

## OBSERVATIONS ON LARVAL MITES (ACARI) PARASITIC ON OPILIONES FROM THE FRENCH PYRENEES

A. Fain<sup>1</sup> and F. D' Amico<sup>2</sup>

1. Institut royal des Sciences naturelles de Belgique, rue Vautier 29, B-1000 Bruxelles, Belgique. 2. Université de Pau et des Pays de l'Adour, Laboratoire d'Ecologie Moléculaire, UFR Sciences et Techniques, IBEAS, Avenue de l'Université, F-64000 Pau, France.

**ABSTRACT** - Larval mites (Acari) parasitic on Opiliones from the French Pyrenees were studied. Three species of the genus *Leptus* (Erythraeidae) were collected two of which were already described: *Leptus ignotus* (Oudemans) collected from *Phalangium opilio* and *Leptus beroni* Fain (syn. *Leptus holmiae* Southcott) from *Mitopus morio*, *Megabunus diadema* and *Oligolophus hansenii*. The third species, *Leptus gyas* sp.n., was collected from *Gyas titanus*. In addition, a second new species, *Tetrathrombium gabasense* sp.n. (Johnstonianidae), was collected from moss, covering a beech which also harboured *Megabunus diadema*, infested with *Leptus beroni*. These new species are described.

Key words - Mites, Acari, *Leptus gyas* sp.n., *Tetrathrombium gabasense* sp.n., Parasitic, Opiliones, French Pyrenees.

**RÉSUMÉ** - Les larves d'acariens (Acari) parasites d'Opilions récoltées dans les Pyrénées françaises sont étudiées. Trois espèces de *Leptus* (Erythraeidae) dont une nouvelle, furent récoltées: *Leptus ignotus* (Oudemans) ex *Phalangium opilio* et *Leptus beroni* Fain (syn. *Leptus holmiae* Southcott) ex *Mitopus morio*, *Megabunus diadema* et *Oligolophus hansenii*. La troisième espèce, *Leptus gyas* sp.n., prélevée sur *Gyas titanus*. Une deuxième espèce nouvelle, *Tetrathrombium gabasense* sp.n. (Johnstonianidae) fut récoltée dans la mousse prélevée sur un hêtre et renfermant également des *Megabunus diadema* infectés de *Leptus beroni*. Ces nouvelles espèces sont décrites.

Mots clé - Acariens (Acari), *Leptus gyas* sp.n., *Tetrathrombium gabasense* sp.n., Parasites, Opilions, Pyrénées françaises.

### INTRODUCTION

The parasitism of Opiliones by larval mites has been reported from various regions of the world. A list of these mites has been given by Cokendolpher (1993). These mites belong to the families Erythraeidae (genera *Leptus* and *Charletonia*) and Trombidiidae (genera *Trombidium* and *Allothrombium*). Among these genera, *Leptus* most common and widespread, is represented on the five continents.

### MATERIAL AND METHODS

The larvae of *Leptus* recorded here, were collected during 1995 (August) and 1996 (July and August) by the

junior author from five species of Opiliones, originating from several research stations in the Vallée d' Ossau, Pyrénées Atlantique, i.e. Gabas, Moundelhs, Bouhaben (Gère) and Montagne verte (Eaux-Bonnes).

At least 18 species of Opiliones, most of them poorly known, have been recorded from this Valley (D' Amico and Besson, 1995). The Opiliones examined in the present study belonged to the family Phalangiidae and represented the following species: *Phalangium opilio*, *Mitopus morio*, *Megabunus diadema*, *Oligolophus hansenii* and *Gyas titanus*. This type of parasitism was, so far, not encountered in the genus *Gyas*.

In addition to these larvae of *Leptus*, several larvae of *Tetrathrombium gabasense* sp.n. were also collected by F.D. from moss covering a beech which also harboured

*Megabunus diadema*, parasitized by *Leptus* larvac. These larvae are described below.

All measurements are in micrometers ( $\mu\text{m}$ ). Metric data are as described in Southcott (1992). The holotypes of the new species have been deposited in the Institut royal des Sciences naturelles de Belgique (IRSNB).

## STUDY OF THE SPECIES

### Family ERYTHRAEIDAE Oudemans, 1902

#### Genus *Leptus* Latreille, 1796

#### *Leptus ignotus* (Oudemans, 1903)

We collected a single larva of this species from *Phalangium opilio* (immature) at Montagne verte (31 July 1996). This specimen corresponds closely with those that A.F. found in Belgium and with the redescription of the holotype of that species by Southcott (1992). *Leptus ignotus* has been reported from various regions of Europe.

Oudemans (1904, 1912) published figures of the above mentioned species. The original drawings were later modified by Oudemans (by addition of sternal setae I and of leg I) and published by Fain (1991).

#### *Leptus beroni* Fain, 1991

*Leptus ignotus* Beron, 1975: 57, non Oudemans, 1904

*Leptus beroni* Fain, 1991: 108

*Leptus holmiae* Southcott, 1992: 60, **syn.nov.**

Beron (1975) redescribed and illustrated under the name *Leptus ignotus* Oudemans, a series of larvae that he had collected in Bulgaria and in the French Pyrenees from Opiliones, mainly *Mitopus morio*. However, these larvae, differed markedly from Oudemans' species mainly by the much greater length of some setae (sternal I and II, coxal I and III, setae AL) and by the legs.

