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Faunistic analysis of freshwater zooplankton in small rock pools of Maritime Antarctica

Abstract. Small water bodies like the rock pools are used as a model system for evolutionary and environmental studies with a growing interest. The zooplankton in the rock pools is a most interesting and promising research object. Although the first papers on Antarctic rock pools were published early in the XX century, these water bodies have been not investigated in detail and comprehensively. The paper aims to review and systematize the knowledge on the diversity of the freshwater zooplankton of the Maritime Antarctica, South Shetland Islands and South Orkney Islands. These organisms include meso- and macro- zooplankton (0.2—20 mm) living in the water and unable to propel themselves against a current, 69 taxa in total. The most diverse of them are 52 taxa of rotifers with 4 taxa identified to the subspecies, 44 — to species, and 4 — to genus level. Crustaceans include 16 taxa (14 identified to the species, 1 — to genus, and 1 — to order); 9 taxa belong to branchiopods, 3 — to ostracods, and 4 — to copepods. One insect species, *Parochlus steinenii*, is present in the plankton at the larval stage. Summarizing these results, the rock pools of the fairly well studied South Shetland Islands and South Orkney Islands (41 and 46 taxa, respectively) exhibit diversity of living organisms similar to the comparable waterbodies from other parts of the world, while the rest of the region has a much lower diversity (11 taxa). However, this discrepancy is presumably a research artifact because so far, only a few special studies have been done in the Maritime Antarctica. For example, at the Argentine Islands three identified taxa only (2 crustaceans and 1 rotifer) are known with a number of rotifers awaiting identification.

Keywords: Crustacea, meso- and macro- zooplankton, Rotifera

1 Introduction

The small and ephemeral water bodies are used as model systems for ecological and evolutional studies. A special case is presented by rock pools and their invertebrate communities. The rock pools are shallow indentations in the rock matrix created by erosion and filled mostly by precipitation (Fig. 1). Despite their insignificant size, they can shelter various invertebrate communities. Freshwater, brackish and hyperhaline rock pools are found worldwide in all major biomes and are usually fed by precipitation. Clusters of rock pools are among the most lasting and oldest habitats in the world (Jocqué et al., 2010). Their morphology and hydrology are largely shaped by climatic and geologic factors; the liquid-water periods range from several days to the whole year. The commonly small volumes bring about large fluctuations in the environmental conditions, low electrical conductivity, and significant pH oscillations (e.g., 4.0 to 11.0), often with clear diurnal periodicity (Scholnick, 1994). The short hydroperiod and the very vari-

Figure 1. Antarctic rock pools at Argentine Islands, Antarctic Peninsula

able habitats and lack of connections between individual pools negatively affect the diversity of planktonic organisms and force the organisms to persevere through high environmental plasticity. Some survival adaptations, e.g., to dry spells and icing, include the evolution of hibernating life stages and modifications for easier dissemination and (re)introduction (Jocqué et al., 2010; Williams, 2006).

Zooplankton organisms are a most interesting group as a model for ecological and evolutional studies. The zooplankton is a crucial biotic component that influences functional aspects of all water ecosystems, is a limiting factor in the food chains, and participates in energy transformation (Suresh et al., 2011). The zooplankton can promote or inhibit the development of other organisms, such as phytoplankton (Gleiber et al., 2015). Various environmental forces which sculpt a pool's features play important role in the diversity, bulk, ecology, and biochemistry of its denizens (Sládeček, 1973; Rocco et al., 2002; Suresh et al., 2011). Therefore, the rock pool zooplankton is a promising monitoring object to discover the short-term and long-term changes in the environment and to study the effect of climate change on biological communities (Jocqué et al., 2007).

