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Short Note

Postmortem Attractions: Humpback Whales Investigate the Carcass of a Killer Whale-Depredated Gray Whale Calf

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Introduction

Scientists have observed postmortem attentiveness to a deceased member of one's own species, or thanatology, in various animal taxa, including cacophonous aggregations in crows (Swift & Marzluff, 2015), skull fondling by elephants (McComb et al., 2006), and leaf-dropping/adornment by chimps (Anderson, 2016). Biologists, cetacean field researchers, captive cetacean trainers, naturalists, and whale watchers have observed cetaceans caring for, attending to, being aroused by, or showing interest in dead or dying individuals (see Bearzi et al., 2018, for a review). Recently, a female Southern resident killer whale (*Orcinus orca*) carried and pushed her deceased calf for approximately 1,609 km over at least 17 d (Center for Whale Research, 2018). To date, nearly all records of postmortem attentive behavior (PAB) in cetaceans are from odontocetes and directed toward members of their own species (Hubbs, 1953; Norris & Prescott, 1961; Caldwell & Caldwell, 1996; Whiting, 2010).

Among the mysticetes, only one observation of PAB has been published (Pack et al., 1998). This involved two adult humpback (*Megaptera novaeangliae*) males displaying sexual interest in a dead adult conspecific that had been observed in ongoing, strenuous competitive activities (e.g., rapid travel, chasing, and head lunging) nearly 2 h previously (Pack et al., 1998). Such activities are common behaviors in competitive groups (Baker et al., 1984). The cause of death was not determined. Herein, we report on two adult humpback whales investigating and making gentle physical contact (i.e., touching with flippers, flukes, back, abdomen, and top of head) with a dead gray whale (*Eschrichtius robustus*) calf. This extends the list of unusual social behaviors exhibited by humpbacks, while also providing the first report of interspecies postmortem attentive behavior (iPAB) between wild species of cetaceans.

Observations

On 21 April 2018 at 0911 h, a group of 13 Bigg's (transient) killer whales (*Orcinus orca*) were spotted together with a floating dead 5-m-long gray whale calf (estimated to be 3 mo old based on expected calving peak in Baja lagoons). The sighting was made from a whale-watching vessel (*Sea Wolf II*, captained by Nancy Black) in Monterey Bay, California (36° 44' 5", 121° 53' 8"), 4.75 nmi from shore (Figure 1). The mother of the calf was not observed. Migrating gray whale mothers fight to protect their calves against killer whale attack (Barrett-Lennard et al., 2011). Based on numerous prior observations in Monterey Bay (N. A. Black, pers. obs.), the mother is presumed to have left after her efforts to protect the calf were no longer fruitful and/or the calf was dead .

Weather conditions were excellent with unimpeded visibility and a Beaufort 2 sea state. For the next 8 h, the killer whales were observed feeding on the carcass. Evidence for feeding on the carcass included repeated, localized dives of the killer whales, surfacing with blubber in their mouths; blubber floating at the surface; an oily slick on the water's surface; the presence of black-footed albatross foraging on scraps; and occasional observations of the gray whale carcass bobbing to the surface. The killing of the calf was not observed; however, the fresh state of the blubber and the modest consumption of the carcass suggest it was killed earlier that morning or during the previous night.

Given the frequency with which killer whale attacks on gray whale calves have been observed

