A comparison of foraging between the South American and Cabot's Tern in southern Brazil

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Abstract: Despite being widely distributed in South America and having relatively large populations, little is known about the trophic ecology of the South American Tern (*Sterna hirundinacea*) and Cabot´s Tern (*Thalasseus acuflavidus*). In Brazil, South American and Terns Cabot´s breed in mixed colonies from the state of Espírito Santo to Santa Catarina. Here, we describe results of a study of the feeding ecology of these two species during the reproductive seasons of April to October of 2003, 2005 and 2006 from Cardos Island, Santa Catarina, Brazil. A total of 6248, 5140, and 4006 fishes were delivered to chicks or females by South American Terns; and 1157, 628 and 98 fish and or other prey items by Cabot´s Terns during the breeding seasons of 2003, 2005, and 2006, respectively. Prey items identified included eight, seven and nine fish families for South American Terns; and, five, three and two families for Cabot´s terns, in the three respective years. The number of food deliveries per chick for South American Terns was between 09:00 and 10:00 am in 2006, and between 11:00 and 12:00 am in 2005. Cabot´s Terns chicks were fed in the early hours of the morning until late afternoon.
Keywords: *Cabot´s Terns, South American Terns, feeding ecology, prey, foraging.*

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Resumo: Apesar da população de *Sterna hirundinacea* e *Thalasseus acuflavidus* ser extensamente distribuída e relativamente grande na America do Sul, pouco se conhece sobre a ecologia trófica dessas duas espécies no continente e principalmente no Brasil. Ao longo da costa brasileira, os *T. acuflavidus* e *S. hirundinacea* reproduzem em colônias mistas do estado do Espírito Santo a Santa Catarina. Neste trabalho estudou-se a ecologia de alimentação destas duas espécies durante as estações reprodutivas de 2003 (maio a outubro), 2005 e de 2006 (abril a outubro) na Ilha dos Cardos, Santa Catarina. Registrou-se 6248, 5140 e 4006 peixes respectivamente, que foram capturados e levados para alimentar os ninhegos por *S. hirundinacea*; e 1157, 628 e 98 peixes respectivamente e ou outros itens alimentares capturados por *T. acuflavidus*, durante as estações de procriação dessas aves em 2003, 2005, e 2006, respectivamente. Os itens alimentares capturados pela *S. hirundinacea* incluíam representantes de oito, sete e nove famílias de peixes, enquanto que para *T. acuflavidus* foram cinco, três e duas famílias, nos três respectivos anos estudados. As *S. hirundinacea* alimentaram os ninhegos das 09:00 as 10:00 em 2006, e das 11:00 as 12:00 em 2005. Os ninhegos de *T. acuflavidus* foram alimentados ao longo do dia, pela manhã até o fim da tarde
Palavras-chave: *Sterna hirundinacea, Thalasseus acuflavidus, ecologia, presa, forrageio.*

Introduction

Terns are globally distributed and often nest synchronously in colonies of thousands of breeding pairs (Nelson 1980). Terns prey on fish, shellfish and marine crustaceans using shallow dives in both fresh and salt water (Nisbet 1983, Burger & Gochfeld 1996). Since terns nests colonially and carry prey to feed mates and offspring in their bills, they also provide an opportunity to estimate the number and size of prey. Terns can thus be used to evaluate the role of type and size of prey on food-sharing (Gatto & Yorio 2009). Generally, during the reproductive season, terns feed on the open sea, in shallow waters, on reefs, sand banks, and tidal lagoons where fish are forced to the surface by the action of predators (Nisbet 1983, Safina & Burger 1988, Yorio 2005).

During the reproductive season, terns tend to feed on the open sea, in shallow waters, and on reefs, sand banks, and tidal lagoons where fish are forced to the surface by the action of predators (Nisbet 1983, Safina & Burger 1988, Yorio 2005). During migration and on the wintering areas, terns are commonly seen in groups foraging on by-catch (Favero et al. 2000, Bugoni & Vooren 2005, Silva-Rodriguez et al. 2005, Barbieri & Pinna 2007, Barbieri & Paes 2008).

Prey selection and delivery has been studied in several species of terns in Europe and the United States (Buckley & Buckley 1974, Nelson 1980, Blokpoel et al. 1982, Burger 1983, Safina & Burger 1988, Pereira 1997, Shealer 1998, McGinnis & Emslie 2001, Aygen & Emslie 2006). However, although terns are widely distributed in South America and have relatively large populations, little is known about their local feeding ecology (Branco 2001, Krull 2004, Bugoni & Vooren 2005, Bugoni et al. 2005, Branco et al. 2006, Gatto & Yorio 2009).