Jocqué et al. (2010) report 460 identified species of freshwater zooplankton in rock pools worldwide, while Alhassan and Matias-Peralta (2015) — only 230 species. However, Alhassan and Matias-Peralta (2015) do not review Antarctic pools at all, and Jocqué et al. (2010) cite only one paper touching upon the continental Antarctica, (Bayly, 1995). They cite copepods *Boeckella poppei* (Mrázek, 1901), *Acanthocyclops mirnyi* Borutzky & Vinogradov, 1957 (outdated name, currently it is called *Diacyclops mirnyi* (Borutzky & Vinogradov, 1957)) and *Calamoecia sp.*, as well as the cladoceran *Daphnia (Ctenodaphnia) studeri* (Rühe, 1914) in the east of the continent, but they do not review the many papers on the East (Murray, 1910; Laybourn-Parry & Marchant, 1992; Dartnall, 1995; Bayly et al., 2003) and West Antarctica (Dartnall & Hollowday, 1985; Dartnall, 2017; Díaz et al., 2019).

The real diversity of rock pool invertebrates is much higher in Antarctica. Dartnall (2017) reports 336 identified taxa of freshwater invertebrates (12 identified to subspecies, 254 — to species, 70 — to genera or a higher level) in total for Antarctica, including 1 cnidarian, 7 flatworms, 115 monogonont rotifers, 25 bdelloid rotifers, 1 Micrognathozoa, 6 gastrotrichs, 35 roundworms, 25 annelids, 25 tardigrades, 7 insects, 52 crustaceans, and 37 chelicerans. This includes 121 taxa (7 identified to subspecies, 77 — to species, 37 — to genera or a higher level) from Maritime Antarctica (2 flatworms, 47 monogonont rotifers, 12 bdelloid rotifers, 4 gastrotrichs, 20 roundworms, 5 annelids, 19 tardigrades, 1 insect and 11 crustaceans). Díaz et al. (2019) provide data for 66 crustacean taxa (1 identified to subspecies, 60 — to species, 5 — to genera, 22 belong

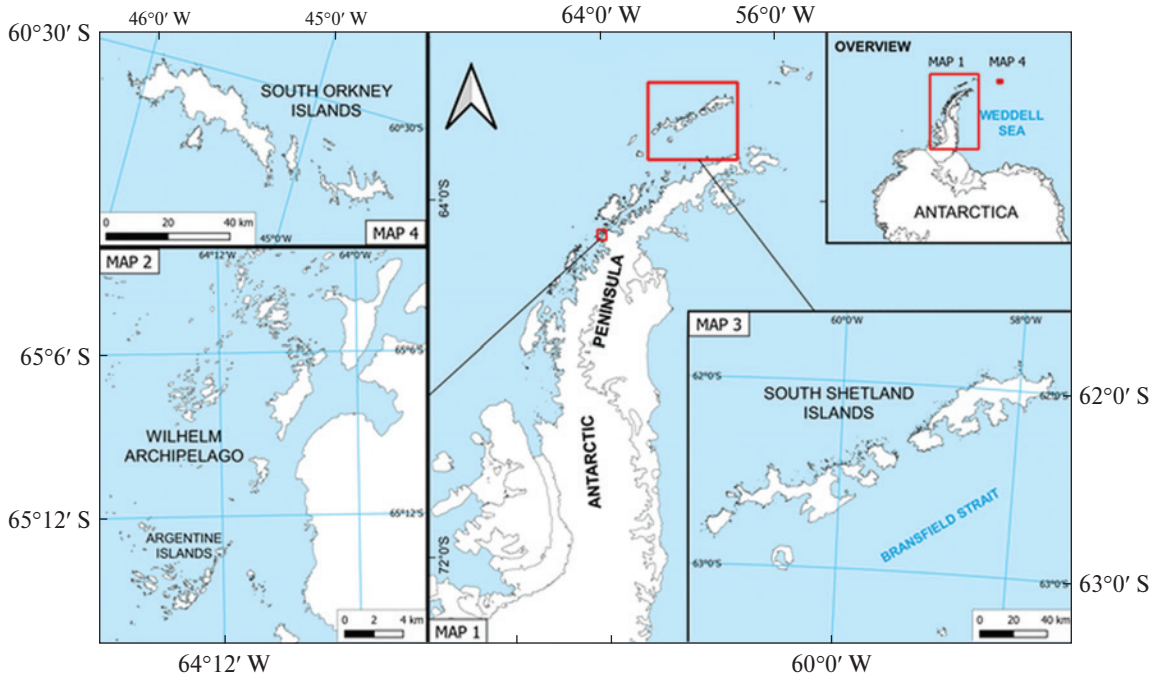

Figure 2. Study areas of the Maritime Antarctica. Map Source: SCAR ADD v7.3 (2020)

to branchiopods, 12 — to ostracods, 24 — to copepods, 7 — to amphipods, and 1 — to isopods). Nine of them were from the Maritime Antarctica (8 identified to species, 1 — to genus; 5 branchiopods, 2 ostracods, and 2 copepods). Janiec and Salwicka (1996) list 12 species of roundworms, 11 tardigrades, 11 rotifers, and 2 crustaceans from samples collected on King George Island.

