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First record of *Heptranchias perlo* (Bonnaterre 1788) in Guatemala's Caribbean Sea

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Abstract

Background: This report represents the first record of the sharpnose sevengill shark *Heptranchias perlo* in Guatemala's Caribbean Sea.

Methods: Two *H. perlo* specimens were captured by artisanal fishermen of the coastal community, El Quetzalito. All specimens were captured with a trammel net, in waters of 200 m depth

Results: Both specimens were female with total lengths of 280 and 370 mm. Details regarding the identification and measurement of both specimens are presented.

Conclusion: These specimens represent the first record of both species in Guatemalan waters. Also, this report further increases the species' range of distribution in the Caribbean and Central America.

Keywords: First record, Deep-water sharks, Hexanchidae, Caribbean

Background

The family Hexanchidae includes three genera and four described species: *Hexanchus* Rafinesque 1810, *Heptranchias* Rafinesque 1810, and *Notorynchus* Ayres 1855 (Ebert and Stehmann 2013). Hexanchidae sharks have a worldwide distribution in cold temperate to tropical seas. Most species in the family are deepwater inhabitants of the outer continental shelves, upper continental slopes, insular shelves and slopes, and submarine canyons down to at least 2500 m depth, occurring in both benthic and neritic (Carpenter 2002; Ebert and Stehmann 2013).

The sharpnose sevengill shark, *Heptranchias perlo* (Bonnattere1788), is uncommon through its range and many aspects of its biology are poorly known. *H. perlo* has been known to occur primarily in deep waters down to 1000 m (Compagno et al. 2005; Ebert et al. 2013).

The sharpnose sevengill shark occurrence in the Western Atlantic has been reported in Mexico, Jamaica, Bahamas (USA), Cuba and Panama (Bonfil 1997; Claro and Parenti 2001; Paul and Fowler 2003; McLaughlin and Morrissey 2004; Kyne et al. 2012; Benavides et al. 2014). The importance of this study lies in the fact that it represents the first confirmed record of occurrence of *H. perlo* in Guatemala's Caribbean Sea. Currently, *H. perlo* is listed as "Near Threatened" by the International Union for the Conservation of Nature's Red List (Paul and Fowler 2003).

Methods

On the 20th March 2016, two female sevengill sharks were captured by artisanal fishermen in Guatemala's Caribbean Sea and landed in the coastal village of El Quetzalito, Izabal (15° 49.776 N, -88° 12.340 W) (Fig. 1). All specimens were captured with a 1000 m long bottom trammel net of 3.5 inches mesh size and one panel. Specimens were captured at approximately 200 m depth, based on known length of net deployed. All specimens were examined and identified to species level using identification guides (Compagno 1984; Compagno et al. 2001).

Both specimens were preserved in formaldehyde (10%) and subsequently transferred to ethyl alcohol (70%) for final preservation. Both sevengill shark specimens were deposited in the Laboratory of Biological Science and Oceanography, Centro de Estudios del Mar y Acuicultura (CEMA) of the Universidad San Carlos de Guatemala

