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INSECTS OF CAMPBELL ISLAND. COLLEMBOLA

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Abstract: Seven genera, 10 species, and 2 subspecies of Collembola are recorded from Campbell Island for the first time. Four new species, *Colonavis litoralis*, *Cryptopygus campbellensis*, *Acanthomurus rivalis*, and *Longkingia salmoni*, are described. All recorded species are listed together with information on distribution and habitats. In a section on generic distribution strong affinity with the New Zealand fauna is recorded. Ecological aspects are discussed.

Collembola were first recorded on Campbell I. when Professor G. H. Carpenter (1909) described a new species (*Triacanthella alba*) from specimens collected by the Philosophical Institute of Canterbury (N. Z.) Expedition in 1907. Carpenter (1925) described a further species (*Lepidophorella australis*) collected by a Canterbury Museum field party in 1923. The first study of the Collembola of Auckland and Campbell Is. was made by Dr. J. T. Salmon from material collected by the Cape Expedition, which consisted of several coast-watching groups during World War II (1941–1945). Salmon (1949) recorded 22 genera, 33 species, and 1 subspecies, including 5 new genera, 23 new species and 1 new subspecies, from Campbell I. A little material, not yet studied, has been taken by various members of the permanent New Zealand meteorological station which was continued on Campbell I. after 1945.

This study is based on collections made by Dr. J. L. Gressitt, Bishop Museum; Mr. K. P. Rennell, N. Z. Meteorological Service; and me, between November 1961, and March 1963. A further 7 new generic records, 10 new specific records, 4 new species, and 2 new subspecific records are added to the Campbell I. list. Unfortunately, it has not been possible to process all the material to hand. Many collection tubes and a whole series of Berlese funnel samples remain to be sorted.

Identifications to date have been made from 576 microscope slide preparations of specimens from alcohol material sorted out of 139 original collection tubes. Up to 9 species have been recorded from a single collection.

Not all species previously recorded from Campbell I. have been recognised. All species, however, whether recorded previously or in this paper for the first time, are listed below. Descriptions and 'Remarks' refer to morphological and taxonomic characters. 'Specimens examined' are those in the present collections only. Numbers of specimens examined refer to numbers of microscope slides. An assessment of abundance and habitat, and whether endemic, indigenous, or introduced, is given for each species under the heading 'CAMPBELL I.' The distribution of genera is outlined in a separate section and in a section on ecology various aspects of the Campbell I. collembolan fauna are discussed.

Holotypes are deposited in the Dominion Museum, Wellington, New Zealand. Paratypes

are in Bishop Museum, but, series of Campbell I. species determined by me, including some paratype specimens, will be deposited in other institutions.

The systematic scheme adopted here is based on the classification of Salmon (1951, 1956, 1959) and the relevant systematic work by Salmon (1941, 1949).

Suborder ARTHROPLEONA

Family ONYCHIURIDAE

Subfamily TULLBERGINAE Bagnall, 1935

Genus **Tullbergia** Lubbock, 1876

KEY TO CAMPBELL I. SPECIES OF TULLBERGIA (from Salmon, 1949)

Body with lancet-like spines laterally on thorax II, III, and abdomen I, IV, and V ... . **scalpellata**
Body normal, without such spines ..... **subantarctica**

Tullbergia scalpellata Salmon

Tullbergia scalpellata Salm., 1949, Cape Exped. Ser. Bull. **4**: 17.

REMARKS: Not recognised in this collection.

DISTRIBUTION: Campbell I.

CAMPBELL I.: 1 specimen, described by Salmon (1949) from under tussock at Tucker Cove. Terrestrial. Endemic.

Tullbergia subantarctica Salmon

Tullbergia subantarctica Salm., 1949, Cape Exped. Ser. Bull. **4**: 18.

SPECIMENS EXAMINED: 4, Beeman Camp, 2–50 m, *Poa* roots, 6–11. XII. 1961, Gressitt; 2, same data but ex *Pleurophyllum criniferum* 1, Beeman Camp, 2–50 m, *Poa*, 18–21.XII.1961, Gressitt; 1, Beeman Hill, 100–180 m, sooty albatross nest, 11–16. XII. 1961, Gressitt; 2, Beeman Beach, 2–50 m, moss, turf, *Poa*, *Bulbinella*, 11, 15. XII. 1961, Gressitt; 1, Tucker Cove, 1–50 m, weed & grass turf, 6–11. XII. 1961, Gressitt by Berlese funnel; 3, *ibid.*, under timber, 28. II. 1963, Wise; 1, *ibid.*, under stones, 28. II. 1963, Wise; 1, *ibid.*, beaten from *Pittosporum*, 26. II. 1963, Wise; 1, Lookout Bay, under *Stilbocarpa*, 3. II. 1963, Wise; 1, *ibid.*, beach, *Dracophyllum*, 16, 19. XII. 1961, Gressitt; 1, Smoothwater Bay, *Tillaea* on rock, 2. III. 1963, Wise; Mt. Lyall, 400 m, moss & lichen, 19. II. 1963, Rennell; 1, Courrejolles Pen., 200 m, mollymawk nests, 14. XII. 1961, Gressitt; 1, *ibid.*, 230 m, mollymawk colony, moss & low plants, 12. II. 1963, Wise; 1, *ibid.*, 230 m, mollymawk colony, in cushion plant & *Tillaea*, 12. II. 1963, Rennell; 1, *ibid.*, moss & leaf-mold, 10.III.1962, Rennell; 3, Mt. Azimuth, 350 m, moss & lichen, 30. XI. 1961, Gressitt by Berlese funnel; 1, *ibid.*, south side, 250 m, under dead albatross chick, 12. II. 1963, Wise; 2, Mt. Azimuth—Courrejolles, under moss & turf, 12. II. 1963, Wise; 3, St. Col Ridge, 180–280 m, moss on rock, 24. XI. 1961, Gressitt by Berlese funnel; 1, Mt. Dumas, above 400 m, under stones, 6. II. 1963, Wise; 1, Monument Hbr., black-backed gull nest, 17. XII. 1961, Gressitt; 3, *ibid.*, top of beach, under stones amongst low plants, 9. II. 1963, Wise; 3, 1961, Gressitt by Berlese funnel.

DISTRIBUTION: Campbell I., New Zealand, Auckland I. (new record). One specimen, originally determined by J. T. Salmon (Dominion Mus., Wellington, N. Z., collection), was collected on Auckland I. (leaf-mold, Dec. 1944, E. G. Turbott).

CAMPBELL I.: Common and widely distributed. Mainly associated with low plant cover and surface debris including ground bird-nests. Terrestrial, beach to above 400 m. Indigenous by natural dispersal.

Subfamily ONYCHIURINAE Bagnall, 1935

Genus **Onychiurus** Gervais, 1841

Onychiurus subantarcticus Salmon

Onychiurus subantarcticus Salm., 1949, Cape Exped. Ser. Bull. **4**: 15.

REMARKS: Not recognised in this collection.

DISTRIBUTION: Campbell I.

CAMPBELL I.: A few recorded by Salmon (1949) under surface debris at Tucker Cove. Terrestrial. Endemic.

Family HYPOGASTRURIDAE Börner, 1913

Subfamily HYPOGASTRURINAE Börner, 1906

Genus **Xenylla** Tullberg, 1869

Xenylla novazealandia Salmon

Xenylla nova-zealandia Salm., 1941, Trans. Roy. Soc. N. Z. **70** (4): 287; 1949, Cape Exped. Ser. Bull. **4**: 5.

SPECIMENS EXAMINED: 1, Beeman Camp, 2–50 m, *Poa*, 18–21. XII. 1961, Gressitt; 2, *ibid.*, 2–50 m, moss & lichen on trunks of *Dracophyllum*, 1–5. XII. 1961, Gressitt; Northwest Bay, tussock, 30. XII. 1962, Rennell; 5, Rocky Bay, S. coast below Mt. Dumas, 10 m, penguin colony, under *Tillaea*, 18. II. 1963, Wise; 4, *ibid.*, on moss on shore rocks, 18. II. 1963, Wise; 2, Monument Hbr., top of beach, under lichen on rock, 9. II. 1963, Wise; 1, 1961, Gressitt by Berlese funnel.

DISTRIBUTION: New Zealand, Campbell I., Auckland I.

CAMPBELL I.: Common and widely distributed. Particularly associated with moss and lichen. Terrestrial, below 50 m. Indigenous through natural dispersal.

Genus **Triacanthella** Schaeffer, 1897

KEY TO CAMPBELL I. SPECIES OF TRIACANTHELLA (adapted from Salmon, 1949)

Claw without inner teeth; a single clavate tenant hair to each foot..... **alba**
Claw with inner teeth; clavate tenant hairs absent ..... **sorenseni**

Triacanthella alba Carpenter

Triacanthella alba Carp., 1909, Subantarctic Islands of N. Z. **1**: 378.—Salmon, 1949, Cape

Exped. Ser. Bull. **4**: 5.

REMARKS: Not found in this collection.

DISTRIBUTION: Campbell I.

CAMPBELL I.: Previously recorded by Carpenter (1909) from highwater mark at Venus Cove and by Salmon (1949) under stones in Tucker Cove. Probably marine supra-littoral. Endemic.

Triacanthella sorenseni Salmon

Triacanthella sorenseni Salm., 1949, Cape Exped. Ser. Bull. **4**: 7.

SPECIMENS EXAMINED: 1, Tucker Cove, under timber, 28. II. 1963, Wise; 1, *ibid.*, beach, under stones near high-water mark, 25. II. 1963, Wise; 1, Camp Cove, beach, under stones near high-water mark, 5. II. 1963, Rennell; 1, Venus Cove, beach, under stones near high-water mark, 2. II. 1963, Wise (type locality); 1, Smoothwater Bay, *Tillaea* on rock, 2. III. 1963, Wise; 3, Middle Bay, beach, under stones above high-water mark, 5. II. 1963, Wise; 1, *ibid.*, beach, in sand under kelp, 20. II. 1963, Wise; 2, Monument Hbr., top of beach, under stones, 9. II. 1963, Wise; 2, *ibid.*, on bank above beach, 9. II. 1963, Wise.

DISTRIBUTION: Campbell I.

CAMPBELL I.: Common on sea beaches and adjacent areas. Mainly supra-littoral. Endemic.

Genus **Hypogastrura** Bourlet, 1839

KEY TO CAMPBELL I. SPECIES OF HYPOGASTRURA (adapted from Salmon, 1949)

1. With a large exsertile sac at junction of antennal segments 3 & 4 ..... **armata**
   Without antennal sac 2
2. Body marked with large oval dark-colored spots ..... **morbillata**
   Body not so marked 3
3. Clavate tenant hairs 2.3.2., set obliquely across tibiotarsus ..... **obliqua**
   Clavate tenant hairs 3.3.3 ..... **pseudopurpurascens**

Hypogastrura armata (Nicolet)

Achorutes armatus Nic., 1841, Nouv. Mém. Soc. Helv. Sc. Nat. **6**: 57.
Podurhippus armatus: Salmon, 1949, Cape Exped. Ser. Bull. **4**: 10.