Larvae presenting the same characters as those of Beron were found by Fain in Belgium on *Mitopus morio* and described under the name *Leptus beroni* Fain, 1991. Southcott (1992) unaware of that publication, named the *ignotus* specimens of Beron, a new species (*L. holmiae*).

*L. beroni* is widespread in Europe. It has been recorded from Netherlands, Bulgaria, Poland, Sweden, United Kingdom, France, Iceland (Southcott, 1992) and Belgium (Fain, 1991). The most common host is *Mitopus morio* but this species is also known from other Opiliones.

*L. beroni* is reported here from the French Pyrenees, from the following hosts and localities: *Mitopus morio* from Moundelhs (64) (2 larvae) and Bouhaben (Gère) (64) (2 larvae); *Megabunus diadema*, from Gabas (64) (4 larvae); *Oligolophus hansenii* from Gabas (64) (2 larvae).

The *Leptus* larvae reported by Beron (1975) from the Pyrenees probably also represented *L. beroni*. This author noted that the specimens from this region had very

long sternal setae, like those of *L. beroni*.

In Table 1 we give the metric data of the holotypes of *L. beroni*, *L. holmiae* and of 11 specimens of *L. beroni* collected from the French Pyrenees.

#### *Leptus gyas* spec. nov.

(Figs. 1-7)

This species is known only from the holotype larva. The metric data are listed in Table 2.

**Description** (Figs. 1-7) - Dorsal scutum broad, pentagonal and with anterior margin distinctly concave. Dorsal surface with 108 setae on the soft cuticle. Ventral surface, posteriad of coxae III, with 49 setae. One pair of setae at the level of coxae III and one pair anterior of coxae III. Setae CxI distinctly longer than StI and StII. Palp genu and palpfemur each with one seta. Length of chelicerae 219, maximum width (combined) 219. Length of leg solenidia:  $\omega I$  28;  $\omega II$  23;  $\phi I$  apical 27;  $\phi I$  basal 35;  $\phi II$  apical 16;  $\phi II$  basal 24;  $\phi III$  25;  $\sigma I$  24.

**Host and locality:** Holotype from *Gyas titanus*, Gabas (64) (31.VII.1996). Deposited in the IRSNB.

**Remarks:** *L. gyas* closely resembles *Leptus clarki* Southcott (1989), described from an ant species, *Pogonomyrmex salinus*, from Idaho, U.S.A. It differs from *L. clarkii* by the following characters (see also Table 2) :

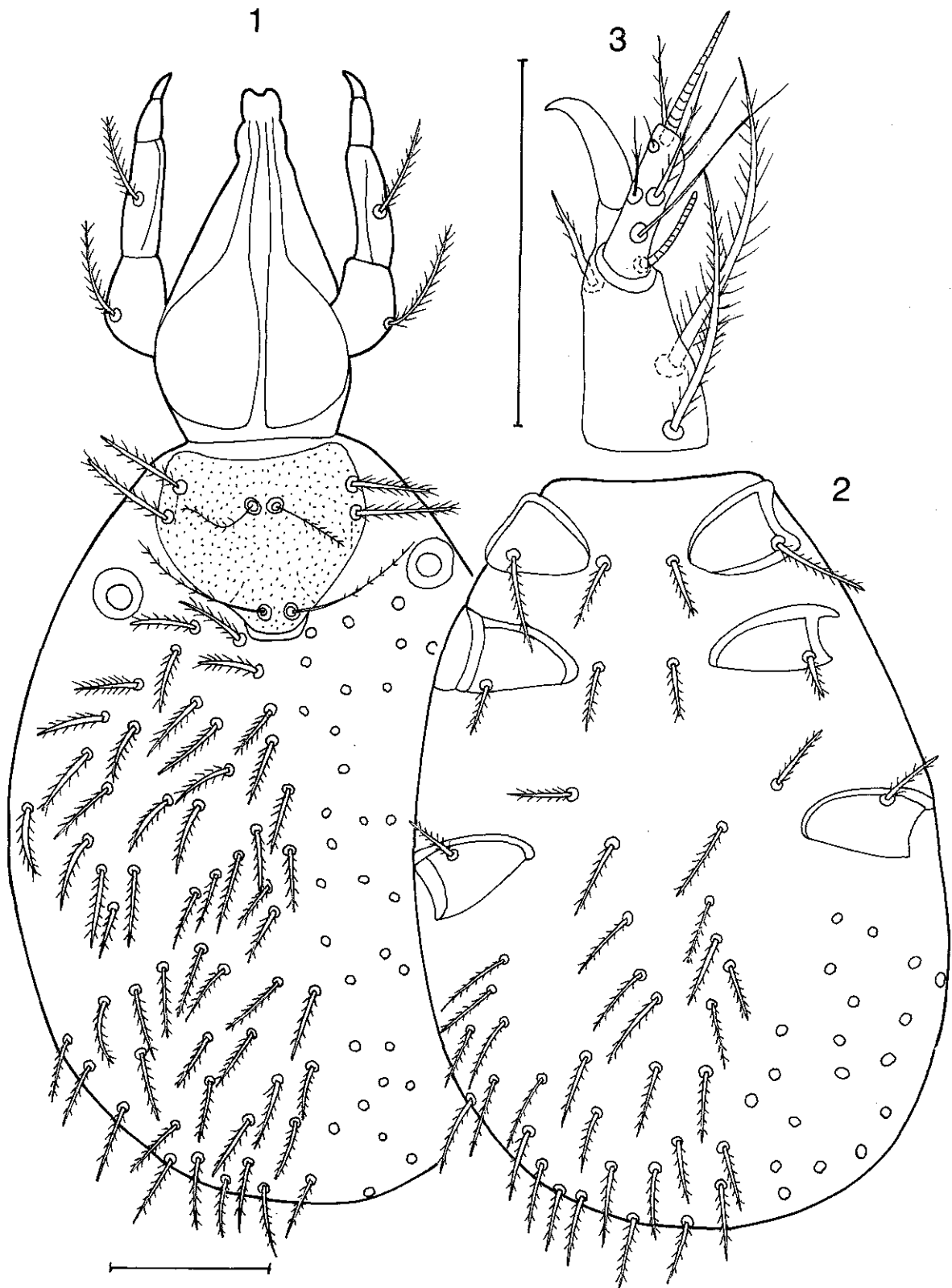
1. Presence of only one pair of setae between coxae II and III as opposed to two pairs in *L. clarki*.
2. Dorsal shield relatively longer, L/W = 0.85 versus 0.73 in *L. clarki*.
3. Setae DS and Oc longer; StI, StII and CxI distinctly shorter.
4. Legs much shorter, especially segments TiI, TiIII and GeIII.
5. Ventral setae (behind coxae III) more numerous (49 versus 32).
6. Sensillae with short barbules on their distal two thirds (only on their distal half in *L. clarki*).
7. Solenidia  $\omega I$ ;  $\phi II$  basal and  $\sigma I$  shorter than those of *L. clarki* (44, 36 and 33 respectively in *L. clarki*).

