

ON SOME FREE LIVING PROSTIGMATIC MITES OF ANTARCTICA¹

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Abstract: Several new and some previously described species of free living prostigmatic mites of Antarctica are illustrated and described. New species are *Eupodes wisei*; *Stereotydeus mollis*; *Rhagidia leechi*; *Rhagidia macquariensis* (from Macquarie Island); *Coccorhagidia gressitti*; *Nanorchestes antarcticus*. Species redescribed are *Stereotydeus villosus* (Trouessart); *Stereotydeus belli* (Trouessart); *Rhagidia gerlachei* Trouessart.

Introduction: Several months prior to his death, Dr. Herbert Womersley, late dean of Australian Acarologists, had been working on a collection of free living prostigmatic mites which had been collected in Antarctica over the past few years. At the time of his death, he had identified most of the species and had completed most of the drawings. It has been my privilege to complete the few unfinished drawings and to write the manuscript.

All the species of prostigmatic mites collected in Antarctica by Bishop Museum personnel are represented in this paper. With one exception, all the species were seen by Dr. Womersley. The exception is *Nanorchestes antarcticus* n. sp. collected by C. Fearon and by Dr. J. L. Gressitt during the antarctic summer just passed.

Mites from the subantarctic region, notably Macquarie I. and Campbell I., will be treated in a separate paper. The reader will note, however, that in the present paper a new species from Macquarie I. is included. Dr. Womersley had prepared the illustrations and given a name to the species and therefore it is included in this paper.

Types of the new species are in the Type Collection of the Bernice P. Bishop Museum, Honolulu, Hawaii, except for the species from Macquarie Island, the type of which is being deposited in the Australian National Insect Collection (ANIC), C. S. I. R. O., Canberra. There are also unmounted wet specimens of each species.

Family EUPODIDAE C. L. Koch, 1842

Genus **Eupodes** C. L. Koch, 1836

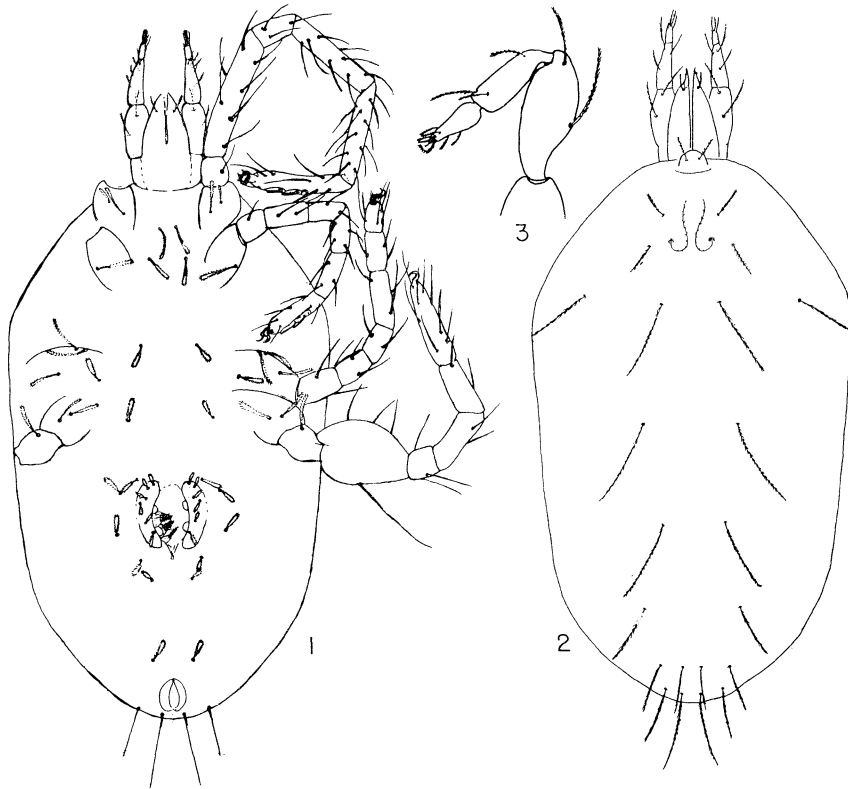
Soft, non-sclerotized mites. Body without constrictions. Rostrum narrow, chelicerae long and narrow, the chela small; pedipalps slender, with 4 movable segments, the terminal segment constricted at base, enlarging suddenly then tapering to a slender apex. Propodo-

1. Partial results of field work on grants from the United States Antarctic Research Program, National Science Foundation.
2. South Australian Museum (deceased 14 Oct. 1962).
3. Bernice P. Bishop Museum, Honolulu, Hawaii.

soma with a small, rounded epivertix bearing 2 small, slender, feathered setae. Legs slender; femora IV greatly enlarged, as if modified for jumping. The genus is widely distributed, occurring in alpine and arctic regions as well as more temperate regions of the world. Thor and Willmann (1941) list 38 certain and 7 uncertain species. Those that are adequately described, either in Thor and Willmann's paper or subsequently, are not referable to *E. wisei* n. sp.

***Eupoeds wisei* Womersley and Strandtmann, n. sp.** Figs. 1-3.

Length of body, exclusive of gnathosoma, 480 μ . Leg I longest, not as long as body. Eyes and transverse suture not apparent. Ventral body setae claviform and finely plumose. Dorsal body setae long, thread-like, ciliate. Body broadly elliptic, nearly 2 \times as long as wide. Shoulders not prominent. *Ventral side* (fig. 1): Epimera in 2 groups, not strongly developed, and widely separated medially. Epimeron I with 2 setae, the outer about 2/3 as long as the inner; epimeron II with 1 seta; epimeron III with 4 setae, 2 on anterior border, 1 mediiodistal, and 1 mediobasal; epimeron IV with 2 central setae originating close together but not as close as the 2 on the anterior border of epimeron III. Medially, there



Figs. 1-3. *Eupoeds wisei* Wom. & Str., n. sp. 1, ventral view of adult; 2, dorsal view of adult; 3, lateral view of pedipalp.

is 1 pair of setae between each of the 4 epimera. Genitalia bracketed by 5 pairs of setae. Each genital cover bears 6 setae; internally are 2 pairs of genital suckers and 4 or more pairs of papillae each with a plumose seta. Excretory pore small, thick-lipped, longitudinal, located ventrally near posterior tip. *Dorsal side* (fig. 2): Epivertex usual, with 2 finely ciliated, filiform setae. Sensory area with 4 equal, finely plumose, slender setae and 1 pair of long, very fine, sparsely ciliated sensillae. Pygidial area with 8 setae similar to but shorter than dorsals, except inner posterior pair which are about equal to the dorsals. A faint transverse suture may be seen in the scapular region on some specimens. Eyes not found. *Gnathosoma*: Rostrum slender, about 2/3 as long as palps, divided about 1/2 way to base. It is simple and unadorned except for a pair of subapical, weakly claviform and lightly plumose setae. Pedipalps (fig. 3) quite usual; segment 2 largest, swollen medially and with 2 long, dorsal setae; segment 3 about 2/3 as long as 2 and with 2 apical and 1 basal setae on dorsal side; segment 4 about 2/3 as long as segment 3, tapering apically and bearing 7 or 8 setae of which 3 ventral setae are widely spaced, but the rest clustered at apex; apical ventral seta characteristically recurved as illustrated. *Leg*: Tarsi I and II each with 2 rhagidial organs. On tarsus I they are subtended by a short, erect, plumose seta; on tarsus II by a short, erect, nude seta. Tarsal empodium split, ciliated, pad-like and as long as claws.

Holotype adult (BISHOP 3418) and 3 paratype adults, Hallett Station, Antarctica, 13. XI. 1960, K. A. J. Wise, under stones in Skua rookery.

Remarks: Professor Womersley had made no mention of these mites in his correspondence, but among his drawings was a ventral view of the mite which is here reproduced. I have added the dorsal view and the pedipalp. To my knowledge, this is the first record of a *Eupodes* from the Antarctic region.

The mite is named in honor of its discoverer, the veteran Antarctic collector, K. A. J. Wise of Bishop Museum.

Family PENTHALODIDAE Sig Thor, 1933

Genus *Stereotydeus* Berlese, 1901

Medium-sized red, or black and red mites; body plump, narrowed posteriorly. Propodosoma divided from hysterosoma by a more or less distinct furrow. Integument ornamented with some degree of sclerotization and more or less obvious transverse and longitudinal lines. A pair of pits at base of coxa III. A mild to very prominent extension of the body, the epiprostrum (which bears the vestigial epivertex) extends partially over the rostrum. Chelicerae large, pubescent; chelae small and malformed. Eyes present (sometimes absent?). Cosmopolitan distribution.

