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Erin E. Easton

The University of Texas Rio Grande Valley, erin.easton@utrgv.edu

Javier Sellanes

Matthias Gorny

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Authors: Easton, Erin E., Sellanes, Javier, and Gorny, Matthias

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First Record of the Yellowfin Soldierfish, *Myripristis chryseres* Jordan & Evermann, 1903, in the Easter Island Ecoregion¹

Erin E. Easton,^{2,3,5} Javier Sellanes,² and Matthias Gorny⁴

Abstract: *Myripristis chryseres* Jordan & Evermann, 1903, is recorded for the first time in the Easter Island Ecoregion. Two specimens were observed swimming along a rock cliff and entering a cavern at ~163 m depth near the peak of Pukao seamount, located ~85 km (46 nm) west of Easter Island. This report expands the geographic range of *M. chryseres* eastward by ~3,800 km and is the first report of the species for the eastern Pacific. It is unclear whether this new record is indicative of a relatively recent range expansion or a lack of visual surveys in the region, which are especially important for surveying fishes that are less likely to be caught by line and trawls because of their behavior and the complex rocky habitats in which they live.

Keywords: range expansion, deep sea, Pacific Ocean, mesopelagic, mesophotic reef, Holocentridae

THE EASTER ISLAND Ecoregion includes Salas y Gómez and Easter Island and the surrounding seamounts. These two islands are the southeasternmost of the Polynesian islands and are more than 2,000 km east of the closest island, Pitcairn, and over 3,000 km west of the coast of continental Chile. Due to their remoteness, relatively few surveys have been made of the fishes in the area, especially below recreational dive depths of ~20–40 m. These studies have revealed the fauna to be relatively depauperate compared with that

of other Polynesian islands, with low species richness but high percentages of endemic species, including fishes, mollusks, algae, and crustaceans (see, e.g., Santelices and Abbott 1987, DiSalvo et al. 1988, Boyko 2003, Randall and Cea 2010, Raines and Huber 2012, Friedlander et al. 2013). For nonendemic species of the Easter Island Ecoregion and the Salas y Gómez Ridge, studies found that more of the species were in common with those of the Indo-West Pacific and Hawai'i than with those of the eastern Pacific coast (Parin et al. 1997, Randall and Cea 2010). This pattern is likely explained and controlled by limited colonization opportunities and time for population establishment due to the Humboldt Current, which acts as a barrier for species dispersal between the continent of South America and the seamounts and islands west of ~83° W (Parin et al. 1997), and the relatively recent origin of Easter Island and Salas y Gómez (~0.8 mya) (Vezzoli and Acocella 2009).

Species of *Myripristis* Cuvier, 1829, like other Holocentridae, generally are associated with rocky bottoms or coral reefs and are nocturnal, foraging at night and hiding in caverns, caves, and crevices during the day (Wyatt 1983, Randall and Heemstra 1986, Randall and Greenfield 1999, Sink et al. 2006, Allen and Erdmann 2012). *Myripristis chryseres* Jordan & Evermann, 1903, is one of 28 spe-

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² Millennium Nucleus for Ecology and Sustainable Management of Oceanic Islands (ESMOI), Departamento de Biología Marina, Facultad de Ciencias del Mar, Universidad Católica del Norte, Coquimbo, Chile.

³ Current address: University of Texas Rio Grande Valley, School of Earth, Environmental, and Marine Sciences, Brownsville, Texas.

⁴ Oceana Chile, Avenida Suecia 0155, Santiago, Chile.

⁵ Corresponding author (e-mail: erineeaston@gmail.com).

cies of *Myripristis* and is considered tropical or antiequatorial, with a range from 3° to 28° N and 5° to 31° S (Randall and Greenfield 1999, Froese and Pauly 2011, GBIF 2016). It is a planktivore (Sandin and Williams 2010) usually found below 30 m and down to ~350 m (Khalaf et al. 1996, Randall and Greenfield 1999, Khalaf and Zajonz 2007). Like other deep-water species in this genus, *M. chryseres* has a large but patchy distribution (Randall and Greenfield 1999, Allen and Erdmann 2012), which likely reflects the relatively limited studies within the depth range of this species and the difficulty of capturing specimens in trawls or by line due to its planktivorous diet and the complex cavernous rocky habitats in which they live. Therefore, many reports of this species come from photographs, videos, or specimens caught in gill nets (see, for example, Clarke 1972, Ralston et al. 1986, Heemstra et al. 2006). Here, we report the presence of *M. chryseres* in the Easter Island Ecoregion from videos taken at the Pukao seamount (Figure 1).

