Prey consumed by Guiana dolphin *Sotalia guianensis* (Cetacea, Delphinidae) and franciscana dolphin *Pontoporia blainvillei* (Cetacea, Pontoporiidae) in an estuarine environment in southern Brazil

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ABSTRACT. The present study provides information about the diet of sympatric populations of small cetaceans in the Babitonga Bay estuary. This is the first study on the diet of these species in direct sympatry. The stomach contents of seven Guiana dolphins *Sotalia guianensis* and eight franciscanas *Pontoporia blainvillei* were analyzed. The prey of both cetaceans was mostly teleost fishes, followed by cephalopods. We identified 13 teleost fishes as part of the diet of the franciscanas, and 20 as part of the diet of Guiana dolphins. *Lolliguncula brevis* was the only cephalopod recorded, and was the most important prey for both cetaceans. *Stellifer rastrifer* and *Gobionellus oceanicus* were also important for franciscana, so as *Mugil curema* and *Micropogonias furnieri* were important for Guiana dolphins. *Stellifer rastrifer* and *Cetengraulis edentulus* were the fishes with the highest frequency of occurrence for franciscana (50%), while *Achirus lineatus*, *C. edentulus, S. brasiliensis*, *Cynoscion leiarchus*, *M. furnieri*, *M. curema*, *Diapterus rhombeus*, *Eugerres brasilianus* and *G. oceanicus* showed 28.6% of frequency of occurrence for Guiana dolphins. Franciscanas captured greater cephalopods than the Guiana dolphins in both total length ($z= -3.38$; $n= 40$; $p< 0.05$) and biomass ($z = -2.46$; $n = 40$; $p<0.05$). All of the prey species identified occur inside the estuary, which represents a safe habitat against predators and food availability, reinforcing the importance of the Babitonga Bay for these cetacean populations.

KEYWORDS. Diet, Babitonga Bay, cetacean, fish, cephalopod.

RESUMO. Presas consumidas pelo boto-cinza *Sotalia guianensis* (Cetacea, Delphinidae) e pela toninha *Pontoporia blainvillei* (Cetacea, Pontoporiidae) em ambiente estuarino no sul do Brasil. O presente estudo fornece informações sobre a dieta de populações simpátricas de pequenos cetáceos no estuário da Baía da Babitonga. Este é o primeiro estudo sobre a dieta destas espécies em simpatria direta. Foi analisado o conteúdo estomacal de sete botos-cinza *Sotalia guianensis* e oito toninhas *Pontoporia blainvillei*. As presas de ambos cetáceos foram principalmente peixes teleósteos, seguida de cefalópodes. Foram identificadas 13 espécies de peixes teleósteos como parte da dieta de toninhas e 20 como parte da dieta de botos-cinza. *Lolliguncula brevis* foi o único cefalópode registrado e foi a presa mais importante para ambos cetáceos. *Stellifer rastrifer* e *Gobionellus oceanicus* foram também importantes para a toninha, assim como *Mugil curema* e *Micropogonias furnieri* foram importantes para os botos-cinza. *Stellifer rastrifer* e *Cetengraulis edentulus* foram as espécies de peixes com maior frequencia de ocorrência para a toninha (50%), enquanto *Achirus lineatus*, *C. edentulus*, *S. brasiliensis*, *Cynoscion leiarchus*, *M. furnieri*, *M. curema*, *Diapterus rhombeus*, *Eugerres brasilianus* e *G. oceanicus* apresentaram 28,6 % de frequência de ocorrência para os botos-cinza. As toninhas capturaram cefalópodes maiores do que os botos-cinza, tanto em comprimento total ($z= -3{,}38$; $n= 40$; $p< 0{,}05$) como em biomassa ($z = -2{,}46$; $n = 40$; $p<0{,}05$). Todas as espécies de presas identificadas ocorrem no interior do estuário, que representa um habitat seguro contra a ação de predadores com disponibilidade de presas, reforçando a importância da Baía da Babitonga para estas populações de cetáceos.

PALAVRAS-CHAVE. Dieta, Baía da Babitonga, cetáceos, peixes, cefalópodes.