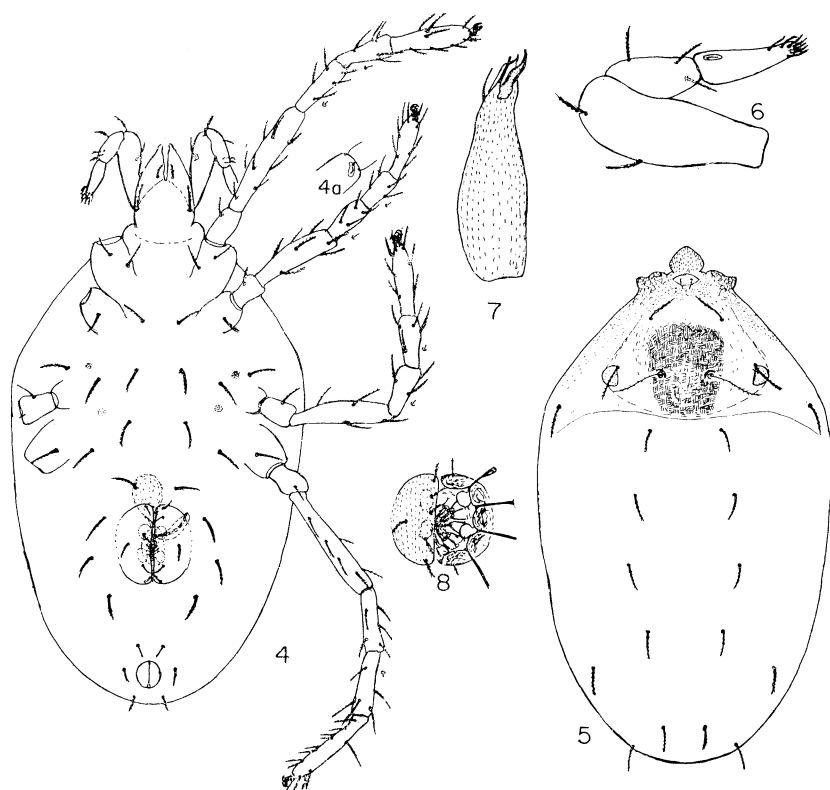
Very little is known about the biology of these mites but some species are known to be plant feeders.

Womersley (1941) indicated that in his opinion *Tectopenthalodes* Tragardh, 1907 is a synonym of *Stereotydeus*, an opinion with which I agree.

Stereotydeus mollis Womersley and Strandtmann, n. sp. Figs. 4-8.

A plump, soft-bodied mite averaging 500 μ long. Legs slender, shorter than body. Eyes well developed. Epiprostral area trilobed but weakly developed, Epivertex smooth,

with 2 small, ciliated setae. Propodosoma with a rectangular, central, very weakly sclerotized area. Eyes strongly convex, lightly striated. Hysterosoma finely striated, the 8 prs. of setae plumose, equal, short. *Ventral side* (fig. 4): Epimera poorly defined, in 2 groups. Coxa I with 2 setae, all others with one. Genitalia medial, with 2 flaps which laterally are not separated from the body wall, differing in this respect from the following 2 species. Both sexes with a cluster of 7 pairs (internal genital) setae plus 2 pairs genital suckers. In ♂ (fig. 4), internal setae relatively small and clustered in an area less than 1/2 as long as external flaps; in ♀ (fig. 8), these setae longer, on apparent papillae, and occupy an area more than 1/2 as long as genital flap. In addition, the ♂ exhibits a sperm sac and frequently also a structure that could be an intromittant organ (fig. 4). Excretory pore posteroventral, small, covered by 2 flaps, bracketed by 6-7 setae. Genitalia bracketed by 6-8 pairs of setae, the number being variable. Terminal segment of pedipalps slender, clearly longer than subterminal segment, with a cluster of 8 plumose setae at tip and a small rhagidiform organ dorsolaterally near base (fig. 6). Movable digit of chela longer than fixed digit and edentate (fig. 7). *Legs*: Setae relatively short and sparse, plumose; those at apices of tarsi almost brush-like. All trochanters with 1 seta each. All femora undivid-



Figs. 4-8. *Stereotydeus mollis* Wom. & Str., n. sp. 4, ventral view of ♂; 4a, dorsal view of tip of tibia II; 5, dorsal view of adult; 6, lateral view of right pedipalp; 7, chelicera of adult; 8, ♀ genitalia with left cover retracted.

ed, with no trace of a division. Genua I, II, III each with a mid dorsal solenidium on basal 1/2. All tibia with a dorsal solenidium basad of middle. Tibiae I and II each with a small, apical rhagidiform organ with a small vertical setae at its anterior end (fig. 4a). Tarsi I and II each with 3 rhagidiform organs placed longitudinally and in a confluent field, but the positions may vary somewhat. Rhagidiforms on tarsus II subtended by a small, nude seta; on tarsus I by a small stellate seta. Tarsal claws rayed basally. Empodium strap-like, ciliated, not as long as claws.

Nymphs: Fourteen immatures were seen. Similar to adults in general appearance and chaetotaxy but smaller in size with genitalia not as well developed. Not all specimens were in proper condition to verify all details but those that could be studied had only 3 setae on each genital flap and lacked internal setae. Two pairs of genital suckers visible on most nymphs. Epirostrum reduced to the middle lobe.

Larvae: Two larvae were found in the collection. They were of course smaller than the nymphs and showed no trace of genitalia. As in the other instars the femora were undivided.

Holotype (BISHOP 3419), Observation Hill, Site #1, Ross I., 29. I. 1963, C. Fearon.

VICTORIA LAND: 4 ♀♀, 2 nymphs, Kukri Hills, N. Facing slope, 1000 m, base of Glacier, Taylor Dry Valley, 23. XII. 1959, R. E. Leech; 1 ♂, 3 ♀♀, Marble Point, Air Temp. 28° F., 13. XII. 1959, R. E. Leech; 3 ♂♂, 4 ♀♀, Marble Point, under rocks, 29. XII. 1959, J. L. Gressitt; 1 ♀, 2 nymphs, Marble Point, under stones, 12. XI. 1959 & 21. II. 1960, C. W. O'Brien; 1 ♀, Mt. Gran Area, N. slope of Camp Plateau, 17 & 22. XII. 1960, K. A. J. Wise; 1 ♀, Mt. Gran Area, S. ridge above Camp Plateau, 12. I. 1962, Wise; 1 ♀, Cape Adare (71° S. Lat.), under stones, 13. I-4. II. 1961, C. Bailey; 1 nymph, Mt. Discovery, moraine, 4. II. 1960, Gressitt (BISHOP); 2 ♀♀, largest of Dailey Is., 3 m, W. Coast and 60 m NW slope, McMurdo Sound, 14. XII. 1961, Wise. ROSS ISLAND: 1 ♀, Observation Hill (Valley NW), McMurdo Sound, 30. XI. 1959, R. E. Leech; 7 ♂♂, 2 ♀♀, S. slope Observation Hill, McMurdo, under rocks around snow melts, 30. XI. 1959, O'Brien; 2 ♂♂, Cape Crozier, hill N. of camp, 17. XII. 1961, Wise, under stones nr. Adelie Rookery; 2 ♂♂, Cape Crozier, 10. XII. 1959, R. E. Leech, under damp stone; 1 ♀, Cape Crozier, 9. X. 1959, R. E. Leech, under damp stones; 1 nymph, Cape Bird, 27. I. 1959, E. B. Fitzgerald, in moss; 1 ♂, 3 ♀♀, 3 nymphs, Cape Royds, 29. I. 1960, Gressitt, rocks with lichens; 1 nymph, Cape Barne, 30. I. 1960, Gressitt, rocks with lichens; 1 ♀, Observation Hill, 10. I. 1961, Wise, under stones (BISHOP).

The following, collected in the antarctic summer of 1962-1963, were not seen by Womersley.

VICTORIA LAND: 1 ♀, 2 ♂♂, Marble Point, 3. XI. 1962, C. Fearon; 1 ♀, 2 nymphs, Lake Rivard, 1. XII. 1962, Fearon; 2 ♀♀, 2 ♂♂, 1 nymph, Buddha Lake, 22. XII. 1962, Fearon; 2 ♂♂, Ricky Glacier, 1. XI. 1962, Fearon; 1 ♂, Walcott Base, 12. I. 1963, Fearon (BISHOP). ROSS ISLAND: 2 ♀♀, 4 ♂♂, 4 nymphs, 2 larvae, Observation Hill, McMurdo, 29. XII. 1962, Fearon; 2 nymphs, Observation Hill, 29. I. 1963, Gressitt; 3 ♂♂, Observation Hill, NE, 29. XII. 1962, Fearon; 6 ♀♀, 3 ♂♂, 2 nymphs, Observation Hill, Site #1, 29. I. 1963, Fearon & Gressitt; 4 ♀♀, 3 ♂♂, 1 nymph, Cape Evans, 30. I. 1963, Gressitt (BISHOP).

Remarks: Figs. 4-6 were completed by Womersley except for inking. I inked the

drawings and added Figs. 7-8.

Professor Womersley had given no name to this mite, but in correspondence indicated that he considered it to be a new species of *Protereunetes* of the family Eupodidae. I had at first also considered it to be a *Protereunetes* but for the reasons stated below, have concluded it has more affinities with the Penthalodidae than the Eupodidae.

Close study reveals some sclerotization and the shape and position of the epivertex is completely unlike that of the Eupodidae. The epiprostrum, though poorly developed, is distinctly present. The arrangement and number of dorsal setae and of the paranal setae further argue in favor of the Penthalodidae.

This species may be differentiated from other forms of the genus by the undivided femora and the greatly reduced sclerotization.

Nymphs were found as early as 1 December and as late as 21 February. Two larvae are recorded for 29 December. Two nymphs were in a premolt stage, the new instar fully formed within the old, on 11 January.

About 1/3 of the ♀♀ were ovigerous but never with more than 1 egg.

Stereotydeus villosus (Trouessart) Figs. 9-16.