MATERIALS AND METHODS

A remotely operated vehicle (ROV) was deployed on 8 and 16 March 2016 to a depth of 152–247 m on Pukao seamount, located ~85 km (46 nm) west of Easter Island (Figure 1). The ROV Commander MKII (Mariscope Meerestechnik, Kiel, Germany) was equipped with two laser pointers having parallel beams 10 cm apart and with a HD Camcorder (Panasonic SD 909) that was positioned in front of the ROV with a fixed angle of 15 degrees toward the bottom. The distance between the HD camera and the seafloor or cliff wall varied between several centimeters and about 2 m. Fish were identified with the aid of the following guides: Jordan and Evermann (1903), Randall and Guézé (1981), Randall and Heemstra (1986), and Randall and Greenfield (1999).

RESULTS AND DISCUSSION

We used eye size, body shape and color, and fin size and position to assign the observed individuals to Myripristinae (see Randall and Heemstra 1986). Individuals were further as-

signed to *Myripristis chryseres* on the basis of the black opercular membrane and the characteristic solid yellow fins (see Randall and Guézé 1981), which are not characteristic of any other species within *Myripristis*. At ~2015 hours local time, near sunset, on 16 March 2016, we observed two individuals of *M. chryseres* (Figure 2A) swimming ~1–1.5 m above the seafloor along and in a cavern in a large rock cliff (~3 m tall) at ~164.5 m depth (seafloor, cavern at ~163 m). As the ROV neared the rock cliff, the individuals entered the cavern, where *Pristilepis oligolepis* and unidentifiable fishes were also residing (see video at <https://youtu.be/yJBL7ahAheA>). The rock outcrop was covered in encrusting algae and surrounded by sandy sediment. Near the base of the cavern was a protruding ledge, lined with whip corals (Figure 2B), and numerous cracks, crevices, holes, ledges, and caves were observed along the outcrop. The nearby sediment was home to clusters of whip corals, rhodoliths, and various species of urchins. In addition to several *Caranx lugubris*, which were swimming nearby (Figure 2C), *Amphichaetodon melbae*, *Caprodon longimanus*, *Chromis* sp., *Cookeolus japonicus*, cf. *Luzonichthys* sp., *Prognathodes* sp., and cf. *Pseudanthias* sp. were observed within ~5 m of the cavern in association with this outcrop. Our observations are consistent with reports that *M. chryseres* is nocturnal, solitary or present in small groups of two or three individuals, and often associated with cliffs, crevices, and caves, where it may coreside with other fishes (Heemstra et al. 2006, Sink et al. 2006).

Myripristis species tend to be tropical, antitropical, or antiequatorial and have the greatest intrageneric diversity and richness in the Central Indo-Pacific and comparatively low richness in the eastern Pacific and Atlantic as well as at higher latitudes (Greenfield 1968). This record of *M. chryseres* expands the known number of species of this genus in the Easter Island Ecoregion to two, the other being the shallow-water species *M. tiki* Greenfield, 1974.

The geographic distribution of *M. chryseres* was originally considered antitropical based on the early reports (Randall 1981), but more recently it has been reported at 5° S and 3° N (see, for example, Froese and Pauly 2011, Allen and Erdmann 2012), so could now be

