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FOUR NEW MITES OF THE GENUS *AGISTEMUS* SUMMERS, 1960
(ACARINA : STIGMAEIDAE)

BY

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Representatives of the genus *Agistemus* are small, yellowish or bright red mites that are found on leaves of trees or shrubs, in some cases associated with populations of tetranychoid mites or other small arthropods. The species to be considered here have been observed by collectors to prey on phytophagous mites or scale insects. One of these species is known to be a facultative plant feeder under laboratory as well as field conditions.

Agistemus and a related genus, *Zetzellia*, have been referred by present day acarologists to the obscure genus *Mediolata* G. Canestrini, 1889. SUMMERS (1960) erected the genus *Agistemus* for *Mediolata terminalis* (*Caligonus terminalis* Quayle) and for a new species, *Agistemus fleschneri* Summers. Another species, *Mediolata africana* Meyer and Ryke, 1959 is now known to belong in *Agistemus*.

This paper describes four new species in the genus *Agistemus*, the names of which are needed for the work of other investigators. A study of additional new species of *Agistemus* and *Zetzellia* is now in progress. Their description and keys for identifying females of both genera will be published in the near future.

I wish to express sincere appreciation to Dr. Elsie COLLYER of the East Malling Research Station, Maidstone, Kent, England, for placing much valuable material at the author's disposal. Thanks are also offered to Dr. Shôzô EHARA, Hokkaido University, Sapporo, Japan, and to Dr. Edward W. BAKER, United States Department of Agriculture, for the loan of specimens. I am also indebted to Dr. Francis M. SUMMERS, University of California Davis, for his guidance during the preparation of this paper.

TERMINOLOGY.

The nomenclature applied to the dorsal plates and setae (fig. 1) is that used by SUMMERS (1960). The unpaired plates are the *propodosomal* (P), *metapodo-*

somal (M), and suranal (SA). The first two are also referred to as the main dorsal plates. The paired dorsal plates are the *humeral*s (H), and *intercalaries* (I). The setae are the *verticals* (*ae*), *preoculars* (*be*), and *postoculars* (*ce*) on the propodosomal plate; the *humeral*s (*he*), one on each humeral plate; the *dorsocentrals* *a*, *b*, and *c*, and the *dorsolaterals* *la* and *lm*, all on the metapodosomal plate; the *intercalaries* or *li*, and the *central* and *lateral suranal* pairs, *e* and *le*.

The row of four setae present on the anogenital covers (fig. 4) are designated as *anogenitals* (labeled consecutively g^1 to g^4) and the two pairs set laterally on independent, non striated areas, are referred to as *paragenitals*, pg^1 and pg^2 .

The numbers given for counts of setae on the podomeres of legs I to IV include the common setae, smooth or barbed, and other sensilla such as solenidia, eupathids and the small spiniform dorsal process on genu I designated as spine *k* in GRANDJEAN'S terminology (1944).

The pair of imperfectly rounded organs located immediately behind the structures commonly called eyes, are referred to as *postocular bodies* (fig. 1). Although possibly they are photoreceptors — a second pair of eyes — there is at present no proof that this is the case.

The present descriptions are solely based on female characters since males do not exhibit good specific features. All females are illustrated to the same scale (fig. 1) whereas a larger scale was selected for drawing the anogenital regions (fig. 2). Whenever possible, 10 female specimens were measured and the standard deviation calculated for each sample. All measurements are given in microns. The distance from the tip of the palptarsus to the anogenital covers was taken to represent body length, whereas the idiosoma was measured from the bases of the palpi to anogenital covers and the first pair of legs from the coxo-trochanteral joint to claw tip.

Abbreviations are also used to indicate location of type specimens, viz. :

- BMNH British Museum (National History), Cromwell Road, London, S. W. 7.
- EEA Estación Experimental Agronómica, University of Chile, Maipú, CHILE.
- EM East Malling Research Station, Maidstone, Kent, ENGLAND.
- HU Hokkaido University, Zoological Institute, Sapporo, JAPAN.
- UCD University of California at Davis, U. S. A.
- USNM United States National Museum, Washington, D. C.

***Agistemus exsertus* n. sp.**

Figs. 1-2.

Agistemus fleschneri, of EHARA, 1962. *Japanese Journ. Appl. Ent. Zool.* 6 : 56.

