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TAXONOMY OF NON-TYDEUS GENERA OF THE MITE FAMILY TYDEIDAE (ACARI: PROSTIGMATA) FROM MOSS, LICHENS AND TREES IN SOUTHERN SWEDEN

by Faten MOMEN * and Lars LUNDQVIST **

SUMMARY: Five tydeid species, belonging to five genera, are illustrated and described as new to science. Neoapolorryia kristinae n. sp. and Paratydaeolus clavatus n. sp. were both collected from mosses and lichens on the soil-surface. Pseudolorrya striata n. sp. was found in mosses on the soil surface and on bark of tree trunks. Orthotydeus maculatus n. sp. was sampled from decaying wood in a tree-hole. Stenipedis quadrisetosus n. sp. was found on bark of trees. Another twelve species of eight genera other than Tydeus are here recorded for the first time in Sweden. Tydeus lambi Baker, 1970 is transferred to the genus Orthotydeus on grounds of leg chaetotaxy. Taxonomic comments are made on the genus Tydulosus Baker, 1965, which is considered to be a junior synonym of Tydeus. Notes on variability in the number of genital setae are given for Orthotydeus caudatus (Dugès, 1834) and Eotydeus mirabilis Kuznetzov, 1973.

Tydeid mites are often found in moss and lichens, and are characteristic species in some micro-habitats of tree-trunks (ANDRÉ, 1985a).

A series of samples from southern Sweden revealed twenty-four species of the tydeid genus Tydeus (MOMEN & LUNDQVIST, 1995 and unpubl.). In the same series of samples was also found a number of non-Tydeus species. Here we report on seventeen species of ten genera. Thus, the hitherto described fauna of Swedish tydeid mites now comprises forty-one species distributed in eleven genera and four subfamilies.

The terminology and, in most cases, the generic concepts followed are those of ANDRÉ (1980, 1981a, b, 1985c).

The mites were extracted in Berlese funnels and mounted individually on microscopic slides in a gum-chloral hydrate medium.

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Mites were prepared for scanning electron microscopy (SEM) by removing the cover-slip of microscopic slides in hot water. The mites were dehydrated through a series of increasing alcohol concentrations ending in absolute ethanol. They were dried in a critical-point dryer, attached to stubs with double-sided tape and sputter-coated with gold-palladium (40:60) in a Polaron 5400 high resolution sputter.

All measurements are given in microns (μm) and based on means when more than two specimens are available. The margin of error when measuring a curved body is indicated by ±.

Type specimens are deposited in the collection of the Zoological Museum, Lund University.

LOCALITIES

Mites were collected from the following localities:

1. Alnarp, Agricultural University, 6 km N of Malmö (N 55°32'; E 13°04').
2. Billebjer, 8 km E of Lund (N 55°42'; E13°19'). Rich deciduous forest on wet clay.
3. Borby tuvor, 21 km E of Ystad (N 55°27'; E 14°09'). Agricultural fields with few, scattered, stands of Ulmus glabra, Betula verrucosa, and hedges of Crataegus monogyna, Carpinus betulus and Sycinga vulgaris.
4. Dalby Norreskog, 6 km NE of Halmstad (N 56°33'; E 13°13'). Coniferous forest, with dense shrub-layer of Sphagnum spp.
5. Dörröd, 5 km WSW of Genarp (N 55°35'; E 13°29'). Old hollow trees, Salix fragilis, along a road.
7. Gudelsövskogen, 27 km E of Malmö (N 55°37'; E 13°26'). Dense planted coniferous forest, Picea abies of moderate (10–15 m) height; sparse field layer.
8. Häckeberga, 27 km E of Malmö (N55°35'; E 13°26'). Old, tall deciduous trees, Ailus glutinosus, Fagus sylvatica, Quercus robur, Ulmus glabra, close by a lake.
9. Kaffatorp, 17 km SW of Olofström (N 56°12'; E 14°18'). Abandoned apple orchards.
10. Lahibiagrottan, Kullaberg, 13 km N of Höganas (N 56°18'; E 12°27'). Sparse vegetation of Pinus sp., Prunus spinosa, Quercus robur, and Euonymus europaea on a stony south-facing slope of a cliff that juts out into the Kattegat sea.
11. Norrskås, 1.5 km S of 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, and S. intermedia.
12. Nyteboda, 11 km NW of Olofström (N 56°20'; E 14°23'). Old (ca 200 years) coniferous forest. Tall trees of Picea abies and Pinus sylvestris. A deep moss layer mixed with grasses.
13. Prästtorpaskanj, 7 km N of Hör (N 55°59'; E 13°34'). Deciduous forest. Tall trees of Quercus robur and Fagus sylvatica.
14. Ransvik, Kullaberg, 12 km N of Höganas (N 56°18'; E 12°29'). Deciduous forest. Tall trees of Quercus robur and Fagus sylvatica.
15. Sandhammaren, 24 km E of Ystad (N 55°23'; E 14°12'). Planted pine forest of moderate height (ca 10 m). Pinus sp. Betula sp., with a dense bush and field layer of Quercus robur, Calluna vulgaris, grasses and Sphagnum spp.
17. Skogaby, 30 km NE of Halmstad (N 56°33'; E 13°13'). Picea abies planted in 1966.
18. Slätteröd, 28 km ESE of Malmö (N 55°31'; E 13°25'). Tall (ca 15m) deciduous trees, Fagus sylvatica, Quercus robur, dense shrub-layer of Corylus avellana, Crataegus oxycantha, F. sylvatica, and Fraxinus excelsior.
20. Stensoffa, 16 km E of Lund (N 55°42'; E 13°26'). Mixed forest, bushes and trees of moderate height, Acer platanoides, Tilia cordata, Fagus sylvatica, Betula pubescens, and Quercus robur.
21. Vomb, 23 km E of Lund (N 55°41'; E 13°33'). Coniferous forest, with Pinus sylvestris of moderate height. Sparse field layer of grasses and, in patches, dense layer of lichens (Cladonia sp.).

