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New record of Dwarf Sperm Whale *Kogia sima* (Owen, 1866) from the Mediterranean Sea (Cetacea Kogiidae)

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ABSTRACT We report a new record of the Dwarf Sperm Whale *Kogia sima* (Owen, 1866) (Cetacea Kogiidae) in the Mediterranean Sea, following the stranding of a dead female of this species occurred on 4th February 2017. The specimen was found at the Trentova seaside near Agropoli (Salerno Province, Southern Italy) within the area of the Cilento, Vallo di Diano and Alburni National Park. The molecular analysis of a partial sequence of the mitochondrial 16S rRNA confirmed the species identification based on anatomical and morphological characters. This stranding is the third on the Mediterranean and Italian coasts.

KEY WORDS *Kogia sima*; Kogiidae; Cetacea; stranding; Mediterranean Sea; mtDNA.

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INTRODUCTION

The Dwarf Sperm Whale *Kogia sima* (Owen, 1866) (Order Cetacea, Suborder Odontoceti, Family Kogiidae), commonly known as "Cogia di Owen" in Italian, has been recognized as a distinct species from *K. breviceps* (Blainville, 1838) (Chivers et al., 2005).

Kogia sima is distributed worldwide, in warm-temperate and tropical oceanic waters of both hemispheres. This species lives over the continental shelf and slope as well as in offshore waters and occasionally strands in cold-temperate areas and in warmer coasts. *Kogia sima* range covers the western Atlantic from southeastern U.S.A. to Brazil, including the Antilles; the eastern Atlantic from Portugal to Cape Province; the Indian Ocean from Cape Province to India and South Australia; the western Pacific from Japan to New Zealand; the eastern Pacific from southern Canada to Chile. It is also found in the Sea of Japan and in the Persian Gulf (Taylor et al., 2012). The most reliable records on the distribution and biology of the species are based on stranded individuals or occasionally on those retrieved from small fisheries (Caldwell & Caldwell, 1989). The seasonality and migration patterns of this species are unknown.

This species is protected by CITES (listed in Appendix II) and it is under the Marine Mammal Protection Act (NOAA) of 1972. At European level

the species is considered "in need of strict protection" in the European Union by the Annex IV of the Council Directive 92/43/EEC of May 21st 1992 on the conservation of natural habitats and of wild fauna and flora, known as "Habitats Directive". *Kogia sima* is also protected by the "Barcelona Convention" for the Protection of the Marine Environment and the Mediterranean Coast (and its new Application Protocol relative to Special Protection Zones and the Biological Diversity in the Mediterranean (Specially Protected Areas of Mediterranean Importance (SPAMI) adopted on 1995), and it is considered an "Endangered or threatened species" in the Annex II. The species is also included in the Appendix II of the "Bern Convention" relative to the Conservation of European Wildlife and Natural Habitats, considered as "Strictly protected fauna species". It is covered by the Agreement on the Conservation of Cetaceans in the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS) according to Annex I. Furthermore, the species is classified as "Data Deficient" on the IUCN Red List of Threatened Species (vers. 2017-3) (Taylor et al., 2012) and further researches are needed in order to better understand the impact of threats of different nature on this species. Finally, in the Mediterranean Sea, the Dwarf Sperm Whale is considered a "Vagrant" species (Notarbartolo di Sciara & Birkun, 2010; Cagnolaro et al., 2015).

In this note we report a new record of the Dwarf Sperm Whale, *K. sima*, in the Mediterranean Sea.

MATERIAL AND METHODS

In order to ascertain the correct species determination of the study samples, we conducted a molecular study on the specimen beached near Agropoli and on the specimen stranded nearby Agrigento in 2002. Total genomic DNA was extracted according to the method described by Sokolov (2000) from alcohol preserved tissue samples. A mitochondrial 16S rRNA gene fragment was amplified with PCR using the universal primer pairs 16Sa and 16Sb (Palumbi, 1996) and sequenced with automated sequencer ABI 3110 (Applied Biosystems). Chromatograms were edited with Chromas Lite©, aligned with BioEdit 7.0.5.3 (Hall, 1999) and blasted in GenBank.

