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A pod of Omura's whale (Balaenoptera omurai) sighted live off Karwar in the EEZ of India

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Abstract

This study documents the presence of a live population of *Balaenoptera omurai* (Omura's whale) in the inshore waters of Arabian Sea sighted during our exploratory purse seining operation conducted at latitude 14°51.264' N / longitude 073°57.417' E on 22nd May, 2023 in the afternoon at around 1600 h. The pod of three baleen whales consisting of a calf and two adults were spotted in shallow waters (30 m), 15 km away from the coast of Karwar (Karnataka). The presence of a weaning calf suggests that this region is a nursing ground for *Balaenoptera omurai* (Omura's whale). This report fills the literature gap thereby providing photographic and videographic evidence of Omura's whale in the western Indian Ocean.

Keywords:
Arabian Sea; Baleen whale; Calf; Shallow water

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Introduction

To date 30 cetacean species are known to inhabit or visit the Indian EEZ including physeterids, kogiids, delphinoids, several ziphiids, a single species of porpoiseand six species of the balaenopterid family. Members of the family Balaenopteriadae also termed as Rorquals include *Balaenoptera musculus* (Blue whale), *B. physalus* (Fin whale), *B. edeni* (Bryde's whale), *B. acutorostrata* (Common Minke whale), *B. omurai* (Omura's whale) and *Megaptera novueangliae* (Humpback whale) (Jefferson *et al.*, 2015). The *Balaenoptera omurai* initially confused with and classified as Bryde's whale (*B. edeni*) was recognised as an individual distinct species with an ancient lineage basal to *B. edeni or B. borealis* clade (Wada *et al.,* 2003). Based on mitochondrial DNA sequencing, skeletal morphology and limited description of external characteristics, the species was identified from the eight specimens collected through Japanese research whaling vessels in late 1970s (Wada *et al.,* 2003). Although, the specimens were earlier considered as 'pygmy Bryde's whales' (Reports by Ohsumi, 1980; Wada and Numachi, 1991;Yoshida and Kato, 1999); Wada *et al.,* 2003; Sasaki *et al.,* 2006, provided great molecular phylogenetic details enabling the species its ancient lineage with an estimated divergence time of 17.0 ± 2.7Ma from the *B. edeni / B. borealis* clade (Marx and Fordyce, 2015). Further Wada *et al.,* 2003 presented a set of skeletal features, which enables specie diagnosis and helps in identification during whaling operations and strandings (Yamada *et al.,* 2006, 2008; Ponnampalam, 2012).

In later years, researchers reported the presence of *Balaenoptera omurai* (Omura's whale) throughout the Southeast Asian region (Yamada *et al*., 2006a, 2008; Yamada, 2009), proving the range extension of this species up to eastern Indo-Pacific region more specifically the tropical eastern Indian Ocean and western Pacific Ocean (Cerchio *et al.,* 2019). Range extension of this species to the western Indian Ocean and eastern North Atlantic Oceanwas observed, in the northwest coast off Madagascar (Cerchio *et al*., 2015) and stranding observed along the coast of Mauritania (Jung *et al.,* 2015). Cerchio *et al*., (2015) documented the first live evidence of Omura's whale, along with detailed external physical appearance, pigmentation patterns and genetic verifications through skin biopsies. A great number of sightings have been reported since then, expanding the range to the western South Atlantic Ocean, Indian Ocean, the northwest Pacific Ocean and Oceania (Cerchio and Yamada, 2018).

Although, Omura's whale is reported throughout Oceania, no live sightings have been reported from the central-western Arabian Sea (i.e., Northern Indian Ocean). The nearest report available is from Qeshm Island, Strait of Hormuz, Iran, (Ranjbar et al. (2016)) based on a juvenile stranding. Sri Lanka in 2015, confirmed sighting of a living Omura's whale off the south coast (de Vos, 2017); further examination suggested numerous encounters with Omura's whale were misidentified as Bryde's whale. The report from Red Sea near Shaab Saiman, close to Port Safaga is suspected to be exceptional because of its secluded location, or lack of proper information.

This report aims to fill the literature gap by providing photographic and videographic evidence of the presence of a live population of *Balaenoptera omurai* (Omura's whale) in the inshore waters of the Arabian Sea. This report also represents the first documentation of live species in the waters of Indian subcontinent.

