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# Polychaeta (Annelida) of Admiralty Bay: species richness, diversity, and abundance

ABSTRACT: The checklist of Admiralty Bay polychaetes elaborated on the basis of historical and current data includes 120 benthic and 5 pelagic species. Admiralty Bay is the most intensively sampled area in the Antarctic, taking into account polychaete fauna, and the checklist of Polychaeta may be therefore considered as a rather comprehensive one. In the sublittoral soft bottom three dominant species: *Leitoscoloplos kerguelensis, Tauberia gracilis* and *Ophelina syringopyge* constitute almost 50% of all collected polychaetes (20%, 16% and 13% respectively). *Rhodine intermedia, Tharyx cincinnatus, Aricidea (Acesta) strelzovi, Apistobranchus sp., Cirrophorus brevicirratus, Microspio moorei, Maldane sarsi antarctica, Aglaophamus ornatus* and *Asychis amphiglypta* make up a group of species of considerable abundance (a further 30% of author's collection). The average abundance of polychaetes of the sublittoral soft bottom was estimated at 120 individuals per 0.1 $m^2$, with the observed maximum 390 individuals per 0.1 $m^2$.

Key words: Antarctica, Polychaeta, biodiversity.

## Introduction

Polychaetes, along with crustaceans, molluscs, and echinoderms, are the richest and most diverse group of marine invertebrates. Fauchald (1977) and Pettibone (1982) estimated the number of extant species to be greater than 8000. In the UNESCO Report of Marine Organisms (Land, 1994) the number of 7400 world marine polychaete species is suggested, which makes up almost 6% of all known marine animals. 600 species of polychaetes were described from Antarctic areas, although the total number of these animals was estimated at 800 (Knox and Lowry 1977). Recent data of Hartmann-Schröder (1983, 1986, 1993), as well as Hart-

mann-Schröder and Rosenfeldt (1988–1992), from West Antarctica suggest that this number may be significantly higher.

The first data on common polychaete species from Admiralty Bay came from Gravier (1911). This was the part of the collection by the second French Antarctic Expedition (1908–1910) in the "*Pourquoi Pas?*", which investigated the areas of the western side of the Antarctic Peninsula. In the littoral and sublittoral zones five species were then found, namely: *Travisia olens, Microspio moorei, Capitella perarmata, Polycirrus kerguelensis* as well as *Branchiomma* sp. Two more species, *Amphitrite kerguelensis* and *Pista godfroyi*, were recorded at a depth of 75 m while *Austrophyllum charcoti, Neanthes kerguelensis, Lumbrineris magalhaensis, Laetmonice producta* and *Flabelligera mundata* at a depth of 420 m. Seventeen years later, in 1927, the bottom of Admiralty Bay was penetrated by the British "Discovery" expedition. At a depth of 391 m additional polychaetes were collected, to enlarge the checklist by a further 14 species (Monro 1930). The most abundant were *Asychis amphiglypta, Maldane sarsi antarctica* and *Perkinsiana antarctica*, and the less abundant: *Harmothoe magellanica, Harmothoe spinosa, Harmothoe crosetensis, Harmothoe cristata, Antinoe setobarba, Nephthys macrura, Lumbriclymenella robusta, Amphicteis gunneri* var. *antarctica, Pista corrientis, Thelepus cincinnatus* and *Euchone pallida.* The checklist of Polychaeta published by Siciński (1986) extended the number of polychaete species from Admiralty Bay by a further 24 species. Polychaeta from the German "Polarstern" expedition in 1984 (Hartmann-Schröder and Rosenfeldt 1988, 1989), partly collected in Admiralty Bay, supplemented the list by a further 55 species. Thirteen of them appeared to be new to science.

The quantitative aspect of the Admiralty Bay soft bottom polychaete assemblages was a matter of interest to a few authors. The pattern of polychaete distribution in the outlet area of Ezcurra Inlet was described by Siciński (1983). More detailed studies on polychaete assemblages in three chosen regions of the bay were carried out by Siciński (1986). The data on the abundance and distribution of some dominant polychaete species in the shallowest sublittoral of the northern part of Admiralty Bay was presented by Wägele and Brito (1990), and in the southern part of the Bay by Siciński and Janowska (1993). Additional information on polychaete assemblages of Admiralty Bay is available in the papers by Siciński (1992, 1993, 1994). The picture of polychaete assemblage of Admiralty Bay was described in detail by Siciński (1998). Here, the author limits himself to only general remarks on polychaete fauna diversity in Admiralty Bay.

## The investigated area

Admiralty Bay has for many years been an area for research activity for Belgian, Brazilian, German, and Polish biologists. Polychaetes and amphipod crusta-

ceans make this basin a very significant one taking into account the abundance, biomass, species' richness, and the biological differentiation of these two groups (Jażdżewski *et al.* 1986, 1991; Jażdżewski and Siciński 1993, Siciński 1993). Several authors have described in many respects the environment of Admiralty Bay. Detailed data on its hydrology and hydrography is given by Pruszak 1980, Samp 1980, Marsz 1983, Lipski 1987 and others. The informations has been recently collected by Rakusa-Suszczewski (1993). Relatively extensive data on the bottom sediments of Admiralty Bay was presented by Siciński (1998). The bay has been recently designated as a key site for the SCAR Program "Ecology of the Antarctic Sea-Ice Zone 1994–2004".

## Material and methods

Material for the quantitative analysis was collected from the soft bottom in the years 1979–1988 during the author's participation in Polish Antarctic Expeditions of the Polish Academy of Sciences to the *H. Arctowski* Polish Antarctic Station. Much of the material was collected in 1985. The shallower sublittoral was sampled to the depth of 165 m.

