1871
ИнБЮМ – IBSS

Морской биологический журнал
Marine Biological Journal
2023, vol. 8, no. 4, pp. 1–4
https://marine-biology.ru

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UDC 597.311.2(265.1)

ON A LARGE SHORTFIN MAKO SHARK *ISURUS OXYRINCHUS* (LAMNIDAE) OBSERVED AT CABO SAN LUCAS, MEXICO (EASTERN CENTRAL PACIFIC OCEAN)

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Received by the Editor 05.07.2023; after reviewing 02.08.2023;
accepted for publication 04.08.2023; published online TEMP.

A large female shortfin mako shark, *Isurus oxyrinchus* Rafinesque, 1810, was observed on 26 March, 2023, off Cabo San Lucas, Baja California Sur, Mexico. The total length was carefully estimated at 450 cm. This shark is the third largest mako ever recorded and the second largest observed and photographed alive.

Keywords: shortfin mako shark, *Isurus oxyrinchus*, Mexico, size

The shortfin mako shark *Isurus oxyrinchus* Rafinesque, 1810 belongs to the order Lamniformes and the family Lamnidae. This shark inhabits temperate and tropical waters of the Atlantic, Pacific, and Indian oceans. It is pelagic, coastal, and oceanic, occurring at a depth range from 1 to 500 m [Compagno, 2002]. The embryonic development of this species is ovoviviparous, with 15–18-month gestation and litter size of 4–25 young. Its size at birth is 60–70 cm, and it can attain a maximum size of 585 cm. This shark feeds on bony fishes, elasmobranchs, marine turtles, squids, crustaceans, marine mammals, birds, salps, and Porifera [De Maddalena et al., 2015].

In the present article, we report a record of a huge shortfin mako encountered in March 2023 by the first author in Pacific Mexican waters.

MATERIAL AND METHODS

On the morning of 26 March, 2023, the first author, Jacob Brunetti, the co-owner of the shark diving company *Cabo Shark Dive*, was snorkeling with a group of snorkelers in the waters off Cabo San Lucas, Baja California Sur, Mexico, in the eastern central Pacific Ocean. From the boat, a 9.5-m "Robalo 2 Bertram," sardines *Sardinops* sp. and bonitos *Sarda* sp. were used as chum to attract the sharks to the site and keep them interested around the snorkelers for viewing purposes. No other boats were present in the area. Pictures of the shark were taken by two of the snorkelers.

RESULTS AND DISCUSSION

At 10:00 a.m., with a relatively calm sea and little wind, a very large shortfin mako was observed in 1,000-m deep blue waters, 2.5 nautical miles from the coast (Fig. 1). The snorkelers were already in the water with a smaller male shortfin mako, with the total length (hereinafter TL) estimated at 150 cm, and four female blue sharks *Prionace glauca* (Linnaeus, 1758), TL ranging from 180 to 210 cm. The large mako showed no interest in the boat; it was shy towards the snorkelers and swam just once close to them. However, it showed an aggressive behavior towards the blue sharks, and it was observed attempting to catch one of them (Fig. 2). After a few minutes, the large mako left the area.

Fig. 1. The estimated 450-cm TL female shortfin mako shark *Isurus oxyrinchus* observed off Cabo San Lucas, Baja California Sur, Mexico, on 26 March, 2023. Photo by Alexander Schmidt

Рис. 1. Самка акулы-мако *Isurus oxyrinchus* длиной 450 см, замеченная у Кабо-Сан-Лукас, Южная Нижняя Калифорния, Мексика, 26 марта 2023 г. Фото Александра Шмидта

The underwater images show clearly the morphological features of the animal that allowed the authors to make an immediate identification of the shark as an unusually large shortfin mako *I. oxyrinchus*. These morphological features include markedly spindle-shaped body, pointed conical snout, wide caudal keels, lunate caudal fin, long gill slits, high and erect first dorsal fin, greyish blue coloration with strong metallic reflection on the flanks, and long and pointed teeth protruding from the mouth in the lower jaw [Compagno, 2002; De Maddalena et al., 2005, 2015]. The first author was also able to observe the pelvic area, which revealed the absence of claspers. He could therefore conclude that the shark was a female. On the head and the trunk, there were bite scars that were likely the result of love bites by male makos.

The size of the shark was estimated by the first author at 450 cm TL, based on the size of an estimated 200-cm blue shark, which was observed swimming close to the mako.

The estimated size of the mako observed off Cabo San Lucas is unusual for *I. oxyrinchus*. A study of 199 shortfin mako sharks showed an average TL of 171 cm [Kohler et al., 1996]. Female shortfin makos attain sexual maturity between 270- and 300-cm TL, and male makos, between 195- and 215-cm TL. This species can sometimes attain huge sizes, but records of specimens reaching and exceeding 4 m are very rare [De Maddalena et al., 2023]. The largest shortfin mako reported to date worldwide was a female caught in the late 1950s in the Aegean Sea off Marmaris, Turkey, which was estimated at 585-cm TL [Kabasakal, De Maddalena, 2011]. The second largest mako ever recorded was an estimated 500-cm-long female observed on 28 June, 2018, near Cabrera Grande, in the Balearic Islands, Spain [Lopez-Mirones et al., 2020].

Fig. 2. The 450-cm TL female shortfin mako shark *Isurus oxyrinchus* performing a vertical approach on a 200-cm TL blue shark *Prionace glauca*. Photo by Pollo Berho

Рис. 2. Самка акулы-мако *Isurus oxyrinchus* (длина — 450 см) вертикально приближается к синей акуле *Prionace glauca* (длина — 200 см). Фото Полло Берхо

Conclusion. The estimated 450-cm TL female shortfin mako shark observed off Cabo San Lucas is one of the largest of its species recorded worldwide. It is the third largest mako ever recorded and the second largest observed and photographed alive.

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О КРУПНОЙ АКУЛЕ-МАКО *ISURUS OXYRINCHUS* (LAMNIDAE), ЗАМЕЧЕННОЙ В КАБО-САН-ЛУКАС, МЕКСИКА (ВОСТОЧНО-ЦЕНТРАЛЬНАЯ ЧАСТЬ ТИХОГО ОКЕАНА)

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Крупную самку акулы-мако *Isurus oxyrinchus* Rafinesque, 1810 наблюдали 26 марта 2023 г. у Кабо-Сан-Лукас, Южная Нижняя Калифорния, Мексика. Общая длина экземпляра оценена в 450 см. Эта акула является третьей по величине акулой-мако, когда-либо зарегистрированной, и второй по величине, наблюдаемой и сфотографированной живой.

Ключевые слова: акула-мако, *Isurus oxyrinchus*, Мексика, размер