

CORTICOLOUS MITES ; NEW AND UNRECORDED SPECIES OF THE GENUS *TYDEUS* (ACARI : PROSTIGMATA : TYDEIDAE) AND A KEY TO SPECIES OF SOUTHERN SWEDEN

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TAXONOMY
TYDEUS
SWEDEN

SUMMARY : Four species of the genus *Tydeus* are described and illustrated as new to science. *T. ivoensis* n.sp. and *T. filiformis* n.sp. were collected from moss layer on the soil surface ; *T. paravarsoviensis* n.sp. and *T. penicillatus* n.sp. from lichens on twigs found on the soil surface. *Paralorryia insignia* Livshitz, 1973, *P. carya* Baker, 1968, *Lorryia funki* Baker, 1968 and *L. polygonata* Kulczycki, 1992 are all transferred to the genus *Tydeus* on the grounds of leg chaetotaxy. The female of *T. funki* is redescribed, based on the holotype, and a male, collected from Sweden, is described for the first time. The female of *T. carya* is described for the first time. Eight species are reported as new to Sweden. A key to adults of the twenty-four *Tydeus* species so far known in Southern Sweden is given.

TAXONOMIE
TYDEUS
SUÈDE

RÉSUMÉ : Quatre nouvelles espèces de *Tydeus* sont décrites. *T. ivoensis* n. sp. et *T. filiformis*, n. sp. ont été récoltées dans de la mousse au sol ; *T. paravarsoviensis* n. sp. et *T. penicillatus* n. sp. dans des lichens sur des tiges tombées au sol. *Paralorryia insignia* Livshitz, 1973, *P. carya* Baker, 1968, *Lorryia funki* Baker, 1968 et *L. polygonata* Kulczycki, 1992 sont transférées dans le genre *Tydeus* en raison de leur chétotaxie pédieuse. La femelle de *T. funki* est redécrise, d'après l'holotype et un mâle récolté en Suède est décrit pour la première fois. La femelle de *T. carya* est décrite pour la première fois. Huit espèces sont nouvelles pour la faune de Suède. Un clé des adultes de vingt-quatre espèces de *Tydeus* de Suède méridionale est donné.

INTRODUCTION

The fauna on the trunk of a tree differs in many respects from that of the leaves of the same tree or from the surrounding soil. The corticolous fauna is heterogeneous in space (species of the tree and of the epiphytic flora) and varies with season, forming microcoenoses (ANDRÉ 1985). The fauna is characterised by microarthropods of several families of which Tydeidae is one (ANDRÉ 1986).

The foraging habits of these small mites, ranging from 150 µm to 400 µm, are most often unknown (ANDRÉ 1986).

In a previous report on tydeid mites in southern Sweden (MOMEN & LUNDQVIST 1995), six species of the genus *Tydeus* were described as new to science. Here we describe another four and present a key to all twenty-four species that are so far known to Sweden.

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METHODS

The mites were extracted with Berlese funnels and mounted individually on microscopic slides in a gum-chloral hydrate medium. Measurements are given either as minimum-maximum lengths, or as means based on 2-8 individuals.

We follow the generic concept of ANDRÉ (1980, 1981 a, b), although we are aware of the criticism that his work has met due to incongruity with the Code of Zoological Nomenclature (KAZMIERSKI 1989). The reason for us to do so is this : we are of the opinion that the family Tydeidae is in need of a total revision, based on sound cladistic methods. Until such a revision is carried out we think it is better to retain one, though defective, system. This is preferable to trying to mend the system in small steps, which may add even more confusion to the present situation.

Holotypes are deposited in the collection of the Zoological Museum, Lund University [ZML]. Paratypes, when at hand, are deposited at the Natural History Museum, London [BMNH], and the National Research Centre, Plant Protection Department, Cairo, Egypt [NRCE]. The distribution of paratypes between collections is listed for each new species. The slide number of the type-series is engraved with a diamond on each slide.

LOCALITIES

Mites were collected from the following localities :

1. Alnarp, Agricultural University, 6 km N Malmö (N 55° 32' ; E 13° 04').
2. Dörröd, 5 km WSW Genarp (N 55° 35' ; E 13° 29'). Old hollow trees, *Salix fragilis*, along the road.
3. Ivöklack, Ivö, 20 km NE Kristianstad (N 56° 08' ; E 14° 24'). Old, abandoned limestone quarry. Calcareous, but water permeable, dry soil.
4. Lahibiagrottan, Kullaberg, 13 km N Höganäs (N 56° 18' ; E 12° 27'). Sparse vegetation of *Pinus* sp., *Prunus spinosa*, *Quercus robur*, and *Euonymus europea* on the stony south-facing slope of a cliff that juts out into the Kattegat sea.
5. Linnebjer, 7 km ENE Lund (N 55° 44' ; E 13° 18'). Mixed forest, bushes (*Corylus avellana*, *Crataegus*

oxyacantha) and tall deciduous trees (*Betula pubescens*, *Quercus robur*, *Sorbus aucuparia*, *Tilia cordata*).

6. Norrekås, 1.5 km S Skillinge (N 55° 28' ; E 14° 17'). Planted coniferous (*Pinus* sp.) forest of moderate height, 10-15 m, close to the sea-shore. Bushes of *Populus tremula*, *Rosa* sp., *Sambucus nigra*, *S. racemosa*, *Sorbus aucuparia*, *S. intermedia*.
7. Prästtorpasjön, 7 km N Höör (N 55° 59' ; E 13° 34'). Deciduous forest. Tall trees of *Quercus robur* and *Fagus sylvatica*.
8. Stensoffa, 16 km E Lund (N 55° 42' ; E 13° 26'). Mixed forest, bushes and trees of moderate height, *Acer platanoides*, *Tilia cordata*, *Fagus sylvatica*, *Betula pubescens*, *Quercus robur*.
9. Södra Åreda, 11 km E Växjö (N 56° 54' ; E 14° 59'). Dense coniferous forest of *Picea abies* mixed with single deciduous trees of *Fagus sylvatica* and *Sorbus aucuparia*. Thick moss layer.
10. Vomb, 23 km E Lund (N 55° 41' ; E 13° 33'). Coniferous forest, with *Pinus sylvestris* of moderate height. Sparse ground vegetation of grasses, with many lichens (*Cladonia* sp.).

SUBFAMILY TYDEINAE

Genus *Tydeus* Koch, 1835, sensu André, 1980

Type species : *Tydeus kochi* Oudemans, 1928, by subsequent designation of BAKER and WHARTON, 1952.

ANDRÉ (1980) defined his new genus *Orthotydeus* in such a way that it included *T. kochi* and treated the name *Tydeus* as a junior synonym to the new genus. KAZMIERSKI (1989) suggested the following synonymies :

Lorryia Oudemans, 1925 (type species : *Lorryia superba* Oudemans, 1925) syn. : *Tydeus* Koch, 1835 sensu André, 1980.

Paralorryia Baker, 1965 (type species : *Lorryia cumbrensis* Baker, 1944) syn. : *Homeotydeus* André, 1980.