The investigated area (Fig. 1) included Ezcurra Inlet and a part of the central basin of Admiralty Bay. This makes up about 20% of the total surface area of the bay. Eighty-six replicate samples were collected using Van Veen grab with sampling area of 0.1 $m^2$. In the shallow sublittoral down to the depth of 30 m, and in the compact sandy bottom, the Tvärminne type bottom sampler (Kangas 1972) operated by SCUBA divers was used. In this part of the bottom 8 replicate samples were collected. The sediments were sieved through 0.5 mm mesh sieves.

The quantitative analysis is based on 90 polychaete species. Some of representatives of the Cirratulidae family and Euclymeniinae subfamily are not taken into account in this analysis. It was impossible to count specimens of these extremely delicate animals. Only a small part of them is usually adequately preserved, and identification of a greater part is unfortunately unfeasible. The difficulties involved in satisfactory establishment of the number of specimens is also the reason for the rejection of Spirorbidae from analysis.

## Results

### Species richness, the checklist of Admiralty Bay polychaetes

In Table 1 the current checklist of polychaetes hitherto recorded in Admiralty Bay is presented. With respect to the polychaete fauna the basin seems to be the most intensively sampled area in the whole Antarctic. The checklist presented, comprising 120 benthic and 5 pelagic species, may be considered as relatively ac-

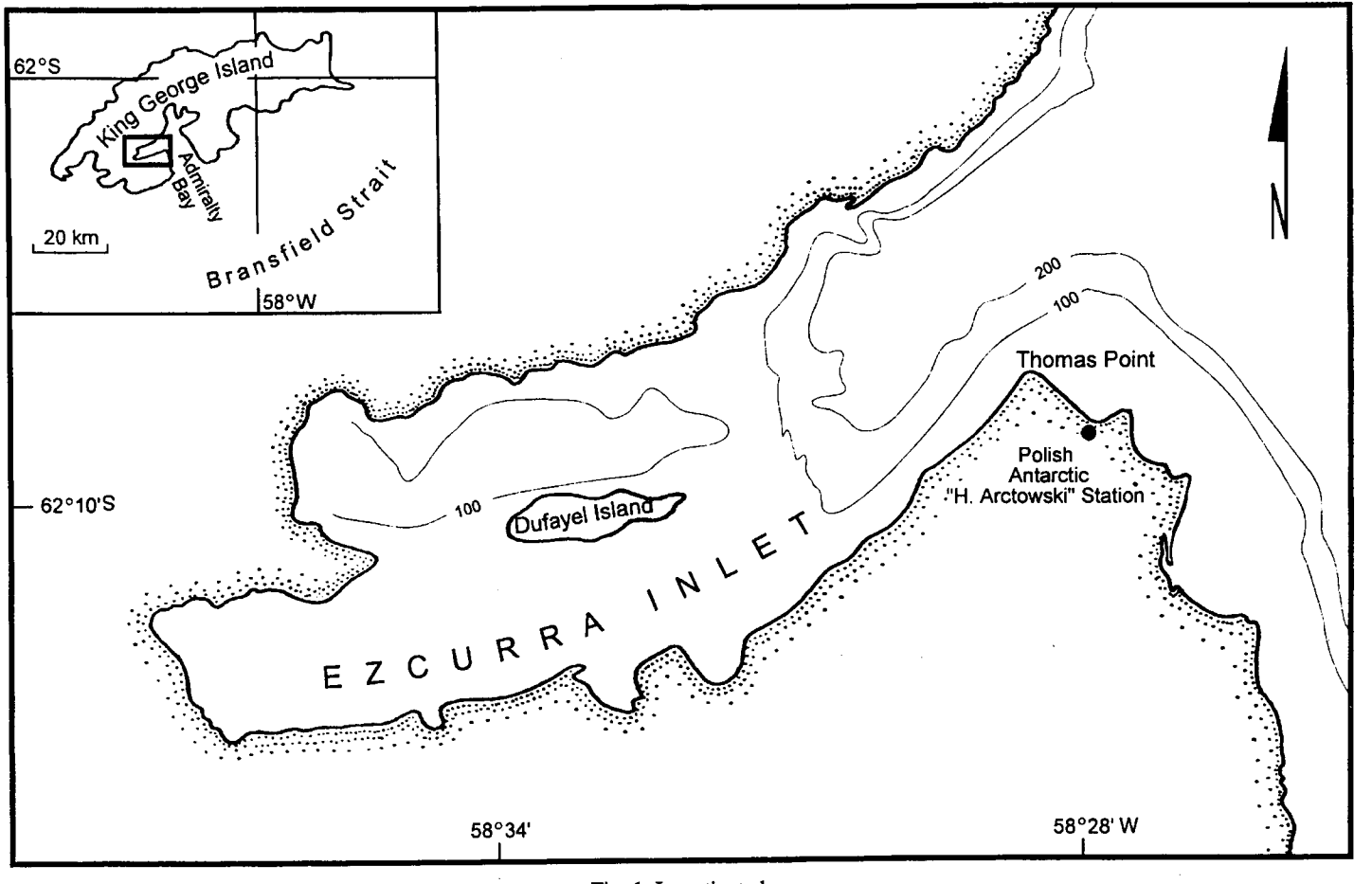


Fig. 1. Investigated area.

