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ARTICLE

Taxonomic composition of mollusks collected from the stomach content of *Astropecten brasiliensis* (Echinodermata: Asteroidea) in Santa Catarina, Brazil

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ABSTRACT: (Taxonomic composition of mollusks collected from the stomach content of *Astropecten brasiliensis* (Echinodermata: Asteroidea) in Santa Catarina, Brazil). The stomach content of 58 individuals of *Astropecten brasiliensis* Müller & Troschel, 1842, trawled by commercial shrimp vessels in Santa Catarina (Brazil), revealed that this starfish feeds upon a variety of mollusk species. A total of 542 mollusk specimens were found in the stomach content and classified into 24 families, 32 genera, and 35 species. The mollusks were usually well preserved and intact, which facilitated their correct identification. Bivalves and gastropods accounted for 72% and 27% of the mollusks collected in the stomachs, respectively. Three mollusk species (*Corbula caribaea*, *Transenella stimpsoni,* and *Natica pusilla*) occurred most frequently in the stomach content, for all sampling periods, locations, and size classes of starfish. Statistical analysis revealed that the average number of individual mollusks found in the stomachs of *A. brasiliensis* was higher during the warmer periods.
Key words: Starfish, southern Brazil, marine bivalves, marine gastropods.

RESUMO: (Análise da composição taxonômica dos moluscos encontardos no conteúdo estomacal de Astropecten brasiliensis (Echinodermata: Asteroidea) em Santa Catarina, Brasil). A análise do conteúdo estomacal de 58 indivíduos da espécie *Astropecten brasiliensis* Müller & Troschel, 1842 coletadas em barcos de pesca comercial de camarão no estado de Santa Catarina, Brasil, revelou que essa espécie de estrela-do-mar pode se alimentar de variadas espécies de moluscos. No total, 542 espécimes de moluscos foram encontradas no conteúdo estomacal de *A. brasiliensis*, e classificadas em 24famílias, 32 gêneros e 35 espécies. Os moluscos encontrados apresentavam-se bem preservados e intactos, facilitando sua correta identificação. O conteúdo digestivo de *A. brasiliensis* mostrou-se composto principalmente por bivalves e gastrópodes, que representaram 72% e 27% do número total de moluscos identificados, respectivamente. Considerando os períodos e locais de coleta, e as classes de tamanho das estrelas, três espécies de moluscos (*Corbula caribaea*, *Transenella stimpsoni* e *Natica pusilla*) apresentaram elevada freqüência de ocorrência no conteúdo estomacal de *A. brasiliensis*. A análise estatística da quantidade média de moluscos encontrados no conteúdo estomacal de *A. brasiliensis* revelou um aumento no número de espécimes durante os períodos do ano mais quentes.
Palavras-chave: estrela-do-mar; sul do Brasil; bivalves marinhos; gastrópodes marinhos.

INTRODUCTION

Mollusks represent an important part of the diet of several marine predators. Fish, crabs, mollusks, and echinoderms are considered major mollusk predators (Mantelatto & Christofoletti 2001, Rios *et al.* 1977, Sá *et al.* 1984). Among the echinoderms, starfish play an important role as predators of a variety of infaunal macrobenthic organisms, and previous studies have indicated that some echinoderm species efficiently prey on mollusks (Feder 1959, Ganmanee *et al.* 2003, Monteiro & Pardo 1994, Penchaszadeh 1973, Penchaszadeh & Lera 1983). Thus, similar to other predators, starfish may exert a strong influence upon the structure of the community they prey on, and studies about the diets of starfish are important and are needed to understand the role of these animals in marine communities (Gaymer *et al.* 2004, Gaymer *et al.* 2001, McClintock & Lawrence 1985, Tokeshi 1991).

Echinoderms of the subclass Asteroidea are predominantly carnivores and have generalist feeding strategies, living on different types of substrates (Ruppert & Barnes 1994). The members of the order Paxillosida, which includes the genus *Astropecten*, are well adapted to soft-bottom substrates (Ruppert & Barnes 1994), being voracious predators of a range of macrofauna invertebrates such as mollusks and crustaceans (Carcelles 1944; Monteiro & Pardo 1994, Penchaszadeh 1973, Penchaszadeh & Lera 1983). It has been reported that *Astropecten* species mainly feed upon gastropods and bivalves, with other infaunal benthos constituting a smaller portion of their diet (Beddingfield & Mcclintock 1993, Ganmanee *et al.* 2003, Monteiro & Pardo 1994, Ventura *et al.* 2000). Paxillosids swallow the prey intact and have an intra-oral feeding mechanism; after ingestion, the prey remains in the stomach for a variable period of time (Beddingfield & Mcclintock 1993, Ventura *et al.* 2000). Therefore, the analysis of the stomach content of these invertebrates can provide reliable information about their diet in a natural environment.