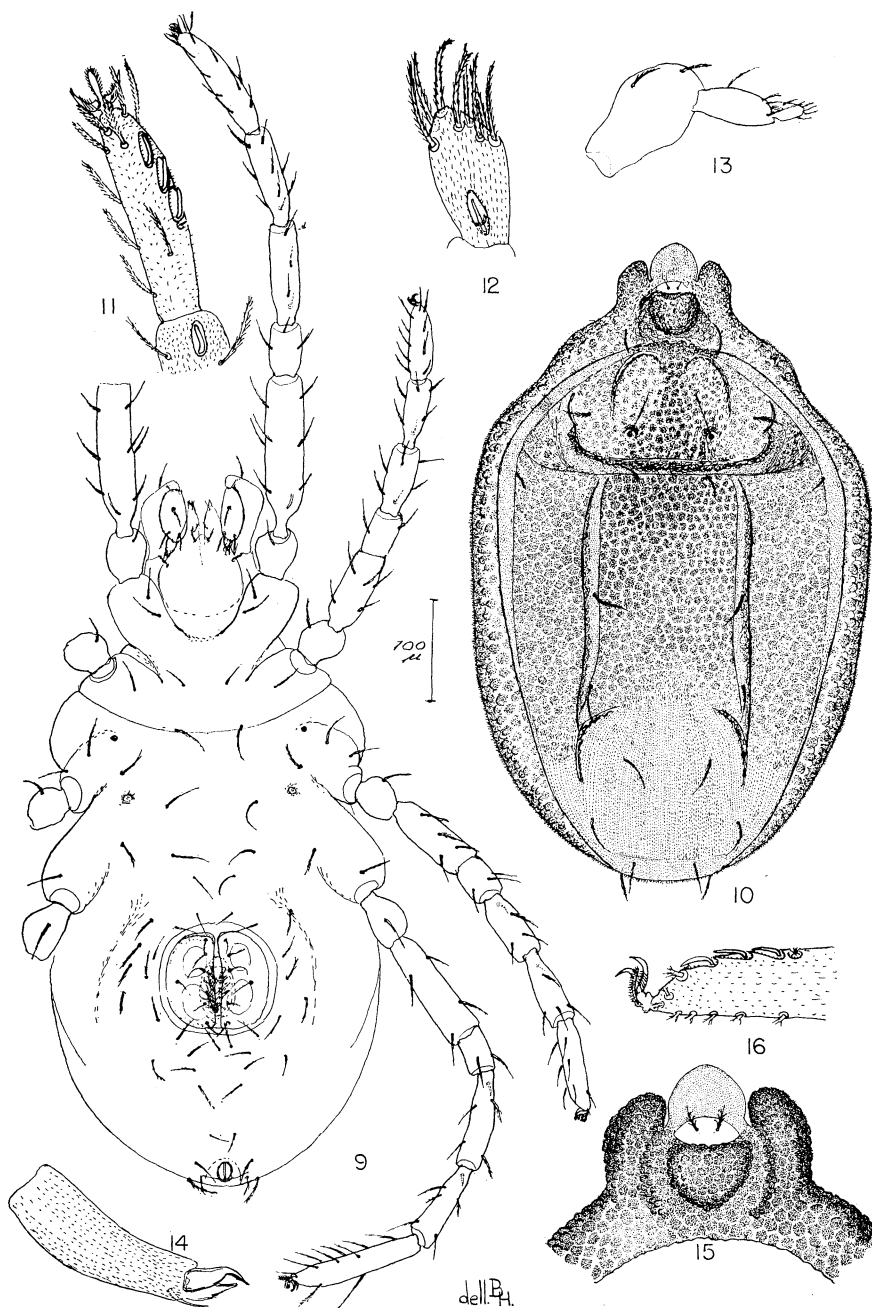
Penthaleus villosus Trst., 1902: 227.

Tectopenthalodes villosus, Tragardh, 1907: 18.

Penthalodes villosus, Trouessart, 1912: 86.

Stereotydeus (Tectopenthalodes) villosus, Berlese, 1917: 8.

A medium-sized, long-legged mite. Average length, from tip of epiprostrum, 630 μ . Dorsal side (fig. 10) well sclerotized, with characteristic lines, folds, and polygonal markings. Epiprostrum prominent and 3-lobed; center lobe smooth, outer 2 papillated. Sensillae very slender and sparingly feathered. Inner and outer propodosomal setae plumose and shorter than sensillae. A lens-like structure, probably an eye, can be seen just laterad of the outer seta. *Ventral side* (fig. 9): Epimera in 2 groups with a distinct suture between them. A prominent pit between epimera III and IV and a smaller, less prominent pit at base of coxa III. All ventral setae tapered and finely plumose, arrangement and numbers as shown. Genitalia medial, covered by 2 convex flaps, each with 6 setae, one of which (the 4th) is distinctly more laterad than the others. Ten to 11 pairs of setae surround the genitalia. Excretory pore small, ventroapical, covered by 2 flaps, surrounded by 3 pairs of setae. *Gnathosoma*: Rostrum divided apically almost 1/2 its length; each 1/2 with 3 small and closely plumose setae. Chelicerae (fig. 14) relatively slender and pubescent; movable finger longer than immovable and with a faint barb subapically; a nude dorsal seta at base of fixed digit. Pedipalp (fig. 13) consists of 4 movable segments, the 3 terminal segments bearing plumose setae. Segment 2, large, globose, with 2 dorsal setae; segment 3 more linear, about 1/2 as long and 1/2 as thick as 2nd and bears 3 setae; segment 4 about 2 \times as long as wide, 1/2 as long as 3, with 8 setae clustered apically, and a small rhagidiform organ on inner side near base (fig. 12). *Legs* slender; leg I same length as body; leg IV a bit longer; legs II and III shorter; all femora divided at about apical 4th; all tibiae and genua with a solenidium dorsally near base (indicated by dotted lines in fig. 9). Tarsus I (fig. 16) with 3 rhagidiform organs, each separated from the other and slightly oblique to the long axis of the leg. A small stellate seta basad of proximal



Figs. 9-16. *Stereotydeus villosus* (Trouessart). 9, ventral view of adult; 10, dorsal view of adult; 11, dorsolateral view of tarsus II and tip of tibia II; 12, terminal segment of pedipalp; 13 lateral view of terminal 3 segments of pedipalp; 14, chelicera; 15, epirostrum; 16, lateral view of tarsus I.

rhagidiform organ. Tibia I with 1 or 2 small rhagidiform organs at dorsal apex, similar to that of tibia II (fig. 11). Tarsus II with 3 rhagidiform organs with a simple seta at base of the most proximal (fig. 11). Tibia II with a single rhagidiform at dorsal apex. A small, solenidium, may sometimes be found at dorsal apex of genu I. Probably this is present on all specimens but it is difficult to find. All claws rayed on basal 1/2 (the apical 1/2 being bare and smooth). Empodium, strap-like, closely ciliated, not as long as claws.

DISTRIBUTION: South Shetland Islands, Antarctic Peninsula.

SPECIMENS EXAMINED. SOUTH SHETLAND IS.: 4, Gonzales I., Greenwich I., 26. XII. 1960; 8, Base Arturo Prat, Greenwich I., 26. XII. 1960; 24, Base. P. A. Cerda, Deception I., 18. I. 1961; 25, W. side entrance to Deception I., 20. I. 1961; 7, Livingston I., 62°42' S: 60°26' W., 22. I. 1961; 2, Chilean Base, Deception I., 4. II. 1961; 4, 200 m, W. Neptune, 63° S. by 60°35' W., 45 m alt., Deception I., 9. III. 1960; 5, Penguin I., 62°06' S by 57°56' W., 11. III. 1960, under stones and grass roots; 19, English Base at Admiralty Bay, 17. III. 1961 (BISHOP). ANTARCTIC PEN.: 5, Gonzales Videla Base, 150 m, 4. I. 1961. All collected by R. E. and T. S. Leech (BISHOP).

Remarks: The illustrations of this mite were prepared by Miss Brenda K. Hubbard, Technical Assistant in Acarology at the South Australian Museum; except figs. 11, 12, and 16, which I added.

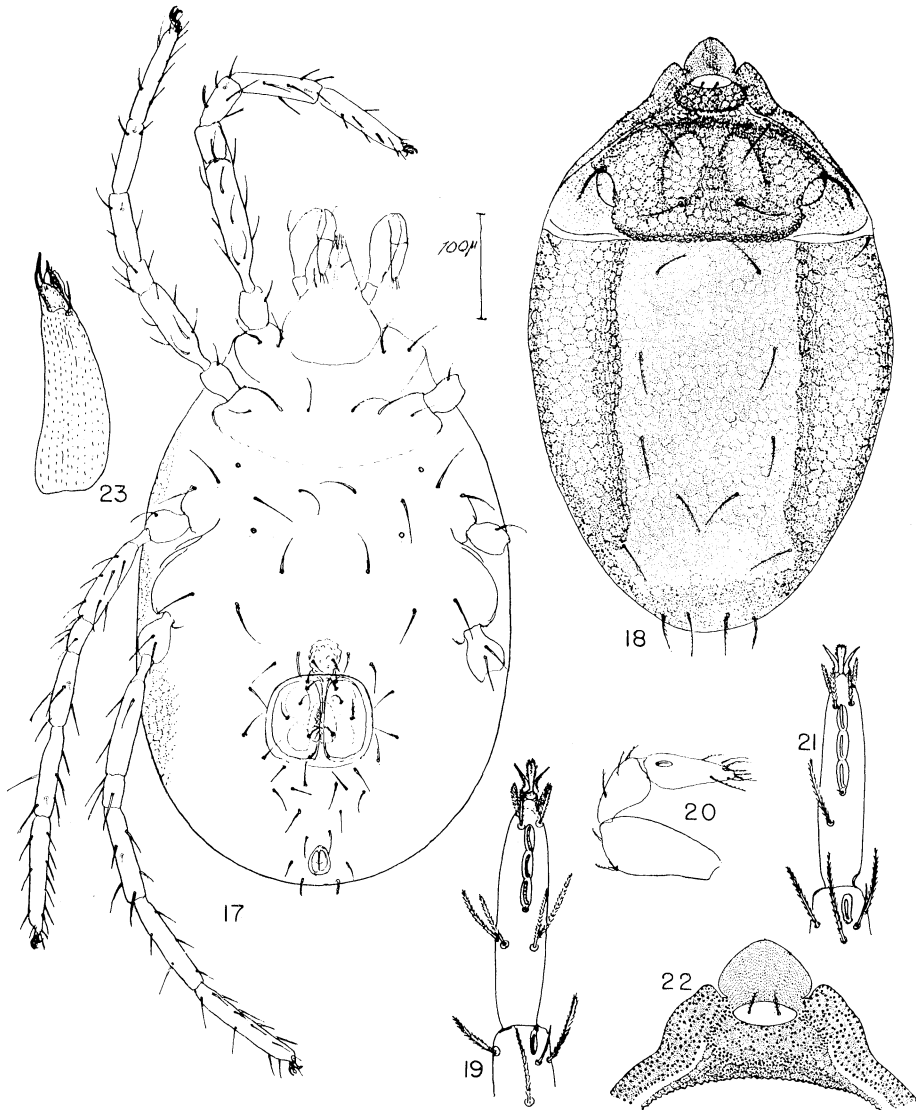
T. villosus was first reported from the Antarctic by Trouessart in 1902. It has subsequently been reported from the Antarctic by Trouessart (1903), Tragardh (1907), and Berlese (1917). The records here reported are apparently the first since 1917. Although a fairly common species, according to recent collectors, no immature stages were represented in the material studied.

