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**Nota científica**

# New records of megamouth shark, *Megachasma pelagios* off Ecuador, Eastern Pacific Ocean

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The occurrence of a female and two male megamouth sharks, *Megachasma pelagios*, between November 2011 and February 2014 off Ecuador is reported. The female was 243 cm of total length (TL) and one of the males between 800-900 cm TL. All specimens were captured incidentally with surface gill nets in the artisanal fishery that aims to capture skipjack tuna *Katsuwonus pelamis* and yellowfin tuna *Thunnus albacares*. The captures were carried out in coastal areas with a high primary productivity.
**Keywords:** Artisanal fishing, surface gill nets, mega marine fauna.

## Nuevos registros de tiburón bocón *Megachasma pelagios* en aguas del Ecuador, Océano Pacífico Oriental

Se reporta la ocurrencia de una hembra y dos machos de tiburón bocón, *Megachasma pelagios*, entre noviembre de 2011 y febrero de 2014 frente a Ecuador. La hembra midió 243 cm de longitud total (LT) y uno de los machos, entre 800-900 cm LT. Todos los especímenes fueron capturados incidentalmente con redes de enmalle de superficie en la pesquería artesanal que tiene como objetivo la captura del atún barrilete *Katsuwonus pelamis* y atún aleta amarilla *Thunnus albacares*. Las capturas se realizaron en zonas costeras con alta productividad primaria.
**Palabras clave:** Pesca artesanal, redes de enmalle de superficie, mega fauna marina.

## Introduction

The megamouth shark, *Megachasma pelagios* Taylor, Compagno & Struhsaker 1983 (Lamniformes: Megachasmidae) is a large, pelagic filter-feeding shark, ranging in depth from the surface down to 1 500 m and distributed in tropical waters worldwide (Simpfendorfer & Compagno 2015).

Until 2015, 102 specimens of megamouth shark were reported around the world (Simpfendorfer & Compagno 2015); on the other hand, the database of the Department of Ichthyology Museum of Natural History of Florida, Gainesville[1] confirmed 60 sightings until July 2017 and they are investigating additional occurrences. The first record of megamouth shark in Ecuadorian waters, commonly named as "dithering" shark (from the belief that it is the product of a cross between two shark species), was on March 8th 2004, when artisanal fishermen incidentally captured one male (420 cm of fork length and approximately 600 kg of total weight) using a surface gillnet 85.37 km from the port of Posorja (province of Guayas) (02°54.374' S; 81°14.858' W) (Romero & Liza-Santa Cruz 2004[2]).

This scientific note aims to report the occurrence of three new cases of megamouth sharks in Ecuadorian waters within the artisanal landings, which could be detected through the fisheries monitoring and control program established by the

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1. https://www.flmnh.ufl.edu/fish/discover/sharks/megamouths/reported-sightings/
2. Romero M, J Liza-Santa Cruz. 2004. Megamouth caught for first time in the Pacific Ocean off the Coast of South America. Instituto del Mar del Perú (IMARPE). https://www.floridamuseum.ufl.edu/index.php/fish/discover/sharks/megamouths/reported-sightings/

fisheries authorities (Sub-Secretariat of Fisheries Resources, SRP/Ministry of Aquaculture and Fisheries, MAP). The sex, total weight and measures (TL = total length, FL= fork length, PCL= precaudal length and IDL = interdorsal length) of each specimen were taken when possible following Compagno *et al*. (1995) and Martínez-Ortiz (2010). The target and bycatch species caught during the fishing operations are also reported.

On Wednesday November 30th 2011, during the monitoring of fishing in the roadstead in the fishing port of Santa Rosa de Salinas (Santa Elena province), the F/V "MARÍA JOSÉ II" (registration B-06-06517), a megamouth shark was registered. The target species of this vessel was skipjack tuna *Katsuwonus pelamis* (Linnaeus 1758) and yellowfin tuna *Thunnus albacares* (Bonnaterre 1788). The fishing gear used was a surface gill net, which dimensions of 1 280 m in length, 12.8 m (depth) and 12.7 cm of mesh opening. The specimen recorded was an immature female of 243 cm TL, 188.2 cm FL; 158.4 cm PCL and 28.8 cm IDS; with a total weight of 90.9 kg (Fig. 1). The geographic position where this female was caught was 2°7.902' S, 81°23.883' W, at 50 km from the coastline. The fishing set was accompanied by eight yellowfin tuna (54.54 kg), 20 frigate tuna *Auxis thazard* (Lacépède 1800) (5.45 kg) and five common dolphinfish *Coryphaena hippurus* Linnaeus 1758 (13.63 kg).

**Fig. 1.** Immature female of *Megachasma pelagios* (243 cm total length) caught on November 30th 2011 with a gill net surface off Santa Rosa de Salinas, Santa Elena, Ecuador. Photo: Jimmy Martínez-Ortiz.

