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Source: Bulletin of the British Ornithologists' Club, 137(4) : 320-324

Published By: British Ornithologists' Club

URL: https://doi.org/10.25226/bboc.v137i4.2017.a11

The second and third documented records of Antarctic Tern *Sterna vittata* in Brazil

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Received 20 August 2017; revised 27 October 2017; published 11 December 2017

http://zoobank.org/urn:lsid:zoobank.org:pub:DC87ECB0-961C-435C-90FD-B28E155A81AD

Antarctic Tern *Sterna vittata* is a medium-sized tern that breeds during the austral spring and summer (October–March) on islands in the Southern Ocean, from 37°S on the Tristan da Cunha archipelago, to 68°S on the Antarctic Peninsula. Some populations remain near their breeding grounds year-round, whereas others migrate north to waters off Argentina, South Africa and New Zealand. Vagrants have been reported as far north as Walvis Bay in Namibia, southern Australia and south-east Brazil (Burger & Gochfeld 1996, Tree & Klages 2004, Sick 1997, Favero & Rodríguez 2005, Shirihai 2008).

The species has been mentioned at least three times in Brazil. The earliest record refers to a 19th-century specimen collected by H. M. Harrison 'at sea, 147 m. S.E. of Imbituba [Santa Catarina state], south Brazil' in July 1882 and deposited in what is now the Natural History Museum, Tring (NHMUK; Saunders & Salvin 1896: 51). Meyer de Schauensee (1966: 108) reported the species as occurring 'in winter to the coast of Rio de Janeiro [south-east Brazil]'. However, this was challenged by Pacheco & Parrini (1998), who argued that no evidence has ever been provided to verify this statement. Lima *et al*. (2004: 148) listed the species among migratory terns that occur in the state of Bahia, on the country's north-east coast, but there also seems to be no evidence for this. Here, we present new documented records and review the existing evidence for the occasional presence of Antarctic Tern in Brazil.

On 3 September 2012 at 13.00 h, NWD photographed a single tern from the *F/V Maria Letícia*, a pelagic longliner operating *c*.90 nautical miles (*c*.166 km) off the state of Rio Grande do Sul (*c*.34°07.3'S, 51°18.7'W; Fig. 1), on the continental slope >800 m depth. Other seabirds observed included albatrosses (*Diomedea* and *Thalassarche*), giant petrels *Macronectes*, Cape Petrels *Daption capense*, White-chinned Petrels *Procellaria aequinoctialis*, prions *Pachyptila* and Wilson's Storm Petrel *Oceanites oceanicus*.

The tern had a short, slender, uniform red bill, black cap, crown and nape contrasting sharply with a narrow, white cheek-stripe, grey back and upperwing with black on the outer edge of the outermost primary, white rump and tail, and grey chin, throat and underparts, with white undertail-coverts (Fig. 2). We identified the bird as an adult breeding-plumage Antarctic Tern, based on bill proportions and colour, and plumage pattern. This is the first record for the state of Rio Grande do Sul (*cf*. Bencke *et al*. 2010).

In the western South Atlantic, Antarctic Terns in breeding plumage are most likely to be confused with Arctic *S. paradisaea* and South American Terns *S. hirundinacea* in the same plumage. Arctic Tern is usually observed in non-breeding plumage in Brazil (Dias *et al*. 2012). Nevertheless, in both breeding and non-breeding plumages their outermost primaries have narrow dark tips, forming a trailing edge (Olsen & Larsson 1995, Shirihai 2008). South American Tern is larger (41–43 cm in length vs. 32–34 cm), has a longer and heavier bill, ill-defined white cheeks, and darker outer webs to the outermost primaries (Escalante 1970, Shirihai 2008).

