

## New mites (Acari) phoretic on Phoridae and Ephydriidae (Diptera) from Thailand

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### Abstract

A new genus and 3 new species of mites (Acari) represented by their deutonymphal or larval stages phoretic on small Diptera collected in Thailand, are described, i.e. *Uroseius (Uroseius) grootaerti* sp. n. (Mesostigmata: Uropodina) represented by a single deutonymph phoretic on *Dohniphora caini* DISNEY, 1990 (Phoridae) and *Thaitrombidium* g.n. (Prostigmata: Trombidiidae: Paputrombidiinae) represented by the larvae of 2 new species, *Thaitrombidium ephydricola* sp. n. and *T. satunense* sp. n., both from *Hecamedoides granifera* THOMSON (Ephydriidae). A new tribe Thaitrombidiini tr.n. is created for the genus *Thaitrombidium*.

**Key words:** Taxonomy, Acari, New genus and 3 new species, Larvae and deutonymph, Phoretic Diptera, Thailand.

### Résumé

Un nouveau genre et 3 nouvelles espèces d'acariens (Acari), représentés par leurs deutonymphe ou larves phorétiques sur des petits diptères de Thaïlande, sont décrits. Il s'agit de *Uroseius (Uroseius) grootaerti* sp. n. (Mesostigmata: Uropodina), représenté par une deutonymphe phorétique sur *Dohniphora caini* DISNEY, 1990 (Phoridae) et *Thaitrombidium* g.n. (Prostigmata: Trombidiidae: Paputrombidiinae) représenté par 2 nouvelles espèces, *Thaitrombidium ephydricola* sp. n. et *T. satunense* sp. n., toutes deux récoltées sur *Hecamedoides granifera* THOMSON (Ephydriidae). Une nouvelle tribu Thaitrombidiini tr.n. est créée pour le genre *Thaitrombidium*.

**Mots-clefs:** Taxinomie, Acari, Nouveau genre et 3 nouvelles espèces, Larves et deutonymphe phorétiques, Diptera, Thaïlande.

### Introduction

The mites (Acari) that are described here were collected by Dr. P. Grootaert from small Diptera during a trip in Thailand in 1997. They belong to 2 different suborders of mites, i.e. *Uroseius (Uroseius) grootaerti* sp. n. (Mesostigmata: Uropodina), collected from *Dohniphora caini* DISNEY, 1990 (Phoridae) and *Thaitrombidium* g.n. (Pros-

tigmata: Trombidiidae: Paputrombidiinae) represented by 2 new species, *Thaitrombidium ephydricola* sp. n. and *T. satunense* sp. n., both collected from *Hecamedoides granifera* Thomson (Ephydriidae).

The presence of the deutonymph of a new species of *Uroseius* on a Phoridae confirms our opinion that this mite genus is biologically related to this group of flies.

*Uroseius (U.) grootaerti* is the sixth species of this genus whose deutonymphs have been found in phoretic association with Phoridae (Fain, 1998).

**Abbreviations:** I.R.S.N.B. = Institut royal des Sciences naturelles de Belgique.

All the measurements are in micrometers.

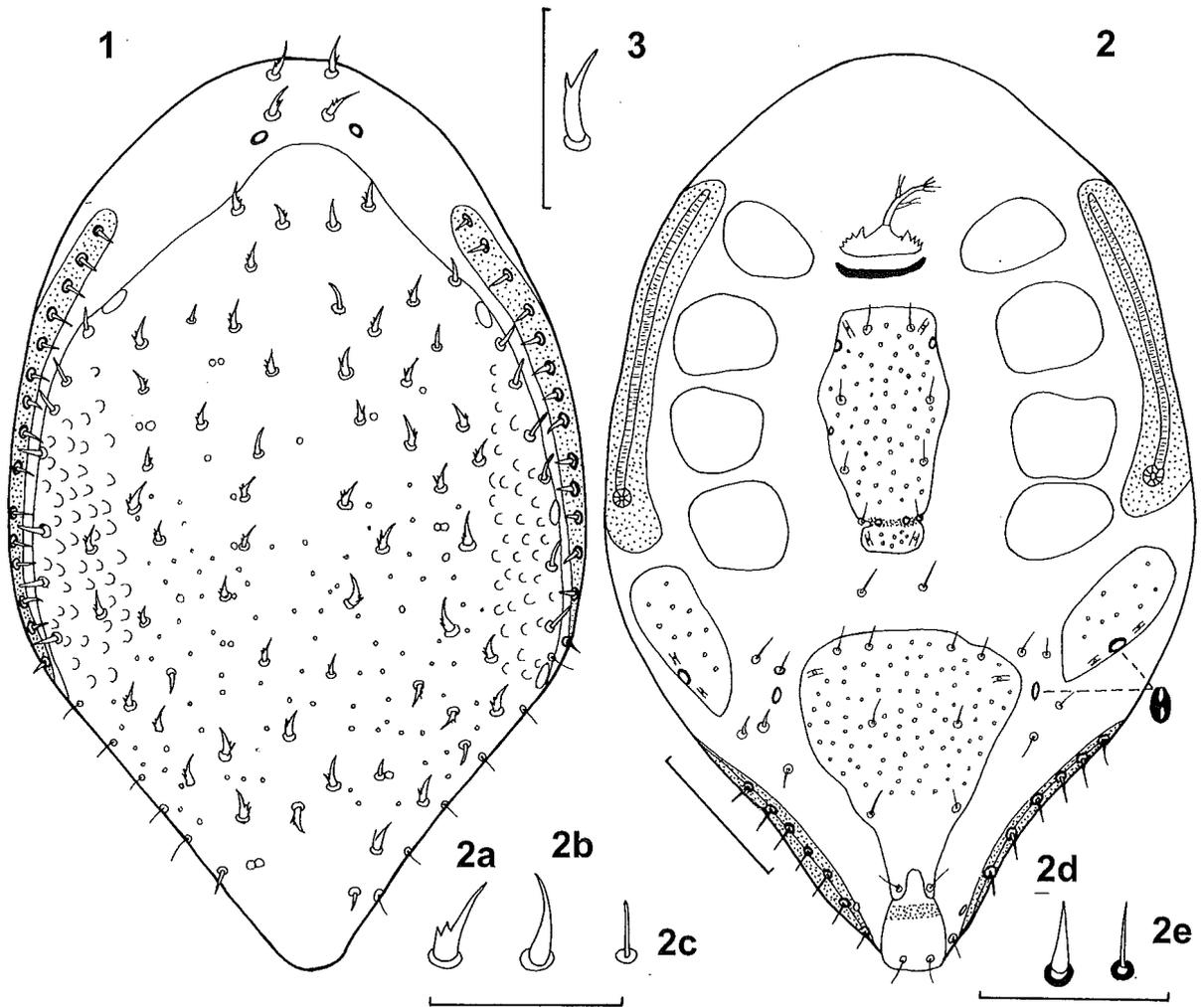
### MESOSTIGMATA: UROPODINA FAMILY POLYASPIDIDAE BERLESE, 1917