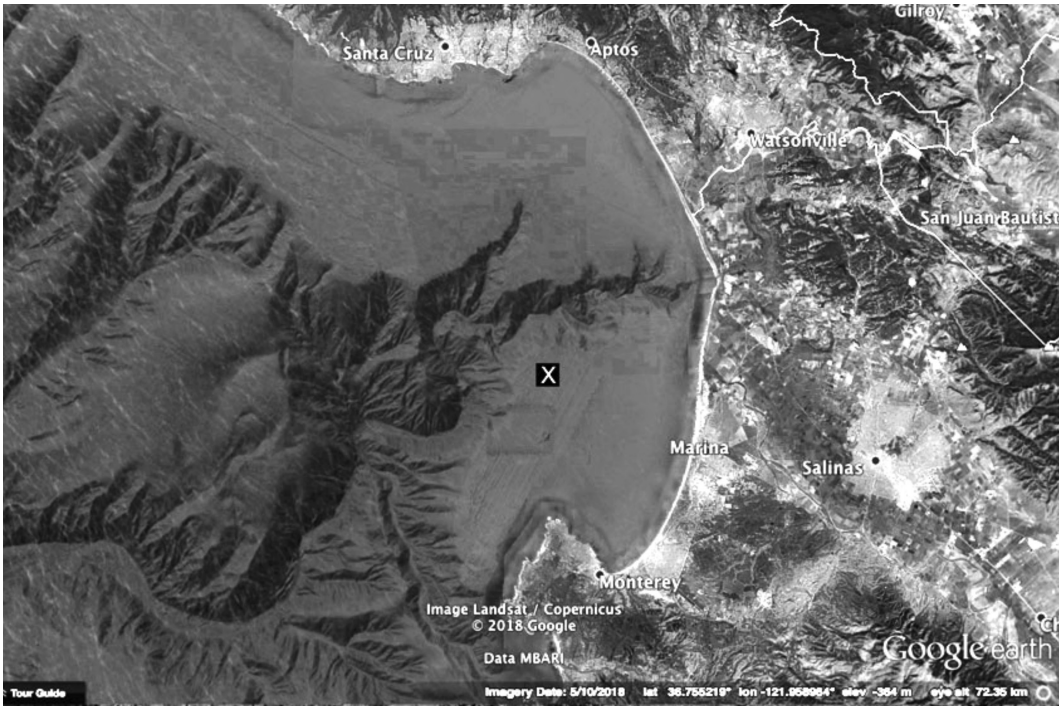

Figure 1. Location of floating gray whale (*Eschrichtius robustus*) carcass, 22 April 2018 (0950 h)

in the area in recent years (N. A. Black, pers. obs.), we make the reasonable assumption that the killer whales which were observed feeding on the carcass were responsible for the calf's death.

Two humpback whales entered the area at 1006 h followed by a third humpback at 1017 h. For nearly 1.5 h, the three humpbacks exhibited mobbing or predator harassment behavior (as described by Pitman et al., 2016), including milling near the killer whales and carcass, following the killer whales, producing emphatic "wheezed" or "trumpet" exhalations (Watkins, 1967), and engaging in tail slashing as well as a tail lob. The three humpbacks were last observed at 1158 h. The killer whales continued to feed until at least 1701 h when the observation vessel departed.

On 22 April 2018 at 0936 h, the *Sea Wolf II* (captained by Liz Schurig) returned to the previous day's carcass position and found five killer whales and two humpback whales that surfaced among the killer whales. Weather conditions were poor due to fog, which reduced visibility to 0.2 nmi; however, sea state was excellent with a Beaufort 1 and a 1.2 m swell. A second whale-watching boat (*Pt. Sur Clipper*, captained by Nancy Black with Jodi Frediani on board) arrived at 0948 h, departing shortly afterward to follow the killer whales as they moved off. At 0950 h, Captain Schurig noted the gray whale carcass alongside the two humpback whales and radioed to the *Pt. Sur Clipper*. The *Clipper* returned to observe the two humpbacks closely approach the carcass (0956 h). Over the next 12 min, the humpbacks maintained close proximity (often ≤ 3 m) to the carcass, repeatedly diving, turning back toward, and pausing next to the dead calf (Figures 2-5). The humpbacks exhibited a range of behaviors, including rolling; raising flukes; fluke splashing; shallow spy hopping; extending flipper(s) above and below the carcass; and touching of the carcass with flippers, flukes, abdomen, back, and top of head (Figures 2-5). Similar behaviors have been reported of a Risso's dolphin (*Grampus griseus*) with a dead Risso's calf wherein the adult touched the carcass with its rostrum, pectoral fin, and dorsal fin (Reggente et al., 2016). The humpbacks also repeatedly exhaled with a wheezing blow, which has previously been associated with excitement or fright (Watkins, 1967).

The humpbacks assumed postures differing from their normal dorsal/ventral/peduncle maneuvers as they apparently attempted to maintain close proximity and physical contact with the calf (Figure 2). Twice, the humpbacks approached in tandem; and on more than one occasion, they positioned the carcass between them (Figure 3).

