

## LARVAL *LEPTUS* (ACARINA : ERYTHRAEIDAE) ECTOPARASITIC ON A NORTH AMERICAN ANT

BY R. V. SOUTHCOTT \*

### TAXONOMY HOST-PARASITE

**SUMMARY :** *Leptus clarki* sp. nov. is described and separated from the two previously described North American larval *Leptus* (Acarina : Erythraeidae), and other American species.

It is the second larval *Leptus* recorded as an ant ectoparasite. Larval Erythraeidae rarely parasitize Hymenoptera. Sites of attachment on the harvester ant *Pogonomyrmex salinus* Olsen are the dorsal to dorsolateral surfaces of the head and thorax. Up to seven mites per ant are recorded.

### TAXONOMIE HÔTE-PARASITE

**RÉSUMÉ :** Description de *Leptus clarki* sp. nov. en Amérique du Nord ; il est séparé de deux espèces larvaires de *Leptus* connues de l'Amérique du Nord, et d'autres espèces américaines.

L'espèce est la seconde connue d'une fourmi hôte. Les larves d'Erythraeidae sont rares comme parasites d'Hymenoptera. Les lieux d'attachement des acariens sur la fourmi moissonnier *Pogonomyrmex salinus* Olsen sont les surfaces dorsales à dorsolatérales de la tête et du thorax. Jusqu'à sept acariens par fourmi sont rapportés.

### INTRODUCTION

Although larval erythraeid mites, including the cosmopolitan genus *Leptus* Latreille, 1796 are not uncommon ectoparasites of insects and arachnids, they are rarely observed upon Hymenoptera. OUDEMANS (1905, 1912) recorded *Leptus debeauforti* (Oudemans, 1905) ectoparasitic upon an unidentified ant in Netherlands New Guinea (now Irian Jaya), and Southcott (1984) recorded *Leptus* sp. upon an unidentified wasp in Papua New Guinea,

and these appear to be the only published records. The author has, additionally, a few unpublished records of *Leptus* spp. ectoparasitic on bees in Australia and Central America.

The only other known instances of a larval erythraeid mite parasitizing a hymenopteran are those of ANDRÉ (1929, 1930), who recorded *Forania mentonensis* (André, 1929) upon the ants *Plagiolepis pygmaea* Latr. and *Pheidole pallidula* Nyl. in France (see SOUTHcott, 1961a).

