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New Zealand Mites of the Family Stigmaeidae (Acari, Prostigmata)

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Abstract

Two new genera and 23 new species of Stigmaeidae are described from New Zealand, and new distribution records are given for a number of other species. Keys to the known species and genera are given. Of the 39 known species, 35 are not known outside New Zealand, whereas of the 11 known genera, only *Mecognatha* n.gen. is indigenous, and *Stigmaeus, Pseudostigmaeus* n.gen., *Eryngiopus, Apostigmaeus, Mediolata, Zetzellia, Ledermuelleria, Cheylostigmaeus, Ledermuelleriopsis* and *Mullederia* are known outside New Zealand. In this paper the genus *Agistemus* Summers has been included in *Zetzellia* Oudemans. Most species appear to be widely distributed throughout the country.

INTRODUCTION

STIGMAEIDAE can be distinguished from other families in the Raphignathoidea by the following combination of features: fixed digits of the chelicerae slender, elongate and ensheathing needle-like stylets; peritremes, if present, leading from base of maxillicoxae to above coxae II; palp-tarsus with a simple and a trifid sensillum distally, the latter more rarely being forked or represented by a single spikelet or by three independent eupathids; empodium consisting of a rod arising from the base of the claws and branching into three Y-shaped raylets; coxae I and II well separated from coxae III and IV. These mites are small ($<700\mu$), often brightly coloured orange, yellow or red, and are assumed to be predators. Some of the arboreal species feed on phytophagous mites such as Tetranychidae, Tydeidae, Tarsonemidae and Phytoptipalpidae (see Ehara, 1962; Collyer, 1964; Gonzalez, 1965) and are therefore of economic significance. Most of the known species live in moss, litter and soil and are also assumed to be predators although their feeding habits have not been studied. A few species have been found living on insects (Hirst, 1926; Mitra and Mitra, 1953; Chaudhri, 1965), but it is not known whether or not they feed on the living tissues of their hosts. A few species have been

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recorded from aquatic or semi-aquatic habitats (Habeeb, 1958, 1961) but do not appear to have any special morphological adaptions to life in this environment.

There is little known about New Zealand Stigmaeidae. Cottier (1934) recorded a trombidiform mite feeding on *Panonychus ulmi* Koch on apple trees, and Collyer (1964) subsequently identified this species as *Agistemus longisetus* Gonzalez. Lamb (1952) recorded *Eustigmaeus kermesinus* Koch (1841, fasc. 37) (a determination by H. Vitzthum), and although this species is unknown to contemporary acarologists, the New Zealand record appears to be based on *Ledermuelleria distincta* Wood. This conclusion was reached after examination of copies of Berlese's (1893) drawings of *E. kermesinus* kindly sent to the author by Professor F. M. Summers, University of California. Gonzalez (1963) described three species of *Agistemus,* and some aspects of their biology were discussed by Collyer (1964). Wood (1964) described *Mullederia arborea,* and the same author (Wood, 1966) described nine species of *Ledermuelleria.* Gonzalez (1965) described *Zetzellia maori* and *Mediolata robusta.* Thus 15 species of Stigmaeidae are known from New Zealand. The present paper provides additional notes on some of these species, presents descriptions of 23 new species and a new record of *Apostigmaeus navicella* Grandjean.

Terminology

Grandjean (1944) laid the foundations for the recent upsurge of interest in the Stigmaeidae (see list of references). His terminology, based on *Apostigmaeus navicella,* has been slightly modified by contemporary workers to suit the needs of genera with different arrangements of dorsal plates and setae. In attempting to adopt a uniform system, the author has used Grandjean's system with Summers' (1960a, 1960b, 1962) modifications to nomenclature of the dorsum and Gonzalez's (1963, 1965) modifications to nomenclature of the venter. The nomenclature has been explained for *Stigmaeus summersi* n.sp. and only slight modifications have been needed for other genera. In the following descriptions setae are denoted by small letters (*be, 3a*), dorsal plates by capital letters (P, SA), inter-setal distances by *ae-ae, ae-be,* etc., and ratios by *ae/be, ae/ae-ae,* etc. Lengths of setae and body measurements are given in microns (μ). The length of the dorsum is measured from the anterior margin of the propodosomal plate to the tip of the anal covers, and the number of specimens on which these measurements are based is given before the body length (n = 10, etc.). Wherever possible descriptions are based on adult females as this sex is more often encountered than males.

Type Material

Holotypes of all new species are in Entomology Division, Department of Scientific and Industrial Research, Nelson, New Zealand (D.S.I.R.). Paratypes, when available, have been lodged with D.S.I.R.; British Museum (Natural History), Cromwell Road, London (B.M.N.H.); United States National Museum, Washington, D.C. (U.S.N.M.); and South Australian Museum, North Terrace, Adelaide, South Australia (S.A.M.).

Key to the Known New Zealand Genera

Gonzalez (1965) recently constructed a key to the genera of Stigmaeidae. The occurrence of three genera in New Zealand not included in this key, and the inclusion, in this paper, of the genus *Agistemus* Summers (1960) with *Zetzellia* Oudemans (1927), necessitates a new key being constructed for the New Zealand genera. Four known genera, *Macrostigmaeus* Berlese (1910), *Barbutia* Oudemans

(1927), *Villersia* Oudemans (1927) and *Villersiella* Willmann (1953) have not been recorded from New Zealand and are not included in the key; nor are the following genera which cannot be recognised with certainty at the present time: *Caligonus* Koch (1838), *Eustigmaeus* Berlese (1910), *Homocaligus* Berlese (1910), *Podaia* Oudemans (1923b), *Storchia* Oudemans (1923b), *Liostigmaeus* Thor (1930). The author has found females of *Cheylostigmaeus* in New Zealand and the genus is included in the key although the species has not been described as males are required for this purpose.

1	Palp-tibial claw represented by a seta, and accessory seta by a tubercle. Mouth parts elongate; chelicerae about half as long as body; palp-femur, -genu and -tibia four or more times longer than broad	*Mecognatha* n.gen.
—	Palp-tibial claw well developed, accessory seta either setaceous or clawlike. Mouth parts not unusually elongate; chelicerae not more than ⅓ as long as body; palp-femur, -genu and -tibia no more than twice as long as broad	2
2	Palp-tibial claw less than half as long as palp-tarsus which is attenuate; only 1 pair of setae on maxillicoxae	*Mediolata* G. Canestrini, 1889
—	Palp-tibial claw more than half as long and often as long as palp-tarsus which is not attenuate; 2 pairs of setae on maxillicoxae	3
3	Dorsal hysterosomal plates broad covering entire width of dorsum; intercalary setae *li* not on striated integument, or individual plate or platelets	4
—	Dorsal hysterosomal plates not occupying entire width of dorsum; intercalary setae either on striated integument, or on single or paired plates	7
4	Dorsum covered with single large idiosomal plate and small terminal suranal plate, no separate humeral plates; only 8 pairs of hysterosomal setae including humerals	*Mullederia* Wood, 1964
—	Dorsum covered with single propodosomal plate, one or two hysterosomal plates and suranal plate; 9 pairs of hysterosomal setae including humerals	5
5	Two hysterosomal (metapodosomal and zonal) plates in addition to suranal plate, each bearing 3 pairs of setae	*Ledermuelleriopsis* Willmann, 1953, 1951b
—	One hysterosomal plate in addition to suranal plate, bearing 6 pairs of setae	6
6	Humeral plates large protruding ventrally between coxae II and III; chelicerae completely separated, arising below overhang of propodosoma	*Ledermuelleria* Oudemans, 1923b
—	Humeral plates relatively small not protruding ventrally between coxae II and III; chelicerae fused dorsally for proximal ⅔, arising terminally from propodosoma	*Cheylostigmaeus* Willmann, 1953
7	Terminal sensillae on palp-tarsus in the form of four independent rod-like eupathids	*Apostigmaeus* Grandjean, 1944
—	Terminal sensillae on palp-tarsus represented by a single eupathid and a eupathid which may be simple, forked or trifid	8

8	Dorsal plates restricted to small raised areas on propodosoma bearing setae *ae* and *be*, and either a single or divided suranal plate	*Eryngiopus* Summers, 1964
—	Propodosomal plate bears 3 or 4 pairs of setae; in addition to suranal plate, hysterosomal setae either on individual platelets and/or 1 or more distinct plates	9
9	Propodosoma with 4 pairs of setae (setae *de* present); coxa II usually with 2 setae; setae *la* and *c* on separate plates	10
—	Propodosoma with 3 pairs of setae (setae *de* absent); coxa II with only 1 seta; setae *la* and *c* always on same plate	*Zetzellia* Oudemans, 1927
10	Arrangement of hysterosomal plates variable, but median plate always present and bearing setae *a, b* and sometimes *c*, or with these setae arranged around its periphery	*Stigmaeus* Koch, 1836
—	Hysterosomal setae situated on individual platelets	*Pseudostigmaeus* n.gen.

Genus STIGMAEUS Koch, emend. Summers

Stigmaeus Koch, 1836. Deutschlands Crustaceen, Myriapoden und Arachniden, fasc. 4 (No. 9). Type species: *Stigmaeus cruentus* Koch, 1836.

Stigmaeus: Summers, 1962. *Hilgardia* 33(10): 495.

RECOGNITION: The definition of the genus given by Berlese (1910), Oudemans (1923a, 1927) and Summers (1962) needs to be extended to include two new species which have the terminal sensillum on the palp-tarsus modified as a simple, rod-like structure as opposed to the distinct trifid sensillum possessed by other known member of the genus, and also to include three new species which do not have the usual solenidion ρ on tibia I. The genus is characterised by the presence of four pairs of setae on the propodosoma which are borne either on a single large plate or on a large median plate and a small pair of lateral plates; median hysterosomal plate bearing either setae *a, b* and sometimes *c* or having these setae situated around its periphery; including the humerals there are nine or ten pairs of hysterosomal setae. The arrangement of dorsal plates varies, but the basic pattern and their nomenclature is given in the description of *Stigmaeus summersi* n.sp.

DISTRIBUTION: Thirty-nine species can be recognised as belonging to *Stigmaeus* of which there are 20 Nearctic, two Holarctic, five Palaearctic, one Holarctic and Neotropical, one Nearctic and Neotropical, two Oriental and eight Australian. Summers (1962) listed ten other species as Species Inquirendae.

KEY TO THE NEW ZEALAND SPECIES OF *Stigmaeus* (FEMALES)

1.	Terminal sensillum on palp-tarsus simple, rod-like with no more than an indistinct cleft distally	2
—	Terminal sensillum on palp-tarsus a distinct trident	3
2.	Two pairs of setae on median plate; seta *a* 5 times as long as *li*	*S. longisetis* n.sp.
—	Median plate with 3 pairs of setae situated on striated integument around its periphery; seta *a* half to ⅓ as long as *li*	*S. confusus* n.sp.

3.	Humeral, lateral and zonal plates absent; median plate very poorly sclerotised, indistinct and coarsely striated; no intercoxal plates	*S. coprosmae* n.sp.
—	Humeral, lateral and zonal plates present; median plate distinct either reticulated or smooth; at least 1 pair of intercoxal plates present	 4
4.	Median zonal plate incorporated into median plate; 1 seta on coxa II	*S. loadmani* n.sp.
—	Separate median zonal and median plates; 2 setae on coxa II	 5
5.	Paired median zonal plates bearing 1 seta each	 6
—	Single median zonal plate bearing a pair of setae	 7
6.	Only setae *b* on median plate, setae *a* on independent platelets; no eyes or postocular bodies; plates delicately reticulate	*S. brevisetis* n.sp.
—	Setae *a* and *b* on median shield; postocular bodies present; plates deeply dimpled, dimples enclosed by thick reticulum	*S. summersi* n.sp.
7.	Dorsal plates dimpled and reticulated fitting close together; eyes present	*S. rotundus* n.sp.
—	Dorsal plates smooth separated by large areas of striated integument; eyes absent	*S. rupicola* n.sp.

Stigmaeus summersi n.sp. (Fig. 1, A-K)

FEMALE (n = 10). Length 570 (420–650).

Dorsum: Plates well developed, fitting close together, strongly sclerotised and ornamented with dimples enclosed by a thick reticulum (Fig. 1A). Large median propodosomal plate (P) bears three pairs of setae, a pair of finely reticulated "ocular fenestrae" (pob) (possibly homologous with the "postocular bodies" of *Zetzellia* and *Mediolata*) laterally between setae *be* and *ce*, and three pairs of small anomalous dimples (referred to as apodemal pits by Summers, 1960) situated medially. A pair of small lateral propodosomal plates (LP) bear setae *de*. Paired humeral (H), lateral (L), lateral zonal (LZ), median zonal (MZ) and intercalary (I) plates each bear a single seta. Single suranal plate (SA) and median plate (M) each bear two pairs of setae. H, I and SA overlap on to venter. Dorsal setae acicular, minutely barbed and with hyaline sheath obvious in distal half (Fig. 1D); sheath observed to be abraded in some specimens. Length of setae: *be* 160; *a, b, c, le, e,* 100–110; *ae, he,* 125; *ce,* 55; others about 140. Areas between plates, including region anterior to P, covered with smooth striae.

Venter: Maxillicoxae distinctly reticulated; setae *n* (40) slightly shorter than *m; n-n* = *m-m;* external rostral setae (*re*) longer than internals (*ri*) and about as long as *m*. Intercoxal plates distinctly reticulated; anterior pair narrowly separated by striated integument; setae *1a* (41) slightly longer than *3a* and *4a*. Three pairs of subequal paragenital setae (pg_1–pg_3) situated on reticulated crescentic plate. Five pairs of setae on anogenital covers: g_1 and g_2 slender, simple and short (20–30), g_3, g_4 and g_5 thicker and longer, 75–85 (Fig. 1C).

Appendages: Legs and palps faintly reticulated. Numbers of setae on leg podomeres special sensillae in parentheses): tarsi 14(ω)–10(ω)–8(ω)–8(ω); tibiae 7(ϕ,$\phi\rho$)–6($\phi\rho$)–6($\phi\rho$)–6($\phi\rho$); genua 4(k)–4(k)–1–1; femora 6–5–3–2; trochantera 1–1–2–1; coxae 2–2–2–2; spine *k* I setiform (85) and about 1.5 times as long as associated dorsal seta *d* (Fig. 1G); *k* II small, difficult to observe; dorsal seta *d* on tibia IV about 1.4 times as long as lateral seta *l* (Fig. 1A); ω IV nearly twice as long as and slightly thicker than ω III, whereas the usual relative dimensions of the tarsal solenidia are I>II>III>IV. Empodium consists of a rod arising from the base of the claws and giving rise to three Y-shaped raylets which are pointed distally (Fig. 1H). Numbers of setae from palp-femur to palp-tarsus 3–2–4–7; tibial claw as long as tarsus and accessory seta (*acc*) claw-like; terminal sensillae on tarsus consists of a simple and a multiple (trifid) eupathid; lateral solenidion on tarsus long and rod-like (Fig. 1B).

One of the four females collected from Tongariro National Park had setae *c* occurring on the median plate together with setae *a* and *b* (Fig. 1K), and all the Tongariro specimens had spine *k* I twice as long as associated dorsal seta *d*, and reaching to the base of setae *tc* on the tarsus.

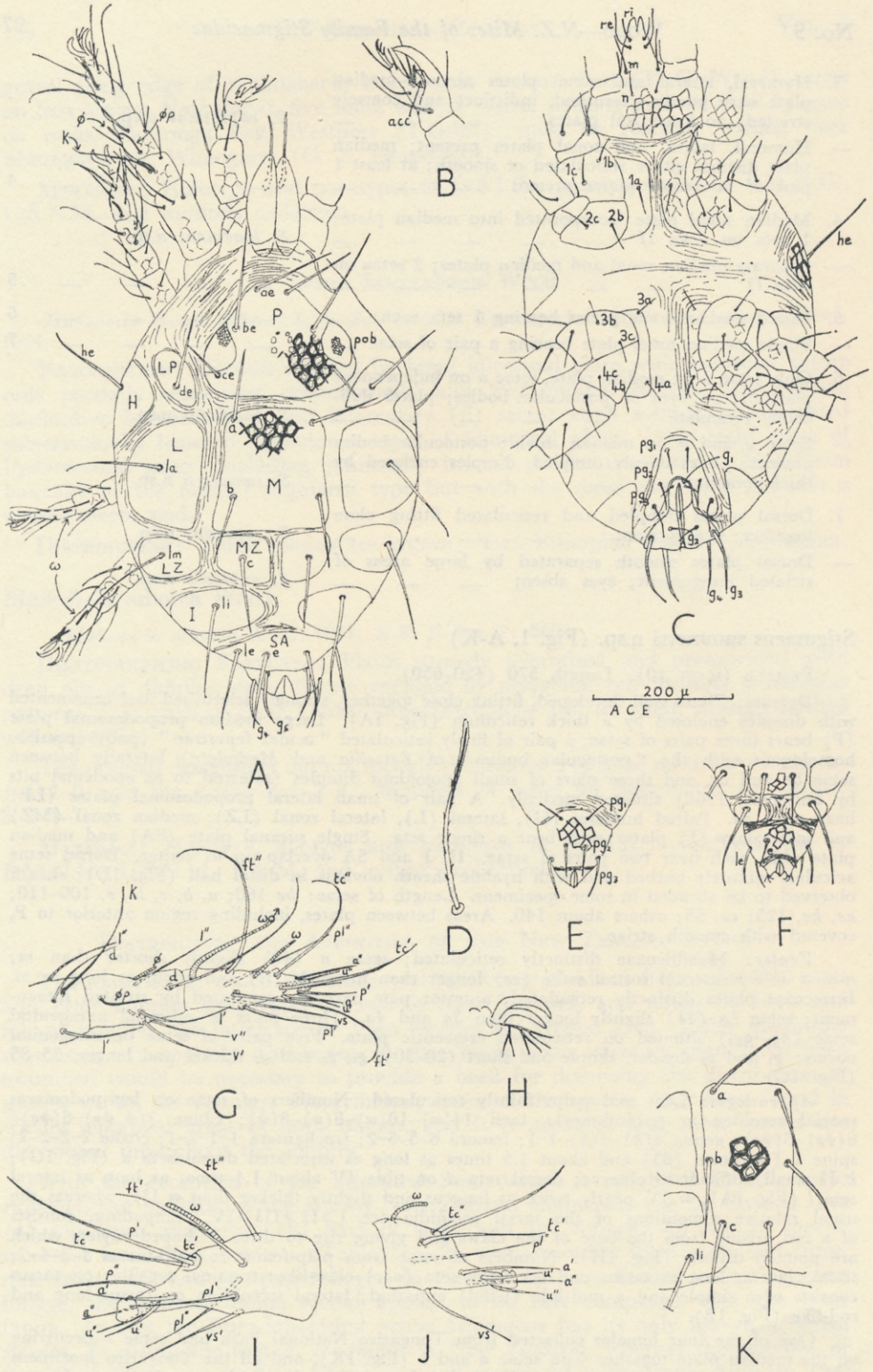

FIG. 1.—*Stigmaeus summersi* n.sp. A, female dorsal; B, palp-tibia and -tarsus; C, female ventral; D, dorsal seta; E, male opisthosoma ventral; F, male opisthosoma dorsal; G, male left leg I; H, claws and empodium; I, larva right leg I; J, larva right leg II; K, median plate female from Tongariro.

MALE (n = 10). Length 420 (370–490).

Differs from female in following features: median zonal plates fused and setae *e* much shorter than *le* (Fig. 1F); paragenital setae dissimilar (Fig. 1E); three pairs of setae on anogenital covers, all minute (Fig. 1F); normal sex-associated solenidion $\omega\delta$ present on all tarsi, and very long reaching beyond base of setae *tc* (Fig. 1G).

IMMATURE STAGES

There are one larval and two nymphal stages. These possess the distinguishing features of the adults. The chaetotaxy of the legs and venter changes during development and is described below.

Larva: Numbers of setae on tarsi and tibiae of legs and palp as in adult except that terminal sensillum on palp-tarsus is forked not trifid; genua 3(*k*)–3(*k*)–0; femora 4–4–3; trochantera 0–0–0; coxae 1–0–0. Intercoxal setae *4a* absent; no paragenital setae; three pairs of anogenital setae. Two setae on palp-femur and one seta on palp-genu. No setae on maxillicoxae. Seta *tc'* on tarsus I and *tc"* on tarsus II very much reduced, hidden behind setae *p'* and *p"* respectively which are very much enlarged; seta *tc"* and *p"* on tarsus I, as in adult (Fig. 1I, 1J). In the larva of *Apostigmaeus navicella* both *tc* and *tc* are very much reduced and *p'* and *p"* very much enlarged (Grandjean, 1944).

First nymph (*protonymph*): Numbers of setae on tarsi and tibiae of legs and palp as in adult except that seta *vs'* absent from tarsus IV; genua 4(*k*)–3(*k*)–0–0; femora 4–4–3–1; trochantera 0–0–1–0; coxae 2–2–2–0. Intercoxal seta *4a* absent; one pair of paragenital setae; three pairs of anogenital setae. Numbers of setae on palp-femur and palp-genu as in adult. One pair of setae on maxillicoxae.

Second nymph (*deutonymph*): Numbers of setae on legs and palp as in adult except genua 4(*k*)–3(*k*)–1–1 and no seta on trochanter IV. Three pairs of paragenital setae and three pairs of anogenital setae. Two pairs of setae on maxillicoxae; intercoxal setae *4a* present.

DISTINGUISHING FEATURES: This species is most similar to *S. pricei* Summers from which it can be distinguished by the hyaline sheath on the dorsal setae, and the relative length of setae *be* and *ce*. Useful diagnostic features are the large "ocular fenestrae", the dorsal reticulation and the length of spine *k* on genu I.

COLLECTION DATA: Holotype (adult female) from moss among forest litter near Lake Waikaremoana, 900m, 19.ii.64 (T. G. Wood). Allotype (adult male) same details as holotype. Other collections: Moss on logs in exotic pine plantation, Waitangi, Bay of Islands (G. S. Grandison); moss and litter, Parua Bay near Whangarei (G. Kuschel); moss and *Nothofagus* litter near Chateau, Tongariro National Park (N. A. Walker); *Podocarpus* litter, moss and lichen, 10 miles west of Tokaanu, Lake Taupo (N.A.W.); *Podocarpus* litter and moss, 1200m, Mount Egmont (N.A.W.); forest litter, Dawson Falls, Mount Egmont (G.K.); moss among *Pinus* litter, Matanaka beach near Dunedin (T.G.W.); moss among *Nothofagus* litter, Paradise Flats, Lake Wakatipu (T.G.W.).

MATERIAL: Holotype, allotype and paratypes in D.S.I.R.; paratypes also in B.M.N.H., U.S.N.M., S.A.M. and author's collection.