SUBFAMILY TYTEINAE ANDRÉ, 1980

Genus Metalorria André, 1980

Type species: Lorryia armaghensis Baker, 1968 by original designation.
Prodorsum: recurved. Opisthosoma: dorsal chaetotaxy: 10 \( (l_2\) and \( h_1\) missing); genital organotaxy (Ad): \( 0 \) eugenital, \( 6 \) genital, and \( 4 \) aggenital setae, male with \( 4 \) eugenitals); poroidotaxy: 3.

Epimeral formula (Ad): \( 3 \) - \( 1 \) - \( 4 \) - \( 2 \); leg chaetotaxy (Ad): I \( 8 \) - \( 3 \) - \( 2 \) - \( 2 \) - \( 0 \), II \( 6 \) - \( 2 \) - \( 1 \) - \( 2 \) - \( 0 \), III \( 5 \) - \( 2 \) - \( 1 \) - \( 1 \) - \( 0 \), IV \( 5 \) - \( 2 \) - \( 1 \) - \( 1 \) - \( 0 \); solenidiotaxy: 2; palp \( 6 \) - \( 1 \) - \( 2 \) + \( \omega \) with a double eupathidium at the end of the palp.

**Metalorryia armaghensis** (Baker, 1968)

2 females, Sandhammaren (Loc. 15) and Skanörs ljung (Loc. 16); ex dead twigs on trees (Pinus sp.); 1 tritonymph, Vomb, (Loc. 21); ex lichens on pine-twigs on ground; 1 tritonymph, Stensoffa (Loc. 20), ex leaves of bush.

Baker’s (1968) description of the species was based on a tritonymph collected from apple-tree, Armagh County, Northern Ireland. Adult, nymphs and larvae have since been collected in Belgium (Andre, 1980, 1987).

Genus *Neoapolorryia* El-Bagoury & Momen, 1990

Type species: *N. aegyptica* El-Bagoury & Momen, 1990 by monotypy.

Prodorsum: recurved. Opisthosoma: dorsal chaetotaxy: 9 \( (l_2\) and \( h_3\) missing); genital organotaxy (Ad): \( 0 - 6 - 4 \); poroidotaxy: 3.

Epimeral formula (Ad): \( 3 - 1 - 4 - 2 \); leg chaetotaxy (Ad): I \( 8 - 3 - 2 - 2 - 0 \), II \( 6 - 1 - 1 - 2 - 0 \), III \( 5 - 1 - 0 - 1 - 0 \), IV \( 5 - 1 - 0 - 1 - 0 \), solenidiotaxy: 2; palp \( 6 - 1 - 2 \) + \( \omega \) with a double eupathidium at the tip of tarsus.

