

## Short Note

# First Sighting of Longman's Beaked Whale (*Indopacetus pacificus*) off the Chichijima Islands, Ogasawara (Bonin) Islands, Japan

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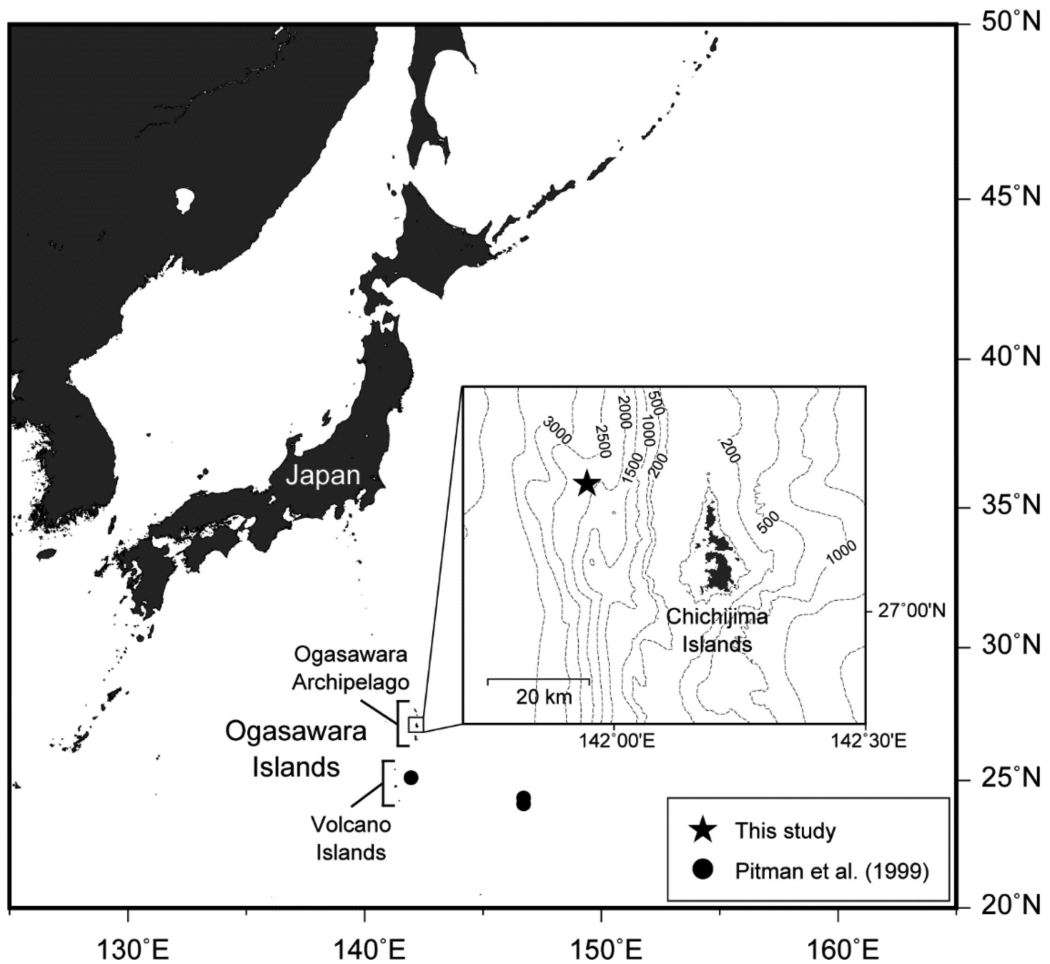
<sup>†</sup>Kyoichi Mori died on 15 June 2022. This is one of his most recent works.

Longman's beaked whale (*Indopacetus pacificus*), also known as the Indo-Pacific beaked whale or tropical bottlenose whale, is one of the rarest and least known cetacean species in the world (Pitman, 2018). This species is distributed in the warm regions of the Indian and Pacific Oceans (Pitman, 2018). The first description of this whale was in 1926 by Longman based on a skull specimen found in Queensland, Australia (Longman, 1926). In 1999, Pitman et al. (1999) reported on the sighting records and external characteristics of "tropical bottlenose whale," which could be *I. pacificus*, in the Indian and Pacific Oceans. By comparing genetic and morphological studies of specimens, Dalebout et al. (2003) confirmed that the tropical bottlenose whales reported by Pitman et al. (1999) are the same species as *I. pacificus*. Following Pitman et al. (1999) and Dalebout et al. (2003), reports of stranding and field-sighting records of this species in the Indian and Pacific Oceans have been published (e.g., Yamada et al., 2004, 2012; Anderson et al., 2006; Afsal et al., 2009; Martin & Nimak-Wood, 2016; Acebes et al., 2022). However, current information on the life history, movement, population structure, and abundance of Longman's beaked whales remains lacking (Yamada et al., 2012).