Genus *Uroseius (Uroseius)* BERLESE, 1888.

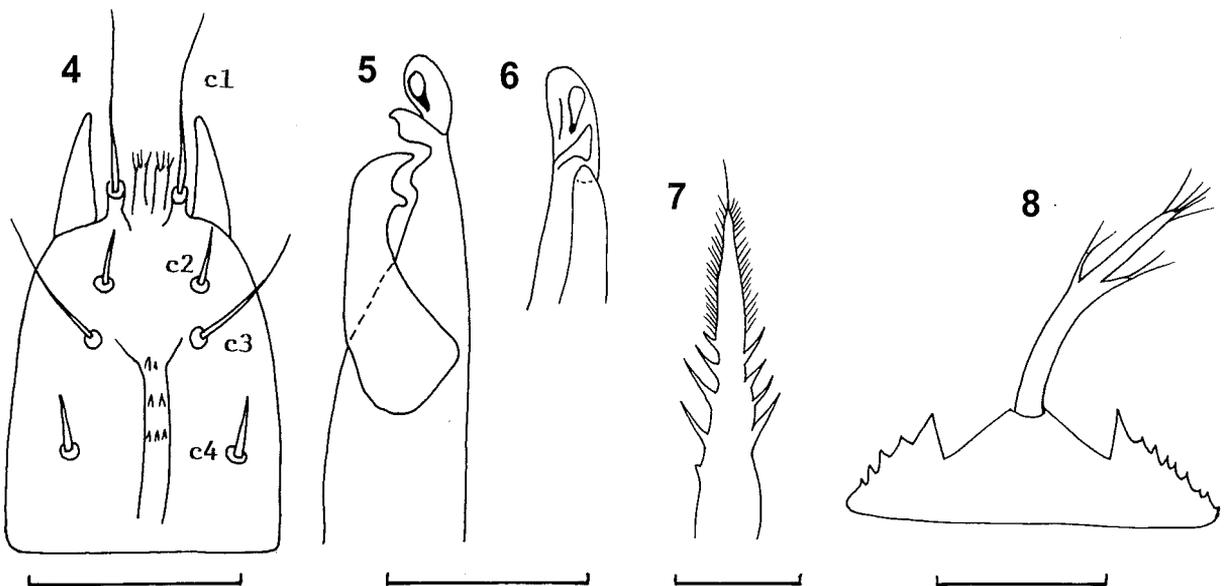
*Uroseius (Uroseius) grootaerti* spec.nov

This species is named for Dr. P. Grootaert, I.R.S.N.B., who collected the mites described in this paper.