### Family JOHNSTONIANIDAE Thor, 1935 Subfamily Tetrathrombiinae Southcott, 1987

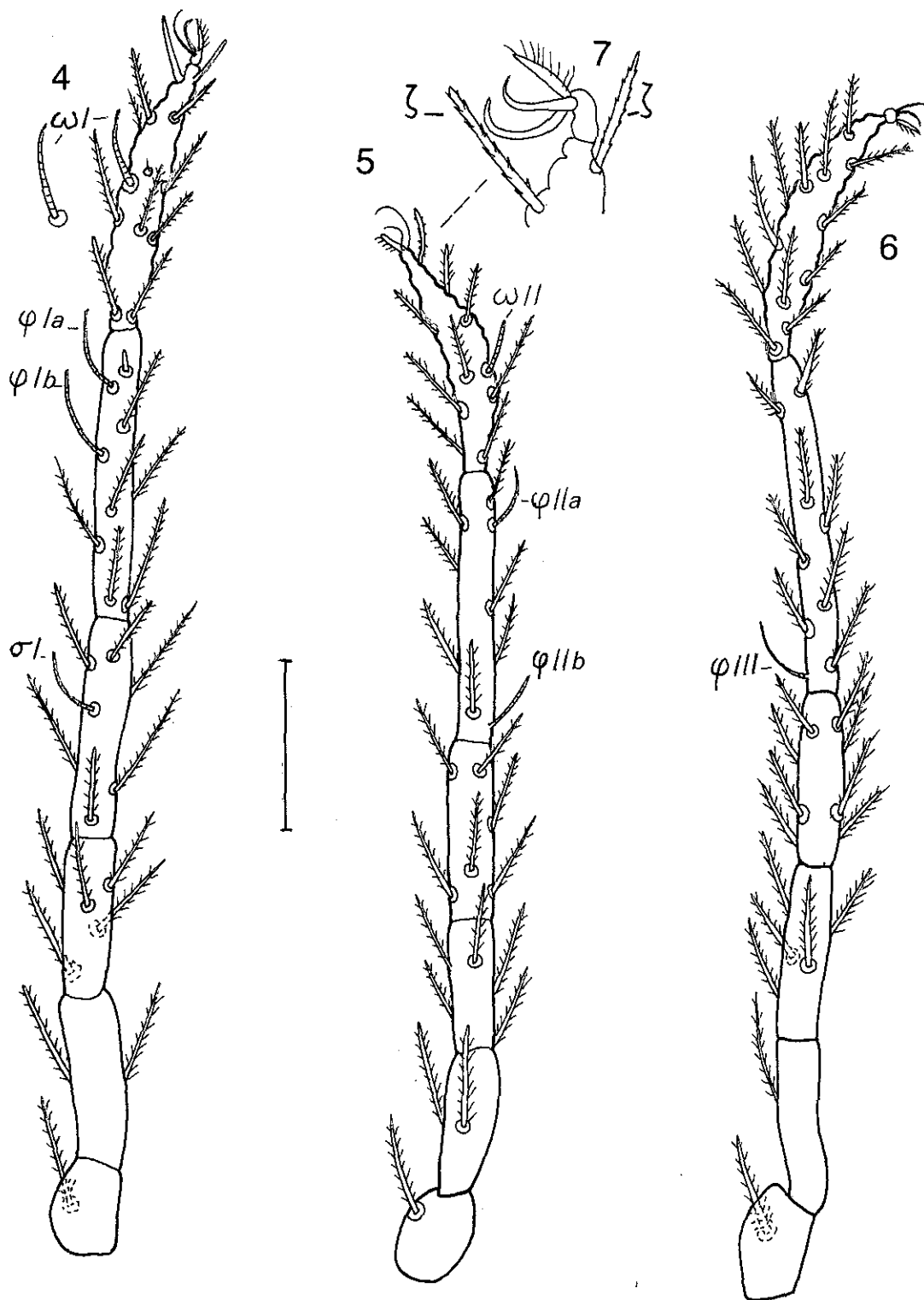
#### Genus *Tetrathrombium* Feider, 1955

