

Taxonomic Composition of the Sublittoral Soft-Bottom Polychaeta of Chile Bay (Greenwich Island, South Shetland Islands, Antarctica)

VICTOR A. GALLARDO⁽¹⁾, SONIA A. MEDRANO AND FRANKLIN D. CARRASCO

ABSTRACT

The taxonomic composition of the sublittoral soft-bottom polychaetes of Chile (Discovery) Bay collected in the summer (1967-1968) by the XXII Chilean Antarctic Expedition is studied. Samples were obtained from depths of 33-355 m with a Petersen 0.1 m² bottom grab and the biological material sieved through a 1 mm² mesh sieve. Polychaetes were as far as possible specifically identified or separated into different forms (DFs). The analysis of 40 quantitative samples collected in 39 benthic stations revealed 206 species or DFs, distributed into 26 families in a total of 13.307 individuals. The Polychaeta Errantia comprised 11 families, 71 species and DFs, and a total of 535 individuals while the Sedentaria contained 15 families, 135 species and DFs, and a total of 12.772 individuals. The most abundant and widely distributed families were Maldanidae and Cirratulidae, while the most species rich were Terebellidae, Spionidae and Phyllodoceidae. Oweniidae was only important in terms of abundance due to a single patch of *Owenia* sp. (St. 56 with 5.440 individuals). The most abundant species were *Maldane sarsi antarctica* Arwidson, 1911 and *Tharyx cincinnatus* Ehlers, 1908. The maximum number of families, species and DFs, and individuals of polychaetes per 0.1 m² sample were, 18, 43 and 5.440 respectively. In general the study discloses the existence in Chile Bay of a highly diversified and complex polychaete infauna dominated by deposit - feeders. Results are discussed with reference to data available in the literature from Arthur Harbor and Almiralty Bay. It is concluded that the polychaete assemblages of this part of Antarctica exhibit a similar taxonomic composition.

Key words: Polychaeta, taxonomic composition, sublittoral benthos, infauna, macrobenthos.

Composición Taxonómica de los Polychaeta de Fondos Blandos Sublitorales de Bahía Chile (Isla Greenwich, Islas Shetland del Sur, Antártica)

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RESUMEN

Se estudia la composición taxonómica de los poliquetos de los fondos blandos sublitorales de Bahía Chile (Discovery Bay) sobre material colectado en el verano (1967-1968), durante la XXII Expedición Antártica Chilena. Las muestras bentónicas fueron obtenidas entre 33 y 355 m con un tomafondos Petersen 0.1m² y el material biológico separado mediante tamizado a través de una malla de 1mm². Los poliquetos fueron identificados en lo posible hasta el nivel específico o separados en formas diferentes (DFs). El análisis de 40 muestras cuantitativas obtenidas en 39 estaciones reveló 206 especies o DFs, distribuidas en 26 familias y un total de 13.307 individuos. Los poliquetos Errantia constituyeron 11 familias, 71 especies y DFs, y 535 individuos mientras que los Sedentaria 15 familias, 135 especies y DFs, y 12.772 individuos. Las familias más abundantes y ampliamente distribuidas fueron Maldanidae y Cirratulidae, mientras que las familias más ricas en especies, Terebellidae, Spionidae y Phyllo-

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docidae. Oweniidae sólo fue importante en términos de abundancia debido a un solo "patch" de Owenia sp. (Est. 56 con 5.440 individuos). Los números máximos de familias, especies y DFS, e individuos de poliquetos por muestra de 0.1 m² fueron, 18, 43 y 5.440, respectivamente. Las especies más abundantes fueron Maldane sarsi antarctica Arwidson, 1911 y Tharyx cinccinnatus Ehlers, 1908. El estudio revela la existencia en Bahía Chile de una infauna altamente diversificada y compleja, dominada por poliquetos sedimentívoros. Se discuten los resultados con referencia a información disponible en la literatura acerca de Bahía Arturo (Isla Anvers) y Bahía Almirantazgo (Isla Rey Jorge), y se concluye que estos conjuntos de poliquetos de esta parte de la Antártica exhiben una composición taxonómica similar.

Palabras claves: Polychaeta, composición taxonómica, bentos sublitoral, infauna, macrobentos.

INTRODUCTION

Quantitative synecological studies on the macrobenthos of Chile Bay were initiated during the summer of 1968 (Gallardo and Castillo 1969, and Gallardo *et al.* 1977). These studies revealed a varied soft bottom benthic community, *i.e.*, 28 main taxonomic invertebrate groups were found, where Polychaeta was most abundant (*ca.* 61%) followed by Crustacea (*ca.* 15%) and Mollusca (*ca.* 12%). Polychaeta was moreover the most important group in terms of biomass (*ca.* 47% preserved wet weight). An analysis of the taxonomic composition of the Polychaeta of Chile Bay was deemed therefore important, previous to further quantitative community analyses. Moreover, the works of Lowry (1975), Richardson and Hedgpeth (1977), and Sicinsky (1986a), provided useful data for a comparative Antarctic soft-bottom polychaete taxonomic composition effort. Such simple analyses appear to provide important information for the understanding of the synecology of soft-bottom benthic communities when applied to data sets from different latitudes and ecosystems.

MATERIALS AND METHODS

Chile Bay is located on the northeastern side of Greenwich Island (62°29' S 59°42' W), about 25 km² in surface area with a maximum depth at the mouth of *ca.* 250 m, adjacent to the English Channel (Fig. 1). The submarine topography appears complex and the sediments diversified (Valenzuela and Varela 1972). During the XXII Chilean Antarctic Expedition (summer 1967-1968) 42 successful benthic stations were covered in this area from which 43 quantitative samples were collected with a Petersen 0.1 m² at depths ranging from 35-355 m (Annex 1). The biological material was separated by sieving through a 1 mm² mesh sieve. This study is based on the main fraction of the original polychaetes collected in 40 samples of 0.1 m² surface area (one sample per station, total sampling area, 4 m²). This fraction resulted from minor losses and damages, presumably random, which occurred with time. The polychaetes were as far as possible identified to the species level or separated into different forms (DFs). (The epifaunistic Serpulidae are disregarded in this analysis).

RESULTS

The careful, although not final, taxonomic analysis performed on the data base revealed a total of 206 species and DFs distributed into 26 families (11 Errantia with 71 species and DFs in 535 individuals, and 15 Sedentaria with 135 species and DFs 12772 individuals), in a total of 13307 individuals (Table 1), (see also Annex 2). The table shows a clear predominance of sedentariate polychaetes in terms of families, species and individuals, even when *Owenia* sp. is not considered.

