

# STIGMAEIDAE (ACARI : PROSTIGMATA) FROM CAMPBELL ISLAND

BY

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## ABSTRACT.

Five species of Stigmaeidae are recorded from Campbell Island. *Stigmaeus campbellensis* n. sp., and *Pseudostigmaeus longisetis* n. sp. are described. The other three species *Pseudostigmaeus collyerae*, *Mecognatha hirsuta* and *Mullederia arborea*, were first recorded from New Zealand, while *M. hirsuta* has also been found in Australia.

## INTRODUCTION.

There are no records of Stigmaeidae from Antarctica, and until the material on which the present paper is based was available for study there were no records of this family from the subantarctic islands. None of the other raphignathoid families are as yet known from the subantarctic islands, and only one species, *Raphignathus johnstoni* WOMERSLEY belonging to the Raphignathidae, is known from Antarctica (WOMERSLEY, 1937).

The system of nomenclature used here follows that previously adopted by the author (WOOD, 1967). All measurements are given in microns ( $\mu$ ). The body length is measured from the anterior margin of the propodosomal plate to the tip of the anal covers and the number of specimens on which measurements are based is given by  $n = 10$  etc.

All specimens have been deposited in the Bishop Museum, Hawaii.

Genus *Stigmaeus* KOCH (1836), emend. SUMMERS (1962).

***Stigmaeus campbellensis* n. sp.**

(fig. 1)

FEMALE ( $n = 8$ ). Length 460 (400-490).

*Dorsum* : Plates well developed, fitting close together, strongly sclerotised and ornamented with dimples enclosed by a thick reticulum (Fig. 1 A). Large median propodosomal plate bears three pairs of setae, a pair of large and finely reticulated "ocular fenestrae" (*pob*) and three

pairs of small anomolous dimples situated medially. A pair of small lateral propodosomal plates bear setae *de*. Median plate bears three pairs of setae, *a*, *b* and *c*. Setae *li* located on paired intercalary plates. Dorsal setae acicular, without barbs and with hyaline sheath in distal half; the ease with which this sheath can be observed varies and on some specimens it is scarcely apparent, in others it is abraded and in some can be readily seen to extend beyond the tip of the central core (Fig. 1 E). Lengths of setae : *be* 108 ; *li*, *e*, *le* 85 ; *ce* 46 ; others 60-80. Areas between plates covered with smooth striae ; large area posterior to chelicerae is not striated but is microtuberculate.

*Venter* : Maxillicoxae distinctly reticulated ; setae *n* (29) slightly shorter than *m* (34) ; *n-n* < *m-m* ; *re* longer than *ri* (fig. 1 C). Intercoxal plates distinctly reticulated, their setae being subequal (29). Three pairs of subequal (31) paragenital setae (*pg*<sub>1</sub> — *pg*<sub>3</sub>) situated on reticulated plate. Four pairs of setae on reticulated anogenital covers : *g*<sub>1</sub> (25) only slightly shorter than *g*<sub>2</sub> (30), both being slender ; *g*<sub>3</sub> (58) and *g*<sub>4</sub> (65) are distinctly thicker and longer. This arrangement of anogenital setae is like that in *Stigmaeus summersi* Wood ; the statement that this latter species had five anogenital setae (Wood, 1967) was an error.

*Appendages* : Legs and palps are faintly reticulated. Numbers of setae on leg podomeres (special sensillae in parentheses) as follows : tarsi 14 (ω) — 10 (ω) — 8 (ω) — 8 (ω) ; tibiae 7 (øp) — 6 (øp) — 6 (øp) — 6 (øp) ; genua 4 (*k*) — 4 (*k*) — 1 — 1 ; femora 6 — 5 — 3 — 2 ; trochantera 1 — 1 — 2 — 1 ; coxae 2 — 2 — 2 — 2. Spine *kI* setiform (57) only slightly longer than associated dorsal seta (fig. 1 H) ; *kII* much shorter, about 1/5 as long as associated dorsal seta ; dorsal seta *d* on tibia IV about 1.4 times as long as lateral seta *l* ; ω IV slightly longer than ω III. Empodium with pointed raylets. Numbers of setae from palp-femur to palp-tarsus is 3 — 2 — 4 — 7 ; tibial claw is as long as tarsus and accessory seta (*acc*) is claw-like (fig. 1 B) ; terminal sensillae on tarsus consists of a simple and a multiple (trifid) eupathid ; lateral solenidion on tarsus rod-like.

