

Short Communication

First report of the hapuku wreckfish *Polyprion oxygeneios* (Polyprionidae) in Argentinian waters

Andrés C. Milessi¹ , Agustín M. De Wysiecki² , Alfredo Carvalho Filho³  & Rodrigo Wiff^{4,5} 

¹Comisión de Investigaciones Científicas de la Provincia de Buenos Aires, Buenos Aires, Argentina

²Centro para el Estudio de Sistemas Marinos, Consejo Nacional de Investigaciones Científicas y Técnicas
Puerto Madryn, Argentina

³Fish Bizz Ltda., São Paulo, Brasil

⁴Center of Applied Ecology and Sustainability (CAPES-UC), Pontificia Universidad Católica de Chile
Santiago, Chile

⁵Instituto Milenio en Socio-Ecología Costera (SECOS), Chile
Corresponding author: Andrés C. Milessi (andresmilessi@yahoo.com)

ABSTRACT. The hapuku wreckfish *Polyprion oxygeneios* is recorded for the first time in Argentinian waters. Four specimens were caught off Mar del Plata (38°S, Argentina) in depths between 60 and 260 m during austral summer (three by sport fishers and one in a research cruise). Up to the present, this species was consistently misidentified with its congener, the common wreckfish *P. americanus*, off Argentina. These records represent a connection between previous records from Brazil and the more austral circumglobal distribution of the species.

Keywords: *Polyprion oxygeneios*; bluish grouper; circumglobal distribution; counter-shaded; rocky fishes; southwest Atlantic

The hapuku wreckfish *Polyprion oxygeneios* (Schneider & Forster, 1801) is one of the species of the genus *Polyprion* (two species worldwide) found in the southern hemisphere around southern Australia, southern Brazil, South Africa, Chile, and New Zealand at depths between 50 and 854 m (Paxton et al. 1989, Pequeño & Sáez 2000, Barreiros et al. 2004). It is a large, slow-growing, long-lived species that can reach up to 160 cm total length, and it can weigh up to 100 kg over a life span of 60 years, reaching sexual maturity at around seven years (Francis et al. 1999, Wakefield et al. 2010). They inhabit mostly crevices, caverns, or caves when living in shallow waters. They are voracious predators, foraging on a large range of other fish species, mollusks, and crustaceans (e.g. Rojas et al. 1985). It is locally misidentified as the more common wreckfish *P. americanus* (Bloch & Schneider, 1801). However, the hapuku wreckfish is easily distinguished by its slenderer body and counter-shaded dichromatism (bluish-grey) compared to the deeper-bodied, uniform-colored (brownish-grey) common wreckfish

(Roberts 1989). The hapuku wreckfish also has a more concave caudal fin, smaller eyes, and more projecting jaws (Barreiros et al. 2004).

The hapuku wreckfish has an exclusive southern circumglobal distribution in temperate-cold waters from 28 to 43°S, as opposed to the common wreckfish that also occurs across north Atlantic waters (Paxton et al. 1989, Froese & Pauly 2019). Particularly in the southwest Atlantic Ocean, its distribution was not documented until records from southern Brazil were published (Barreiros et al. 2004). To date, only the common wreckfish is documented in Argentinian waters (Cousseau et al. 1998), which is caught in coastal and shelf areas by trawlers (Bovcon et al. 2013), and near rocky reefs off Mar del Plata, Argentina (38°00'S, 57°30'W) by sport anglers year-round (A. Milessi, *pers. obs.*). Here, the first report of the hapuku wreckfish, which is largely misidentified in Argentinian waters, is presented for the first time based on fishers' local ecological knowledge (LEK). Records also represent a connection between southern Brazilian