Our work aims to review and systematize the published data of the diversity of meso- and macrozooplankton of the Maritime Antarctica.

2 Materials and methods

The data from the region of the Maritime Antarctica only were considered (Fig. 2) (Díaz et al., 2019). Data were used both from previously published works that considered the region and from the Global Biodiversity Information Facility (GBIF, https://www.gbif.org/). Our own previously unpublished data were not used in this article.

We review the freshwater species of meso- and macrozooplankton (0.2—20 mm) from the rock pools which live in the water during their whole lives or during a certain developmental period only. The validity of all taxa was checked against the World Register of Marine Species (WoRMS) database (https://www.marinespecies.org/) and Rotifer World Catalog (http://www.rotifera.hausdernatur.at/). For convenience's sake, the review operates not with the same-level taxa (for example, Calanoida, Anomopoda, and Anostraca) but with the more traditional ones or their valid analogues, such as Copepoda, Anostraca, and Diplostraca. Some sources divide the considered rock pools into big lakes and small pools. However, they do not provide clear criteria for the division. For convenience, in this work freshwater reservoirs are defined in the same way as in the cited sources, such as lakes or pools.

3 Results

The zooplankton of Antarctic rock pools is represented by several animal taxa such asprotozoa, rotifers, and crustaceans (mostly branchiopods and maxillopods). Besides, zooplankton includes the larval stages of other organisms (the meroplankton). The protozoans are omitted here as they belong to the microzooplankton, not mesozooplankton.

In total, different authors identified 69 zooplankton organisms (Table, Appendix) in the Maritime Antarctica rock pools. Four of them were identified to subspecies or morph, 59 — to species, and 6 — to genera or a higher level. Rotifers are the basis of rock pool diversity. In total, different authors have recorded here 52 taxa (4 identified to subspecies, 44 — to species, and 4 — to genera) of rotifers belonging to 17 genera of 10 families and 1 order. The crustaceans are represented by 16 taxa (of which 14 were identified to species, 1 — to genus and 1 — to order): 9 taxa are branchiopods (all identified to species level), 3 are ostracods (2 species and 1 genus), and 4 are copepods (3 identified to species, 1 to order). Besides that, only one other species belonging to the Hexapoda subphyla, *Parochlus steinenii* (Gercke, 1889) (Diptera: Chironomidae), joins the community as a larva.

Most of the discovered works concerned the South Orkney (60° S) and South Shetland (62° S) islands. Data are scarce for the Argentine Islands (65° S). Only 1 article was found dedicated to the southern edge of Maritime Antarctica. Dartnall (1980) lists 3 crustaceans for the water bodies around the Rothera Station (Adelaide Island, 67° S).

Rotifera

Of the phylum Rotifera, only the class Eurotatoria is living in Antarctic freshwater rock pools. Eurotatoria includes subclasses Bdelloidea (only benthic species in the study area) and Monogononta.