SPECIMENS EXAMINED: 1, Beeman Camp, 2–50 m, *Poa* roots, 6–11. XI. 1961, Gressitt; 4, *ibid.*, 2–50 m, chicken yard debris, 6–11. XII. 1961, Gressitt by Berlese funnel; 1, *ibid.*, 2–50 m, under old boards, 21–25. XI. 1961, Gressitt; 1, *ibid.*, 2–50 m, *Dracophyllum scoparium*, 12–17. XII. 1961, Gressitt; 4, *ibid.*, under box-wood, 5. III. 1963, Wise; 1, Beeman Hill, 100–180 m, sooty albatross nest, 11–16. XII. 1961, Gressitt; 6, Beeman beach, kelp, 16. XII. 1961, Gressitt; 1, Tucker Cove, 1–50 m, weed & grass turf, 6–11. XII. 1961, Gressitt by Berlese funnel; 3, *ibid.*, on surface of pools, 25. II. 1963, Wise; 2, Lookout Bay, kelp on beach, 16, 19. XII. 1961, Gressitt; 3, *ibid.*, under *Stilbocarpa*, 3. II. 1963, Wise; 1, Courrejolles Pen., 200 m, mollymawk nests, 14. XII. 1961, Gressitt; 2, St. Col Ridge, 180–280 m, moss on rock, 24. XI. 1961, Gressitt by Berlese funnel.

DISTRIBUTION: Cosmopolitan, including New Zealand and Campbell I.

CAMPBELL I.: Common and apparently centered on Tucker and Beeman camps area associated with low plants and surface debris. In moss on St. Col Ridge at head of Tucker valley and elsewhere in ground bird-nests. Marine supra-littoral and terrestrial from beach to 200 m. Either indigenous by natural dispersal or introduced by man.

Hypogastrura pseudopurpurascens Womersley

Hypogastrura pseudopurpurascens Wom., 1928, Ann. Mag. Nat. Hist. ser. 10, **2**: 593.
Podurhippus pseudopurpurascens: Salmon, 1949, Cape Exped. Ser. Bull. **4**: 10.

REMARKS: Not discovered in this collection.

DISTRIBUTION: New Zealand, Campbell I.

CAMPBELL I.: Previously recorded by Salmon (1949) on freshwater pools, also taken under surface debris in Tucker Cove. Terrestrial. Presumably introduced by man.

Hypogastrura morbillata (Salmon)

Achorutes morbillatus Salm., 1941, Trans. Roy. Soc. N. Z. **70** (4): 292.
Podurhippus morbillatus: Salm., 1949, Cape Exped. Ser. Bull. **4**: 10.

REMARKS: Not found in this collection.

DISTRIBUTION: New Zealand, Campbell I.

CAMPBELL I.: Previously recorded by Salmon (1949) from lichen in Tucker Cove. Terrestrial. Presumably introduced by man.

Hypogastrura obliqua (Salmon)

Podurhippus obliquus Salm., 1949, Cape Exped. Ser. Bull. **4**: 10.

REMARKS: Not recognised in the present collection.

DISTRIBUTION: Campbell I.

CAMPBELL I.: Recorded by Salmon (1949) from Tucker Cove on epiphytic lichens. Terrestrial. Endemic.

Subfamily BRACHYSTOMELLINAE Salmon, 1956

Genus **Subantarctica** Salmon, 1949

Subantarctica flava Salmon

Subantarctica flava Salm., 1949, Cape Exped. Ser. Bull. **4**: 13.

SPECIMENS EXAMINED: 2, Tucker Cove, beach, under stones near high-water mark, 25. II. 1963, Wise; 4, Venus Cove, beach, under stones near high-water mark, 2. II. 1963, Wise (type locality); 1, Davis Point, 1–3 m, shore rocks, 12. XII. 1961, Gressitt; 3, Courrejolles Pen., 220 m, mollymawk colony, under stones, 12. II. 1963, Wise; 1, Middle Bay, top of beach, at seepage & stream, under stones & driftwood, 5. II. 1963, Wise; 2, *ibid.*, beach, under stones above high-water mark, 5. II. 1963, Wise; 1, *ibid.*, under stones in grass just above beach, 5. II. 1963, Wise; 1, *ibid.*, under kelp, 20. II. 1963, Wise.

DISTRIBUTION: Campbell I.

CAMPBELL I.: Common on beaches but also occurs at ca. 220 m in a mollymawk colony suggesting local dispersal by sea-birds. Mainly marine supra-littoral. Endemic.

Genus **Colonavis** Salmon, 1949

A new species, described below, is placed in this genus as it differs from the original generic diagnosis only in the number of anal spines. *Colonavis* should consequently be described as with 4 or more anal spines.

Key to species of Colonavis

With 4 anal spines..... **grandis**
With 11 anal spines ..... **litoralis**

Colonavis grandis Salmon

Colonavis grandis Salm., 1949, Cape Exped. Ser. Bull. **4**: 14.

Specimens examined: 4, Beeman Camp, 2–50 m, *Poa*, 18–21. XII. 1961, Gressitt; 5, *ibid.*, 2–50 m, *Poa* roots, 6–11. XII. 1961, Gressitt; 1, Camp Cove, northern spur Mt. Dumas, 80 m, swept from tussock, 6. II. 1963, Wise; 1, Shoal Point, 0–10 m, sweeping tussock, 29.VII.1962, Rennell; 1, *ibid.*, tussock near beach, 1. II. 1963, Rennell; 3, Mt. Lyall, 400 m, moss & lichen, 19. II. 1963, Rennell; 1, Courrejolles Pen., moss & leaf-mold, 10. III. 1962, Rennell; 5, *ibid.*, 220 m, mollymawk colony, under stones, 12. II. 1963, Wise (type locality); 1, Monument Hbr., top of beach, tussock, 9. II. 1963, Rennell; 1, 1961, Gressitt by Berlese funnel.

DISTRIBUTION: Campbell I.

CAMPBELL I.: Common and widely distributed. Associated with plant cover, and under stones. Terrestrial, from beach to 400 m. Endemic.

Colonavis litoralis Wise, n. sp. Figs. 1–9.

Color: Dark blue to black.

Clothing: Short straight and curved simple setae with several long, simple and serrate setae to each segment, with more on head and posterior segments. Thoracic segment III and abdomen I–V (fig. 1) each with a dorsal pair of long finely serrate spines. Abdomen VI (figs. 1, 2) dorsally with 11 stout minutely-serrate spines arranged as a pair of short spines anteriorly, 2 transverse rows of 4 long spines, and 1 shorter median posterior spine. *Body*: Length up to ca. 2 mm. Antenna almost as long as head. Antenna IV (fig. 3) with subapical exsertile knob and subapical straight sense rods. Sense organ of antenna III (fig. 4) consisting of 2 stout sense rods bent at right angles very close to base, exposed. Postantennal organ absent. Ocelli (fig. 5) 8 to eachside arranged as an anterior group of 5 and a posterior group of 3, subequal. Mandible (fig. 6) without molar area but with 7 apical teeth plus 1 small lateral tooth between apical 3 & 4. Maxilla (fig. 7) elongate with large subapical tooth, toothed lamella not reaching to apex. Cuticle coarsely granulate and tuberculate, abdomen with paratergal swellings. Tenaculum absent. *Legs* (figs. 8, 9): Claw without tooth or, if present, very small. Tibiotarsus with 10 clavate tenant hairs and 6 others. Base of claw with a slender seta present on each side, unguiculus absent. *Furcula*: Absent.

Specimens examined: Holotype, Lookout Bay, beach, under stones & kelp, 3. II. 1963, Wise; paratypes, 5, Lookout Bay, beach, under stones & kelp, 3. II. 1963, Wise; other specimens, 3, Smoothwater Bay, shore rocks, 2. III. 1963, Wise.

Remarks: This species is placed in the genus *Colonavis*, and not in *Friesea* Dalla Torre,

1895, on account of the absence of furcula and tenaculum, absence of papillae for the anal spines, and presence of serrate setae, as in *C. grandis*.

Figs. 1–9. *Colonavis litoralis* n. sp. 1, abdomen V, VI, dorsolateral view (×280); 2, abdomen VI, dorsal view (×280); 3, antenna IV, apex (×1000); 4, antenna III, subapical sense organs (×1500); 5, ocelli (×700); 6, mandible, apex (×1500); 7, maxillae (2 specimens), apices (×1500); 8, foot, right posterior (×400); 9, foot, right posterior (same specimen as 8) (×400). (All magnifications are comparative, not actual).

DISTRIBUTION: Campbell I.

CAMPBELL I.: Scarce, on 2 beaches under stones and kelp, and on shore rocks. Marine supra-littoral. Endemic.

Subfamily ANURIDINAE Salmon, 1956

Genus **Anurida** Laboulbene, 1865

Anurida granaria (Nicolet)

Anoura granaria Nic., 1847, Ann. Soc. Ent. France **5**: 387.
Anurida granaria: Salmon, 1949, Cape Exped. Ser. Bull. **4**: 15.

REMARKS: Not found in the present collection.

DISTRIBUTION: Cosmopolitan including Campbell I.

CAMPBELL I.: 3 specimens recorded by Salmon (1949) under surface debris in Tucker Cove. Terrestrial. Presumably introduced by man.

Subfamily NEANURINAE Börner, 1906

Genus **Neanura** MacGillivray, 1893

KEY TO CAMPBELL I. SPECIES OF NEANURA

All setae mounted on large bosses which have 7–8 non-tuberculate radiating lines... **radiata**
Setae mounted on granulate bosses ..... **hirtella schotti**

Neanura radiata Salmon

Neanura radiata Salm., 1941, Trans. Roy. Soc. N. Z. **70** (4): 308.

SPECIMENS EXAMINED: 4, Tucker Cove, under timber, 28. II. 1963, Wise.

DISTRIBUTION: New Zealand, Campbell I. (new record).

CAMPBELL I.: Few in Tucker Camp area under surface debris. Terrestrial, below 50 m. Introduced by man.

Neanura hirtella schotti (Womersley)

Achorutes hirtellus schötti Wom., 1935, Trans. R. Soc. Soc. Sth. Austral. **59**: 210.

SPECIMENS EXAMINED: 2, Tucker Cove, under stones, 28. II. 1963, Wise.

DISTRIBUTION: Australia, New Zealand, Campbell I. (new record).

CAMPBELL I.: 2 only, in Tucker Camp area under stones. Terrestrial, below 50 m. Introduced by man.

Family ISOTOMIDAE Schaeffer, 1896

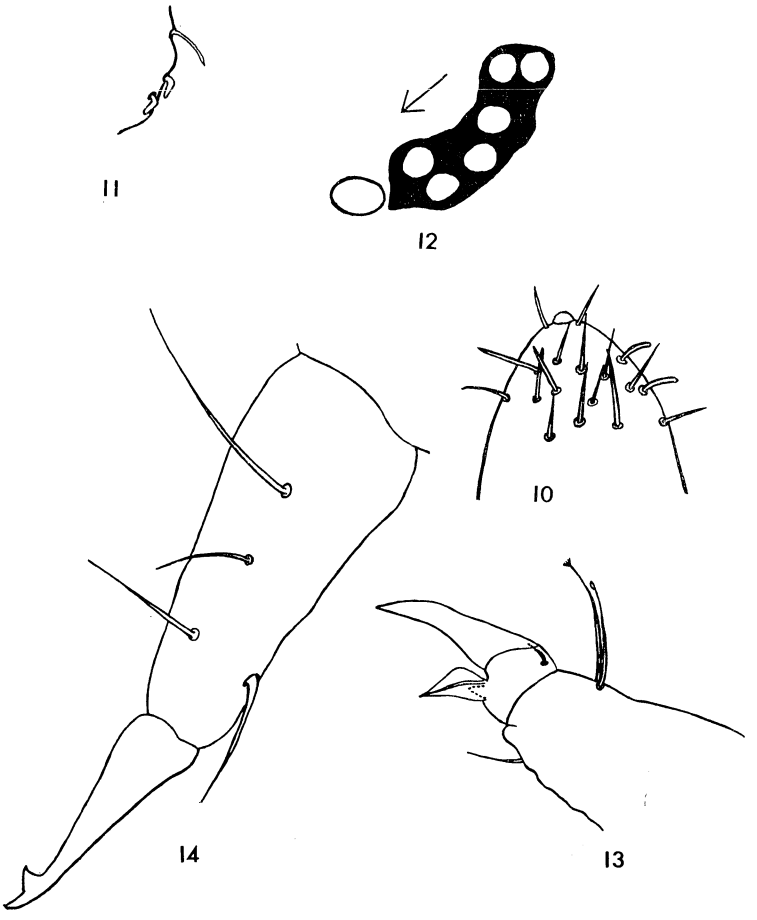
Subfamily ANUROPHORINAE Börner, 1901

Genus **Cryptopygus** Willem, 1901

Cryptopygus campbellensis Wise, n. sp. Figs. 10–14.