MALE : Not known.

#### IMMATURE STAGES.

*Stigmaeus campbellensis*, like *S. summersi* Wood (Wood, 1967), appears to have one larval and two nymphal stages in which the chaetotaxy of the legs and venter changes during development. The most obvious changes are outlined below. However, unlike *S. summersi*, the dorsal shields are different to those of the adult in that the median plate bears only two pairs of setae, *a* and *b*, and setae *c* are borne on paired median zonal plates (fig. 1 D) ; also the dorsal setae are longer, relative to the length of the body, than those of the adult.

*Larva* : Genua 3 (*k*) — 3 (*k*) — 0 ; femora 4 — 4 — 3 ; trochantera 0 — 0 — 0 ; coxae 1 — 0 — 0. Terminal sensillum on palp-tarsus is forked, not trifid ; two setae on palp-femur and one on palp-genu. Intercoxal setae *qa* absent ; no paragenital setae ; three pairs of anogenital setae (*g*<sub>1</sub> absent) ; no setae on maxillicoxae.

*First nymph (protonymph)* : Seven setae on tarsus IV (*vs'* absent) ; genua 4 (*k*) — 3 (*k*) — 0 — 0 ; femora 4 — 4 — 3 — 1 ; trochantera 0 — 0 — 1 — 0 ; coxae 2 — 2 — 2 — 0. Intercoxal seta *qa* absent ; one pair of paragenital setae and three pairs of anogenital setae (fig. 1 F) ; one pair of setae on maxillicoxae.

*Second nymph (deutonymph)* : Genua 4 (*k*) — 3 (*k*) — 0 — 0 ; no setae on trochanter IV. Three pairs of anogenital setae (fig. 1 G).