Information regarding feeding habits is important for understanding the trophic relationships in an ecosystem. Small cetaceans are top predators and have an important influence on the populations of their prey species and, consequently, on the energy flow in their associated ecosystems (Bowen & Siniff, 1999).

The Guiana dolphin, *Sotalia guianensis* (P. J. van Bénéden, 1864), is a coastal species distributed from Nicaragua (Carr & Bonde, 2000) to state of Santa Catarina, southern Brazil (Simões-Lopes, 1988). The franciscana, *Pontoporia blainvillei* (Gervais & D'Orbigny, 1844), can be found from the north of state of Espírito Santo, south-eastern Brazil (Siciliano, 1994) to Golfo Nuevo, northern Argentina (Crespo *et al.*, 1998). In contrast to the Guiana dolphin, the franciscana does not commonly occur in estuarine areas, with the exception of Babitonga Bay in south Brazil (Cremer & Simões-Lopes, 2005). In this area, both dolphins live in direct sympatry (*sensu* Bearzi, 2005), but they were never seen together (Cremer & Simões-Lopes, 2008). The franciscana population is smaller than the Guiana dolphin population in this area, being estimated at 50 and 208 individuals, respectively (Cremer & Simões-Lopes, 2008; Cremer *et al.*, 2011). According to Pauly *et al.* (1998), franciscana and Guiana dolphin exhibit a very similar trophic level.

Franciscana feeding habits have been extensively studied, mainly in its southern distribution range. Published data about its diet was described in some areas of Argentina and Uruguay (Fitch & Brownell, 1971; Rodríguez *et al.*, 2002), as well as for the Brazilian coast (Santos & Haimovici, 2001; Bittar & Di benedItto, 2009). A review of prey species recorded for the franciscana can be found at Danilewicz *et al.* (2002). The species feeds mainly on teleost fishes. Cephalopods were also found to be very important in its diet, and crustaceans were poorly represented.

Studies related to Guiana dolphins diet have been intensified during recent years in Brazil (Borobia & Barros, 1989; Santos & Haimovici, 2001; Santos *et al.*, 2002; Gurjão *et al.*, 2003; Di Beneditto & Siciliano, 2007; Pansard *et al.*, 2010; Daura-Jorge *et al.*, 2011). Teleost fishes were also considered the main prey items, though the diet includes cephalopods and crustaceans.

Studies related to cetacean feeding ecology are traditionally conducted through the analyses and interpretation of stomach contents that are resistant to digestion, such as fish teeth, bone structures, scales, squid beaks, crustacean exoskeleton fragments, and otoliths of fishes (Fitch & Brownell, 1968; Pierce & Boyle, 1991; Bowen & Siniff, 1999). However, digestion and the presence of structures that originated from the prey species stomachs can result in distortion of the results (Fitch & Brownell, 1971). The fact that the majority of such results have been derived from the examination of stomach contents of stranded animals may also be a reason for errors (Barros & Odell, 1990). However, such method was considered a reasonable approach for dolphins like *Tursiops truncatus* (Montagu, 1821) (Barros & Wells, 1998).

Almost all the studies addressing the diet of franciscana and Guiana dolphins revealed that the composition of prey differed along the distribution and habitats occupied by these species. The main objective of the present study was to provide additional data on the diet of franciscana and Guiana dolphins, so as to identify the preys consumed by both cetacean species in Babitonga Bay, an estuarine environment in south Brazil. This information could be very useful to understand the ecology of these populations, which occur in direct sympatry in this estuary.

MATERIALS AND METHODS

Sample collection. The samples used in this study were obtained from dead animals recovered inside Babitonga Bay estuary, on north coast of state of Santa Catarina, south Brazil (26°02'-26°28'S and 48°28'-48°50'W). Thus, we presumed that they corresponded to animals that were part of the recognised populations of the Guiana dolphins and franciscanas that live in this estuary (Cremer & Simões-Lopes, 2008; Cremer *et al.*, 2011). The collection of the animals was opportunistic and depended on the information of local people. The results do not reflect the seasonal stranding patterns of cetaceans in the study area. All of the animals recovered were recorded in the collection of UNIVILLE (Universidade da Região de Joinville).

