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MORE ORIBATID MITES (Acari: Cryptostigmata) FROM CAMPBELL I.[1]

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Abstract: Descriptions and records are provided for 12 species of Cryptostigmata collected on Campbell I., mainly from the Beeman Hill area. The list comprises: *Andacarus campbellensis* n. sp. (Acaronychidae), *Neophthiracarus neotrichus* n. sp. (Phthiracaridae), *Holonothrus concavus* n. sp., *Acronothrus brevicornutus* n. sp. (Holonothridae), *Pedrocortesia ?australis* Hammer (Plateremaeidae), *Halozetes plumosus* n. sp., *H. marinus* (Lohm.) ssp. *minor* n. ssp., *H. macquariensis* (Dal.), *H. crozetensis* (Richt.) (Podacaridae), *Scheloribates flagellatus* n. sp. (Scheloribatidae), *Macrogena monodactyla* n. gen. n. sp. (Ceratozetidae) and *Totobates antarcticus* (Wallw.) n. comb. The species *Eutegaeus bostocki* (Mich.) is recorded from peat deposits.

This paper is the fourth in a continuing series devoted to the Cryptostigmata of Campbell I. and is based on collections made by Dr J. L. Gressitt of Bishop Museum. These collections are so extensive that it is not possible to deal with the various groups represented in systematic order. Instead, the collections are being described by locality, the present contribution being concerned mainly with species from the Beeman Hill area. Some representatives from this locality have been described previously (Wallwork 1964a, b & c). Type material will be deposited in the Dominion Museum, with paratypes in the Bishop Museum.

Family ACARONYCHIDAE Grandjean, 1932

Genus **Andacarus** Grandjean, 1958

A single specimen of an adult ♀ containing 2 eggs, and apparently belonging in this genus, was examined. It bears a strong resemblance to the species *A. watsoni* Travé described from Macquarie I. (Travé 1964), particularly in the possession of a fusiform sensillus, an unusual character in this genus. Undoubtedly the 2 forms are congeneric, but may be separated on the basis of differences in the length of dorsal setae. These differences will be discussed in some detail after the following description. The form from Campbell I. is tentatively designated as a new species, although additional material will be required to confirm this.

Andacarus campbellensis Wallwork, n. sp. Fig. 1.

Measurement: Length of body: 375.2μ.

1. Fieldwork supported by a grant to Bishop Museum from the National Science Foundation (G-18800).

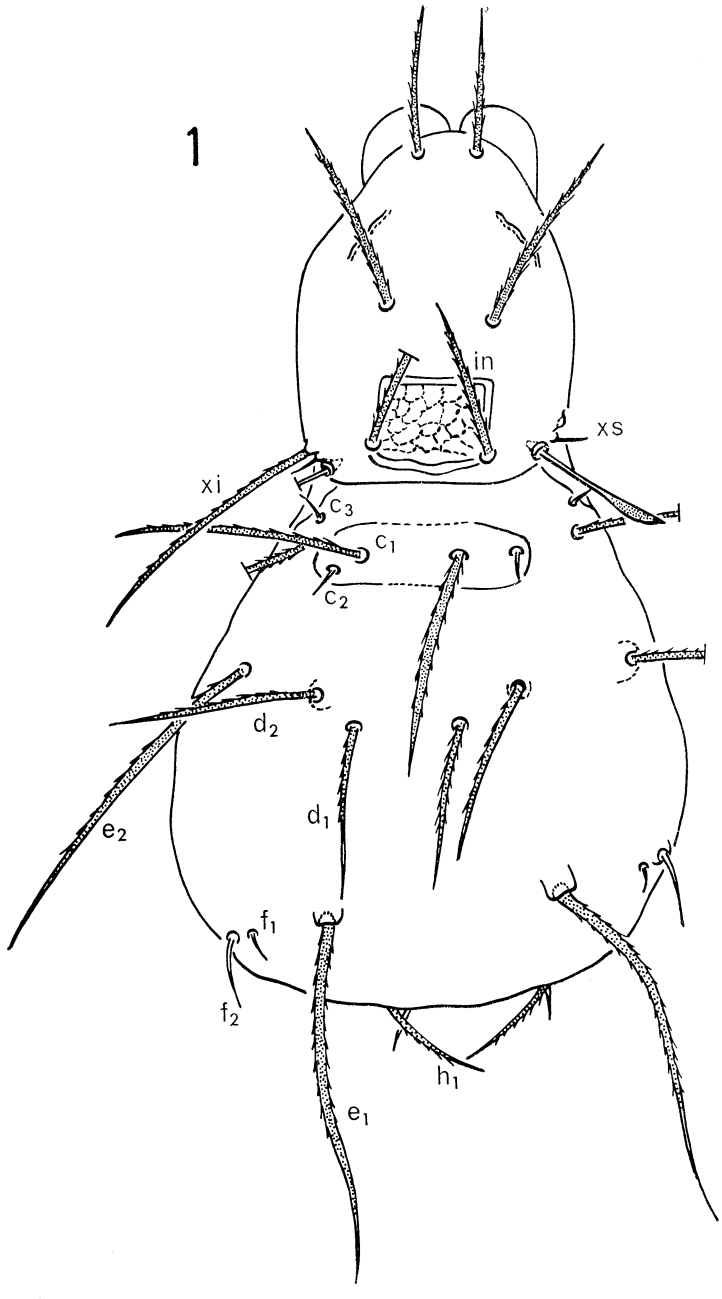


Fig. 1. *Andacarus campbellensis* n. sp. Holotype. Adult. Dorsal. *xs*= superior exopseudostigmatic seta; *xi*=inferior exopseudostigmatic seta; *in*=interlamellar seta; c_1, c_2, c_3, d_1, d_2, e_1, e_2, f_1, f_2, h_1=notogastral setae.

Integument: Body covering weakly chitinized and easily deformed. Hysterosomal sclerites weakly developed, with almost the same pale color as remainder of integument. Limits of only the anterior, unpaired sclerite can be defined.

Dorsal region: Naso broadly rounded anteriorly, bearing insertions of rostral setae dorsally. Prodorsal setae, with exception of superior exopseudostigmatic seta (*xs* which is short and slender), long, thickened, barbed and dark in color. Rostral and interlamellar setae approximately equal in length; lamellars slightly longer than these, and inferior exopseudostigmatic setae (*xi*) longer still. Microsculpture of interlamellar region very similar to that described for *A. watsoni*. Sensillus expanded distally into a fusiform head which narrows to a short point apically. Posterior margin of prodorsum distinct and clearly demarcates this region from notogaster.

Principal features of notogaster identifying this specimen with *Andacarus* include, the reduced asthenic zone, presence of setae c_1 and c_2 on anterior unpaired sclerite, separation of setae h_1 from f_1 and f_2, and the approximately equal lengths of setae d_1 and d_2. As mentioned above, the only sclerite identifiable is the anterior unpaired plate bearing the insertions of setae c_1 and c_2. Notogastral setae generally well developed, thickened, barbed and dark in color, particularly setae c_1, d_1, d_2, e_1, e_2 and h_1. Setae c_2, c_3, f_1 and f_2 less conspicuous (fig. 1). Setae c_1 rather longer than d_1 and d_2 which are approximately equal in length. Setae e_1 and e_2, approximately equal in length and longer than the remainder.

Ventral region: Ventral characters agreeing with those of *A. watsoni*, in that chaetotaxy of anal, adanal, genital and aggenital regions is normal. Coxisternal region hidden by ventral flexure of legs, and its chaetotaxy not ascertained.

(In view of the fact that this form was represented by a single specimen in collection, no attempt was made to dissect it to investigate details of the gnathosoma or leg chaetotaxy).

LOCALITY DATA: From moss, Beeman Hill, 2.6.XII.1961, J. L. Gressitt.

Remarks: The species from Macquarie I., *A. watsoni*, differs from the form described above in the following respects. The naso is more strongly constricted, and the posterior margin of the prodorsum is less distinct. The interlamellar setae are relatively shorter, and not as long as the rostrals; notogastral setae c_1, d_1 and d_2 are relatively shorter, and setae e_1 are appreciably longer than e_2.

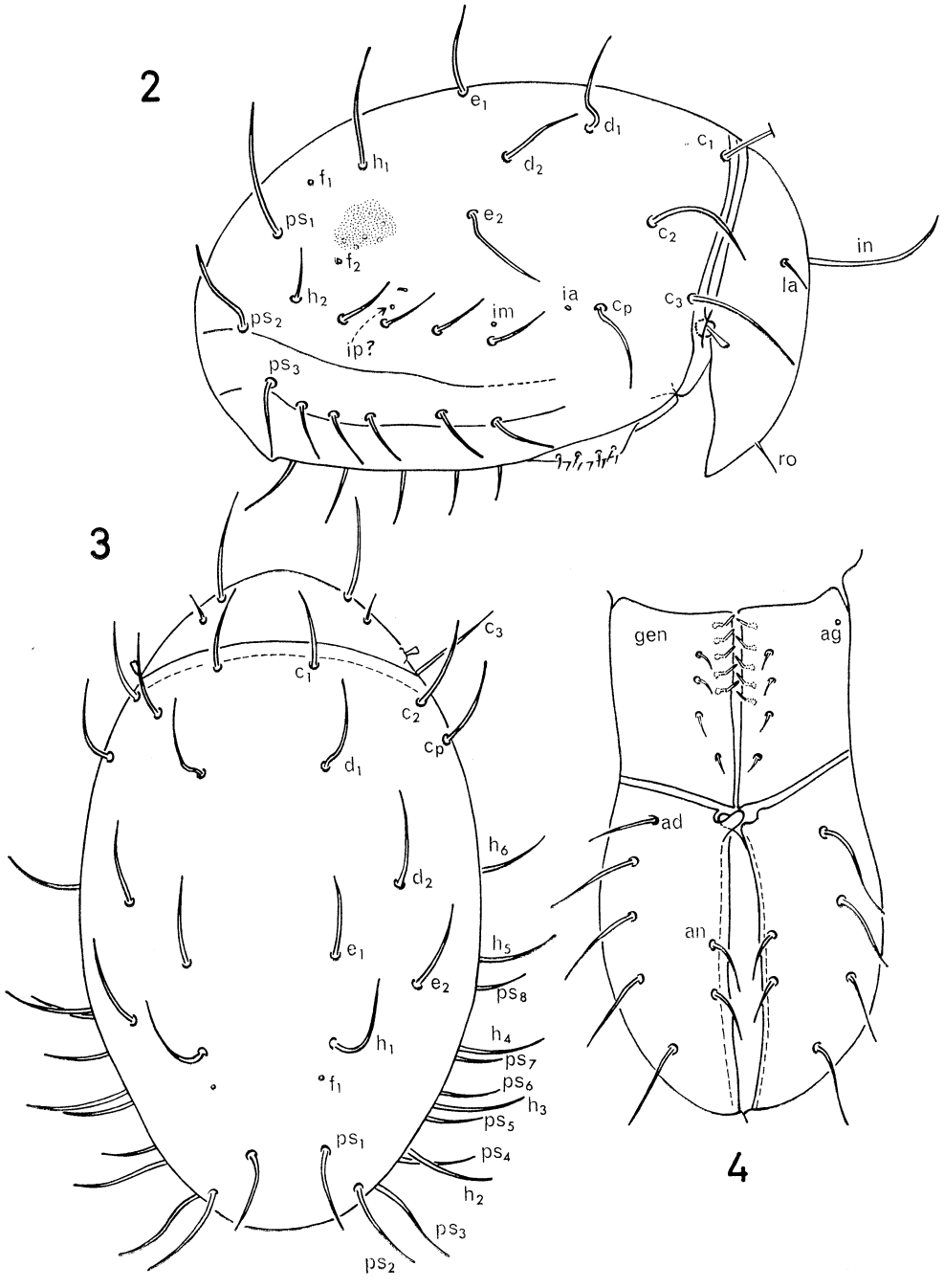
Family PHTHIRACARIDAE Perty, 1841

Genus **Neophthiracarus** Bal., 1963

The occurrence of this genus on Campbell I. is of considerable zoogeographic interest, for hitherto it has been recorded only from a single locality in southern Argentina where the type species, *N. insignis* Bal., was collected (Balogh and Csiszár 1963). The genus is characterized by the neotrichous condition of the notogastral and anal/adanal chaetotaxy. Unfortunately only 1 specimen has been examined from Campbell I., so its designation can only be considered provisional. However it differs so clearly from the type that it is described below tentatively as *Neophthiracarus neotrichus* n. sp.