The study of the stomach content of different starfish species has shown that some species are not selective with

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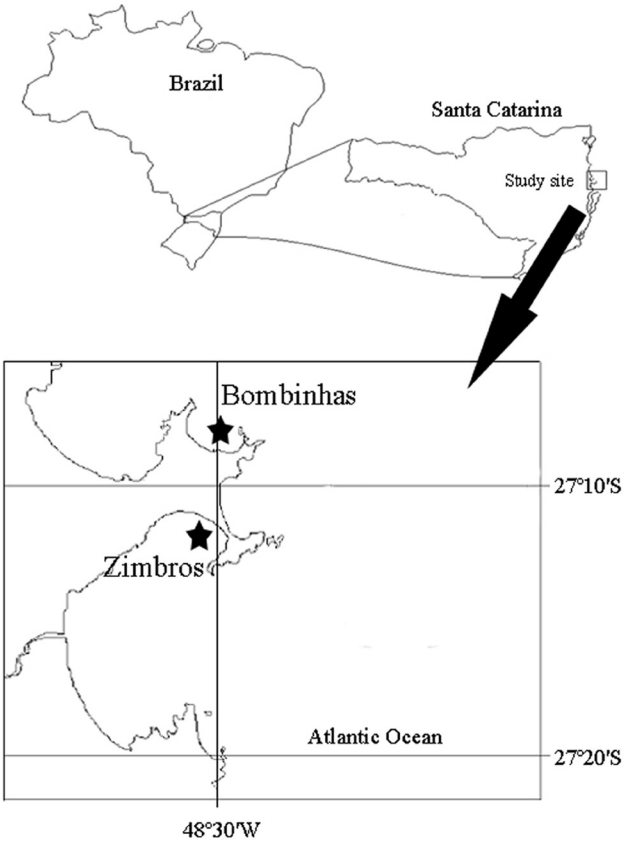

Figure 1. Sampling site locations (in detail) in Santa Catarina, Brazil.

regard to their prey, while others feed upon a restricted group of mollusks (Ganmanee *et al.* 2003, Gaymer *et al.* 2004, Gaymer *et al.* 2001, McClintock & Lawrence 1985, Penchaszadeh 1973, Penchaszadeh & Lera 1983, Ribi *et al.* 1977, Ventura *et al.* 2000). This selectivity is influenced by different factors. For instance, the ability of some *Astropecten* to feed upon large prey is limited by intra-oral feeding mechanisms, and it is closely related to the diameter of the oral disk (Ventura *et al.* 2000). Seasonal and spatial variations also influence the patterns of consumption of the prey of the paxillosids, since distribution and abundance of preys are determined by a combination of environmental conditions (Gaymer *et al.* 2001, McClintock & Lawrence 1985, Monteiro & Pardo 1994). Therefore, variations in mollusk availability play an important role in determining which species can be considered a food resource (Penchaszadeh 1973, Ventura *et al.* 2000). Studies concerning the feeding aspects of many starfish have been conducted throughout the world, but little information about the diet of Brazilian starfish is available to date.

The South American starfish *Astropecten brasiliensis* Müller and Troschel, 1842, has a wide geographical distribution in thesouthern Atlantic Ocean, being reported from the Antilles, Brazil, Uruguay, and Argentina (Tommasi 1970). Its bathymetric distribution is wide; Tommasi (1970) states that this species is common between 1 and 30 meters, but it can also be found at greater than 80 meters in southern Brazil (Rio Grande) (Rios & Oleiro 1970). Previous analyses of the stomach content of *A. brasiliensis* have revealed a strong preference for mollusks (Penchaszadeh 1973). However, few works have identified and analyzed the taxonomic variation and composition of mollusk species found in the stomach content of this starfish (Rios & Oleiro 1970; Ventura *et al.* 2000). Thus, the aims of the present work were: (1) to identify and classify, to the lowest possible taxa, the mollusks collected from the stomach content of *Astropecten brasiliensis*, through the identification of shells; (2) to evaluate temporal and spatial variation in the mollusk composition found in the *A. brasiliensis* stomachs; and (3) to determine whether the size of *A. brasiliensis* correlates with the number of mollusk items found in their stomachs.