Stigmaeus rotundus n.sp. (Fig. 2 A, B, C)

FEMALE DEUTONYMPH (n = 2). Length 280.

Dorsum: Plates well developed, fitting close together, strongly sclerotised and ornamented with shallow dimples enclosed by thick reticulum (Fig. 2A). Large median propodosomal plate bears three pairs of setae, a pair of eyes and three pairs of small anomalous dimples situated medially. A pair of small lateral propodosomal plates bear setae *de*. Paired humeral, lateral, lateral zonal and intercalary plates each bear a single seta. Single median zonal plate bears a pair of setae and single suranal plate bears two pairs of setae. Suranal plate narrow, tucked under posterior margin of hysterosoma as in some species of *Ledermuelleria* (e.g., *L. brevisetosa* Wood), and ventral to intercalary region rather than terminal as in other known species of *Stigmaeus*. Dorsal setae short and straight, faintly barbed and with hyaline sheath distally (Fig. 2B). Lengths of setae: *ce, le,* 21; *be,* 36; *de, li, e,* 31–33; others 26. Setae *he* arise ventro-laterally. Areas between plates including region anterior to P, covered with smooth striae.

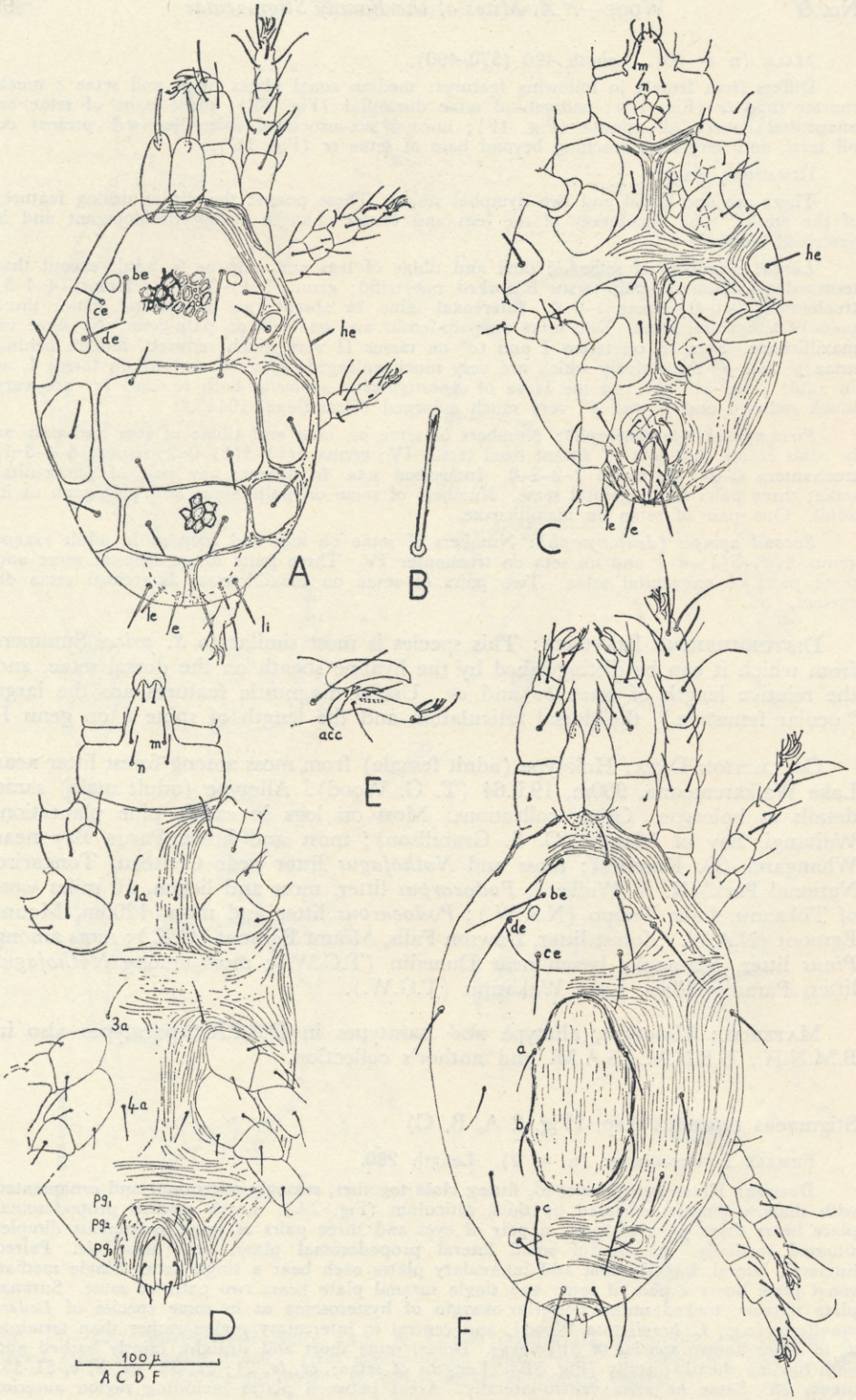

FIG. 2.—*Stigmaeus rotundus* n.sp. A, female (deutonymph) dorsal; B, dorsal seta; C, female (deutonymph) ventral. *Stigmaeus coprosmae* n.sp. D, female ventral; E, palp-tibia and -tarsus; F, female dorsal.

Venter: Maxillicoxae faintly reticulated; setae *n* short (12) not reaching as far as base of setae *m* (18); *n–n* = *m–m; re* longer than *ri*. Intercoxal plates narrowly separated and faintly reticulated; intercoxal setae short (16–18), subequal. Basal podomeres of legs faintly reticulated; coxae III more widely separated than coxae IV. Two pairs of subequal (15) paragenital setae situated on reticulated, broad, crescentic plate. Three pairs of short (10), subequal setae on anogenital covers (Fig. 2C).

Appendages: Numbers of setae on leg podomeres similar to deutonymph of *S. summersi* and differs from adult of this species as follows: genua 4(*k*)–3(*k*)–0–0; femora 6–4–3–1; trochantera 1–1–2–0; spine *k* I setiform (25), longer than associated dorsal seta; *k* II small; tibial macroseta *d* IV about 1.4 times as long as associated lateral seta. Empodium with pointed raylets. Terminal sensillum on palp-tarsus a distinct trident; lateral solenidion rod-like; tibial claw about as long as tarsus, accessory seta very short and claw-like.

MALE: Not observed.

DISTINGUISHING FEATURES: The presence of eyes, arrangement of dorsal plates and the shape and lengths of the dorsal setae are diagnostic.

COLLECTION DATA: Holotype (female deutonymph) from moss and forest litter near Fox Glacier, 20m, 18.ii.65 (T. G. Wood). Also known from moss on bark of *Podocarpus,* Waitakere range, west of Auckland (T. G. Wood).

MATERIAL: Holotype in D.S.I.R.

Stigmaeus coprosmae n.sp. (Fig. 2 D, E, F)

FEMALE (n = 10). Length 340 (300–355).

Dorsum: Plates indistinct, thinly sclerotised or absent (Fig. 2F). Single, smooth propodosomal plate bears four pairs of setae and a pair of eyes; plate narrows anterior to setae *ce*. Small, paired intercalary plates bear a single seta each; single suranal plate bears two pairs of setae; these plates smooth. Median plate indistinct and consisting of an elongate area of raised integument bearing setae *a* and *b*, and extending anterior to *a* and posterior to *b;* this plate can only be differentiated from the surrounding striated integument by its discontinuous, coarse, longitudinal striae. No other dorsal plates; setae *he, la, lm* and *c* situated on striated integument; striae microtuberculate; area immediately posterior to chelicerae not striated but covered with minute tubercles. All setae simple, their lengths as follows: *be, de,* 65; *c, le, e,* 43–47; *ae, de, he,* 36–41; others 26–31; setae *ce* situated medially so that *de–de/ce–ce* = 1.7, and *ce–ce* is only slightly less than *be–be*.

Venter: Maxillicoxae smooth; setae *n* (21) slightly shorter than *m* (26); *m–m* = *n–n; re* longer than *ri*. No intercoxal plates, intercoxal setae situated on striated integument; setae *1a* (32) slightly longer than *3a* and *4a* (26). Coxal setae on I and II slightly longer than those on III and IV. Three pairs of slender, short (15), subequal paragenital setae situated on striated integument. Four pairs of setae on anogenital covers, pair g_2 slightly longer (21) than other three pairs (16) (Fig. 2D).

Appendages: Numbers of setae on leg podomeres differ from *S. summersi* as follows: tibiae 6(φρ)–6(φρ)–6(φρ)–6(φρ); genua 4(*k*)–2–0–0; femora 6–4–3–2; *k* I about ⅓ as long as associated dorsal seta; tibial macroseta *d* IV about 2.6 times as long as associated lateral seta; ω I and ω II long and slender; ω IV short and tubercle-like ⅛ as long as ω I. Empodial rod with capitate raylets. Palp-tibia with claw only slightly shorter than palp-tarsus and with accessory seta short and thorn-like (Fig. 2E); palp-tarsus angled at base with the three setae and lateral solenidion arising near the angle, and dorsal seta modified into an unusual thorn-like process; terminal sensillum a distinct trident.

MALE: Not observed.

DISTINGUISHING FEATURES: This species resembles certain fusiform species described by Summers (1962) in that the boundary of the median hysterosomal plate is vaguely discernible. It can be distinguished by the presence of two pairs of setae on the suranal plate, the absence of intercoxal plates, the position of setae *ce* and the leg chaetotaxy.

COLLECTION DATA: Holotype (adult female) from cavities (acarodomatia) on lower surface of leaves of *Coprosma australis* (A. Rich.) Robinson, Riwaka River, Nelson, 15.i.65 (E. Collyer). Other collections: Leaf cavities of *C. australis* and *Carpodetus serratus* J. R. and G. Forst., Whangamoa saddle, 600m, Nelson (E.C.);

leaves of *Rubus, C. australis* and *C. serratus,* Pelorus River, Nelson (E.C.); leaves of *C. serratus,* Lake Rotoroa, Nelson Lakes National Park (E.C.); leaves of *C. australis,* Manahau, north-west Nelson (T. G. Wood).

MATERIAL: Holotype and paratypes in D.S.I.R.; paratypes also in B.M.N.H., U.S.N.M. and author's collection.

Stigmaeus loadmani n.sp. (Fig. 3 A, B, C)

FEMALE (n = 5). Length 450 (440–455).

Dorsum: Plates thinly sclerotised, smooth, not fitting closely together. Single large propodosomal plate bears four pairs of setae and a pair of eyes (Fig. 3A). Small, paired humeral, lateral, lateral zonal and intercalary plates bear one seta each. Large, elongate median plate bears three pairs of setae. Single suranal plate bears two pairs of setae. Dorsal setae slender, acicular, faintly barbed, their lengths as follows: *ce,* 10; *ae, le,* 52; *e,* 45; *c,* 38; *de,* 83; *be, he,* 94; others, 69–76; setae *ce* situated medially and slightly posterior to *de* so that *ce–ce* = *be–be* and *de–de/ce–ce* = 2.3. Integumental striae smooth; area immediately posterior to chelicerae covered with minute tubercles.

Venter: Maxillicoxae smooth; setae *n* flagelliform (65), extending past tip of rostrum, but less than twice as long as *m* (41); *n–n* about half as long as *m–m; re* and *ri* subequal (28). Anterior intercoxal plates smooth, narrow bearing flagelliform setae *1a* (83); posterior intercoxal plates absent, setae *3a* and *4a* subequal (65) and situated on striated integument (Fig. 3C). Three pairs of simple, slender paragenital setae; pg_1 (28) situated on striated integument; pg_2 (31) and pg_3 (56) situated on a pair of small, smooth, elongate plates. Four pairs of setae on anogenital covers; g_1 (56) and g_2 (28) simple, g_3 (28) and g_4 (37) slightly thicker and faintly barbed. Ventral striae posterior to coxae IV sparsely microtuberculate, other striae smooth.

Appendages: Numbers of setae on leg podomeres differ from *S. summersi* as follows: tibiae 6(φρ)–6(φρ)–6(φρ)–6(φρ); genua 3–2–0–0; femora 5–4–3–2; trochantera 1–1–1–0; coxae 2–1–2–2; there are no *k* spines on the genua, and the trochanteral and coxal formulas are unusual; tibial macroseta *d* IV 4.0 times as long as associated lateral seta; tarsal and tibial eupathids very long; dorsal seta on femora faintly barbed and in some specimens apically forked. Empodium with capitate raylets. Terminal sensillum on palp-tarsus a trident with very short prongs compared with the length of the stem; lateral solenidion long, rod-like; tibial claw shorter than tarsus, accessory seta slender and spike-like (Fig. 3B).

MALE: Not observed.

DISTINGUISHING FEATURES: The minute propodosomal setae *ce* and their position, the presence of only one seta on coxa II and trochanter III and the absence of setae from trochanter IV distinguish this species from other known species.

COLLECTION DATA: Holotype (adult female) beaten from ferns, Ruby Bay, Nelson, 17.vi.65 (E. Collyer). Other collections: From *Dacrydium intermedium* Kirk, Canaan road, north-west Nelson, *Alectryon excelsum* Gaertn., same details as holotype; *Elaeocarpus hookerianus* Raoul, Lake Rotoiti, Nelson Lakes National Park; all collections by E. Collyer.

MATERIAL: Holotype and paratypes in D.S.I.R.

Stigmaeus brevisetis n.sp. (Fig. 3 D, E, F, G)

MALE (n = 3). Length 360 (357–365).

Dorsum: Plates well developed, fitting fairly close together, moderately sclerotised and ornamented with delicate net-like reticulum (Fig. 3G). Median propodosomal plate bears three pairs of setae, no eyes or ocular fenestrae. A pair of small lateral propodosomal platelets bear setae *de*. Paired humeral, lateral, lateral zonal, median zonal and intercalary plates bearing one seta each; L elongate, extending from anterior to setae *a* to setae *la,* other plates small. Single humeral plate bears two pairs of setae. Median plate narrow, elongate, bearing only setae *b,* as setae *a* situated on small platelets alongside anterolateral margin of median plate. Dorsal setae short, simple, of relatively uniform length: *he,* 47; *le, e,* 35; *li,* 26; others 21. Integumental striae smooth; area posterior to chelicerae covered with minute tubercles.

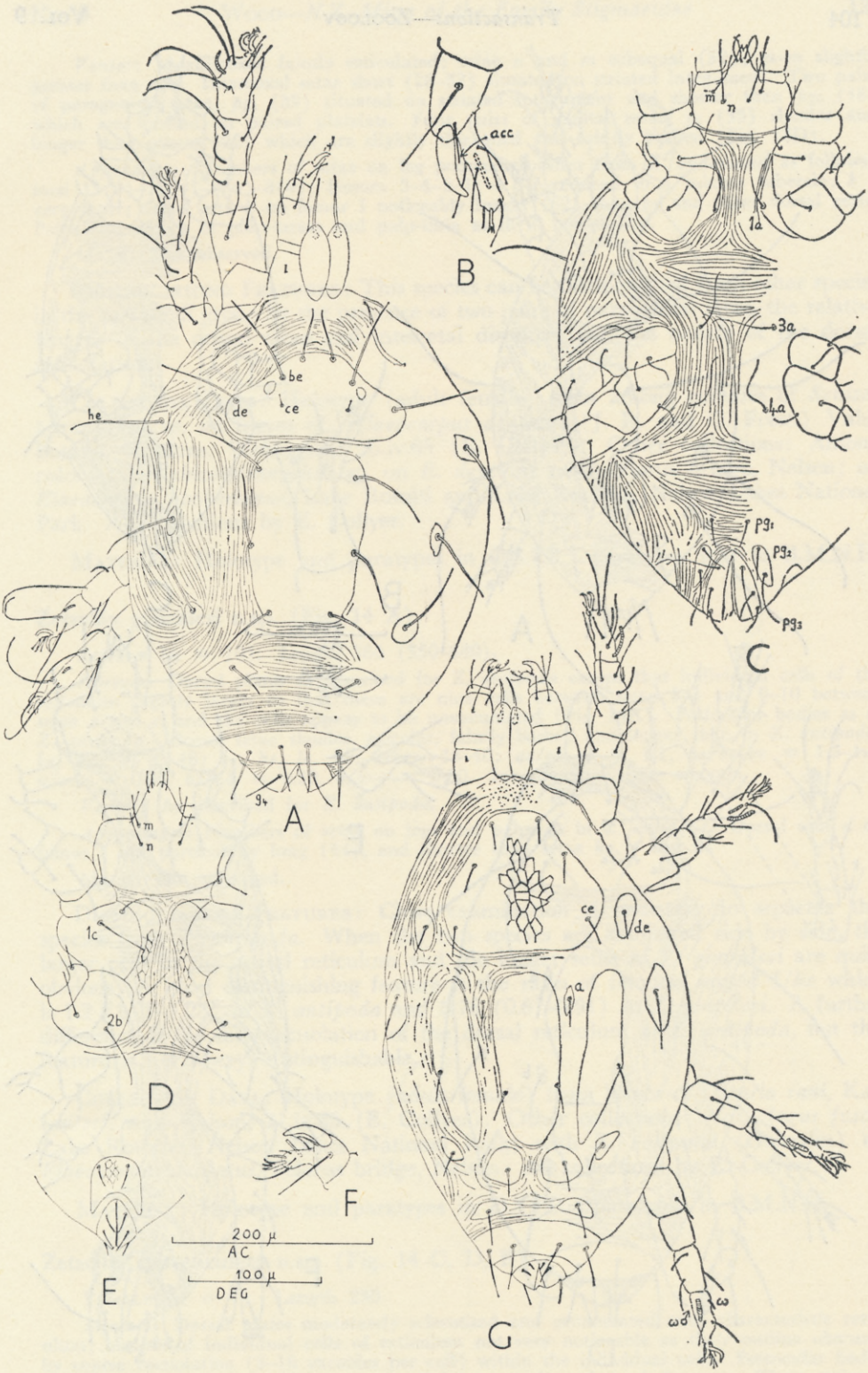

FIG. 3.—*Stigmaeus loadmani* n.sp. A, female dorsal; B, palp-tibia and -tarsus; C, female ventral. *Stigmaeus brevisetis* n.sp. D, male propodosoma ventral; E, female (protonymph) opisthosoma ventral; G, palp-tibia and -tarsus; H, male dorsal.

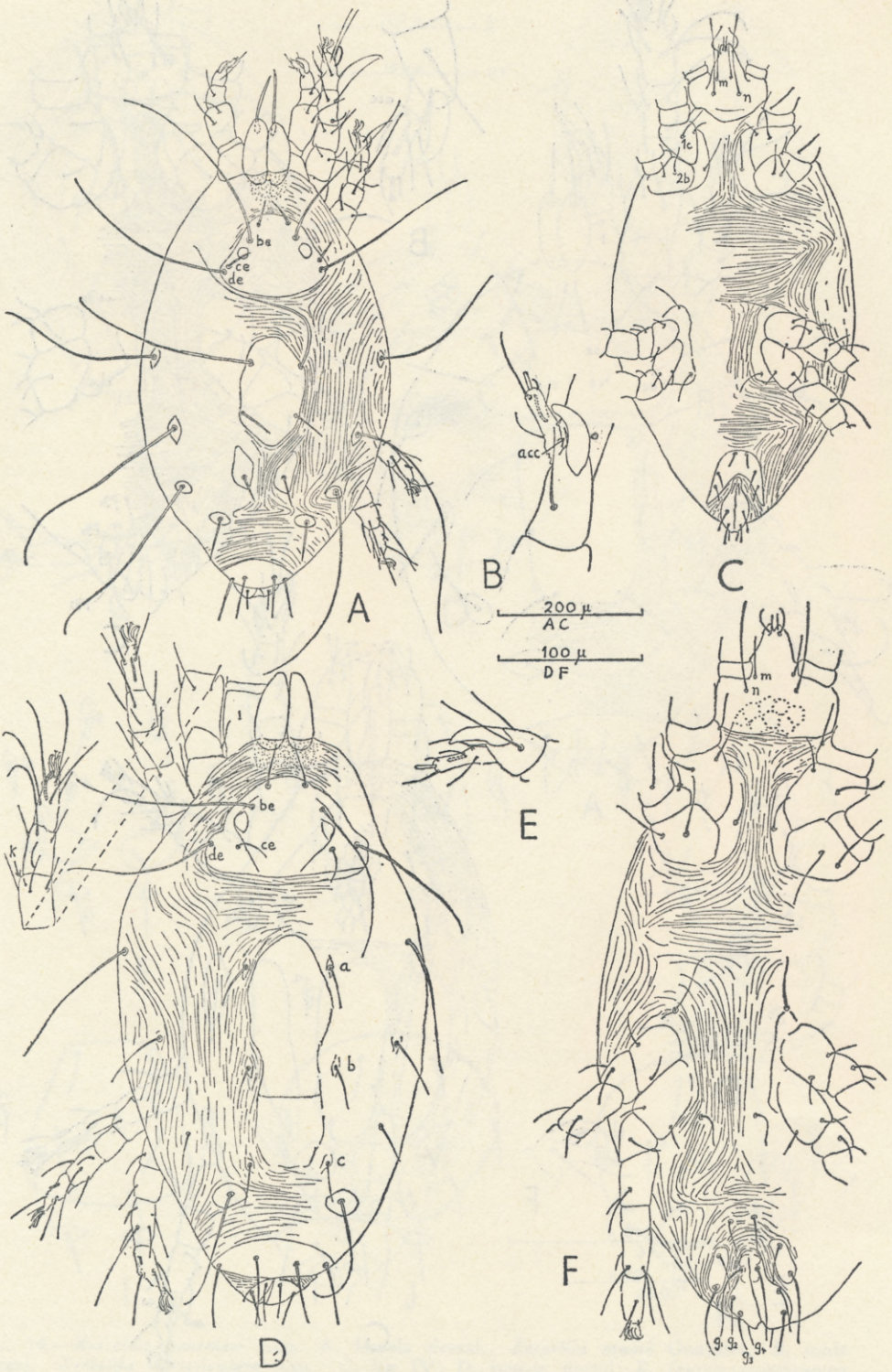

Fig. 4.—*Stigmaeus longisetis* n.sp. A, female dorsal; B, palp-tibia and -tarsus; C, female ventral. *Stigmaeus confusus* n.sp. D, female dorsal; E, palp-tibia and -tarsus; F, female ventral.

Venter: Maxillicoxae faintly reticulated; setae *n* and *m* subequal (26); *n–n* = *m–m; re* slightly longer than *ri* (Fig. 3D). Intercoxal plates faintly reticulated, anterior pair narrowly separated anteriorly; intercoxal setae subequal (24). Coxal setae *1c* and *2b* much longer (48) than other coxal setae, and longer than any of the dorsal setae except *he*. Two pairs of paragenital setae on faintly reticulated elongate plate. Three pairs of anogenital setae, g_2 and g_3 being very short.

