

First record of the harp seal (*Pagophilus groenlandicus*) extralimital presence in the Mediterranean Sea

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The stranding of a harp seal on the beach in the municipality of Motril (southern Spain) represents the first record of this species in the Mediterranean Sea and the southernmost known report. It was a male which reached the beach very tired and sick, dying after two hours on the sand. The specimen presented three species of epibionts. This is the second species of Arctic seal recorded in the Mediterranean Sea.

Keywords: harp seal, Mediterranean Sea, stranding, epibionts

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The harp seal *Pagophilus groenlandicus* (Erxleben, 1777) is the most usual species in the North Atlantic (Folkow *et al.*, 2004). This species consists of three populations with three independent breeding grounds, the north-west Atlantic, the Greenland Sea and the White Sea/Barents Sea population (Folkow *et al.*, 2004; Nordøy *et al.*, 2008). The north-west Atlantic population breeds in the Gulf of St Lawrence and off the coasts of Labrador and Newfoundland. The East Greenland population breeds near Jan Mayen Island, and the Barents Sea population breeds in the White Sea. After breeding, harp seals carry out important migratory journeys, always in waters of the North Atlantic and mainly around the Barents Sea (Kovacs, 2008; Nordøy *et al.*, 2008).

Five other species of Arctic seals have been reported in Atlantic waters next to the Strait of Gibraltar (Avellá *et al.*, 1993; Bree, 1997), but only the hooded seal *Cystophora cristata* (Erxleben, 1777) was previously reported inside the Mediterranean Sea (Bellido *et al.*, 2007). There are no prior reports of harp seal occurrence in the Mediterranean basin.

On 26 September 2008, one harp seal was found stranded (Figure 1) in Motril (36°41'N 3°29'W) Granada, Spain, inside the Mediterranean Sea (Figure 2). This specimen was a male with a total length of 170 cm and a weight of 61.5 kg. External anatomical characters and dental formula were used to determine the species of seal. The animal was very sick, extremely thin, with external injuries and presented three species of epibionts (Cirripedia: *Lepas hilli* Leach, 1818; *Conchoderma virgatum*, Spengler, 1790; *Conchoderma auritum*, Linnaeus 1767) (Figure 3) which may be a signal of a long period of weakness (Aznar *et al.*, 2005) with slow swimming. However, the epibiotic relation between species of genus *Conchoderma* and high migratory pelagic animals

such as swordfish *Xiphias gladius* (Linnaeus, 1758), bluefin tuna *Thunnus thynnus* (Linnaeus, 1758) or whales is not unusual in the Mediterranean Sea (i.e. Báez *et al.*, 2003). Nevertheless, we did not find reports of similar cases in seals.

The harp seal died on the beach while it was being treated by the emergency team. McAlpine & Walker (1990) found a low rate of survival in extralimital strandings and sightings on the east coast of the USA, and suggested that this is common in specimens that leave their usual ranges of feeding and breeding and spend the summer in southern waters.

During the necropsy stones and sand were found in the stomach, as well as cephalopods and nematodes. The finding of stones in the stomach is not unusual in this species and it may be related to an aid in the physical breakdown of fish flesh and hard fish bones (Nordøy *et al.*, 1995). The presence of sand and stones in the stomach has been also confirmed in two specimens of hooded seal stranded on the Mediterranean Spanish coast (Mons *et al.*, 1999; Bellido *et al.*, 2007).



Fig. 1. Harp seal stranded in Motril (southern Spain).

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Fig. 2. Location of the harp seal stranding in the Mediterranean Sea.

Samples of skin, fat tissue, and muscle are kept in the Aula del Mar of Málaga (Spain) under the control of the Consejería de Medio Ambiente de la Junta de Andalucía (Andalusian Government), and the skull is housed in the Vertebrate Collection of the Estación Biológica de Doñana.

This sighting constitutes the southernmost known report for the harp seal worldwide, and could be put in the context of the unusual increase of extralimital records of harp seal reported by McAlpine *et al.* (1999) in the Gulf of Maine (north-west Atlantic) since the end of the past century. According to MacAlpine *et al.* (1999) ‘invasion years’ could be impelled by fish stock collapses which would force seals to travel south in search of food or by demographic explosions leading to greater numbers of extralimital animals. Indeed, Gjosæter *et al.* (2009) reported a recent collapse of the capelin, *Mallotus villosus* Müller, 1776, stock in the Barents Sea, which is the principal prey of harp seals (Nordøy *et al.*, 2008).



Fig. 3. Epibiont organisms on the stranded harp seal.

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