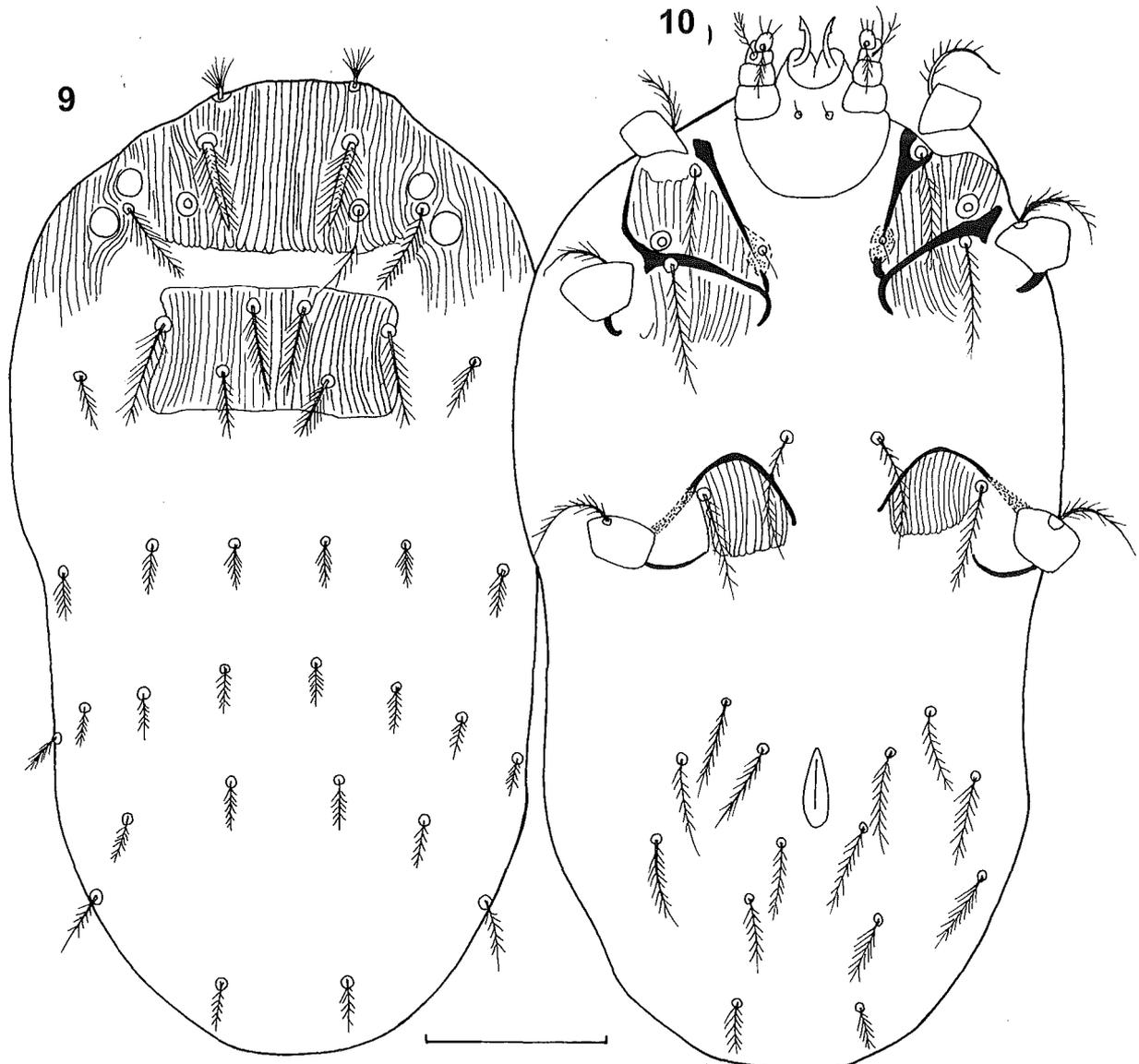
**Deutonymph**, holotype and only known specimen (figs 1-8): Body strongly narrowed in posterior third. Idiosoma 650 long and 380 wide. **Dorsum** (fig 1) with a large sclerotized and finely punctate shield. This shield is devoid of a pattern of lines or a reticulum but its median third bears in its lateral parts several longitudinal rows of pits (diameter 3 to 6). Much smaller pits (diameter 1.2 to 1.5) are also present but in few numbers in the median part of the shield. The shield bears about 50 pairs of setae 10-12 long and inflated in their basal half which generally carries one or two, more rarely 3 small teeth (figs 1 and 2a). Among these setae about 15 pairs are situated along the margins of the shield. These marginal setae are devoid of teeth (fig 1 and 2b) and in the posterior part of the shield they become acicular (fig 1 and 2c). Outside the shield there is a slightly sclerotized longitudinal band which becomes ventral in the posterior third of the body



Figs. 1-3 – *Uroseius (Uroseius) grootaerti* sp. n. (figs 1-2): Deutonymph in dorsal (1) and ventral (2) view (scale line 100  $\mu$ m). Median scutal seta (2a), marginal scutal setae on dorsum (2b) and on venter (2c). Seta of the lateral band on dorsum (2d) and on venter (2e) (scale lines 25  $\mu$ m). *Uroseius (Uroseius) disneyi* Fain, 1998 (fig 3): Deutonymph. Median scutal seta (Scale line 25 $\mu$ m).



Figs. 4-8 – *Uroseius (Uroseius) grootaerti* sp. n.: Deutonymph. Gnathosoma in ventral view (4), cheliceral digits in lateral (5) and ventral (6) view, epistome (7), and tritosternum (8). Scale lines 50  $\mu$ m (fig 4) and 25  $\mu$ m (figs 5-8)



Figs. 9-10 – *Thaitrombidium ephydricola* sp. n. Larva in dorsal (9) and ventral (10) view (scale line 50  $\mu$ m)

reaching the posterior extremity of the body. This band, about 25 wide, bears a single row of 20-22 setae with inflated bases and slightly shorter than the marginal setae, these setae are toothless and inserted in small sclerotized ringlets (figs 1 and 2d). In the postero-ventral part of this band these setae are acicular (fig 2e). In front of the shield the soft cuticle bears 2 pairs of relatively large (15-20 long) toothed setae. *Venter* (fig 2) with a narrow transverse sclerotized band behind the tritosternum. Sternal shield entire, with a small constriction at about 20 in front of its posterior margin. This shield is 153 long and 85 wide, it bears 4 pairs of setae (12-15 long) and 2 pairs of lyrifissures. The surface of this shield bears numerous small pits (diameter 1.2 to 2.5). Ventrianal shield trapezoidal, 174 long and 141 wide in its anterior half, with very small pits (1.2-2.2 in diameter) and 5 pairs of setae 10-12 long. The posterior extremity of this shield is distinctly excavated. Soft cuticle of opisthogaster with

