



First record of pygmy killer whale *Feresa attenuata* Gray, 1874 from India with a review of their occurrence in the World Oceans

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Abstract

The pygmy killer whale *Feresa attenuata* Gray, 1874 has been reported from Munambam fishing harbour, Kochi for the first time in India. Two specimens, one adult of 2.2 m total length and a calf of 1.5 m were recorded. The sighting/ stranding records from 115 data sets of pygmy killer whales around the world have been documented in the paper. The range of distribution of this species is discussed.

Keywords: Pygmy killer whale, India, world occurrence, stranding

Introduction

Pygmy killer whale *Feresa attenuata* Gray, 1874 belongs to the dolphin family Delphinidae. John Edward Gray, a British Zoologist first described the species as *Delphinus intermedius* in the year 1827 based on a skull obtained by the British Museum of Natural History from an unknown locality (Gray, 1827). After 44 years, he established the genus *Feresa* for the same species (Gray, 1871). He later described the species *F. attenuata* in the year 1874 based on another skull obtained from an unknown locality by the British Museum (Gray, 1874). After 80 years, Muneasto Yamada discovered another specimen of *F. attenuata* from Honshu Island of Japan in 1952 (Yamada, 1954). He proposed the common name pygmy killer whale in 1954 and since then the name has been commonly used. He proposed the name based on the resemblance of the body of the specimen to the killer whale *Orca*. The fourth specimen of pygmy killer whale was observed from Senegal (West Africa) in 1958 (Cadenat, 1958). The first alive specimens of pygmy killer whales were reported on July 6, 1963 in Hawaii Island (Pryor and Norris, 1965).

Pygmy killer whales have been reported from subtropical to tropical waters of the world from about 40°S to 40°N (Caldwell and Caldwell, 1971).

Although the species has been reported from Sri Lanka in the 1980s, there were no records from India. Kumaran (2000) reported the possible occurrence of pygmy killer whale from India based on their occurrence in Sri Lanka. Information on global distribution and population estimation of pygmy killer whale is very poor. IUCN-World Conservation Union classified the species as 'Data Deficient'. This rare species was recorded for the first time in India in 2009. This paper is a brief description on the stranding record and a consolidation of the available information on the occurrence of *F. attenuata* in the world oceans.

Stranding of pygmy killer whale

For the first time in India, two dead specimens of the pygmy killer whale *F. attenuata* were landed at Munambam Fishing Harbour (10° 10' 59 N lat., 76° 10' 16 E long.) near Kochi (Kerala) on 14th December, 2009 (Fig. 1). The total length of the large specimen was 2.2 m and another was 1.5 m. They were caught alive incidentally by fishermen 48 nautical miles off Kochi at 200 m depth by using drift gillnet of 110 mm mesh size. The dead specimens were brought to the landing centre by the fishermen, which were photographed. The specimens were dark grey in colour from eye to tail on each side of the flank. On the ventral side, white patch was seen around the genital area. The edges of the



Fig. 1. Pygmy killer whale *F. attenuata* landed at Munambam Fishing Harbour

lips were white. Due to several constraints, other details could not be collected. The identification of the specimen was confirmed based on the description made by Donahue and Perryman (2002). Anoukchika D. Ilangakoon Sri Lanka (personal communication) confirmed the identification.

Discussion

The available sighting/stranding records of 115 data sets of pygmy killer whales around the world are given in Table 1. Available information shows that the sightings/stranding of pygmy killer whales were more in the Pacific Ocean, especially off Hawaii and Taiwan. In the Indian Ocean, the sighting/

stranding records were high in Sri Lanka than in the African countries. Even though the pygmy killer whales have wide distributional range, they have not been reported so far in the following countries: Bangladesh, Myanmar, Cambodia, Hong Kong, Singapore, Pakistan, Botswana, Zimbabwe, Aldabra Atoll, eastern Mediterranean, United Kingdom, Ireland, Poland, Belgium, Netherlands, Germany, Russia, Norway, Denmark, Sweden Iceland, Eastern Baltic States and Faroe Islands. Vivekanandan *et al.* (2010) reported 26 species of cetaceans in the Indian seas, but did not list the pygmy killer whale in their inventory. Based on the available data sets, it appears that the densities of pygmy killer whales in the world oceans are very low compared to other cetacean species.

