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A second species of Arctic shark: Pacific sleeper shark *Somniosus pacificus* from Point Hope, Alaska

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Abstract We report a dead, 229-cm-long Pacific sleeper shark, *Somniosus pacificus*, discovered in 1998 along the shore at Point Hope, Alaska. This is the first definitive record of this species from within the Arctic Circle, the first definitive report of a shark from the Chukchi Sea, and the first report of a shark other than a Greenland shark from within the Arctic Circle.

Introduction

The diversity and distribution of polar sharks is unclear. In the Northern Hemisphere, the Greenland shark, *Somniosus microcephalus* (Bloch and Schneider, 1801), is well known within the Arctic Circle from the Atlantic Ocean and contiguous waters (Bigelow and Schroeder 1948; Templeman 1963). The presence of sharks within the Arctic Circle above the northern Pacific Ocean is more uncertain. Several synoptic publications (Castro

1983; Compagno 1984) implied that the Pacific sleeper shark, *S. pacificus* Bigelow and Schroeder, 1944, inhabits that region, and possibly as far north as Barrow, Alaska (Compagno 1984). However, neither of these publications (Castro 1983; Compagno 1984) cited primary records supporting the occurrence of this species in Arctic waters, and we are unaware of any primary record of such.

Herein, we report a shark discovered along the shore well within the Arctic Circle in the Chukchi Sea.

The collection

On 15 November 1998, a large, dead shark was discovered along the shore at Point Hope, Alaska (ca. 68°21'N 166°48.5'W; Chukchi Sea, Arctic Ocean). The specimen appeared relatively fresh and was transported by A.K. Sr. to Point Hope, where it was examined, measured, and dissected by students at the Tikigaq High School.

Description of shark

Sex undetermined, body (Fig. 1a–c) torpedo shaped and roughly cylindrical in cross section, silver-gray above with pink underbelly (pink coloration probably an artifact associated with pooling of blood in dead specimen). Skin texture rough and sandpaper-like. Lesion present posterior to pelvic fins (Fig. 1c), 10–20 cm across and several centimeters deep, seemingly caused by a scavenger such as another shark. Snout broadly rounded (Fig. 1a), eyes nearly circular, spiracle present, external gill openings about uniform in length and only several times eye diameter (Fig. 1a), pectoral fins short and paddle-like. Dorsal fins low and without spines, first dorsal fin originating behind bases of pectoral fins and in front of origins of pelvic fins, anal fin lacking, caudal fin with well-developed lower lobe and unshortened upper lobe (Fig. 1c). Functional teeth in lower jaw (Fig. 1d) approximately 7–8 mm tall, crowns with inclined cusps bearing a convex distal blade separated from the crown

A. Kowunna Sr. is deceased

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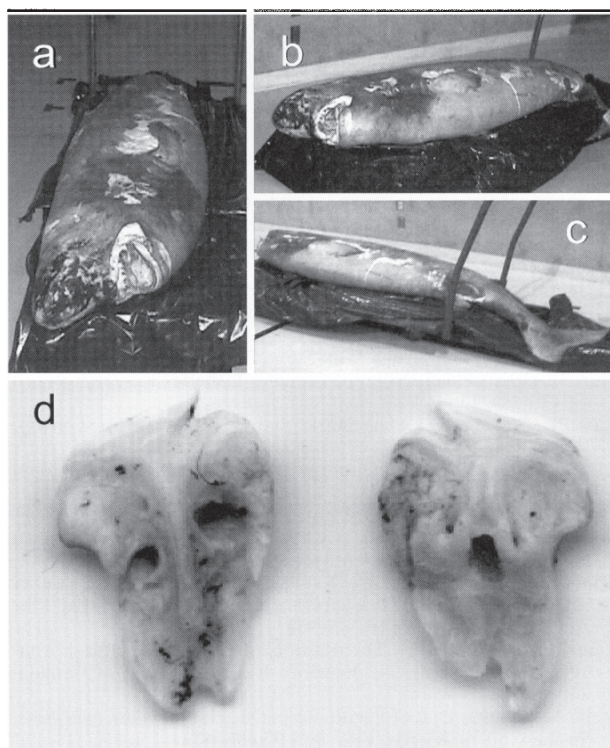


Fig. 1a–d Pacific sleeper shark (*Somniosus pacificus* Bigelow and Schroeder, 1944) washed ashore dead at Point Hope, Alaska. **a** Anterior view; **b** antero-ventral view; **c** postero-ventral view; **d** two functional teeth from lower jaw; left tooth, labial view; right tooth, lingual view. Photographs courtesy of Tikigaq High School

foot by a notch. Some organs frozen at time of examination, organs intact, stomach containing several rocks and a green fluid.

