

THE COLLEMBOLA OF ANTARCTICA¹

By **K. A. J. Wise**²

Abstract: Subsequent to an earlier paper on Antarctic Collembola, further references and specimen locality records are given, and a new classification is used. Named species and definite distributions are combined in a definitive list of the Collembola of Antarctica. One new synonymy, *Hypogastrura viatica* (= *H. antarctica*), is recorded.

Collections additional to those reported by Wise (1967) are recorded here, together with further information on some of the species, including one new synonymy. References in the synonymic lists are only those additional to the ones published in my previous paper. As in that paper, S. Orkney Is. and S. Sandwich Is. records are included here, but are excluded from the list of species in Antarctica.

In addition to the Bishop Museum collections, specimens from collections of other institutions are recorded as follows: U.S. National Museum, Smithsonian Institution (USNM), British Museum (Nat. Hist.) (BMNH), British Antarctic Survey Biological Unit (BAS), and Canterbury University Antarctic Biology Unit (CUABU).

The arrangement of figures and legends are as in Wise (1967). In specimen data a figure at the beginning of a group is the number of micro-slide specimens; a figure at the end, after the collector's name, is the collector's site number.

Classification

Classification of the Antarctic species previously (Wise 1967) followed that of Salmon (1964) which radically changed some of the earlier classifications, separating some of the Suborder Arthropleona as distinct families in a new suborder, Nearthropleona. Since then, Massoud (1967) has published a sound revision of the Neanuridae, in which he has sunk the Suborder Nearthropleona establishing the families recorded therein by Salmon as subfamilies or tribes in the Family Neanuridae.

Under Salmon's classification the Antarctic species were listed (Wise 1967) as follows.

Suborder Nearthropleona

Family Anuridae

Friesea grisea

Suborder Arthropleona

Superfamily Hypogastruroidea

Family Onychiuridae

Subfamily Tullbergiinae

Tullbergia mixta

Tullbergia mediantarctica

Family Hypogastruridae

Biscoia sudpolaris

1. Partial results of research on U.S. Antarctic Research Program (NSF grant GA-131 to Bishop Museum).
2. Now of Auckland Institute and Museum, Auckland, New Zealand.

Gomphiocephalus hodgsoni
Hypogastrura viatica
Hypogastrura antarctica

Superfamily Entomobryoidea
 Family Isotomidae
 Subfamily Anurophorinae

Gressittacantha terranova
Cryptopygus antarcticus
Cryptopygus cisantarcticus
Cryptopygus caecus
Neocryptopygus nivicolus
Anurophorus subpolaris

Subfamily Proisotominae

Archisotoma brucei

Subfamily Isotominae

Isotoma klouvstadi
Isotoma sp.
Parisotoma octooculata
Antarcticinella monoculata

Following Massoud, the classification and list of the Collembola of Antarctica are established as follows. (One new synonymy is noted and one doubtful species of *Isotoma* is excluded.)

Suborder Arthropleona Börner, 1901
 Section Poduromorpha Börner, 1913
 Family Onychiuridae Börner, 1913
 Subfamily Tullbergiinae Bagnall, 1935
 Genus *Tullbergia* Lubbock, 1876

Tullbergia mixta Wahlgren, 1906
Tullbergia mediantarctica Wise, 1967

Family Hypogastruridae Börner, 1913
 Genus *Biscoia* Salmon, 1962

Biscoia sudpolaris Salmon, 1962

Genus *Gomphiocephalus* Carpenter, 1908

Gomphiocephalus hodgsoni Carpenter, 1908

Genus *Hypogastrura* Bourlet, 1839

Hypogastrura viatica (Tullberg, 1872)
 (= *Hypogastrura antarctica* Salmon, 1962) (**n. syn.**)

Family Neanuridae *sensu* Massoud, 1967

Subfamily Frieseinae Massoud, 1967

Genus *Friesea* Dalla Torre, 1895

Friesea grisea (Schäffer, 1891)

Section Entomobryomorpha Börner, 1913

Family Isotomidae Börner, 1901

Subfamily Anurophorinae Börner, 1901

Genus *Gressittacantha* Wise, 1967*Gressittacantha terranova* Wise, 1967Genus *Cryptopygus* Willem, 1902*Cryptopygus antarcticus* Willem, 1901*Cryptopygus cisantarcticus* Wise, 1967*Cryptopygus caecus* Wahlgren, 1906Genus *Neocryptopygus* Salmon, 1965*Neocryptopygus nivicolus* Salmon, 1965Genus *Anurophorus* Nicolet, 1864*Anurophorus subpolaris* Salmon, 1962

Subfamily Proisotominae Stach, 1947

Genus *Archisotoma* Axelson, 1912*Archisotoma brucei* (Carpenter, 1907)

Subfamily Isotominae Schäffer, 1896

Genus *Isotoma* Bourlet, 1893*Isotoma klouvstadi* Carpenter, 1902Genus *Parisotoma* Bagnall, 1940*Parisotoma octooculata* (Willem, 1901)Genus *Antarcticinella* Salmon, 1965*Antarcticinella monoculata* Salmon, 1965

SPECIES RECORDS

Tullbergia mixta Wahlgren, 1906

Tullbergia mixta: Bagnall, 1935, *Ann. Mag. Nat. Hist.* (10) **15**: 237.—Tilbrook, 1967, *Phil. Trans. Roy. Soc. Lond.* **B 252**: 266, 271, 277, 278.—Gressitt, 1967, *Ant. Res. Ser.* **10**: 3, 14.—Wise, 1967, *op. cit.*, 126.—Tilbrook, 1967, *op. cit.*, 337, 338, 354.—Gressitt, 1967, *op. cit.*, 378, 385, 387.

Following examination of further specimens of this species, additional information on morphological characters has been noted.

PAO lobes, 36–65. A small lateral spine present on each side of Th. II, Th. III, as in *T. bisetosa*. Foot without unguiculus but a short lateral lobe present.

Specimens examined. S. Shetland Is. Deception I.: 2, Whalers Bay, under whale bones on beach, 3.II.1965, J. Strong; Whalers Bay, under whale bones & debris on beach, 3.II.1965, Strong.

USNM: S. Shetland Is. Deception I.: 1, King George I., Potters Cove, 4.III.1963, W. L. Schmitt, 73a–63. Livingstone I., False Bay, mosses, 25.III.1963, Schmitt, 60–63. 4, Collins Pt., 3.II.1966, O. S. Flint; Collins Pt., 4.II.1966, Flint; 1, black-bellied petrel nest, 7.II.1966, Flint. Penguin I.: 19.II.1966, Flint.

BMNH: S. Shetland Is. Admiralty Bay: 1, E. Mackellar Inlet, 3–9 m, from mosses & grasses, 21.I.1937, Discovery Exped.

BAS: S. Shetland Is. Deception I.: 2, P. Tilbrook, XVIa.

Remarks. Although this species is found to have lateral thoracic spines it is still separated from *T. bisetosa* on characters of the PAO, unguiculus, and setation.

Distribution. S. Shetland Is.

Recorded as a species of *Tullbergia* from the peninsula area by Gressitt (1967a) but indicated on the distribution map (Gressitt, 1967a, Plate 10, Map 6) as on S. Shetland Is. only.

Tullbergia mediantarctica Wise, 1967 Fig. 1.

Tullbergia mediantarctica Wise, 1967, Ant. Res. Ser. **10**: 126–128.—Gressitt, 1967, *op. cit.*, 10, 14.—Janetschek, 1967, *op. cit.*, 244.

The holotype and allotype specimens were re-examined and the following character found.

Th. II, III, each with a pair of small lateral spines (Fig. 1) as in *T. bisetosa*.

Specimens examined. Central Antarctica. Nunatak in Shackleton Gl.: soil, 13.XII.1965, K. A. J. Wise, Site 18.

Remarks. *T. mediantarctica*, near the center of Antarctica, *T. mixta*, of the S. Shetland Is., and a new species of *Tullbergia* from Heard I. (Wise 1970), form a group of southern species with 30–65 lobes in the PAO. All 3 have also been found to have a pair of small lateral spines on each of Th. II and Th. III, as in the widespread subantarctic species *T. bisetosa*, which has over 70 lobes in the PAO. Further specimens and investigations are needed to determine the true relationship of these 4 southern species, one with another, and with other southern species. The presence of one species on the S. Shetland Is., one on the opposite side of the continent on Heard I., and one in the middle,

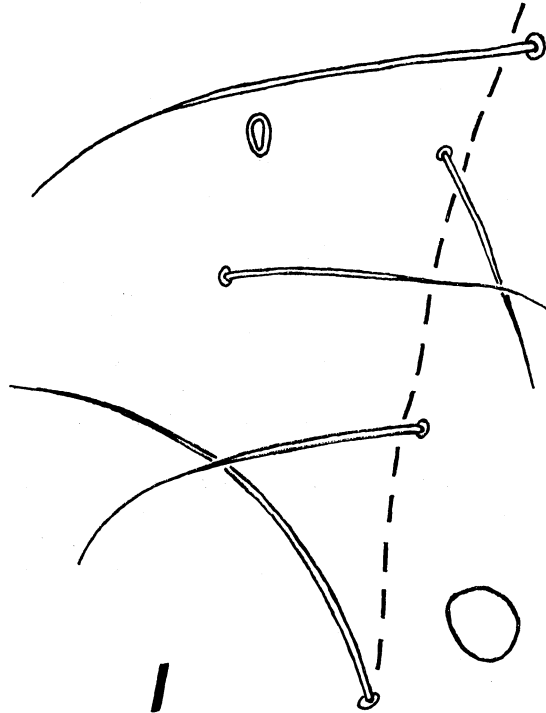


Fig. 1. *Tullbergia mediantarctica* Wise, 1967. Holotype. Th. II. Pseudocellus, setae, and lateral spine. ($\times 1000$).

in central Antarctica, may be evidence of an Antarctic source or pathway in the past, but on the other hand, these 3 species may be southern derivatives from the more widespread *T. bisetosa*.