Rotifers are the most diverse group of Antarctic freshwater zooplankton. They were first recorded in small freshwater reservoirs on the Ross Island and to the west of the McMurdo Sound by Shackleton's first expedition in 1907—1909 (Murray, 1910). A while later, rotifers were found in the Antarctic Peninsula area. Schmitt (1945) notes a benthic rotifer *Philodina gregaria* Murray, 1910, in the freshwater reservoirs of the Red Rock Ridge, Graham Land; Dartnall and Hollowday (1985) found three plankton rotifers in rock pools of the Antarctic Peninsula: *Colurella colurus* (Ehrenberg, 1830), *Resticula gelida* (Harring & Myers, 1922) and *Encentrum sp.* The authors record 30 species in large lakes, 8 in small rock pools of the Signy Island, and 15 on the South Georgia Island. In total, their paper lists 42 rotifer taxa (1 subspecies, 40 species, and 1 rotifer identified to the genus level), of which 27 belonged to plankton. Such a diversity of rotifers on Signy Island compared to other regions (Dartnall & Hollowday, 1985) is explained by the quality and intensity of research; the authors stress that often the samples are collected and analyzed not by zooplankton specialists, which might have an impact on the data quality. The example they provide is Murray (1910), who isolated 15 species from the Ross Island rock pools and 8 from the Signy Island. Dartnall and Hollowday (1985) suppose that the real rotifer diversity on the Antarctic continent and Maritime Antarctica might be far larger than the currently known.

Further rotifer research in the region focused more on the South Shetlands, particularly on the King George Island. Thus, Janiec (1993) provides 10 species of monogonont rotifers for the Admiralty Bay; later, Janiec and Salwicka (1996) list 11 species. Downie et al. (2000) found *Notholca walterkostei* José de Paggi, 1982, *Cephalodella sp.*, and 3 unidentified bdelloid rotifers on the Deception Island. Toro et al. (2006) report unidentified rotifers on the Livingston Island. Nędzarek and Pociecha (2010) report 5 rotifer species in the lakes of the King George Island. A large study by Dartnall (2017) lists 47 rotifer species, with 36 distributed in the plankton all over Maritime Antarctica. In total, the mentioned authors record 52 plankton rotifer taxa in the Maritime Antarctica's freshwater reservoirs. Four were identified to subspecies, 44 — to species, and 4 — to genera (Table, Appendix).

Between the identified species (Table, Appendix), *Notholca salina* Focke, 1961 is of special significance because it was recorded on the South Orkney and the South Shetland Islands (Dartnall, 2017). However, this species is currently considered extinct (Segers, 2007) and needs to be verified.

Arthropoda

Of the Arthropoda, only Hexapoda and Crustacea are recorded in Antarctic freshwater zooplankton. Some Hexapoda develop in the water (meroplankton) or live their whole lives in it (for example, Dytis-

cidae) and belong to benthoneuston (also not considered here). Crustacea are mostly aquatic, including plankton and freshwater species.

Crustacea

Crustaceans are the most well-studied and documented group of Antarctic invertebrates. All eight major orders are found here, although there are fairly few data on Amphipoda and Isopoda (Dartnall, 2017). The freshwater zooplankton of the Maritime Antarctica is represented by four main groups: Anostraca (2 species), Diplostraca (7), Copepoda (4), and Ostracoda (3).

Although the first studies of the freshwater invertebrates of the Maritime Antarctica are known from the turn of the XX century (Murray, 1906), for a while, they were limited to sample collection (Heywood, 1967). Thorough research of freshwater crustaceans in the region began in the 1960s. Heywood (1967) lists 1 Anostraca (*Branchinecta gaini* Daday, 1910), 3 Diplostraca (*Macrothrix hirsuticornis* Norman & Brady, 1867, *Alona rectangula* G.O. Sars, 1862 (now called *Coronatella rectangula* (G.O. Sars, 1862)), and *Ilyocryptus brevidentatus* Ekman, 1905, 2 Copepoda (*Pseudoboeckella silvestri* Daday, 1901 (now called *Boeckella silvestri* (Daday, 1901)) and *Parabroteas sarsi* (Daday, 1901)), and 2 Ostracoda (*Cypridopsis frigogena* Graf, 1931 (now called *Neocypridopsis frigogena* (Graf, 1931)) and *Eucypris sp.*) on the Signy Island. Heywood (1977) reports the copepod *Boeckella poppei* (Mrázek, 1901) and an unidentified marine cyclopoid in the lakes on the Alexander Island. Dartnall (1980) lists 3 crustaceans for the water bodies around the Rothera Station (Adelaide Island). Janiec (1993) and Janiec and Salwicka (1996) report the copepod *Boeckella poppei* and *Branchinecta gaini* (Anostraca) in the Admiralty Bay (King George Island). About the same organisms for Lake Wujka (King George Island) report Trokhymets et al. (2021). Downie et al. (2000) report *B. poppei* and an unidentified harpacticoid on the Deception Island. Toro et al. (2006) mentioned about 4 crustaceans in the lakes of the Livingston Island, including the *Daphnia* (*Ctenodaphnia*) *studeri* (Rühe, 1914) (Diplostraca), which is typical for the Eastern Antarctica and had not been noted in the region before. A large crustacean-focused study (Díaz et al., 2019) described 66 species for the continent as a whole and 9 — for the Maritime Antarctica. Polishuk et al. (2009) and Chernov et al. (2020) report *Boeckella poppei* and *Branchinecta granulosa* Daday, 1902 in the Argentine Islands water bodies. Notably, the latter species has not been reported by any other author from any part of Antarctica.

