

ACARINA: ASTIGMATA: SAPROGLYPHIDAE OF SOUTH GEORGIA¹

By A. M. Hughes²

Abstract: *Neocalvolia claggi*, n. gen., n. sp. is described from South Georgia. Included are descriptions of the ♂, ♀, and tritonymph.

The specimens of *Neocalvolia claggi* n. gen., n. sp. were found by H. B. Clagg on 27 May 1963 on tussock grass growing on Landing Beach of Bird Island. Eighteen specimens were found, consisting of 7 ♂♂, 8 ♀♀ and 3 tritonymphs (no. B. I. 275B). In January of the following year 2 tritonymphs and 1 protonymph were found on grass at Busen Peninsula, The Crutch, between sea level and 150 m (no. SG 144B). These specimens were collected by hand.

In a previous paper (Hughes & Tilbrook 1966), *Calvolia antarctica* from the South Sandwich Is. was described. This was placed tentatively in the genus *Calvolia*, largely because of the possession of a pair of dorsal corneae on the sides of the propodosoma. It was pointed out, however, that this species was distinguished from other species of *Calvolia* by having well-developed ventral terminal spines on the tarsi, and also by the elaborate and complex genitalia present in the male.

C. antarctica closely resembles the species described in this paper, and it is proposed to erect a new genus *Neocalvolia* with *N. claggi* as type-species and to include in it *Calvolia antarctica* which in future will be known as *Neocalvolia antarctica* (Hughes & Tilbrook 1966), new combination.

Genus *Neocalvolia* Hughes, new genus

Mites with the characters of the genus *Calvolia* (Oudemans 1911), but differing in having the 3 ventral-terminal setae p—u, q—v and s thickened as spines. Copulatory suckers may or may not be present on tarsi I and II of the ♂, but the ventral spine s is missing from these tarsi. The genitalia of the ♂ are extremely well-developed and complex, the penis straight and dagger-shaped. The bursa copulatrix is correspondingly enlarged and sclerotized in the ♀ and may be annular or tubular.

Type-species: *Neocalvolia claggi*, n. sp.

Neocalvolia claggi Hughes, new species

Holotype (♂) (fig. 1). Length of idiosoma: 414 μm.

Idiosoma is elongated, oval in shape with a transverse constriction between propodosoma and hysterosoma. Cuticle with a yellowish tinge in preserved specimens and is almost smooth. Dorsal propodosomal shield present with a pair of transparent corneae in anterolateral corners and vertical internal (v i) setae projecting forwards from center of anterior edge. Encircling the dorsal region of the 1st pair of legs is a ridge-like lateral sclerite at whose anterior end is Grandjean's organ and whose posterior end runs behind the supracoxal seta (sup). Grandjean's organ is a small tongue-shaped projection of cuticle and supracoxal seta is a tapering rod. Lateral region of idiosoma longitudinally grooved and some of muscles originating from genitalia inserted here.

Ventrally, apodemes (ap) well-developed, those of legs I meeting to form a short sternum (st) (fig. 2). Apodemes II end freely at their internal edges and apodemes III are united by a transverse thickening with each other and also with apodemes IV (fig. 3). Central region (cent. reg) enclosed by apodemes III, and IV sclerotised and probably concerned with muscle attachment. Coxal regions (cox) of legs I to IV also thickened to form ill-defined epimeral plates. Gnathosoma tapers from base to apex. Chelicerae dentate, each digit with 3 or 4 "teeth".

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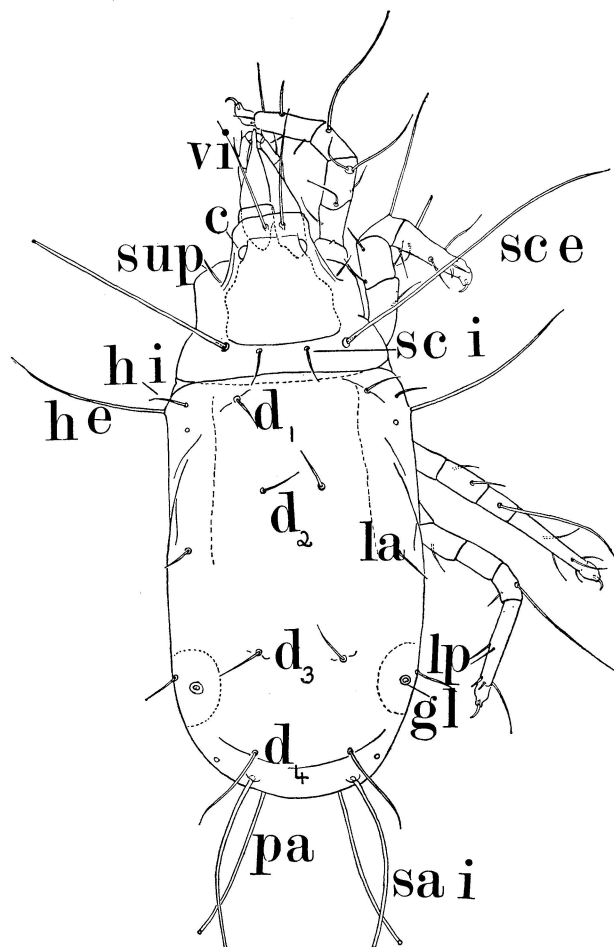