The number of species, frequency of occurrences and abundances of the families of Polychaeta in Chile Bay are shown in Table 2. This table shows that in terms of number of species Terebellidae, Spionidae, Phyllodoceidae and Ampharetidae were the most diversified. Maldanidae, Terebellidae, and Cirratulidae, were the most frequently occurring and again Maldanidae and Cirratulidae by far the most abundant families. Oweniidae is excluded in this analysis because it is present only in 6 out of the 40 samples and in one (St. 56) obtains most of its representation (5440 individuals).

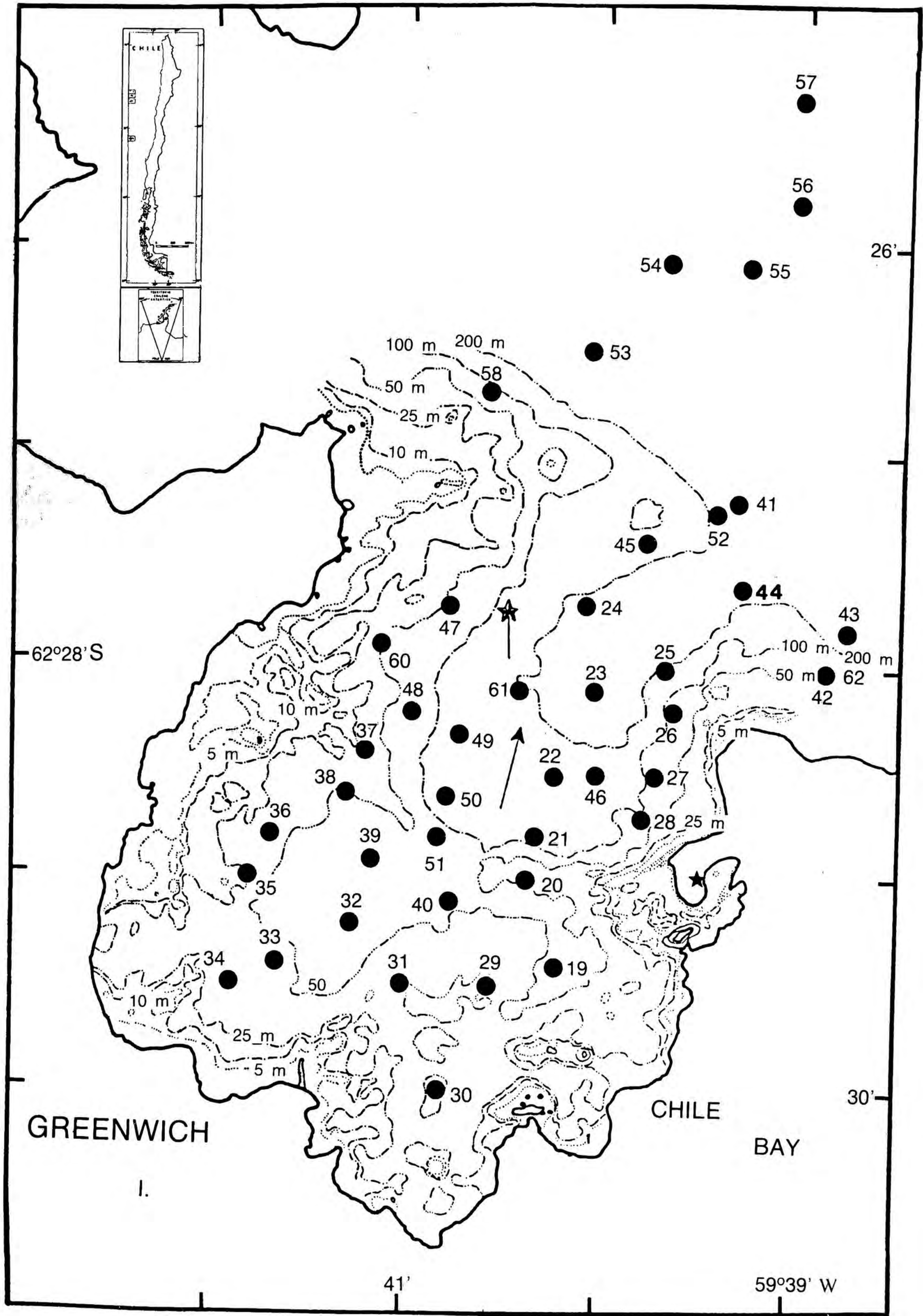


Fig. 1. Map with the location of the quantitative benthic sampling stations in Chile Bay, Greenwich Island, South Shetland Islands, (January 1968), XXII Chilean Antarctic Expedition.

Table 1

NUMBER OF FAMILIES, GENERA, SPECIES AND INDIVIDUALS OF POLYCHAETA FROM 40 BENTHIC SAMPLES OF 0.1 m² COLLECTED IN CHILE BAY, GREENWICH ISLAND, ANTARCTICA, WITH PERCENTAGES (WITH AND *WITHOUT *Owenia* SP. FROM ST. 56 = 5440 INDIVIDUALS)

	FAMS	%	GEN.	%	SPP.	%	IND.	%	IND.*	%
Errantia	11	42.3	36	36.4	71	34.5	535	4.0	535	7.0
Sedentaria	15	57.7	63	63.6	135	65.5	12772	96.0	7332	93.0
TOTAL	26		99		206		13307		7867	

Table 2

NUMBER OF SPECIES, FREQUENCY OF OCCURENCE AND ABUNDANCE OF POLYCHAETA FAMILIES, WITH PERCENTAGES (SEDENTARIA AND ERRANTIA) FROM 40 BENTHIC SAMPLES OF 0.1 m² COLLECTED IN CHILE BAY, GREENWICH ISLAND, ANTARCTICA. (RANKING BY FREQUENCY, WITHOUT *Owenia* SP. OF ST. 56)

FAMILY	SPP.	FREQ.	ABUND.	% SPP.	% FREQ.	%ABUND.
Maldanidae	11	139	3844	5.3	18.3	48.9
Terebellidae	25	90	305	12.1	11.9	3.9
Cirratulidae	12	68	2088	5.8	9.0	26.5
Paraonidae	10	47	247	4.9	6.2	3.1
Ampharetidae	15	43	58	7.3	5.7	0.7
Opheliidae	4	39	275	1.9	5.1	3.5
Spionidae	23	38	93	11.2	5.0	1.2
Lumbrineridae	6	37	290	2.9	4.9	3.7
Polynoidae	13	30	37	6.3	4.0	0.5
Trichobranchidae	4	28	62	1.9	3.7	0.8
Phyllodocidae	17	27	42	8.3	3.6	0.5
Sabellidae	12	25	115	5.8	3.3	1.5
Syllidae	13	25	68	6.3	3.3	0.9
Orbiniidae	7	24	130	3.4	3.2	1.7
Nephtyidae	6	24	30	2.9	3.2	0.4
Flabelligeridae	5	13	27	2.4	1.7	0.4
Scalibregmidae	2	12	43	1.0	1.6	0.6
Capitellidae	3	11	27	1.5	1.4	0.4
Sphaerodoridae	7	11	21	3.4	1.4	0.3
Hesionidae	2	8	15	1.0	1.1	0.2
Glyceridae	2	7	17	1.0	0.9	0.2
Oweniidae	1	5	17	2.0	0.7	0.2
Nereidae	2	4	6	1.0	0.5	0.1
Dorvilleidae	2	2	7	1.0	0.3	0.1
Pilargidae	1	1	2	0.5	0.1	—
Pectinariidae	1	1	1	0.5	0.1	—
TOTAL	206	759	7867			