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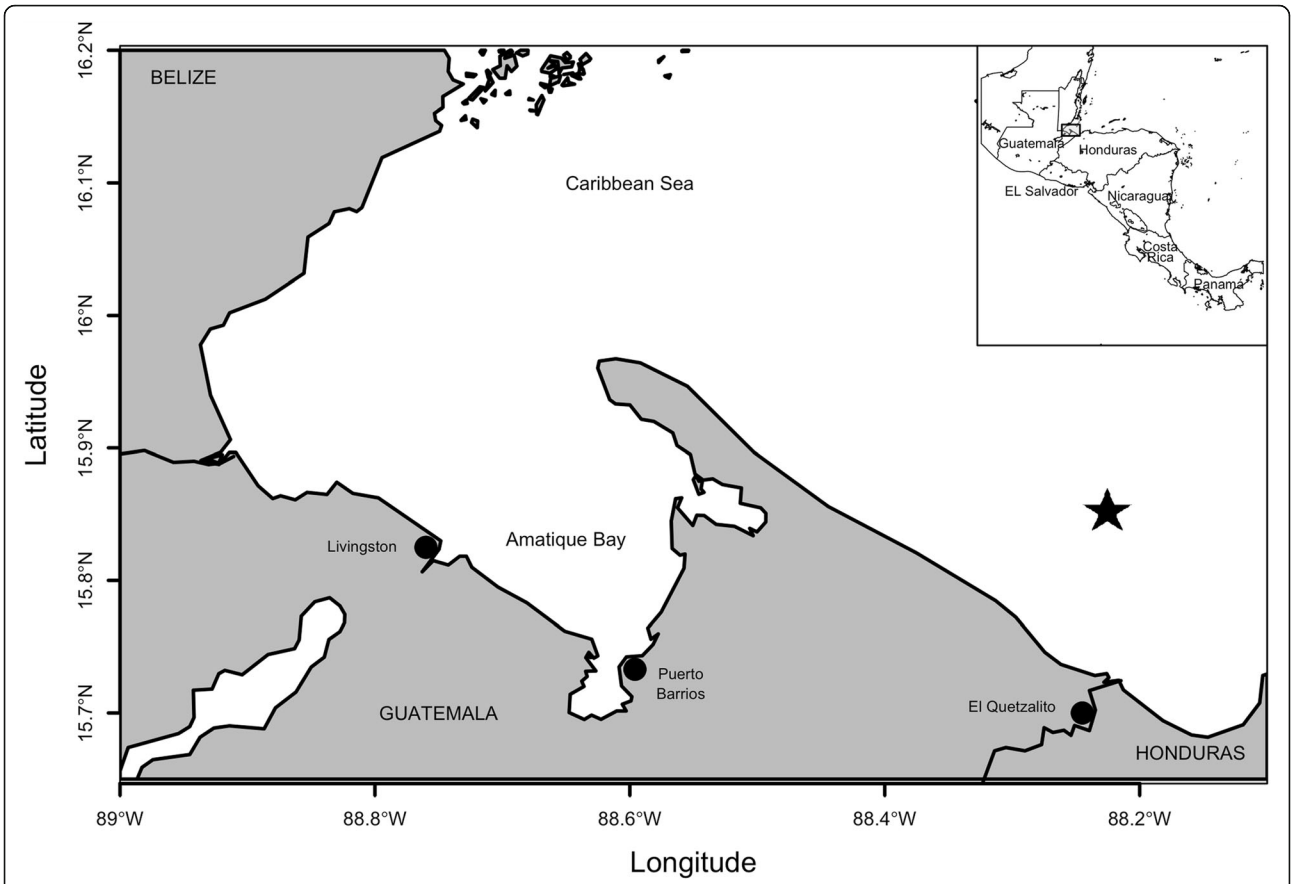

Fig. 1 Study area with location (⋆) of capture in relation to the fishing village of El Quetzalito

(USAC). The specimens are part of the collection registered to the Consejo Nacional de Áreas Protegidas (CONAP) under the reference number (Rf) 250 and 251. Measurements were taken on the sevengill shark specimens using a vernier calipers or measuring tape, as proposed by Compagno (2001). A total of 80 morphometric measurements were taken (Compagno 2001).

Results

Systematic account

Family: Hexanchidae

Genus: Heptranchias Rafinesque, 1810

Heptranchias perlo (Bonnaterre, 1788)

Common name: Sharpnose sevengill shark, cañabota (local name)

