

A CROCODILE SHARK, *Pseudocarcharias kamoharai*, (SELACHII: LAMNIDAE) FROM PELAGIC WATERS OFF BAJA CALIFORNIA, MÉXICO

Un tiburón cocodrilo, *Pseudocarcharias kamoharai*, (Selachii: Lamnidae) en las aguas pelágicas de Baja California, México.

RESUMEN: Se capturó un espécimen hembra del tiburón cocodrilo, *Pseudocarcharias kamoharai* (Matsubara 1936), de 992 mm LT, en aguas pelágicas a 960 km de la costa de Baja California, México. Este ejemplar representa el primer registro de la especie frente a las costas occidentales de Norteamérica y extiende su rango geográfico más hacia el este del Océano Pacífico de lo documentado previamente.

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Long, D.J. & J.A. Seigel. 1997. A crocodile shark, *Pseudocarcharias kamoharai*, (Selachii: Lamnidae) from pelagic waters off Baja California, México. *Oceanides*, 12(1):61-63.

The crocodile shark, *Pseudocarcharias kamoharai* (Matsubara, 1936) is a widely distributed pelagic shark of tropical and subtropical waters; however, the limits of its oceanic range are not well established. Crocodile sharks range into the eastern Central Pacific, including the Marquesas and Hawaiian Is-

lands, off the western coasts of Costa Rica and Panamá, to the Galápagos Islands, and possibly into the southern waters of the eastern North Pacific Ocean (Abe, 1973; Abe *et al.* 1969; Compagno, 1984; Compagno *et al.* 1995). Recently, the first crocodile shark from the eastern North Pacific (Fig. 1) was captured off the coast of northwestern México, confirming the presence of this species and establishing the northern limits of its range in the eastern Pacific.

The specimen described here was captured by Capt. B. Mounier on a pelagic longline vessel that departed from San Diego, California, and sailed to international waters off western México. A 992 mm total length (TL) female (Fig. 1), was caught on 22 February, 1994 about 960 km off the coast of western Baja California, México (25° 40' N, 129° 00' W). The shark was hooked on a longline baited with light sticks (phosphorescent cyalume) set in the evening at a depth of 21 to 24 m (surface temp. 18° C) over water 4070 m deep. The shark was frozen after capture and brought to the Natural History Museum of Los Angeles County where it was examined, measured, photographed, and curated (LACM 45857-1). The color after freezing and before preservation was of an overall brownish gray dorsum fading into a lighter grayish white ventrum; the fins were dark with the distal edges lighter, and al-

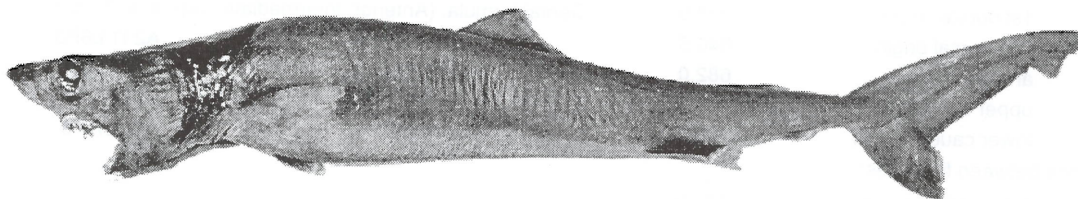


Figure 1.- *Pseudocarcharias kamoharai*, LACM 45857-1, 996 mm TL, female, caught about 960 km off the coast of western Baja California, México, 22 February, 1994. Photo by R. Meier, LACM.

Figura 1.- *Pseudocarcharias kamoharai*, LACM 45857-1, 996 mm LT, hembra, capturado aproximadamente a 960 Km de la costa occidental de Baja California, México, el 22 de febrero de 1994. Fotografía de R. Meier, LACM.

though the specimen had a slightly lighter gray lateral post-oral marking (which is a little more pronounced on the right side), it is not as light as those discussed by Abe (1973). Bite scars attributable to conspecifics were noted on the left lateral side posterior to the insertion of the pectoral fin; no obvious external parasites were seen, and the stomach was empty. Mea-

surements (in mm) are listed in Table 1. Liver and muscle samples were frozen.