***Stereotydeus belli* (Trouessart), n. comb.** Figs. 17-23.

Penthaleus belli Trouessart, 1902: 225.

Chromotydaeus belli, Thor and Willmann, 1941: 66.

Slender legged, lightly sclerotized, eyes evident, terminal segment of pedipalp longer than subterminal. Average length, 560 μ . *Ventral side* (fig. 17): Epimera in 2 groups, poorly developed, separated by a weak transverse furrow. All ventral setae slightly plumose; number and arrangement as shown. Two small pits each side near bases of coxae III and IV. Genital flaps convex, obscurely rectangular and each with 6 setae, 5 near the lip, one much more laterad and medial. As in *villosus*, the genitalia is in a camerostome. An internal sperm sac may be seen in some specimens. Excretory pore subterminal, small, surrounded by 6 setae. Sides of venter obscurely marked with polygonal areas. *Dorsal side* (fig. 18): Epirostral shield about 1/2 as large as in *villosus*, not as strongly trilobed. Epivertex small, smooth, with 2 small, plumed setae. Sensillae very slender, weakly ciliated, and reaching only about halfway to lateral setae. Inner and outer propodosomal setae equal and plumose, the outer are at the anterior margin of the well-formed eyes. Eyes apparently ciliated. Hysterosoma with 8 pairs of setae as shown. Dorsal setae plumose. Propodosomal area, between eyes and from base of epivertex to propodosomal suture more strongly sclerotized than the rest of dorsum and much more so than indicated in the drawing. *Gnathasoma*: Rostrum roughly triangular with 2 or 3 pairs of setae. Chelicera (fig. 23) relatively narrow, pubescent; movable arm smooth, longer than fixed arm. A nude



Figs. 17-23. *Stereotydeus belli* (Trst.). 17, ventral view of ♂; 18, dorsal view of adult; 19, tarsus I and apex of tibia I, dorsal view; 20, lateral view of terminal 3 joints of pedipalp; 21, tarsus II and tip of tibia II, dorsal view; 22, epirostrum; 23, chelicera.

seta, about $1/2$ as long as fixed digit, on the dorsal side at the base of the fixed digit. Pedipalps (fig. 20). Terminal segment tapers from base to apex, longer than subterminal segment, $2/3$ as long as segment 2. Segment 2 with 2 setae, 3rd with 3, 4th with 8, plus a small rhagidiform basally on inner side. All setae plumose. Legs slender; legs I and IV longest but not as long as body, Solenidia: dorsally at apex of tibiae and genua I and II, at apex of tibia III, medially on genua III and IV (indicated by dotted lines on fig. 17). Tar-

sus I with 3 rhagidiform organs in a continuous field, subtended by a stellate seta. One rhagidiform organ at apex of tibia I (fig. 19). Tarsus II with a similar rhagidial field subtended by a small, erect, nude seta. Tibia II with a rhagidiform organ at dorsal apex (fig. 21). Leg setae plumose, those at tips of tarsi rather brush-like. Number of setae per segment of each leg, beginning with the trochanter and proceeding distally are: Leg I; 1, 24, 13, 8, 21. Leg II; 1, 18, 7, 8, 17. Leg III; 1, 14, 5, 8, 16. Leg IV; 2, 10, 6, 9, 15. Claws rayed basally. Empodium strap-like, ciliated ventrally, not as long as claws.

DISTRIBUTION: Victoria Land (Antarctica).

SPECIMENS EXAMINED. VICTORIA LAND: 1, SW Coast of Edisto Islet, 10 km from Hallett Station, 7. XI. 1960, K. A. J. Wise, under scree slope; 2, Hallett Station, 13. XI. 1960, Wise, under stones, skua rookery; 3, Cape Hallett, 30. XI. 1959, Brian Reid; 4, Cape Hallett, 1-3. XII. 1959, Reid; 8, Cape Hallett, Hallett Station, 5. II. 1960, C. W. O'Brien, under stones on beach; 4, Cape Adare (71° S. Lat.), 23. I. 1961, C. A. Bailey, on cliff top in vicinity of Skua nests, amongst mossy growths; 1, Cape Adare, 13. I-4. II. 1961, Bailey, under rocks (BISHOP).

Remarks: Figures 17, 18, 20, and 22 were prepared by Miss Brenda K. Hubbard of the South Australian Museum. Figures 19, 21, and 23 were added by me.

Dr. Womersley had labeled the plate *Stereotydeus fallai* sp. nov. but had crossed out the *fallai* and replaced it with *belli* (Trst.). Since these mites were collected at the type locality and do not disagree with the rather brief characterization given by Trouessart, the appellation *belli* is very likely correct. Although our specimens average smaller, the range falls within the size given by Trouessart. Thor and Willman (1941) placed the mite in *Chromotydaeus* Berlese, 1903, a genus that some have considered a synonym of *Penthalodes* (vide Vitzthum, 1941; Baker, 1946; Baker and Wharton, 1952). However this poses no conflict because *belli* had been so poorly characterized that evaluation of its affinities in the absence of specimens was purely conjectural.

Family RHAGIDIIDAE Oudemans, 1922

Genus *Rhagidia* Thorell, 1871

Large, elongate, long-legged, nonsclerotized mites. Propodosoma prominently delineated from hysterosoma; pseudostigmatic organs thread-like and weakly hirsute; leg and body setae feathered; eyes generally present although a lens may be lacking. Chelicerae large, with large, strong, well formed chelae. Occurs under moss, stones, forest debris, etc. throughout the world. Also commonly found in caves.

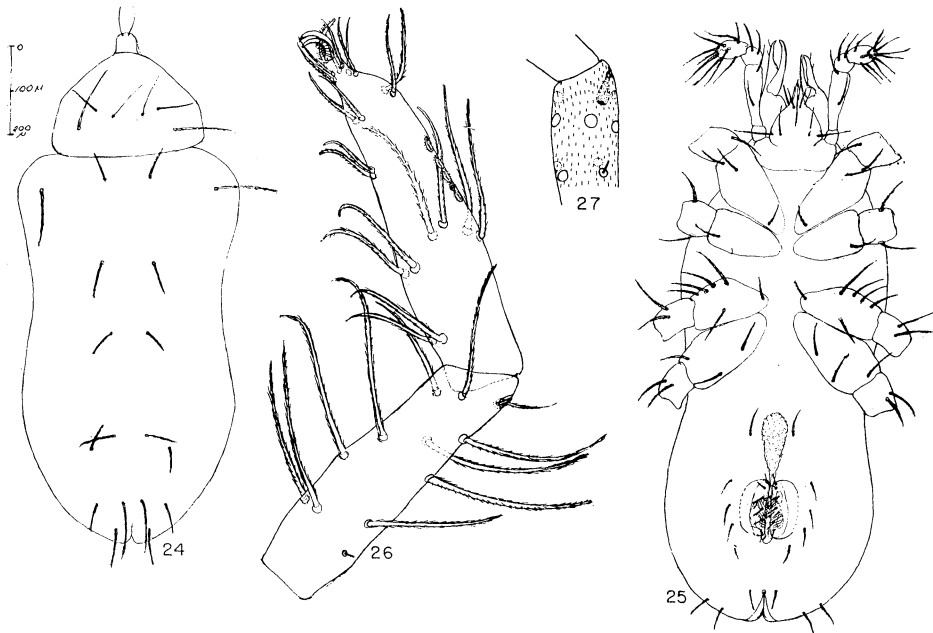
Rhagidia gerlachei Trouessart Figs. 24-33.

Rhagidia gigas var. *Gerlachei* Trst., 1903.

Rhagidia Racovitzai Tragardh, 1907.