Distribution. Central Antarctica in the Ross Sea sector. Recorded as a new species of *Tullbergia* from the Queen Maud Mts by Gressitt (1967a).

Biscoia sudpolaris Salmon, 1962

Biscoia sudpolaris: Gressitt, 1967, Ant. Map Folio Ser. **5**: 18.—Gressitt, 1967, Ant. Res. Ser. **10**: 9, 14.—Wise, 1967, *op. cit.*, 128.—Janetschek, 1967, *op. cit.*, 295–303.—Wise & Shoup, 1967, *op. cit.*, 330.

Distribution. Central Antarctica in the Ross Sea sector.

Gomphiocephalus hodgsoni Carpenter, 1908

Gomphiocephalus hodgsoni: Gressitt, 1967, Ant. Map Folio Ser. **5**: 18, 1967, Ant. Res. Ser. **10**: 4, 5, 14. Wise, 1967, *op. cit.*, 128–129.—Janetschek, 1967, *op. cit.*, 231–84, 295–303.—Wise & Shoup, 1967, *op. cit.*, 330.

Specimens examined. South Victoria Land. L. Penny: 1, 23.XI.1964, J. Shoup & Burckholder; 1, soil under stones, sample, 26.X.1964, E. Svaton; soil samples, 9, 26.XI.1963, Wise; S. shore, active under stones, 9.XI.1963, Wise; quadrats, 11–12, 25.XI.1963, 9.I.1964, 8.II.1964, Wise; soil under stone, 9.I.1964, 22, 23.II.1964, Wise; soil under stone, 8.II.1964, Wise; colony under stone, 12.XI.1963, Wise; colony under rock, 11.XI.1963, 9.IX.1964, K. P. Rennell; 1, under stones, 22.II.1964, Wise & Rennell; soil sample, 9.IX.1964, Rennell; colony under rock, 10.XII.1963, A. V. Spain; soil under snowdrift, samples 10c, 10Dz, 10B, 22.II.1964, Wise; specimen under rock, 9.XI.1963, 22.II.1964, Rennell; soil sample 2.5–10 cm below surface, 22.II.1964, Wise; NE of L. Penny; black ridge, colony under stone, 11.XI.1963, Wise. Heald I.: 1, summit, 4.II.1966, O. R. Wilkes. S. of Blue Gl.: 152 m, soil sample, 29.I.1964, Spain, 13; 2 m, under stones amongst moss, 29.I.1964, Wise, 12; 20 m, under rocks on sand, 18.XII.1963, Gressitt; sand & stones, 18.XII.1963, Gressitt. Stranded Moraines: W. side, soil, 29.I.1964, Spain, 11; under stones, 29.I.1964, Wise, 11. L. Péwé: 1, 23.XII.1964, Shoup & Burckholder; 1, 14.XI.1964, R. S. Buchanan; soil under stones, sample, 26.X.1964, Svaton; soil samples to 5 cm depth, 3, 13.XI.1963, Wise; quadrats 13.XI.1964, 10.I.1964, 6.II.1964, Wise; colony under stone, 10.I.1964, Wise; 13.XI.1963, Spain. L. Teardrop: 518 m, under stones, 29.I.1964, Wise, 15; 518 m, soil sample, 29.I.1964, Spain, 15. Miers Valley: 1, 23.XII.1965, R. Bell. Above Butter Pt: 360 m, under stones, 8.I.1964, Wise, 7; 366 m, under stones, 29.I.1964, Spain, 7. Mt. Coleman Ridge: 914 m, soil sample, 28.I.1964, Wise, 6; 914 m, under stones, 28.I.1964, Wise, 6. Below Taylor Gl.: soil sample, 18.III.1964, Wise. Marble Pt: 19.I.1966, J. M. Fitzsimons; on surface of rock, 13.XII.1965, Fitzsimons; under surface at rocks, 13.XII.1965, Fitzsimons; 1, 23.XII.1964, Shoup & Burckholder; 1, soil under stones, sample, 26.X.1964, Svaton; soil samples, 14.XII.1964, Spain; under stone & in soil beneath, 11.II.1965, J. McDonald; under stones 14.XI.1963, Wise; slope in front of glacier, stones amongst moss, 12.I.1964, Wise; quadrats 11.I.1964, 10.II.1964, Wise; SW of knoll, quadrat, 19.XI.1963, Wise; soil samples, 12.I.1964, Wise; colony from stone, 15.XII.1963, Wise; 14.XII.1963, Spain. Lizards Foot: 500 m, under stones, 28.I.1964, Wise & Spain, 3; 500 m, soil sample, 28.I.1964, Spain, 3. King Pin Nunatak: 762 m, under stones, 28.I.1964, Wise, 5; soil sample, 28.I.1964, Spain, 5. Mt. Doorly ridge: 839 m, soil sample, 28.I.1964, Wise, 4. Dunlop I.: soil sample, 28.I.1964, Wise, 2; soil sample, 28.I.1964, Spain. Spike Cape: soil samples, 28.I.1964, Spain, 1; soil sample, 12.II.1964, Wise, 5. Flatiron: soil sample, 16.XII.1963, Wise; soil sample, 15.I.1964, Spain; under stones, 15.XI.1964, Wise; quadrat, 16.XII.1963, Gressitt; quadrats 1, 2, 3, 4, 14–15. I.1964, 13.II.1964, Wise; soil sample, 16.XII.1963, Spain; soil samples, 13.II.1964, Wise; colonies under rock, 16.XII.1963, Spain. Finger Pt.: feathers & soil, and penguin roost, 14.I.1964, Wise. Kar Plateau: under stones, 16.XI.1963, Wise, Spain. Convoy Range: Towle Gl. 24.XII.1967–4.I.1968, D. A. Pittard.

Ross I. Small crater above McMurdo Stn: S slope nr pond, 1.II.1966, Fitzsimons. Cape Barne: by Sunk Lake, 10 m, under stones, moss & soil sample, 21.I.1964, Wise. Cape Evans: The Ramp, 49 m, soil sample, under stones, 29.I.1964, Wise, 3; Spain, 3; The Ramp below Dreadnought Cone, 55 m, under stones, 21.I.1964, Wise, 2. Cape Royds: 61 m, under stones, 20.I.1964, Wise, 9; nr Clear Lake, 15 m, under stones, 20.I.1964, Wise, 1; Horseshoe Bay, under stones, 20.I.1964, Wise, 5; S of Horseshoe Bay, 20.I.1964, Wise, 4; N of Clear Lake, soil & moss sample, 20.I.1964, Wise, 3; soil sample, 15.XII.1964, Gressitt; 1, 15.XI.1963, Buchanan. Rocky Pt.: 20 m, soil samples, under stones, 26.I.1964, Wise, Spain, 3. Cape Crozier: 1, W of Post Office Hill, 260 m, sample, 2.II.1966, Wilkes, 169; 1, summit Sugarloaf Hill, 54 m, 2.II.1966, Wilkes, 166; 1, Hut, 145 m, sample, 30.I.1966, Wilkes, 162; 1, Conical Hill, sample, 28.I.1966, Wilkes, 161; 2, behind hut, 550–700 m, sample, 2.II.1966, Wilkes, 167, 168; 1, cliff edge Sugarloaf, 40 m, 1.II.1966, Wilkes, 165; 1, The Saddle, 120 m, 2.II.1966, Wilkes, 171; 1, inland of Sugarloaf Hill, 40 m, 2.II.1966, Wilkes, 164; 1, 3.II.1966, Fitzsimons; N side, soil above penguin rookery, sample, 24.I.1964, Wise, S4; side, under stones, 24.I.1964, Wise, 5; 1, S. side, soil samples, 24.I.1964, Spain, 5. Cape Mackay: 700 m, under stones, soil samples, 24.I.64, Wise, 6.

CUABU: Ross I. C. Royds: moss, 21.I.1965, J. Spellerberg. Rocky Pt.: edge of lake, 1.I.1965, Spellerberg.

Distribution. South Victoria Land and off-shore islands.

Hypogastrura viatica (Tullberg, 1872) Fig. 2, 3.