The crocodile shark is currently known from widely scattered tropical and subtropical localities but is thought to have a continuous distribution in Equatorial and sub Equatorial waters, leading Compagno (1984)

Table 1.- Measurements (in mm) of *Pseudocarcharias kamoharai* (LACM 45857-1).

Tabla 1.- Medidas (en mm) de *Pseudocarcharias kamoharai* (LACM 45857-1).

Total length	992.0	1st dorsal fin:	
Trunk width at pectoral origin	86.5	overall length	122.5
Trunk height at pectoral origin	109.0	length base	92.0
Inner distance between nostrils	28.5	length posterior margin	65.0
Mouth width	54.0	height	46.0
Mouth length	69.0	2nd dorsal fin:	
Horizontal eye diameter	29.0	overall length	74.5
Vertical eye diameter	32.5	length base	44.0
1st gill-opening length	58.5	length posterior margin	26.5
2nd gill-opening length	55.0	height	25.5
3rd gill-opening length	56.5	Anal fin:	
4th gill-opening length	58.5	overall length	55.0
5th gill-opening length	60.0	length base	27.5
Snout tip to		length posterior margin	26.5
outer nostril	51.5	height	11.0
eye	65.5	Pectoral fin:	
mouth	66.5	length base	39.0
spiracle	126.0	length anterior margin	104.0
1st gill opening	178.5	length distal margin	62.0
2nd gill opening	187.0	Caudal:	
3rd gill opening	199.0	length of dorsal lobe	220.0
4th gill opening	220.0	length of vertical notch	114.5
5th gill-opening	230.0	dorsal tip to notch	60.0
pectoral insertion	257.0	notch depth	28.0
pelvic insertion	654.0	Dental formula: (Anterior, Intermediate, Lateral & Posterior)	
cloaca	678.0	upper left	A2 I1 L6P3
1st dorsal origin	388.0	upper right	A2 I1 L6P3
2nd dorsal origin	640.5	lower left	A2 L7 P3
anal fin origin	682.0	lower right	A2 L7 P3
upper caudal origin	762.5		
lower caudal origin	763.0		
Distance between fin bases:			
1st and 2nd dorsal	172.0		
2nd dorsal and caudal	75.0		
pectoral and pelvic	317.0		
pelvic and anal	49.0		
anal and caudal	38.5		

to map a hypothetical distribution for the species. Later, Compagno *et al.* (1995) illustrated the northern range in the eastern Pacific as far north as western Costa Rica with a possible (although questionable) range farther north. Our new occurrence falls north of the supposed range of Compagno (1984) and Compagno *et al.* (1995), supporting a wider distribution in the eastern North Pacific. The capture locality is near the boundary zone between the California current and the North Equatorial counter-current in the eastern Pacific, which is a possible barrier that marks the actual northern limit of the species.

The presence of conspecific bite marks are interpreted as mating scars, a feature not documented from this species but common among other species of sharks (Stevens, 1974). Table 1 is included because meristic measurements have been documented primarily for males of the species (Cadenat, 1963; D'Aubrey, 1964; Fujita, 1981), and data on adult females is sparse.

ACKNOWLEDGMENTS

We wish to thank B. Mounier for donation of the specimen, D.R. Nelson, California State University Long Beach, for his help, H.J. Walker Jr, Scripps Institute of Oceanography, and D. Catania and T. Iwamoto, California Academy of Sciences, for information on other *Pseudocarcharias* specimens, and to two anonymous reviewers who contributed helpful comments on this article.

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La revista OCEANIDES Vol. 12 N° 1 publicada por el CICIMAR-IPN, se terminó de imprimir en el mes de junio de 1997, en los talleres de CAOSA Impresores, ubicado en Alberto Salinas 162, Col. Aviación Civil, México, D.F. El tiraje consistió en 500 ejemplares más sobrantes para reposición