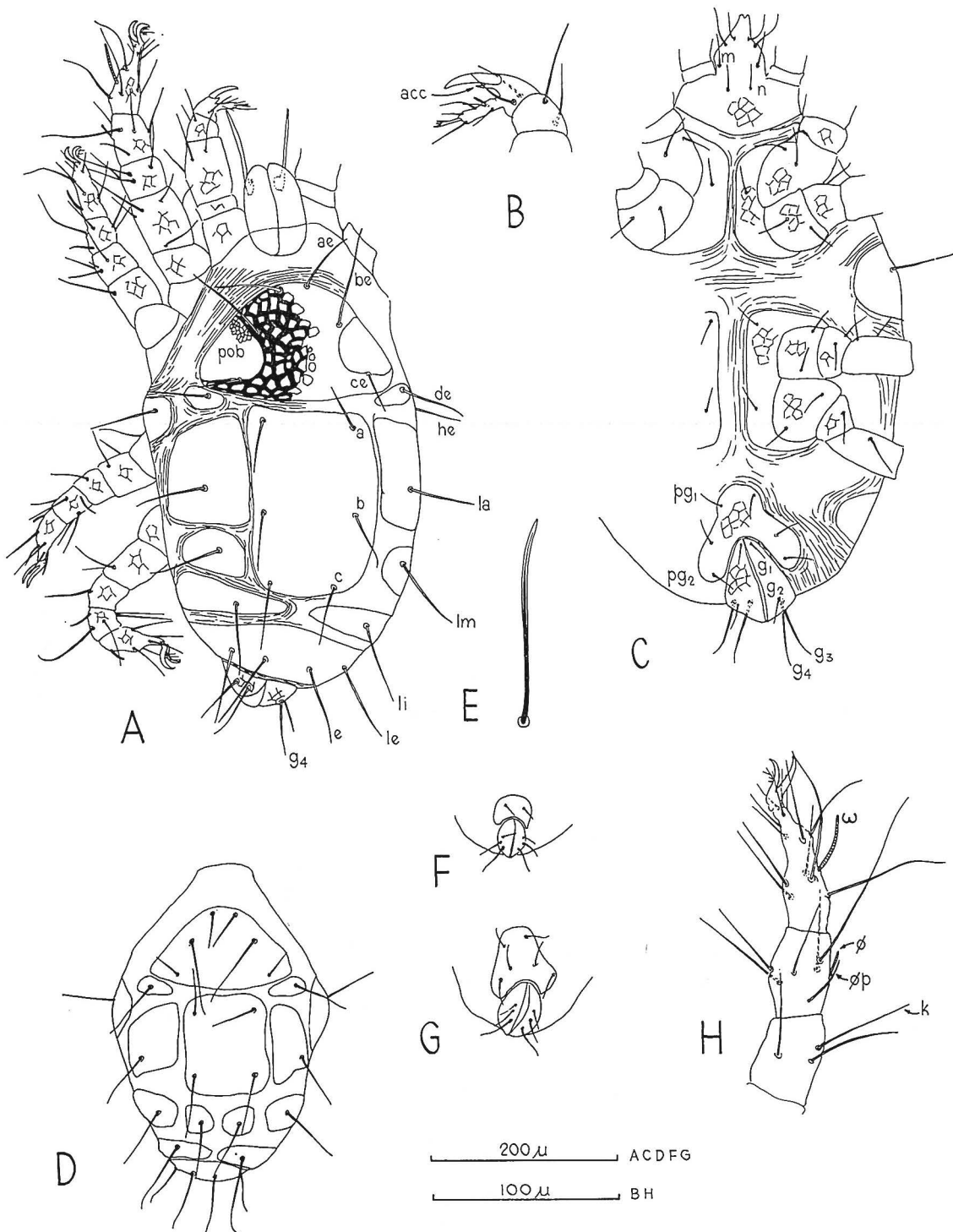


FIG. 1 : *Stigmaeus campbellensis* n. sp.

A. — Female, dorsal ; B. — Palp-tibia and tarsus ; C. — Female, ventral ; D. — Female, protonymph, dorsal ; E. — Dorsal seta ; F. — Female, protonymph, opisthosoma, ventral ; G. — Female, deutonymph, opisthosoma, ventral ; H. — Female, right leg I.

#### DISTINGUISHING FEATURES.

*S. campbellensis* is very similar to *S. summersi* from New Zealand. The most obvious difference in the adults is in the nature of the median hystersomal plate which bears setae *a*, *b*, and *c* in *campbellensis* but only setae *a* and *b* in *S. summersi* in which setae *c* are borne on paired median zonal plates. Minor differences from *S. summersi* are the slightly smaller size, relatively shorter dorsal setae ( $a/a - a$  and  $b/b - b = 0.6$  in *S. campbellensis* and 1.0 in *S. Summersi*), the absence of small barbs on the dorsal setae, the microtuberculate integument anterior to the propodosomal shield (striated in *S. summersi*) and the length of spine *kI*, which is only slightly longer than the associated dorsal seta but about 1.5 times longer in *S. summersi*. However, in the immature stages both species have setae *c* on paired median zonal plates and the relative length of *kI* and the associated dorsal seta is the most obvious distinguishing feature.