In the Atlantic Ocean, the South American Tern, *Sterna hirundinacea,* Lesson, 1831, is found from Tierra del Fuego (Argentina) to Bahia (Brazil) (Sick 1997) and in the southern Pacific from Tierra del Fuego to the Peruvian coast (Higgins & Davies 1996). Also, large reproductive colonies are in the Falkland Islands. Cabot's Tern, *Thalasseus sandvicensis acuflavidus* (Latham, 1737) can be found from the Caribbeean islands (12° S) to Deseado Port (46° S, Buckley & Buckley (1974) and along the Brazilian coast. In Brazil, South American and Cabot's Terns often breed in mixed colonies in Papagaios Island in Macaé (RJ) (Sick & Leão 1965), in Espírito Santo with up to 5,000 pairs on Escalvada Island (Efe 2004, Efe et al. 2000), Rio de Janeiro (Alves et al. 2004), São Paulo (Campos et al. 2004), Paraná (Krull 2004), Santa Catarina (Soares & Schiefler 1995; Branco 2003a,b) and Argentina (Yorio et al. 1994, Scolaro et al. 1996, Quintana & Yorio 1997). However, there is no information about the diet in Brazil for the two species of terns. Therefore, we analyzed the diet of the South American Terns and Cabot´s Terns breeding colony on the island of Cardos, Florianópolis, Santa Catarina, Brazil.

We hypothesized that, in mixed breeding colonies, partitioning of resources should occur between two very similar species. Thus, we predict that there are qualitative (species) and quantitative (size and frequency) differences between the food items delivered to the nests in these two species of terns. We also compare delivery rates and other characteristics of feeding in the two species.

Methods

Daily observations were made of prey items brought by terns returning to the breeding colony on the island of Cardos (27° 48' 54" S and 48º 34' 52" W), Florianópolis, Santa Catarina, Brazil (Figure 1), from April to October of 2003, 2005 and 2006 (totaling 63, 121 and 144 days and 315, 847 and 1440 hours of observation, respectively). The island area is approximately 1.0 ha (130 m long and 70 m wide) and its peripheral portion to the center, there is a predominance of loose rock, interspersed with grasses. Data were collected from assessment, courtship, hatching, chick rearing and