Fig. 1. *Neocalvolia claggi*. ♂. Dorsal view. c cornea; sup supracoxal seta; v i, sc i, sc e, h i, h e, l a, l p, sa i, p a, d₁ to d₄ setae of the idiosoma; gl opening of latero-abdominal gland.

Body setae smooth and arranged as shown in fig. 1. With the exception of v i, sc e, h e, sa i and p a, they are short. Sc i arise nearer to sc e than to each other, the distance between sc i and sc e being approximately equal to length of sc i. Distance between d₁ and d₁ is more than 2 × that between d₂ and d₂; d₄ are nearly 2 × length of l p and arise close to long sa i setae; sa i and sc e are longer than p a and h e, sa i being characteristically bow-shaped; h i and h v are of the same order of dimension as l a and l p; l p arise at same level as openings of latero-abdominal glands (gl), as they do in *Calvolia antarctica* Hughes and Tilbrook, 1966. Table 1 gives the lengths of the shorter setae in ♂, ♀ and tritonymph.

Ventral surface with coxal setae present on coxae I only and 3 pairs of genital setae (g) surrounding genital opening. Two short anal setae flanking anus.

As in *C. antarctica*, the genital sclerites supporting the penis are elaborate and complex (figs. 3, 4). The penis (p) is a dagger-shaped tube arising from a basal sclerite (b s), its apex is directed anteriorly and it is internal to a strongly sclerotised plate (s p). Flanking the penis and ventral to it are lateral struts which articulate with lateral plates (l p) embedded in the ventral body wall. These struts are directed posteriorly, but can be

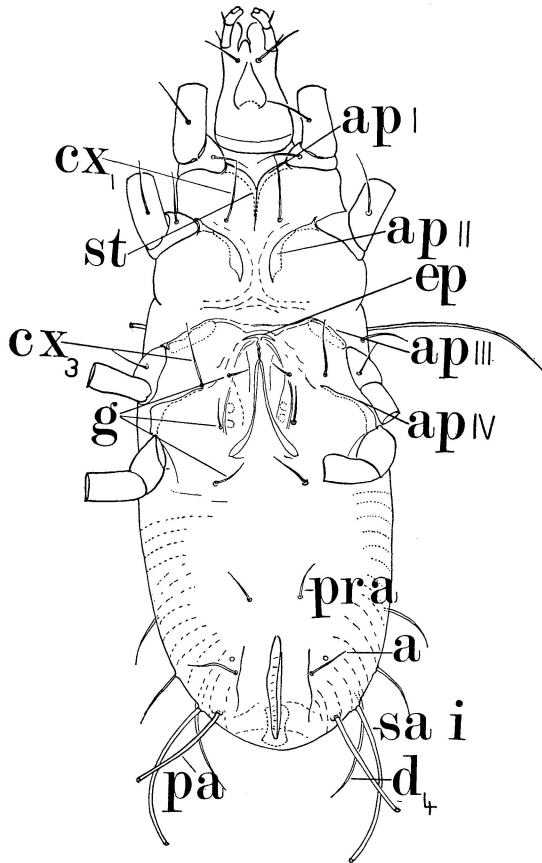


Fig. 2. *Neocalvolia claggi*. ♀. Ventral view. st sternum; ap I to IV apodemes I to IV; ep epigynum; cx₁, cx₃, pr a, a, sa i, p a, d₄, g setae of the idiosoma.

Table 1. Lengths of dorsal setae in μm

	sc i	d ₁	d ₂	d ₃	d ₄	l a	l p	h 1	h v
♂	20	20	27	30	51	16	27	20	16
♀	27	20	27	46	65	27	40	30	30
Tritonymph	20	20	30	32	49	16	24	16	20

rotated so as to point forwards and protrude between the genital folds (gen. f) (fig. 3). It is possible that they act as supports to the penis during copulation. Lateral muscles (m) run from this complex apparatus to the sides of the body as thin sheets. Genital sense organs (gen. s) are present on internal surface of genital folds.

