

Inventory of the marine soft bottom macrofauna of São Sebastião Channel, southeastern Brazilian continental shelf

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ABSTRACT: Analysis of macrofauna from 91 quantitative soft-bottom samples (from five surveys) obtained in the São Sebastião Channel at depths ranging from 2 to 45 m yielded 431 species from a total of 38,630 individuals. The present contribution gives a list of the species found in the area and their depth distribution and sedimentary preferences (granulometric characteristics of the sites where they occurred). This is the first complete inventory of the subtidal invertebrate soft-bottom fauna of the São Sebastião Channel, a peculiar marine area under crescent human impact.

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INTRODUCTION

Ecological studies are deeply entangled with the biodiversity knowledge of a given region or system. The São Sebastião Channel (SSC) is a conspicuous area located in the southeastern Brazilian shelf, submitted to a complex oceanographic regime (Castro and Miranda, 1998) and multiple human impacts (Zanardi *et al.* 1999; Arasaki *et al.* 2004; da Silva and Bicego, 2010). The channel harbors the main maritime oil terminal in Brazil (Dutos e Terminais Centro Sul — DTCS), the commercial São Sebastião Port, with intense fishery activity, and the São Sebastião city that contributes with large amount of sewage to the area.

In order to describe the species composition of the unconsolidated bottom in the SSC, the present study reports macrofauna species found along the channel during five surveys performed as part of two interdisciplinary projects. The “Oceanography of São Sebastião Channel” (OPISS Project, Pires-Vanin 2008) and the “Assessment of benthic fauna and organic contamination in critical areas of São Sebastião Channel” (CONCASS Project), both supported by Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP). The depth range of each species and the dominant sediment type of the sampling stations where they occurred were reported as means of distinguish and define their ecological preferences. This is the first comprehensive inventory of the subtidal species of soft-bottom macrofauna at São Sebastião Channel. In order to create an initial scenario for future work in ecology, monitoring and management it is important to know actual diversity of the area.

MATERIAL AND METHODS

The São Sebastião Channel is located on the northern coast of São Paulo State (23°41′–23°53.5′ S, 45°19′–45°30′ W), Brazil (Figure 1). It lays parallel to the coast, separate the continent from the São Sebastião Island and functions

as barrier for the adjacent open sea. The channel itself is about 25 km long with two relatively large openings (6–7 km wide) and a narrow central part of nearly 2 km in width. It presents fan-like features in the south and a well sorted sand barrier in the north. Also, its northern region has a counter-clockwise vortex, which transports fine grains to the south, causing deposition of fine-sediment at the continental margin, an area of low hydrodynamics. In the central deepest parts of the channel no deposition of sediments occurs, probably due to the increase in current speed caused by narrowing (Furtado 1995; Furtado *et al.* 2008).

Although marine currents in Southern Brazilian shelf are variable in space and time, they mainly move towards the NE in the SSC (Castro Filho 1990), except in summer (Fontes 1995), when a two-layer opposite water flow establishes, the superficial flow directed to the SW and the deep flow towards the NE. The bottom current is not influenced by wind but may be associated with the South Atlantic Central Water (SACW) intrusion and is characterized by low temperature (<18°C) and high salinity (>36). For the rest of the year the prevailing water mass is the Coastal Water (CW) with temperature higher than 20°C and salinity lower than 34.5 (Castro Filho *et al.* 1987). For detailed physical and biological characterization of the SSC and of the main processes responsible by the maintenance of the populations see Pires-Vanin (2008).

The São Sebastião Channel is also affected by multiple human activities. It harbours one of the largest oil terminals in Brazil (Dutos e Terminais Centro Sul, DTCS), a commercial port and it is also an important tourist place. Given the frequent oil spills, dredge activities and sewage discharge from both the “Araçá” pipe and the neighbor cities, SSC is subjected to great environmental stress (da Silva and Bicego, 2010).

The present data are the result of five surveys carried out in the framework of the two interdisciplinary projects mentioned before. For OPISS four seasonal surveys at 15 oceanographic stations were performed (two replicates, 120 samples). They were distributed in five radials perpendicular to the axis of the channel (Figure 1a), and were carried out in November 1993, February, April and August 1994 on board of the boats “Veliger II” and “Albacora” from the Oceanographic Institute of the University of São Paulo. For the CONCASS project one survey was carried out in June 2002 at 31 stations according to figure 1b (three replicates, 93 samples). Stations were positioned with GPS (Global Positioning System) and depths were measured by sounding with “Fish – Finder”. Sampling was carried out using a van Veen grab of 0.1 m². The sediment was washed on board through 0.5 mm mesh sieves and the material retained was preserved in 70% ethanol. In the laboratory, sediments were elutriated (Santos *et al.* 1996) before sorting and identification under stereoscopic microscope.

Species were identified by the authors (PM and SB, Polychaeta; AMSPV, Crustacea) and by some other specialists (E Schelenz, University of São Paulo - USP, Anthozoa; SA Vanin, USP, Mollusca; AMG Monteiro, UNESP, Botucatu, Echinodermata; EF Nonato, USP, Polychaeta). WoRMS (WoRMS Editorial Board 2014) and Malacolog database (Rosenberg 2009) was used for checking up the taxonomic status of the polychaete and mollusk species, respectively. The material is deposited at the “Biological Collection Prof. Edmundo F. Nonato” (ColBio) of the Instituto Oceanográfico USP.

RESULTS

Table 1 and 2 present geographical coordinates, depth and sediment type of the sampling stations. Depth varied between 2 and 45 m with the deeper places situated in the middle of the channel axis. Sand sediment composed by many classes of grain sizes was patchy distributed along the bottom, except in the channel's central part where muddy sites occur.

A total of 431 species of invertebrates were found, being Polychaeta the dominant group with 181 species belonging to 42 families. Among these, 6 families were distinguished for their higher species richness: Spionidae (12 species); Orbiniidae (11 species); Onuphidae and Eunicidae (10 species each); Syllidae and Paraonidae (9 species each) (Table 3).

Mollusca presented 119 species, from which 75 were bivalves found in mixed sand substrates, especially in very fine grains. Another diversified group was Crustacea, represented by 57 species of Peracarida and 42 species of Decapoda. Amphipoda characterizes half of the Peracarida species, whereas Brachyura did the same for the Decapoda. The last diverse group was Ophiuroidea, encompassing 18 species from a total of 24 found for echinoderms. All the species reported here are from southern Brazilian inner shelf, area under temperatures between 18 and 25°C most of the year (Soares-Gomes and Pires-Vanin 2005; Pires-Vanin 2008).

For detailed studies about structure of benthic communities in the SSC see Muniz and Pires (1999; 2000), Pires-Vanin (2008); for functional ecology data see Arasaki *et al.* (2004) and Pires-Vanin *et al.* (2013) and for ecosystem functioning Venturini *et al.* (2011; 2012).