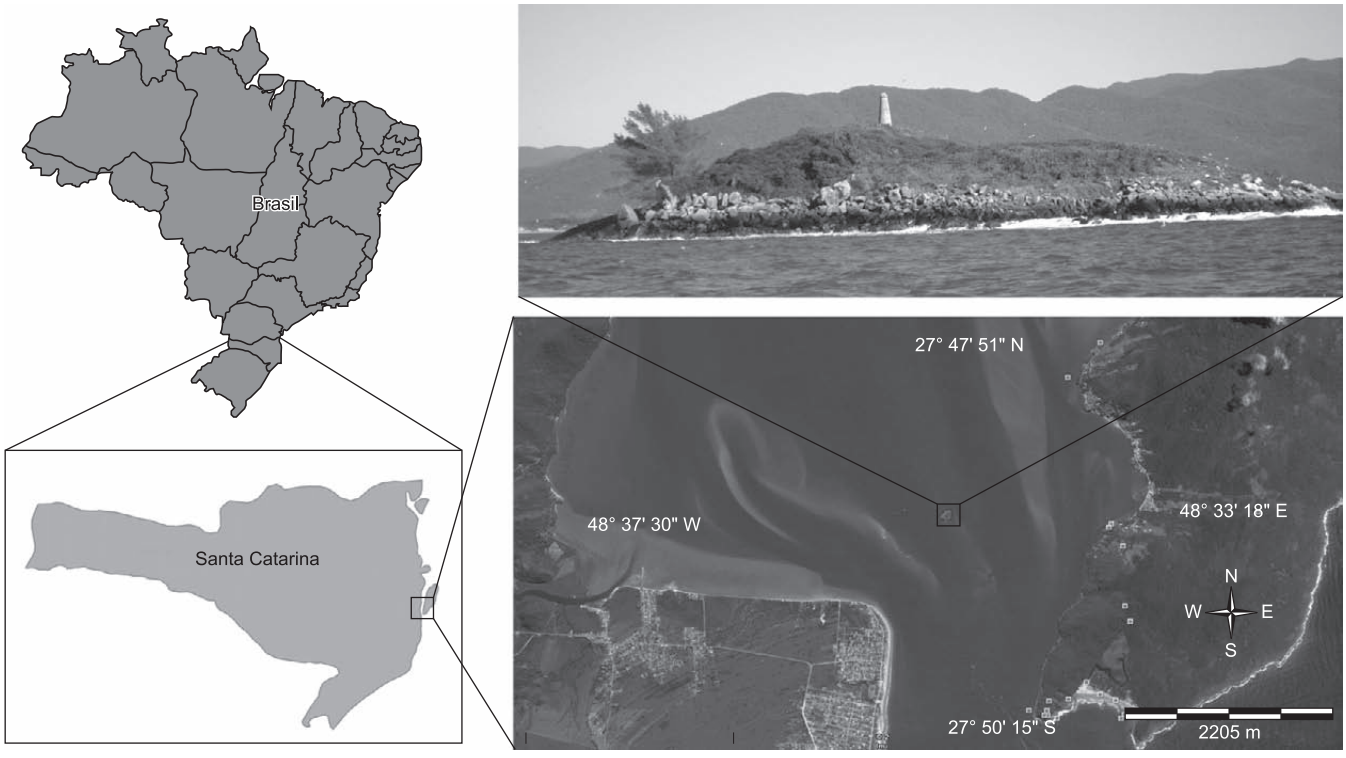

Figure 1. Map and overview of the study area, showing the location of the island of Cardos in Brazil, and coastal state of Santa Catarina.

fledging stages. These were the courtship feeding period (totaling 1500, 1700 and 2000 pairs) and the four distinct age stages of the chicks being fed (JI-JIV, see below). Additionally, fishes found in regurgitations of the chicks and unconsumed prey remaining near the nest was also identified.

The observations were performed by focal group recording all occurrences of feeding defined part of the colony from a fixed point, using binoculars (Bushnell10 X 50) during daylight hours to identify and to visually estimate size of the prey items transported to the colony by individual terns. Often using photographs of known prey items as a reference, each prey item was identified to the lowest taxonomic level possible using morphological characters and size was estimated by comparing its length to the bill-length of the adult. Size of prey was categorized as 'Small' (<1.0 bill-length), 'Medium' (1.0-1.5 bill length) and 'Large' (>1.5 bill length, Shealer 1998). To reduce observer bias in the determination of prey size, all feeding observations and estimations of length of prey were made by a single observer (H. A. A. Fracasso) in all years.

Each year we counted the number of times chicks were fed per day (N = 109), the time interval between feedings for chicks (N = 236), and age of the chicks being fed. Age groups of South American tern chicks were characterized as JI from hatching up to six days; the JII 7-12 days; JIII 13-26 days; JIV 27 to 35; and J over 36 days old. The JI chicks of Cabot´s tern correspond to the nestlings from 1 to 5 days of age, JII chicks 6-15 days, JIII chicks 16 to 30 days, JIV 31 to 46 days; and J indicated young over 47 days old.

Unconsumed prey items were collected in 2003 as the researchers encountered them during the nests visits. They were stored in individual plastic bags, and were analyzed in the Biology laboratory of Universidade do Vale do Itajaí (UNIVALI) to the lowest taxonomic level possible, which was influenced by the degree they were already digested (Figueiredo & Menezes 1978; Figueiredo & Menezes 2000; Menezes & Figueiredo 1980). The number of feedings, as well as the feeding behavior (benthonic, demersal or pelagic), total length (cm) and weight (Wt) of prey (g) were recorded.

1. Statistical analyses

The number of feedings per chick per day, and time between daily food deliveries to chicks were compared between species through (Zar 1999). The contrast of means (Tukey- Kramer test) was used to indicate which means were significantly different.

Results

1. South American Terns

We recorded 6248, 5140 and 4006 fish transported by *Sterna hirundinacea* to the colony in 2003, 2005 and 2006, respectively (Table 1). The observed prey included items belonged to eight, seven and nine families in 2003, 2005, and 2006, respectively. Most prey caught were members of the Engraulidae, and varied in size between years. The majority were small members of this group in 2003, large ones in 2005 and medium-sized ones in 2006. Other prey commonly brought to the colony included members of Clupeidae, Trichiuridae , Loliginidae and Sciaenidae and in lowest proportions were Ariidae and Sparidae (Table 1).

