

# First confirmation of occurrence of the pan-tropical spotted dolphin, *Stenella attenuata*, in Pakistani waters through a mass stranding event

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*The pan-tropical spotted dolphin Stenella attenuata is typically found in deep tropical and warm temperate waters and has been previously confirmed from the waters of most of Pakistan's neighbouring countries. However, to date, there has been no record of this species from Pakistan. This paper reports the first confirmed occurrence of this species in Pakistani waters, specifically a mass stranding event of 200–250 animals on 6 March 2009. The animals live stranded and all except two were rescued. These possibly died as a result of being stranded for a long time on the beach in hot, arid conditions that generally prevail along the coastline of Pakistan. All the animals appeared healthy but the exact cause of this mass stranding event could not be determined. Being the first confirmed record of this species in Pakistan, this information is an important addition and consideration for the Pakistan Biodiversity Action Plan.*

**Keywords:** pan-tropical spotted dolphin, *Stenella attenuata*, mass stranding, Pakistan

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Approximately 200–250 pan-tropical spotted dolphins, *Stenella attenuata* (Gray, 1846), stranded on Gaddani Beach (GPS coordinates: 25°09.024'N 66°44.298'E) on the Balochistan coast of Pakistan, approximately 50 km north-west of Karachi on 6 March 2009. The species is known to occur in tropical and warm-temperate waters between about 40°N and 40°S around the world (Jefferson *et al.*, 2008; Perrin, 2009) and has been recorded from the waters of countries neighbouring Pakistan and other countries in the region, i.e. Oman, India, Sri Lanka, Bangladesh and the Maldives in the Indian Ocean (Leatherwood, 1986; Gallagher, 1991; Leatherwood *et al.*, 1991; Salm *et al.*, 1993; Ballance & Pitman, 1998; Kumaran, 2002) but there have been no previous confirmed records of this species from Pakistani waters (de Boer *et al.*, 2003). Although Niazi (1990) mentions that the pan-tropical spotted dolphin is among the species that gets killed in large-mesh sized (150–240 mm) surface gill-nets used for catching large pelagic fish in offshore waters of Pakistan, the information is based only on a few anecdotal records reported by fishermen. This paper presents the first confirmed record of the pan-tropical spotted dolphin from Pakistan.

The Cetacean Conservation Pakistan (CCP) project conducted systematic surveys of the entire coastline of Pakistan between November 2005 and October 2008 and confirmed the occurrence of 12 cetacean species but did not encounter pan-tropical spotted dolphins. Species identification for the

stranded animals was confirmed from photographs taken by bystanders; the typical long beak tipped with white, well-defined cape passing high over the eye and flipper stripe passing towards the gape are clearly visible.

Animals began to beach at about 1000 hours and continued until 1400 hours. There were also reports that some animals beached on the following day (7 March 2009). The dolphins included juveniles as well as adults; lengths ranged from 1.5 to 2.3 m. No detailed information was collected on sex and size of animals. Most of the dolphins returned to the water without assistance. Attempts were made to float others out into the water and were largely successful; only two of the dolphins were reported to have died. At least 11 dolphins were recorded to have superficial injuries on different parts of their bodies. Personnel from Sindh Wildlife Department and WWF Pakistan assisted with the rescues. One carcass on the beach was retrieved on 8 March and taken to the Centre of Excellence in Marine Biology (CEMB) in Karachi for preparation as an osteological specimen. A tissue sample was collected and preserved in ethanol for DNA studies.

Only a few mass strandings of pan-tropical spotted dolphin have been previously recorded: three in Florida, of between three and 11 individuals (Walsh *et al.*, 2001) and one in Western Australia, of 13 (Mell, 1988). No mass stranding of this species of such large-scale has ever been recorded from any of the neighbouring and regional countries of Pakistan, however, two large-scale mass strandings involving at least 152 small cetaceans were recorded along the Iranian coast in September 2007. About 79 spinner dolphins (*Stenella longirostris*) washed ashore near the port of Jask in southern Iran on 20 September 2007 and then approximately 73 live striped dolphins (*Stenella coeruleoalba*) were found in almost the

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**Fig. 1.** Dead specimen of a pan-tropical spotted dolphin *Stenella attenuata* found on Gaddani Beach after the mass stranding event. (Photograph: Abrar-ul-Hassan, Zoological Survey Department (ZSD) Pakistan).

same area as the previous mass stranding event on 24 October 2007 (Braulik *et al.*, 2010a). Detailed investigation was carried out by experts from the IUCN Cetacean Specialist Group headed by G. Braulik, it was concluded that negative fishing interaction was most likely the underlying cause of the first event, while complex coastal features trapped the dolphins in the second event and caused them to live strand. However, it remained unknown what agents caused an off-shore species, i.e. striped dolphins, to enter into nearshore, shallow waters. Braulik *et al.* (2010a) also suggested that there was no evidence to suggest that the two mass strandings were linked because they involved different species and also exhibited different characteristics.