11 small setae and 2 pores. Metapodal shields elongate more than twice as long as wide (111 x 45 and 105 x 45), each carrying few very small pits, 1 pair of lyrifissures and 1 elongated pore. Peritremes almost straight, 180 long and lying on a punctate shield 30 wide. Tritosternum (fig 8) with a base 50 wide, bearing along its anterior margin, at each side, one large internal tooth and laterally 5 to 6 very small triangular teeth. Lacinia 38 long, with 2 lateral setulose projections and a setulose apex. *Gnathosoma* (figs 4-7): Setae c1, c2, c3 and c4 38-12-30-12 long respectively. Deutosternum with 3 rows of 2-3-3 denticles. Chelicerae 195 long, movable digit 28 long. Epistome 78 long. Palpal-trochanter with 2 setae 50 and 9 long respectively.

*Host and locality:*

Holotype, and only known specimen, from *Dohrniphora caini* DISNEY, 1990 (Phoridae)

Table 1. – Measurements of the larvae of *Thaitrombidium ephydricola* n.sp. and *T. satunense* n.sp. (in micrometers) (Nomenclature following Southcott).

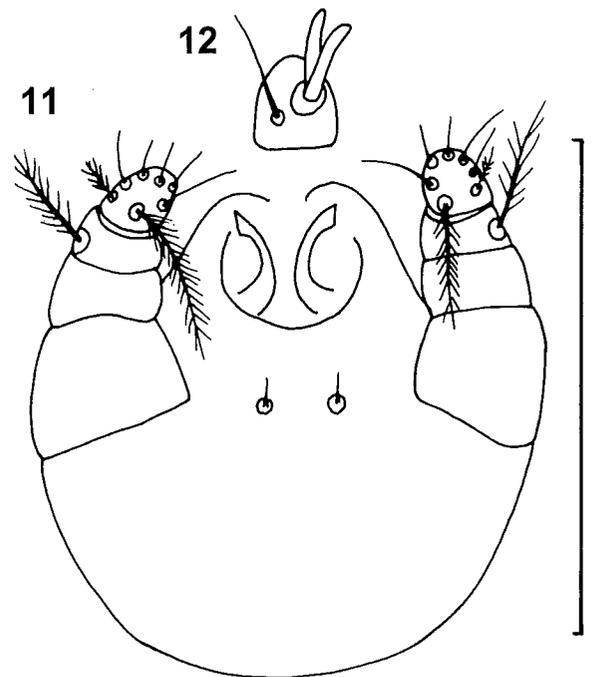
Charac- ters	<i>T. ephy- dricola</i>	<i>T. satunense</i>		Charac- ters	<i>T. ephy- dricola</i>	<i>T. satunense</i>			
	<i>Holotype</i>	<i>Holotype</i>	<i>Paratype n° 1</i>		<i>Paratype n° 2</i>	<i>Holotype</i>	<i>Holotype</i>	<i>Paratype n° 1</i>	<i>Paratype n° 2</i>
AM	14	10	12	10	DS	12-15	12-18	–	13-16
AL	30	25	24	23	TaI	34	36	39	35
PL	27	23	22	22	TaII	24	25	24	27
SE	22	25	21	–	TaIII	21	24	24	23
AMB	36	16	–	–	TiI	24	24	24	24
SB	48	54	–	–	TiII	18	17	18	18
AW	46	52	–	48	TiIII	17	18	18	18
PW	87	80	–	73	GeI	15	18	18	19
SA	20	18	25	17	GeII	12	12	12	13
SP	21	18	20	13	GeIII	12	12	12	14
MA	21	48	54	50	FeI	23	30	30	30
AP	27	25	23	24	FeII	21	24	30	30
L	54	90	88	90	FeIII	30	29	31	34
W	65	78	–	73	ωI	8	12	13	12
L/W	0.83	1.15	–	1.23	φI ant.	12	13	15	15
LN	–	3	–	4	φI post.	10	16	17	18
ASB	36	68	62	74	σI	30	28	20	26
PSB	15	18	24	21	ωII	15	17	18	16
PSW	70	50	55	54	φII	9	9	11	14
PSL	38	42	45	42	σII	35	26	18	30
QL	16-29	14-18	18-30	16-20					

Locality: Hin Pheng, waterfall, rain forest, Krabi Province, Thailand (coll. P. Grootaert, 25.X.1997. Holotype in I.R.S.N.B.