Every leg ends in a membranous pretarsus into the distal end of which is inserted a well-developed claw. Table 2 shows the chaetotactic formula for adults and tritonymph according to Grandjean (1939). The figures in brackets give the number of setae and solenidia arising from tarsus, tibia, genu, femur and trochanter respectively.

The setae and solenidia have the same basic arrangement as in other acarid mites. On legs I, omega₁ (ω₁) is a tapering rod arising almost at right angles from central region of tarsus (fig. 5); it arises from the same projection as epsilon (ε). Omega₃ (ω₃) is longer than ω₁ and terminal, whilst ω₂ is a short blunt structure

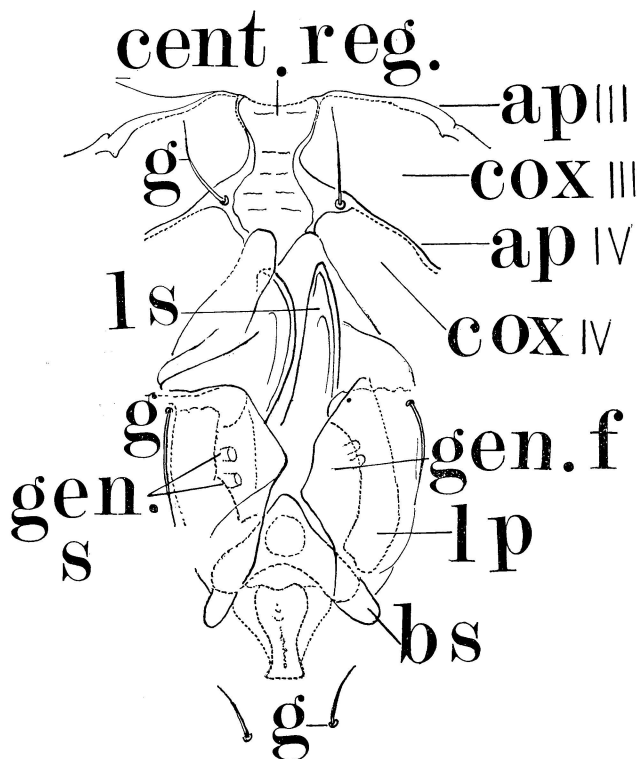


Fig. 3. *Neocalvolia claggi*. ♂ Ventral view of genital region. ap III and IV apodemes III and IV; cent. reg. central region; gen. f. edge of genital fold; l s lateral strut; l p lateral plate; gen s genital sense organ; b s basal sclerite; g genital seta.

Table 2. Chaetotactic formula

	Leg I	Leg II	Leg III	Leg IV
A Setae				
♂, ♀ and Tritonymph	(8.2.2.1.1.)	(8.2.2.1.1.)	(8.1.1.0.1.)	(6.1.0.1.0.)
B Solenidia				
♂, ♀ and Tritonymph	(3.1.2.0.0.)	(1.1.1.0.0.)	(0.1.1.0.0.)	(0.1.0.0.0.)

inserted near base of tarsus. The ω_1 of tarsus II is longer than that of tarsus I, as is the case in most acarids (fig. 6). The long whip-like solenidion phi (φ) is always longer than the tarsus of the corresponding leg and on genu I, sigma (σ_1) is shorter than σ_2 and represented by a single solenidion on genu III (fig. 7).

In the ♂ of *C. antarctica* and other species of *Calvolia*, tarsal suckers are present on the ventral terminal surfaces of tarsi I and II and the ventral spine s is missing. In *N. claggi* these suckers are not present, but the terminal spines p + u and q + v are reduced in size and s is missing. On tarsi III and IV, these spines are well-developed (fig. 7 and 8). One can assume, therefore, that the tarsi of the anterior legs are used during copulation, particularly as these tarsi have the slightly sinuous outline which is also found in some species of *Glycy-*

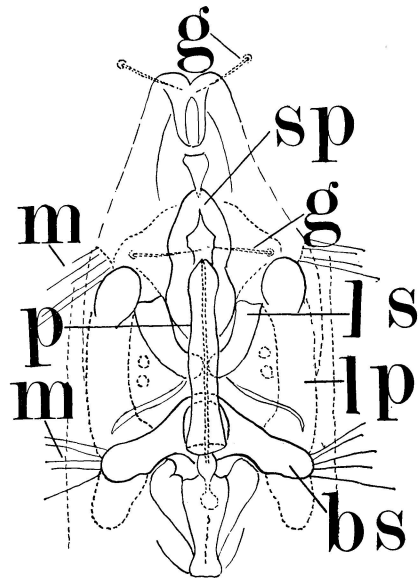


Fig. 4. *Neocalvolia claggi*. ♂. Dorsal internal view of genital region. g genital seta; p penis; bs basal sclerite; ls lateral strut; lp lateral plate; m sheet of muscle; sp sclerotised plate.