DISCUSSION

Our present results showed that despite the relative small study area, the channel presented high number of species, similar to that found in the adjacent São Sebastião shelf (Pires-Vanin 2008). However, comparison of diversity results with others reported in the current literature may be done with caution since the sampling methods, units and scales are often different, and moreover the diversity of habitats in tropical and subtropical ecosystems are high (Chardy and Clavier 1988; Alongi 1990). From the high number of species reported (431) nearly 25% cannot be identified, or because they were juveniles, as in the case of mollusks, or were new species, as in the case of crustaceans Isopoda and Cumacea. However, that number

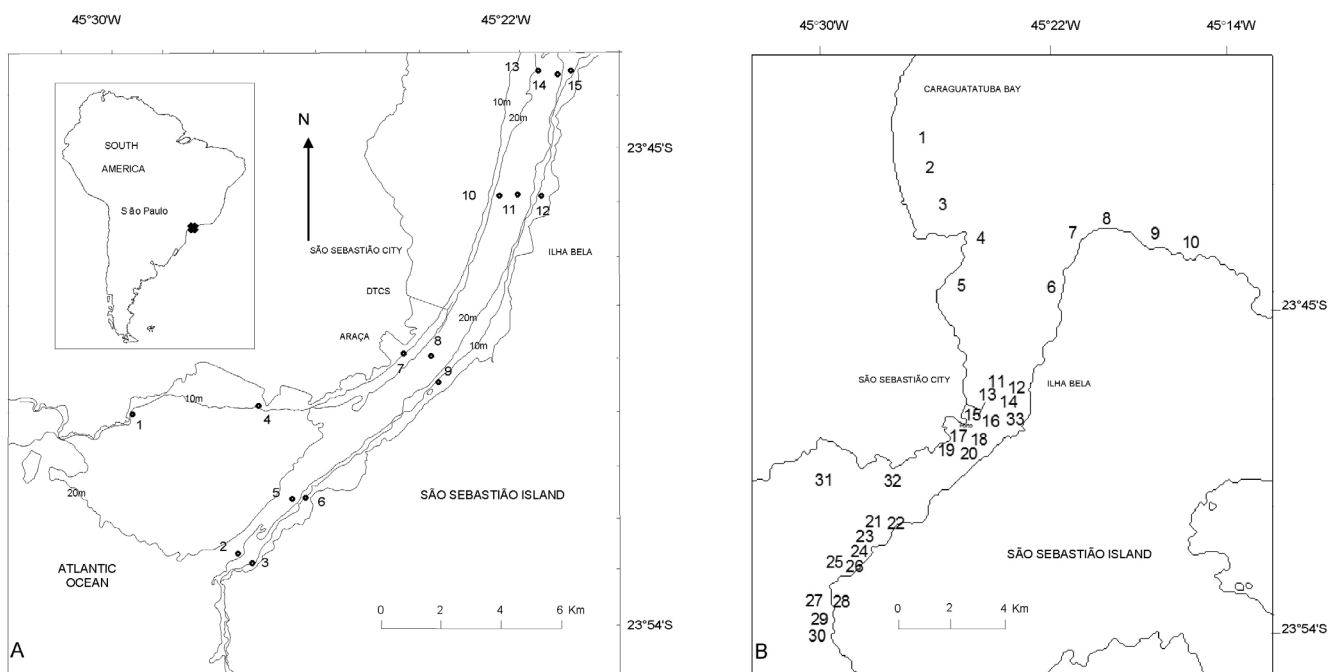


FIGURE 1. São Sebastião Channel, Southeastern Brazilian shelf, showing the sampling stations.

TABLE 1. Environmental variables studied at the 15 stations in the four surveys carried out in São Sebastião Channel (OPISS Project). CS = coarse sand; MS = medium sand; FS = fine sand; VFS = very fine sand; SC = coarse silt; SM = medium silt; SF = fine silt.

STATIONS	LATITUDE (S)	LONGITUDE (W)	DEPTH (m)	SEDIMENT TYPE
Spring (November/93)				
1	23°50'24"	45°29'42"	15	FS
2	23°52'42"	45°27'30"	26	SF
3	23°53'00"	45°27'06"	10	CS
4	23°50'00"	45°27'00"	10	VFS
5	23°51'48"	45°23'24"	23	VFS
6	23°51'48"	45°26'00"	10	SC
7	23°49'00"	45°24'00"	10	SM
8	23°49'06"	45°23'42"	45	SC
9	23°49'24"	45°23'24"	10	MS
10	23°46'06"	45°22'18"	10	SM
11	23°46'06"	45°21'54"	28	CS
12	23°46'06"	45°21'24"	9	VFS
13	23°44'18"	45°20'54"	11	SM
14	23°43'48"	45°21'12"	26	MS
15	23°43'24"	45°20'42"	8	FS
Summer (February/94)				
1	23°50'24"	45°29'42"	15	VFS
2	23°52'42"	45°27'30"	26	SM
3	23°53'00"	45°27'06"	10	MS
4	23°50'00"	45°27'00"	10	VFS
5	23°51'48"	45°23'24"	23	VFS
6	23°51'48"	45°26'00"	10	VFS
7	23°49'00"	45°24'00"	10	SM
8	23°49'06"	45°23'42"	45	SM
9	23°49'24"	45°23'24"	10	MS
10	23°46'06"	45°22'18"	10	SM
11	23°46'06"	45°21'54"	28	MS
12	23°46'06"	45°21'24"	9	VFS
13	23°44'18"	45°20'54"	11	MS
14	23°43'48"	45°21'12"	26	CS
15	23°43'24"	45°20'42"	8	SM
Autumn (May/94)				
1	23°50'24"	45°29'42"	15	VFS
2	23°52'42"	45°27'35"	26	SM
3	23°53'00"	45°27'06"	10	MS
4	23°50'00"	45°27'00"	10	VFS
5	23°51'48"	45°23'24"	23	SC
6	23°51'48"	45°26'00"	10	VFS
7	23°49'00"	45°24'00"	10	SM
8	23°49'06"	45°23'42"	45	VFS
9	23°49'36"	45°23'24"	10	MS
10	23°46'06"	45°22'18"	10	SM
11	23°46'06"	45°21'54"	28	CS
12	23°46'06"	45°21'24"	9	SC
13	23°44'18"	45°20'54"	11	VFS
14	23°43'48"	45°21'12"	26	CS
15	23°43'24"	45°20'42"	8	MS
Winter (August/94)				
1	23°50'24"	45°29'42"	15	VFS
2	23°52'42"	45°27'30"	26	SM
3	23°53'00"	45°27'06"	10	VFS
4	23°50'00"	45°27'06"	10	VFS
5	23°51'48"	45°23'24"	23	VFS
6	23°51'48"	45°26'06"	10	VFS
7	23°49'00"	45°24'00"	10	SF
8	23°49'06"	45°23'42"	45	SC
9	23°49'36"	45°23'24"	10	MS
10	23°46'06"	45°22'18"	10	SM
11	23°46'06"	45°21'54"	28	CS
12	23°46'06"	45°21'24"	9	FS
13	23°44'18"	45°20'54"	11	FS
14	23°43'48"	45°21'12"	26	MS
15	23°43'24"	45°20'42"	8	MS

reflects a good knowledge of the macrofauna in São Sebastião Channel when contrasted to deeper areas of the adjacent shelf, as Ubatuba. In the outer parts of this last region, at the shelf break, near 50% of the macrobenthic species remains undetermined and at 500 m deep, in the slope, 70% of the Isopoda were new (Pires-Vanin, 2001).

