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First records of elephant seals on the Guayaquil Gulf, Ecuador: on the ocurrence of either a *Mirounga leonina* or *M. angustirostris*

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Elephant seals are the largest pinnipeds (Monachine, Phocidae) in the world, with two antitropical, closely-related species, showing marked sexual dimorphism, polygyny and pelagic habits: the northern elephant seal, *Mirounga angustirostris*, and the southern elephant seal, *M. leonina* (Le Boeuf and Laws, 1994). The former is distributed in the Northern Hemisphere, occurring only in the eastern North Pacific between California, USA–38°N, and south of Baja California, Mexico–24°N (Stewart *et al.,* 1994; Le Boeuf *et al.,* 2000; Deméré *et al.,* 2003). This species reproduces from Baja California (Mexico) to California and Oregon (USA), mainly on peninsulas and offshore islands, from December to March, with two foraging migrations (Stewart and Huber, 1993; Le Boeuf and Laws, 1994; Stewart *et al.,* 1994). Feeding grounds for males are near both western and eastern Aleutian Islands and in the Gulf of Alaska, and females venture further south, 38-60°N and 173°E (Le Boeuf *et al.,* 1993; Stewart and Huber, 1993; Le Boeuf *et al.,* 2000). Northern elephant seal rookeries seem to continue increasing in California through 1994, but appear to be stable or slowly decreasing in Mexico (Stewart *et al.,* 1994). It is estimated that the world's total population is about 127,000 animals (Stewart *et al.,* 1994).

The southern elephant seal, *M. leonina*, is abundant and widely distributed in the circumpolar-subantartic region in the Southern Ocean, mainly on oceanic islands, with the major breeding concentrations or stocks located at South Georgia, Marion-Crozet, Kerguelen-Heard and Macquarie Islands (McCann, 1985; Ling and Bryden, 1992; Laws, 1994; Reeves *et al*., 2002; Deméré *et al.,* 2003). South Georgia encompasses the largest population, followed by Kerguelen-Heard islands, both remaining in stable numbers (McMahon *et al.,* 2005). Macquarie Island, located in the Pacific region of the Southern Ocean, contains the third largest southern elephant seal population, presently showing signs of decline (Laws, 1994; McMahon *et al.,* 2005). Recently, the colony settled at Península Valdés has increased along the coast of southern Argentina (Campagna and Lewis, 1992; Lewis and Campagna, 2001). Non-breeding colonies are found at 163°W in suitable islands located at high latitudes of the Pacific Ocean (Laws, 1994). Both males and females can disperse to different feeding areas at sea, and during the non-breeding season, these seals migrate over great distances in the Southern Ocean (Campagna *et al*., 1993; Fedak *et al.,* 1994; Hindell and McMahon, 2000; Fabiani *et al.,* 2003). Some individuals of this species are vagrants, their presence being reported for the coast of central Chile, Angola, South Africa, the southern Australian coast, Tasmania and New Zeland (Reeves *et al*., 2002). Moreover, a southern elephant seal was reported at Sawqarah (18°07'N, 56°32'E) on the coast of Oman (Sultanate of Oman), Northern Hemisphere, in 1989 (Johnson, 1990), and other individuals have been reported all along the Brazilian coast: Fernando de Noronha oceanic archipelago, Pernambuco state (Lodi and Siciliano, 1989); Bahia state (Carvalho and Gonchorosky, 1992[3]); Rio de Janeiro state (Magalhães *et al*., 2003); Rio Grande do Sul, Santa Catarina and Paraná states (Castello, 1984; Pinedo, 1990; Simões-Lopes *et al*., 1995; Drehmer *et al*., 1998). Once, these seals were evidently common on the Juan Fernandez Islands off the coast of Chile and the south part of Peru in the South Pacific Ocean (Ling and Bryden, 1992). The global population abundance is estimated between 664,000 and 740,000 animals, distributed in 14 stocks (Laws, 1994; Le Boeuf and Laws, 1994; McMahon *et al.,* 2005).

In this note, we report the first two sightings of elephant seals recorded on the Gulf of Guayaquil, Ecuador. The first record occurred in December 1998 along the Babahoyo River (2°05'S, 79°48'W), one of the main tributaries of Guayas River on the Bioregion of the Guayaquil Gulf. The presence of this unusual and alien pinniped to this region caused alarm in the human communities settled along the river. A local TV news station (Ecuavisa, Channel 2) video-taped this seal and a VHS tape[4] was delivered to the authors for species identification. The identification of this pinniped as belonging to genus *Mirounga* was also confirmed by another marine mammal specialist (Ben Haase, Centro Informativo Natural Peninsular/FEMM, PO Box 09-01-11905, Guayaquil, Ecuador, pers. comm.). A survey was carried out along Babahoyo River in order to obtain additional information about the specimen. However, after about eight hours of search, the animal was not