MATERIAL AND METHODS

Starfish were trawled by commercial shrimp vessels, at depths between 3 and 12 meters in the Porto Belo peninsula (27°05'S-27°13'S; 48°27'W-48°37'W), Santa Catarina, Brazil (Fig. 1). Sampling was carried out at two sites during different periods: May–June 1995 and January 1997 at Zimbros; September–October 1995, October–December 1996, January–February 2000, and January–March 2005 at Bombinhas.

All individuals were fixed and preserved in 70 °GL ethanol. Tommasi (1970) was used to identify and determine starfish species. The size of the *A. brasiliensis* individuals was evaluated by measuring the diameter of the disk (equal to twice the distance between the center of the disk and the edge of the disk in the interradius) (Sumida *et al.* 2001). In order to test for the influence of each starfish's size on the number of mollusk items recovered, specimens were grouped in three size classes: < 25 mm, 25.1–30 mm, and > 30.1 mm.

Starfish were opened in the oral area, the stomach content was collected, and the content was examined using a dissecting microscope. The mollusk items collected were counted and each item was identified to the lowest possible taxon. Specialized bibliographies (Abbott 1974, Absalão & Pimenta 2005, Rios 1994) and the malacological collection of the Zoological Department of the Universidade Federal do Rio Grande do Sul (UFRGS) were used to identify the mollusks.

The taxonomic group of mollusks in the stomach content was analyzed relative to the frequency (F%) and relative occurrence (S%) of mollusk species *x*, using the following equations:

F (%) = [total number of mollusks of species *x* / total number of mollusks individuals found across all analyzed stomachs]*100

S (%) = [number of stomachs containing species *x* / total number of stomachs containing any mollusk]*100

Results obtained from stomach analyses were compared between sampling periods and sizes of *A. brasiliensis*.

Table 1. Relative frequency (F%) and relative occurrence (S%) of mollusks species collected and identified from 58 *Astropecten brasilienis* stomachs. Values in brackets are percentages of total mollusk items shown for each sampling period.