Table 3 shows the frequency of occurrence and the abundance of the 23 most commonly found species. This table shows that while in terms of frequency of occurrence **Tharyx cincinnatus**, **Maldane sarsi antarctica**, **Rhodine loveni**, **Lumbrineris magalhaensis**, **Axiothella antarctica**, **Ophelina breviata**, and **Asychis amphiglypta**, all occur in more than 50% of the samples, in terms of abundance only two species **M. s. antarctica** and **T. cincinnatus** are important with 3043 (39%) and 1134 (14%) individuals, respectively, of the total without **Owenia** sp., i.e. 7867 individuals. It is worth noting that about 50% of the species occurred only once in the whole survey, that is, once in forty samples. This observation suggests a high complexity of the polychaete infauna in the region under study. Another result which points in the same direction is seen in Table 4 which shows the maximum numbers of families, species and individuals per 0.1 m². These figures, performed on a data base which excludes **Owenia** sp. of St. 56, appear at first sight, unusually high, considering that each sample contains, besides Polychaeta, a normal composition of other invertebrate taxa (Gallardo and Castillo *op. cit.*).

DISCUSSION AND CONCLUSIONS

According to Hartman (1966, 1967), 457 species of polychaetes had been cited for the Southern Ocean until 1965, many of which had been recorded only once. These number included 212 species of Errantia (5 parasites), and at least 240 species of Sedentaria. Knox and Lowry (1977) adjusted the number of Antarctic polychaete species upwards to 558 species and reported a number of 44 families and 440 species for depths less than 500 m. In the present study 206 species and DFs, including 11 families and 71 species of Errantia, and 15 families and 135 species of Sedentaria, were recognized. While our analysis is not zoogeographical in scope and no new records could be claimed for Antarctica with these preliminary identifications, new records and even new species could result from the detailed study of the samples. In this connection the number of species and DFs recognized in the collections from Chile Bay, appears high, being close to 40% of the number given by Knox and Lowry for the whole of the Southern Ocean (*op. cit.*). This figure may, however, reflect the combination of both the presence in Chile Bay of a homogeneously distributed species-rich biota as well as a poorly known one, two considerations already made by previous workers. Indeed, Knox (1977) had concluded that the polychaete fauna was relatively homogeneous around Antarctica with many circumpolar species (see also Sicinsky 1986b). Hartman (*op. cit.*), in turn had expressed the view that the collections under study would reveal a diversity unknown for invertebrate animals from Antarctica (Knox and Lowry *op. cit.*, also Knox 1977).

Quantitative synecological studies on the Antarctic softbottom sublittoral are scarce (Gallardo 1987), and data to show the quantitative taxonomic structure of Polychaeta, the most important group in the soft bottoms of this region, are almost non-existent. The only available works to discuss in relation with our results are those of Lowry (1975), Richardson and Hedgpeth (1977), and a recent work by Sicinsky (1986a), all from Western Antarctica. The first two were carried out in Arthur Harbor, Anvers Island, and the latter in Admiralty Bay, King George Island. Our results must be discussed in relation to these works.

Lowry found 36 species of Polychaeta (6 Errantia with 8 species and 112 individuals, and 11 Sedentaria with 24 species and 3684 individuals) from 24 samples of ca. 0.06 m² (sieving through a 1 mm² mesh, total sampling area = 1.44 m²) taken at two stations between March 1967-January 1968. Richardson and Hedgpeth took 68 samples of 0.07 m² (5 replicates in 12 stations, total sampling area = 4.76 m²). Most samples were collected between 5-75 m, although a few were taken from 200-700 m depth in January-February 1971. Sieving was done through 1 mm² mesh. These authors report 102 species and DFs of polychaetes from 30 families (11 Errantia with 30 species and 19 Sedentaria —one uncertain— with 72 species) among 42092 individuals of annelids (including Oligochaetes). From the published data it is unfortunately not possible to calculate the total number of Polychaeta found in this survey. It could be suspected that it is rather large, most probably larger than that studied in the present work, even if a fair quantity is allowed for the dominant Oligochaetes. Sicinsky (1986a), working also during the summer, covered 18 stations with 53

Table 3

FREQUENCY OF OCCURRENCE AND ABUNDANCE OF THE MOST IMPORTANT POLYCHAETE SPECIES FROM 40 BENTHIC SAMPLES OF 0.1 m² COLLECTED IN CHILE BAY, GREENWICH ISLAND, ANTARCTICA, WITH PERCENTAGES. RANKING BY ABUNDANCE, WITHOUT 5440 INDIVIDUALS OF *OWENIA* sp. FROM St. 56, N= 7867)

SPECIES OR DFs.	FREQ.	ABUND.	% FREQ.	% ABUND.
<i>M. sarsi antarctica</i>	34	3043	80.9	36.2
<i>Tharyx cincinnatus</i>	35	1134	83.3	14.4
<i>Tharyx</i> sp. 2	10	485	23.8	6.2
<i>Rhodine loveni</i>	27	303	64.3	3.9
<i>Lumbrineris magalhaensis</i>	27	272	64.3	3.4
<i>Asychis amphiglypta</i>	25	238	59.5	3.0
<i>Axiothella antarctica</i>	27	201	64.3	2.6
<i>Ophelina breviata</i>	27	149	64.3	1.9
<i>Proclea glabrolimbata</i>	20	138	47.6	1.8
<i>Leitoscoloplos kerguelensis</i>	15	97	35.7	1.2
<i>Tauberia</i> sp.	18	96	42.9	1.2
<i>Aricidea</i> (A) sp.	10	59	23.8	0.7
<i>Ophelina</i> sp. 1	10	59	19.0	0.7
<i>Streblosoma</i> sp.	14	59	33.0	0.7
<i>Scalibregma inflatum</i>	11	42	26.1	0.5
<i>Laonice</i> sp.	7	28	16.7	0.4
<i>Terebellides stroemi</i>	16	27	38.1	0.4
<i>Pista cristata</i>	13	27	31.0	0.4
<i>Praxillela kerguelensis</i>	11	23	26.1	0.3
<i>Notomastus</i> (C.) <i>lineatus</i>	8	23	19.0	0.3
<i>Pionosyllis</i> ? <i>stylifera</i>	7	22	16.7	0.3
<i>Aglaophamus macroura</i>	12	15	28.6	0.2
<i>Ampharete kerguelensis</i>	11	14	26.1	0.2