curate and comprehensive. In the present author's collection there are some specimens of uncertain generic status: *Polynoidae* spp., *Maldanidae* spp., *Ampharetinae* gen. sp., *Amphitritinae* gen. sp., *Thelepinae* gen. sp., *Oweniidae* gen. sp., and *Sabellinae* spp., as well as some others not yet identified to the species level, namely: *Sphaerodorum sp., Flabelligera sp., Capitella sp., Leaena sp.* The identification of *Harmothoe kerguelensis* (MacIntosh, 1885) and *Aedicira belgicae* (Fauvel, 1936) in the papers by Siciński (1986, 1991) as well as by Arnaud *et al.* (1986) are erroneous. Also the determination *Sphaerodoridium antarcticum* (McIntosh, 1885) is doubtful. All these species are therefore not included in the Table 1. In addition the species not precisely identified in the paper by Siciński (1998) presented in Table 2 are also not included in the checklist. *Nereis eugeniae* (Kinberg, 1866) in the papers by Siciński (1983, 1986) as well as by Arnaud *et al.* (1986) is in fact *Ceratonereis* (*Composetia*) *antarctica* Hartmann-Schröder and Rosenfeldt (1988). The previous determination was wrong. The collective name Serpulidae *sensu lato* (Siciński 1986) actually encompasses three species from the Spirorbidae family listed in Table 1. Some incomplete previous determinations in the papers by Siciński (1986) and Arnaud *et al.* (1986) are now clarified as follows:

*Harmothoe* sp. – *Harmothoe spinosa*
*Aglaophamus* sp. – *Aglaophamus ornatus*
*Glycera* sp. – *Glycera kerguelensis*
*Lumbrineris* sp. – *Lumbrineris magalhaensis*
*Dorvilleidae* g. sp. – *Ophryotrocha notialis*
*Spiophanes* sp. – *Spiophanes tcherniai*
*Brada* sp. – *Brada villosa*
*Ammotrypane* sp. – *Ophelina syringopyge* and *Ophelina cylindricaudata*
*Notomastus* sp. – *Notomastus latericeus*
*Nicomache* sp. – *Nicomache monroi*
*Maldanidae* g. sp. 1 – *Asychis amphiglypta*

Table 1

The checklist of Admirality Bay polychaetes (explanations in text).

| author | Gravier 1911 | Monro 1930 | Siciński 1986a 1986b | Hartmann-Schröder, Rosenfeldt 1988, 1989 | Siciński and Janowska 1993 | Siciński 1998 |
|---|---|---|---|---|---|---|
| depth range | 0–420m | 391m | 15–250m | 20–458m | 5–30m | 5–165m |
| **Aphroditidae** | | | | | | |
| *Laetmonice producta* Grube, 1877 | * | | | * | | |
| **Polynoidae** | | | | | | |
| *Antinoella setobarba* (Monro, 1930) | | * | * | * | | * |
| *Barrukia cristata* (Willey, 1902) | | * | * | * | | * |
| *Eucranta mollis* (McIntosh, 1876) | | | | | | * |
| *Harmothoe crosetensis* (McIntosh, 1885) | | * | | | | |
| *Harmothoe magellanica* (McIntosh, 1885) | | * | | | | ? |

Table 1 continued.

| | | | | | | |
|---|---|---|---|---|---|---|
| *Harmothoe spinosa* Kinberg, 1855 | | * | * | * | | * |
| *Polynoe antarctica* Kinberg, 1858 | | | | * | | |
| **Phyllodocidae** | | | | | | |
| *Anaitides patagonica* (Kinberg, 1866) | | | * | * | | * |
| *Austrophyllum charcoti* (Gravier, 1911) | * | * | * | | | * |
| *Eteone sculpta* Ehlers, 1897 | | | | * | * | * |
| *Eulalia sotniki* Averincev, 1971 | | | | * | | |
| *Genetyllis polyphylla* (Ehlers, 1897) | | | | * | | * |
| *Mystides borealis* Theel, 1879 | | | | * | | |
| *Notalia picta* (Kinberg, 1866) | | | | * | | * |
| **Hesionidae** | | | | | | |
| *Kefersteinia fauveli* Averincev, 1972 | | | | * | | |
| **Syllidae** | | | | | | |
| *Autolytus charcoti* Gravier, 1906 | | | | | | * |
| *Brania rhopalophora* (Ehlers, 1897) | | | | * | * | * |
| *Exogone heterosetoides australis* Hartmann-Schroeder and Rosenfeldt, 1988 | | | | | | * |
| *Exogone heterosetosa* McIntosh, 1885 | | | * | * | * | * |
| *Exogone obtusa* Hartmann-Schroeder and Rosenfeldt, 1988 | | | | | | * |
| *Exogone tridentata* Hartmann-Schroeder and Rosenfeldt, 1993 | | | | | | ? |
| *Pionosyllis maxima* Monro, 1930 | | | | * | | |
| *Sphaerosyllis antarctica* Gravier, 1907 | | | | * | | |
| *Sphaerosyllis hirsuta* Ehlers, 1897 | | | | | | * |
| *Syllides articulosus* Ehlers, 1897 | | | | * | | * |
| **Nereididae** | | | | | | |
| *Ceratonereis (Composetia) antarctica* Hartmann-Schroeder and Rosenfeldt, 1988 | | | * | * | | * |
| *Neanthes kerguelensis* (McIntosh, 1885) | * | | * | * | * | * |
| **Nephtyidae** | | | | | | |
| *Aglaophamus ornatus* Hartman, 1967 | | | | | * | * |
| *Aglaophamus macroura* (Schmarda, 1861) | | ? | | | | |
| **Sphaerodoridae** | | | | | | |
| *Ephesiella muelenhardte* Hartmann-Schroeder and Rosenfeldt, 1989 | | | | | | |
| *Ephesiella antarctica* (McIntosh, 1885) | | | * | | | |
| *Sphaerodoropsis arctovskyensis* Hartmann-Schroeder and Rosenfeldt, 1988 | | | | | | * |
| *Sphaerodoropsis parva* (Ehlers, 1913) | | | | | | * |
| **Glyceridae** | | | | | | |
| *Glycera kerguelensis* McIntosh, 1885 | | | | | | * |
| **Lumbrineridae** | | | | | | |