Pygmy killer whales are known to inhabit the depths of 120 – 1000 m of the Indian Ocean, Pacific and Atlantic Oceans. In warmer waters, it is usually seen close to the coast (Wade and Gerrodette, 1993). The pygmy killer whales have been sighted a number of times in Sri Lankan waters (Table 1). The first record was as early as 1981 (Leatherwood *et al.* 1991). They contribute only 2% to the cetaceans in monitored by-catches in gillnet fisheries in

Table 1. Sighting/Stranding records of pygmy killer whale *Feresa attenuata* in the world oceans

Country/Sea	Sighting/Stranding records	Period of Observation	Reference
Gulf of Aden	38 individuals	March, 1980	Leatherwood <i>et al.</i> , 1991
Sacotra Island	15 individuals	May, 1995	Ballance <i>et al.</i> , 1996
Eastern Tropical Pacific	39,800 individuals (estimation based on 29 sightings)	1986-1990 (120 days/year- July to December)	Wade and Gerrodette, 1993
Gulf of Mexico	518 individuals	1994-1995	Hansen <i>et al.</i> , 1995
	408 individuals	1996-2001	Mullin and Fulling, 2004
	323 individuals	2003-2004	Mullin, 2007
	808-standing stock	2004	Mullin and Fulling 2004
Maldives	1 individual	25 November, 1988	Anderson, 1990 & Anderson <i>et al.</i> , 1999
	6 individuals	1990-2002	Anderson, 2005
	2 individuals	April, 1998	Ballance <i>et al.</i> , 2001
	12 individuals (Huvadhu Atoll)	8 March, 2003	Madsen <i>et al.</i> , 2004

Sri Lanka	22 individuals	1981-1985	Leatherwood <i>et al.</i> , 1991
	3 individuals	6 February, 1983	Alling, 1986
	3 individuals	3 March, 1984	Alling, 1986
	122 individuals	April 1982 & April 1983	Leatherwood <i>et al.</i> , 1984
	50 individuals	October 1991-September 1992	Dayaratne and Joseph, 1993
Indonesia	15 individuals	28 April, 2003	Madsen <i>et al.</i> , 2004
	2 pods (1 pod of 5)	28 August, 1979	Hembree, 1980
	3 individuals	30 December, 1981	Alling, 1986
	2 individuals	20 January, 1982	Alling, 1986
	3 individuals	24 January, 1982	Alling, 1986
	30 individuals	24 September, 1993	Rudolph <i>et al.</i> , 1997
	1 individual	October, 1999	Kahn <i>et al.</i> , 2000
	1 individual	October, 2000	Kahn <i>et al.</i> , 2000
	18 individuals	January-February, 2005	Kahn, 2005
	8 individuals	19 April 2006	Mustika <i>et al.</i> , 2009
Oman	47 individuals	March, 1980 & January, 1982	Leatherwood <i>et al.</i> , 1984
	2 individuals	1982	Alling, 1986
Gulf of Oman	3 individuals	1982	Alling, 1986
	1 individual	February, 1983	Alling, 1986
	3 individual	22 February, 1987	Papastavrou and Salm, 1991
Indian Ocean	5 sightings with 163 individuals	March-July, 1995	Ballance and Pitman, 1998
	1 pod of 18 individuals (between Mauritius and Philippines)	March-April 1999	de Boer, 2000
Eastern Tropical Pacific Ocean	1 individual	1969	Perrin and Hubbs, 1969
	29 individuals	1986-1990 (July-December)	Wade and Gerrodette, 1993
Mozambique	9 individuals	August 1984 - October 1985	Leatherwood <i>et al.</i> , 1991
	25-30 individuals	July, 1985	Leatherwood <i>et al.</i> , 1991
South Africa	1 individual	May, 1968	Bass, 1969
	11 individuals	2 August, 1969	Best, 1970
	1 individual	1974	Ross, 1979
	1 individual	January-December, 2001	Oosthuizen, 2002
	1 individual (Namibia)	January-December, 2004	Oosthuizen, 2004
Seychelles	12 individuals	April-June, 1980	Keller <i>et al.</i> , 1982
Ecuador	1 individual	December, 1971	Anon, 1972
	1 individual	April, 1992	Félix <i>et al.</i> , 1996