Female. — Main dorsal plates not reticulate; propodosomal plate with a median notch on posterior margin, slightly wider than metapodosomal plate, the latter symmetrically hexagonal and relatively small; intercalary plates equidistant from metapodosomal and suranal plates. Eyes conspicuously outlined; post-

cular bodies large, protuberant (hence the name, *exsertus*); an oblique fold of integument arises behind eyes and passes close to mesal border of postocular bodies. Dorsal setae set on tubercles, ratio length distance between bases of verticals = 2.2. Preocular *be* much longer than distance to base of postocular *ce* and slightly longer than *c*; postoculars *ce*, dorsocentrals *a*, and intercalaries *li* subequal; distance between bases of pair *a* approximately equal to two-thirds length of seta of this pair; dorsocentrals *b* noticeably closer to *la* than to *lm*. Ventral opisthosoma with two pairs of paragenital setae; pg^1 14 μ , pg^2 16 μ ; distance between pg^1 — pg^2 = 18 μ ; anogenital g^1 17 μ , overreaches base of g^2 , the latter longest of anogenitals. Tip of palpus extends forward to genu-tibial flexure of leg I. Main dorsal seta of femur I long, prominent, barbed; dorsal seta on genu I barbed, almost two times length of segment; tibia II with one dorsal seta barbed; tibiae III and IV with two setae barbed. Average measurements ($n = 8$ specimens): body length 460 ± 23 , idiosoma 365 ± 26.5 , leg I 228 ± 7.4 , setae *ae* 51 ± 3.6 , *be* 80 ± 2.5 , *ce* 68 ± 2.9 , *he* 55 ± 5.2 , *a* 67 ± 4.5 , *b* 66 ± 3.7 , *c* 77 ± 2.8 , *lm* 74 ± 4 , *li* 69 ± 6.2 , *e* 31 ± 4.2 , *le* 22 ± 2.7 .

Holotype. — ♀ on orange, Kurume, JAPAN, August 13, 1960 (K. INOUE). Deposited in USNM, no. 2925.

Paratypes. — Eight ♀, 1 ♂ same data as holotype specimen. Paratypes in HU, BMNH, UCD and author's collection.

Other collections. — Two ♀ on *Citrus* sp., Gangtok, Sikkim, INDIA, May 30, 1959 (C. A. FLESCNER).

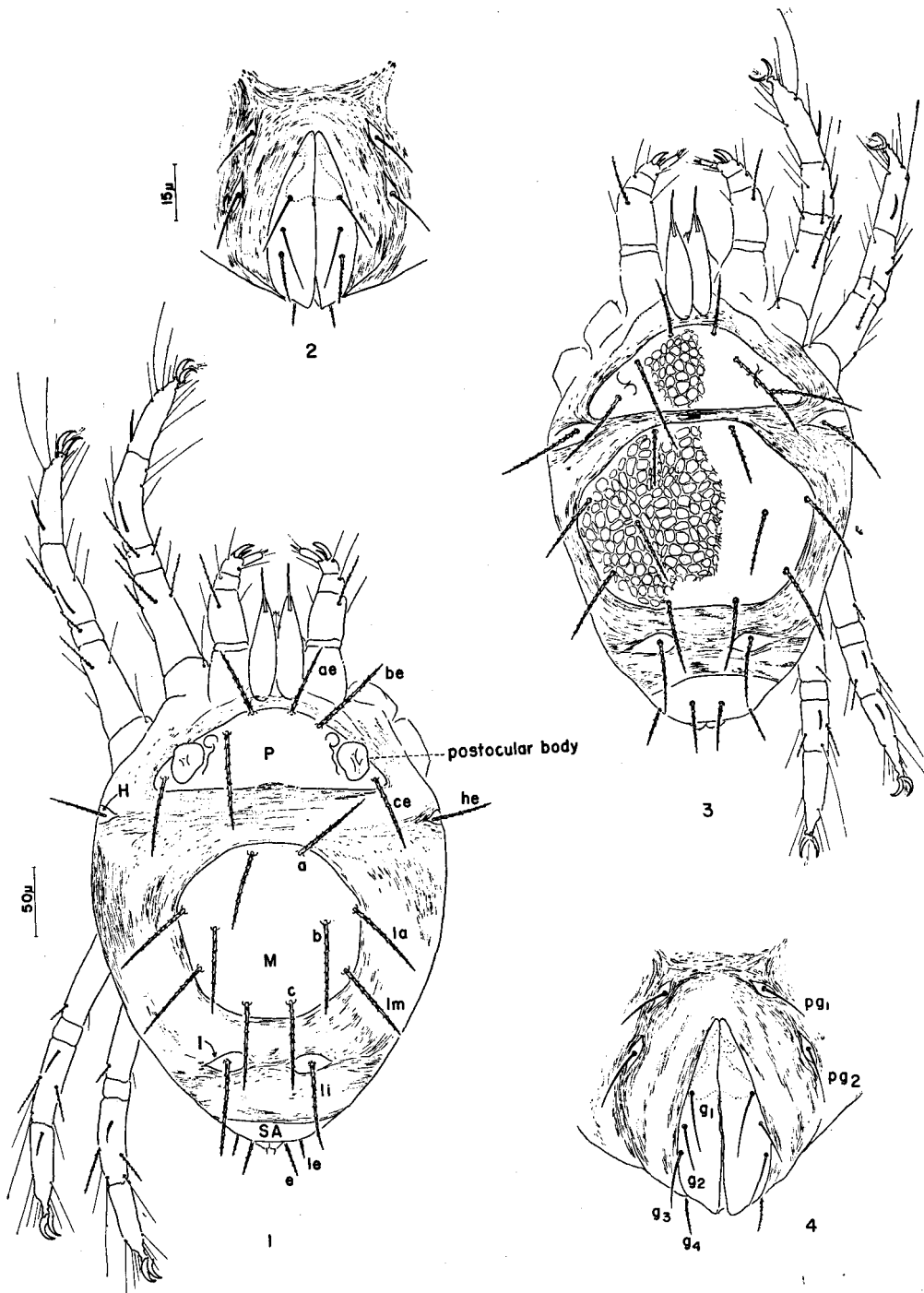
Recognition characters. — The illustration and description given by EHARA (pp. 56-58) for a specimen identified as *A. fleschneri* from tea plants fit the foregoing description of *A. exsertus*. EHARA emphasized the prominent postocular bodies, the small and symmetrical metapodosomal plate and the two pairs of paragenital setae, which are specific features of this new species. Additional characters, such as the presence of a prominent median dorsal seta on femur and genu of leg I, and a single barbed seta lateral on tibia II also characterize *A. exsertus*.