RESULTS AND CONCLUSIONS

On 4th February 2017 a dead female specimen, phenotypically ascribable to *K. sima*, was found beached lifeless on the seaside of Trentova Bay near Agropoli (Salerno Province, Campania, Southern Italy), within the territory of the Cilento, Vallo di Diano and Alburni National Park (CVDANP) (Lat. 40°20'56''N - Long. 014°58'29''E) (Figs. 1−3). The individual was 195 cm long (head-to-tail length) and weighed 115.5 kg. The carcass was at medium stage of decomposition (Code 3, moderately decomposed) according to Geraci & Loundsbury (2005). This stranding is the third on the Mediterranean and Italian coasts and the first documented record of *Kogia* G.R. Gray, 1846 for the Campania Region (Maio & Quercia, 2006; Maio et al., 2012) Fig. 4).

Dwarf Sperm Whales are extremely rare for the entire Mediterranean basin and there are only two other reports of beached specimens of this species, namely: a specimen found dead and partly buried on 20th May 1988 at Foce Chiarone along the border between Tuscany and Lazio Region (Centro Studi Cetacei, 1990) and an individual that stranded alive and then died in 2002 in the Province of Agrigento (Centro Studi Cetacei, 1990). The former animal had a total body length of 220 cm, and although it was not possible to sex this specimen, the complete closure of the vertebral epiphyses and the almost complete (90%) closure of the pulp cavity of teeth indicated that it was probably an adult (Baccetti et al., 1991). The latter individual stranded alive at Eraclea Minoa, nearby Agrigento, Western Sicily, on 8th September 2002. This specimen measured 207 cm in total length and must therefore be considered an adult or a subadult (Bortolotto et al., 2003). These two specimens from the Mediterranean Sea are preserved in Italian museums (Cagnolaro et al., 2014; Insacco et al., 2014).

The resulting 16S rRNA sequences were of 470 bp, and showed 100% identity (uncorrected p-distance) between the two studied samples (Agropoli and Eraclea Minoa). A BLAST search retrieved 98% identity with homologous 16S rRNA segments of three deposited sequences in GenBank of *K. sima*. One of them was from an Indian sample, which in turn showed an identity of 100% and 99.8%, respectively, with the remaining two samples from unknown localities (Accession

numbers: MG000942, AF334490, AF304066). Considering these preliminary molecular evidences, our two studied samples can be assigned to *K. sima* and they would represent the sister group of the other three available samples. Furthermore, the dorsal fin was located at about the midpoint of the body length, it had a relatively long base and measured 19.8 cm in height, therefore representing over 10% of total body length (i.e.: > 5% of TBL which identified *K. sima* and not *K. breviceps*).

All these data support the fact that this specimen is a *K. sima* and not a *K. breviceps*, according to morphological characters of the species reported in literature (Jefferson et al., 1993).

According to Caldwell and Caldwell (1989), Robineau (2005) and Perrin et al. (2009) the total body length of adults ranges from 210 to 270 cm and the weight from 135 to 272 kg with females generally slightly smaller than males. Dwarf Sperm Whales become sexually mature at 2.5−5 years, when they reach a length of about 2 meters. The estimated lifespan for this species may be up to 22 years. Therefore, we can consider the specimen an adult.

The skeleton (without the skull, which was unfortunately lost) was collected and it will be exposed in "CVDANP in "Villa Matarazzo" Museum Centre, at S. Maria of Castellabate (Salerno).

Figure 1. The female specimen of Dwarf Sperm Whale, *Kogia sima*, found beached lifeless on the seaside of Trentova Bay near Agropoli (Salerno, Campania) within the territory of the "Cilento, Vallo di Diano and Alburni National Park" on 4th February 2017. Figure 2: particular of the head. Figure 3: particular of the dorsal fin (photos by A. Gasparro). Figure 4. • Known data records of specimens stranded in the Mediterranean Sea. • This report.

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REFERENCES

Baccetti N., Cancelli, F. & Renieri, T., 1991. First record of *Kogia simus* (Cetacea, Physeteridae) from the Mediterranean Sea. Mammalia, 55: 152−154.

Bortolotto A., Papini L., Insacco G., Gili C., Tumino G., Mazzariol S., Pavan G. & Cozzi B., 2003. First record of a dwarf sperm whale, *Kogia sima* (Owen, 1866) stranded alive along the coasts of Italy. 31st Symposium of the European Association for Aquatic Mammals. Tenerife, Spain, 14−17 march 2003, 1−8 pp.

Cagnolaro L., Cozzi B., Notarbartolo di Sciara G. & Podestà M. (Eds.), 2015. Fauna d'Italia Vol. XLIX. Mammalia IV. Cetacea. Calderini, Bologna, 375 pp.