At present this genus comprises two species, viz. *T. zachvatkini* Feider, 1955 (type species) from a plecopteran and *T. macronychus* Feider and Suciú, 1956, from a tipulid (Diptera). Both species were recorded from eastern Europe and are known only from their larval stages.

We add here a new species, *T. gabasense*, collected from moss covering a beech in the French Pyrenees.



Figs. 1-3. *Leptus gyas* spec.nov. Larva - 1. dorsal surface, 2. ventral surface, 3. palpal tibia and palpal tarsus, ventral view. Scale lines 100  $\mu$ m (Figs. 1 and 2), 50  $\mu$ m (Fig. 3).



Figs. 4-7. *Leptus gyas* spec.nov. Larva - 4. leg I, dorso-lateral view, 5. leg II, dorso-lateral view, 6. leg III, dorso-lateral view, 7. claws and eupathidia *dzeta* on leg I. Scale lines 100  $\mu$ m (Figs. 4-6).

Table 1. Metric data for *Leptus beroni* larvae

Characters	<i>Leptus beroni</i> Holotype	<i>Leptus holmiae</i> Holotype	11 larvae from French Pyrenees		Characters	<i>Leptus beroni</i> Holotype	<i>Leptus holmiae</i> Holotype	11 larvae from French Pyrenees	
			Range	Mean				Range	Mean
AW	84	88	75-87	79.6	"Oc"	45	49	39-48	43.4
PW	105	98	90-106	98.7	MDS	36-43	34-40	-	-
SBa	15	18	14-18	15.8	PDS	35-42	36-41	-	-
SBp	18	15	15-20	18	TaI	150	164	130-150	140
ASBa	30	23	25-30	27.7	TaII	136	145	120-134	123
ASBM (sensu Fain)	21	22	18-24	20.2	TaIII	148	155	120-150	135.7
ISD	68	68	60-75	67	TiI	210	198	170-190	185
L	108	113	99-120	105	TiII	170	168	150-165	160.1
W	110	107	95-114	104	TiIII	226	220	195-220	207.7
L/W	0.98	1.05	-	-	GeI	147	152	120-146	136
AAS	33	34	-	-	GeII	122	128	118-120	118
A-P	19	20	15-19	16.8	GeIII	135	140	117-130	126
AL	81	69	63-76	69	StI	105	91 (par.)	65-87	78.9
PL	72	69	57-66	61	StII	78	53 (par.)	48-65	60.7
ASE	63	50	45-57	51.8	CxI	105	95	75-99	85
PSE	87	c.60	75-90	81.1	CxII	39	38	33-48	36.8
DS	39-50	34-49	28-56	31.9-49.5	CxIII	80	53 (par.)	48-67	61.7

Table 2. Metric data for *Leptus gyas* sp. n. and *Leptus clarki* Southcott (1989), larvae.

Characters	<i>Leptus gyas</i> sp.n. Holotype	<i>Leptus clarki</i> Southcott Holotype	Characters	<i>Leptus gyas</i> sp.n. Holotype	<i>Leptus clarki</i> Southcott Holotype
AW	108	96	"Oc"	43	36
PW	117	112	MDS	45	36
SBa	12	13	PDS	46	44
SBp	15	18	TaI	145	155
ASBa	33	29	TaII	115	127
ASBM (sensu Fain)	27	-	TaIII	126	156
ISD	63	57	TiI	155	195
L	108	91	TiII	139	168
W	126	125	TiIII	174	246
L/W	0.85	0.73	GeI	109	145
AAS	46	42	GeII	99	129
A-P	18	16	GeIII	102	138
AL	55	65	StI	36	53
PL	66	60	StII	36	49
ASE	42	70	CxI	65	73
PSE	75	82	CxII	24	29
DS	30-57	33-44	CxIII	42	38

***Tetrathrombium gabasense* spec. nov.**  
(Figs. 8-15)

This species is represented by 4 larvae. Metric data of this species and those of the two known species are given in Table 3. Some data given for the latter was calculated from the original figures and scales of the authors and are followed by the letter c.

