformes: Centrolophidae) from the Pacific coast of Costa Rica. *Marine Biodiversity Records*, 7(e70), 1–4.
- Angulo, A. (2014b). First record, and range extension, of the Slimy head *Hoplostethus mento* (Beryciformes: Trachichthyidae) from the Pacific coast of Costa Rica. *Marine Biodiversity Records*, 7(e88), 1–4.
- Angulo, A., Naranjo-Elizondo, B., Corrales-Ugalde, M., & Cortés, J. (2014). First record of the genus *Paracaristius* (Perciformes: Caristiidae) from the Pacific of Central America, with comments on their association with the siphonophore *Praya reticulata* (Siphonophorae: Prayidae). *Marine Biodiversity Records*, 7(e132), 1–6.
- Angulo, A., López, M. I., Bussing, W. A., & Murase, A. (2014). Records of chimaeroid fishes (Holocephali: Chimaeriformes) from the Pacific coast of Costa Rica, with the description of a new species of *Chimera* (Chimaeridae) from the eastern Pacific Ocean. *Zootaxa*, 3861, 554–574.
- Bussing, W. A., & López, M. I. (1994). *Peces demersales y pelágicos costeros del Pacífico de Centro América meridional. Guía ilustrada*. San José: Editorial de la Universidad de Costa Rica.
- Bussing, W. A., & López, M. I. (2005). *Peces de la Isla del Coco y peces arrecifales de la costa Pacífica de América Central meridional*. San José: Editorial de la Universidad de Costa Rica.
- Bussing, W. A., & López, M. I. (2009). Marine fish. Part 39. In I. S. Wehrtmann, & J. Cortés (Eds.), *Marine biodiversity of Costa Rica, Central America* (pp. 1–538). New York: Springer.
- Bussing, W. A., & López, M. I. (2011). *Demersal and pelagic inshore fishes of the Pacific coast of lower Central America*. San José: Editorial de la Universidad de Costa Rica.
- Castellanos-Galindo, G. A., Rubio-Rincón, E. A., Beltrán-Léon, B. S., & Baldwin, C. C. (2006). Check list of stomiiform, aulopiform and myctophiform fishes from Colombian waters of the tropical eastern Pacific. *Biota Colombiana*, 7, 245–262.
- Castro-Aguirre, J. L., & Balart, E. F. (1996). Contribución al conocimiento del origen y las relaciones de la ictiofauna de aguas profundas del Golfo de California, México. *Hidrobiológica*, 6, 76.
- Cortés, J., Sánchez-Jiménez, A., Rodríguez-Arrieta, A., Quirós-Barrantes, G., González, P. C., & Blum, S. (2012). Elasmobranchs observed in deepwaters (45–330m) at Isla del Coco National Park, Costa Rica (Eastern Tropical Pacific). *Revista de Biología Tropical*, 60, 257–273.
- Davis, M. P., & Chakrabarty, P. (2011). Tripodfish (Aulopiformes: *Bathypterois*) locomotion and landing behaviour from video observation at bathypelagic depths in the Campos Basin of Brazil. *Marine Biology Research*, 7, 297–303.

- Eschmeyer, W. N., & Fong, J. D. (2014). *Species by family/subfamily in the Catalog of Fishes*. California Academy of Sciences. Retrieved from: <http://research.calacademy.org/redirect?url=http://researcharchive.calacademy.org/research/ichthyology/catalog/fishcatget.aspandtbl=speciesandspid=14464>
- Franco, M. A. L., Braga, A. C., Nunan, G. W. A., & Costa, P. A. S. (2009). Fishes of the family Ipnopidae (Teleostei: Aulopiformes) collected on the Brazilian continental slope between 11° and 23°S. *Journal of Fish Biology*, 75, 797–815.
- Froese, R., & Pauly, D. (2014). *FishBase*. Retrieved from: <http://fishbase.org>
- Garman, S. (1899). Reports on an exploration off the west coasts of Mexico, Central and South America, and off the Galapagos Islands, in charge of Alexander Agassiz, by the U.S. Fish Commission Steamer “Albatross,” during 1891, Lieut. Commander Z. L. Tanner, U.S. N., Commanding. XXVI. The Fishes. *Memoirs of the Museum of Comparative Zoology at Harvard College*, 24, 1–431.
- López-Garro, A., Zanella, I., Golfín-Duarte, G., & Pérez-Montero, M. (2012). First record of the blacktip reef shark *Carcharhinus melanopterus* (Carcharhiniformes: Carcharhinidae) from the Tropical Eastern Pacific. *Revista de Biología Tropical*, 60, 275–278.
- McCosker, J. E., & Rosenblatt, R. H. (2010). The fishes of the Galápagos Archipelago: an update. In *Proceedings of the California Academy of Sciences*, vol. 61 (pp. 167–195).
- Parin, N. V., & Makushok, V. M. (1973). Deep-sea bottom fishes collected during the 4th cruise of the R/V “Akademik Kurchatov” in the South Eastern part of the Pacific Ocean. *Akademii Nauk, Trudy Instituta Okeanologii P.P. Shirshov*, 94, 173–187.
- Pequeño, G. (1989). Peces de Chile. Lista sistemática revisada y comentada. *Revista de Biología Marina, Valparaiso*, 24, 1–132.
- Pequeño, G. (1997). Peces de Chile. Lista sistemática revisada y comentada: addendum. *Revista de Biología Marina y Oceanográfica*, 32, 77–94.
- Pequeño, G. (2000). Delimitaciones y relaciones biogeográficas de los peces del Pacífico suroriental. *Estudios Oceanológicos*, 19, 53–76.
- Starr, R. M., Green, K., & Sala, E. (2012). Deep water fish assemblages at Isla del Coco National Park and Las Gemelas Seamount, Costa Rica. *Revista de Biología Tropical*, 60, 347–362.
- Sato, T. (2009). Ipnopidae. In K. Nakaya, M. Yabe, H. Imamura, M. C. Romero, & M. Yoshida (Eds.), *Deep-sea fishes of Peru* (pp. 136–137). Tokyo: Japan Deep Sea Trawlers Association.
- Sulak, K. J. (1977). The systematics and biology of *Bathypterois* (Pisces, Chlorophthalmidae) with a revised classification of benthic myctophiform fishes. *Galathea Report*, 14, 49–108.
- Wehrtmann, I., & Nielsen-Muñoz, V. (2009). The deepwater fishery along the Pacific coast of Costa Rica, Central America. *Latin American Journal of Aquatic Research*, 37, 543–554.