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found. From the video, it was noted that this pinniped had large head, big eyes, and absence of external ear pinnae (Figure 1a). The second record of this species occurred in February 2002, on a mangrove and estuarine creek zone called the "El Estero Salado" located in the south part of Guayaquil City (2°10'S, 79°56'W). This individual was seen around a thermoelectric plant (Electroguayas-Electroecuador) close to human settlements. Shortly after this sighting, the specimen was seen resting on a shrimp farm located close to that zone. According to interviews with shrimp farm workers, this pinniped was lying down over the muddy soil of a shrimp pond already harvested. The workers were impressed by the large size of the animal (≈ 3m). On that occasion it was possible to see and identify the animal *in situ* in a narrow creek channel near to the shrimp farm. Photos were taken for species identification (Figure 1b).

These two individuals were likely southern elephant seals. One of them, the first record, was a young male, probably around 4 years of age; males of this age class are rarely observed during the breeding season, and they start coming to land for molting in late November (Filippo Galimberti, Elephant Seals Research Group, Via Buonarroti 35, 20145 Milano, Italy, pers. comm.). However, because of the difficulty to identify appropriately these young individuals at sea, a complete identification cannot be fully warranted. Thus, it is possible that these specimens might be also northern elephant seals.

1a

1b

Figure 1a. Elephant seal swimming along the Babahoyo River, Guayas River Basin of the Gulf of Guayaquil, Ecuador, in December 1998 (photo by the J.J.Alava). **Figure 1b.** Elephant seal in a mangrove area, Guayaquil Gulf, in February 2002 (photo by Rafaela Orrantia).

Both records took place adjacent to the non-breeding or molting season of southern elephant seals (December-February), when they can disperse to different feeding grounds (Campagna *et al*., 1993; Le Boeuf and Laws, 1994; Reeves *et al*., 2002). These two extralimital records at the end and beginning of 1998 and 2002, respectively, could be related to the post-El Niño phenomena or the La Niña event, a cold oceanographic event along the South America Pacific Coast as well as the influence of the Humboldt Current. Records of other non-native pinnipeds species to the Ecuadorian marine territory have also been documented in the last decade. For example, several records of South American sea lions, *Otaria flavescens*, have been reported along the Ecuadorian shoreline, and their presence has been linked to the El Niño event when prey abundance starts to decline (Felix *et al*., 1994). Skulls of South American sea lions have also been discovered at some locations in the Galápagos Island; however, no live animals have been reported (Merlen, 1995). Merlen (1995) documented the presence of a different kind of fur seal, which was identified as Juan Fernandez fur seal, *Arctocephalus philippii*, or as Guadalupe fur seal, *A. townsendi*, on the southwest of San Cristobal, Galápagos Islands. Records of the South American fur seal, *A. australis*, are also uncommon on the Ecuadorian coast (Felix, 1996). Although the occurrence of non-indigenous pinnipeds occur on the Ecuadorian coast is not particularly unusual, phocid pinnipeds are rare.

Hindell and McMahon (2000) reported a long distance movement of a juvenile female southern elephant seal, dispersed about 5200km from Macquire Island to Peter 1 ØY, Southern Ocean, in 1999. At that time, the record was considered the longest movement for a southern elephant seal at an early age. In addition, a sub-adult male tagged on Sea Lion Island was reported on Gough Island, about 4000km away, and most re-sightings of elephant seals tagged on Sea Lion Island come from the Península Valdés, and from islands off the Antarctic Peninsula (e.g. the South Shetlands) within the 1500km range (Filippo Galimberti, Elephant Seals Research Group, Via Buonarroti 35, 20145 Milano, Italy, pers. comm.). Recently, Fabiani *et al.* (2003) have also evidenced the long-range paternal male-mediated gene flow in southern elephant seal as far as 8000km (from one extreme of the species range to the other) on the circum-Antarctic region. From a demographic point of view, the two records reported in this note are the longest displacement achieved by this species in the Pacific Ocean, dispersing over a geographic range of about 8000km from the circum-Antartic region to Ecuador. An alternative scenario is to consider that these individuals could have been northern elephant seals (*M. angustirostris*). Males of this species can undergo movements averaging 4259 ± 251km along northeastern Pacific regions (e.g., up to 4775km away at western Aleutian Islands, Alaska) at about 42°–58°N and 170°W, whereas females can reach regions around 38°–60°N and between 125°W and 173°E by moving through distances of about 3000 ±1164 km with an maximum of 5431km (Le Boeuf *et al.,* 2000). Nevertheless, given that the distribution and migratory behavior of this species are restricted to the eastern and central Northeastern Pacific, and anomalously, a few records of vagrants or wanderers juveniles have been registered near to Japan and at Midway Islands in the northwestern Hawaiian Islands (Reeves *et al.,* 1992; 2002), the likelihood of its occurrence in Ecuador is probably low. Even so, it is worth to consider the possibility of occurrence of both monachine phocids, either a northern or a southern elephant seal, at a given locality of the Ecuadorian coast due to the strategic geographical location of Ecuador on the mid latitude (equator) of the planet. Vagrant individuals of the southern species have been found as far north as the south coast of Peru, whereas the northern species have been recorded as far south as Baja California. It is known that some populations of seals from the North Hemisphere are currently expanding their range and spreading to new localities, where they have not been recorded in the past (Ricardo Bastida, Dpto. Ciencias Marinas, C. C. 43, 7600 Mar del Plata, Argentina, pers. comm.).

