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New Collembola occurrence records from the western Antarctic Peninsula

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Abstract. In the light of the considerable global climatic changes observed over recent decades, and particularly their magnification in the western Antarctic Peninsula (WAP) region (maritime Antarctic), it is important to document in detail the biodiversity of this region to provide a baseline for assessing potential future shifts in species distribution ranges. The aim of this study was to document the species diversity of springtails (Collembola) collected during the Antarctic summer season (December 2023 to March 2024) from various locations in the coastal regions of the WAP. A total of 141 invertebrate samples were collected and analysed from different types of vegetated substrates, predominantly mosses, and from the nesting materials of the seabirds *Stercorarius maccormicki* and *Larus dominicanus*. Samples were obtained from 35 locations within four sub-regions of the WAP, including the South Shetland Islands, Graham Coast, Biscoe Islands and Adelaide Island and its neighbouring islands. For 20 of these surveyed locations, Collembola diversity was recorded for the first time and, for a further three locations, new records were obtained supplementing those in the existing literature. A total of 9 143 Collembola specimens were identified, representing three species: *Cryptopygus antarcticus*, *Folsomotoma octooculata* and *Friesea antarctica*, all of which are native to the studied region. Two of these species were identified in bird nest material, with *Fo. octooculata* being absent. Although all three species were present in many of the samples obtained, *C. antarcticus* was generally the most abundant, both in samples from vegetated substrates and in the nesting material of both bird species, accounting for nearly 90% of all collected specimens. This likely indicates a high degree of ecological plasticity in *C. antarcticus*, which may facilitate its persistence in the harsh environmental conditions of Antarctica amid ongoing climate change.

Keywords: *Cryptopygus antarcticus*, *Folsomotoma octooculata*, *Friesea antarctica*, maritime Antarctic, springtail

1 Introduction

Collembola (springtails) are free-living terrestrial arthropods commonly found in moist environments. They are an important component of soil fauna and play significant roles in the functioning of terrestrial ecosystems (Bardgett & van der Putten, 2014). Currently, approximately 9 600 species of the class Collembola have been described worldwide (Bellinger et al., 1996–2024). Springtails are present in most environments, climatic zones, and latitudes (Bellinger et al., 1996–2024) and are one of the main groups of terrestrial invertebrates found today in Antarctica, where their diversity and distribution have been studied since the early days of Antarctic terrestrial research (Gressitt, 1967; Strong, 1967; Greenslade, 1995; Baird et al., 2019a). As now realized with most groups of Antarctic terrestrial invertebrates, they show considerable "short range" regional endemism and deep molecular evolutionary divergences within Antarctica (Carapelli et al., 2020a; 2020b; Convey et al., 2020). Under the influence of global climate change (Turner et al., 2014; Chown et al., 2015; Convey & Peck, 2019; Siegert et al., 2019; Clem et al., 2020; Lee et al., 2022) and the consequences of human activity in the region (Tin et al., 2009; Chown et al., 2015; McCarthy et al., 2022; Tejedo et al., 2022), significant changes in the distribution of native species, as well as the introduction of new springtail species, are possible (Greenslade et al., 2012; Hughes et al., 2015; 2020; 2025; Potocka & Krzemińska, 2018; Convey & Peck, 2019; Enríquez et al., 2019; Bartlett et al., 2020; Chwedorzewska et al., 2020; Lee et al., 2022; McCarthy et al., 2022; Leihy et al., 2023; Hernandez-Martelo et al., 2024; Hushtan et al., 2025). However, even with the current level of knowledge, due to the extremely challenging environmental conditions and intense practical logistic limitations in Antarctica, many areas are yet to receive even cursory biological survey, or the attention of taxonomic expertise specific to springtails (or other terrestrial invertebrate groups).

The study of Collembola in the Antarctic region commenced in the late 19th century. Their earliest mention dates back to specimens collected on January 26, 1898, on Auguste Island (a small island located near Brabant Island) in the Gerlache Strait, off the west coast of the Antarctic Peninsula (Fig. 1). These were gathered during the Belgian Antarctic Expedition (1897–1899) led by A. de Gerlache (Willem, 1901; 1902; Wise, 1967). Subsequent research has revealed that the species diversity of Collembola in Antarctica is relatively low compared to other regions globally. Some species have long been recognized as endemic to (parts of) the continent, although belonging to more widely distributed genera (Greenslade, 1995), with recent taxonomic and molecular studies increasing these levels of species endemism (Greenslade, 2018; Carapelli et al., 2020a; 2020b; Convey et al., 2020). This overall low diversity is also reflected at a regional level, for example in the South Shetland Islands or the Graham Coast in the western Antarctic Peninsula (WAP) region.

Eleven species of springtail are currently known from the South Shetland Islands specifically (Greenslade, 2010). In the current study, only Nelson Island was sampled in this archipelago, from which the presence of four species has been reported, *Cryptopygus antarcticus* Willem, 1901 (Isotomidae), *Folsomotoma octooculata* (Willem, 1901) (previously known as *Parisotoma octooculata* and *Isotoma octooculata*) (Isotomidae), *Friesea grisea* (Schäffer, 1891) (recently re-assigned to *Fr. antarctica* (Greenslade, 2018) with *Fr. grisea* now limited to its type locality of sub-Antarctic South Georgia) (Neanuridae), and *Tullbergia mixta* Wahlgren, 1906 (Tullbergiidae) (Greenslade, 2010; Fanciulli et al., 2018; GBIF, 2025).

The first Collembola records from the Argentine Islands (the part of Wilhelm Archipelago, Graham Coast) were provided by Ukrainian Antarctic expeditions (2000–2001 and 2005–2010) (Bezkrovna, 2005; Polishuk et al., 2009; Trokhymets & Tancredi, 2009; Dykyy et al., 2012). Three species were identified from Galindez Island: *C. antarcticus* (with an error in the species name used in the articles of Polishuk et al. (2009) and Dykyy et al. (2012), who referred to *C. antarctica*), *Fr. antarctica*, and *Fo. octooculata*. On Irizar Island, in