Table 4

MAXIMUM NUMBERS OF FAMILIES, SPECIES AND INDIVIDUALS OF POLYCHAETA PER SAMPLE OF 0.1 m² AND STATISTICS, AS FOUND IN 40 BENTHIC SAMPLES FROM CHILE BAY, GREENWICH ISLAND. (WITHOUT *Owenia* sp. OF st. 56)

Groups	Number/0.1 m ²	Mean	S.D.
Families	18	10,6	4,4
Species	43	19,0	9,3
Individuals	727	196,7	160,6

samples of 0.09 m² between 15-250 m depth (three replicates per station, except for two stations with two and one with four replicates, total sampling area = 4.77 m²) in Admiralty Bay, King George Island. Washing was done through a 0.5 mm mesh sieve. This author reports a total of 60 species of soft bottom polychaetes belonging to 25 families (9 Errantia with 17 species and 191 individuals, and 16 Sedentaria with 43 species and 4077 individuals), in a total of 4268 specimens (63 specimens were not identified and 1536 epifaunistic Serpulidae are disregarded). Results from our study and data available in the literature are summarized in Table 5. From this we conclude that the number of species of Polychaeta and DFs as found in Chile Bay, although higher than those found in Arthur Harbor and Admiralty Bay, appears to be within the order of magnitude that can be expected in this Antarctic habitat. The sampling concept –extensive rather than intensive– applied in the complex bottom topography of Chile Bay, may have contributed to the higher species count in an area which may be expected to be rich in biotopes. It is also observed that the proportions of errantiate versus sedentariate polychaetes, in terms of families, species and individuals are rather consistent and in favor of the sedentariates in all of the compared areas. This is a fact that might perhaps be expected in the level soft bottoms of the Archipelagos of West Antarctica, which appear to be similar to those found elsewhere in the world, but different from those of East Antarctica, as noticed by some workers (Mills and Hessler, 1974). It could be predicted that in East Antarctica where a mixed infauna/soft-bottom-epifauna exists (Gallardo 1987), a different pattern might exist, *i.e.*, predominance of errantiate polychaeta.

According to Lowry's data the most abundant families in his collection were Apistobranchidae (39.2%), Maldanidae (24%), Orbiniidae (11.6%), Paraonidae (10.2%) and Opheliidae (8.6%). Richardson and Hedgpeth (1977) give no clear quantitative data at the family or species level but it can be gathered that the most diversified families were Terebellidae, Sabellidae, Syllidae and Maldanidae. From Sicinsky's data a clear picture of the quantitative importance of families and species can be obtained. In terms of diversification (number of species) the most important families are, Terebellidae (15%), Maldanidae (13.3%), and Polynoidae (10%). The most frequent families are Maldanidae (19%), Polynoidae (9.2%), and Orbiniidae (7.3%), and the most abundant, Maldanidae (24.9%), Paraonidae (19.2%), Opheliidae (17.8%), and Orbiniidae (16.4%).

These results show a complex pattern but the following general observations can be advanced from their analysis. Firstly, the Terebellidae is consistently the most diversified family in all three sites. Next, Maldanidae is the most frequent and abundant family in both Chile Bay and Admiralty Bay while it is the second most abundant in Arthur Harbor, after Apistobranchidae. Apistobranchidae was the most abundant family in Arthur Harbor, but was only a minor component in Admiralty Bay (2.2%), and absent in Chile Bay. Terebellidae has been recognized as the most diversified sedentariate family in the Antarctic (Knox and Lowry 1977) and therefore it is not surprising that it is the most diversified family also in these sites. The abundance of Maldanidae provide a different case, however, to be explained ecologically. Perhaps in the deeper areas of both Chile Bay and Admiralty Bay, where it is particularly abundant (*i.e.* **Maldanae sarsi antarctica**), favorable conditions for its development occur. A similar explanation could be advanced for **Tharyx cincinnatus**, which appears to be more abundant in the shallower areas of Chile Bay.

Lowry's most important species were, **Apistobranchus** sp. (39.2%), **Leitoscoloplos kerguelensis** (11.6%), **Paraonis** sp. (10.1%), **Rhodine loveni** (9.5%), **Ammotrypane** sp. (8.5%), **Axiothella** sp. (5.9%), and **Capitella perarmata** (3.9%). In turn Richardson and Hedgpeth's main species were **Apistobranchus typicus**, **Ammotrypane syringopyge**, **Tharyx cincinnatus**, **Rhodine loveni**, **Leitoscoloplos kerguelensis**, **Paraonis gracilis**, **Ophryotrocha clapederii**, and an unidentified maldanid. In the Admiralty Bay polychaete assemblage the most abundant species were **Paraonis gracilis** (18.7%), **Ammotrypane** sp. (17.2%), **Maldane sarsi antarctica** (17.2%), and **Leitoscoloplos kerguelensis** (16.2%). Less important were **Tharyx cincinnatus** (7.2%) and **Rhodine loveni** (3.5%).

Several of the above mentioned species were also found important in Chile Bay and Arthur Harbor, although there appear to be some differences. In order to determine more objectively the de-

gree of similarity between these three areas a numerical classification analysis was performed on the binary data matrix produced by including the ten most abundant species found in each of the four sites. Thus, in total the following 19 species were considered, *Aglaophamus ornatus*, *Ammotrypane* sp., *Apistobranchnus typicus*, *Asychis amphiglypta*, *Axiothella antarctica*, *Capitella perarmata*, *Leitoscoloplos kerguelensis*, *Lumbriclymenella robusta*, *Lumbrineris magalhaensis*, *Maldane sarsi*, (includes *M. s. antarctica*), Maldanidae spp., *Ophelina breviata*, *Ophryotrocha clapederii*, *Paraonis* sp (includes *Paraonis gracilis*), *Rhodine loveni* and *Tharyx cincinnatus* (includes *Tharyx* sp. 2).

The results of the application of Jaccard's similarity coefficient and an UPGMA clustering strategy, indicated a greater similarity between Arthur Harbor and Admiralty Bay (Fig. 2). Chile Bay stands out due to a higher proportion of species unshared by either of the other two sites. How much of this difference is real or due to both field (sample washing and sieving procedures) and laboratory (taxonomic work) methods, remains to be seen with future observations.

Also Sicinsky's data allows for an insight as to the general complexity of the polychaete assemblage of Admiralty Bay with respect of sample composition. The maximum number of families, species and individuals per station at this site are shown in Table 6. Data in Table 6 are similar to those from Chile Bay (Table 4), a fact that reveals an interesting regularity in the general complexity of the polychaete assemblages of this part of Antarctica, at least under the environmental conditions prevailing during the summer months.