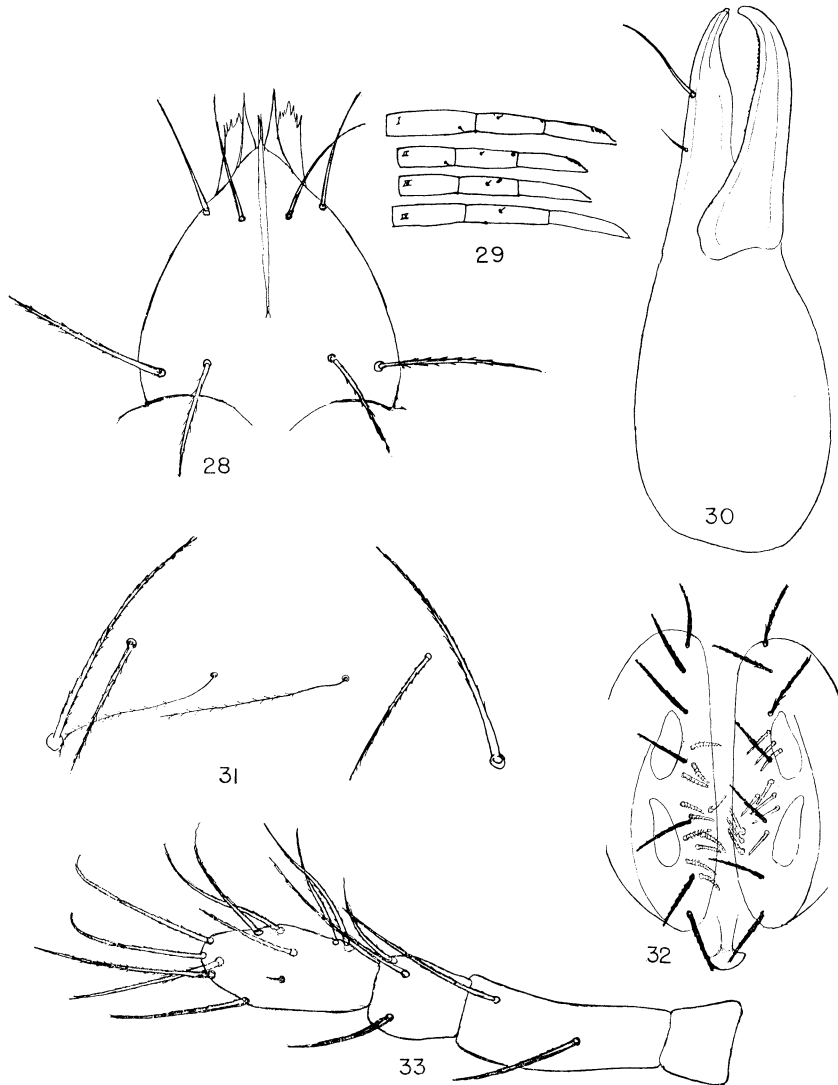
Rhagidia gerlachei, Berlese, 1917: 2.

Length of body about 1400 μ , varying from 1250-1550. Body about 2.5 \times as long as wide. Legs slender but shorter than body. Tarsal claws simple, without accessory clawlets. *Ventral side* (fig. 25): Epimera distinct, large, in 2 groups; from 1st to 4th the number of setae are 3, 1, 6, 3. Genitalia medially placed, the 2 flaps kidney-shaped and bearing 6 to 7 plumose setae (fig. 32). Beneath the flaps are 2 pairs of genital suckers and 9-11



Figs. 24-27. *Rhagidia gerlachei* Trst. 24, dorsal view of adult; 25, ventral view of ♂; 26, lateral view of tibia and tarsus I; 27, lateral view of apical portion of tibia II.

plumose setae. An internal sac extends forward from the genitalia in some specimens. Figure 25 shows one pair of setae about midway between coxae IV and the genitalia, but it is not usually so far forward. Excretory pore terminal, large, with 3 setae on each side. *Dorsal side* (fig. 24): Propodosoma with 3 pairs of setae as shown. Sensillae very fine, lightly ciliated and reach or surpass base of posterolateral propodosomal setae (fig. 31). Eyes not visible. Hysterosoma with 9 pairs of setae as shown. Scapulars and medial subterminal setae longer than other dorsals. *Gnathosoma*: Rostrum (fig. 28) with strongly convex sides terminating in transparent projections about as shown. The 4 apical setae equal and nude, the outer pair a bit more apical than the inner pair. The 4 basal setae lightly plumose, in a transverse row, and inner pair noticeably shorter than outer pair. Chelate portion of chelicera comprises nearly 1/2 the total length. Fixed digit (fig. 30) with 2 dorsal setae, the apical about 3× as long as basal. Inner margin of movable digit finely and closely serrated. Pedipalp as shown (fig. 33); all setae lightly plumose. The nude dorsal spinule on the apical segment is easily overlooked. Number of setae on segments are, from 2nd to 4th; 2, 3, 10. *Legs* slender, with a moderate number of long, closely plumose setae. Legs I and IV are longest, leg I not quite as long as body. Claws rayed basally. Empodium a narrow, reflexed, pubescent pad somewhat longer than claws (fig. 26). No accessory claws. Chaetotaxy of legs: Fig. 25 and 26 indicate rather accurately the size and number of setae per segment; trochanter I with 1 seta, all others with 2; femora, genua and tibiae with 9-11 setae each; tarsi with 16-18. Very small solenidia located as follows: inner side apically on genua I and II and on outer dorsal side of all tibiae (fig. 29). Tarsus I with 4 obliquely placed rhagidial organs with a stellate seta



Figs. 28-33. *Rhagidia gerlachei* Trst. 28, ventral view of rostrum; 29, silhouettes of apical 3 segments of legs I-IV showing positions of the solenidia; 30, chelicera; 31, propodosomal setae and sensillae; 32, genitalia of ♀; 33, pedipalp.

between the basal 2. Tarsus II with 3 rhagidial organs subtended by a nude seta. In addition, rhagidial organ situated at apex of tibia I and 1 on about the middle of tibia III. Peculiar bottle-shaped cavity at apex of tibia II (fig. 27). Femora of all legs partially divided at approximately middle.

Nymph: Among the specimens available for study was 1 nymph, collected 26 December on Isle de la Fuente, Shetland Islands. The general body chaetotaxy, and the chaetotaxy of the legs were similar to that of the adults. It was smaller in size, had fewer genital

setae and lacked the internal genitalia.

DISTRIBUTION: Antarctica (South Shetland Is., Antarctic Peninsula).

SPECIMENS EXAMINED. SOUTH SHETLAND IS.: 1, just E of entrance to Deception I., 20. I. 1961, T. S. & R. E. Leech; 2 ♂♂, 2 ♀♀, just W of entrance to Deception I., 20. I. 1961, Leech & Leech; 2 ♂♂, 1 ♀, British Base, Deception I., 17. I. 1961, Leech & Leech; 1 ♂, 2 ♀♀, 1 nymph, Greenwich I., Isla de la Fuente, 26. XII. 1960, R. E. Leech; 1 ♂, Livingston I., 62°42' S. by 60°26' W., 22. I. 1961, Leech & Leech (BISHOP). ANTARCTIC PEN.: 1 ♂, 1 ♀, Gonzales Videla Base, 150 m, 4. I. 1961, Leech & Leech (BISHOP).

Remarks: Except for figs. 27 and 29, which are mine, all the drawings of this species here presented are Womersley's. For a further discussion of the taxonomy, see the remarks under *R. leechi*.

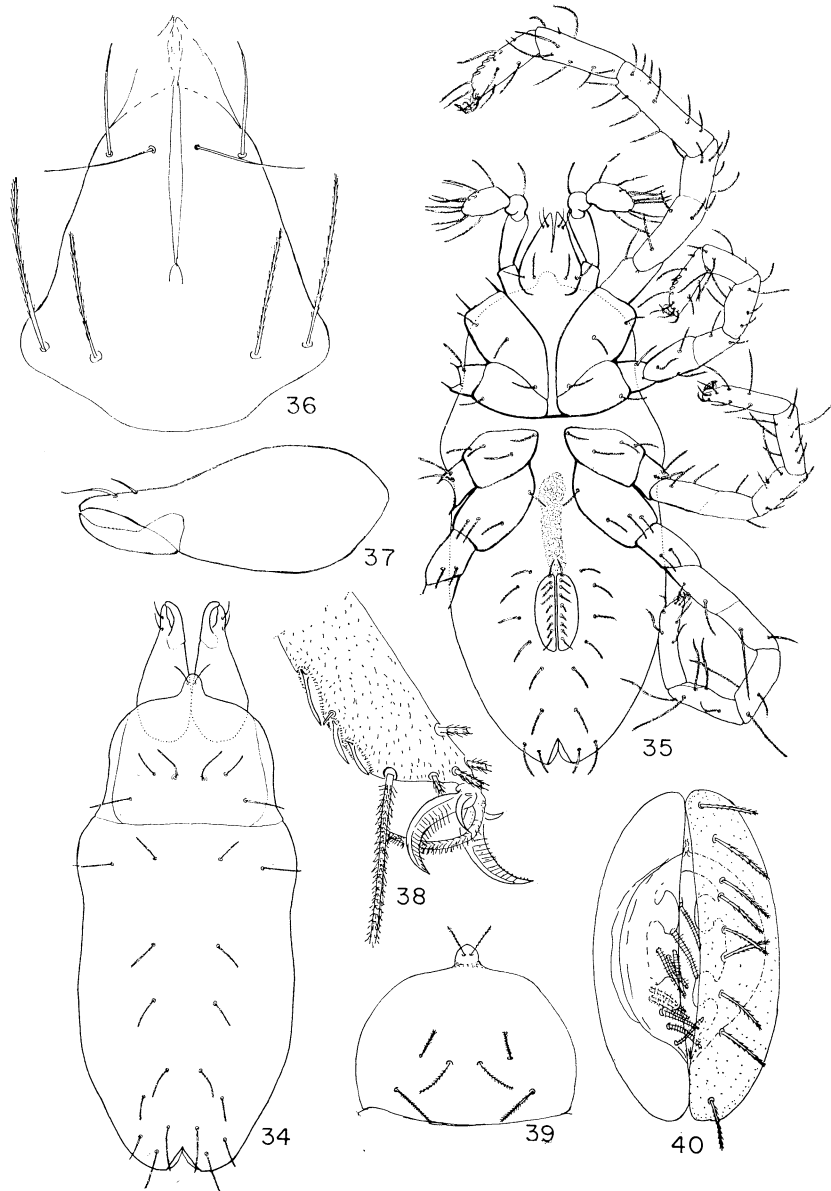
Rhagidia leechi Strandtmann, n. sp. Figs. 34–40.