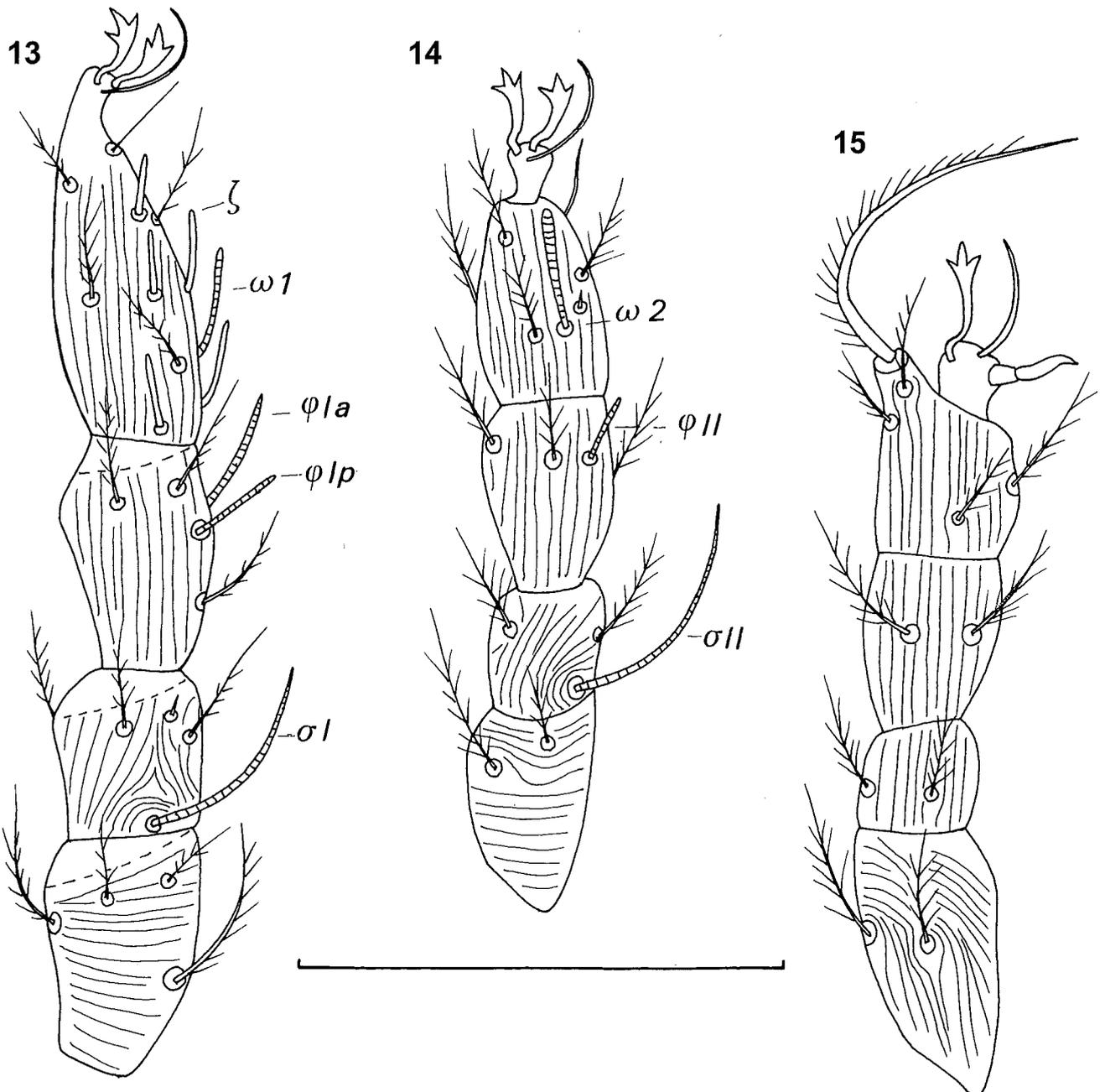
*Remarks:*

This species is the closest to *Uroseius (U.) disneyi* FAIN, 1998, described from *Dohniphora rostrata*, from Zimbabwe. It differs from this species by the following characters:

1. Setae of the median part of the scutum with shorter inflated base and with the tooth, or teeth, more basal (in basal half of the seta) (figs n° 2a and 3)
2. Setae of the anterior part of the lateral band with inflated bases. In *U. disneyi* all the setae of this band are acicular.
3. The pits on dorsal and ventral plates are less numerous and smaller.
4. Sternal plate entire and much shorter (153 x 85). In *U. disneyi* this plate is divided into 2 parts and longer (total length is 180, maximum width 80)
5. Metapodal shields shorter and relatively wider (115 x 45 and 105 x 45). In *U. disneyi* they are 155 long and 50 wide.
6. Ventrianal shield more narrowed backwards and incised posteriorly (not incised in *U. disneyi*).



Figs. 11-12 – *Thaitrombidium ephydricola* sp. n. Larva. Gnathosoma in ventral view (11), palpal tibia in dorsal view (12) (scale line 50 μm)



Figs. 13-15 – *Thaitrombidium ephydricola* sp. n. Larva. Leg I (13), leg II (14) and leg III (15) (scale line 50  $\mu$ m)

Dr. H. Disney, who identified our phorid fly, host of the mite, informed us (in litt.) that he had already reported the presence of an unidentified mite from the same host from Sulawesi (Disney, 1990)

#### PROSTIGMATA

FAMILY TROMBIDIIDAE LEACH, 1815

SUBFAMILY PAPUTROMBIDIINAE FAIN, 1992

We divide here the Paputrombidiinae into 2 tribes: Paputrombidiini FAIN, tr.nov. and Thaitrombidiini tr.nov. Both taxa are represented only by their larval stages.

#### TRIBE PAPUTROMBIDIINI tr.nov.

*Definition:* With the characters of the subfamily. Type genus: *Paputrombidium* FAIN, 1992.

#### Genus *Paputrombidium* FAIN, 1992

This genus is represented by 2 species, i.e. *Paputrombidium grootaerti* FAIN, 1992, (type species) and *P. chersodromia* FAIN and GROOTAERT, 1995, both described from Papua New Guinea.

