

## Short Note

# No Danger in Sight? An Observation of Sperm Whales (*Physeter macrocephalus*) in Marguerite Formation off Muscat, Sultanate of Oman

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Whales have developed anti-predator strategies of varying sophistication (Lima & Dill, 1990; Ford & Reeves, 2008). An aspect of the complex behavioural ecology of sperm whales (*Physeter macrocephalus*) includes the “marguerite” formation, first described by Nishiwaki (1962) and observed by whalers off Peru (Caldwell et al., 1966). The marguerite formation involves a group of whales positioning themselves in a circle at the surface in a manner akin to the spokes of a wheel, with their heads together on the inside of the formation and their tails radiating outwards (Nishiwaki, 1962; Whitehead, 2002) or in reverse with their heads facing outwards (Arnbom et al., 1987). A literature review of this behaviour revealed that almost every documented observation of sperm whales in marguerite and parallel flank-to-flank formations was associated with the presence of cetacean predators, such as killer whales (*Orcinus orca*), short-finned pilot whales (*Globicephala macrorhynchus*), and false killer whales (*Pseudorca crassidens*) (Smultea et al., 2008), and/or attacks by these predatory species (Arnbom et al., 1987; Palacios & Mate, 1996; Weller et al., 1996; Pitman et al., 2001; Hucke-Gaete et al., 2004; Dunn & Claridge, 2013).

Sironi et al. (2008) reported two incidents of southern right whales (*Eubalaena australis*) in Argentina gathering in marguerite formation when the groups came under attack by killer whales in 1972 and 1975. A video posted online showed a group of sperm whales off southern Sri Lanka clustering together in marguerite formation as they came under attack by a pod of killer whales in April 2013 (Heinrichs, 2013; Gemmell et al., 2015) in what appears to be the first documented account of such for the Northern Indian Ocean region (Gemmell et al., 2015). A similar observation of an unsuccessful orca attack on sperm whales near

Isla San Pedro Martir in the Gulf of California, Mexico, was made in April 2013. This was supported by photographs and also was reported online (see <https://www.expeditions.com/daily-expedition-reports/155632/baja-california>). Herein, I report on the first confirmed sighting of sperm whales from Oman engaging in marguerite and parallel formations, one that is in the absence of any visible predators.

The sperm whale is one of 18 species of cetaceans known to occur in the deeper waters of the Sultanate of Oman (Alling, 1986; Gallagher, 1991; Baldwin, 1998; Ballance & Pitman, 1998; Ponnampalam, 2009; Minton et al., 2010). In the Arabian Sea, the species was a target of Yankee whaling fleets between 1850 and 1870 (Wray & Martin, 1983; Smith et al., 2012) and illegal Soviet whaling fleets between 1963 and 1967 (Mikhalev, 2000). Sperm whales were the most frequently sighted cetacean species during a survey in the western tropical Indian Ocean in 1995, which included the coast of Muscat, Oman (Ballance & Pitman 1998). Boat-based surveys of cetaceans along various parts of Oman’s coastline between 2000 and 2006 yielded much lower encounter rates of sperm whales (< 10 sightings) (Ponnampalam, 2009; Minton et al., 2010).

On 31 May 2006, during line transect boat surveys for cetaceans south of Muscat, my team and I were contacted (0944 h) by a dolphin-watching tour operator who had encountered a large group of sperm whales offshore (23° 39.725' N, 58° 41.574' E) of the village of Sidab, approximately 11.0 km east of Muscat and 5.7 km northeast of where our research team was located. Our team immediately proceeded towards the sighting location and, upon arrival (0957 h), found the group of sperm whales (possibly females and young adults, judging from body sizes) mixed with bottlenose