Color: Deep blue to black, paler ventrally.

Clothing: Well clothed with short to long simple setae. *Body*: Length up to ca. 1.5 mm. Antenna longer than head as 5 : 4, the 4 segments as 10 : 25 : 20 : 45. Antenna IV (fig. 10) with small apical sensory dome, clothing of medium length straight, stout, setae, and short slightly-curved sense rods. Antenna III (fig. 11) with 2 short, stout sense rods close together and a longer slightly-curved sense rod somewhat removed. Ocelli (fig. 12) 6 to each side, subequal. Postantennal organ (fig. 12) roundly oval, almost as wide as long, almost as big as 2 apical ocelli together. Rami of tenaculum each with 4 barbs. *Legs* (fig. 13): Claw without teeth, a medium length basal seta on each side. Unguiculus about 1/2 as long as claw, with strongly curved inner lamella reaching almost to apex and broad outer lamella reaching to apex. Clavate tenant hairs appear as 1.1.1 but possibly 1.2.2. On most specimens there appears to be 1 obviously clavate tenant hair and 1 simple tenant hair on mid and hind legs, but on holotype there are distinctly 2 clavate hairs on each hind leg, 1 widely clavate, the other narrowly clavate (fig. 13) and on each mid leg the



Figs. 10–14. *Cryptopygus campbellensis* n. sp. 10, antenna IV, apex (×700); 11, antenna III, subapical sense organs (×700); 12, ocelli and postantennal organ (×400); 13, foot, posterior (×700); 14, dens and mucro (×1000).

apparent simple hair seems to be slightly dilate as seen under oil immersion ×1500 magnification. *Furcula* (fig. 14): Ratio of manubrium: dens: mucro as 7 : 5 : 3. Dens with 3 ventral setae, 1 dorsal seta. Mucro narrow, elongate, with 2 teeth, apical tooth slightly longer and narrower than pre-apical.

SPECIMENS EXAMINED: Holotype, Rocky Bay, S. coast below Mt. Dumas, 10 m, penguin colony, under *Tillaea*, 18. II. 1963, Wise. Paratypes: 6, same data as holotype.

REMARKS: This species is very close to *C. antarcticus* Willem in having 6 ocelli and possibly clavate tenant hairs 1.2.2. It differs from that species in having a rounded post-antennal organ, a more elongate mucro and fewer setae on dens.

DISTRIBUTION: Campbell I.

CAMPBELL I.: Few in one isolated coastal area under low plants. Terrestrial, 10 m. Endemic.

Subfamily PROISOTOMINAE Stach, 1947

Genus **Parafolsomia** Salmon, 1949

KEY TO CAMPBELL I. SPECIES OF PARAFOLSOMIA

Ocelli absent; mucro with 5 teeth ..... **litorea**
Five ocelli on each side, mucro with 2 teeth ..... **decemoculata**

Parafolsomia litorea Salmon

Parafolsomia litorea Salm., 1949, Cape Exped. Ser. Bull. **4**: 21.

SPECIMENS EXAMINED: 1, Beeman Camp, 2–50 m, *Poa*, 18–21. XII. 1961, Gressitt; 4, *ibid.*, under timber on ground, 14. II. 1963, Wise; 3, Beeman Beach, 2–50 m, moss, turf, *Poa*, *Bulbinella*, 11, 15. XII. 1961, Gressitt; 1, Tucker Cove, 1–50 m, weed & grass turf, 6–11. XII. 1961, Gressitt by Berlese funnel; 1, *ibid.*, under stones, 28. II. 1963, Wise; 1, Lookout Bay, beach, *Dracophyllum*, 16, 19. XII. 1961, Gressitt; 1, Davis Point, 1–3 m, shore rocks, 12. XII. 1961, Gressitt; 1, Mt. Lyall, 200–400 m, moss, 3, 5, 12. XII. 1961, Gressitt; 2, Courrejolles Pen., 220 m, mollymawk colony, under stones, 12. II. 1963, Wise; 1, Mt. Azimuth, 300 m, sooty albatross nest, 30. XII. 1961, Gressitt; 3, *ibid.*, 350 m, moss & lichen, 30. XI. 1961, Gressitt by Berlese funnel; 2, St. Col Ridge, 180–280 m, moss on rock, 24. XI. 1961, Gressitt by Berlese funnel; 2, Mt. Azimuth—Courrejolles, under moss & turf, 12. II. 1963, Wise; 3, Middle Bay, under stones in grass just above beach, 5. II. 1963, Wise; 2, Mt. Dumas, NW slopes, 150 mm, in weevil pupal cells in soil 30 cm under *Bulbinella*, 20. II. 1963, Wise.

DISTRIBUTION: Campbell I.

CAMPBELL I.: Common and widely distributed, mainly occurring under low plant cover, stones and surface debris, also in soil. Found to a depth of 30 cm in fairly large numbers in and about pupal cells of large weevils. Terrestrial from beach to 350 m. Endemic.

Parafolsomia decemoculata Salmon

Parafolsomia decemoculata Salm., 1949, Cape Exped. Ser. Bull. **4**: 20.

SPECIMENS EXAMINED: 2, Beeman Camp, 2–50 m, *Poa* roots, 6–11. XII. 1961, Gressitt; 2,

ibid., 2–50 m, *Pleurophyllum criniferum*, 6–11. XII. 1961, Gressitt; 1, Beeman Hill, 100–180 m, sooty albatross nest, 11–16. XII. 1961, Gressitt; 1, Beeman Beach, 2–50 m, moss, turf, *Poa*, *Bulbinella*, 11, 15.XII.1961, Gressitt; 1, Tucker Cove, 1–50 m, weed & grass turf, 6–11. XII. 1961, Gressitt by Berlese funnel; 1, Davis Point, moss, 12. XII. 1961, Gressitt; 1, Smooth-water Bay, shore rocks, 2. III. 1963, Wise; 3, *ibid.*, *Tillaea* on rock, 2. III. 1963, Wise; 2, Mt. Lyall, 200–400 m, moss, 3, 5, 12. XII. 1961, Gressitt; 1, Courrejolles Pen., 200 m, mollymawk nests, 14. XII. 1961, Gressitt; 3, *ibid.*, moss & leaf-mold, 10. III. 1962, Rennell; 2, Mt. Azimuth, 300 m, sooty albatross nest, 30. XII. 1961, Gressitt; 3, *ibid.*, 350 m, moss & lichen, 30. XI. 1961, Gressitt by Berlese funnel; 1, St. Col Ridge, 180–280 m, lichens on *Dracophyllum*, 4, 7, 9, 13.XII.1961, Gressitt; 2, Rocky Bay, S. coast below Mt. Dumas, on moss on shore rocks, 18. II. 1963, Wise; 3, 1961, Gressitt by Berlese funnel.

DISTRIBUTION: Auckland I., Campbell I. (new record).

CAMPBELL I.: Common and widely distributed under low plants and in ground bird-nests. Terrestrial, from shore to 350 m. Indigenous through natural dispersal.

Genus **Folsomia** Willem, 1902

Folsomia sp.

SPECIMENS EXAMINED: 3, Beeman Camp, under timber on ground, 14. II. 1963, Wise.

REMARKS: Of the 3 specimens of this species, 2 have been damaged when mounted although they can be recognised as being con-specific with the third. They belong to either a non-New Zealand or a new species but further specimens are required for proper determination.

DISTRIBUTION: Campbell I. (new record).

CAMPBELL I.: From Beeman Camp area under surface debris. Terrestrial below 50 m. Endemic or possibly introduced by man.

Genus **Proisotoma** Börner, 1901

KEY TO CAMPBELL I. SPECIES OF PROISOTOMA

Sense organ of antenna III with bases of rods and cuticular pockets in transverse line ..... **octojuga**

Sense organ of antenna III with bases of rods and cuticular pockets diagonal..... **xanthella**

Proisotoma octojuga Salmon

Proisotoma octojuga Salm., 1949, Cape Exped. Ser. Bull. **4**: 33.

SPECIMENS EXAMINED: 1, Beeman Camp, 2–50 m, *Pleurophyllum criniferum*, 6–11. XII. 1961, Gressitt.

DISTRIBUTION: Campbell I.

CAMPBELL I.: 1 specimen from Beeman Camp area associated with low plants. Few previously recorded from Tucker Cove (Salmon, 1949). Terrestrial below 50 m. Endemic.

Proisotoma xanthella Salmon

Proisotoma xanthella Salm., 1949, Cape Exped. Ser. Bull. **4**: 34.

SPECIMENS EXAMINED: 1, Beeman Camp, 2–50 m, chicken yard debris, 6–11. XII. 1961, Gressitt by Berlese funnel.

DISTRIBUTION: Campbell I.

CAMPBELL I.: 1 specimen from Beeman Camp area under surface debris. Previously recorded from leaf-mold (Salmon, 1949). Terrestrial, below 50 m. Endemic.

Subfamily ISOTOMINAE Schaeffer, 1896

Genus **Acanthomurus** Womersley, 1934

Acanthomurus rivalis Wise, n. sp. Figs. 15–19.

Color: In alcohol, body (except Thorax I) deep violet to brown, paler ventrally, head, legs, and furcula ochreous, antenna I & II ochreous or pale violet, antenna III & IV deep violet to brown.

Clothing: Densely clothed with moderately long finely-ciliated setae with some longer setae on dorsum of body and head, up to 4 very long setae on dorsum of each body segment (not shown in fig. 15). Antennae densely clothed with short finely-ciliated setae. *Body*: Length up to 2 mm. Antenna over 1.5× length of head, the 4 segments related as 15 : 50 : 50 : 50. Ocelli not all seen but ocellar patch (fig. 16) as in *Acanthomurus alpinus* (Salmon, 1949). Postantennal organ (fig. 16) oval, smaller than large ocellus and double outlined. Abdomen III slightly longer than abdomen IV as 55 : 50. *Legs* (fig. 17): Claw without teeth, a slender seta at base. Unguiculus strongly curved with broad outer lamella and narrower inner lamella not reaching apex. Two slender plain setae to each foot. *Furcula* (figs. 18, 19): Ratio of manubrium : dens as 1 : 2. Dens with a single row of serrate spines, 3- or 4-pointed (fig. 18). Manubrium and dens with many fine, short, ciliated setae and 2 ventral rows of longer ciliated setae. A single stout ciliated seta, arising on apex of dens, stands out beside mucro. Mucro with 4 teeth, large apical, larger subapical, smaller central, and a still smaller exterior lateral tooth.