	Zimbros			Bombinhas				Total		
Taxa	**May-Jun. 1995**	**Jan. 1997**	**F(%)**	**Sep.-Oct. 1995**	**Oct.-Dec. 1996**	**Jan.-Feb. 2000**	**Jan.-Mar. 2005**	**F(%)**	**F(%)**	**S(%)**
Bivalvia										
Nuculidae										
Nucula semiornata	-	2 (3.2%)	1.59	-	1 (0.8%)	-	-	0.24	0.5	3.9
Arcidae										
Anadara chemnitzi	1 (1.5%)	-	0.80	1 (2.7%)	-	-	1 (0.4%)	0.48	0.5	5.8
Mytilidae										
Crenella divaricata	-	-		-	1 (0.8%)	-	2 (0.8%)	0.72	0.5	3.9
Ostreidae										
Ostrea equestris	-	-		-	1 (0.8%)	-	-	0.24	0.2	1.9
Lucinidae										
Codakia costata	-	2 (3.2%)	1.59	-	2 (1.6%)	-	-	0.48	0.7	7.8
Ctena pectinella (?)	-	-		1 (2.7%)	-	-	-	0.24	0.2	1.9
Ungulinidae										
Diplodonta punctata	-	1 (1.6%)	0.80	-	-	-	-	0.0	0.2	1.9
Cradiidae										
Trachycardium muricatum	-	-		2 (5.4%)	-	-	3 (1.2%)	1.08	0.9	7,8
Semelidae										
Ervilia aff.concentric	-	-		-	-	-	38 (15.7%)	0.24	7	4.5
Ervilia concentrica	-	-		-	1 (0.8%)	-	28 (11.5%)	6.97	5.3	9.8
Veneridae										
Chione cancellata	-	-		-	-	-	1 (0.4%)	0.24	0.2	1,9
Chione paphia	-	2 (3.2%)	1.59	4 (10.8%)	10 (8%)	-	1 (0.4%)	3.60	3.1	17.6
Chione pubera	-	1 (1.6%)	0.80	-	7 (5.6%)	-	6 (2.4%)	3.12	2.5	11,7
Callista maculata	-	1 (1.6%)	0.80	-	-	-	-	0.0	0.2	1.9
Dosinia concentrica	-	5 (8.2%)	4.00	-	-	-	11(4.5%)	2.64	2.9	9.8
Gouldia cerina	-	1 (1.6%)	0.80	-	-	-	1 (0.4%)	0.24	0.3	3.9
Pitar sp.	-	-		-	-	-	3 (1.2%)	0.72	0.5	1.9
Pitar fulminatus	1 (1.5%)	3 (4.9%)	3.17	-	-	5 (41.6%)	4 (1.6%)	2.16	2.4	9.8
Transenella stimpsoni	-	21(34.4%)	16.70	5 (13.5%)	21 (16.8%)	-	37 (15.3%)	15.14	15.5	31.4
Corbulidae										
Corbula sp.	-	4 (6.5%)	3.17	-	12 (9.6%)	-	13 (5.3%)	6.00	5.3	21.5
Corbula caribaea	22 (33.8%)	13 (21.3%)	27.78	5 (13.5%)	18 (14.4%)	2 (16.6%)	61 (25.2%)	16.35	22.3	60.8
Crassatellidae										
Crasinella lunata	-	-		-	1 (0.8%)	-	-	0.24	0.2	1.9
Crassinella marplatesis	-	-		-	-	-	4 (1.6 %)	0.96	0.7	7.8
Pandoridae										
Pandora bushiana	-	-		-	2 (1.6%)	-	1 (0.4%)	0.72	0.5	3.9
Gastropoda										
Calyptraeidae										
Calyptrae centralis	-	1 (1.6%)	0,80	1 (2.7%)	3 (2.4%)	-	2 (0.8%)	1.44	1.3	15.7
Naticidae										
Natica pusilla	25 (38.5%)	3 (4.8%)	19,84	3 (8.1%)	40 (32%)	5 (41.6%)	17 (7%)	15,62	17.1	41.2
Cerithiopsidae										
Seila adamsi	-	-		-	-	-	1 (0.4%)	0.24	0.2	1.9
Epitoniidae										
Opalia hotesseriana (?)	-	-		-	1 (0.8%)	-	-	0.24	0.2	1.9
Columbellidae										
Anachis sp.	-	-		-	1 (0.8%)	-	-	0.24	0.2	1.9
Anachis isabellei	-	-		-	-	-	1 (0.4%)	0.24	0.2	1.9
Anachis obesa	13 (20%)	-	10,32	1 (2.7%)	1 (0.8%)	-	1 (0.4%)	0,72	2.9	5.8
Anachis sparsa	-	1 (1.6%)	0,80	-	-	-	2 (0.8%)	0.48	0.5	5.8
Nassariidae										
Buccinanops coclidium	1 (1.5%)	-	0,80	-	-	-	-	0.0	0.2	1.9
Olividae										
Olivella sp.	-	-		-	1 (0.8%)	-	-	0.24	0.2	1.9
Turridae										
Ithycythara lanceolata	-	-		-	1 (0.8%)	-	-	0.24	0.2	1.9

Table 1. Cont.

Acteonidae									
Acteon pelecais	-	-	1 (2.7%)	-	-	-	0.24	0.2	1.9
Cylichinidae									
Acteocina candei	-	-	-	-	-	1 (0.4%)	0.24	0.2	1.9
Scaphander (?)	-	-	-	-	-	1 (0.4%)	0.24	0.2	1.9
Hamineidae									
Haminoea aff. elegans (?)	-	-	13 (35.1%)	-	-	-	3,12	2.4	1.9
Scaphopoda									
Dentalidae									
Antalis disparile	2 (3.1%)	-	1,59	-	-	-	0.0	0.3	1.9
Dentalium americanum	-	-	-	-	-	1 (0.4%)	0.24	0.2	1.9
Total mollusks items	65	61	37	125	12	242			
N° examined stomachs	9	5	6	7	3	28			
N° stomachs containing mollusks	9	5	6	7	2	22			

A one-way analysis of variance (ANOVA) was used to test the differences in the relative frequency of mollusk species (F%) between sampling periods and specimen size. In cases where the ANOVA was significant, means were compared using the Student-Newman-Keuls test. Significance levels were set at 0.05.

RESULTS

Taxonomic composition of mollusks in the stomach of Astropecten brasiliensis

Among the 58 stomachs of *A. brasiliensis* analyzed 88% contained mollusks and 12% were empty. A total of 542 specimens of mollusks were found and classified into 24 families, 32 genera, and 35 species (Tab. 1).