*Description* (Figs. 8-15) - *Dorsum*: Cuticle with indistinct striations confined to some areas. Shield poorly sclerotized, roughly rectangular, with anterior and posterior margins almost straight, lateral margins convex in their posterior half. Sensillae very long and thin, without distinct setules. AL and PL with very short poorly distinct setules. Diameter of anterior eyes 9 to 11, posterior eyes 6 to 7, 51-55 apart. Soft cuticle posteriad of coxae III with

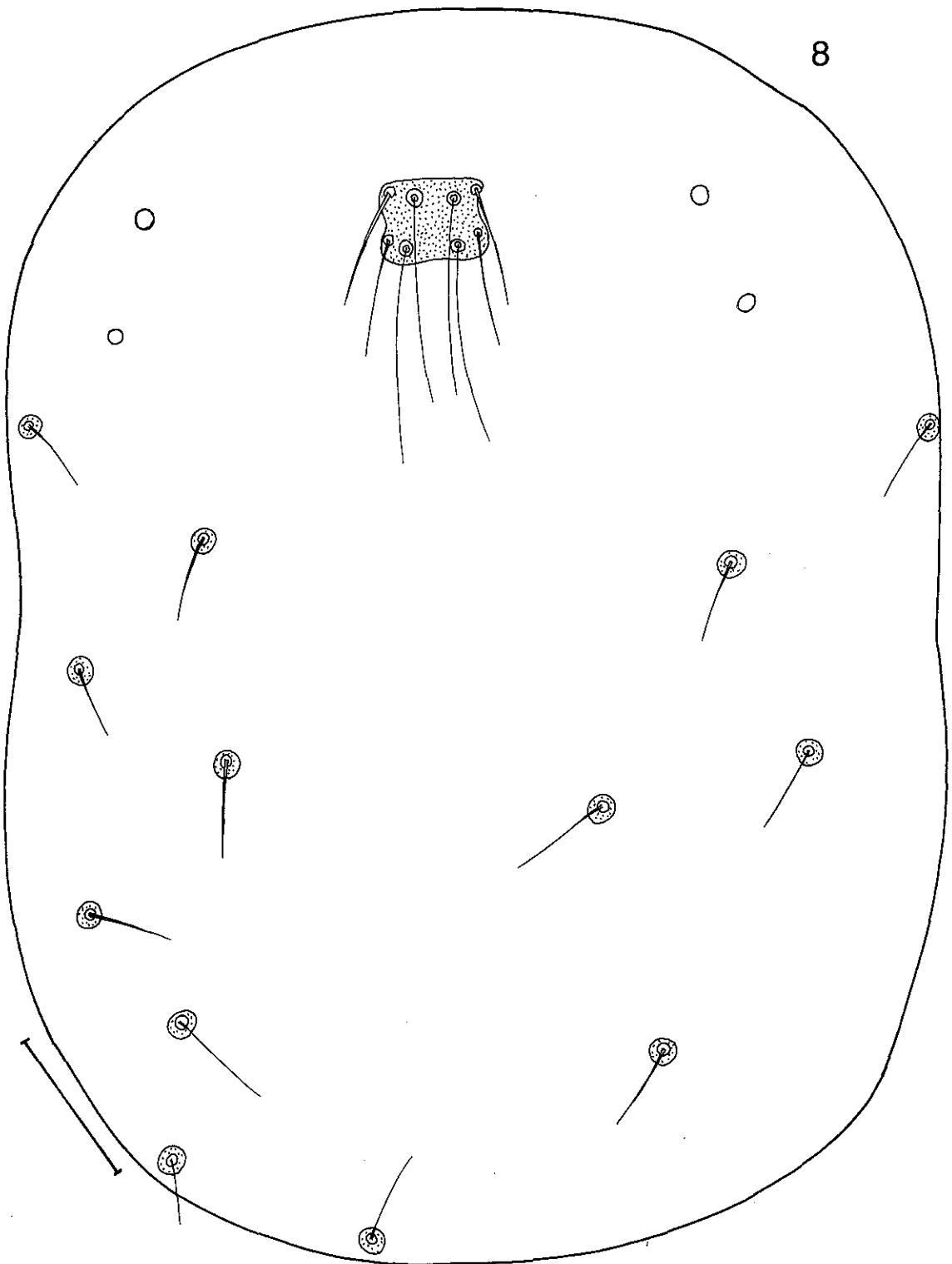


Fig. 8. *Tetrathrombium gabasense* spec.nov. Larva - 8. dorsal surface. Scale line 100  $\mu$ m.