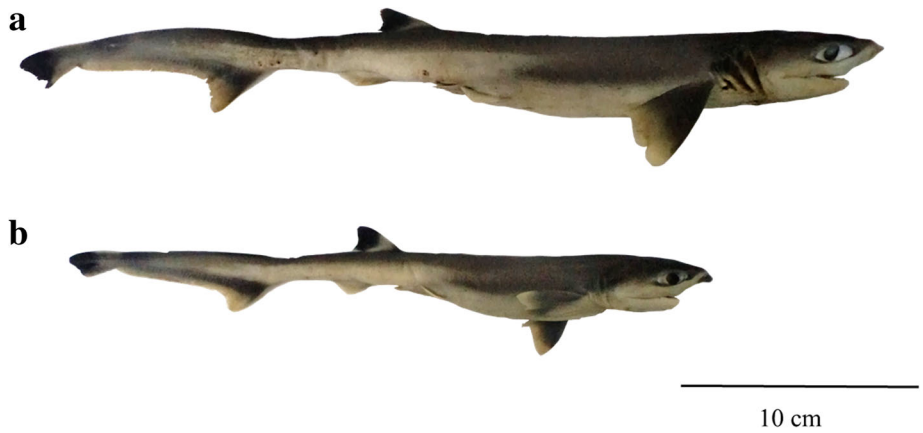

Fig. 2 *Heptranchias perlo*: **a**. Rf250, female, 370 mm TL and (**b**). Rf251, female, 280 mm TL

Table 1 Morphometric measurements (mm) of individuals of two female specimens of *Heptranchias perlo*

Measurements	Rf250	Rf251
Total length	370	280
Fork length	280	210
Precaudal fin length	260	190
Pre-first dorsal-fin length	179.6	136.2
Head length	80.5	62.9
Prebranchial length	62.6	51.6
Prespiracular length	55.4	44.1
Preorbital length	21.9	18.5
Prepectoral-fin length	73.3	59.1
Prepelvic-fin length	157.1	166.7
Snout-vent length	171.1	123
Preanal-fin length	199.7	143.1
Dorsal caudal-fin space	45.9	37
Pectoral-fin pelvic-fin space	60.3	35
Pelvic-fin anal-fin space	25.2	16
Anal-fin caudal-fin space	34.4	25.3
Pelvic-fin caudal-fin space	72.9	56.2
Vent caudal-fin length	149.5	127.5
Prenarial length	10.8	6.5
Preoral length	19.4	16.5
Eye length	20.2	14.7
Eye height	7	4.1
Intergill length	22.3	10.3
First gill slit height	25.5	16.6
Second gill slit height	21.6	13.1
Third gill slit height	18.8	10.8
Fourth gill slit height	16.9	9.1
Fifth gill slit height	15.4	8.9
Sixth gill slit height	14.4	7.3
Seventh gill slit height	13	6.4
First dorsal-fin length	30.5	21.1
First dorsal-fin anterior margin	29.1	22.9
First dorsal-fin base	23.5	16.3
First dorsal-fin height	16.7	10.8
First dorsal-fin inner margin	7	5.4
First dorsal-fin posterior margin	15.2	12.8
Pectoral-fin anterior margin	44.6	32.2
Pectoral-fin base	38.2	26.2
Pectoral-fin inner margin	22.2	12.6
Pectoral-fin posterior margin	32.8	22.4
Pectoral-fin height	35.9	24.3
Dorsal caudal-fin margin	112.8	92.5
Preventral caudal-fin margin	28.6	21.8
Upper postventral caudal-fin margin	57.1	42.9
Lower postventral caudal-fin margin	16.8	8.2
Caudal-fin fork width	20.3	19.1
Caudal-fin fork length	27.5	24.1
Subterminal caudal-fin margin	16.5	13
Subterminal caudal-fin width	8.2	4.2
Terminal caudal-fin margin	12.4	11
Terminal caudal-fin lobe	17.5	12.3
Pelvic-fin length	34.9	27.1
Pelvic-fin anterior margin	15.4	10.6
Pelvic-fin base	20.6	14.5
Pelvic-fin height	9.8	9.5
Pelvic-fin inner margin [length]	12.3	10.5
Pelvic-fin posterior margin [length]	24.6	16.9
Anal-fin length	26.7	18.4
Anal-fin anterior margin	15.4	10.7
Anal-fin base	20.2	13.6
Anal-fin height	9.9	7.6
Anal-fin inner margin	6.3	4.7
Anal-fin posterior margin	15.4	12.6
Head height	28.7	20.5
Trunk height	20.7	12.9
Abdomen height	20.8	11.8
Tail height	17.8	10.8
Caudal-fin peduncle height	14.2	9.3
Mouth length	36.9	28.4
Mouth width	22.7	17.4
Nostril width	5.7	3.5
Internarial space	11	6.4
Interorbital space	20	14.9
Spiracle length	1.9	0.9
Eye spiracle space	12.5	9.4
Head width	29.7	19.7
Trunk width	24.9	18.1
Abdomen width	9.6	8.3
Tail width	14.5	10.7
Caudal-fin peduncle width	6.1	4.8