Tydeus Koch, 1835 (type species : *Tydeus kochi* Oudemans, 1928) syn. : *Orthotydeus* André, 1980.

However, there may be other, perhaps simpler, ways to handle the problem with the identification of the three genera and their type species, e.g. giving them sub-generic rank in the genus *Tydeus* Koch, 1835. For the time being, with the motivation given

under METHODS, we use the name *Tydeus* as ANDRÉ (1980) suggested.

The genus *Tydeus* is characterised by : Prodorsum recurved. Opisthosoma : dorsal chaetotaxy : 10 (l_2 and h_1 missing); poroidotaxy : 3; genital organotaxy (0,4-6-4), anterior eugenital flap of males (when known) with three pairs of setae, posterior eugenital flap with a single pair of setae; epimeral formulae : (3-1-4-2); leg setal patterns : I 8(1)-4-3-3-1; II 6(1)-2-2-3-0; III 5-2-1-2-1; IV 5-2-1-1-0.

KEY TO ADULTS OF THE GENUS *Tydeus* in Southern Sweden

Glossary :

Reticulation : the striation forms *cells* (Fig. 1) that are connected to each other by *cross-ties* (Fig. 7).

Reticulated area : distinct sector with reticulation surrounded by non-cell forming striation (Fig. 48).

Reticulated elements : single cells or loose units of few cells (Fig. 19).

1. Dorsum completely reticulated or divided into 6-
>20 discrete sections..... 2
- small reticulated area or a few reticulated elements
anteriorly on prodorsum or without reticulation on
anterior part of prodorsum 12
2. Dorsum uniformly reticulated, without discrete sec-
tions 3
- dorsum divided into discrete sections 7
3. Trichobothrium flagellate, smooth ; dorsal body setae
either 1) broadly expanded and smooth or 2) blunt
distally, ornamented or sparsely serrated..... 4
- trichobothrium blunt distally, faintly serrate ; dorsal
body setae long and sparsely serrate..... 6
4. Dorsal body setae broadly expanded, smooth ..
..... *T. parainflatus* Momen & Lundqvist, 1995
- dorsal body setae blunt distally ; ornamented or
sparsely serrate 5
5. Dorsal body setae ornamented ; palp tarsus shorter
than moveable digit of chelicera ; terminal eupathidium
on palp thick *T. ivoensis* n.sp.
- dorsal body setae sparsely serrate ; palptarsus as long
as moveable digit of chelicera ; terminal eupathidium
on palp bidentate *T. paravarsoviensis* n.sp.
6. Dorsal body setae long (25-33 µm) ; terminal eupathidium
on palp bidentate ; setae k on tibia I divided ..
..... *T. hughesae* Momen & Sinha, 1991

- dorsal body setae very long (44-48 µm) ; ter-
minal eupathidium on palp and seta k on tibia I
simple *T. reticulata* Oudemans, 1928
7. Reticulated pattern of dorsum divided into 6, 9, 13 or
28 sections ; most dorsal body setae lanceolate,
smooth or serrate and curved..... 8
- reticulated pattern of dorsum divided into 7 or
8 sections ; dorsal body setae simple or rodlike,
smooth..... 11
8. Trichobothrium rodlike ; dorsal setae h_2 blunt and
expanded distally ; reticulate pattern of dorsum divi-
ded into 6 sections ..
..... *T. nytebodensis* Momen & Lundqvist, 1995
- trichobothrium flagellate ; dorsal setae h_2 lanceolate,
tapering distally ; reticulate pattern of dorsum divi-
ded into 9, 13, or 28 sections 9
9. Dorsum with 9 reticulated sections, dorsal body setae
smooth *T. catenulata* (Thor), 1931
- dorsum with 13 or 28 reticulated sections, dorsal
body setae serrate..... 10
10. Dorsum with 13 reticulated sections ; moveable digit
of chelicera 2 times longer than palptarsus ..
..... *T. polita* (Kuznetzov), 1975
- dorsum with >20 reticulated sections ; moveable
digit of chelicera about the same length as palpta-
rus *T. funki* (Baker), 1968
11. Dorsum with 8 reticulated sections ; dorsal body
setae rodlike *T. polygonata* (Kulczycki), 1992
- dorsum with 7 reticulated sections ; dorsal body setae
simple and blunt distally.....
..... *T. danuta* (Kazmierski), 1978
12. Without reticulated area on anterior part of prodor-
sum..... 13
- small reticulated area or a few reticulated elements on
anterior part of prodorsum 18
13. Striation between setae d_2 longitudinal 14
- striation between setae d_2 transverse..... 16
14. Striation between setae d_3 and d_4 longitudinal.....
..... *T. maga* (Kuznetzov), 1973
- striation between setae d_3 and d_4 transverse.... 15
15. Setae p_1 and p_2 simple, smooth ; terminal eupathidium
on palp bidentate ; palptarsus as long as
moveable digit of chelicera.... *T. penicillatus* n.sp.
- setae p_1 and p_2 serrate ; terminal eupathidium on palp
thick and elongate ; moveable digit of chelicera 1.5
times as long as palptarsus. *T. carya* (Baker), 1968
16. Dorsal body setae simple, smooth ; seta d on palp
divided ..
..... *T. unguis* Karg, 1975
- dorsal body setae faintly serrate ; seta d on palp
simple..... 17
17. Dorsal setae d_4 , d_5 , l_4 , and l_5 long (26-30 µm) ;

- moveable digit of chelicera shorter than palptarsus *T. obstinatus* Livshitz, 1973
- dorsal setae d_4 , d_5 , l_4 , and l_5 short (14-17 μm) ; moveable digit of chelicera longer than palptarsus *T. jaculus* Kuznetsov, 1973
18. Distinct reticulated area on anterior part of prodorsum 19
- at most a few reticulated elements on anterior part of prodorsum 22
19. Dorsal body setae lanceolate, strongly serrate, curved ; terminal eupathidium on palp thick, elongate 20
- dorsal body setae 1) aciculate and smooth or 2) simple, faintly serrate ; terminal eupathidium on palp bidentate 21
20. Dorsal body setae pointed distally *T. insignia* (Livshitz), 1973
- dorsal body setae blunt distally *T. octomaculatus* Momen & Lundqvist, 1995
21. Dorsal body setae aciculate, nude ; seta d on palp forked *T. caputoperio* Momen & Lundqvist, 1995
- dorsal body setae simple, faintly serrate ; seta d on palp simple *T. matus* Livshitz, 1973
22. Dorsal body setae strong and serrate 23
- dorsal body setae aciculate, nude *T. danielssoni* Momen & Lundqvist, 1995
23. Striae with round lobes ; moveable digit of chelicera relatively short ; terminal eupathidium on palp bidentate, seta d divided *T. exiguelitteratus* Momen & Lundqvist, 1995
- striae with transverse lobes ; moveable digit of chelicera long ; terminal eupathidium on palp thick, elongate, seta d simple *T. filiformis* n.sp.