The São Sebastião Channel is a depositional environment and has the narrow central area characterized by bottoms of silt and clay. The other sites are sandy places, with well-sorted grains at the South and coarser sands at the North. Sediment pattern deeply influences species diversity of macrofauna in the area, as showed by Pires-Vanin *et al.* (2013). In the São Sebastião shelf, at the outer side of the channel, the authors found fewer species in the finest-sediment site-group than in the coarser site-groups.

Species richness varied spatially and seasonally (42 to 72 species). The highest values was reported for the northern part of the channel (stations 13, 14, 15 of OPISS project, see Figure 1), whereas significant higher mean

value were obtained in the winter (41 species) and the lowest in fall (26 species). These findings show the role of sediment type and hydrodynamics in structuring the benthic environment (Loureau 2000). Sandy sediments predominate in areas with high number of species, a frequent result found in other benthic investigations around the world (Gray *et al.* 2002; Gray and Elliot 2009). In the Southwest Atlantic shelf the oceanographic regime controlling macrobenthic distribution is composed by three water masses, Coastal Water, Tropical Water and South Atlantic Central Water, which fill the shelf and cause striking seasonal change on the environment (Castro and Miranda 1998). As a consequence the destabilization of the benthic fauna structure occurs (Absalão *et al.* 2006; Venturini *et al.* 2011). So, the season-controlled distribution of the benthic species was expected, despite the existence of the major constraint represented by sediment characteristics (Muniz and Pires 2000).

TABLE 2. Environmental variables studied at the 31 stations carried out in São Sebastião Channel (CONCASS Project). VCS = very coarse sand; CS = coarse sand; MS = medium sand; FS = fine sand; VFS = very fine sand; SC = coarse silt; SM = medium silt; SF = fine silt.

STATIONS	LATITUDE (S)	LONGITUDE (W)	DEPTH (m)	SEDIMENT TYPE
1	23°40'48"	45°25'19"	2,0	SM
2	23°41'37"	45°25'03"	2,5	CS
3	23°42'36"	45°24'42"	3,0	SC
4	23°43'34"	45°23'40"	7,0	SF
5	23°44'52"	45°24'12"	4,0	SM
6	23°44'52"	45°21'14"	17,3	SM
7	23°43'21"	45°20'40"	13,0	CS
8	23°43'03"	45°19'41"	13,0	SM
9	23°43'31"	45°18'29"	12,5	VFS
10	23°43'43"	45°17'34"	11,0	MS
11	23°47'27"	45°22'51"	9,0	SF
12	23°47'30"	45°22'45"	20,0	SM
13	23°47'51"	45°23'03"	12,0	SF
14	23°47'54"	45°22'55"	24,5	SM
15	23°48'34"	45°23'35"	10,0	SM
16	23°48'36"	45°23'23"	23,0	SM
17	23°48'54"	45°23'54"	9,8	SM
18	23°49'02"	45°23'48"	22,5	SF
19	23°49'11"	45°24'12"	11,0	SM
20	23°49'15"	45°24'06"	20,0	SC
21	23°51'32"	45°26'26"	25,0	SF
22	23°51'38"	45°26'03"	20,0	FS
23	23°51'54"	45°26'39"	26,0	SC
24	23°52'07"	45°26'42"	18,0	CS
25	23°52'42"	45°27'31"	24,0	SF
26	23°52'48"	45°27'16"	12,0	MS
27	23°53'35"	45°28'02"	26,0	VFS
28	23°53'40"	45°27'49"	24,0	CS
29	23°54'03"	45°27'53"	26,0	VCS
30	23°54'24"	45°27'58"	29,0	SM
31	23°50'25"	45°28'04"	12,0	VFS

TABLE 3. Macrobenthic species of invertebrates found in the São Sebastião Channel, northern São Paulo State continental shelf. VCS, Very Coarse Sand; CS, Coarse Sand; MS, Medium Sand; FS, Fine Sand; VFS, Very Fine Sand; SC, Coarse Silt; SM, Medium Silt; SF, Fine Silt.

SPECIES	DEPTH RANGE (m)	SEDIMENT TYPE
ANTHOZOA		
<i>Edwardsia</i> sp.	8–41	CS to SC
SIPUNCULA		
<i>Aspidosiphon (Akrikos) albus</i> Murina, 1967b	8–24	MS to SC
<i>Aspidosiphon (Aspidosiphon) gosnoldi</i> Cutler, 1981	9–10	MS
<i>Nephasoma (Nephasoma) confusum</i> (Sluiter, 1902)	23–40	CS, SC
<i>Phascolion (Isomya) hedraeum</i> Selenka & De Man, 1883	10–41	MS, VFS, SC
<i>Sipunculus (Sipunculus) nudus</i> Linnaeus, 1766	10	VFS
<i>Thysanocardia catharinae</i> (Grube, 1868)	8–41	CS to SM
ANNELIDA POLYCHAETA		
<i>Grubeulepis fimbriata</i> (Treadwell, 1901)	2	SM
<i>Harmothoe aculeata</i> Andrews, 1891	13–26	CS, FS, SC
<i>Eunoe papillosa</i> Amaral & Nonato, 1985	8–41	MS to SM
<i>Eunoe serrata</i> Amaral & Nonato, 1985	8–41	MS to SC
<i>Malmgreniella lunulata</i> (Delle Chiaje, 1830)	8–40	CS to SC
<i>Pholoe minuta</i> (Fabricius, 1780)	9–29	VCS to SF
<i>Pholoe</i> sp.	8–41	MS to SM
<i>Sthenolepis grubei</i> (Treadwell, 1901)	4–26	CS to SF
<i>Sthenelais articulata</i> Kinberg, 1856	20	FS
<i>Sthenelais limicola</i> (Ehlers, 1864)	9–40	FS, VFS, SC
<i>Sthenelanella uniformis</i> Moore, 1910	10–14	MS, FS, VFS
<i>Fimbriosthenelais</i> sp.	13–26	VFS to SM
<i>Sigalion</i> sp.	10	CS
<i>Bhawania</i> sp.	9	MS
<i>Chrysopetalum occidentale</i> Johnson, 1897	26	VCS
<i>Paleanotus heteroseta</i> Hartman, 1945	18	CS
<i>Daylithos parmatius</i> (Grube, 1877)	18	CS
<i>Piromis</i> sp.	2–12,5	CS, VFS, SM
<i>Sternaspis</i> sp.	3–20	SC to SF
<i>Euphrosine</i> sp.	12,5–26	VCS, CS, VFS
<i>Linopherus ambigua</i> (Monro, 1933)	8–41	CS to SM
<i>Anaitides</i> sp.	10–15	FS
<i>Phyllodoce mucosa</i> Örsted, 1843	10–41	MS to SC
<i>Eulalia</i> sp.	12,5–26	VCS, CS, VFS
<i>Gyptis</i> sp.	9–28	CS, MS, VFS
<i>Podarkeopsis capensis</i> (Day, 1963)	9–26	VFS to SF
<i>Oxydromus</i> sp.	18–26	CS, VFS, SC, SF
<i>Periboea</i> sp.	8	VFS
<i>Hermundura fauveli</i> (Berkeley & Berkeley, 1941)	8–41	CS to SF
<i>Ancistrosyllis jonesi</i> Pettibone, 1966	8–41	MS, SC, SM
<i>Cabira incerta</i> Webster, 1879	9–41	CS to SF
<i>Sigambra grubii</i> Müller in Grube, 1858	8–41	CS to SF
<i>Exogone arenosa</i> Perkins, 1981	8–41	CS to SM
<i>Odontosyllis</i> sp.	8–41	CS to SC
<i>Pionosyllis uraga</i> Imajima, 1966	11–17,3	MS, VFS, SM
<i>Syllis prolifera</i> Krohn, 1852	13–26	VCS, CS
<i>Syllis gracilis</i> Grube, 1840	18	CS
<i>Syllis hyalina</i> Grube, 1863	8–41	CS to SC
<i>Syllis</i> sp.	8–41	CS to SC
<i>Trypanosyllis</i> sp.	11–26	VCS, MS
<i>Syllides</i> sp.	12	MS
<i>Alitta cf. succinea</i> (Leuckart, 1847)	8–41	MS to SF
<i>Neanthes bruaca</i> Lana & Sovierzovsky, 1987	8–40	CS to SF
<i>Nereis broa</i> Lana & Sovierzovsky, 1987	10–28	MS
<i>Nereis</i> sp.	10–40	CS to SC
<i>Ceratocephale oculata</i> Banse, 1977	12,5–29	VCS to SM
<i>Nephtys squamosa</i> Ehlers, 1887	10–40	CS, MS, VFS, SF
<i>Glycera americana</i> Leidy, 1855	10–23	VFS to SM
<i>Glycera oxycephala</i> Ehlers, 1887	10	VFS