We analysed the stomach contents of eight franciscanas and seven Guiana dolphins, collected between 2000 and 2006. Details about the studied specimens are presented in Table I. Each animal was measured and the sex determined whenever possible. During necropsy the stomachs, including all chambers, were excised and frozen for later analysis.

Data analysis. Stomach contents were washed through three sieves, with 2-mm, 850-µm and 425-µm mesh sizes. Food items were recovered, and information about the prey species was obtained through the analysis of fish otoliths and cephalopod beaks present in the stomach. The identification of shrimps was not possible because of the digestion stage. Otoliths and cephalopod beaks were stored dry, and undigested items were preserved in 70% alcohol. The number of prey items found in each stomach is presented in Table I.

Teleost fish otoliths were identified through reference collections of the Laboratório de Nectologia, Universidade da Região de Joinville, and also through the use of specific identification keys (Corrêa & Vianna, 1992; Lemos *et al.*, 1992; Lemos *et al.*, 1995a,b). We used the sagitta otolith

Tab. I. Information about sex, total length (TL), date of recovery and number of prey items found in the stomachs of eight *Pontoporia blainvillei* and seven *Sotalia guianensis* individuals recovered for analysis in Babitonga Bay, southern Brazil (ni = sex not identified; 1, female with a foetus of 37 cm length; SD, standard deviation; M, male; F, female).

Number	Sex	TL (cm)	Date	Otoliths	Beaks	Shrimps
P. blainvillei						
UNIVILLE - 10[1]	F	138	16/07/2001		13	
UNIVILLE - 15	F	95.2	15/08/2001	9	2	
UNIVILLE - 37	ni	118	08/09/2002	35		1
UNIVILLE - 42	ni	107	05/08/2003	81		
UNIVILLE - 44	ni	73	13/01/2006	59	1	
UNIVILLE - 53	M	87.3	15/08/2005	316		
UNIVILLE - 56	M	109	23/06/2006	34	8	
UNIVILLE - 62	M	111	13/09/2006	8	8	
Mean ± SD		98.8 ± 32.5 cm				
S. guianensis						
UNIVILLE - 06	M	148	29/11/2000	23		1
UNIVILLE - 16	M	198	17/09/2001	30		
UNIVILLE - 31	F	145	28/03/2004			
UNIVILLE - 33	M	168	27/10/2002	31		2
UNIVILLE - 34	M	135	14/02/2003		7	
UNIVILLE - 40	M	159	21/12/2005	13		
UNIVILLE - 52	M	167	25/04/2006	27	1	
Mean ± SD		160 ± 20.6 cm				

for species identification, preferentially the left one. Teleost fish otoliths were measured to estimate the total length of the fish based on regression equations presented by Corrêa & Vianna (1992), Lemos *et al.* (1992; 1995a,b) and from data of the reference collections of the Laboratório de Nectologia, Universidade da Região de Joinville. Measurements were collected using a micrometric scale (0.01-mm precision) adapted to a stereoscopic microscope. Imagines were taken using Image Pro Plus 3.0 software adapted to a stereoscopic microscope.

Cephalopod beaks were identified with the help of the reference collection of cephalopods of the Centro de Pesquisa e Gestão de Recursos Pesqueiros do Litoral Sudeste e Sul, Instituto Chico Mendes de Conservação da Biodiversidade (CEPSUL/ ICMBio, Itajaí, SC). For the estimation of mantle length and total weight, measurements of lower rostral length and upper rostral length were used. All measurements were collected using a stereoscopic microscope. The total length and weight were estimated based on regression equations presented by Santos & Haimovici (2001).

The total length of the prey ingested by the dolphins was compared using the Mann-Whitney U-test (Statistica 6.0®) (only for those species with sufficient sample size). The significance level considered was $\alpha<0.05$. We calculated the percentage numeric frequency (%NF) and the percentage of frequency of occurrence (%FO). We used an adaptation to the Pinkas *et al.* (1971) index of relative importance (IRI) because of the high number of digested otoliths for which we could not estimate the biomass. The index was calculated as: IRI = %NF x %FO. For each stomach, the maximum number of either left or right otoliths was used as the minimum number of identified fishes. The same was assumed for the lower and upper cephalopod beaks.