Hypogastrura viatica: Gressitt, 1967, Ant. Map. Folio Ser. 5: 18.—Tilbrook, 1967, *Phil. Trans. Roy. Soc. Lond. B* 252: 266, 277.—Gressitt, 1967, Ant. Res. Ser. 10: 14.—Wise, 1967, *op. cit.*, 129.—Tilbrook, 1967, *op. cit.*, 337, 338.

Hypogastrura antarctica Salmon, 1962, *Pacif. Ins.* 4(4): 887–889.—Tilbrook, 1967, *Phil. Trans. Roy. Soc. Lond. B* 252: facing page 278.—Gressitt, 1967, Ant. Res. Ser. 10: 9, 14.—Wise, 1967, *op. cit.*, 130. (**n. syn.**)

Description of foot of S. Shetland Is. specimens including holotype of *Hypogastrura antarctica* Salmon (Figs. 2, 3).

Claw with 2 outer, 1 inner, teeth. Tibiotarsi of mid and posterior feet with 3 tenant hairs arising in a straight line, 2 hairs clavate, the 3rd hair very finely clavate.

Specimens examined. USNM. Antarctic Pen. Tower I.: 1, sheathbill nest, 5.II.1966, Flint. S. Shetland Is. Deception I.: 1, Collins Pt., 3.II.1966, Flint; 1, Collins Pt., 4.II.1966, Flint.

BAS: S. Shetland Is. Deception I.: 4, from dead gull & under rocks & wood, Tilbrook.

Remarks. Specimens of *Hypogastrura* from the S. Shetland Is. were previously recorded (Wise, 1967) as *H. viatica*. The holotype specimen of *H. antarctica* Salmon, has now been examined and found to be conspecific with the previous specimens and those recorded above. The legs of the *antarctica* holotype are not lying absolutely laterally and the teeth of the claw appear as in Fig. 2. There are 2 outer and 1 inner teeth to the claw, not 1 outer and 1 inner as recorded and figured by Salmon (1962). There are also 3 tenant hairs, not 2 as recorded by Salmon. The fact that 1 of the 3 is only very finely clavate does not remove the specimens from the species *viatica*. Other characters fall within the range of characters of this species.

I am grateful to P. N. Lawrence for his opinion on S. Shetland Is. specimens of this species.

Distribution. Cosmopolitan, including the S. Shetland Is.

Gressitt (1967a) recorded 2 species of *Hypogastrura* on S. Shetland Is., meaning *viatica* and *antarctica*, and also recorded *H. viatica* from the peninsula area and several subantarctic islands. However, as indicated on the distribution map (Gressitt 1967a, Plate 10, Map 6), the peninsula area reference referred only to S. Shetland Is. No species of *Hypogastrura* has yet been taken on the Antarctic continent. One specimen is recorded above from a bird nest on Tower I., one of the

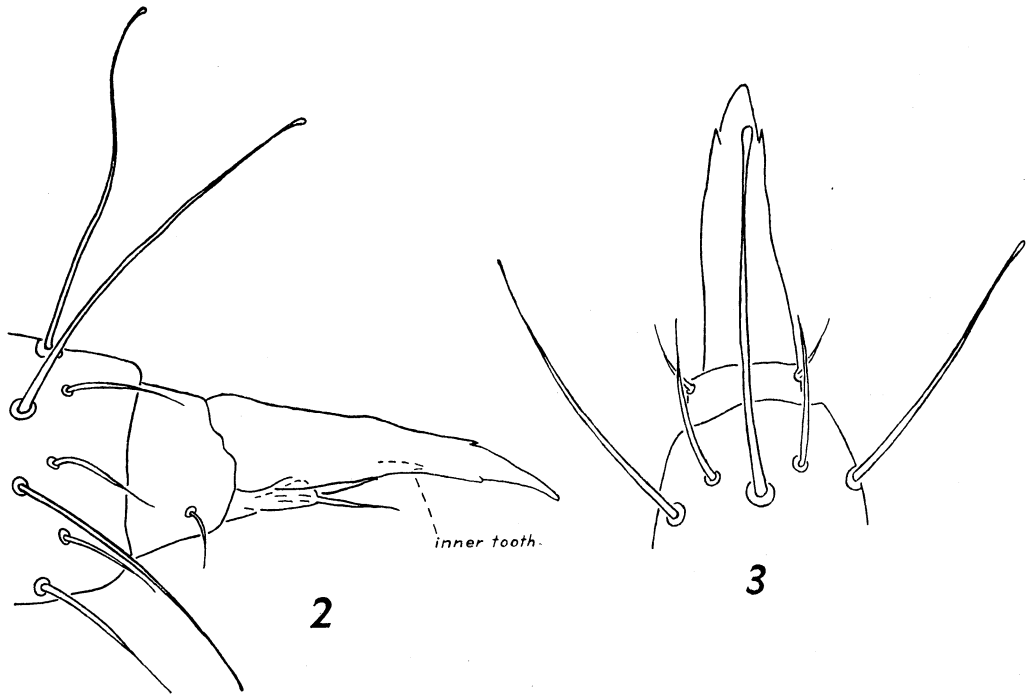


Fig. 2-3. *Hypogastrura viatica* (Tullberg). 2. Outer-lateral view of left posterior foot (holotype of *H. antarctica* Salmon). ($\times 1000$). 3. Outer view of foot (different specimen). ($\times 1000$).

Antarctic Pen. off-shore islands, but this record requires confirmation. Tower I. appears to be one of the nearest to the S. Shetland Is.

Friesea grisea (Schaffer, 1891)

Friesea grisea: Gressitt, 1967, Ant. Map Folio Ser. 5: 18, 20-21.—Tilbrook, 1967, *Phil. Trans. Roy. Soc. Lond. B* 252: 266, 277, 278.—Massoud, 1967, *Biol. Amer. Aust.* 3: 133.—Gressitt, 1967, Ant. Res. Ser. 10: 5, 11, 14, 19.—Wise, 1967, *op. cit.*, 125-126.—Gressitt & Shoup, 1967, *op. cit.*, 319-320.—Wise & Shoup, 1967, *op. cit.*, 325-330.—Tilbrook, 1967, *op. cit.*, 334-354.—Strong, 1967, *op. cit.*, 361, 366, 367.—Gressitt, 1967, *op. cit.*, 374-388.

Friesea antarctica: Salmon, 1964, *Roy. Soc. N.Z. Bull.* 7: 261,

Specimens examined. North Victoria Land. S of Crater Cirque: sample, 14.XI.1964, Wise, 10; 396 m, moss, soil, lichen, 26.XI.1964, Wise 10: 1, 396 m, moss, soil, lichen, 26.XI.1964, Wise, 10; under stones, 14.XI.1964, Wise, 10. Redcastle Ridge: 21.XI.1964, Shoup; 360 m, under stones, 21.XI.1964, Shoup. Between Manhaul & Edisto Glaciers: 1, 200 m, 20.XI.1964, Gressitt, 17. E of Luther Peak: 61-152.5 m, 18.XI.1964, Wise, 17; 1, W side, 61 m, moss & soil sample, 18.XI.1964, Wise, 17. C. Christie: top, 305 m, soil under stones, 10.XI.1964, Wise, 7; 1, top, 457 m, 10.XI.1964, Shoup, 11. Hallett: 2.I.1966, Fitzsimons; 1, skua flats, 13.XI.1964, Gressitt; 1, flats, 24-25.XI.1964, Gressitt & Shoup; transect, moss & soil, 22.XI.1964, Wise & Shoup, 18; transect 4.XI.1964, Wise; transect, black alga, 6.XI.1964, Wise; transect D, 26.XI.1964, Gressitt & Shoup; moss patch on slope, wet moss & stones, 25.XI.1964, Wise; 30 m, under stones below moss patch on slopes, 26.XI.1964, Wise; 213 m, talus slopes, 14.XI.1964, Wise; skua rookery, under stones, 13.XI.1964, Wise; 30.5 m, stones & coarse soil below snow patch, 26.XI.1964, Wise. Islands Pt.: 1, 15 m, under stones

on cliff ledges, 8.XI.1964, Wise; 1, soil & algae sample, 8.XI.1964, Wise, 5. Mouth of Wallis Gl.; 30.5 m, in rock cliff, 8.XI.1964, Shoup, 5.

East Antarctica. Molodeznaya: 1, 1.I.1965, G. Meyer.

Antarctic Peninsula. Anvers I.: 1, Norsel Pt., *Polytrichum*, 17.III.1965, C4; Arthur Hbr, Humble I., moss, 27.I.1965; Arthur Hbr, Janus I., surface of soil patch, 1.II.1965; Arthur Hbr, Janus I., clump of moss in niche in rock, 1.II.1965; Norsel Pt, 28.I.1965; Norsel Pt, in moss clumps, 28.I.1965. Port Lockroy: shell-moss habitat, 8.II.1965, Strong. Melchior Station: 1, -.I.1965, R. Fralick.