Neophthiracarus neotrichus Wallwork, n. sp. Figs. 2-4.

Measurements: Length of body, retracted (dorsal view), 543.2μ; width of body, retracted



Figs. 2–4. *Neophthiracarus neotrichus* n. sp. Holotype. Adult. 2, Lateral; 3, Dorsal; 4, Genito-anal region, ventral. *ro*=rostral seta; *in*=interlamellar seta; *la*=lamellar seta; c_{1-3}, c_p, d_{1-2}, e_{1-2}, h_{1-6}, ps_{1-8}=notogastral setae; f_1, f_2=vestiges of notogastral setae; *ia, im, ip*=notogastral fissures; *gen*=genital plate; *ag*=insertion of aggenital seta; *ad*=adanal setae; *an*=anal setae.

(dorsal view), 364.0 μ; length of aspis (lateral view), 257.6 μ; width of aspis (lateral view), 72.8 μ; length of notogaster (lateral view), 487.2 μ; height of notogaster (lateral view), 336.0 μ.

Integument: Color of body yellow-brown, legs red-brown. Microsculpture consisting of fine punctations, with a few slightly larger circular figures scattered sporadically on posterior half of notogaster.

Aspis: Rostral and lamellar setae rather short, and only slightly curved. Interlamellar setae much longer, curved away from surface of aspis and directed posteriorly (figs. 2 & 3). Pseudostigmata hidden beneath notogastral rim in retracted condition of specimen. Sensillus very short and fusiform. In lateral view (fig. 2) the aspis rather narrow with a flattened anterior contour.

Notogaster: Broadly ovate in shape in lateral and dorsal view. Setae long, in most cases as long as interlamellars and similar in form, being moderately thickened and finely barbed, directed away from notogastral surface, curving anteriad. Notogastral neotrichy unequally developed on each side; 22 setae on right side, 20 on left, for a total of 42 notogastral setae. (Interpretation of chaetotaxy is given in figs. 2 & 3, and although some of the designations are uncertain, particularly at the posterior end of the notogaster, it is evident that neotrichy affects setae of the *h* and *ps* series).

Genito-anal region (fig. 4): Each ano-adanal plate with 2 anal setae inserted on medial margin; adanal part of this plate with 4–5 relatively long adanal setae. Row of adanal setae quite distinct from that of anal setae. Nine pairs of genital setae arranged in 2 rows (4+5) (fig. 4) similar to that in type species.

LOCALITY DATA: From moss, Beeman Hill, 2.6.XII.1961, J. L. Gressitt.

Remarks: The type species, *N. insignis*, is rather smaller than the specimen described above. It also differs in having weaker notogastral neotrichy, represented by 17 pairs of setae; these setae are thin and of medium length in the type. Anal neotrichy is more strongly developed in *N. insignis*; there are 9 setae on each anoadanal plate, compared with 6–7 in *N. neotrichus*.

Family HOLONOTHRIDAE Wallwork, 1963

Genus **Holonothrus** Wallwork, 1963

This genus was known only from Macquarie I. up to the present time (Wallwork 1963), but it is evidently not uncommon on other islands of the New Zealand group, for it is represented in Michael's collection at the British Museum and it has also been collected by Hammer (Hammer, in press). Several specimens of adult and immature stages are present in collections from Beeman Hill, Campbell I.; they differ in several respects from the type species from Macquarie I. and Hammer's species (Hammer, pers. comm.), and accordingly are described below as a new species, *Holonothrus concavus* n. sp.

Holonothrus concavus Wallwork, n. sp. Figs. 5–8.

MATERIAL EXAMINED: 10 adults, 4 nymphs, 1 larva.

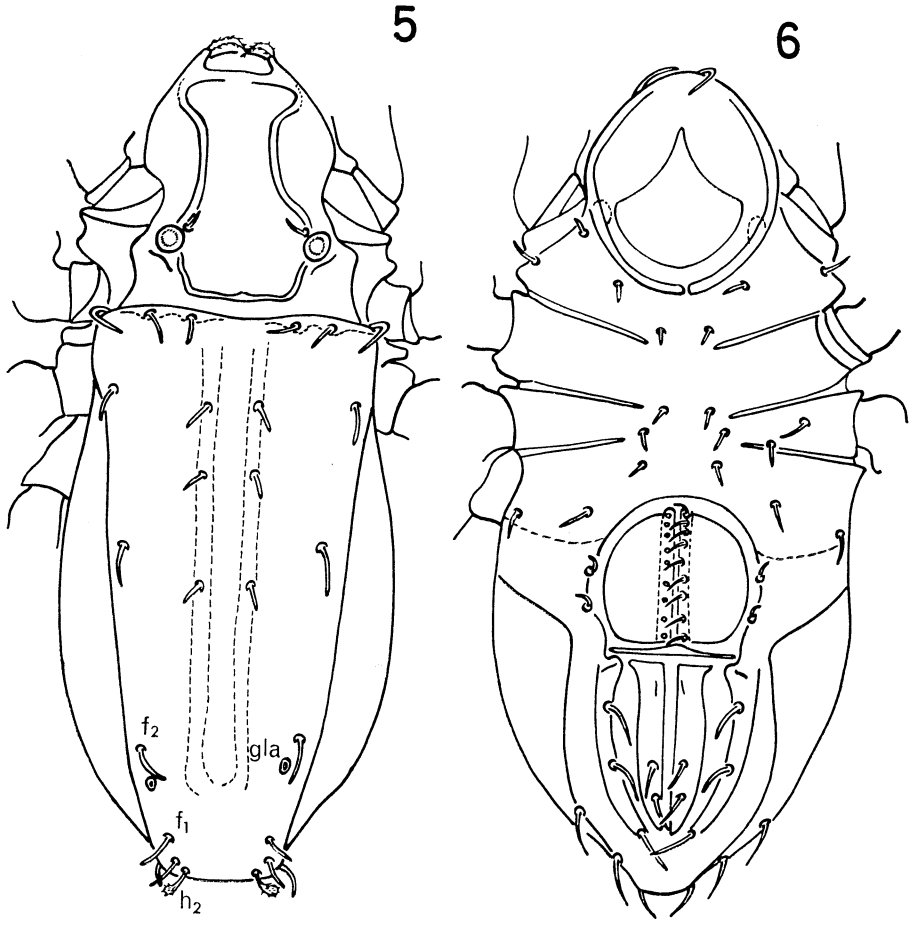
ADULT

Measurements: Average length of body: 754.3 μ (range: 683.2 μ–834.4); average width:

343.3 μ (range : 313.6 μ-380.8 μ).

Integument: Body and legs brown, surface of integument (or cerotegument?) covering body with fine, punctate microsculpture; this ornamentation more distinct on prodorsum and ventral region than on notogaster.

Prodorsum: Rostral setae hardly visible in dorsal view due to ventral curvature of this region; setae inserted on extreme anterior rim (fig. 6), and thickened and curved ventrad. Lamellar setae similar in form to rostrals, but more markedly barbed, inserted on short apophyses, as in type species. Transverse prodorsal ridge joining bases of these apophyses may be an extension of a pair of longitudinal ridges which run forward from pseudostigmata. These longitudinal ridges almost parallel for most of their lengths, except anteriorly where they curve laterad to join base of each lamellar apophysis. Interlamellar setae inserted at posterior extremity of each of these ridges, in juxtaposition to pseudostigma. Insertion of this seta not visible in all specimens; when present, seta short and thickened



Figs. 5-6. *Holonothrus concavus* n. sp. Holotype. Adult. 5, Dorsal; 6, Ventral; *gla*= aperture of lateral abdominal gland. Other notations as is figs. 2-4.

and not carried on an apophysis. Each pseudostigma completely contains the globular sensillus, as in type species. Posterior to level of pseudostigmata with a transverse prodorsal ridge, broadly U-shaped, with lateral extremities curving forwards towards each pseudostigma.

Notogaster: Sharply demarcated from prodorsum by a transverse suture. Dorsal part strongly flattened and depressed, forming a concavity, from which feature the species derives its name. 16 pairs of notogastral setae (i. e. holotrichy) with only 13 pairs visible in dorsal view (fig. 5); pseudoanal setae (3 pairs) visible in ventral view (fig. 6). Distribution of setae similar to that of type species, but setae f_1 more remote from f_2 and nearer posterior margin than in *H. foliatus*. All setae thickened but not foliate, with exception of setae h_2. Aperture of lateral abdominal gland (fig. 5) visible in some specimens, not in others.

Genito-anal region (fig. 6): Generally resembling type species, the principal difference being in the form of the setae. Two pairs of anal and 3 pairs of adanal setae appreciably longer than in type. Genital setae aligned longitudinally down median margin of each plate, and their number varies between 9 and 10. Two pairs of aggenital setae inserted on rim of genital aperture.

Coxisternal region: As in the type with ridges II, ventro-sejugal and III developed but not extending to mid-ventral line. Chaetotaxy with some variation, but arrangement usually following that of type, the formula (4-1-3-3) being common.

Gnathosoma: Labio-genal articulation complete and stenarthral, as in type species.

Legs: Chaetotaxy was not studied in detail. All tarsi tridactyle, homodactyle. Setae on proximal segments of legs I and II inserted on prominent apophyses.

IMMATURE STAGES

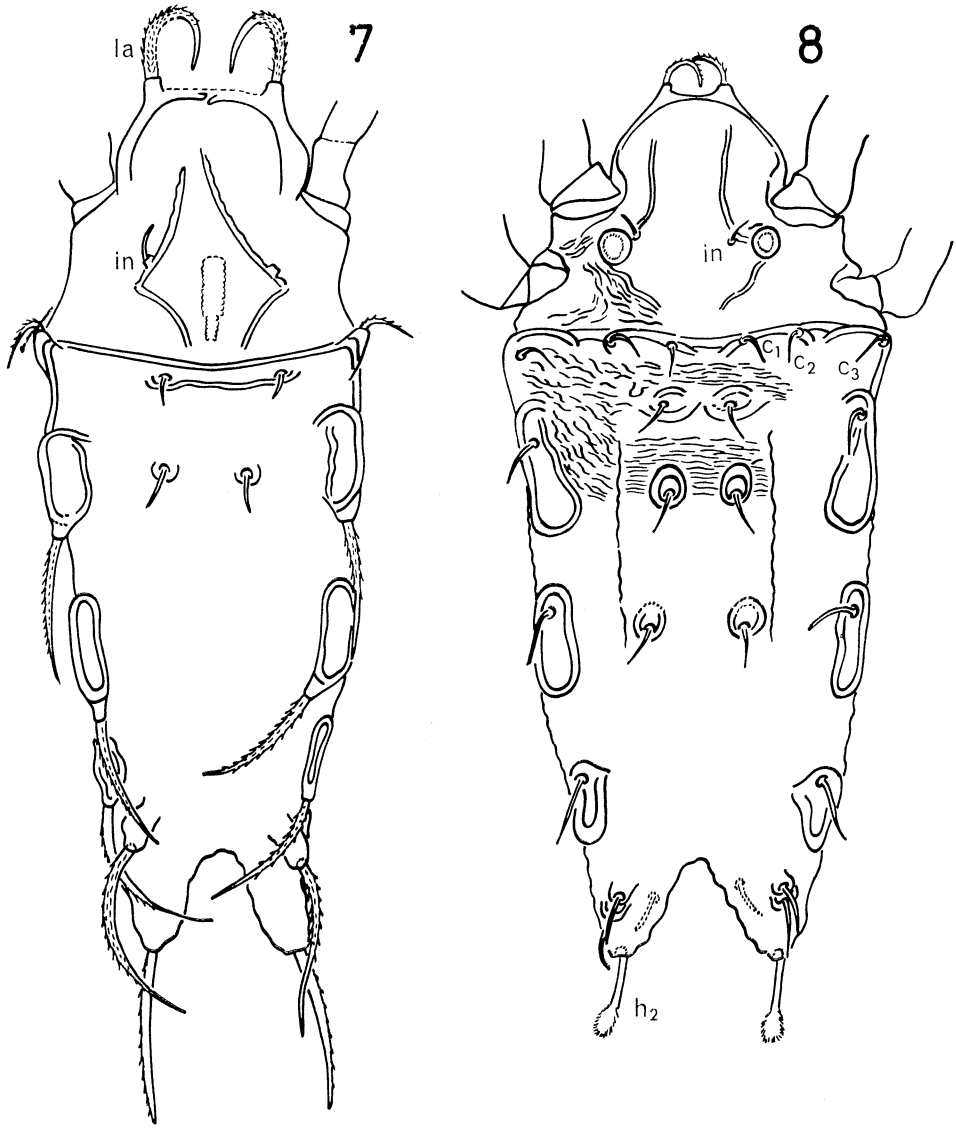
Dorsal appearance of larval and nymphal stages illustrated in figs. 7 and 8.