Although some evidence is here presented as to the complexity and high species richness of the polychaete biota of Chile Bay and Arthur Harbor, comparisons with similarly obtained data from other regions, both within and without Antarctica, will be necessary in order to propose valid hypotheses. At present we can only advance that both long-term (equilibrium or evolutionary) and short term (non-equilibrium or transient) pathways to species diversity may be involved. Further quantitative community analyses performed on this data-base from Chile Bay are expected to shed some more light on this problem.

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Table 5

POLYCHAETE TAXONOMICAL COMPOSITION OF FOUR ANTARCTIC SITES: Ch.B.= CHILE BAY*, A.H.1= ARTHUR HARBOR (LOWRY 1975), A.H.2 = ARTHUR HARBOR (RICHARDSON & HEDGPETH 1977), A.B. = ADMIRALTY BAY (SICINSKY 1986a), n.d. = NO DATA.

Sites	FAMILY				SPECIES				INDIVIDUALS			
	Errant		Sedent.		Errant.		Sedent.		Errant.		Sedent.	
	N	%	N	%	N	%	N	%	N	%	N	%
Ch.B.	11	42.3	15	57.7	71	34.5	135	65.5	535	6.8	7332	93.2
A.H.1	6	35.3	11	64.7	8	25.0	24	75.0	112	3.9	3684	96.1
A.H.2	11	36.7	19	63.3	30	29.4	72	70.6	nd.		n.d.	
A.B.	9	36.0	16	64.0	17	28.3	43	71.7	191	4.5	4077	95.5

*Without *Owenia* sp. from St. 56.

Table 6

MAXIMUM NUMBERS OF FAMILIES, SPECIES AND INDIVIDUALS OF POLYCHAETA PER 0.270 m² AND STATISTICS AS FOUND IN 18 STATIONS FROM ADMIRALTY BAY, KING GEORGE ISLAND (FROM SICINSKY 1986a).

Groups	Number/0.270 m ²	Mean	S.D.
Families	18	10.2	4.5
Species	31	15.2	6.9
Individuals	619	237.2	193.7

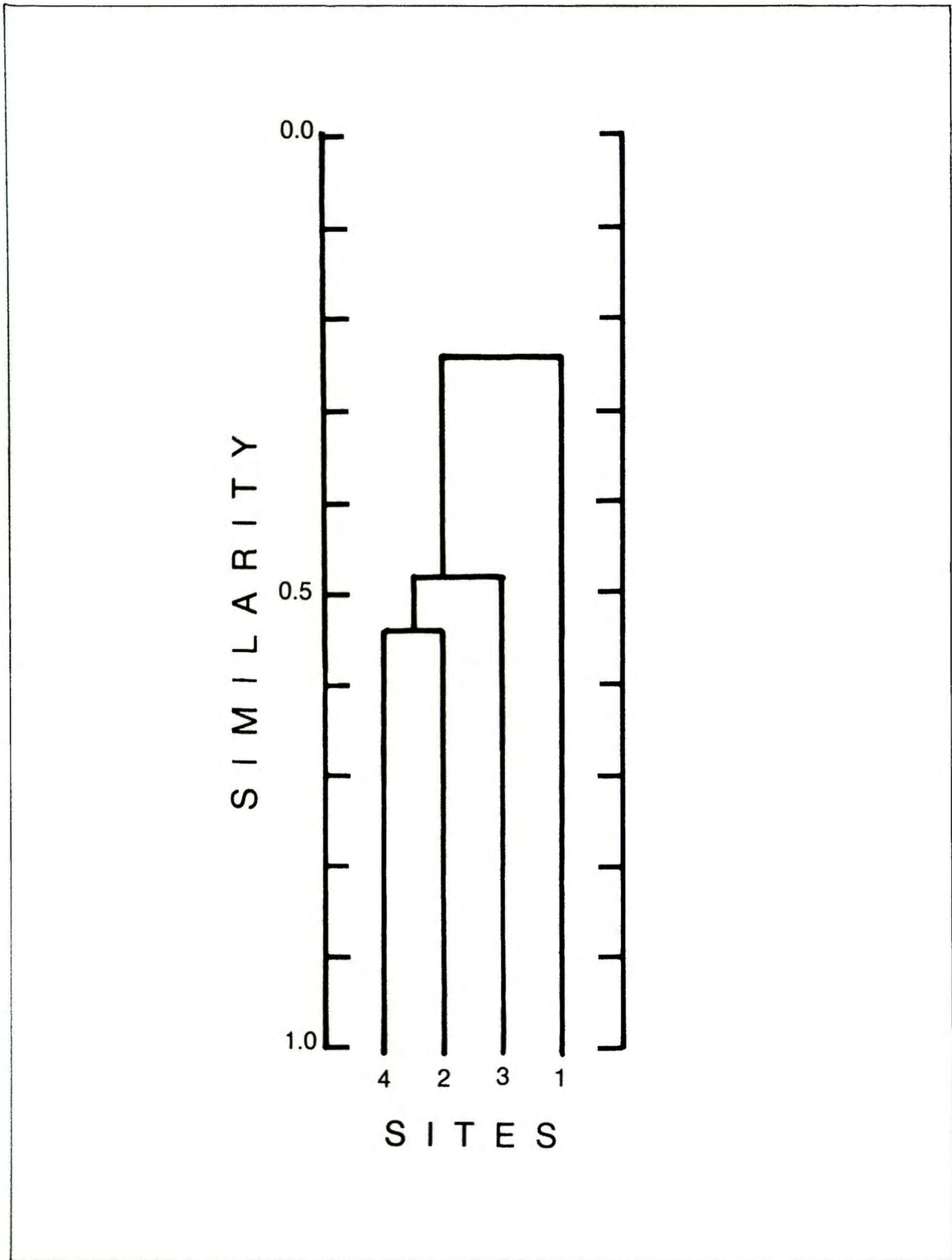


Fig. 2. Dendrogram showing the degree of similarity among the sublittoral soft-bottom Polychaeta assemblages from three Antarctic sites: (1) Chile Bay, Greenwich Island, (2) Arthur Harbor, Anvers Island, (Lowry 1975), (3) Arthur Harbor, Anvers Island, Richardson and Hedgpeth 1977, and (4) Admiralty Bay, King George Island, (Sicinsky, 1986a).