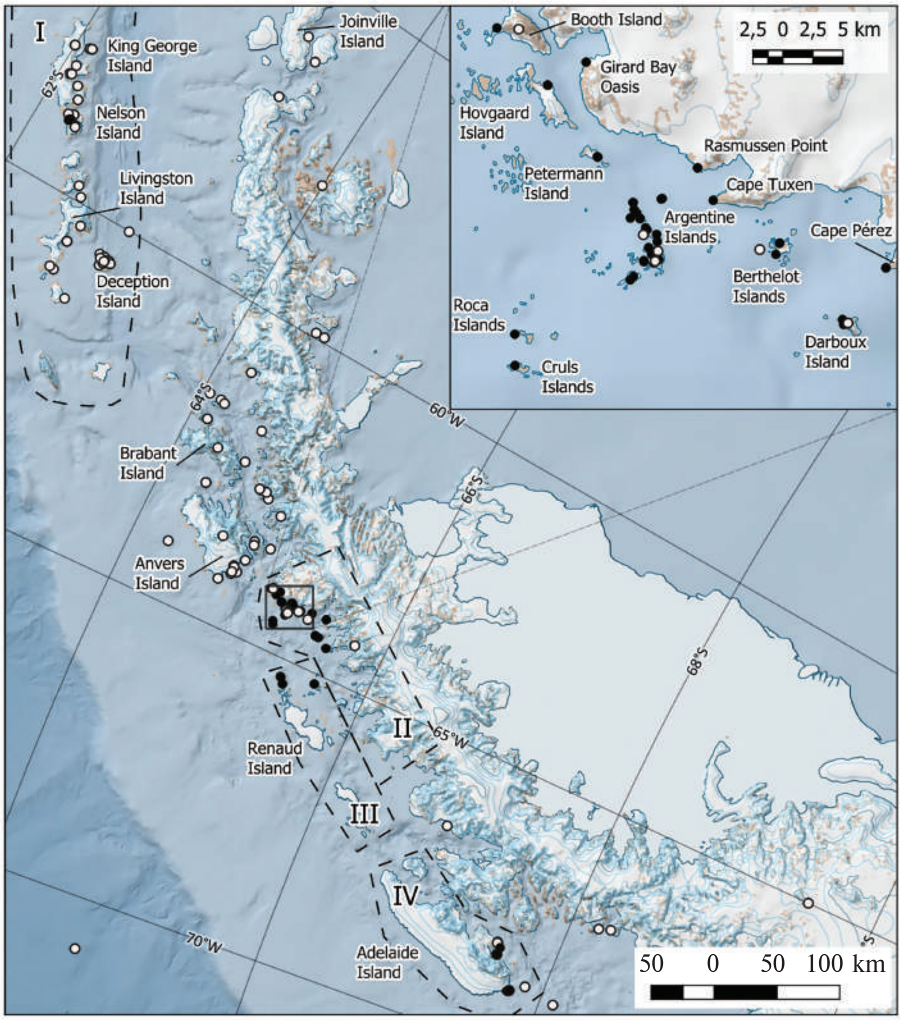

Figure 1. Locations in the Antarctic Peninsula region where Collembola species have been recorded. Our samples are marked in black; occurrence data derived from GBIF (2025) are marked in white. The dashed lines indicate four subregions of the WAP: I — South Shetland Islands, II — Graham Coast, III — Biscoe Islands, IV — Adelaide Island and its associated islands. The map background uses Antarctic geographical datasetes from the Quantarctica3 collection

the same archipelago, *C. antarcticus* and *Fr. antarctica* were identified (Dykyy et al., 2012). All three species have been reported from the Yalour Islands (but without specific confirmation of which of the islands). For the Berthelot Islands only the presence of *C. antarcticus* has specifically been confirmed (Bezkrovna, 2005). All three species are noted in the general area of the Berthelot Islands in GBIF (2025), however, the coordinates given are imprecise and located in the sea, not on specific islands. According to the location information given by Fanciulli et al. (2018), only *Fo. octooculata* has been recorded from the largest island in the archipelago, now known as Ukraine Island.

Although the occurrence of *Cryptopygus badasa* Greenslade, 1995, *C. antarcticus*, *Fo. octooculata*, and *Fr. antarctica* has been documented from Adelaide Island and associated local islands in Ryder Bay (Convey & Smith, 1997; Block & Worland, 2001; Hayward et al., 2004; Bokhorst et al., 2008a; 2008b; Hughes et al., 2017), there have been no formal ongoing monitoring studies in recent years.

Water balance is critical for polar Collembola, and soil moisture content influences their fine-scale distribution in Antarctica (Convey et al., 2003; Hayward et al., 2004; Sinclair et al., 2006; Beet et al., 2022). Springtail diets commonly comprise bacteria, algae, fungi, lichen and moss fragments and decomposing remains, although some members of the genus *Friesea* can also predate nematodes (Hopkin, 1997; Worland et al., 2000; Beet et al., 2022). Plant and algal communities provide optimal habitats for Antarctic Collembola (Convey & Smith, 1997; Castaño-Meneses et al., 2004). The species composition of plant communities is not thought to have a strong influence on their contained springtail diversity in the polar regions, although particularly high abundances of *C. antarcticus* are commonly associated with the foliose alga *Prasiola crispa* (Lightf.) Kütz., 1843 (Prasiolaceae), which itself occurs in abundance in association with ornithogenic nutrient enrichment such as around penguin colonies (Convey & Smith, 1997; Babenko, 2000). However, a decline in native springtail species abundance has been reported on some sub-Antarctic islands, possibly linked with invasions of non-native collembolans (Convey et al., 1999; Chown et al., 2022).

Bird nests function as distinct microhabitats that are frequently colonized by various invertebrates (Nordberg, 1936). Within the severe High Arctic environment, bird nests may provide sites of opportunity for invertebrate colonization (Coulson et al., 2009). On King George Island (South Shetland Islands, maritime Antarctic), an analysis of collembolan diversity in the nests of southern giant petrels (*Macronectes giganteus* (Gmelin, 1789), Procellariidae), Adélie penguins (*Pygoscelis adeliae* (Hombron & Jacquinot, 1841), Spheniscidae) and south polar skuas (*Stercorarius maccormicki* H. Saunders, 1893, Stercorariidae) identified five Collembola species (Gwiazdowicz et al., 2022). In nests of *M. giganteus* and *S. maccormicki*, the most abundant collembolan was *C. badasa* while, in the nesting material of *P. adeliae*, the most abundant species was *C. antarcticus*. In an earlier study focusing on the Argentine Islands region, the nests of four seabird species were investigated, *S. maccormicki*, *Larus dominicanus* M. H. K. Lichtenstein, 1823 (Laridae), *Leucocarbo atriceps* (King, 1828) (Phalacrocoracidae) and *Pygoscelis papua* (J.R. Forster, 1781) (Spheniscidae) (Dykyy et al., 2012). Three springtail species were found in the collected material (excepting that from *P. papua*, from which only ectoparasitic mites were recorded), *C. antarcticus*, *Fr. antarctica*, and *Fo. octooculata*. Only *Fr. antarctica* was found in the nesting material of *La. dominicanus*, *S. maccormicki*, and *Le. atriceps*, while *Fo. octooculata* was absent from the nests of *Le. atriceps*, and *C. antarcticus* was absent from those of *S. maccormicki*.

In this study, we expand currently available information on the diversity of springtails present at locations across the WAP, including 20 locations previously not sampled, during the 28th Ukrainian Antarctic Expedition which took place in the 2023–2024 austral summer, placing this information in the context of the known diversity of springtails in the wider maritime Antarctic region and associated with different substrate types.

2 Materials and methods

Substrate samples were collected between December 2023 and March 2024. In total, 141 samples were collected from 35 locations across four sub-regions of the WAP: Nelson Island (South Shetland Islands), Graham Coast, Biscoe Islands, and Adelaide Island and its associated islands (Fig. 1, Appendix Table 1). The substrates sampled can be separated into two groups:

1) 132 samples of living vegetation, including: the mosses *Sanionia georgicouncinata* (Müll. Hal.) Ochyra & Hedenäs, 1998 (Scorpidiaceae), *Warnstorfia fontinaliopsis* (Müll. Hal.) Ochyra, 2001, *W. sarmentosa* (Wahlenb.) Hedenäs (Calliergonaceae), *Brachythecium austrosalebrosum* (Müll. Hal.) Kindb. (Brachytheciaceae), *Polytrichum strictum* Menzies ex Brid., 1801 (Polytrichaceae), *Bryum pseudotriquetrum* (Hedw.) G. Gaertn., B. Mey. & Scherb., 1802 (Bryaceae), *Syntrichia filaris* (Müll.

Figure 2. Collembola species identified in the current study: (a) *Cryptopygus antarcticus*; (b) *Folsomotoma octooculata*; (c) *Friesea antarctica*

Hal.) R. H. Zander., *Syntrichia magellanica* (Mont.) R.H. Zander (Pottiaceae) and *Cratoneuropsis chilensis* (Lorentz) Ochyra (Amblystegiaceae); the liverwort *Barbilophozia hatcheri* (A. Evans) Loeske (Anastrophyllaceae); the grass *Deschampsia antarctica* É. Desv., 1854 (Poaceae); the foliose green alga, *P. crispa*; and some lichens such as *Usnea antarctica* Du Rietz (Parmeliaceae).

2) Nine samples of nesting material of kelp gulls (*La. dominicanus*, n = 6) and south polar skuas (*S. maccormicki*, n = 3).

In addition, existing records in GBIF (accessed April 3, 2025) of springtails in the WAP were extracted.