In addition to the specimen mentioned in Saunders & Salvin (1896) as taken off Santa Catarina (NHMUK 1894.10.28.9), another (NHMUK 1923.8.8.1) was collected on 21 July 1923

 ISSN-2513-9894 (Online)

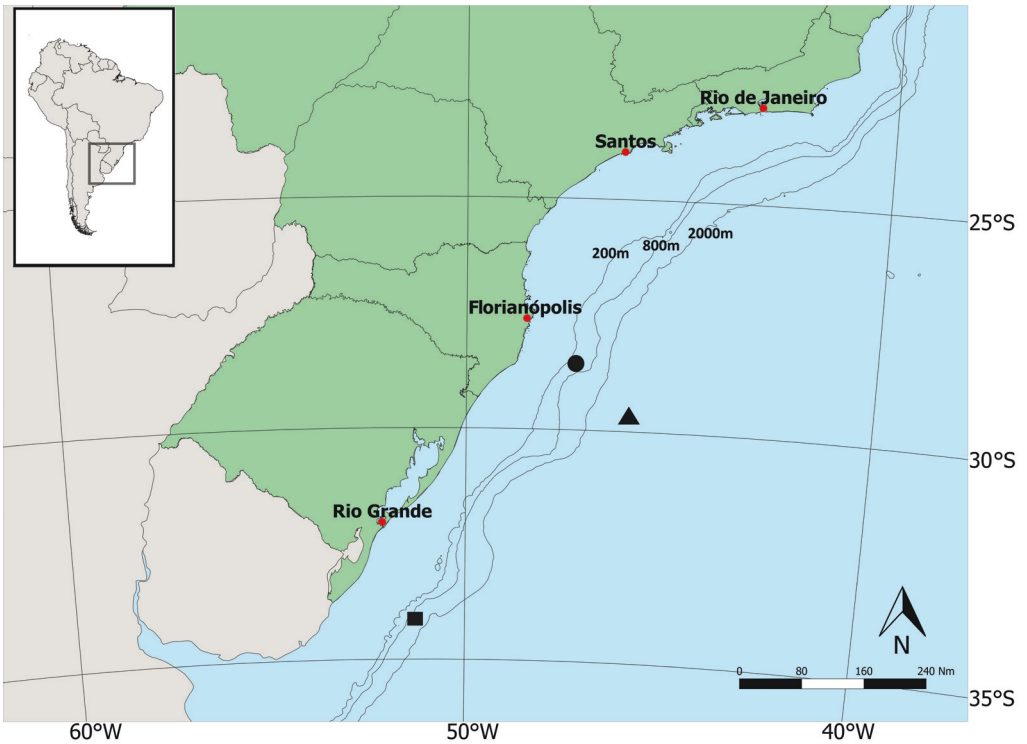

Figure 1. Records of Antarctic Tern *Sterna vittata* off southern Brazil: NHMUK 1894.10.28.9 (circle; Saunders & Salvin 1896), NHMUK 1923.8.8.1 (triangle; this work), and *c*.34°07.3'S; 51°18.7'W (square; this work).

by Lieutenant H. S. Tracy at '28°35'S, 47°20'W, off coast of S. Brazil' (Fig. 1). Data on their labels indicate that both specimens are males. They are in juvenile plumage with crown and nape black streaked/mottled white and buff and extending below the eye, forehead white spotted black, upperparts greyish barred brown, especially on the tertials, dark carpal bar on the upperwing, and underparts white. The bills are black and the legs and feet are blackish flesh (Fig. 3). Their measurements (in mm), taken by HvG, are as follows: exposed culmen 33.1 and 33.3; tarsus 19.5 and 17.6; and wing 250 and 255. Juvenile Antarctic Terns have the throat and breast washed brown; however, partial moult of the head and body begins in March, consequently older juveniles have generally white underparts (Harrison 1991, Shirihai 2008).

Juvenile Antarctic and South America Terns are similar in plumage but, according to Murphy (1938), they are separable on size. However, Murphy (1938) only presented measurements of adults of the six currently accepted subspecies of Antarctic Tern. *S. v. gaini* of the South Shetland Islands and the Antarctic Peninsula, and *S. v. tristanensis* of Tristan da Cunha are largest, whereas *S. v. georgiae* of South Georgia, the South Orkney, South Sandwich and Bouvet Islands is smallest but longest-winged. The other three subspecies breed on islands in the southern Indian Ocean and New Zealand region, and are all intermediate in size (Murphy 1938, Burger & Gochfeld 1996).