Appendages: Numbers of setae on leg podomeres (excluding special male solenidia) as in *S. summersi* except for: genua 4(*k*)–2–0–0; femora 4–4–3–2; spine *k* I ⅓ to ¼ as long as associated dorsal seta; dorsal macroseta on tibia IV 1.2 times as long as lateral seta; ω♂ I short, not reaching beyond base of ω I, these two setae subequal. Empodium with faintly capitate raylets. Numbers of setae on palp segments as in *S. summersi;* tibial claw as long as tarsus, accessory seta slender and spike-like; lateral solenidion on tarsus rod-like, terminal sensillum a distinct trident (Fig. 3F).

FEMALE PROTONYMPH (n = 1). Length 350.

Dorsal setae and arrangement of plates as described for male. One pair of paragenital setae on faintly reticulated crescentic plate; three pairs of anogenital setae (Fig. 3E).

DISTINGUISHING FEATURES: The nature of the dorsal reticulation, absence of eyes, relative lengths of the dorsal setae and the arrangement of setae around the median hysterosomal plate are diagnostic.

COLLECTION DATA: Holotype (adult male) from moss on rocks near Kurow, North Otago, 300m, 2.iii.65 (T. G. Wood). Also known from moss on logs, Stephens Island, Marlborough Sounds (G. W. Ramsay).

MATERIAL: Holotype and paratype in D.S.I.R.

Stigmaeus longisetis n.sp. (Fig. 4 A, B, C)

FEMALE (n = 10). Length 465 (390–560).

Dorsum: Plates moderately sclerotised, smooth, not fitting closely together (Fig. 4A). Single propodosomal plate with strongly convex posterior margin bears four pairs of setae and a pair of eyes. Paired humeral, lateral, lateral zonal, median zonal and intercalary plates, all very small, bearing one seta each. Median plate small, longer than broad, bears two pairs of setae. Suranal plate small, bears two pairs of setae. Dorsal setae simple, six pairs being ultralong: *be, de, a,* 250–270; *la, lm,* 300–315; *he,* 210; *ae, ce, c,* 38; *b,* 46; *e, le, li,* 55–60. Most of the dorsum striated, striae smooth; area posterior to chelicerae covered with minute tubercles.

Venter: Maxillicoxae smooth; setae *n* flagelliform (105), twice as long as *m* and extending past tip of rostrum; *n–n* slightly greater than *m–m; re* twice as long as *ri* (Fig. 4C). Intercoxal plates narrow, smooth, indistinct, their setae subequal (45). Coxal setae *1c* and *2b* much longer (45) than other coxal setae. Three pairs of subequal (22) paragenital setae situated on smooth crescentic plate. Four pairs of setae on anogenital covers: g_1 very short (13), others subequal (26).

Appendages: Numbers of setae on leg podomeres differ from *S. summersi* as follows: genua 4(*k*)–3(*k*)–0–0; femora 6–4–3–2; *k* I short, less than $\frac{1}{10}$ as long as associated dorsal seta; *k* II short, difficult to observe; tibial macroseta *d* IV 1.5 times as long as lateral seta. Empodium with capitate raylets. Palp-tibial claw noticeably shorter than tarsus, accessory seta slender and spike-like; lateral solenidion on tarsus rod-like, terminal sensillum a simple rod with no apparent terminal cleft or fork (Fig. 4B).

MALE: Not observed.

DISTINGUISHING FEATURES: The arrangement of dorsal plates and their relative size, the extremely long dorsal setae and the simple terminal sensillum on the palp-tarsus are distinctive.

COLLECTION DATA: Holotype (adult female) from moss, William's Stream, upper Clarence River, 1000m, 30.x.62 (J. I. Townsend). Other collections: Moss and *Nothofagus* litter, mouth of Spey River, west arm of Lake Manapouri (N. A. Walker); moss and forest litter, McLennan's Bush, west of Methven, Canterbury (N.A.W.); moss among *Nothofagus* litter, 1100m, Cobb reservoir, north-west Nelson (T. G. Wood); moss among litter, 1300m, Mount Gomorrah, north-west Nelson

(T.G.W.); *Nothofagus* litter near Arthur's Pass (T.G.W.); moss and litter, Dawson Falls, Mount Egmont (G. Kuschel); *Podocarpus* litter, moss and lichen, 900m, Mount Egmont (N.A.W.).

MATERIAL: Holotype and paratypes in D.S.I.R.; paratypes also in B.M.N.H., U.S.N.M., S.A.M. and author's collection.

Stigmaeus confusus n.sp. (Fig. 4 D, E, F)

FEMALE (n = 10). Length 360 (280–385).

Dorsum: Plates thinly sclerotised, smooth, indistinct, widely separated (Fig. 4D). Single propodosomal plate indented laterally bears four pairs of setae, a pair of eyes and lines of thickening running external to and posteriorly from each eye. Paired intercalary plates bear one seta each. Single suranal plate bears two pairs of setae. Median plate very thinly sclerotised, elongate, running from anterior to setae *a* to the level of setae *c*, and with a faint transverse suture just posterior to setae *b*; this plate bears no setae as setae *a*, *b* and *c* are borne on minute platelets situated around the periphery of the plate; plate narrows posteriorly at level of setae *b*. Setae *he* and *lm* apparently situated on striated integument; setae *la* situated on faintly discernible, minute platelets (L). Dorsal setae slender and simple, their lengths as follows: *be*, 130; *ce*, *he*, 100–110; *li*, 80; *la*, *le*, *e*, 40; others 25–30; setae *ce* situated medially immediately posterior to eyes and slightly posterior to *de*, so that *ce–ce* is much less than *de–de*. Integumental striae smooth; area posterior to chelicerae covered with minute tubercles.

Venter: Maxillicoxae faintly reticulated; setae *n* flagelliform (65) twice as long as *m* and extending past tip of rostrum; *n–n* slightly greater than *m–m*; *re* longer than *ri* (Fig. 4F). Intercoxal plates narrow, smooth, indistinct; setae *3a* situated on anterior margin of posterior plates, setae *4a* situated on striated integument; setae *3a* longer (42) than other intercoxal setae. Coxal setae *1c*, *2b* and *2c* somewhat flagelliform (38–42) and longer than other coxal setae. Three pairs of paragenital setae: pg_1 (21) situated on striated integument; pg_2 (27) and pg_3 (44) situated on a pair of smooth, elongate plates. Five pairs of setae on anogenital covers, g_1 (45) longer than others which are subequal (25–30).

Appendages: Numbers of setae on leg podomeres differs from *S. summersi* as follows: tibiae 6($\phi\rho$)–6($\phi\rho$)–6($\phi\rho$)–6($\phi\rho$); genua 4(*k*)–2–0–1; femora 6–4–3–2; *k* I short, about 1/6 as long as associated dorsal seta; tibial macroseta *d* IV 2.8 times as long as lateral seta. Empodium with capitate rayiets. Palp-tibial claw shorter than tarsus, accessory seta slender and spike-like; lateral solenidion on tarsus rod-like, terminal sensillum rod-like (Fig. 4E).

MALE: Not observed.

DISTINGUISHING FEATURES: The position and length of setae *ce* relative to other dorsal setae and the spike-like terminal sensillum on the palp-tarsus are diagnostic.

COLLECTION DATA: Holotype (adult female) from bark of palm (*Rhopalostylis sapida* Wendl. and Drude), Waitakere Range, west of Auckland, 200m, 13.ii.64 (T. G. Wood). Other collections: Moss and litter, same locality as holotype; moss and litter around kauri (*Agathis australis* Salisb.), Waipoua Forest (G. S. Grandison); *Podocarpus* litter and moss, Tangarakau Gorge, west of Mount Egmont (N. A. Walker); litter, moss and lichen, 17 miles north of Te Anau (N.A.W.).

MATERIAL: Holotype and paratypes in D.S.I.R.; paratypes also in B.M.N.H. and U.S.N.M.

Stigmaeus rupicola n.sp. (Fig. 5 A, B, C, D, E)

MALE (n = 2). Length 400.

Dorsum: Plates moderately sclerotised, not fitting close together, apparently smooth, but under phase contrast-oil immersion appear faintly punctured (Fig. 5A, E). Median propodosomal plate elongate, parallel sided and faintly reticulate (Fig. 5E) and bears three pairs of setae. Small lateral propodosomal plates bear setae *de*. Small, paired humeral, lateral, lateral zonal and intercalary plates bear one seta each. Single median zonal bears one pair of setae. Single suranal plate bears two pairs of setae. Median plate elongate, parallel sided, extending from anterior to setae *a* to mid-way between setae *b* and *c* and bearing two pairs of setae. All dorsal setae except *be* and *he* (Fig. 5E) faintly pilose, their lengths as

follows: *he,* 81; *be,* 70; *e,* 46; *le, li,* 39; others 24–29; setae *ce* situated medially and posterior to *de* so that *de–de/ce–ce* = 2.2. Integumental striae smooth, widely separated except above coxae I and II and around anterior margin of propodosomal plate where they are much closer together; area posterior to chelicerae covered with minute tubercles.

Venter: Maxillicoxae smooth; setae *n* (24) shorter than *m* (39) and not reaching as far as base of *m; n–n* = *m–m; re* and *ri* subequal (Fig. 5C). Intercoxal plates smooth, distinct, anterior pair narrowly separated anteriorly; intercoxal setae and coxal setae subequal (20) except *1b* and *2b* which are flagelliform (85) and longer than any of the dorsal setae except *he*. Four pairs of paragenital setae on elongate plate; pg_4 35, others 21. Three pairs of anogenital setae; g_1 21, others minute 9–11. All ventral (including coxal) setae faintly pilose except *1b* and *2b* which are simple.

Appendages: Numbers of setae on leg podomeres (excluding special male solenidia) differs from *S. summersi* as follows: genua 6(*k*)–5(*k*)–1–1; femora 6–4–3–2; *k* I and *k* II ⅓ to ¼ as long as associated dorsal setae and terminally forked, this latter feature being more obvious in *k* I; tibial macroseta *d* IV 2.0 times as long as lateral seta; $\omega\delta$ and ω subequal on tarsi I and II, $\omega\delta$ greater than ω on II and IV. Empodium with faintly capitate raylets. Palp-tibial claw slightly shorter than tarsus, accessory seta simple; lateral solenidion on tarsus rod-like, terminal sensillum a distinct trident with stem slightly shorter than prongs (Fig. 5B); palp-femur distally swollen (Fig. 5A).

FEMALE DEUTONYMPH (n = 1). Length 355.

Arrangement of plates, setae, etc., as described for male. Three pairs of subequal (21) paragenital setae on elongate plate; three pairs of setae on anogenital covers, g_1 32, others 42 (Fig. 5D).

DISTINGUISHING FEATURES: The arrangement of dorsal plates, the shape and relative lengths of the dorsal setae and the numbers of setae on the genua are diagnostic. *S. rupicola* is very similar to *S. fissuricola* Halbert in general shape of the body, shape of dorsal plates and arrangement of setae on them, absence of eyes, relative lengths of dorsal setae, and shape of palp-femur. The original description of *S. fissuricola* (*S. rhodomelas* var. *fissuricola* Halbert, 1920) does not give details of the ventral surface or the leg chaetotaxy, but as the illustration shows thorn-like seta at base of palp-tarsus and no setae on genua III and IV, these features apparently distinguish the two species. *S. fissuricola* was recorded as an inhabitant of horizontal fissures in limestone rocks in the intertidal Orange Lichen or *Pelvetia* zone, near Dublin, Ireland.

COLLECTION DATA: Holotype (adult male) found living in crevices in granite rocks in the intertidal zone, Manahau, Sandy Bay, west Nelson, 26.ix.65 (E. Collyer).

MATERIAL: Holotype and paratypes in D.S.I.R.

Genus PSEUDOSTIGMAEUS n.gen. (masculine)

Description: General appearance (body shape. relative lengths of body, legs, palps and chelicerae) similar to *Stigmaeus*. Median propodosomal plate bearing three pairs of setae and a pair of eyes; a pair of lateral propodosomal plates bear one seta each. All hysterosomal setae, except suranals, situated on small individual platelets, which may be indistinct. Intercoxal plates present; two pairs of setae on maxillicoxae; two setae on coxae II; three pairs of paragenital setae; four pairs of anogenital setae. Setae *tc* and *ft* on tarsus I long and slightly recurved; empodium with capitate raylets. Palp-tarsus with terminal sensillum apparently rod-like, but with minute terminal cleft.

RECOGNITION AND AFFINITIES: The genus can be distinguished from *Stigmaeus* by the absence of a median hysterosomal plate, and from *Barbutia, Apostigmaeus* and *Eryngiopus* by the three setae on the median propodosomal plate, the presence of intercoxal plates and the presence of two setae on coxa II. Morphologically the genus is intermediate between the *Stigmaeus* species with poorly developed, thinly sclerotised plates and the genera mentioned above with dorsal setae, except suranals, situated on minute platelets or on striated integument.

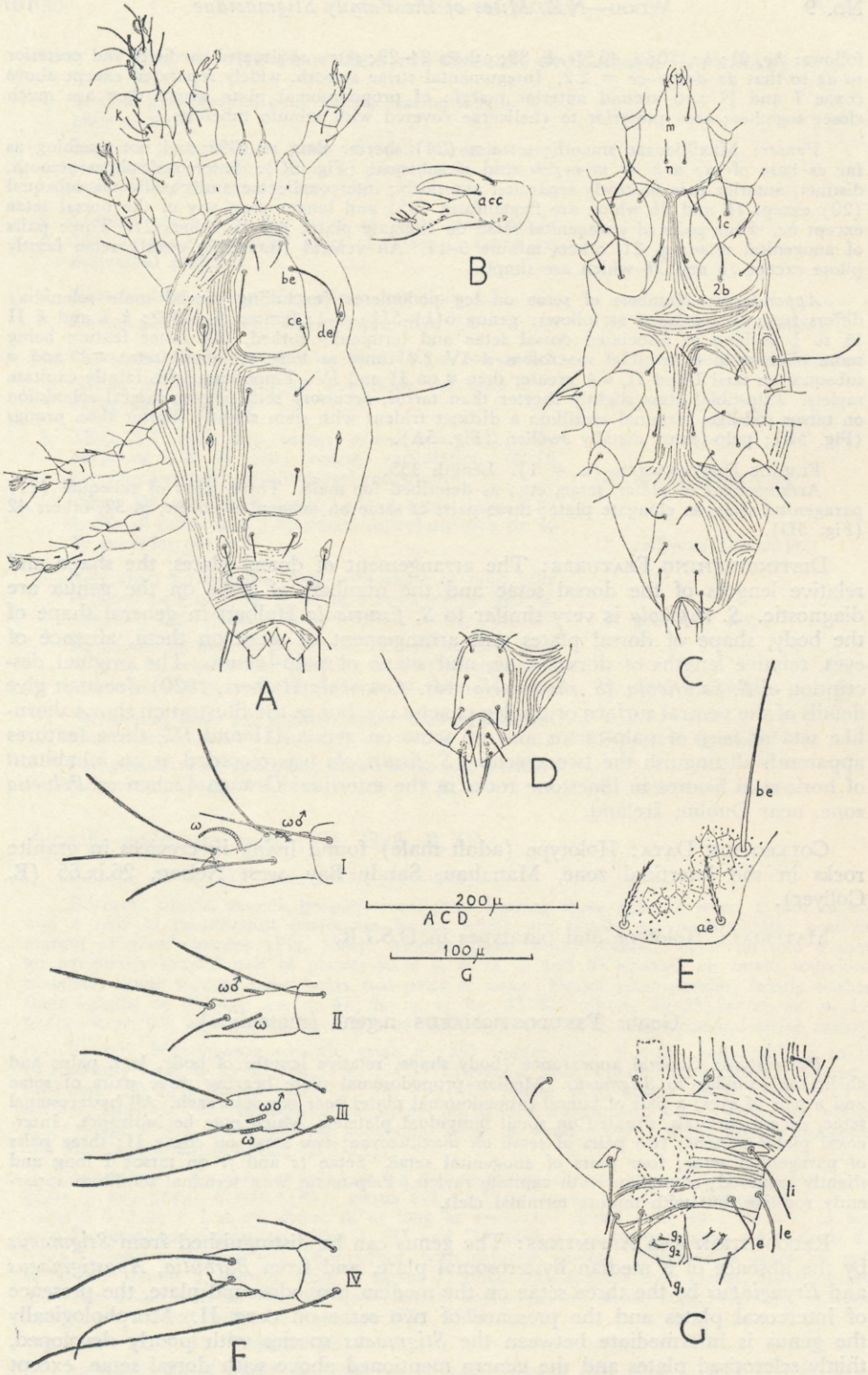

Fig. 5.—*Stigmaeus rupicola* n.sp. A, male dorsal; B, palp-tibia and -tarsus; C, male ventral; D, female (deutonymph) opisthosoma ventral; E, part of propodosomal plate. *Pseudostigmaeus ·ollyerae* n.gen. n.sp. F, male tarsi; G, male opisthosoma dorsal.

DISTRIBUTION: Two species are known, both described below; one is known only from New Zealand, the other from New Zealand and Mangaia in the southern Cook Islands.

TYPE SPECIES: *Pseudostigmaeus collyerae* n.sp.

KEY TO THE NEW ZEALAND SPECIES OF *Pseudostigmaeus*

1. Setae *be* at least five times as long as *ce; he* more than four times as long as *a;* paragenital setae on two pair of platelets .... *P. collyerae* n.sp.

— Setae *be* about twice as long as *ce; he* 3.5 times as long as *a;* paragenital setae sharing one pair of platelets .... *P. striatus* n.sp.

Pseudostigmaeus collyerae n.sp. (Fig. 5 F, G; 6 D, E, F, G)

FEMALE (n = 10). Length 520 (470–545).

Dorsum: Plates smooth, thinly sclerotised, arranged as described for genus (Fig. 6G). Propodosomal plate with incisions along posterior margin almost encircling setae *ce*. Lateral propodosomal platelets, and platelets surrounding bases of hysterosomal setae very small. Suranal plate almost divided medially and bearing two pairs of setae. Setae slender, acicular, faintly barbed, their lengths as follows: *he,* 135; *be,* 84; *de, li,* 68; *la,* 62; *le, e,* 53; others, 36–42. Integumental striae in antero-lateral region around propodosomal plate faintly microtuberculate, other striae smooth; striae interrupted by microtuberculate area between chelicerae and propodosomal plate.

Venter: Maxillicoxae smooth; setae *n* flagelliform (135), about 2.5 times as long as *m* (57) and extending well past tip of rostrum; *n–n* = *m–m; re* slightly longer than *ri* (Fig. 6D). Intercoxal plates thinly sclerotised, anterior pair closer together than posterior pair; their setae subequal (45–47). Coxal setae *1c* and *2b* flagelliform (75), distinctly longer than other coxal setae. Three pairs of subequal (35–38) paragenital setae situated on either one or two pairs of small platelets (see below). Four pairs of anogenital setae: g_1 very short (20), widely separated from others which are subequal (30).

Two distinct " forms " of this species can be recognised on the basis of the arrangement of the paragenital plates. Form A has pg_1 and pg_2 sharing a pair of small platelets and pg_3 on individual platelets; pg_3–pg_2 is 2.0 to 5.0 times as long as pg_2–pg_1 (Fig. 6D). Form B has pg_1 situated on striated integument and pg_2 and pg_3 sharing a pair of platelets; pg_1–pg_2 = pg_2–pg_3 (Fig. 6F). The observed occurrence of these two forms is indicated in the collection data below, and although they have been recorded from the same locality (Canaan, north-west Nelson) they have not been found in mixed populations.

Appendages: Numbers of setae on leg podomeres as follows: tarsi 14(ω)–10(ω)–8(ω)–8(ω); 7(ϕ,φρ)–6(φρ)–6(φρ)–6(φρ); genua 4(*k*)–4(*k*)–1–1; femora 6–4–3–2; trochantera 1–1–2–1; coxae 2–2–2–2; *k* I and *k* II minute, less than $\frac{1}{16}$ as long as associated dorsal seta; tibial macroseta *d* IV 2.7 times as long as lateral seta; ω III and IV shorter than ω I and II. Empodium with capitate raylets. Numbers of setae on palp-femur to palp-tarsus: 3–2–4–7; terminal sensillum on tarsus apparently a simple rod-like structure, but depending upon the orientation a shallow cleft or fork can be observed terminally; lateral solenidion on tarsus globose; tibial claw slightly shorter than tarsus, accessory seta slender and spike-like (Fig. 6E).

MALE (n = 5). Length 355 (345–370).

Distinguishing features as described for female. One male from *Hebe* sp. (Dun Mountain track, Nelson) with setae *le* twice as long as *e*, whereas in the other four specimens examined these setae are subequal (Fig. 5G). Anogenital setae g_2 and g_3 minute. Solenidion ω♂ on tarsus I very small, not reaching as far as base of setae *tc* and about $\frac{1}{4}$ as long as ω I; ω♂ II slightly longer, about half as long as ω II; ω♂ III about equal in length to ω♂ II and only slightly shorter than ω III; only one solenidion on tarsus IV (Fig. 5F).

DISTINGUISHING FEATURES: The relative lengths of the dorsal setae and the arrangement of the paragenital plates distinguish this species from *P. striatus,* the only other known species.