RESULTS

We recovered a total of 852 otoliths; 19.5% were found in Guiana dolphin stomachs and 80.5% in franciscana stomachs. Cephalopod beaks were the second most important item found, with a total of 71 beaks (20% in Guiana dolphin stomachs and 80% in franciscana stomachs) (Tab. I). Crustaceans were poorly represented, with only three individuals registered in Guiana dolphin stomachs and one in a franciscana stomach. We identified 478 otoliths (56.1%) and 40 cephalopod beaks (56.3%). The shrimp species could not be identified because they were highly digested, which was also true for 374 otoliths (43.9%). Only one stomach (*S. guianensis*) was empty (UNIVILLE 31). To avoid errors, the size and biomass of many teleost species was not estimated because they were highly digested.

Teleost fishes were the principal prey identified in the diet of both cetacean species, and the family Sciaenidae was the most common. However, two franciscana stomachs and one Guiana dolphin stomach contained only cephalopods. Twenty-six fish species were identified, 13 of which were observed as franciscana prey items and 20 as Guiana dolphin prey items (Tabs II, III). Seven fish species and the cephalopod *Lolliguncula brevis* (de Blainville, 1823) were consumed by both cetaceans. Thus, the Guiana dolphin was observed to prey on more species (21 species) than the franciscana (14 species), and 50% of the franciscana prey species were also found in the diet of the Guiana dolphin. For the Guiana dolphin, only 33.3% of the prey species were shared with franciscana.

The highest frequency of occurrence (%FO) for the franciscana prey was observed for the cephalopod

Tab. II. Prey consumed by franciscana *Pontoporia blainvillei* in Babitonga Bay, southern Brazil, with respective values of the number of individuals (N), frequency of occurrence (FO), numeric frequency (NF), index of relative importance (IRI) and importance level (IL) of each prey species (□ = species shared with *Sotalia guianensis*); (IL value was established according to the value of IRI: the highest value of IRI was also the highest value of IL).

Family	Species	N	FO (%)	NF (%)	IRI	IL
TELEOST						
Paralichthidae	*Paralichthys isosceles*	2	12.5	0.4	5	11
Engraulidae	*Cetengraulis edentulus*	28	50	5.3	265	3
	Anchoa filifera	6	37.5	1.1	41.2	7
	Lycengraulis grossidens	9	25	1.7	42.5	6
Sciaenidae	*Stellifer brasiliensis*	20	37.5	3.8	142.5	4
	Stellifer rastrifer	119	50	22.7	1.135	1
	Cynoscion leiarchus	4	12.5	0.8	10	10
	Cynoscion microlepidotus	2	12.5	0.4	1	12
	Micropogonias furnieri	2	12.5	0.4	5	8
	Isopisthus parvipinnis	8	37.5	0.8	30	11
Gerreidae	*Eugerres brasilianus*	5	12.5	0.9	11.2	9
Clupeidae	*Opisthonema oglinum*	12	25	2.3	57.5	5
Gobiidae	*Gobionellus oceanicus*	147	25	28.1	702.5	2
Non identified	-	374	-	-	-	-
CEPHALOPODS						
Loliginidae	*Lolliguncula brevis*	32	62.5	100	6,250	1

specie, *L. brevis* (62.5%) and for two fish species: *Cetengraulis edentulus* (Cuvier, 1829) (Engraulidae) and *Stellifer rastrifer* (Jordan, 1899) (Sciaenidae), which were found in 50% of the stomachs investigated (Tab. II). *Stellifer rastrifer* also corresponded to the species with highest IRI, followed by *Gobionellus oceanicus* (Pallas, 1770) (Gobiidae). The IRI value of these species was much higher than that of the other species.

Lolliguncula brevis occurred in 100% of the Guiana dolphins analyzed, followed by nine fish species with 28.6% of frequency of occurrence: *Achirus lineatus* (Linnaeus, 1758) (Achiridae), *C. edentulus* (Engraulidae), *Stellifer brasiliensis* (Schultz, 1945), *Cynoscion leiarchus* (Cuvier, 1830), *Micropogonias furnieri* (Desmarest, 1823) (Sciaenidae), *Mugil curema* (Valenciennes, 1836) (Mugilidae), *Diapterus rhombeus* (Cuvier, 1829), *Eugerres brasilianus* (Cuvier, 1830) (Gerreidae) and *G. oceanicus* (Tab. III). Although the IRI value declined gradually between the prey items, the highest value was recorded for *M. curema*, followed by *M. furnieri*.

