

First record of Commander Skate (*Bathyraja lindbergi*) in Canadian Pacific waters

JACKIE R. KING^{1,*}, GORDON A. MCFARLANE¹, and TYLER B. ZUBKOWSKI¹

¹Pacific Biological Station, Fisheries and Oceans Canada, 3190 Hammond Bay Road, Nanaimo, British Columbia V9T 6N7 Canada

*Corresponding author: Jackie.King@dfo-mpo.gc.ca

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Abstract

We report the first verified record of a Commander Skate (*Bathyraja lindbergi* Ishiyama and Ishihara, 1977) from British Columbia, Canada. A female measuring 829 mm in total length was captured by bottom trawl on 2 August 2009 in Queen Charlotte Sound, Canada (51°37'N, 130°6'W). The depth of capture was 449 m. We used physical characteristics as well as meristic and morphometric characters to identify the specimen as a Commander Skate.

Key words: Commander Skate; *Bathyraja lindbergi*; British Columbia; first record; range extension

Commander Skate (*Bathyraja lindbergi* Ishiyama and Ishihara, 1977) was described based on several specimens captured in the Bering Sea at depths between 160 m and 570 m. The species is found throughout the Bering Sea southward from approximately 60°N (Ishiyama and Ishihara 1977; Mecklenburg *et al.* 2002); in the eastern North Pacific throughout the Aleutian Islands and in the Gulf of Alaska as far south as the Alexander Archipelago (Stevenson *et al.* 2007); and in the western North Pacific along the Kamchatka Peninsula (Ishiyama and Ishihara 1977) into the Sea of Okhotsk near Hokkaido (Masuda *et al.* 1984). It is found in waters ranging in depth from 126 m to 1193 m (Stevenson *et al.* 2007), but usually deeper than 200 m (Mecklenburg *et al.* 2002). A record reported at a depth of 2000 m is based on an erroneous species identification (Mecklenburg *et al.* 2002). Because of its deep-water habitat, Commander Skate is encountered infrequently in commercial fisheries; for example, from 2004 to 2008, only 100 kg of Commander Skate were recorded by observers as annual bycatch in United States Gulf of Alaska groundfish fisheries (Stevenson and Lewis 2010).

Commander Skate, like all members of the softnose skate family Arhynchobatidae and especially the genus *Bathyraja*, has a soft, flexible snout. In addition, Commander Skate has a short, broad snout and is differentiated from other sympatric species of *Bathyraja* by the absence of scapular thorns and the presence of a continuous row of well-developed, mid-dorsal thorns from the scapular region to the first dorsal fin (Ishiyama and Ishihara 1977).

On 2 August 2009, a Commander Skate was captured by bottom trawl during a research survey conducted on the *M.V. Viking Storm* in Canadian Pacific waters at 51°37'N, 130°6'W. The modal depth of the fishing event was 449 m. The specimen (Figure 1) was a female with a total length of 829 mm, a size at about which 50% of females are mature (Ebert 2005). Initial species iden-

tification was based on Stevenson *et al.* (2007), namely: flexible and short snout; scapular thorns absent; median tail thorns well developed along entire length of tail; dorsal surface grey-brown in colour, with ventral surface grey and darker around pectoral and pelvic fin margins; white colour around mouth and nostrils; ventral surface of disc smooth and without denticles; mid-dorsal thorns present and strong. Some authors consider the closely related species *Bathyraja matsubarai* to be a synonym for Commander Skate (Mecklenburg *et al.* 2002), which has contributed to confusion regarding this species' depth range and geographic distribution. *Bathyraja matsubarai* is dark purplish brown in colour and has an interrupted row of mid-dorsal thorns (Ishiyama and Ishihara 1977); neither characteristic applies to our specimen.

The specimen was frozen at sea and thawed later in the laboratory for character counts and measurements according to Hubbs and Ishiyama (1968) and Ishiyama and Ishihara (1977; Table 1). A muscle tissue sample was preserved in 95% undenatured ethanol for genetic analyses. The whole specimen was transferred to the Royal British Columbia Museum (Victoria, British Columbia, Canada) ichthyology collection for long-term storage (catalog number: RBCM 16401). As such, character measurements that required dissection (i.e., spiral valves of the intestine, eyeball length, length of electric organ, and cranium size) were not made. Radiographs were used for vertebral counts, but were not suitable for other measurements of internal structures, such as cranium size.

All character counts and measurements of this specimen were within the range of those made for the holotype (male) and paratypes ($n = 6$ males, $n = 5$ females) of *B. lindbergi* provided in Ishiyama and Ishihara (1977; Table 1). Our specimen is the first record of *B. lindbergi* in Canadian Pacific waters and extends the verified range of this species southward in the eastern North Pacific to include Queen Charlotte Sound, Canada.