*P. grootaerti* was known so far only from small flies of the genus *Cymatopus* spp (Dolichopodidae) from Papua

Table 2. – List of the species of the subfamily Paputrombidiinae with their hosts and localities.

MITES		HOSTS (DIPTERA)		LOCALITIES
Genus	Species	Genus and species	Family	
Paputrombidium Fain, 1992	<i>P. grootaerti</i> Fain, 1992	<i>Cymatopus tibialis</i> Kertesy	Dolichopodidae	Laing Is, Papua New Guinea
„	„	<i>Cymatopus leopoldi</i> Meuffels & Grootaert	Dolichopodidae	Laing Is, Papua New Guinea
„	„	<i>Hecamedoides granifera</i> Thomson	Ephydriidae	Pak Bara, Satun Province, Thailand
„	<i>P. chersodromia</i> Fain & Grootaert, 1995	<i>Chersodromia flavipyga</i>	Hybotidae	Laing Is, Papua New Guinea
„	„	„	„	New Ireland, Nusen Is, Papua New Guinea
Thaitrombidium Fain g.n.	<i>T. ephydricola</i> Fain n.sp.	<i>Hecamedoides granifera</i> Thomson	Ephydriidae	Pak Bara, Satun Province, Thailand
„	<i>T. satunense</i> Fain n.sp.	„	„	Pak Bara, Satun Province, Thailand

New Guinea. This species has now been found from *Hecamedoides granifera* THOMSON (Ephydriidae) from Pak Bara, Thailand (4 larvae) (N°97135). The larvae were attached to the anterior part of the abdomen of the flies.

#### TRIBE THAITROMBIDIINI tr.nov.

This new tribe differs from Paputrombidiini by the following characters:

1. Hysteronotum with 22 to 42 setae in Thaitrombidiini instead of 135 to 238 in Paputrombidiini; opisthogaster with 14 to 26 setae in Thaitrombidiini instead of 110 to 154 in Paputrombidiini.
2. Coxae with 1-1-1 setae (instead of 4-6-7 setae in Paputrombidiini).
3. Setae PL situated off the shield, between anterior and posterior eye. In Paputrombidiini these setae are on the shield.
4. Tarsi and claws III modified. In Paputrombidiini they are normal.
5. Tarsi I with 2 to 5 “solenidion-like” eupathidia. In Paputrombidiini there is only one eupathidium.
6. Tibia II with only 1 solenidion, femur III without solenidion. In Paputrombidiini tibia II bears 2 solenidia and femur III 1 solenidion.
7. Anterior eyes smaller than posterior eyes. In Paputrombidiini the anterior eyes are much larger than the posterior ones.

Type genus: *Thaitrombidium* g.n.

Genus *Thaitrombidium* gen nov.

Definition: With the characters given for the tribe.

Type species: *Thaitrombidium ephydricola* n.sp. Other species: *Th.satunense* sp. n.

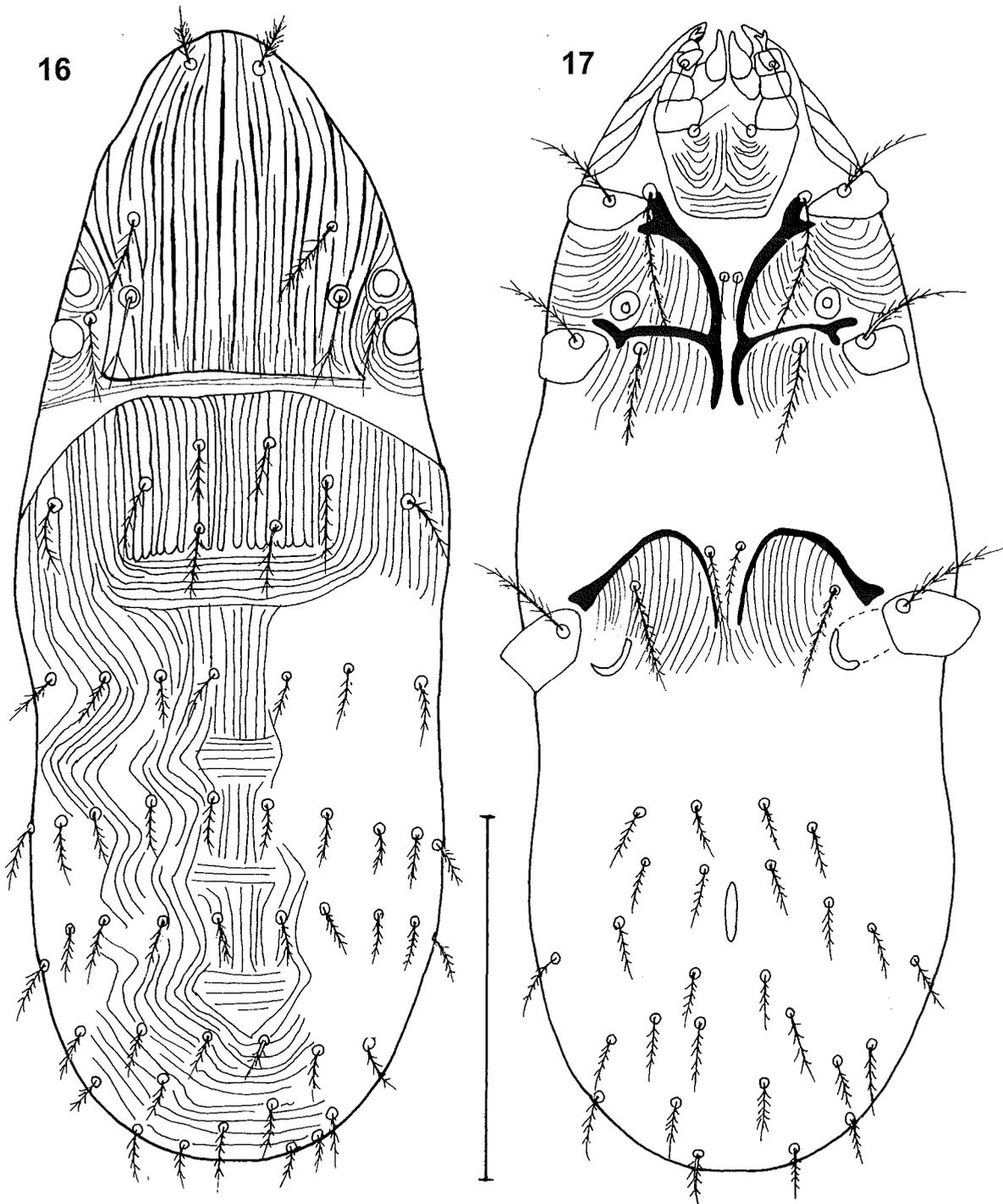
#### 1. *Thaitrombidium ephydricola* spec.nov.