Some years ago Mr. William A. CLARK, Museum

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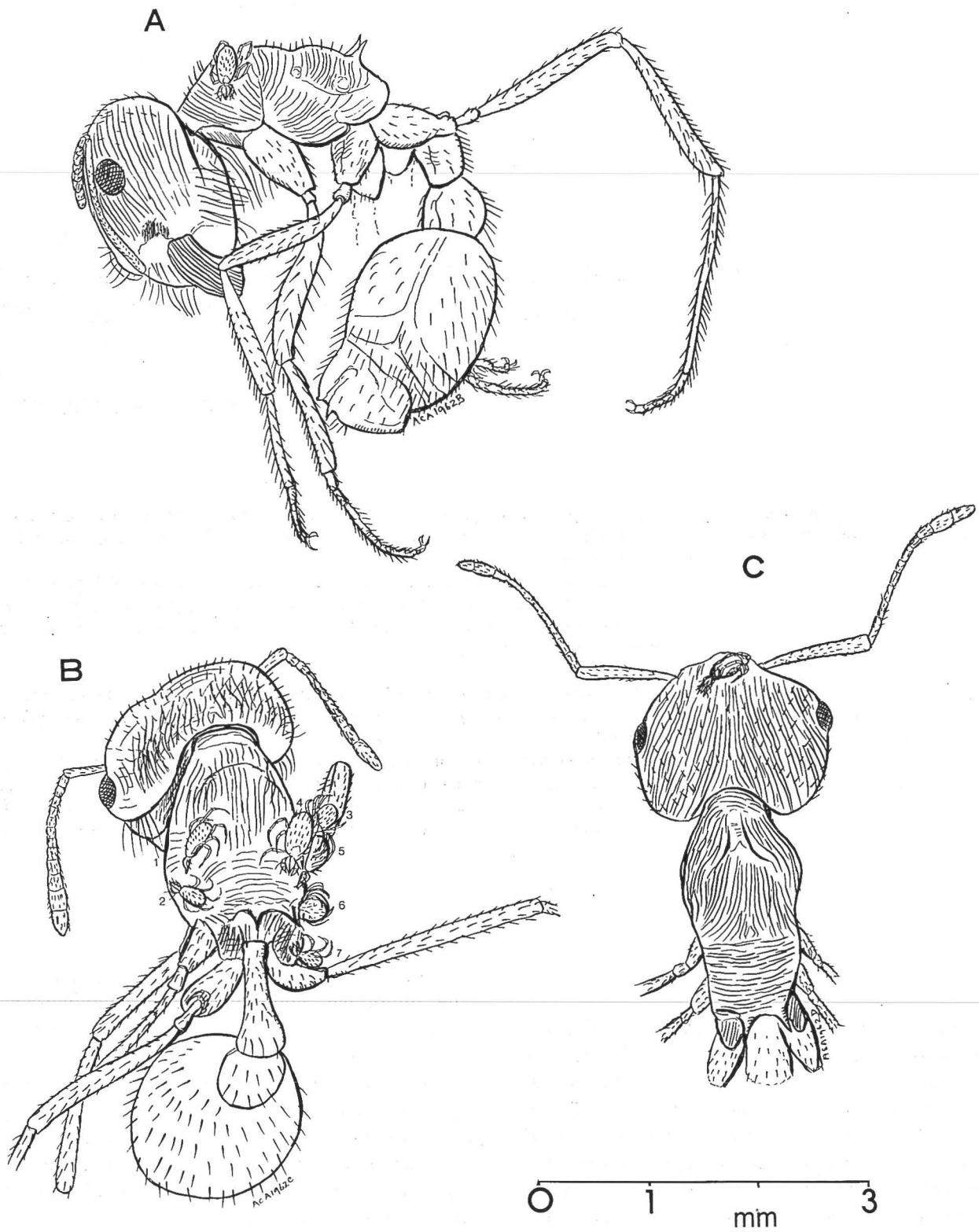


FIG. 1 : Three ants, *Pogonomyrmex salinus* Olsen, with ectoparasitic mites *Leptus clarki* sp. nov. A. — Specimen ACA1962B attached to dorsolateral aspect of prothorax of ant. B. — Seven mites, ACA196201-7, attached to dorsal and lateral aspects of mesothorax and metathorax. C. — Mite ACA1962D attached to frontal region of head of the third ant.

of Natural History, College of Idaho, Idaho, United States of America, sent me a series of the North American harvester ant, *Pogonomyrmex salinus* Olsen, with ectoparasitic erythraeid mites *in situ* (Fig. 1 A, B, C). These are described here as *Leptus clarki* sp. nov., dedicated to Mr. W. H. CLARK. The identification of the ant species by Mr. WILSON is based on SHATTUCK'S (1987) revision of the genus *Pogonomyrmex* (subfamily Myrmicinae) in North America. *P. salinus* is one of two species of the genus in Idaho (see YENSEN *et al.*, 1977), with the Synonymizing of *P. occidentalis* Cole, 1938, with *P. salinus* Olsen, 1934.

The genus *Leptus* is clearly widely distributed in the Americas, being recorded e.g. as larvae by OUDEMANS (1912) and WELBOURN (1983). TREAT (1975) achieved the rearing of an unnamed North American larva to its adult instar. However, for North America only two larval forms have been recognizably described, by FAIN *et al.* (1987), ectoparasitic upon Opilionata. A further species, ectoparasitic upon *Apis mellifera* L. in Guatemala, has also been recognized (SOUTHCOTT, 1989).

Chaetotoxic and other descriptive codes follow the author's previous terminology (SOUTHCOTT 1961a, b, 1963, 1984). The dorsal scutum metric measure coded as ASBM by FAIN *et al.* (1987) is also adopted. All measurements are in micrometres ( $\mu\text{m}$ ) unless stated otherwise.