Table 1 continued.

| | | | | | | |
|---|---|---|---|---|---|---|
| *Lumbrineris magalhaensis* (Kinberg, 1865) | * | * | | | * | * |
| **Dorvilleidae** | | | | | | |
| *Ophryotrocha notialis* (Ehlers, 1908) | | | | | | * |
| *Parougia furcata?* (Hartman, 1953) | | | | | | * |
| *Schistomeringos furcata* (Hartman, 1953) | | | | * | | |
| **Onuphidae** | | | | | | |
| *Kinbergonuphis notialis* (Monro, 1930)** | | | | | | |
| **Orbiniidae** | | | | | | |
| *Leitoscoloplos kerguelensis* (McIntosh, 1885) | | | * | * | * | * |
| *Orbinia (Phylo) minima* Hartmann-Schroeder and Rosenfeldt, 1990 | | | | | | * |
| *Scoloplos (Leodamas) marginatus* (Ehlers, 1897) | | | * | | * | * |
| **Paraonidae** | | | | | | |
| *Aricidea (Acesta) strelzovi* Hartmann-Schroeder and Rosenfeldt, 1988 | | | | * | | * |
| *Aricidea (Allia) antarctica* Hartmann-Schroeder and Rosenfeldt, 1988 | | | | * | | * |
| *Aricidea (Allia) oculata* Hartmann-Schroeder and Rosenfeldt, 1990 | | | | * | | |
| *Cirrophorus brevicirratus* Strelzov, 1973 | | | | * | * | * |
| *Tauberia gracilis* (Tauber, 1879) | | | * | * | | * |
| **Spionidae** | | | | | | |
| *Laonice weddellia* Hartman, 1978 | | | | * | | ? |
| *Microspio moorei* (Gravier, 1911) | * | | | * | * | * |
| *Pygospiopsis dubia* (Monro, 1930) | | | | * | | * |
| *Scolelepis eltaninae* Blake, 1983 | | | | | | ? |
| *Spiophanes tcherniai* Fauvel, 1950 | | | | * | * | * |
| **Apistobranchidae** | | | | | | |
| *Apistobranchus gudrunae* Hartmann-Schroeder and Rosenfeldt, 1988 | | | | * | * | ? |
| **Cirratulidae** | | | | | | |
| *Cauleriella homosetosa* Hartmann-Schroeder and Rosenfeldt, 1989 | | | | | | * |
| *Chaetozone setoza* Malmgren, 1867 | | | | * | | ? |
| *Cirriformia pentatentaculata* Hartmann-Schroeder and Rosenfeldt, 1989 | | | | * | | |
| *Cirratulus parafiliformis* Hartmann-Schroeder and Rosenfeldt, 1989 | | | | * | | |
| *Tharyx cincinnatus* (Ehlers, 1908) | | | * | * | | * |
| *Tharyx epitoca* Monro, 1930 | | | * | * | * | |
| *Tharyx fusiformis* Monro, 1939 | | | | * | | |

** Siciński, unpubl.

Table 1 continued.

| | | | | | | |
|---|---|---|---|---|---|---|
| **Flabelligeridae** | | | | | | |
| *Brada villosa* (Rathke, 1843) | | | | * | | * |
| *Flabelligera mundata* Gravier, 1906 | * | | | | | * |
| *Pherusa kerguelarum* (Grube, 1877) | | | | | | * |
| **Scalibregmidae** | | | | | | |
| *Scalibregma inflatum* Rathke, 1843 | | | * | | | * |
| **Opheliidae** | | | | | | |
| *Ophelina cylindricaudata* (Hansen, 1878) | | | | * | | * |
| *Ophelina gymnopyge* (Ehlers, 1908) | | | | * | | |
| *Ophelina syringopyge* (Ehlers, 1901) | | | | * | * | * |
| *Travisia kerguelensis* McIntosh, 1885 | | | * | * | * | * |
| *Travisia olens* Ehlers, 1897 | * | | | | | |
| **Sternaspidae** | | | | | | |
| *Sternaspis scutata* (Ranzani, 1817) | | | * | * | | * |
| **Capitellidae** | | | | | | |
| *Capitella capitata* (Fabricius, 1780) | | | | * | * | * |
| *Capitella perarmata* (Gravier, 1911) | * | | | | | |
| *Notomastus latericeus* Sars, 1851 | | | | * | | * |
| **Maldanidae** | | | | | | |
| *Asychis amphiglypta* (Ehlers, 1897) | | * | | * | | * |
| *Eupraxillella antarctica* Hartmann-Schroeder and Rosenfeldt, 1989 | | | | * | | |
| *Lumbriclymenella robusta* Arwidsson, 1911 | | * | * | * | | * |
| *Maldane sarsi antarctica* Arwidsson, 1911 | | * | * | * | | * |
| *Nicomache monroi* Hartman, 1967** | | | | | | |
| *Praxillella kerguelenensis* (McIntosh, 1885) | | | * | | | * |
| *Rhodine intermedia* Arwidsson, 1911 | | | * | * | * | * |
| **Oweniidae** | | | | | | |
| *Myriochele joinvillensis* Hartmann-Schroeder and Rosenfeldt, 1989 | | | | * | | |
| *Myriochele wilsoni* (Blake, 1984) | | | | * | | * |
| **Ampharetidae** | | | | | | |
| *Amage sculpta* Ehlers, 1908 | | | | * | | * |
| *Ampharete kerguelensis* McIntosh, 1885 | | | | * | | * |
| *Amphicteis gunneri* (Sars, 1835) | | * | * | * | | * |
| *Anobothrella antarctica* (Monro, 1939) | | | | * | | |
| *Anobothrus patagonicus* (Kinberg, 1867) | | | * | | | |
| *Neosabellides elongatus* (Ehlers, 1912) | | | * | * | | * |
| *Phyllocomus crocea* Grube, 1877 | | | * | * | | * |
| **Terebellidae** | | | | | | |
| *Amphitrite kerguelensis* McIntosh, 1876 | * | * | * | * | | * |