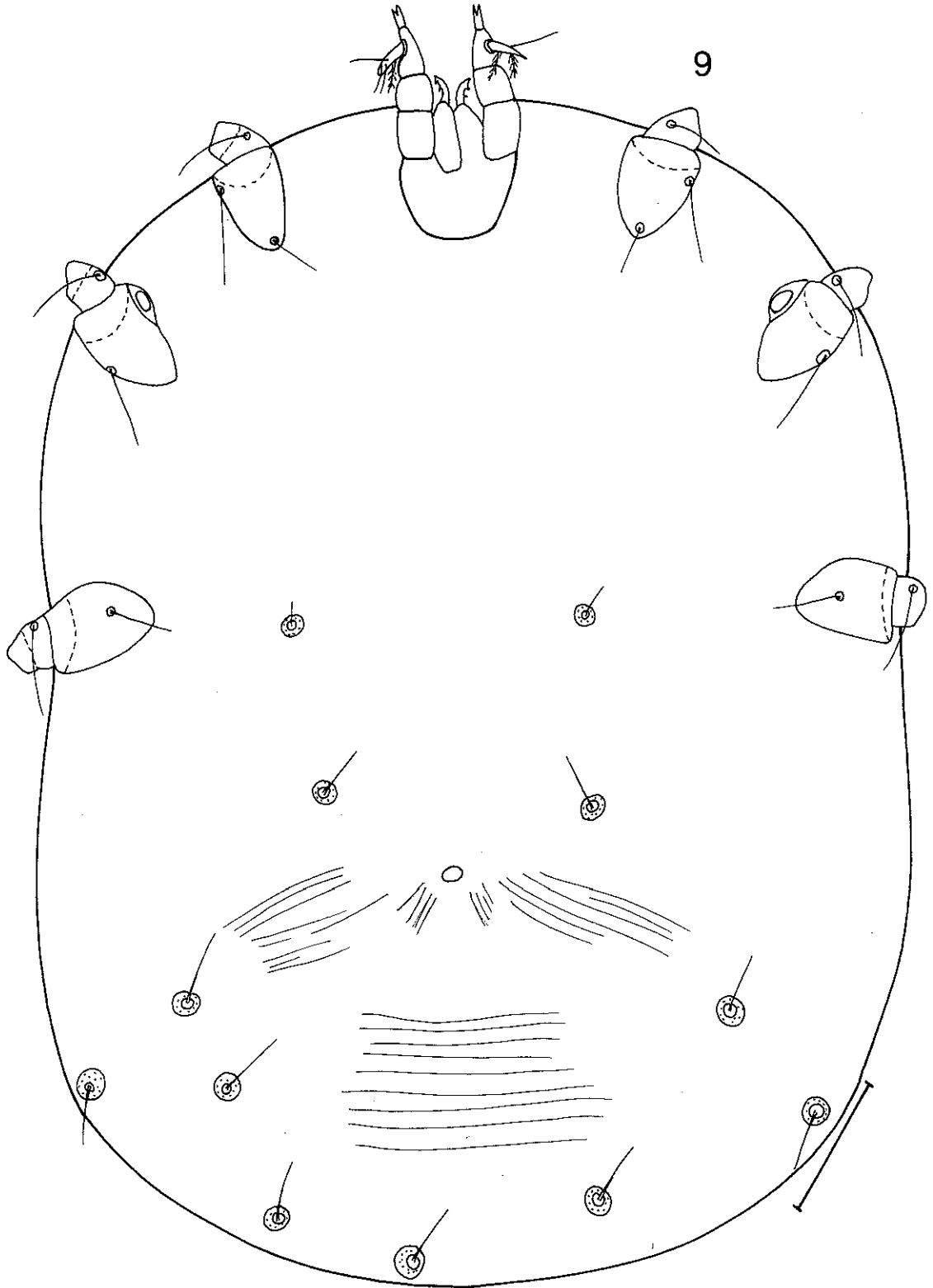
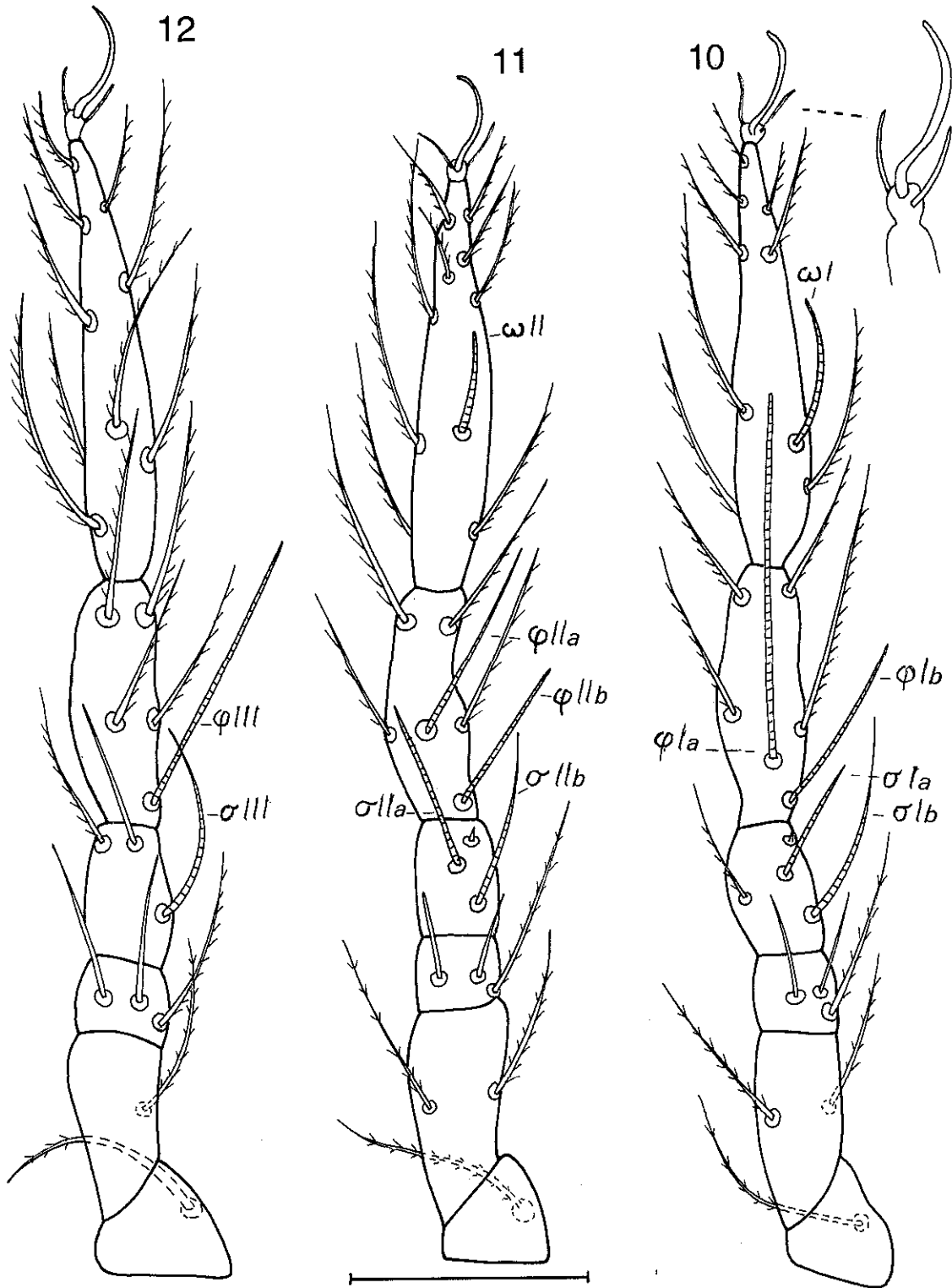