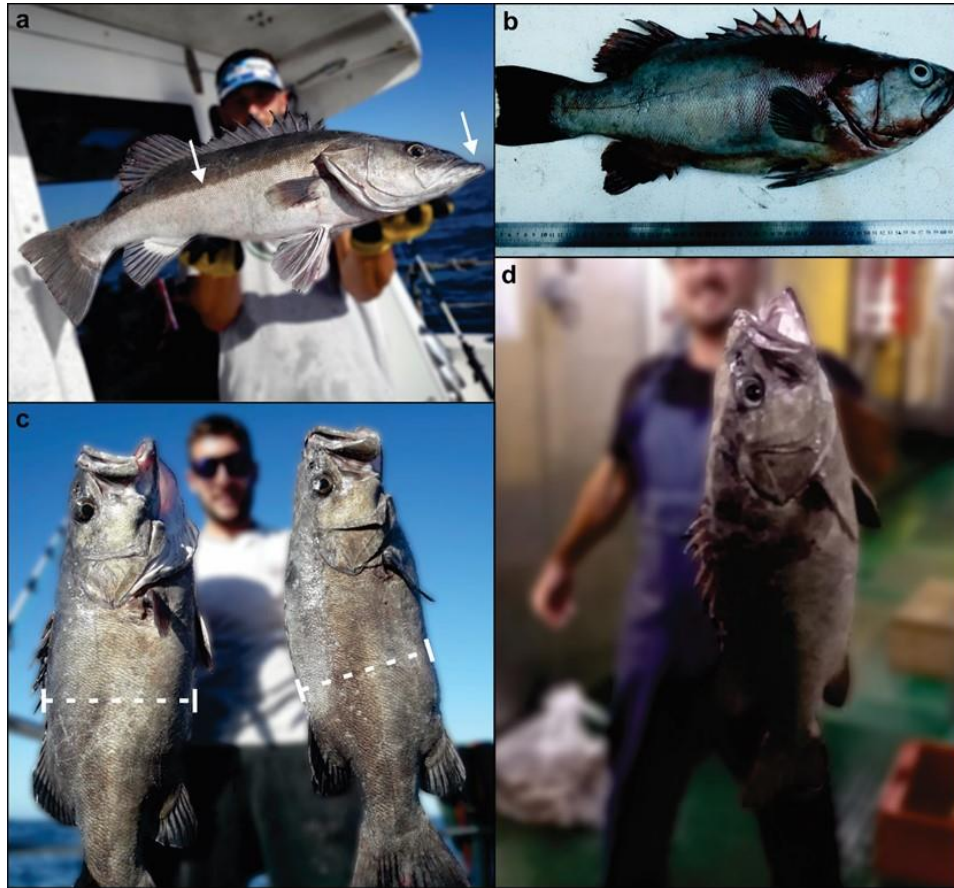


Figure 1. Photographic evidence of the first hapuku wreckfish *Polyprion oxygeneios* records reported off Argentina, including a) freshly caught, b) sampled, c) a few hours dead specimens from S/V Mako at ca. 60 m depth, and d) an hour dead specimen from research cruise R/V Víctor Angelescu. In picture c), both the hapuku wreckfish (right) and the common wreckfish *P. americanus* (left) are shown for morphological comparison. Main distinguishable features in a) coloration and jaw projection (arrows), and b) body size (dashed segments) are indicated. Note that the hapuku wreckfish specimen in pictures b) and c) is the same individual.

records and the more austral southern circumglobal distribution of the hapuku wreckfish. Additionally, we discuss biogeographic hypotheses that may explain the presence of this species in the southwest Atlantic.

The LEK obtained from three expert sport anglers indicated the two wreckfish species' presence (*P. americanus* and *P. oxygeneios*) in Mar del Plata (Argentina) since 2009. Anglers stated that the hapuku wreckfish is occasionally caught at depths larger than 60 m. They also stated that the species is consistently misidentified with the common wreckfish, even though they are easily distinguishable when fresh, one of them being bluish and elongated and the other one brownish and more frequent. Under this local knowledge, four catch records (three photographs and one specimen) were recently identified as the hapuku wreckfish following Roberts (1989). It is important to note that the LEK presented here is related to the fishermen's

individual experiences and other records before the year 2009 may have occurred.

