

*Short Communication*

## New size record of the lollipop shark *Cephalurus cephalus* caught offshore Bahía Magdalena, Mexico

Mario Jaime-Rivera<sup>1</sup>, Roberto Carlos López-Archundia<sup>2</sup> & Cesar Augusto Salinas-Zavala<sup>3</sup>

<sup>1</sup>Departamento de Biología Marina, Universidad Autónoma de Baja California Sur  
La Paz, B.C.S., México

<sup>2</sup>Instituto Politécnico Nacional, Centro Interdisciplinario de Ciencias Marinas (CICIMAR)  
La Paz, B.C.S., México

<sup>3</sup>Centro de Investigaciones Biológicas del Noroeste (CIBNOR), La Paz, B.C.S., México  
Corresponding author: Mario Jaime-Rivera (carcharodonmaritus@yahoo.com.mx)

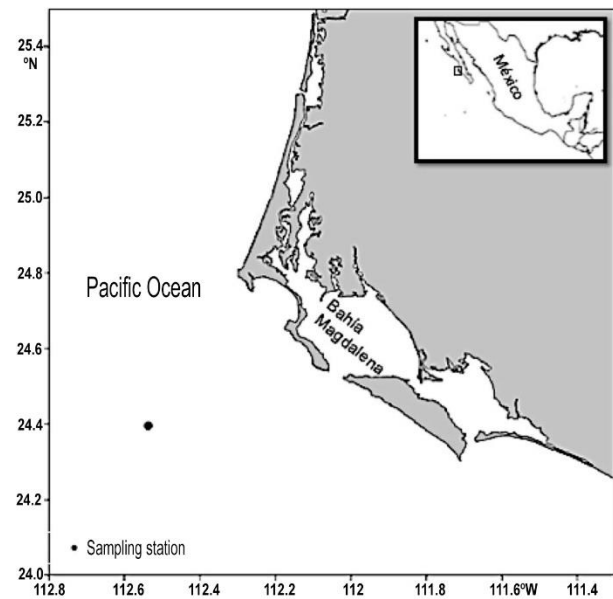
**ABSTRACT.** A new size record of the lollipop shark *Cephalurus cephalus* is described. It is a 367 mm of total length female captured offshore Bahía Magdalena, Mexico. This is a contribution to the knowledge of rare deep-sea Chondrichthyans of demersal habits.

**Keywords:** *Cephalurus cephalus*; shark; deep-sea fauna; demersal habits; Mexico

Biology of deep-sea chondrichthyan fishes is poorly known due to its infrequent capture and low or non-existent commercial value (Ruiz-Campos *et al.*, 2010). One of the less studied deep-sea sharks is the lollipop catshark *Cephalurus cephalus* (Castro, 2010). It inhabits the eastern tropical Pacific and the Gulf of California at depths of 155 to 927 m (Compagno, 1984). This fish has a body like a tadpole, broadly rounded head with a trunk that narrows to the caudal fin. Its anatomy is in accord with its demersal habits (Compagno, 1984). The lollipop catshark is a placental viviparous fish. Females have two functional ovaries and retain pairs of thin-shelled egg cases until they hatch. Neonates measure about 100 mm of total length (TL); sexual maturation is reached at a length of ~190 mm TL for males and ~240 mm TL for females (Compagno, 1984). The goal of this paper is to update the known maximum size of *Cephalurus cephalus* (see Compagno, 1984; Castro, 2011).

Sharks were caught incidentally during an exploring hake fishing campaign of the oceanographic vessel BIP XII of the Centro de Investigaciones Biológicas del Noroeste during July 2017. Fishing operation with trawling epibenthic nets lasted 40 min at a depth range of 365 m offshore Bahía Magdalena (Fig. 1).

Caught lollipop sharks were kept in ice at -4°C and carried to the laboratory. In order to determine the size structure, the total length of sharks was measured. Sharks were sexed based upon its sexual dimorphism,



**Figure 1.** Location where the lollipop sharks were caught offshore Bahía Magdalena, Mexico (24°4'N, 112°5'W).

identifying the presence (length and maturation state) of claspers. A total of 309 sharks were collected; 122 were males and 187 females. Female lengths were 83-367 mm TL, with an average of 156 mm TL. Male lengths were 85-245 mm TL with an average of 132 mm TL. A singular large female measured 367 mm and



**Figure 2.** Female of lollipop shark *Cephalurus cephalus*. a) Dorsal view, b) lateral view.

**Table 1.** Measures for the female described of *Cephalurus cephalus*.

Character	mm	% TL
Total length	367	100
Pre-caudal length	250	68.1
Preorbital length	22	6.0
Eye length	15	4.1
Eye height	5	1.4
Prenarial length	15	4.1
Preoral length	20	5.4
Tip of snout to origin of furrow above eye	10	2.7
Length of mouth	34	9.3
Width of mouth	23	6.3
Inter-narial space	10	2.7
Width of nostril	9	2.5
Length of anterior nasal flaps	5	1.4
Inter-orbital space	27	7.4
First dorsal height	17	4.6
First dorsal base	20	5.4
First dorsal length	35	9.5
Superior lobe length	19	5.2
Height of first gill slit	14	3.8
Height of fifth gill slit	10	2.7

weighted 194 g (Fig. 2). It had immature oocytes in the ovaries, there were no egg cases retained in the oviducts, the uteruses were void with no embryos, and no stomach content was found. Anatomy character measures are shown in Table 1.