Breeding pairs foraged in daylight with the highest frequencies of foraging between 09:00 AM and 11:00 AM and with the lowest after midday in 2003 (Table 1). In 2005 the arrival of prey items to the nest remained constant between 09:00 AM and 03:00 PM, with the highest rate at 11:00-12:00 AM and the lowest at 08:00-09:00 AM and 05:00 PM. In 2006 the peak delivery time was at 09:00-10:00 AM and 02:00-03:00 PM with a gradual decrease until 1:00 PM and 5:00 PM, respectively (Table 1).

Of the 160 fishes transported by males to females to be offered during courtship, 90 were delivered before, and 70 were delivered after mating, and small and medium Engraulidae were the most abundant offerings. Courtship feeding was observed at its highest rate between 09:00 AM and 10:00 AM and increased after 08:00 AM (Figure 2). The highest observed rate of food deliveries to the nestlings (850 total items for the 09:00-10:00 AM time block for the breeding season) was in 2003, followed by more than 500 items between 09:00-10:00 AM in 2006, and more than 400 items between 11:00 AM and 12:00 AM in 2005. The lowest food delivery rates in all years were prior to 08:00 AM and after 04:00 PM (Figure 3). The number of prey items delivered per day did not differ significantly between different ages of nestlings (ANOVA $F_{4\text{-}108} = 1{,}17$, $P > 0{,}05$). However, the number of prey item deliveries/day increased gradually with age, but decreased slightly at fledgling (JIV), and was further reduced in juveniles, but no significant differences were found (ANOVA $F_{3\text{-}232} = 0{,}40$, $P > 0{,}05$) (Figure 4), on the other hand the time between feedings decreased throughout the age classes (Figure 5).

In 2003, we collected 62 regurgitations, and identified eight families, nine genera and nine species of prey items (Table 2). Of the identified prey, six species were pelagic and three species were demersal, *Licengraulis grossidens* represented 58% of the number of individuals and 62.6% of total biomass of food regurgitated, followed by material that could not be identified due to the high degree of its digestion. The largest fish taken was a *Trichiurus lepturus* (22.8 cm) and the greatest weight was from a *Harengula clupeola* (17.54 g) (Table 2).

2. Cabot´s Terns

We recorded 1157, 628 and 98 prey items brought to the colony by Cabot's Terns in 2003, 2005 and 2006, respectively (Table 3). Prey included five, three and two families for those years, respectively. The most common prey items were medium-sized Clupeidae in 2003 and large Clupeidae in 2005 and 2006.

The breeding pairs brought most prey items back to the colony between 10:00-11:00 AM, 11:00-12:00 AM, and 12:00 AM - 1:00 PM in 2003, 2005 and 2006, respectively (Table 3). The delivery of food to chicks occurred almost exclusively between 09:00 AM and 03:00 PM, with the highest rates obtained being 200 prey items for the time blocks 09:00-10:00 AM and 10:00-11:00 AM in 2003 followed in 2005 by peaks of 40-50 prey items per hour blocks 11:00-12:00 AM and 12:00 AM - 01:00 PM, and relatively uniform rates of 20 items/hour block from 09:00 AM - 01:00 PM in 2006 (Figure 6).

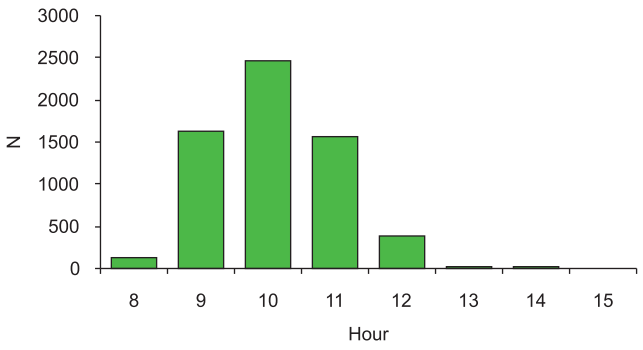

Figure 2. Time of fish delivery to female by the male South American Tern during the courting period of the reproductive season of 2005.

Table 1. Family and size of prey carried to colony by time of day by South American Terns.