The sizes of the cephalopods consumed by both cetaceans differed in both total length and biomass. Franciscanas captured greater cephalopods than the Guiana dolphins in both total length ($z= -3.38$; $n= 40$; $p< 0.05$) and biomass ($z = -2.46$; $n = 40$; $p<0.05$) (Tab. IV).

We did not observe differences in the sizes of either *S. brasiliensis* ($z= 1.53$; $n= 26$; $p>0.05$) or *C. edentulus* ($z= 1.13$; $n= 26$; $p>0.05$) (Tab. IV) individuals consumed by both cetaceans. For the other prey species shared between the franciscana and Guiana dolphins, we could not analyse the differences because of the small sample size. Only two *M. furnieri* individuals were recorded in franciscana stomachs, with an average total length estimated at 4.1 ± 0.05 cm. This value was much lower than that estimated for the individuals consumed by the Guiana dolphin (10.4 ± 3 cm). The same tendency was observed for *Anchoa filifera* (Fowler, 1915) because Guiana dolphins seem to consume larger individuals than did franciscanas.

DISCUSSION

BARROS & ODELL (1990) pointed out that findings derived from stranded animals may be a reason for errors in such results. However, the animals analysed in this study do not exhibit signs of disease or trauma and probably died as a consequence of entanglement in fishing nets, which is a problem previously described in Babitonga Bay by PINHEIRO & CREMER (2003).

We analysed only the stomachs from animals recovered inside Babitonga Bay, where the populations of these two cetaceans are small, estimated at 50 individuals for franciscanas (CREMER & SIMÕES-LOPES, 2008) and 208 individuals for Guiana dolphins (CREMER *et al.*, 2011). In this way, we considered that our aim

Tab. III. Prey consumed by Guiana dolphin *Sotalia guianensis* in Babitonga Bay, southern Brazil, with respective values of the number of individuals (N), frequency of occurrence (FO), numeric frequency (NF), index of relative importance (IRI) and importance level (IL) of each prey (□ = species shared with *Pontoporia blainvillei*); (IL value was established according to the value of IRI: the highest value of IRI was also the highest value of IL).

Family	Species	N	FO (%)	NF (%)	IRI	IL
TELEOST						
Achiridae	*Achirus lineatus*	2	28.6	1.7	48.6	9
Paralichthidae	*Citharichthys spilopterus*	8	14.3	6.7	95.8	7
	Citharichthys arenaceus	1	14.3	0.8	11.4	12
Cynoglossidae	*Symphurus tesselatus*	1	14.3	0.8	11.4	12
Engraulidae	*Cetengraulis edentulus* □	6	28.6	5	143	5
	Anchoa filifera □	1	14.3	0.8	11.4	12
Sciaenidae	*Larimus breviceps*	1	14.3	0.8	11.4	12
	Stellifer brasiliensis □	7	28.6	5.9	168.7	4
	Cynoscion acoupa	2	14.3	1.7	24.3	11
	Cynoscion leiarchus □	2	28.6	1.7	48.6	9
	Conodon nobilis	1	14.3	0.8	11.4	12
	Micropogonias furnieri □	14	28.6	11.8	337.5	2
Mugilidae	*Mugil curema*	20	28.6	16.8	480.5	1
	Mugil gaimardianus	2	14.3	1.7	24.3	11
	Mugil sp.	3	14.3	2.5	35.7	10
Gerreidae	*Diapterus rhombeus*	13	28.6	10.9	311.7	3
	Eugerres brasilianus □	3	28.6	2.5	71.5	8
Clupeidae	*Pellona harroweri*	3	14.3	2.5	35.7	10
Trichiuridade	*Trichiurus lepturus*	1	14.3	0.8	11.4	12
Gobiidae	*Gobionellus oceanicus* □	5	28.6	4.2	120.1	6
Non identified	-	23	85.8	19.3	-	-
CEPHALOPODS						
Loliginidae	*Lolliguncula brevis* □	8	28.6	100	2.860	1

Table IV. Preys of Guiana dolphin *Sotalia guianensis* and franciscana *Pontoporia blainvillei* in Babitonga Bay, Southern Brazil, and respective values of the mean of total length and standard deviation (SD) (cm) for each prey species. (…) Indicates the presence of a prey item, but that was impossible to identify; (-) Indicates the absence of the prey item.