COLLECTION DATA: Holotype (adult female) and allotype (adult male) from leaves of *Coprosma pseudocuneata* W. R. B. Oliver (form A), 1000m, north Egmont Chalet, 26.xii.64 (E. Collyer). Other collections: *Libocedrus bidwilli*

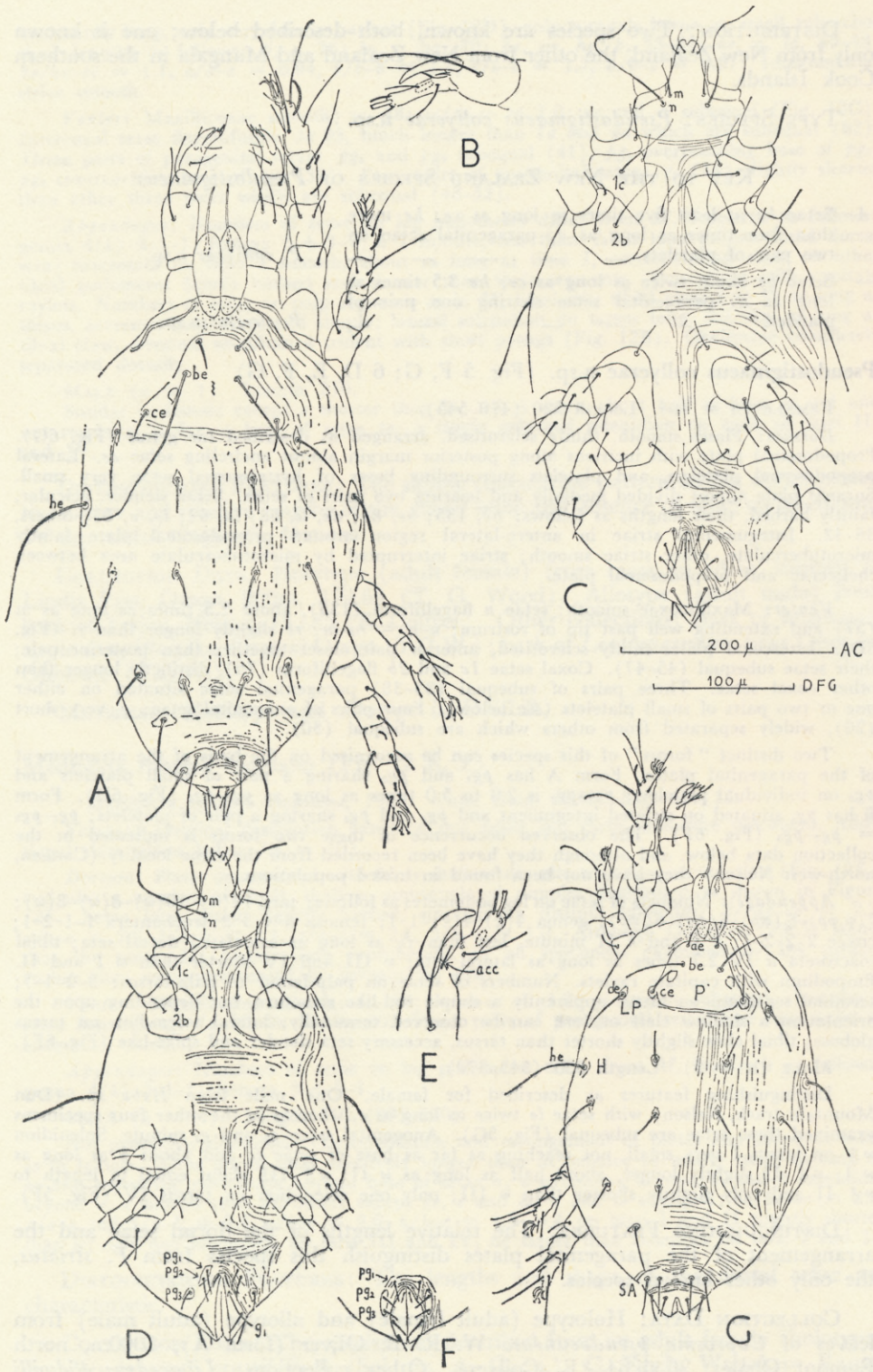

FIG. 6.—*Pseudostigmaeus striatus* n.gen. n.sp. A, female dorsal; B, palp-tibia and -tarsus; C, female ventral. *Pseudostigmaeus collyerae* n.gen. n.sp. D, female (form A) ventral; E, palp-tibia and -tarsus; F, female (form B) opisthosoma ventral; G, female dorsal.

Hook. f. (form A), 1200m, Mount Egmont; *Nothofagus fusca* (Hook. f) Oerst. (form B), Lake Waikaremoana; *Elaeocarpus hookerianus* (form B), *Nothofagus menziesii* (Hook. f.) Oerst. (form B), *Sophora microphylla* Ait. (form B), Lake Rotoroa, Nelson Lakes National Park; *Nothofagus menziesii* (form B), *Metrosideros* sp. (form A), *Dacrydium intermedium* (form B), *Elaeocarpus hookerianus* (form B), *Neopanax* sp., (form A), *Libocedrus bidwilli* (form A), Canaan, north-west Nelson; *Carpodetus serratus* (form B), *Coprosma* sp. (form B), Fringed Hill, Nelson; *Metrosideros parkinsonii* Buchan. (form A), Waingaro River, 1000m, Takaka, north-west Nelson; *Dracophyllum* sp. (form B), *Cyathodes juniperina* (J. R. and G. Forst.) Druce (form B), *Hebe* sp. (form B), Dun Mountain track, Nelson, *Nothofagus menziesii* (form B), *Neopanax simplex* (Forst. f.) Allan (form B), *Nothofagus fusca* (form B), *Leptospermum ericoides* A. Rich. (form B), upper Pelorus River, Nelson; small fern (form A), Kaiteriteri, west Nelson. All collections by Dr E. Collyer, and specimens obtained by beating from the foliage.

MATERIAL: Holotype, allotype and paratypes in D.S.I.R.; paratypes also in B.M.N.H., U.S.N.M., S.A.M. and author's collection.

Pseudostigmaeus striatus n.sp. (Fig. 6 A, B, C)

FEMALE (n = 5). Length 440 (430–460).

Dorsum: Plates as described for genus. Suranal plate either completely divided medially, each individual plate bearing one pair of setae, or very narrow medially. Humeral, intercalary, lateral zonal and median zonal platelets distinct and slightly larger than lateral and median platelets. Median propodosomal plate has median subcuticular thickening in the form of a short wavy line (Fig. 6A). Setae slender, acicular, faintly barbed (except *be* and *he*), their lengths as follows: *be,* 168; *he,* 140; *de,* 70; *la, li, le, e,* 50–63; others, 28–35. Integumental striae smooth; area between chelicerae and propodosomal plate covered with minute tubercles.

Venter: Maxillicoxae smooth; setae *n* flagelliform (120), about 3.5 times as long as *m* (35) and extending well past tip of rostrum; *n–n* = *m–m; re* and *ri* subequal (Fig. 6C). Intercoxal plates thinly sclerotised, anterior pair closer together than posterior pair; their setae subequal (27–33). Coxal setae *1c* and *2b* flagelliform (70–75), distinctly longer than other coxal setae. Three pairs of subequal (26) paragenital setae, situated on a pair of smooth, elongate plates (one specimen with anomalous seta situated on striated integument just anterior to pg_1 on right side). Four pairs of anogenital setae: g_1 minute (14), others subequal (29).

Appendages: Numbers of setae on leg podomeres as in *P. collyerae; φ* on tibia I small, difficult to observe; *k* I and *k* II minute, less than $\frac{1}{10}$ as long as associated dorsal seta; tibial macroseta *d* IV 3.0 times as long as lateral seta. Empodium with capitate raylets. Numbers of setae on palp-femur to palp-tarsus as in *P. collyerae;* tibial claw slightly shorter than tarsus, accessory seta slender, spine-like; lateral solenidion on tarsus rod-like, terminal sensillum rod-shaped with indistinct terminal cleft (Fig. 6B).

MALE (n = 1). Length 340.

Distinguishing features as given for female. Tarsal solenidia differ from those in males of *P. collyerae*: ω♂ I equal in length to ω I and reaches as far as base of ω I; two solenidia on tarsus IV; ω♂ II, III and IV longer than ω on these podomeres.

DISTINGUISHING FEATURES: See under *P. collyerae.*

COLLECTION DATA: Holotype (adult female) from moss and litter, McLennan's Bush, west of Methven, 300m, 27.ii.65 (N. A. Walker). Allotype (adult male) from leaf litter, Mangaia, Cook Islands, 12.vi.65 (G. W. Ramsay).

MATERIAL: Holotype and allotype in D.S.I.R.; paratypes also in B.M.N.H. and U.S.N.M.

Genus ERYNGIOPUS Summers

Eryngiopus Summers, 1964. *Proc. ent. Soc. Wash.* 66: 186. Type species: *Eryngiopus gracilis* Summers, 1964.

RECOGNITION: Summers' (1964) definition of the genus requires slight modification to include two new species with a forked terminal sensillum on the palp-tarsus. The dorsal body plating is restricted to small raised areas on the propodosoma

bearing two pairs of setae and a pair of eyes, and to the suranal region (SA) of the hysterosoma. Terminal sensillum on palp-tarsus either forked or a single spikelet. Dorsal setae simple, little variation in length. No intercoxal or paragenital plates. Intercoxal and posterior pair of setae (*n*) on maxillicoxae may be flagelliform. Only one seta on coxa II.

DISTRIBUTION: Seven species are known: Four Nearctic and three Australian.

KEY TO THE NEW ZEALAND SPECIES OF *Eryngiopus*

1.	Genu II without setae; intercoxals *1a* longer than setae *n* on maxillicoxae	*E. bifidus* n.sp.
—	Genu II with one seta; intercoxal setae *1a* shorter than setae *n* on maxillicoxae	2
2.	Terminal sensillum on palp-tarsus forked; suranal plate paired	*E. similis* n.sp.
—	Terminal sensillum on palp-tarsus a simple spikelet; suranal plate single	*E. arboreus* n.sp.

Eryngiopus arboreus n.sp. (Fig. 7 D, E, F, G)

FEMALE (n = 10). Length 390 (375–400).

Dorsum: Propodosomal plates confined to small wedge-shaped areas separated by striated integument and bearing setae *ae, be* and a pair of eyes (Fig. 7F). Plates and area between them elevated. Suranal plate single, narrow and bearing two pairs of setae. Dorsal setae slender, simple, but under oil-immersion appearing faintly barbed; suranal setae noticeably thickened; lengths of setae as follows: *de, he, la, le, e,* 33–36; *be,* 26; others, 21–24; *b–b* about 2.0 times as long as *c–c* and 1.5 times as long as *a–a; lm* only slightly anterior to *c,* so that *la–lm* is about 1.5 times as long as *lm–li.* Integumental striae smooth, longitudinal except for transverse striae in area between and posterior to setae *li.*

Venter: Maxillicoxae smooth; setae *n* ultralong (78) extending well past tip of rostrum; *m,* 26; *m–m* = *n–n; re* and *ri* subequal (Fig. 7D). Intercoxal setae *1a* (43) shorter than *3a* and *4a* which are subequal (52); *1a/1a–1a* = 1.6, *3a/3a–3a* = 0.7, *4a/4a–4a* = 1.6. Two pairs of slender paragenital setae: pg_1 (23) shorter than pg_2 (37). Four pairs of anogenital setae: g_1 slender (37), longer than other three pairs which are slightly thickened; g_2 and g_3 subequal (16), g_4 (26) (Fig. 7G).

Appendages: Numbers of setae on leg podomeres as follows: tarsi 14(ω)–10(ω)–8(ω)–8(ω); tibiae 6(φρ)–6(φρ)–6(φρ)–6(φρ); genua 4(*k*)–1–0–0; femora 4–4–2–2; trochantera 1–1–1–0; coxae 2–1–2–1; *k* I small, less than 1/12 as long as associated dorsal seta; ω I short and stout. Empodium with capitate raylets. Numbers of setae on palp-femur to palp-tarsus 3–1–4–7; tibial claw slightly shorter than tarsus, accessory seta slender and spike-like; lateral solenidion on tarsus rod-like, terminal sensillum spike-like, with no terminal cleft or fork (Fig. 7E).

MALE: Not observed.

DISTINGUISHING FEATURES: The coxal formula, absence of setae from trochanter IV and presence of one seta on genu II distinguish this species from all others except *E. similis* n.sp., from which it can be distinguished by the simple terminal sensillum on the palp-tarsus, the relative lengths of the intercoxal setae, the short intercalaries (*li*) relative to the suranals and the single suranal plate.

COLLECTION DATA: Holotype (adult female) from Kowhai (*Sophora microphylla*), 350m, Lake Rotoroa, Nelson Lakes National Park, 2.i.65 (E. Collyer). Other collections: *Nothofagus menziesii,* same locality as holotype; *Melicytus ramiflorus* J. R. and G. Forst., *Alectryon excelsus, Olearia rani* (A. Cunn.) Druce, Sandy Bay and Ruby Bay, west Nelson; *Elaeocarpus hookerianus,* Canaan, north-west Nelson; *Rhipogonum scandens* Forst., Dovedale, near Nelson. All collections by Dr E. Collyer, and specimens obtained by beating from the foliage.

MATERIAL: Holotype and paratype in D.S.I.R.; paratypes also in B.M.N.H., U.S.N.M. and S.A.M.

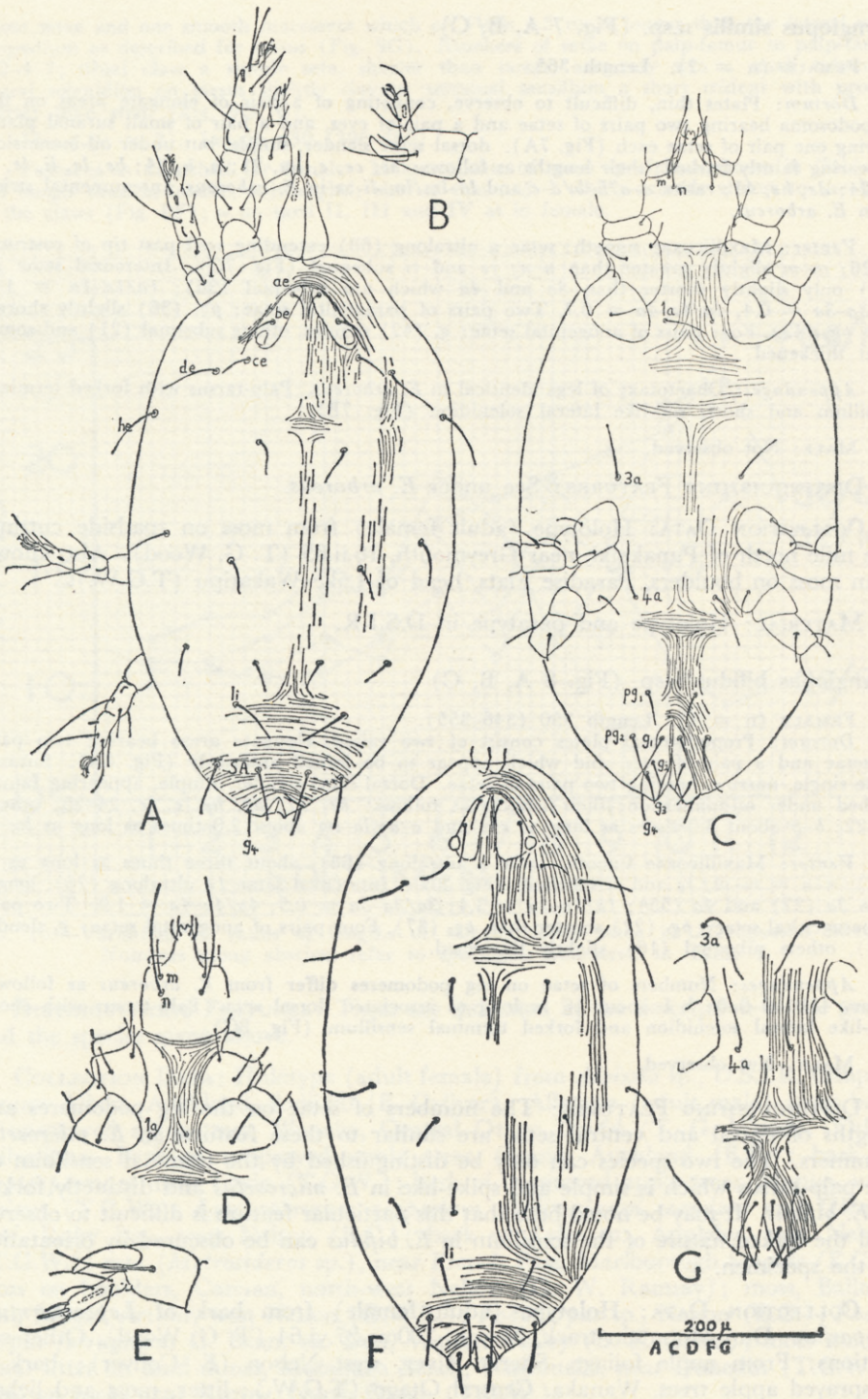

FIG. 7.—*Eryngiopus similis* n.sp. A, female dorsal; B, palp-tibia and -tarsus; C, female ventral. *Eryngiopus arboreus* n.sp. D, female propodosoma ventral; E, palp-tibia and -tarsus; F, female dorsal; G, female hysterosoma ventral.

Eryngiopus similis n.sp. (Fig. 7 A, B, C)

FEMALE (n = 2). Length 365.

Dorsum: Plates thin, difficult to observe, consisting of a pair of elongate areas on the propodosoma bearing two pairs of setae and a pair of eyes, and a pair of small suranal plates bearing one pair of setae each (Fig. 7A). dorsal setae slender, simple, but under oil-immersion appearing faintly barbed; their lengths as follows: *ae, ce, c, lm,* 21; *a, b,* 24; *be, la, li, le, e,* 31–34; *de, he,* 41; ratios *a–a/b–b/c–c* and *la–lm/lm–li* as in *E. arboreus*. Integumental striae as in *E. arboreus*.

Venter: Maxillicoxae smooth; setae *n* ultralong (68) extending well past tip of rostrum; *m* 26; *m–m* slightly greater than *n–n; re* and *ri* subequal (Fig. 7C). Intercoxal setae *1a* (32) only slightly shorter than *3a* and *4a* which are subequal (36); *1a/1a–1a* = 1.0, *3a/3a–3a* = 0.4, *4a/4a–4a* = 0.7. Two pairs of paragenital setae; pg_1 (36) slightly shorter than pg_2 (42). Four pairs of anogenital setae: g_1 (42) slender, others subequal (21) and somewhat thickened.

Appendages: Chaetotaxy of legs identical to *E. arboreus*. Palp-tarsus with forked terminal sensillum and short, rod-like lateral solenidion (Fig. 7B).

MALE: Not observed.

DISTINGUISHING FEATURES: See under *E. arboreus*.

COLLECTION DATA: Holotype (adult female) from moss on roadside cutting, one mile north of Punakaiki, near Greymouth, 16.ii.65 (T. G. Wood). Also known from moss on boulders, Paradise Flats, head of Lake Wakatipu (T.G.W.).

MATERIAL: Holotype and paratype in D.S.I.R.

Eryngiopus bifidus n.sp. (Fig. 8 A, B, C)

FEMALE (n = 4). Length 350 (346–355).

Dorsum: Propodosomal plates consist of two raised, elongate areas bearing two pairs of setae and a pair of eyes, and which appear to be joined anteriorly (Fig. 8A). Suranal plate single, narrow, bearing two pairs of setae. Dorsal setae slender, simple, appearing faintly barbed under oil-immersion; their lengths as follows: *be,* 37; *de, he, e, le,* 24–26; others, 16–22; *b–b* about 3.0 times as long as *c–c* and *a–a; la–lm* about 2.0 times as long as *lm–li*.

Venter: Maxillicoxae smooth; setae *n* ultralong (68), about three times as long as *m* (21); *n–n* = *m–m; re* and *ri* subequal (Fig. 8B). Intercoxal setae *1a* ultralong (76), longer than *3a* (37) and *4a* (55); *1a/1a–1a* = 3.4; *3a/3a–3a* = 0.5; *4a/4a–4a* = 1.9. Two pairs of paragenital setae: pg_1 (22) shorter than pg_2 (37). Four pairs of anogenital setae: g_1 slender (42), others subequal (16), slightly thickened.

Appendages: Numbers of setae on leg podomeres differ from *E. arboreus* as follows: genua 4(*k*)–0–0–0; *k* I about ⅙ as long as associated dorsal seta. Palp-tarsus with short, rod-like lateral solenidion and forked terminal sensillum (Fig. 8C).

MALE: Not observed.

DISTINGUISHING FEATURES: The numbers of setae on the leg podomeres and lengths of dorsal and ventral setae are similar to these features in *E. microsetus* Summers. The two species can only be distinguished by the terminal sensillum on the palp-tarsus which is simple and spike-like in *E. microsetus* and distinctly forked in *E. bifidus*. It may be noted here that this particular feature is difficult to observe, and the forked nature of the sensillum in *E. bifidus* can be obscured by orientation of the specimen.

COLLECTION DATA: Holotype (adult female) from bark of *Leptospermum scoparium*, Dun Mountain track, Nelson, 700m, 27.vi.64 (T. G. Wood). Other collections: From apple foliage, Sherry River, west Nelson (E. Collyer); bark of unsprayed apple trees, Wanaka, Central Otago (T.G.W.); litter, moss and lichen, 17 miles north of Te Anau (N. A. Walker).

MATERIAL: Holotype and paratype in D.S.I.R.; paratype also in B.M.N.H.

Genus APOSTIGMAEUS Grandjean

Apostigmaeus Grandjean, 1944. *Archs. Sci. phys. nat.* 26: 105. Type species: *Apostigmaeus navicella* Grandjean, 1944.

RECOGNITION: The genus is characterised by the palp-tarsus which bears terminally four independent sensillae (eupathids) (Fig. 8 D) as opposed to the two sensillae of other genera, in which one sensillum is modified in the form of a spike, fork or trident. The dorsal plating is confined to an elongate propodosomal plate bearing only setae *ae* and *be* and no eyes, and individual plates around the other setae except for the suranals which are borne on a single or a paired plate (Fig. 8 E). The anal and genital covers are distinct but have a common opening (Fig. 8 F). There are three pairs of anal setae, three pairs of genital setae and four pairs of paragenital setae.

DISTRIBUTION: Two species are known: *A. navicella* Grandjean which is known from the Palaearctic, Ethiopian and Australian regions, and *A. pacificus* Summers from the Oriental, Australian and Neotropical regions.

Apostigmaeus navicella Grandjean (Fig. 8 D, E, F)

Apostigmaeus navicella Grandjean, 1944. *Archs. Sci. phys. nat.* 26: 105.

DISTINGUISHING FEATURES: The New Zealand specimens examined show minor differences from Grandjean's (1944) specimens: no observable platelets around the bases of setae *a, b* and *c* (Fig. 8 E); slightly smaller size (mean length of 10 specimens = 460); length of pg_2 equals pg_2–pg_3 rather than slightly more than half this length (Fig. 8 F). The numbers of setae on the legs and palp, the relative lengths of dorsal setae and the shape and reticulate ornamentation of the propodosomal plate are identical to the description given by Grandjean.

COLLECTION DATA: Twelve females from bark of *Eucalyptus* sp., Nelson, 17.xi.63 (T. G. Wood).