Table 1 continued.

| | | | | | | |
|---|---|---|---|---|---|---|
| *Artacama proboscidea* Malmgren, 1866 | | | * | | | * |
| *Axionice spinifera* (Ehlers, 1908) | | | * | * | | * |
| *Hauchiella tribullata* (McIntosh, 1869) | | | * | | | * |
| *Lanicides bilobata* (Grube, 1877) | | | * | | | * |
| *Leaena antarctica* McIntosh, 1885 | | | | * | | |
| *Nicolea chilensis* (Schmarda, 1861) | | | | * | | |
| *Phisidia rubrolineata* Hartmann-Schroeder and Rosenfeldt, 1989 | | | | * | | |
| *Pista corrientis* McIntosh, 1885 | | * | | | | |
| *Pista godfroyi* (Gravier, 1911) | * | | | | | |
| *Pista patriciae* Hartmann-Schroeder and Rosenfeldt, 1989 | | | | | | * |
| *Polycirrus kerguelensis* (McIntosh, 1885) | * | | | | * | |
| *Proclea graffii* (Langerhans, 1884) | | | | * | | |
| *Terebella ehlersi* Gravier, 1906 | | | | | | * |
| *Thelepides koehleri* Gravier, 1911 | | | | | | * |
| *Thelepus cincinnatus* (Fabricius, 1780) | | * | * | * | | * |
| **Trichobranchidae** | | | | | | |
| *Octobranchus sexlobatus* Hartmann-Schroeder and Rosenfeldt, 1989 | | | | * | | * |
| *Terebellides stroemi kerguelensis* McIntosh, 1885 | | | * | | | * |
| *Trichobranchus glacialis antarcticus* Hessle, 1917 | | | | * | | * |
| **Sabellidae** | | | | | | |
| *Amphiglena mediterranea* (Leydig, 1851) | | | | * | | |
| *Desdemona antarctica* Hartmann-Schroeder and Rosenfeldt, 1989 | | | | * | | |
| *Euchone pallida* Ehlers, 1908 | | * | * | * | | * |
| *Oriopsis limbata* (Ehlers, 1897) | | | | | * | |
| *Oriopsis longipyge* Hartmann-Schroeder and Rosenfeldt, 1989 | | | | * | | |
| *Perkinsiana antarctica* (Kinberg, 1867) | | * | * | * | | * |
| **Spirorbidae** | | | | | | |
| *Paralaeospira antarctica* (Pixell, 1913) | | | | | | * |
| *Paralaeospira levinseni* (Caullery and Mesnil, 1897) | | | | | | * |
| *Protolaeospira (Dextralia) stalagmia* Knight-Jones and Walker, 1972 | | | | | | * |
| **Serpulidae** | | | | | | |
| *Serpula narconensis* Baird, 1865 | | | | | | * |
| *Helicosiphon biscoensis* Gravier, 1907 | | | | | | * |

As regards *Rhodine loveni* in the papers by Siciński (1986) and Arnaud *et al.* (1986), the opinion of Hartmann-Schröder and Rosenfeldt (1989) is accepted that *Rhodine antarctica, Rhodine loveni* sensu Willey (1902) and Gravier (1911) as well as *Rhodine intermedia* Arwidsson (1911) may be the same species. Some uncertain determinations are marked in the Table 1 with a question mark. The presence in Admiralty Bay of *Nephthys macroura* Schmarda, 1861 recorded by Monro (1930) was never confirmed, not only in the Bay but also in the whole West Antarctic. One can suppose that the species mentioned by Monro is in fact *Aglaophamus ornatus* Hartmann, a very frequent and relatively abundant polychaete in Admiralty Bay as well as in other Antarctic seas. The status of *Apistobranchus* sp. in the papers by Siciński (1986 and 1998) as well as by Arnaud *et al.* (1986) needs some clarifications. It is not quite clear whether *Apistobranchus gudrunae* described by Hartmann-Schröder and Rosenfeldt (1988) from Admiralty Bay is the *Apistobranchus* sp. mentioned by Siciński (1986, 1998). The taxa from the paper by Siciński (1986) designated by serial numbers (Maldanidae gen. sp. 2 and 3 as well as Sabellinae gen. sp. 1 and 2) are not included in the present checklist. Maldanidae gen. sp. 1 is actually *Asychis amphiglypta.*

Two further species recorded in Admiralty Bay by Hartmann-Schröder and Rosenfeldt (1989), namely *Lanassa sp.* and *Leaena* cf. *collaris*, as well as *Branchiomma* sp. mentioned by Gravier (1911), are also not included in the Table 1.

Five holopelagic polychaete species were encountered in the pelagic zone of the Bay, namely:

Alciopidae
*Rynchonerella bongraini* (Gravier, 1911)
Lopadorhynchidae
*Maupasia coeca* Viguier, 1886
*Pelagobia longicirrata* Greef, 1879
Typhloscolecidae
*Travisiopsis levinseni* Southern, 1910
*Typhloscolex muelleri* Busch, 1851

**Domination, frequency, and species abundance**

The basis for the quantitative characteristics listed below is the author's own collection.