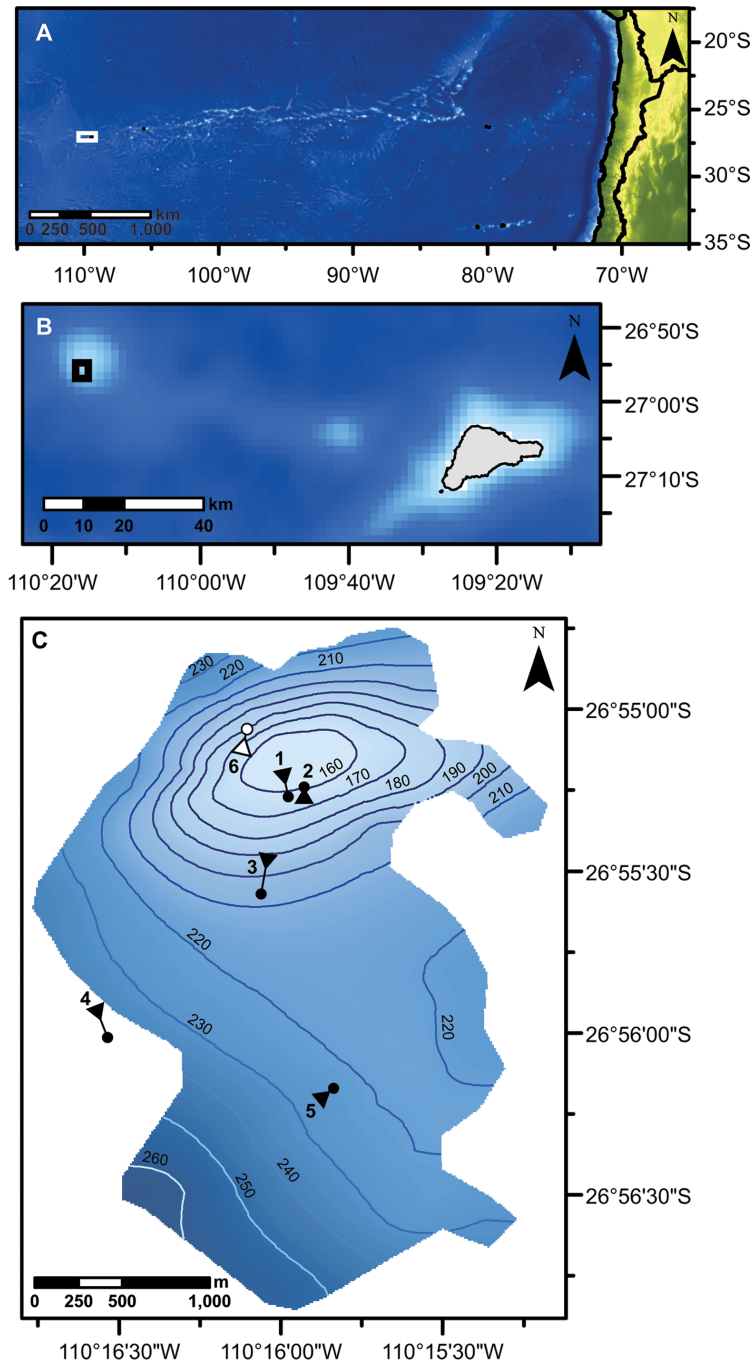


FIGURE 1. Map of the location of (C) Pukao seamount relative to (B) Easter Island and (A) continental Chile. The extent of (B) is indicated in (A) by the white outline, and the extent of (C) is indicated by the black outline in (B). Remotely operated vehicle transects at Pukao began at the filled arrows and ended at the filled circles; the white arrow and circle indicate the transect on which two individuals of *Myripristis chryseres* were observed.