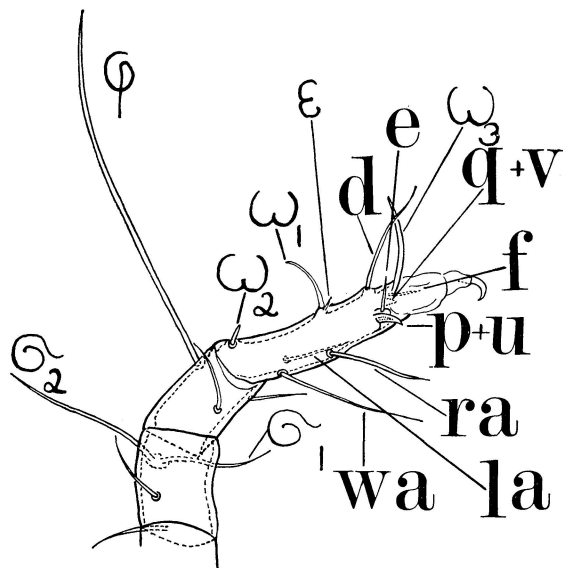


Fig. 5. *Neocalvolia claggi*. ♂. External view of termi of terminal three segments of right leg I. ω_1 to ω_3 , φ , σ_1 , σ_2 solenidia; ϵ famulus; p + u, q + v ventral terminal spines; e, f, wa, ra, la leg setae.

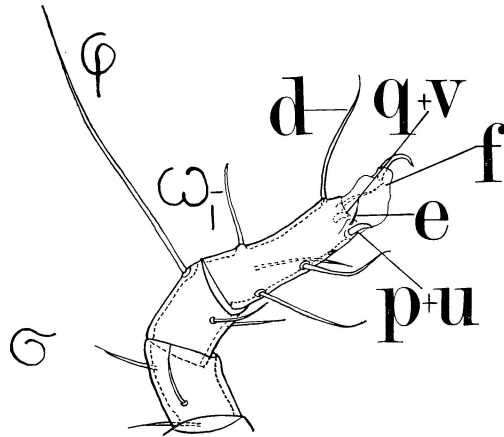


Fig. 6. *Neocalvolia claggi*. ♂. External view of terminal three segments of right leg II. ω_1 , φ , σ solenidia; p + u, q + v ventral terminal spines; d e, f leg setae.

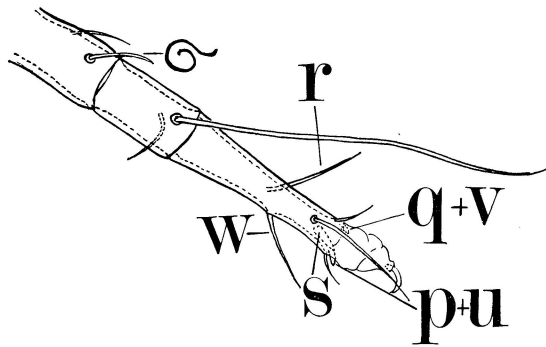


Fig. 7. *Neocalvolia claggi* ♂ Dorsal view of terminal three segments of right leg III. σ solenidium; r, w setae; p+u, q+v, s terminal spines.

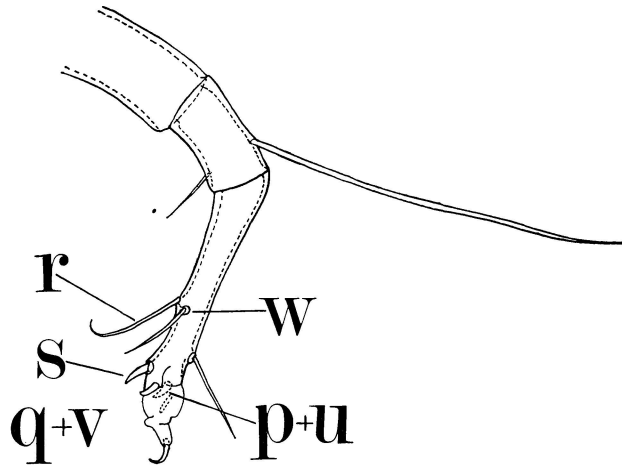


Fig. 8. *Neocalvolia claggi*. ♂ Internal view of terminal three segments of right leg IV. r, w setae; p + u, q + v, s terminal spines.

phagus. The short terminal setae e and f are present on tarsi I to III, but missing from tarsus IV. The ventral seta wa on tarsi I and II is longer than the more distal setae ra and la. These 3 ventral setae are represented by the 2 setae r and w on tarsi III and IV which arise almost at the same level. The dorsal terminal seta d is present on all the tarsi. The chaetotaxy of trochanters and femora follows the usual acarid pattern.