Collembola specimens were extracted from the collected substrates using a Berlese-Tullgren funnel (over a 24 h period) and an aspirator. They were immediately preserved in 96% ethanol, stored at −20 °C and returned to Ukraine for further analysis. The samples were examined using a Bresser Advance ICD microscope (Germany). Taxonomic identification of springtails was carried out following Greenslade (1995) and Convey et al. (1999), taking into account the updated taxonomy for *Fr. antarctica* given in Greenslade (2018). Specimens were microphotographed using a Biolam LOMO microscope with a mounted FUJIFILM X-S10 camera (Japan), followed by image processing using Helicon Focus (Lite, Pro, Premium) 7.5.8 software.

Maps were created using QGIS 3.40 and the Quantarctica3 collection of Antarctic geographical datasets (Matsuoka et al., 2021).

Extracted substrate samples were dried and stored in paper bags. Bryophytes and lichens were identified using a binocular magnifying glass and microscope following Bednarek-Ochyra et al. (2000), Øvstedal & Smith (2001), and Ochyra et al. (2008).

3 Results

A total of 9 143 Collembola individuals were identified in this study, representing three species: *C. antarcticus*, *Fo. octooculata* and *Fr. antarctica* (Fig. 2). The most abundant species across all samples, accounting for 88.89% of individuals, was *C. antarcticus* (Table). The only specific locations where a different species, *Fo. octooculata*, was most abundant were Eight Island and Locator Island.

Table. Springtail species and numbers of individuals obtained from the different sampling locations in this study

Sampling site		Number of samples	Number of specimens		
			Cryptopygus antarcticus	*Friesea antarctica*	*Folsomotoma octooculata*
South Shetland Islands					
Nelson Island		13	313	56	42
Graham Coast					
Kyiv Peninsula	Girard Bay Oasis	1	1	1	1
	Rasmussen Point [1]	3	53	2	9
	Cape Tuxen	1	1 220	0	0
	Cape Pérez	5	96	20	92
Wilhelm Archipelago	Booth Island	1	261	1	1
	Hovgaard Island	9	212	39	33
	Petermann Island	9	411	13	26
	Darboux Island	7	129	16	58
	Great Yalour Island	3	330	5	23
	Fanfare Island	4	540	14	19
	Irizar Island	5	182	8	0
	Eight Island [1]	8	105	88	194
	Uruguay Island	6	699	5	7
	Eastern Corner Island [1]	4	175	1	3
	Grotto Island	1	1	1	0
	Galindez Island	6	388	3	17
	Skua Island	4	955	10	2
	Central Pig Island [1]	2	61	2	0
	Bondarchuk Island [1]	3	596	1	1
	Un-named island of the Cruls Islands [2]	1	1	0	0
	Locator Island	1	1	1	2
Berthelot Islands	Ukraine Island [1]	9	171	73	61
The south side of Beascochea Bay	Mount Waugh	4	48	7	27
Lippmann Islands	Sagaidachnyi Island [1]	2	4	3	1
Leroux Bay	Lahille Island	1	0	0	1
	Chavez Island	1	1	0	0
Biscoe Islands					
Hook Island		4	139	1	5
Pitt Islands	Krivus Island	2	4	3	0
	Un-named island No. 1 [2]	4	249	0	0
	Un-named island No. 2 [2]	2	2	0	0
Adelaide Island and associated islands					
Adelaide Island		4	323	1	0
Anchorage Island		1	65	0	0
Avian Island		7	342	15	0
Léonie Island		3	50	0	0
Total		**141**	**8 128**	**390**	**625**

Notes: [1] — location names follow Yevchun et al. (2021); [2] — precise coordinates are provided in Appendix Table 1.

All three springtail species were recorded in vegetation substrates, while only *C. antarcticus* and *Fr. antarctica* were obtained from bird nesting material (Appendix Table 1).

All three species were present in three of the four surveyed regions, the exception being the lack of *Fo. octooculata* from Adelaide Island and associated islands (Appendix Table 1). In the vast majority of studied locations – 21 in total – all three species were detected (Table). However, at several locations in the South Shetland Islands, Graham Coast and Biscoe Islands, one or two species were not present in our samples. For instance, on Lahille Island, only a single *Fo. octooculata* was documented while, at five locations, *C. antarcticus* was the sole recorded species (Cape Tuxen, Chavez Island, an un-named island of the Cruls Islands, and two un-named islands of the Pitt Islands). Two species, *C. antarcticus* and *Fr. antarctica*, were recorded on four islands (Central Pig Island, Grotto Island, Irizar Island and Krivus Island). The southernmost of the studied regions, Adelaide Island and its associated islands, was characterized by the presence of only two species, *Fr. antarctica* and *C. antarcticus*. Both were found on Adelaide Island and Avian Island, while on Anchorage Island and Léonie Island only *C. antarcticus* was identified.

4 Discussion

A total of 20 species representing five families are currently known from the WAP region considered in this study (Appendix Table 2; see also Greenslade, 1995; 2010; 2018; Enríquez et al., 2018; 2019; Baird et al., 2019b; Hughes et al., 2025; Terauds et al., 2025) (Fig. 3). Of these 20 species, 13 are only known from the South Shetland Islands in our study region while, as noted earlier, Nelson Island, the only location in the archipelago sampled here, has a recorded diversity of four species: *C. antarcticus*, *Fo. octooculata*, *Fr. antarctica* and *T. mixta* (Greenslade, 2010; Fanciulli et al., 2018; GBIF, 2025).

Friesea topo Greenslade, 1995 is endemic to southern Alexander Island and is the only species in the overall WAP region not to occur on the South Shetland Islands. *Archisotoma brucei* (Carpenter, 1907) is an intertidal species known to occur as far south as Anvers Island (Greenslade, 1995), slightly to the north of the Graham Coast sub-region sampled in this study, but is specific to a habitat not sampled in the current study. *Friesea woyciechowskii* Weiner, 1980 (Neanuridae) occurs in a limited number of substrate types (Enríquez et al., 2018) and is recorded from the South Shetland Islands and South Orkney Islands (Greenslade, 1995). Of the remaining species, *C. badasa* has not been recorded from the majority of the WAP other than Livingston Island (South Shetland Islands), locations in Marguerite Bay and southeastern Alexander Island (Greenslade, 1995). *Folsomia candida* Willem, 1902, *Mucrosomia caeca* (Wahlgren, 1906) (formerly known as *Cryptopygus caecus*), *Protophorura fimata* (Gisin, 1952), *Ceratophysella succinea* (Gisin, 1949), *Deuteraphorura cebennaria* (Gisin, 1956), *Mesaphorura macrochaeta* Rusek, 1976 and *Proisotoma minuta* (Tullberg, 1871) are currently only known from the highly visited Deception Island (Greenslade, 2010; Greenslade et al., 2012; Enríquez et al., 2019). The majority of these species are thought to be anthropogenically-introduced species, as is *Hypogastrura viatica* (Tullberg, 1872), which is also abundant and widely distributed on the island as well as being recorded once on Léonie Island close to Adelaide Island (Greenslade, 1995) where it has not proved possible to relocate more recently (Hughes et al., 2017). *Mucrosomia caeca* is associated with vegetation in active geothermally heated areas on Deception Island, as it is on the remote maritime Antarctic South Sandwich Islands, and is thought to be native to these very limited habitats in this region (Convey et al., 2000). The species *Tullbergia templei* Wise & Kaj, 1970, is referred to in GBIF based on two South Shetland Islands records from 1982 contained in Sanabria et al. (2023), but there appears to be no subsequent confirmation of these records or this species' occurrence in the region. Thus, only seven of the overall 20 species cur-

