

## Short Note

# Unusual Behaviour of Humpback Whale (*Megaptera novaeangliae*) Mothers and Calves

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The humpback whale (*Megaptera novaeangliae*) is a well-known worldwide species that migrates yearly from high latitude feeding areas to tropical and subtropical waters for mating and calving (Clapham & Mead, 1999). The social relationship between mother and calf is strong, considering that mother–calf pairs remain together for at least 10.5 mo (Chittleborough, 1958; Gabriele et al., 2001) when weaning occurs. In some areas, extended associations have been observed in which mother–calf pairs remained together for more than 1 y (Hamilton & Cooper, 2010).

The International Whaling Commission (IWC) (2015) addresses seven breeding stocks in the Southern Hemisphere. Breeding Stock A is located in Brazilian waters, mainly in the Abrolhos Bank (16° 40' to 19° 40' S, 39° 10' to 37° 20' W), which is the location of the highest aggregation of humpback whales in the South Atlantic Ocean (Martins et al., 2001; Andriolo et al., 2006, 2010). The presence of humpback whales on the Brazilian coast occurs seasonally, essentially from July to November, with the pinnacle of abundance in September (Morete et al., 2003).

Herein, we describe unusual mother–calf behaviour over three events on the Brazilian breeding grounds. Two of them involved temporary, although atypically long (i.e., in duration and distance) separation of calves from their mothers in the presence of a boat; while the third event details a calf interacting with the carcass of a female whale that was assumed to be its mother. Ultimately, to the best of our knowledge, we report the first description of a calf displaying a postmortem attentive behaviour towards an adult humpback whale.

### Events Involving Separation of Mother–Calf Pairs

In October 2008, at 1440 h, during a research cruise, a humpback whale mother–calf pair was sighted resting at the surface in Abrolhos Bank (17° 10' S, 38° 11' W). The meteorological conditions were good (Beaufort 1; wind speed of 6 kts), and depth was 27 m. The research boat was a wooden trawler (14.5 m long) with a centre propeller and inboard engine. While the boat approached at a speed of 5 kts, the mother and calf remained resting and breathing at the surface; no other whales were in view. The distance from the boat to the whales was ~100 m when the whales dove. Brazilian regulations establish 100 m as the limit to how close ships and recreational boats can approach whales; however, research boats may have a special permit that allows a closer approach for sample collections. The boat navigated to the whales' last sighting position and stopped, shifting the engine to idle. A few minutes later, the calf surfaced to breathe at ~50 m to our vessel's port side and then dove again. The boat moved towards its last position and stopped. Subsequently, the calf surfaced near the boat and started swimming around it within 2 m distance, occasionally rubbing its body against the hull. Some features of the calf (Figure 1) included pale grey colour on the body and a dorsal fin tilted towards the right, suggesting the calf was a few weeks old (Chittleborough, 1959; Cartwright & Sullivan, 2009).

While the calf maintained its behaviour of swimming around the boat, an adult humpback whale was sighted more than 200 m from the vessel. Because there was no sign of other groups



**Figure 1.** Humpback whale (*Megaptera novaeangliae*) calf swimming close to the research boat (Event #1) (Photo credit: Milton C. C. Marcondes)

within our visual range, we assumed that this individual was the mother and began to observe her. Over approximately 25 min, the calf remained swimming in close proximity to the boat near the surface and performed behaviours such as belly-up, tail slaps at the surface, and release of small bubbles from the blowhole, making contact with the vessel several times. Meanwhile, the mother was sighted periodically at the surface for breathing, each time moving in different directions, possibly an indication that she was searching for her calf. The distance between the female to the boat fluctuated during our observations and was estimated to range between 200 to 400 m.

At ~30 min of observation, with the calf still near the boat, we decided to attempt to slowly lead the calf towards the mother. The engine was restarted, and the boat navigated at 3 kts, moving towards the location where the mother was last observed. The calf followed the research boat for roughly 80 m when it began to swim farther from the port side. Shortly afterwards, the engine was idled, and the boat halted. At this point, the mother surfaced ~100 m from the bow, with her head pointing towards the calf's direction, when she dove. A few minutes later, both mother and calf were sighted together roughly 50 m distant from the boat. The

observation of this pair continued and confirmed that they remained together. Following confirmation that they were together, the observation ended, and the boat departed. The total period of separation between calf and mother was ~40 min, and the maximum distance between them was estimated at 400 m.

A second event was observed on 11 September 2012 in Porto Seguro, Bahia State (16° 29' S, 39° 01' W), by the crew of a whale watching (WW) boat, 6 km from the coast, who sighted a humpback whale mother–calf pair. The boat was an 18-m fibber trawler with a centre propeller. Depth was 10 m, and there was a maximum underwater visibility of 2 m.