Larva (Only 1 sp. of this stage was available for examination): Lamellar apophyses strongly developed, as are lamellar setae. Transverse prodorsal ridge joining bases of lamellar apophyses is interrupted in mid-dorsal line; laterally each ridge continuing along contour of prodorsum but not joining longitudinal prodorsal ridges where interlamellar setae are located. These longitudinal ridges convergent anteriorly, sharply "elbowed" just posterior to level of interlamellar setae. Setae short and thickened, inserted on short apophyses situated on outer margin of longitudinal ridges. Pseudostigmata and sensilli lacking.

Hysterosomal chaetotaxy showing deficiency, especially anteriorly and centro-dorsally; all but 2 pairs of 8 pairs of setae identified are relatively long, strongly thickened and barbed, located latero-dorsally on prominent apophyses. Three pairs of these apophyses inserted on ovoid porose sclerites, which differ from those of the type species in being paler with conspicuous chitinized margins. Apophyses of the other 3 pairs of lateral setae (namely humerals and 2 pairs posteriorly) not associated with well-defined porose sclerites. Most posterior pair of notogastral setae inserted on a pair of large lobes. Length of these latero-dorsal setae increasing progressively from anterior part of notogaster to posterior. In addition 2 pairs of setae inserted centrodorsally on rounded sclerites considerably shorter than laterodorsals.

Nymphs (figs. 7 & 8): There are considerable differences between the appearance of

larva and nymphs, the nymphs being more closely identifiable with the adult morphological plan: Lamellar apophyses and setae relatively smaller than those in larva with longitudinal prodorsal ridges becoming more or less parallel, with pseudostigmata and sensilli present and developed as in adult, and with 16 pairs of notogastral setae (i.e. holotrichy). In addition, interlamellar setae adopting form and location of corresponding setae in adult. (The significance of these features will be discussed later).



Figs. 7-8. *Holonothrus concavus* n. sp. 7, Larva (Dorsal); 8, Nymph (Dorsal). Notations as in figs. 2-4.

Appearance of hysterosoma resembling that of the type in general features, particularly in the insertion pattern of the setae, development of porose sclerites latero-dorsally and in possessing a pair of prominent posterior lobes. Hysterosomal setae thickened, but not folinate, with the exception of h_2 inserted at apex of each posterior lobe. Anterior setae (series *c*) inserted on curved, chitinized ridges; 3 pairs of centrodorsal setae inserted on conspicuous, rounded plates; latero-dorsal setae inserted on anterior part of a porose sclerite, as in the type. (None of the hysterosomal setae are borne on prominent apophyses).

LOCALITY DATA: All specimens taken from moss, Beeman Hill, 2.6.XII.1961, J. L. Gressitt.

Remarks: *H. concavus* may be distinguished from the type, *H. foliatus*, by the following adult characters: 1, Interlamellar setae short, simple, not inserted on apophyses; 2, Notogastral setae thickened, but not foliate, except for setae h_2; 3, Notogastral setae f_1 more remote from f_2 than in type; 4, Anal and adanal setae longer than in type.

Similarly, the nymphs of the 2 species may be separated on the basis of differences in the form of the notogastral setae and of the porose notogastral sclerites. The latter are paler in color and have a more conspicuous rim in *H. concavus* than in *H. foliatus*.

The development of *H. concavus* has several interesting features. The absence of pseudostigmata and sensilli in the larval form is remarkable, and also worthy of note is the shift in the position and manner of insertion of the interlamellar setae. In the larva these setae are inserted in the same way as they are in all developmental (including adult) stages of *H. foliatus*, i. e. on an apophysis located on the longitudinal prodorsal ridge, but the apophysis is lost and the insertion moves to the median margin of this ridge in the nymphal and adult stages of *H. concavus*. Considerable significance is also attached to the deficient condition of the larval notogastral chaetotaxy. This feature necessitates a modification of the diagnostic characters of the family, and also indicates a relationship between *Holonothrus* and the genus *Acronothrus* (see below).

Genus **Acronothrus** Berl., 1916

This interesting genus was erected with a species collected in New Zealand, *Nothrus cophinarius* Michael 1908, as the type. The genus has also been recorded from Africa (Berlese 1916), Marquesas I. (Jacot 1935), Australia (Womersley 1957), Peru (Beck 1962) and Argentina (Balogh & Csiszár 1963), so that its distribution is extensive in the southern hemisphere.

The Bishop Museum collections contain specimens of a form representing a species belonging in this genus, which was considered initially to be the same as *A. cophinarius* (Mich.). Comparison with Michael's material at the British Museum revealed differences which are sufficient to warrant the erection of a new species for the specimens from Campbell I., and this is described below as *A. brevicornutus* n. sp. The similarities and differences between this species and the type are discussed. A review of the genus is being prepared for a separate publication.

Acronothrus brevicornutus Wallwork, n. sp. Figs. 9-14.

MATERIAL EXAMINED: 6 adults, 2 nymphs. This material is preserved partly as slide mounts, partly in alcohol. The slide preparations (4 adults, 1 nymph) are all damaged

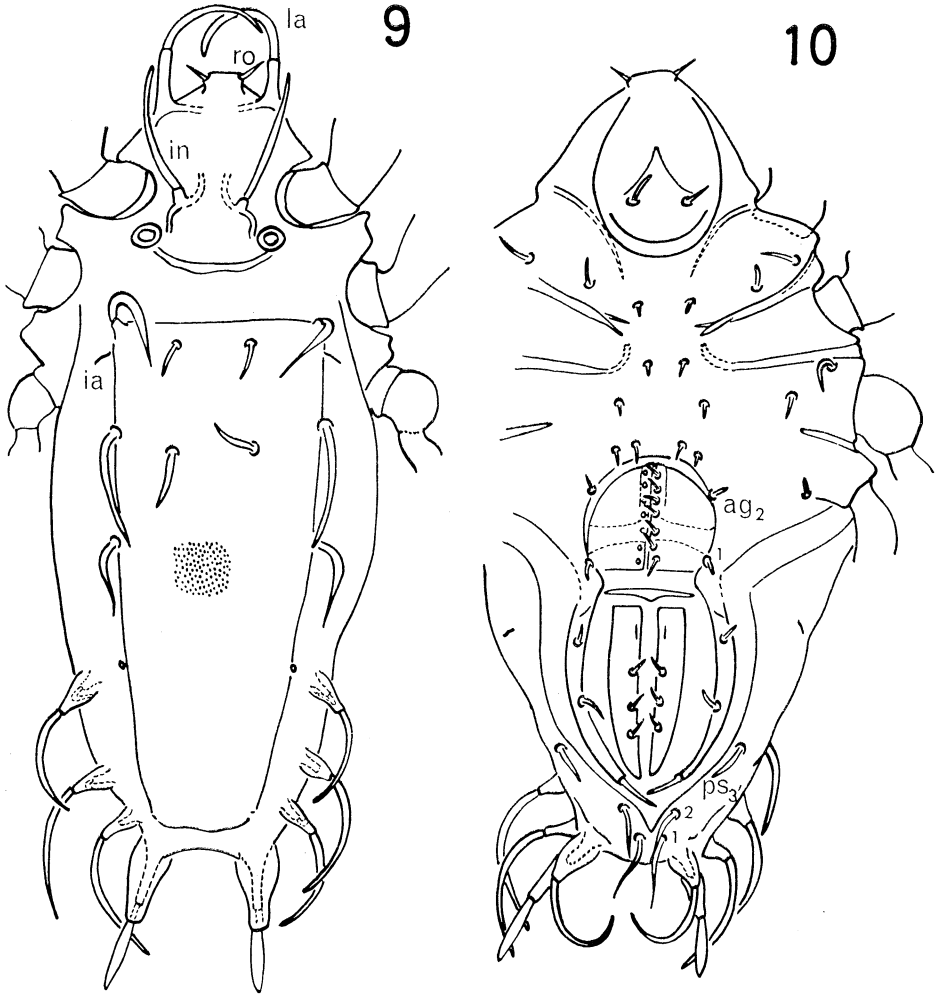
to some extent, and although invaluable for providing details of chaetotaxy, they are not in a suitable condition for accurate measurements of body size.

ADULT.

Measurements: Length of body (excluding apophyses) : 995–1036 μ; width : 535 μ.

Integument (Body generally covered with a thick layer of debris, which must be removed before details of surface structures can be observed) : Color of cuticle brown or red-brown, surface with microsculpture of dark, rounded punctations or granules which are particularly prominent on notogaster and ventral region.

Prodorsum: Rostral tectum produced into a truncate "nose", with each rostral seta



Figs. 9–10. *Acronothrus brevicornutus* n. sp. Holotype, Adult. 9, Dorsal; 10, Ventral: ag_1, ag_2=aggenital setae. Other notations as in figs. 2–4.

thick, strongly divergent, straight and inserted at lateral angles. A pair of chitinized "horns" or apophyses, situated over lateral contour of prodorsum and located a short distance behind rostrum, and projecting away from this contour in an antero-dorsal direction so that they flank rostrum. Each apophysis slightly curved, truncate anteriorly, with lateral and median margins parallel. Basally each apophysis widens at it merges with a curved ridge lying on surface of prodorsum, directed mediad. Basal ridges associated with 2 apophyses apparently not joining to form a complete transverse ridge (accumulation of debris between the apophyses renders the details of this region obscure). Apophyses not extending much farther forwards than anterior limit of rostrum, approximately half as long as their mutual distance. Lamellar seta thick, pale with a hollow central cylinder, curved strongly mediad forming overlapping loops anterior to rostrum and inserted at apophysical apex. Surface of seta smooth, but covered with some kind of secretion.

Lateral contour of prodorsum on each side strongly excavated to accommodate insertions of legs I and II. Interlamellar setae originating on short apophyses situated anteromedian to pseudostigmata and inserted at level of leg I. These setae similar in form and length to lamellars, extending forward almost to apex of lamellar apophysis. Interlamellar apophyses located on a pair of prodorsal ridges which arise just median to pseudostigmata, curving towards mid-line and then turning anteriad. Each pseudostigma circular, not projecting markedly from prodorsal surface, and completely containing globular sensillus. Posterior to level of pseudostigmata is a strongly chitinized transverse ridge, broadly U-shaped, with concave anterior margin, connecting the pseudostigmata. This ridge is more conspicuous than anterior margin of notogaster.