In Japanese waters, a part of the western North Pacific, four strandings of Longman's beaked whales have been recorded (Yamada et al., 2004, 2012; Kobayashi et al., 2021a, 2021b), and records of at-sea sightings are very limited (Pitman et al., 1999). These records include three sightings from the waters south of the Volcano Islands, a subset of the Ogasawara (Bonin) Islands (Figure 1). However, Longman's beaked whales around the Ogasawara Archipelago had never been confirmed. In this short note, we report the first

confirmed at-sea sighting of Longman's beaked whales off the Chichijima Islands, a subset of the Ogasawara Archipelago, with the aim of updating information on the occurrence of Longman's beaked whales in Japanese waters.

On 19 October 2021 at 1304 h (local time), a group of Longman's beaked whales consisting of at least six individuals was sighted approximately 15 nmi west-northwest of the Chichijima Islands (27° 13' 38.63" N, 141° 56' 46.61" E; Figure 1) during a boat-based survey of sperm whales (*Physeter macrocephalus*). Associated animals were not observed around the group. The whales were detected visually and with an 8 × 30 binocular lens (Nikon Monarch 7; Nikon Corp., Tokyo, Japan), and they were photographed using a digital camera (Canon EOS 90D; Canon Inc., Tokyo, Japan) with a zoom lens (Canon EF 100-400 mm f/4.5-5.6 L IS II USM, Canon Inc.). Aerial images and videos were captured using an unmanned aerial vehicle (UAV) (DJI Matrice 200; DJI, Shenzhen, China) with a camera (DJI Zenmuse X4s, DJI). The observations of Longman's beaked whales lasted for approximately 30 min. The weather conditions during the observation were sunny with good visibility, and the Beaufort Sea State was 2. The water depth at the sighting location, calculated based on the M7023 digital bathymetry chart provided by the Japan Hydrographic Association, was approximately 2,200 m. The sea surface temperature (SST) at the location on that day was 27.5°C, which was obtained by the Second-Generation Global Imager (SGLI) aboard the Global Change Observation Mission-Climate (GCOM-C) satellite that records data at a spatial resolution of 1 km. Data were obtained from the Japan Aerospace Exploration Agency through the Globe Portal System (G-Portal; <https://gportal.jaxa.jp/gpr/index/index>).