TABLE 3. Continued.

SPECIES	DEPTH RANGE (m)	SEDIMENT TYPE
<i>Glycera dibranchiata</i> Ehlers, 1868	2,5	CS
<i>Hemipodia californiensis</i> (Hartman, 1938)	10–24	VFS
<i>Hemipodus</i> sp.	10–26	CS, MS, SM
<i>Goniada brunnea</i> Treadwell, 1906	23	VFS
<i>Goniada maculata</i> Örsted, 1843	8–24	MS, FS, VFS, SM
<i>Goniada littorea</i> Hartman, 1950	10–28	CS to VFS
<i>Goniada</i> cf. <i>emerita</i> Audouin & Milne-Edwards, 1833	9	VFS
<i>Goniada</i> sp.	10–24	CS, VFS
<i>Goniadides carolinae</i> Day, 1973	8–28	CS to VFS; SM
<i>Glycinde multident</i> Müller in Grube, 1858	8–26	MS, FS, VFS
<i>Mooreonuphis lineata</i> Lana, 1991	8–10	MS, FS, VFS
<i>Mooreonuphis intermedia</i> (Kinberg, 1865)	10	MS, VFS
<i>Diopatra cuprea</i> (Bosc, 1802)	10–40	MS, VFS, SC
<i>Diopatra tridentata</i> Hartman, 1944	8–41	CS to SC
<i>Diopatra neapolitana</i> Delle Chiaje, 1841	2,5–3	CS, SC
<i>Ramphobranchium</i> sp.	10–41	CS, MS, SC
<i>Kinbergonuphis orensanzii</i> (Fauchald, 1982)	10–40	CS, VFS, SC
<i>Kinbergonuphis</i> cf. <i>fauchaldi</i> Lana, 1991	10–15	MS, FS
<i>Kinbergonuphis difficilis</i> (Fauchald, 1982)	2,5–29	CS to VFS, SM, SF
<i>Onuphis eremita oculata</i> Hartman, 1951	10–15	CS, VFS
<i>Nicidion cincta</i> Kinberg, 1865	20–26	FS, SC
<i>Leodice rubra</i> (Grube, 1856)	8–41	CS to SM
<i>Eunice vittata</i> (Delle Chiaje, 1828)	8–26	MS to SM
<i>Nicidion cariboea</i> (Grube, 1856)	10–40	VFS, SC
<i>Lysidice schmardae</i> (McIntosh, 1885)	8–28	CS to SF
<i>Lysidice ninetta</i> Audouin & Milne-Edwards, 1833	8–28	CS, MS, FS
<i>Lysidice hebes</i> (Verrill, 1900)	11–24	CS to VFS
<i>Marphysa sanguinea</i> (Montagu, 1815)	9–26	MS, VFS, SM
<i>Marphysa sebastiana</i> Steiner & Amaral, 2000	20	SC
<i>Marphysa</i> sp.	24–26	MS, VFS
<i>Lumbrineris tetraura</i> (Schmarda, 1861)	8–40	CS to SF
<i>Lumbrineris janeirensis</i> Augener, 1934	10–40	CS to SF
<i>Lumbrineris januarii</i> Grube, 1878	10–25	MS, FS, VFS
<i>Lumbrineris latreilli</i> Audouin & Milne Edwards, 1834	11	SM
<i>Lumbrineris</i> sp.	10–40	MS, VFS, SC, SM
<i>Lumbrineris mucronata</i> Ehlers, 1908	10	CS
<i>Ninoe brasiliensis</i> Kinberg, 1865	8–40	MS, FS, VFS, SM
<i>Arabella iricolor</i> (Montagu, 1804)	12,5	VFS
<i>Drilonereis filum</i> (Claparède, 1868)	12–26	VCS, CS, VFS, SC
<i>Notocirrus</i> sp.	13–26	VCS, CS
<i>Lysarete brasiliensis</i> Kinberg, 1865	8–15	FS, SM
<i>Protodorvillea</i> sp.	11–29	VCS to MS, VFS to CS
<i>Pisione complexa</i> (Alikuhni, 1942)	24	CS
<i>Polygordius appendiculatus</i> Fraipont, 1887	12,5–26	VCS to VFS
<i>Scoloplos (Scoloplos) capensis</i> (Day, 1961)	11–13	MS, SM
<i>Scoloplos treadwelli</i> Eisig, 1914	8–40	CS to SF
<i>Scoloplos rubra</i> (Webster, 1879)	10–28	MS, VFS
<i>Scoloplos robustus</i> (Verrill, 1873)	14	VFS
<i>Scoloplos</i> sp.	9–10	MS
<i>Leodamas verax</i> Kinberg, 1866	10–12	MS, FS, VFS
<i>Leitoscoloplos kerguelensis</i> (McIntosh, 1885)	11–24	VFS, SM
<i>Orbinia</i> cf. <i>latreilli</i> (Audouin & Milne Edwards, 1833)	10–26	MS, VFS, SF
<i>Orbinia</i> sp.	10	MS, SM
<i>Phylo felix</i> Kinberg, 1866	10–26	VFS, SM, SF
<i>Naineris setosa</i> (Verrill, 1900)	8–26	FS, SC, SM
<i>Levinsenia gracilis</i> (Tauber, 1879)	8–41	CS to SM
<i>Aricidea (Aricidea) curviseta</i> Day, 1963	2–3	CS, SC, SM
<i>Aricidea (Aricidea) cf. fragilis</i> Webster, 1879	8–28	CS to SM
<i>Aricidea (Acmira) cf. simplex</i> Day, 1963	10–41	CS to SC

TABLE 3. Continued.