On June 16, 2018, sport anglers on board the S/V Mako (11.8 m long, two 280 HP inboard motor) caught, measured (total length, TL), and weighed (total weight, TW) a specimen (45 cm TL and 3.7 kg TW) locally known by the fishermen as 'chernia verdolina' (Fig. 1a). On December 23, 2018, sport anglers on-board the S/V Raptor (9.5 m long, one 280 HP inboard motor) caught another similar specimen. Although we were not able to access this specimen because it was commercialized, a photograph of fish in fresh was provided by the anglers, in addition to the weight and longitude (~3 kg TW, ~40 cm TL). Another specimen was caught on February 17, 2019, by the S/V Mako team at depths of 60 m. This specimen was taken to the laboratory, where it was identified and sampled (immature female of 60 cm TL and 3.195 kg TW, Fig. 1b). Even though the

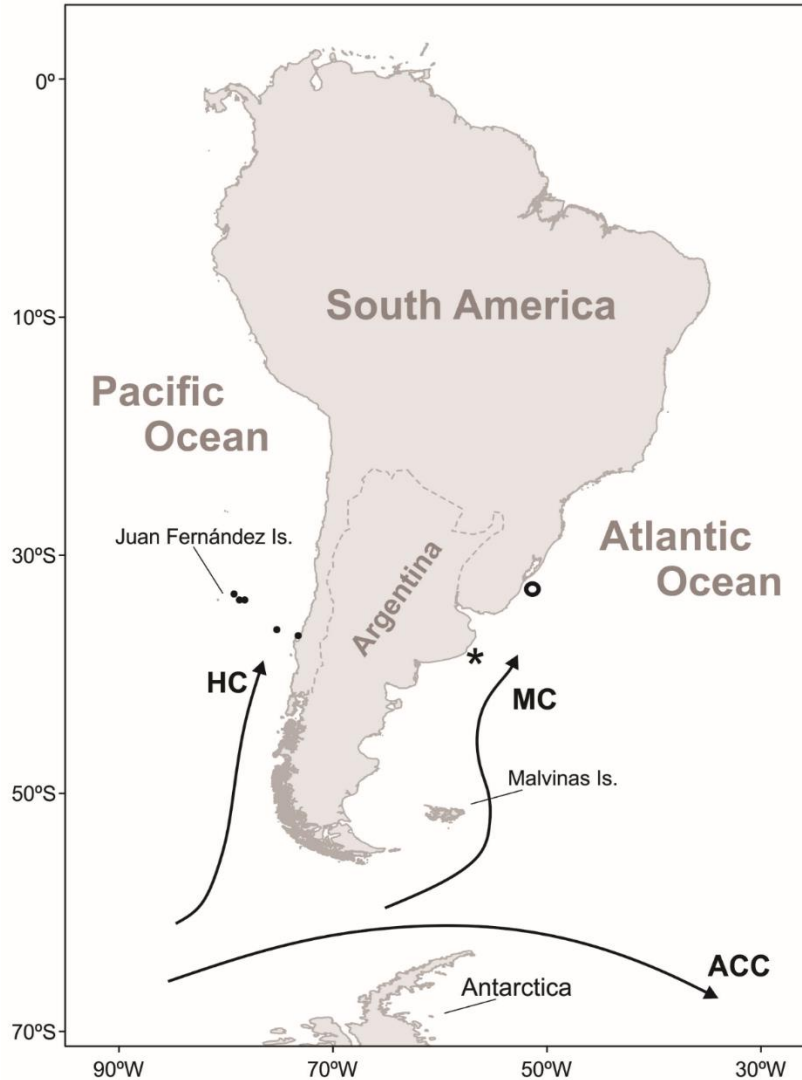


Figure 2. Map of South America and Antarctica showing the location of the hapuku wreckfish *Polyprion oxygeneios* records documented for the Atlantic Ocean in Argentina (*present study) and Brazil (◐Barreiros et al. 2004), and for the Pacific Ocean in Chile (•records are taken from FishBase, Froese & Pauly 2019). A schematic representation of the main cold currents mentioned in the text is shown. ACC: Antarctic Circumpolar Current, MC: Malvinas Current, and HC: Humboldt Current.

color of the species rapidly changes after its death it can still be identified by its more slender body than the common wreckfish (Fig. 1c). On May 2019, a fourth specimen was caught on-board research cruise R/V Víctor Angelescu of the Instituto Nacional de Investigación y Desarrollo Pesquero (Argentina) at 260 m depth (~50 cm TL, ~5 kg TW), but this specimen was not preserved and only photographic evidence was provided (Fig. 1d).