Prey	Number of prey measured		Total length ± SD (cm)	
	S. guianensis	*P. blainvillei*	*S. guianensis*	*P. blainvillei*
TELEOST				
Achirus lineatus	2	-	10.2 ± 1.1	-
Citharichthys spilopterus	9	-	11.3 ± 1.7	-
Citharichthys arenaceus	1	-	15.8	-
Paralichthys isosceles	-	2	-	5.6 ± 0.03
Symphurus tesselatus	1	-	14.2	-
Cetengraulis edentulus	5	21	10.1 ± 1.3	9.2 ± 1.9
Anchoa filifera	1	6	8.9	5 ± 0.2
Lycengraulis grossidens	...	9	...	1.01 ± 0.1
Larimus breviceps	...	-	...	-
Stellifer brasiliensis	7	19	8.5 ± 3.1	9.7 ± 0.9
Stellifer rastrifer	-	40	-	10.8 ± 1.1
Cynoscion leiarchus	2	...	9.7 ± 0.6	...
Conodon nobilis	...	-	...	-
Micropogonias furnieri	14	2	10.4 ± 3	4.1 ± 0.05
Cynoscion microlepidotus	-	...	-	...
Isopisthus parvipinnis	-	8	-	5.7 ± 1.2
Diapterus rhombeus	...	-	...	-
Eugerres brasilianus	...	...	...	...
Pellona harroweri	...	-	...	-
Opisthonema oglinum	-	...	-	...
Trichiurus lepturus	1	-	110	-
Gobionellus oceanicus	4	167	26.31 ± 5.7	13.29 ± 4.5
CEPHALOPODS				
Lolliguncula brevis	8	32	4.5 ± 0.3	5.5 ± 0.9

was achieved by the identification of the prey species consumed by these cetaceans in the Babitonga Bay estuary. For franciscanas, our sample consisted of around 16% of the estimated population and for Guiana dolphin we analysed around 3.4% of the estimated population.

The Guiana dolphin diet exhibited higher richness than the franciscana diet. The number of preys varied along the distribution of these species in south and southeastern Atlantic (Santos *et al.*, 2002; Gurjão *et al.*, 2003; Di Beneditto & Siciliano, 2007; Bittar & Di Beneditto, 2009; Daura-Jorge *et al.*, 2011) and could be related to changes in prey availability and accessibility (Danilevicz *et al.*, 2002; Daura-Jorge *et al.*, 2011). Predation on abundant resources could characterize an opportunistic behaviour, following the definition of Begon *et al.* (1996). This characteristic could lead the species to change its foraging patterns as a consequence of fish stock reductions (Danilevicz *et al.*, 2002), and could represent a reduced vulnerability of the franciscanas in relation to food availability.

The three fish species with the highest IRI values in the franciscana diet (*S. rastrifer*, *G. oceanicus* and *C. edentulus*) have a small size, occur in large schools and show a high abundance in estuaries (Almeida & Branco, 2002; Silva *et al.*, 2003; Andrade-Tubino *et al.*, 2008). For the Guiana dolphins, the two fish species with highest IRI values are species of large size and high energy value (*M. curema* and *M. furnieri*) (Curcho *et al.*, 2009) that show variations in abundance of adult individuals inside estuarine regions (Castro & Petrere, 2001; Carvalho *et al.*, 2007).

It is not possible with our data to make conclusive analysis whether the species consume prey of different size. Literature information indicated that prey size for *S. guianensis* changes along its distribution, as recorder by Pansard *et al.* (2010) (mean 13.18 ± 8.85 cm) and Daura-Jorge *et al.* (2011) (mean = 21.4 ± 21.2 cm). For *P. blainvillei* it seems that the species preys on fishes of smaller total length (Rodriguez *et al.*, 2002; Bittar & Di Beneditto, 2009).