Average size about 1350 μ , varying from 1240–1600. Superficially very similar to *gerlachei* but with slight but consistent variations. Rostrum (fig. 36) triangular with basal angles roundly produced. Chelate portion of chelicera only 1/3 the total length of chelicera (fig. 37). Genitalia (fig. 40) larger, genital flaps more elongated and with 9–10 plumose setae. Sensillae of prodosoma (fig. 39), a bit shorter, not quite reaching posterior propodosomal setae. They are also a bit more robust than in *gerlachei* but this is a relative and subtle character. Coxa (or epimeron) III with only 4 setae (instead of 6 as in *gerlachei*). On tarsus II (fig. 38) the small erect seta associated with the rhagidial organs is between the 2 proximal organs; in *gerlachei* it is at the base of the proximal organ. All the tarsal claws have small accessory basal clawlets (fig. 38). **Ventral side** (fig. 35): Epimera large, well defined, in 2 rather closely associated groups, the anterior group nearly meeting on midventral line. Number of setae on coxae are 3, 1, 4, 3 or 4 (number of setae on coxae IV being variable, some specimens had 3 setae on 1 coxa and 4 on the other, some had 4 on both coxae and some had 3 on both coxae). Number of setae on trochanters are: 1, 1, 2, and 2 or 3 (the number varying on trochanter IV between 2 and 3). As in *gerlachei*, all femora are partially divided at about the middle. Leg chaetotaxy: setae long, fine, closely ciliated, and abundant; the number per segment is about 50% greater than in *gerlachei*. Solenidia as follows: ventroapically on genua I and II and medioventrally on genu III; dorsoapically on tibiae I, II, III and mediolateral on tibia III; dorsoapically on the basal 1/3 of tarsus I and II. Rhagidial organs: 4 obliquely on tarsus I, 3 obliquely on tarsus II, and 1 dorsoapically on tibiae I and II. Leg IV with neither solenidia nor rhagidial organs.

Immatures: There were 3 immatures; in general like the adult but smaller, the setae a bit shorter, the genitalia not as well developed, having only 5 pairs of external setae and no internal structures.

Holotype ♀ (BISHOP 3425), Livingstone I., South Shetland Is., 62°42' S. by 60°26' W., 22. I. 1961, R. E. & T. S. Leech.

SOUTH SHETLAND IS.: 2 ♀♀, just E of entrance, Deception I., 20. I. 1961; 1 ♂, 2 ♀♀, 1 nymph, just W of entrance, Deception I., 20. I. 1961; 5 ♀♀, Chilean Base, Deception I., 4. XI. 1961; 1 ♂, 1 ♀, British Base, Deception I., 17. I. 1961; 1 ♀ (+24 ruined in mounting), Base P. A. Cerda, Deception I., 18. I. 1961; 2 ♂♂, 2 ♀♀, Gonzales I. (Isla



Figs. 34-40. *Rhagidia leechi* Strandtmann, n. sp. 34, dorsum of adult; 35, ventral view of ♂; 36, ventral view of rostrum; 37, chelicera; 38, apical 1/2 of tarsus II (not all the setae are shown, and those that are, are only partially shown); 39, dorsal view of epivertex and propodosoma; 40, genitalia of ♀.

de la Fuente), Greenwich I., 26. XII. 1960; 2 ♂♂, 1 ♀, 1 nymph, Livingston I., 62°42' S. by 60°26' W., 22. I. 1961; all collected by T. S. Leech & R. E. Leech (BISHOP). ANTARCTIC PEN.: 1 nymph, S. side of glacier on W. shore Edisto inlet, 8 km, WSW Hallett Station,

3. XI, Wise, under stones on moraine (BISHOP).

Remarks: I confess that I am not sure I know how to distinguish the sexes of rhagidiid mites. Hence it is possible that what I have described as 2 species may be opposite sexes of the same species. Thirty-one of the 41 slides before me had been studied by Womersley and all 31 were determined by him as *Rhagidia gerlachei*. Nineteen of those 31 were what I am calling *R. leechi*. I do not know whether Professor Womersley knew that he had 2 distinct forms. In a letter to Bishop Museum dated 27/6/62 he wrote, "I have now completed most of the drawings in detail and hope to have the ms. completed in a week or two, health permitting. Hitherto *gerlachei* has only been figured for the mandible and claws of tarsi I. I am giving full figures including the ♂ genitalia."

Apparently Dr. Womersley left no further notes and had not started on the ms. It could be that he had completed only the illustrations of what he considered to be the ♂ and considered the other form to be the ♀ but had not gotten around to illustrating it. It is difficult for me to believe that Womersley did not see that there were 2 distinct forms, which argues that he considered the 2 forms to be ♂ and ♀ of the same species. This is how I had at first fully intended to treat them but was persuaded to a different concept primarily because an internal "sperm sac" was found in individuals of both types. Thor and Willmann (1941: 95) in discussing the characteristics of the Rhagidiidae state, "Innerhalb der Genitalöffnung sind mehrere Zipfel mit gefiederten Haaren vorhanden, und in Männchen kommen Samenbläschen zum Vorschein." If these internal sacs truly denote a ♂ then there can be no doubt that there are 2 species because some individuals of both types had the structures. Verifying ♀♀ by the presence of eggs was unfortunately complicated by the fact that many individuals contained spore cysts of a protozoal parasite. These are egg-like in appearance and in my abysmal ignorance of the biology of this group of mites, I was never quite certain when a mite contained a large, egg-like body, whether it was a cyst or an egg.

Now that it has been explained why 2 species are recognized, it remains to be explained why one of them is dubbed with Trouessart's name, *R. gerlachei*. The only *Rhagidia* reported from the Antarctic is *Rhagidia gigas* var. *gerlachei* Trst., first reported by Trouessart (1903), subsequently by Tragardh (1907) and by Berlese (1917). None of these authors at any time gave an adequate description of the mite so the use of the name here is purely on geographic grounds or if Womersley had any other basis, he failed to make it known. Thor and Willmann (1941) gave an illustration of the tarsal claws and as they showed no accessory claws, the name *gerlachei* is logically applied to the form illustrated by Womersley in the present paper.

That *R. leechi* is a previously undescribed species is at least partly conjectural. It does not fit any of the species listed by Thor and Willmann (1941) or described subsequently, but many of the earlier described species were so poorly characterized that their identity remains obscure.

Figs. 34 and 35 were done by Miss Sharon Shannon, scientific illustrator at Bishop Museum. The remainder of the figures are mine. The mite is named for the brothers, R. E. and T. S. Leech, who collected most of these mites.

***Rhagidia macquariensis* Womersley and Strandtmann, n. sp.** Figs. 41-47.

A medium large mite, averaging 1000 μ long. Body shape typical for the genus.



Figs. 41-47. *Rhagidia macquariensis* Wom. & Str., n. sp. 41, dorsal view of adult; 42, ventral view of adult; 43, chelicera; 44, pedipalp; 45, propodosomal setae and sensillae; 46, ventral view of rostrum; 47, lateral view of tibia and tarsus I.

Chelate portion of chelicera very large, almost $1/2$ as long as the total length of chelicera. Fixed digit with a prominent tooth subapically. Movable digit apparently smooth. *Ventral side* (fig. 42): All ventral setae subequal, of moderate length, and finely plumose. Setae on epimera I-IV; 3-1-6-3. Epimera in 2 groups that nearly join on the mid ventral line. Genital flaps kidney-shaped, with 6 setae. Internally, 2 pairs of genital suckers and a number of plumose setae on papillae. Two rows of 5-6 setae bracket the genitalia. *Dorsal side* (fig. 41): Propodosoma with the usual 6 setae. Sensillae very fine, lightly ciliated

and extending beyond base of posterolateral setae. Hysterosoma with the usual 8 pairs of setae. The scapulars are the longest dorsal setae. Most posterior inner dorsals not as long as the most posterior outer pair. Epivertex usual, setae lightly plumose. *Gnathosoma* (figs. 43, 46): The 4 anterior setae of rostrum equal, smooth, the inner pair a bit more anterior than the outer pair. Posterior setae plumose, the inner pair a bit more anterior than the outer pair. Posterior setae plumose, the inner pair shorter than the outer. Pedipalps about as shown (fig. 44); terminal segment with 9–10 setae and generally longer than figure depicted by Womersley. In all specimens available for study, the pedipalps were curled inward so that no good side view was obtained. If a nude seta was present, it was not found. *Legs*: moderately long and slender; leg I as long as body; all femora divided approximately at middle; tarsal claws weakly rasped on inner side, angulate at base but without accessory clawlets; empodium narrow, hairy, reflexed, as long as claws. Chaetotaxy of legs: finely plumose, moderately long and moderately abundant. Tarsus I with 4 rhagidial organs obliquely placed and with a small stellate seta between the basal 2. Tibia I with 2 small, oblique rhagidiform organs at anterodorsal apex (fig. 47). Tarsus II with 3 rhagidiform organs and a spinule at base of the most proximal. I could find no other rhagidiforms or solenidia.

