

Range extension of *Sanopus splendidus* (Actinopterygii: Batrachoidiformes: Batrachoididae) in the Caribbean Sea

Extensión de rango del *Sanopus splendidus* Actinopterygii: Batrachoidiformes: Batrachoididae) en el mar Caribe

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ABSTRACT

This paper records the presence of the splendid toadfish *Sanopus splendidus* Collete, Starck & Phillips, 1974, an endemic species from the Mexican Caribbean in two sampling sites in the Costa Occidental de Isla Mujeres, Punta Cancún y Punta Nizuc National Park (Mexico). Two individuals were photographed by sport divers. This is the northernmost record of this species in the Caribbean, broadening the known range by approximately 105 km from their type locality (Cozumel Island).

Keywords: splendid toadfish, new record, Mexico, endemic species, fish

RESUMEN

En este trabajo registramos la presencia del sapo espléndido *Sanopus splendidus* Collete, Starck & Phillips, 1974, especie endémica del Caribe mexicano en dos localidades, en el Parque Nacional Costa Occidental de Isla Mujeres, Punta Cancún y Punta Nizuc (México). Buzos deportivos fotografiaron dos individuos. Este es el registro más al norte para esta especie en el Caribe y extiende su área de distribución en 105 km desde su localidad tipo (Isla Cozumel).

Palabras clave: sapo espléndido, nuevo registro, México, especie endémica, peces

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INTRODUCTION

Batrachoididae is the only recorded family in the fish order Batrachoidiformes and is comprised of 23 genera and 83 validated species worldwide (Nelson *et al.* 2016). In the Western Central Atlantic, 23 species occur in seven genera (Greenfield *et al.* 2008). Most of the toadfish are benthic, are distributed in marine brackish waters and can be occasionally found in rivers, like some species from South America. These fish range from small to medium size (up to 57 cm), have a broad body and flattened head, and are often ornamented with barbels and fleshy flaps around their large mouths. They are generally dark brown with some spots on their backs (Collette, 2003, Greenfield *et al.* 2008).

The *Sanopus* genus is represented by two endemic species in the Caribbean, *Sanopus johnsoni* and *Sanopus splendidus* (Collette, 1974, Schmitter-Soto *et al.* 2000). This paper documents the presence of the splendid toadfish *S. splendidus* Collette, Starck & Phillips, 1974 in two sites within the Costa Occidental de Isla Mujeres, Punta Cancun y Punta Nizuc National Park in the Mexican Caribbean Sea, which expands their known distribution range by approximately 105 km north.

MATERIALS & METHODS

This report is based on the observation of two *S. splendidus* individuals, which were photographed by sport divers within the Costa Occidental de Isla Mujeres, Punta Cancun y Punta Nizuc National Park in the Mexican Caribbean Sea (Fig. 1). The two individuals were identified by comparing photographs to the original description (Collette, 1974) and the work of Humman and Deloach (2014). In order to obtain additional records of the organisms, several online data bases were consulted, including Fishbase (Froese & Pauly, 2017), the Global Biodiversity Information Facility (GBIF) Data Portal, Ocean Biogeographic Information System (OBIS), and Shorefishes of the Greater Caribbean online Information System (Robertson & Van Tassell, 2017), complemented with a broad literature review.

RESULTS

The first individual was photographed in the Herradura Reef on December 24th, 2016, at a depth of 16.7 m., hidden in a cave with a sandy bottom. The second specimen was observed and photographed on April 20th, 21st, and 22nd, 2017 in the Manchones Reef, at a depth of 9.1 m (Fig. 2). Both reefs are separated by a distance of approximately seven kilometers.