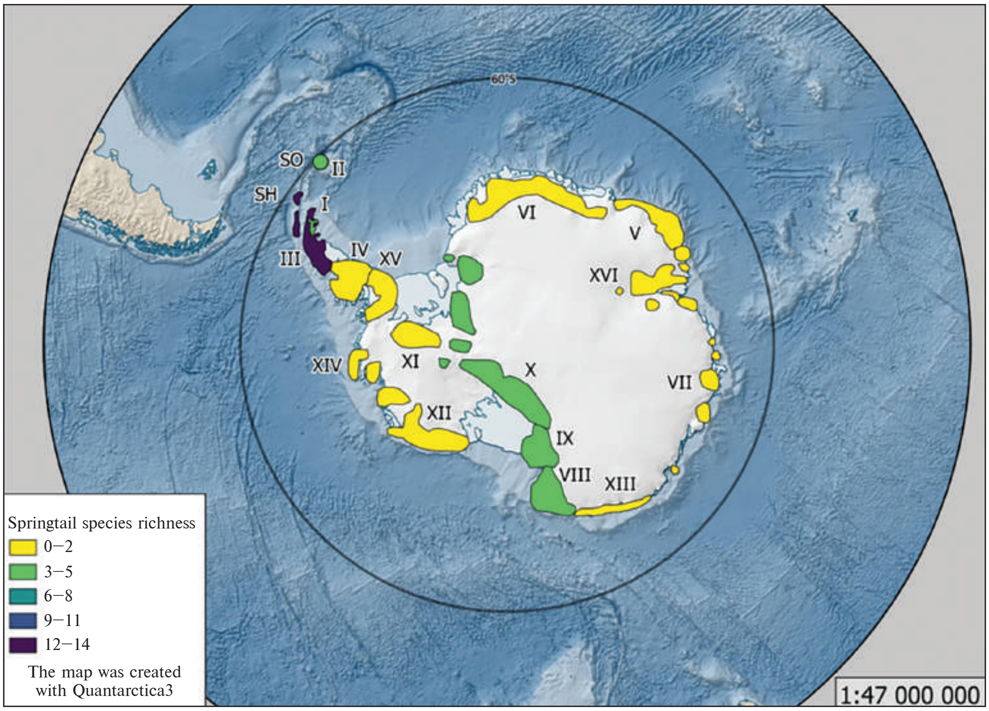

Figure 3. Collembola species richness in the 16 different Antarctic Conservation Biogeographic Regions (see Terauds & Lee, 2016), as reported by Baird et al. (2019a): SH – South Shetland Islands, SO – South Orkney Islands. ACBRs are labelled I – North-east Peninsula, II – South Orkney Islands, III – North-west Peninsula (including South Shetland Islands, which hosts 11 species not recorded elsewhere in this ACBR or Antarctica, with the Antarctic Peninsula element of the ACBR hosting at most only four species), IV – Central South Peninsula, V – Enderby Land, VI – Dronning Maud Land, VII – East Antarctica, VIII – North Victoria Land, IX – South Victoria Land, X – Transantarctic Mountains, XI – Ellsworth Mountains, XII – Marie Byrd Land, XIII – Adelie Land, XIV – Ellsworth Land, XV – South Peninsula, XVI – Prince Charles Mountains

rently reported anywhere in the WAP region are known to occur on the Antarctic Peninsula itself or close offshore islands.

The study area surveyed here is of biogeographical interest as it encompasses several geographically separated regions. The most distant sampling sites are separated by approximately 750 km, and, according to existing literature, these areas differ substantially in Collembola species diversity (Convey & Smith, 1997; Bokhorst et al., 2008a; Greenslade, 2010; Dykyy et al., 2012; Trokhymets et al., 2014; Fanciulli et al., 2018).

In the samples obtained in this study, we identified three collembolan species that are well-known from the maritime Antarctic and already recorded from the South Shetland Islands and WAP (Convey & Smith, 1997; Greenslade, 2010; Dykyy et al., 2012; Fanciulli et al., 2018; GBIF, 2025). Our study expands considerably the specific distributional information available for these species, reporting the presence of Collembola for the first time at 20 locations: Central Pig Island, Bondarchuk Island (the Barchans), Eastern Corner Island, an un-named island in the Cruls Islands, Eight Island, Grotto Island, Hovgaard Island, Lahille Island, Locator Island, Girard Bay Oasis, Cape Pérez, Rasmussen Point, Cape Tuxen, Mount Waugh, Sagaidachnyi Island, Chavez Island (Graham Coast), Hook Island, Krivus Island and two un-named islands in the Pitt Islands (Biscoe Islands) (Appendix Table 3). Additionally, known Collembola diversity was increased at three further locations. These included the first record of *Fr. antarctica* from Avian Island, increasing the island's total species count to two, and the first records of *Fr. antarctica* and *Fo. octooculata* from Booth Island and Skua Island, bringing their totals to three species (Appendix Table 3).

The significant number of new records obtained in this study clearly reflects the limited previous targeted survey effort available. Of the four sub-regions included, Nelson Island has the oldest springtail records (Wahlgren, 1906). The island's Collembola diversity was revisited by Greenslade (2010), although it is, perhaps, notable that currently available records represent only four of the 19 species known from the South Shetland Islands. The first specific investigations of collembolan diversity took place at several islands in the Wilhelm Archipelago (WAP region) only in the early 21st century (e.g., Fanfare Island, Galindez Island, Great Yalour Island, Irizar Island, Petermann Island) (Bezkrovna, 2005; Trokhymets & Tancredi, 2009; Trokhymets et al., 2011; 2012; 2014), including some material that was used in the redescription of *Fo. octooculata* (Fanciulli et al., 2018). The current study did not increase the overall known springtail diversity in this sub-region. Of the overall known WAP springtail diversity, given their known distributions, only two further species might plausibly be expected to occur within our regions II—IV, along and off the western coast of the Antarctic Peninsula itself: *A. brucei*, confirmation of which would require targeted sampling of its intertidal habitat, and *C. badasa*, whose overall distribution is currently poorly documented and, in the absence of molecular taxonomic studies, could even represent two or more species given its apparently disjunct distribution in southern Alexander Island, Marguerite Bay and the South Shetland Islands.

Convey and Smith (1997) previously reported the abundance and diversity of Collembola in the southernmost sub-region IV considered here — south-east Adelaide Island and associated offshore islands. Occurrence records from this area have also been reported in the context of experimental studies assessing the potential effects of climate change (Bokhorst et al., 2008a; 2008b), and in cryobiological research (Block & Worland, 2001; Worland & Convey, 2001). Hayward et al. (2004) examined the effect of environmental humidity on the distribution of *C. antarcticus* and *Fr. antarctica* near Rothera Station on Adelaide Island. In general, comparing with the records presented by Convey and Smith (1997), based on samples collected in the 1994—1995 season, the current study identified two of the four Collembola known from this sub-region, not recording *Fo. octooculata* and *C. badasa*. However, that study only recorded a single specimen of *Fo. octooculata*, out of c. 25 000 extracted specimens examined, so it is unsurprising that the species was not detected in the current study and suggests that it reaches its current southern distributional limit in this region (see also Vega et al., 2020).

Most collembolan species are known to feed on decomposing organic matter, making their presence in living vegetation-based substrates unsurprising. Nevertheless, different Collembola species may exhibit vertical stratification within moss turfs. For example, *C. antarcticus* typically occupies the upper 3 cm, whereas *Fr. woyciechowskii* shows a preference for deeper layers, at depths of 6—9 cm (Booth & Usher, 1985; Usher & Booth, 1986). Some Antarctic Collembola (including all three species identified in the current study) have been reported from a variety of substrate types, ranging across grass, short and tall moss turfs and cushions, algal mats, beneath and around stones embedded in vegetation or soils, associated with penguin colonies and wallows used by southern elephant seals (Convey & Smith, 1997). In contrast, some species, such as *Fr. woyciechowskii*, appear restricted to a much more limited range of substrate types (Enríquez et al., 2018). It is also important to note that different Collembola species have distinct moisture requirements, for instance *C. antarcticus* is typically associated with moister habitats, while *Fr. antarctica* can tolerate drier conditions (Hayward et al., 2004).

The absence of *Fo. octooculata* in samples of bird nesting material in the current study differs from Dykyy et al. (2012), who reported this species in both *La. dominicanus* and *S. maccormicki* nest material in the Graham Coast region. However, they also reported that *C. antarcticus*, which we found in large numbers in the nests of both bird species, was found only in the nest material of kelp gulls. These differences most likely indicate insufficient sampling of this substrate. Determining which Collembola species are capable of sustaining long-term populations within bird nesting material has important relevance in the context of proposals of Antarctic invertebrate dispersal being facilitated by seabirds (Peckham, 1971; Dykyy et al., 2012; Parnikoza et al., 2018; Ivanets et al., 2022; Edgington et al., 2023).