Annex 1

LIST OF QUANTITATIVE BENTHIC STATIONS COVERED IN CHILE (DISCOVERY) BAY, GREENWICH ISLAND, DURING THE XXII CHILEAN ANTARCTIC EXPEDITION (SUMMER OF 1967-1968)

St. N°	Date	Lat. S	Long. W	Depth (m)	Substrate
19	11.01.68	62°29'4	59°39'4	70	Mud
20	"	29'0	39'7	61	"
21	"	28'8	39'6	146	"
22	"	28'5	39'4	196	"
23	"	28'1	39'0	225	"
24	"	27'7	39'1	228	"
25	"	28'0	38'3	200	"
26	"	28'2	38'2	90	"
27	"	28'5	38'4	90	Sandy mud
28	"	28,7	38'5	93	"
29	12.01.68	29'5	40'1	49	"
30	"	30'0	40'1	60	Mud
31*	"	29'1	41'0	39	Sandy mud
32	"	29'2	41'5	71	"
33	"	29'0	42'0	50	"
34	"	29'0	42'1	38	"
35	"	29'0	42'6	48	"
36	"	28'7	42'4	33	Mud
37	"	28'4	41'4	33	Sandy mud
38*	"	28'6	41'6	54	"
39	"	28'9	41'3	54	"
40	"	29'1	40'5	44	"
41	13.01.68	27'2	37'6	220	"
42	"	28'0	36'6	82	"
43	"	27'8	36'4	270	"
44	"	27'6	37'5	249	Mud
45	"	27'4	38'5	139	"
46*	"	27'5	39'0	154	"
47	"	27'7	40'5	66	Sandy mud
48	"	28'2	40'9	73	"
49	"	28'3	40'4	124	"
50	"	28'6	40'5	123	Mud
51	"	28,8	40'6	79	Sandy mud
52	17.01.68	27'2	37'8	252	"
53	"	26'5	39'1	184	"
54	"	26,1	38'3	347	"
55	"	26,1	37'5	355	"
56	"	25'8	37'0	274	Fine sand
57	"	26'3	37'0	294	Mud
58	"	26,7	40'1	90	Mud
60	"	27'9	41'2	54	Sandy mud
61	"	28,1	39,8	188	Mud
62**	13.01.68	28'0	36'6	82	Sandy mud

* Stations not considered in this study.

** A second sample at St. 42.

Annex 2

LIST OF FAMILIES, SPECIES AND DFs OF POLYCHAETA FROM 39 STATIONS
(40 SAMPLES 0.1 m²) COLLECTED IN CHILE (DISCOVERY) BAY DURING THE XXII
CHILEAN ANTARCTIC EXPEDITION (1967-1968).
(STATION NUMBERS AS IN ANNEX 1 AND ABUNDANCES IN PARENTHESIS).

1. POLYNOIDAE

1. <i>Austrolaenilla setobarba</i>	36(1), 39(1), 62(1).
2. <i>Barrukia cristata</i>	27(2), 34(3), 36(1), 40(1), 47(1), 58(1), 61(1).
3. <i>Barrukia</i> sp.	27(1)
4. <i>Eulagisca</i> sp.	33(1).
5. ? <i>Eunoe</i> sp.	19(1), 23(2), 47(1), 50(2).
6. <i>Eunoe</i> sp. 1	36(1), 39(1), 45(1), 62(1).
7. <i>Harmothoe spinosa typica</i>	34(1), 58(1).
8. <i>Harmothoe spinosa</i>	58 (1).
9. <i>Harmothoe</i> sp. 1	34(1), 35(1), 55(1).
10. ? <i>Harmothoe</i> sp.	61(1).
11. <i>Lepidonotus</i> sp.	47(1).
12. Polynoidae sp. A	55(1).
13. Polynoidae sp. B	61(2).

2. PHYLLODOCIDAE

14. <i>Anaitides</i> sp.	22(1).
15. <i>Anaitides bowersi</i>	33(1), 53(1).
16. <i>Anaitides</i> ? <i>longipes</i>	22(1).
17. <i>Eteone sculpta</i>	47(3), 48(1), 62(2).
18. <i>Eulalia varia</i>	21(4), 44(3).
19. <i>Eulalia</i> sp.	48(1).
20. ? <i>Eulalia</i> sp.	25(1), 51(2).
21. <i>Eulalia</i> sp. 1	58(1).
22. <i>Eumida</i> sp. 1	21(1).
23. <i>Eumida</i> sp. 2	25(1), 44(1).
24. ? <i>Genetyllis</i> sp.	61(2).
25. <i>Phyllodoce</i> sp. 2	23(3), 50(2), 62(1).
26. <i>Phyllodoce</i> sp. 1	26(3).
27. <i>Prochaetoparia brevis</i>	21(1).
28. ? <i>Protomystides</i> sp.	50(1).
29. Phyllodocidae sp. A	23(1), 26(1).
30. Phyllodocidae sp. B	47(1), 62(1).

3. HESIONIDAE

31. <i>Gyptis</i> sp.	22(1), 26(1), 47(3), 50(1), 60(2), 61(4).
32. Hesionidae sp. A	50(1), 60(2).

4. PILARGIDAE

33. ? <i>Pilargidae</i> sp.	54(2).
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5. SYLLIDAE

34. ? <i>Exogone</i> sp.	47(1).
35. <i>Exogone gemmifera</i>	23(3), 37(2), 47(5), 52(1), 61(1).

(Annex 2, cont.)

36. **Exogone naidine** 19(2).
37. **Exogone cf. minuscula** 62(12).
38. **Exogone heteroseta** 19(2).
39. **Exogone verugera** 47(1).
40. **Exogonoides ? antenata** 19(2).
41. **Langerhansia cornuta** 19(1), 62(8).
42. **Pionosyllis sp.** 52(1).
43. **Pionosyllis ? stylifera** 26(2), 33(1), 34(1), 45(1), 52(1), 53(1), 54(15).
44. **Syllides articulatus** 33(1).
45. **Typosyllis cf. brachychaeta** 47(1), 61(1).
46. **Syllides longocirrata** 61(1).

6. NEREIDAE

47. **Nicon ehlersi** 25(1), 39(1), 54(1).
48. **Neanthes kerguelensis** 58(3).

7. NEPHTYIDAE

49. **Aglaophamus macroura** 20(1), 22(1), 24(1), 25(1), 26(1), 27(1), 28(1), 29(3), 34(1), 37(1), 42(2), 51(1).
50. **Aglaophamus foliosus** 22(1), 23(1), 41(1).
51. **Aglaophamus sp. 1** 20(2), 21(1), 33(1), 44(1), 50(1), 55(2).
52. **Aglaophamus sp. 2** 30(2).
53. **Aglaophamus sp. 3** 41(1).
54. **Aglaophamus sp. 5** 58(1).

8. SPHAERODORIDAE

55. **Ephesiella sp.** 23(1).
56. **?Levidorum sp.** 50(2).
57. **Sphaerodorum sp. 1** 21(2), 54(3).
58. **Sphaerodorum sp. 2** 23(2), 53(1).
59. **Sphaerephesia sp. 1** 54(1).
60. **Sphaerodopsis sp. 2** 44(1), 60(1), 62(6).
61. **Sphaerodopsis sp. 1** 25(1).

9. GLYCERIDAE

62. **Glycera kerguelensis** 22(1), 23(1), 50(2).
63. **Hemidopus sp.** 24(5), 25(2), 44(4), 54(2).