SPECIES	DEPTH RANGE (m)	SEDIMENT TYPE
<i>Aricidea (Acmira) sp.</i>	10	CS
<i>Aricidea (Aricidea) cf. albatrossae</i> Pettibone, 1957	9–41	CS to SM
<i>Aricidea (Aricidea) taylori</i> Pettibone, 1965	8–41	CS to SF
<i>Cirrophorus americanus</i> Strelzov, 1973	8–41	SF
<i>Cirrophorus branchiatus</i> Ehlers, 1908	8–40	MS to SM
<i>Malacoceros indicus</i> (Fauvel, 1928)	26	VFS
<i>Dispio remanei</i> Friedrich, 1956	10–11	CS, MS, SM
<i>Laonice branchiata</i> Nonato, Bolivar & Lana, 1986	8–41	CS to SF
<i>Laonice cirrata</i> (M. Sars, 1851)	10–41	MS to SF
<i>Paraprionospio pinnata</i> (Ehlers, 1901)	8–41	MS to SF
<i>Prionospio dayi</i> Foster, 1969	26	MS
<i>Prionospio steenstrupi</i> Malmgren, 1867	10–11	MS, FS, SM
<i>Dipolydora socialis</i> (Schmarda, 1861)	10	CS
<i>Spiophanes bombyx</i> (Claparède, 1870)	10	VFS
<i>Spiophanes duplex</i> (Chamberlin, 1919)	9–41	CS to SM
<i>Scoelepis (Scoelepis) squamata</i> (O.F. Müller, 1806)	10–28	CS to VFS
<i>Microspio pigmentata</i> (Reish, 1959)	8–41	MS to SM
<i>Magelona crenulata</i> Bolivar & Lana, 1986	9–25	CS to SC
<i>Magelona nonatoi</i> Bolivar & Lana, 1986	8–26	MS, FS, VFS
<i>Magelona papillicornis</i> F. Müller, 1858	8–28	CS to SF
<i>Magelona posterolongata</i> Bolivar & Lana, 1986	8–41	CS to SF
<i>Magelona riojai</i> Jones, 1963	10–15	VFS
<i>Magelona variolamellata</i> Bolivar & Lana, 1986	9–41	CS to SM
<i>Poecilochaetus australis</i> Nonato, 1963	8–25	MS to SM
<i>Chaetopterus variopedatus</i> (Renier, 1804)	10–41	MS to SM
<i>Mesochaetopterus capensis</i> (McIntosh, 1885)	26	VFS, SC
<i>Spiochaetopterus costarum</i> (Claparède, 1869)	8–41	CS to SM
<i>Spiochaetopterus nonatoi</i> Bhaud & Petti, 2001	3–26	VCS, CS, SC to SF
<i>Tharyx sp.</i>	8–41	CS to SM
<i>Timarete sp.</i>	24	CS
<i>Armandia agilis</i> (Andrews, 1891)	3	SC
<i>Armandia ilhabelae</i> Hartmann-Schröder, 1956	3–29	VCS to SF
<i>Armandia maculata</i> (Webster, 1884)	3–29	CS, MS, VFS to SM
<i>Ophelina sp.</i>	28	MS
<i>Leiocapitella sp.</i>	8–25	MS to SM
<i>Notomastus lobatus</i> Hartman, 1947	8–41	MS to SM
<i>Notomastus (Clistomastus) hemipodus</i> Hartman, 1945	8–24	VFS, SM
<i>Dasybranchus sp.1</i>	10	SM
<i>Dasybranchus sp.2</i>	8–10	SM
<i>Mediomastus capensis</i> Day, 1961	2–29	VCS to SF
<i>Cossura sp.</i>	9–29	CS to VFS, SC to SF
<i>Clymenella brasiliensis</i> Mangum, 1966	8–41	MS to SC
<i>Clymenella dalesi</i> Mangum, 1966	8–41	MS to SM
<i>Euclymene sp.</i>	10–40	FS, SC
<i>Rhodine loveni</i> Malmgren, 1865	24	VFS
<i>Asychis sp.</i>	26	SM
<i>Notoproctus sp.</i>	10	FS
<i>Owenia fusiformis</i> Delle Chiaje, 1844	9–41	CS to SM
<i>Pectinaria sp.</i>	9–40	CS to SC
<i>Amphictene catharinensis</i> (Grube, 1870)	24	VFS
<i>Isolda pulchella</i> Müller in Grube, 1858	8–26	CS, MS, VFS
<i>Amphicteis gunneri</i> (M. Sars, 1835)	20–26	FS, VFS
<i>Amphicteis sp.</i>	10–15	FS, VFS, SM
<i>Thelepus setosus</i> (Quatrefages, 1866)	13–29	CS to SM
<i>Pista cristata</i> (Müller, 1776)	20–26	VCS, FS
<i>Loimia medusa</i> (Savigny in Lamarck, 1818)	26	SC
<i>Artacama sp.</i>	26	SC
<i>Streblosoma sp.</i>	26	VFS
<i>Terebella sp.</i>	13–18	CS

TABLE 3. Continued.

