



## The recurring visit of a southern elephant seal (*Mirounga leonina* L. 1758) to the coast of Antofagasta, northern Chile

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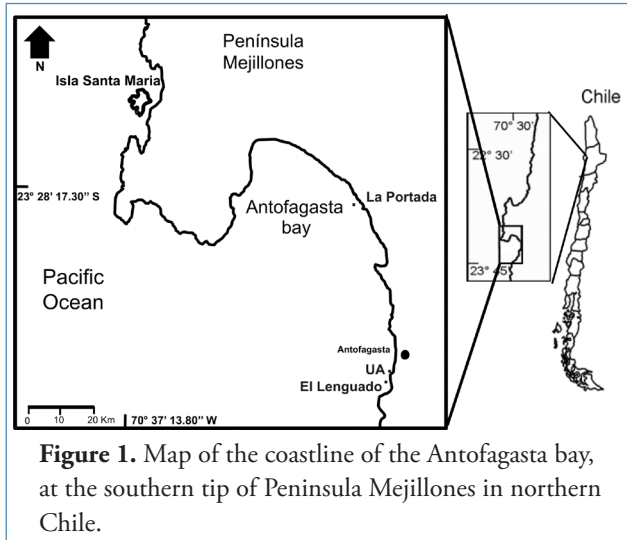
Elephant seals (*Mirounga* spp. Monachinae, Phocidae) are the largest pinnipeds of the world (Hindell and Perrin, 2009). They are characterized by having the most striking sexual dimorphism, with adult males weighing eight to ten times more than adult females, and also for showing a prominent proboscis in the case of males, which is fully developed when adulthood is reached (Hindell and Perrin, 2009). The southern elephant seal *Mirounga leonina* is distributed throughout several regions of Patagonia and the Southern Ocean, where it comes ashore twice a year for breeding (September to November) and molting (December to March) events, after which it undertakes post-breeding (3 months) and post-molting (7 months) feeding migrations in pelagic waters (Lewis *et al.*, 2006). Dispersal movements between these functional areas can span several thousand kilometers (Hindell and McMahon, 2000; Daneri and Carlini, 2002; Setsaas *et al.*, 2008; Reisinger and Bester, 2010).

The presence of *M. leonina* in northerly locations beyond the main breeding colony at Península Valdés in the Southwest Atlantic Ocean is unusual, although there are a few reported sightings, including two subadult males in Uruguay (*e.g.*, Daneri, 2009) and both female and male subadults in Brazilian locations (*e.g.*, Magalhães *et al.*, 2003). In the Southeast Pacific, this species also has been reported at very distant locations away from the main distributional areas in the Southern Ocean. For example, on Juan Fernandez and Pascua (Easter) Islands and in locations in the Magellanic (-53°S) and central regions (-30°S) off the coast of Chile (Aguayo *et al.*, 1995; Lewis *et al.*, 2006; Sepúlveda *et al.*, 2007). In this note, we report two years (2005, 2006) of consecutive observations of the same individual on the northern coast of

Chile (-23°S), while it hauled out for molting in the area of Antofagasta.

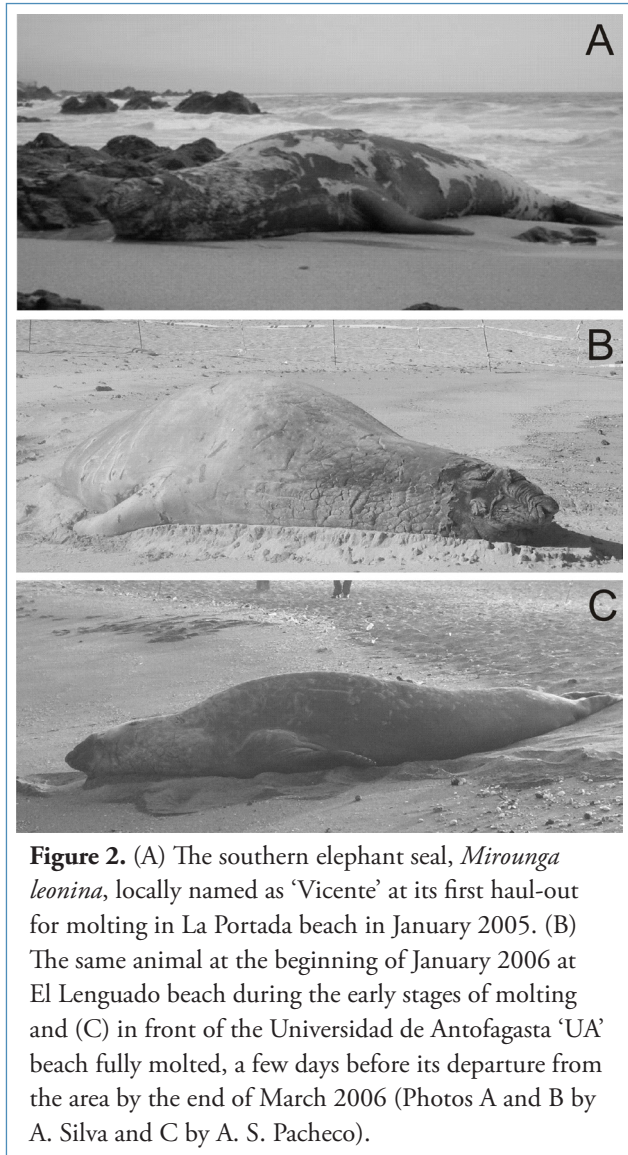
A subadult male *Mirounga leonina* was first sighted at La Portada beach, within Antofagasta Bay (23°30'S, 70°25'W), Antofagasta region, northern Chile, on 3 January 2005 (Figure 1). The estimated length of this individual from nose to hind flippers was around 4-4.5m. According to the length/age relationship obtained from a growth/energy model (Boyd *et al.*, 1994), the estimated age of the sighted animal would be 7-8 years old. Several photographs of the animal were taken in order to document the record (Figure 2). On 5 January 2006 another sighting was made in the surrounding areas of La Portada beach. This time we followed and monitored the seal along the coast for 3 to 5 days per week, including morning and afternoon observations. After two days at La Portada, the individual moved into El Lenguado, a sandy beach located toward the southern limit of Antofagasta Bay (Figure 1). The seal hauled out for molting for 6 weeks in this location, as we observed layers of skin shedding from its entire body surface (Figure 2). Fences were installed by personnel of the Animal Rescue Center of the Universidad de Antofagasta, surrounding the elephant seal and covering a perimeter of 100m<sup>2</sup> with the intention of protecting the animal by keeping people at a prudent distance and avoiding disturbance in general.