#### MATERIALS AND METHODS

Fourteen larvae of *Leptus clarki* have been studied. These were forwarded *in situ* on dried specimens of *Pogonomyrmex salinus*. All mites were partly fed. After being photographed or sketched *in situ* on their hosts, the mites were removed. They were first moistened with 70 % ethanol on the tip of a fine brush, then wetted with a water droplet, then removed with the point of a needle. They were then mounted by standard methods through 50 % lactic acid to Hoyer's medium.

All illustrations were made with camera lucida.

#### *Leptus* Latreille, 1796

For definition and synonymy see SOUTHCOTT (1961a, p. 514).

#### *Leptus clarki* sp. nov. (Figs. 1-4)

Description of larva (from mounted holotype ACA1962A1, supplemented by paratypes).

Colour in dried state red. Idiosoma with elongate oval outline, length 670, width 460; over-all length from tip of mouthparts to posterior pole of idiosoma 870.

Dorsal scutum moderately chitinized, with numerous light porosities but without striations; shape approximately that of an equilateral triangle; anterior border excavated; anterolateral borders convex; posterolateral borders slightly concave; angles rounded; posterior pole of scutum with slight median notch.

Scutal scobalae (scutalae) lightly pigmented, expanding distally, obconical, with columns of robust, acutely-pointed setules. Sensillary setae filiform, with fine setules in distal half.

Standard and other data of dorsal scutum and legs as in Table 1.

Eyes circular, 20 across, on small oval or circular surrounding sclerite, 25 across.

Dorsum of idiosoma with about 102 setae, similar to scutalae, in irregular transverse rows.

Ventral surface of idiosoma: sternalae I narrow, parallel-sided, with long setules, arising near medial angles of coxae I; sternalae II blunted, with long setules, arising near medial angles of coxae II, 49 long. Anterior to coxae III a curved row of four setae as figured, laterals 28 long, medials 38 (similar to sternalae II). Between and behind coxae III about 32 setae, the more anterior ones parallel-sided, grading to the obconical posterior setae, which are similar to dorsal idiosomalae but more slender, 29-37 long, in irregular transverse rows.

Coxalae 1, 1, 1; coxala I long, pointed, well setulose; II and III blunt-ended, well setulose.

Legs normal; lengths (including coxae and claws): I 845, II 765, III 935. Leg barbed setae (scobalae) normal.

Leg specialized setae as follows (lengths in parentheses): SoGeI.60d(33), VsGeI.94pd(7), SoTiI.62d (37), SoTiI.86d(21), VsTiI.90pd(9), VsGeII.91pd(7),