In total, different authors recorded in the Maritime Antarctica 14 crustaceans identified to the species level, 1 identified to the genus, and 1 — to the order (Table, Appendix). These numbers are quite low; of them, only 2 species are widely distributed (*Branchinecta gaini* and *Boeckella poppei*). There is also a tendency to the lower crustacean species diversity with growing latitude. Thus, the most diversity is recorded on the South Orkney Islands, with almost all (14) taxa of the crustaceans found in the region, and the Maritime Antarctica is the poorest (5 taxa). The rotifers, on the other hand, are the most diverse on the South Shetland Islands.

Besides these taxa, in the coastline rock pools at the edge of the splash zone, marine littoral harpacticoids of the genus *Tigriopus* Norman, 1869 (Park et al., 2014) can be found at any time, but these are not freshwater species.

Hexapoda

The subphylum Hexapoda is represented in the area of the Maritime Antarctica in the freshwater plankton by a single chironomid, *P. steinenii*, possibly introduced from the South Georgia Island, first found on the King George Island by Torres (1956). It was later described also from the Livingston Island (Edwards & Usher, 1985). However, Agius et al. (2009) considered the remnants of the species in the sediments of the Byers Peninsula (Livingston Island), probably deposited much earlier, and so doubted the species's recent introduction.

4 Discussion

The zooplankton community of the Antarctic rock pools appears more poor in comparison to other fresh-

water reservoirs. This is typical for water bodies with a short hydroperiod (Williams, 2006). However, compared to rock pools from other regions, the diversity is not exactly low. Thus, Pinder et al. (2000) list 71 taxa for the rock pools of Australia; Jocque et al. (2007) mention 47 taxa in the water bodies of Utah, USA; and according to Tavernini (2008), there are 53 taxa found in the rock pools of the northern Apennines, Italy. Thus, the diversity of the freshwater zooplankton in Antarctica is comparable with other latitudes. However, much diversity in the region is typical only for the South Shetland and South Orkney Islands (41 and 46 taxa, respectively) which lie not higher than the 62nd parallel and have the mildest climate in the region. The more southerly region of Maritime Antarctica with its 11 taxa seems thus much poorer. Yet some authors (Dartnall & Hollowday, 1985) suppose that the insufficiently thorough and specialized sampling, rather than latitude, might be the reason for the apparent lack of variety. This might indeed be the case, seeing as the most of the diversity is found on the Signy Island (South Orkneys) and King George Island (South Shetlands) which have been researched in detail for many years. For the rest of the region, relatively little work has been published compared to South Shetlands and South Orkneys. Other authors point out that a significant limiting factor can be the duration of the period of liquid water, which decreases with increasing latitude. Williams (2006) notes that already with a reduction in the hydroperiod to less than 150 days/year, a decrease in the number of recorded taxa is observed, compared with water bodies with a hydroperiod of 150—250 days. However, it can be argued that Murray (1910) records 15 species of rotifers for Ross Island (75° S), which is much more to the south of the Argentine Islands, but nevertheless shows a greater diversity of identified taxa. Therefore, the assumption about insufficient knowledge of the region is more likely. With an active study of the plankton of such Antarctic water bodies located at different latitudes, we will be able to understand which of the proposed versions are correct.