The stomach content of *A. brasiliensis* was composed mainly of Bivalvia, which represented 72% of the total number of mollusks. The three commonest bivalve species were the following: *Corbula caribaea* d'Orbigny, 1853 (Fig. 2a–b); *Transenella stimpsoni* Dall, 1902 (Fig. 2c–d); and *Ervilia concentrica* (Holmes 1860) (Fig. 2e–f). Of all the mollusks analyzed, 22.3% belonged to *C. caribaea* and this species was present in 60.8% of the stomachs. *T. stimpsoni* and *E. concentrica* accounted for 15.3% and 12.3% of relative frequency and were found in 31.4% and 14.3% of the stomachs, respectively. Moreover, *Corbula barrattiana* C.B. Adams, 1852, was found in 21.5% of the starfish, despite its low relative frequency (5.5%).

The Gastropoda accounted for 27% of the collected mollusks. *Natica pusilla* Say, 1822 (Fig. 3) was the most abundant gastropod species (F = 17.1%), and was present in 41.2% of the stomachs. Scaphopoda was the least abundant group observed in the stomach content, accounting for only 1% of total number of mollusks. *Dentalium americanum* Chenu, 1843, and *Antalis disparile* (d' Orbigny, 1848) had a relative frequency of 0.5% and were found in 3.8% of the stomachs.

Temporal and spatial differences in the mollusk items

The total number of mollusk items per stomach of *A. brasiliensis* was compared among sampling periods and locations (Tab. 1). A total of 126 mollusk specimens were found in the stomach content of *A. brasiliensis* collected at Zimbros, and 20 different mollusk species were identified. During the winter (1995), from a total of 65 specimens, 7 mollusk species (3 bivalves, 3 gastropods, and 1 scaphopod) were identified. In the summer of 1997, 61 mollusk individuals were found, and 15 different species (12 bivalves and 3 gastropods) were identified. Three species were present in the digestive content of *A. brasiliensis* in both seasons (*Natica pusilla*, *Pitar fulminatus,* and *Corbula caribaea*).

The results from both periods revealed that three different species were commonly found in the stomachs of *A. brasiliensis*; *C. caribaea* was the most frequent mollusk item found in collections from Zimbros, and represented 27.78% of the total mollusks identified for that region. Starfish collected during winter had more *C. caribaea* in their stomachs (33.8%) than summer samples (21.3%). *Natica pusilla* was the second most frequently observed mollusk species, and accounted for 19.84% of the total number of mollusks. Frequency analysis revealed that this species was dominant during winter

Table 2. Total number of mollusk species and taxa, and the avarage species number within *Astropecten brasiliensis* size classes.

Size class (mm)	N° mollusk preys	N° mollusk taxa	Mean N° of mollusks preys
< 25 (n = 14)	130	20	9.2
25.1 – 30.0 (n = 27)	328	26	12.1
30.1 < (n = 10)	82	19	8.2

(38.5%) when compared to summer (4.8%). Although it was only found in the stomach content of *A. brasiliensis* that was collected during summer, *Transenella stimpsoni* was the third mollusk item most frequently observed, and represented 16.7% of the total mollusk species identified for the season.

A total of 416 mollusk individuals were found in the stomach content of starfishes collected in Bombinhas, and 35 different species were identified. During the spring (1995), 37 mollusk specimens were observed and 11 different species (6 bivalves and 5 gastropods) were identified; one year later (spring 1996), from a total of 125 specimens analyzed, 19 different mollusk species (12 bivalves and 7 gastropods) were identified. From