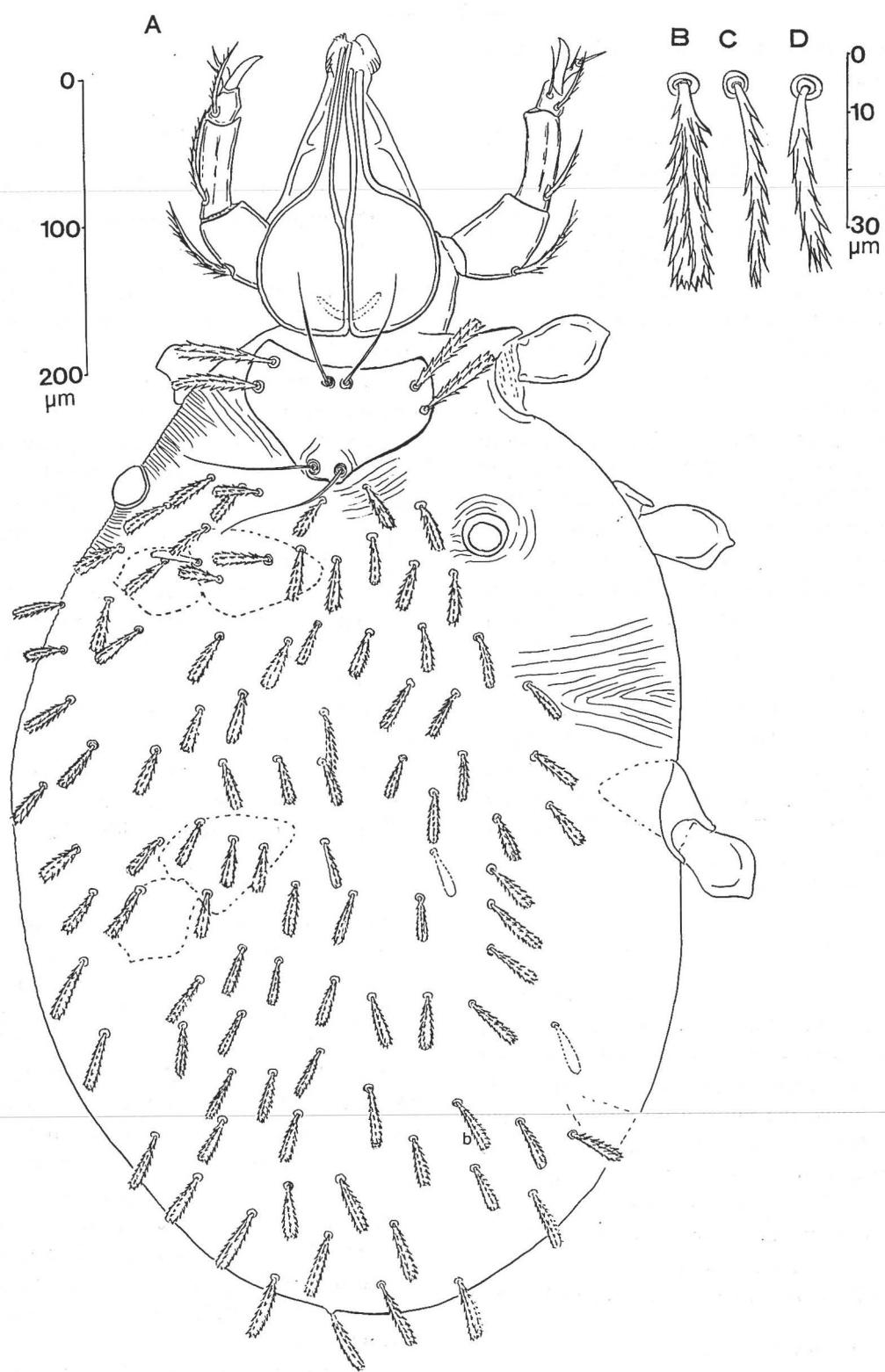


FIG. 2 : *Leptus clarki* sp. nov., holotype larva ACA1962A1. A. — Dorsal aspect, legs omitted beyond trochanters. B. — Dorsal idiosomal seta ('b' in A), further enlarged. C, D. — Ventral idiosomal setae ('c', 'd' in Fig. 3), to same scale.

TABLE 1. — Data of larvae of *Leptus clarki* sp. nov.

Character	Holotype	n	range	mean	s.d.
AW	96	12	91-106	96.17	4.9513
PW	112	12	105-217	112.00	7.0711
SBa	13	12	13-17	14.75	1.2881
SBp	18	14	16-19	17.36	0.9288
LX	27	3	26-27	26.677	—
ASBa	29	2	22-29	25.50	—
ABM	9	2	9-10	9.50	—
ISD	57	11	56-69	58.91	3.5342
L	91	3	91	91.00	—
W	125	11	115-135	126.91	5.8558
AAS	42	12	36-44	40.08	2.3143
A-P	16	11	15-20	17.09	1.4460
AL	65	14	55-69	62.29	3.8115
PL	60	11	49-61	56.64	3.3548
ASE	70	13	47-70	55.08	5.2988
PSE	82	13	75-85	79.38	3.3050
DS	33-44	14	40-50*	45.07*	2.2690*
‘Oc.’	36	14	32-36	34.79	1.4769
MDS	36	14	34-38	35.57	1.3425
PDS	44	14	40-50	45.21	2.3916
GeI	145	12	145-162	153.33	4.9605
TiI	195	14	191-214	201.79	6.6004
TaI(L)	155	12	155-173	164.00	6.0151
TaI(H)	27	14	20-29	25.57	2.3110
TiI/GeI	1.34	12	1.18-1.37	1.3050	0.050722
GeII	129	13	126-140	133.46	4.9433
TiII	168	14	166-190	177.57	7.3559
TaII(L)	127	14	127-145	137.93	5.2545
TaII(H)	31	14	23-33	27.07	2.7023
TiII/GeII	1.30	13	1.29-1.40	1.3323	0.029199
GeIII	138	12	138-160	147.92	5.9001
TiIII	246	14	244-279	261.14	9.0542
TaIII(L)	156	14	156-175	168.29	6.2194
TaIII(H)	19	13	18-24	20.54	1.6641
TiIII/GeIII	1.78	12	1.65-1.82	1.7625	0.046539
AW/ISD	1.68	9	1.52-1.83	1.6578	0.085408
ISD/A-P	3.56	11	3.22-3.75	3.4573	0.21148
AW/A-P	6.00	9	5.39-6.13	5.7578	0.25975
StI	53	13	46-55	50.69	3.8813
CxI	73	13	64-81	74.00	5.0332
CxII	29	12	27-33	29.42	1.8809
CxIII	38	12	37-46	40.83	2.7907
TiI/AW	2.03	12	1.89-2.26	2.085	0.11485
TiIII/AW	2.56	12	2.52-2.93	2.7108	0.15335
AW/AL	1.48	12	1.40-1.75	1.5550	0.11828
AL/AAS	1.55	12	1.43-1.73	1.5525	0.088536