Material examined

Rf 250: female, 370 mm TL (Fig. 2a, Table 1); Rf 251: female, 280 mm TL (Fig. 2b, Table 1).

Description

Small shark with seven pairs of gill openings. Slender body. Head extremely narrow and pointed, with large eyes

and narrow mouth. Dorsal coloration brownish grey, with lighter coloration below. One spineless dorsal fin with black apex.

Discussion

This report represents the first record of *H. perlo*, in Guatemala's Caribbean Sea. In the Caribbean of Central America, *H. perlo* has only been reported for Panama (Benavides et al. 2014). During a deep water fishery survey using bottom trawling along the Caribbean coast of Central America, three *H. perlo* individuals were captured in Panama (Benavides et al. 2014); one female (670 mm TL) and two male (750–820 mm TL), sizes greater than the specimens reported in this study. Additionally, the capture depth of *H. perlo,* approx. 200 m (this study), coincides with the range describe by the species (Ebert and Stehmann 2013; Benavides et al. 2014). Knowledge of *H. perlo* biology is limited. A reproductive study conducted in the southwestern waters of Kyushu, Japan report *H. perlo* maturity of female is reached between 950 mm and 1050 mm (Tanaka and Mizue 1977). Moreover, birth size of *H. perlo* is 260–270 mm (Tanaka and Mizue 1977), close to that obtained in this study for Rf 251 specimen (280 mm TL).

Globally, this species is of minor commercial importance and occurs mostly as bycatch in bottom trawl and longline fisheries which may have caused population declines where deepwater fisheries have been practiced in the last decade. According to artisanal fishers in the region, *H. perlo* is rarely captured by the area's local fishermen, and is only captured incidentally when fishing with trammel nets. When captured, fishers rarely utilize the meat due to the species' small size although they render the liver for shark oil.

Conclusion

To date, reports regarding shark diversity of Guatemala´s Caribbean Sea are scare (Thorson et al. 1966; Hacohen-Domené et al. 2016; Polanco-Vásquez et al. 2017). This study forms the first confirmed records of *H. perlo* in Guatemala's Caribbean Sea and increase the number of known shark species in Guatemala. This report further increases the species' range of distribution throughout the Caribbean and Central America. This study highlights the need for comprehensive deep-sea research surveys to obtain a more complete assessment of the region's deep-water elasmobranchs.

Abbreviations

Cm: Centimeter; M: Meter; Mm: Millimeter; TL: Total length

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Availability of data and materials

The specimens are available at the Laboratory of Biological Science and Oceanography, Centro de Estudios del Mar y Acuicultura (CEMA) of the Universidad San Carlos de Guatemala (USAC). The specimens are part of the collection registered to the Consejo Nacional de Áreas Protegidas (CONAP) under the reference numbers (Rf) 250 and (Rf) 251. Additionally, photographs and dataset supporting the conclusions of this article are included.

Authors' contributions

AH and FP participated in the identification of the species, recorded the morphometric data of all specimens, and contributed to draft the manuscript. RTG contributed to draft the manuscript. All authors read and approved the final manuscript.

Competing interest

The authors declare that they have no competing interests.

Consent for publication

Not applicable.

Ethics approval

The work was carried out under permit N°00263-B, issued by the Consejo Nacional de Áreas Protegidas (CONAP), Guatemala.

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