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Killer Whale (*Orcinus orca*) Male Carrying a Dead Calf

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Killer whales (*Orcinus orca*) in the coastal waters off Norway are known to follow the seasonal movements of herring (*Clupea harengus*), a major prey item for the whales (Christensen, 1988). Photo-identification studies of killer whales in Norwegian waters were initiated in the 1980s in areas where herring concentrated on wintering grounds and during spawning in the spring (Jourdain et al., 2021). Stable associations between adult males and females, and within both sexes, were revealed already during the first years of fieldwork (Lyrholm, 1988; Bisther & Vongraven, 1995; Similä, 1997).

In 1987, the Tysfjord area in Lofoten (68° N) became a new wintering ground for the herring, which was followed by several hundred killer whales. The scenario lasted until 2002 when parts of the herring stock started wintering offshore (Kuningas, 2014). The killer whales in the Tysfjord area occurred in groups of ~15 to 20 whales. Observed groups contained females with young and adult males, or temporary (in terms of hours) constellations of two or three adult males (Bisther & Vongraven, 1995). Actual group sizes and social organisation of Norwegian killer whales have been studied in recent years (Jourdain et al., 2021) and are still under investigation. Due to the high concentration of killer whales in the fjord area, it was common to have several groups of killer whales within close range of others, sometimes splitting into smaller units or aggregating into larger ones. One way to study the social behaviour of the whales in such crowded scenarios was to use a focal sampling approach in which specific individuals were continously observed to reveal, for instance, companion preferences (Vongraven & Bisther, 1993). This approach was used when an adult killer whale male, readily identified as fully grown due to its larger size and characteristic dorsal fin, surfaced with a dead calf on 15 November 1993.

The male and the dead calf, which seemed to be newborn due to the reddish coloration and relatively tiny size (approximately 2 m), occurred together with one juvenile and three female-sized whales. These three whales were smaller than the male and could either be adult females or subadult males. The group moved in a slow, tight formation, and the male pushed and carried the calf forward with his rostrum. Several of the whales spy-hopped frequently, lifting their heads vertically out of the water, and, after 45 min, the male also spy-hopped, holding the calf in his mouth. A female-sized whale, and possibly the mother of the calf, swam close (within a whale length) and synchronously next to the male and kept her proximity to him during the entire encounter that lasted 2 h 12 min. This whale did not touch the calf when she surfaced. The observation of the male carrying the calf ended when five other female-sized whales, one young male, and two calves approached the group. Both groups made a 3-min-long dive. The male and the female-sized whale then surfaced and moved away, leaving the dead calf with the new group. The calf was last seen in the center of the new group, with whales milling around it. The male and the escorting female-sized whale were later identified as NV-6 and NV-5, and both had also been identified together the previous year (T. Similä, pers. comm., 14 April 1996).

This kind of behaviour is rarely observed among whales, and such information is therefore often found to be anecdotal. The few records of killer whales carrying dead calves include an adult female observed in 2010 in the coastal waters of Washington State carrying a dead neonate while escorted by her young son (Reggente et al., 2016) and an adult female in the same area that became known through media worldwide when carrying a dead calf for over 17 d (Cuthbert & Main, 2018).

Bearzi et al. (2018) analysed 78 records of behavioural responses to dead conspecifics among cetaceans. The observations were made between 1970 and 2016, and included only two records where adult males were observed carrying dead calves. One included a short-finned pilot whale (*Globicephala macrorhynchus*) described in Baird (2016), and the other is a short blog post about the adult killer whale male described in this paper (van Ginneken, 1994).

The carrying of a dead calf can be described as a subcategory of epimeletic behaviour and is

considered a consequence of the cooperative and protective nature of long-lived social mammals, often displaying alloparental care, and can be explained by kin selection (Reggente et al., 2018). Killer whales and pilot whales have been shown to have similar social systems, which are based on matrilinear kinship groups and with little or no dispersal by males from their natal group (Alves et al., 2013). This might partly explain why the few records so far of adult males displaying epimeletic behaviour towards dead calves are found in these two species. However, an alternative and opposite explanation is also plausible for males carrying dead newborns due to the observation of infanticidal teamwork conducted by an adult killer whale male and his post-reproductive mother in the West Coast Transient population in the North Pacific Ocean (Towers et al., 2018). Together, the two whales killed and carried around a newborn calf of an unrelated female from the same population, a behaviour suggested to provide mating opportunities for the infanticidal male and inclusive fitness benefits for his mother.

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