The specimens examined from Japan were found to feed on eggs of the citrus red mite, *Panonychus citri* (McGregor), by the collector (EHARA, personal communication).

***Agistemus novazelandicus* n. sp.**

Figs. 3-4.

Female. — A moderately large species with median dorsal plates reticulated as in *A. fleschneri*. Humeral and intercalary plates approximately equal in dimensions. Dorsal setae set on tubercles; preoculars *be* noticeably longer than all others; ratio length/distance separating setae of pair *ae* = 1.5; length of preoculars equals twice the distance *be* — *ce*; postoculars *ce* equal to humerals *he*;



FIGS. 1-2. — *Agistemus exsertus* n. sp.
 1, Dorsum of female ; 2, Venter of opisthosoma.

FIGS. 3-4. — *Agistemus novazelandicus* n. sp.
 3, Dorsum of female ; 4, Venter of opisthosoma.

dorsocentral setae much shorter than distance from the base of one pair to another ; $a < b < c$; $c = lm$; suranal e somewhat longer than le . Ventral opisthosoma with two pairs of paragenital setae, individual setae of each pair set far apart ; pg^1 13 μ , pg^2 16 μ ; anogenital g^1 17.3 μ , reaches bases of g^3 ; only g^4 barbed. Tip of palptarsus extends to tibio-tarsal joint of leg I ; microspur on palpcoxa conspicuous ; dorsal setae on femur I emphatically barbed, longer than vertical ae ; one barbed seta on tibiae I, II, two of this type present on tibiae III and IV, lateral one much heavier than mesal. Average measurements ($n = 10$ specimens) : body length 406 ± 31.4 , idiosoma 300 ± 19.6 , leg I 196 ± 16.5 , barbed seta femur I 43 ± 1.5 , setae ae 39 ± 2.3 , be 63 ± 5 , ce 54 ± 2.2 , he 53.4 ± 2.3 , a 45 ± 4.6 , b 46.1 ± 3.9 , c 53.5 ± 2.2 , lm 53 ± 3 , li 49 ± 2.9 , e 37 ± 1.7 , le 32.5 ± 1 .

Holotype. — ♀ on *Luculia* sp., feeding on *Brevipalpus* sp., at Plant Diseases Division, Auckland, NEW ZEALAND, May 3, 1961 (Elsie COLLYER). Holotype deposited in the USNM, no. 2920.