***Tydeus ivoensis* n.sp.**

(Figs 1-9)

ADULT FEMALE (Fig. 1). Dorsum 375-388 μm ; width 273-285 μm , completely reticulated, without distinct areas except a small area around seta p_3 ; mesh of reticulation irregular, lines with I and Y-shaped cross-ties (Fig. 7). Dorsal setae strong, blunt distally, smooth, with delicate ornamentation, which is visible only under high magnification (1000 \times) ; trichobothrium simple and filiform ; seta h_2 situated ventrally.

Setal measurements : p_1 and p_2 subequal 22 μm ; p_3 , d_1 and d_2 subequal 26 μm ; s 80 μm ; d_3 , d_4 and d_5 subequal 29 μm ; l_1 26 μm ; l_4 30 μm ; l_5 27 μm ; h_2 19 μm ; ps 16 μm .

Ventrally striation replaces reticulation ; posterior of venter reticulated to setae ps .

All legs possess two claws and an empodial hook (Figs 2-5). Solenidion on tarsus I slender and long (9 μm). Solenidion on tarsus II short (4 μm). Seta k on tibia I forked (Figs 2-3). Individual variability of leg chaetotaxy has been recorded in this species (MOMEN & LUNDQVIST 1993).

Gnathosoma completely covered dorsally by anterior projection of prodorsum. Setal pattern of palpus 6(1)-2-2 ; terminal eupathidium thick, seta d divided ; solenidion on palp long (4 μm) (Fig. 6). Moveable digit of chelicera (15 μm) longer than palptarsus (10 μm).

Aggenital and genital setae setiform (Fig. 9).

ADULT MALE. Similar to female except genital area. Setae on eugenital flaps feathered (Fig. 8).

TYPE DATA. Holotype, female, slide no. 5520, October 29, 1991. Allotype, male, slide no. 5777, May 20, 1992, 3 females paratypes, October 29, 1991, 9 females and 1 male paratypes, May 20, 1992 : Ivöklack, Ivö (Loc. 3) ; ex moss on soil surface, leg. LUNDQVIST. Distribution of paratypes : 5 females, 1 male [ZML], 3 females, 1 male [BMNH], 4 females [NRCE].

ETYMOLOGY. The species name is derived from the type locality.

REMARKS. *Tydeus ivoensis* n.sp. is distinct in having strong, ornamented dorsal setae, reticula irregular in shape and short palptarsus with long solenidion. This combination of characters separates the species from all congeners.

***Tydeus paravarsoviensis* n.sp.**

(Figs 10-18)

ADULT FEMALE (Fig. 10). Length of body 294-305 μm ; width 195-206 μm . Dorsum with three rosette-like areas marking muscle attachments between setae d_1 and d_2 , d_2 and d_3 . Dorsum completely reticulated ; lines of dorsal reticulation with Y, I and X-shaped cross-ties (Fig. 16). Dorsal setae strong, blunt and sparsely serrate, except trichobothrium which is filiform and smooth.

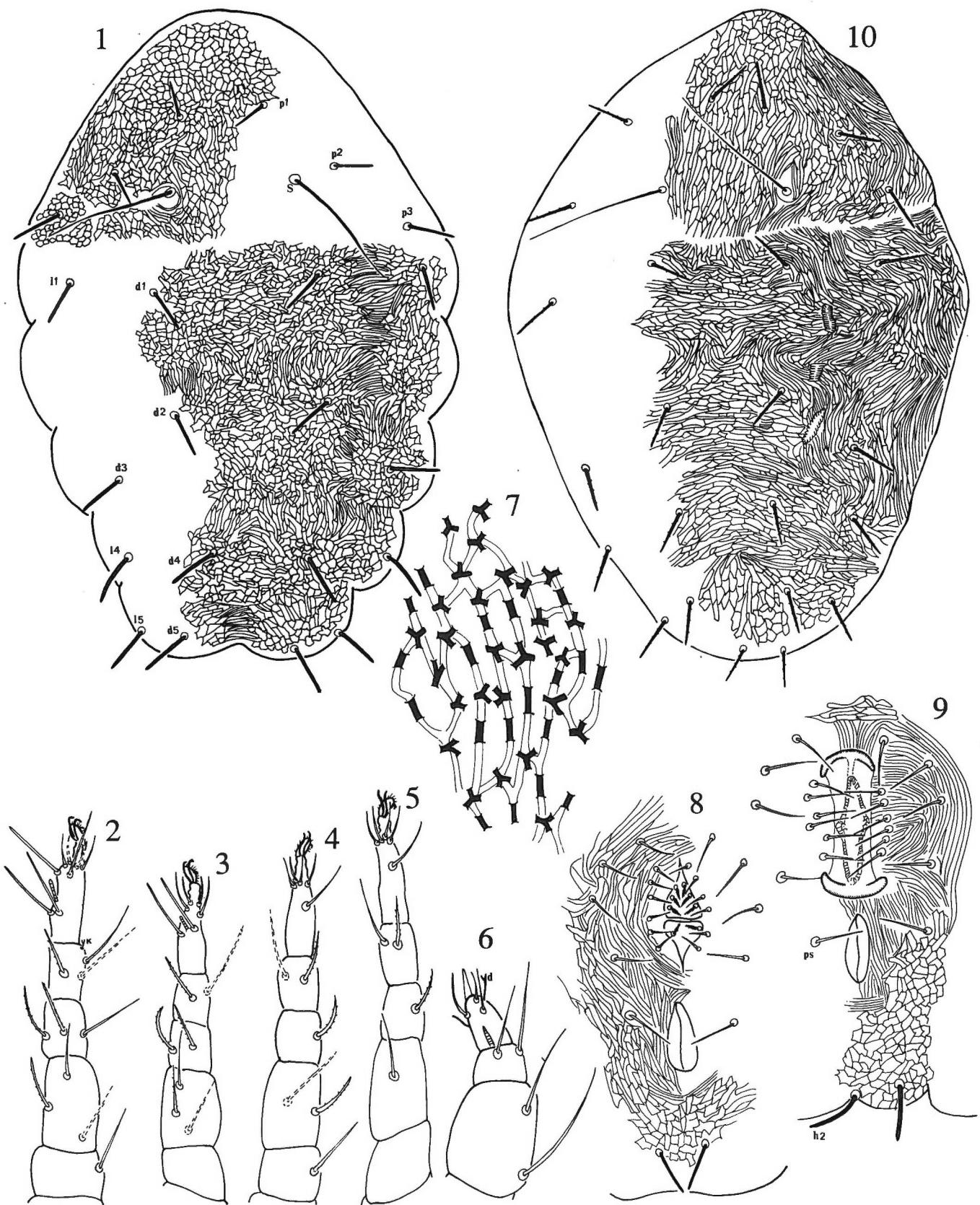
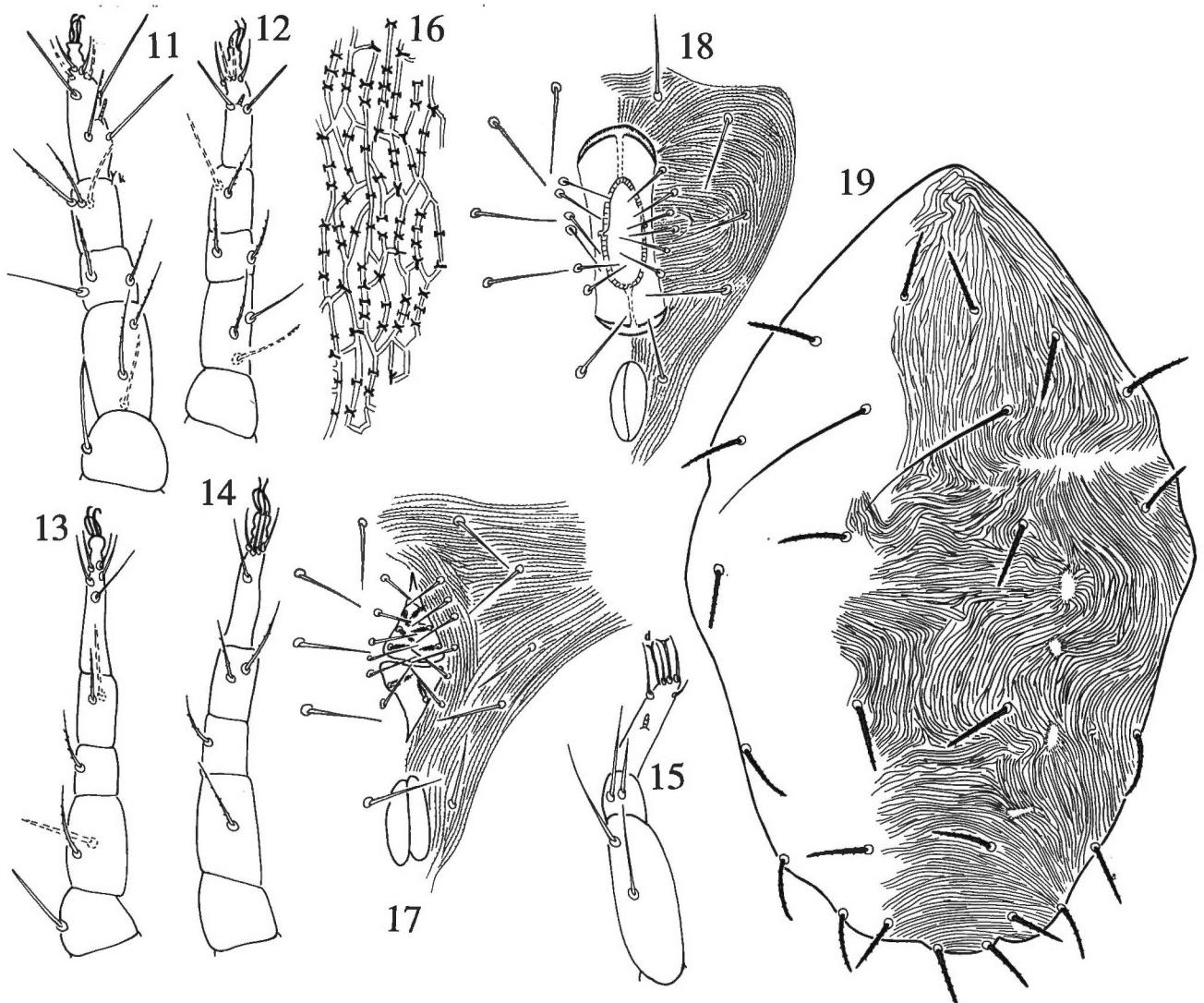