Recently fledged juvenile terns are smaller than adults. For example, in Sandwich Terns *Thalasseus sandvicensis* on Griend, in the Dutch Wadden Sea, growth of body mass and wing length are almost complete within 100 days of hatching (Stienen & Brenninkmeijer 2002). Similarly, according to Murphy (1936: 1108), juvenile Antarctic Terns on Petermann Island, Antarctica, attain the size of adults within three months of hatching. We assume

 ISSN-2513-9894 (Online)

Figure 2. Antarctic Tern *Sterna vittata*, at sea off Rio Grande do Sul, Brazil (*c*.34°07.3′S 51°18.7′W), 3 September 2012 (Nicholas W. Daudt)

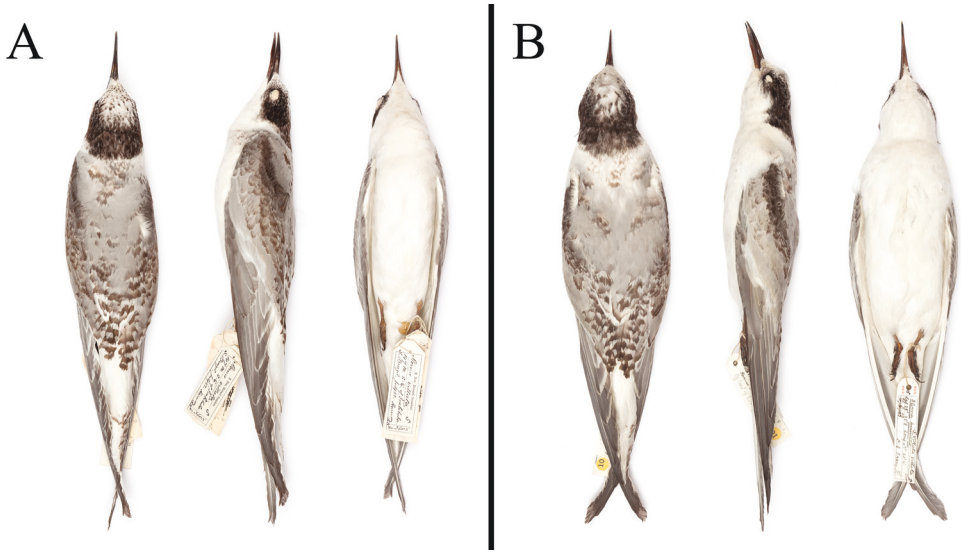

Figure 3. Brazilian specimens of Antarctic Tern *Sterna vittata* in the Natural History Museum, Tring: NHMUK 1894.10.28.9 (A) and NHMUK 1923.8.8.1 (B) (Harry Taylor, © Natural History Museum, London)

both specimens had completed their growth, since they have white underparts and were collected in July. Their measurements agree with those given by Murphy (1938) for Antarctic Terns breeding on islands in the South Atlantic and on the Antarctic Peninsula (*cf*. Table 1).

One of us (NWD) measured juvenile and adult South American Tern specimens in the Coleção de Aves Marinhas da Universidade Federal do Rio Grande—FURG,

 ISSN-2513-9894 (Online)

TABLE 1
Measurements (in mm) of Antarctic Tern *Sterna vittata* subspecies from islands in the South Atlantic and the Antarctic Peninsula. (1) adults, specimens (Murphy 1938); (2) adults (sexes pooled), live birds (Tree & Klages 2004). Data = range (mean; sample size).

		S. v. tristamensis		*S. v. georgiae*		*S. v. gaini*
		Male	**Female**	**Male**	**Female**	**Male**
Culmen	(1)	36.3–37.7 (37.1; 6)	34.6–36.2 (35.5; 3)	30.0–32.8 (31.2; 18)	28.5–30.5 (29.4; 8)	35–37 (36.4; 4)
	(2)	33.6–42.1 (30)*		28.5–30.5 (26)*		
Tarsus	(1)	19.5–19.8 (19.7; 6)	18.4–20.0 (19.2; 3)	16.0–17.8 (16.7; 18)	15.9–17.5 (16.5; 8)	18.0–19.1 (18.6; 4)
	(2)	18.4–21.4 (36)		15.9–17.8 (26)		
Wing	(1)	252–260 (254.7; 6)	260–267 (263.3; 3)	246–270 (257.6; 18)	255–266 (262.3; 8)	278–285 (280.7; 4)
	(2)	240–270 (34)		246–270 (26)		

* Sexes pooled.