Paratypes. — Nine ♀ same data as holotype ; 1 ♀ on dwarf trees, Auckland, January 21, 1960 ; 4 ♀ on mealybug colonies, Cassey's Creek, May 21, 1960 ; 1 ♀, 1 ♂, Te Morepu, nr. Auckland, May 14, 1961 ; 8 ♀ *ex galls* on *Elaeococcus dentatus*, Auckland, June 10, 1961. All specimens collected in New Zealand by Dr. Elsie COLLYER. Paratypes distributed to BMNH, UCD, EM, EEA. Others returned to Dr. E. COLLYER.

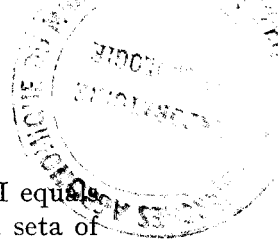
Recognition characters. — The two diagnostic features are the enlarged and heavily barbed seta on femur I which is longer than the verticals ae and the noteworthy length of the humerals. The latter are longer than the dorsocentrals a and b approximately equal to ce and c . Other distinctive features are the reduced length of the tibial podomeres, the pattern of reticulation on the median dorsal plates, and the smooth anogenital g^3 .

***Agistemus longisetus* n. sp.**

Figs. 5-6.

Agistemus fleschneri, of GONZÁLEZ, 1961, *Univ. de Chile, Est. Exp. Agron. Bol. Técn.* 11 : 35-39.

Female. — A species having long legs and nonreticulated dorsal plates. Metapodosomal plate occupies more than two-thirds of idiosomal dorsum. Dorsal setae ultralong, thick, profusely barbed, set on tubercles. Ratio length/distance between setae of pair $ae = 2.7$; preocular setae be and metapodosomal lm longest of all dorsal series ; be much longer than twice the distance $be - ce$; postoculars ce and dorsocentrals c subequal ; verticals and humerals longer than suranal e ; ratio length distance between setae of pair $a = 3$, distance between setae of pair a equals distance between setae of pair c . Two pairs of paragenital setae ; pg^1 19 μ , pg^2 22 μ ; distance between both pairs 15 μ ; anogenital g^1 23 μ , reaches to base of g^3 .



Tip of palpus extends to genu-tibial joint of leg I; barbed seta on femur I equals suranal e ; two dorsal setae on tibiae III and IV barbed; one prominent seta of this type occurs on tarsi III, IV. Average measurements ($n = 10$ specimens): body length 527 ± 21 , idiosoma 368 ± 16.7 , leg I 337 ± 13 , setae ae 77 ± 8 , be 123 ± 12.3 , ce 111 ± 7.8 , he 70 ± 9.4 , a 104 ± 12 , b 103 ± 11.6 , c 118 ± 12.5 , lm 123 ± 19 , li 90 ± 6.4 , e 56 ± 3.5 , le 36 ± 1.9 .

Holotype. — ♀ on *Rubus ulmifolius*, Pelarco, Talca, CHILE, January 28, 1962 (R. H. GONZÁLEZ); deposited in USNM, no. 2926.

Paratypes. — Nine ♀, 9 ♂ collected with holotype; 23 ♀, 30 ♂ on *Viburnum opulus*, Maipú, CHILE (H. M. GONZÁLEZ); 9 ♀ on apple foliage, Linderos, CHILE, April 20, 1959 (R. H. G.); 4 ♀, 2 ♂ on apple, Curicó, CHILE, April, 1961 (R. H. G.); 11 ♀, 11 ♂ on apple, Talca, CHILE, March, 1961 (R. H. G.); 2 ♀ on apple fruit, CHILE (intercepted at Wilmington, N. C.), June 15, 1959 (J. MANAHEY). Paratypes in USNM, BMNH, EM, UCD, EEA, and personal collections of Dr. E. COLLYER and the author.