FIG. 1-9 : *Tydeus ivoensis* n.sp.

1. — Adult female, dorsal view. 2-6 : Adult female. 2. — Leg I. 3. — Leg II. 4. — Leg III. 5. — Leg IV. 6. — Adult female, palp. 7. — Adult female, reticulation pattern on dorsum. 8. — Adult male, genital region. 9. — Adult female, genital region.

FIG. 10 : *Tydeus paravarsoviensis* n.sp. Dorsal view. Adult female



Figs 11-18 : *Tydeus paravarsoviensis* n.sp.

11-15 : Adult female, 11. — leg I. 12. — Leg II. 13. — Leg III. 14. — Leg IV. 15. — Adult female, palp. 16. — Reticulation pattern on dorsum of adult female. 17. — Genital region of adult male. 18. — Adult female, genital region.

FIG. 19. *Tydeus filiformis* n.sp. Dorsal view of adult female.

Setal measurements : p_1 and p_3 subequal 22 μm ; p_2 20 μm ; s 63 μm ; d_1-d_5 and l_1-l_5 subequal 20 μm ; h_2 and ps subequal 15 μm .

Ventrally striation replaces reticulation.

Each apotelle with two claws and an empodium. Empodia without claws (Figs 11-14). Solenidion on tarsus I slender, long (7 μm). Seta k on tibia I forked (Fig. 11).

Setal pattern of palpus : 6(1)-2-2 ; terminal eupathidium bidentate distally, whereas seta d divided and seta ba short and slender (Fig. 15). Moveable digit of chelicera as long as palptarsus (18 μm).

Aggenital and genital setae setiform (Fig. 18).

ADULT MALE. Similar to female except genital area (Fig. 17).

TYPE DATA. Holotype, female, slide no. 5638, allotype, male, slide no. 5639; 1 female and 4 males paratypes: Vomb (Loc. 10), *ex* lichens on pine twigs on ground, collected April 28, 1992, 4 females, 8 males, paratypes: same loc., same date, *ex* moss on soil surface; leg. LUNDQVIST; 1 female paratype, Stenoffa (Loc. 8), *ex* bark of dead branch, collected May 6, 1992; leg. LUNDQVIST, 1 male, paratype: Kullaberg (Loc. 4), *ex* bark of dead tree, *Pinus* sp., collected May 14, 1992; leg. LUNDQVIST. Distribution of paratypes: 2 females, 6 males [ZML], 2 females, 4 males [BM(NH)], 2 females, 4 males [NRCE].

ETYMOLOGY. Because of the similarity to *Lorryia varsoviensis* Kazmierski, the species is named *para-varsoviensis* (*para*, Lat. = alike).

REMARKS. The species is closely related to *Lorryia varsoviensis* Kazmierski, 1979, collected in Poland. It differs from the latter by having most of the meshes of reticulum between the trichobothria longitudinally elongate rather than all meshes as long as broad in that area as in *L. varsoviensis*. It can be separated also by having seta *k* on tibia I forked, eupathidium on palp bidentate distally and seta *d* on palptarsus forked, opposed to having seta *k* on tibia I, eupathidium on palptarsus and seta *d* on palp all simple as in *L. varsoviensis*.

Tydeus filiformis n.sp.

