

Notes on mites parasitic or phoretic on Australian centipedes, spiders and scorpion

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Abstract

A collection of mites (Acari) found on Australian centipedes and spiders and on a scorpion was studied.

Leptus waldockae sp. nov. (Erythraeidae) is described from its larval form taken from a scorpion, *Lychas alexandrinus* Hirst, 1911 (Buthidae) in Western Australia; *Dimothrombium southcotti* sp. nov. (Trombidiidae) is described from the larva found attached to a theridiid spider in Queensland; *Ljunghia pulleinei aname* subsp. nov. (Laelapidae) is described from adult forms found on a spider *Aname diversicolor* (Hogg, 1902) in Western Australia.

Introduction

The mites studied herein were found on centipedes, spiders and a scorpion in Australia. Some of them (i.e. the deutonymphs of *Histiostoma ferontiarum* (Dufour, 1839) and of *Caloglyphus* sp.) are purely phoretic and not pathogenic, whilst the other species are feeding on their hosts and should therefore be considered as parasitic.

All these mites were sent to the author by Miss J. M. Waldock, Technical Assistant of the Arachnology Department of the Western Australian Museum, Perth.

The holotypes of the new species or subspecies are deposited in the Western Australian Museum (WAM). Paratypes are also deposited there, in the Institut royal des Sciences naturelles de Belgique, Brussels (IRSNB) and in the British Museum, Natural History (BMNH). The hosts are in WAM.

All measurements are in micrometers.

Systematics

Family Erythraeidae

Genus *Leptus* Latreille, 1796

Leptus waldockae sp. nov.

(Figures 1—8)