Notogaster: Dorsal plate flattened in lateral view, but not appearing to be markedly depressed centro-dorsally. Anterior limit represented by a thin, weakly chitinized suture, which does not serve to delimit this region clearly from prodorsum. Lateral contours rounded, widest about half-way along notogaster. Posterior margin with a truncate or concave contour between posterior pairs of notogastral apophyses. Rectangular centro-dorsal part clearly delimited from darker-colored latero-dorsal part. Notogastral chaetotaxy shows a deficient condition, and setal homologies difficult to establish. There are 13 pairs of setae, of which 9 pairs are visible in dorsal view (fig. 9), the remainder in ventral view (fig. 10). Only 2 pairs inserted on centro-dorsal part, and these are shorter than other dorsal setae. A pair inserted on antero-lateral angles situated on short apophysial projections; immediately posterior to these are the conspicuous slits of the fissures *ia*. Two pairs of long, thickened setae inserted, one behind the other, on line separating centro-dorsal from latero-dorsal part of notogaster; these setae not inserted on apophyses, and frequently difficult to see owing to their pale color. The 5 pairs of setae inserted postero-laterally or posteriorly are all carried on prominent apophyses. Four pairs of these structures identifiable in dorsal view; the 5th pair (not shown in fig. 9), lies ventral to the most posterior pair (fig. 10). In all cases, these apophyses and the setae they bear are nymphal structures; corresponding adult structures contained within them and can be seen clearly (fig. 9). Nymphal apophyses characteristically with a bulbous base which is lacking in adult structures which are shorter, narrower and darker. Three pairs of pseudoanal setae which are shorter than posterior setae, and not carried on apophyses, located on recurved part of notogaster as seen in ventral view (fig. 10); these setae are shorter. All notogastral setae similar in form to prodorsals, being thickened and pale in color.

Ano-genital region: Anal plates separate from adanals; both elongate, narrow and pointed posteriorly. Each anal plate with anal fissure and 3 setae inserted along medial margin. Each adanal plate with adanal fissure and 3 setae, the most posterior of which is inserted on posterior point of plate. Anteriorly each adanal plate is fused to corresponding aggenital plate which is not delimited from the most posterior coxisternal plate of ventral region of podosoma. Genital aperture formed as an excavation, circular in outline, in aggenital/coxisternal plates, and 2 pairs of aggenital setae inserted on rim of this excavation. Some specimens with genital field relatively larger than in others (this may be a secondary sexual character). Genital plates with a light transverse band, similar to that present in *Platynothrus*. All genital setae medially inserted on each plate, the number varying between 7 and 10. (It is usual for the larger genital fields to have more setae than the smaller).

Ventral region of podosoma: Right and left halves of all coxisternal fields confluent in sternal region; no sternal ridge or excavation present. Coxisternal ridges, developed as in fig. 10, not extending to mid-ventral line, although ridges II and ventro-sejugal are longer than remainder. Each ventro-sejugal ridge curving antero-medially towards sternal part of ridge II. Coxisternal neotrichy lacking, chaetotaxy being represented by the formula (3-1-3-3); these setae resembling other ventral setae in being relatively short, thickened and pale in color.

Legs: All tarsi tridactyle, the 3 claws being equally well developed. Setae on proximal leg segments inserted on prominent apophyses. (A detailed study of chaetotaxy was not made).

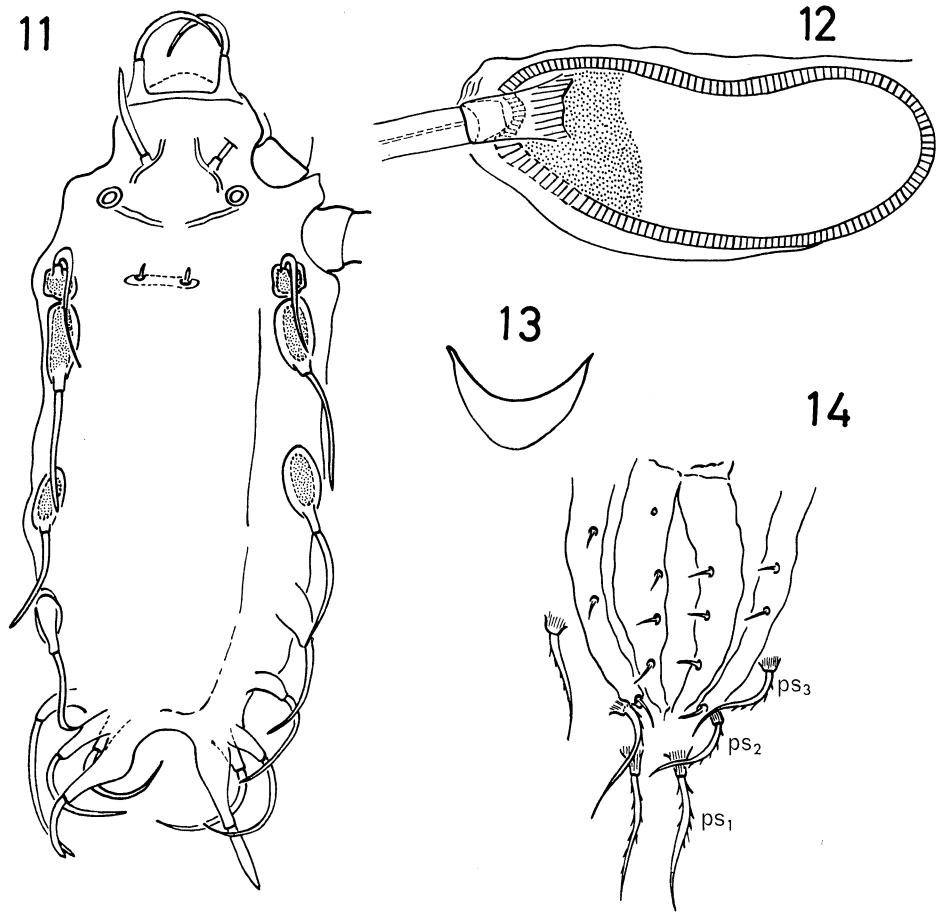
Nymph: The particular developmental stage was not identified, but both specimens examined are only slightly smaller than the adults, and it is concluded that these represent late nymphal stages, probably tritonymphs.

Prodorsal features essentially similar to those of adult. Prodorsal/notogastral suture not evident and these 2 regions broadly confluent. Twelve pairs of notogastral setae identified; all except 1 centro-dorsal pair inserted laterally or posteriorly; centro-dorsal pair short, inconspicuous and inserted on a weakly chitinized plate; remaining setae long, thickened, and pale in color resembling those of adult (of these, 3 pairs inserted on flattened, circular or oval porose sclerites, each of which is produced into a short, projecting apophysis carrying the insertion of the corresponding seta; fig. 12). More posteriorly, setae inserted on prominent apophyses described already for adult. Five pairs of these structures visible in dorsal view (fig. 11), identical in position to those of adult. Three pairs of pseudoanal setae, flanking anal field, also carried on apophyses (fig. 14); the latter shorter than posterior notogastral apophyses. Apophysis associated with most posterior pseudoanal seta longer than that associated with seta ps_2; latter longer than that associated with the most anterior seta in this row, ps_3.

In lateral view, the notogaster is seen to be strongly depressed centro-dorsally; lateral margins with porose sclerites and apophyses, are produced into dorso-lateral wings.

LOCALITY DATA: 7 of the 8 specimens examined (5 adults, 2 nymphs) were taken from moss collected at 100-180 m on Beeman Hill, Campbell I., 2.6.XII.1961; 1 adult specimen was collected from Mollymawk nests at 200 m, Courejolles Penin., Campbell I., 14. XII. 1961, J. L. Gressitt.

Remarks: The comparison between this species and *A. cophinarius* is necessarily brief, pending a redescription of the type (Wallwork in prep.). The 2 species are similar in



Figs. 11–14. *Acronothrus brevicornutus* n. sp. 11, Nymph, dorso-laterally flattened. 12, Notogastral porose plate and setal apophysis; 13, Cross-sectional plan of nymphal hysterosoma; 14, Ano-adanal region of nymph: Ventral, Notations as in figs. 2–4.

regard to the ventral chaetotaxy, the general size and shape of the body, and the number and disposition of the notogastral apophyses. The differences between them may be summarised as follows: 1, Surface of integument smooth in *A. cophinarius*, punctate or granular in *A. brevicornutus*; 2, Lamellar apophyses rather longer and thinner in type; 3, Lateral notogastral setae appear as short, thickened structures in Michael's preparations, whereas these setae are long and thickened in *A. brevicornutus*; 4, Postero-median pair of adult notogastral apophyses longer and more slender in type, i. e. they are longer than their mutual distance; 5, Nymphal apophyses retained over adult structures on posterior part of notogaster not bulbous in *A. cophinarius*, as in *A. brevicornutus*[1].

1. *A. brevicornutus* is similar to *A. brachyrostrum* Hammer (1966: Biol. Skr. 15, 2: 108 pp.) but differs in having more strongly developed laterodorsal notogastral setae and in the wider separation of penultimate and ultimate notogastral apophyses.

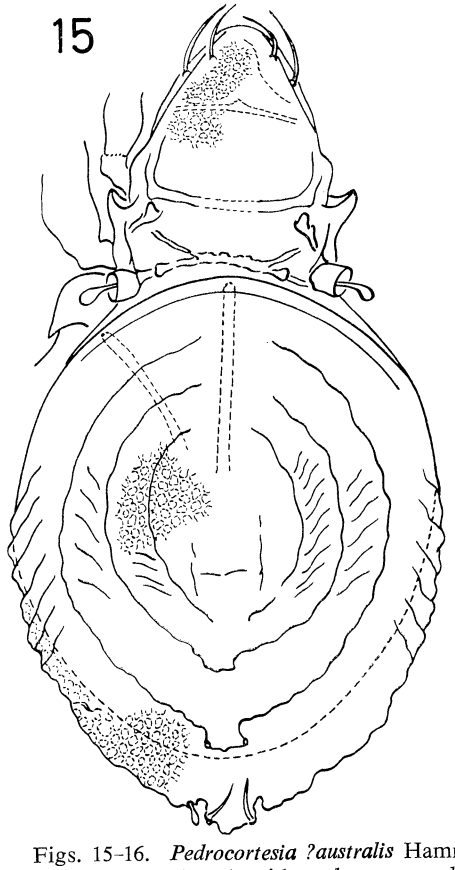
Two features of the above description are worthy of comment, namely the deficient condition of the notogastral chaetotaxy in the immature (nymphal) and adult stages, and the presence of latero-dorsal porose sclerites on the notogaster of the nymphs. Both of these characteristics appear to be generic features and are of great significance in that they recall the features of the larval stage of *Holonothrus concavus* (see earlier, fig. 7). A relationship is thus established between the genera *Holonothrus* and *Acronothrus*, and there is strong morphological evidence that this evolutionary dichotomy is characterized, in the case of *Acronothrus*, by a retention of larval characters in the nymphal and, to a lesser extent, the adult stages.

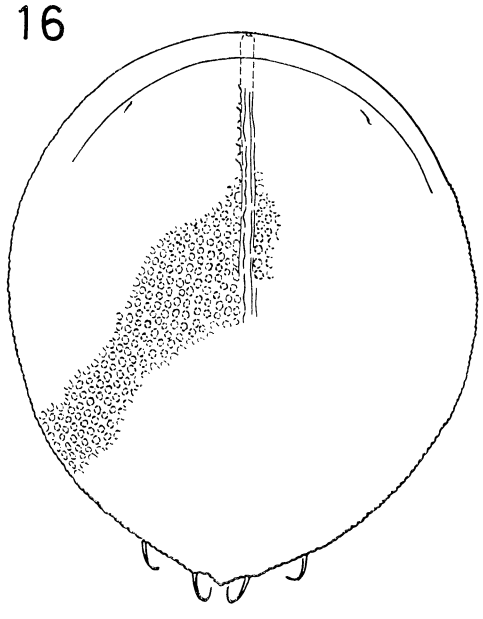
Family PLATEREMAEIDAE Trägårdh, 1931

Genus **Pedrocortesia** Hammer, 1958

Pedrocortesia ?australis Hammer, 1962. Figs. 15–16.

A single specimen examined is identified tentatively with this species, described originally from Tierra del Fuego, on the basis of similarities of notogastral chaetotaxy, in particular the possession of a pair of pointed, anteriorly-directed setae on the posterior





Figs. 15–16. *Pedrocortesia ?australis* Hammer. Adult. 15, Dorsal, immature scalps in place; 16, Notogaster, dorsal, with scalps removed.

border of the nymphal scalp, and the form and distribution of the two pairs of posterior notogastral setae in the adult. The development of prodorsal ridges, particularly in the interpseudostigmatic region is rather different from that described by Hammer, and in addition no interlamellar setae were observed. It is possible that other differences may exist which would warrant the separation of the form from Campbell I. as a new subspecies, but as only one specimen has so far been examined, it is not proposed to do this at the present time. Instead, diagrams illustrating the dorsal features of the adult are given in figs. 15 and 16.