In the current study, *C. antarcticus* dominated in all nest material collected (ranging from 3 to 170 individuals), with the exception of one *La. dominicanus* nest from Central Pig Island, where two individuals of *Fr. antarctica* and one of *C. antarcticus* were obtained. *Fr. antarctica* was otherwise absent from all *S. maccormicki* nest samples examined and was represented by only a single individual in the other *La. dominicanus* nests. Our findings are similar to those of Gwiazdowicz et al. (2022), who reported that *C. antarcticus* and the closely related *C. badasa* were numerically dominant in *S. maccormicki* nest material on King George Island. In contrast, Dykyy et al. (2012) did not report *C. antarcticus* in *S. maccormicki* nest samples. Both the current study and that of Dykyy et al. (2012) confirmed the presence of *Fr. antarctica* in *La. dominicanus* nesting material.

5 Conclusions

The three Collembola species (*C. antarcticus*, *Fo. octooculata* and *Fr. antarctica*) identified in this study, based on 141 samples from 35 specific locations and comprising 9 143 specimens, are consistent with the known diversity of the South Shetland Islands and the WAP region. The study provides the first reports of springtail diversity at 20 sampling locations and expands the known diversity at three futher locations. *Cryptopygus antarcticus* was the dominant species (almost 90% of identified specimens) in both vegetation and in the nesting material of *La. dominicanus* and *S. maccormicki* within the study region.

Data availability. All data are presented in the article and the Appendices.

Author contributions. All authors have read and approved the final version of the manuscript. Yu. P. contributed to writing and editing the manuscript, performed data analysis and visualization. O. P. conducted species identification and edited the manuscript. P. K. collected samples, contributed to writing and editing the manuscript, and visualization. I. P. collected samples, determined all bryophytes and lichens and edited the manuscript. A. P. collected samples and edited the manuscript. L. S. contributed to light microscopy and micro photo preparation. P. C. contributed to species identification, results validation, supervision, writing and editing the manuscript. I. K. was responsible for study conceptualization, project administration and curation, and writing and editing the manuscript.

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Conflict of Interest. The authors declare no conflict of interest.

Permit Compliance Statement. The sample collection in areas regulated by the Management Plan for Antarctic Specially Protected Areas (ASPAs), including ASPA 117 and ASPA 177, as well as all other locations, was conducted under Permit from the Ministry of Education and Science of Ukraine, Series AP No 094-23, for the proposed activity of a physical or juridical person in the Antarctic Treaty area (south of 60°S), issued on December 6, 2023.

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Нові реєстрації Collembola із західної частини Антарктичного півострова

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Анотація. З огляду на значні глобальні кліматичні зміни, що спостерігаються впродовж останніх десятиліть, та особливо інтенсивного їхнього посилення в регіоні західного Антарктичного півострова, важливим є аналіз видового різноманіття живих організмів цього регіону, щоб забезпечити точку відліку для оцінки потенційних майбутніх змін ареалів видів. Метою дослідження було встановлення видового багатства ногохвісток (Collembola) деяких прибережних локалітетів Західної Антарктики. Матеріал зібрано впродовж антарктичного літа 2023–2024 років (із грудня по березень). Усього проаналізовано 141 зразок безхребетних, зібраних у різних типах рослинного субстрату (переважно мохів) та гніздового матеріалу морських птахів (*Stercorarius maccormicki* та *Larus dominicanus*) із 35 локалітетів, що належать до чотирьох субрегіонів уздовж західного узбережжя Антарктичного півострова: Південних Шетландських островів, узбережжя Ґреяма, островів Біско, а також острова Аделаїда з навколишніми островами. Для двадцяти досліджених локалітетів видовий склад колембол надано вперше, а ще для трьох його доповнено. Загалом зібрано 9 143 особини ногохвісток, що належать до трьох видів: *Cryptopygus antarcticus*, *Folsomotoma octooculata* та *Friesea antarctica*. Усі вони є аборигенними для досліджуваного регіону. У пташиних гніздах траплялися два із цих видів (*Fo. octooculata* не виявлено). Всі три види зустрічалися в багатьох досліджених зразках, а найчисельнішим був *C. antarcticus* – загалом, майже 90% від загальної кількості особин. Це, ймовірно, свідчить про високу екологічну пластичність цього виду, яка забезпечує його виживання в суворих умовах Антарктики під час змін клімату.

Ключові слова: *Cryptopygus antarcticus, Folsomotoma octooculata, Friesea antarctica*, морська Антарктика, ногохвістка

APPENDIX

Table 1. Description of sampling sites with Collembola species abundance

Location	coordinates	Sampling date	Substrate	*Cryptopygus antarcticus*	*Friesea antarctica*	*Folsomotoma octooculata*
South Shetland Islands						
Nelson Island, Stansbury Peninsula	-62.247171, -58.978890	20.01.2024	*Bryum pseudotriquetrum* and *Sanionia georgicouncinata*	44	0	0
	-62.242511, -58.992225		*Sanionia georgicouncinata*	16	1	20
	-62.240653, -58.994628		*Drepanocladus longifolius (*Wilson ex Mitt.) Broth. ex Paris (Amblystegiaceae), *Warnstorfia sarmentosa*	50	0	0
	-62.240331, -58.997834		*Warnstorfia sarmentosa*	10	0	1
	-62.240331, -58.997834		*Warnstorfia sarmentosa*	6	0	0
	-62.236070, -58.998885		*Bryum pseudotriquetrum*	54	13	0
	-62.236070, -58.998885		*Bryum pseudotriquetrum*	50	15	0
	-62.235707, -58.998198		*Deschampsia antarctica* and *Sanionia georgicouncinata*	1	1	1
	-62.235732, -58.997602		*Syntrichia filaris*	1	15	1
	-62.235732, -58.997602		*Syntrichia filaris*	1	6	0
	-62.235825, -58.997019		*Sanionia georgicouncinata*	16	4	19
	-62.235455, -59.007684		*Bryum pseudotriquetrum* and *Sanionia georgicouncinata*	1	1	0
	-62.235606, -59.010383		*Sanionia georgicouncinata* and *Prasiola crispa*	63	0	0
Graham Coast, Kyiv Peninsula						
Cape Pérez	-65.407567, -64.097567	08.02.2024	*Polytrichum strictum*	18	5	17
	-65.407583, -64.097550		*Brachythecium austroglareosum*	2	1	9
	-65.407600, -64.097567		*Sanionia georgicouncinata*	63	13	65
	-65.407583, -64.097583		*Pohlia* sp.	12	0	0
	-65.407567, -64.097567		*Sanionia georgicouncinata*, *Warnstorfia fontinaliopsis*, and *Polytrichum strictum*	1	1	1
Rasmussen Point	-65.248033, -64.083833	09.02.2024	*Polytrichum strictum*	2	1	3
	-65.248033, -64.083817		*Pohlia drummondii* (Müll.Hal.) A.L. Andrews (Mniaceae)	27	1	0
	-65.248033, -64.083833		*Sanionia georgicouncinata*	24	0	6