Following Brazilian regulations, the boat kept a 100-m distance from the pair with the gear in idle. At 0951 h, the humpback whales approached the trawler and swam nearby it. At 1002 h, the calf was observed alone at a distance that ranged from 1 to 10 m to the boat and started swimming around and under it. The calf presented a variety of behaviours, including pectoral slap, fluking, and diving (Figure 2). The mother was observed moving away from the trawler and was no longer visible at the surface, whereas the calf remained close to the boat for nearly 50 min.



**Figure 2.** Humpback whale calf near the whale-watching boat (Event #2) (Photo credit: Thais H. M. Melo)

At about 50 min into the observation of the calf, a blow was observed more than 1 km away, which was assumed to be the mother as no other humpback whales were sighted in the vicinity. At 1052 h, the boat navigated at minimum velocity towards the mother, revving the engine slightly when the calf was at the bow and decelerating when it was at the stern. During the entire period of navigation, the calf stayed with the boat—sometimes at the bow, sometimes at the stern. Once the boat arrived at the mother, maintaining a distance of 50 m, the calf dove and then surfaced next to its mother at 1108 h. The distance travelled by the boat from the first sighting of the mother–calf pair to the final

position where they rejoined was ~1.3 km. The period from separation to reunion was 66 min.

In the close relationship between mother and calf humpback whales, the role of the adult female is to protect and feed their calves, as well as to avoid associations with other whales (Connor et al., 2005), especially with competitive males, and also to avoid close proximity to vessels (Bauer, 1993). Szabo & Duffus (2008) analysed the behaviour of humpback whale mother–calf pairs on a feeding ground and noticed that mothers maintained an average of 50 m closeness to their calves. On breeding grounds, females with calves tended to occupy calmer, more sheltered sites (Martins

et al., 2001; Valani et al., 2020). The temporary dissociation of a mother and her calf, as described in this note, was considered unusual due to the amount of time that elapsed (40 min for the first event and 66 min for the second) and the considerably large distance mothers kept from their calves (400 m and an estimate of 1.3 km, respectively). It has been documented that humpback whales tend to change their behaviour in the presence of boats. Through a land-based survey, Morete et al. (2007) found that humpback whale mothers and offspring responded strongly to vessel approaches at 100 to 300 m distance, presenting significant behavioural modifications such as increased speed for the pair and reduced active behaviour at the surface for calves (e.g., fluke-up, rolling, etc.). Partly, these findings contrast with the observations reported herein in which the calves presented active surface behaviour reminiscent of a recent study on the Peruvian coast (Stock G) in which, through the analyses of the responses by humpback whales to the approach of WW boats, it was found that a single boat did not trigger significant behavioural changes (Villagra et al., 2021). Furthermore, we described in these two events how a carefully conducted vessel maneuver was successful in leading the calves back to their mothers.

For these observations of the presented events, several possible explanations can be considered for the separation between calf and mother: lack of maternal experience—maybe first parturition—might have led to a lapse of care by the mother; the

calf may have approached the boat out of curiosity and lost contact with the mother; acoustic disturbance by the vessel approach could have masked potential mother–offspring vocal communication that is regularly noted on breeding sites (Zoidis et al., 2008; Indeck et al., 2020); or even a combination of these and other unknown factors.

The concern is whether these temporary detachments may draw to a permanent early separation that would largely affect calves' survival. Neto et al. (2007) reported a case of a lone calf found along the northern Bahia coast presenting an unusual behaviour that was probably rooted in health dysfunction. Even though this hypothesis was not considered relevant to the events reported herein, it is also a reasonable explanation for mother and calf early separation.

#### Event of a Calf Exhibiting Postmortem Attentive Behaviour

On 2 February 2011, at Itacimirim Beach, Camaçari, Bahia State, Brazil (12° 37' S, 38° 02' W), a humpback whale carcass was observed floating near the beach along with a live calf swimming within close proximity to it (Figure 3). The presence of humpback whales at that site in February was remarkably unusual. Whales start to leave the north coast of Bahia state in October; and by February, humpback whales from Stock A are expected to be at the feeding area, which neighbors South Georgia and the South Sandwich Islands (Zerbini et al., 2006).