Previously reported maximum TL for the species was a specimen from Chile of 320 mm (Compagno, 1984; Castro, 2011). Castro-Aguirre (1981) reported lengths for females and males of 295 and 245 mm TL,

respectively. The paratype of the species was a male of 243 mm TL described by Gilbert (Howe & Springer, 1993). Bigelow & Schroeder (1941) examined and described an immature male of 186 mm TL while established the genus *Cephalurus* for this species. Maximum lengths recorded by scarce registers are shown in Table 2. The lack of embryos and egg cases suggest that the female could undergo a reproductive event. Hatching occurs from summer to winter with no

**Table 2.** Maximum lengths recorded for *Cephalurus cephalus*. M: male, F: female, ns: not specified.

Reported maximum size (mm)	Location	Depth (m)	Reference
186 (M)	Gulf of California	662	Bigelow & Schroeder (1941)
243 (M)	Islas Revillagigedo	841	Gilbert (1892) cited by Howe & Springer (1993)
243 (F), 257 (M)	Gulf of California	464-486	Aguirre-Villaseñor & Salas-Singh (2012)
264 (ns)	Gulf of California	341-500	Mathews & Ruiz (1974)
295 (F), 245 (M)	Western coast of Baja California Sur	112-508	Castro-Aguirre (1981)
295 (F), 298 (M)	Western coast of Baja California Sur	230-280	Balart <i>et al.</i> (2000)
320 (F)	Chile	ns	Compagno (1984); Castro (2011)
367 (F), 245 (M)	Western coast of Baja California Sur	358-365	This study

defined breeding season (Balart *et al.*, 2000; Aguirre-Villaseñor & Salas-Singh, 2012).

A new size record of this cryptic shark that expands knowledge of deep-sea chondrichthyan fishes, and a new record for the species is herein reported. Data concerning the biology of *Cephalurus cephalus* are deficient (Valenti, 2009). The importance of catching this species as an incidental catch regards in the improvement of the knowledge about its population trend and conservation status.

#### ACKNOWLEDGMENTS

We wish to thank Fernando Manini for the facilities in the ship. Funding was provided by the Project “Transferencia de paquete tecnológico para la merluza, *Merluccius* productos en la costa occidental de la Península de Baja California, México” Centro de Investigaciones Biológicas del Noroeste (CIBNOR) and CONACYT.

#### REFERENCES

- Aguirre-Villaseñor, H. & Salas-Singh, C. 2012. New records of the lollipop catshark *Cephalurus cephalus* (Scyliorhinidae) from the Gulf of California, Mexico. *Revista Mexicana de Biodiversidad*, 83(1): 298-300.
- Balart, E.F., González-García, J. & Villavicencio-Garayzar, C. 2000. Notes on the biology of *Cephalurus cephalus* and *Parmaturus xaniurus* (Chondrichthyes: Scyliorhinidae) from the west coast of Baja California Sur, México. *Fishery Bulletin*, 98: 219-221.
- Bigelow, H.B. & Schroeder, W.C. 1941. *Cephalurus*, a new genus of scyliorhinid shark with redescription of the genotype, *Catulus cephalus* Gilbert. *Copeia*, 2: 73-76.
- Castro, J.I. 2011. *The sharks of North America*. Oxford University Press, Oxford.
- Castro-Aguirre, J.L. 1981. Especies de la familia Scyliorhinidae (Elasmobranchii, Galeoidea), de la costa occidental de México, con especial referencia a *Cephalurus cephalus* (Gilbert). *Anales de la Escuela Nacional de Ciencias Biológicas, México*, 24: 71-93.
- Compagno, L.J.V. 1984. *Sharks of the world: an annotated and illustrated catalogue of shark species known to date*. FAO, Rome, pp. 305-306.
- Howe, J.C. & Springer, V.G. 1993. Catalog of type specimens of recent fishes in the National Museum of Natural History, Smithsonian Institution, 5: Sharks (Chondrichthyes: Selachii). *Smithsonian Contributions to Zoology*, 540: 19 pp.
- Mathews, C.P. & Ruiz, D. 1974. *Cephalurus cephalus*, a small shark, taken in the northern Gulf of California, with a description. *Copeia*, 2: 556-560.
- Ruiz-Campos, G., Castro-Aguirre, J.L., Balart, E.F., Campos-Dávila, L. & Vélez-Marín, R. 2010. New specimens and records of chondrichthyan fishes (Vertebrata: Chondrichthyes) off the Mexican Pacific coast. *Revista Mexicana de Biodiversidad*, 81(2), 363-371.
- Valenti, S.V. 2009. *Cephalurus cephalus*. The IUCN Red List of Threatened Species: e.T161455A5428230.

Received: 9 January 2019; Accepted: 10 April 2019