Limited records of pan-tropical spotted dolphins are available from Oman (Alling, 1986; Ballance *et al.*, 1996; G. Minton & R. Baldwin, personal communication). There are only a few records of live sightings dating back to the mid-1990s made by R. Baldwin. A number of third party sightings are also available but their authenticity cannot be confirmed. Three stranding records of this species are available from Oman dating back to the 1970s and 1980s made by M. Gallagher—the former curator of the Oman Museum of Natural History (G. Minton, personal communication). The species is still to be confirmed in Iranian waters (Braulik *et al.*, 2010b). In India, pan-tropical spotted dolphin is recorded from at least five sighting records, two stranding records, and one skull that resides in the British Museum (Alling, 1986; De Silva, 1987; Anon, 1999a, b; Sathasivam, 2002). It is interesting to note that one of these strandings was a live mass stranding of a mixed group of spinner dolphins and pan-tropical spotted dolphins involving a total of 12 animals that were all rescued while the second stranding involved four dead pan-tropical spotted dolphins that beached just after three days of the first event in almost the same area. It is possible that the same animals that were rescued died and beached again. The species is common along the coast of Sri Lanka but there is no stranding record available (A. Ilankoon, personal communication). In Bangladesh it is only recorded through a live sighting (Smith *et al.*, 2008). Only one beach-worn pan-tropical spotted dolphin skull is recorded from the Maldives (Anderson *et al.*, 1999). The Pakistan stranding is the largest reported for this species to date. The cause of the stranding is unknown. The pan-tropical dolphin typically inhabits

deep pelagic waters (Jefferson *et al.*, 2008) and is not usually seen in shallow coastal waters. The Balochistan coast is characterized by a narrow continental shelf with water over 2000 m deep within 25–35 km offshore. No harmful algal blooms (HABs) or seismic exploration were observed in the days prior to or on the day of stranding; although it is possible that these activities or events may have been occurring at the time of the stranding, and cannot be ruled out as the cause. Pollution from a local ship-breaking industry has been singled out as a possible contributor to contamination and an unhealthy habitat for cetaceans in this particular area (Gore *et al.*, 2007). A multi-national naval exercise (AMAN 09) involving more than 20 warships (including vessels from the US, UK, France and Australia) was, however, being conducted in a deep water region of Pakistan between 5 March and 14 March (Geo Pakistan, 2009) and data on vessel locations and sonar use during this exercise must be analysed before a naval sonar link to the stranding can be ruled out. Naval exercises have been associated with mass strandings of a variety of species, including small cetaceans (Parsons *et al.*, 2008). In the case of the Pakistan event, nothing could be determined about the cause of this mass stranding due to lack of expertise for detailed investigation of dead animals and also due to non-availability of vessel presence and sonar use data during the AMAN 2009 naval exercises. However, if these data become available in the near future, it may lead to the solution of this riddle.

This new information regarding the occurrence of pan-tropical spotted dolphin in Pakistani waters is very significant for Pakistan, which is in the process of updating information about its marine mammal fauna, and will assist in the development of Pakistan's National Conservation Strategy for marine mammals and the Pakistan Biodiversity Action Plan.

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## REFERENCES

- Alling A. (1986) Records of odontocetes in the northern Indian Ocean (1981–1982) and off the coast of Sri Lanka (1982–1984). *Journal of the Bombay Natural History Society* 83, 376–394.
- Anderson R.C., Shaan A. and Waheed Z. (1999) Records of cetacean 'strandings' from the Maldives. *Journal of South Asian Natural History* 4, 187–202.
- Anon. (1999a) Dolphins rescued. *The Hindu*, Saturday, 7 August 1999, p. 3.
- Anon. (1999b) Four dead dolphins washed ashore. *The Hindu*, Wednesday, 11 August 1999, p. 5.