USNM: Antarctic Pen. Ross I. group: 1, Hope Bay, Louis Phillippe Pen., 15.II.1963, Schmitt, 47A-63. Danco Coast: 1, Paradise Hbr, Argentine Base "Brown", moss, 2.II.1963, Schmitt, 21-63; 1, Alcock I., off Brialmont Cove, 11.II.1963, Schmitt, 41b-63. Anvers I.: 1, Port Lockroy, off Wiencke I., mosses, 26.I.1963, Schmitt, 10-63: 1, Bonaparte I., moss sample, 1.III.1963, Schmitt, 69-63; 1, Bonaparte I., 24.I.1963, Schmitt, 69-63; 1, Norsel Pt., 22.I.1963, Crowell & Schmitt, 4e-63. Hovgaard I.: 1, N end, algae, 28.I.1963, Schmitt, 20-63. Torgeson I.: 1, nr Adelie penguin rookery, 22.I.1963, 4d-63. Argentine I. anchorage: 1, Penguin I., moss sample, 31.I.1963, Schmitt, 16-63. C. Tuxen: 1, moss & lichen sample, 31.I.1963, Schmitt, 16a & c-63. Adelaide I.: 1, moss sample, 20.I.1963, Schmitt, 3c-63; 1, nr top hill with beacon, moss sample, 19.I.1963, T. E. Berg & Schmitt, Z-63. Avian I. off Adelaide I.: 1, 19.I.1963, Berg & Schmitt, 2a-63. Litchfield I. nr Palmer Stn: *Macronectes* nest, 21.I.1966, Flint; 3, 21.I.1966, Flint; petrel nest, 21.I.1966, Flint; *Larus dominicanus* nest, 21.I.1966, Flint. Anvers I.: Palmer Stn, 28.I.1966, Flint; Bonaparte I., 26.I.1966, Flint. Nr Anvers I.: Unnamed I., Laggard Gp, 27.I.1966, Flint; I. off Hermit I., 27.I.1966, Flint. Off Anvers I.: Dream I., 24.I.1966, Flint. Off Adelaide I.: Avian I., 1966, Flint. Tower I.: 5.II.1966, Flint.

S. Shetland Is. Livingstone I.: 2, False Bay, 25.II.1963, Schmitt, 60-63. King George I.: 1, Potters Cove, 4.III.1963, Schmitt, 73a-63. Deception I.: 1, Collins Pt., 3.II.1966, Flint; Collins Pt., black-bellied petrel nest, 7.II.1966, Flint; Macaroni Pt., 2.II.1966, Flint. Penguin I.: 19.II.1966, Flint.

BMNH Antarctic Pen. Port Lockroy: 1, summit of Gondier I., 12 m, from snow melt pools in granodiorite rock, 26.XI.1944, I. Mackenzie Lamb, Oper. Tabarin; 2, Gondier I., under stones in damp places & wet moss cushions, 22.XI.1944, Oper. Tabarin; 3, Gondier I., 6 m, wet moss, 6, 26.XI.1944, Lamb, Oper. Tabarin; 4, cliffs S of Alice Creek, 17.XI.1950, 11.I.1951, F.I.D.S..

S. Shetland Is. E. Penguin I.: 30 m, mosses, 9.I.1937, Discovery Exped. Admiralty Bay: 1, Pt. Thomas, 6 m, lichen encrusted lava, 21.I.1937, Discovery Exped.; 3, E Mackellar inlet, 3-9 m, from mosses & grass, 21.I.1937, Discovery Exped.

B.A.S. Antarctic Pen. Danco I.: 2, Tilbrook, XXVIb. Uruguay I.; 2, on water, Tilbrook.

S. Shetland Is.: 2, Tilbrook, XIV.

Distribution. North Victoria Land, East Antarctica, Antarctic Pen. and off-shore islands, S. Shetland Is., and subantarctic islands.

Recorded by Wise (1967) from Antarctic continent, S. Shetland Is., and S. Georgia. Wise also recorded *Friesea* sp. (see below) from S. Orkney Is. Tilbrook (1967b) recorded *F. grisea* from Antarctic Pen., S. Shetland Is., S. Orkney Is., and listed the species as a doubtful inhabitant of S. Sandwich Is. Gressitt (1967b) recorded the species from Antarctic continent, S. Shetland Is., S. Georgia. A south Victoria Land record by Wise (1967) still needs confirmation before being considered definite.

***Friesea* sp.** Wise, 1967

Friesea sp. Wise, 1967, Ant. Res. Ser. **10**: 126.—Gressitt, 1967, *op. cit.*, 14.

Wise (1967) recorded *Friesea* sp. on S. Orkney Is., as specimens were not typical of *F. grisea*. Tilbrook (1967b) recorded *Friesea grisea* from S. Orkney Is. but also stated that the species of *Friesea* collected on those islands resembled *F. grisea*, except for certain characters. Gressitt (1967c) recorded only *Friesea* for S. Orkney Is. Thus it is still not certain, although it is likely that the *Friesea* sp. on the S. Orkney Is., is *Friesea grisea*.

Gressittacantha terranova Wise, 1967

Gressittacantha terranova Wise, 1967, Ant. Res. Ser. 10: 130.—Gressitt, 1967, *op. cit.*, 14.

Specimens examined. South Victoria Land. Terra Nova Bay: 5, Cape W. of Campbell Gl., 12 m, in hollow 400 m from sea, 9.XI.1965, Wilkes.

Distribution. South Victoria Land.

Gressitt (1967a) referred to this species as an unnamed genus.

Cryptopygus antarcticus Willem, 1901

Cryptopygus antarcticus: Womersley, 1934, *Trans. Proc. Roy. Soc. Sth Australia* 58: 89.—Gressitt, 1967, Ant. Map Folio Ser. 5: Pl. 10, Map 5.—Tilbrook, 1967, *Phil. Trans. Roy. Soc. Lond.* B 252: 263–278.—Gressitt, 1967, Ant. Res. Ser. 10: 3, 5, 14, 374–388.—Wise, 1967, *op. cit.*, 130–134.—Tilbrook, 1967, *op. cit.*, 334–355.—Strong, 1967, *op. cit.*, 361–369.—Holdgate, Tilbrook & Vaughan, 1968, *Br. Antarct. Bull.* 15: 3. *Cryptopygus crassus*: Womersley, 1934, *Trans. Proc. Roy. Soc. Sth Australia* 58: 89.

Specimens examined. Antarctic Pen. Anvers I.: 1, Arthur Hbr, on algae on iceberg, 15.I.1966, Gressitt; Norsel Pt., *Drepanocladus* sample, 19.III.1965; 1, Norsel Pt., *Drepanocladus* sample, 26.III.1965, Strong; Arthur Hbr, Janus I., dirty penguin feathers & guano, 1.II.1965; Arthur Hbr, Humble I., moss, 27.I.1965; Norsel Pt., *Drepanocladus* & *Deschampsia* sample, 17.III.1965; Norsel Pt., feather habitat, 2.III.1965; Arthur Hbr, Janus I., surface of soil patch, 1.II.1965; Arthur Hbr, Janus I., clump of moss in niche in rock, 1.II.1965; Norsel Pt., *Bryum* sample, 16.III.1965. Port Lockroy: shell-moss habitat, 8.II.1965, Strong.

S. Shetland Is. Deception I.: 1, Whalers Bay, under whale bones on beach, 3.II.1965, Strong; Whalers Bay, under whale bones & debris on beach, 3.II.1965, Strong. King George I.: moss, 3.II.1965, Strong.

USNM: Antarctic Pen. Johnson Coast: 2, Joinville I. group, C. Welchness, W extremity of Dundee I., moss, 20.II.1963, Schmitt, 54c–63. Off Graham Coast: 2, Peterman Is., Port Circoncision, 29.I.1963, Schmitt, 13–63. Off Adelaide I.: Avian I., melt pool, 19.I.1963, Schmitt, 2d–63: Avian I., 19.I.1963, Berg & Schmitt, 2a–63. Anvers I.: 1, Port Lockroy, off Wiencke I., moss, 26.I.1963, Schmitt, 10a–63: 1, Norsel Pt., mosses, 22.I.1963, Crowell & Schmitt, 4e2–63; 2, Arthur Hbr, Bonaparte I., moss sample, 24.I.1963, 1. III.1963, Schmitt, 69–63; 2, Norsel Pt., 22.I.1963, Crowell & Schmitt, 4e–63. N end Hovgaard I.: 1, Lammaire Channel, Pleneau I., algae, 28.I.1963, Schmitt, 12d–63, 20–63. Off C. Tuxen: 2, Green I., moss sample, 31.I.1963, Schmitt, 16e–63. C. Tuxen: 1, algae sample, 31.I.1963, Schmitt, 16b–63; 3, moss & lichen sample, 31.I.1963, Schmitt, 16a & c–63. Torgeson I.: 1, nr Adelie penguin colony, 22.I.1963, Schmitt, 4d–63. Argentine I. anchorage: 2, Penguin I., moss sample, 31.I.1963, Schmitt, 16–63. Adelaide I.: 2, moss sample, 20.I.1963, Schmitt, 3c–63: 1, nr top of hill with beacon, moss sample, 19.I.1963, Berg & Schmitt, z–63. Litchfield I. nr Palmer Stn.: 21.I.1966, Flint; petrel nest, 21.I.1966, Flint; *Larus dominicanus* nest, 21.I.1966, Flint. Nr Anvers I.: Unnamed I., Laggard Grp, 27.I.1966, Flint; I. off Hermit I., 27.I.1966, Flint. Anvers I.: Bonaparte Pt., 26.I.1966, Flint. Off Anvers I.: Dream I., 24.I.1966. Off Adelaide I.: Avian I., 1966, Flint. Tower I.: 5.II.1966, Flint.