This genus is not uncommon in South America, and it is of interest to record the presence of a form from the New Zealand islands which is closely related to, and possibly conspecific with, a species described from Tierra del Fuego. Here again is another example of the close relationship existing between the acarine faunas of these two, now widely separate regions.

Family PODACARIDAE Grandjean, 1955

Genus **Halozetes** Berl., 1916

In previous papers (e.g. Wallwork 1965, 1966 in press) I have suggested that this family has a circum-sub-Antarctic distribution, and possibly originated in the eastern part of the sub-Antarctic region where it is abundantly represented. Species of the genus *Halozetes* are particularly common in this region, and the group is well represented on Macquarie I. (Wallwork 1963). It is then not surprising to find *Halozetes* on Campbell I., and although the full extent of its representation has not yet been ascertained, 4 distinct species have been found in the collections examined so far. One of these is undoubtedly new and is described below under the name *Halozetes plumosus*; another appears to be a subspecies of *H. marinus* (Lohm.), and the other 2 are identified with *H. macquariensis* (Dal.) and *H. crozetensis* (Richt.) respectively.

Halozetes plumosus Wallwork, n. sp. Figs. 17–19.

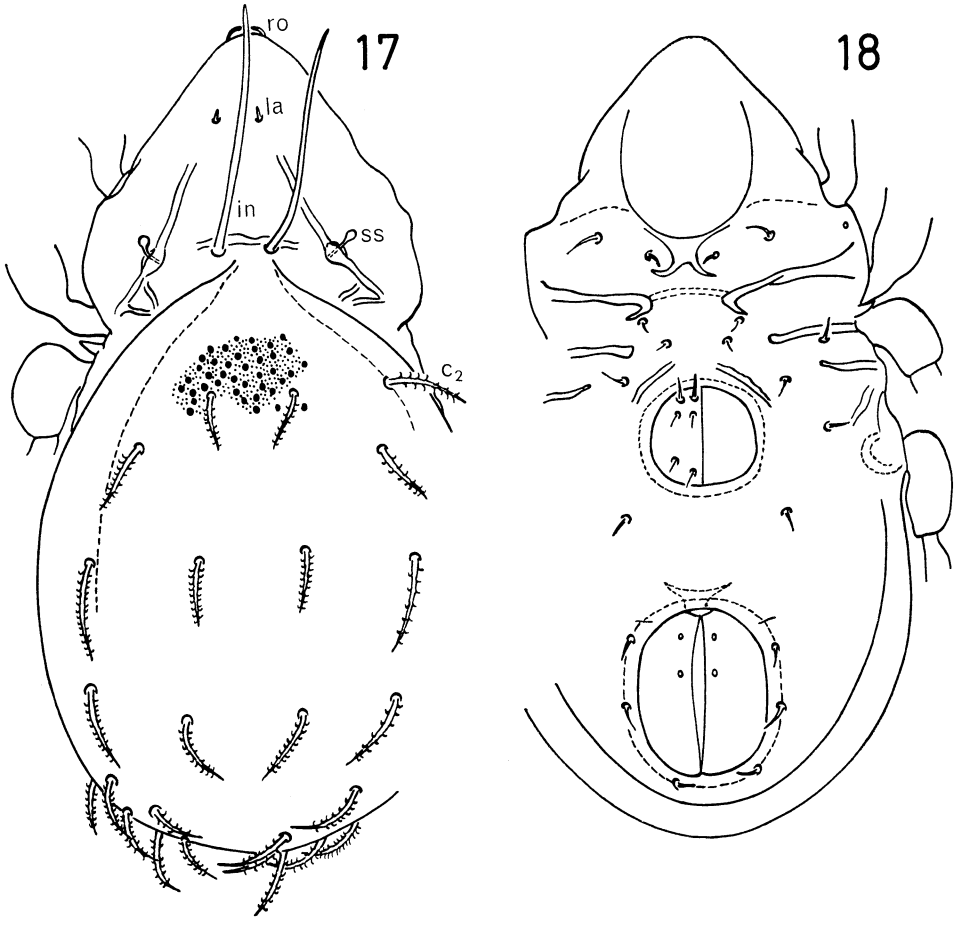
MATERIAL EXAMINED: 6 adults (2♀♀, 4♂♂), 4 nymphs. All adults examined are damaged to some extent.

ADULT.

Measurements: ♀♀. Average body length: 672.0 μ; average width (at widest part of notogaster): 364.0 μ. ♂♂. Average body length: 621.6 μ; average width (at widest part of notogaster): 355.6 μ.

Cerotegument: Well developed, conspicuously ornamented with circular black granulations; granules relatively large, achieving a diameter of 7–10 μ in most cases.

Prodorsum: Rostral setae short, thick, barbed, incurved, and inserted on anterior rim of rostral tectum. Lamellar setae very short, inserted in usual position on dorsal part of prodorsum. Interlamellar setae inserted close together on a conspicuous transverse ridge which crosses posterior part of prodorsum in interpseudostigmatic region; setae considerably longer than other prodorsal setae, approximately 5× as long as their mutual distance, thickened, finely barbed, and brown in color. Lamellar ridges well developed, slightly convergent. Pseudostigmata weakly developed as slight depressions in these ridges. Each



Figs. 17–18. *Halozetes plumosus* n. sp. Holotype ♂. Adult. 17, Dorsal; 18, Ventral. *ss*= sensillus. Other notations as in figs. 2–4.

sensillus with a globular head, but much more weakly developed than in most other members of Podacaridae.

Notogaster: Broadly oval in shape. Anterior margin narrowing to a peak mid-dorsally, which may be open and confluent with prodorsum, or closed by a very weak suture. In contrast to other species in this genus, all notogastral setae are relatively long, with latero-dorsals rather longer than centro-dorsals, thickened and plumose, hence the species name. Anterior setae c_1 and c_3 lacking, and occasionally c_2 also (left side, fig. 17). Total number of notogastral setae varies from 24 to 26.

Ventral region: [The details of this region, illustrated in fig. 18, are similar to those of *H. intermedius* (Wallwork 1963, fig. 23), particularly in regard to the deficient condition of the coxisternal chaetotaxy, as expressed by the formula: (3-1-2-2)]. Transverse chitinized bar joining 2 halves of coxisternal ridge II present in both ♂♂ and ♀♀, but is more strongly developed in the latter. A pair of convergent pre-genital ridges present in

both sexes, and again these are better developed in ♀♀. Genital, aggenital, anal and adanal chaetotaxy normal in both sexes; aggenital neotrichy lacking. As usual, genital aperture of ♀♀ relatively larger than that of ♂♂.

Sexual dimorphism: Secondary sexual differences between adult ♂♂ and ♀♀ mainly involve body size (♀♀ generally larger), size of the genital aperture (larger in ♀♀) and development of sternal connection between coxisternal ridges II (stronger in ♀♀).

Nymph: The general morphology of the immatures examined closely resembles that of the nymph of *H. intermedius* described previously (cf. fig. 19 with Wallwork 1963: fig. 26). The regression of pseudostigmata and sensilli, the strong development of barbed notogastral setae and the general arrangement of porose hysterosomal sclerites are similar in both species. The differences between the nymphs of the two forms are slight; in *H. plumosus* the prodorsal exopseudostigmatic setae are plumose, whereas they are simple in *H. intermedius*; lamellar setae relatively longer in *H. intermedius* and, in addition, there are slight differences in the form of some of the porose hysterosomal sclerites, particularly the posterior, unpaired sclerite.

LOCALITY DATA: All material examined collected at Rocky Bay on the south coast below Mt Dumas, Campbell I., 18. II.1963, K. A. J. Wise.

Remarks: *H. plumosus* may be distinguished from all other members of the genus so far described by the long, plumose, notogastral setae of the adult. In other respects, adults of *H. plumosus* resemble those of *H. intermedius*, a species described from neighbouring Macquarie I., particularly in the chaetotaxy of the ventral surface. Nymphs of the two species differ from each other in only a few minor respects.

Fig. 19. *Halozetes plumosus* n. sp. Nymph (Dorsal). *ex*=exopseudostigmatic seta.

Comparison between the immature and adult stages of *H. plumosus* suggests that the unusual plumose condition of the notogastral setae of the adult may represent the neotenous retention of a juvenile character. This is not the case in *H. intermedius*.

Halozetes marinus (Lohmann) **minor** Wallwork, n. subsp. Figs. 20–21.

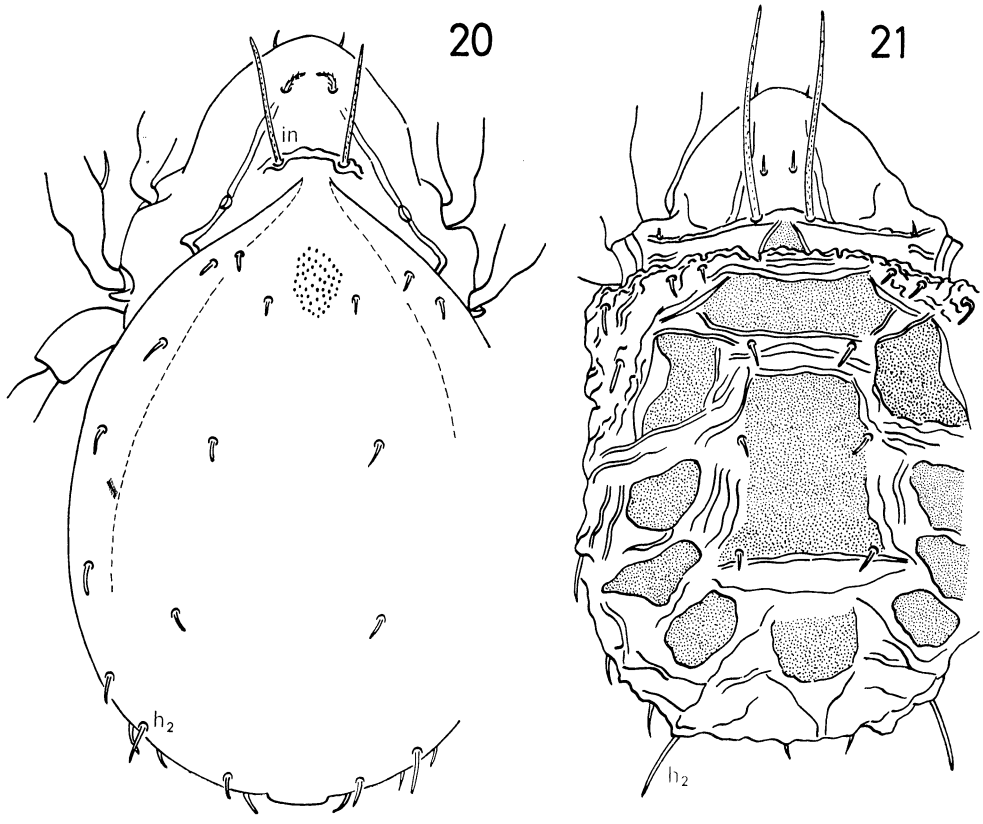
MATERIAL EXAMINED: 3 adults (1♀, 2♂♂), 3 nymphs.

ADULT.

Measurements: ♀. Length of body: 804.0 μ; maximum width of body: 448.0 μ. ♂. Length of body: 700.0 μ; maximum width: 408.8 μ.

The differences between this form and the nominate, which was redescribed from Macquarie I. (Wallwork 1963), are not very great, and involve mainly body size (*minor* is rather smaller than *marinus*), the length of the interlamellar setae (these are, as shown in fig. 20, relatively short in *minor*, being approximately 2× as long as their mutual distance), and possibly the length of the latero-dorsal and posterior notogastral setae. The latter are slightly longer than the centro-dorsals, and setae h_2 are rather longer than the remainder. None of the specimens examined possessed prodorsal sensilli; the pseudostigmata are reduced to small pits, as they are in the nominate form.