Figure 2. HW-MN0500323, with rotation of left pectoral flipper, next to the gray whale calf carcass (09:59:14 h) (white boxes indicate location of gray whale calf carcass) (Photo by J. Frediani)

Figure 3. Both humpbacks (*Megaptera novaeangliae*) maintain close proximity to the carcass (09:59:23 h); HW-MN0500323 does headstand, which included gentle tail lob (not shown). (Photo by J. Frediani)

Figure 4. HW-MN0500323 touching carcass with side of body (1000 h) (Photo by J. Frediani)

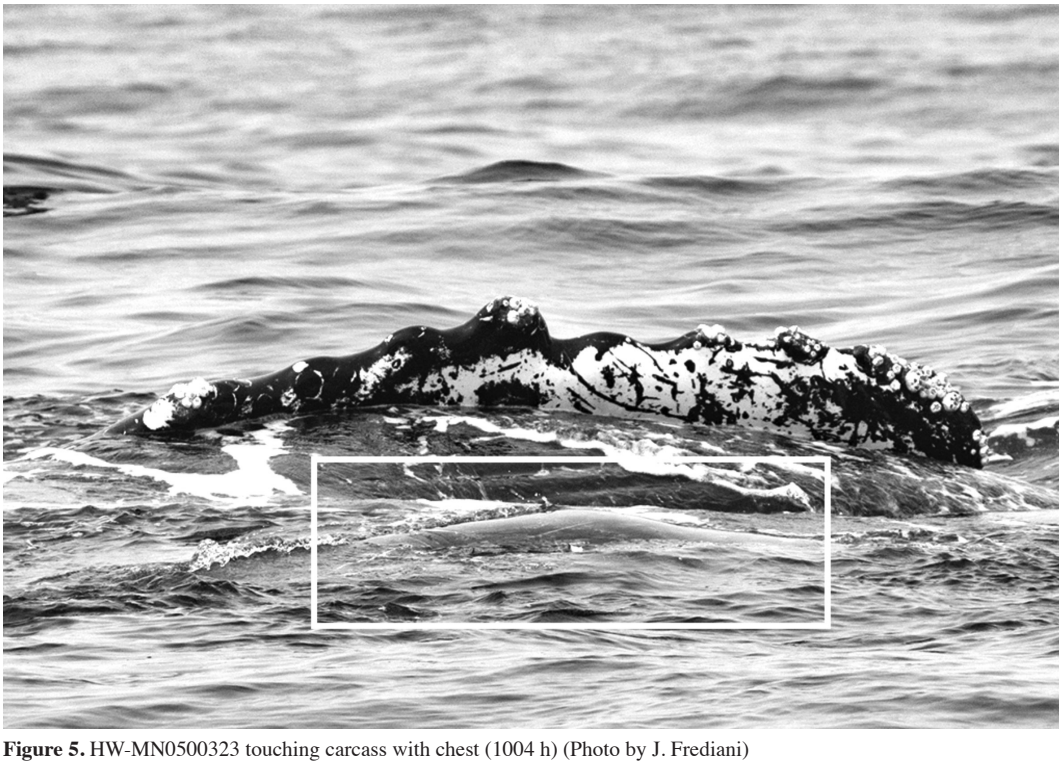

Figure 5. HW-MN0500323 touching carcass with chest (1004 h) (Photo by J. Frediani)

Figure 6. Gray whale calf carcass, 22 April 2018 (1012 h) (Photo by J. Frediani)

The humpbacks were last observed at 1007 h, and the carcass was noted floating alone at 1009 h (Figure 6). The *Pt. Sur Clipper* departed the area at 1014 h. Photographs of the event were obtained using a Canon EOS 7D MKII with a Canon EF 100-400 mm f/4.5-5.6L IS II USM lens.

Both humpbacks were identified from fluke ID photos matched by Happywhale (HW; www.Happywhale.com). HW numbers are Happywhale identification numbers, and CRC numbers are from the Cascadia Research Collective database. Both humpback whales have extensive sighting histories. Between 29 March 2015 and 7 November 2019, CRC-16456/HW-MN0500323 was sighted on the feeding grounds in Monterey Bay (49 obs.) and offshore from San Francisco Bay (3 obs.), and on the breeding grounds in Baja California Sur (Cabo San Lucas) (1 obs.) and Nayarit, Mexico (1 obs.) (https://happywhale.com/individual/3480). Between 3 September 2014 and 27 June 2019, CRC-15401/HW-MN0500205 was sighted in Monterey Bay (33 obs.), offshore from San Francisco Bay (2 obs.), in Baja California Sur (Cabo San Lucas) (1 obs.), and in Nayarit, Mexico (2 obs.) (https://happywhale.com/individual/3185).