**Neoapolorryia kristinae** n. sp. (Figs. 1-10)

**ADULT FEMALE** (Fig. 1): Length of body 270 ± 3 \( \mu \)m; width 182 ± 6 \( \mu \)m; Opisthosoma: the reticulation of dorsum is conspicuous, consisting of irregular cells connected to each other by simple and Y-shaped cross-ties (Figs. 9-10). All dorsal setae plumose except for the trichobothrium, which is filiform and smooth.

Setal measurements: \( p_1 \) - \( p_3 \), \( d_4 \) and \( l_1 \) all subequal 15 \( \mu \)m, \( d_3 \) 13 \( \mu \)m, \( d_4 \), \( l_4 \) and \( l_5 \) subequal 15 \( \mu \)m, \( d_5 \) 12 \( \mu \)m, \( p_5 \) 10 \( \mu \)m, \( s \) 39 \( \mu \)m.

Genital setae typical for the genus (Fig. 7). Epimeral formula as for the genus.

Each apotele of the legs has two claws and an empodial hook (Figs. 2-5). Solenidion on tarsus I is short, and seta \( k \) on tibia I is simple (Fig. 2).

Terminal eupathidium of palp thick and bidentate distally; seta \( ba \) short, seta \( d \) forked (Fig. 6).

Moveable digit of chelicera (16 \( \mu \)m) slightly shorter than palpdtarsus (19 \( \mu \)m).

**ADULT MALE:** Similar to female except for the genital area. Anterior eugenital flap with three pairs of feathered setae, posterior eugenital flap with a single pair of setae (Fig. 8).

**TYPE DATA:** Holotype, female, slide no. 5888, 8 females, 2 males, 1 tritonymph paratypes: Falsterbo kanal (Loc. 6) August 22, 1993, ex moss and lichens on the soil surface. 1 female, 1 male, paratypes, same locality, ex mosses on the soil surface, leg. LUNDQVIST.

**ETYMOLOGY:** The specific trivial name is a noun in the genitive case, named after Miss Kristina DAHMÉN, who helped collect the types.

**REMARKS:** *Neoapolorryia kristinae* n. sp. is the second described species of the genus. It differs from the type species *N. aegyptica* El-Bagoury & Momen, 1990, by having plumose dorsal body setae, rather than serrate as in *N. aegyptica*. It can also be distinguished by having the terminal eupathidium on palpdtarsus bidentate distally (thick and rounded in *N. aegyptica*), and seta \( d \) on palp divided (simple in *N. aegyptica*). The dorsum of *N. kristinae* n. sp. is divided into 9 discrete areas as opposed to 13 in *N. aegyptica*.

**NOTES:** El-Bagoury & Momen (1990) described *N. aegyptica* from sandy soil with roots of tomato plants, *Lycopersicum esculentum*, Tahrir Province, Egypt, and from sandy soil with roots of the egg plant, *Solamum melongena*, South Sinai, Egypt. The new species, *N. kristinae* n. sp. was also found on sandy soil, close to the shore of the Baltic Sea. *N.*
**FIGS. 1-9: Neapolorrhyia kristinae** n. sp., adult female (1-7, 9) and male (8)


*kristinae* n. sp. is the only species of the genus in which the male is known.

**Genus Orthotydeus André, 1980**

Type species: *Tydeus goetzi* Schruft, 1972 by original designation.

Prodorsum: recurved. Opisthosoma: dorsal chaetotaxy: 10 \((l_{2} \text{ and } h_{1} \text{ missing)}\); genital organotaxy (Ad): \((0 \text{ (female), } 4 \text{ (male) - } 6 - 4)\); poroidotaxy: 3. Epimeral formula (Ad): \((3 - 1 - 4 - 2)\); Leg chaetotaxy: I \((8 - 4 - 3 - 3 - 1)\), II \((6 - 2 - 2 - 2 - 0)\), III \((5 - 2 - 1 - 1 - 1)\), IV \((5 - 2 - 1 - 1 - 0)\); solenidiotaxy: 2; palp \((6 - 2 - 2) + \infty\) with a double eupathidium at the tip of tarsus.

**Orthotydeus calabrus** Castagnoli, 1984

2 females and 2 males from Alnarp (Loc. 1), ex bark of apple tree.
Fig. 10: *Neoapolorryia kristinae* n. sp., SEM photograph, adult female. A: Dorsal view. B: Detail of A, with seta $d_1$. 
CASTAGNOLI (1984) collected *O. calabrus* from olive trees in Italy.