Nearly 50% of all polychaetes found in Admiralty Bay are formed by three dominant species: *Leitoscoloplos kerguelensis, Tauberia gracilis* and *Ophelina syringopyge*, having a share in the total material of 20%, 16%, and 13%, respectively. Also *Rhodine intermedia, Tharyx cincinnatus, Aricidea (Acesta) strelzovi, Apistobranchus* sp., *Cirrophorus brevicirratus, Microspio moorei, Maldane sarsi antarctica, Aglaophamus ornatus* and *Asychis amphiglypta* are species of considerable abundance; they constitute a further 30% of the collection. All species mentioned above were characterized by a high frequency, ranging from 25% to 70% (Table 2). The

most common was *Leitoscoloplos kerguelensis*, the presence of which was confirmed in nearly all the stations, independent of the depth and the type of the bottom. It is interesting to note that it was a dominant species in 1/3 of the stations. Besides *Leitoscoloplos kerguelensis*, *Aglaophamus ornatus* was another abiding species. These species were characterised by high values of population density, sometimes exceeding 200 individuals per 0.1 $m^2$ of the bottom (Table 2).

Table 2

Mean and maximal abundances, domination and frequencies of 90 polychaete species from shallower sublittoral of Admiralty Bay (on the basis of 94 quantitative samples).

| | Species | Mean density (ind./0.1$m^2$) | Domination (%) | Frequency (%) | Maximal density (ind./0.1$m^2$) |
|---|---|---|---|---|---|
| 1 | *Leitoscoloplos kerguelensis* | 23.9 | 19.8 | 88.3 | 135 |
| 2 | *Tauberia gracilis* | 19.4 | 16.1 | 48.9 | 176 |
| 3 | *Ophelina syringopyge* | 16.0 | 13.3 | 69.1 | 183 |
| 4 | *Rhodine intermedia* | 10.0 | 8.3 | 64.9 | 210 |
| 5 | *Tharyx cincinnatus* | 6.0 | 5.0 | 37.2 | 74 |
| 6 | *Aricidea strelzovi* | 4.0 | 3.3 | 26.6 | 66 |
| 7 | *Apistobranchus* sp. | 3.7 | 3.1 | 30.9 | 102 |
| 8 | *Cirrophorus brevicirratus* | 3.6 | 3.0 | 29.8 | 58 |
| 9 | *Microspio moorei* | 3.3 | 2.7 | 11.7 | 99 |
| 10 | *Maldane sarsi antarctica* | 2.7 | 2.3 | 30.9 | 42 |
| 11 | *Aglaophamus ornatus* | 2.3 | 1.9 | 73.4 | 10 |
| 12 | *Asychis amphiglypta* | 2.3 | 1.9 | 25.5 | 33 |
| 13 | *Aricidea antarctica* | 1.9 | 1.5 | 35.1 | 23 |
| 14 | *Capitella capitata* | 1.3 | 1.1 | 25.5 | 26 |
| 15 | *Ophelina cylindricauda* | 1.2 | 1.0 | 19.1 | 35 |
| 16 | *Chaetozone* sp. | 1.0 | 0.8 | 22.3 | 19 |
| 17 | *Lumbrineris magalhaensis* | 1.0 | 0.8 | 37.2 | 9 |
| 18 | *Barrukia cristata* | 0.9 | 0.7 | 33.0 | 9 |
| 19 | *Myriochele wilsoni* | 0.9 | 0.7 | 17.0 | 25 |
| 20 | *Sphaerodoropsis* sp. | 0.8 | 0.7 | 18.1 | 44 |
| 21 | *Scoloplos marginatus* | 0.8 | 0.6 | 10.6 | 38 |
| 22 | *Exogone heterosetoides australis* | 0.8 | 0.6 | 19.1 | 19 |
| 23 | *Spiophanes tscherniai* | 0.7 | 0.6 | 21.3 | 15 |
| 24 | *Exogone* sp. | 0.7 | 0.6 | 16.0 | 10 |
| 25 | *Lumbriclymenella robusta* | 0.7 | 0.6 | 20.2 | 18 |
| 26 | *Amphitritinae* gen. sp. | 0.6 | 0.5 | 9.6 | 31 |
| 27 | *Neanthes kerguelensis* | 0.5 | 0.4 | 20.2 | 10 |
| 28 | *Amphitrite kerguelensis* | 0.5 | 0.4 | 27.7 | 5 |
| 29 | *Genetyllis polyphylla* | 0.5 | 0.4 | 11.7 | 21 |
| 30 | *Amphicteis gunneri* | 0.5 | 0.4 | 16.0 | 14 |
| 31 | *Harmothoe spinosa* | 0.4 | 0.4 | 22.3 | 9 |
| 32 | *Perkinsiana antarctica* | 0.4 | 0.4 | 13.8 | 10 |
| 33 | *Sphaerodoropsis arctowskyensis* | 0.4 | 0.4 | 11.7 | 11 |
| 34 | *Exogone heterosetosa* | 0.4 | 0.3 | 20.2 | 7 |
| 35 | *Brada villosa* | 0.4 | 0.3 | 16.0 | 9 |
| 36 | *Pista patriciae* | 0.4 | 0.3 | 16.0 | 8 |
| 37 | *Orbinia minima* | 0.4 | 0.3 | 13.8 | 8 |
| 38 | *Sphaerodoropsis parva* | 0.4 | 0.3 | 6.4 | 19 |

Table 2 continued.