#### COLLECTION DATA.

Holotype (adult female) (Bishop 8248) from leaf mould under tussock, Perseverance Harbour, Lookout Bay, 3.ii.63 (K. A. J. WISE). Other collections : 2 ad. ♀, 11 juv. ♀ (1 paratype ♀ protonymph), *Azorella*, 200 m, Courrejolles Peninsula (J. L. GRESSITT) ; 1 ad. ♀, moss and leaf mould, Courrejolles Peninsula, 10.iii.62 (K. RENNELL) ; 1 juv. ♀, moss and lichens, 1-50 m, Tucker Cove, 21-25.xi.61 (J. L. G.) ; 1 ad. ♀ (paratype), moss and lichens on rocks below summit of Mt. Lyall, 390 m, 14-ii.63 (K. A. J. W.) ; 1 ad. ♀ (paratype), mixed moss, St. Col-Lyall-Bee-man, 3-5.xii.61 (J. L. G.) ; 1 juv. ♀, *Azorella* etc., Beeman beach, 19.xii.61 (K. R.).

#### Genus *Pseudostigmaeus* WOOD (1967).

##### *Pseudostigmaeus longisetis* n. sp.

(fig. 2).

FEMALE ( $n = 4$ ). Length 535 (520-545).

*Dorsum* : Typical for the genus in that the dorsal plates are confined to a median propodosomal plate, bearing three pairs of setae and a pair of eyes, and a suranal plate, which in this species is narrowly divided each plate bearing two pairs of setae. All other dorsal setae are borne on minute platelets. The plates are smooth and the median propodosomal plate has a median subcuticular thickening in the form of a short, wavy line (fig. 2 A) and short lines lateral to the eyes. Setae slender, acicular, their lengths as follows : *be* 165 ; *he* 105 ; *de* 55 ; *la*, *li*, *e*, *le* 45 ; others 27-34. Integumental striae smooth ; area anterior to propodosomal plate is microtuberculate.

*Venter* : Maxillicoxae smooth ; setae *n* flagelliform (110), about 2.7 times as long as *m* and extending well past tip of rostrum ; *n - n* about 1.5 times longer than *m - m* ; *re* and *ri* subequal (fig. 2 C). Intercoxal plates smooth, thinly sclerotised, anterior pair closer together than posterior pair ; setae *1a* flagelliform (125), *3a* and *4a* subequal (28). Coxal setae *1c* and *2b* flagelliform (48), distinctly longer than other coxal setae ; setae *2b* and *2c* appear to arise much closer together than in other species. Three pairs of subequal (24) paragenital setae, *pg*<sub>1</sub> located on striated integument, *pg*<sub>3</sub> and *pg*<sub>2</sub> borne on a pair of smooth, elongate plates ; one aberrant specimen has two setae in the *pg*<sub>1</sub> position on the left side. Four pairs of anogenital setae, *g*<sub>1</sub> minute (10) others subequal (28). Transverse striae between the anterior and posterior groups of coxae are microtuberculate.

*Appendages* : Numbers of setae on leg podomeres as follows : tarsi 14 ( $\omega$ ) — 10 ( $\omega$ ) — 8 ( $\omega$ ) — 8 ( $\omega$ ) ; tibiae 7 ( $\sigma$ ,  $\sigma\sigma$ ) — 6 ( $\sigma\sigma$ ) — 6 ( $\sigma\sigma$ ) — 6 ( $\sigma\sigma$ ) ; genua 4 ( $k$ ) — 4 ( $k$ ) — 1 — 1 ; femora 6 — 4 — 3 — 2 ; trochantera 1 — 1 — 2 — 1 ; coxae 2 — 2 — 2 — 2 ; spines  $kI$  and  $kII$  short, about  $1/6-1/8$  as long as associated dorsal seta ; solenidion  $\sigma$  on tibia I is small, difficult to observe ; tibial macroseta  $d IV$  3.0 times as long as lateral seta. Empodium with capitate raylets. Numbers of setae on palp-tarsus to palp-femur 7 — 4 — 3 — 2 ; tibial claw slightly shorter than tarsus ; accessory seta short, slender ; lateral solenidion on tarsus rod-like, terminal sensillum rod-shaped with indistinct terminal cleft (fig. 2 B).