Genus MECOGNATHA n.gen. (feminine)

Description: Superficially resembling certain members of the Eupalopsellidae (see Summers, 1960a). Single, large propodosomal plate (P) bearing three pairs of setae and two pairs of eyes, the posterior pair of eyes not globose but peg-like with narrow base equal to about half the height. Metapodosomal plate (MP) bearing four pairs of setae including humerals *he;* zonal plate (Z) with two pairs of setae, intercalary plate (I) with one pair of setae and suranal plate (SA) with two pairs of setae; these plates occupy the whole width of the dorsum, but as the body narrows posteriorly MP is wider than Z which is wider than I which is wider than SA. Legs and gnathosoma elongate. Palp-femur, -genua and -tibia four or more times longer than broad; tibial claw represented by a simple seta and accessory seta by a small tubercle; palp-tarsus less than twice as long as broad, with normal complement of setae including a very short trifid terminal sensillum. Chelicerae long, equal to about half the body length. Setae *n* on maxillicoxae and intercoxal setae flagelliform. No intercoxal or paragenital plates. Chaetotaxy of legs as described for type species. Empodium a short rod with three Y-shaped, capitate raylets, nearly three times as long as the axial rod; stem of the Y very short. Males with ω and ωδ on all tarsal podomeres.

RECOGNITION AND AFFINITIES: The extreme elongation of the palps and chelicerae, the reduction of the palp-tibial claw to a simple seta and the tubercle-like accessory seta, and the peg-like posterior pair of eyes are unique among the Stigmaeidae, and indicate a close affinity to the Eupalopsellidae. Stigmaeidae and Eupalopsellidae can only be distinguished by the nature of the empodium, which in Eupalopsellidae consists of raylets arising independently from a median knob between the claws (Summers, 1960a). In *Mecognatha* the axial rod characteristic of the stigmaeid empodium is very much reduced in length and the raylets arise close together on this short rod and in addition the common stem of each pair of

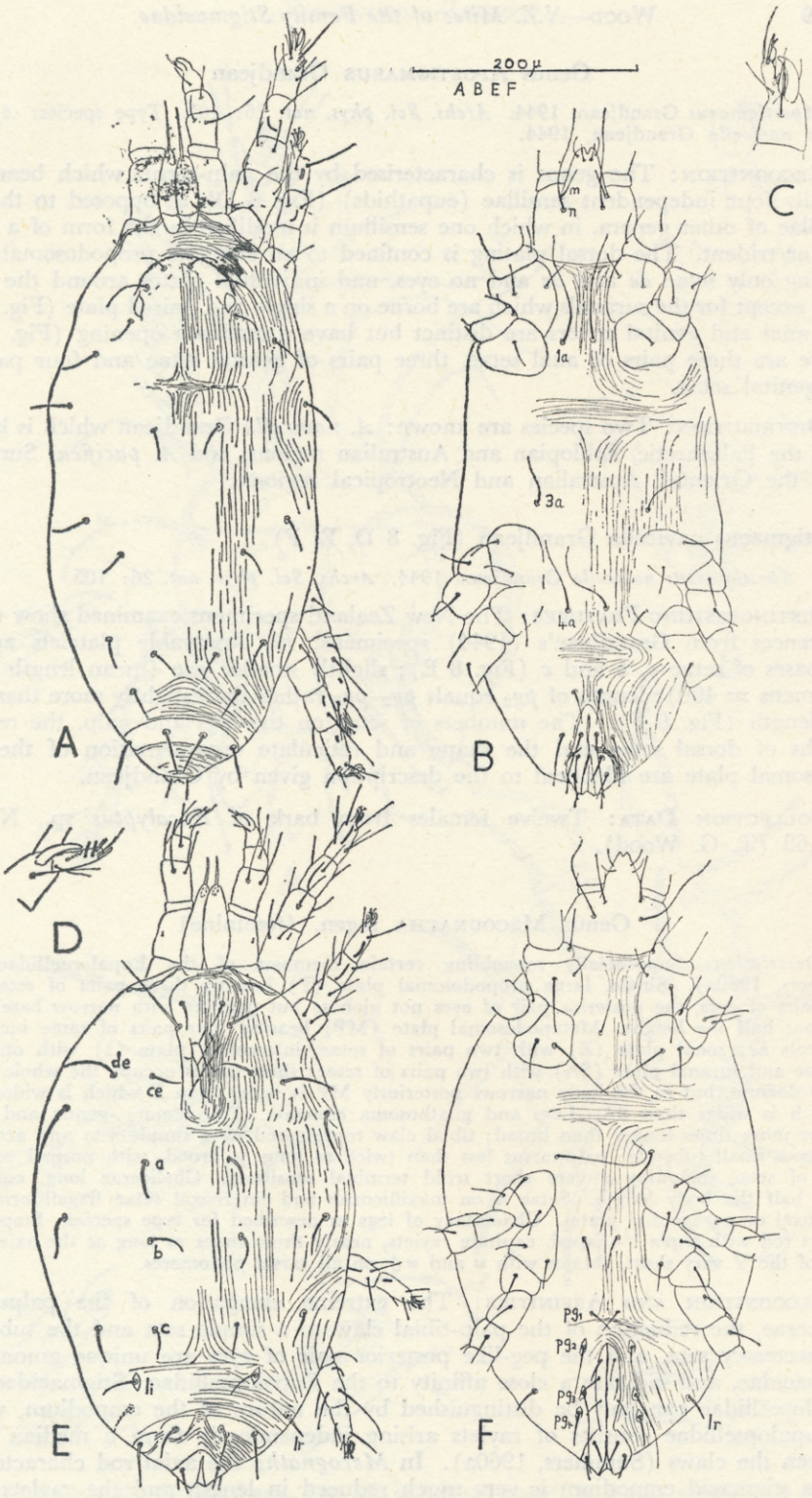

Fig. 8.—*Eryngiopus bifidus* n.sp. A, female dorsal; B, female ventral; C, palp-tibia and -tarsus. *Apostigmaeus navicella* Grandjean. D, palp-tibia and -tarsus; E, female dorsal; F, female ventral.

raylets is very short. A slight shortening of the axial rod to form a knob and a further reduction in length of the common stem of each pair of raylets would place *Mecognatha* in the Eupalopsellidae. *Mecognatha* has no close relatives in the Stigmaeidae. It possesses several unique features indicated above, although the presence of only one seta on coxa II and the absence of seta *de* from the propodosoma may indicate affinities with *Eryngiopus, Zetzellia* and *Mediolata.*

DISTRIBUTION: The one known species is known to occur only in New Zealand where it appears to be widely distributed in both islands.

TYPE SPECIES: *Mecognatha hirsuta* n.sp.

Mecognatha hirsuta n.sp. (Fig. 9 A-G)

FEMALE (n = 10). Length 470 (375–575).

Dorsum: Body not flattened dorso-ventrally like many stigmaeids, but arched dorso-medially and tapering posteriorly. Plates, eyes and arrangement of setae as described for genus (Fig. 9A, D); suranal plate overlaps on to venter. All plates well sclerotised, very finely punctured and appearing smooth in cleared and mounted specimens but faintly reticulated in living specimens. Pairs of small pits or dimples distributed on dorsal plates as shown in Figure 9A, D. Plates narrowly separated from one another and often no striated integument observed between them. Dorsal setae very variable; varying from moderately long and heavily barbed (Fig. 9D) to very long and less heavily barbed (Fig. 9A); many intermediates exist consisting of various combinations of long and short setae, so that although the two extremes appear to be quite distinct, the series of specimens examined (n = 35) belong to the one species. Measurements of a selection of these specimens are given in Table I, and the range of variation based on the relative lengths of certain setae is illustrated in Figure 10. All dorsal setae situated on tubercles which are extremely large on all but the suranals. Integumental striae smooth.

TABLE I.—Variations in lengths of body and dorsal setae in *Mecognatha hirsuta* n.gen. n.sp. (measurements in microns).

Specimen and number	Body Length	*ae*	*be*	*ce*	*a*	*b*	*c*	*he*	*la*	*lm*	*li*	*le*	*e*
FEMALES													
Apple bark, Wanaka (1)	470	187	177	166	156	156	156	166	187	187	114	62	104
Leptospermum, Ruby Bay (2)	510	177	166	156	135	135	156	156	177	166	104	42	73
Rhipogonum, Ruby Bay (3)	575	197	166	177	156	156	177	166	187	187	114	52	83
Olearia, Ruby Bay (4)	470	187	166	156	125	125	135	135	166	166	125	52	73
Metrosideros, French Pass (5)	375	177	156	156	125	125	125	125	146	146	104	52	73
Apple bark, Oratia (6)	520	260	270	156	135	146	166	156	187	187	104	42	73
Apple bark, Oratia (7)	440	208	218	156	125	125	135	114	177	156	197	135	62
Salix, Appleby (8)	450	440	385	250	354	260	260	230	270	220	187	62	114
Apple bark, Wanaka (9)	480	354	320	220	231	230	208	177	241	197	135	62	94
Podocarpus, Nelson (10)	575	437	425	197	385	335	270	208	290	220	146	62	114
Moss, Canaan (11)	415	335	335	146	354	197	156	135	187	166	156	42	73
Albizzia, Auckland (12)	470	470	425	260	416	335	292	187	281	230	135	42	73
MALES													
Apple bark, Wanaka	435	260	260	166	156	177	156	123	208	177	125	31	62
Leptospermum, Ruby Bay	450	260	296	156	250	220	156	135	187	156	104	42	73
Apple bark, Oratia	405	187	187	125	125	125	125	104	166	146	94	31	62

Venter: Maxillicoxae smooth; setae *n* flagelliform (130) reaching to tip of rostrum, setae *m* 70; *m–m* slightly less than *n–n; re* and *ri* subequal (Fig. 9B). Intercoxal setae subequal, flagelliform (140). Coxal setae 40–70, setae *2b* longest. Two pairs of subequal (32) paragenital setae situated on striated integument. Four pairs of subequal (32) anogenital setae. All ventral setae simple.

Appendages: Numbers of setae on leg podomeres as follows: tarsi 13(ω)–10(ω)–8(ω)–8(ω); tibiae 6(φρ)–6(φρ)–6(φρ)–6(φρ); genua 2(k)–1–1–1; femora 5–4–2–2; trochantera 1–1–1–1; coxae 2–1–2–2; *k* I very small less than $\frac{1}{16}$ as long as associated dorsal seta; ω on tarsi III and IV much shorter than on I and II; most of setae situated on tubercles; tibiae with four

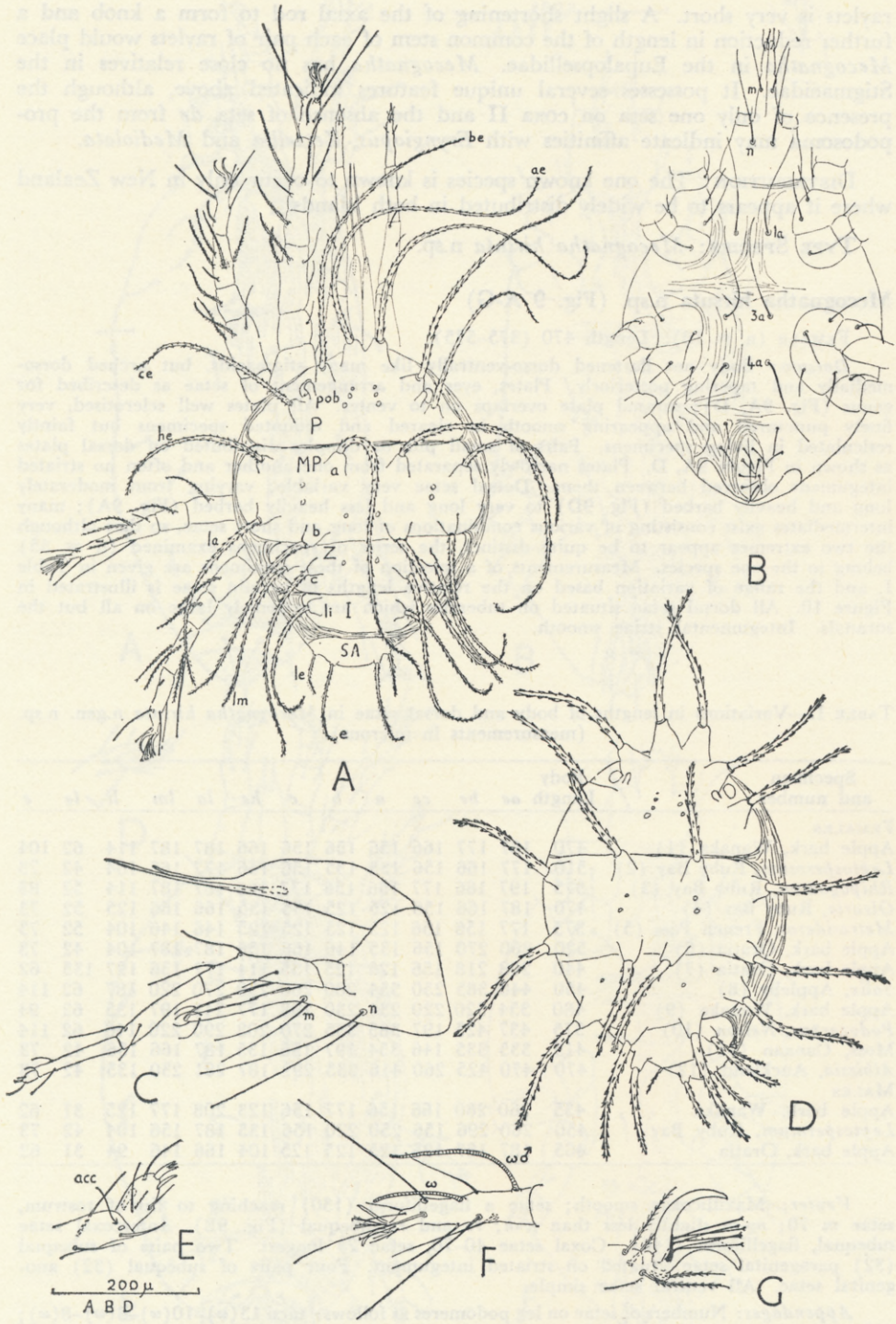

FIG. 9.—*Mecognatha hirsuta* n.gen. n.sp. A, D, female dorsal; B, female ventral; C, gnathosoma lateral; E, palp-tibia and -tarsus; F, male left leg I; G, claws and empodium.

pilose setae and one smooth macroseta which on IV is 1.5 times longer than the lateral seta. Empodium as described for genus (Fig. 9G). Numbers of setae on palp-femur to palp-tarsus 3–2–4–7; tibial claw a simple seta, shorter than tarsus, accessory seta a small tubercle; lateral solenidion on tarsus slightly clavate, terminal sensillum a short trident with prongs shorter than stem (Fig. 9C, E).

MALE (n = 8). Length 430 (395–460).

Features as described for female. Measurements of some specimens shown in Table I. ω I longer than in female, only slightly shorter than ω♂ I which extends almost to the base of the claws (Fig. 9F); ω on tarsi II, III and IV as in female.

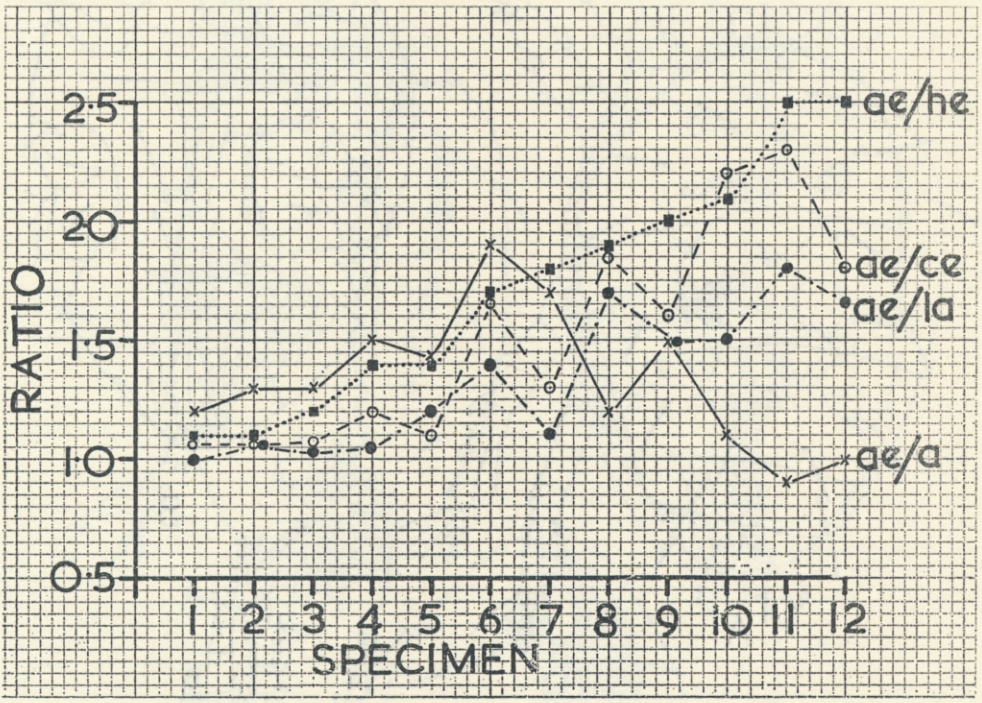

FIG. 10.—Variations in ratios of lengths of certain dorsal setae in *Mecognatha hirsuta*. Numbers along abscissa refer to specimens numbered in Table I.

DISTINGUISHING FEATURES: These are indicated in the description of the genus and the species given above.

COLLECTION DATA: Holotype (adult female) from *Albizzia* sp., D.S.I.R. campus, Mount Albert, Auckland, 2.viii.60 (E. Collyer). Allotype (adult male) from bark of unsprayed apple trees, Wanaka, Central Otago, 7.v.64 (T. G. Wood). Other collections: Bark of unsprayed apple trees, Oratia, Auckland (E.C.); bark of *Leptospermum,* near Levin (T.G.W.); bark of unsprayed apple trees, Mapua, west Nelson (T.G.W.); *Leptospermum scoparium, Rhipogonum scandens* and *Olearia rani,* Ruby Bay, west Nelson (E.C.); bark of *Salix* sp., Appleby, west Nelson (T.G.W.); rata (*Metrosideros* sp.), near French Pass, Marlborough Sounds (E.C.); moss on boulders, Canaan, north-west Nelson (G. W. Ramsay); moss, Balloon Hill, Mount Arthur, west Nelson (G.W.R.); *Podocarpus* sp., Nelson (E.C.); *Podocarpus ferrugineus* G. Benn. ex. Don, Wairau Valley (B. B. Given); moss among *Pinus* litter on sand dunes, Matanaka Beach, Waikouaiti, near Dunedin (T.G.W.); moss on rocks near Kurow, North Otago (T.G.W.).

MATERIAL: Holotype, allotype and paratypes in D.S.I.R.; paratypes also in B.M.N.H., U.S.N.M., S.A.M. and author's collection.

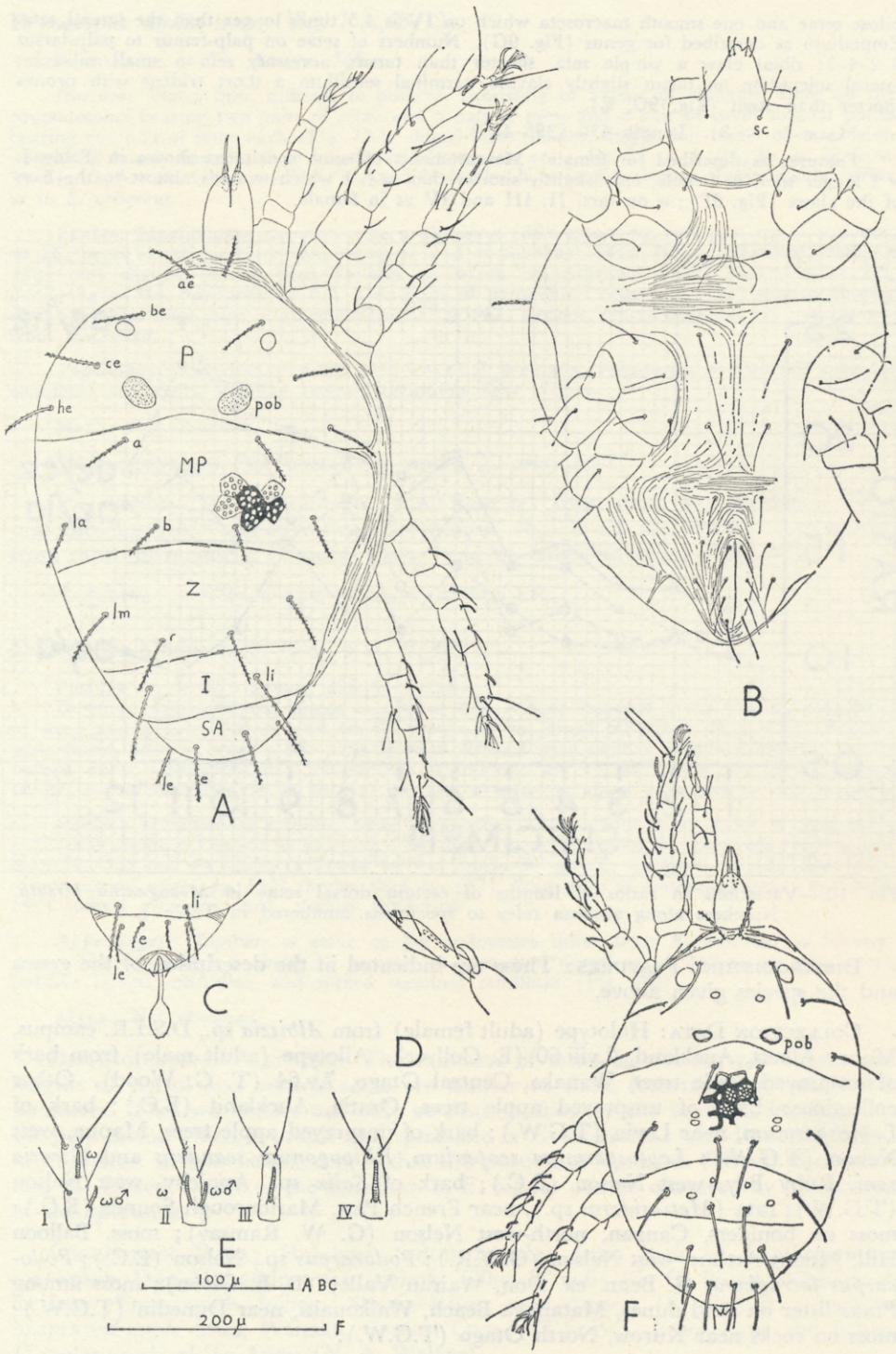

Fig. 11.—*Mediolata brevisetis* n.sp. A, female dorsal; B, female ventral; C, male opisthosoma dorsal; D, palp-tibia and -tarsus; E, male tarsi. *Mediolata favulosa* n.sp. F, female dorsal.

Genus MEDIOLATA G. Canestrini, emend. Gonzalez

Mediolata G. Canestrini, 1889. *Atti Ist. veneto Sci.* 7: 524. Type species: *Stigmaeus longirostris* Berlese, 1887.

Mediolata: Gonzalez, 1965. *Univ. Calif. Publs. Ent.* 41: 7.