**Orthotydeus caudatus** (Dugès) sensu Castagnoli, 1984

*Tetranychus caudatus* Dugès, 1834.
*Tydeus croceus* (L.), Oudemans, 1914.
*Tydeus spathulatus* Oudemans, 1928.
*Brachytydeus caudatus* (Duges); Thor 1933.
*Tydeus* (*Tydeus*) *caudatus* (Duges); Baker, 1970.

The species was found on leaves; 2 females from *Alnus glutinosa* at Billebjer (Loc. 2), 1 tritonymph on *Prunus padus* at Dalby Norreskog (Loc. 4), 5 tritonymphs on *Acer platanoides*, *Pyrus malus* and *Tussilago farfara* at Stensøfa (Loc. 20), 5 tritonymphs on *Fraxinus excelsior* and *Pteridium aquilinum* at Ransvik (Loc. 14), 1 female and 1 tritonymph, ex tree hole, *Salix fragilis*, at Dorrod (Loc. 5).

The species is widespread on different plants in temperate areas of the world (Baker, 1970), i.e. olive, walnut and mulberry trees in Italy (Castagnoli, 1984), and apple trees in Dublin (Momen, 1987). It has also been collected from stored wheat at Treheme, Manitoba (Momen unpublished), and from soil in Egypt (El-Bagoury, 1978).

Kulczycki (1992) recorded the species from Ukraine.

**NOTES:** We observed irregularity in the number of genital setae in one female (6 ge on one side, 5 on the other). Similar anomalies have been reported by Kazierski (1989, 1990) in *Lorryia inconstans* Kazierski, 1989 and *Eotydeus mirabilis* Kuznetzov, 1973. Momen & Lundqvist (1995) reported different numbers of dorsal setae *ps* in the species *Tydeus maga* (Kuznetzov, 1973).

**Orthotydeus kochi** (Oudemans), sensu Castagnoli, 1984

*Tydeus kochi* Oudemans, 1928.
*Tydeus* (*Tydeus*) *kochi* Oudemans; Baker, 1970.

6 males were found on leaves from *Rubus idaeus* and *Pteridium aquilinum*, and from forest litter at Ransvik, Kullaberg (Loc. 14); 1 male from *Juniperus communis* at Lahibiagrottan, Kullaberg (Loc. 10); 1 female, 2 males from whole plants (including roots) of *Fragaria* *X ananassa* at Alnarp (Loc. 1); 3 females, 1 male from *Fragaria* *X ananassa* at Borby tuvor (Loc. 3); 2 females, 1 tritonymph from moss and lichens on the soil surface at Falsterbo kanal (Loc. 6).

This species has a world-wide distribution and has been found in most climatic zones (Baker, 1970). It has been collected from Italy (Castagnoli, 1984), Dublin (Momen, 1987), Poland (Kazierski, 1990), and Ukraine (Kulczycki, 1992).

**Orthotydeus maculatus** n. sp. (Figs. 11–19)

**ADULT FEMALE** (Fig. 11): Length of body 257 ± 3 µm; width 185 ± 3 µm. Opisthosoma: striae of dorsum forming a basket-weave pattern over the entire dorsum (Fig. 12), but covers only a small posterior marginal section of venter near the setae *ps* (Fig. 18). Under SEM the pattern turns out to be formed by numerous papillae (Fig. 19, tritonymph). Dorsal body setae *p*₁–*p*₃ and *d*₁, *d*₂, *l*₁ are slightly lanceolate and serrate; trichobothrium filiform; *d*₃, *d*₄, *l*₄, *l*₂, *h*₂ are spatulate distally and serrate. Setal measurements: *p*₁ 18 ± 1 µm, *p*₂ and *p*₃ subequal 20 ± 35 µm, *d*₁ and *d*₂ subequal 13 µm, *d*₃, *d*₄ and *l*₅ subequal 11 µm, *d*₅ and *l*₄ subequal 15 µm, *l*₁ 19 µm, *h*₂ and *ps* subequal 14 µm.

Genital setae (Fig. 18) and leg chaetotaxy (Figs. 14–17) are typical for the genus. Each apotele has two claws and an empodium. Solenidion on tarsus I short, seta *k* on tibia I divided (Fig. 14).

Setal pattern of palp as for the genus. Terminal eupathidium bidentate, and seta *d* simple (Fig. 13).

Moveable digit of chelicera as long as palpatarsus (15 µm).

