

STRAGGLER SUBANTARCTIC FUR SEALS (*ARCTOCEPHALUS TROPICALIS*) ON THE COAST OF RIO DE JANEIRO STATE, BRAZIL

JAILSON FULGENCIO DE MOURA^{1,2,*} AND SALVATORE SICILIANO²

ABSTRACT: Eighteen specimens of subantarctic fur seals (*Arctocephalus tropicalis*) were recorded along the coast of Rio de Janeiro state in the period 1994-2006. Of these, 55.5% (n=10) were males, 11.1% (n=2) were females, and 33.3% (n=6) were of undetermined sex. Most of the records occurred during the austral winter (n=15; 83.3%), with a peak in August, followed by 11.1% and 5.5% during spring and autumn, respectively. There was no record during summer. All males found and measured were subadults and the two recorded females were one adult and one juvenile. In 2002 six specimens were recorded, accounting for 33.3% of the total records followed by 2000 (n=4; 22.2%). The records presented here suggest that the population increase in many breeding sites of *A. tropicalis* could result in new extra limital records. Furthermore, a complex marine current system appears to have an important role on the dispersal of the subantarctic fur seals found along the Atlantic South American coast. In addition, the contact of humans with these pinnipeds could increase the risk of disease transmission.

RESUMO: Dezoito espécimens de lobo-marinho-subantártico (*Arctocephalus tropicalis*) foram encontrados ao longo da costa do estado do Rio de Janeiro no período de 1994-2006. Desses, 55.5% (n=10) foram machos, 11.1% (n=2) foram fêmeas, e 33.3% (n=6) não puderam ser sexados. A maioria dos registros ocorreu durante o inverno austral (n=15; 83.3%), com pico em agosto, seguido por 11.1% e 5.5% para primavera e outono, respectivamente. Nenhuma ocorrência foi observada durante o verão. Todos os machos encontrados e medidos foram subadultos e das fêmeas encontradas uma era subadulta e a outra adulta. Em 2002 ocorreram seis exemplares sendo esses 33.3% de todos os registros feitos nesse estudo, seguido por 2000 (n=4; 22.2%). Os resultados apresentados sugerem que o crescimento populacional de *A. tropicalis* em muitas locais de reprodução pode resultar em novos registros extra-limite para a espécie. Além disso, um sistema complexo de correntes marinhas parece ter um importante papel na dispersão dos lobos-marinhos-subantárticos que são encontrados na costa Atlântica da América do Sul. Assim, o contato de humanos com esses pinípedes poderia crescer o risco de transmissão de doenças.

KEYWORDS: Subantarctic fur Seal, *Arctocephalus tropicalis*, Rio de Janeiro state, Malvinas Current, human Interaction, vagrants.

Seven species of pinnipeds have been recorded along the Brazilian coast (Pinedo, 1990). Subantarctic fur seals (*Arctocephalus tropicalis*) are widely distributed in the Southern Hemisphere. They breed on many Subantarctic Islands, north of the Antarctic convergence (Jefferson *et al.*, 1993) including Gough/Tristan da Cunha (40°20'S, 09°54'E), Prince Edward/Marion (46°38'S, 37°57'E), Amsterdam/Saint Paul (37°50'S, 77°31'E), Crozet (45°57'S, 50°33'E), and Macquarie Islands (54°30'S, 158°57'E) (Bester, 1987; Pinedo *et al.*, 1992). The northern limit of the species range is not well known, but vagrants have appeared in South Africa (Shaughnessy and Ross, 1980), Argentina (Bastida *et al.*, 1999; Bastida and Rodriguez, 2003), Brazil (Pinedo, 1990), Australia and New Zealand (Taylor, 1990), and Juan Fernandez Islands, Chile (Torres and Aguayo, 1984). In Brazil, *A. tropicalis* has been recorded in the states of Rio Grande do Sul and Santa Catarina (Castello and Pinedo, 1977; Simões-Lopes *et al.*, 1995; Oliveira, 1999), Paraná (Oliveira *et al.*, 2005³), São Paulo and Rio de Janeiro (Siciliano and Lodi, 1986⁴),