RECOGNITION: Palp-tibial claw not more than half as long as palp-tarsus, the latter being as long as or longer than the palp-tibia. Arrangement of dorsal plates varies: the four New Zealand species all have a large propodosomal plate (P) bearing four pairs of setae including humerals (*he*), plus a pair of eyes and a pair of postocular bodies; metapodosomal plate (MP) bearing three pairs of setae, zonal plate and intercalary plate bearing two pairs of setae each; these plates completely covering the dorsum, contiguous laterally and separated mid-dorsally by distinct sutures; single suranal plate bearing two pairs of setae. In other species the four hysterosomal plates exhibit varying degrees of fusion. Only one pair of setae (*sc*) on maxillicoxae, and one seta on coxa II. No intercoxal plates. The chelicerae may be partly fused dorsally.

DISTRIBUTION: Eleven species can be definitely assigned to this genus: five Nearctic, two Palaearctic and four Australian.

KEY TO THE NEW ZEALAND SPECIES OF *Mediolata* (FEMALES)

1.	Only one seta on genu II; *b/b–b* and *c/c–c* less than 1.0	*M. brevisetis* n.sp.
—	Genu II with three setae; *b/b–b* and *c/c–c* more than 1.0	2
2.	Dorsal reticulation simple, no vacuolation within dimples	*M. simplex* n.sp.
—	Dorsal reticulation with obvious vacuolation within dimples	3
3.	6–13 vacuoles within each dimple; *be/be–ce* less than 1.5	*M. favulosa* n.sp.
—	20 or more vacuoles within each dimple; *be/be–ce* more than 2.0	*M. robusta* Gonzalez

Mediolata brevisetis n.sp. (Fig. 11 A, B, C, D, E)

FEMALE (n = 2). Length 340.

Dorsum: Plates well sclerotised, reticulated, covering whole of dorsum and overlapping laterally; reticulum obscured by coarse vacuolation within each dimple (5–10 vacuoles per dimple); no small anomalous dimples (Fig. 11A). Postocular bodies on propodosoma roughly oval, protuberant and with very faint microtuberculate surface structure. Metapodosomal, zonal and intercalary plates contiguous laterally, but separated by distinct sutures for most of their width. Dorsal setae of fairly uniform length, acicular and moderately barbed; their lengths as follows: *li*, 52; *la*, *b*, 32; others, 34–37; *be/be–ce* = 0.75, *a/a–a* = 0.37, *b/b–b* = 0.55, *c/c–c* = 0.78, *b/b–c* = 0.43. Integumental striae smooth.

Venter: Maxillicoxae smooth; *sc*, 36; *sc/sc–sc* = 1.0; *re* and *ri* subequal (Fig. 11B). Intercoxal setae flagelliform, situated on striated integument: *1a* 57, *3a* 68, *4a* 34. Three pairs of paragenital setae situated on striated integument: pg_1 26, not quite reaching to base of pg_2; pg_2 and pg_3 subequal (33); pg_2 overreaches base of pg_3. Four pairs of anogenital setae: g_1 longest (36); g_2 and g_3 subequal (26); g_4 32 and somewhat thickened.

Appendages: Numbers of setae on leg podomeres as follows: tarsi 12(ω)–10(ω)–8(ω)–8(ω); tibiae 6(φρ)–6(φρ)–6(φρ)–6(φρ); genua 4(k)–1–1–1; femora 5–4–2–1; trochantera 1–1–1–0; coxae 2–1–2–2; ω I noticeably thickened; dorsal macroseta on tibia I smooth and longer than tibia I, corresponding setae on other tibial podomeres barbed and shorter than their segments; *k* I short, about ⅓ as long as associated dorsal seta. Empodium with capitate raylets. Numbers of setae on palp-femur to palp-tarsus 2–1–4–7; tibial claw less than half as long as tarsus, accessory seta simple; tarsus with lateral rod-like solenidion shorter than

tibial claw, terminal sensillum a short trident with inconspicuous prongs (Fig. 11D). Chelicerae fused dorsally for proximal ⅔ of their length.

MALE (n = 1). Length 260.

Distinguishing features as in female. Differences are: *e* shorter than *le*, so that *li* nearly twice as long as *e* (Fig. 11C); ω♂ I and II shorter than ω I and II, and only one solenidion (which is enlarged) on tarsi III and IV (Fig. 11E).

DISTINGUISHING FEATURES: The short dorsal setae, the protuberant postocular bodies, pattern of reticulation and numbers of setae on genua and trochantera are the principal diagnostic characters.

COLLECTION DATA: Holotype (adult female) from leaf of *Coprosma australis*, 500m, Whangamoa Saddle, Nelson, 21.iii.65 (E. Collyer). Allotype (adult male) from bark of *Eucalyptus* sp., Nelson, 17.xi.63 (T. G. Wood). Also known from leaf of unsprayed apple tree, Appleby, west Nelson (E.C.).

MATERIAL: Holotype and allotype in D.S.I.R.

Mediolata favulosa n.sp. (Fig. 11 F)

FEMALE (n = 1). Length 350.

Dorsum: Plates well sclerotised, reticulated, covering whole of dorsum but not overlapping laterally; reticulation distinct, each dimple with 6–13 vacuoles; several small anomalous dimples without vacuolation distributed as shown in Figure 11F. Postocular bodies on propodosoma roughly circular, appearing as invaginated pits. Hysterosomal plates as in *M. brevisetis*. Dorsal setae acicular, moderately barbed, situated on small tubercles, their lengths as follows: *be, b, c, lm, li,* 49–55; *e, le, ce, he,* 42–47; *ae, a, la,* 35–40; *be/be–ce* = 1.1, *a/a–a* = 1.1, *b/b–b* = 1.6, *c/c–c* = 1.6, *b/b–c* = 0.89. Integumental striae smooth.

Venter: Maxillicoxae smooth; *sc,* 49; *sc/sc–sc* = 1.2; *re* and *ri* subequal. Intercoxal setae flagelliform: *1a* 42, *3a* 63, *4a* 48. Three pairs of paragenital setae situated on striated integument: all subequal (26); pg_1 not reaching to base of pg_2, pg_2 overreaching base of pg_3. Four pairs of anogenital setae: g_1 and g_2 38–40, g_3 and g_4 31–35.

Appendages: Numbers of setae on leg podomeres differ from *M. brevisetis* as follows: genua 4(*k*)–3–1–1; femora 5–4–3–1; trochantera 1–1–1–1; ω I not particularly thickened; macroseta on tibia I smooth, as long as tibia I, corresponding setae on other tibial podomeres barbed and shorter than their segments; *k* I short, about ⅓ as long as associated dorsal seta. Empodium with capitate raylets. Numbers of setae on palp segments as in *M. brevisetis;* details of palp-tibia and palp-tarsus as in *M. brevisetis*. Chelicerae fused dorsally.

MALE (n = 1). Length 220.

Distinguishing features as in female except *a, b* and *c* subequal and shorter than *li* so that *b/b–b* = 0.8, *c/c–c* = 0.9, *b/b–c* = 0.6; *e* shorter than *le*. Solenidia on tarsi I and II as in *M. brevisetis,* but two solenidia on tarsus III where ω♂ is slightly longer than ω; only one solenidion (which is enlarged) on tarsus IV.

DISTINGUISHING FEATURES: This species most closely resembles *M. robusta* Gonzalez from which it can be distinguished by the presence of one seta on trochanter IV, the presence of fewer vacuoles in the individual dimples of the dorsal reticulum; the more slender, shorter and less conspicuously barbed dorsal setae and the relative lengths of certain setae and inter-setal distances.

COLLECTION DATA: Holotype (adult female) from bark of unsprayed apple tree, Tadmor, near Nelson, 15.ix.65 (R. Miller). Allotype (adult male) from moss on boulders, 1000m, Crown Range, Queenstown, 7.v.64 (T. G. Wood).

MATERIAL: Holotype and allotype in D.S.I.R.

Mediolata simplex n.sp. (Fig. 12 A, B, C, D)

FEMALE (n = 3). Length 415 (410–423).

Dorsum: Plates well sclerotised with obvious thin-walled reticulum surrounding fairly deep dimples which are not vacuolated (Fig. 12A, D). Arrangement of plates as in *M. brevisetis*. Several small anomalous dimples distributed as shown in Figure 12A. Postocular bodies on propodosoma roughly circular, appearing as invaginated pits. Dorsal setae

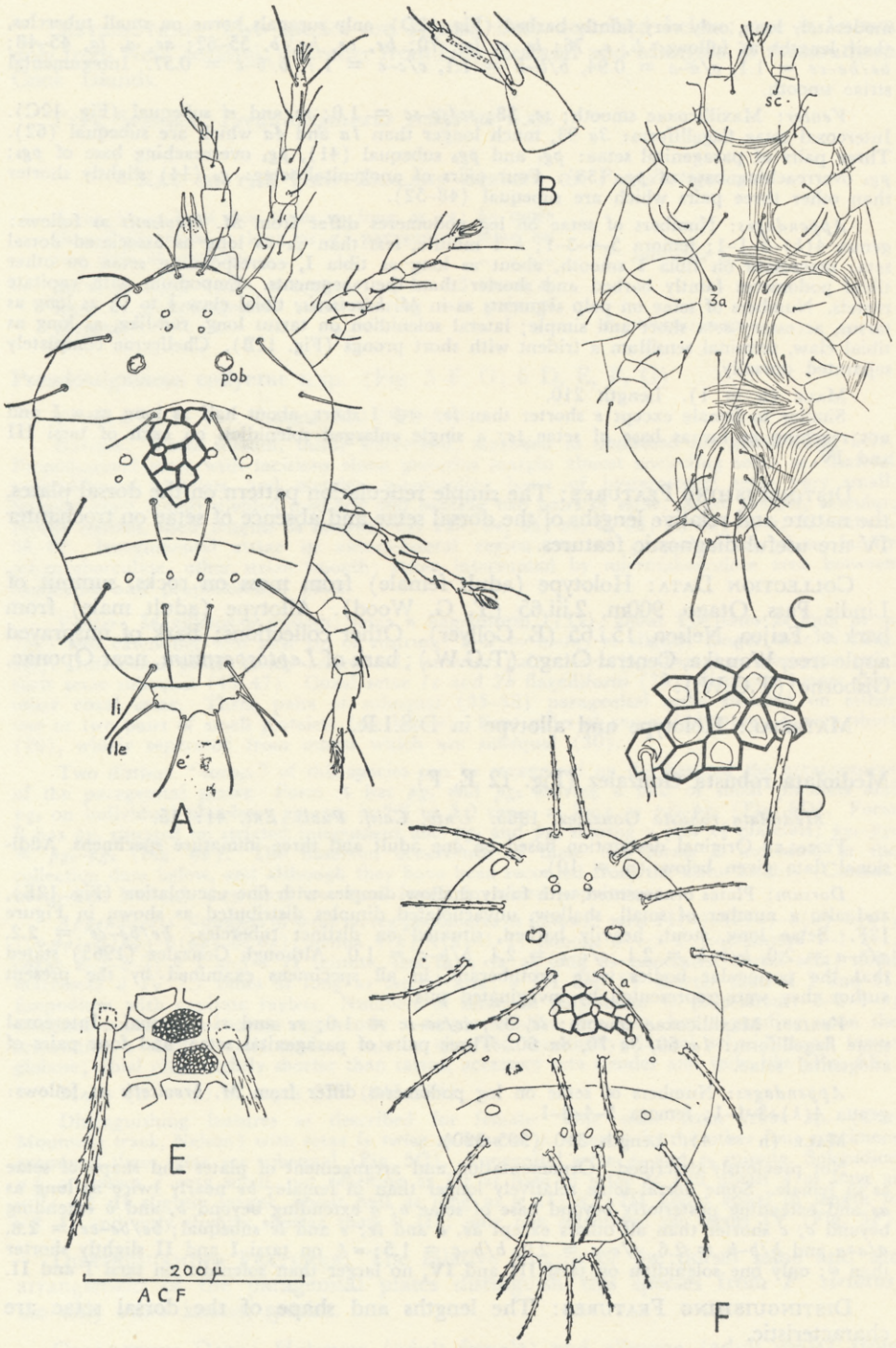

FIG. 12.—*Mediolata simplex* n.sp. A, female dorsal; B, palp-tibia and -tarsus; C, female ventral; D, reticulation around dorsal setae *b*. *Mediolata robusta* Gonzalez. E, reticulation around dorsal setae *b;* F, female dorsal.

moderately long, only very faintly barbed (Fig. 12D), only suranals borne on small tubercles, their lengths as follows: *li, e,* 76; *le, c, lm,* 70; *be, ce, he, b,* 55–62; *ae, a, la,* 45–48; *be/be–ce* = 1.1, *a/a–a* = 0.94, *b/b–b* = 1.1, *c/c–c* = 1.7, *b/b–c* = 0.57. Integumental striae smooth.

Venter: Maxillicoxae smooth; *sc,* 38; *sc/sc–sc* = 1.0; *re* and *ri* subequal (Fig. 12C). Intercoxal setae flagelliform: *3a* 93, much longer than *1a* and *4a* which are subequal (62). Three pairs of paragenital setae: pg_1 and pg_2 subequal (41), pg_1 overreaching base of pg_2; pg_2 overreaching base of pg_3 (38). Four pairs of anogenital setae: g_2 (44) slightly shorter than other three pairs which are subequal (48–52).

Appendages: Numbers of setae on leg podomeres differ from *M. brevisetis* as follows: genua 4(*k*)–3–1–1; femora 5–4–3–1; *k* I minute, less than $\frac{1}{16}$ as long as associated dorsal seta; macroseta on tibia I smooth, about as long as tibia I, corresponding setae on other tibial podomeres faintly barbed and shorter than their segments. Empodium with capitate raylets. Numbers of setae on palp segments as in *M. brevisetis;* tibial claw $\frac{1}{2}$ to $\frac{1}{3}$ as long as tarsus, accessory seta short and simple; lateral solenidion on tarsus long, rod-like, as long as tibial claw, terminal sensillum a trident with short prongs (Fig. 12B). Chelicerae completely separated dorsally.

MALE (n = 1). Length 210.

Similar to female except *e* shorter than *le.* $\omega\delta$ I short, about half as long as ω I and not reaching as far as base of setae *tc;* a single enlarged solenidion on each of tarsi III and IV.

DISTINGUISHING FEATURES: The simple reticulation pattern on the dorsal plates, the nature and relative lengths of the dorsal setae and absence of setae on trochanter IV are useful diagnostic features.

COLLECTION DATA: Holotype (adult female) from moss on rocks, summit of Lindis Pass, Otago, 900m, 2.iii.65 (T. G. Wood). Allotype (adult male) from bark of Feijoa, Nelson, 15.i.65 (E. Collyer). Other collections: Bark of unsprayed apple tree, Wanaka, Central Otago (T.G.W.); bark of *Leptospermum,* near Oponae, Gisborne (T.G.W.).

MATERIAL: Holotype and allotype in D.S.I.R.

Mediolata robusta Gonzalez (Fig. 12 E, F)

Mediolata robusta Gonzalez, 1965. *Univ. Calif. Publs. Ent.* 41: 15.

FEMALE: Original description based on one adult and three immature specimens. Additional data given below (n = 10).

Dorsum: Plates ornamented with fairly shallow dimples with fine vacuolation (Fig. 12E), and also a number of small, shallow, unvacuolated dimples distributed as shown in Figure 12F. Setae long, stout, heavily barbed, situated on distinct tubercles: *be/be–ce* = 2.2, *a/a–a* = 2.0, *b/b–b* = 2.1, *c/c–c* = 2.1, *b/b–c* = 1.0. Although Gonzalez (1965) stated that the postocular bodies were protuberant, in all specimens examined by the present author they were represented by invaginated pits.

Venter: Maxillicoxae smooth; *sc,* 37; *sc/sc–sc* = 1.0; *re* and *ri* subequal. Intercoxal setae flagelliform: *1a* 60, *3a* 70, *4a* 60. Three pairs of paragenital setae, and four pairs of anogenital setae.

Appendages: Numbers of setae on leg podomeres differ from *M. brevisetis* as follows: genua 4(*k*)–3–1–1; femora 5–4–3–1.

MALE (n = 4). Length 310 (305–320).

Not previously described. Ornamentation and arrangement of plates and shape of setae as in female. Some dorsal setae relatively longer than in female; *be* nearly twice as long as *ae* and extending posteriorly beyond base of setae *a; a* extending beyond *b,* and *b* extending beyond *c; c* shorter than all others except *ae, e* and *le; e* and *le* subequal; *be/be–ce* = 2.8, *a/a–a* and *b/b–b* = 2.6, *c/c–c* = 2.0, *b/b–c* = 1.5; $\omega\delta$ on tarsi I and II slightly shorter than ω; only one solenidion on tarsi III and IV, no larger than solenidia on tarsi I and II.

DISTINGUISHING FEATURES: The lengths and shape of the dorsal setae are characteristic.

COLLECTION DATA: The species was described from an adult female (holotype) on *Pseudopanax crassifolium* (Sol. ex. A. Cunn.), C. Koch, Waitakere Range,

Auckland, and three immature females on *Knightia excelsa* R. Br., in the same locality; collections by E. Collyer. Additional specimens have been collected from the following localities and examined by the present author: *Nothofagus fusca* and *Carpodetus serratus,* Lake Rotoroa, Nelson Lakes National Park; *Pseudopanax crassifolium,* Napier; *Nothofagus* sp., Sherry River, Nelson (E. Collyer); moss on rocks, Kurow, Central Otago; moss on *Nothofagus menziesii,* Governor's Bush, Mount Cook (T. G. Wood).

MATERIAL: Holotype in B.M.N.H.; paratype in D.S.I.R. (forwarded by D. C. M. Manson from Department of Agriculture, Levin, New Zealand). The present author has sent specimens to D.S.I.R., U.S.N.M. and S.A.M.

Genus ZETZELLIA Oudemans

Zetzellia Oudemans, 1927. *Ent. Ber., Amst.* 7(158): 263. Type species: *Zetzellia methlagli* Oudemans, 1927.

Agistemus Summers, 1960b. *Proc. ent. Soc. Wash.* 62: 234 (new combination).

RECOGNITION: Propodosomal plate bears three pairs of setae, a pair of eyes and a pair of irregularly shaped postocular bodies. Humeral and intercalary setae borne on individual platelets, two pairs of suranal setae borne on a single plate, arrangement of other hysterosomal setae and plates variable, but setae *c* and *1m* never on separate plates. Two pairs of setae on maxillicoxae. Only one seta on coxa II. One or two pairs of paragenital setae. Palps normal: Tibial claw half to as long as tarsus; latter with terminal sensillum as a trident with short prongs. Chelicerae completely separated.

The definition of the genus (Oudemans, 1927; Summers, 1960b) was broadened by Gonzalez (1965) to include species with a divided median hysterosomal plate (such as *Z. maori* Gonzalez, *Z. mapuchina* Gonzalez), and the same author also clarified the status of the genus by illustrating for the first time the type species, *Z. methlagli* Oudemans. Summers (1960b) erected the genus *Agistemus* for several *Zetzellia*-like species with a large, entire, median hysterosomal plate bearing dorso-lateral setae *la* and *lm* and dorso-median setae *a, b* and *c*. *Agistemus* and *Zetzellia* have many features in common and the genera can only be distinguished by the location of setae *la,* which are on the median plate in *Agistemus* and on independent platelets in *Zetzellia.* The arrangement of dorsal plates in *Zetzellia* is very variable, but it is possible to distinguish four groups (Fig. 14 C, D, E, F), typified by *maori, australis, mali* and *methlagli,* which exhibit a gradual change from three pairs of small median plates to a large integral median plate. *Agistemus* has a fairly uniform arrangement of dorsal plates (Fig. 14 G, H) which appears to be the next step from the *methlagli* group in integration of the median plate. According to Gonzalez (1965) *Agistemus striolatus* Gonzalez and *Zetzellia mali* (Ewing) go through similar ontogenetic changes in organisation of dorsal plates, which in the proto-nymph stage is similar to the adult stage in *Z. maori.* Studies on *Zetzellia* and *Agistemus* led Gonzalez (1965) to suggest that "—*Agistemus* represents an evolutionary line apparently evolved from the *Zetzellia maori* group of species." Whilst agreeing with this, the present author suggests that this evidence is sufficient to justify enlarging the definition of *Zetzellia* to include all the species hitherto included in *Agistemus.* This arrangement appears to conform to current ideas on the definition of stigmaeid genera, where some genera (such as *Stigmaeus* and *Mediolata*) exhibit considerable variation in arrangements of plates and setae.

DISTRIBUTION: The genus has a world-wide distribution and 37 species are known: One cosmopolitan, two Holarctic, one American, one Southern Hemisphere, six Nearctic, four Palearctic, four Neotropical, six Ethiopian, five Oriental and eight Australian.

Key to the New Zealand Species of *Zetzellia* (females)

1.	Median hysterosomal plate entire, bearing four or five pairs of setae	2
—	Median hysterosomal plate divided medially and transversely into three pairs of plates; only setae *lm* and *c* share the same plate	7
2.	Median plate with five pairs of setae including *la*	3
—	Median plate with four pairs of setae; *la* borne on individual platelets	6
3.	Dorsal plates reticulated; *a/a–a* less than 1.5	4
—	Dorsal plates smooth; *a/a–a* more than 2.5	*Z. longiseta* (Gonzalez)
4.	Genua 4–1–0–0; six setae on tibia IV; *ae/ae–ae* 1.5	*Z. novazelandica* (Gonzalez)
—	Genua 3–0–0–0; four or five setae on tibia IV; *ae/ae–ae* 1.0 or less	5
5.	Tibia IV with five setae; *a/a–a* less than 0.5; *be/be–ce* 1.0 or less; coarse vacuolation (6–16 vacuoles per cell) within dorsal reticulum	*Z. subreticulata* n.sp.
—	Tibia IV with four setae; *a/a–a* more than 0.8; *be/be–ce* more than 1.0; dorsal reticulum with up to 30 vacuoles per cell	*Z. collyerae* (Gonzalez)
6.	Reticulum on median plate with eight or nine cells between pair of setae *b;* setae *b* reaching to base of setae *lm;* ratio dorsal seta on femur I/*be* less than 0.9	*Z. gonzalezi* n.sp.
—	Reticulum on median plate with 12 cells between pair of setae *b;* setae *b* not reaching to base of setae *lm;* ratio dorsal seta on femur I/*be* more than 1.1	*Z. antipoda* n.sp.
7.	Paragenital setae pg_2 slightly longer than pg_1; dorsal setae short, *a–a/a* = 3.4, *ae/ae–ae* = 0.8	*Z. maori* Gonzalez
—	Paragenital setae subequal; dorsal setae not particularly short, *a–a/a* = 1.4, *ae/ae–ae* = 1.4	*Z. oudemansi* n.sp.