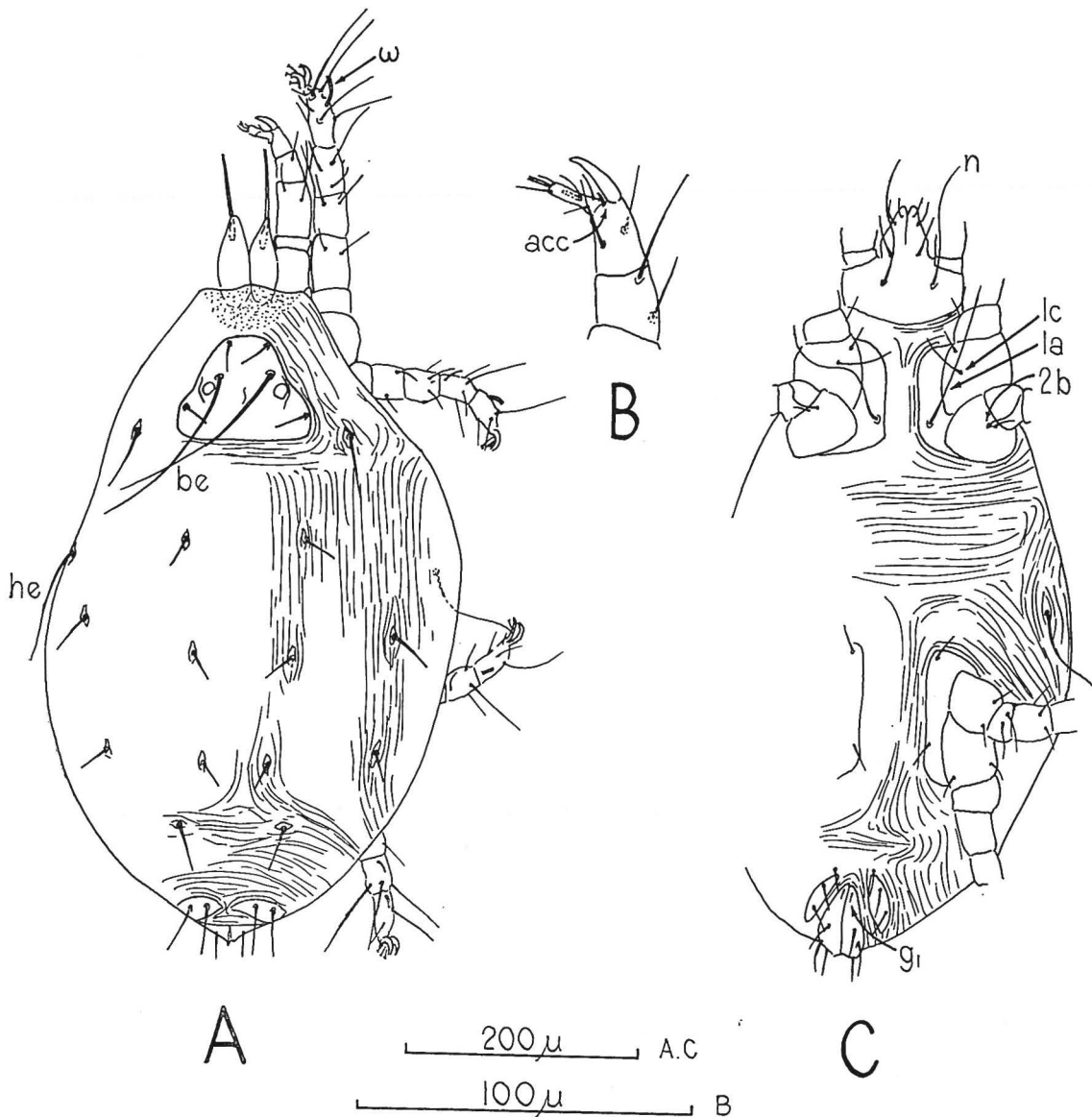


FIG. 2 : *Pseudostigmaeus longisetis* n. sp.  
A. — Female dorsal ; B. — Palp-tibia and tarsus ; C. — Female ventral.