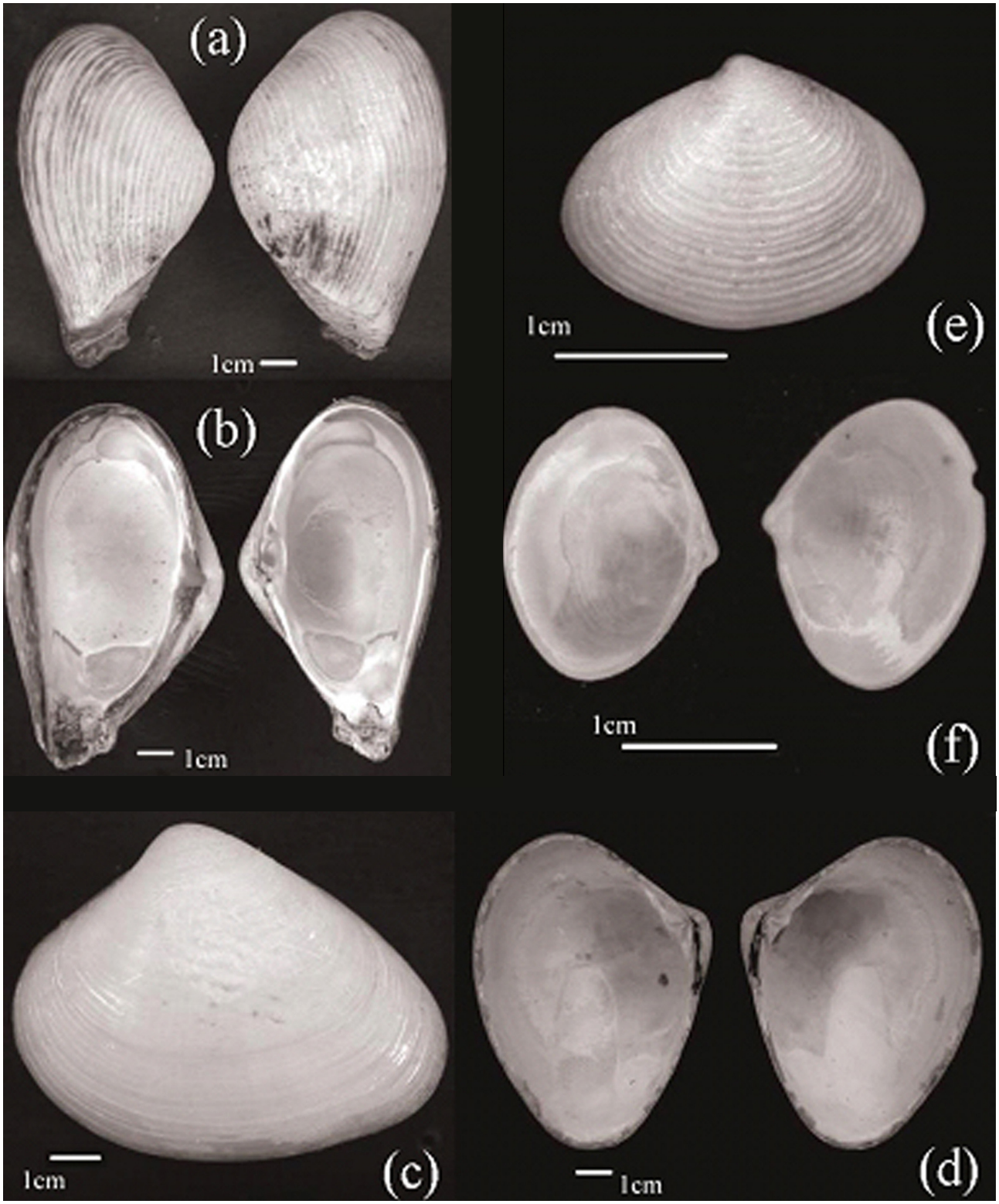

Figure 2. Bivalve species most frequent in the stomach content of *Astropecten brasiliensis*. (a) dorsal and (b) ventral view of *Corbula caribaea*; (c) dorsal and (d) ventral view of *Transenella stimpsoni*; (e) dorsal and (f) ventral view of *Ervilia* sp.

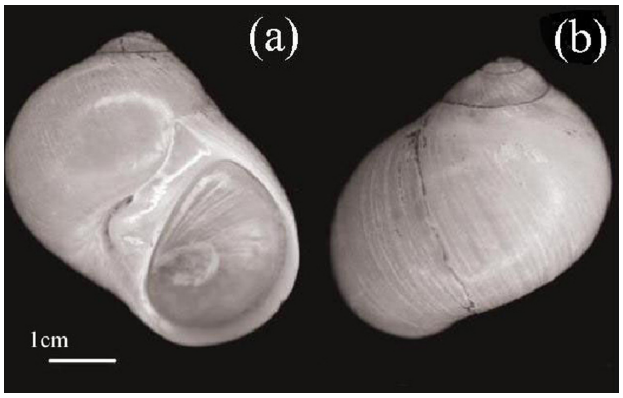

Figure 3. Gastropod species most frequent in the stomach content of *Astropecten brasiliensis*. (a) ventral and (b) dorsal view of *Natica pusilla*.

samples collected during the summer season (2000), a total of 12 mollusk individuals of 3 different species were found in the stomach content of *A. brasiliensis*, while in the summer of 2005, a total of 242 specimens were analyzed and 26 different mollusk species (17 bivalves, 8 gastropods, and 1 scaphopod) were identified. However, only two mollusk species were present in all four sampling periods from the Bombinhas region (*C. caribaea* and *N. pusilla*).