(Figs 19-28)

ADULT FEMALE (Fig. 19). Length of body 345-357 µm; width 212-222 µm. Dorsum with four pairs of rosette-like areas marking muscle attachments between setae *d*₁ and *d*₂, *d*₂ and *d*₄. A few reticulated elements scattered on the anterior portion of the prodorsum. Dorsal body striae with transverse lobes (Fig. 28). Dorsal body setae strong and serrate except the trichobothrium which is filiform and smooth.

Setal measurements: *p*₁-*p*₃ subequal 29 µm; *s* 67 µm, *d*₁-*d*₃ subequal 27 µm; *d*₄ and *d*₅ subequal 25 µm, *h*₂ 27 µm, *l*₁ 26 µm; *l*₄ 30 µm; *l*₅ 27 µm; *ps* 19 µm.

All legs terminate in two claws and a hairy

empodium with a claw (Figs 20-23). Solenidion on tarsus I long and slender (10 µm), solenidion on tarsus II short (3 µm); seta *k* on tibia I strong and simple (Figs 20-21).

Setal pattern of palpus: 6(1)-2-2. Terminal eupathidium thick and elongate; seta *d* simple and slender (Fig. 24). Moveable digit of chelicera (Fig. 25) longer (36 µm) than palptarsus (21 µm).

Aggenital and genital setae setiform (Fig. 26).

ADULT MALE. Similar to female except for the genital area (Fig. 27).

TYPE DATA. Holotype, female, slide no. 5660: Vomb (Loc. 10), *ex* moss on soil surface, collected April 28, 1992, leg. LUNDQVIST; allotype, male, slide no. 5743; 7 females and 6 males paratypes, Kullaberg (Loc. 4), *ex* bark of tree, *Pinus* sp., collected May 14, 1992; leg. LUNDQVIST; 3 females, paratypes, Linnebjer (Loc. 5), collected June 9, 1993, *ex* moss on fallen tree, leg. LUNDQVIST. Distribution of paratypes: 4 females, 3 males [ZML], 3 females, 3 males [BM(NH)], 3 females, 1 male [NRCE].

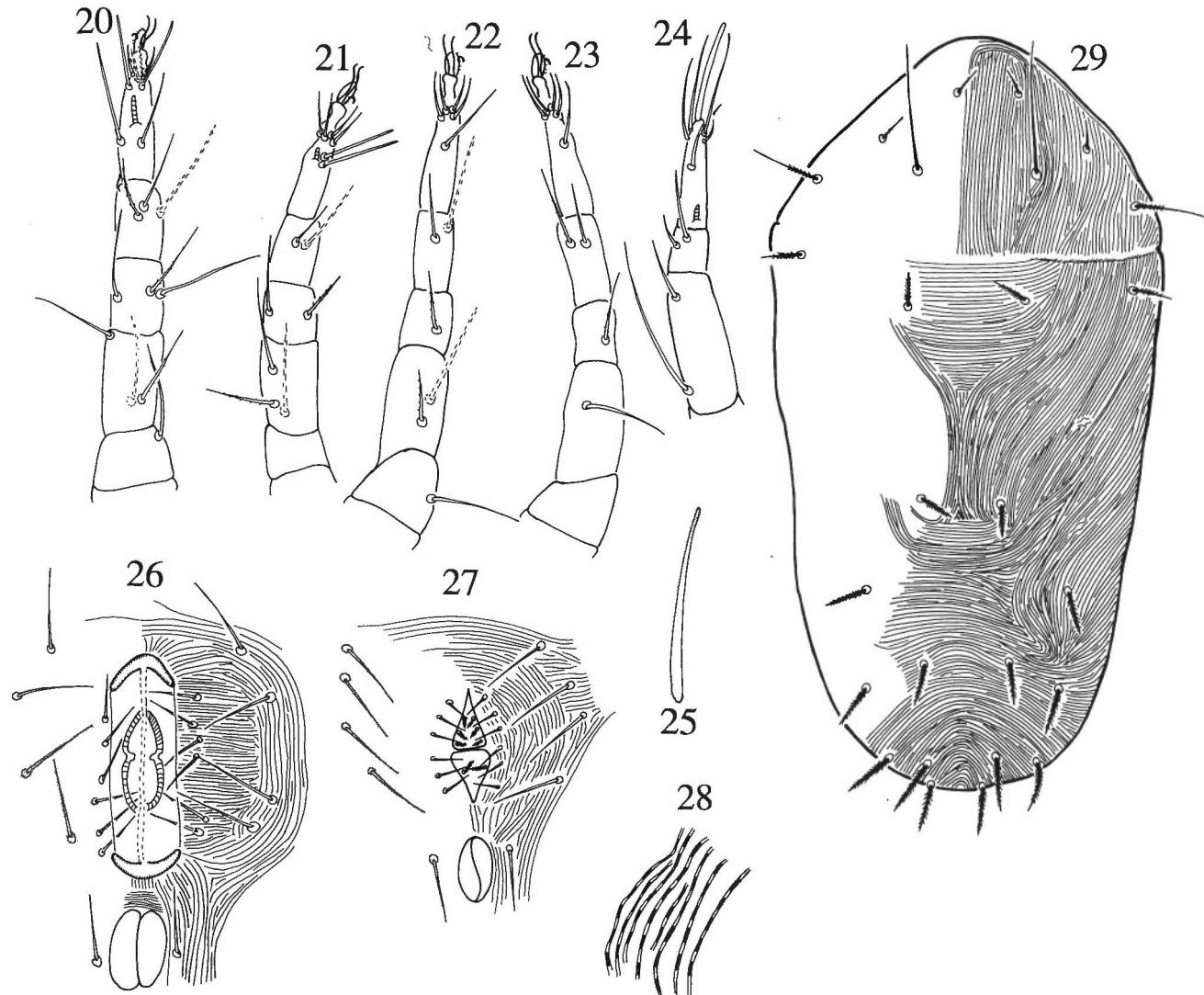
ETYMOLOGY. The species name refers to the long trichobothria (*filiformis* Lat. = thread-like).

REMARKS. The new species is similar to *Paralorryia mansoni* Baker, 1968b, collected at Pohutakawa, Orera, New Zealand. It can be distinguished by having few reticulated elements on the anterior portion of prodorsum, and by having transverse lobes on striae, as opposed to round lobes in *P. mansoni*. The species can also be distinguished by the long trichobothrium, which is more than 2 times longer than other dorsal body setae; the trichobothrium in *P. mansoni* is relatively shorter.

Tydeus penicillatus n.sp.

(Figs. 29-37)

ADULT FEMALE (Fig. 29): Length of body 248-260 µm, width 121-127 µm. Dorsum of body without reticulate pattern. Dorsal body striae with round lobes (Fig. 37). Dorsal body setae *p*₁ and *p*₂ thin and smooth; proximal half of setae *p*₃ serrated, other dorsal body setae strongly serrate except the trichobothrium, which is filiform and smooth.



FIGS 20-28 : *Tydeus filiformis* n.sp.

20-25 : Adult female 20. — Leg I. 21. — Leg II. 22. — Leg III. 23. — Leg IV. 24. — Palp. 25. — Moveable digit of chelicera. 26. — Genital region of adult female. 27. — Genital region of adult male. 28. — Striation pattern on dorsum of adult female.