The freshwater invertebrates of the Argentine Islands (65° S, 64° W) of the Wilhelm Archipelago have been studied rarely and little, with more attention paid to soil and epiphytic organisms. For example, Trokhymets and Tancredi (2009) provided data on collembolans of the Petermann, Galindez, and Great Yalour Islands. Trokhymets et al. (2014) list 28 invertebrates from the moss banks of the Petermann Island. As for the freshwater plankton invertebrates, only *Boeckella poppei* and *Branchinecta granulosa* Daday, 1902 were registered on the Galindez Island, Skua Island and The Barchans (Polishuk et al., 2009). These two species and several unidentified monogonont rotifers were found on the Uruguay Island (Chernov et al., 2020). According to Fontaneto et al. (2015), the rotifer *Colurella colurus* (Ehrenberg, 1830) was found on the Petermann Island. As for the branchiopod *B. granulosa*, it was not listed before in Antarctica, and (Polishuk et al., 2009; Chernov et al., 2020) do not mention another species found all over Antarctica, *Branchinecta gaini*. However, *B. granulosa* is known in the southern areas of Chile and Argentina (Rogers et al., 2020), and given the branchiopods' ability to disseminate with migrating birds, the species just can be present in the West Antarctica. This calls for an in-depth revision of the genus *Branchinecta* Verrill, 1869 on the Argentine Islands.

Three identified species are found in the region: 2 crustaceans and 1 rotifer, and an unknown number of unidentified ones (Uruguay Island rotifers). In addition, the status of one of the identified species requires a more detailed review. This is evidence of an insufficient level of research of the freshwater zooplankton of the region. The situation is complicated due to the ongoing climate change.

Regarding individual taxonomic groups, according to the reviewed sources, rotifers exhibit the highest diversity in Antarctic freshwater zooplankton (52 taxa of 69). Copepods and branchiopods were observed most regularly in the rock pools, although they had less diversity (16 taxa). The most well-studied group is crustaceans (Dartnall, 2017). However, this is probably due to the lower group diversity and higher occurrence.

5 Conclusions

The rock pools of the Antarctic continent and the Maritime Antarctica are still sparsely studied. The

overall 69 various freshwater zooplankton taxa in the region were reported by different authors. The basis of the zooplankton diversity is formed by the rotifers (52 taxa, 4 identified to subspecies, 44 — to species, and 4 — to genera). Crustaceans include 16 taxa (14 identified to species, 1— to genus, 1 — to order), of which 9 are branchiopods, 3 are ostracods, and 4 are copepods. Besides, only one other organism, *P. steinenii*, was found in the plankton as larvae.

Overall, the Antarctic rock pools do not exhibit a much lower diversity than the similar water bodies worldwide. However, this was confirmed for the South Shetland and South Orkney Islands only. The rest of the regions have a much lower diversity (41, 46, and 11 taxa, respectively). This may be due to the latitude, duration of the hydroperiod, and insufficient knowledge of the rest of the region. A more detailed study can significantly improve our knowledge of the rock pools inhabitants.

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Фауністичний аналіз прісноводного зоопланктону скельних ванн морської Антарктики

Реферат. Невеликі скельні ванни використовуються як модельні системи для проведення екологічних та еволюційних досліджень. З цієї точки зору, зоопланктон скельних ванн є цікавим та перспективним модельним об'єктом для проведення таких досліджень. Хоча скельні ванни Антарктики почали вивчати ще на початку минулого століття, ці водойми досі не є дослідженими в достатній мірі. Метою даної роботи є розгляд та систематизація наявних досліджень різноманіття прісноводного зоопланктону морської Антарктики. До уваги беруться тільки мезо- та макрозоопланктонні організми (0.2 мм — 20 мм), які постійно живуть в товщі води та не можуть протистояти течії протягом усього життя або певної стадії розвитку. Загалом різні автори відмічають 69 таксонів зоопланктонних організмів для прісних вод регіону. Основу різноманіття складають Rotifera (52 таксонів, з них 4 ідентифіковані до підвиду, 44 — до виду та 4 — до роду). Crustacea включають 16 таксонів (14 — до виду, 1 — до роду, 1 — до ряду), з них 9 таксонів — Branchiopoda, 3 — Ostracoda, 4 — Copepoda. Інші організми в планктоні представлені єдиним видом — *Parochlus steinenii* (Gercke, 1889) (Diptera: Chironomidae), присутнім на стадії личинки. В цілому, антарктичні скельні ванни не демонструють значно нижчого різноманіття, ніж аналогічні водойми з інших частин світу. Але це стосується тільки досить детально досліджених Південних Шетландських та Південних Оркнейських островів, інша частина регіону демонструє значно менше різноманіття (40 та 44 таксони відповідно). Однак, це може бути пов'язано з необхідністю проведення більш детальних досліджень морської Антарктики. Для Аргентинських островів наводять 3 визначених таксони організмів зоопланктону (2 Crustacea та 1 Rotifera) та згадують про деяку кількість невизначених Rotifera, що свідчить про недостатню дослідженість прісноводного зоопланктону в регіоні.