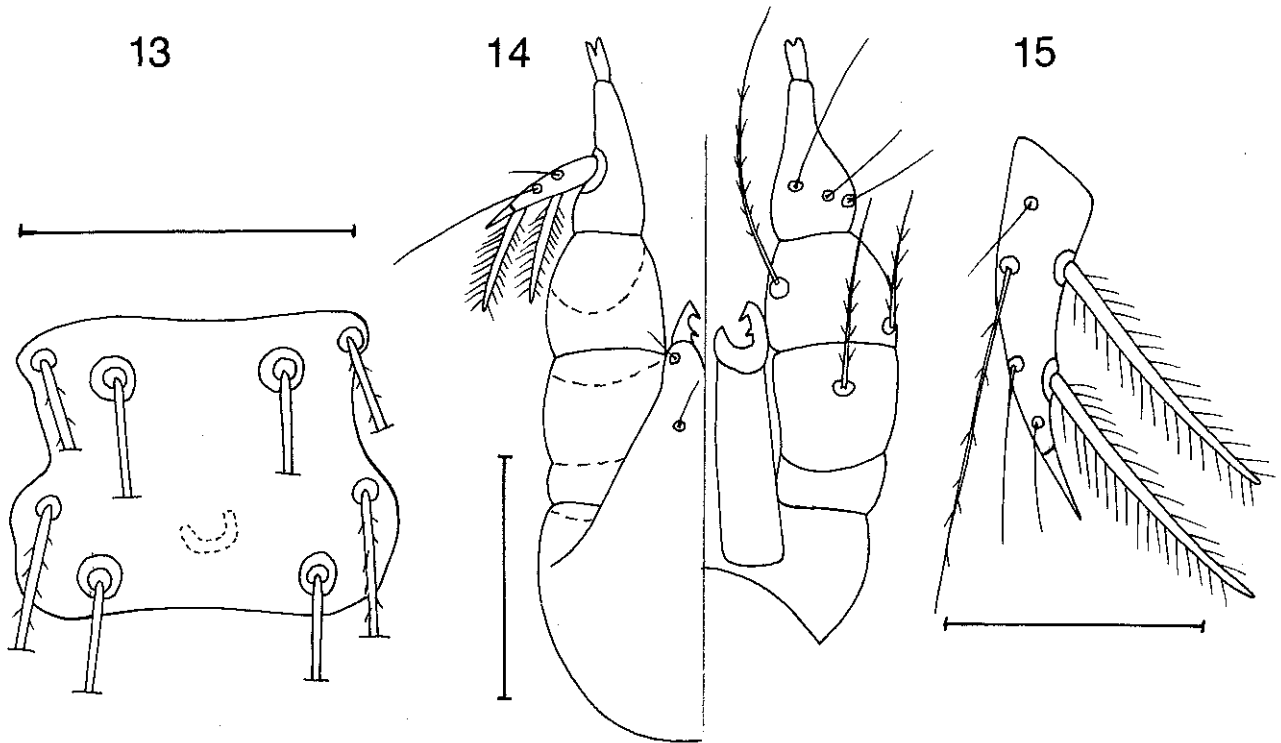