Considering the four sampling periods together (spring 1995 and 1996; and summer 2000 and 2005), three mollusk species were identified as dominant in the content of the stomachs. *Corbula caribaea* was the mollusk item most frequently found, and represented 16.35% of the total specimens identified and was frequenter during summer periods (summer 2005 – 25.2% and 2000 – 16.6%; and spring 1995 – 13.5% and 1996 – 14.4%). *Natica pusilla* was the second most frequently found mollusk item, accounting for 15.62% of the total specimens and occurred in greater amounts during two distinct periods (summer 2000 - 41.6% and spring – 1996 (32%) when compared to the two other sampling periods analyzed (spring – 8.1% and summer – 7.0%). *Transenella stimpsoni* was identified as the third most frequently found mollusk species in the digestive content of starfish during summer (2000 - 15.14% and 2005 – 15.3%) and spring (1995 – 13.5% and 1996 - 16.8%).

When analyzing the results from both sampling locations together (Zimbros and Bombinhas), over a period of ten years, the dominant mollusk species found in the stomach content of *A. brasiliensis* were always the same, and in the same order of dominance (*Corbula caribaea, Natica pusilla*, and *Transenella stimpsoni*).

Effect of Astropecten brasiliensis' size on the relative frequency of mollusks

In order to analyze the relationship between starfish sizes and the relative frequency of mollusk species, data about the stomach content of *A. brasiliensis* containing mollusk items was compared to the classes of disk diameter (< 25 mm, 25.1–30 mm, > 30.1 mm).

Corbula caribaea, Natica pusilla, and *Transenella stimpsoni* were the most frequent mollusks (Fig. 4) when compared to other mollusk species, representing more than 50% of identified mollusks for any size class. *Natica pusilla* showed a high relative frequency in the smaller starfish (34.4%) when compared to the two other bivalve species together (20.8%); however, no statistical difference was observed ($p = 0.47$) when the frequency of *N. pusilla* was compared to other mollusks species. *Corbula caribaea* and *T. stimpsoni* were the main mollusks found in the 25.1–30 mm and > 30.1 mm size classes, comprising approximately 50% of the relative frequency for the larger size class (> 30.1 mm). However, no statistical difference was observed when the relative frequency was compared among the three size classes.

The relationship between the number of mollusk items per stomach and body size (Table 2) was not statistically different among the size classes ($p = 0.67$). The larger *A. brasiliensis* individuals did not contain more mollusk items in their stomachs when compared to the smaller starfish. The number of mollusk taxa was also similar among the three size classes.

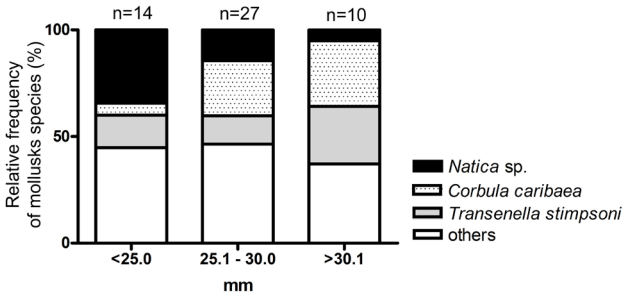

Figure 4. Relative frequency (F%) of mollusks species in the stomach contnent of *Astropecten brasiliensis* according to disk diameter classes.

DISCUSSION

This study showed that individuals of *A. brasiliensis* collected at Zimbros and Bombinhas (Porto Belo, Santa Catarina, Brazil) feed upon a variety of mollusks, and 35 species were identified in the content of their stomachs. However, three species were the most abundant: the bivalves *Corbula caribaea* and *Transenella stimpsoni*, and the gastropod *Natica pusilla*. A study by Ventura *et al.* (2000) about the feeding niche of three different starfish in Cabo Frio, Rio de Janeiro, Brazil, found similar results for *A. brasiliensis,* and observed that this species of starfish ingested significant amounts of *C. caribaea* and *N. pusilla*. Rios (1970) observed a high frequency of *Natica canrena* and *Corbula patagonica* in the stomachs of *Astropecten cingulatus* and *A. brasiliensis* collected in Tramandaí and Rio Grande (Rio Grande do Sul, Brazil). This demonstrates that these mollusk taxa may represent an important food resource for South American

Astropecten starfish.