SPECIMENS EXAMINED: Holotype, Moubray Hill, SW slope, 50 m, under stones in stream, 2. III. 1963, Wise; paratypes, 2, Moubray Hill, SW slope, 50 m, under stones in stream, 2. III. 1963, Wise.

REMARKS: This species is separated from other species of *Acanthomurus* by the form of the dental spines, absence of teeth on claws, and/or size of the postantennal organ in relation to the ocelli.

DISTRIBUTION: Campbell I.

CAMPBELL I.: Several under stones partially submerged in shallow streamlet above Perseverance Hbr. Semi-aquatic, 50 m. Endemic.

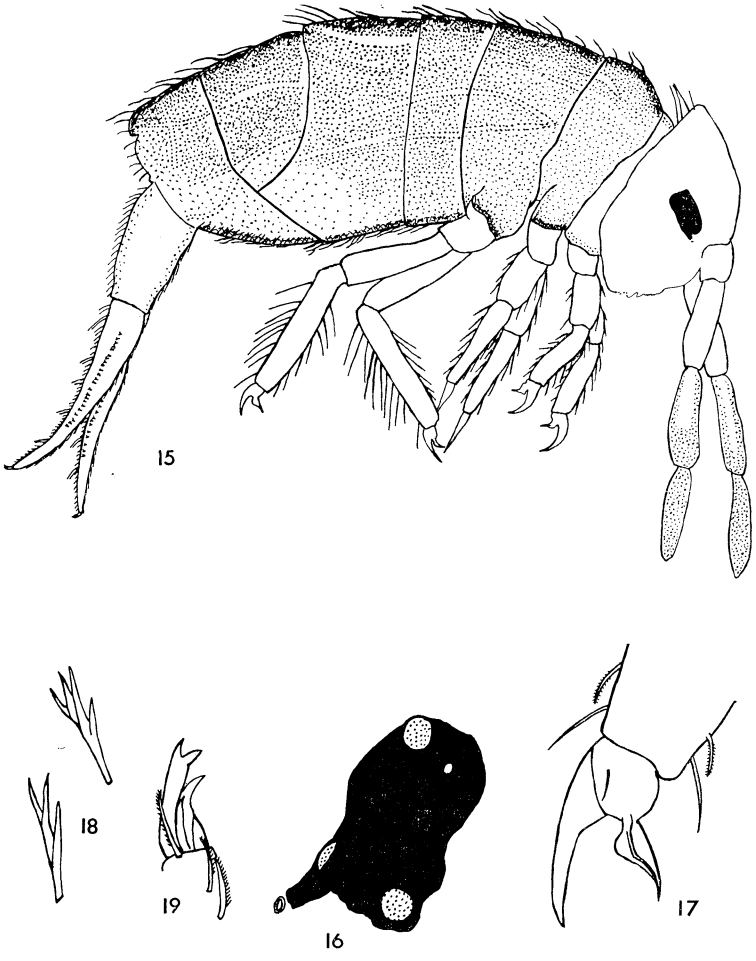
Genus **Proisotomurus** Womersley, 1934

Proisotomurus lapidosus Salmon

Proisotomurus lapidosus Salm., 1949, Cape Exped. Ser. Bull. **4**: 25.

REMARKS: Not found in this collection.

DISTRIBUTION: Campbell I.



Figs. 15–19. *Acanthomurus rivalis* n. sp. 15, whole insect (×28); 16, ocellar patch and postantennal organ (×280); 17, foot, posterior (×400); 18, spines of dens (×1000); 19, mucro, ventro-lateral view (×700).

CAMPBELL I.: Several specimens recorded from under rocks, Monument Hbr. and under surface debris at Tucker Cove. Terrestrial. Endemic.

Genus **Sorensia** Salmon, 1949

Recorded by Paclt (1959) from South Africa but that record is not accepted here (see below, *S. subflava*).

Key to Campbell I. specimens of Sorensia

One ocellus to each side; empodium of foot short..... **subflava**
Two ocelli to each side; empodium of foot long..... **minuta**

Sorensia subflava Salmon

Sorensia subflava Salm., 1949, Cape Exped. Ser. Bull. **4**: 22.

SPECIMENS EXAMINED: 2, Beeman Camp, 2–50 m, *Poa*, 18–21. XII. 1961, Gressitt; 1, Beeman Beach, 2–50 m, moss, turf, *Poa*, *Bulbinella*, 11, 15. XII. 1961, Gressitt; 1, *ibid.*, on top of rock, 19. XII. 1961, Rennell; 2, Tucker Cove, under timber, 28. II. 1963, Wise; 2, *ibid.*, 1–50 m, weed & grass turf, 6–11. XII. 1961, Gressitt by Berlese funnel; 1, *ibid.*, under stones, 28. II. 1963, Wise; 2, Mt. Lyall, 200–400 m, moss, 3, 5, 12. XII. 1961, Gressitt; 1, Courrejolles Pen., 200 m, mollymawk nests, 14.XII.1961, Gressitt; 2, *ibid.*, moss & leaf-mold, 10.III.1962, Rennell; 1, St. Col Ridge, 180–280 m, on rock, 4, 7, 9.XII.1961, Gressitt; 1, *ibid.*, 180–280 m, moss on rock, 24. XI. 1961, Gressitt by Berlese funnel; 3, Mt. Dumas, above 400 m, under stones, 6. II. 1963, Wise; 1, *ibid.*, summit, 500 m, under stones, 6. II. 1963, Rennell; 1, Monument Hbr., top of beach, under stones among low plants, 9. II. 1963, Wise; 1, 1961, Gressitt by Berlese funnel.

REMARKS: Paclt (1959) synonymised both *Sorensia subflava* and *S. minuta* with *Isotoma finitima* Ščerbakov, 1899, in the genus *Sorensia*, but there seem to be no real grounds for this. In the original and later descriptions of *I. finitima* the postantennal organ is recorded as absent but this organ is well developed in *Sorensia*.

DISTRIBUTION: Campbell I., Auckland I.

CAMPBELL I.: Common and widely distributed under low plants and stones. Terrestrial from beach to 500 m. Indigenous by natural dispersal.

Sorensia minuta Salmon

Sorensia minuta Salm., 1949, Cape Exped. Ser. Bull. **4**: 24.

REMARKS: Not recognised in this collection. This species, together with *S. subflava* (see above) was synonymised with *Isotoma finitima* Ščerbakov by Paclt (1955). However the type material has been examined and it is as described and figured by Salmon (1949) so the species is not here synonymised with either *I. finitima* or *S. subflava*.

DISTRIBUTION: Campbell I.

CAMPBELL I.: A few specimens from leaf-mold under tussock in Tucker Cove. Terrestrial. Endemic.

Genus **Papillomurus** Salmon, 1941

Papillomurus ochraceus Salmon

Papillomurus ochraceus Salm., 1949, Cape Exped. Ser. Bull. **4**: 27.

Color: Although normally ochreous in color, a deep violet variant occurs fairly frequently. In a series of specimens examined the violet pigment extends from a narrow longitudinal strip, through intermediate stages, to cover the whole insect. All such specimens have the typical 4 teeth to the mucro.

SPECIMENS EXAMINED: 1, Beeman Camp, 2–50 m, *Poa* roots, 6–11. XII. 1961, Gressitt; 1, *ibid.*, 2–50 m, *Poa*, 18–21. XII. 1961, Gressitt; 2, *ibid.*, 2–50 m, chicken yard debris, 6–11. XII. 1961, Gressitt by Berlese funnel; 1, Beeman Hill, 2. II. 1963, Wise; 3, *ibid.*, 100–180 m, sooty albatross nest, 11–16. XII. 1961, Gressitt; 1, *ibid.*, under *Pleurophyllum speciosum*, 2.

II. 1963, Wise; 1, Beeman Beach, 2–50 m, moss, turf, *Poa*, *Bulbinella*, 11, 15. XII. 1961, Gressitt; 2, Beeman–Tucker, intertidal, under rocks, 8. XII. 1961, Gressitt; 1, Tucker Cove, under timber, 28. II. 1963, Wise; 3, *ibid.*, under stones, 28. II. 1963, Wise; 1, *ibid.*, 1–50 m, weed & grass turf, 6–11. XII. 1961, Gressitt by Berlese funnel; 1, Lookout Bay, beach, under rock at high-water mark, 16, 19. XII. 1961, Gressitt; 2, *ibid.*, under stones, 3. II. 1963, Wise; 1, Smoothwater Bay, *Tillaea* on rock, 2. III. 1963, Wise; 1, Lyall-Beeman Saddle, 70 m, *Pleurophyllum*, 3, 5, 8, 12. XII. 1961, Gressitt; 1, Mt. Lyall, 200–400 m, moss, 3, 5, 12. XII. 1961, Gressitt; 1, *ibid.*, SW slopes, 150 m, under stones, 19. II. 1963, Wise; 1, *ibid.*, 400 m, moss & lichen, 19. II. 1963, Rennell; 1, Courrejolles Pen., 200 m, mollymawk nests, 14. XII. 1961, Gressitt; 1, *ibid.*, 230 m, mollymawk colony, moss & low plants, 12. II. 1963, Wise; 1, *ibid*, 230 m, mollymawk colony, in cushion plant & *Tillaea*, 12. II. 1963, Rennell; 3, *ibid.*, moss & leaf-mold, 10. III. 1962, Rennell; 1, 200 m, mollymawk nests, *Colobanthus*, 14. XII. 1961, Gressitt; 3, Mt. Azimuth, 350 m, moss & lichen, 30. XI. 1961, Gressitt; 2, *ibid.*, 300 m, sooty albatross nest, 30. XII. 1961, Gressitt; 1, *ibid.*, 360 m, under stones, 12. II. 1963, Wise; 1, *ibid.*, S. side, 250 m, under dead albatross chick, 12. II. 1963, Wise; 2, St. Col Ridge, 180–280 m, lichens on *Dracophyllum*, 4, 7, 9, 13.XII.1961, Gressitt; 1, *ibid.*, 180–280 m, moss on rock, 24. XI. 1961, Gressitt by Berlese funnel; 1, Middle Bay, under stones & wood in grass, 5. II. 1963, Wise; 1, Rocky Bay, S. coast below Mt. Dumas, 10 m, penguin colony, under *Tillaea*, 18. II. 1963, Wise; 1, Mt. Dumas, above 400 m, under stones, 6. II. 1963, Wise; 1, *ibid.*, northern spur, 310 m, on peat, 6.II.1963, Rennell; 6, 1961, Gressitt by Berlese funnel.

DISTRIBUTION: Campbell I.

CAMPBELL I.: Common and widely distributed under low plants, stones and surface debris, and in ground bird-nests. One marine littoral record, occasional supra-littoral, probably stray occurrences from terrestrial habitats. Mainly terrestrial to above 400 m. Endemic.

Genus **Tomocerura** Wahlgren, 1900

Tomocerura colonavia Salmon

Tomocerura colonavia Salm., 1949, Cape Exped. Ser. Bull. **4**: 31.

Body: Length up to 3.5 mm. Antenna 3× length of head, segments as 20 : 50 : 55 : 85.