MALE. Not known.

DISTINGUISHING FEATURES.

There are two other described species of *Pseudostigmaeus* (WOOD, 1967) both of which occur in New Zealand\*. *P. longisetis* is very similar to *P. striatus* Wood and in fact the only obvious difference between the two species is the length of intercoxal setae *1a*, which in *P. longisetis* are flagelliform (125) and 4.5 times as long as the other intercoxal setae whereas in *P. striatus* the three pairs of intercoxal setae are more or less subequal (27-33). A less obvious difference between the two species is the relative length and position of setae *a*, *b* and *c*. In both species these setae are about the same length but in *P. longisetis* pair *a* is more widely separated than pair *b* which are more widely separated than pair *c*, whereas in *P. striatus* the distance between the members of each pair are more or less the same: the ratios *a-a/a*, *a-b/a*, *b-b/b* and *c-c/c* in *P. longisetis* and *P. striatus* respectively are 4.0, 4.0, 3.4, 2.0 and 2.4, 3.0, 2.4, 2.0.

COLLECTION DATA.

Holotype (adult female) (Bishop 8249) from yellow moss, 100-180 m, Beeman Hill, 11-16.xii.61 (J. L. GRESSITT). Other collections: 2 ad. ♀, mollymawk nests, Courrejolles Peninsula, 14.xii.61 (J. L. G.); 1 ad. ♀ (paratype), weed and grass turf, 1-50 m, Tucker Cove, 6-11.xii.61 (J. L. G.); 1 ad. ♀, "miscellaneous Berlese extractions", 1961 (J. L. G.).

*Pseudostigmaeus collyerae* Wood.

*Pseudostigmaeus collyerae* WOOD, 1967, p. 109.

This is an arboreal species which is widely distributed in New Zealand (WOOD, 1967). It exists in two forms, only one of which (form B) has been collected from Campbell Island: 2 ad. ♀, lichens on *Dracophyllum scoparium*, above Tucker Cove, 28.ii.63 (K. A. J. WISE); 1 ad. ♀, *Coprosma*, Beeman, 15.viii.62 (collector not specified); 1 ad. ♂, *Coprosma*, Lookout Bay beach, 3.xii.61 (J. L. GRESSITT).

Genus *Mecognatha* Wood (1967).

*Mecognatha hirsuta* Wood.

*Mecognatha hirsuta*, WOOD, 1967, p. 117.

This species is widely distributed in New Zealand (WOOD, 1967) and occurs on the bark and foliage of trees as well as in leaf litter. I have also found it in Australia. On Campbell Island 2 ♀ were collected from moss and lichen on the trunk of *Dracophyllum scoparium*, 2-50 m, Beeman Camp, 1-5.xii.62 (J. L. GRESSITT).

Genus *Mullederia* Wood (1964).

*Mullederia arborea* Wood.

*Mullederia arborea*, WOOD, 1964, p. 580.

This is an arboreal species which is widely distributed in New Zealand (WOOD, 1964). On Campbell Island 1 ♀ was collected from *Coprosma*, Beeman, 15.viii.62 (K. RENNELL).

\* MEYER (1969) described *Pseudostigmaeus capensis* from South Africa after this paper was prepared for publication.

#### DISCUSSION.

Three of the five species of Stigmaeidae known to occur on Campbell Island (400 miles south of New Zealand) are widely distributed in New Zealand, and the other two species are very similar morphologically to species also known to occur in New Zealand. The relationship between the Campbell Island and New Zealand Stigmaeidae appears to be much closer than in the case of the oribatids (Cryptostigmata) (HAMMER, 1968), the only other group of Acari for which comparisons between the two regions can be made.

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