Photographs showing distinctive dorsal fin scarring (Figures 7 & 8) revealed that one of the individuals (CRC-15401/HW-MN0500205) was present during the predator harassment event the previous day (21 April). Photographic documentation by passengers on the *Sea Wolf II* during the previous day's feeding event has failed to indicate that CRC-16456/HW-MN0500323 was present.

Both humpbacks are adults of undetermined sex; however, several behavioral observations (as noted below) suggest they are both males. HW-MN0500205 was observed in a competitive group of four whales on 21 December 2016 in Nayarit, Mexico (https://happywhale.com/individual/3185;enc=46637), and HW-MN0500323 was observed in a competitive group of six whales on 27 December 2017 in Nayarit (https://happywhale.com/individual/3480;enc=34909).

In a study involving skin biopsies of 141 humpback whales in competitive groups, the majority of members were found to be male, no group contained more than one female, and several consisted of males only (Clapham et al., 1992). Additionally, neither whale has been sighted with a calf in 92 combined sightings.

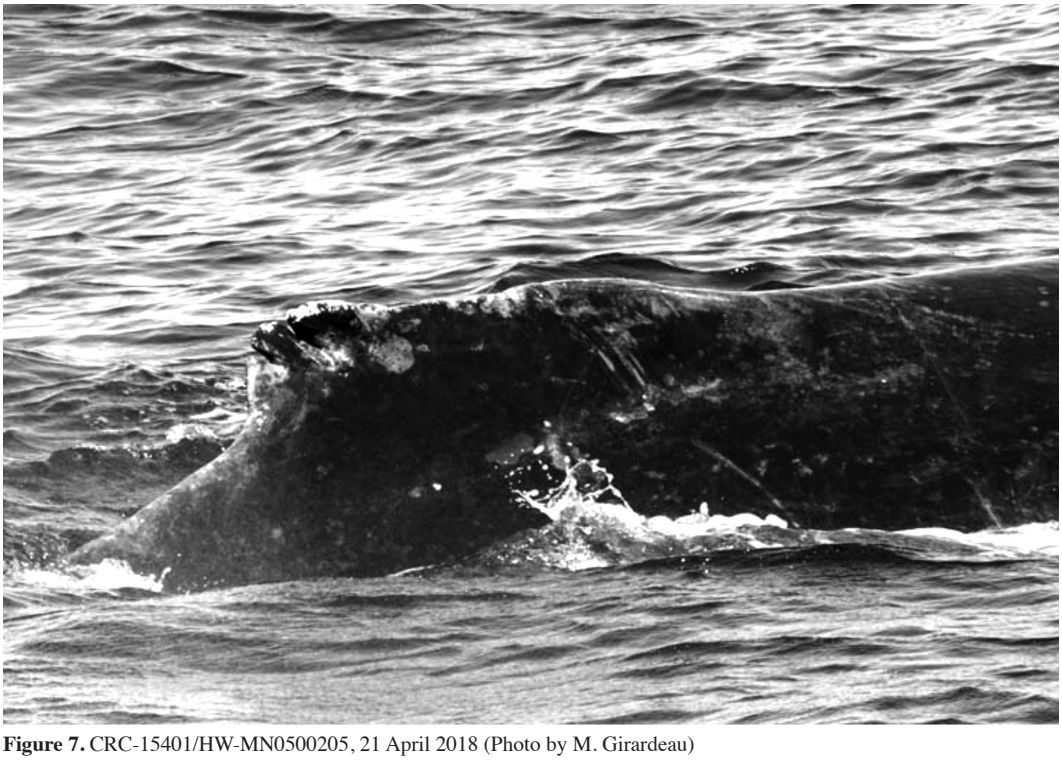

Figure 7. CRC-15401/HW-MN0500205, 21 April 2018 (Photo by M. Girardeau)

Figure 8. CRC-15401/HW-MN0500205, 22 April 2018 (Photo by J. Frediani)

Discussion

There have been no published reports of mysticetes showing PAB with their own calves, let alone with other species. In contrast, there are 77 documented incidents of PAB in odontocetes (Bearzi et al., 2018).