- Ballance L.T. and Pitman R.L.** (1998) Cetaceans of the western tropical Indian Ocean: distribution, relative abundance, and comparisons with cetacean communities of two other tropical ecosystems. *Marine Mammal Science* 14, 429–459.
- Ballance L.T., Pitman R.L., Reilly S.B. and Force M.P.** (1996) Report of a cetacean, seabird, marine turtle and flying fish survey of the western Tropical Indian Ocean aboard the RV 'Malcom Baldrige', 21 March–26 July 1995. NOAA Technical Memorandum NMFS (NOAA-TM-NMFS-SWFSC-224), 132 pp.
- Boer M.N. de, Baldwin R., Burton C.L.K., Eyre E.L., Jenner K.C.S., Jenner M.N.M., Keith S.G., McCabe K.A., Parsons E.C.M., Peddemors V.M., Rosenbaum H.C., Rudolph P. and Simmonds M.P.** (2003) Cetaceans in the Indian Ocean Sanctuary: a review. *Whale and Dolphin Conservation Society Science Report*, pp. 1–52.
- Braulik G.T., Savadkouhi O.S., Fadakar S., Mohammadi H., Brownell Jr, R.L., Reeves R.R., Nabavi M.B. and Fernández A.** (2010a) A retrospective investigation of two dolphin mass mortality events in Iran, Autumn 2007. *Zoology in the Middle East*, no. 49.
- Braulik G.T., Ranjbar S., Owfi F., Aminrad T., Dakhteh S.M.H., Kamrani E. and Mohsenizadeh F.** (2010b) Marine mammal records from Iran. *Journal of Cetacean Research and Management* 11, 49–63.
- De Silva P.H.D.H.** (1987) Cetaceans (whales, dolphins and porpoises) recorded off Sri Lanka, India, from the Arabian Sea and Gulf, Gulf of Aden and from the Red Sea. *Journal of the Bombay Natural History Society* 84, 505–525.
- Gallagher M.D.** (1991) Collection of skulls of Cetacea: Odontoceti from Bahrain, United Arab Emirates and Oman, 1969–1990. In Leatherwood S. and Donovan G.P. (eds) *Cetaceans and cetacean research in the Indian Ocean Sanctuary*. UNEP Marine Mammal Technical Report 3, 89–97.
- Geo Pakistan** (2009) *Pak Navy deep-sea operational exercise third phase kicks off*. <<http://geo.tv/3-10-2009/36937.htm>> Accessed 20 December 2010.
- Gore M.A., Ahmad E., Ali Q.M., Culloch R.M., Hameed S., Hasnain S.A., Hussain B., Kiani S., Shaik N., Siddiqui P.J. and Ormond R.F.** (2007) Sperm whale, *Physeter macrocephalus*, stranding on the Pakistani coast. *Journal of the Marine Biological Association of the United Kingdom* 87, 363–364.
- Jefferson T.A., Webber M.A. and Pitman R.L.** (2008) *Marine mammals of the world*. Amsterdam, The Netherlands: Elsevier Academic Press.
- Kumaran P.L.** (2002) Marine mammal research in India: a review and critique of the methods. *Current Science* 83, 1210–1220.
- Leatherwood S.** (1986) *Whales, dolphins and porpoises of the Indian Ocean Cetacean Sanctuary. A catalogue of available information*. San Diego, CA: Hubbs Marine Research Center Technical Report No. 87–197, 208 pp.
- Leatherwood S., McDonald D., Prematunga W.P., Girton P., Ilangakoon A. and McBrearty D.** (1991) Records of the 'Blackfish' (killer, false killer, pilot, pygmy killer and melonheaded whales) in the Indian Ocean, 1772–1986. In Leatherwood S. and Donovan G.P. (eds) *Cetaceans and cetacean research in the Indian Ocean*. Nairobi, Kenya: Black Bear Press Limited, pp. 33–65.
- Mell D.J.** (1988) An operational perspective of the rescue of false killer whales (*Pseudorca crassidens*) stranded at Augusta in July 1986. In Augee M.L. (ed.) *Marine mammals of Australasia. Field biology and captive management*. Sydney, Australia: Royal Zoological Society of New South Wales, pp. 43–57.
- Niazi M.S.** (1990) *A brief on major fisheries of Pakistan and mortality of dolphins in different fishing gear*. IWC Workshop on mortality of cetaceans in passive fishing nets and traps, La Jolla, California, 22–25 October, Doc SC/090/630. [See also Perrin *et al.*, 1994, p. 14.]
- Parsons E.C.M., Dolman S., Wright A.J., Rose N.A. and Burns W.C.G.** (2008) Navy sonar and cetaceans: just how much does the gun need to smoke before we act? *Marine Pollution Bulletin* 56, 1248–1257.
- Perrin W.F.** (2009) Pantropical spotted dolphin *Stenella attenuata*. In Perrin W.F., Würsig B. and Thewissen J.G.M. (eds) *Encyclopaedia of marine mammals*. Amsterdam, The Netherlands: Academic Press, p. 819–821.
- Salm R.V., Jensen R.A.C. and Papastavrou V.** (1993) *Marine fauna of Oman: cetaceans, turtles, seabirds and shallow water corals*. Gland, Switzerland: IUCN.
- Sathasivam K.** (2002) *A catalogue of marine mammal records*. Madurai, India.
- Smith B.D., Ahmed B., Mowgli R.M. and Strindberg S.** (2008) Species occurrence and distributional ecology of nearshore cetaceans in the Bay of Bengal, Bangladesh, with abundance estimates for Irrawaddy dolphins *Orcaella brevirostris* and finless porpoises *Neophocaena phocaenoides*. *Journal of Cetacean Research and Management* 10, 45–58.
- and
- Walsh M.T., Ewing R.Y., Odell D.K. and Bossart G.D.** (2001) Mass strandings of cetaceans. In Dierauf L.A. and Gulland F.M.D. (eds) *CRC handbook of marine mammal medicine*. Second edition. Boca Raton, FL: CRC Press, pp. 83–96.

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