10. LUMBRINERIDAE

64. **Augeneria tentaculata** 23(4), 24(1), 41(1), 49(1), 61(2).
65. **Augeneria sp.** 25(1).
66. **Augeneria antarctica** 24(1), 61(3).
67. **Lumbrineris cingulata** 22(3).
68. **Lumbrineris magalhaensis** 19(1), 20(2), 21(17), 22(20), 23(23), 24(21), 25(15), 26(1), 27(3), 28(6), 29(2), 39(4), 41(19), 42(5), 44(1), 45(3), 47(4), 48(3), 49(19), 50(1), 51(2), 52(23), 53(5), 54(46), 57(1), 60(1), 61(24).
69. **Lumbrineris sp.** 40(1).

(Annex 2, cont.)

11. DORVILLEIDAE

70. **Dorvillea furcata** 23(1).
71. **Ophryotrocha clapederii** 37(6).

12. ORBINIIDAE

72. **Leistoscoloplos kerguelensis** 19(1), 20(1), 23(2), 27(3), 33(1), 36(1), 37(37),
40(7), 43(2), 45(2), 48(8), 50(2), 60(5), 61(1),
62(24).
73. **Haploscoloplos** sp. 1 51(3).
74. **Haploscoloplos** sp. 2 45(8).
75. **Haploscoloplos** sp. 3 58(1).
76. **Nainereis ? quadricuspida** 37(7), 47(1), 60(10).
77. **Orbinia** sp. 2 54(1).
78. **Orbinia** sp. 1 43(1), 45(1).

13. PARAONIDAE

79. **Aricidea (Acesta) ?assimilis** 45(1), 47(7), 48(1), 50(15), 58(8).
80. **Aricidea (Acesta) ?simplex** 29(1), 37(9), 52(3), 53(3).
81. **Aricidea (Acesta) ?finitima** 58(1).
82. **Aricidea (Aedicira) sp.** 22(1), 33(2), 36(1), 37(2), 39(1), 43(3), 45(9),
54(27), 61(6), 62(7).
83. **?Aricidea** sp. 22(1).
84. **Paraonella** sp. 1 21(3), 23(2), 50(11), 51(1), 62(4).
85. **Paraonella** sp. 2 62(2).
86. **Paraonis** sp. 61(4).
87. **?Paraonis** sp. 57(15).
88. **Tauberia** sp. 19(1), 24(1), 25(1), 29(8), 30(2), 33(1), 34(2),
35(8), 36(38), 37(7), 40(3), 41(1), 43(1),
47(13), 48(4), 58(1), 61(2), 62(2).

14. SPIONIDAE

89. **Laonice antarcticae** 61(3), 62(2).
90. **Laonice** sp. 24(1), 40(2), 42(1), 44(1), 54(7), 61(1), 62(15).
91. **Laonice cirrata** 52(1).
92. **Laonice** sp. 1 48(2), 53(1), 58(15).
93. **Laonice ? weddellia** 61(1).
94. **?Mesospio** sp. 61(1).
95. **?Microspio** sp. 23(2), 61(2).
96. **?Minuspio** sp. 2 23(2).
97. **?Minuspio** sp. 1 23(2).
98. **Pseudomalacoceros** sp. 22(5), 47(1), 61(5).
99. **Spiophanes bombyx** 22(1).
100. **Spiophanes tcherniai** 52(1).
101. **Spiophanes** sp. 22(1), 23(2).
102. **Spiophanes ? soederstroemi** 41(1).
103. **?Spio** sp. 61(1).
104. **Spionidae** sp. A 47(1), 61(1).
105. **Spionidae** sp. B 47(1).
106. **Spionidae** sp. C 23(1), 50(2).
107. **Spionidae** sp. D 35(1).

(Annex 2, cont.)

108. Spionidae sp. E 61(2).
109. Spionidae sp. F 26(2).
110. Spionidae sp. G 25(1).
111. Spionidae sp. H 54(1).

15. CIRRATULIDAE

112. **Chaetozone** ? **setosa** 22(1), 23(2), 25(6), 57(1).
113. **Chaetozone** sp. 3 23(1), 61(2).
114. **Chaetozone** sp. 1 60(51).
115. **Chaetozone** sp. 2 57(3).
116. **Cirriformia filigera** 22(1).
117. **Cirriformia filiformis** 51(2).
118. **Cirratulus** sp. 47(1).
119. **Tharyx cincinnatus** 19(17), 20(6), 21(25), 22(27), 23(27), 24(64),
25(75), 26(10), 28(35), 29(31), 30(42), 32(2),
33(65), 34(14), 35(2), 36(50), 37(35), 39(41),
40(43), 41(2), 43(8), 44(33), 45(11), 47(81),
48(76), 49(1), 50(73), 51(31), 52(24), 54(2),
57(16), 58(11), 60(99), 61(27), 62(28).
120. **Tharyx fusiformis** 22(4), 25(4), 26(1), 50(4), 61(8).
121. **Tharyx** sp. 1 23(23), 26(12), 35(11), 37(299), 50(9), 61(22).
122. **Tharyx** sp. 2 19(1), 22(6), 23(1), 35(25), 37(267), 39(5),
47(148), 50(19), 57(2), 62(11).
123. ?**Tharyx** sp. 61(1).

16. FLABELLIGERIDAE

124. **Diplocirrus** sp. 2 23(2), 29(2), 37(1), 45(1), 50(4).
125. **Diplocirrus** sp. 1 23(3).
126. Flabelligeridae sp. A 40(1).
127. **Pherusa** ? **swakopianus** 26(1).
128. **Pherusa** sp. 1 21(3), 24(3), 25(3), 47(1), 61(2).

17. SCALIBREGMIDAE

129. **Scalibregma inflatum** 19(1), 20(1), 21(2), 26(2), 28(8), 48(9), 50(10),
51(1), 58(4), 60(2), 62(2).
130. **Scalibregma** sp. 48(1).

18. OPHELIIDAE

131. **Ophelina breviata** 19(3), 21(16), 22(2), 23(14), 24(3), 25(14),
26(15), 28(4), 30(1), 32(1), 36(2), 39(1),
40(11), 44(2), 45(7), 47(2), 48(4), 50(14),
51(1), 52(8), 53(5), 54(1), 57(2), 58(1), 60(1),
61(13), 62(1).
132. **Ophelina** sp. 1 22(1), 23(1), 26(6), 37(17), 47(21), 54(54),
60(8), 62(5).
133. **Ophelina** sp. 3 48(9), 53(2)
134. **Ophelina** ? **breviata** 37(1), 58(1).

(Annex 2, cont.)

19. CAPITELLIDAE

135. **Notomastus (Clistomastus) lineatus** 22(1), 23(6), 24(2), 32(1), 41(1), 44(2), 52(2), 61(8).
136. **Capitella** sp. 47(1), 57(1).
137. **Capitellidae** sp. A 40(2).