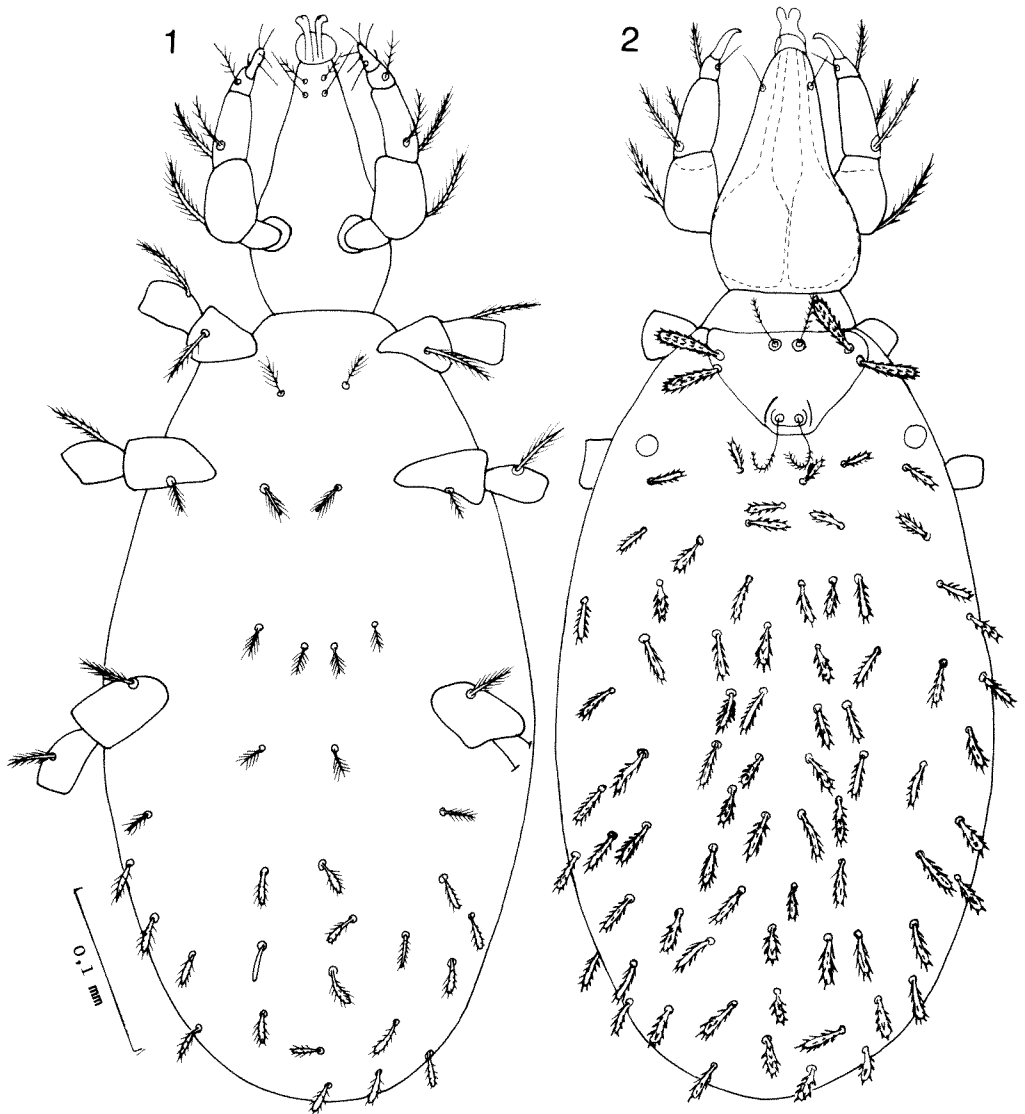
Holotype

WAM 89/178, larva on slide, from the body of a scorpion, *Lychas alexandrinus* Hirst, 1911 (Buthidae), WAM 89/222, from Learmonth, WA, 22°15'S, 114°05'E, 1.3 km W of, Western Australia. (Coll. D.B. Brooks & J. Waldock, 20 September 1988).

Paratypes

Eight larvae, with the same data as the holotype, of which five paratypes in WAM, one paratype in BMNH and two paratypes in IRSNB.

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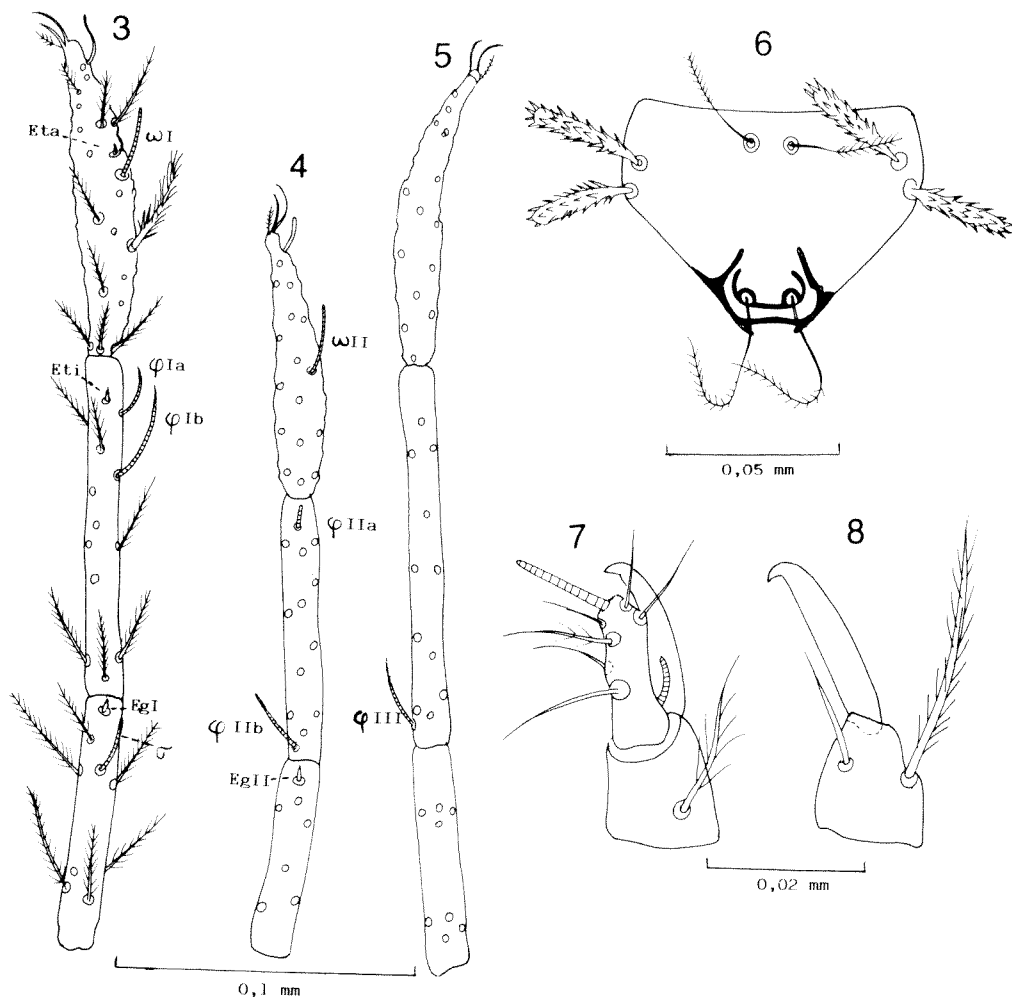


Figures 1-2. *Leptus waldockae* sp. nov. Larva in ventral (1) and dorsal (2) view.

Diagnosis

This new species is represented only by its larval stage. Until now about 80 species of *Leptus* have been described in the world from their larval stage. Many of them were inadequately described and are difficult to recognize from the original description.