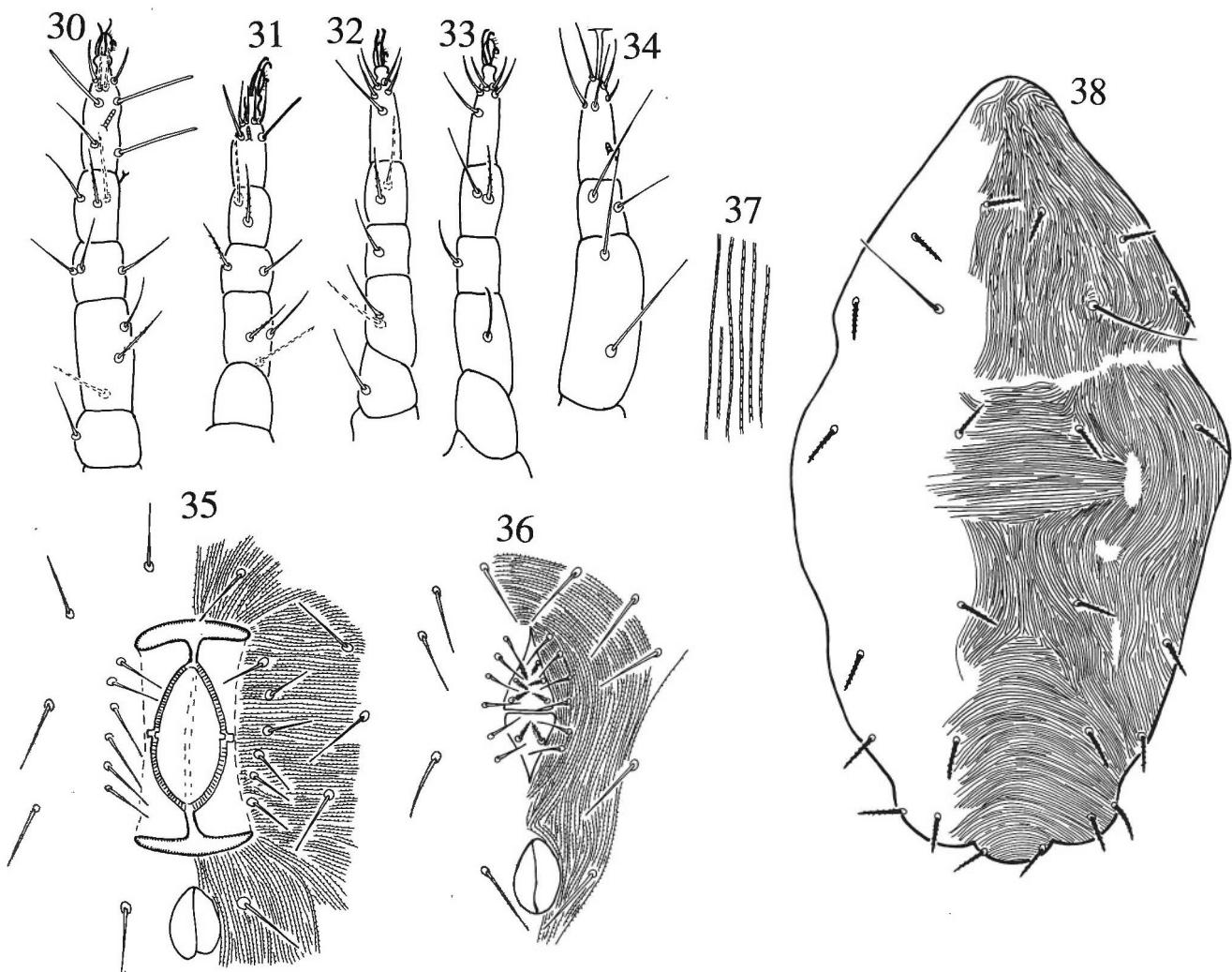
Fig. 29. *Tydeus penicillatus* n.sp. Dorsal view of adult female.

Setal measurements : p_1 and p_2 subequal 7 μm ; d_1 and d_2 subequal 10 μm ; d_3 and d_4 subequal 12 μm ; d_5 17 μm ; h_2 15 μm ; l_1 11 μm ; l_4 14 μm ; l_5 16 μm ; ps 9 μm ; s 38 μm .

Each apotele with two claws and an empodial hook (Figs 30-33). Solenidion on tarsus I slender and relatively short (5 μm); seta k on tibia I divided (Fig. 30).

Setal pattern of palpus : 6(1)-2-2. Terminal eupathidium bidentate distally; seta d simple and seta ba short and slender (Fig. 34). Moveable digit of cheliceras as long as palptarsus (11 μm).

ADULT MALE. Similar to female except genital area (Fig. 36).



Figs 30-37. *Tydeus penicillatus* n.sp.

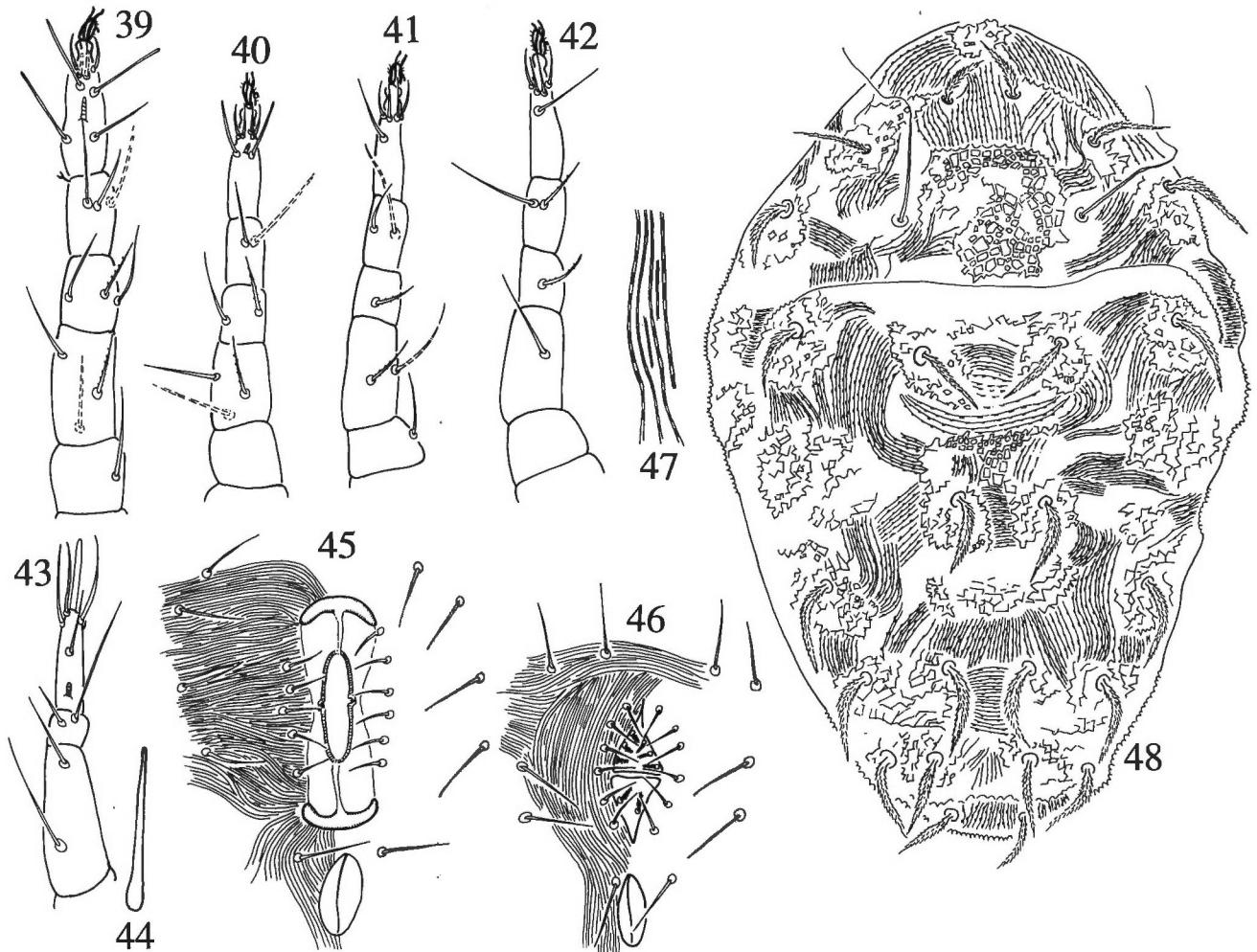
30-34 : Adult female. 30. — Leg I. 31. — Leg II. 32. — Leg III. 33. — Leg IV. 34. — Palp. 35. — Genital region of adult female. 36. — Genital region of adult male. 37. — Striation pattern on dorsum of adult female.