Continuation of Table 1

Location coordinates		Sampling date	Substrate	*Cryptopygus antarcticus*	*Friesea antarctica*	*Folsomotoma octooculata*
Cape Tuxen	-65.269187, -64.123919	09.02.2024	*Deschampsia antarctica* and *Warnstorfia fontinaliopsis*	1220	0	0
Girard Bay Oasis	-65.138483, -64.001083	14.03.2024	*Polytrichum strictum*, *Sanionia georgicouncinata*, *Brachythecium austrosalebrosum*, and *Bryum pseudotriquetrum*	1	1	1
Graham Coast, Wilhelm Archipelago						
Hovgaard Is.	-65.120600, -64.067500	02.02.2024	*Bryum pseudotriquetrum* and *Brachythecium austrosalebrosum*	6	7	16
	-65.120233, -64.067633		*Polytrichastrum alpinum* (Hedw.) G.L.Sm. (Polytrichaceae)	1	0	0
	-65.120167, -64.067717		*Sanionia georgicouncinata* and *Bryum pseudotriquetrum*	23	6	5
	-65.120250, -64.067667		*Brachythecium austrosalebrosum*	3	0	1
	-65.120183, -64.067700	12.02.2024	*Sanionia georgicouncinata*	60	0	0
	-65.120183, -64.067700		*Brachythecium austrosalebrosum*	31	4	3
	-65.120183, -64.067700		*Polytrichastrum alpinum*	42	16	7
	-65.120183, -64.067700		*Syntrichia magellanica* (Mont.) R.H. Zander (Pottiaceae)	5	6	1
	-65.120183, -64.067700		*Bryum pseudotriquetrum*, *Brachythecium austroglareosum*, and *Pohlia nutans* (Hedw.) Lindb. (Mniaceae)	41	0	0
Petermann Is.	-65.177033, -64.143800	09.01.2024	*Sanionia georgicouncinata*	15	0	0
	-65.177400, -64.144183		*Brachythecium austrosalebrosum*	1	0	0
	-65.177367, -64.143750		*Prasiola crispa*	1	0	0
	-65.177033, -64.143800	09.02.2024	*Prasiola crispa*	26	1	0
	-65.177017, -64.143717	12.02.2024	*Deschampsia antarctica* and *Sanionia georgicouncinata*	2	3	13
	-65.177017, -64.143717		*Polytrichum strictum*	36	5	12
	-65.177033, -64.143800		*Pohlia nutans*	40	1	1
	-65.177400, -64.144183		*Brachythecium austrosalebrosum*	210	2	0
	-65.177033, -64.143800		*Sanionia georgicouncinata*	80	1	0
Darboux Is.	-65.395386, -64.215502	21.12.2023	*Cratoneuropsis chilensis*	0	1	15

Continuation of Table 1

Location coordinates		Sampling date	Substrate	*Cryptopygus antarcticus*	*Friesea antarctica*	*Folsomotoma octooculata*
	-65.395386, -64.215502		*Ceratodon purpureus* (Hedw.) Brid. (Ditrichaceae) and *Cratoneuropsis chilensis*	0	0	1
	-65.395217, -64.215383	08.02.2024	*Polytrichum strictum*	10	0	0
	-65.395217, -64.215383		*Cratoneuropsis chilensis*	13	6	17
	-65.395217, -64.215383		*Brachythecium austroglareosum*	16	3	4
	-65.395217, -64.215383		*Sanionia georgicouncinata*	89	5	21
	-65.397450, -64.222283		*Bryum pallescens* Schleich. ex Schwägr. (Bryaceae)	1	1	0
Booth Is.	-65.067383, -64.015700	12.02.2024	*Bryum pseudotriquetrum*	261	1	1
Great Yalour Is.	-65.234400, -64.160400	09.02.2024	*Prasiola crispa* and *Sanionia georgicouncinata*	0	5	23
	-65.233833, -64.162000		*Sanionia georgicouncinata*	221	0	0
	-65.233783, -64.161817		*Warnstorfia fontinaliopsis*	109	0	0
Bondarchuk Is. of the Barchans	-65.239250, -64.316067	03.03.2024	*Prasiola crispa* and *Sanionia georgicouncinata*	550	0	0
	-65.239283, -64.316050		*Polytrichum strictum*	1	1	1
	-65.240367, -64.308067		*Warnstorfia fontinaliopsis*	45	0	0
Central Pig Is.	-65.242150, -64.274433	18.03.2024	*Larus dominicanus* nesting material: *Sanionia georgicouncinata*, *Bryum pseudotriquetrum*	1	2	0
	-65.242667, -64.276500		*Sanionia georgicouncinata*	60	0	0
Eastern Corner Is.	-65.244967, -64.233283	04.03.2024	*Prasiola crispa*	112	0	0
	-65.245017, -64.233267		*Andreaea regularis* Müll.Hal. (Andreaeaceae)	62	1	2
	-65.245050, -64.233517		*Pohlia nutans*	0	0	1
	-65.245083, -64.233483		*Warnstorfia fontinaliopsis*	1	0	0
Eight Is.	-65.225733, -64.209367	20.02.2024	*Polytrichum strictum*	15	1	3
	-65.225800, -64.209050		*Sanionia uncinata* (Hedw.) Loeske (Scorpidiaceae) and *Brachythecium austrosalebrosum*	3	8	35
	-65.225750, -64.209350		*Andreaea regularis*	2	1	14

Continuation of Table 1

Location	coordinates	Sampling date	Substrate	*Cryptopygus antarcticus*	*Friesea antarctica*	*Folsomotoma octooculata*
	-65.225733, -64.209367		*Bartramia patens* Brid. (Bartramiaceae)	1	1	12
	-65.225917, -64.210100		*Bryum pallescens*	9	17	30
	-65.225917, -64.210100		*Deschampsia antarctica*	70	1	15
	-65.225917, -64.210100		*Syntrichia magellanica*	3	42	76
	-65.225917, -64.210100		*Sanionia uncinata*	2	17	9
Fanfare Is.	-65.216083, -64.189333	12.02.2024	*Sanionia georgicouncinata*	1	1	0
	-65.216033, -64.189400		*Sanionia georgicouncinata*	79	1	6
	-65.216033, -64.189400		*Bryum pseudotriquetrum*	450	3	3
	-65.215900, -64.189700	01.03.2024	*Andreaea depressinervis* Cardot (Andreaeaceae)	10	9	10
Galindez Is.	-65.247467, -64.249800	29.02.2024	*Andreaea regularis*	1	1	0
	-65.247433, -64.249817		*Polytrichum strictum*	5	0	4
	-65.247767, -64.247733		*Pohlia nutans*	0	1	11
	-65.244833, -64.255783		*Warnstorfia fontinaliopsis*	210	0	0
	-65.245417, -64.255467		*Prasiola crispa*	150	1	2
	-65.245556, -64.258667	07.03.2024	*Usnea antarctica*	22	0	0
Grotto Is.	-65.241133, -64.249967	03.02.2024	*Sanionia georgicouncinata*	1	1	0
Irizar Is.	-65.221817, -64.203600	16.12.2023	*Andreaea regularis* and *Sanionia georgicouncinata*	22	4	0
	-65.219050, -64.200500		*Sanionia georgicouncinata*	12	2	0
	-65.221817, -64.203600		*Sanionia georgicouncinata*	19	2	0
	-65.219183, -64.216567		*Sanionia georgicouncinata*	27	0	0
	-65.219167, -64.200333	01.03.2024	*Andreaea regularis*	102	0	0
Skua Is.	-65.250317, -64.266583	20.01.2024	*Sanionia georgicouncinata*	448	0	0
	-65.249550, -64.270783		*Prasiola crispa* and *Sanionia georgicouncinata*	500	0	0