The larvae of *Leptus* parasitize a wide range of arthropods in all the parts of the world. *L. waldockae* is close to the cosmopolitan group *ignotus* characterized by the presence of



Figures 3-8. *Leptus waldockae* sp. nov. Larva: Tarsus, tibia and genu of leg I (3), of leg II (4), of leg III (5); dorsal shield (6); palptarsus and palptibia in ventral view (7) and dorsal view (8).

two solenidia on tibiae I and II, one solenidion on genu I and no solenidion on genu II and the presence of one barbed seta on palpfemur. It differs, however from this group by the presence of two barbed setae on palpgenu.

In Australia four species of *Leptus* have been recorded from the larval stage, i.e. *Leptus chelonethus* Womersley, 1934 (host: a pseudoscorpion in WA); *L. bathypogonus* Womersley, 1934 (host: an Asilid, *Bathypogonus*, in WA); *L. anomalus* Southcott, 1946 (found in the soil in South Australia); *L. torresianus* Southcott, 1988 (from Cicadas in north Queensland).

L. waldockae differs from *L. chelonethus* by the longer legs, the shorter dorsal setae (42 long in that species), the greater length of AL (35) compared to PL (30) whilst in the species of Womersley the AL is shorter (33) than the PL (48).

It is distinguished from *L. bathypogonus* by the much smaller length of the legs, the scutum and the setae AL and PL and the greater length of the dorsal setae.

It differs from *L. torresianus* by the presence of two solenidia on tibia I and one solenidion on genu I (for three and two respectively in that species) and two barbed setae on palpgenu (for only one in that species).

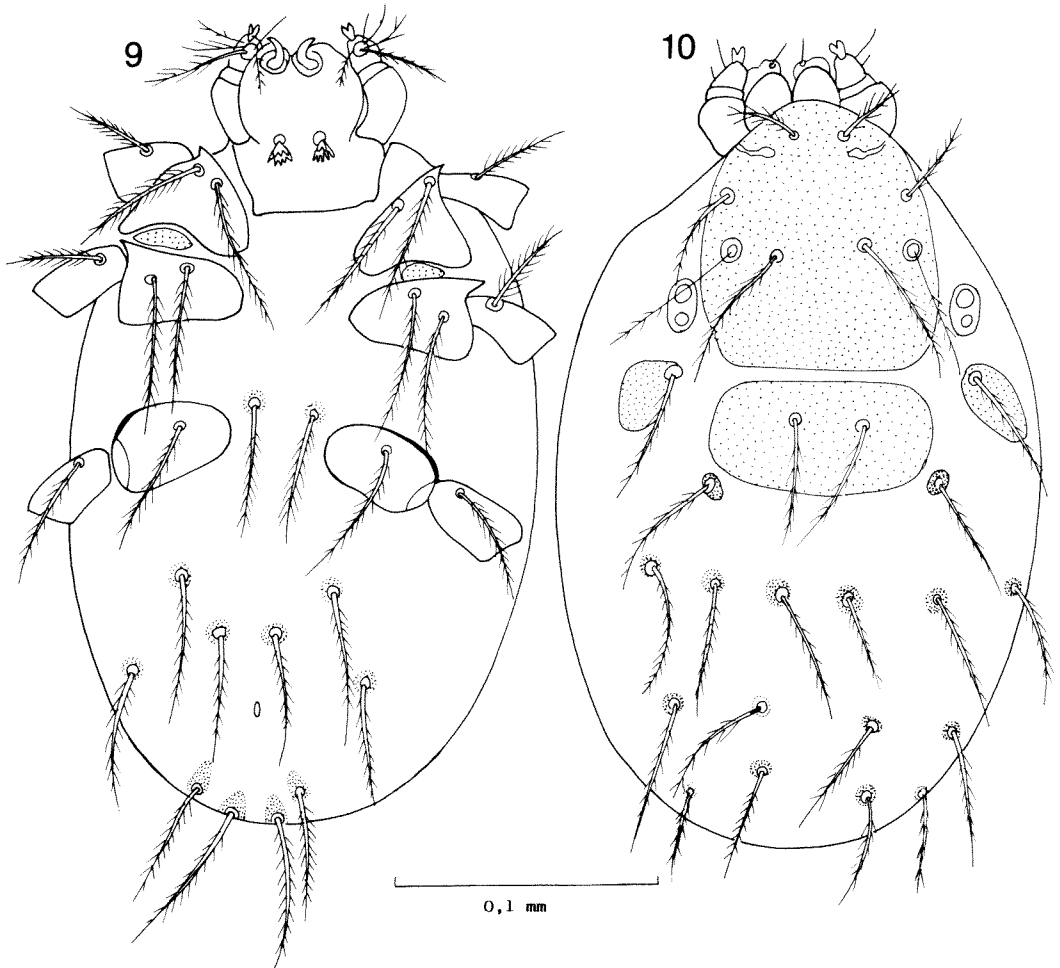


Figure 9-10. *Dinothrombium southcottii* sp. nov. Larva in ventral view (9) and dorsal view (10).