Other collections. — Two ♀, on *Prunus persicae*, Peumo, O'Higgins, CHILE, April 18, 1960 (R.H.G.); 1 ♂ on *Annona reticulata* fruit, PERU (at Miami), January 30, 1961 (SMITH & BACHE); 1 ♀ on citrus, Valle, MEXICO, February 12, 1953 (H. D. SMITH); 2 ♀ on avocado, Fortin & Córdoba, MEXICO, February 6, 1954 (C. A. FLESCHNER); 1 ♀ on avocado, Huatusco, MEXICO, February 9, 1954 (C. A. F.); 2 ♀, 1 ♂ on tree, Fortin de las Flores, Veracruz, MEXICO, April 21, 1959 (E. W. BAKER); 3 ♀ on avocado, San Salvador, EL SALVADOR, November 29, 1953 (C. A. F.); 1 ♀ on *Persea gigantea*, Mt. Uyuca, HONDURAS, November 7, 1953 (C. A. F.); 20 ♀, 7 ♂ on *Pohutakawa whangarei*, Auckland, NEW ZEALAND, January, 1960 (E. COLLYER); 10 ♀, 2 ♂ on *Rubus fruticosus*, Havelock North Research Orchard, Hawke's Bay, N. Z., July 27, 1960 (E. C.), 22 ♀, 7 ♂, same data, February 23, 1961 (E. C.); 2 ♀, 1 ♂ on *Albizia* sp., Plant Diseases Division, Auckland, N. Z., August 2, 1960 (E. C.); 1 ♀ on peach, Auckland, N. Z., February 3, 1960 (E. C.).

Recognition characters. — The relative lengths and insertions of dorsal setae and the leg chaetotaxy, are diagnostic features of *A. longisetus*. The unusual numerical ratio length/distance between bases of pair $a = 3$, is an exclusive character for *A. longisetus*.

The New Zealand population on *Pohutakawa whangarei* exhibits a larger body size and longer dorsal setae than the other populations sampled, but this variation does not characterize the locality but the host plant, since additional specimens from New Zealand on plant hosts other than *Pohutakawa* have dimensions given for type specimens.