Allotype (♀) (fig. 2). Length of idiosoma: 447 μ m.

Cuticle irregularly wrinkled on dorsal surface of idiosoma, irregular markings extending on to sides and part of ventral surface. A pair of longitudinal grooves also runs down dorsal side of idiosoma. Dorsal propodosomal shield with anterior corneae present as in ♂. Ventrally, apodemes I join to form a sternum, apodemes II and IV free, whilst apodemes III are united with a median epigynium (ep). Coxal setae arise from coxae III as well as coxae I.

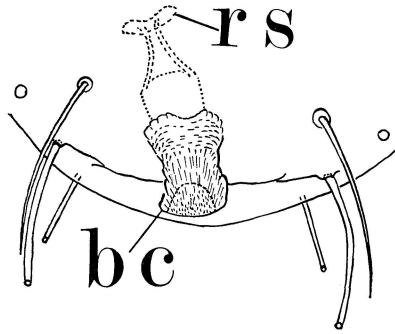


Fig. 9. *Neocalvolia claggi*. ♀ Dorsal view of posterior end of idiosoma. b c bursa copulatrix; r s receptaculum seminis.

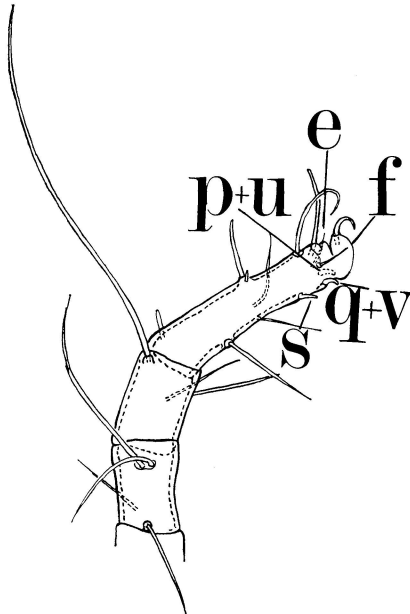


Fig. 10. *Neocalvolia claggi*. ♀ Internal view of left leg I. e, f terminal setae; p + u, q + v, s terminal spines.

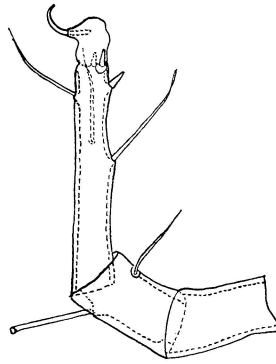


Fig. 11. *Neocalvolia claggi*. ♀ Internal view of left leg IV.

Body setae arranged as in ♂ and, with exception of d_1 and d_2 , the shorter setae longer than those of ♂ (see table 1). A pair of pre anal (pr a) setae present which are not found in ♂. Genital folds which cover genital opening extend between coxae III and IV, and posteriorly a large and well-tanned cylindrical bursa copulatrix (b c) projects from dorsal surface. Internally this communicates by means of 2 slender tubes with receptaculum seminis (r s) (fig. 9).

Chaetotaxy of legs similar to that of ♂, except that tarsi I and II straight rather than sinuous in outline, and have 3 terminal spines (fig. 10), p + u, q + v and s, as do tarsi III and IV (table 2). As in the ♂, setae e and f are missing from tarsi IV (fig. 11).

Tritonymph. Length of idiosoma: 390 μ m.

Closely resembling ♀. Cuticle with same slight transverse wrinkling, and chaetotaxy of body and legs same (tables 1 and 2).

Protonymph. (Length of idiosoma: 344 μ m) also resembles the tritonymph, but shows the same modifications in chaetotaxy as is characteristic of other free-living acarids.

Holotype ♂ (BISHOP 8843), and allotype ♀ mounted in CM mountant and labelled "tussock grass, Bird I., S. Georgia. B.I. 275B., H. B. Clagg coll." in addition to the names. These slides are in the possession of the Bishop Museum, Honolulu. Three paratypes, ♂, ♀ and tritonymph, similarly mounted and labelled are in the Arachnida Department of the British Museum (Nat. Hist.), London, catalogue number 1969.170. A duplicate set of paratypes is in my possession and the remaining specimens in spirit with their original labels have been returned to the Bernice P. Bishop Museum.

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