It differs from *L. anomalus* mainly by the presence of two solenidia on tibia I (for one in that species) and also by the following characters: scutum relatively longer and distinctly triangular posteriorly (rounded in *L. anomalus*), legs distinctly shorter, barbed setae of scutum slightly unequal, the anterior longer than the posterior (equal in *L. anomalus*), the coxal setae I distinctly shorter, solenidium of tarsus of leg I shorter, basal solenidium of palptarsus much shorter.

André (1953) described a new species, *Leptus pyrenaeus*, from a scorpion, *Buthus occitanus* L., in Banyuls, France. The present species is clearly distinct from the latter especially by the much smaller number of setae on the dorsum and the venter (about 120 and 75 respectively in *L. pyrenaeus*), the smaller size of these setae, the shape of the scutum with postero-lateral margins almost straight (concave in *L. pyrenaeus*).

Description

The standard data proposed by Southcott (1961) for the scutum are used herein and the measurement ASBM is added here, which is the perpendicular distance between the bases of the anterior sensilla and the anterior border of the scutum in the midline (Fain *et al.* 1987a and 1987b). The lengths of the legs include the claws and the coxae.

Larva holotype

This larva is unfed. Length of the body, including gnathosoma 585, width 240. Length of two paratypes: 630 and 750. Dorsum with 65 barbed setae, slightly club-shaped and placed on 10 rows of five to eight setae 21 to 30 long. Diameter of eye lens 16. Shield: see table 1. Venter with 31 barbed setae of which eight are in podosomal region; those on the opisthogaster 15 to 25 long and bear longer barbs than dorsal setae. Coxal setae I-III 36, 12 and 21 long respectively. Gnathosoma 160 long. Palps: Femurs bearing one barbed seta 40 long; genu 48 long devoid of a crest and bearing 2 barbed setae, a dorsal 46 long and a ventral thinner 30 long; tibia with apical curved spine and three setae, of which two barbed (a dorsal and a ventral) and one bare (dorsal); tarsus 16 long, with six setae (five

Table 1. Standard data of *Leptus waldockae* sp. nov.

	Holotype	Paratype n°1	Paratype n°2	Paratype n°3
L	60	63	63	57
W	84	84	76	81
AL	35	40	35	39
PL	30	34	28	34
A Sens	25	33	34	
P Sens	57	58	56	56
AW	72	75	70	72
PW	81	81	75	78
SBa	12	11	11	12
SBp	12	11	11	12
ISD	42	40	37	33
A-P	9	9	8	8
ASBM	10	11	9	10

bare and one barbed) and two unequal solenidia (an apical and a subbasal, 12 and five long respectively). Legs I to III 480, 408 and 495 long; tarsus, tibia and genu of leg I 105, 110 and 78 long. Number of barbed setae on legs I-III: trochanters 1-1-1, basifemora 2-2-1, telofemora 5-5-5, genua 8-8-8, tibiae 14-14-14. Solenidia $\omega 1$ 22; $\omega 2$ 16; $\phi 1a$ 16; $\phi 1b$ 28; $\sigma 1$ 21.

This new species is named for Miss J. Waldock, who collected the mite.

***Leptus* sp.**

Three specimens of larvae of *Leptus* sp. were strongly macerated and not identifiable. They were collected on the following hosts:

Leptus sp. (WAM 69/1616) from *Urodacus armatus* (δ) (Scorpionidae) (N.T. Museum), collected in Alice Springs, 8 January 1958 (23°42'S, 133°52'E)

Leptus sp. (WAM 69/1614) from *U. yaschenkoi* (ϕ), Lake Victoria, N.S.W. (34°04'S, 141°11'E), 23 June 1969. (Coll. Sir Robert Blackwood).

Leptus sp. (WAM 69/1617), from *U. hoplurus* (ϕ), Marloo Stn., (28°19'S, 116°11'E). 2 February 1969 (Coll. L.E. Koch and A.M. Douglas).

Family Trombidiidae

Subfamily Trombidiinae

Genus *Dinothrombium* Oudemans, 1910

Dinothrombium Oudemans, 1910: 48; Newell, 1979: 425

Isothrombium André, 1949: 354

Angelothrombium Newell & Tevis, 1960: 293; Newell, 1979: 425; Southcott, 1986: 31

The type species of *Dinothrombium* is *Acarus tinctorius* L., 1767.

Thor and Willmann (1947) listed 22 species in the genus *Dinothrombium*, all known only from the adult stage. These species were found in all the parts of the world except Australia. Hirst (1928), however, had described several new species in this genus from Australia but Womersley (1934) showed that they actually belonged to other genera. Newell and Tevis (1960) described a new genus and species, *Angelothrombium pandorae*, from both adult and larval stages, and collected in the U.S.A. Later, Newell (1979), synonymized this genus and species with *Dinothrombium tinctorium*.