SPECIES	DEPTH RANGE (m)	SEDIMENT TYPE
<i>Terebellides anguicomus</i> Müller in Grube, 1858	9–12	MS, VFS
<i>Hypsicomus</i> sp.	18	CS
<i>Megalomma bioculata</i> (Ehlers, 1887)	13	VS
<i>Sabella</i> sp.	26	VCS, VFS
<i>Paradialychone filicaudata</i> (Southern, 1914)	18	CS
<i>Euchone rosea</i> Langerhans, 1884	18–26	VCS, CS, FS
<i>Chone</i> sp.	9–28	CS to VFS
<i>Spirographis braziliensis</i> Treadwell, 1932	26–41	MS, VFS, SC
<i>Sabella</i> sp.	26	MS
<i>Spirobranchus</i> sp.	18	CS
<i>Hydroides plateni</i> (Kinberg, 1867)	40–41	SC
<i>Hydroides uncinatus</i> (Philippi, 1844)	9–11	MS, SM
<i>Hydroides</i> sp.	40	SC
<i>Protodrilus corderoi</i> Marcus, 1948	8–28	CS, MS, FS
ARTHROPODA CRUSTACEA		
Order AMPHIPODA		
<i>Ampelisca brevisimulata</i> J.L. Barnard, 1954	10–28	CS, MS
<i>Ampelisca cristata</i> Holmes, 1908	10	CS, MS, VFS
<i>Ampelisca paria</i> Barnard & Agard, 1986	10–15	VFS
<i>Ampelisca pugetica</i> Stimpson, 1864	8–41	CS to SC
<i>Ampelisca</i> sp.	8–40	FS, SC
<i>Ampelisciphotis podophthalma</i> (J.L. Barnard, 1958)	8–40	CS to SC
<i>Amphilochus neapolitanus</i> Della Valle, 1893	15	VFS
<i>Caprella dilatata</i> Krøyer, 1843	10	CS
<i>Caprella scaura</i> Templeton, 1836	10	SM
<i>Caprella</i> sp.	10	MS
<i>Cheiriphotis megacheles</i> (Giles, 1885)	10	MS
<i>Corophium</i> sp.	3	SC
<i>Gibberosus myersi</i> (McKinney, 1980)	14	VFS
<i>Heterophoxus videns</i> K.H. Barnard, 1930	8–41	CS to SM
<i>Liljeborgia dubia</i> (Haswell, 1880)	10	VFS
<i>Idunella titinga</i> (Wakabara, Tararam, Valério-Berardi & Leite, 1988)	10–41	MS, VFS, SC
<i>Eudevenopus gracilipes</i> (Schellenberg, 1931)	12	MS, VFS
<i>Maera hirondellei</i> Chevreux, 1900	40	SC
<i>Metharpinia longirostris</i> Schellenberg, 1931	9–12	MS, VFS
<i>Microphoxus cornutus</i> (Schellenberg, 1931)	10–24	CS to SC
<i>Photis brevipes</i> Shoemaker, 1942	10	VFS
<i>Photis longicaudata</i> (Bate & Westwood, 1862)	10–15	MS, FS, VFS
<i>Phoxocephalopsis zimmeri</i> Schellenberg, 1931	9–40	MS, SC, SM
<i>Phtisica verae</i> Quitete, 1979	8–10	MS, FS
<i>Microphoxus moraesi</i> Bustamante, 2002	12	VFS
<i>Pseudharpinia dentata</i> Schellenberg, 1931	26	SM
<i>Tiburonella viscana</i> (J.L. Barnard, 1964)	10–15	MS, FS, VFS
Order ISOPODA		
<i>Uromunna peterseni</i> Pires, 1985	3	SC
<i>Uromunna</i> sp.	12,5	VFS
<i>Amakusanthura</i> sp.	13–26	CS, VFS, SC
<i>Panathura</i> sp.	26	SC
<i>Kupellonura</i> sp.	11–13	CS, MS
<i>Neohyssura</i> sp.	13	CS
<i>Ananthura</i> sp.1	10–26	VFS, SC, SF
<i>Ancinus brasiliensis</i> Lemos de Castro, 1959	15	VFS
<i>Apanthura</i> sp.	9–40	CS, MS, SC, SM
<i>Edotia</i> sp.	10	VFS
<i>Excorallana costata</i> Lemos de Castro, 1960	10	MS
<i>Eurydice elongata</i> Moreira, 1972	12–24	CS, MS
<i>Natatolana</i> sp.	18	CS
<i>Politolana eximia</i> (Hansen, 1890)	24	VFS
<i>Politolana tricarinata</i> Riseman, Pires-Vanin & Brusca, 2001	24	VFS

TABLE 3. Continued.

SPECIES	DEPTH RANGE (m)	SEDIMENT TYPE
<i>Rocinela signata</i> Schioedte & Meinert, 1879	10–28	CS, MS
<i>Synidotea marplatensis</i> Giambiagi, 1922	15–26	FS, SF
<i>Gnathia ubatuba</i> Pires, 1996	20	FS
Order TANAIACEA		
<i>Bunakenia (Extensibasella) sudvestatlantica</i> Gutu, 1996	8–40	CS, MS, VFS, SC
<i>Mesokalliapseudes brasiliensis</i> Bacescu, 1986	18	SC
<i>Psammokalliapseudes mirabilis</i> Lang, 1956	3	SC
<i>Calozodion</i> sp.	13–26	VCS, CS, FS, SF
<i>Leptochelia savignyi</i> (Krøyer, 1842)	10–40	VFS, SC
<i>Saltipedis (Saltipedis) robustispinosus</i> Gutu, 1996	13–26	VCS, CS, SC, SM
<i>Saltipedis (Saltipedis) paulensis</i> (Brum, 1971)	8–41	CS to SM
Order CUMACEA		
<i>Anchistylis</i> sp.	15	VFS
<i>Diastylis</i> sp.	10	MS, VFS
<i>Diastylis planifrons</i> Calman, 1912	10–12	CS, VFS
<i>Oxyurostylis salinoi</i> Brum, 1966	10	MS
<i>Campylaspis</i> sp.	24	VFS
Order DECAPODA		
<i>Sicyonia dorsalis</i> Kingsley, 1878	15	VFS
<i>Sicyonia typica</i> (Boeck, 1864)	24	CS
<i>Rimopenaeus constrictus</i> (Stimpson, 1871)	28	CS
<i>Alpheus nuttingi</i> (Schmitt, 1924)	10–24,5	MS, SM
<i>Alpheus floridanus</i> Kingsley, 1878	8–26	SC, SM, SF
<i>Alpheus</i> sp.	9–40	VFS, SC
<i>Automate rectifrons</i> Chace, 1972	8–24	VFS, SM
<i>Automate</i> sp.	10	FS, VFS, SF
<i>Leptochela (Leptochela) serratorbita</i> Spence Bate, 1888	14	VFS
<i>Leptochela</i> sp.	10–25	MS, FS
<i>Ogyrides alphaerostris</i> (Kingsley, 1880)	7–22,5	SM, SF
<i>Ogyrides orientalis</i> (Stimpson, 1860)	2,5	CS
<i>Processa hemphilli</i> Manning & Chace, 1971	9–24	MS, VFS
<i>Processa</i> sp.	9	VFS
<i>Callinectes danae</i> Smith, 1869	15	VFS
<i>Dissodactylus crinitichelis</i> Moreira, 1901	10	CS
<i>Fabia byssomiae</i> (Say, 1818)	40	SC
<i>Heterocrypta granulata</i> (Gibbes, 1850)	10	MS
<i>Hexapanopeus paulensis</i> Rathbun, 1930	9–23	CS, MS
<i>Acantholobulus schmitti</i> (Rathbun, 1930)	10–41	MS, SC
<i>Hepatus pudibundus</i> (Herbst, 1785)	7–24	CS, SF
<i>Ebalia stimpsoni</i> A. Milne-Edwards, 1880	11	MS
<i>Ebalia cariosa</i> (Stimpson, 1860)	10	MS
<i>Persephona punctata</i> (Linnaeus, 1758)	15	FS
<i>Cataleptodius floridanus</i> (Gibbes, 1850)	12,5–20	CS, FS, VFS
<i>Austinixa patagoniensis</i> (Rathbun, 1918)	4–24,5	SC to SF
<i>Pinnixa gracilipes</i> Coelho, 1997	2,5–9	CS, SF
<i>Pinnixa chaetopterana</i> Stimpson, 1860	10–26	SC, SM
<i>Pinnixa rapax</i> Bouvier, 1917	9–10	MS, VFS
<i>Pinnixa sayana</i> Stimpson, 1860	8–28	CS to SM
<i>Pinnixa</i> sp.	10–40	VFS, SC
<i>Zaops ostreus</i> (Say, 1817)	40–41	SC
<i>Pinnotheres</i> sp.	41	SC
<i>Cyclograpsus integer</i> H. Milne Edwards, 1837	9,8–24,5	SM, SF
<i>Hypoconcha arcuata</i> Stimpson, 1858	24	CS
<i>Pseudopaguristes calliopsis</i> (Forest & de Saint Laurent, 1968)	13	CS
<i>Pagurus criniticornis</i> (Dana, 1852)	26	VCS
<i>Polyonyx gibbesi</i> Haig, 1956	20–26	SC, SM
<i>Upogebia paraffinis</i> Williams, 1993	18	CS
<i>Upogebia vasquezii</i> Ngoc-Ho, 1989	11–18	CS, MS
<i>Callichirus major</i> (Say, 1818)	11–26	MS, SC, SM, SF