		70 individuals	1 September, 2003	Castro, 2004
Japan		1 individual (Honshu Island)	1952	Yamada, 1954
		1 individual	1963	Nishiwaki <i>et al.</i> , 1965
		1 individual (Sagami Bay)	1997	Terasawa <i>et al.</i> , 1997
U.S.A	Hawaii	50 individuals	6 July, 1963	Pryer <i>et al.</i> , 1965
	Florida	1 individual	1975	Caldwell and Caldwell, 1975
	Florida	5 individuals	15 February, 1976	Schmidly, 1981
	Florida	3 individuals	8 January, 1981	Odell and Asper, 1986
	Maui, Hawaii	4 individuals	13 June, 1981	Mazzuca <i>et al.</i> , 1999
	Florida	3 individuals	10 July, 1983	Odell and Asper, 1986
	Texas	3 individuals	1 December, 1983	Brownell <i>et al.</i> , 2009
	Georgia	4 individuals	7 May, 1988	Brownell <i>et al.</i> , 2009
	Maui, Hawaii	3 individuals	16 July, 1988	Mazzuca <i>et al.</i> , 1999
	Florida	3 individuals	4 September, 1992	Brownell <i>et al.</i> , 2009
	North Carolina	6 individuals	1992	Hansen <i>et al.</i> , 1994
	West coast Hawaii	817-standing stock	2002-2004	James <i>et al.</i> , 2009
	Hawaii	201 individuals	April 1985- December 2007	McSweeney <i>et al.</i> , 2009
Bay of Biscay		4 individuals	April & May, 1995-1999	Williams <i>et al.</i> , 2002
Thailand		1 individual	1 April, 1996	Chantrapornsyl, 1996
Australia		1 individual	1971	Anon, 2010
		1 individual	15 February, 1973	Bryden, 1976
		1 individual	5 January, 1984	Anon, 2010
		1 individual	29 August, 1988	Anon, 2010
		15 individual	7 June, 1993	Anon, 2010
		1 individual	6 March, 1995	Anon, 2010
		5 sightings (3-45 individuals/sight)	August 2001 - February 2002	Ross, 2006
World		1,096 individuals in 59 observations at 24 datasets	1978 - 2006	Read <i>et al.</i> , 2010
Brazil		1 individual	1997	Zerbini and Santos, 1997
		1 individual	Winter 2000	Salvatore Siciliano <i>et al.</i> , 2006
		1 individual	22 October, 2005	Magalhaes <i>et al.</i> , 2008
		1 stranding and 4 sightings	2007	Magalhães <i>et al.</i> , 2007
		1 individual	2010	de Maura <i>et al.</i> , 2010
Peru		1 individual	1988	Van Waerebeek and Reyes, 1988
Puerto Rico		1 individual	25 February, 1997	López and Giannoni, 1999
Argentina		1 individual	18 April, 1987	Lichter, 1990