*Larva* (Holotype) (figs 9-15): Standard measurements, see table 1. *Idiosoma* 282 long, 160 wide. *Dorsum*: Anterior shield finely and completely striated longitudinally, its lateral margins indistinct. Sensillae very thin with a few relatively long setulae in their apical two thirds. Setae PL situated off the shield, between anterior and posterior eyes. Posterior eyes larger (diameter 8-9) than anterior eyes (diameter 7,5). Setae AM bush-like, the AL very thick with numerous setulae. Scutellum striated longitudinally, with 3 pairs of setulose setae. Hysteronotum with 4 transverse rows of 6-8-6-2 setulose setae. *Venter*: Coxae with 1-1-1 long setulose setae. A pair of very short smooth sternal setae and another pair of much longer setulose setae between coxae III. Opisthogaster with 7 pairs of setulose: setae 15-27 long. Anus well developed. Urstigma small, rounded, attached to coxa I. Gnathosoma small, 42 long (in midline), and 48 wide (fig 11). Palpal tibia with a deeply incised and slightly curved claw 7.5 long (fig 12). Hypostome with a pair of very small smooth setae. Chelicerae with narrow relatively long toothed digits.

*Legs* (figs 13.15): Tarsus I distinctly longer and thicker than tarsus II and longer than tarsus III. Tarsi I-II with 2 trifold claws and a thin empodium.

Tarsi III modified, with a dorso-apical process bearing a long (35-40) and thick strongly curved and setulose seta; anterior claw trifold, almost straight; posterior claw short and thick only slightly curved at apex.

*Leg chaetotaxy* (setulose setae): Trochanters 1-1-1, Femora 6-4-4, Genua 4-2-2, Tibiae 7-5-5, Tarsi 13-13-13. *Solenidia*: Tarsi I-II:  $\omega 1$ ,  $\omega 2$ . Tibia I with  $\phi$  I anterior and  $\phi$  I posterior. Tibia II with only one solenidion ( $\phi$  II), tibia III without solenidion. Genua I and II each with a long solenidion. Genu III without a solenidion. *Eupathi-*



Figs. 16-17 – *Thaitrombidium satunense* p. n. Larva in dorsal (16) and ventral (17) view (scale line 100  $\mu$ m)

*dia*: Tarsus I with 5 eupathidia resembling solenidia (very refringent, cylindrical but without transverse striations and generally situated ventro-laterally).