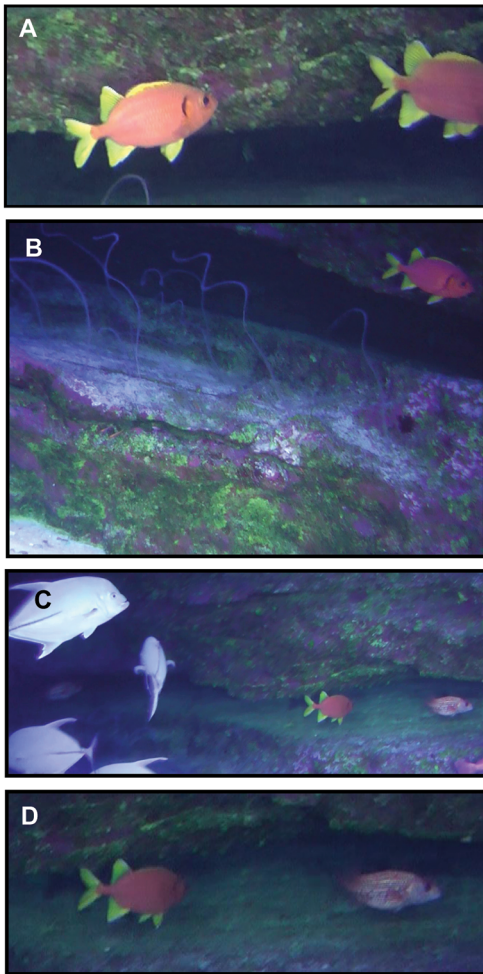


FIGURE 2. Images (A–D) of the two individuals of *M. chryseres* that were observed swimming at 163 m along and into a crevice that was ~1 m above the seafloor in a ~3-m-tall rock cliff. They were observed at ~2015 hours during transect 6, which started at 26° 55.142' S, 110° 16.123' W and ended at 26° 55.046' S, 110° 16.100' W (Figure 1). (Photo: Oceana/Matthias Gorny.)

considered a tropical or antiequatorial species with a latitudinal range that extends to 31° S and 28° N in the Indian and western Pacific Oceans. Before this report, the easternmost reports for this species are Hawai'i in the North Pacific and the Tuamotus of French Polynesia in the South Pacific (Allen and Erdmann 2012, GBIF 2016). This report expands its geographic range ~3,800 km eastward and is the first report of this species in the eastern Pacific. This range expansion could

be indicative of the lack of studies and the sampling methods used in the South Pacific, especially at mesophotic and deeper depths. Further nocturnal studies and sampling with gill nets and video surveys in the eastern Pacific are necessary to determine the eastern extent of its geographic range and to determine population sizes and distributions along its geographic and depth range, especially if population size and persistence varies with interannual and intra-annual environmental variation, for example, in temperature or currents (see, for example, Randall et al. 1997).

If *M. chryseres* has pelagic larval durations (40–60 days) similar to those of its wide-ranging and relatively deep-dwelling congeners *M. berndti* and *M. jacobus* (Craig et al. 2007, and references therein), then its larvae could disperse from the western Pacific to the Easter Island Ecoregion, especially in El Niño years, and maintain genetic connectivity among its populations. Because this observation was made near the end of the relatively strong El Niño of 2015–2016, it is possible that the individuals observed were a transient pair or the result of a temporary population established due to faster than average dispersal rates proposed for associated changes in currents with El Niño. Alternatively, persistent populations in the Easter Island Ecoregion may not have been discovered previously because studies deeper than 30 m have not been done previously in the region and *M. chryseres*, because of its diet and behavior, is unlikely to be caught by artisanal fishing methods used in the area. The latter is probable and would not be the first case for the region of a recently reported, deeper-dwelling species. *Evisias acutirostris*, like *M. chryseres*, has recently been reported with isolated records from Easter Island (Hernández et al. 2015); however, we regularly observed *E. acutirostris* in subsequent surveys, including this one at Pukao.

The distance from Easter Island to other lands likely contributes not only to the lack of studies but also to the relatively low species richness of fishes in shallow waters (Friedlander et al. 2013, Wieters et al. 2014). In contrast, seamounts may provide habitat for and enable connections among populations of deeper-dwelling species, such as *M. chryseres*

and *E. acutirostris*, and therefore harbor relatively rich communities of fishes. Preliminary surveys at mesopelagic depths at Easter Island and Salas y Gómez have found relatively high richness at ~150–300 m relative to shallow depths (<40 m) (Easton et al. 2016). The seamounts between French Polynesia and the eastern Salas y Gómez Ridge have not been surveyed, so future surveys, using advanced collection and observational technologies, are needed to evaluate the relative richness of these communities and how extensive the connection is among seamounts.

The observed specimens are consistent with *M. chryseres*, which is the only species of the genus with the characteristic solid bright-yellow fins (Randall and Guézé 1981, Randall and Greenfield 1999). Nevertheless, due to the large distance and potentially limited connectivity between *M. chryseres* populations of the Easter Island Ecoregion and the Indo-West Pacific, it is also possible that the observed specimens represent a genetically distinct population or a potential new species that closely resembles *M. chryseres*. This possibility is supported by Easter Island having a high percentage of endemic fishes and other fauna and by recent observations at similar depths of numerous potential new species of fishes that are morphologically similar to congeners in the Indo-West Pacific and Hawaiian archipelago (see Easton et al. 2016). Therefore, collection of specimens is critical for future studies of presumed *M. chryseres* from the Easter Island Ecoregion and connectivity among its populations.

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