The average number of preys was higher during the warm periods, and the samples from October–December (spring-summer period), in 1996, were statistically different from the May–June 1995 and September–October 1995 (winter-spring period) samples. Temporal changes in prey availability can have a strong influence on the diet of starfish. Gaymer *et al.* (2001) observed that *Leptasterias polaris* and *Asterias vulgaris* select alternative species of prey when preferred preys become scarce or absent. In our study, mollusks, such as *Ervilia concentrica*, *Anachis obesa,* and *Haminoe elegans*, which were considerably common during different periods and had low relative occurrence, could possibly represent alternative food resources for some *A. brasiliensis* individuals. Besides the seasonal dynamics of the benthic community, the feeding rate of starfish is also affected by water temperature. Recent laboratory studies have shown that small changes in water temperature had large effects on the feeding rate of the intertidal predator *Pisaster ochraceus*, which decreased during cold periods (Sanford 2002). Ganmanee *et al.* (2003) observed that the feeding rate of *Astropecten scoparius* in its natural habitat was influenced by temperature and noted that the number of prey consumed increased during the summer.

Similarly to Ventura *et al.* (2000), our results indicate that the populations of *C. caribaea* and *N. pusilla* are food resources throughout the year. The bivalve *T. stimpsoni*, frequently found in the stomach content of starfish may also be an important food for *A. brasiliensis* found in the region of this study. Almeida *et al.* (2006) emphasize that the *T. stimpsoni* population represents a valuable element in the benthic community of southern Brazil.

It is generally suggested that the ability of starfishe to feed on macrobenthic prey is closely related to disk diameter, and previous studies on prey selection have reported that some starfish species show a significant preference for a particular size of prey (Beddingfield & Mcclintock 1993; Gaymer *et al.* 2004; Gaymer *et al.* 2001; McClintock & Lawrence 1985). However, according to Ventura *et al.* (1994) there is no evident relationship between the body size of three paxillosid starfishe (*Astropecten brasiliensis*, *Astropecten cingulatus*, and *Luidia ludwigi scotti*) and the size of their prey. Moreover, Monteiro & Pardo (1994) observed no relationship between starfish size and the amount of ingested prey when analyzing the stomach content of *Astropecten marginatus* and *Luidia senegalensis*. Similarly, in the present study no significant differences of mollusks size were observed among the starfish size classes. Besides, the larger specimens did not contain significantly more mollusk items in their stomachs compared to the other size classes. Although our data revealed no statistical differences among the size classes in the number of mollusks present in the stomachs, the small *A. brasiliensis* showed high amounts of *N. pusilla* juveniles (i.e., length < 5 mm) in contrast to larger starfish. By contrast, the frequency of *Corbula caribaea* was evidently higher in the larger *A. brasiliensis* size classes, and the majority of these mollusks were small adults (larger individuals reached 12.5 × 8 mm). The frequency of *T. stimpsoni* was also high in the larger starfish (> 30.1 mm), and the majority of the individuals from this species were also small adults (largest specimens were 10 × 8 mm). When taking the size of the mollusks into consideration, we suggest that the diet of *A. brasiliensis* was probably based on small mollusks, which were small adults and juveniles. Moreover, the three major species identified (*C. caribaea, T. stimpsoni*, and *N. pusilla*) could be considered potential preys for *A. brasiliensis*, since the adult individuals of these bivalves and gastropod are smaller than the smallest established starfish size class, which was based on the oral disk diameter (< 25 mm); Rios (1994) states that the disk diameter of an adult specimen of *C. caribaea* is 9.0 × 6.0 mm, *T. stimpsoni* is 15.0 × 12.0 mm, and *N. pusilla* is 8 mm.

In summary, this paper identifies and provides information about the taxonomic mollusk groups that can potentially be considered food resources for *A. brasiliensis*. Our observations suggest that *A. brasiliensis* relies on a variety of mollusk species as food, but three species (*Corbula caribaea*, *Transenella stimpsoni,* and *Natica pusilla*) represent the most important part of the *A. brasiliensis* diet for every sampling period, location, and starfish size class.

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