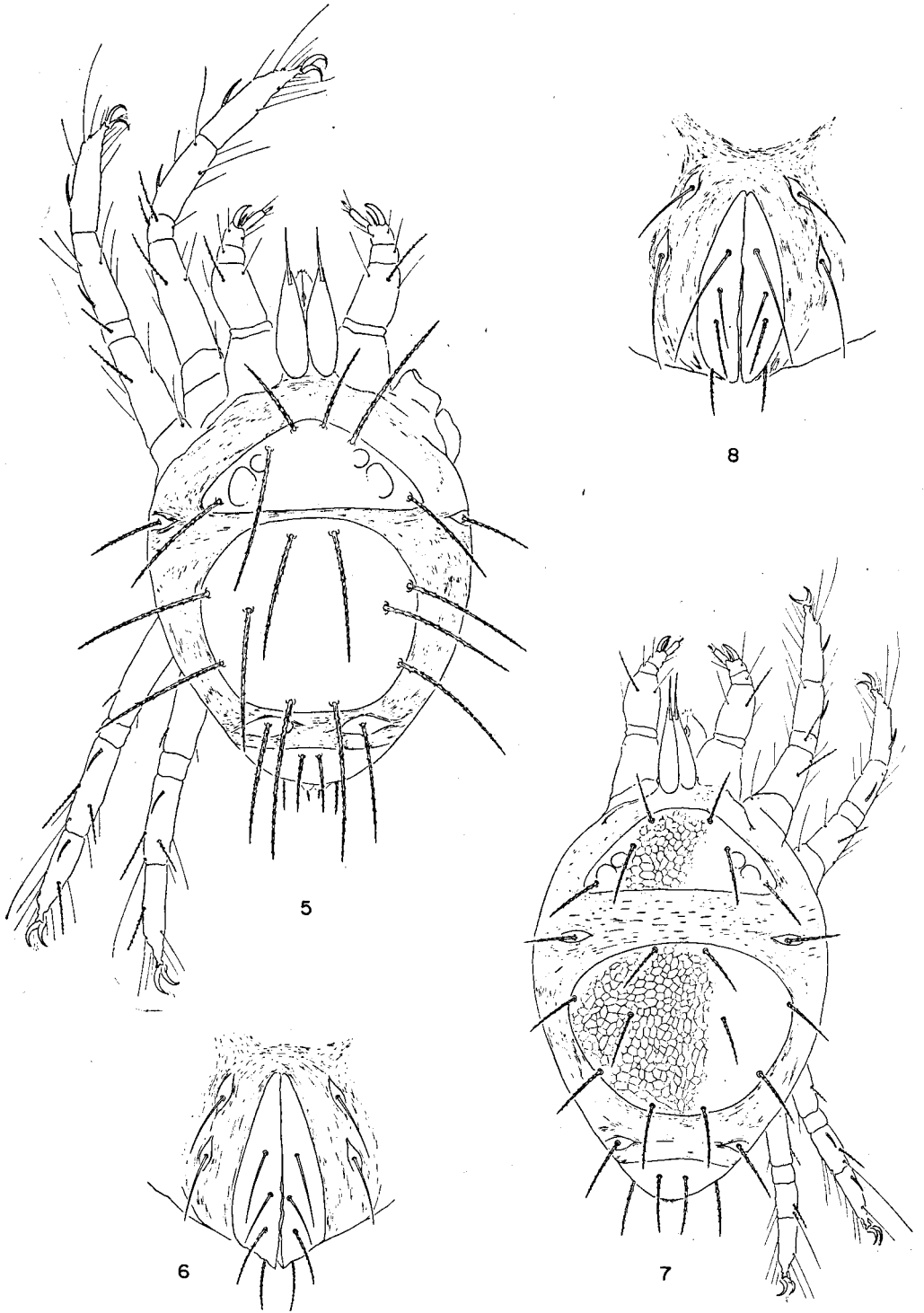


FIG. 5-6. — *Agistemus longisetus* n. sp.
5, Dorsum of female ; 6, Venter of opisthosoma.

FIGS. 7-8. — *Agistemus collyerae* n. sp.
7, Dorsum of female ; 8, Venter of opisthosoma.

Agistemus collyerae n. sp.

Figs. 7-8.

Female. — A small species with median dorsal plates extensively ornamented with a thin-walled network or reticulation. Humeral plates situated high on dorsum so that seta *he* almost aligns with *ce* and *la*. Intercalary plates far apart. Dorsal setae short, set not on tubercles; dorsocentral setae on metapodosomal plate comparatively short, length of *a* shorter than distance *a* to *b*, likewise *b* does not extend to base of *c*. Length of setae *ae* approximately equals distance between individuals of this pair; preoculars *be* shorter than intercalaries *li*, the latter, longest setae of dorsum; postoculars and humerals equal in length; distance separating dorsocentrals *a* less than length of one seta of this pair; dorsocentrals *b* equidistant from laterals *la* and *lm*; suranals setae *e* and *le* of equal length. Two pairs of dissimilar paragenital setae on venter of opisthosoma, pg^1 21 μ , pg^2 33 μ ; anogenital seta g^1 ultralong extends to base of g^4 . Tip of palpus reaches solenidion of tarsus I. Formula for leg setae unusual for the genus: tarsi 12-9-8-8-, tibiae 6-6-6-4, genua 3-0-0-0, femora 4-4-2-2; tibia IV lacks solenidion and one ventral seta; genu I without usual lateral seta; no mesal seta on femur I. All setae on tibiae I, II smooth, and only one, the lateral, is barbed on tibiae III, IV. Average measurements ($n = 10$ specimens): body length 380 ± 15 , idiosoma 270 ± 17.4 , leg I 160 ± 3.5 , setae *ae* 32 ± 3.7 , *be* 42.2 ± 3 , *ce* 37 ± 4.5 , *he* 38.5 ± 1.9 , *a* 30 ± 2.3 , *b* 31.8 ± 1.3 , *c* 43.5 ± 1.7 , *lm* 36 ± 2.8 , *li* 46 ± 4.7 , *e* 40 ± 1.3 , *le* 38.5 ± 0.6 .

Holotype. — ♀ ex gall on *Rubus* sp., Little Huia, near Auckland, NEW ZEALAND, April 23, 1961 (Elsie COLLYER); deposited in USNM, no. 2917.

Paratypes (All collected by Elsie COLLYER). — Five ♀ on apple leaves, Auckland, N. Z., January, 1960; 3 ♀ on apple leaves, Baor, N. Z., January 11, 1961; 4 ♀ on dwarf trees, at Plant Disease Division, Auckland, N. Z., January 21, 1960; 3 ♀ on *Luculia* sp., at Plant Disease Division, Auckland, N. Z., November 13, 1960; 4 ♀ on eriophyid leaf galls on *Vitex lucens*, Auckland, N. Z., May 20, 1961. Paratypes in BMNH, UCD, EEA and Dr. COLLYER'S collection.

This species is named after Dr. Elsie COLLYER, East Malling Research Station, in appreciation for her contribution of much New Zealand material.

Recognition characters. — This species is characterized by reduction in number of leg setae, by the unusual lengths of paragenital pg^2 and anogenital g^1 , and by the length equality of the two pairs of suranal setae. No other described species of *Agistemus* possesses such distinctive features.

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