Hour	Year	Items										Total
		Engraulidae			Clupeidae			Trichiuridae	Loliginidae	Sciaenidae	Other	
		S	M	L	S	M	L					
6	2006	1	4	5	-	-	-	-	2	-	-	12
7	2006	6	54	142	2	12	5	-	8	-	1	230
8	2003	53	52	18	-	10	1	-	-	4	-	138
	2005	4	9	3	-	1	C-	-	-	-	-	17
	2006	40	97	80	10	30	27	2	10	-	-	296
9	2003	686	439	156	59	147	54	-	2	9	17	1632
	2005	73	105	95	4	18	17	58	-	4	-	374
	2006	87	234	235	69	82	68	34	11	1	2	823
10	2003	1056	640	325	89	232	58	-	-	14	2	2476
	2005	157	144	170	9	22	27	65	2	4	1	601
	2006	89	194	235	61	100	65	26	8	-	2	780
11	2003	772	346	178	48	126	47	-	-	1	-	1565
	2005	385	186	360	11	39	48	128	-	6	-	1163
	2006	58	84	81	23	75	62	9	4	-	-	396
12	2003	144	109	37	20	56	23	-	-	-	-	389
	2005	319	173	268	10	29	62	131	-	3	2	997
	2006	81	107	76	20	54	56	36	2	1	-	433
13	2003	6	6	4	-	3	2	-	-	-	-	21
	2005	159	101	137	3	32	43	66	2	-	-	543
	2006	33	17	21	23	15	3	3	-	-	-	115
14	2003	6	1	3	3	4	2	-	-	-	-	19
	2005	145	164	185	6	33	41	60	-	4	-	638
	2006	61	94	54	25	61	21	44	7	1	4	372
15	2003	3	2	-	-	2	1	-	-	-	-	8
	2005	74	115	203	9	40	15	47	-	-	1	504
	2006	66	75	35	27	59	31	22	1	1	-	317
16	2005	29	65	120	1	1	4	9	-	-	-	229
	2006	36	49	32	8	38	18	22	2	1	1	207
17	2005	17	19	35	-	2	1	-	-	-	-	74
	2006	4	8	3	3	7	-	-	-	-	-	25
Total	2003	2726	1595	721	219	580	188	170	2	28	19	6248
	2005	1362	1081	1576	53	217	258	564	4	21	4	5140
	2006	562	1017	999	271	533	356	198	55	5	10	4006

S = small, M = medium and L = large. Other = Mugilidae, Carangidae, Ariidae, Pomacanthidae, Monacanthidae, Sparidae, Insects and Not identified.

Discussion

1. Geographical comparisons

South American Terns at Cardos Island showed similar behavioral patterns as Common Terns (*S. hirundo*) and Artic Terns (*S. paradisea)*, in Massachusetts (USA), where the courting process has three stages: 1) the male carries the fish around the colony and calls to several females, but does not feed even when the pair is firmly established; 2) the pairs spend time in the foraging area during the day, where the male may feed the female, and both return to the colony during the night; and 3) the female stays in their territory and is fed by the male until the nest is complete once the territory is established, the female spends most of her time there, leaving only to drink water and to bathe, and captures little or no food for herself (Nisbet 1973).

Records from both the breeding colonies and wintering areas suggest that there are differences in behavior and diversity of prey caught during the migratory season since there are much poorer feeding conditions relative to those of the nesting sites (Buckley & Buckley 1974). This may be related to the high cost of energy needed for migration and feather molt, the difficulty of obtaining adequate food, and to disease and parasites (Blokpoel et al. 1982).

In wintering places, such as Trinidad, fishermen often observed Common Terns following their vessels and catching small fish discarded at sea and in the costal waters; In Guyana Common Terns were observed in aggregations around small fishing boats at the mouths of rivers, feeding together with gulls (*Larus atricilla*) on fish and crustaceans smaller that 15-20 cm in length; and in Suriname when the local ferry-boats cross rivers, the thrusters resuspend the mud, bringing the bottom mud of the river up along with small fish and crustaceans which terns then fed upon (Blokpoel et al. 1982). This same behavior was observed on the coast of Rio Grande do Sul, where terns were observed during the non-reproductive periods feeding near the Lagoa dos Patos and consuming the discarded by-catch fish (Bugoni & Vooren 2005, Bugoni et al. 2005). However, Branco (2001), Branco et al. (2006), Krull (2004) described South

Table 2. Food items identified from regurgitations of South American Terns, registered number of portions, foraging habit, total length and body mass.