The genus *Isothrombium* André (1949) (type species: *I. oparbellae* André, 1949, from a solpugid, *Oparbella fagei* Vachon, in Western Africa) has been synonymized with *Dinothrombium* by Southcott (1986).

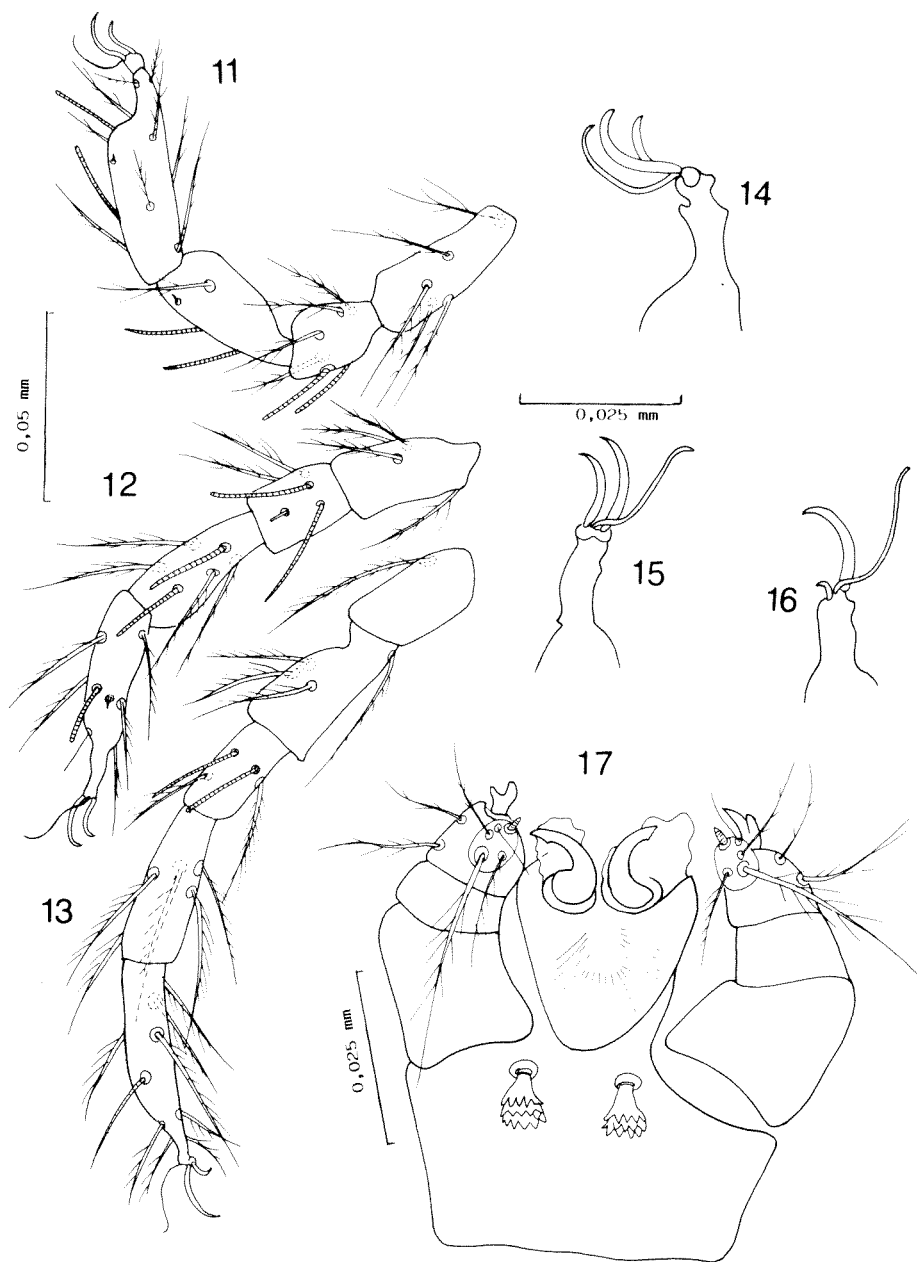
The genus *Dinothrombium* was, until now not known from Australia. I describe, herein, the first Australian species.

***Dinothrombium southcotti* sp. nov.**

(Figures 9-17)

Holotype

WAM 89/298, larva on slide, ex an unidentified spider (WAM 89/297), from Wolfdene, Qld. (27°47'S, 153°11'E). (Coll. A.E. de Jong, 13 August 1988).



Figures 11-17. *Dinotrombium southcotti* sp. nov. Larva: Leg I (11); leg II (12); leg III (13) ambulacrum of leg I (14), of leg II (15), of leg III (16); gnathosoma (17).

Paratypes

6 paratypes larvae WAM 89/299-304, with the same data as the holotype. Amongst these specimens, 3 paratypes are in WAM, one in the BMNH and two in the IRSNB.