**ADULT MALE:** Unknown.

**TYPE DATA:** Holotype, female, slide no. 5812, 1 tritonymph paratype: Dörröd (Loc. 5), ex decaying wood in a tree-hole, *Salix fragilis*, leg. Lundqvist.
FIGS. 11-18: Orthotydeus maculatus n. sp., adult female.

Fig. 19: *Orthotydeus maculatus* n. sp., SEM photograph, tritonymph. A: Dorsal view. B: Details of A, with setae $p_1$-$p_6$, trichobothrium, and $d_1$. 
ETYMOLOGY: The specific trivial name refers to the spotted (macula Lat. = spot) pattern of the dorsum.

REMARKS: Orthotydeus maculatus n. sp. is characterised by the striae forming a basket-weave pattern over the entire dorsum. This pattern separates the species from all other Orthotydeus species known so far.

BAKER (1965) created the genus Tydulosus for the two species Tydeus granulosus Canestrini, 1886 (type species by original designation) and Tydulosus lolitae Baker, 1965. Later KUZNETZOV & LIVSHITZ (1973) described and included another two species in the genus, viz. T. damousus Kuznetzov, 1973 and T. visendus Kuznetzov, 1973. All four species have the same type of dorsal sculpturing, called basket-weave pattern (BAKER, 1965), similar to that of Orthotydeus maculatus n. sp.

ANDRÉ (1980) synonymized the genus Tydulosus with Tydeus since species of the two genera have identical leg chaetotaxy. The species described by us has one seta less on femur II and III, respectively, compared to species of Tydeus sensu ANDRÉ, 1980.

The adult complement of setae on leg segments of mites of the family Tydeidae varies greatly (ANDRÉ, 1980). The lowest total number of setae on the legs, 2 × 37, is found in the genus Apolorryia ANDRÉ, 1980 and the highest, 2 × 76, in the genus Pseudotydeus Baker & Delfinado, 1974. Intergeneric variation is found in all leg segments among the 49 valid genera of the family (ANDRÉ, 1980, 1985b, c; SCHIESS, 1981; EL-BAGOURY & ABOU-AWAD, 1986; EL-BAGOURY & MOMEN, 1990; NOTI & ANDRÉ, 1990; and MOMEN & SINHA, 1991). The adult complement of all setae on trochanter I – IV is either 0 or 1, and on tibia III and IV the number varies between 1 and 2. In all other leg segments the adult complement varies between genera with 3 up to 6 setae. On femur II and III, the adult complement varies between 1 – 4 and 1 – 3, respectively. There are 14 genera where the adults have 1 seta on femur III (as in O. maculatus n. sp.) and 17 genera with 2 setae (as in the other species with basket-weave pattern). Seven genera have 2 setae on femur II (all of which also have 1 seta on femur III) and 21 have 3 setae.

Considering that the number of setae on femur II and III varies greatly between genera, and that the number of setae on each leg segment can vary unilaterally, at least in two species (MOMEN & LUNDQVIST, 1993), it is likely that the loss of one or even two particular setae is not an unique event during the evolution of modern tydeid mites. The duplicated loss of particular leg setae is probably more likely, than that the basket-weave pattern would appear twice (provided of course that the basket-weave pattern is a true homology, and not just a superficial similarity; something that has to be verified). If homologous the basket-weave pattern could be regarded as a synapomorphy indicating a monophyletic origin of the five species mentioned above.

However, for the sake of taxonomic stability we have decided, for the time being, to assign our species to the genus Orthotydeus, rather than reviving and redefining BAKER’s genus Tydulosus.

Orthotydeus lambi (Baker), new combination

Tydeus (Tydeus) lambi BAKER, 1970.

2 tritonymphs from leaves of Fraxinus excelsior and Pteridium aquilinum at Ransvik, Kullaberg (Loc. 14).


Genus Pseudolorryia Kazmierski, 1989

Type species: P. edwardbakeri Kazmierski, 1989, by original designation.

Prodorsum: recurved. Opisthosoma: dorsal chaetotaxy: 10 (l2 and h1 missing); genital organotaxy (Ad): (0,4 - 6 - 4); poroidotaxy: 3.

Epimeral formula (Ad): (3 - 1 - 4 - 2); leg chaetotaxy (Ad): I (8 - 4 - 3 - 3 - 1), II (6 - 2 - 2 - 3 - 0), III (5 - 2 - 1 - 1 - 1), IV (5 - 2 - 1 - 1 - 0); solenidiotaxy: 2; palp (6 - 2 - 2) + w with a double eupathidium at the tip of tarsus.
**Pseudolorryia striatus** n. sp.  
(Figs. 20–28)

**ADULT FEMALE** (Fig. 20): Length of body 315 ± 5 μm; width 230 ± 6 μm. Dorsal body striae with lobes (Fig. 21). Dorsal body setae simple and smooth; trichobothrium filiform.