TABLE 3. Continued.

SPECIES	DEPTH RANGE (m)	SEDIMENT TYPE
<i>Sergio mirim</i> (Rodrigues, 1966)	13	CS
MOLLUSCA		
Class GASTROPODA		
<i>Calliostoma adspersum</i> (Philippi, 1851)	18–20	CS, FS
<i>Caecum achirona</i> (de Folin, 1867)	10	MS
<i>Caecum pulchellum</i> Stimpson, 1851	10–12	MS, VFS
<i>Caecum striatum</i> de Folin, 1868	10–28	CS, MS, SM
<i>Teinostoma</i> sp.	10	FS
<i>Solariorbis</i> sp.	10	FS
<i>Macromphalina argentina</i> Castellanos, 1975	8–40	MS to SC
<i>Finella dubia</i> (d'Orbigny, 1840)	11	MS
<i>Crepidula</i> sp.	40	SC
<i>Bostrycapulus aculeatus</i> (Gmelin, 1791)	23–41	CS, MS, SC
<i>Calyptrea centralis</i> (Conrad, 1841)	8–10	VFS
<i>Tectonatica pusilla</i> (Say, 1822)	10–40	MS to SC
<i>Natica isabelleana</i> d'Orbigny, 1840	12–13	CS, VFS
<i>Eunaticina papilla</i> (Gmelin, 1791)	10	MS, FS
<i>Polinices lacteus</i> (Guilding, 1834)	10	MS
<i>Polinices uberinus</i> (d'Orbigny, 1842)	10	MS
<i>Sinum perspectivum</i> (Say, 1831)	10	FS
<i>Epitonium novangliae</i> (Couthouy, 1838)	10	MS
<i>Epitonium</i> sp.	10	MS
<i>Opalia pumilio</i> (Mörch, 1874)	13	CS
<i>Eulima bifasciata</i> d'Orbigny, 1841	10–25	MS, VFS
<i>Eulima mulata</i> Rios & Absalão, 1990	10	VFS
<i>Eulima</i> sp.	12,5	VFS
<i>Balcis arcuata</i> Leach, 1852	41	SC
<i>Siratus senegalensis</i> (Gmelin, 1791)	10–28	MS
<i>Parvanachis obesa</i> (C. B. Adams, 1845)	4–26	CS, FS, SC, SM
<i>Anachis</i> sp.	40	SC
<i>Episcynia inornata</i> (d'Orbigny, 1842)	4	SM
<i>Olivella defiorei</i> Klappenbach, 1964	10	MS, VFS
<i>Olivella minuta</i> (Link, 1807)	10	CS
<i>Nannodiella vespuciana</i> (d'Orbigny, 1842)	9	MS
<i>Cryoturris adamsii</i> (E. A. Smith, 1884)	14	VFS
<i>Duplicaria gemmulata</i> (Kiener, 1839)	14	VFS
<i>Euterebra riosi</i> (Bratcher & Cernohorsky, 1985)	10	VFS
<i>Turbonilla</i> sp.	11	VFS
<i>Acteon pelecais</i> Ev. Marcus, 1972	10–23	MS, VFS
<i>Cylichnella</i> cf. <i>bidentata</i> (d'Orbigny, 1841)	15–26	VFS, SM
<i>Acteocina candei</i> (d'Orbigny, 1841)	8	SM
<i>Acteocina</i> sp.	10	FS
<i>Philine mera</i> Ev. Marcus & Er. Marcus, 1969	24	VFS
<i>Volvulella persimilis</i> (Mörch, 1875)	10	VFS
<i>Volvulella texasiana</i> Harry, 1967	10–15	VFS
Class BIVALVIA		
<i>Nucula semiornata</i> d'Orbigny, 1842	8–24	CS to SC
<i>Anadara ovalis</i> (Bruguière, 1789)	15	VFS
<i>Lioberus castaneus</i> (Say, 1822)	8–28	MS, FS
<i>Musculus lateralis</i> (Say, 1822)	40	SC
<i>Musculus</i> sp.	12,5	VFS
<i>Lima</i> sp.	23	VFS
<i>Parvilucina pectinella</i> (C.B. Adams, 1852)	8–24	MS to SM
<i>Diplodonta punctata</i> (Say, 1822)	9–28	MS, VFS
<i>Diplodonta</i> sp.	8–10	MS, FS
<i>Felaniella viladerboana</i> (d'Orbigny, 1846)	8–23	FS, VFS, SM
<i>Phlyctiderma semiaspera</i> (Philippi, 1836)	8–28	CS to VFS
<i>Chama macerophylla</i> Gmelin, 1791	10	MS
<i>Arcinella brasiliana</i> (Nicol, 1953)	40	SC

TABLE 3. Continued.