Diagnosis

The larva of *D. southcotti* differs from the two other species known in the genus by the following characters (see below). It is to be noted that the descriptions of *D. oparbellae* and *D. tinctorium* (larva of *Angelo-thrombium pandorae*) do not mention the basic measurements of the dorsal shields. The following key, therefore is based mainly on the figures given by the authors.

Key to the larvae of *Dinothrombium*

1. Posterior region of idiosoma with 4 barbed setae much longer than the other hysterosomal setae *D. oparbellae* (André, 1949)
Posterior region of idiosoma without long terminal setae 2
2. Intercoxal setae II 1,5 times as long as coxal setae I-III. Most setae of palptarsus and palptibia are bare. Opisthogaster with 4 pairs of setae. Anterior scutum wider than long. Setae QL longer than PL. Setae QL more spaced. Cheliceral blade not toothed *D. tinctorium* (L.1767)
Intercoxal setae II shorter than coxal setae. Most setae of palptarsus and palptibia are barbed. Opisthogaster with 5 pairs of setae. Anterior scutum longer than wide. Setae QL shorter than PL. Setae QL less spaced. Cheliceral blade toothed *D. southcotti* sp. n.

Description

Most of the larvae are unengorged. Holotype 300 long (including the gnathosoma) and 180 wide. In three paratypes length and width are 294 x 170; 291 x 190; 283 x 149. *Dorsum*: Outside of scuta dorsum bears nine pairs of setae, 45-50 long, all barbed. First pair situated on a small oval shield, the other setae are situated on smaller rounded platelets. *Venter*: Coxae I-III with 2-2-1 barbed setae 55 to 60 long. Opisthogaster with five pairs of barbed setae 45 to 60 long. Legs I-III are 245-240-260 long (claws and coxae included). Tarsi with three claws, the posterior claw of tarsi III very short. Chaetotaxy of legs (number of barbed setae): trochanters 1-1-1, femora 5-4-4, genua 4-3-3, tibiae 5-5-5, tarsi 19-14-14. Number of solenidia: tarsi 2-1-1, tibiae 2-2-0, genua 2-2-2. A short eupathidia is present on tarsi I and II, tibia I and genu II. *Gnathosoma*: Palpal tibia with apical bifid spine and three setae (two barbed and one bare). Palptarsus very short with one apical solenidion, one thin and short bare seta and three barbed setae of which one very long. Base of gnathosoma with pair of strong and short setae ending into numerous small teeth. Cheliceral blade with small preapical tooth.

This species is named for Dr R.V. Southcott in recognition for his comprehensive work on trombidid mites.

Genus *Cliotrombium* Southcott, 1986
***Cliotrombium antares* Southcott, 1986**
 (Figures 18-19)

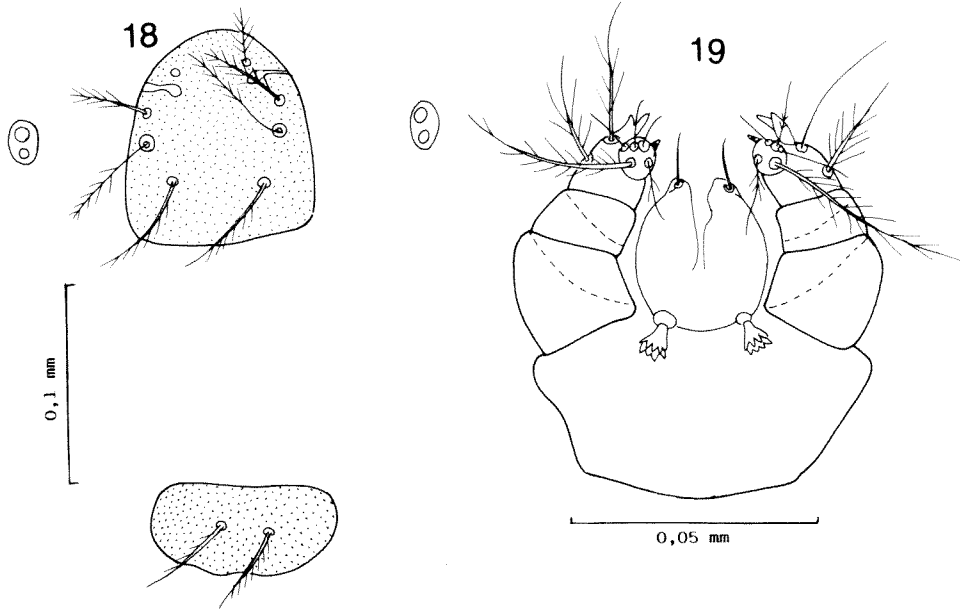
This species was described from a single larva attached to a small spider, from South Australia.

The present specimen, also a larva (WAM 89/318), was attached to a small unidentified spider (WAM 89/317) found under a rock at Mt Cooke, WA (32°, 25'S, 116°18'E) (Coll. B. Hendrick, 6 May 1989).