Measurements of shark

Total body length = 229 cm, distance from tip of snout to eye = 20 cm, distance from tip of snout to upper jaw = 25 cm, mouth width = 14 cm, distance from tip of snout to first external gill slit = 48 cm, distance from tip of snout to origin of pectoral fin = 70 cm, distance from tip of snout to first dorsal fin = 130 cm, length of first dorsal fin = 12 cm, distance from tip of snout to second dorsal fin = 177 cm, body circumference at level of eyes = 66 cm, body circumference just posterior to pectoral fins = 112 cm.

Discussion

The reported shark was considered a representative of *Somniosus* LeSueur, 1818 (Somniosidae: Squaliformes) based on its agreement with the genus characteristics provided by Compagno (1984). The specimen was assigned as *S. pacificus* based on the distance between its snout and first dorsal fin being approximately 57% of

the total body length, and on the interspace between the dorsal fins (calculated as the snout to second dorsal fin length minus the snout to first dorsal fin length minus the first dorsal fin length) being approximately 73% of the length from the snout to the first external gill opening (see Bigelow and Schroeder 1957; Compagno 1984).

The Pacific sleeper shark has been reported widely (Bigelow and Schroeder 1944; Bright 1959; Tanaka et al. 1982; Borets 1986; Ebert et al. 1987; Orlov 1999; Yang 1999), and although it is well known from waters off southern Alaska (Mecklenburg et al. 2002), we were unable to locate any definitive report of it from within the Arctic Circle or Chukchi Sea. Castro (1983: p 64) stated that the species ranges southward within the North Pacific Ocean from “polar latitudes.” Compagno (1984) stated that it ranges from Japan along the Siberian coast to the Bering Sea and then southward along the western coast of North America. However, Compagno’s (1984) range map indicated that the species occurs within the Chukchi Sea and above the Arctic Circle, and it also suggested that it might be present in the eastern Siberian and Beaufort Seas. Last and Stevens (1994) also provided a similar mismatch of text and range-map information regarding the distribution of *S. pacificus* in the northern Pacific Ocean. None of the foregoing authors (Castro 1983; Compagno 1984; Last and Stevens 1994) provided a citation supporting their range descriptions. Ebert (2003) stated that the range of *S. pacificus* above the Arctic Circle is unclear, but he did not note any record of the species north of the Bering Sea. Mecklenburg et al. (2002) used information contained in Compagno’s distribution map (Compagno 1984) to describe in words and illustrate the range of *S. pacificus* in Alaskan waters, but they did not provide definitive evidence of the species north of the Bering Sea. Hart (1973) likewise did not provide reference to a record of the species north of the Bering Sea. Based on this, we regard this as the first report of *S. pacificus* from within the Chukchi Sea or the Arctic Circle, as well as the first report of a shark other than the Greenland shark from within the Arctic Circle. Inupiat elders at Point Hope, Alaska have not seen (personal communications with J.C.G.) other beach-cast sharks during their lifetime (i.e., ca. 80 years); however, J.C.G. has heard of two instances, one each from Wainwright and Barrow, Alaska (both locations well above 70°N latitude), of live sharks (species unknown) that were seen in nearshore waters within the past 5 years.

Key to sharks from Arctic waters (characters modified slightly from those of Bigelow and Schroeder 1957):

1. Length from tip of snout to origin of first dorsal fin < 50% of total length; interspace between dorsal fins \geq snout to first external gill opening length.....*Somniosus microcephalus*

2. Length from tip of snout to origin of first dorsal fin > 50% of total length; interspace between dorsal fins < snout to first external gill opening length.....*Somniosus pacificus*

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