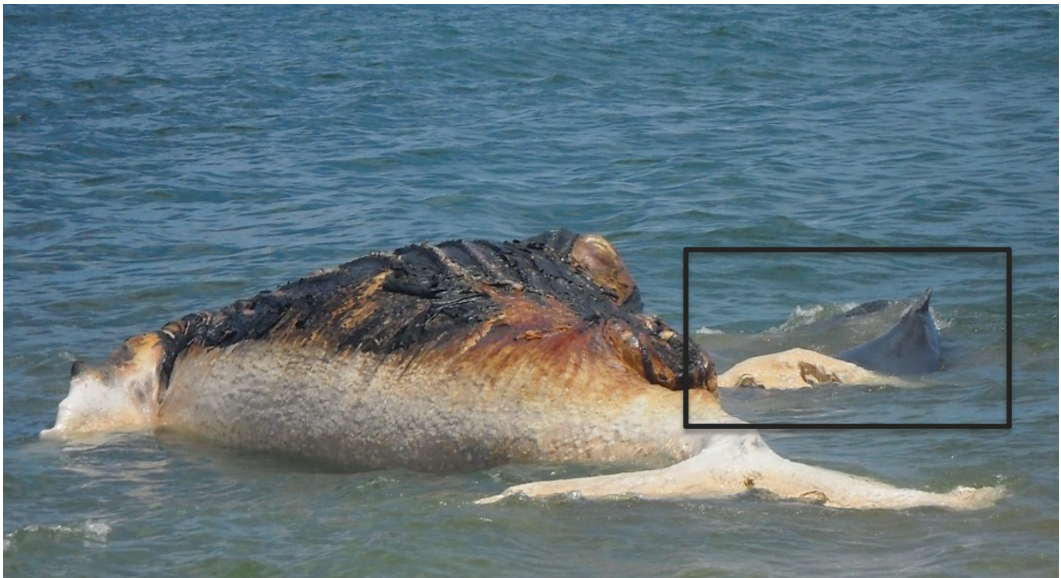
**Figure 3.** An adult female humpback whale carcass and a calf observed from the beach (Event #3) (Photo credit: Donated from the Humpback Whale Institute's archives bank)

Because of that, and also because late-lactating females are the last to leave tropical waters (Craig et al., 2003), we assumed that the female carcass corresponded to the calf as its mother. The calf followed the carcass towards the shore and swam very close to and around the dead whale. It was noticed that the calf dove under the pectoral flipper of the carcass and lifted the flipper over its head

(Figures 4 & 5). The carcass was in an advanced decomposition state (code 4), as described by Geraci et al. (2006), suggesting that the calf had been following it for at least some days. The observation occurred very near the shoreline, and some witnesses entered the water to drive off the calf, attempting to prevent it from stranding alongside the carcass. After the carcass stranded fully, the calf



**Figure 4.** Humpback whale calf diving towards the female pectoral flipper (Photo credit: Donated from the Humpback Whale Institute's archives bank)



**Figure 5.** Humpback whale calf lifting the pectoral flipper of the female over its head (Photo credit: Donated from the Humpback Whale Institute's archives bank)

moved away, and there were no longer records of it. The carcass was buried without necropsy because the removal of the carcass was required to avoid a public health risk. The total length of the adult whale was approximately 14 m, and there were many cookiecutter shark (*Isistius brasiliensis*) bites along the body, as well as bites from other species of sharks along the tail.

The behaviours displayed by the calf (e.g., swimming around and keeping in physical contact with the carcass; trying to lift the mother's flipper) do not match with what would be expected if the calf was simply seeking care. Videsen et al. (2017) reported that, when nursing closer to the surface, calves are motionless, positioning themselves on the ventral portion of their mothers' bodies while suckling.

Considering the decomposition state of the carcass, it is possible to presume that the calf remained by its mother's body for several days, regardless of sharks foraging on it, and only moved away in response to the approach of people and potential stranding. According to Bearzi et al. (2018), postmortem attentive behaviour (PAB) in cetaceans applies when there is an array of behaviours directed to a dead conspecific by a postmortem attender (PA). PAB involves close proximity, with repeated physical contact keeping the carcass of a conspecific from sinking or carrying the carcass (Bearzi et al., 2018). Hence, we considered PAB to be the most accurate interpretation for this record. Additionally, the persistence of the PAB, even after the female body was nearly decomposed, may indicate a strong social bond instead of a simple unawareness of its death; thus, we also acknowledge the probability of grieving behaviour.

The knowledge on how marine mammals respond to death is scarce (Reggente et al., 2018), and little evidence of PAB has been recorded within the Mysticeti (Bearzi et al., 2018; Frediani et al., 2020). There is one report of two adult humpback whale males directing attention to a carcass of another humpback whale and displaying sexual interest (Pack et al., 1998), and another case of two adult humpback whales investigating and maintaining physical contact with a dead grey whale (*Eschrichtius robustus*) calf (Frediani et al., 2020). Herein, to the best of our knowledge, we present the first description of PAB in cetaceans in which the calf was the PA and the adult was the receiver.

The descriptions of the events in this note provide novel observations on the humpback whale mother–calf relationship, helping to build up the scarce knowledge on their bonding. The presence of the mother close to the calf on breeding grounds is vital to nursing and protection from predators. A separation for a long time and distance would jeopardize calves' survival. Therefore, we recommend further studies to identify the factors that

might trigger temporary separations and how the latter might turn into permanent pre-weaning, early separations. Moreover, we report potential evidence of a strong bond between calves and their mothers in a first report of PAB displayed by a calf towards an adult. Finally, we believe that grieving may be present when such strong social bonds exist, and we encourage a more systematic study on humpback whale mother–calf relations at breeding grounds.

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