The elephant seal was usually observed in the upper and driest part of the sandy beaches, resting and often covering its body with sand using its flippers during sunny days. Occasionally, it swam in the surrounding area for short time intervals, and then it returned to the same spot on land. While in the water the seal was observed to defecate, suggesting



recent feeding. During the progress of molting the seal used at least three sandy beaches towards the north of the coast, ending up in front of the Universidad de Antofagasta beach. At this time, the animal was totally molted (Figure 2) and left the area by 17 March 2006. At this time the seal's length was estimated at 4.5m. Further photographic analysis based on the skin markings revealed that this elephant seal was the same individual that was observed and described in January 2005.

It is difficult to assess the dispersal distance traveled by this individual since the colony of origin is unknown. However, if assuming that the nearest breeding colony was located in the South Shetland Island, then the minimal distance traveled by this seal would be ~4,500km. *Mirounga leonina* is regularly capable of dispersal distances of ~5,000km, but more usually within its normal breeding areas around the Patagonian region and the Southern Ocean (Lewis *et al.*, 2006). Our records add a further distance of ~300 km to the previous northernmost records for the coastal area of Chile, off Isla Chañaral (29°02'S, 71°36'W) and Reserva Marina Islas Choros-Damas (29°14'S, 71°32'W) (Sepúlveda *et al.*, 2007). *Mirounga* spp. individuals have been sighted at locations off the Gulf of Guayaquil in the coast of Ecuador (Alava and Carvajal, 2005) as well as in the Galápagos Islands (Lewis *et al.*, 2006), potentially representing the most Equatorial occurrence for the species on the western coast of South America. However, in both cases the authors recognized that the species identity could not be ascertained. Alava and Carvajal (2005) based their identification on the observation of animals at sea, which cannot fully warrant species identity and it could be confounded with the northern elephant seal *Mirounga angustirostris*. Lewis *et al.* (2006) reported on the dispersal of southern elephant seals into the southern Pacific and Atlantic Oceans based on tagging efforts, reporting the sighting of an individual at the Galápagos Islands. However, the tag of the sighted animal was identical in color and model to the tags used



with northern elephant seals at Guadalupe Island, Mexico. In this report, the short proboscis (Figure 2) and the lack of the reddish coloration around the neck characteristic of northern elephant seals strongly suggest that our observed species was *M. leonina*.

Subadult and adult southern elephant seals show strong habitat selection and site fidelity during molting due to previous haul-out experience, while young seals tend to be less habitat-selective (Mulaudzi *et al.*, 2008). Our observations of the same subadult male for two consecutive years, together with the sightings of another subadult male in Chañaral Island in 2004 and its re-sighting in 2005 in the central coast of Chile (Sepúlveda *et al.*, 2007) suggest that these apparently unusual dispersal events involve some degree of habitat recognition. However, a future return to this area is unlikely, as older individuals may stay around seal-populated areas once they reach breeding age.

Previous sightings of this species in Chile have been recorded in insular locations relatively isolated from human

populations (Aguayo *et al.*, 1995; Sepúlveda *et al.*, 2007). Instead, our elephant seal was frequently observed in densely inhabited beaches during the austral summer, similar to the sightings made at two coastal city areas off Uruguay (Daneri, 2009). In Antofagasta, the animal did not appear to be disturbed by the human presence, except for the occasions when people approached too close, making it move into the water. However, the animal usually returned to its original spot after a short period of time.

A high coastal primary productivity driven by cold, nutrient-rich upwelling waters associated with the Humboldt Current is a dominant oceanographic feature off northern Chile, in spite of its low-latitude location (Thiel *et al.*, 2007). In addition, the coastline is composed of extensive, protected and exposed sandy beaches alternated with cliffs and rocky shores. Although this region is clearly not sub-antarctic, these cool-habitat conditions could be considered suitable for a *M. leonina* individual searching for a place for resting and molting. Subadult males prefer to forage in continental shelf waters (Daneri and Carlini, 2002; Mulaudzi *et al.*, 2008), which in this region is influenced by the equatorward direction of the Humboldt Current. These environmental conditions have likely played a role in the unusual northern dispersion of this southern elephant seal into the Antofagasta coast.

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