Setal measurements, see table 1.

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**TABLE 1:** Setal measurements (μm) of 4 females and 4 males of *Pseudolorryia striatus* n. sp. from Sweden. If more than two observations were made, minimum (min.), maximum (max.) and mean (X) values are given; n = number of observations.

Each apotele with two claws and an empodial hook (Figs. 23–26). Solenidion on tarsus I slender; seta k on tibia I divided (Fig. 23).

Setal pattern of palpus: 6(1) - 2 - 2. Terminal eupathidium thick and rounded distally; seta d slender (Fig. 22). Moveable digit of chelicera (41 μm), longer than palptarsus (14 μm).

Aggential and genital setae setiform (Fig. 27).

**ADULT MALE:** Similar to female except for genital area. Setae on eugenital flaps feathered (Fig. 28).

**TYPE DATA:** Holotype, female, slide no. 5813, Gödeslövsskogen (Loc. 7), ex moss on soil surface, 1 male and 2 tritonymphs paratypes, Stensoffa (Loc. 20), ex bark of apple tree, 3 females, 3 males paratypes, Dörröd (Loc. 5), ex bark of the trunk of *Salix fragilis*, leg. LUNDQUIST.

**ETYMOLOGY:** The specific trivial name *striatus* (Lat. = striated) indicates that the species lacks reticulated elements on the dorsum.

**REMARKS:** The genus *Pseudolorryia* includes six previously known species: *Lorryia taurica* Kuznetsov, 1971, *Paralorryia andreae* Ueckermann & Meyer, 1979, *Pseudolorryia edwardbakeri* Kazmierski, 1989, *Melanotydeus chapultepecensis* Baker (1943) 1944, *Paralorryia nikitensis* Livshitz, 1973, and *Tydeus spinea* Livshitz, 1973. The first three species have at least reticulated areas on the dorsum, whereas the latter ones lacks reticulation. The new species, *Pseudolorryia striatus* n. sp. and *P. spinea* (Livshitz) are the only two among the striated species that have transverse striation between the setae *d2*. The dorsal setae of *P. striatus* n. sp. are all simple, and *lJ* and *hJ* are longer than the rest of the other dorsal setae as opposed to the other three striated species.

The type of striation and the length of seta *lJ* in *P. striatus* match those of *Paralorryia bipilis* (André, 1984) (new combination, see KAZMIERSKI, 1989 for synonymy.). *P. striatus* n. sp. has setae *hJ* long and the moveable digit of chelicera three times longer than the palptarsus. Whether or not these characters differ from *P. bipilis* is not known, since ANDRÉ (1984) did not mention these characters in his description, and type material of *P. bipilis* has not been to our disposal.

**Genus Eotydeus** Kuznetsov, 1973

Type species: *Tydeus (Eotydeus) mirabilis* Kuznetsov, 1973 by original designation.

Prodorsum: recurved. Opisthosome: dorsal chaetotaxy: 10 (*l2* and *h1* missing); genital organotaxy Ad (female): (0 - 2 - 4); poroidotaxy: 3.

Epinemeral formula (Ad): (3 - 1 - 4 - 2); leg chaetotaxy (Ad): I (8 - 4 - 3 - 3 - 1), II (6 - 2 - 2 - 3 - 0), III (5 - 2 - 1 - 1 - 1), IV (5 - 2 - 1 - 3 - 0); solenidiotaxy: 2; palp (6 - 2 - 2) + ω with a double eupathidium at the tip of tarsus.

**Eotydeus mirabilis** Kuznetsov, 1973

4 females from moss on the soil surface at Gödeslövsskogen (Loc. 7), 2 females from moss on tree-stump at Stenshuvud (Loc. 19), 1 female from moss on tree-trunk at Slätteröd (Loc. 18).
NOTES: *Eotydeus mirabilis* Kuznetzov has 2 *g* and 4 *ag* setae (Kuznetzov, 1973). ANDRÉ’s (1980) diagnosis of the genus *Eotydeus* was based on 1 female only, with the genital organotaxy (0 - 2 - 3).