Legs: Each posterior tibiotarsus with extremely long stout setae on proximal 1/3 reaching almost to distal end.

SPECIMENS EXAMINED: 1, Moubray Hill, SW slope, 50 m, under stones in stream, 2. III. 1963, Wise; 3, Mt. Lyall, SW slopes, 240 m, on stones in streamlet, 19. II. 1963, Wise; 1, Courrejolles Pen., 220–230 m, mollymawk colony, under stones, 12. II. 1963, Rennell (type locality); 1, Mt. Dumas, 460 m, under stones, 6. II. 1963, Rennell; 1, *ibid.*, 400 m, in moss on rocks, 6. II. 1963, Rennell.

REMARKS: All specimens seen and described by Salmon (1949) were immature. Morphological characters described above are from mature specimens.

DISTRIBUTION: Campbell I.

CAMPBELL I.: Scarce in wet habitats, as on stones in streams, above 400 m, and probably in mollymawk colony where there is much seepage. Semi-aquatic from 50–460 m. Endemic.

Genus **Parisotoma** Bagnall, 1940

Key to Campbell I. species of Parisotoma

Six ocelli to each side; claw with lateral plate..... **picea**
Four ocelli to each side; claw without lateral plate..... **octooculata ovata**

Parisotoma picea Salmon

Parisotoma picea Salm., Cape Exped. Ser. Bull. **4**: 36.

Specimens examined: 1, Beeman-Tucker, intertidal, under rocks, 8. XII. 1961, Gressitt; 1, Tucker Cove, beach, intertidal, under rock, 7–8. XII. 1961, Gressitt (type locality); 3, *ibid.*, beach, under stones below high-water mark, 1. II. 1963, Wise; 2, *ibid.*, beach, under stones below high-water mark, 25. II. 1963, Wise; 2, Venus Cove, beach, on stone near low-water mark, 2. II. 1963, Wise; 3, *ibid.*, beach, under stones at high-water mark, 2. II. 1963, Wise.

DISTRIBUTION: Campbell I.

CAMPBELL I.: Common under stones, in intertidal zone in Perseverance Hbr. which is the main area of sheltered shore-line on the island. Marine littoral. Endemic.

Parisotoma octooculata (Willem)

Isotoma octo-oculata Will., 1902, IN Exped. Ant. Belge, pp. 1–19.
Parisotoma octo-oculata: Salmon, 1949, Cape Exped. Ser. Bull. **4**: 36, 39.

Parisotoma octooculata ovata Salmon

Parisotoma octo-oculata ovata Salm., 1949, Cape Exped. Ser. Bull. **4**: 39.

Specimens examined: 4, Beeman Camp, 2–50 m, *Poa* roots, 6–11. XII. 1961, Gressitt; 2, *ibid.*, 2–50 m, *Poa*, 18–21. XII. 1961, Gressitt; 1, *ibid.*, 2–50 m, *Coprosma* ?, 26–30. XI. 1961, Gressitt; 2, *ibid.*, 2–50 m, *Pleurophyllum criniferum*, 6–11.XII.1961, Gressitt; 1, Beeman Hill, 100–180 m, sooty albatross nest, 11–16. XII. 1961, Gressitt; Beeman beach, kelp, 16.XII.1961, 1, *ibid.*, 2–50 m, moss, turf, *Poa*, *Bulbinella*, 11, 15. XII. 1961, Gressitt; Tucker Cove, 1–50 m, weed & grass turf, 6–11. XII. 1961, Gressitt by Berlese funnel; 1, *ibid.*, under timber, 28. II. 1963, Wise; 2, *ibid.*, under stones, 28. II. 1963, Wise; Lookout Bay, beach, *Dracophyllum*, 16, 19. XII. 1961, Gressitt; 1, Moubray Hill, 200 m, moss, 12. XII. 1961, Gressitt; Smooth-water Bay, *Tillaea* on rock, 2. III. 1963, Wise; 1, Mt. Lyall, 400 m, moss & lichen, 19. II. 1963, Rennell; 1, Courrejolles Pen., 200 m, mollymawk nests, 14. XII. 1961, Gressitt; 10, *ibid.*, moss & leaf-mold, 10.III.1962, Rennell; 2, *ibid.*, 230 m, mollymawk colony, in cushion plant & *Tillaea*, 12. II. 1963, Rennell; 3, Mt. Azimuth, 350 m, moss & lichen, 30. XI. 1961, Gressitt; 2, *ibid*, 300 m, sooty albatross nest, 30. XII. 1961, Gressitt; 4, St. Col Ridge, 180–280 m, moss on rock, 24. XI. 1961, Gressitt by Berlese funnel; 1, *ibid.*, 180–280 m, lichens on *Dracophyllum*, 4, 7, 9, 13. XII. 1961, Gressitt; 2, Rocky Bay, penguin nest, 28. XI. 1961, Gressitt.

DISTRIBUTION: Campbell I., Auckland Is.

CAMPBELL I.: Common and widely distributed in vegetation and ground bird-nests, under stones and surface debris. Terrestrial, from beach to 400 m. Indigenous by natural dispersal.

Family TOMOCERIDAE Schaeffer, 1896

Subfamily LEPIDOPHORELLINAE Börner, 1906

Genus **Lepidophorella** Schaeffer, 1897

KEY TO CAMPBELL I. SPECIES OF LEPIDOPHORELLA

1. Claw with 2 or 4 inner teeth on mid and posterior feet 2
   Claw with 3 inner teeth on mid and posterior feet 3
2. Claw with 2 inner teeth on mid and posterior feet ..... **australis**
   Claw with 4 inner teeth on mid and posterior feet ..... **brachycephala**
3. Claw with 3 equal inner teeth on feet; color cream to black ..... **communis**
   Claw with 2 large and 1 small apical inner teeth; color black, usually with paler diagonal lateral stripes on thorax II ..... **nigra**

Lepidophorella australis Carpenter

Lepidophorella australis Carp., 1925, Mem. Proc. Manchester Litt. & Phil. Soc. **69**: 97.

Legs: The holotype and other Campbell I. specimens have a suggestion of a 3rd inner tooth on fore claws. There is a slit visible though normally the tooth lies flush with the inner surface of the claw. In some mounts where the claw is more or less squashed, the tooth opens out giving the appearance of 3 inner teeth as in *L. nigra* or *L. communis*. All feet have a single tooth on outer membrane of unguiculus, the tooth being most prominent on the fore feet.

SPECIMENS EXAMINED: 1, Beeman Camp, *Pleurophyllum criniferum*, 6–11. XII. 1961, Gressitt; 1, *ibid.*, under box-wood, 5. III. 1963, Wise; 6, *ibid.*, 50 m, tin can trap in *Dracophyllum* scrub, 6–11. XII. 1961, Gressitt; 4, *ibid.*, 50 m, 12–17. XII. 1961, Gressitt; 1, *ibid.*, tin trap in *Dracophyllum*, 12. XII. 1961, Gressitt; 2, *ibid.*, 50 m, tin can traps, 12–17. XII. 1961, Gressitt; 2, *ibid.*, under timber on ground, 14. II. 1963, Wise; 2, Beeman Hill, 30–100 m, *Poa* roots & moss, 6. XII. 1961, Gressitt; 2, Tucker Cove, under timber, 28. II. 1963, Wise; 2, *ibid.*, 2–50 m, moss, 21–25. XI. 1961, Gressitt; 1, *ibid.*, under debris, 1.II.1963, Wise; 1, *ibid.*, in peat bank, 25. II. 1963, Wise; 1, *ibid.*, on surface of pools, 25. II. 1963, Wise; 2, *ibid.*, beaten ex *Pittosporum*, 26. II. 1963, Wise; 1, *ibid.*, 2 m, peat bank, 1. II. 1963, Rennell; 1, *ibid.*, under boards, 1. II. 1963, Rennell; 1, *ibid.*, 0–30 m, *Dracophyllum*, 7. VIII. 1962, Rennell; 1, *ibid.*, 4 m, *Coprosma*, 6. VIII. 1962, Rennell; Lookout Bay, swept beside stream, 3. II. 1963, Wise; 1, Camp Cave, northern spur Mt. Dumas, 80 m, swept from tussock, 6. II. 1963, Rennell; 2, Venus Cove, 0–2 m, tussock, 2. II. 1963, Rennell; 1, Shoal Point, 0–10 m, 7. II. 1963, Rennell; 1, *ibid.*, 0–10 m, sweeping tussock, 29. VII. 1962, Rennell; 1, 1961, Gressitt by Berlese funnel.

REMARKS: The above described characters of the feet have not previously been recorded. The characters of the fore feet should not be considered for the separation of this species from *L. nigra* or *L. communis*.

DISTRIBUTION: Campbell I., New Zealand.

CAMPBELL I.: Common about shores of Perseverance Hbr. In vegetation, under low plants and surface debris. Terrestrial, below 100 m. Indigenous or introduced by man. This species was first collected on Campbell I. in 1923. The fact that it was described from Campbell I. specimens does not preclude the possibility that it may have been in-

troduced by man from New Zealand.

Lepidophorella communis Salmon

Lepidophorella communis Salm., 1937, Trans. Roy. Soc. N. Z. **67**: 353.

SPECIMENS EXAMINED: 2, Beeman Camp, tin trap in *Dracophyllum*, 12. XII. 1961, Gressitt; 3, *ibid.*, 2–50 m, *Poa* roots, 6–11. XII. 1961, Gressitt; 1, *ibid.*, 2–50 m, moss & lichen on *Dracophyllum* trunks, 1–5.XII.1961, Gressitt; 2, *ibid.*, under box-wood, 5. III. 1963, Wise; 1, Beeman Beach, 2–50 m, moss, turf, *Poa*, *Bulbinella*, 11, 15. XII. 1961, Gressitt; 1, Lookout Bay, under *Stilbocarpa*, 3. II. 1963, Wise.

DISTRIBUTION: New Zealand, Campbell I. (new record).

CAMPBELL I.: Few specimens in Beeman Camp area extending to Lookout Bay. In vegetation and under surface debris. Terrestrial, below 50 m. Introduced by man.

Lepidophorella nigra Salmon

Lepidophorella nigra Salm., 1943, Trans. Roy. Soc. N. Z. **72**: 383.

SPECIMENS EXAMINED: 1, Beeman Camp, 50 m, *Pleurophyllum criniferum*, 6–11. XII. 1961, Gressitt; 1, *ibid.*, under timber on ground, 14. II. 1963, Wise; 2, Beeman Beach, 2–50 m, moss, turf, *Poa*, *Bulbinella*, 11, 15. XII. 1961, Gressitt; 3, Tucker Cove, under timber, 28. II. 1963, Wise; 1, *ibid.*, 2 m, peat bank, 1. II. 1963, Rennell; 2, Shoal Point, 0–10 m, 7. II. 1963, Rennell; 1, *ibid.* decaying bottom of tussock, 7. II. 1963, Rennell.

DISTRIBUTION: New Zealand, Campbell I. (new record).

CAMPBELL I.: Few specimens in Tucker and Beeman Camps area and on opposite shore of Perseverance Hbr. at Shoal Point, amongst low plants and under surface debris. Three specimens, originally determined by J. T. Salmon, but previously unrecorded (2 in Dominion Mus., Wellington; 1 in Canterbury Mus., Christchurch) were collected at Monument Hbr., Campbell I. (beneath rocks back of beach, 15. XI. 1945, J. H. Sorenson). These are the only *Lepidophorella* specimens recorded outside the Perseverance Hbr. area. Terrestrial, below 50 m. Indigenous or introduced by man.