Examining the most recent historical reviews on the status and past exploitation for both species in the eastern Pacific Ocean (Laws, 1994; Stewart, 1994), a lack of information is available on the occurrence of these phocids out of their distributional range or other regions (e.g., tropical zones: 40°N–40°S) than those depicted in the present contribution. Phocids are rare in tropical warm waters, except for the Hawaiian monk seals, *Monachus schauinslandi* around Islands of Hawaii (20–30°N) in the Pacific, and the already extinct Caribbean species, *M. tropicalis*, once present in the Caribbean Sea, Yucatan Peninsula and Gulf of Mexico (Daneri and De Santis, 2002 ; Deméré *et al*., 2003).

We cautiously suggest that these extralimital records are probably the first northernmost records of juvenile southern elephant seal south of the equatorial line in the Southern Hemisphere or, less likely, the southernmost records of juvenile northern elephant seal south of the equatorial line.

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References

CAMPAGNA, C. AND LEWIS, M. (1992) Growth and distribution of a Southern elephant seal colony. *Marine Mammal Science* 8: 387-396.

CAMPAGNA, C., LEWIS, M.AND BALDI, R. (1993) Breeding biology of southern elephant seals in Patagonia. *Marine Mammal Science* 9: 34-47.

CASTELLO, H.P. (1984) Registros del elefante marino, *Mirounga leonina* (Carnivora, Phocidae) en las costas del Atlántico Sur Occidental, fuera del area de cria. *Revista del Museo Argentino de Ciencias Naturales, Zoologia*, 24(13): 235-243.

DANERI, G.A. AND DE SANTIS, L.J.M. (2002) Ejemplar de la especie extinta *Monachus tropicalis* (Carnivora, Phocidae) en el Museo de La Plata (Argentina). *Mastozoologia Neotropical* (*Journal of Neotropical Mammalogy*) 9(1): 59-63.

DEMERE, T., BERTA, A. AND ADAM, P.J. (2003) Pinnipedimorph evolutionary biogeography. *Bulletin American Museum of Natural History* 279: 32-76.

DREHMER, C.J., FERIGOLO, J. AND BORSATO, E.S. (1998) Ocorrência de *Mirounga leonina* Linnaeus (Pinnipedia, Phocidae) no extremo-sul do Brasil: agressão e patologias. *Revista Brasileira de Zoologia* 15(4): 1061-1068.

FABIANI, A., HOELZEL, A.R., GALIMBERTI, F. AND MUELBERT, M.M.C. (2003) Long-range paternal gene flow in the southern elephant seal. *Science* 299: 676.

FÉLIX, F. (1996) *Primer registro del lobo fino Sudamericano (*Arctocephalus australis*) en Ecuador. en* Resumenes, VII Reunión de Trabajo y I Congreso de la Sociedad Latinoamericana de Especialistas en Mamíferos Acuáticos de América del Sur, 22 Octubre - 25 Octubre. Viña del Mar, Chile.

FÉLIX, F., HAASE, B., SAMANIEGO, J. AND OECHSLE, J. (1994) New evidence of the presence of the South American sea lion *Otaria flavescens* (Carnivora Pinnipedia) in Ecuadorian waters. *Estudios Oceanológicos* 13: 85-88.

FEDAK, M.A., ARNBOM, T.A., MCCONNELL, B.J., CHAMBERS, C.,BOYD, I.L., HARWOOD, J. AND MCCANN, T.S. (1994) Expenditure, investment, and acquisition of energy in southern elephant seals. Pages 354-374 *in* LE BOEUF, B.J. AND LAWS, R.M. (Eds) *Elephant seals, population ecology, behavior, and physiology*. University of California Press, Berkeley, CA.

GALIMBERTI, F., SANVITO, S., BOITANI, L. AND FABIANI, A. (2001) Viability of the southern elephant seal population of the Falkland Islands. *Animal Conservation* 4: 81-88.