\* For the maxima of DS.

SoTiII.05d(c.36), SoTiII.83d(15). SoTiIII.03d(28).

Tarsus I with SoTaI.52d(44). Tarsus II with SoTaII.44d(18).

Tarsal claws : anterior smooth, falciform, with faint setules along shaft ventrally ; middle (empodium) longer, more slender, falciform, smooth ; posterior slender, retroflexed, with about 15-20 ventral setules, proximals long, then diminishing in length distally.

Gnathosoma : cheliceral bases with rounded posterior element, moderately chitinized, porose, not striate, length 200, width (combined) 122. Dorsal hypostomal seta absent. Ventral hypostomal seta (code pH) tapering, pointed, 64 long, with three setules in about middle region.

Palpal setal formula 0, 0, 1, 1, 3, 7. Palpal femoralia, genuala and tibialia pointed, well setulose, thickest at about middle of seta ; PaScTi2 similar. Other palpal setae as figured. Palpal supracoxala a blunted peg, 4 long. Palpal tibial claw (odontus) smooth, with single terminal hook.

#### Material examined

United States of America : 10 miles north of Howe, Butt Co., Idaho, 22.vi.1966, coll. W. F. BARR, received *in situ* on five worker harvester ants, *Pogonomyrmex salinus* Olsen (det. W. H. CLARK), 14 larvae. On hosts as follows : ACA1962A-3, in transverse row across dorsum of mesothorax (ACA1962A1, holotype) ; ACA1962B (Fig. 1 A) on dorsolateral aspect of prothorax ; ACA1962C1-7, on dorsolateral aspects of mesothorax and metathorax, two on left, five on right (Fig. 1 B) ; ACA1962D on frontal region of head (Fig. 1 C) ; ACA1962E1,2 on dorsolateral aspect of prothorax and mesothorax. (ACA1962A2,3, B, C1-7, D, E1,2 paratypes).

Holotype to be deposited in American Museum of Natural History, New York ; paratypes to Orma J. SMITH Museum of Natural History, College of Idaho, Caldwell, Idaho, U.S.A. (C.I.D.A.) ; California Academy of Science, San Francisco (C.A.S.C.) ; Smithsonian Institution, Washington (U.S.N.M.) ; William F. BARR ; Entomology Museum, Moscow, Idaho (U.I.C.M.) ; British Museum (Natural History), London (B.M.(N.H.)) ; South Australian Museum, Adelaide (S.A.M.A.).

Ant hosts to be deposited in C.I.D.A., U.I.C.M., and S.A.M.A.