Lepidophorella brachycephala (Moniez)

Drepanura brachycephala Mon., 1894, Rev. Biol. Nord. France, 6.

SPECIMENS EXAMINED: 1, Camp Cove, northern spur Mt. Dumas, 80 m, swept from tussock, 6. II. 1963, Wise; 1, Shoal Point, tussock near beach, 1. II. 1963, Rennell.

DISTRIBUTION: New Zealand, Campbell I. (new record).

CAMPBELL I.: 2 specimens only from widely separated points on opposite shores of Perseverance Hbr., in tussock. Terrestrial, below 80 m. Probably introduced by man, although not taken in the actual camp area.

Subfamily TOMOCERINAE

Genus **Tomocerus** Nicolet, 1842

Tomocerus setoserratus Salmon

Tomocerus setoserratus Salm., 1941, Trans. Roy. Soc. N. Z. **70** (4): 347.

SPECIMENS EXAMINED: 1, Tucker Cove, under timber, 28. II. 1963, Wise.

DISTRIBUTION: New Zealand, Campbell I. (new record).

CAMPBELL I.: 2 specimens only in Tucker camp area, under surface debris. Terrestrial, below 50 m. Introduced by man.

Family ENTOMOBRYIDAE Schaeffer, 1896

Subfamily ENTOMOBRYINAE

Genus **Entomobrya** Rondani

Entomobrya nivalis (Linnaeus)

Podura nivalis L., 1758, Systema Naturae, ed. 10: 608.
Entomobrya nivalis: Salmon, 1941, Trans. Roy. Soc. N. Z. **70** (4): 361.
Mydonius exfoliatus: Salmon, 1949, Cape Exped. Ser. Bull. **4**: 40.

SPECIMENS EXAMINED: 2, Beeman Camp, 2–50 m, chicken yard debris, 6–11. XII. 1961, Gressitt; 4, *ibid.*, under box-wood, 5. III. 1963, Wise; Beeman Hill, 2–50 m, old *Dracophyllum* trunk, 21–25. XI. 1961, Gressitt; 1, Beeman Beach, 2–50 m, moss, turf, *Poa*, *Bulbinella*, 11, 15. XII. 1961, Gressitt; 1, Tucker Cove, 1–50 m., old camp, under boards, 6–11. XII. 1961, Gressitt; 1, *ibid.*, 1–50 m, *Dracophyllum*, 21–25. XI. 1961, Gressitt; 1, *ibid.*, 2 m, 22. XI. 1961, Gressitt; 1, *ibid.*, under debris, 1.II.1963, Wise; 1, *ibid.*, old camp, under timber, 1.II.1963, Wise; 1, *ibid.*, under timber, 28. II. 1963, Wise; 1, Lookout Bay, swept beside stream, 3. II. 1963, Wise; 2, *ibid.*, beach, under stones & kelp, 3. II. 1963, Wise; 2, *ibid.*, under *Stilbocarpa*, 3. II. 1963, Wise; 2, Mt. Azimuth, 350 m, moss-lichen, 30. XI. 1961, Gressitt by Berlese funnel; 1, Mt. Azimuth–Courrejolles, under moss & turf, 12. II. 1963, Wise; 1, Venus Cove, 0–2 m, tussock, 2. II. 1963, Rennell; 1, *ibid.*, tussock, 2. II. 1963, A. Wright; 1, Shoal Point, 0–10 m, sweeping tussock, 29. VII. 1962, Rennell; 1, Shoal Point, tussock, 1. XII. 1962, Rennell.

REMARKS: The present Campbell I. specimens are conspecific with specimens recorded as *Mydonius exfoliatus* by Salmon (1949) but not with New Zealand specimens of *Entomobrya exfoliata* Salmon, 1943. Both Campbell I. series appear to be conspecific with the species known as *E. nivalis* in New Zealand (Salmon, 1941) although the color pattern is more extensive. There are some constant differences in color pattern from *E. nivalis* as restricted by South (1961), but until such time as South's methods and results are applied to the genus *Entomobrya* in New Zealand, it seems best to retain the New Zealand–Campbell I. species under this name.

DISTRIBUTION: Cosmopolitan (see South, 1961) including New Zealand and Campbell I. (new record).

CAMPBELL I.: Common in Tucker and Beeman Camps area mainly under surface debris. Associated with plant cover in other areas, occurring in tussock at Venus Cove and Shoal Pt. on the S. side of Perseverance Hbr., and in moss, lichen, and turf on Mt. Azimuth. Terrestrial from beach to 350 m. Indigenous or possibly introduced by man as common in the camps area but scarce elsewhere.

Genus **Parasinella** Bonet, 1934

Parasinella castanea Salmon

Parasinella castanea Salm., 1949, Cape Exped. Ser. Bull. **4**: 41.

SPECIMENS EXAMINED: 2, Rocky Bay, S. coast below Mt. Dumas, 10 m, penguin colony, under *Tillaea*, 18. II. 1963, Wise (type locality).

DISTRIBUTION: Campbell I.

CAMPBELL I.: Few specimens, apparently confined to one isolated area on the S. coast. Under low plant cover. Previously recorded under stones in same locality and in leaf-mold (Salmon, 1949). Terrestrial, 10 m. Endemic.

Genus **Lepidiaphanus** Salmon, 1949

Lepidaphanus eudyptidus Salmon

Lepidiaphanus eudyptidus Salm., 1949, Cape Exped. Ser. Bull. **4**: 42.

SPECIMENS EXAMINED: 1, Beeman Camp, 2–50 m, *Poa*, 18–21. XII. 1961, Gressitt; 1, *ibid.*, 2–50 m, *Pleurophyllum criniferum*, 6–11. XII. 1961, Gressitt; 1, Beeman Hill, 30–100 m, *Poa* roots & moss, 6.XII.1961, Gressitt; 1, *ibid.*, under *Pleurophyllum speciosum*, 2.II.1963, Wise; 1, Beeman Beach, 2–50 m, moss, turf, *Poa*, *Bulbinella*, 11, 15. XII. 1961, Gressitt; 1, *ibid.*, 5 m, *Dracophyllum*, 19. XII. 1961, Rennell; 1, Tucker Cove, under stones, 28. II. 1963, Wise; 1, *ibid.*, 1–50 m, weed & grass turf, 6–11. XII. 1961, Gressitt by Berlese funnel; 1, Lookout Bay, beach, *Dracophyllum*, 16, 19. XII. 1961, Gressitt; 1, *ibid.*, under stones, 3. II. 1961, Wise; 1, Courrejolles Pen., 220–230 m, mollymawk colony, under stones, 12. II. 1963, Rennell; 1, Mt. Azimuth—Courrejolles, under moss & turf, 12. II. 1963, Wise; 1, Middle Bay, under stones & wood in grass, 5. II. 1963, Wise; 1, Rocky Bay, S. coast below Mt. Dumas, 10 m, penguin colony, under *Tillaea*, 18. II. 1963, Wise (type locality).

DISTRIBUTION: Campbell I.

CAMPBELL I.: Not common in any one locality but widely distributed. Mainly associated with low plant cover, occasionally under stones. Terrestrial, from beach to 220 m. Endemic.

Genus **Lepidocyrtus** Bourlet, 1839

Lepidocyrtus cyaneus cinereus Folsom

Lepidocyrtus cyaneus cinereus Fols., 1924, Amer. Mus. Novit. **108**: 9.

SPECIMENS EXAMINED: 1, Beeman Camp, under box-wood, 5. III. 1963, Wise; 1, Beeman Hill, 2–50 m, old *Dracophyllum* trunk, 21–25. XI. 1961, Gressitt; 1, Tucker Cove, 22. XI. 1961, Gressitt; 1, *ibid.*, under timber, 28. II. 1963, Wise.

DISTRIBUTION: North America, New Zealand, Campbell I. (new record).

CAMPBELL I.: 4 specimens only taken under surface debris in Tucker and Beeman Camps area. Terrestrial, below 50 m. Introduced by man.

Genus **Lepidobrya** Womersley, 1937

KEY TO CAMPBELL I. SPECIES OF LEPIDOBRYA

1. Color mainly blue or violet 2
   Color deep ochreous with wine-colored edging to thoracic terga and posterior seg-

mental margins ..... **thalassarchia**
2. Color pale ochreous with wide segmental bands of pale blue ..... **mawsoni**
Color mainly violet ..... **violacea**

Lepidobrya mawsoni (Tillyard)

Entomobrya mawsoni Tilly., 1920, Sci. Rep. Australas. Ant. Exped., 1911–14, (C) **5**(8) : 11.
Lepidobrya mawsoni : Salmon, 1949, Cape Exped. Ser. Bull. **4** : 43.

REMARKS : Not in present collection. The 1 specimen known from Campbell I. is as described by Salmon (1949) and belongs to the genus *Lepidobrya*.

DISTRIBUTION : Macquarie I., Campbell I.

CAMPBELL I. ; 1 specimen recorded by Salmon (1949) under firewood (presumably Tucker Camp area). Possibly indigenous but probably introduced.

Lepidobrya thalassarchia Salmon

Lepidobrya thalassarchia Salm., 1949, Cape Exped. Ser. Bull. **4** : 44.

SPECIMENS EXAMINED : 1, Beeman Hill, under *Pleurophyllum speciosum*, 2. II. 1963, Wise ; 1, Tucker Cove, under timber, 28. II. 1963, Wise ; 1, Shoal Point, 0–10 m, 7. II. 1963, Rennell ; 1, Courrejolles Pen., 220 m, mollymawk colony, under stones, 12. II. 1963, Wise (type locality) ; 1, Northwest Bay, tussock, 30. XII. 1962, Rennell ; 2, Middle Bay, under stones & wood in grass, 5. II. 1963, Wise ; 1, Monument Hbr., top of beach, tussock, 9. II. 1963, Rennell ; 1, (SW), vegetation & under boards, 28–29. XI. 1961, Gressitt ; 1, 1961, Gressitt by Berlese funnel.

DISTRIBUTION : Campbell I.

CAMPBELL I. : Not common in any one area but widely distributed. Associated with low plant cover and surface debris. Terrestrial, beach to 220 m. Endemic.

Lepidobrya violacea Salmon

Lepidobrya violacea Salm., 1949, Cape Exped. Ser. Bull. **4** : 46.

SPECIMENS EXAMINED : 1, Beeman Camp, 2–50 m, *Poa* roots, 6–11. XII. 1961, Gressitt ; 1, Beeman Beach, 2–50 m, moss, turf, *Poa*, *Bulbinella*, 11, 15. XII. 1961, Gressitt ; 1, Tucker Cove, under timber, 28. II. 1963, Wise (type locality) ; 1, *ibid.*, on surface of pools, 25. II. 1963, Wise (type locality) ; 2, *ibid.*, under stones, 28.II.1963 (type locality) ; 1, Lookout Bay, swept beside stream, 3. II. 1963, Wise ; 1, Camp Cove, N. spur Mt. Dumas, 80 m, swept from tussock, 6. II. 1963, Wise ; 1, Lyall–Beeman Saddle, 70 m, *Pleurophyllum*, 3, 5, 8, 12. XII. 1961, Gressitt ; 1, Mt. Lyall, 200–400 m, moss, 3, 5, 12.XII.1961, Gressitt ; 1, *ibid.*, 150 m, SW slopes, under stones, 19. II. 1963, Wise ; 1, Courrejolles Pen., 220 m, mollymawk colony, under stones, 12. II. 1963, Wise ; 1, Mt. Azimuth, under stones, 12. II. 1963, Wise ; 2, St. Col Ridge, 180–280 m, lichens on *Dracophyllum*, 4, 7, 9, 13. XII. 1961, Gressitt ; 1, Rocky Bay, penguin nest, 28. XI. 1961, Gressitt.