Immatures: At least 2 nymphal stages were available. They were similar to the adult in shape and relative proportions of the chelicera. One nymph was approximately 500 μ long and had only 1 pair of genital setae. Another was approximately 700 μ long and had 5 pairs of genital setae. The latter mite also had only 5 setae on epimeron III.

Designated as holotype (ANIC) is an adult collected on Macquarie I., Base Camp, 2 m, 5. XII. 1960, J. Linsley Gressitt, from Tussock roots, via Berlese funnel. Paratypes: 2, same data as holotype; 3, N. end, W. beach, 10. XII. 1960, ex *Colobanthus crassifolius*; 2, Wireless Hill, 100 m, 9. XII. 1960, ex *Pleurophyllum* debris; 4, NW coast, 1–3 m, 4–10. XII. 1960, ex *Pleurophyllum* debris; all Macquarie I., collected by J. L. Gressitt.

Remarks: Although 12 specimens were before us, all but 3 were so badly damaged in the process of mounting that they were of no use for critical study. They were placed in this species because of the toothed chela and the relative paucity of leg setae.

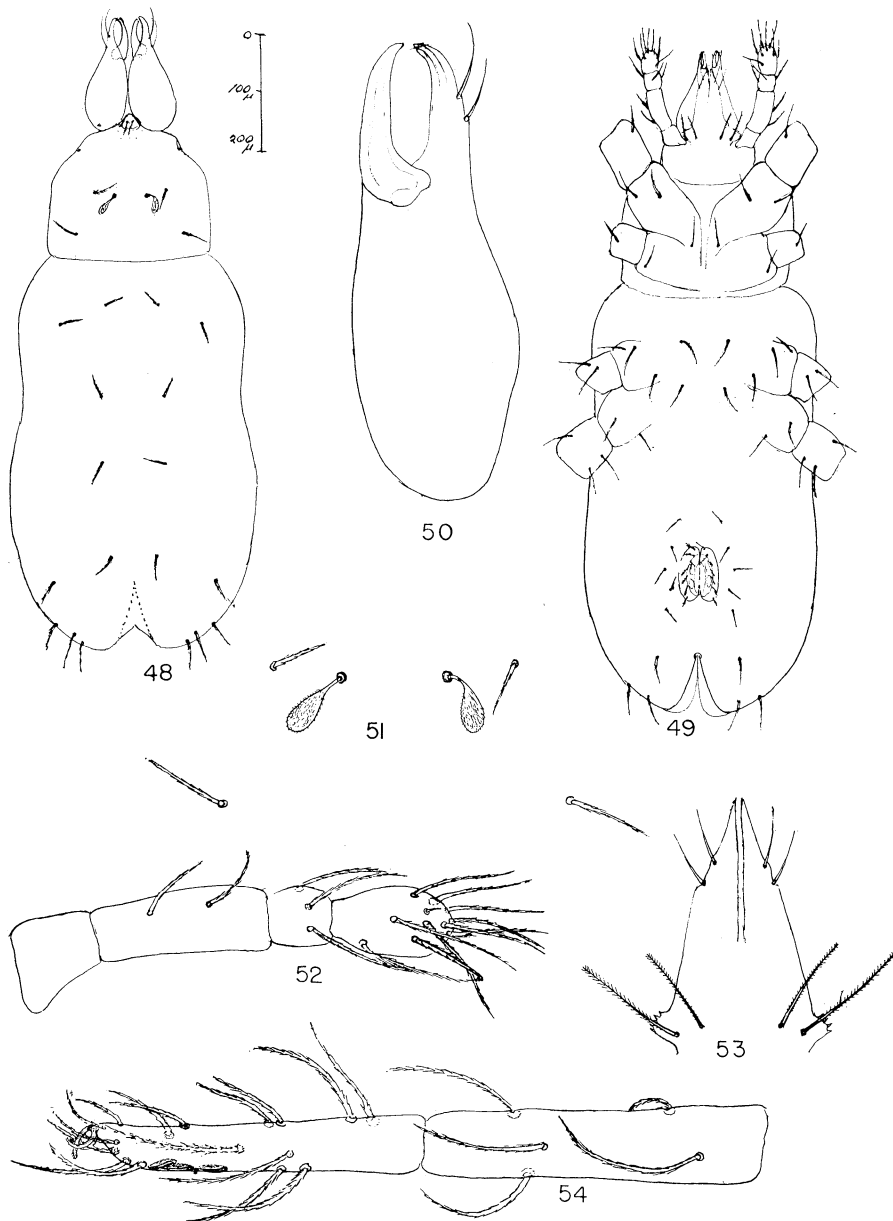
All the drawings of this mite, and the name chosen, are by Womersley. I have added only the description. The kidney-shaped body shown in figs. 34 and 35 represent a sporozoal cyst according to correspondence that was exchanged between Womersley and the Bishop Museum.

Genus *Coccorhagidia* Sig Thor, 1934

Differs from *Rhagidia* primarily in having claviform or inflated sensillae. The leg and pedipalp segments are said to be short and globular but in the species described below the segments are elongated and slender, as in *Rhagidia*. According to Thor and Willmann (1941), the genus is widely distributed in Europe.

***Coccorhagidia gressitti* Womersley and Strandtmann, n. sp.** Figs. 48–54.

Length of body, including rostrum, 1140 μ ; a little more than 2 \times as long as wide. Legs shorter than body but slender and with elongated segments. Leg I longest, 800 μ .



Figs. 48-54. *Coccorhagidia gressitti* Wom. & Str., n. sp. 48, dorsal view; 49, ventral view; 50, chelicera; 51, propodosomal setae, showing claviform sensillae; 52, pedipalp; 53, ventral view of rostrum; 54, side view of tibia and tarsus I.

Four apical setae of rostrum and 2 setae on each chela nude. All other setae ciliated with the exception of the rhagidial setae and a small spine-like setae on each pedipalp.

Ventral side (fig. 49): Epimera I and II large and nearly meeting on midline; epimera III and IV widely separated on midline. Epimeral seta, from I-IV, 3, 1, 3, 2. One pair of setae between epimera III, 1 pair between epimera IV. Genitalia bracketed by 5 setae on each side. Genital flaps kidney-shaped, each with a row of 7 setae; internally, 2 pairs of genital suckers and 10 pairs of fleshy papillae each bearing a long, plumose seta. Excretory pore large, terminal, with a triangle of setae on each side. *Dorsal side* (fig. 48): Epivertex small, roundly cone-shaped, bearing 2 fine, ciliated, setae which are a bit longer than epivertex. A pair of claviform, finely pubescent sensillae, separated by about their length medially located on propodosoma. Anterolateral to them is a pair of finely plumose setae which are about 2/3 as long as 2nd pair placed near the corners of the propodosoma. Rest of dorsum with 9 pairs of subequal setae as shown. Eyes absent as far as we could tell. Two cheliceral digits equally long, elongate, and comprising 1/3 the total length of the chelicera. Fixed digit with 2 nude setae fairly close together, the apical a bit longer (fig. 50). Rostrum (fig. 53) extends to apex of segment 3 of pedipalp; apically with 4 equal, nude setae, basally with 4 subequal finely plumose setae. The outer basal angles project and are irregularly but not prominently spined. Pedipalps (fig. 52) rather short; segment 2 longest and of uniform diameter, segment 3 globose and about as long as wide, (apical) segment 4 swollen, broadly rounded apically and about 2× as long as 3. Segment 2 with 2 setae dorsally; 3rd with 2 dorsal and 1 ventral setae, and apical segment with 10 setae and 1 small spine as shown. All leg segment slender, unlike other species of the genus which are said to have short, rounded segments. Tarsi I and II each with 3 rhagidial organs, each in a separate depression which lie obliquely on the tarsus. Small stellate seta between and a little to one side of the 2 basal rhagidial organs of tarsus I and a small nude seta similarly placed on tarsus II.

Holotype adult (BISHOP 3426), Hallett Station, 13. XI. 1960, K. A. J. Wise, under stones in a Skua rookery. Paratypes: 1, same data as holotype; 1, SW coast Edisto Islet, 6 mi. from Hallett Station, 7. XI. 1960, Wise, under stone, scree slope; 2, S. side glacier on W. shore Edisto Islet, 5 mi. WSW from Hallett Station, 3. XI. 1960, Wise, under stones on moraine; 1, Cape Adare, 13. I-4. II. 1961, C. Bailey, under rocks.

Remarks: The figures here presented were given to me complete except for the ciliations on the basal 4 setae of the rostrum. Dr. Womersley had shown them as nude and I added the ciliations, which accounts for the apparent difference in them and the body setae; they are actually identical in appearance.

In a letter to the Bishop Museum dated 27 June 1962, Dr. Womersley wrote, "... 5 specimens collected on 19/11/59 (B. Reid) in which the sensillae bases are very much closer together than the typical form. These I am describing and figuring as new under the name of *C. gressitti* sp. n. var. *reidi* nov."

I have been unable to find these specimens and so I am not including a description of the variety. Dr. Womersley had complete figures for it and there is, in truth, no difference other than the nearness of the sensillae.

The name *gressitti* was selected by Dr. Womersley. It is in honor of Dr. J. Linsley Gressitt, one of the foremost investigators of dispersal of terrestrial arthropods in the Antarctic and subantarctic.