Table 2: Measurements (in micrometers) of the larvae of *Dinothrombium southcotti* sp. nov. and *Cliotrombium antares* Southcott, 1986

	<i>Dinothrombium southcotti</i>				<i>Cliotrombium antares</i>	
	Holotype	Para 1	Parat. 2	Parat. 3	Specimen WAM 89:318	Original description
<i>Anterior scutum</i>						
L	96	99	100	98	106	110
A	90	93	90	—	93	104
AM	30	28	30	30	41	34
AL	37	34	39	39	45	54
PL	66	75	68	65	57	78
Sens	60	60	56	54	60	73
AMB	26	29	25	25	36	40
AW	75	77	75	—	67	83
PW	34	39	38	36	49	55
SB	69	75	74	69	66	74
MA	33	33	30	29	25	29
AP	30	26	27	26	36	39
SA	19	19	18	21	57	
SP	15	16	18	16	21	
LN	13	15	15	15	23	17
PSB	45	45	42	42	51	54
<i>Posterior scutum</i>						
PSL	42	39	39	39	45	46
PSW	84	87	84	81	90	80
QL	52	54	52	54	48	66
QW	27	29	30	27	24	25
PLN	15	15	15	13	18	17

The specimen corresponds with the description and the figures of *C. antares* given by Southcott except for some minor differences such as a smaller length of PL and AW (57 and 67 long instead of 78 and 83 in *C. antares* (see table 2).



Figures 18-19. *Clinotrombium antares* Southcott. Larva: Dorsal shields (18); gnathosoma (19). (Specimen from Western Australia).

Family Laelapidae

Genus *Ljunghia* Oudemans, 1932

Ljunghia hoggi Domrow, 1975

This species has been described from a mygalomorph spider, *Aganippe subtristis* Pickard-Cambridge (Idiopidae); from Seacliff, Adelaide, South Australia.

The present specimens (eight females and two nymphs, WAM 89/320-9) were collected from a spider (*Eucyrtops* sp.) (WAM 89/319), at 5 km NW of Stoneville, WA (Coll. D. Mead-Hunter and G. Harold, 6 May 1989). They agree with the description of Domrow except that the dorsal shield bears 24 pairs of setae (podonotal 17, opisthonotal 7) instead of 25 pairs in the typical series.

Ljunghia pulleinei Womersley, 1956, emend. nov.

Ljunghia pulleinei Womersley, 1956

Womersley (1956) and Domrow (1975) (see below) incorrectly spelled this name *pulleini*. The person concerned was the arachnologist Robert Henry Pulleine. We correct therefore the species name in *pulleinei* (Art. 32c of the International Code of Zoological Nomenclature, 1985).

This species has been described from a spider *Selenocosmia stirlingi* Hogg (Theraphosidae) from South Australia. Domrow (1975) redescribed this species and recorded the discovery of new specimens from another spider, *Aname* sp. (Nemesiidae). This author noted that the specimens from *Aname* differed from the typical series by the lack of the subterminal pair of setae on the scutum and the smaller length of the body setae.

The present specimens were collected from a spider *Aname diversicolor* (Hogg, 1902) in WA. They present the same characters as the specimens from *Aname* studied by Domrow. It seems therefore that the differences with the typical series are stable and I think that it justifies their separation in a new subspecies that I describe below.

***Ljunghia pulleinei aname* subsp. nov.**

(Figure 20)

Holotype

WAM 89 187, female on slide, ex a spider *Aname diversicolor* (♂) (WAM 89/223), from Woorolo, WA (31°48'S, 116°19'E), collected by A.R. Gilliespie, 6 February, 1978.

Paratypes

15 females and three males (WAM 89 188-204), with same data as holotype; four females, five males and eight nymphs (WAM 89 226-42) from the same host (♂) (WAM 89 225) from Cooralya Stn, WA (24°27'S, 114°04'E). Coll. G. Maslim, 12 April 1989.

Holotype and 13 females, six males and six nymphs in WAM, two females in the BMNH and four females, two males and two nymphs in the IRSNB.

Diagnosis

In this new subspecies there are only 16 pairs of setae on the dorsal shield and the setae *j6* are much shorter, moreover the setae *j3*, *j4* and *Z5* and some setae outside of the shield are distinctly longer than in *L. pulleinei* s. str.

Description

Female (holotype: Idiosoma 675 long and 440 wide. Dorsal shield 495 long and 270 wide bearing 16 pairs of setae (14+2). Lengths of setae: *j1* 42; *j2* 54; *j3* 185; *j4* 180; *j5* 35; *j6* 54; *z1* 38; *z2* 180; *z3* 190; *z5* 42; *s1* 50; *s3* 70; *s4* 200; *s5* 200; *J4* 9; *Z5* 100. Setae on the soft cuticle outside the shield 120 to 220 long. Other characters as in typical form.