| | | | | | |
|---|---|---|---|---|---|
| 39 | *Euchone pallida* | 0.4 | 0.3 | 18.1 | 4 |
| 40 | *Travisia kerguelensis* | 0.3 | 0.3 | 10.6 | 7 |
| 41 | *Brania rhopaloropha* | 0.3 | 0.2 | 11.7 | 7 |
| 42 | *Neosabellides elongatus* | 0.3 | 0.2 | 13.8 | 7 |
| 43 | *Exogone obtusa* | 0.2 | 0.2 | 8.5 | 9 |
| 44 | *Orbinia* sp. | 0.2 | 0.2 | 8.5 | 8 |
| 45 | *Austrolaenilla setobarba* | 0.2 | 0.2 | 13.8 | 4 |
| 46 | *Thelepus cincinnatus* | 0.2 | 0.2 | 9.6 | 6 |
| 47 | *Nicomachine* gen. sp. | 0.2 | 0.2 | 5.3 | 12 |
| 48 | *Trichobranchus glacialis* | 0.2 | 0.2 | 7.4 | 5 |
| 49 | *Proclea graffii* | 0.2 | 0.1 | 6.4 | 6 |
| 50 | *Anaitides patagonica* | 0.2 | 0.1 | 10.6 | 3 |
| 51 | *Sphaerosyllis hirsuta* | 0.1 | 0.1 | 6.4 | 6 |
| 52 | *Ophryotrocha notialis* | 0.1 | 0.1 | 8.5 | 3 |
| 53 | *Syllides articulosus* | 0.1 | 0.1 | 9.6 | 3 |
| 54 | *Terebellides stroemi* | 0.1 | 0.1 | 9.6 | 2 |
| 55 | *Oriopsis* sp. | 0.1 | 0.1 | 8.5 | 2 |
| 56 | *Phyllocomus crocea* | 0.1 | 0.1 | 8.5 | 3 |
| 57 | *Notalia picta* | 0.1 | 0.1 | 8.5 | 2 |
| 58 | *Streblosoma* sp. | 0.1 | 0.1 | 4.3 | 5 |
| 59 | *Thelepides koehleri* | 0.1 | 0.1 | 3.2 | 4 |
| 60 | *Ampharete kerguelensis* | 0.1 | 0.1 | 5.3 | 3 |
| 61 | *Autolytus charcoti* | 0.1 | 0.1 | 5.3 | 3 |
| 62 | *Ephesiella* sp. 1 | * | 0.1 | 5.3 | 2 |
| 63 | *Octobranchus sexlobatus* | * | 0.1 | 2.1 | 5 |
| 64 | *Praxillella kerguelensis* | * | * | 4.3 | 2 |
| 65 | *Lanicides bilobata* | * | * | 5.3 | 1 |
| 66 | *Glycera kerguelensis* | * | * | 4.3 | 2 |
| 67 | *Eteone sculpta* | * | * | 2.1 | 3 |
| 68 | *Artacama proboscidea* | * | * | 4.3 | 1 |
| 69 | *Flabelligera mundata* | * | * | 2.1 | 3 |
| 70 | *Ampharetinae* gen. sp. | * | * | 3.2 | 1 |
| 71 | *Nicomache* sp. | * | * | 3.2 | 1 |
| 72 | *Polycirrus kerguelensis* | * | * | 3.2 | 1 |
| 73 | *Terebella ehleri* | * | * | 2.1 | 2 |
| 74 | *Polynoidae* gen. sp. X | * | * | 2.1 | 2 |
| 75 | *Scalibregma inflatum* | * | * | 3.2 | 1 |
| 76 | *Pygospiopsis dubia* | * | * | 1.1 | 3 |
| 77 | *Pherusa kerguelarum* | * | * | 2.1 | 1 |
| 78 | *Laonice weddellia* | * | * | 2.1 | 1 |
| 79 | *Ephesiella* sp. 2 | * | * | 1.1 | 2 |
| 80 | *Ceratonereis antarctica* | * | * | 2.1 | 1 |
| 81 | *Notomastus latericeus* | * | * | 1.1 | 1 |
| 82 | *Eucranta mollis* | * | * | 1.1 | 1 |
| 83 | *Hauchiella tribullata* | * | * | 1.1 | 1 |
| 84 | *Tharyx fusiformis* | * | * | 1.1 | 1 |
| 85 | *Austrophyllum charcoti* | * | * | 1.1 | 1 |
| 86 | *Parougia furcata* | * | * | 1.1 | 1 |
| 87 | *Flabelligera* sp. 1 | * | * | 1.1 | 1 |
| 88 | *Flabelligera* sp. 2 | * | * | 1.1 | 1 |
| 89 | *Polynoidae* gen. sp. Y | * | * | 1.1 | 1 |
| 90 | *Capitella perarmata* | * | * | 1.1 | 1 |

* less than 0.1

The average number of polychaete species per one sample (0.1 $m^2$ of the surface) equals 13 (±10 SD) with n = 94. Maximum value was 48 species in one sample.

The mean polychaete population density equalled 120 (±100 SD) individuals per 0.1 $m^2$ (n=94), with a maximum value of 390 individuals per 0.1 $m^2$. The 95% confidence limits is within 100–140 individuals per 0.1 $m^2$.

The species richness of the polychaete fauna in the investigated part of Admiralty Bay, expressed by the Margalef index equals 9.53. The species diversity expressed by the Shannon (H') index, has been calculated as 2.95. Its theoretical maximum value, calculated for the group of 90 species analysed here equals 4.5. The evenness, calculated on the basis of the Shannon index, frequently attains high values, nearly 84%. Its mean value for the entire tested area equals 65.5%. The diversity has also been calculated on the basis of the Simpson formula and equals 90.2%.

## Discussion

Until now the soft bottom surface of Admiralty Bay has revealed 120 species of Polychaeta (Gravier 1911; Monro 1930; Siciński 1986, 1998; Hartmann-Schröder and Rosenfeldt 1988, 1989; Siciński and Janowska 1993). One should expect a moderate increase in this list as parts of the bottom from 300 m to the deepest parts have not yet been sufficiently penetrated. The polychaete species number is similar to the number of amphipods known from the Bay, which was estimated by Jażdżewski *et al.* (*in press*) at 126. Both these taxa are most important in terms of species richness and diversity in Admiralty Bay.