S. Shetland Is. Deception I.: 1, Whalers Bay, on rock, 12.II.1963, Schmitt, 42b–63; 2, Whalers Bay, moss by old whale factory, 12.II.1963, Schmitt, 42c–63. King George I.: 1, Potters Cove,

4.III.1963, Schmitt, 73a-63; 1, Collins Hbr, Ardley Pen. anchorage, moss & lichen sample, 28.II.1963, Schmitt, 64a-63. False Bay: 1, Livingstone I., moss sample, 25.III.1963, Schmitt, 60-63. Elephant I.: 17.II.1966, Flint; C. Belsham, 17.II.1966, Flint. Deception I.: 2, Collins Pt, 3.II.1966, Flint; 1, Collins Pt, 4.II.1966, Flint; Whalers Bay, mushrooms, 3.II.1966, Flint; Collins Pt, black-bellied petrel nest, 7.II.1966, Flint; Macaroni Pt, 2.II.1966, Flint. Gibbs I.: 1, 18.II.1966, Flint; fulmar nest, 18.II.1966, Flint. Off Gaston I.: "Slippery Rock", cormorant nests, 30.I.1966, Flint; 30.I.1966, Flint. Penguin I.: 19.II.1966, Flint.

S. Orkney Is. Larsen I.: 2, 8.II.1966, Flint; 7.II.1966, Flint. Laurie I.: Martin Pt., 10.II.1966, Flint.

BMNH Antarctic Pen. Booth I.: 2, 6-45 m, surface of water, 1.III.1958, Royal Navy Hydrogr. Surv. party. Port Lockroy: 2, summit of Gondier I., from snow melt pools in granodiorite rock, 26.XI.1944, Lamb, Oper. Tabarin; 2, Gondier I., 6 m, wet moss, 26.XI.1944, Lamb, Oper. Tabarin; 2, Gondier I., 6 m, wet moss, 27.XI.1944, Lamb, Oper. Tabarin; 3, Weincke I., surface rainwater pools, 8.II.1945, Oper. Tabarin, A19: cliffs S. of Alice Creek, rocks & mud under stones, 17.XI.1950, F.I.D.S. Hope Bay: 2, Trinity Pen., Lake Boeckella, 15.IV.1945.

S. Shetland Is. King George I.: 2, Penguin I., 30 m, mosses, 9.I.1937, Discovery Exped.; 2, E side Esther Hbr, 24-30 m, moss, 6.I.1932, Discovery Exped.; 2, nr. Martins Head, 0-30 m, moss, Discovery Exped.; 2, Esther Hbr, summit, 30 m, under stones & moss, 6.I.1937, Discovery Exped.; 2, nr Martins Head, 0-30 m, 7.I.1967, Discovery Exped. Gibbs I.: 3, S. coast, 91 m, under flat stones on scree, 2.II.1937, Discovery Exped. E. Penguin I.: 2, 30 m, mosses, 9.I.1937, Discovery Exped.; 2, E of island, volcanic crater nr penguin rookery, 12 m, under stones, 9.I.1937, Discovery Exped. Admiralty Bay: 2, Pt. Thomas, 6 m, lichen encrusted lava, 21.I.1937, Discovery Exped.; 2, Mackellars Inlet, on wet ground under stones, 21.I.1937, Discovery Exped.; 2, E. Mackellar Inlet, 3-9 m, moss & grass, 21.I.1937, Discovery Exped.

S. Orkney Is. Signy I.: 244 m above Paal Hbr, mosses, *Usnea melaxantha*, 13.II.1937, Discovery Invest. W. Scotia Bay: 2, 45 m, mosses, 8.II.1937, Discovery Invest.; 2, 15 m, mosses, 8.II.1937, Discovery Invest.; 2, Laurie I., 91 m, 8.II.1937, Discovery Invest. Graptolite I.: 2, 23-30 m, in soil under stones penguin rookery, 11.II.1937, Discovery Invest. NW C. Geddes: 2, 7 m, under stones & moss, 23.XII.1946, F.I.D.S.; 2, 10 m, clusters under rocks, 10.XII.1946, F.I.D.S.

B. A. S. Antarctic Pen. Danco I.: 2, Tilbrook, XXVIb. Uruguay I.: 2, on water, Tilbrook. S. Shetland Is. Deception I.: 2, beach, Tilbrook; 2, moss, Tilbrook, XXXXII.

Remarks. Gressitt & Shoup (1967) recorded *Cryptopygus antarcticus* in error for *C. cisantarcticus* Wise, 1967.

Distribution. Antarctic Pen. and off-shore islands, S. Shetland Is., and subantarctic islands.

As recorded by Wise, 1967, with the addition of *Bouvetøya* recorded by Tilbrook (1967a). A Tasmanian record (see Wise 1967) requires confirmation.

***Cryptopygus cisantarcticus* Wise, 1967**

Cryptopygus cisantarcticus Wise, 1967, Ant. Res. Ser. **10**: 134-136.—Gressitt, 1967, *op. cit.*, 14.—Wise & Shoup, 1967, *op. cit.*, 325-330.

Cryptopygus antarcticus: Gressitt & Shoup, 1967, Ant. Res. Ser. **10**: 319-320.

Specimens examined. N. Victoria Land. S. of Crater Cirque: 1, sample, 14.XI.1964, Wise, 10; 1, 396 m, moss, soil lichen sample, 26.XI.1964, Wise, 10; 1, sample, 26.XI.1964, Wise, 10; 1, moss & soil sample, 14.XI.1964, Wise, 10. Between Manhaul & Edisto Glaciers: 1, 200 m, 20.XI.1964, Gressitt, 17. E. of Luther Peak: 1, 15 m, feather bolus, 18.XI.1964, Wise, 17; 1, 61 m, moss & soil sample, 18.XI.1964, Wise, 17. Hallett: 1, 80 m, 13.XI.1964, Gressitt; 1, transect 281.5 m, 22.XI.1964, Wise & Shoup; 5 transect, moss, 22.XI.1964, Wise; 2, transect, moss, algae, soil sample,

22.XI.1964, Wise & Shoup; transect 275.5 m, 4.XI.1964, Wise; transect 320 m, 22.XI.1964, Wise; transect, soil & black algae samples, 6.XI.1964, Wise; 2, transect, moss & soil sample, 6.XI.1964, Wise; nr transect, under stone in moss patch, soil & moss sample, 6.XI.1964, Wise; 10, flats, transects C, D, 24–26.XI.1964, Gressitt & Shoup; 1, under stones skua rookery, 17.XI.1964, Wise; 1, in dry moss patch on slope, under wet moss & stones, 25.XI.1964, Wise; moss patch on slope, wet moss, 25.XI.1964, Wise; under stones skua rookery, 13.XI.1964, Wise; stones soil, moss, below snow patch on slope, sample, 26.XI.1964, Wise; moss on slope, 26.XI.1964, Gressitt; 80 m, in moss, 13.XI.1964, Gressitt, 11. C. Phillips: 1, 579 m, 2.I.1966, Fitzsimons. C. McCormick: 2, 6.I.1966, Fitzsimons; 1, 200 m, volcanic rock debris, 8.XI.1964, Gressitt. Foyn I.: 2, 4.I.1966, Fitzsimons. Possession I.: 1, 9.I.1966, Fitzsimons.

Distribution. Balleny Is., north Victoria Land and off-shore islands.

Cryptopygus caecus Wahlgren, 1906

Cryptopygus caecus: Womersley, 1934, *Trans. Proc. Roy. Soc. Sth Australia* **58**: 89 (*coecus*).—Tilbrook, 1967, *Phil. Trans. Roy. Soc. Lond. B* **252**: 266, 277.—Gressitt, 1967, *Ant. Res. Ser.* **10**: 14.—Wise, 1967, *op. cit.*, 136.—Tilbrook, 1967, *op. cit.*, 337.

Distribution. S. Shetland Is. and subantarctic islands.

A South African record (see Wise 1967) requires confirmation.

Neocryptopygus nivicolus Salmon, 1965

Neocryptopygus nivicolus: Gressitt, 1967, *Ant. Map Folio Ser.* **5**: 18; 1967, *Ant. Res. Ser.* **10**: 9, 14.—Wise, 1967, *op. cit.*, 136.—Janetschek, 1967, *op. cit.*, 244–284.