Mexico	1 individual	1998	Delgado <i>et al.</i> , 1998
Western Atlantic			
Texas-Padre Island	1 individual	21 January, 1969	James <i>et al.</i> , 1970
St. Vincent	1 individual	1969	Caldwell and Caldwell, 1971
Costa Rica	1 individual	1969	Perrin and Hubbs, 1969
West Africa			
Sénégal	1 individual	1958	Cadenat, 1958 & Fraser, 1960
Gulf of Guinea	1 individual	1980	Tormosov <i>et al.</i> , 1980
Cape Verde	1 individual	1992	Jefferson <i>et al.</i> , 1997
Ghana	1 individual	31 December, 2007	Van Waerebeek <i>et al.</i> , 2009
Venezuela	1 individual	1991	Romero <i>et al.</i> , 1991
	1 individual	15 July, 1996	Bolanos and Villarroel, 2003
	2 individuals	2001	Villarroel <i>et al.</i> , 2001
	3 individuals	17 February, 1998	Bolanos and Villarroel, 2003
Taiwan	1 individual	1987	Mizue, 1988
	20 individuals	1995	Kaiya <i>et al.</i> , 1995
	18 individuals	23 February, 1996	Brownell <i>et al.</i> , 2009
	5 individuals	7 January, 1997	Brownell <i>et al.</i> , 2009
	3 individuals	18 January, 1997	Brownell <i>et al.</i> , 2009
	4 individuals	4 July, 2002	Brownell <i>et al.</i> , 2009
	8 individuals	22 February, 2005	Brownell <i>et al.</i> , 2009
	1 individual	13 April 1999- September 2000	Wang <i>et al.</i> , 2001
	2 mass stranding	February 2005	Wang and Yang, 2006
	25 individuals	19 July & 13 August, 2005	Wang and Yang, 2006
	28 individuals	23 February, 2005	Brownell <i>et al.</i> , 2009
	20-40 individuals	February, 1995	Brownell <i>et al.</i> , 2009
	20 individuals	11 February, 2003	Brownell <i>et al.</i> , 2009
	20 individuals	26 February, 2005	Brownell <i>et al.</i> , 2009
Malaysia	1 individual (Borneo)	29 March-17 April 1999	de Boer, 2000 & Jamann, 2004
Philippines	1 individual	May 1994-May 1995	Dolar, 1999
	6 individuals	June 1997 - April 2001	Aragones <i>et al.</i> , 2002
	1 individual	2005	Dolar <i>et al.</i> , 2006
Mayotte (Indian Ocean)	1 individual	July 2004- August 2005	Kiszka <i>et al.</i> , 2007
Vietnam	2 individuals	April 1995	Smith <i>et al.</i> , 1995
New Caledonia	3 individuals	30 January 2006	Borsa, 2006
	2 individuals	3 February 2006	Borsa, 2006
British Virgin Island	5 individuals	16 September 1995	Mignucci - Giannoni <i>et al.</i> , 1999

Trincomale (Sri Lanka) but in villages on the southwest coast of Sri Lanka, the number of stranded pygmy killer whale may amount to 300-900 of the 15,000-45,000 dolphins estimated to die each year in such fisheries (Ross and Leatherwood, 1994). In 1994, the International Whaling Commission (IWC) estimated that about 170 pygmy killer whales is killed annually in fisheries off the coast of Sri Lanka. It is after 18 years, the first record of the species has been reported in the contiguous southern Indian seas. The much delayed record may be due to any of the following reasons: (i) *F. attenuata* have extended their distributional range into the southeast Arabian Sea due to changes in the climate and/or availability of prey. (ii) Fishing in India has extended to deep and oceanic waters in the last ten years, thereby enhancing the possibility of more encounters between the fishing gears such as surface gillnets and the pygmy killer whale. (iii) *F. attenuata* occurred in the bycatch for a long time before, but were not noticed or recorded.

Marine mammals are particularly vulnerable to the climate change. Learmonth *et al.*, (2006) predicted the possible range expansion of pigmy killer whales towards the pole due to the climate change effects. Deep water cetacean diversity responses to SST changes were very similar in two of the most oceanographically contrasting areas on earth, the Northwest Atlantic and Southeast Pacific (Whitehead *et al.*, 2008). The direct and indirect effects of climate change on prey species can in turn have several indirect effects on marine mammals, including changes in distribution, abundance and migration, community structure, susceptibility to disease and contaminants, and reproductive success (Learmonth *et al.*, 2006). Prey composition of pygmy killer whales are 30% fishes and 50% cephalopods and 20% others (Pauly *et al.*, 1998). During captivity, pygmy killer whales preferred to feed on mackerels and squids (Pryer *et al.*, 1965). The availability of prey species in the Indian waters might have influenced the range expansion of pygmy killer whales from Sri Lankan and Maldives waters.

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