Cagnolaro L., Maio N. & Vomero V. (Eds.), 2014. The cetacean collections of Italian museums. First part (living Cetaceans). Museologia Scientifica Memorie, 12: 1−420.

Caldwell D.K. & Caldwell M.C., 1989. Pygmy sperm whale *Kogia breviceps* (de Blainville, 1838); Dwarf sperm whale *Kogia simus* Owen, 1866. In: Handbook of Marine Mammals (Ridgway S.H., Harrison S.R., eds), Vol. 4: River Dolphins and the Larger Toothed Whales. Academic Press, London, pp. 235−260.

Centro Studi Cetacei, 1990. Cetacei spiaggiati lungo le coste italiane. III. Rendiconto 1988. Atti della Società italiana di Scienze Naturali e del Museo Civico di Storia Naturale di Milano, 130 (1989): 269−287.

Centro Studi Cetacei, 2004. Cetacei spiaggiati lungo le coste italiane. XVII. Rendiconto 2002. Atti della Società italiana di scienze naturali e del Museo civico di storia naturale di Milano, 145: 155−169.

Chivers S.J., Leduc R.G., Robertson K.M., Barros N.B. & Dizon A.E., 2005. Genetic variation of *Kogia* spp. with preliminary evidences for two species of *Kogia sima*. Marine Mammal Science, 21: 619−634.

Geraci J.R. & Loundsbury V.J. 2005. Marine mammals ashore: a field guide for strandings. 2nd ed. National Aquarium in Baltimore, Baltimore, MD, pp. 167−228.

Hall T.A., 1999. BioEdit: a user-friendly biological sequence alignment editor and analysis program for Windows 95/98/NT. Nucleic Acids Symp 1999, 41: 95–98.

Insacco G., Buscaino G., Buffa G., Cavallaro M., Crisafi E., Grasso R., Lombardo F., Lo Paro G., Parrinello N., Sarà M. & Spadola F., 2014. Il patrimonio delle raccolte cetologiche museali della Sicilia. Museologia Scientifica Memorie, 12: 391−405.

Jefferson T.A., Leatherwood S. & Webber M.A., 1993. FAO species identification guide. Marine Mammals of the World. F.A.O., Roma.

Maio N., Pollaro F., Di Nocera F., De Carlo E. & Galiero G., 2012. Cetacei spiaggiati lungo le coste della Campania dal 2006 al 2011 (Mammalia: Cetacea). Atti della Società italiana di scienze naturali e del Museo civico di storia naturale di Milano, 153: 241−255.

Maio N. & Quercia F., 2006. Cetacei spiaggiati lungo il litorale campano: ricerca e conservazione. In: Gugliemi R. & Nappi A. (Eds.), Atti Convegno: "La Natura in Campania: aspetti biotici e abiotici". Napoli, 18 novembre 2004: 158−164.

Notarbartolo di Sciara G. & Birkun A. Jr., 2010. Conserving whales, dolphins and porpoises in the Mediterranean and Black Seas: an ACCOBAMS status report, 2010. ACCOBAMS, Monaco.

Palumbi S.R., 1996. Nucleic acids II: the polymerase chain reaction. In: Hillis D.M., Moritz C. & Mable B.K. (Eds.), Molecular Systematics, 2nd Edition. Sunderland, USA, 205–247.

Perrin W.F., Würsig B. & Thewissen J.G.M. (Eds.), 2009. Encyclopedia of Marine Mammals (Second Edition). Academic Press - Elsevier, San Diego, CA. xxix, 1316 pp.

Robineau D., 2005. Cétacés de France. Faune de France vol. 89. Fédération Française des Sociétés de Sciences Naturelles, Paris, 646 pp.

Sokolov E.P., 2000. An improved method for DNA isolation from mucopolysaccharide-rich molluscan tissue. Journal of Molluscan Studies, 66: 573−575.

Taylor B.L., Baird R., Barlow J., Dawson S.M., Ford J.K.B., Mead J.G., Notarbartolo di Sciara G., Wade P. & Pitman R.L., 2012. *Kogia sima*. The IUCN Red List of Threatened Species, Version 2012: e. T11048A17695273.http://dx.doi.org/10.2305/ IUCN. UK.2012.RLTS.T11048A17695273.en. Downloaded on 14 December 2017.