Continuation of Table 1

Location	coordinates	Sampling date	Substrate	*Cryptopygus antarcticus*	*Friesea antarctica*	*Folsomotoma octooculata*
Uruguay Is.	-65.251983, -64.261283	03.03.2024	*Polytrichum strictum*	6	10	1
	-65.251983, -64.261283		*Andreaea regularis*	1	0	1
	-65.232617, -64.220433	03.02.2024	*Sanionia georgicouncinata*	1	0	0
	-65.234233, -64.222533	10.02.2024	*Prasiola crispa*	250	1	1
	-65.242333, -64.222583		*Polytrichum strictum*	4	1	0
	-65.234217, -64.222500		*Pohlia nutans*	1	2	5
	-65.234167, -64.222517		*Warnstorfia fontinaliopsis*	93	0	0
	-65.234200, -64.222517		*Sanionia georgicouncinata*	350	1	1
un-named island of the Cruls Islands	-65.189217, -64.542567	17.03.2024	*Sanionia georgicouncinata*	1	0	0
Locator Is.	-65.179017, -64.492317	17.03.2024	*Sanionia georgicouncinata*	1	1	2
Graham Coast, Berthelot Islands						
Ukraine Is.	-65.329130, -64.161938	21.12.2023	*Sanionia georgicouncinata*	2	0	1
	-65.327967, -64.140833	18.02.2024	*Sanionia georgicouncinata*	22	17	16
	-65.328033, -64.141117		*Andreaea regularis*	2	8	0
	-65.328033, -64.140983		*Prasiola crispa* and *Pohlia nutans*	74	23	18
	-65.328033, -64.140683		*Deschampsia antarctica* and *Brachythecium austroglareosum*	1	0	1
	-65.328000, -64. 140967		*Pohlia nutans*	27	5	0
	-65.328033, -64.140983		*Sanionia georgicouncinata*	22	15	7
	-65.328000, -64.140967		*Warnstorfia fontinaliopsis*	20	4	0
	-65.327950, -64.140833		*Polytrichum strictum*	1	1	18
Graham Coast, the south side of Beascochea Bay						
Mount Waugh	-65.518367, -64.083817	24.02.2024	*Andreaea regularis*	11	1	16
	-65.518283, -64.084083		*Polytrichum strictum*	1	3	3

Continuation of Table 1

Location coordinates		Sampling date	Substrate	*Cryptopygus antarcticus*	*Friesea antarctica*	*Folsomotoma octooculata*
	-65.518283, -64.084083		*Prasiola crispa*	11	1	8
	-65.518467, -64.083350		*Warnstorfia fontinaliopsis*	25	2	0
Graham Coast, Lippmann Islands						
Sagaidachnyi Is.	-65.497431, -64.410580	09.01.2024	*Sanionia georgicouncinata, Bartramia patens, Pohlia nutans*	1	1	1
	-65.496750, -64.414283	24.02.2024	*Sanionia georgicouncinata*	3	2	0
Graham Coast, Leroux Bay						
Lahille Is.	-65.522896, -64.417755	09.01.2024	*Deschampsia antarctica* and *Sanionia georgicouncinata*	0	0	1
Chavez Is.	-65.603891, -64.530346	15.03.2024	*Polytrichastrum alpinum*, *Sanionia georgicouncinata*, *Bryum pseudotriquetrum*, *Bartramia patens*, *Cratoneuropsis chilensis*, and *Pohlia cruda* (Hedw.) Lindb. (Mniaceae)	1	0	0
Biscoe Islands						
Hook Is.	-65.637208, -65.169749	03.03.2024	*Barbilophozia hatcheri* and *Sanionia georgicouncinata*	35	0	0
	-65.637120, -65.169725		*Brachythecium austrosalebrosum*, *Sanionia georgicouncinata*, *Polytrichastrum alpinum*, and *Pohlia nutans*	54	0	0
	-65.637271, -65.169146		*Sanionia georgicouncinata*	16	1	5
	-65.637435, -65.169787		*Polytrichum strictum*	34	0	0
Pitt Islands, un-named island No.1	-65.400167, -65.302683	17.12.2023	*Sanionia georgicouncinata*	1	0	0
	-65.400167, -65.302683		*Prasiola crispa* and *Sanionia georgicouncinata*	22	0	0
	-65.400700, -65.302600	12.01.2024	*Prasiola crispa* and *Sanionia georgicouncinata*	26	0	0
	-65.400700, -65.302600		*Prasiola crispa*	200	0	0
Pitt Islands, un-named island No.2	-65.395917, -65.295583	17.12.2023	*Sanionia georgicouncinata*	1	0	0
	-65.395933, -65.296100		*Sanionia georgicouncinata*	1	0	0
Pitt Islands, Krivus Is.	-65.431933, -65.395183	17.12.2023	*Sanionia georgicouncinata*	1	1	0
	-65.431967, -65.396267		*Prasiola crispa*, *Sanionia georgicouncinata*	3	2	0

End of Table 1

Location	coordinates	Sampling date	Substrate	*Cryptopygus antarcticus*	*Friesea antarctica*	*Folsomotoma octooculata*
Adelaide Island and associated islands						
Adelaide Is., close to Carvajal Station	-67.761345, -68.915058	01.03.2024	*Sanionia georgicouncinata*	54	0	0
	-67.755420, -68.912315		*Larus dominicanus* nesting material: fur-seal hair (80%), feathers, and limpets	15	1	0
	-67.755473, -68.912555		*Larus dominicanus* nesting material: fur-seal hair (80%), feathers, and limpets	170	0	0
	-67.761696, -68.913867	02.03.2024	*Sanionia georgicouncinata*	84	0	0
Anchorage Is.	-67.597525, -68.203147	29.02.2024	*Sanionia georgicouncinata*	65	0	0
Avian Is.	-67.772660, -68.890283	01.03.2024	*Sanionia georgicouncinata*	134	0	0
	-67.772189, -68.889139	01.03.2024	*Sanionia georgicouncinata*	45	1	0
	-67.772597, -68.889844	01.03.2024	*Sanionia georgicouncinata*	55	13	0
	-67.769305, -68.879936	01.03.2024	*Larus dominicanus* nesting material: fur-seal hair (80%), feathers, and limpets (20%)	19	0	0
	-67.768906, -68.879003	01.03.2024		20	1	0
	-67.769305, -68.879936	01.03.2024	*Larus dominicanus* nesting material: fur-seal hair (80%), feathers, and limpets (20%)	20	0	0
	-67.772070, -68.885621	01.03.2024	*Stercorarius maccormicki* nesting material: *Sanionia georgicouncinata* 80%, fur-seal hair 18%, limpets, and feathers (2%)	49	0	0
Léonie Is.	-67.593785, -68.335666	29.02.2024	*Stercorarius maccormicki* nesting material: 80% *Deschampsia antarctica,* 5% limpets, *Syntrichia magellanica* (10%), *Brachythecium austrosalebrosum* (5%), *Sanionia georgicouncinata* (<1%)	37	0	0
	-67.593082, -68.339860		*Stercorarius maccormicki* nesting material: *Sanionia georgicouncinata* 85%, *Deschampsia antarctica* 10%, *Bryum pseudotriquetrum* 5%, fur seal hair <1%	3	0	0
	-67.593550, -68.338233		*Bryum pseudotriquetrum*, *Sanionia georgicouncinata*, and *Brachythecium austrosalebrosum*	10	0	0

Table 2. Collembola species recorded from the western Antarctic Peninsula with associated archipelagos and islands

No	Species	References
	Family Hypogastruridae Börner, 1906	
1	*Gomphiocephalus hodgsoni* Carpenter, 1908	Terauds et al., 2025
2	*Hypogastrura viatica* (Tullberg, 1872)	Greenslade, 1995, 2010; Hughes et al., 2015; 2017; 2025; Baird et al., 2019b
3	*Ceratophysella succinea* (Gisin, 1949)	Enríquez et al., 2019; Hughes et al., 2025
	Family Isotomidae Schäffer, 1896	
4	*Archisotoma brucei* (Carpenter, 1907)	Greenslade, 2010; Baird et al., 2019b
5	*Cryptopygus antarcticus* Willem, 1901	Convey & Smith, 1997; Greenslade, 2010; Baird et al., 2019b
6	*Cryptopygus badasa* Greenslade, 1995	Convey & Smith, 1997; Greenslade, 1995, 2010; Baird et al., 2019b
7	*Folsomia candida* Willem, 1902	Greenslade, 2010; Baird et al., 2019b
8	*Folsomotoma octooculata* (Willem, 1901)	Convey & Smith, 1997; Greenslade, 2010; Baird et al., 2019b
9	*Mucrosomia caeca* (Wahlgren, 1906)	Greenslade, 2010; Baird et al., 2019b
10	*Proisotoma minuta* (Tullberg, 1871)	Greenslade et al., 2012; Baird et al., 2019b
	Family Neanuridae Börner, 1901	
11	*Friesea antarctica* (Willem, 1901)	Convey & Smith, 1997; Greenslade, 2010, 2018; Dykyy et al., 2012; Baird et al., 2019b; Terauds et al., 2025
12	*Friesea bispinosa* Deharveng, 1981	Enríquez et al., 2018
13	*Friesea topo* Greenslade, 1995	Greenslade, 1995; Convey & Smith, 1997; Baird et al., 2019b
14	*Friesea woyciechowskii* Weiner, 1980	Greenslade, 2010; Baird et al., 2019b
	Family Onychiuridae Lubbock, 1867	
15	*Deuteraphorura cebennaria* (Gisin, 1956)	Greenslade et al., 2012; Baird et al., 2019b
16	*Protaphorura fimata* (Gisin, 1952)	Greenslade, 2010; Baird et al., 2019b
	Family Tullbergiidae Bagnall, 1935	
17	*Mesaphorura macrochaeta* Rusek, 1976	Greenslade et al., 2012; Baird et al., 2019b
18	*Tullbergia bisetosa* Börner, 1903	Terauds et al., 2025
19	*Tullbergia mixta* Wahlgren, 1906	Greenslade, 2010; Baird et al., 2019b
20	*Tullbergia templei* Wise & Kaj, 1970	Sanabria et al., 2023