Lolliguncula brevis was important prey species for both cetaceans and was the only cephalopod recorded. Cephalopods were also very important in the diet of *P. blainvillei* in the north coast of state of Rio de Janeiro (Bittar & Di Beneditto, 2009), but have low importance for *S. guianensis* both north and south of its distribution (Pansard *et al.*, 2010; Daura-Jorge *et al.*, 2011). *Loligo plei* (Blainville, 1823) and *Loligo sanpaulensis* (Brakoniecki, 1984), which have been identified in franciscana and Guiana dolphin diets in other Brazilian states (Di Beneditto & Siciliano, 2007; Bittar & Di Beneditto, 2009), are species with a wide distribution along the coast of state of Santa Catarina (Perez, 2002). This species was also the only cephalopod registered in Guiana dolphin stomachs at North Bay, also in Santa Catarina (Daura-Jorge *et al.*, 2011). Only in the genus *Lolliguncula* there are cephalopod species that are highly tolerant to low salinity, common in estuaries (VECCHIONE, 1991).

MARCUCCI & CREMER (2003) analysed the franciscana diet from individuals recovered outside of the Babitonga Bay estuary in state of Santa Catarina. Among the prey identified, two teleost fishes and one cephalopod were different from the species identified in the individuals recovered inside the estuary: *Anchoa tricolor* (Spix & Agassiz, 1829), *Paralonchurus brasiliensis* (Steindachner, 1875) and *L. plei*, respectively. These fish and cephalopod species have very coastal habits and rarely are found inside estuarine environments, indicating some local differences in the diet of the franciscana. CREMER & SIMÕES-LOPES (2008), based on information about the animals distribution, suggest that franciscanas of the Babitonga Bay are resident and remain within the bay along the whole year.

Thus, this hypothesis could have been enhanced with this information on the diet of the population. The franciscana diet in Babitonga Bay was composed only of prey that typically occurs in estuarine waters, probably indicating that these animals do not leave the bay.

Because of our small sample size, it was not possible to analyse the diet with respect to different ages, sex or seasonality. Furthermore, it is possible that our results are strongly influenced by the composition of the sample. This problem is more evident in the case of Guiana dolphin because information was obtained only from males. Variations in diet composition have been observed for the franciscana in Argentina (RODRÍGUEZ *et al*. 2002).

Analysing prey behaviour, we conclude that both dolphins feed at the surface and at the bottom of the water column. The majority of the prey species form large schools, and this could influence the predators' feeding behaviour. Predation on fish schools requires coordinated group behaviour to amplify individual success. The occurrence of large groups participating in feeding behaviours has been observed in Babitonga Bay for Guiana dolphins (CREMER *et al.*, 2011) and for franciscanas (CREMER & SIMÕES-LOPES, 2005). Additionally, flatfishes were registered in the stomachs of both franciscanas and Guiana dolphins, and fishing behaviour associated with the bottom, as described for Guiana dolphin by ROSSI-SANTOS & WEDEKIN (2006), has also been observed in the study area.

The fact that the studied species occupy a similar feeding niche in an area where they are in sympatry could be explained by the abundance of resources. Moreover, the prey species with higher importance for each of the cetacean species do not overlap, and this fact could contribute to the co-occurrence of these populations. In the Bay of Biscay, bottlenose dolphins and harbour porpoise have been observed to exhibit interference competition because they occur in mixed-predator aggregations and show a significant feeding niche overlap (SPITZ *et al*., 2006). In Babitonga Bay, franciscana and Guiana dolphins do not form mixed-predator aggregations, although both species use the same foraging habitats (CREMER & SIMÕES-LOPES, 2005).

The information available about the distribution of Guiana dolphins and franciscana in Babitonga Bay, collected in the last 10 years, indicates that both cetacean populations might be resident in the Babitonga Bay estuary (CREMER & SIMÕES-LOPES, 2005, 2008; CREMER *et al*., 2011). All of the prey species identified occur inside the estuary, which reinforces the importance of Babitonga Bay for these populations because it represents a secure habitat against predators with the availability of food for both cetacean populations.

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