Specimens examined. South Victoria Land. N. slopes Springtail Pt.: 2, soil under stones below snow patch, samples, 31.XII.1963, Wise; 2, soil under stones below snow patch, samples, 29.XII.1963, Wise. Convoy Range: 1, Towle Glacier, 24.XII.1967–4.I.1968, D. Pittard.

Distribution. South Victoria Land.

Recorded in south Victoria Land and at C. Crozier, Ross I., by Salmon (1965) (Wise 1967). As this species had not been seen at C. Crozier, or extracted from samples, by me, a request was made to O. R. Wilkes (Bishop Museum field party, 1956/66) to search for the species in that area. Wilkes searched and took samples at C. Crozier in January–February, 1966, but only *Gomphiocephalus hodgsoni* was found (see records for that species above). Janetschek (1967, footnote pp. 283–284) has thrown doubt on the occurrence of *N. nivicolus* in his C. Crozier samples so, in view of the fact that it has not been re-collected at C. Crozier, it seems best to restrict the distribution record to south Victoria Land, for the time being.

Anurophorus subpolaris Salmon, 1962

Anurophorus subpolaris: Gressitt, 1967, *Ant. Map Folio Ser.* **5**: 18 (*sudpolaris*); 1967, *Ant. Res. Ser.* **10**: 9, 14.—Wise, 1967, *op. cit.*, 136.—Janetschek, 1967, *op. cit.*, 235, 244, 282.

Specimens examined. Central Antarctica. Point E. side Barrett Gl.: 1, 457 m, soil & moss sample, 14.XII.1964, Wise, 21; 1, 548 m, stone & soil sample, 14.XII.1964, Wise, 21; 1, 457 m, thick dry blackish moss sample, 13.XII.1964, Wise, 21; 1, 518 m, under stones on damp soil, 14.XII.1964, Wise, 21; 1, under stone on soil & moss, 14.XII.1964, Wise, 21; 1, thin moss, 14.XII.1964, Wise, 21. Garden Spur: 1, 701 m, soil & lichen sample, 13.XII.1964, Wise, 20. E side Waldron Spurs: 1, 365 m, moss sample, 15.XII.1964, V. L. Yeats. E side Massam Gl.: 1, 457 m, in soil, 15.XII.1964, Shoup, 12. Nunatak in Shackleton Gl.: 1, 13.XII.1966, Wise, 18. E of Mt. Speed: 283 m, base of cliffs, 13.XII.1964, Wise, 19.

Distribution. Central Antarctica in the Ross Sea sector.

Archisotoma brucei (Carpenter, 1907) Fig. 4-6.

Archisotoma brucei: Gressitt, 1967, Ant. Map Folio Ser. **5**: 18.—Tilbrook, 1967, *Phil. Trans. Roy. Soc. Lond. B* 252: 266, 277.—Gressitt, 1967, Ant. Res. Ser. **10**: 14, 376-88.—Wise, 1967, *op. cit.*, 136-137.—Tilbrook, 1967, *op. cit.*, 334-347.—Strong, 1967, *op. cit.*, 361.—Holdgate, Tilbrook & Vaughan, 1968, *Br. Antarct. Bull.* 15: 3.

The specimens are typical of the genus. The following characters of the head are redescribed.

Eight ocelli on each side (Fig. 4). PAO length less than 4 diameters of nearest ocellus. *Griffe* of maxilla (Fig. 5, 6) with two teeth, equal in length, dorsal more pointed than ventral; *lamelle ventral externe* expanded, with at least 3 rows of setae or fringes of finger-like extensions; *lamelle ventrale interne* little longer than *griffe*, with 1 row of extensions; *lamelle médiane interne* longer and narrower than *lamelle dorsale interne*, sinuate; *lamelle dorsale interne* very wide, with long straight teeth on one edge; *lamelle proximale interne* well developed, with proximal extension.

Specimens examined. Antarctic Pen. Anvers I.: 2, Norsel Pt., in tide zone 26.XII.1965, G. Lippert, 6; 4, Norsel Pt., intertidal zone, in gravel, 26.XII.1965, Strong; 8, Biscoe Pt, intertidal gravel-sand flats, 8.I.1966, Gressitt; 3, Biscoe Pt, intertidal zone, Gressitt.

USNM: Antarctic Pen. Danco Coast: 1, Cuverville I., on old rotten whale vertebra, 5.II.1963, Schmitt, 31a-63.

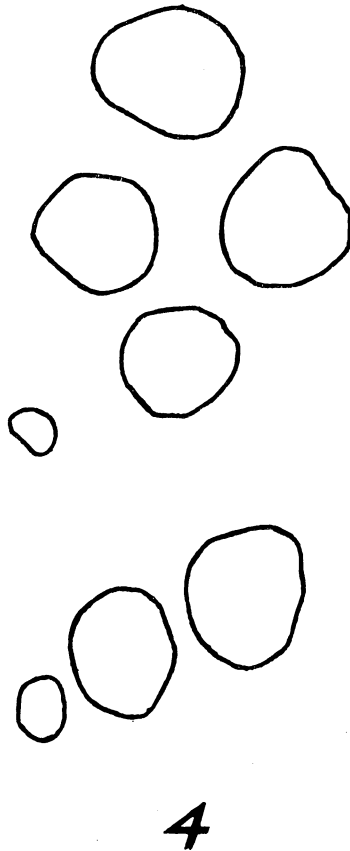


Fig. 4. *Archisotoma brucei* (Carpenter). Right ocelli. ($\times 1000$).

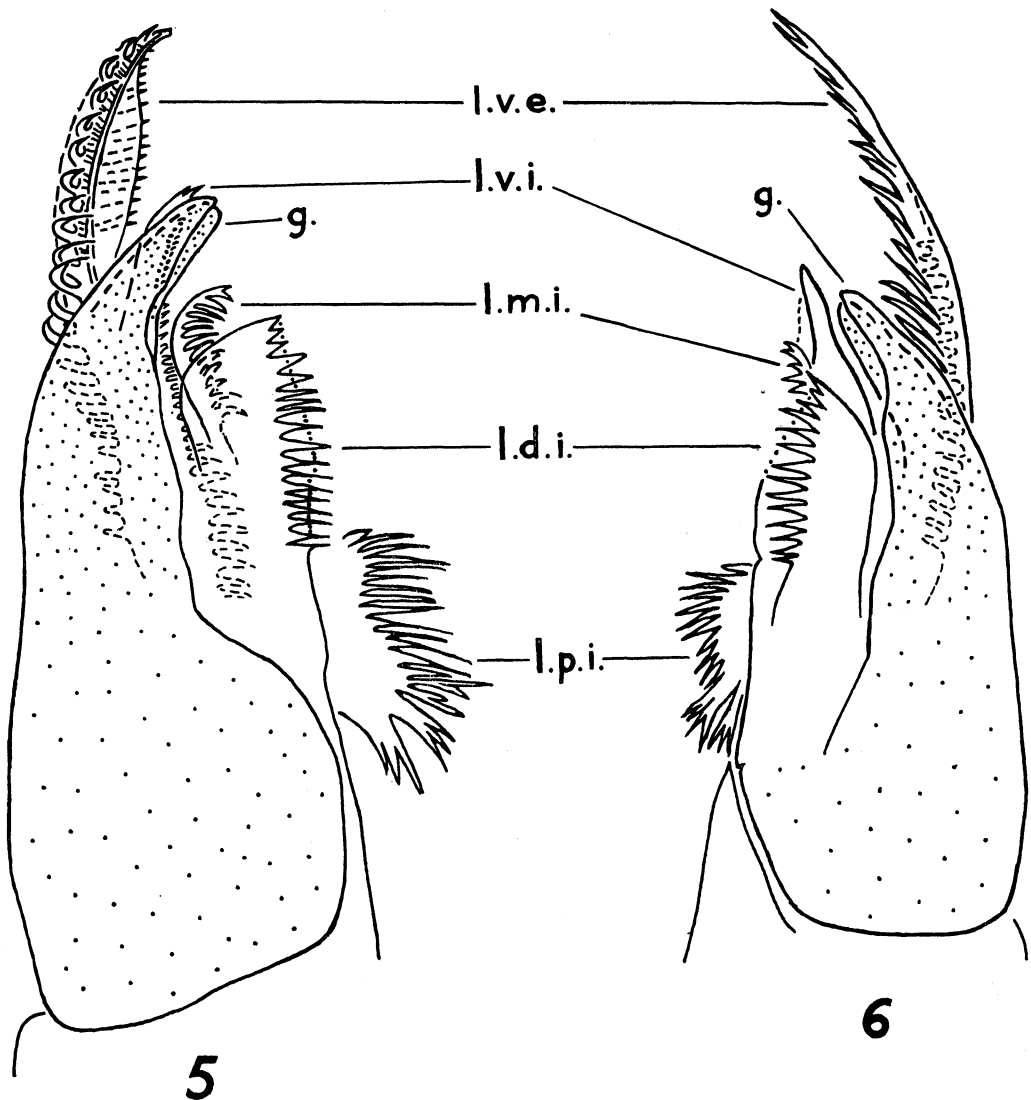


Fig. 5-6. *Archisotoma brucei* (Carpenter). Dorsal view of maxillae. ($\times 1500$). 5. Left maxilla head (S. Orkney Is. specimen). 6. Right maxilla head (Anvers I. specimen). g-griffe; l.v.e.-lamelle ventrale externe; l.v.i.-lamelle ventrale interne; l.m.i.-lamelle médiane interne; l.d.i.-lamelle dorsale interne; l.p.i.-lamelle proximale interne.