Bahia (Neves *et al.*, 1990⁵; Velozo, 2007) and Alagoas (Ximenez, 1980). Adult males are up to 1.8m long and weigh 70 to 165kg, whereas females reach 1.4m and weigh 25 to 55kg. Newborns are about 60cm and 4 to 4.4kg. Subantarctic fur seals pup and breed from late October to early January, with a peak in mid-December. Seals also come ashore for the annual moult between February and April, with a peak in March and April (Jefferson *et al.*, 1993). In this note we gathered the available information on the records of the species to the Rio de Janeiro coast, Brazil.

Most of the records presented in this note were made during a long-term monitoring program of stranded marine mammals conducted between Quissamã (22°06'24"S, 41°28'20"W) and Saquarema (22°55'12"S, 42°30'37"W), on the east coast of the Rio de Janeiro state, Brazil, initiated in March 1999. Furthermore, information on the presence of "seals" and "sea lions" provided by life-guards, fishermen, bathers, and others were considered after examining the animals or

¹ PPG em Saúde Pública e Meio Ambiente, Escola Nacional de Saúde Pública/FIOCRUZ.

² Projeto de Monitoramento de Mamíferos Marinhos na Bacia de Campos - CENPES/PETROBRAS & ENSP/FIOCRUZ, Grupo de Estudos de Mamíferos Marinhos da Região dos Lagos - Escola Nacional de Saúde Pública - FIOCRUZ, Depto. de Endemias. Rua Leopoldo Bulhões, 1480 - 6º andar, Manguinhos, Rio de Janeiro, RJ 21410-210, Brazil.

Corresponding author, e-mail: jailsonfm@gmail.com.

³ Oliveira, M. R., Krul, R. and Krug, L. A. and Santos, H. F. (2005) *Pinípedes na costa paranaense: um estudo da ocorrência destes animais em ambiente de praia*. Page 25 in Abstracts, IV Encontro Nacional sobre Conservação e Pesquisa de Mamíferos Aquáticos - IV ENCOPEMAQ, 12-15 October, Itajaí, SC, Brazil.

⁴ Siciliano, S. and Lodi, L. (1986) *Ocorrências de Arctocephalus tropicalis (Gray, 1872) (Pinnipedia, Otariidae) para o litoral do Rio de Janeiro e São Paulo*. Page 227 in Abstracts, XIII Congresso Brasileiro de Zoologia, 02-07 February, Cuiabá, MT, Brazil.

⁵ Neves, M. L. C., Reis, M. S. S. and Brasileiro, M. T. R. (1990) *Sobre a ocorrência de Arctocephalus tropicalis (Gray, 1872) na baía de Todos os Santos, Bahia, Brasil (Mammalia, Arctocephalinae)*. Page 47 in Abstracts, Reunión de Trabajo de Especialistas em Mamíferos Acuáticos de América Del Sur, 12-15 November, Valdivia, Chile.

available pictures. Identification was made according to general features of the species, *i.e.* cream yellow chest presented by both sexes and the presence of dense fur on the top of the head in adult males, and measured and sexed whenever possible.

Eighteen specimens of *A. tropicalis* were recorded along the Rio de Janeiro state in the period 1994-2006 (Figure 1). Of these, 55.5% (n=10) were males, 11.1% (n=2) were females, and 33.3% (n=6) were of undetermined sex. Most of the records occurred during the austral winter (n=15; 83.3%) with a peak in August, followed by 11.1% (n=2) and 5.5% for spring and autumn, respectively. There was no record during summer. All males found and measured were subadults and for females one was adult and other juvenile. Three cases of human interaction could be noted (Table 1). Specimen GEMM-P 25 found in Unamar beach, Cabo Frio, clearly presented net marks on its back; specimen GEMM-P 05 was found entangled in fishing nets near the coast, and the GEMM-P 01 suffered intervention by fishermen who tried to capture it, without success. In all these reported cases the individuals were alive and were aggressive to humans who approached them as they came ashore.