Species	Habit	Number			Length (cm)			Mass (g)			Total	%
		Prey	Reg	%	<	>	Me ± SE	<	>	Me ± SE		
MOLLUSCA												
Loligonidae												
Loligo sanpaulensis (Brackoniecki, 1984)	Pelagic	1,0	1,0	1,6	13,5	13,5	-	9,1	9,1	-	9,1	2,1
OSTHEICHTYES												
Engraulidae												
Licengraulis grossidens Agassiz, 1829	Pelagic	49,0	36,0	**58,1**	1,1	15,5	9,3 ± 0,4	0,3	15,2	5,6 ± 0,5	277	**62,6**
Cetengraulis edentulus (Cuvier, 1829)	Pelagic	3,0	3,0	4,8	5,5	8,8	7,2 ± 1,0	0,8	3,35	1,82 ± 0,8	5,5	1,2
Clupeidae												
Harengula clupeola (Cuvier, 1829)	Pelagic	5,0	3,0	4,8	7,5	7,5	7,5 ± 0,0	3,4	17,5	10,45 ± 4,1	48,5	11
Mugilidae												
Mugil platanus Gunther, 1880	Pelagic	1,0	1,0	1,6	11,5	11,5	-	16	15,5	-	15,5	3,5
Sciaenidae		2,0	2,0	3,2	5,0	8,7	6,9 ± 1,9	2,8	7,27	5,0 ± 2,2	10,0	
Isopistus parvipinis (Cuvier, 1830)	Demersal	1,0	1,0	1,6	6,0	6,0	-	1,6	1,6	-	1,6	0,4
Trichiuridae												
Trechiurus lepturus Linnaeus, 1758	Pelagic	1,0	1,0	1,6	22,8	22,8	-	8,3	8,3	-	8,3	1,9
Stromateidae												
Peplirus paru (Linnaeus, 1758)	Demersal	3,0	3,0	4,8	5,0	7,5	6,3 ± 0,7	1,5	5,3	3,9 ± 1,2	11,8	2,7
Monacanthidae												
Stephanolepis hispidus (Linnaeus, 1776)	Demersal	1,0	1,0	1,6	5,5	5,5	-	1,8	1,8	-	1,8	0,4
Not identify	-	10,0	10,0	**16,1**	-	-	-	1,6	13,3	6,3 ± 1,3	63,5	**14,4**
Total	-	-	**62,0**	100,0	-	-	-	-	-	-	441	100,0

Reg = Regurgitations, < = Minimum, > = Maximum, Me = means and SE = standard error.

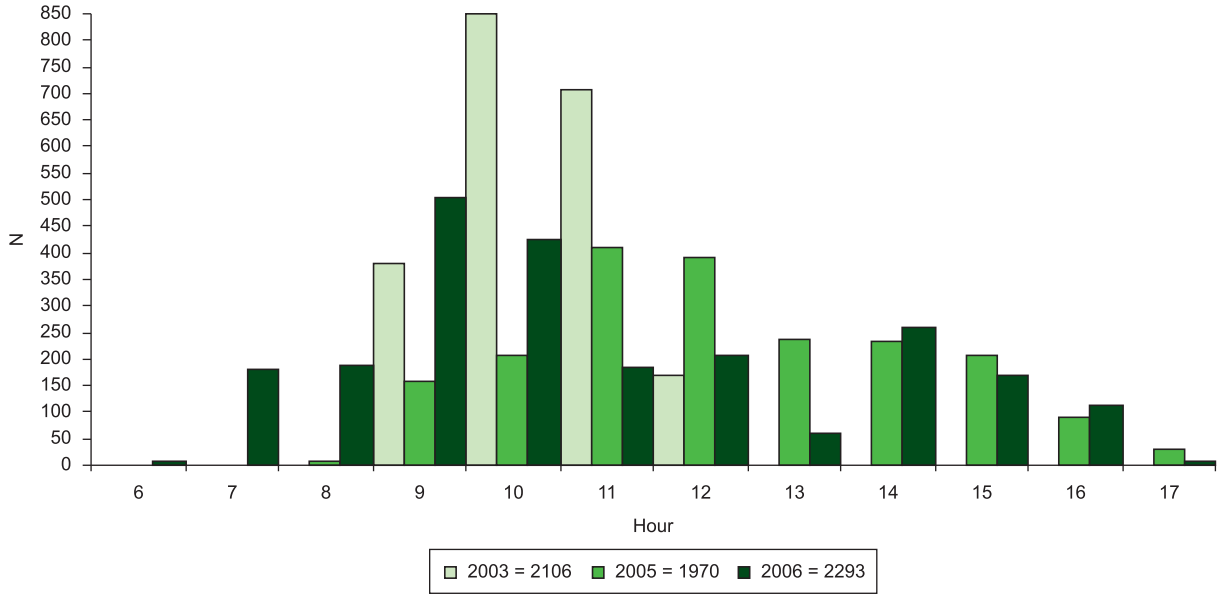

Figure 3. Timing and number of food deliveries of prey items to chicks of South American Terns during reproductive seasons of 2003, 2005 and 2006.