B.A.S.: S. Shetland Is. Deception I.: 2, Tilbrook, XXa: 2, seaweed, Tilbrook. S. Orkney Is. Signy I.: seaweed on shore, Tilbrook.

Remarks. The original description of this species (Carpenter, 1907) gave the number of ocelli as 12 but there are definitely 16 as in *A. besselsi* (Packard, 1877) (see Delamare Deboutteville 1953). This is the first description of the maxilla of specimens from the S. Orkney Is., the type locality of the species. Previously maxillae have been described and figured from Auckland I. specimens

(Delamare Deboutteville 1953; Poinot 1965). The present description and figures must refer to the true *brucei* but those by the earlier authors may refer to a separate Auckland I. species or subspecies. There are slight differences between the 2 and, unfortunately, I have not yet found specimens of *Archisotoma* amongst Auckland Is. collections to hand. As seen in the figures the Antarctic specimens agree with those from S. Orkney Is.

There is a *brucei* group of species with 2 teeth to the *griffe*, not with 1 as in the *besselsi* group. Carpenter (1907) described the "galea" as with 3 teeth, which may account for Delamare Deboutteville's descriptions as "tridentée" and "porte trois dents". The latter's figure shows *griffe* with only 2 teeth; an indeterminate point indicated behind *lamelle dorsale interne* probably being the *lamelle médiane interne*.

French terms, for the parts of the maxilla head, have been retained in honor of the work done on this genus by C. Delamare Deboutteville and N. Poinot, and also to facilitate direct comparison of my figures with theirs.

Distribution. Antarctic Pen. and off-shore islands, S. Shetland Is., and subantarctic islands.

Tilbrook (1967a) recorded the species from Antarctic Pen., S. Shetland Is., S. Orkney Is., S. Sandwich Is., and Bouvetøya. Gressitt (1967a) recorded the species in the Peninsula area, the distribution map (Gressitt 1967a, Pl. 10, Map 6) indicating it for both the Antarctic Pen. and S. Shetland Is. *A. brucei* has also been recorded from New Zealand and Auckland Is. (see Wise, 1967) but such records require confirmation by further examination of maxillae.

***Isotoma klovstadi* Carpenter, 1902**

Isotoma klovstadi: Gressitt, 1967, Ant. Map Folio Ser. 5: 18.—Tilbrook, 1967, Phil. Trans. Roy. Soc. Lond. B 252: 275.—Gressitt, 1967, Ant. Res. Ser. 10: 3, 14.—Wise, 1967, *op. cit.*, 137.—Janetschek, 1967, *op. cit.*, 245–268.—Gressitt & Shoup, 1967, *op. cit.*, 320, Figs. 2, 3.—Wise & Shoup, 1967, *op. cit.*, 325–330.—Tilbrook, 1967, *op. cit.*, 353.

Specimens examined. North Victoria Land. S. of Crater Cirque: 1, sample 14.XI.1964, Wise, 10; 2, soil under stones, moss & soil sample, 14.XI.1964, Wise, 10; 1, under stones, 14.XI.1964, Wise, 10. The Football: 1, 91 m, under stones, 13.XI.1964, Wise, 8; spur at base, soil sample, 13.XI.1964, Wise, 8. Between Manhaul & Edisto Gls.: 1, 200 m, 20.XI.1964, Gressitt, 17. Redcastle Ridge: 213 m, in algal debris, 21.XI.1964, Shoup; 1, under stones, 20.XI.1964, Wise; 1, 365 m, under stones, 21.XI.1964, Shoup; 1, 228 m, below snow field, under stones, 21.XI.1964; 1, under stones on damp soil, 13.XI.1964, Wise, 9. E of Luther Peak: 1, cliff, 100 m, 22.XI.1964, Gressitt; 1, 152 m, feather bolus, 18.XI.1964, Wise, 17; 1, top of S ridge, 472 m, 18.XI.1964, Wise, 17; 1, 67–76 m, 18.XI.1964, Wise, 17; 1, 61 m, moss & soil sample, 18.XI.1964, Wise, 17. C. Christie: 1, top, 300 m, soil under stones, sample, 10.XI.1964, Wise, 7; 1, top, 381–457 m, 10.XI.1964, Shoup, 11; 1, plateau, 350 m, 9.XI.1964, Gressitt. Hallett: 1, moss patch on slope, wet moss & stones, 25.XI.1964, Wise; transect 4.XI.1964, 22.XI.1964, Wise; flats, transect D7, 26.XI.1964, Gressitt & Shoup; on talus slope, soil under stones, samples, 6.XI.1964, Wise; moss patch on slope, wet moss, sample, 25.XI.1964, Wise; foot of slope, 13.XI.1964, Gressitt, 10; on slope, 30 m, feather boluses disgorged by skuas, 23.XI.1964, Wise; 30 m, below snow patch on slope, stones, soil, moss, 26.XI.1964, Wise; 30 m, beneath snow patch, stones, algae, soil, feather boluses, 26.XI.1964, Wise; 2.I.1966, Fitzsimons. C. Phillips: 1, 579 m, 2.I.1966, Fitzsimons. C. McCormick, 1, 6.I.1966, Fitzsimons; 1, 200 m, volcanic rock debris, 8.XI.1964, Gressitt. Foyne I.: 1, 4.I.1966, Fitzsimons. Possession I.: 2, 9.I.1966, Fitzsimons. C. Adare: 1, Ridley Beach, 25.I.1965, Shoup. C. Klövstad: 1, under stones, 8.XI.1964, Wise, 3. W side Islands Point: 1, 15 m, under stones on cliff edges, 8.XI.1964, Wise, 5. Pressure Bay: 1, 7 m, on cliffs, 8.XI.1964, Shoup, 1; 1, on stone from cliffs, 8.XI.1964, Shoup, 1. S side mouth

of Wallis Gl.: 1, 130 m, rock debris sample, 8.XI.1964, Shoup, 5. Between Fendley & Wallis Gls.: 1, in cliffs, 8.XI.1964, Shoup 4.

Distribution. North Victoria Land and off-shore islands.

Parisotoma octooculata (Willem, 1901)

Parisotoma octooculata: Gressitt, 1967, Ant. Map Folio Ser. 5: 18.—Tilbrook, 1967, *Phil. Trans. Roy. Soc. Lond.* B 252: 267, 277, 278.—Gressitt, 1967, Ant. Res. Ser. 10: 14.—Wise, 1967, *op. cit.*, 137–138.—Tilbrook, 1967, *op. cit.*, 334–335.—Strong, 1967, *op. cit.*, 361–370.—Gressitt, 1967, *op. cit.*, 374–388.

Specimens examined. Antarctic Pen. Port Lockroy: 1, in moss, 8.II.1965, Strong: 3, shell-moss habitat, 8.II.1965, Strong. Anvers I.: Arthur Hbr, Humble I., from moss, 27.I.1965: Arthur Hbr, Janus I., clump of moss in niche in rock, 1.II.1965; Norsel Pt, under moss, *Drepanothrix*, 23.II.1965, Strong. Melchior Stn 1: —.I.1965, Fralick.

S. Shetland Is. King George I.: 1, in moss, 3.II.1965, Strong.

USNM Antarctic Pen. Ross I. group: 1, Hope Bay, Louis Phillippe Pen., 15.II.1963, Schmitt, 47a–63. Danco Coast; 1, Paradise Hbr., Argentine Base “Brown”, 2.II.1963, Schmitt, 21–63; 1, Paradise Hbr, Argentine Base “Brown”, fine moss sample, 2.II.1963, Schmitt, 21–63; 1, Alcock I., off Brialmont Cove, 11, 23.II.1963, 41b–63, 56b–63. Schmitt. Torgeson I.: 3, nr Adelie penguin colony, 22.I.1963, Schmitt, 4d–63. C. Tuxen; 1, moss & lichen, 31.I.1963, Schmitt, 16a & c–63. Anvers I.: 1, Arthur Hbr, Bonaparte I., 24.I.1963, Schmitt, 6a–63: 1, Norsel Pt., 22.I.1963, Crowell & Schmitt, 4e–63. Litchfield I.: nr Palmer Stn., *Macronectes* nest, 21.I.1966, Flint; petrel nest, 21.I.1966, Flint; nr Palmer Stn, *Larus dominicanus* nest, 21.I.1966. Anvers I.: Palmer Stn, 28.I.1966, Flint; Bonaparte Pt., 16.I.1966, Flint. Nr Anvers I.: Island off Hermit I., 27.I.1966, Flint. Off Anvers I.: Dream I., 24.I.1966, Flint. Tower I.: 5.II.1966, Flint.