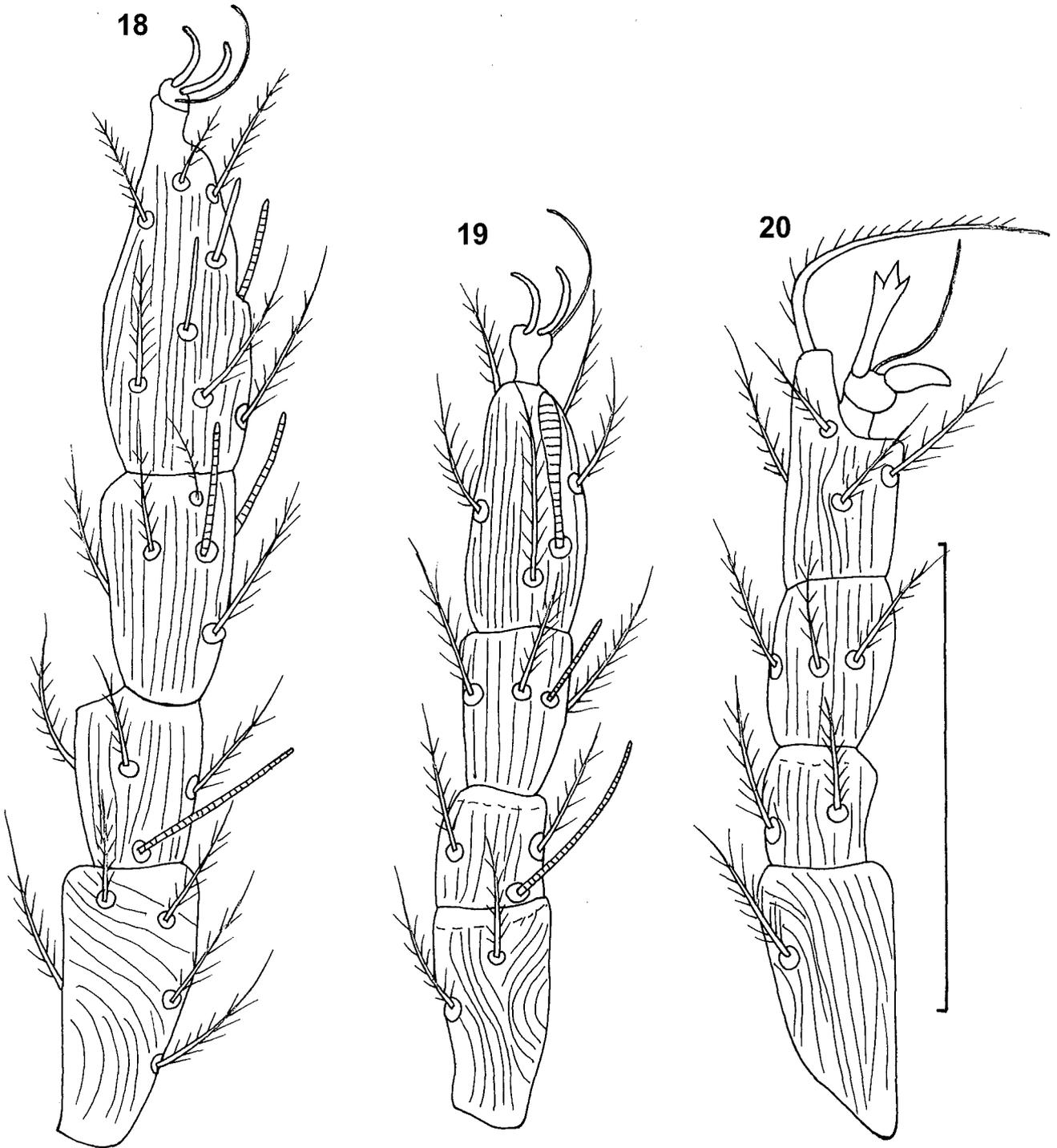
*Host and locality*

Holotype larva, and only know specimen, attached to the abdomen of *Hecamedoides granifera* THOMSON (Diptera: Ephydriidae) from Pak Bara, Satun Province, Thailand

(6°50' N, 99°50' E), Host n° 97135. Holotype in I.R.S.N.B.

2. *Thaitrombidium satunense* spec.nov.

Larva (holotype) (figs 16-20): Standard measurements, see table 1. *Idiosoma* 302 long 117 wide, completely and very finely striated. *Dorsum*: Anterior shield covered



Figs. 18-20 – *Thaitrombidum satunense* sp. n. Larva. Leg I (18), leg II (19) and leg III (20) (scale line 50  $\mu$ m).

with thick longitudinal striations, its lateral margins relatively well distinct. Setae PL very lateral and off the shield, they are situated between anterior and posterior eyes. Diameter of eyes 9,8 (anterior eye) and 12 (posterior eye). Scutellum with 6 setulose setae. Hysteronotum bearing 42 setae forming 6 transverse rows of

7-10-10-6-4-5 setae 12 to 18 long. *Venter*: Coxae with 1-1-1 setulose setae 26-30 long. One pair of short and smooth sternal setae and one pair of longer setulose between coxae III. Opisthogaster with 13 pairs of setulose setae 12-15 long. Anus well developed. Urstigma small attached to coxa I. *Gnathosoma* 48 long, 41 wide.

Palpal tarsus and palpal tibia as in *T. ephydricola*. Legs (figs 18-20): Tarsus I thicker and longer than tarsi II and III. Tarsi I and II with normal claws and empodium, the claw lacking the preapical teeth. Tarsi III as in *T. ephydricola*. Leg chaetotaxy (number of setulose setae): Trochanters 1-1-1, Femora 6-4-4, Genua 4-2-2, Tibia 7-5-5, Tarsi 14-14-13. *Solenidia*: as in *T. ephydricola*. *Eupathidia*: tarsus I with only 2 smooth cylindrical eupathidia

*Host and locality:*

Holotype and 2 paratypes (all larvae) with the same data as for *T. ephydricola*. The 3 specimens are deposited in I.R.S.N.B.

*Remarks:*

*T. satunense* differs from *T. ephydricola* by the following characters:

1. Body more elongate, ratio length/width = 2.5 whilst in *T. ephydricola* this ratio is 1.76.
2. Antero-dorsal shield much longer (90) than in *T. ephydricola* (54) and with thinner setae
3. Tarsi I with 2 cylindrical and smooth eupathidia (instead of 5 in *T. ephydricola*)
4. Claws of tarsi I-II simple, not trifurcate (trifid in *T. ephydricola*)
5. Hysteronotum with 42 setae (instead of 22 setae in *T. ephydricola*)
6. Coxae closer to the midline than in *T. ephydricola*

## Acknowledgements

I thank Dr H. Disney, University of Cambridge, who kindly identified the phorid fly, host of the *Uroseius* species which is described here.

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