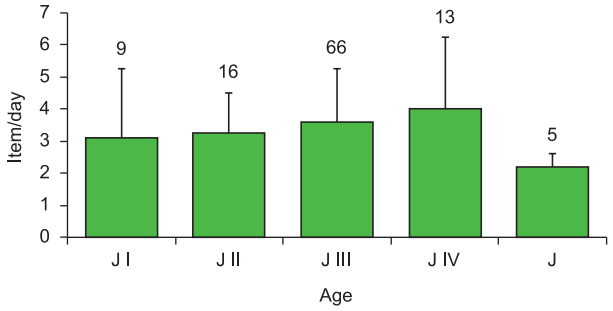

Figure 4. Mean number of times that chicks of South American Terns were fed per day, according to age during 2003, 2005 and 2006. (transversal bar indicates SE, and numbers above bars the number of observations).

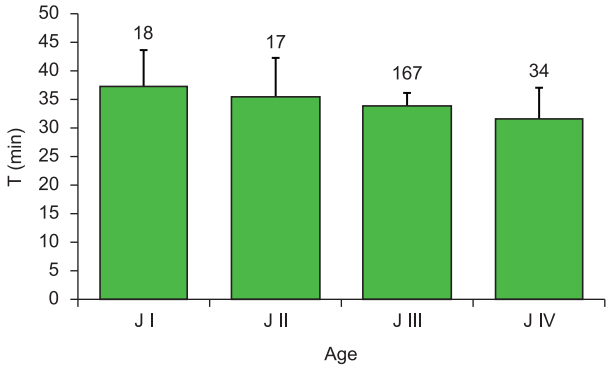

Figure 5. Average time between food deliveries to chicks of South American Terns according age. (transversal bar indicates SE, and numbers above bars the number of observations).

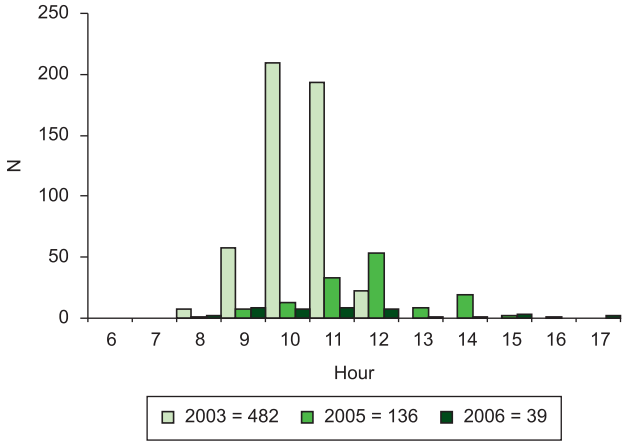

Figure 6. Timing and number of food deliveries to chicks of Cabot´s Terns during breeding seasons of 2003, 2005 e 2006.

American and Cabot´s terns nesting on the coast of Santa Catarina and Paraná feeding primarily on the by-catch of the bob-shrimp fishery during the reproductive period. Cabot´s and South American Terns use the same foraging areas, approximately 15 km of Cardos Island, and groups of adults were observed fishing on the same fish school. However the diet of Cabot´s Terns was composed primarily of larger prey, belonging to the Clupeidae and that of South American Terns of small Engraulidae.

Uncertainties in the rate that prey is available and the fact that parents have to adjust the size of prey taken to the age of their chicks or the nutrients required, suggest that chick feeding is not as efficient as possible (Hulsman 1988), corroborated the observations made in the Ilhéu da Vila, Açores, Portugal, with Common and Roseate Terns (*Sterna dougalli*), which showed differences in the amount of prey ingested by chicks during development (Pereira 1997). In the Netherlands about 75% of the fish (Clupeidae and Ammodytidae) brought to Sandwich Tern chicks on Griend were eaten, and parents met the increasing energy demands of the growing chicks by adjusting prey size, rather than increasing the rate of prey transport to the chicks (Stienen & Brenninkmeijer 2002, Stienen et al. 2000). According to Gatto & Yorio (2009) and Gatto (pers. com.), the supply of prey delivered increased with increasing age of chicks, and the average length of prey also increased significantly, South American and Cabot´s Terns from Cardos Island used mainly fish, but they did not exhibit a change in species of prey during the season, at different times of day, or in different stages of chick development.