Male: Idiosoma 510 long and 330 wide. Dorsal shield as in female. Ventral surface as in typical form.

Family Histiostomatidae

Genus *Histiostoma* Kramer, 1876

***Histiostoma feroniarum* (Dufour, 1839)**

The only specimen (a deutonymph or hypopus) of the collection (WAM 89/146-72) was mixed with deutonymphs of *Caloglyphus* sp. collected from three centipedes *Cormocephalus aurantiipes* (Newport, 1844) (WAM 80/1934-5 and 82/61) from Mt Cooke, WA (Coll. E.G. Cockett, 23 March 1968) (32°25'S, 116°18'E) (see below).

This species has a cosmopolitan distribution and it has already been recorded from Australia from various habitats. The deutonymph was found on a millipede (Womersley, 1941).

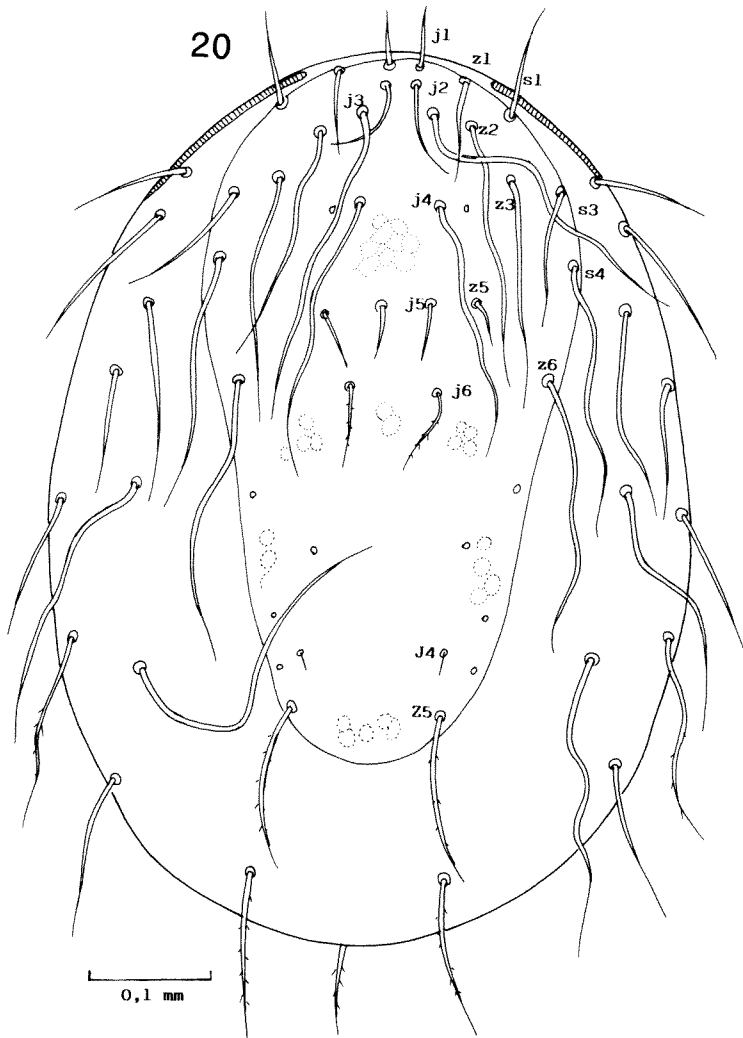


Figure 20. *Ljunghia pulleinei aname* subsp. nov. Female in dorsal view.

Family Acaridae
Genus *Caloglyphus* Berlese, 1923
***Caloglyphus* sp.**

This species is represented only by deutonymphs (hypopi). The specific identification of the deutonymphs of this genus is very difficult and I prefer not to name the specimens of this collection in the absence of the adults. Womersley (1941) collected numerous adults of *Caloglyphus berlesei* (Michael, 1903) in Australia. Perhaps our deutonymphs belong to this species.

The present specimens were attached to the following hosts:

25 deutonymphs (WAM 89/146-71) from three centipedes *Cormocephalus aurantiipes* (WAM 80/1934-5 and 82-61) from Mt Cooke, WA (see above).

Two deutonymphs (WAM 89/175-76) from *Cormocephalus hartmeyeri* Kraepelin, 1908 (WAM 80/891) from Nannup, WA (33°59'S, 115°46'E) (Coll. M. Colreavy, 4 June 1978).

Nine deutonymphs (WAM 89/206-14) from *Aname diversicolor* (Hogg, 1902) (WAM 89/224) from Bates Junction, near Albany, WA (35°01'S, 117°53'E) (Mr Proctor don. 14 November 1988).

Acknowledgements

I thank Mr D. MacFarlane, British Museum (Nat. Hist.) who provided literature necessary for this study.

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