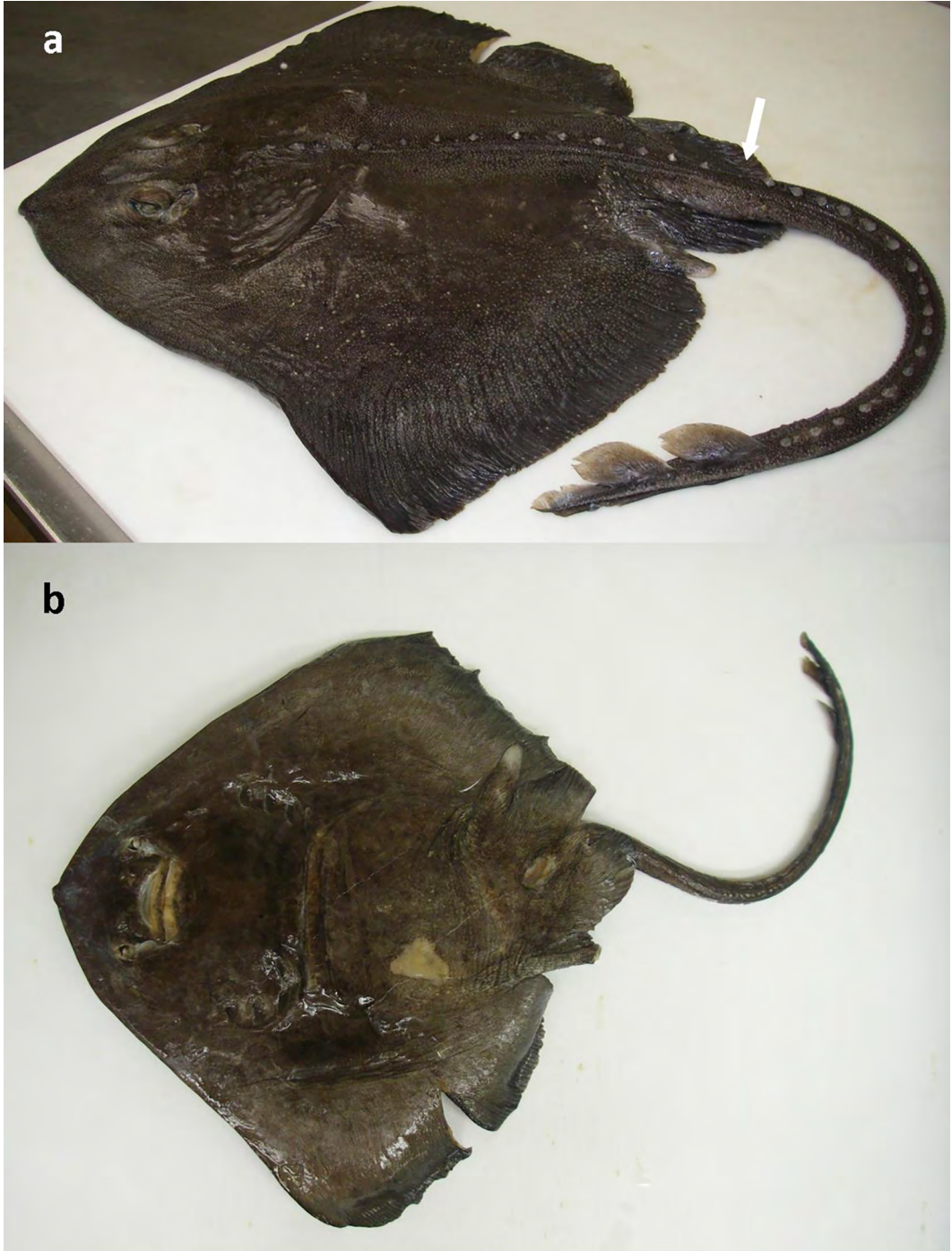


FIGURE 1. Commander Skate (*Bathyraja lindbergi*) collected 2 August 2009 in Queen Charlotte Sound, Canadian Pacific waters (RBCM 16401). a. Dorsal surface with grey-brown colouration; scapular thorns absent; mid-dorsal thorns present and strong; median tail thorns also strong along entire length of tail. Arrow indicates location of one broken thorn evident in pelvic region; base of thorn was intact. b. Ventral surface with grey colouration, darker around pectoral and pelvic fin margins; white colour surrounding mouth and nostrils; ventral surface of disc smooth and without denticles. Photos: T. Zubkowski.

TABLE 1. Character counts and measurements of Canadian Commander Skate (*Bathyraja lindbergi*) specimen collected in Canadian waters (RBCM 16401) along with those reported for the holotype (MTUF 21820) and paratypes (minimum–maximum range) reported in Ishiyama and Ishihara (1977).

Character	Holotype ♂	Paratypes (n = 11)	Canadian specimen ♀
Total length, mm	874	768–876	829
Disk width, mm	551	491–607	516
Head length, mm	134	131–153	140
Tail length, mm	482	391–488	437
Precaudal vertebrae	31	29–34	32
Caudal vertebrae	71	68–72	70
Total vertebrae	114	113–117	114
Nuchal thorns	4	3–5	4
Lumbar thorns	5	4–6	6
Tail thorns	25	20–28	23
Tooth rows on upper jaw	27	21–29	26
Pseudobranchial folds	17.5	15–17.5	16
As % of disk width			
Total length	158.6	144.3–160.7	160.7
Disk length	76.8	74.9–81.0	80.4
Tail length	87.5	79.3–88.0	84.7
As % of head length			
Preocular length	59.7	58.8–64.9	64.3
Interorbital length	29.1	23.5–27.0	27.4
Eyeball length	22.4	16.5–20.7	20.0
Spiracle length	22.4	17.3–21.4	19.2
Over first gill slits (female)	–	119.0–133.6	129.3
Eyeball length as % of			
Interorbital length	76.9	67.5–82.4	73.0
Preocular length	37.5	27.1–32.9	31.1
Spiracle length	100.0	83.3–113.8	104.2
As % of tail length			
Precaudal length	81.5	79.1–98.7	89.2
First dorsal fin origin to tail end	24.9	21.4–26.8	24.3
Post dorsal length	7.9	6.6–9.7	8.0

Author Contributions

Writing – Original Draft: J.K.; Writing – Review & Editing: J.K., G.M., and T.Z.; Investigation: J.K., G.M., and T.Z.; Formal Analysis: J.K. and G.M.

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