HINDELL, M.A. AND MCMAHON, C.R. (2000) Long distance movement of a southern elephant seal (*Mirounga leonina*) from Macquarie Island to Peter 1 ∅Y. *Marine Mammal Science* 16:504-507.

JOHNSON, D.W. (1990) A southern elephant seal (*Mirounga leonina*) in the Northern Hemisphere (Sultanate of Oman). *Marine Mammal Science* 12: 242-243.

LAWS, R.M. (1994) History and present status of southern elephant seal population. Pages 49-65 *in* LE BOEUF, B.J. AND LAWS, R.M. (Eds) *Elephant seals; population ecology, behavior, and physiology*. University of California Press, Berkeley, CA.

LE BOEUF, B.J. AND LAWS, R.M. (1994) Elephant Seals: an introduction to the genus. Pages 1-26 *in* LE BOEUF, B.J. AND LAWS, R.M. (Eds) *Elephant seals, population ecology, behavior, and physiology*. University of California Press, Berkeley, CA.

LE BOEUF, B.J., CROCKER, D., BLACKWELL, S. AND MORRIS, P. (1993) Sex differences in diving and foraging behaviour of northern elephant seals. *Symposia of the Zoological Society of London* 66: 149-178.

LE BOEUF, B.J., CROCKER, D.E., COSTA, D.P., BLACKWELL, S.B., WEBB, P.M. AND HOUSER, D.S. (2000) Foraging ecology of northern elephant seals. *Ecological Monographs* 70(3): 353–382

LEWIS, M. AND CAMPAGNA, C. (2001) *Temporal and spatial variation by age and sex in a growing southern elephant seal colony*. Page126 *in* Abstracts XIV Biennal Conference on the Biology of Marine Mammals, 28 November - 3 December, Vancouver, Canada.

LING, J.K., AND BRYDEN, M.M. (1992) *Mirounga leonina*. *Mammalian Species* 391: 1-8.

LODI, L. AND SICILIANO, S. (1989) A southern elephant seal in Brazil. *Marine Mammal Science* 5: 313.

MAGALHÃES, F.A., HASSEL, L.B., VENTUROTTI, A.C. AND SICILIANO, S. (2003) Southern elephant seals (*Mirounga leonina*) on the coast of Rio de Janeiro State, Brazil. *The Latin American Journal of Aquatic Mammals* 2: 55-56.

MCCANN, T.S. (1985) Size, status and demography of southern elephant seal *Mirounga leonina* populations. Pages 1-18 *in* LING, J.K. AND BRYDEN, M.M. (Eds) *Sea mammals of south latitudes*. Proceedings of a symposium of the 52dn ANZAAS congress. May 1982, South Australian Museum, Northfield, Sydney, Australia.

MCMAHON, C.R., BESTER, M.N., BURTON, H.R., HINDELL, M.A. AND BRADSHAW, C.J.A. (2005) Population status, trends and a re-examination of the hypotheses explaining the recent declines of the southern elephant seal *Mirounga leonina*. *Mammal Review* 35: 82-100.

MERLEN, G. (1995) *A Field Guide to the Marine Mammals of the Galápagos*. Instituto Nacional de Pesca, Guayaquil, Ecuador.

PINEDO, M.C. (1990) Ocorrência de pinípedes na costa brasileira. *Garcia de Orta, Série Zoologia,* 15(2): 37-48.

REEVES, R.R., STEWART, B.S. AND LEATHERWOOD, S (1992) *The Sierra Club Handbook of seals and Sirenians*. Sierra Clubs Books, San Francisco, CA.

REEVES, R.R., STEWART, B.S., CLAPHAM, P.J. AND POWELL, J.A. (2002) *Guide to the Marine Mammals of the world*. National Audobon Society. New York, NY.

SIMÕES-LOPES, P.C., DREHMER, C.J. AND OTT, P.H. (1995) Nota sobre os Otariidae e Phocidae (Mammalia, Carnivora) da costa norte do Rio Grande do Sul e Santa Catarina, Brasil. *Biociências*, 3(1): 173-181.

STEWART, B.S. AND HUBER, H.R. (1993) *Mirounga angustirostris*. *Mammalian Species* 449: 1-10.

STEWART, B.S., LE BOEUF, B.J., YOCHEM, P.K., HUBER, H.R., DELONG, R.L., JAMESON, R.J., SYDEMAN, W. AND ALLEN, S.G. (1994) History and present status of the northern elephant seal population. Pages 29-48 *in* LE BOEUF, B.J. AND LAWS, R.M. (Eds.) *Elephant seals, population ecology, behavior, and physiology*. University of California Press, Berkeley, CA.

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