Based on LEK, photographs, and specimens, the two wreckfish species of *Polyprion* are better distinguished by their color pattern. The freshly caught hapuku wreckfish presents a bluish-grey counter-

shaded color pattern, whereas a brownish-grey uniform tabby pattern characterizes the common wreckfish. Once dead, both species lose pigmentation to a uniform pale grey; hence they can only be identified by slight differences in body size and jaw projection (i.e. greater height:length ratio and more projecting jaws; Roberts 1989, Barreiros et al. 2004).

Records reported in the present study represent the first documented/scientific evidence of the hapuku wreckfish occurrence on the Argentinian coast. It appears that the distinction between the two species was largely prevented until now since the body coloration of the hapuku wreckfish and the common

wreckfish are similar when specimens are dead. The LEK from expert fishers played a crucial role as a base ground for scientists to report species usually confound by their external anatomical features. In this context, cooperation between scientists and the fishing community can potentially lead to more advanced taxonomic identification levels. Correct species identification is essential to ensure more effective conservation measures. In recent years, sport fishermen's information has been important to correctly classify morphologically similar species (Lyon et al. 2018), and thus, anglers can also be seen as cost-efficient sources of valuable biological data for recreational species. The LEK and morphological analysis usually allow for a preliminary assessment of putative species identification that can later be confirmed or rejected by more precise and costly genetic analysis. In the case of the *Polyprion* genus, Ball et al. (2000) confirmed the hapuku wreckfish as an outgroup from common wreckfish populations found in different regions of the world, confirming species differentiation between the two.

The occurrence of the species off Argentina (present study) and Brazil (Barreiros et al. 2004) may be explained by the drift of the Malvinas Current, which is a cold and nutrient-rich branch of the Antarctic Circumpolar Current that flows north along with the continental shelf break of Argentina and southern Brazil (e.g. Matano et al. 2010; Fig. 2). Recently, Brun et al. (2020) using historical and new high-resolution hydrographic data, revealed a net eastward water transport from the Pacific Ocean to the Atlantic Ocean, which may act as a dispersion agent to fish species and other marine organisms. This mechanism is regarded as the main explanation for cold-water and circumpolar marine species presence across warm-temperate and subtropical waters in the southwest Atlantic region. Similarly, the hapuku wreckfish records from Juan Fernández Archipelago (Sepúlveda & Pequeño 1985, Pequeño & Lamilla 2000) and continental and southern region of Chile (Arana 1992, Pequeño & Sáez 2000) may be a result of the northward extension of the cold Humboldt Current (Fig. 2). A few other fish species with a southern circumglobal distribution have recently been reported in Argentinian waters, suggesting amphioceanic connectivity between the Pacific and Atlantic oceans (Whöler & Scarlato 2006, Waessle & Milessi 2013, Bovcon et al. 2017, San Martín et al. 2017). Further amphioceanic connectivity has been proposed for crustaceans (e.g. Vinuesa 2005) and mollusks (e.g. Brunetti et al. 1999) in the region. It is probably a result of the broader Antarctic circumpolar mechanism proposed by Bovcon et al. (2017), which connects the Pacific, Indian, and Atlantic oceans. Sporadic records may also be explained by the member-vagrant

hypothesis, in which members are considered dense-independent losses from the original populations (Sinclair & Iles 1989). However, the hypotheses mentioned above are only possible biogeographic explanations that cannot be empirically tested.

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