Given observations of humpback whales interacting with live victims of killer whale predation (Pitman et al., 2016), the potential for PAB is presumably present. However, relative to odontocetes, which routinely engage in PAB, there may be fewer opportunities to observe this behavior in mysticetes given their lower relative abundance and their often pelagic habits. Moreover, the fresh carcasses of many species of baleen whales are negatively buoyant, and neonates may be especially prone to sink given their thin blubber layers (Nousek-McGregor et al., 2014; Moore et al., 2020).

The interspecies aspect of this event discounts kinship, mating partner, or group member as proximate causal factors associated with predatory harassment or postmortem investigation. At least one of the humpbacks (CRC-15401/HW-MN0500205), which had been present the day before while the killer whales fed on the carcass, presumably had knowledge of the calf's morbidity, and, thus, their attentiveness can be attributed to PAB rather than rendering assistance to a live victim. Additionally, the calf carcass was missing most of the head as a result of the prior feeding activity of the killer whales. Furthermore, no lifting of the calf above the water was observed, which is commonly seen among odontocetes engaged in epimeletic behavior (Bearzi et al., 2018).

Also per Bearzi et al. (2018), where the sex was known, 75% of those exhibiting PAB, often expressed as epimeletic or "care-giving" behavior, were adult females with dead calves or juveniles (possibly their own offspring, with exceptions), consistent with a strong mother–calf bond. The two humpback whales in this observation, as noted above, were likely males. In cetaceans, paternal care is currently believed to be completely absent (Rendell et al., 2019), lessening the likelihood that the humpbacks were engaged in epimeletic behavior.

Male escorts, however, are known to assist mothers in defending their calves from killer whale predation (Pitman et al., 2014). PAB may represent a form of predator inspection (Curio, 1978) whereby a prey species attempts to gather information on their enemy's abundance, satiation, and intent. The California/Mexico humpback is subject to relatively high incidence of killer whale tooth-rake scarring on their flukes (Steiger

et al., 2008), and, thus, inspections of a corpse may provide further information on predation risk and hunting techniques. Touching or appearing to touch the carcass is consistent with this behavior.

Most killer whale attacks on humpback whales target calves (Steiger et al., 2008). Humpback whale mothers and male escorts vigorously defend calves under attack (Pitman et al., 2014) and tend to remain in the vicinity of their predators after the initial engagement (Ford & Reeves, 2008). Predator inspection is consistent with humpbacks exhibiting fight as opposed to flight strategies (Ford & Reeves, 2008).

In this case, the killer whales had departed the area prior to observation of the unique PAB suggesting that the humpbacks were motivated by more than carcass defense. However, while predator inspection is a reasonable hypothesis, particularly given the likelihood that these two humpbacks were male, we cannot be certain of their intent. This raises the possibility of other incentives such as curiosity (Glickman & Sroges, 1966), morbid fascination, grief (Bekoff, 2000), and play (Deakos et al., 2010), all of which merit consideration.

A recent comprehensive literature review of 78 records on cetacean thanatology reported between 1970 and 2016 found only one case of iPAB and that was in captivity (Bearzi et al., 2018). The undated, second-hand report by trainers at Sea World in Gold Coast, Queensland, Australia involved an adult female humpback dolphin (*Sousa chinensis*) that carried a dead *Tursiops truncatus* calf in her mouth for a prolonged period and refused to relinquish the carcass to trainers for over a week (Porter, 2002).

Humpback whales have been observed in a variety of interspecies interactions in addition to killer whale mobbing behavior noted earlier. These include feeding alongside gray whales (Murphy, 2019), lifting a dolphin out of the water using the rostrum in apparent play behavior (Deakos et al., 2010), swimming with dolphins that were bow-riding the whale's head (Monterey Bay Whale Watch, 2019), and intermingling with Steller sea lions (*Eumetopias jubatus*) (F. Sharpe, pers. obs.). The interspecies interaction described in this short note extends the humpbacks' portfolio of unusual, heterospecific social activities and provides the first official record of iPAB among free-living whales.

The plethora of anecdotal observations summarized by Pitman et al. (2016) have provided much insight into mobbing and altruism in humpback whales. As such, we urge field workers to be vigilant for, and report incidences of, postmortem activity in this enigmatic mysticete.

Acknowledgments

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