Zetzellia oudemansi n.sp. (Fig. 13 A, B, C)

Female (n = 3). Length 370 (360–375).

Dorsum: Single, smooth propodosomal plate bearing three pairs of setae, a pair of eyes and a pair of protuberant postocular bodies which are faintly microtuberculate; posterior margin of plate concave (Fig. 13A). Median plate totally divided: setae *lm* and *c* share an irregularly shaped pair of plates; setae *a, b, la, li* and *he* situated on small, individual platelets; single suranal plate bears two pairs of setae. Dorsal setae slender, faintly barbed, their lengths as follows: *ce, a,* 47; *la, b, c, lm,* 35–42; others, 49–55; *ae/ae–ae* = 1.4, *be/be–ce* = 1.2, *a/a–a* = 0.74, *b/b–b* = 0.39, *b/b–c* = 0.42. Integumental striae smooth.

Venter: Maxillicoxae smooth; setae *n* (58) longer than *m* (42) and reaching to tip of rostrum; *m–m* = twice *n–n* (Fig. 13C). Intercoxal setae situated on striated integument, subequal (50–55). Coxal setae *2c, 3b, 4b* (42) longer than others (30). Two pairs of slender, subequal (42) paragenital setae; pg_1 on striated integument, pg_2 on crescentic plates; pg_1/pg_1–pg_2 = 1.2. Four pairs of anogenital setae; g_1 slender (42), others slightly thickened and faintly barbed, subequal (25–28).

Appendages: Numbers of setae on leg podomeres as follows: tarsi 13 (ω)–10(ω)–8(ω)–7; tibiae 6(φρ)–6(φρ)–6(φρ)–6(φρ); genua 4(*k*)–1–0–0; femora 5–4–2–1; trochontera 1–1–1–1; coxae 2–1–2–2; *k* I short, about ⅓ as long as associated dorsal seta; φρ I slender, as long as ω I; dorsal macrosetae on tibiae I, III and IV reaching as far as claws, *d* IV about 2.1 times as long as lateral seta. Empodium with capitate raylets. Numbers of setae on palp as follows: femur 3, genu 1, tibia 4, tarsus 7; tibial claw shorter than tarsus, accessory seta spine-like about half as long as claw; lateral solenidion on tarsus long, rod-like, terminal sensillum a trident with short prongs (Fig. 13B).

Male (n = 1). Length 310.

Arrangements of plates and setae as in female except that setae *a, b, c* and *lm* share a pair of elongate plates as in male of *Z. maori* (Fig. 14B); setae *e* about half as long as *le*,

Solenidia ω ♂ I and II long, reaching to base of setae *tc;* a single solenidion on each of tarsus III and IV, the one on tarsus III being short and about half as long as the one on tarsus IV.

DISTINGUISHING FEATURES: This species can be distinguished from other species in the *maori* group by the following features: relative lengths of dorsal setae and inter-setal distances; the presence of five setae on femur I; the presence on a crescentic plate of two pairs of subequal paragenital setae, pg_1 being longer than pg_1–pg_2 and equal in length to g_1.

COLLECTION DATA: Holotype (adult female) and allotype (adult male) from moss on rocks, 1000m, near top of Lindis Pass, Otago, 2.iii.65 (T. G. Wood). Other collections: Bark of *Leptospermum scoparium,* Dun Mountain track, Nelson (T.G.W.); foliage of *Dysoxylum* sp., Pelorus Sound, Marlborough (D. B. Reid).

MATERIAL: Holotype and allotype in D.S.I.R.; paratype in B.M.N.H.

Zetzellia maori Gonzalez (Fig. 14 B)

Zetzellia maori Gonzalez, 1965. *Univ. Calif. Publs. Ent.* 41: 22.

FEMALE: Additional data given below (n = 10).

Dorsum: *a/a–a* = 0.30, *b/b–b* = 0.24, *b/b–c* = 0.35.

Venter: Maxillicoxae smooth; setae *n* (22) slightly longer than *m* (20) which are slightly thickened; *m–m* = 1.7 times as long as *n–n*. Intercoxal setae situated on striated integument, subequal (20–24).

Appendages: Numbers of setae on leg and palp segments as in *Z. oudemansi* except two setae on femur IV (note 13 setae, including ω, on tarsus I; not 12 as noted by Gonzalez, 1965).

MALE (n = 10).

Arrangement of plates on dorsum differs from female in that setae *a, b, c* and *lm* share a pair of narrow elongate plates (Fig. 14B) as in females of *Z. australis* Gonzalez and males of *Z. oudemansi*. Only one solenidion on each of tarsi III and IV. For other details see Gonzalez (1965).

DISTINGUISHING FEATURES: The unequal paragenital setae on individual platelets, length of suranal setae relative to other dorsals, the relatively short dorsal setae and the presence of five setae on femur I are distinctive.

COLLECTION DATA: New plant host and locality records are: *Sarothamnus* sp. (Nelson, Christchurch, Raumati); *Leptospermum ericoides* (Nelson, Wairau Valley, Marlborough); *Knightia excelsa* (New Plymouth); *Geniostoma ligustrifolium* A. Cunn. (Levin); *Olearia rani, Alectryon excelsum, Melicytus ramiflorus, Banksia* sp., *Cyathodes* sp., *Asplenium lucidum* Forst. f., *Erica lusitanica, Cassinia* sp., *Sophora microphylla* (Nelson and bays of west Nelson). Collections by E. Collyer, D. C. M. Manson and T. G. Wood.

Zetzellia antipoda n.sp. (Fig. 13 D, E, F)

FEMALE (n = 8). Length 375 (355–390).

Dorsum: Dorsal plates moderately sclerotised, ornamented with network of thin-walled, polygonal reticulum, the individual cells of which are very finely vacuolated (30 or more minute vacuoles per cell), but this latter feature is difficult to observe. Propodosomal plate with convex posterior margin and bearing three pairs of setae, three pairs of small cells situated medially, a pair of eyes and a pair of postocular bodies, the latter being small, not obviously protuberant, faintly microreticulate and only about 1.5 times the diameter of the eye (Fig. 13F). Median plate entire bearing four pairs of setae; number of polygonal cells between setae *b–b* = 10–11; number of cells between setae *a–c* = 11–13. Setae *he, la* and *li* on individual platelets. Setae slender, acicular, faintly barbed, their lengths as follows: *be, e, le,* 51; *li,* 46; *a, b, la, lm,* 35; others, 41; setae *e* and *le* slightly thickened; *ae/ae–ae* = 1.1, *be/be–ce* = 1.0, *a/a–a* = 0.43, *b/b–b* = 0.30, *b/b–c* = 0.46. Integumental striae smooth.

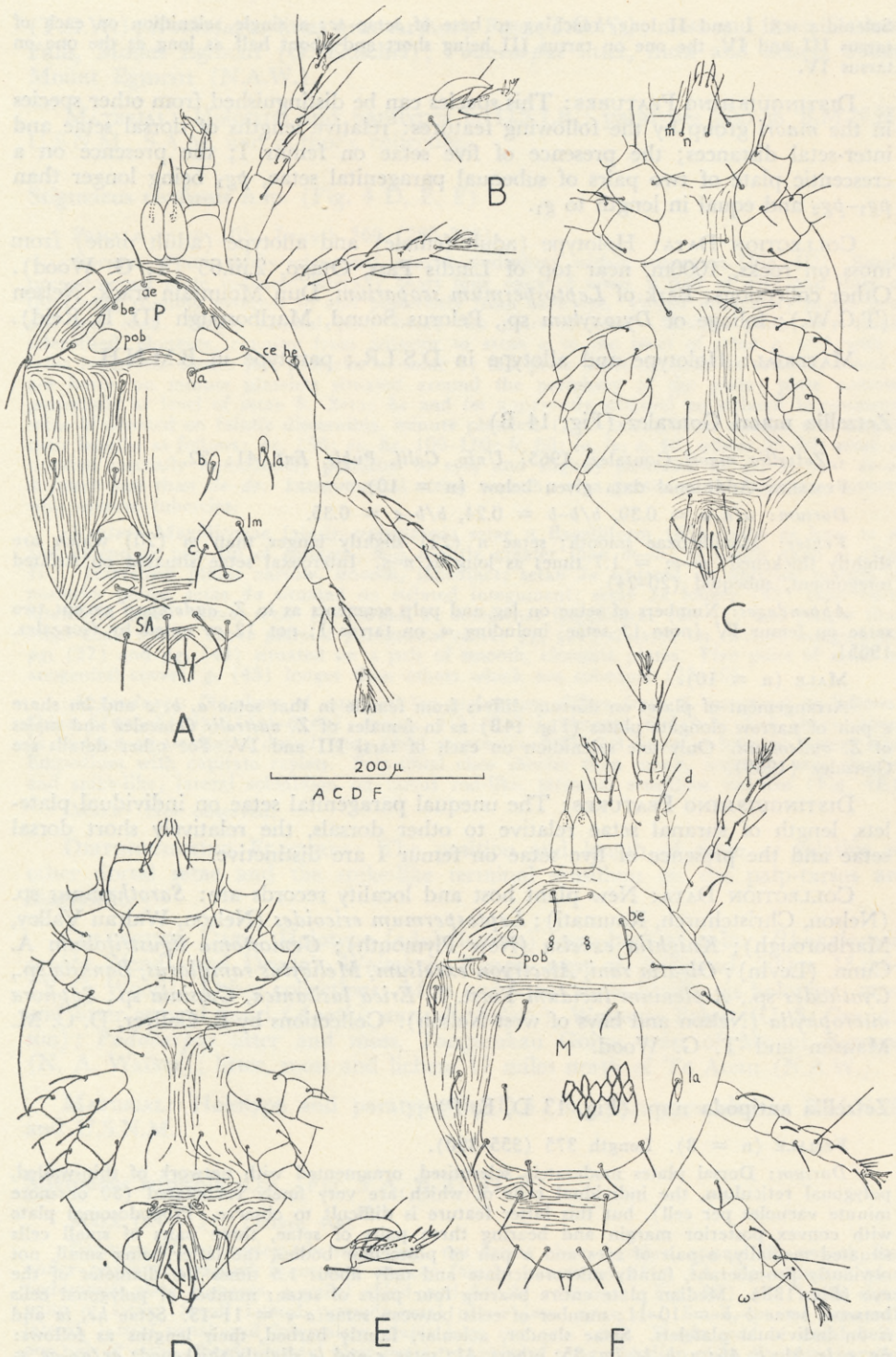

FIG. 13.—*Zetzellia oudemansi* n.sp. A, female dorsal; B, palp-tibia and -tarsus; C, female ventral. *Zetzellia antipoda* n.sp. D, female ventral; E, palp-tibia and -tarsus; F, female dorsal.

Venter: Maxillicoxae faintly reticulated; setae *n* and *m* subequal (32); *m–m* slightly greater than *n–n*. Intercoxal setae short (28–32) situated on striated integument. Two pairs of paragenital setae, pg_1 (33) situated on striated integument and shorter than pg_2 (48) which are located on paired platelets. Four pairs of genital setae, g_1 (35) slender and longer than others (22) which are slightly thickened and faintly barbed (Fig. 13D).

Appendages: Numbers of setae on leg podomeres differ from *Z. oudemansi* as follows: tarsi 13(ω)–10(ω)–8(ω)–8(ω); femora 5–4–2–1; ω IV reduced to a minute tubercle; *k* I very short; dorsal seta *d* on femur I noticeably longer (62) than *be* and other dorsal setae. Palps and details of palp-tarsus and palp-tibia as in *Z. oudemansi.*

MALE: Not observed.

DISTINGUISHING FEATURES: This species can be distinguished from other species in the *methlagli* group by the presence of two pairs of paragenital setae, the relative lengths of the dorsal setae and intersetal distances and the nature of the dorsal reticulation.

COLLECTION DATA: Holotype (adult female) from among colonies of *Schizotetranychus* sp. on leaves of *Elaeocarpus dentatus* (J. R. and G. Forst.) Vahl, Botanic Gardens, Wellington, 26.iv.65 (E. Collyer). Other collections: Among colonies of *Schizotetranychus* sp. on *E. dentatus* near Pelorus bridge, Nelson; on *Elaeocarpus hookerianus,* Lake Rotoiti and Lake Rotoroa, Nelson Lakes National Park. All collections by E. Collyer.

MATERIAL: Holotype and paratypes in D.S.I.R.; paratypes sent to B.M.N.H.

Zetzellia gonzalezi n.sp. (Fig. 14 A)

FEMALE (n = 10). Length 360 (350–380).

Dorsum: Dorsal plates as described for *Z. antipoda* except that individual cells of the reticulum slightly larger so that there are nine cells between setae *b–b* and 9–10 between setae *a* and *c,* and the cells appear to be unvacuolated (Fig. 14A). Postocular bodies as in *Z. antipoda.* Dorsal setae slender, acicular, faintly barbed and longer than in *Z. antipoda*: *be,* 62; *li, e,* 48; *ce, he, le,* 44; *others* 38–40: *ae/ae–ae* = 1.1, *be/be–ce* = 1.3–1.4, *a/a–a* = 0.55, *b/b–b* = 0.38, *b/b–c* = 0.60. Integumental striae smooth.

Venter: As described for *Z. antipoda.*

Appendages: Numbers of setae on legs and palps as in *Z. antipoda.* Dorsal seta *d* on femur I not particularly long (44), and shorter than setae *be, e* and *li.*

MALE: Not observed.

DISTINGUISHING FEATURES: Close examination is necessary to separate this species from *Z. antipoda.* When the two species are compared side by side, the larger cells in the dorsal reticulum and the longer setae of *Z. gonzalezi* are quite obvious. A good distinguishing feature is the ratio of femoral seta *d* I/*be* which is 1.2 (1.05–1.28) in *Z. antipoda* and 0.76 (0.67–0.91) in *Z gonzalezi.* A further difference is the fine vacuolation of the dorsal reticulum in *Z. antipoda,* but this feature is not always distinguishable.

COLLECTION DATA: Holotype (adult female) from leaves of *Olearia rani,* Kaiteriteri, west Nelson, 21.ix.65 (E. Collyer). Other collections: *Nothofagus fusca,* Lake Rotoroa, Nelson Lakes National Park; with *Z. collyerae* (Gonzalez) on *Elaeocarpus dentatus,* Pelorus bridge, Nelson. All collections by E. Collyer.

MATERIAL: Holotype and paratypes in D.S.I.R.; paratypes in B.M.N.H.

Zetzellia subreticulata n.sp. (Fig. 14 C, D, E)

FEMALE (n = 1). Length 230.

Dorsum: Dorsal plates moderately sclerotised and ornamented with characteristic reticulum; outline of individual cells of reticulum not very noticeable as their outline obscured by coarse vacuolation (6–16 vacuoles per cell) within the individual cells. Postocular bodies protuberant, small, their diameter only slightly exceeding that of the eyes. Three pairs of

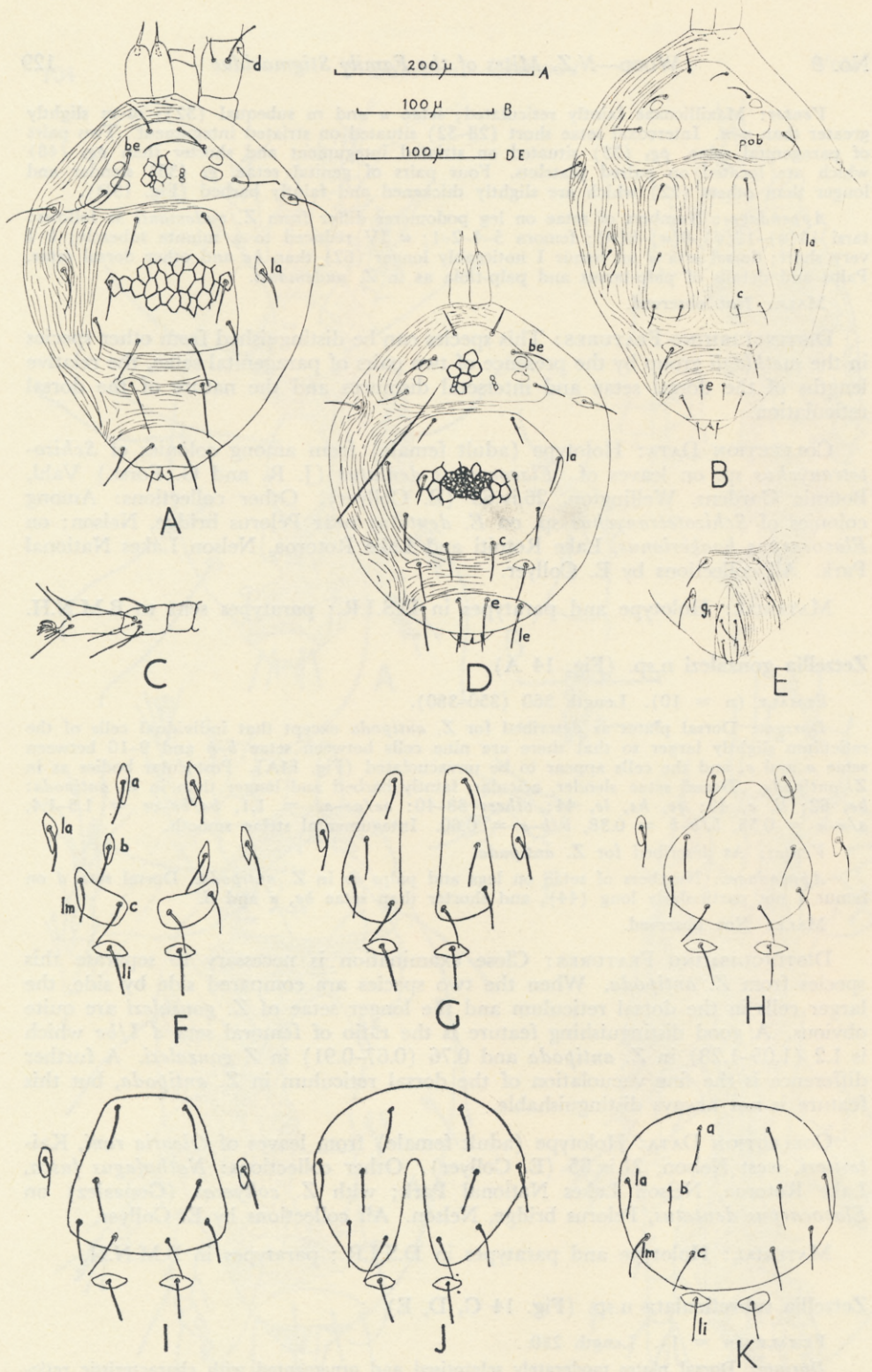

FIG. 14.—*Zetzellia gonzalezi* n.sp. A, female dorsal. *Zetzellia maori* Gonzalez. B, male dorsal. *Zetzellia subreticulata* n.sp. C, leg IV; D, female dorsal; E, female opisthosoma ventral. Variation in arrangement of dorsal hysterosomal plates in females of the genus *Zetzellia*: F, *maori, graeciana, mapuchina, oudemansi,* protonymphs of other Zetzellia species; G, *australis* (plus males of *oudemansi* and *maori*); H, *mali, yusti;* I, *methlagli, languida, silvicola, gonzalezi, antipoda;* J, *denotatus* (formerly *Agistemus denotatus*); K, all species, except *denotatus,* formerly included in the genus *Agistemus* Summers.

small, unvacuolated cells situated medially on the propodosoma. Median plate entire with five pairs of setae; only setae *he* and *li* on individual platelets (Fig. 14D). Dorsal setae short, slender, faintly barbed, their lengths as follows: *e, le,* 31–33; *be,* 26; *li, lm, c,* 26–28; *la, he, ce,* 23; *a, b, ae,* 21; *ae/ae–ae* = 0.71, *be/be–ce* = 0.90, *a/a–a* = 0.36, *b/b–b* = 0.31, *b/b–c* = 0.40. Integumental striae smooth.

Venter: Maxillicoxae faintly reticulated; setae *n* (25) distinctly longer than *m* (21); *m–m* only slightly greater than *n–n*. Intercoxal setae subequal (22), distinctly shorter than coxal setae I and II (28). Two pairs of paragenital setae situated on small platelets, pg_1 (24) less than pg_1–pg_2; pg_2 (26). Four pairs of genital setae, g_1 (37) slender and very long, others slightly thickened and faintly barbed, g_2 and g_3 subequal (18), g_4 (14) (Fig. 14E).

Appendages: Numbers of setae on leg podomeres diagnostic for species and differing from *Z. oudemansi* as follows: tarsi 13(ω)–10(ω)–8(ω)–6; tibiae 6(φρ)–6(φρ)–6(φρ)–5; genua 3(*k*)–0–0–0; femora 4–4–2–2; solenidion and ventral seta absent from tarsus IV as in *Z. collyerae;* solenidion absent from tibia IV (Fig. 14C); spine *k* I minute. Numbers of setae on palp as in *Z. oudemansi;* accessory seta on palp-tibia a short spine; lateral solenidion on palp-tarsus a short rod, terminal sensillum a trident with prongs shorter than stem.

MALE: Not observed.

DISTINGUISHING FEATURES: The species is very similar to *Z. collyerae* from which it can be distinguished by the presence of five setae on tibia IV, the nature of the dorsal plate ornamentation and the relative lengths of certain setae and intersetal distances (*e* and *le* longer than *be* and *li, ae/ae-ae* less than 1.0 and *a/a-a* less than 0.5).

COLLECTION DATA: Holotype (adult female) from *Nothofagus menziesii,* Pelorus, near Nelson, 13.vi.65 (E. Collyer).

MATERIAL: Holotype in D.S.I.R.

Zetzellia collyerae (Gonzalez), new combination

Agistemus collyerae Gonzalez, 1963. *Acarologia* 5: 349.

Agistemus collyerae: Gonzalez, 1965. *Univ. Calif. Publs. Ent.* 41: 34.

FEMALE: Additional data given below (n = 10).

Dorsum: Individual cells of dorsal reticulum with distinct vacuolation (15–30 vacuoles per cell); three pairs of small, unvacuolated dimples situated medially on propodosomal plate and three or four pairs on median plate *be/be–ce* = 1.1, *a/a–a* = 0.85, *b/b–b* = 0.50, *b/b–c* = 0.60.

Venter: Maxillicoxae smooth; setae *n* (25) slightly longer than *m* (20).

Appendages: Numbers of setae on tarsi 13(ω)–10(ω)–8(ω)–7, not 12–9–8–8 as given by Gonzalez (1963).

MALE: Not known.

DISTINGUISHING FEATURES: The presence of only four setae on tibia IV is sufficient to distinguish *Z. collyerae* from other known species; other useful characters are the lengths of g_1 and pg_2, numbers of setae on the genua and the relative lengths of certain dorsal setae and intersetal distances.