TABLE 2
Measurements (in mm) of South American Tern *Sterna hirundinacea* specimens from southern Brazil. Data = range (mean; sample size).

	Juvenile	**Adults**
Culmen	33.75–38.85 (36.2; 13)	35.65–42.2 (38.77; 8)
Tarsus	20.0–23.7 (21.4; 13)	20.0–22.05 (21.08; 12)
Wing	259–285 (273; 11)	259–300 (281; 9)

Rio Grande, Brazil (Appendix). Juvenile South American Terns, which are barred blackish brown on the upperparts and buffish brown on the breast-sides and flanks (Harrison 1991, Hogan *et al*. 2010), are similar in size to Antarctic Terns, but tend to have a longer bill, tarsus and wings; adults are distinctly larger. The two NHMUK specimens have biometrics outwith the lower range of values reported for South American Tern (*cf*. Table 2).

All three Brazilian Antarctic Tern records were made during the austral winter. For most of the year, the oceanography off the Brazilian coast is dominated by the warm South Equatorial and Brazil Currents, resulting in waters of relatively low biological productivity (Longhurst & Pauly 1987). However, in winter strong southerly winds reach the southern Brazilian coast and, as a result, the cold, nutrient-rich Malvinas/Falkland Current advances over the continental shelf (Garcia 1997). This phenomenon causes an increase in biological productivity and a rapid influx of Antarctic and sub-Antarctic organisms, including seabirds (Murphy 1936, Palacio 1982, Carlos 2009). In the western South Atlantic, migrant Antarctic Terns occur off Argentina (Burger & Gochfeld 1996, Favero & Rodríguez 2005) and may well reach southern Brazil more regularly in the wake of intense cold weather systems.

Acknowledgements

At-sea observations by NWD were made as part of a research project by Projeto Albatroz, which is supported by Petróleo Brasileiro S.A. (Petrobras) via the Programa Petrobras Socioambiental and the Albatross Task Force, a BirdLife International and Save Brasil programme sponsored by the Royal Society for the Protection of Birds (RSPB, BirdLife partner in the UK). We are grateful to Dimas Gianuca for inviting NWD to join the research cruise off south Brazil and for reading the manuscript, and to Leandro Bugoni (FURG) for permitting us to examine specimens under his care. Vinícius Reveilleau helped prepare the map. CJC is supported by a post-doctoral fellowship from the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES), Brazil; NWD is supported by a M.Sc. scholarship from Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), Brazil.

 ISSN-2513-9894 (Online)

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Appendix: List of South America Tern *Sterna hirundinacea* specimens examined in the Coleção de Aves da Universidade Federal do Rio Grande—FURG (CAFURG), Rio Grande, Brazil.

Juveniles—Thirteen unsexed; Brazil, Rio Grande do Sul: Lagoa do Peixe (CAFURG 137), 5/xi/1986; Praia do Cassino (CAFURG 123, 134, 142, 143, 149, 151, 154, 173, 184, 188), xi/1982, 30/vii/1982, unknown date, 19/vii/1984, winter/1984, 19/vii/1984, x–xi/1987, xi/1992, 19/viii/1984, 01/ix/1982; 'southern Brazil' (unregistered), unknown date; Uruguay, Rocha: La Paloma (CAFURG 111), 21/x/1986.

Adults—Four males; Brazil, Rio Grande do Sul: São José do Norte (CAFURG 402), 31/vii/2000; Praia do Cassino (CAFURG 040, 144, 150), 17/vi/1983, 17/vi/1983, 17/vi/1983; eight unsexed; Brazil, Espírito Santo: Vila Velha (CAFURG 147), vii/1984; Rio Grande do Sul: Praia do Cassino (CAFURG 140, 145, 152, 153, 181, 187, 458), 13/iv/1984, 27/vi/1982, 05/vii/1982, 28/ix/1987, 19/vii/1984, unknown date, 28/ix/2000.

 ISSN-2513-9894 (Online)