#### Remarks on classification

In the author's key to the larval *Leptus* of the Americas (SOUTHCOTT, 1989), *L. clarki* keys to caption 8 and *L. nearcticus*, from which it may readily be distinguished as follows :

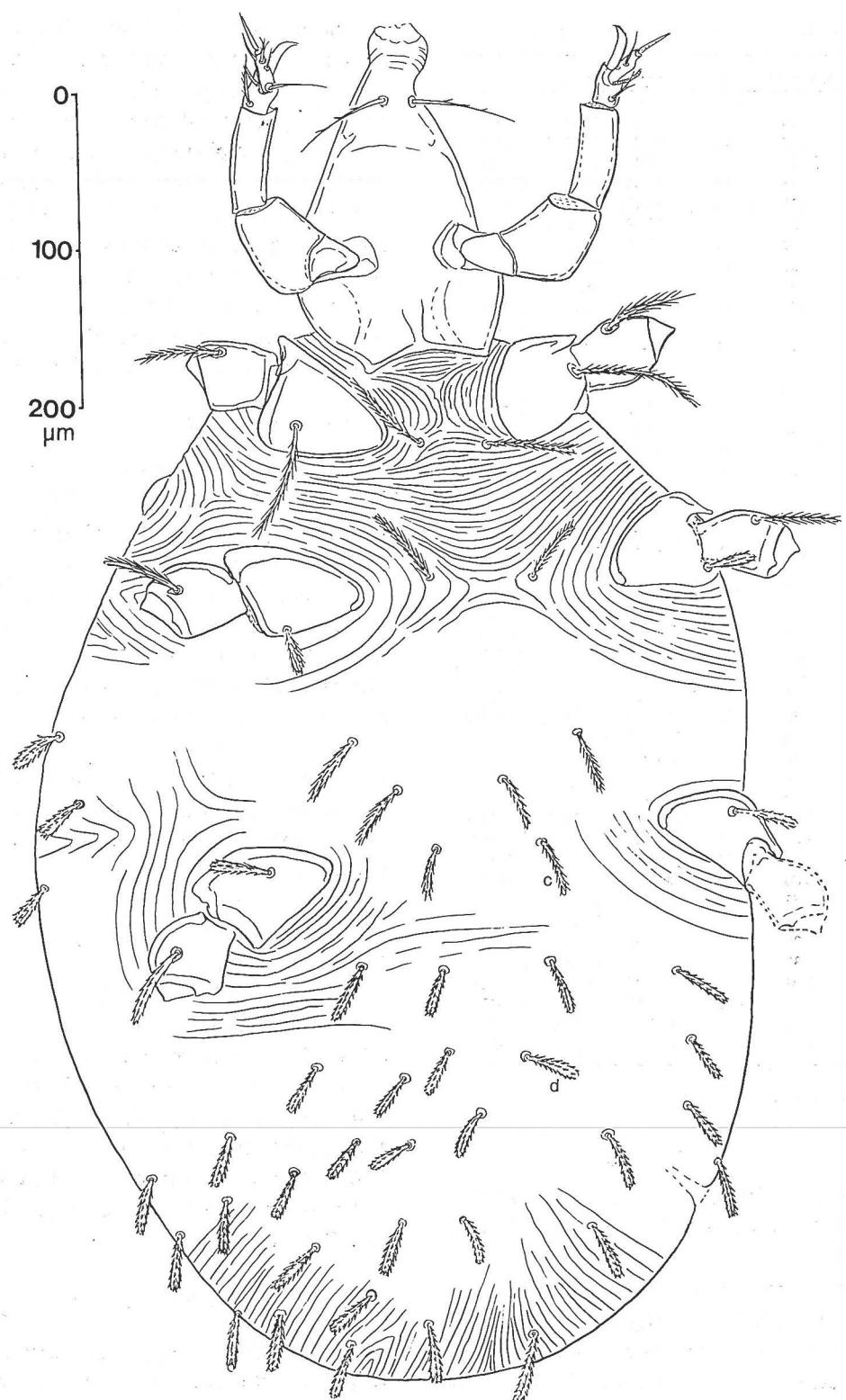


FIG. 3 : *Leptus clarki* sp. nov., holotype larva ACA1962A1. Ventral aspect, legs omitted beyond trochanters. (Owing to specimen being slightly rolled, three of the dorsal idiosomal setae are shown on left between levels of coxae II and III).