2 specimens in our collection of *E. mirabilis*, have 3 *g* and 3 *ag* setae on one side of the body, and 2 *g* and 4 *ag* on the other. A similar asymmetry in the species has been observed by KAZMIERSKI (1989).

**SUBFAMILY MEYERELLINAE ANDRÉ, 1980**

Genus *Pseudotriophtydeus* André, 1980

Type species: *Pseudotriophtydeus vegei* André, 1980 by original designation.

*Pseudotriophtydeus vegei* André, 1980

5 females, 1 male from Stensoffa (Loc. 20) on bark of apple tree; 7 males from Lahibiagrottan, Kullaberg (Loc. 10), on bark of *Pinus* sp. and from lichens on *Prunus spinosa*; 1 female, 1 male from...
Alnarp (Loc. 1) on bark of apple trees; 2 males from Nyteboda (Loc. 12) on lichens on twigs; 1 female from Vomb (Loc. 21) on lichens on trunk of pine trees.

*Pseudotriophtydeus vegei* was described by André (1980) from Belgium and sampled on the bark of different trees. It is known also from Dublin on bark of apple trees (MOMEN, 1987), and from Poland (KAZMIERSKI, 1990).

**SUBFAMILY TRIOPHTYDEINAE André, 1980**

**Genus Stenipedis** n. gen.

Type species: *Stenipedis quadrisetosus* n. sp.

Prodorsum: recurved; 3 eyes. Opisthosoma: dorsal chaetotaxy: 11 (l₂ missing); genital organotaxy (Ad): (2, 6 - 6 or 4 - 5 or 4); poroidotaxy: 4.

Epimeral formula (Ad): (3 - 1 - 3 - 3); leg chaetotaxy (Ad): I (10 - 5 or 4 - 3 - 5 - 1), II (6 - 2 - 2 - 4 - 1), III (5 - 1 - 2 - 1 - 1), IV (5 - 2 - 2 - 1 - 2); femur IV divided (Ad); solenidiotaxy: 2; palp (6 - 2 - 2) + ω with a triple eupathidium at the tip of tarsus.

**Remarks:** The new genus is close to the genus *Triophtydeus* Thor, but can be separated by the following combination of characters: 4 setae on tibia I as opposed to 5 in *Triophtydeus*, and 4 genital and aggenital setae, whereas *Triophtydeus* has 6 and 5 or 4 respectively.

**Etymology:** The genus *Stenipedis* is named after Dr Sten Rundgren, who has been a great help to us by reading numerous drafts to several manuscripts, and who thinks our illustrations look like dance-charts (pedis Lat. = feet). The name is masculine in gender.

*Stenipedis quadrisetosus* n. sp.

(Figs. 29–35)

**Adult female** (Fig. 29): Length of body (excluding gnathosoma) 188 ± 3 μm; width 90 ± 3 μm.

Dorsal body stria longitudinal on prodorsum, transverse on mid-opisthosoma, stria with lobes. Opisthosoma: dorsal body setae serrate; setal measurements: p₁ and p₂ subequal 6 μm, p₃ 9 μm, s 23 μm, d₁ and d₂ subequal 6 μm, d₃ 8 μm, d₄ 10 μm, d₅ 18 μm, h₁ 15 μm, h₂ 11 μm, l₁ 12 μm, l₄ 15 μm, l₅ 22 μm, p₅ 6 μm.

Aggenital and genital setae serrate (Fig. 35).

Epimeral formula and leg chaetotaxy as for the genus (Figs. 31–34). Solenidion I longer than solenidion II; seta k on tibia I forked.

Gnathosoma visible in dorsal view; setal pattern of palpus as for the genus, seta v forked (Fig. 30).

**Adult male:** Unknown.

**Type data:** Holotype (slide no. 5614), female; 2 females, paratypes, Prästtorpsjön (Loc. 13), ex bark of fallen tree on ground, leg. LUNDQVIST; 5 females, paratypes, Kaffatorp (Loc. 9), ex bark of apple tree, leg. LUNDQVIST; 1 female, paratype, Häckeberga (Loc. 8), ex moss and bark of *Quercus robur*, leg. LUNDQVIST.

**Etymology:** The specific name is an adjective, derived from *quattuor* (Lat. = four) referring to the triplet combination of four setae on the mite.

**Remarks:** The new species is unique in its genus. It superficially resembles *Triophtydeus craveni* Wood, 1965 but can be separated from this species on the generic level.