Methodology

The scientific expedition of the exploratory purse seiningconducted in the month of May 2023 from 21st to 24th, observed marine mammals throughout its duration. During one such purse seining operation, a pod of whales was sighted along the starboard side of vessel **Emerald – II**. Sighting details including latitude, longitude, date, time, depth, and distance from shore, pod size, behaviour, species identifications and environmental data (e.g., sea and wind state and temperature) were recorded. Behavioural data such as surfacing, breaching, porpoising, dive sequence, travelling, splashing and inter and intra dive duration were recorded through continuous videography. Photographs and snapshots were taken from the videos, for photo-identification of the cetacean species. Cetaceans were identified to the lowest taxonomic level possible based on field guides and descriptions provided by Vivekanandan & Jeyabaskaran (2012) and Jefferson *et al*., 2015. The photographic data collected during the survey was compared with photos from fresh stranded specimens, whose species was confirmed through genetic analysis.

Results and discussion

During the survey, on 22ndMay 2023 at 16:10 hrsat latitude 14^{0}51.264' N / longitude 073^{0}57.417' E, the pod of three baleen whales including a calf along with two adult individuals were sighted 15 km away from the coast of Karwar (Karnataka) at a water depth of 30 m. As the vessel was operating a purse seine net, the whales kept approaching the vessel (or the school of fishes). Clear videography was possible, from which photographs and snapshots were extracted in order to spot key morphological features.

The morphological characteristics for identification include:

1. ***Asymmetrical coloration:*** The body pigmentation is similar to that of fin whale, where the right side of the lower jaw in the sighted baleen whale is white in colour (Figure 1), while the left side part of the lower jaw is darker (Figure 1);

2. ***Blowholes:*** Presence of double blowholes and a single median ridge was observed (Figure 2(1));

3. ***Sprouts/ blow pattern:*** The blow was noted to be conspicuous and short (Figure 3);

4. ***Dive sequence:*** Surfacing of head at a low angle followed by rolling of body, submergence of splash guard and appearance of dorsal fin. Further, the dorsal fin drops below the surface, and body rolls sharply as the whale begins to dive (Figure 2). Although the tail stock arches strongly, the flukes do not appear above the surface (Berta 2015);

5. ***Asymmetrical chevron:*** White to pale pigmented chevron around the dorsal fin evident on right side of the body (Figure 4), lighter chevron prominent anterior to dorsal fin than posterior depicting the asymmetric nature on right and left sides of the body;

6. ***Dorsal fin:*** Tall and strongly falcate and rising at steep angle from back (Figure 5);

7. ***Blaze:*** white pigmentation is visible more on the right side of the body compared to the left (Figure 4).

Apart from the distinguishing morphological characteristics, certain behaviour was observed during sighting. Those behavioural characteristics include: The presence of a single calf confirming the presence of at least one adult female. Typical nursing behaviour of Mother – calf pairing was sighted i.e., calf always swims in infant position, alongside the mother, usually behind her dorsal fin; cow-calf proximity is greater

during travel and breaching; mother and calf show synchronized dive patterns; mother encourages the calf to perform breaching and porpoising. Calf was usually present at the infant position, or observed breaching right in front of the adult individuals. Although no feeding was observed, the calf showed active breaching and porpoising. Adult individuals were found to be closeto each other and to the calf. Scared or fearful behaviour was not found in adult or calf. The calf was observed to possess moderately to strongly bent dorsal fin, recommending it to be a young individual not a neonate. Also, the calf lacked fetal folds.

The sighting lasted for approximately 45minutes. During sighting, wind conditions were 15 - 20 knots gusting to 25 knots. Thewind direction was northwest. The sea state appeared rough, with large white caps. Air and Sea surface temperatures were observed to be 29°C and 25°C respectively.

Fig. 1: Left: Showing asymmetrical right side of lower jaw being white coloured
Right: Showing asymmetrical left side of lower jaw being darker in colour