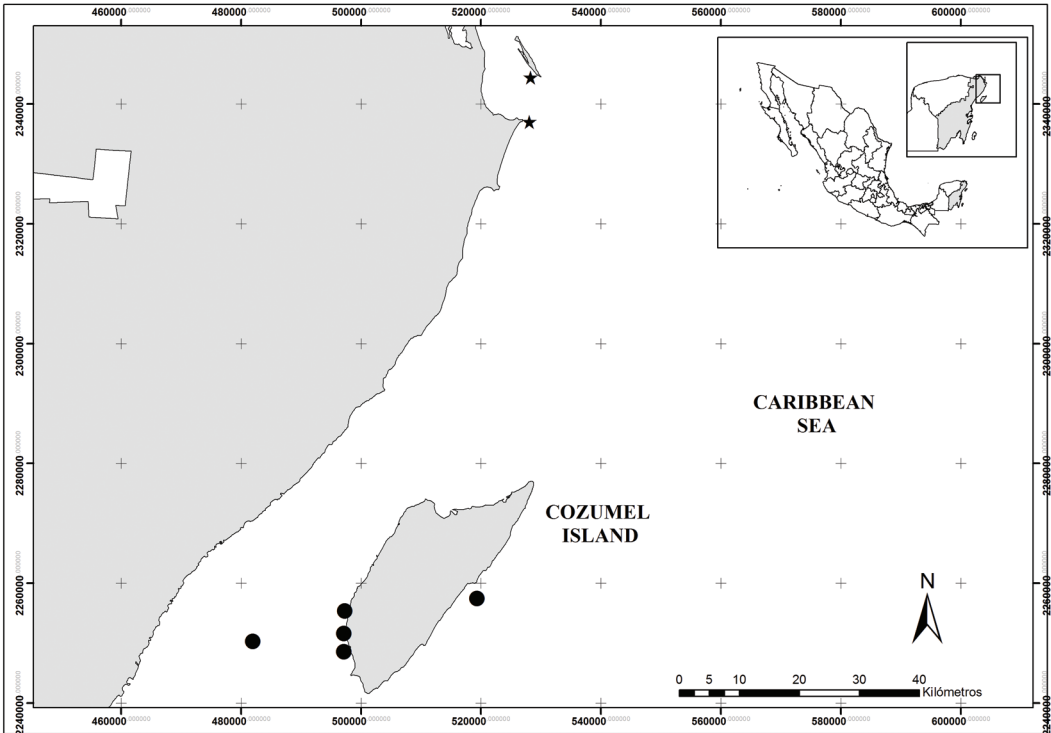
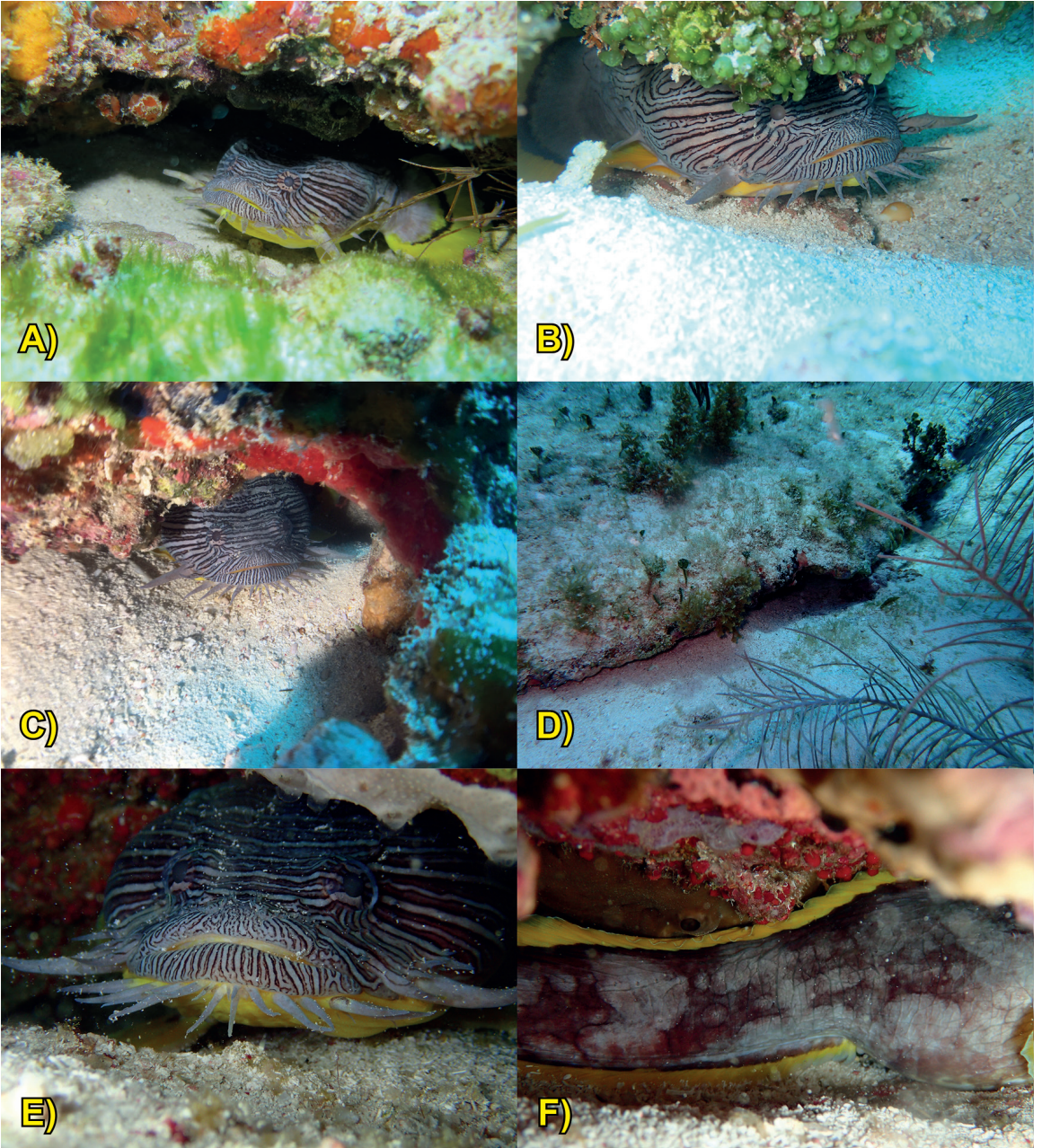