The richness of the Polychaeta species in Admiralty Bay may be presented as follows. It is possible that the 120 species determined constitute in Antarctic a typical value for a basin of this size. The results of the research on Polychaeta within selected areas of Antarctica, although not rich, allow for making comparisons. The sea areas, which in size could at least be partially comparable to Admiralty Bay, have been taken into consideration. Only such studies have been taken into consideration that were similar in their intensity and methods.

On the basis of the data from Lowry (1975) and Richardson and Hedgpeth (1977) the number of known polychaete species from Arthur Harbour (Anvers Island, Palmer Archipelago) can be estimated at about 110–120. This number is close to the above-mentioned number for Admiralty Bay. On the Elephant Island shelf, within the depth range from 70 m to 552 m, using different collecting techniques, 126 species of Polychaeta have been found (Hartmann-Schröder and Rosenfeldt 1990, 1991). A smaller species richness has been found in the Terra Nova Bay (Ross Sea) at the depth from 23 to 194 m. Gambi *et al.* (1997) found 77

species of Polychaeta there, treating this number as very high against the background of 146 species known generally for the entire Ross Sea. Terra Nova Bay is about twice as large as Admiralty Bay. Rather surprising are the results of studies on Polychaeta in Chile Bay (Greenwich Island), a sea area of about 25 $km^2$, where at the depths of 33 m to 355 m Gallardo *et al.* (1988) determined the presence of 206 species and different forms of Polychaeta. The ambiguity of the term "different forms" used by the authors makes comparison and interpretation of their data difficult. It is interesting to notice that the authors of that paper present a number of species which are not recorded later in many other more up-to-date papers on Polychaeta in West Antarctica. On the other hand this list does not include some species very common in the described area of Antarctica, such examples are eurytopic *Aglaophamus ornatus*, *Ophelina syringopyge*, *Tharyx cincinnatus*, and *Tauberia gracilis*.

The polychaete fauna of Admiralty Bay is dominated by *Leitoscoloplos kerguelensis*, constituting 20% of all soft bottom Polychaeta as far as the number of individuals is concerned. The above-mentioned species as well as *Aglaophamus ornatus*, are marked by a high frequency with values equalling 88% and 73%, respectively. *Leitoscoloplos kerguelenesis* is an extensively widespread species found not only in Antarctic and Subantarctic but also at the southern coasts of South America, Africa, and Australia (Hartmann-Schröder and Rosenfeldt 1990, Branch 1994). In polychaete taxocenes this species belongs to the group of dominants. The same is true for Admiralty Bay (Wägele and Brito 1990), as well as other places located around the entire continent. As far as West Antarctica is concerned the data of Lowry (1975) and Richardson and Hedgpeth (1977) from Arthur Harbour (Anvers Island), as well as the information collected by Hartmann-Schröder and Rosenfeldt (1990) from the Elephant Island shelf (South Shetland Islands) is an evidence of *Leitoscoloplos kerguelensis* commonness and abundance. Similarly in other regions of Antarctic this species proved to be the most abundant species found in a majority of the tested sea areas. This is true for the shallow sublitoral of the Davis Sea (Averincev 1982), in Eastern Antarctic, and Ross Sea (Gambi *et al.* 1997). The observations presented above refer also to the Subantarctic, and are confirmed by the data of Dûchene (1984) and Arnaud (1987) from the Morbihan Bay (Kerguelen Islands). *Leitoscoloplos kerguelensis* is a highly eurytopic species. It has been found at the depth from 3 m to 4099 m (Hartmann-Schröder and Rosenfeldt 1988). Furthermore, similarly as in Admiralty Bay, it was also found on various bottoms, that was confirmed also by the data collected by Dûchene (1984).

On the basis of the hitherto collected data one can suppose that in Admiralty Bay there are no less than about 150 polychaete species because meiobenthos has not been yet studied and the deepest sublittoral as well as some special habitats (*e.g.* brown algae holdfasts) have been insufficiently explored and some further species may be expected from these habitats.

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## Streszczenie

Lista znanych wieloszczetów z Zatoki Admiralicji, opracowana na podstawie danych historycznych i badań współczesnych, obejmuje 120 bentosowych i 5 holopelagicznych gatunków. Akwen należy w Antarktyce do bardzo intensywnie badanych i dlatego prezentowana lista może być traktowana jako względnie dokładna. Należy spodziewać się umiarkowanego jej powiększenia, jako że niektóre szczególne siedliska jak również głęboki sublitoral nie zostały jeszcze dokładniej zbadane. Około 50% wszystkich złowionych przez autora w Zatoce Admiralicji osobników Polychaeta stanowiły trzy dominujące gatunki: *Leitoscoloplos kerguelensis, Tauberia gracilis* i *Ophelina syringopyge,* których udział w całości materiału wynosił odpowiednio 20%, 16% i 13%. Grupę znacząco liczebnych gatunków stanowiły także: *Rhodine intermedia, Tharyx cincinnatus, Aricidea (Acesta) strelzovi, Apistobranchus* sp., *Cirrophorus brevicirratus, Microspio moorei, Maldane sarsi antarctica, Aglaophamus ornatus* i *Asychis amphiglypta,* tworzące dalsze 30% kolekcji. Średnia gęstość zasiedlenia dna przez wieloszczety wynosiła 120 osobników na 0,1 $m^2$ dna. Porównanie z danymi literaturowymi, dotyczącymi samego tylko obszaru Antarktyki skłania ku przekonaniu, że Zatoka Admiralicji pod względem fauny Polychaeta nie wyróżnia się na tle innych, stosunkowo dobrze zbadanych i porównywalnych pod względem wielkości akwenów.