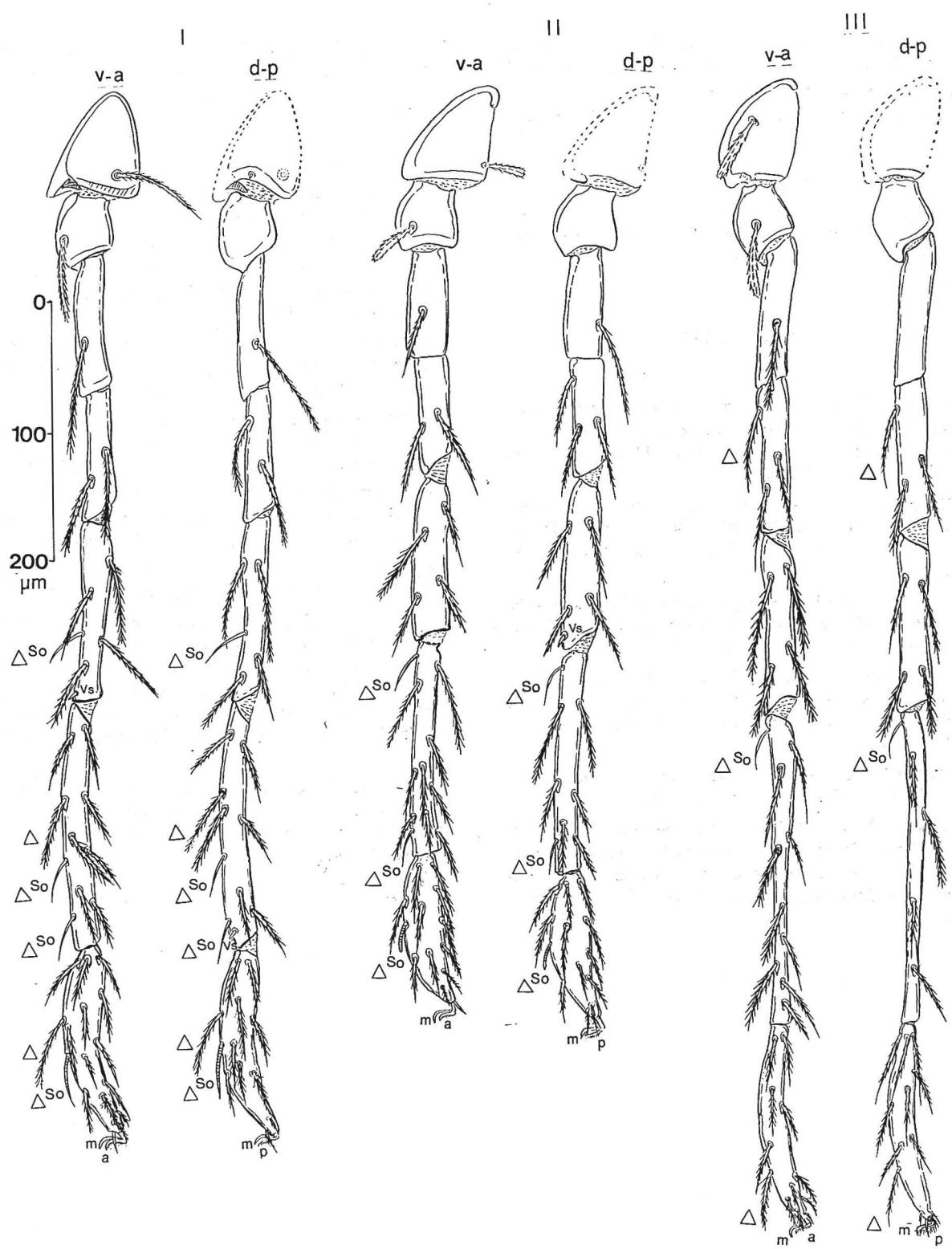


FIG. 4 : *Laptus clarki* sp. nov., holotype larva ACA1962A1. Legs I, II, III, to standard symbols. (Some details of tibiae I and II tarsi I, II and III completed from paratypes).

- Dorsal idiosomal setae 45-75 µm long. Dorsum of idiosoma with 94 setae..... *L. nearcticus* Fain et al., 1987  
Dorsal idiosomal setae 33-50 µm long. Dorsum of idiosoma with c.102 setae..... *L. clarki* sp. nov.

#### ACKNOWLEDGEMENT

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