Fig 1. Map showing the records of *Sanopus splendidus* in the Mexican Caribbean Sea. Black stars indicate the new records at the Costa Occidental de Isla Mujeres, Punta Cancun y Punta Nizuc National Park

Fig 1. Mapa con los registros de *Sanopus splendidus* en el Mar Caribe mexicano. Las estrellas negras indican los nuevos registros en el Parque Nacional Costa Occidental de Isla Mujeres, Punta Cancun y Punta Nizuc

The two individuals observed had a relatively elongated scaleless body and a large, wide, and depressed head, with branched barbels and fleshy projections, especially around the lower jaw. Some of the main features that allowed their identification are as follows. Only two central barbels are branched, and the specimens have no

cirrus between their eyes. The front nostrils are tubular and the gill openings are restricted to one side before the pectoral fin base. The gill plate presents two solid spines in the upper corner and one in the lower one. The head coloration is brown with white lines forming a zebra-like pattern, whereas the body is dark greyish



◀ Fig. 2. *Sanopus splendidus* recorded in 2018-2019 at the Costa Occidental de Isla Mujeres, Punta Cancun y Punta Nizuc National Park., A) *Sanopus splendidus* recorded in 2019. B) *S. splendidus* specimen in the Manchones Reef with a total length (TL) of 25-30 cm. C) Habitat of the second individual in the Herradura Reef at 16.1 m. deep. D) *S. splendidus* specimen with a total length (TL) of 15 cm. E) Front view of individual photographed in the Herradura Reef. F) Lateral view of individual photographed in the Herradura Reef. Photos credit to Patricio Caro

Fig. 2. Registro de *Sanopus splendidus* de 2018-2019 en el Parque Nacional Costa Occidental de Isla Mujeres, Punta Cancún y Punta Nizuc. A) *Sanopus splendidus* registrado en 2019. B) Ejemplar de *S. splendidus* en Arrecife Manchones 25-30 cm de longitud total (LT). C) Hábitat del segundo individuo en Arrecife Herradura a 16.1 m de profundidad. D) Individuo de 15 cm de longitud total (LT). E) Vista frontal del individuo fotografiado en Arrecife Herradura. F) Vista lateral del individuo fotografiado en Arrecife Herradura. Créditos de fotografías: Patricio Caro

brown with dark grey fins and broad yellowish orange and black bands, and pelvic fins are yellow. According to

the literature consulted, 30 occurrences have been seen of this species (25 in Mexico and 5 in Belize) (Table 1).

Table 1. Historical records of the splendid toadfish (*Sanopus splendidus*) along the Caribbean Sea. References: 1) Global Biodiversity Information Facility, 2) Ocean Biogeographic Information System, 3) Fishbase, 4) This paper, 5) Shorefishes of the Greater Caribbean, 6) Harborne (2000) N/A = Not available

Cuadro 1. Registros históricos del pez sapo espléndido (*Sanopus splendidus*) en el Mar Caribe. Referencias: 1) Global Biodiversity Information Facility, 2) Ocean Biogeographic Information System, 3) Fishbase, 4) Este informe, 5) Shorefishes of the Greater Caribbean, 6) Harborne (2000) N/A = No disponible

Locality	Site	Country	Latitude	Longitude	Depth (m)	Year	Basis of record	References
Cozumel	N/A	Mexico	20.36	87.03	9	2017	Observation	1
Cozumel	N/A	Mexico	20.38	87.1	N/A	2017	Observation	1
Cozumel	N/A	Mexico	20.41	86.81	N/A	2013	Observation	1
Cozumel	N/A	Mexico	20.39	87.01	N/A	2013	Observation	1
Cozumel	N/A	Mexico	20.4	87.03	N/A	2010	Observation	1
Cozumel	N/A	Mexico	20.35	87.17	N/A	2009	Observation	1