Family PACHYGNATHIDAE Kramer, 1877

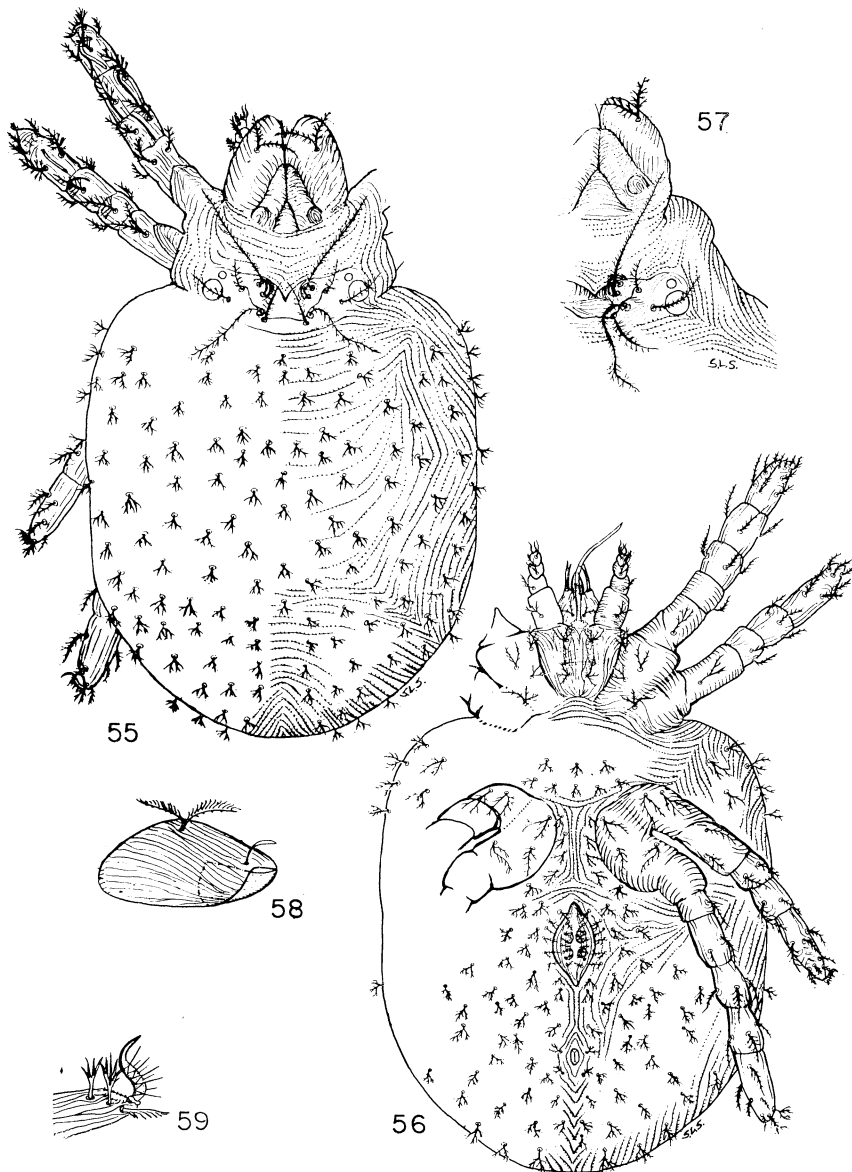
Genus *Nanorchestes* Topsent and Trouessart, 1890

Very small globular mites with a sharp demarcation between propodosoma and hysterosoma. Body setae branched, tree-like; cuticle striated, opaque and somewhat iridescent. Legs short; tarsi with only 1 claw. Chelicera large, with a branched dorsal seta. Pedipalps small. Propodosoma with 2 pairs of filiform, ciliated sensillae and 3 pairs shorter, plumose setae. The anterior sensillae based in a pit which is raised on one side and partially covers the complex sensillary base. There are actually 2 setae in the pit; the long sensilla with a short basal stalk (na), and a very short seta (nf) which leans toward the longer, making it appear as if the sensilla has 2 bases. Eyes present, 2 on each side, of unequal size. Some species said to be saltatorial.

Recorded only from Europe, including the arctic zone.

Nanorchestes antarcticus Strandtmann, n. sp. Figs. 55-59.

A small, globose, red, somewhat iridescent mite averaging $240\ \mu$ long. The hysterosoma a bit longer than wide and about as deep as wide. Uric acid crystals make the mites opaque. When cleared, the branched setae and prominent striations are readily visible. Body striations punctulate or spinulate, leg striations simple. *Ventral side* (fig. 56): all ventral setae branched; epimera in 2 groups, indistinct. Number of setae per coxa are, from I-IV, 3, 1, 2, 3. Genital lips poorly defined, longitudinally striated, and bear a row of 7 plumose setae. Beneath the lips are 2 pairs of genital suckers and 3 ($\text{\textcircled{f}}$) or 7 ($\text{\textcircled{m}}$) pairs of internal, branched setae. Excretory pore very small and about midway between genital pore and posterior tip of body. Two pairs of small branched setae on either side of excretory pore and a variable number of setae (ca 20 pairs) on rest of ventral hysterosoma. *Dorsal side* (fig. 55): propodosoma with only the setae found in the sensory area; 2 pairs of eyes, a small anterior and a larger posterior. Anterior sensillae ciliated nearly to base and separated from each other by more than the diameter of the larger eye; posterior sensillae more slender and more delicately feathered than the anterior; 3 pairs of plumose setae fairly long, from $1/3$ to $2/3$ as long as the sensillae. Characteristic, branched setae uniformly and rather sparsely scattered over hysterosoma. *Gnathosoma*: Epirostrum with a median, inverse-Y-shaped sulcus, very much like that figured for *amphibius* by Schuster (1958). Pedipalp consists of 4 movable segments which become progressively smaller from base to apex. Palp tarsus small with 3 or 4 nude, claw-like setae and 2-4 feathered setae apically; chelicerae (fig. 58) large, striated; chelae heavy, edentate, and very difficult to find. At base of fixed digit is an apically, inflated, nude seta that nearly always fits closely against the digit, making it difficult to find. Large 2-branched, plumose setae situated mid-dorsally on chelicera. The 2 maxillae on ventral side of gnathosoma each 2-tined. Between them are 2 slender, incurved, nude setae and just dorsal to these appear to be 2 small feathered setae. Arising posterior to, and passing between this complex of maxillae and setae is the long, tubular, slender and pointed "organ intermandibulaire" which joins basally with a jug-shaped body, the pharynx. Legs rather short and thick. Legs I and IV longer than II and III. Leg I a bit more than $1/3$ as long as body; leg II about $1/3$ body length. Seen among the striations are serpentine lines on tarsi I and II, tibiae I, II, and genu I. Schuster (1958) mentions the presence of a



Figs. 55-59. *Nanorchestes antarcticus* Str., n. sp. 55, dorsal view of ♂; 56, ventral view of ♂; 57, portion of the propodosoma and epirostrum; 58, chelicera; 59, tip of tarsus III showing tarsal claw.

transparent, inflated, solenidium on tarsus II. I have been unable to find this on *N. antarcticus* but both tarsus I and II have what appears to be one of the serpentine lines a bit larger and raised above the silhouette of the leg. These could be modified solenidia or perhaps modified rhagidial organs. Trochanters of all legs without setae. Femora I

and IV partially divided. Number of setae per segment, from the femur distally, are: I, 4, 6, 6, 14; II, 2, 4, 5, 10; III, 3, 3, 3, 10; IV, 3, 3, 3, 10. The single claw is 5-6 rayed each side basally.

Holotype ♀ (BISHOP 3427), Observation Hill, Site #1, Ross Island, 29. I. 1963, C. Fearon and J. L. Gressitt. Paratypes: 2 adults, Cape Royds, Ross I., 29. I. 1960, Gressitt, under rocks; 4 adults (2 containing larvae), Lake Penny, S. Victoria Land, 26. I. 1963, 78° S., 163° E., Fearon and Gressitt; 2 adults, Observation Hill, Scott Base side, Ross I., 27. I. 1963, Fearon and Gressitt; 6 adults, Cape Evans, Ross I., 30. I. 1963, Gressitt; 1 adult, Walcott Glacier, 12. I. 1963, Fearon.

Remarks: Thor and Willmann (1941) list 4 species of *Nanorchestes*, *N. amphibius* T. & T., *N. siculus* (Berl.), *N. arboriger* (Berl.), and *N. collinus* Hirst, none of which are adequately described. Grandjean (1942) rather briefly described *N. pulvinar* but gave fine details of the propodosomal and sensory area. It differs from *N. antarcticus* in having an unbranched cheliceral seta. Schuster (1958) gives good illustrations and descriptions of 2 species, *N. amphibius* Toppent and Trouessart, and *N. pseudocollinus* Schuster. *N. antarcticus* differs from both those forms in details of the gnathosoma, tarsal claws and serpentine lines on the tarsi. Of the species listed by Thor and Willmann, *N. siculus* (Berlese) has claviform sensillae. The remaining 2 species, *N. collinus* Hirst and *N. arboriger* (Berlese) are so ambiguously described that a differentiation between them and *N. antarcticus* is impossible. They are excluded from consideration for geographical reasons; *N. collinus* is reported from England, *N. arboriger* from North, South and Central Europe.

According to Grandjean (1942), ♂♂ of *Nanorchestes* have 7 pairs of internal genital setae and ♀♀ have 3 pairs. *N. pulvinar* is stated to have 3 nymphal stages and the ♀ is said to produce only 1 egg at a time.

In *N. antarcticus*, 2 ♀♀ (from Lake Penny, 78° S., 26. I. 1963) had each a fully developed larva indicating that this species at least is larviparous.

As far as I am aware, this is the first record of *Nanorchestes* from Antarctica.

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