DISTRIBUTION : Campbell I.

CAMPBELL I. : Common and widely distributed. Associated with low plant cover and surface debris. Terrestrial, beach to 360 m. Endemic.

Suborder SYMPHYPLEONA

Family SMINTHURIDAE Lubbock, 1870

Not all the Campbell I. species of this family have been fully worked out. There appear to be 3 species in addition to the 4 recorded below. More specimens are required before they can be finally determined.

Subfamily SMINTHURIDINAE Börner, 1906

Tribe *Katiannini* Börner

Genus **Sminthurinus** Börner, 1901

Sminthurinus discordipes Salmon

Sminthurinus discordipes Salm., 1949, Cape Exped. Ser. Bull. **4**: 49.

SPECIMENS EXAMINED: 2, Beeman Camp, 2–50 m, moss & lichen on trunks of *Dracophyllum*, 1–5. XII. 1961, Gressitt; 1, *ibid.*, 2–50 m, *Poa*, 18–21. XII. 1961, Gressitt; 3, *ibid.*, 2–50 m, *Pleurophyllum criniferum*, 6–11. XII. 1961, Gressitt; 4, Courrejolles, moss & leaf-mold, 10. III. 1962, Rennell; 1, Mt. Azimuth, 350 m, moss & lichen, 30. XI. 1961, Gressitt by Berlese funnel; 1, St. Col Ridge, 180–280 m, moss on rock, 24. XI. 1961, Gressitt by Berlese funnel; 1, 1961, Gressitt by Berlese funnel.

DISTRIBUTION: Campbell I.

CAMPBELL I.: Widely distributed but not common in any one place. In vegetation and under low plant cover mainly in damp areas. Terrestrial, above beach to 350 m. Endemic.

Genus **Pseudokatianna** Salmon, 1949

KEY TO CAMPBELL I. SPECIES OF PSEUDOKATIANNA

Antenna IV not divided; posterior foot with 5 clavate hairs ..... **campbellensis**
Antenna IV subdivided; posterior foot with 3 clavate hairs..... ..... **triclavata**

Pseudokatianna campbellensis Salmon

Pseudokatianna campbellensis Salm., 1949, Cape Exped. Ser. Bull. **4**: 52.

SPECIMENS EXAMINED: 1, Smoothwater Bay, *Tillaea* on rock, 2. III. 1963, Wise.

DISTRIBUTION: Campbell I.

CAMPBELL I.: Few at one isolated area under low plants but previously recorded at Tucker Cove under surface debris (Salmon, 1949). Terrestrial below 50 m. Endemic.

Pseudokatianna triclavata Salmon

Pseudokatianna triclavata Salm., 1949, Cape Exped. Ser. Bull. **4**: 53.

SPECIMENS EXAMINED: 1, Moubray Hill, SW slope, 50 m, under stones in stream, 2. III. 1963, Wise; 3, Smoothwater Bay, shore rocks by stream, 2. III. 1963, Wise; 2, Courrejolles Pen., 220 m, mollymawk colony, under stones, 12. II. 1963, Wise (type locality); 1, *ibid.*, 220–230 m, mollymawk colony, under stones, 12. II. 1963, Rennell; 3, Northwest Bay, kelp

on rock, 29. XI. 1961, Gressitt; 1, *ibid.*, tussock, 30. XII. 1962, Rennell; 8, Middle Bay, top of beach, at seepage & stream, under stones & driftwood, 5. II. 1963, Wise; 1, *ibid.*, beach, under stones above high-water mark, 5. II. 1963, Wise; 2, Rocky Bay, S. coast below Mt. Dumas, top of boulder beach, on seepage pools, 18. II. 1963, Wise.

DISTRIBUTION: Campbell I.

CAMPBELL I.: Common and widely distributed. Although occurring mainly about seashore at top of supra-littoral it is considered to be associated more with freshwater seepage and streams. The occurrence at 220 m in a mollymawk colony, where the species was common on seepage and rivulets, suggests local dispersal by seabirds. Semi-aquatic. Endemic.

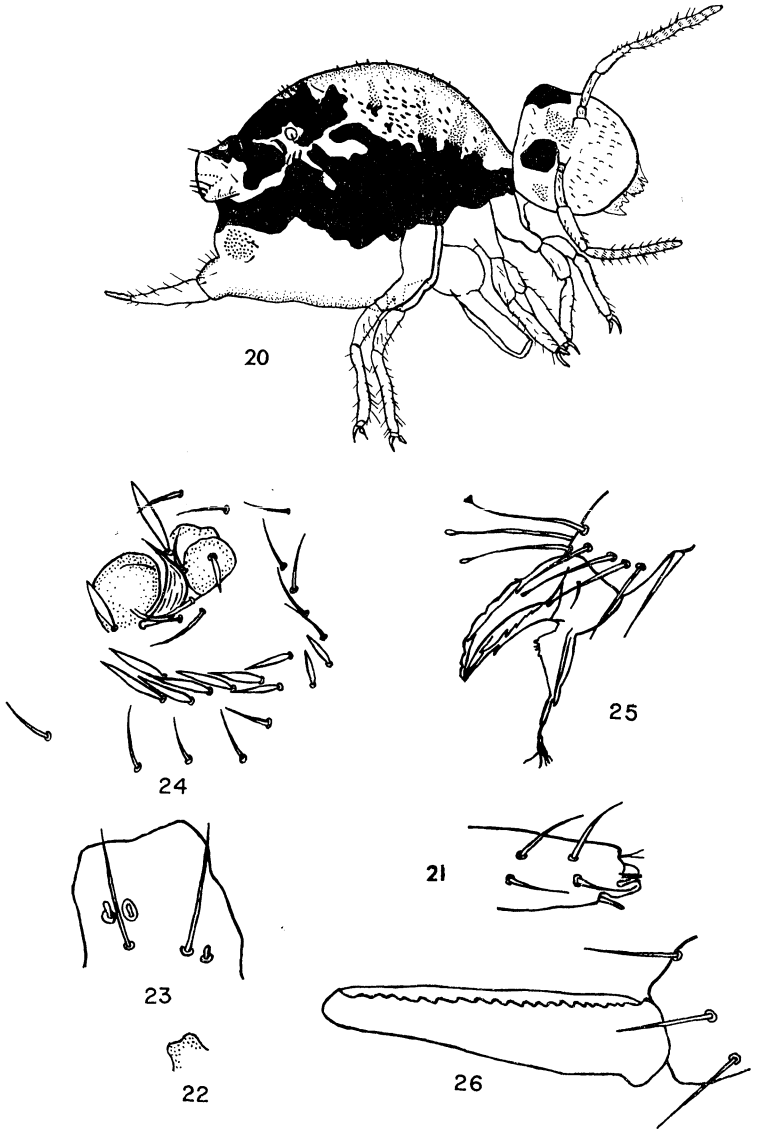
Genus **Longkingia** Salmon, 1946

Longkingia salmoni Wise, n. sp. Figs. 20–26.

Color: In alcohol, body dark green, colorless dorsal patch and ventrally. Pigment in a wide lateral band on each side spreading in transverse bands dorsally in thoracic region, a pigmented dorsal patch posteriorly. Head more or less pigmented with dark patch between antennal bases, and colorless or white patch from between black ocellar patches to hind margin of head. Antenna and legs pale orange, furcula colorless to pale orange.

Clothing: Occasional short plain setae on body, most numerous postero-dorsally and on head, antennae, legs, and furcula. Numerous stout, erect, straight, dagger-like spines on antero-dorsal portion of body. Length up to ca. 1.2 mm. Antennae 2× as long as head, the 4 segments as 10 : 20 : 30 : 60. Antenna IV (fig. 21) annulated with 2 apical sensory processes, 1 finger-like, 1 rounded, and several apical short, straight, sense rods. Antenna III with small peg-like organ (fig. 22) at 1/3, and subapical sense organs (fig. 23) consisting of a pair of short exposed sense rods and a 3rd similar rod somewhat removed to one side and below with 1 seta beside it. Eight ocelli, 5 large outer peripheral, 2 small inner, and 1 very small central. Dorso-lateral sensory abdominal protuberances present, each (fig. 24) consisting of 2 rounded swellings, the anterior being smaller and bearing a short, stout, seta. Between the swellings a large straight spine-like seta dorsally, a single stout seta below it, a stout seta ventrally, with 2 further setae below it, and posteriorly a very large, wide, curved seta. A single large straight spine-like seta posteriorly on posterior swelling and 2 rows of 6 similar setae below protuberance. *Legs* (fig. 25): Claw with a single inner tooth just beyond center, 2 pairs of outer teeth, 1 at 1/3, 1 at 2/3, a strong tunica with prominently serrate edges. Unguiculus lanceolate, inner lamella much broader than outer, the inner angulated with 4 small teeth beyond angle, the subapical bristle very stout basally and dividing into a number of intertwining strands which overreach end of claw. There appear to be 8 clavate tenant hairs on mid and posterior legs. *Furcula* (fig. 26): Dens to mucro as 11 : 4. Mucro plump, rounded apically, inner lamella serrate.

SPECIMENS EXAMINED: Holotype, Camp Cove, N. spur Mt. Dumas, 80 m, swept from tussock, 6.II.1963, Wise; paratypes: 1, Beeman, *Coprosma*, 15.VIII.1962, Rennell; 1, Beeman Beach, 2–50 m, moss, turf, *Poa*, *Bulbinella*, 11, 15. XII. 1961, Gressitt; 1, Beeman, 20 & 80 m, sweeping *Coprosma*, 27. VII. 1962, Rennell; 1, Tucker Cove, beaten ex *Pittosporum*, 26. II. 1963, Wise; 2, Camp Cove, northern spur Mt. Dumas, 80 m, swept from tussock, 6.II.1963, Rennell; 1, Beeman–Lyall, *Pleurophyllum speciosum*, 10. II. 1962, Rennell; 1, St. Col Ridge,



Figs. 20–26. *Longkingia salmoni* n. sp. 20, whole insect (×28); 21, antenna IV, apex (×700); 22, antenna III, basal peg-like organ (×700); 23, antenna III, subapical sense organs (×700); 24, sensory protuberance of body, end view (×200); 25, foot, middle (×400); 26, mucro and apex of dens (×600).

180–280 m, lichens on *Dracophyllum*, 4, 7, 9, 13. XII. 1961, Gressitt; 1, Monument Hbr., top of beach, tussock, 9. II. 1963, Rennell. Other specimens: 1, Beeman Camp, 2–50 m, *Dracophyllum scoparium*, 12–17. XII. 1961, Gressitt; 1, *ibid.*, 2–50 m, *Poa* roots, 6–11. XII. 1961, Gressitt; 2, Beeman, *Coprosma*, 15. VIII. 1962, Rennell; 1, *ibid.*, 30 m, sweeping sedge, 27.