38. — *Tydeus carya* (Baker). Dorsal view of adult female

TYPE DATA. Holotype, female, slide no. 5626, allotype, male, slide no. 5625; 1 female paratype : Prästtorpasjön (Loc. 7), ex lichens on twigs on soil surface, collected April 14, 1992, leg. LUNDQVIST. Distribution of paratypes : 1 female [ZML].

ETYMOLOGY. The species is named *penicillatus* (Lat. = like a brush) referring to the shape of setae p_3 .

REMARKS. *Tydeus penicillatus* n.sp. is distinct in having dorsal setae p_1 and p_2 short, thin and smooth, setae p_3 long and proximally serrated, all other dorsal setae robust and strongly serrate. This combination of characters separates the species from all congeners.



FIGS 39-47 : *Tydeus carya* (Baker)

39-44 : Adult female. 39. — Leg I. 40. — Leg II. 41. — Leg III. 42. — Leg IV. 43. — Palp. 44. — Moveable digit of chelicera. 45. — Genital region of adult female. 46. — Genital region of adult male. 47. — Striation pattern on dorsum of adult female.

FIG. 48. — *Tydeus funki* (Baker), Dorsal view of adult female (holotype).

REDESCRIPTIONS,
NEW COMBINATIONS AND DISTRIBUTIONAL DATA
FOR PREVIOUSLY KNOWN SPECIES

Tydeus carya (Baker, 1968) new combination
(Figs. 38-47)

Paralorryia carya BAKER, 1968b.

ADULT FEMALE (Fig. 38). Length of body 345-357 μm ; width 212-224 μm . Dorsum of body

without reticulate pattern; dorsum with three pairs of lateral dimples formed by the striae, striae with transverse lobes (Fig. 47). Dorsal body setae strong and serrate except the trichobothrium, which is filiform and smooth.

Setal measurements : p_1 16 μm ; p_2 17 μm ; p_3 19 μm ; d_1 — d_5 subequal 18 μm ; h_2 16 μm ; l_1 and l_4 subequal 18 μm ; l_5 19 μm ; ps 17 μm ; s 42 μm .

All legs terminate in two claws and a hairy empodium with a claw (Figs 39-42). Solenidion on tarsus I long (9 μm) and slender. Solenidion on

tarsus II short (3 µm) ; seta *k* and tibia I forked (Figs 39-40).

Setal pattern of palp : 6(1)-2-2. Terminal eupathidium thick and elongate ; seta *d* simple and slender, seta *ba* very short (Fig. 43). Moveable digit of chelicera (Fig. 44) longer (30 µm) than palptarsus (20 µm).

Aggenital and genital setae setiform (Fig. 45).

ADULT MALE. Similar to female except genital area (Fig. 46).

COLLECTION DATA. 13 females and 15 males : Kullaberg (Loc. 4), *ex* bark of dead tree (*Pinus* sp.), collected April 14, 1992, leg. LUNDQVIST.

REMARKS. BAKER (1968b) described the male of *T. carya* from specimens collected on carya bark, Pennsylvania. The female is until now undescribed.

According to ANDRÉ's (1980) definition of the genus, *P. carya* should be moved to *Tydeus*.

Our specimens collected on bark in southern Sweden agree fairly well with BAKER's description with the exception of the length of some dorsal setae (especially *p₂* and *d₂*) and possibly the striation. However, since the type is not available for study, we do not have support to establish a new taxa for the Swedish material.

Tydeus funki (Baker, 1968) new combination (Figs. 48-56)

Lorryia funki Baker, 1968a.

ADULT FEMALE (redescription of holotype, Fig. 48) : Opisthosoma : reticulated ill-defined areas around the base of the dorsal setae, plus a few more areas, striation with square lobes ; cells of reticulated areas connected with square (X-shaped) cross-ties (Fig. 53). All dorsal setae plumose except the trichobothria, which are filiform and smooth. Setal measurements : see table 1. Ventral : Only five genital setae could be observed on one side, no genitals at all on the other side (Fig. 54). Epimeral formula as for the genus. Leg chaetotaxy as for the genus (Figs 49-52) ; dorsal setae on femur, genu and tibia plumose. Each apotele of the legs has two claws and an empodial hook, solenidion on tarsus

seta	female (holotype, USA)		male (Sweden)	
	left	right	left	right
<i>p₁</i>	16	—	12	13
<i>p₂</i>	21	21	15	15
<i>p₃</i>	20	22	16	14
<i>s</i>	58	57	44	46
<i>d₁</i>	22	24	21	—
<i>d₂</i>	23	23	23	—
<i>d₃</i>	23	23	18	20
<i>d₄</i>	25	24	19	20
<i>d₅</i>	23	22	13	—
<i>l₁</i>	22	23	18	16
<i>l₄</i>	23	23	20	18
<i>l₅</i>	21	22	19	20
<i>h₂</i>	18	18	12	13
<i>ps</i>	9	10	7	7
body length	231		196	
body width	149		126	

TABLE 1 : Measurements (in µm) for two specimens of *T. funki*. Left and right refer to how the specimens are orientated on the slide. Accuracy : ± 0.65 µm for setae, ± 3.16 µm for body measurements.