Table 3. Comparison of the recorded Collembola species diversity with literature data for all study locations. Species documented for a given location for the first time are indicated in bold

Locality	Current study	Literature data
South Shetland Islands		
Nelson Is.	*Cryptopygus antarcticus*, *Friesea antarctica*, *Folsomotoma octooculata*	*Tullbergia mixta*, *Cryptopygus antarcticus, Friesea antarctica*, *Folsomotoma octooculata* (Greenslade, 1995, 2010; Fanciulli et al., 2018; GBIF, 2025)
Graham Coast, Kyiv Peninsula		
Girard Bay Oasis Cape Pérez Rasmussen Point	***Cryptopygus antarcticus, Friesea antarctica, Folsomotoma octooculata***	No data
Cape Tuxen	***Cryptopygus antarcticus***	No data
Graham Coast, Wilhelm Archipelago		
Booth Is.	*Cryptopygus antarcticus,* ***Friesea antarctica, Folsomotoma octooculata***	*Cryptopygus antarcticus* (GBIF, 2025)
Hovgaard Is.	***Cryptopygus antarcticus, Friesea antarctica, Folsomotoma octooculata***	No data
Petermann Is.	*Cryptopygus antarcticus*, *Friesea antarctica*, *Folsomotoma octooculata*	*Cryptopygus antarcticus*, *Friesea antarctica*, *Folsomotoma octooculata* (Bezkrovna, 2005; Trokhymets & Tancredi, 2009; Trokhymets et al., 2014)
Darboux Is.	*Cryptopygus antarcticus*, *Friesea antarctica*, *Folsomotoma octooculata*	*Cryptopygus antarcticus*, *Friesea antarctica*, *Folsomotoma octooculata* (GBIF, 2025)
Graham Coast, Yalour Islands		
Great Yalour Is.	*Cryptopygus antarcticus*, *Friesea antarctica*, *Folsomotoma octooculata*	*Cryptopygus antarcticus*, *Friesea antarctica*, *Folsomotoma octooculata* (Trokhymets & Tancredi, 2009)
Graham Coast, Argentine Islands		
Bondarchuk Is. of the Barchans	***Cryptopygus antarcticus, Friesea antarctica, Folsomotoma octooculata***	No data
Central Pig Is.	***Cryptopygus antarcticus, Friesea antarctica***	
Eastern Corner Is. Eight Is.	***Cryptopygus antarcticus, Friesea antarctica, Folsomotoma octooculata***	
Fanfare Is.	*Cryptopygus antarcticus*, *Friesea antarctica*, *Folsomotoma octooculata*	*Cryptopygus antarcticus*, *Friesea antarctica*, *Folsomotoma octooculata* (Trokhymets et al., 2012)
Galindez Is.	*Cryptopygus antarcticus*, *Friesea antarctica*, *Folsomotoma octooculata*	*Cryptopygus antarcticus*, *Friesea antarctica*, *Folsomotoma octooculata* (Trokhymets & Tancredi, 2009)
Grotto Is.	***Cryptopygus antarcticus***, ***Friesea antarctica***	No data
Irizar Is.	*Cryptopygus antarcticus*, *Friesea antarctica*	*Cryptopygus antarcticus* and *Friesea antarctica* (Trokhymets et al., 2011; 2012)
Skua Is.	*Cryptopygus antarcticus*, ***Friesea antarctica***, ***Folsomotoma octooculata***	*Cryptopygus antarcticus* listed in the GBIF (2025); however, the coordinates correspond to the sea ca. 5 km from Skua Island
Uruguay Is.	*Cryptopygus antarcticus*, *Friesea antarctica*, *Folsomotoma octooculata*	*Cryptopygus antarcticus*, *Friesea antarctica*, *Folsomotoma octooculata* (Trokhymets et al., 2012)

Continuation of Table 3

Locality	Current study	Literature data
Graham Coast, Cruls Islands		
Un-named island	***Cryptopygus antarcticus***	No data
Graham Coast, Roca Islands		
Locator Is.	***Cryptopygus antarcticus, Friesea antarctica, Folsomotoma octooculata***	No data
Graham Coast, Berthelot Islands		
Ukraine Is.	*Cryptopygus antarcticus, Friesea antarctica, Folsomotoma octooculata*	*Folsomotoma octooculata* reported by Fanciulli et al. (2018). *Folsomotoma octooculata*, *Friesea antarctica*, and *Cryptopygus antarcticus* documented for the islands (possibly Ukraine Is. also) according to Bezkrovna (2005) and GBIF (2025)
Graham Coast, the south side of Beascochea Bay		
Mount Waugh	***Cryptopygus antarcticus, Friesea antarctica, Folsomotoma octooculata***	No data
Graham Coast, Lippmann Islands		
Sagaidachnyi Is.	***Cryptopygus antarcticus, Friesea antarctica, Folsomotoma octooculata***	No data
Graham Coast, Leroux Bay		
Lahille Is.	***Folsomotoma octooculata***	No data
Chavez Is.	***Cryptopygus antarcticus***	No data
Biscoe Islands		
Hook Island	***Cryptopygus antarcticus, Friesea antarctica, Folsomotoma octooculata***	No data
Krivus Is.	***Cryptopygus antarcticus, Friesea antarctica***	No data
Un-named island No. 1	***Cryptopygus antarcticus***	No data
Un-named island No. 1		
Adelaide Island and associated islands		
Adelaide Is.	Many *Cryptopygus antarcticus* specimens and a single individual of *Friesea antarctica* were found in one of the samples	One springtail species used for cryo studies was *Cryptopygus antarcticus* (Block & Worland, 2001). *Friesea antarctica* and *Cryptopygus antarcticus* collected from Rothera Point (-67.566667, -68.133333; more than 39 km from sites used in the current research) were used in the study of Hayward et al. (2004). *Cryptopygus badasa* and *Folsomotoma octooculata* are also noted at this location by Convey and Smith (1997). *Friesea antarctica* has also been reported near the coast (GBIF, 2025), although the map shows that this is not on the island, and the database does not specify the exact location
Anchorage Is.	*Cryptopygus antarcticus*	*Cryptopygus antarcticus*, *Cryptopygus badasa*, *Friesea antarctica* (Convey & Smith,1997; Bokhorst et al., 2008a; 2008b)

End of Table 3

Locality	Current study	Literature data
Avian Is.	*Cryptopygus antarcticus*, ***Friesea antarctica***	*Cryptopygus antarcticus* (GBIF, 2025)
Léonie Is.	*Cryptopygus antarcticus*	*Cryptopygus antarcticus*, *Cryptopygus badasa*, *Friesea antarctica*, *Folsomotoma octooculata* (single specimen) (Convey & Smith, 1997)