Nymph: The immature form (fig. 21) resembles that of the nominate form, particularly in the general development of porose hysterosomal sclerites, in the pattern of ornamen-



Figs. 20–21. *Halozetes marinus* (Lohm.) ssp. *minor* n. subsp. 20, Adult holotype (Dorsal); 21, Nymph (Dorsal). Notations as in figs. 2–4.

tation on the mid-dorsal part of the hysterosoma, and in the strong development of hysterosomal setae h_2. The features by means of which this form may be distinguished from the nominate include the possession of an unpaired anterior hysterosomal porose sclerite (paired sclerites are present in the nominate form), the relatively longer latero-dorsal and posterior hysterosomal setae, and the more rudimentary development of the pseudostigmata. Sensilli were not observed. In all other respects there is little difference between the nymph of *minor* and that of the nominate form.

LOCALITY DATA: All specimens were collected from under stones associated with a Mollymawk colony, at 220 m, Courejolles Penin., Campbell I., 12.II.1963, K. A. J. Wise.

Remarks: The main points of difference between this new sub-species and the nominate form have been given above. *H. marinus* (nominate form) is known principally from the eastern sub-Antarctic, although its distribution also extends to the western part of this region (Wallwork 1966, in press). The collections examined so far indicate that this form is essentially a shore-dweller, associated with tidal debris and green algae. Possibly the sub-species *minor* has different ecological preferences.

Halozetes macquariensis (Dalenius).
Fig. 22.

Several specimens, comprising ♂♂, ♀♀ and 1 nymph, are identified with this species which was redescribed from Macquarie I. (Wallwork 1963). The nymphal form, which has not previously been described, is shown from the dorsal aspect in fig. 22. It resembles the nymph of *H. belgicae* (see Wallwork 1965) in the possession of relatively long posterior hysterosomal setae, but differs in that these setae are roughened although less markedly barbed than those of *H. belgicae*. The presence of porose hysterosomal sclerites also distinguishes this nymph from that of *H. belgicae*, although these plates are not strongly developed.

LOCALITY DATA: Collected under stones and driftwood at a seepage and stream,

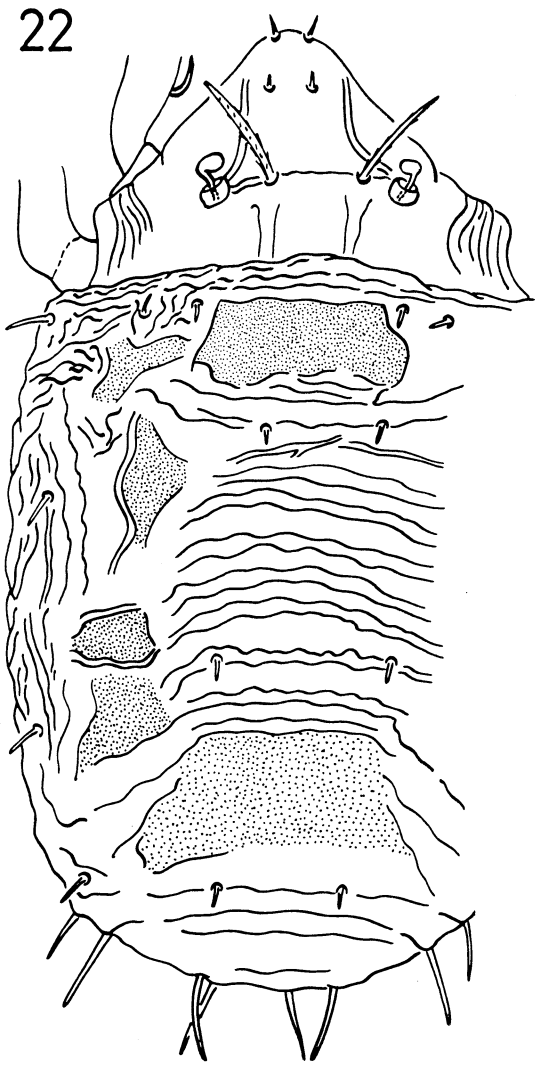


Fig. 22. *Halozetes macquariensis* (Dalenius). Nymph (Dorsal).

near top of beach, Middle Bay, Campbell I., 5.II.1963, K. A. J. Wise.

Halozetes crozetensis (Richt.)

This species, which is common on Macquarie I. from where it was redescribed (Wallwork 1963), has been encountered in four of the collections from Campbell I. so far examined. It is identified by general body size and shape, especially the oval form of the notogaster which narrows mid-dorsally to a peak, posteriorly with a pair of indentations, and by the form of the body setae, particularly the notogastrals which are short, thickened and strongly barbed. These setae are all more or less the same length. Other diagnostic features include the presence of setae c_3 on the humeral region of the notogaster (present in all the Campbell I. specimens examined), aggenital neotrichy in adult ♂♂ (expressed by the symmetrical duplication of the aggenital setae in 1 ♂ from Campbell I., lacking in a 2nd specimen), and the presence of pre-genital ridges in adults of both sexes (present, but variously developed in the specimens examined).

LOCALITY DATA: (1) 1♀ collected from burrow of sooty shearwater, south of Courejolles Penin., 12.II.1963, K. A. J. Wise. (2) 1♂ collected from debris taken from Mollymawk nests at 200 m, Courejolles Penin., XI-XII.1961, J. L. Gressitt. (3) 1♂ from moss at 100-180 m, Beeman Hill., 2,6.XII.1961, J. L. Gressitt. (4) 1 damaged shell (♂) from under stones, near Mollymawk colony, at 220 m, Courejolles Penin., 12.II.1963, K. A. J. Wise.

Remarks: It is very probable that the collections examined do not represent the complete distribution pattern for this species on Campbell I. Furthermore, too few specimens have been observed to provide a comparison with those from Macquarie I. Some slight differences were noted; thus the notogastral setae are heavily barbed in the 4 Campbell I. specimens and, in addition, coxisternal setae *1b* are strongly developed. These features are frequently more weakly developed in the specimens from Macquarie I., although they are subject to such variation that these difference are probably not significant at the specific level.

Family SCHELORIBATIDAE Grandjean, 1933

Genus **Scheloribates** Berl., 1908

This genus, common in many other parts of the world, has not hitherto been recorded in collections south of Campbell I., although the family is represented on the Antarctic Continent by the genus *Maudheimia* (Dalenius & Wilson 1958, Wallwork 1962). A large number of specimens of an apparently new species of *Scheloribates* have been collected at Beeman Hill, and this form is described below under the name *Scheloribates flagellatus*, n. sp.

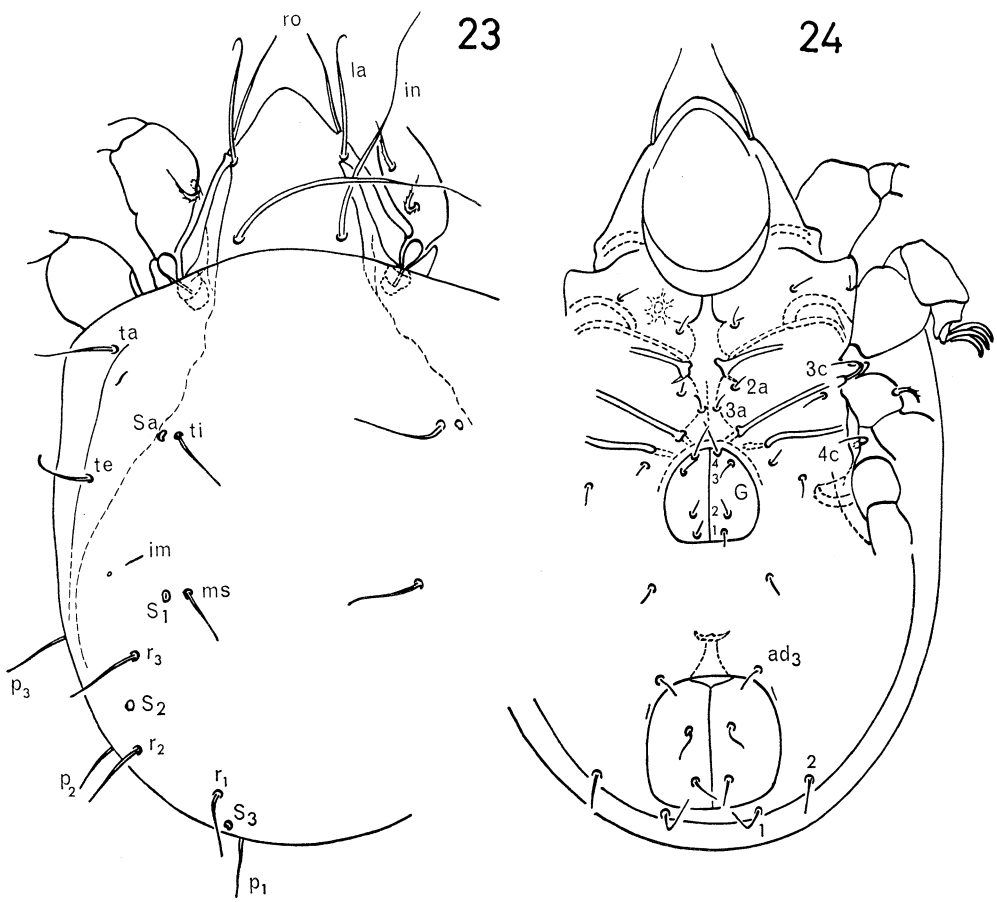
Scheloribates flagellatus Wallwork, n. sp. Figs. 23-27.

MATERIAL EXAMINED: 62 adults (40♀♀; 22♂♂).

Measurements: ♀♀. Average length of body: 263.2 μ (range: 240.8 μ-302.4 μ); average width: 159.6 μ (range: 134.4 μ-184.8 μ). ♂♂. Average length of body: 246.4 μ (range: 224.0 μ-280.0 μ); average width: 145.6 μ (range: 123.2 μ-179.2 μ).

Integument: Color of body and legs brown; cuticle generally smooth; a peripheral ring of pale areas weakly developed on lateral margins of notogaster; coxisternal region weakly fenestrated.

Prodorsum: Rostrum rounded anteriorly, sub-triangular in shape. Prodorsal setae smooth, slender and terminate in fine flagelliform tips. Lamellar setae approximately as long as rostrals, inserted at anterior extremity of each lamellar ridge. Interlamellar setae exceptionally long and flagelliform (fig. 23). Lamellar ridges extending anteriorly from pseudostigmatic region for a distance equal to 2/3 length of prodorsum; each ridge narrows anteriorly, is broad posteriorly and produced into a vertical blade which appears to be continuous with anterior margin of each pteromorph. Pseudostigmata completely covered by base of pteromorphs; sensillus with a short stalk, hardly extending beyond rim of pseudostigma, and a globular, smooth head, concealed in part by base of pteromorph.



Figs. 23–24. *Scheloribates flagellatus* n. sp. Holotype. Adult. 23, Dorsal; 24, Ventral. *Sa*, S_1 S_2, S_3=notogastral sacculi; *ta, te, ti, ms*, r_{1-3}, p_{1-3}=notogastral setae; G=genital plate; *2a, 3a, 3c, 4c*=coxisternal setae. Other notations as in figs. 2–4.

Notogaster: Dorso-sejugal suture distinct, slightly curved in contour. Pteromorphs well developed, broadly curved ventrad. In general shape, notogaster broadly rounded, only slightly longer than its breadth. There are 10 pairs of notogastral setae inserted in usual positions (fig. 23); these setae are quite distinct and with flagelliform tips. Four pairs of sacculi small and dark-colored. (A frequent variation in the specimens examined is the subdivision of sacculus S_1 into two).