Subantarctic fur seals have been recorded in several areas far from their traditional breeding locations (Jefferson *et al.*, 1993). Torres and Aguayo (1984) suggest that subantarctic fur seals found in Juan Fernandez Islands, Chile, could have come from Amsterdam Island or Saint Paul Islands, and arrived there after a trip of more of 10000nm. The authors also suggest that these fur seals could be from the Gough Island. In South Africa the occurrence of subantarctic fur seals is seasonal and most of them occurred between May and September (Shaughnessy and Ross, 1980). Hofmeyer *et al.* (2006) reported three sightings of *A. tropicalis* in Bouvetøya Island and suggested that seals were from Gough Islands and were helped by the Circumpolar Current. Taylor (1990) presented records of *A. tropicalis* in New Zealand and suggested that they could be coming from Amsterdam Island, and reached the New Zealand coast after swimming at least 9000km, helped by the West Wind Drift. The same author further suggested that subantarctic fur seals could in the future become a common species in New Zealand.

Most of the subantarctic fur seals presented in this note were males and occurred during the austral winter,

mainly in August (Figure 2). The same pattern of occurrence was observed in southern Brazil, where subantarctic fur seals are most frequent from June to October (Simões-Lopes *et al.*, 1995). According to Oliveira (1999) this irregular pattern of occurrence could be related to the change of ENSO (El Niño Southern Oscillation) and LNSO (La Niña Southern Oscillation) events. The animals are typically adults and subadults and the most of them males (Simões-Lopes *et al.*, 1995). However, subantarctic fur seals represented only 26.8% of the Otariidae found in that area, in contrast with the 73.1% of the otariids represented by *A. tropicalis* in this study. Castello and Pinedo (1977) reported on the first record of *A. tropicalis* for the Brazilian coast. They proposed that these seal reached Rio Grande do Sul with the aid of the Falkland/Malvinas current, possibly coming from South Georgia. Most of the records made along the Brazilian coast occur in the south (Simões-Lopes *et al.*, 1995) and have been attributed to the cold Falkland/Malvinas Current which flows northward, similar to other pinnipeds (Castello and Pinedo, 1977; Pinedo, 1992). Nevertheless, Oliveira *et al.* (1999) suggested that the fur seals found on the southern Brazilian coast could be vagrant individuals from Gough or Tristan da Cunha, aided by the South Atlantic Anticyclonic System, which in turn is comprised by the currents from Benguela, Antarctic Circumpolar and Brazil. Ximenez (1980) reported a young subantarctic fur seal in Maceió, Alagoas state and suggested that there is a periodic presence of these animals in northeastern Brazil, a normal migratory pattern for the species.