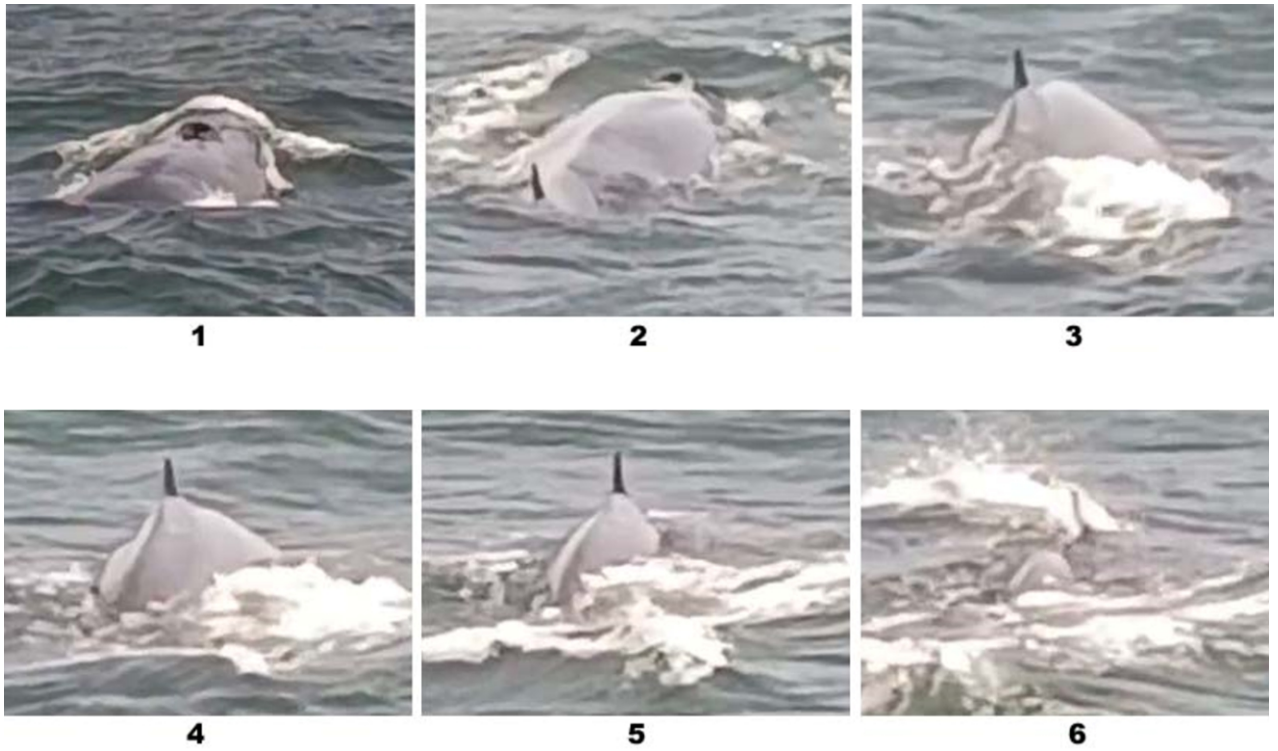

Fig 2: Dive Sequence: (1) Surfacing of head at a low angle.
(2) Followed by rolling of body, submergence of splash guard and appearance of dorsal fin.
(3 & 4) The dorsal fin drops below the surface, and body rolls sharply as the whale begins to dive
(5 & 6) Tail stock arches strongly, the flukes do not appear above the surface

Fig 3: Blow of the Omura's Whale

Fig. 4: Pictures depicting the asymmetrical chevron on Omura's whale

Fig. 5: Strongly falcate dorsal fin of Omura's Whale

Principally, this study helps our understanding on the first live population identified from fieldstudy in Northern India Ocean.This population of baleen whalessighted off Indian coast could beconsidered as the closest population related to the sightings from Sri Lankan coast. From the above-mentioned morphological characteristics, the sighting could be identified as *Balaenoptera omurai* (Omura's whale), thus confirming the presumption of a locally found population of *Balaenoptera omurai* in the northern Arabian Sea (Ranjbar 2016). These diagnostic characteristics match the ones provided by Cerchio et al., 2019, thereby filling the literature gaps and justifying the stranding in the northern regions of western Indian Ocean.

Omura's whales feed on zooplankton and occupy a high position within the trophic profile of their habitat. In terms of nutrient cycling, Omura's whales and other baleen whales distribute organic material obtained from their zooplankton prey throughout oceanic waters to allow for the growth of phytoplankton and the continuation of the plankton cycle (Vos, 2017). Baleen whales also serve as hosts for a large variety of endo-parasitic and ectoparasitic invertebrates, including nematodes, tapeworms, amphipod whale lice, and sessile parasitic copepods (Jung et al., 2015).

Availability of a young individual in this region suggests that this region may serve as nursing ground or calving habitatfor the species. Due to high availability of food, the populations from the southern regions like Sri Lanka or Madagascar might migrate upwards from their breeding grounds. It could be further highlighted that the calf is in its weaning period, since most calves leave their natal group and birth area after weaning (Berta 2015). There could be a possibility of allomaternal care (where a single calf is looked after by two adult females) which is well documented in sperm whales, and pilot whales, since a single calf is accompanied by two adult individuals. This tends to be energetic advantage as one female babysits the calf, while the mother dives longer and deeper in search of prey.

During the purse seine operation, a relatively high density of oil sardine *Sardinella longiceps* was found in the region and it could be an association with the *Balaenoptera omurai*. Thus, it seems a possibility that abundance of oil sardine or the conditions that increase the abundance of this dominant fishery resource could be an indicator for the occurrence of *Balaenoptera omurai*.

Due to rare occurrence of Omura's whale, continuous monitoring and recorded sightings are required around the Indian seas so as to improve our understanding. Thus, this report provides information on the distribution of *Balaenoptera omurai*, and its continuous distribution in the west coast of India and Arabian Sea, similar to the distribution in the eastern Indian Ocean.

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