Ключові слова: Crustacea, Rotifera, мезо- та макрозоопланктон

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Appendix

Table. Identified taxa of freshwater planktonic invertebrates of Maritime Antarctica

Phylum or Sub-Phylum	Class	Order	Family	Genus	Species	SO	SS	AP	Source
Rotifera	Eurotatoria	Ploima	Epiphanidae	Epiphanes	*Epiphanes senta* (Müller, 1773)	+	+		1, 3, 4, 5, 6
			Brachionidae	Brachionus	*Brachionus bidentatus* Anderson, 1889		+		1
					Brachionus bidentatus f. inermis Rousselet, 1906			+	1
					Brachionus havanaensis Rousselet, 1911		+		1
					Brachionus urceolaris Müller, 1773		+		1
				Keratella	*Keratella americana* Carlin, 1943		+		1
					Keratella cochlearis (Gosse, 1851)		+		1
					Keratella valga (Ehrenberg, 1834)		+		10
					Keratella sp.		+		1
				Notholca	*Notholca hollowdayi* Dartnall, 1995		+		10
					Notholca salina Focke, 1961 †	+	+		1, 4, 5
					Notholca squamula (Müller, 1786)		+		3, 6
					Notholca walterkostei José de Paggi, 1982	+	+	+	1, 3, 4, 5
					Notholca walterkostei reducta Dartnall & Hollowday, 1985	+			1, 4
			Euchlanidae	Euchlanis	*Euchlanis oropha* Gosse, 1887	+			1
					Euchlanis parva Rousselet, 1892	+	+		4
					Euchlanis dilatata Ehrenberg, 1832	+			10
			Lepadellidae	Colurella	*Colurella adriatica* Ehrenberg, 1831	+			10
					Colurella colurus (Ehrenberg, 1830)		+		1, 3
					Colurella colurus compressa (Lucks, 1912)	+		+	1,4
				Lepadella	*Lepadella intermedia* Dartnall & Hollowday, 1985	+	+		1,4
					Lepadella minuta (Weber & Montet, 1918)		+		5
					Lepadella patella (Müller, 1773)		+		1, 3, 4, 5
					Lepadella patella oblonga (Ehrenberg, 1834)	+	+		1, 4, 6