Locality	Site	Country	Latitude	Longitude	Depth (m)	Year	Basis of record	References
Cozumel	N/A	Mexico	20.5	86.96	N/A	2004	Observation	1
Cozumel	N/A	Mexico	20.42	86.92	N/A	1974	Specimen	1
Cozumel	N/A	Mexico	N/A	N/A	3.75	1970	Specimen	1
Cozumel	N/A	Mexico	N/A	N/A	3.75	1970	Specimen	1
Cozumel	N/A	Mexico	N/A	N/A	10	1968	Specimen	1
Cozumel	N/A	Mexico	20.34	87.03	N/A	1968	Specimen	1
Cozumel	N/A	Mexico	20.45	86.89	N/A	N/A	Specimen	1
Cozumel	N/A	Mexico	20.4488	86.8912	N/A	1971	Specimen	1
Cozumel	Palancar Reef	Mexico	20.335	87.0272	N/A	1998	Specimen	1, 2
Cozumel	Punta Tunich	Mexico	20.3963	87.0255	13.5	2010	Observation	1
Cozumel	N/A	Mexico	20.3502	87.1725	N/A	2009	Observation	1
Cozumel	N/A	Mexico	20.4992	86.9594	N/A	2004	Observation	1
Cozumel	N/A	Mexico	20.3909	87.0052	N/A	2013	Observation	1
Cozumel	Palancar Reef	Mexico	20.335	87.0272	N/A	1974	Specimen	1, 2
Cozumel	Casa Blanca	Mexico	20.3625	87.0271	9.7	2017	Observation	1
Cozumel	N/A	Mexico	20.4151	86.8143	N/A	2013	Observation	1
Cozumel	N/A	Mexico	N/A	N/A	N/A	N/A	Observation	1
Cozumel	N/A	Mexico	N/A	N/A	N/A	N/A	Observation	1
Cozumel	N/A	Mexico	N/A	N/A	N/A	N/A	Observation	3,5
Isla Mujeres	Manchones	Mexico	21.2008	86.7273	10	2016	Observation	4
Cancun	Herradura	Mexico	21.134	86.7296	16.7	2016	Observation	4
Glover's Reef	N/A	Belize	N/A	N/A	N/A	N/A	Observation	5
Turneffe Atoll	N/A	Belize	N/A	N/A	N/A	1998	Observation	6
South Water Caye Marine Reserve	N/A	Belize	N/A	N/A	N/A	1998	Observation	6
Sapodilla Cayes	N/A	Belize	N/A	N/A	N/A	1998	Observation	6
Snake Cayes	N/A	Belize	N/A	N/A	N/A	1998	Observation	6

DISCUSSION

This paper confirms the presence of *S. splendidus* in other locations of the Caribbean Sea, broadening its range extension by ~105 km north. This species has been previously recorded in only two locations within the Caribbean Sea, first in its type locality, Cozumel Island (Collete, 1974, Greenfield *et al.* 2008), and second in Glover's Reef (Belize). According to interviews to sport divers operating in the area, *S. splendidus* has been sighted in the Manchones Reef since 2009, concurring with the opening of the Submarine Art Museum. The specimen photographed in this reef lives very close to the statue known as "El Volcho" and, due to its high habitat specificity, it has become another attraction for sport divers operating in the area. In addition, the divers interviewed mentioned also spotting this fish in nearby reefs (Grampin, Cementerio de Caracoles, and Barco Hundido); however, there is no photographic evidence supporting these observations.

According to the IUCN, *S. splendidus* and *S. reticulatus* are endangered species (Collete *et al.* 2015) due to their restricted distribution and various human threats such as overfishing, habitat destruction, pollution, and climate change. The data in this paper suggests a wider distribution in the region, which creates the need for actions

towards their conservation. This is especially necessary if we consider that the diver fishermen that fish for spiny lobster indicate they have not seen this species in their fishing areas, which are located near other protected natural areas such as Xcalak Reef National Marine Park (near Belize), Puerto Morelos Reef National Marine Park (central area), and the State of Yucatán.

We wish to thank Yuri Hernández, Patricio Caro, and Mami Ikegaya from Solo Buceo Dive shop for the information and photographs provided of this species and the diver fishermen from Puerto Morelos, Xcalak, and Yucatán for informing us about the absence of the species in their area. We would also like to thank Ross Robertson for his feedback to improve the paper.

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