Fig. 9. *Tetrathrombium gabasense* spec.nov. Larva - 9. ventral view. Scale line 100  $\mu$ m.



Figs. 10-12. *Tetrathrombium gabasense* spec.nov. Larva - 10. leg I, dorso-lateral view, 11. leg II, dorso-lateral view, 12. leg III, dorso-lateral view. Scale line 50  $\mu$ m.





Figs. 13-15. *Tetrathrombium gabasense* spec.nov. Larva - 13. dorsal shield of holotype, 14. gnathosoma in ventral (to the left) and dorsal (to the right) view, 15. palptarsus enlarged. Scale lines 50  $\mu$ m (Figs. 13-14) , 25  $\mu$ m (Fig.15).

7 pairs of thin setae, 40 to 60 long, set on rounded punctate platelets 10 to 12 diameter.

*Venter*: Sternal setae absent. Opisthogaster with a small uropore and 5 pairs of setae, 30 to 48 long, faintly setulose. Coxal setae 2-1-1.

*Gnathosoma*: 78 long. Chelicerae 52 long (paratype), with a strong bidentate movable digit. Palps 96 long, 23 wide. Tarsus 24 long. Tarsus with a short apical smooth seta, 5 thin faintly setulose setae, 2 broad and long bipectinate setae and 1 basal solenidion. Tibia with an apical forked spine and 3 thin dorsal setae. Genu with 2 and femur with 1 short setulose and rather long dorsal setae.

*Legs*: Empodium 18-20 long, anterior and posterior claws thinner and shorter (9 to 11) than empodium. Legs widely separate; urstigma attached to coxa II; leg segments 7-7-7. Number of setae (excluding solenidia and other sensory setae): Trochanter 1-1-1; Basifemur 2-2-1; Telfemur 5-5-5; Genu 3-3-4; Tibia 10-10-10. Solenidia  $\omega$ I 36;  $\omega$ II 25;  $\phi$ Ia 70;  $\phi$ Ib 35;  $\phi$ IIa 43;  $\phi$ IIb 35;  $\phi$ III 50;  $\sigma$ Ia 23;  $\sigma$ Ib 30;  $\sigma$ IIa 35;  $\sigma$ IIb 35;  $\sigma$ III 48.

*Habitat*: Holotype larva from moss on a beech in Gabas, French Pyrenees. Three paratypes larvae with the same data as holotype.

*Remarks*: *T. gabasense* differs from *T. zachvatkini* especially by the different shape and smaller size of the

scutum, the shorter length of some of the leg segments, especially the tibiae and genua, and the smaller number of dorsal setae. It is distinguished from *T. macronychus* by the shape of the shield, wider than long, and the shape and size of the tarsal claws. In *T. macronychus* the median claw (empodium) is thick and abruptly bent, and the two other claws (anterior and posterior) are very short.

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Table 3. Metric data for *Tetrathrombium zachvatkini* Feider, *T. macronychus* Feider & Suciú and *T. gabasense* sp. n. larvae.

Characters	<i>T.zachvatkini</i>	<i>T.macronychus</i>	<i>T.gabasense</i> sp.n.			Characters	<i>T.zachvatkini</i>	<i>T.macronychus</i>	<i>T.gabasense</i> sp.n.		
			2 paratypes						3 paratypes		
			Holotype	Holotype	Holotype				Range	Mean	Holotype
AW	56c	53c	45	42-48	45	ASE	76	98-126	98	90-96	93
PW	42c	50c	43	42-45	43.5	PSE	63	78-84	93	96	96
SBa	27c	25c	24	24-27	25.5	DS	23	57-66	40-60	-	-
SBp	30c	26c	31	30-31	30.5	TaI	116	129	108	90-93	91
ISD	36c	50c	30	30-33	31.5	TaII	108	115	90	85-90	88.3
L	60c	51-68	45	43-45	44	TaIII	108	129	94	91-96	94
W	68c	50-54	55	50-52	51	TiI	67	75	51	51-53	52.6
L/W	0,88	-	0.81	0.82-0.9	0.86	TiII	76	75	48	48-51	50
AAS	14c	13c	11	10-13	11.5	TiIII	96	75	60	56-60	57.6
A-P	34c	33c	22	19-21	20	GeI	42	34	30	30-30	30
AL	36c	58-74	51	48-50	49	GeII	42	34	27	26-27	26.5
PL	44c	58-74	44	42-44	43	GeIII	46	34	30	29-30	29.6

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