In prior observations reported for the tern colony studied in the Açores, a total of 2245 fish were delivered to chicks, of which 1314 for the Common Tern and 931 for the Roseate Terns (Pereira 1997). While 13 prey families were identified for food items of chicks of Common Terns, with the predominant species being fish-stick (*Capros aper*) and horse mackerel (*Trachurus picturatus*) and 10 species were found in items delivered to chicks of Roseate terns, with the most prevalent being horse mackerel and saury (*Scomberesox saurus*) (Pereira 1997). On Cardos Island we found that a higher number of prey was available to South American Tern chicks, but the prey belonged mainly to three families (Engraulidae, Trichiuridae and Clupeidae), with the predominant foods being members of the Engraulidae.

Conclusions

During a symposium held in Argentina (RAO 2008), South America scientists concluded that these two tern species consume mainly fish (of commercial value), and use the same or ecologically similar prey during the reproductive season. In the colony prey that provides higher energy is more likely to be stolen, reducing reproductive success. In wintering areas the diets of these two tern species are more varied, and includes invertebrates. The by-catch of fisheries is also an important source of food, both in areas close to breeding colonies as in Santa Catarina, (Branco et al. 2006) and in the wintering areas in the Coast of Argentina and Rio Grande do Sul (Bugoni & Vooren 2005, Bugoni et al. 2005).

Despite the overlap observed in prey resources used, Engraulidae of small size was the main prey for South American Tern and medium/large Clupeidae for Cabot´s terns in our study, suggesting possible food sharing exists between the two species. Gatto & Yorio (2009) found that in Argentina, Argentine Anchovy (*Engraulis anchoita*) was the main prey for Royal Terns while two species, both silversides (*Odontesthes argentinensis*, *O. nigricans*) and anchovies comprised the bulk of the diet for Cayenne Terns.

Prey size is an important mechanism of dietary segregation as reported in several seabird studies (Ashmole & Ashmole 1967, Hulsman 1988, Fasola et al. 1989). Ecological segregation in seabirds may be achieved through a combination of differences in diet, feeding range, and feeding behavior (Ashmole & Ashmole 1967, Ridoux 1994, Croxall et al. 1997), and thus further studies augmented by aid of telemetry and stable isotope analysis are needed in the area of distribution and concentration of terns along the Brazilian and Argentina coast to better understand all the variables that affect the distribution and ecology of these species. In this study the prey of South American Terns had been fish of the Engraulidae family while for Carbot´s Terns had been of the Clupeidae family. Confirming the hypothesis that has difference in the type of prey between the two seabirds.

Table 3. Family and size of prey carried to colony by Cabot's Terns during time of observation.

Time	Year	Engraulidae			Clupeidae			Trichiuridae	Loliginidae	N iden	Total
		S	M	L	S	M	L				
7	2006	-	-	1	-	-	-	-	-	-	1
	2003	1	2	-	-	6	-	-	-	-	9
8	2005	-	1	-	-	3	-	-	-	-	4
	2006	-	-	-	-	1	3	-	-	-	4
	2003	37	41	17	19	72	16	4	-	1	207
9	2005	2	5	1	3	7	21	-	-	-	39
	2006	-	-	-	1	2	14	-	-	-	17
	2003	129	78	46	58	120	25	8	-	2	466
10	2005	6	6	2	6	4	28	-	-	-	52
	2006	-	-	-	-	5	15	-	-	-	20
	2003	121	85	33	48	93	16	1	1	2	400
11	2005	16	25	15	6	16	62	-	-	-	140
	2006	-	-	-	3	5	9	-	-	-	17
	2003	9	16	3	9	27	10	-	-	-	74
12	2005	18	16	9	5	11	83	-	-	-	142
	2006	-	2	1	1	5	10	-	-	-	19
	2003	-	-	-	-	1	-	-	-	-	1
13	2005	10	9	7	2	10	30	1	-	-	69
	2006	-	-	-	-	-	2	-	-	-	2
14	2005	19	7	11	4	21	66	-	-	-	128
	2006	1	-	-	2	-	4	-	-	-	7
	2005	2	6	8	1	7	15	-	-	-	39
15	2006	-	1	-	-	2	4	-	-	-	7
	2005	-	3	2	1	-	3	-	-	-	9
16	2006	-	1	-	-	1	-	-	-	-	2
	2005	-	1	4	-	-	1	-	-	-	6
17	2006	-	-	-	-	-	2	1	-	-	2
Total	2003	297	222	99	134	319	67	13	1	5	1157
	2005	73	79	59	28	79	309	1	-	-	628
	2006	1	4	2	7	21	63	-	-	-	98

S = Small, M = medium and L = large.

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