Rotifera	Eurotatoria	Ploima	Lepadellidae	Lepadella	*Lepadella rhomboides signiensis* Dartnall & Hollowday, 1985 (uncertain taxon)	+			1, 4
					Lepadella triptera (Ehrenberg, 1830)	+			1, 4
			Lecanidae	Lecane	*Lecane lunaris* (Ehrenberg, 1832)	+	+		1, 4
					Lecane closterocerca (Schmarda, 1859)	+	+		1, 4
			Notommatidae	Cephalodella	*Cephalodella auriculata* (Müller, 1773)	+	+		1, 4
			Notommatidae	Cephalodella	*Cephalodella catellina* (Müller, 1786)	+	+		1, 3, 4, 6
					Cephalodella delicata Wulfert, 1937	+			1
					Cephalodella forficata (Ehrenberg, 1832)	+	+		1, 3, 4, 6
					Cephalodella gibba (Ehrenberg, 1830)	+	+		1, 4
					Cephalodella megalocephala (Glasscott, 1893)	+			1, 4
					Cephalodella rotunda Wulfert, 1937	+			10
					Cephalodella sterea (Gosse, 1887)		+*		1, 5
					Cephalodella sp.		+		1
				Eosphora	*Eosphora najas* Ehrenberg, 1830	+	+		1, 4
				Resticula	*Resticula gelida* (Harring & Myers, 1922)	+	+	+	1, 3, 4
					Resticula nyssa Harring & Myers, 1924		+		1, 3, 6
				Scaridium	*Scaridium longicaudum* (Müller, 1786)	+			1
					Scaridium bostjani Daems & Dumont, 1974	+			4
			Trichocercidae	Trichocerca	*Trichocerca brachyura* (Gosse, 1851)	+			1, 4
					Trichocerca rattus globosa Dartnall & Hollowday, 1985 (uncertain taxon)	+			1, 4
					Trichocerca tigris (Müller, 1786)		+		1, 4
			Dicranophoridae	Dicranophorus	*Dicranophorus sp.*	+*			1, 4
				Encentrum	*Encentrum mustela* (Milne, 1885)	+	+		1, 3, 4
Rotifera	Eurotatoria	Ploima	Dicranophoridae		*Encentrum permolle gigantheum* (Dartnall & Hollowday, 1985)	+			1
					Encentrum uncinatum (Milne, 1886)	+	+		1
					Encentrum sp.		2 sp.	+	1, 3, 5
			Mytilinidae	Mytilina	*Mytilina mucronata* (Müller, 1773)		+		4
			Proalidae	Proales	*Proales reinhardti* (Ehrenberg, 1834)		+*		5
Arthropoda — Crustacea	Branchiopoda	Anostraca	Branchinectidae	Branchinecta	*Branchinecta gaini* Daday, 1910	+	+	+	1,2,3,6,7,8
					Branchinecta granulosa Daday, 1902			+	9

End of Table

Phylum or Sub-Phylum	Class	Order	Family	Genus	Species	SO	SS	AP	Source
Arthropoda — Crustacea	Branchiopoda	Anomopoda	Chydoridae	Chydorus	*Chydorus sphaericus* (O. F. Müller, 1776)	+			1, 2
				Coronatella	*Coronatella rectangula* (G. O. Sars, 1862)	+			6
				Ovalona	*Ovalona weinecki* (Studer, 1878)	+	+		1, 2
			Ilyocryptidae	Ilyocryptus	*Ilyocryptus brevidentatus* Ekman, 1905	+			1, 2, 6
			Macrothricidae	Macrothrix	*Macrothrix oviformis* Ekman, 1900	+	+	+	1, 2, 7
					Macrothrix hirsuticornis Norman & Brady, 1867	+			6
			Daphniidae	Daphnia	*Daphnia (Ctenodaphnia) studeri* (Rühe, 1914)	+			7
	Ostracoda	Podocopida	Cyprididae	Eucypris	*Eucypris fontana* (Graf, 1931)	+			1, 2
					Eucypris sp.	+			1, 2
				Neocypridopsis	*Neocypridopsis frigogena* (Graf, 1931)	+			1, 2, 6
	Copepoda	Calanoida	Centropagidae	Boeckella	*Boeckella poppei* (Mrázek, 1901)	+	+	+	1, 2, 3, 7, 8
					Boeckella silvestri (Daday, 1901)	+			6
				Parabroteas	*Parabroteas sarsi* (Daday, 1901)	+		+	1, 2, 6, 8
		Harpacticoida			*Harpacticoida gen. sp.*		+		1
Arthropoda — Hexapoda	Insecta	Diptera	Chironomidae	Parochlus	*Parochlus steinenii* (Gercke, 1889)		(+)	(+)	1

Notes: SO — South Orkney Islands; SS — South Shetland Islands; AP — Antarctic Peninsula. + — the presence of a particular species in a given location; +* — a questionable or dubious record; (+) — probably an anthropogenic/introduced species.

Sources: 1 — (Dartnall, 2017); 2 — (Díaz et al., 2019); 3 — (Janiec & Salwicka, 1996); 4 — (Dartnall & Hollowday, 1985); 5 — (Janiec, 1993); 6 — (Heywood, 1967); 7 — (Toro et al., 2006); 8 — (Dartnall, 1980); 9 — (Polishuk et al., 2009); 10 — GBIF database