I (8 µm, Fig. 49) is almost three times longer than that on tarsus II (3 µm, fig. 50). Terminal setae on palptarsus difficult to see. Moveable digit of chelicera (14 µm) slightly shorter than palptarsus (16 µm).

No female was found in our samples from Sweden.

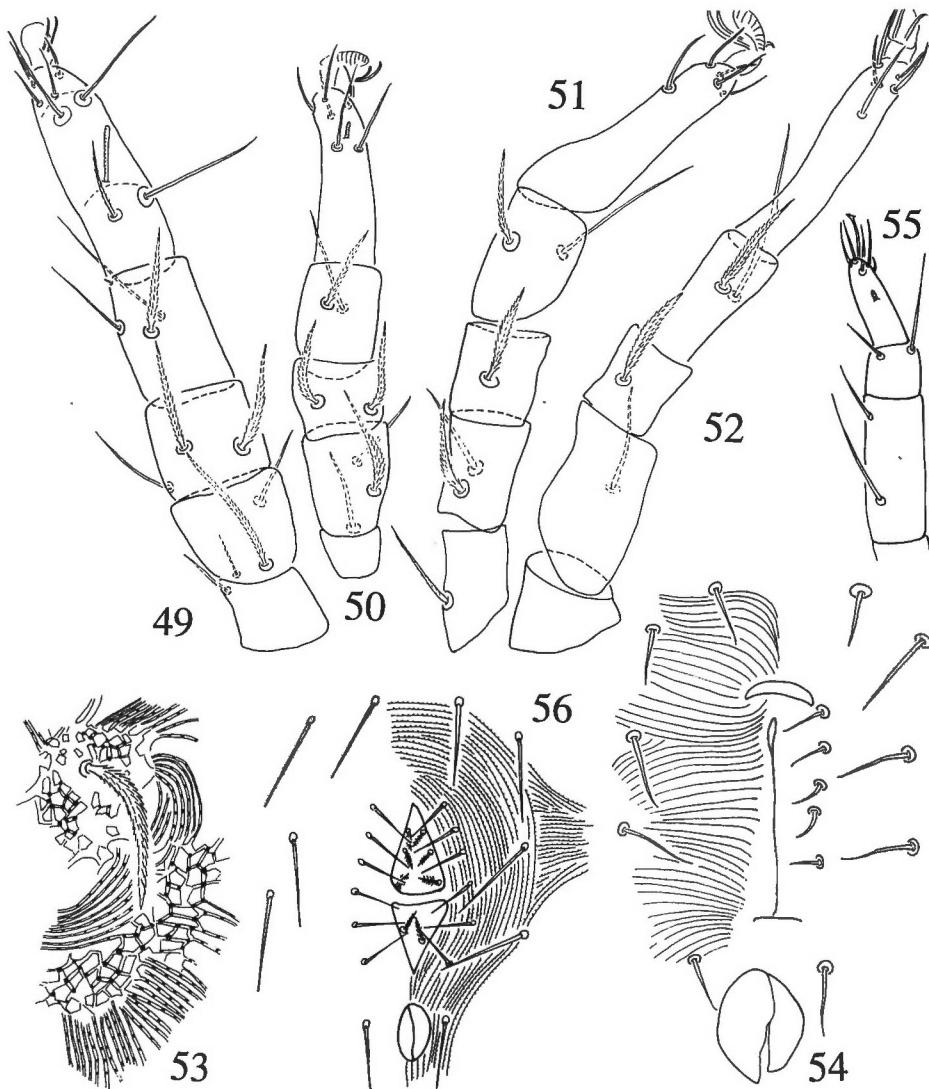
ADULT MALE (Swedish material). Similar to female except genital area (Fig. 56). Setal measurements : see table 1. Solenidion on tarsus I (7 µm) slender, seta *k* on tibia I simple. Setal pattern of palpus 6(1)-2-2. Terminal eupathidium bidentate distally ; seta *d* simple and slender ; seta *ba* short (Fig. 55). Moveable digit of chelicera slightly longer (15 µm) than palptarsus (12 µm).

Aggenital and genital setae setiform (Fig. 56).

TYPE DATA. Holotype, female, USNM no. 3193, *ex* debris in *Asyndesmus lewisi* (Gray) [= *Melanerpes lewisi*, Lewis' Woodpecker] nest, 2 miles S of Fort Collins, Colorado, March 7, 1959 ; leg. R.C. FUNK.

COLLECTING DATA (SWEDEN) : One male ; Dörröd (Loc. 2), *ex* tree hole, *Salix fragilis*, collected July 13, 1993, leg. LUNDQVIST

REMARKS. The male of this species has not been previously described.



FIGS 49-56 : *Tydeus funki* (Baker)

49-54 : Adult female (holotype). 49. — Leg I. 50. — Leg II. 51. — Leg III. 52. — Leg IV. 53. — Seta d_2 and striation pattern on dorsum. 54. — Genital region (as seen on holotype). 55-56 : Adult male. 55. — Palp. 56. — Genital region.

There are noteworthy differences between the two specimens from USA and Sweden, especially the length of some of the dorsal setae (which might be sex related) and the relative length of the moveable digit compared to the palptarsus. The

reticulated areas of the opisthosoma are not distinct and difficult to compare from one specimen to another. Considering the limited material we have at hand, these differences do not justify the naming of a new taxa based on the Swedish material.

Tydeus insignia (Livshitz), 1973 new combination

Paralorryia insignia Livshitz, 1973.

COLLECTION DATA : One female, and five tritonymphs from Norrekås (Loc. 6), *ex* moss and lichens on pine tree (*Pinus* sp.), collected July 20, 1993.

Tydeus jaculus, Kuznetzov, 1973

COLLECTION DATA : One male from Södra Åreda (Loc. 9), *ex* moss on soil surface.

Tydeus matus Livshitz, 1973

COLLECTION DATA : Two females and two males from Vomb (Loc. 10), *ex* Lichens, *Cladonia* sp., on ground, collected April 28, 1992.

Tydeus obstinatus Livshitz, 1973

COLLECTION DATA : One female from Alnarp (Loc. 1), *ex* bark of apple tree, collected May 11, 1992.

Tydeus polygonata (Kulczycki, 1992),
new combination

Lorryia polygonata Kulczycki, 1992.

COLLECTION DATA : Two females, one male, and five tritonymphs from Prästtorpasjön (Loc. 7), *ex* lichens on twigs on ground, collected April 14, 1992.

REMARKS : KULCZYCKI (1992) described *T. polygonata* from fruit orchards in the Ternopol region, Ukraine. Our specimens agree with his description, except for seta *d* on the palp, which is divided in our specimens as opposed to slender in KULCZYCKI's description.

Tydeus unguis Karg, 1975

COLLECTION DATA : Two females from Vomb (Loc. 10), *ex* Lichens on pine twigs on ground, collected April 28, 1992.

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