20. MALDANIDAE

138. **Asychis amphiglypta** 19(1), 20(7), 21(2), 22(2), 24(5), 25(3), 32(4), 34(3), 37(1), 39(19), 41(15), 43(2), 45(21), 48(1), 49(3), 50(2), 52(17), 53(7), 54(13), 55(23), 56(26), 57(37), 58(4), 61(16).
139. **Axiothella antarctica** 19(5), 20(3), 21(11), 23(17), 24(3), 25(6), 26(2), 29(3), 30(2), 33(3), 34(1), 37(1), 40(1), 41(13), 42(13), 44(1), 45(16), 48(2), 49(13), 50(12), 52(3), 53(3), 54(2), 56(32), 58(6), 61(7), 62(20).
140. ?**Clymenura** sp. 34(2).
141. **Lumbriclymenella robusta** 23(1), 24(2), 34(1), 37(2), 55(16), 57(1).
142. **Maldane sarsi** 50(2), 51(1).
143. **Maldane sarsi antarctica** 19(19), 20(14), 21(228), 22(170), 23(134), 24(242), 25(298), 27(1), 28(1), 29(3), 30(3), 32(26), 33(18), 34(1), 39(17), 40(2), 41(470), 42(3), 43(163), 44(298), 45(35), 48(1), 49(150), 50(45), 51(5), 52(391), 53(18), 54(98), 55(47), 56(14), 57(4), 58(17), 61(104), 62(3).
144. **Maldanidae** sp. A 41(1).
145. **Nichomache monroi** 21(1), 41(3), 52(1), 58(1).
146. **Praxillela kerguelensis** 25(2), 27(1), 29(2), 30(5), 32(2), 34(2), 39(3), 45(1), 47(2), 49(2), 52(1).
147. **Rhodine loveni** 19(3), 20(1), 21(2), 23(1), 24(1), 25(2), 26(5), 27(6), 34(13), 37(3), 40(1), 41(3), 42(24), 43(2), 44(15), 45(18), 47(7), 48(4), 50(3), 52(2), 53(9), 54(1), 55(2), 56(88), 57(50), 58(8), 62(29).
148. **Rhodine** sp. 44(1).

21. OWENIIDAE

149. **Owenia** sp. 26(7), 33(1), 34(6), 47(1), 56(5440), 62(2).

22. PECTINARIIDAE

150. **Cistenides ehlersi** 54(1).

23. AMPHARETIDAE

151. **Ampharete kerguelensis** 21(1), 22(1), 26(1), 27(2), 41(1), 44(2), 47(1), 48(2), 58(1), 60(1), 61(1).
152. **Ampharete** sp. 1 25(1), 39(1).
153. **Ampharete** sp. 2 22(1), 25(2), 52(3), 54(2).
154. **Amphicteis gunneri antarctica** 41(1), 55(2), 61(1).
155. **Amphicteis gunneri** 21(1), 25(1), 48(1), 54(1).

(Annex 2, cont.)

156. **Anobothrus** sp. 54(1), 58(1), 62(3).
157. **Anobothrus patagonicus** 26(4), 27(1), 44(1).
158. **Anobothrus antarcticus** 44(2), 54(2).
159. Ampharetidae sp. C 21(1), 50(1).
160. Ampharetidae sp. D 22(1), 61(1).
161. **Grubaniella antarctica** 50(1).
162. **Melinna cristata** 40(1).
163. **Neosabellides elongatus** 58(1), 60(1), 62(1).
164. **Sosanides ? glandularis** 51(1).
165. Ampharetidae sp. A 25(1).

24. TERESELLIDAE

166. ?**Amaena** sp. 48(8).
167. Amphitritinae sp. A 47(1).
168. **Amphitrite kerguelensis** 34(1), 36(3), 42(1), 45(2), 58(2), 60(1), 61(1).
169. **Amphitrite** sp. 61(1).
170. ?**Axionice** sp. 58(1).
171. **Lysilla loveni macintoshi** 53(3), 58(1), 62(2).
172. **Lysilla** sp. 2 22(2), 27(1), 36(1).
173. **Lysilla** sp. 1 24(1).
174. **Nicolea** sp. 51(1).
175. **Phisidia** sp. 19(3), 33(1), 42(1), 47(4), 50(2), 55(1).
176. **Pista ? corrientis** 61(3).
177. **Pista cristata** 19(9), 25(1), 33(2), 37(1), 39(2), 40(1), 45(1), 47(1), 48(1), 50(1), 53(1), 57(1), 62(5).
178. **Pista** sp. 2 20(1), 39(1), 42(2).
179. **Pista** sp. 1 54(3).
180. **Polycirrus** sp. 2 48(1).
181. **Polycirrus** sp. 1 21(1), 51(1), 58(1).
182. **Proclea glabrolimbata** 19(2), 21(1), 23(1), 26(4), 27(1), 28(1), 33(4), 36(1), 39(3), 42(1), 43(4), 45(18), 47(3), 48(1), 50(2), 51(1), 52(2), 53(3), 58(5), 62(80).
183. **Proclea** sp. 34(1).
184. ?**Proclea** sp. 34(3).
185. **Streblosoma** sp. 22(3), 23(4), 24(12), 25(6), 26(10), 28(1), 40(1), 41(2), 43(1), 44(3), 50(1), 52(9), 54(4), 61(2).
186. **Thelepus cincinnatus** 22(1), 58(2).
187. ?**Thelepides** sp. 58(1).
188. **Artacama proboscidea** 40(1), 48(10).
189. Terebellidae sp. A 19(1).
190. Terebellidae sp. B 36(1).

25. TRICHOBRANCHIDAE

191. **Octobranchus phyllocomus** 47(1), 53(1), 58(3), 62(15).
192. **Terebellides stroemi kerguelensis** 19(1), 22(2), 23(1), 26(2), 33(1).
193. **Terebellides stroemi** 20(1), 23(3), 25(3), 29(2), 30(3), 32(3), 33(1), 36(1), 39(2), 40(1), 41(1), 42(1), 48(1), 51(1), 54(2), 55(1).
194. **Trichobranchus glacialis antarcticus** 21(1), 37(2), 54(5).

(Annex 2, cont.)

26. SABELLIDAE

195. Amphiglena sp.	50(1).
196. Amphiglena mediterranea	62(1).
197. Chone sp.	37(26), 47(2), 62(13).
198. Euchone sp.	19(15), 47(5), 60(2), 62(1).
199. Euchone sp. 1	62(1).
200. Fabricia sabella	62(33).
201. Jasmineira caeca	61(1).
202. Jasmineira sp.	28(1), 42(1), 48(1), 51(1), 53(2), 58(1).
203. ? Potamethus sp.	22(1), 25(1), 51(1).
204. Potamethus sp.	21(1), 27(1).
205. Sabellidae sp. A	29(1).
206. Sabellidae sp. B	54(1).

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