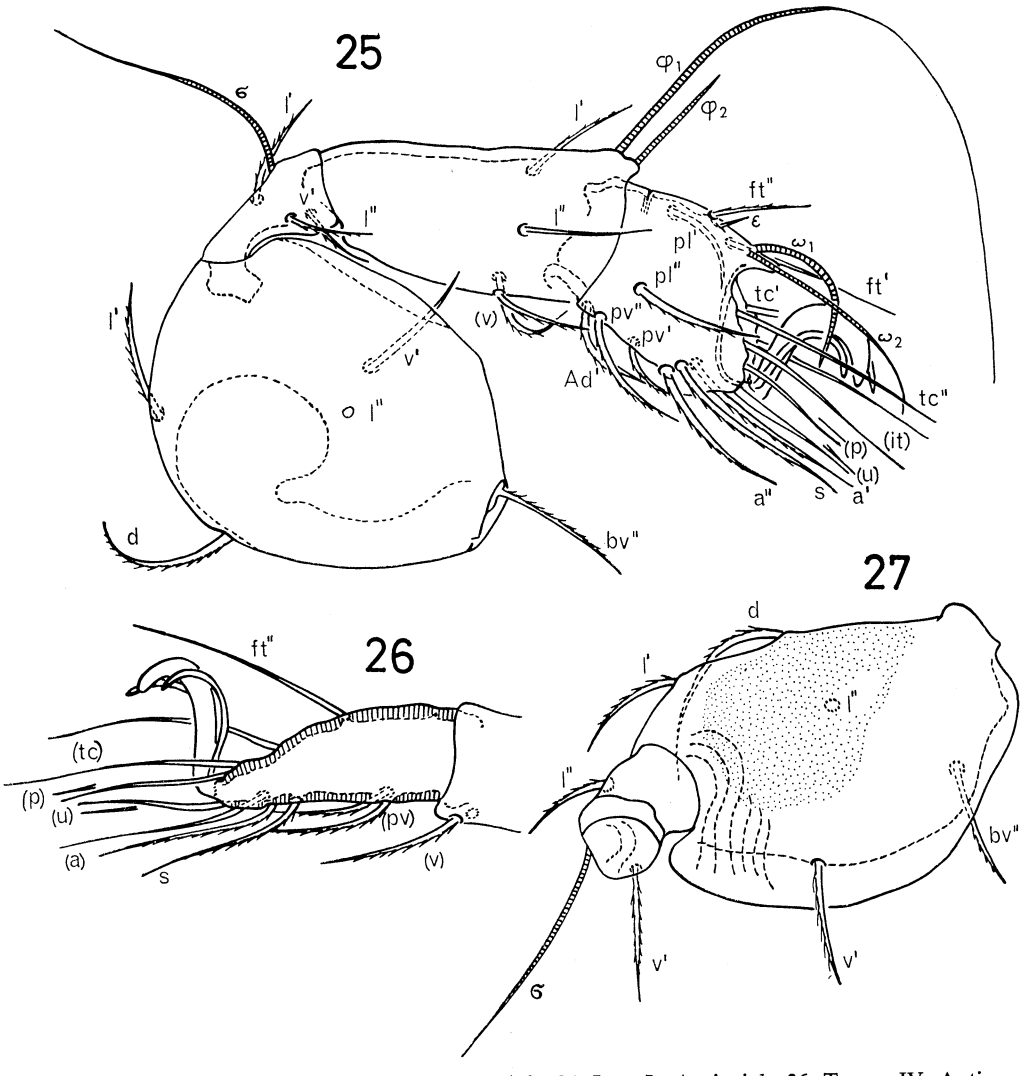
Ventral region: Anal aperture almost square in outline. Anal and adanal setae slender and smooth, appreciably longer than coxisternal and genital setae. Adanal setae ad_3 (anteriorly) inserted close to anterior rim of anal aperture; setae ad_2 remote from anal field, and ad_1 post-anal in position (fig. 24). In 2 specimens examined, 1 anal plate with 3 setae, the other plate normal with 2 setae (this was the only variation noted in the chaetotaxy of the anal/adanal region). Genital aperture ovoid in outline, broadly rounded anteriorly. Each genital plate with 4 setae arranged in usual manner, as a general rule. Variations affecting chaetotaxy of this region slight; the penultimate genital seta anteriorly (*G3*) is lacking on 1 plate, the other plate normal, in 1 sp.; in another specimen, the most anterior genital seta (*G4*) is remote from anterior margin of plate, and is posteromedian in position to seta *G3*, on both plates.

Coxisternal ridges and their associated apodemes developed in usual manner (fig. 24); ventro-sejugal and ridge III occasionally extending to rim of genital aperture. Sternal ridge weakly developed. Coxisternal setae generally short and smooth; setae *3c* and *4c* longer than rest, the former inserted on a short, conical projection immediately posterior to pedotectum II. Coxisternal setal formula (3-1-3-3), relatively constant in specimens examined; 1 specimen with an additional seta inserted at sternal extremity of ventro-sejugal apodeme, on one side only. Setae *2a* variable in position, and so, to a lesser extent, are setae *3a*.

Lateral region of podosoma: Tutorium lacking; sub-lamellar ridge well developed; sublamellar area porosa conspicuous in lateral view, rounded in shape. Pedotecta I and II present; discidium not developed as a projecting ridge, but merely as a shallow wing bearing insertion of coxisternal seta *4c*. Circum-pedal ridge present, weakly developed.

Legs: All femora enlarged, particularly femora I and II which are laterally compressed and bear a well developed ventral keel (figs. 25 & 27). Trochanters III and IV large, ovoid (III) or rounded (IV). Tibiae I and II heavily developed; tibiae III and IV broad, but less strongly developed than I and II. Tarsi short and broad, excavated distally forming concavity into which the claws may be reflexed; this excavation is strongly developed on tarsi I and II where the concavity is bordered laterally by a pair of serrated ridges bearing insertions of setae (*tc*) and (*it*); dorsally, concavity is limited by a prominent crest on which origins of solenidia ω_1 and ω_2 (fig. 25) are located. Tarsi III and IV less strongly excavated; the former possesses lateral serrated ridges, but these lacking or weakly developed in latter; both tarsi III and IV lacking dorsal crests (fig. 26).

Leg chaetotaxy summarised as follows for trochanter, femur, genu, tibia, tarsus and claws of legs I-IV: I(1-5-3-4-19-3); II(1-5-2-4-15-3); III(2-3-1-3-15-3); IV(1-2-2-3-12-3). An additional seta (*Ad'*) present on tarsus I (fig. 25). Famulus of tarsus I (ε) is a short spine located just distal to seta *ft''*. All tarsi tridactyle, heterodactyle, with median claw more strongly developed than the 2 laterals. Distribution of solenidia on genu, tibia and tarsus of legs I-IV normal, the formula being: I(1-2-2); II(1-1-2); III(1-1-0); IV



Figs. 25–27. *Scheloribates flagellatus* n. sp. Adult. 25, Leg. I; Antiaxial; 26, Tarsus IV, Antiaxial; 27, Femur and genu II, Paraxial. Setal notations follow Grandjean's scheme. Notations in parentheses denote paired setae.

(0-1-0). Solenidion φ_1 very long and flagelliform on tibiae I and II; solenidion φ_2 on tibia I a rather short, slender structure and inserted, together with φ_1, on a knob-like projection. Solenidion ω_1 on tarsus I strongly curved, baculiform, rather shorter than flagelliform solenidion ω_2. Solenidia ω_1 II and ω_2 II approximately equal in length and resembling ω_1 I in form.

LOCALITY DATA: All specimens collected from moss, Beeman Hill, 2, 6. XII. 1961, J. L. Gressitt.

Remarks: This new species may be characterised by the following combination of features: 1, Interlamellar setae long and flagelliform; 2, Sensillus short, clavate; 3, Pseudostigmata covered by base of pteromorphs; 4, All notogastral setae flagelliform; 5, Adanal setae ad_2 remote from anal aperture; 6, Femur strongly developed on all legs; tarsi, particularly I and II, short, broad and excavated.

The curious development of the tarsi is reminiscent of that noted previously in the genus *Totobates* (Wallwork 1964c), and it also occurs in several South American forms described by Hammer (1961, 1962), notably *Cantharozetes lucens* and *Andeszetes diversidactylus*. *S. flagellatus* may be distinguished easily from these on the basis of the other characters listed above.

Family CERATOZETIDAE Jacot, 1925

Several specimens collected at Beeman Hill represent a new form which is identified with the family Ceratozetidae on the basis of the following characters: A well developed tutorium is present on the prodorsum, and this region lacks a sub-lamellar ridge; camerostome has a genal incision; porose areas are present on the notogaster; pedotectum I is large; discidial and custodial points are well developed; pteromorphs curve ventrad and are not hinged. The form possesses some unusual characters which cannot be identified with any of the known genera belonging in this family. Accordingly it is considered to represent a new genus, designated *Macrogena*.

Genus **Macrogena** Wallwork, n. gen.

This new genus is characterised by the following combination of morphological features: genal process very strongly developed; prodorsal lamellae with short, broad cusps, each bearing insertion of lamellar seta; translamella strongly developed; tutorium with a free cusp; notogastral porose areas small and rounded, but distinct; there are 10 pairs of short, fine, notogastral setae; all tarsi monodactyle; setae (*it*) lacking on all tarsi; genital setae number 5 pairs; anterior margin of pteromorph deeply incised at point of junction with notogaster.

Type species: *Macrogena monodactyla* n. gen. n. sp.

Macrogena monodactyla Wallwork, n. sp. Figs. 28-32.

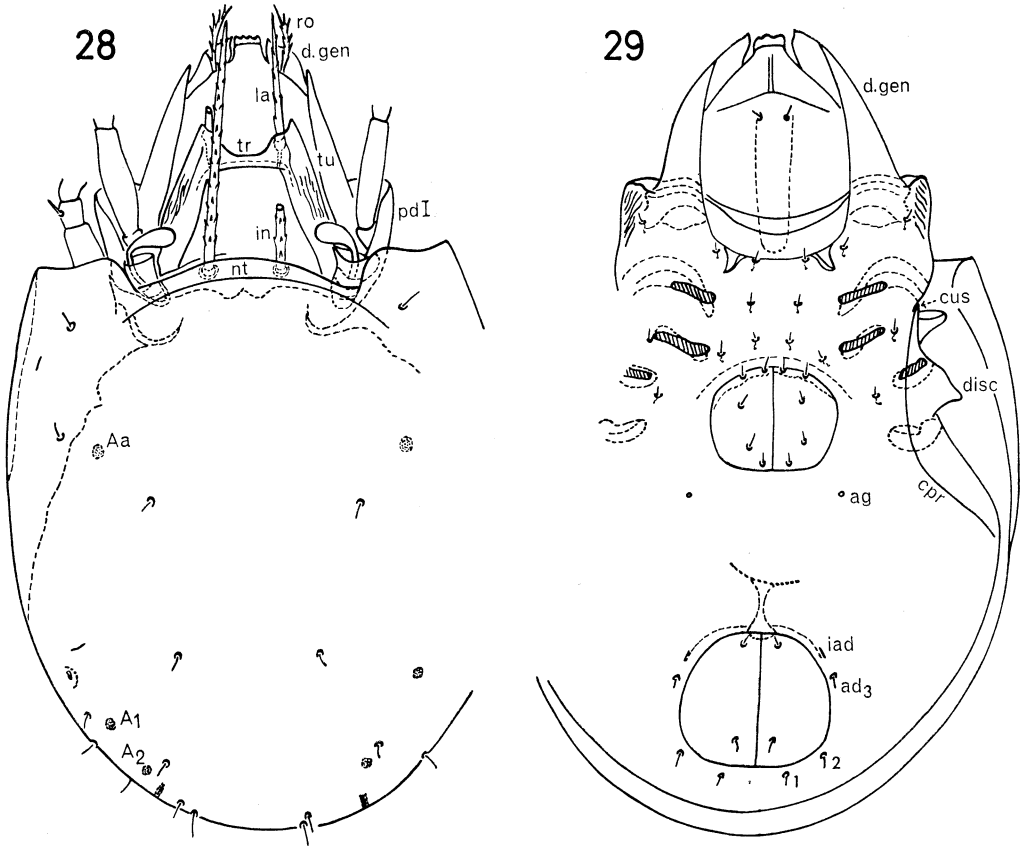
MATERIAL EXAMINED: 13 adults (7♀♀, 6♂♂).