S. Shetland Is. Deception I.: 1, Whalers Bay, from bottom of rock, 12.II.1963, Schmitt, 42b–63; 2, Collins Pt, 3, 4.II.1966, Flint; Macaroni Pt., 2.II.1966, Flint. Penguin I.: 19.II.1966, Flint. Off Gaston I.: “Slippery Rock,” 30.I.1966, Flint. King George 1, I.: Potters Cove, 4.III.1963, Schmitt, 73a–63. False Bay: 1, Livingstone I., moss sample, 25.III.1963, Schmitt, 60–63. Yankee Hbr: 1, Greenwich I., 13.II.1963, Schmitt, 43b–63; 1, Greenwich I., 13.II.1963, Schmitt 43–63.

S. Orkney Is. Larsen I.: 2, 7, 8.II.1966, Flint. Laurie I.: Martin Pt, 10.II.1966, Flint.

BMNH: Antarctic Pen. Port Lockroy: 2, Gondier I., under stones in damp places & wet moss cushions, 22.XI.1944, Oper. Tabarin; 2, Gondier I., 6 m, wet moss, 26.XI.1944, Lamb, Oper. Tabarin; 3, cliffs S of Alice Creek, 11.I.1951, F.I.D.S.

S. Shetland Is. Pt. Thomas: Admiralty Bay, 6 m, lichen encrusted lava, 21.I.1937, Discovery Exped. Esther Hbr.: 1, summit, 30 m, cliff, 6.I.1937, Discovery Invest. E. Mackellar Inlet: 2, Admiralty Bay, 3–9 m, mosses & grass, 21.I.1937, Discovery Exped.

S. Orkney Is. NW C. Geddes: 2, 10 m, 10.XII.1946, F.I.D.S.

B.A.S. Antarctic Pen. Danco I.: 2, Tilbrook, XXVIb. Uruguay Is.: 2, on water, Tilbrook.

S. Shetland Is. Deception I.: 2, moss & rock, Tilbrook.

Distribution. Antarctic Pen. and off-shore islands, S. Shetland Is., and subantarctic islands.

Antarcticinella monoculata Salmon, 1965

Antarcticinella monoculata: Gressitt, 1967, Ant. Map Folio Ser. 5: 18; 1967, Ant. Res. Ser. 10: 9, 14.—Wise, 1967, *op. cit.*, 138–139.—Janetschek, 1967, *op. cit.*, 244–282.

Specimens examined. South Victoria Land. N slopes Springtail Pt.: 2, soil under stones, samples, 29.XII.1963, Wise; 1, soil under stones below snow patch, sample, 31.XII.1963, Wise. Nunatak NE of Mt. Murray: 3, W end, soil samples, 30.I.1964, Wise, 20; 1, under stones in wet soil under

Table 1. Collembola of Antarctica, distribution and status.

	East Ant- arctica	Central Ant- arctica	S. Vic- toria Land	off- shore islands	N. Vic- toria Land	off- shore islands	Balleny Is.	Ant- arctic Pen.	off- shore islands	S. Shet- land Is.	Status	Distribution elsewhere
Onychiuridae												
<i>Tullbergia mixta</i>										×	Endemic	
<i>Tullbergia mediantarctica</i>		×									Endemic	
Hypogastruridae												
<i>Biscoia sudpolaris</i>		×									Endemic	
<i>Gomphiocephalus hodgsoni</i>			×	×							Endemic	
<i>Hypogastrura viatica</i>										×	Indigenous	Cosmopolitan
Neanuridae												
<i>Friesea grisea</i>	×				×			×	×	×	Indigenous	Subantarctic islands
Isotomidae												
<i>Gressittacantha terranova</i>			×								Endemic	
<i>Cryptopygus antarcticus</i>								×	×	×	Indigenous	Subantarctic islands
<i>Cryptopygus cisantarcticus</i>					×	×	×				Endemic	
<i>Cryptopygus caecus</i>										×	Indigenous	Subantarctic islands
<i>Neocryptopygus nivicolus</i>			×								Endemic	
<i>Anurophorus subpolaris</i>		×									Endemic	
<i>Archisotoma brucei</i>								×	×	×	Indigenous	Subantarctic islands
<i>Isotoma klovtadi</i>					×	×					Endemic	
<i>Parisotoma octooculata</i>								×	×	×	Indigenous	Subantarctic islands
<i>Antarctcinella monoculata</i>			×								Endemic	

edge of snow patch, 30.I.1964, Wise, 20; 1, soil sample, 30.I.1964, Spain, 20; 1, W end, soil sample, 30.I.1964, Spain, 20b; 1, W end, soil under stones with fruticose lichens, sample, 31.XII.1963, Wise.

Distribution. South Victoria Land.

DISCUSSION

The species, genera, and distributions remain much as before (Wise 1967) except for one new synonymy in the genus *Hypogastrura*. The discovery of a close relationship between two antarctic and two subantarctic species of *Tullbergia* gives occasion for further thought on the subject of Antarctica as an earlier source or pathway for southern faunas.

A definitive list of the Collembola of Antarctica and their known distributions is given in Table 1. Doubtful occurrences as yet requiring confirmation are excluded. All non-endemic species are recorded in the table as indigenous but the possibility of introduction by man cannot be entirely excluded. This possibility was raised by Wise (1967) when *Cryptopygus caecus* was found to occur on S. Shetland Is. It is now considered that *Hypogastrura viatica* (= *H. antarctica*) is not an introduction; it may be distributed as far as one of the Antarctic Pen. off-shore islands. *Archisotoma brucei* is definitely not introduced as it has now been found in the intertidal zone of both S. Shetland Is. and Antarctic Peninsula.

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REFERENCES

- Carpenter, G. H.** 1907. Scottish National Antarctic Expedition "Scotia" Collections. Collembola from the South Orkney Islands. *Proc. Roy. Soc. Edinburgh* **26**: 473-83.
- Delamare Deboutteville, C.** 1953. Collemboles marins de la zone souterraine humide des sables littoraux. *Vie et Milieu* **4**(2): 290-319.
- Gressitt, J. L.** 1967a. The fauna. In V. C. Bushnell (Ed.), *Terrestrial Life of Antarctica*. Antarctic Map Folio Ser., Folio **5**: 17-21.
- 1967b. Introduction. In J. L. Gressitt (Ed.), *Entomology of Antarctica*. Ant. Res. Ser. **10**: 1-33.
- 1967c. Notes on arthropod populations in the Antarctic Peninsula—South Shetland Islands—South Orkney Islands area. In J. L. Gressitt (Ed.), *Entomology of Antarctica*. Ant. Res. Ser. **10**: 373-91.
- Gressitt, J. L. & J. Shoup.** 1967. Ecological notes on free-living mites in north Victoria Land. In J. L. Gressitt (Ed.), *Entomology of Antarctica*. Ant. Res. Ser. **10**: 307-20.
- Janetschek, H.** 1967. Arthropod ecology of south Victoria Land. In J. L. Gressitt (Ed.), *Entomology of Antarctica*. Ant. Res. Ser. **10**: 205-93.
- Massoud, Z.** 1967. Monographie des Neanuridae, Collemboles Poduromorphes à pièces buccales modifiées. *Biologie de l'Amérique Australe* **3**: 7-399.
- Poinsot, N.** 1965. Révision du genre *Archisotoma* Linnaniemi 1912. *Rev. Ecol. Biol. Sol.* **2**(3): 453-59.
- Salmon, J. T.** 1962. A new species and redescrptions of Collembola from Antarctica. *Pacif. Ins.* **4**(4): 887-94.
1964. An index to the Collembola. *Roy. Soc. N.Z. Bull.* **7**: 3 vol., p. 1-651.
1965. Two new genera of Antarctic Collembola. *Pacif. Ins.* **7**(3): 468-72.

- Tilbrook, P. J.** 1967a. The terrestrial invertebrate fauna of the maritime Antarctic. *Phil. Trans. Roy. Soc. Lond. B* **252**: 261-78.
- 1967b. Arthropod ecology in the maritime Antarctic. In J. L. Gressitt (Ed.), *Entomology of Antarctica*. Ant. Res. Ser. **10**: 331-56.
- Wise, K. A. J.** 1967. Collembola (springtails). In J. L. Gressitt (Ed.), *Entomology of Antarctica*. Ant. Res. Ser. **10**: 123-48.
- 1970a. Collembola of South Georgia. *Pacif. Ins. Monogr.* 23: 183-208.
- 1970b. Collembola of Heard Island. *Pacif. Ins. Monogr.* 23: 209-15.

ADDENDUM

Since this paper was written, Massoud and Rapoport (1968, *Collemboles Isotomides de l'Amerique du Sud et de L'Antarctique. Biologie de L'Amerique Australe* 4: 307-37) have recorded *Cryptopygus antarcticus* from subantarctic islands, Antarctic Pen. and Tierra del Fuego (a new record), *Cryptopygus caecus* from the Antarctic Pen. ("Peninsule de Palmer (Antarctique)") and South America (both new records), as well as *S. Georgia*, and *Archisotoma brucei* from the Antarctic Pen.