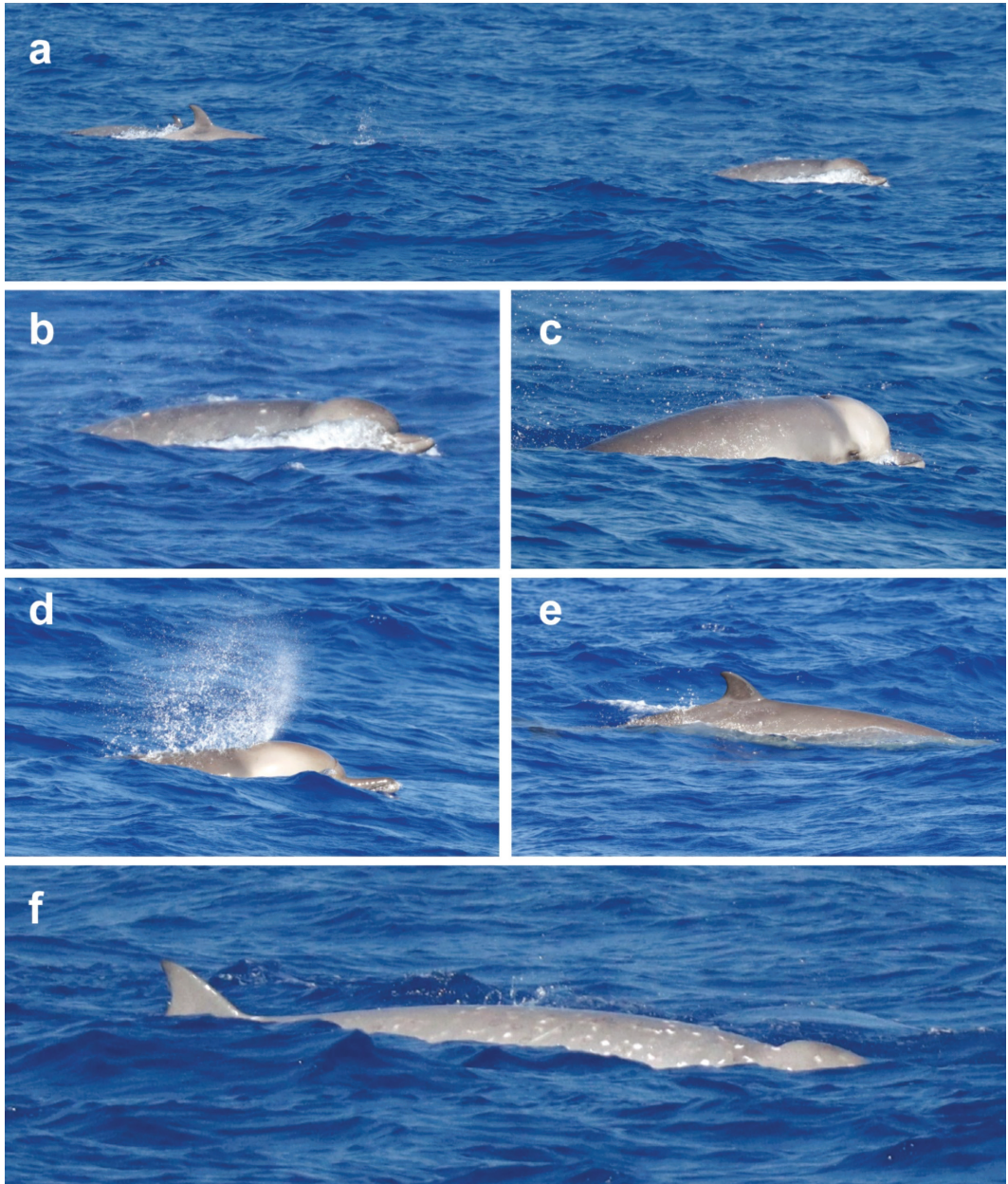


**Figure 1.** Sighting location of Longman's beaked whales (*Indopacetus pacificus*) off the Chichijima Islands, Ogasawara Islands, Tokyo, Japan, on 19 October 2021 (star). Circles show previous sighting locations of Longman's beaked whales in the waters of the Ogasawara Islands reported by Pitman et al. (1999). The bathymetry data were based on the M7023 digital bathymetry chart provided by the Japan Hydrographic Association. The figure was created using GMT (*Generic Mapping Tools*), Version 5.4.3 (<https://www.generic-mapping-tools.org>; Wessel et al., 2013).

Animals were identified as Longman's beaked whales based on the shape of their beak, head, dorsal fin, and body color (Figure 2a-f). The animals have a long beak and distinctly rounded melon (Figure 2b-d). The melon was gray to pale gray, and the area behind the blowhole and beak was gray to grayish brown (Figure 2b-d). The area immediately behind the eye was partially white in color (Figure 2c). The dorsal fin was large, slightly sickle-shaped, and located behind the middle point of the back (Figure 2e). The color of the back was gray to grayish brown (Figure 2b, c, e, & f), and at least three animals had white circular scars, which were probably cookie cutter shark bites, and linear scratches on their body surface

(Figure 2b, c, & f). Individuals with fewer circular scars and linear scratches had a more distinct color gradation between the body and melon (Figure 2b, c, & f). The conspicuous blow was low and bushy (Figure 2c; Supplementary Video; see *Aquatic Mammals* website). It also appeared to be tilted slightly forward (Figure 2c). These characteristics are consistent with those described by Pitman et al. (1999).