On Friday March 30th 2012, a small-scale ("fiberglass") boat accidentally caught a male megamouth shark with a surface gill net 12.7 cm mesh opening. According to the interview with the fisherman, the fishing region where the shark was caught is known as "Cope or Montañita Seamount" 1°49.936' S, 81°3.584' W, currently declared as "Bajo Cope" Marine Reserve by the Ministry of the Environment of Ecuador (AME, AM 130 of 12/29/16, published in RO 44 of 07/26/17); which is 38.89 kilometers beachfront Montañita (province of Santa Elena) side of the continental coast. The specimen was sliced and sold on the local fish market Caraguay in Guayaquil (Guayas province) (Fig. 2). Fins could not be marketed for being quite buttery.

**Fig. 2.** Carcass of a male *Megachasma pelagios*, caught on March 30th 2012 with a gill net surface off Puerto Daniel López, Manabí, Ecuador. Photo: Rubén López-Párraga.

On Saturday February 1st 2014, during the monitoring of fishing in the roadstead the fishing port of Santa Rosa de Salinas (Santa Elena province), the F/V "SIEMPRE CHEO" (registration B-06-04386) the fins of a megamouth shark were recorded (Fig. 3). The target species of this vessel was the skipjack tuna. The fishing gear used surface gill net as well. The specimen on record was a male about 8-9 m in total length, according to fishermen (about the same size as the boat). The coordinates where it was captured were 2°24.984' S, 81°16.958' W to 333.36 km (course 227°) of the continental coastline. The fishing consisted of 80

**Fig. 3.** The first autor with a caudal fin of a ~9 m total length male *Megachasma pelagios* (1 700 mm measured at the dorsal margin of the caudal fin); caught on February 1st 2014 with a gill net surface off Santa Rosa de Salinas, Santa Elena, Ecuador. Photo: Ángel Matamoros-Valencia.

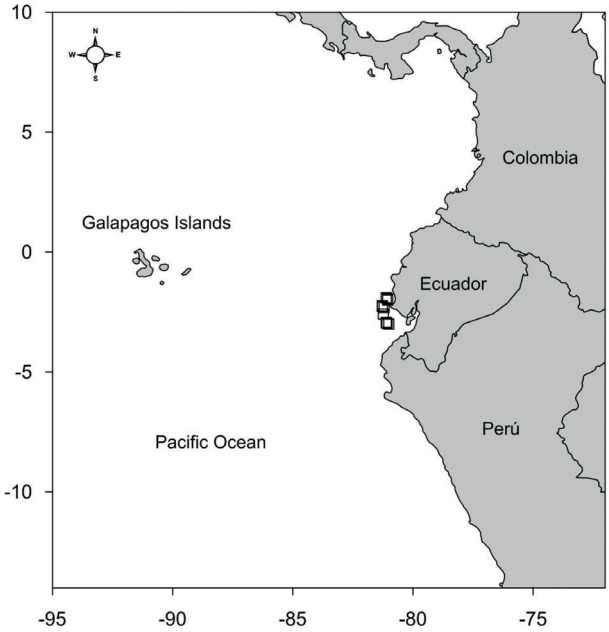


**Fig. 4.** Areas of occurrence of megamouth shark (*Megachasma pelagios*) within the continental shelf of Ecuador (including the first record March 2004).

skipjack tuna, 45 common dolphinfish and a blue shark *Prionace glauca* (Linnaeus 1758).

In Ecuador the sites of occurrence of the megamouth sharks are focused on the coastal area (Fig. 4), with high primary productivity related to the Equatorial Front (Jiménez 1983). Equatorial Front hydrographic conditions determine the formation of areas of convergence and divergence in the surface levels, which favor the local increase of planktonic biomasses. Such conditions coincide with those reported in Sebastian Vizcaino bay, on the West coast of the Baja California peninsula, Mexico, where *M. pelagios* has been reported in the artisanal fishery catches too (Castillo-Géniz *et al*. 2012).

Because the megamouth shark is a filter-feeding species, it has been speculated that it looks for these "corridors of food" between the continental shelf and the slope, which are also used by the whale shark *Rhincodon typus* Smith 1828, the giant manta *Manta birostris* (Walbaum 1792) and the humpback whale *Megaptera novaeangliae* (Borowski 1781).

*Megachasma pelagios* is part of the high diversity of species of elasmobranchs that are present in Ecuadorian waters, though can be considered as a rare species in fish landings of Ecuador. Only four examples of this species have been reported in the last 13 years (2004-2016), however it is quite likely that other unreported occurrences have existed and whose main interaction is with fishing gear operating in the epipelagic zone. Under these considerations, there is a need of promoting conservation and importance of marine mega fauna in the Eastern Pacific Ocean.

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