COLLECTION DATA: Previously known only from the North Island around Auckland. The following new records indicate that the species is widely distributed: *Vicia angustifolia* L. (Auckland); *Nothopanax* sp. (Te Maparu, near Lake Taupo); apple foliage (various localities in the Nelson area); *Rubus* sp., *Sophora microphylla, Elaeocarpus dentatus, Alectryon excelsum* (various areas around Nelson and the bays of west Nelson); *Carpodetus serratus, Rubus* sp., *Rubus schmidelioides* A. Cunn., *S. microphylla, Nothofagus* sp. (Lakes Rotoroa and Rotoiti, Nelson Lakes National Park); *E. dentatus* (Wellington Botanic Gardens). Collections by F. Duguid, E. Collyer and T. G. Wood.

Zetzellia novazelandica (Gonzalez), new combination

Agistemus novazelandicus Gonzalez, 1963. *Acarologia* 5: 344.

Agistemus novazelandicus: Gonzalez, 1965. *Univ. Calif. Publs. Ent.* 41: 34.

FEMALE: Additional details given below (n = 10).

Dorsum: Individual cells of dorsal reticulum with distinct vacuolation (up to 35 vacuoles per cell). *be/be–ce* = 1.9, *a/a–a* = 0.75, *b/b–b* = 0.55, *b/b–c* = 0.68.

Venter: Maxillicoxae smooth; setae *n* and *m* subequal (26).

MALE (n = 3).

Not previously described. Dorsal setae shorter in relation to body length than in female (e.g., *be/be–ce* is only slightly greater than 1.0); setae *c* particularly reduced; *le/e* = 1.5 as compared with about 1.0 in female. Solenidia ω♂ longer than ω on tarsi I and II and reaching to base of setae *tc;* only one solenidion on each of tarsi III and IV, the one on IV being slightly longer than the one on III. Palps noticeably enlarged.

DISTINGUISHING FEATURES: A combination of characters separates this species from other reticulate species with two pairs of paragenital setae: dorsal seta on femur I longer than *ae, be/be–ce* = 2.0, shape of the dorsal setae and nature of the reticulation.

COLLECTION DATA: Previously recorded from the North Island around Auckland. The following new records indicate that the species is widely distributed. *Alectryon excelsum* (Levin); *Rubus* sp. (Havelock North); *Elaeocarpus dentatus* (Wellington Botanic Gardens); *Nothopanax* sp., *Ascarina lucida* Hook f., *Rubus* sp., *A. excelsum, Phymatodes* sp. and unidentified ferns (various localities around Nelson and the bays of west Nelson); *Carpodetus serratus, Sophora microphylla* (Lake Rotoroa, Nelson Lakes National Park). Collections by E. Collyer and D. C. M. Manson.

Zetzellia longiseta (Gonzalez), new combination

Agistemus longisetus Gonzalez, 1963. *Acarologia* 5: 346.

Agistemus longisetus: Gonzalez, 1965. *Univ. Calif. Publs. Ent.* 41: 36.

FEMALE: Additional details given below (n = 5).

Dorsum: Close examination of the smooth dorsal plates reveals the presence of a number of small dimples (compare Figure 9A, D, for *Mecognatha hirsuta*), three pairs located medially on the propodosoma, one pair between setae *a* and *b* and three pairs between setae *lm* and *c*. *be/be–ce* = 1.9, *a/a–a* = 2.8, *b/b–b* = 1.0, *b/b–c* = 1.3.

Venter: Maxillicoxae smooth; setae *n* (60) longer than *m* (45).

DISTINGUISHING FEATURES: The smooth dorsal plates, shape and length of the dorsal setae and particularly ratios such as *be/be–ce* and *a/a–a* are diagnostic.

COLLECTION DATA: Previously recorded only from the North Island around Auckland and from Havelock North. The following new records indicate that the species is widely distributed: *Passiflora* sp. (Otaki); *Prunus* sp. (Helensville); *Coprosma tenuicaulis* Hook f. (Tauranga); *Gerbera* sp. (Hastings); *Rubus* sp. (Gisborne); *Nothofagus* sp. (1100m, Lake Waikaremoana); *Alectryon excelsum* (Napier); *Forsythia* sp., *Rosa* sp. (Palmerston North); *Elaeocarpus dentatus* (Wellington); *Rubus* sp., *Tetrapathaea tetranda* (Banks et Sol. ex DC) Cheesem., *Brachyglottis repanda* J. R. and G. Forst., *A. excelsum,* various apple orchards (Nelson and bays of west Nelson); *Rubus* sp., *Nothofagus* sp. (Lake Rotoroa, Nelson Lakes National Park). Collections by E. Collyer, H. Gardner, A. J. Harre, M. Hodgkins, J. Hume, D. C. M. Manson, R. Viney and T. G. Wood. The species is also known from Australia, Mexico, Central America and Chile (Gonzalez, 1965).

Genus LEDERMUELLERIA Oudemans

Ledermuelleria Oudemans, 1923b. *Ent. Ber., Amst.* 6(130): 150. Type species: *Caligonus segnis* Koch, 1836.

RECOGNITION: Chelicerae completely separated and arising from beneath an overhang of the propodosoma. Dorsal plates consisting of propodosomal bearing four pairs of setae and usually a pair of eyes, hysterosomal bearing six pairs of setae and suranal bearing two pairs of setae; humeral plate large, triangular, with apex protruding between coxae II and III, and bearing one seta each. Plates cover entire dorsum and may overlap laterally.

DISTRIBUTION: Nine species are known from New Zealand (Wood, 1966). The known species are distributed as follows: 13 Nearctic, five Palaearctic, five Holarctic, six Neotropical and nine Australian.

Genus CHEYLOSTIGMAEUS Willmann, emend. Summers and Ehara

Cheylostigmaeus Willmann, 1951a. *Bonn. zool. Beitr.* 2: 141–176. Type species: *Cheylostigmaeus grandiceps* Willmann, 1951a.

Cheylostigmaeus: Summers and Ehara, 1965. *Acarologia* 7: 49.

RECOGNITION: Arrangement of dorsal plates and setae as in *Ledermuelleria* except plates do not overlap laterally and humeral plates not unusually large or protruding between coxae II and III. Chelicerae fused dorsally for at least ⅔ of their length and arising terminally from propodosoma.

DISTRIBUTION: Two females of an undescribed species (specimens in D.S.I.R.) have been collected in New Zealand, but the species cannot be described until males are obtained (see Summers and Ehara, 1965). Twelve species are known: eight Palaearctic, two Nearctic, one Holarctic and one Neotropical.

Genus LEDERMUELLERIOPSIS Willmann

Ledermuelleriopsis Willmann, 1953. *Sber. Akad. Wiss. Wein. Abt. I* 162: 487. Type species: *Ledermuelleriopsis triscutata* Willmann, 1953.

Ledermuelleriopsis: Willman, 1951b. *Sber. Akad. Wiss. Wein. Abt. I* 160: 140.

RECOGNITION: Chelicerae completely separated. Arrangement of dorsal plates as in *Ledermuelleria* and *Cheylostigmaeus* except that hysterosomal plate divided transversely into metapodosomal and zonal plates with three pairs of setae each.

DISTRIBUTION: Five species are known: one Palaearctic, one Holarctic, one Nearctic and two Australian.

KEY TO THE NEW ZEALAND SPECIES OF *Ledermuelleriopsis* (FEMALES)

1. Dorsal setae simple; propodosomal plate incised along anterolateral margins; one pair of paragenital setae — *L. incisa* n.sp.

— Dorsal setae slightly clavate with whorls of spinules; propodosomal plate normal; three pairs of paragenital setae ..... — *L. spinosa* n.sp.

Ledermuelleriopsis spinosa n.sp. (Fig. 15 B, C, G, H)

FEMALE (n = 1). Length 310.

Dorsum: Plates moderately sclerotised and ornamented with distinct polygonal reticulum which encloses shallow dimples (Fig. 15C). Dimples finely vacuolated with about 40 vacuoles per dimple; diameter of dimples exceeds distance between them. Arrangement of plates and

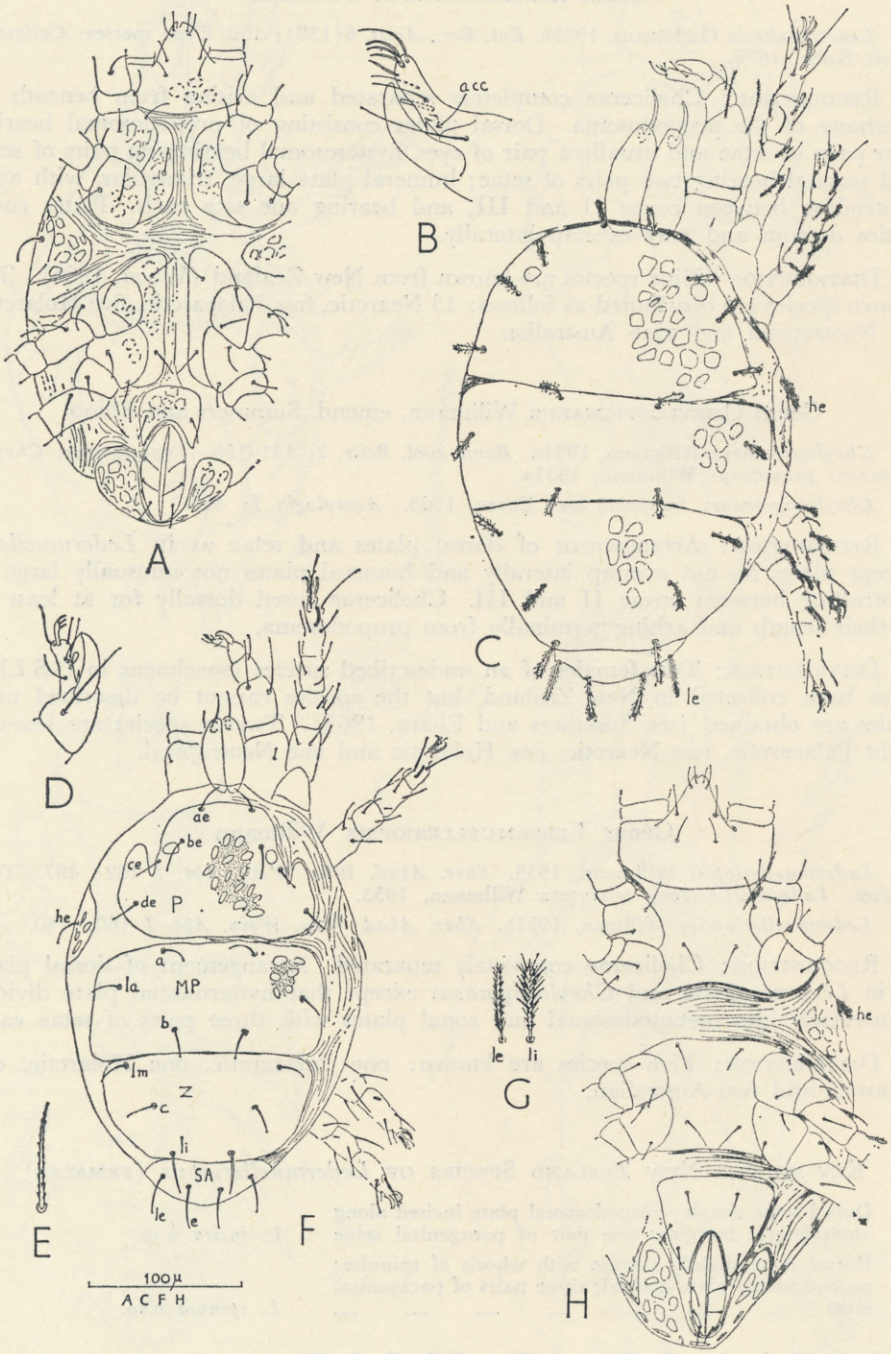

FIG. 15.—*Ledermuelleriopsis incisa* n.sp. A, female ventral; D, palp-tibia and -tarsus; E, dorsal seta; F, female dorsal. *Ledermuelleriopsis spinosa* n.sp. B, palp-tibia and -tarsus; C, female dorsal; G, dorsal setae; H, female ventral.

setae as described for genus; one pair of eyes on propodosoma. Dorsal setae slightly clavate, but this feature obscured by whorls of spinules which are particularly long on the distal half of each seta; setae *le* rod-like with shorter spinules of uniform length (Fig. 15G); lengths of setae fairly uniform: *li, le, e,* 26–31; others, 16–21. Integumental striae smooth.

Venter: Maxillicoxae apparently smooth; setae *n* (17) shorter than *m* (20) and not reaching as far as base of *m; n–n = m–m; re* slightly longer than *ri* (Fig. 15H). Intercoxal plates completely fused in mid-line, very faintly reticulated, anterior plate continuing to base of gnathosoma and incised anterolaterally adjacent to coxae I; intercoxal setae subequal (20). Three pairs of subequal (15) paragenital setae borne on wedge-shaped plate which surrounds anterior third of anogenital covers. Three pairs of subequal (15) anogenital setae borne on posterior half of covers. Suranal plate overlaps on to venter posterolaterally. All ventral setae simple.

Appendages: Numbers of setae on leg podomeres as follows: tarsi 14(ω)–10(ω)–8(ω)–7; tibiae 7(φ,φρ)–6(φρ)–6(φρ)–6(φρ); genua 4(*k*)–3–1–1; femora 6–4–3–2; trochantera 1–1–2–1; coxae 2–2–2–2; spine *k* I very small; φρ I long and slender; ω III very small, ω IV absent; one clavate spinose, dorsal seta on all tibiae, genua and femora, other leg setae either simple or faintly barbed. Empodium with three pairs of capitate raylets. Palps noticeably thickened; numbers of setae on palp-femur to palp-tarsus 3–2–4–7; dorsal setae on palp-femur slender and pilose; lateral solenidion on palp-tarsus rod-like, terminal sensillum a distinct trident with very long prongs and a short stem; tibial claw nearly as long as tarsus, accessory seta modified into a short, stout claw (Fig. 15B).

MALE: Not observed.

DISTINGUISHING FEATURES: This species is similar to *L. plumosa* Willmann (redescribed by Summers, 1957), from which it can be distinguished by the clavate, spinose humeral setae (*he*), the rod-like, pilose lateral suranal setae (*le*), the absence of spine *k* II and the presence of clavate, spinose dorsal setae on the tibiae, genua and femora.

COLLECTION DATA: Holotype (adult female) from moss on roadside cutting, Taheke, North Auckland, 13.xi.64 (G. S. Grandison).

MATERIAL: Holotype in D.S.I.R.

Ledermuelleriopsis incisa n.sp. (Fig. 15 A, D, E, F)

FEMALE (n = 10). Length 275 (265 to 280).

Dorsum: Plates thinly sclerotised so that surface ornamentation difficult to see, and most obvious on downcurved lateral margins of body; ornamentation consists of faint reticulum enclosing shallow, rounded or oval dimples which are not vacuolated (Fig. 15F). Arrangement of dorsal plates and setae as described for genus. Propodosomal plate bearing a pair of eyes, and with its anterolateral margins incised alongside the eyes and setae *ce*. Dorsal setae acicular and very faintly barbed (Fig. 15E), and of fairly uniform length: *li, le, e,* 26–28; *ce,* 17; others, 19–23. Dorsal striae smooth.

Venter: Maxillicoxae faintly reticulated; setae *n* and *m* subequal (13), *n* reaching to base of *m; n–n = m–m; re* and *ri* subequal (Fig. 15A). Intercoxal plates faintly reticulated, distinctly separated medially by striated integument; coxal and intercoxal setae subequal (18–21) except setae *2b* which are slightly longer (24). One pair of paragenital setae (16) on small, crescentic plate, which is faintly reticulated and surrounds the anterior quarter of the anogenital covers. Three pairs of anogenital setae. All ventral setae simple.

Appendages: Numbers of setae on leg podomeres as in *L. spinosa* except femora: 6–5–3–2; *k* I about a quarter as long as associated dorsal seta; φρ I not particularly long, almost spine-like, φρ III and IV very short and spine-like, ω absent on tarsus IV. Empodium with capitate raylets. Palps not noticeably thickened; lateral solenidion on palp-tarsus clavate, terminal sensillum a distinct trident with long stem; tibial claw as long as tarsus, accessory seta a short spine (Fig. 15D).

MALE: Not observed.

DISTINGUISHING FEATURES: The shape of the dorsal setae, presence of one pair of paragenital setae and the antero-lateral incisions on the propodosomal plate are distinctive.

COLLECTION DATA: Holotype (adult female) from litter, moss and lichen, 17 miles north of Te Anau, 17.ii.65 (N. A. Walker). Other collections: Moss among

gravel along edge of Waimakariri River, near Arthurs Pass (T. G. Wood); moss on logs among *Nothofagus*, five miles west of Otira, Arthurs Pass (T.G.W.); moss on rocks, Tauronga Bay, Westport (T.G.W.); moss on roadside cutting near Maungaturoto, Whangarei (G. S. Grandison).

Material: Holotype and paratypes in D.S.I.R.; paratypes also in B.M.N.H., U.S.N.M. and author's collection.

Genus Mullederia Wood

Mullederia Wood, 1964. *N.Z. Jl. Sci.* 7: 579. Type species: *Mullederia arborea* Wood, 1964.

Recognition: Dorsum covered by large idiosomal plate with indistinct suture only partially separating propodosomal and hysterosomal regions, and bearing diminutive humeral (*he*) and intercalary (*li*) setae; small suranal plate located sub-terminally beneath posterior margin of idiosomal plate. Only eight pairs of hysterosomal setae (including humerals) instead of the usual nine. Empodium basically of the normal stigmaeid type but with the axial rod lying beneath a membraneous pad.

Distribution: Three species are known: Two Ethiopian and one Australian.

Mullederia arborea Wood

Mullederia arborea Wood, 1964. *N.Z. Jl. Sci.* 7: 580.

Distinguishing Features: Plates strongly sclerotised and ornamented with deep pits or dimples, each dimple enclosed by polygonal cell forming a reticular pattern. Two pairs of eyes. Dorsal setae (except *he* and *li*) stout, strongly barbed and spike-like.

The original description did not include the numbers of setae on the trochantera: 1–1–1–0 and the coxae 2–1–2–2. Numbers of setae on palp-femur to -tarsus: 3–2–4–7.

Material: Holotype, allotype and paratypes in D.S.I.R.; paratypes also in B.M.N.H., U.S.N.M., S.A.M. and author's collection.

Distribution and Affinities of the New Zealand Fauna

The material on which this study was based was obtained from some 300 moss and litter samples from most regions in New Zealand, and about 50 bark and foliage samples, the latter mostly from around the Nelson area. Litter inhabiting stigmaeids are sparsely distributed so that many more samples than have been examined would be necessary to provide a basis for discussing the distribution of species within the country. Nevertheless, many of the species have been found in widely separated areas of both islands, and it is probable that most species are distributed throughout the country.

With the exception of the intertidal zone, which is inhabited by *Stigmaeus rupicola*, the habitats of the known New Zealand stigmaeids can be divided into (a) soil, moss and litter, (b) bark of trees, and (c) foliage. Of the 38 species recorded from these habitats (Table II), 24 were recorded from moss and litter, nine from bark and 18 from foliage. In view of the very limited collecting from foliage, the arboreal fauna would appear to be rich compared with the litter fauna. In fact the litter-inhabiting genus *Stigmaeus* has its only known arboreal species, *S. coprosmae* and *S. loadmani* in New Zealand, whereas the number of species of *Stigmaeus* in litter (five) is small compared with North America (24, Summers, 1962).

TABLE II.—Occurrence of the known New Zealand Stigmaeidae in different habitats. Subjective index of frequency of occurrence given by: x rare, xx infrequent, xxx frequent

Species	Moss and forest litter	Bark	Foliage of trees and shrubs	Intertidal zone
Ledermuelleria mixta	xxx		x	
Ledermuelleria simplex	xxx			
Stigmaeus summersi	xxx			
Stigmaeus longisetis	xxx			
Ledermuelleria distincta	xx			
Stigmaeus confusus	xx	x		
Ledermuelleria dumosa	x			
Ledermuelleria granulosa	x			
Ledermuelleria manapouriensis	x			
Ledermuelleria clavigera	x			
Ledermuelleria brevisetosa	x			
Stigmaeus rotundus	x			
Stigmaeus brevisetis	x			
Ledermuelleriopsis spinosa	x			
Ledermuelleriopsis incisa	x			
Pseudostigmaeus striatus	x			
Eryngiopus similis	x			
Mediolata simplex	x	x		
Ledermuelleria corticola	x	xx		
Eryngiopus bifidus	x	x	x	
Mediolata favulosa	x	x	x	
Zetzellia oudemansi	x	x	x	
Apostigmaeus navicella		x		
Mecognatha hirsuta	x	xx	xx	
Mediolata brevisetis		x	x	
Stigmaeus loadmani			x	
Zetzellia subreticulata			x	
Zetzellia gonzalezi			x	
Zetzellia antipoda			x	
Mediolata robusta	x		xx	
Eryngiopus arboreus			xx	
Mullederia arborea			xx	
Stigmaeus coprosmae			xxx	
Pseudostigmaeus collyerae			xxx	
Zetzellia maori			xxx	
Zetzellia collyerae			xxx	
Zetzellia novazelandica			xxx	
Zetzellia longiseta			xxx	
Stigmaeus rupicola				x

Although the stigmaeid fauna of Asia, Africa, Australia and South America has scarcely been studied and the fauna of most regions is very imperfectly known, the occurrence of *Stigmaeus, Zetzellia, Ledermuelleria, Ledermuelleriopsis, Eryngiopus, Apostigmaeus, Cheylostigmaeus* and *Mediolata* in New Zealand, Europe and North America suggests that most stigmaeid genera have a world-wide or nearly world-wide distribution. Certain genera, such as *Stigmaeus, Zetzellia, Ledermuelleria* and *Ledermuelleriopsis,* have distinct species-groups which are also distributed in these regions, although none of the Northern Hemisphere species occur in New Zealand. Two other New Zealand genera, *Mullederia* and *Pseudostigmaeus,* are known from other regions, and further collecting may show that the one indigenous genus, *Mecognatha,* is also widespread. It is almost certain that the New Zealand genera (with the possible exception of *Apostigmaeus*) are endemic and that adaptive radiation has occurred at the species level rather than at the generic level. This contrasts with the situation in certain other invertebrates such as earthworms of the family Megascolecidae (Lee, 1959) in which the 178 species known from New Zealand are distributed among 27 genera of which 13 are indigenous; the Melolonthinae (Given, 1952) in which the 77 known species are distributed among ten

genera of which nine are indigenous; and the Eriococcidae (Hoy, 1962) in which the 75 known species are distributed among nine genera of which seven are indigenous.

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