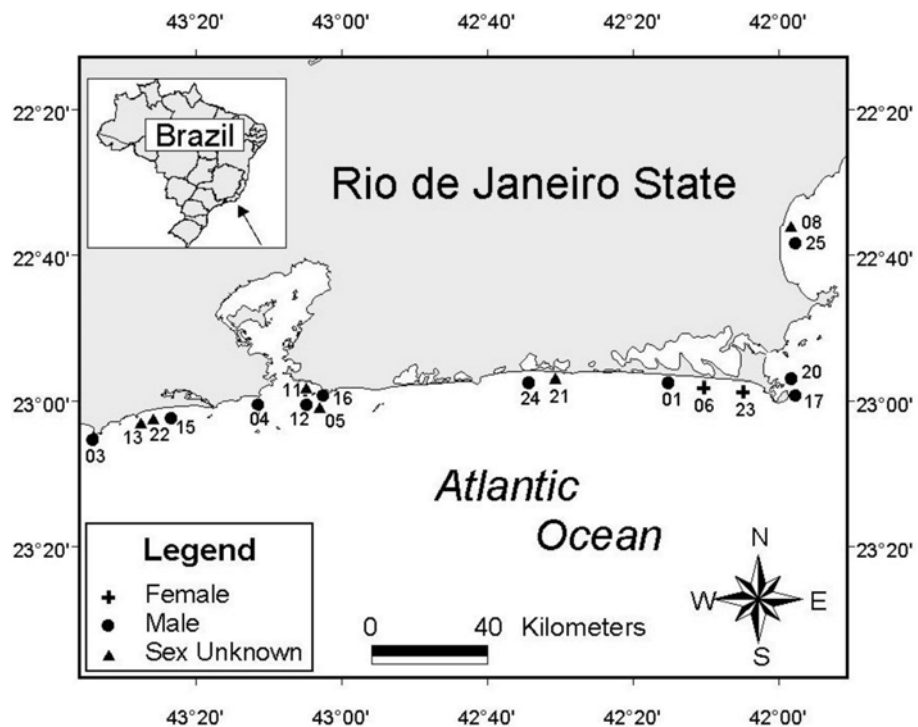
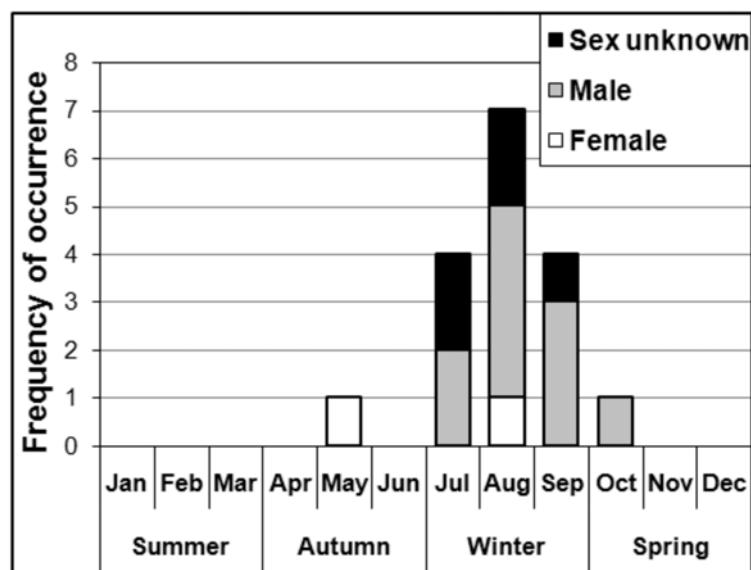


Figure 1. Occurrence locations for subantarctic fur seals along the Rio de Janeiro state, Brazil, 1994-2006. Numbers follow specimens listed in Table 1.

Table 1. Records of subantarctic fur seals (*A. tropicalis*) found along the coast of Rio de Janeiro state, Brazil, in the period 1994-2006.

NºGEMM	DATE	LOCALITIES OF OCCURRENCE	SEX	LENGTH (cm)
GEMM-P 01*	15 July 1994	Praia Seca, Araruama	♂	160
GEMM-P 03	07 October 1999	Pedra de Guaratiba, Rio de Janeiro	♂	160
GEMM-P 04	06 August 2000	Praia Vermelha, Urca, Rio de Janeiro	♂	170
GEMM-P 05*	08 August 2000	Camboinhas, Niterói	U	-----
GEMM-P 06	08 August 2000	Figueira, Arraial do Cabo	♀	82
GEMM-P 08	28 September 2000	Praião, Barra de São João	U	-----
GEMM-P 11	09 July 2002	Itaipu, Niterói	U	80
GEMM-P 12	09 July 2002	Itaipu, Niterói	♂	160
GEMM-P 13	14 July 2002	Recreio dos Bandeirantes, Rio de Janeiro	U	-----
GEMM-P 15	11 August 2002	Barra da Tijuca, Rio de Janeiro	♂	170
GEMM-P 16	18 August 2002	Itacoatiara, Niterói	♂	160
GEMM-P 17	11 September 2002	Ilha do Farol, Arraial do Cabo	♂	93
GEMM-P 20	16 August 2003	Prainha, Arraial do Cabo	♂	170
GEMM-P 21	26 September 2003	Itaúna, Saquarema	♂	120
GEMM-P 22	10 October 2005	Recreio dos Bandeirantes, Rio de Janeiro	U	-----
GEMM-P 23	06 May 2006	Praia Grande, Arraial do Cabo	♀	160
GEMM-P 24	07 August 2006	Jaconé, Maricá	U	-----
GEMM-P 25*	26 September 2006	Unamar, Cabo Frio	♂	145