SPECIES	DEPTH RANGE (m)	SEDIMENT TYPE
<i>Crassinella lunulata</i> (Conrad, 1834)	10–25	CS to SM
<i>Mactra</i> sp.	10	VFS
<i>Tumbeziconcha janeiroensis</i> (E. A. Smith, 1915)	10	SF
<i>Anatina anatina</i> (Spengler, 1802)	10	MS
<i>Solen tehuelchus</i> Hanley, 1842	10–28	MS
<i>Angulus gibber</i> Ihering, 1907	8–10	VFS, SM
<i>Angulus versicolor</i> De Kay, 1843	10–11	VFS
<i>Eurytellina nitens</i> C. B. Adams, 1852	10	VFS
<i>Temnoconcha brasiliiana</i> (Dall, 1921)	2–26	SC to SF
<i>Tellina alternata</i> Say, 1822	2–26	SC, SM
<i>Tellina martinicensis</i> d'Orbigny, 1853	12,5	VFS
<i>Tellina punicea</i> Born, 1778	10–15	VFS
<i>Tellina</i> sp.	9–10	MS, VFS
<i>Strigilla</i> sp.	2,5–12	CS, MS, SC
<i>Macoma cleryana</i> (d'Orbigny, 1846)	11	MS
<i>Macoma</i> cf. <i>brevifrons</i> (Say, 1834)	28	MS
<i>Macoma tenta</i> (Say, 1834)	10	VFS
<i>Macoma uruguayensis</i> (E. A. Smith, 1885)	10	SF
<i>Macoma</i> sp.	10	SM
<i>Periploma margaritaceum</i> (Lamarck, 1801)	2–11	CS, MS, SC, SM
<i>Mulinia cleryana</i> (d'Orbigny, 1846)	2–7	SC to SF
<i>Semelina nuculoides</i> (Conrad in Hodge, 1841)	12	MS
<i>Semele proficua</i> (Pulteney, 1799)	8	SM
<i>Semele</i> sp.	10	MS, VFS
<i>Abra lioica</i> (Dall, 1881)	10–41	CS to SM
<i>Abra</i> sp.	10–15	MS, VFS
<i>Tagelus divisus</i> (Spengler, 1794)	4	SM
<i>Ervilia concentrica</i> (Holmes, 1860)	9–12	CS, MS, VFS
<i>Ervilia nitens</i> (Montagu, 1808)	12,5–24	CS, MS, VFS
<i>Solecuretus cumingianus</i> (Dunker, 1862)	24	CS
<i>Solecuretus</i> sp.	10	VFS
<i>Ennucula puelcha</i> (d'Orbigny, 1842)	12–26	VCS, MS, VFS
<i>Nucula semiornata</i> d'Orbigny, 1842	4–24	CS, MS, VFS, SM, SF
<i>Tivela mactroides</i> (Born, 1778)	2–17,3	CS, SM
<i>Gouldia cerina</i> (C. B. Adams, 1845)	10–25	CS, MS, FS
<i>Chione</i> sp.	10–12	MS, VFS
<i>Lirophora paphia</i> (Linnaeus, 1767)	9–26	CS, MS, VFS
<i>Transennella stimpsoni</i> (Dall, 1902)	9–10	MS
<i>Anomalocardia brasiliiana</i> (Gmelin, 1791)	20	FS
<i>Pitar rostratus</i> (Philippi, 1844)	29	SM
<i>Pitar fulminatus</i> (Menke, 1828)	23	CS
<i>Pitar</i> sp.	9–10	MS
<i>Callista maculata</i> (Linnaeus, 1758)	9–12	MS, VFS
<i>Dosinia concentrica</i> (Born, 1778)	8–24	FS, VFS
<i>Cyclinella tenuis</i> (Récluz, 1852)	9–24	CS to SM
<i>Cooperella atlantica</i> Rehder, 1943	10–11	VFS
<i>Corbula</i> cf. <i>cymella</i> Dall, 1881	9–40	CS to SF
<i>Corbula patagonica</i> d'Orbigny, 1845	8–40	CS to VFS; SM
<i>Corbula pulchella</i> Philippi, 1893	10–41	CS, FS, SC
<i>Corbula swiftiana</i> C. B. Adams, 1852	8–41	CS to, SM
<i>Corbula contracta</i> Say, 1822	4–26	VCS to SF
<i>Corbula</i> sp.1	10–40	MS to SM
<i>Corbula</i> sp.2	10–41	MS, VFS, SC
<i>Corbula</i> sp.3	10	SM
<i>Martesia</i> sp.	10	MS
<i>Thracia similis</i> Couthouy, 1839	28	MS
<i>Dallocardia muricata</i> (Linnaeus, 1758)	12,5–20	CS, FS, VFS, SC
<i>Anadara brasiliiana</i> (Lamarck, 1819)	18–26	CS, FS, SC, SF
<i>Eontia bisulcata</i> (Lamarck, 1819)	11	SM

TABLE 3. Continued.

SPECIES	DEPTH RANGE (m)	SEDIMENT TYPE
<i>Cardites micellus</i> (Penna-Neme, 1971)	18–20	CS, FS
<i>Periploma</i> sp.	10–41	FS, SC
<i>Entodesma patagonicum</i> (d'Orbigny, 1846)	10	CS, VFS
<i>Entodesma</i> sp.	10	MS
<i>Cardiomya cleryana</i> (d'Orbigny, 1842)	40	SC
<i>Cardiomya</i> sp.	3–24,5	SC, SM
Class SCAPHOPODA		
<i>Paradentalium gouldii</i> (Dall, 1889)	10	FS, VFS
Class POLYPLACOPHORA		
<i>Chaetopleura (Chaetopleura) angulata</i> (Spengler, 1797)	28–40	MS, SC
ECHINODERMATA		
Class OPHIUROIDEA		
<i>Amphiodia pulchella</i> (Lyman, 1869)	10–24	MS to SM
<i>Amphiodia</i> sp.	9–25	SC, SM
<i>Ophiophragmus riisei</i> (Lütken in Lyman, 1860)	9–10	MS, VFS
<i>Amphiplus lucyae</i> Tommasi, 1971	40	SM
<i>Amphipholis januarii</i> Ljungman, 1866	10	MS
<i>Amphipholis squamata</i> (Delle Chiaje, 1828)	10–24	MS, FS, VFS
<i>Amphipholis</i> sp.	10–25	MS, VFS
<i>Microphiopholis atra</i> (Stimpson, 1852)	8–41	CS to SM
<i>Microphiopholis subtilis</i> (Ljungman, 1867)	8–26	MS to SM
<i>Amphiura flexuosa</i> Ljungman, 1867	10	VFS
<i>Amphiura joubini</i> Koehler, 1912	24–40	VFS, SC
<i>Amphiura</i> sp.	10	VFS
<i>Hemipholis elongata</i> (Say, 1825)	8–41	CS to SC
<i>Ophiactis brasiliensis</i> Manso, 1988	9	MS
<i>Ophiactis lymani</i> Ljungman, 1872	10–40	CS, MS, SC
<i>Ophiactis savignyi</i> (Müller & Troschel, 1842)	9–23	CS, MS, VFS
<i>Ophioderma januarii</i> Lütken, 1856	23–41	CS, MS, SC
<i>Ophiophragmus luetkeni</i> (Ljungman, 1872)	10	VFS
Class ECHINOIDEA		
<i>Encope emarginata</i> (Leske, 1778)	10	CS
Class ASTEROIDEA		
<i>Astropecten brasiliensis</i> Müller & Troschel, 1842	10	VFS
<i>Astropecten marginatus</i> Gray, 1840	10–11	VFS
Class HOLOTHUROIDEA		
<i>Cucumaria</i> sp.	9–28	CS, MS
<i>Protankyra benedeni</i> (Ludwig, 1881)	10	SM
<i>Thyone pawsoni</i> Tommasi, 1972	10	VFS
CHORDATA		
CEPHALOCORDATA		
<i>Branchiostoma caribaeum</i> Sundevall, 1853	9–28	CS, MS, VFS

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