VII. 1962, Rennell; 1, Tucker Cove, *Dracophyllum*, 4. XII. 1961, Gressitt; 2, Lookout Bay, beach, *Dracophyllum*, 3. XII. 1961, Gressitt; 1, Shoal Point, 0–10 m, sweeping tussock, 29. VII. 1962, Rennell; 1, Courrejolles Pen., 200 m, mollymawk nests, 14. XII. 1961, Gressitt.

REMARKS: This species is separated from other species of *Longkingia* by color and markings, form of the abdominal sensory protuberances, and characters of the feet.

The species is named for the founder of the genus, Professor J. T. Salmon, whose previous work on Campbell I. Collembola laid a solid foundation for the present study.

DISTRIBUTION: Campbell I.

CAMPBELL I.: Common and widely distributed, mainly in aerial portion of vegetation and consequently collected most by sweeping and beating. Terrestrial, from beach to 200 m. Endemic.

GENERIC DISTRIBUTION

In the accompanying table (Table 1) of the distribution of genera occurring on Campbell I., the numbers of species occurring on Antarctica, Campbell I., and Auckland Is. are given. A "×" indicates the presence of at least one species of the genus in other areas.

There are 3 genera (*Subantarctica*, *Colonavis*, and *Lepidiaphanus*) endemic to Campbell I. Only *Lepidobrya* is indigenous to Campbell, Auckland, and Macquarie Is.; and *Sorensia* is indigenous to Campbell, Auckland, and Three Kings Is. (N of New Zealand). *Pseudokatianna* is recorded from Campbell I. and New Zealand only. *Papillomurus* is restricted to Campbell I., Auckland Is., and New Zealand, while *Acanthomurus*, *Proisotomurus*, and *Longkingia* are indigenous to Campbell I., New Zealand, and Australia. All the cosmopolitan genera, except *Anurida*, which occur on Campbell I. also are represented in New Zealand. The Collembolan fauna of Campbell and Auckland Is. is strongly associated with the New Zealand fauna.

Concerning the southern element, the genera *Xenylla*, *Triacanthella*, *Tomocerura*, and *Lepidophorella*, all have semi-circumpolar distribution although *Xenylla* and *Triacanthella* also occur in the northern hemisphere. The 4 genera (*Tullbergia*, *Hypogastrura*, *Cryptopygus*, and *Parisotoma*) with endemic species on Campbell I. are each represented by 1 species in Antarctica (including South Shetland Is.), by at least one on other subantarctic islands and also in New Zealand. *Cryptopygus* is completely southern circumpolar in distribution although it is centered in New Zealand.

ECOLOGY

Although an isolated subantarctic island, Campbell I. has been influenced by man for over a century—parties of sealers operated from about 1810–1830; whalers were later active ashore in Windlass Bay (E of Middle Bay) and Northeast Hbr.; sheep were introduced about 1890 and a sheep run was actively operated during 1896–1931; a few scientific expeditions were established for short periods; and a meteorological station has been occupied, firstly as a coastwatching unit during World War II, continuously since 1941. The farmhouse and coastwatching camp were located in Tucker Cove and the present meteorogical station is situated on the point below Beeman Hill. Shepherds and their stores were replaced every one or two years and, likewise, present camp personnel every year. In considering the possibility or probability of Collembola being introduced to Campbell I., it must be

Table 1. Distribution of genera of Collembola occurring on Campbell Island.

	Antarctica	Campbell I.	Auckland Is.	Other Subantarctic Islands	New Zealand	Elsewhere
Tullbergia	1*	2	1	×**	×	Cosmopolitan
Onychiurus		1			×	Cosmopolitan
Xenylla		1	1	×	×	Cosmopolitan
Triacanthella		2	1	×	×	Tierra del Fuego, Malta, Italy
Hypogastrura	1	4	1	×	×	Cosmopolitan
Subantarctica		1				
Colonavis		2				
Anurida		1		×		Cosmopolitan
Neanura		2			×	Cosmopolitan
Cryptopygus	1	1		4	8	Australia, 2 South Africa, 1
Parafolsomia		2	2		×	Cosmopolitan
Folsomia		1			×	Cosmopolitan
Proisotoma		2		×	×	Cosmopolitan
Acanthomurus		1			×	Australia
Proisotomurus		1			×	Australia
Sorensia		2	1			Three Kings Is.
Papillomurus		1	2		×	
Tomocerura		1		×		Australia, Patagonia
Parisotoma	1	2	2	×		Cosmopolitan, Patagonia
Lepidophorella		4			×	Australia, Chile
Tomocerus		1			×	Cosmopolitan
Entomobrya		1			×	Cosmopolitan
Parasinella		1			×	Cosmopolitan ?
Lepidiaphanus		1				
Lepidocyrtus		1			×	Cosmopolitan
Lepidobrya		3	1	×		
Sminthurinus		1		×	×	Cosmopolitan ?
Pseudokatianna		2			×	
Longkingia		1			×	Australia

* Number of species for genus.
** One or more species of genus present.

remembered that all food and general supplies of all kinds—building materials, and fence posts—were supplied directly by ships from New Zealand. At least in later years, boxes of vegetable plants in soil have been taken to the island, and the vegetables planted in outside plots.

Many of the species recorded above appear to be centered in the Tucker and Beeman camps area, but this to some extent is influenced by less frequent collecting elsewhere. Each species has been recorded as 'endemic' when it is known only from Campbell I.; 'indigenous by natural dispersal' when it is non-endemic and is widely spread on the island or occurs in isolated areas away from the camps area; and as 'introduced by man' when it is non-endemic and has only been collected in the Tucker and/or Beeman Camps area. However, owing to the long period of human and sheep habitation, the last two categories cannot be properly defined or separated. Some of the species classed, at present, as 'endemic' are only known from a few specimens in the camps area. If any of these should in

Table 2. Species of Collembola endemic to Campbell Island, related to ecological areas.

	Terrestrial				Semi-aquatic		Supra-littoral	Littoral	Elsewhere
	Wide-spread	Above 300 m	Camps area	Isolated	Below 300 m	Above 300 m			
Tullbergia scalpellata			×						
Onychiurus subantarcticus			×						
Triacanthella alba							×		
Tr. sorenseni							×		
Hypogastrura obliqua			×						
Subantarctica flava							×		220 m Molly-mawk colony
Colonavis grandis	×	×	×						
C. litoralis							×		
Cryptopygus campbellensis				×					
Parafolsomia litorea	×	×	×						
Folsomia sp.			×						
Proisotoma octojuga			×						
P. xanthella			×						
Acanthomurus rivalis					×				
Sorensia minuta			×						
Proisotomurus lapidosus			×	×					
Papillomurus ochraceus	×	×	×				×	×	
Tomocerura colonavia					×	×			
Parisotoma picea								×	
Parasinella castanea				×					
Lepidiaphanus eudyptidus	×		×						
Lepidobrya thalassarchia	×		×						
L. violacea	×	×	×						
Sminthurinus discordipes	×	×	×						
Pseudokatianna triclavata					×				220 m Molly-mawk colony
Ps. campbellensis			×	×					
Longkingia salmoni	×		×						

Table 3. Species of Collembola indigenous or introduced to Campbell Island, related to ecoloical areas on Campbell Island and distribution elsewhere.

	Campbell Island			Auckland Island	New Zealand	Elsewhere	Suggested status on Campbell I.
	Below 300 m	Above 300 m	Camps area (below100 m)				
Tullbergia subantarctica	×	×	×	×	×		Indig.*
Xenylla novazealandia	×		×	×	×		Indig.
Hypogastrura armata	×		×		×	Cosmopolitan	Indig. or Intro.**
Hy. pseudopurpurascens			×		×		Intro.
Hy. morbillata			×		×		Intro.
Anurida granaria			×			Cosmopolitan	Intro.
Neanura radiata			×		×		Intro.
Ne. hirtella schotti			×		×	Australia	Intro.
Parafolsomia decemoculata	×	×	×	×			Indig.
Sorensia subflava	×	×	×	×			Indig.
Parisotoma octooculata ovata	×	×	×	×			Indig.
Lepidophorella australis	×		×		×		Indig. or Intro.
L. communis	×		×		×		Intro.
L. nigra	×		×		×		Indig. or Intro.
L. brachycephala	×				×		Intro.
Tomocerus setoserratus			×		×		Intro.
Entomobrya nivalis	×	×	×		×	Cosmopolitan	Indig. or Intro.
Lepidocyrtus cyaneus cinereus			×		×	North America	Intro.
Lepidobrya mawsoni			×			Macquarie I.	Possibly Indig., Probably Intro.

* Indigenous. ** Introduced.

the future be discovered in New Zealand or elsewhere, they may be found to have been introduced into Campbell I. Such species are *Tullbergia scalpellata*, *Onychiurus subantarcticus*, *Folsomia* sp., *Proisotoma octojuga*, *P. xanthella*, and *Sorensia minuta*.

Of the species endemic to Campbell I. (Table 2), each species is indicated for ecological areas in which it has been recorded. Of the indigenous or introduced species (Table 3), each is indicated for important ecological areas on Campbell I., and for distribution elsewhere.

It is generally recognised that the present topography of Campbell I. is largely due to glaciation (Marshall, 1909; Oliver, 1950). Most of the hill-tops are isolated and most are ringed by rock bluffs (remains of lava flows) at about the 300 m level. My field observations of other insects (apterous terrestrial Plecoptera) suggest that faunas have been isolated on the present hill-tops above those bluffs. Whether these are relict faunas, being survivors after the last glaciation from previously more widespread faunas, or whether they represent the earliest colonisers of the first land appearing as glaciation receded, is an interesting question. None of the present-day Collembolan species are restricted to the hill-tops, but some which could have spread from hill-tops post-glacially are *Colonavis grandis*, *Parafolsomia litorea*, *Papillomurus ochraceus*, *Lepidobrya violacea*, *Sminthurinus discordipes*, *Tullbergia subantarctica*, *Parafolsomia decemoculata*, *Sorensia subflava*, and *Parisotoma octooculata ovata*; and of these the last four are common to Auckland I.

Species represented in the present collections are associated with ecological habitats as follows:

Vegetation, low plant cover, surface debris, stones: Most species are associated with various types of cover. They often occur indiscriminately in several or all of these. Tussock covers much of the island but few, if any, species are restricted to it. Several species occur in mosses and lichens on rocks and in epiphytic mosses and lichens on *Dracophyllum*. The low plant *Tillaea*, where it grows on shore rocks, often provides cover for large populations of insects, particularly Collembola. Species in this category are: *Tullbergia subantarctica*, *Hypogastrura armata*, *Colonavis grandis*, *Neanura radiata*, *Neanura hirtella schotti*, *Cryptopygus campbellensis*, *Parafolsomia litorea*, *P. decemoculata*, *Folsomia* sp., *Proisotoma octojuga*, *P. xanthella*, *Sorensia subflava*, *Papillomurus ochraceus*, *Parisotoma octooculata ovata*, *Lepidophorella australis*, *L. communis*, *L. nigra*, *L. brachycephala*, *Tomocerus setoserratus*, *Entomobrya nivalis*, *Parasinella castanea*, *Lepidiaphanus eudyptidus*, *Lepidocyrtus cyaneus cinereus*, *Lepidobrya thalassarchia*, *L. violacea*.

Streams and seepage: *Acanthomurus rivalis*, *Tomocerura colonavia*, *Pseudokatianna triclavata*.

Beaches and shore rocks: *Triacanthella sorenseni*, *Subantarctica flava*, *Colonavis litoralis*.

Intertidal: *Parisotoma picea*.

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