(GEMM-P) Grupo de Estudos de Mamíferos Marinhos da Região dos Lagos-Pinípedes); (*) subantarctic fur seals that suffered human interaction; (U) unknown.

**Figure 2.** Frequency distribution of occurrence of subantarctic fur seals found, by sex, along the coast of Rio de Janeiro state, Brazil, in the period 1994-2006.

Following the cessation of intensive exploitation, populations have increased, often dramatically, and many islands have been recolonized by the species (SCAR, 1992). Payne (1979) made five records of *A. tropicalis* in South Georgia, south of the Antarctic Convergence during four seasons. Furthermore, these animals could be found in South America. He suggested that the Antarctic Convergence is not an absolute boundary to this species, but it could be a normal dispersal pattern. Long-distance dispersal could mean the colonization of fresh locations, which has clear advantages to marine species breeding on remote islands, such as *A. tropicalis*. Most of the previous authors related the occurrence of pinnipeds in southern Brazil in association with the Falkland/Malvinas Current, and indeed, during winter the Falkland/Malvinas Current, originary from a ramification of the Antarctic Circumpolar Current, penetrates more intensively over the Brazilian continental shelf. The cold water intrusion has temperatures of 14°C from about 30°S-49.5°W until 27°S-48°W. Due to the mixing over the continental shelf region, the temperatures of this "tongue" reach 20°C at its northern boundary (23°50'S, 43°50'W) (Silva *et al.*, 1996). The intrusion of the Falkland/Malvinas Current appear to have an important role in the dispersal of the subantarctic fur seals as well as Antarctic fur seals found along the South American coast (Oliveira *et al.*, 2001a), as shown in this paper. A recent genetic study comparing the *A. tropicalis* found on the Brazilian coast with animals from the main breeding colonies of this species indicated that despite the majority of the vagrants being from Gough Islands (40°20'S, 09°54'E), they could also come from other reproductive colonies (Ferreira *et al.*, 2007). Furthermore, one vagrant individual which presented a DNA sequence matching an exclusive haplotype from the Crozet Islands (45°95'S, 50°33'E), probably moved west with assistance of the West Wind Drift, around the Antarctic and Falkland/Malvinas currents, reaching the Brazilian coast after covering a distance of about 16500Km.

The records presented here suggest that the population increase in many breeding sites of *A. tropicalis* could result in new extra limital records. In addition, the increasingly common occurrences of subantarctic fur seals along the Brazilian coast could also result in greater human interactions, such as incidental catches in nets, which are known to kill more than 1000 franciscanas (*Pontoporia blainvillei*) annually in Rio Grande do Sul state, Brazil (Ott, 2002; Siciliano *et al.*, 2006). We present here three cases of human interaction: two of these had evidence of entanglement in fishing nets, and the third suffered intervention by fishermen who tried to capture it. Other cases of human interaction have been described. Anthropogenic aggression against an adult male subantarctic fur seal at Rio Grande do Sul (Oliveira *et al.*, 2001b) and injuries also caused by humans have also been reported for Paraná (Oliveira *et al.*, 2005³). As pinnipeds are not a familiar sight to beach-goers in Rio de Janeiro state, their occurrence often attracts people.

Infection diseases discovered in marine mammals have the potential to be transmitted to other mammals such as humans (Geraci and Lounsbury, 2005). Bastida *et al.* (1999) described a case of tuberculosis in a wild subantarctic fur seal found on the Argentine coast. The public health must be taken into account in any future management plan for this species, particularly as it relates to the translocation and reintroduction of vagrant individuals along the Brazilian coast.

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