A single whale was first filmed in the UAV footage, and then a group of six whales was filmed approximately 150 s after the single whale was seen diving (see Supplementary Video). It was unclear whether the previously photographed whale was in the group of six whales or not. In



**Figure 2.** Longman's beaked whales observed off the Chichijima Islands on 19 October 2021 (a-f). Photographs (c), (d), and (e) are of the same young individual. (*Photo credit:* Koki Tsujii, Ogasawara Whale Watching Association)

the group of six whales, the aerial images showed two large and four small individuals (Figures 3 & 4; Supplementary Video). We also measured the body length of the Longman's beaked whales based on aerial images (Figure 3). Assuming that the UAV was horizontal, the size was estimated using homography based on the altitude

of the UAV, camera tilt angle, and angle of view. Considering the attitude and flight speed of the UAV and the position and depth of each whale, we were only able to measure one individual that was photographed alone earlier and one large and one small individual each in the group of six individuals. The body length was estimated to be



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**Figure 3.** Aerial view of two Longman's beaked whales observed off the Chichijima Islands on 19 October 2021 obtained with the unmanned aerial vehicle (UAV)

approximately 6 m for large whales ( $n = 2$ ) and less than 5 m for small whales ( $n = 1$ ).

Social and surface-active behaviors were not observed, and they were considered to be travelling. For the single whale photographed by the UAV, the horizontal swimming speed near the sea surface calculated from aerial images was approximately 1.8 m/s, considering the global positioning system data of the UAV and the angle of the attached camera (see Supplementary Video). For the group of six whales, reliable swimming speed could not be calculated due to the short filming time (see Supplementary Video). A swimming formation was observed where four small individuals were located between two large individuals in the group of six whales (Figure 4; Supplementary Video). The individuals at both ends were approximately 70 m apart horizontally, and the distance between adjacent individuals ranged from a few meters to 35 m. Throughout the observations, no avoidance behavior was observed as the boat approached, and the animals were at a minimum distance of 100 m from the boat. No reaction was observed when the UAV was flying at an altitude of approximately 15 to 25 m.

Our report is the new confirmed sighting record of Longman's beaked whales in the Ogasawara

Islands after Pitman et al. (1999). The SST at the location was 27.5°C, and the water depth was over 2,000 m. Previous studies have shown that this species has been sighted mostly at a depth greater than 2,000 m and at SSTs above 26.0°C (Pitman et al., 1999; Pitman, 2018). Regarding the group size, our record (six individuals) was smaller than the mean of 29.2 (range 3 to 100;  $n = 15$ ) reported in the western Pacific (Pitman et al., 1999). The estimated body length of two large individuals and one small individual was approximately 6 m and less than 5 m, respectively, which is approximately the same as that reported previously (Yamada et al., 2012; Pitman, 2018). Pitman (2018) reported that the color of the melon in calves is pale and appears to become dark with age. According to that description, we could assume that the group we found included some calves or subadults because of the occurrence of small individuals with pale melons (Figure 2c-e). These small individuals were not considered neonates because they were not as small as the neonates described by Kobayashi et al. (2021b).

Whale-watching tours have been conducted around the Ogasawara Archipelago since 1988 (Ichiki, 2003), and offshore sighting surveys have been conducted monthly since 2003 (Ogasawara



**Figure 4.** Aerial view of six Longman's beaked whales observed off the Chichijima Islands on 19 October 2021 obtained with the UAV

Whale Watching Association, unpub. data). However, to date, there have been no sighting records of Longman's beaked whales in this area, suggesting that their occurrence is probably extremely rare or that they might mainly use off-shore areas outside the search area. In our records, Longman's beaked whales were found in October; and in previous records, this species was also observed in the waters south of the Volcano Islands but in July and September (Pitman et al., 1999). Although all these records are during periods of high water temperatures, there are insufficient data to determine any pattern of the occurrence in the Ogasawara Islands. Further accumulation of data is needed to understand when and how the species use the waters of the Ogasawara Islands. There are few records of at-sea sightings of this species in Japanese waters, and no information exists on its seasonal distribution and migration (Yamada et al., 2012; Pitman, 2018). This short note provides valuable information about the distribution and occurrence of Longman's beaked whales in the western North Pacific region. In addition, aerial video footage was a very useful method to obtain more detailed information on the group size, surface swimming behavior, and morphological characteristics.

**Note:** The Supplementary Video for this short note is available in the "Supplemental Material" section of the *Aquatic Mammals* website: [https://www.aquaticmammalsjournal.org/index.php?option=com\\_content&view=article&id=10&Itemid=147](https://www.aquaticmammalsjournal.org/index.php?option=com_content&view=article&id=10&Itemid=147).

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