Measurements: ♀♀. Average length of body: 321.4 μ (range: 308.0 μ-330.4 μ); average width: 205.5 μ(range: 190.4 μ-212.8 μ). ♂♂. Average length of body: 306.3 μ(range: 296.8 μ-313.6 μ); average width: 196.0 μ (range: 184.8 μ-201.6 μ).

Integument: Surface of cuticle generally smooth, light brown in color. Cerotegument lacking over most of exposed surfaces of body and legs, but present as a folded membrane ornamented with black dots beneath pteromorphs. A strip of this membrane also extending across interpseudostigmatic region, closely applied to tectal extension of notogastral margin.

Prodorsum: In lateral view (fig. 30) rostrum steeply curved ventrad; in dorsal view (fig. 31) lateral margins converging rather sharply in front of rostral setae, with anterior

extremity of rostral tectum produced into a truncated lobe capped with a fringe of very thin cerotegument. One specimen examined with a lateral tooth-like projection on one side of rostral knob. Rostral setae strongly thickened, as long as their mutual distance, with thick branches, slightly curved, extending beyond anterior tip of rostrum for a distance equal to 1/2 their length. Flanking rostral knob is a pair of genal processes (*d. gen.*) each originates ventrolaterally on propodosoma, is strongly developed, pale in color, extending as far forwards as anterior extremity of rostrum, and terminating anteromedially in a point (figs. 28 & 31). Each lamella is a broad, clearly defined plate, attached to prodorsum along its medial margin, extending obliquely away so that the lateral edge is free. Anteriorly each lamella produced into a short, broad, free cusp, as wide as lamella; apex of each cusp indented to accommodate insertion of lamellar seta. A strongly developed translamella connecting the 2 lamellae (*tr* in fig. 28); posterior edge of this transverse ridge attached to prodorsum, continuous with medial margins of lamellae; blade of translamella extending away obliquely from prodorsal surface. Lamellae with a microsculpture



Figs. 28-29. *Macrogena monodactyla* n. gen. n. sp. Holotype. Adult. 28, Dorsal; 29, Ventral. *d. gen*=genal process; *tr*=translamella; *tu*=tutorium; *nt*=notogastral tectum; *pdI*=pedotectum I; *Aa*, A_1, A_2=notogastral areae porosae; *cus*=custodium; *disc*=discidium; *cpr*=circum-pedal ridge; *iad*=adanal fissure. Other notations as in figs. 2-4.

of longitudinal ridges. Each lamellar seta strongly thickened, rod-like, with short, thick barbs; setae about 2× as long as their mutual distance. Each interlamellar seta originating on a prominent insertion located on interpseudostigmatic region which is covered by the tectal extension of the anterior notogastral margin; these setae strongly thickened, similar in form to lamellar setae, much longer than the other prodorsal setae, extending anteriorly as far as anterior limits of lamellar and rostral setae. Each pseudostigma large, uncovered except basally, flanked laterally by anterior lobe-like development of the pteromorph, with median wall continuous with free lamellar blade (fig. 32). Sensillus with a short, strongly curved stem and a smooth globular head directed medially.

Notogaster: Broadly rounded posteriorly, not markedly domed in lateral view. Pteromorphs large and broad, deeply curving ventrad (fig. 30), extending anteriorly beyond anterior margin of notogaster but not ear-like in form; anterior pteromorphal margin with a concave contour; this margin strongly recurved posteriad where it overlaps lateral wall of pseudostigma (fig. 32). A thin tectal extension of anterior notogastral margin forming a bridge between pteromorphs, covering insertions of interlamellar setae and basal part of pseudostigmata. Surface of pteromorph with a fine, veined microsculpture (fig. 30). There are 10 pairs of fine notogastral setae, arranged as shown in fig. 28, and 3 pairs of small, rounded areae porosae; there are no posterior areae porosae A_3.

Ventral region: All ventral setae short and fine; there are 3 pairs of adanals (the most anterior (*ad*$_3$) located posterior to adanal fissure *iad*), 2 pairs of anals, 1 pair of very short or virtual aggenitals, and 5 pairs of genitals; 2 genital setae inserted on anterior margin of each plate, remainder distributed down length of plate (fig. 29). Genital aperture of ♂♂ relatively smaller than that of ♀♀.

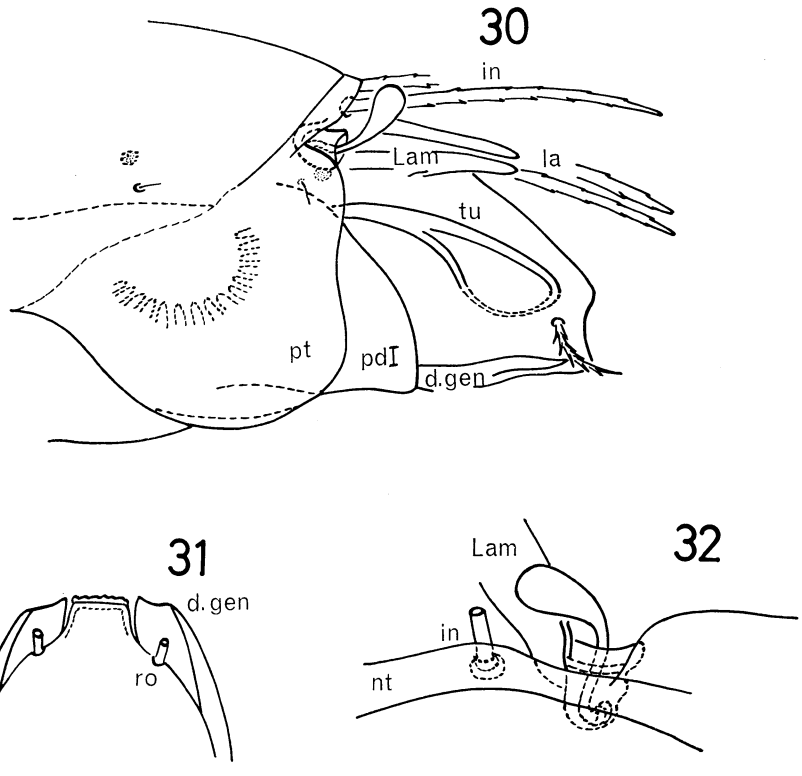
Coxisternal chaetotaxy and development of apodemes and ridges in this region reminiscent of genus *Ceratozetes*, and details are given in fig. 29. Coxisternal setae *3c* and *4c* were not observed. Sternal ridge lacking.

Lateral region of podosoma: Main features of lateral region of prodorsum given in fig. 30. Tutorium strongly developed (*tu*), terminating anteriorly in a free cusp which is expanded and scoop-shaped and applied closely to lateral margin of prodorsum; this ridge with a microsculpture of longitudinal striae, similar to that of lamella. Insertion of rostral seta not associated with tutorium. Genal process mentioned above broadly inserted ventrolaterally in this region, extending forwards to rostrum. No sub-lamella present. Exopseudostigmatic setae short and inconspicuous; sub-lamellar area porosa ill-defined. Pedotectum I very large, its outer surface ornamented with longitudinal ridges.

A circum-pedal ridge (*cpr*) is developed; discidium (*disc*) is heavily developed and sharply pointed, particularly in ♀♀; custodium thickened and tapering abruptly to a point (*cus*) at level of pedotectum II. These features can be seen in ventral view (fig. 29), as can the broad origin of genal process.

Gnathosoma: Labio-genal articulation diarthral; rutellum pantelebasic. Chaetotaxy of palp normal, expressed by formula: (0-2-1-3-9); form of palpal setae similar to those of *Ceratozetes*, and a "corne double" formed between solenidion and seta *acm* on tarsus.

Legs: Ventral crests developed but not conspicuous on all femora. All tarsi with a single, well developed claw. Tarsal chaetotaxy with several interesting features; setae (*it*) lacking on all tarsi; setae (*pl*) retained on tarsus II; seta *ft''* considerably shorter than *ft'* on tarsus I; famulus on tarsus I short and baculiform. Tarsal setal formula may



Figs. 30–32. *Macrogena monodactyla* n. gen. n. sp. Holotype. Adult. 30, Lateral region of propodosoma; 31, Rostrum, Dorsal, tutoria removed; 32, Pseudostigmatic region, Dorsal. *pt*=pteromorph; *Lam*=lamella. Other notations as in figs. 28–29.

be summarised as follows:

I: e; (*pl*); (*ft*); (*p*); (*u*); (*tc*); (*pv*); *s*; (*a*)=16
II: (*pl*); (*ft*); (*p*); (*u*); (*tc*); (*pv*); *s*; (*a*)=15
III: (*ft*); (*p*); (*u*); (*tc*); (*pv*); *s*; (*a*)=13
IV: *ft*''; (*p*); (*u*); (*tc*); (*pv*); *s*; (*a*)=12

Variations: These are slight and are frequently associated with sexual dimorphism; genital aperture smaller in ♂♂ than ♀♀, and the discidium more weakly developed in the ♂♂. There are minor variations in the contours of rostral and genal margins.

LOCALITY DATA: All specimens were collected from moss taken at Beeman Hill, Campbell I., 2,6.XII.1961, J. L. Gressitt.

Remarks: This new genus is similar in some respects to *Boreozetes* Hammer (1955) from Alaska, particularly in general size and shape, the form of prodorsal ridges, the indented character of the anterior notogastral margin, and the ventral characters. In other respects, the two genera may be separated easily. Thus the form of the genal processes, the tutorium, the sensillus and the dorsal setae is different in the two cases and, in addition, *Boreozetes* has 13 pairs of notogastral setae, 4 pairs of notogastral areae porosae and tridactylous tarsi.

Family HAPLOZETIDAE Grandjean, 1936

Genus **Totobates** Hammer, 1961

Previously (Wallwork 1964c) a description has been given of the form *Totobates elegans* (Hammer) ssp. *antarcticus* Wallw. from Campbell I. Since the publication of this description, Dr Hammer has very kindly compared some of the specimens examined by me with her own material, and she is of the opinion that the Campbell I. form represents a species distinct from *T. elegans*. It is therefore propose to designate this form under the new combination: *Totobates antarcticus* n. comb. I am grateful to Dr Hammer for making the comparison.

Totobates is undoubtedly well represented in the New Zealand islands, although the various species are not readily distinguishable from each other. Several forms have been encountered in the Campbell I. collections but have not been studied in detail as yet. One species which has been identified tentatively with the nominate form of *T. elegans* is present in collections from Monument Harbor, taken from under lichen growing on rock at the top of the beach by K. A. J. Wise on 9.II.1963.

Cryptostigmata from peat

Among the Bishop Museum collections examined in this present work were 18 vials of Cryptostigmata collected from peat deposits at Tucker Cove, Campbell I. by K. Rennell and K. A. J. Wise on 25.II.1963. Almost all of the specimens in these collections are damaged integumental shells, unsuitable in many cases for identification or description. However, it was possible to distinguish 2 different species of *Eutegaeus*, one of which appears to be *E. bostocki* (Mich.), the other apparently new, *Macrogena monodactyla*, and a species of *Totobates*.

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AUSTRALIAN GLOW-WORMS OF THE GENUS ARACHNOCAMPA EDWARDS (Diptera: Mycetophilidae)

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Abstract: Cave-dwelling mycetophilids of the genus *Arachnocampa* are treated and keyed. Two new species, *richardsae* and *flava*, are described.

The most recent taxonomic work on *Arachnocampa* is that by me (1961) redescribing the New Zealand species *A. luminosa* (Skuse). Since then, interest in Australian glow-worms has grown and it has become desirable to re-examine the Australian fauna taxonomically. One species has been described from Australia *viz. A. tasmaniensis* Ferguson, and I (1961) indicated that it was close to *A. luminosa* but that a larger series was needed for a satisfactory examination of the fauna.

Several collections of adults and larvae have now been gathered together and, as a result of the study of them it has been possible to formulate some ideas on the species in existence and of their relationships. This paper gives results of such study.

Acknowledgment for help in locating collections and for loaning specimens is grate-