**Genus Triophtydeus** Thor, 1932

Type species: *Tydeus triophthalmus* Oudemans, 1929 by original designation.

Prodorsum: recurved; 3 eyes. Opisthosoma: dorsal chaetotaxy: 11 (l₂ missing); genital organotaxy (Ad): (2, 6 - 6 or 5 or 4); poroidotaxy: 4.

Epimeral formula (Ad): (3 - 1 - 3 - 3); leg chaetotaxy (Ad): I(10 - 5 - 3 - 5 - 1), II (6 - 2 - 2 - 4 - 1), III (5 - 1 - 2 - 1 - 1), IV (5 - 2 - 2 - 1 - 2); femur IV divided (Ad); solenidiotaxy: 2; palp (6 - 2 - 2) + ω with a triple eupathidium at the tip of tarsus.
Triophydeus triophthalmus (Oudemans, 1929)

T. lebruni André, 1980 (André, 1985c).

10 specimens (females and males) from Picea abies at Skogaby (Loc. 17).

Notes: This species is known from Germany (Thor, 1933), and Belgium (?) (André, 1980).

Triophydeus craveni Wood, 1965

2 females from leaves of Acer platanoides at Stensoffa (Loc. 20).

Notes: Wood (1965) described this species from mosses (Camptothecium sericeum and Tortella tortuosa) in the U.K.

Subfamily Tydaolinæ André, 1980

Genus Paratydaeolus André, 1980

Type species: Paratydaeolus lukoschusi André, 1980 by original designation.

Paratydaeolus clavatus n. sp.

(Figs. 36–43)

Adult female (Fig. 36): Length of body (excluding gnathosoma) 173 ± 3 µm; width 81 ± 1 µm.

Opisthosoma: Body setae strongly serrate except for trichobothrium, which is clavate with many small bristles (Fig. 37); setal measurements: $p_1$ 17 µm; $p_2$ 6 µm; $p_3$ 19 µm; $s$ 30 µm; $d_1$ and $d_2$ subequal 13 µm; $d_3$ and $d_4$ subequal 17 µm; $d_5$ 20 µm; $h_1$ 17 µm; $h_2$ 19 µm; $l_1$ 17 µm; $l_4$ and $l_5$ subequal 23 µm; $ps$ 8 µm.
Four pairs of aggenital and three pairs of genital setae (Fig. 43).

Epimeral formula (3 - 1 - 4 - 3). Leg setal patterns as for the genus (Figs. 39-42):

Solenidion I slender, longer than solenidion II, seta k on tibia I feathered (Figs. 39-40).

Gnathosoma visible in dorsal view; setal pattern of palp as for the genus (Fig. 38).

**ADULT MALE:** unknown.

**TYPE DATA:** Holotype (slide no. 5445), female, 1 female paratype, Nyteboda, Loc. (12), ex moss on soil surface, leg. LUNDEQVIST.

**ETYMOLOGY:** The trivial name is an adjective. The world is Latin for club-shaped and refers to the shape of the trichobothrium.

**REMARKS:** Seven species of Paratydaeolus have previously been described. *P. clavatus* n. sp. and *P. loadmani* (Wood, 1965) are distinguished from the rest by having strong and pilose dorsal body setae. The new species can be separated from *P. loadmani* by having the trichobothrium clavate rather than globose as in *P. loadmani*, the seta k on tibia I is feathered as opposed to slender in *P. loadmani*, and the solenidia *ω*₁ and *ω*₂ are slender rather than club-like. Further, setae *p₃*, *l₄* and *l₂* are twice as long as those of *P. loadmani*. 
Paratydaeolus lukoschi André, 1980

2 females from Pråsttorpåsjon (Loc. 13) from lichens on twigs.

Genus Tydaeolus Berlese, 1910, sensu Baker 1965

Type species: Tydaeus atomus Berlese, 1908 by original designation.

Prodorsum: procurved; trichobothrium (sensilla) club-like. Opisthosoma: dorsal chaetotaxy: 11 (I2 missing); genital organotaxy (Ad): (0,? - 2 - 4); poroidotaxy: 4.

Epimeral formula (Ad): (3 - 1 - 4 - 3); leg chaetotaxy (Ad): I (11 - 5 - 4 - 6 - 1), II (8 - 2 - 4 - 4 - 1), III (7 - 2 - 2 - 3 - 1), IV (7 - 2 - 1 - 2 - 0); solenidiotaxy: 3; palp (? - 7 - 2) + ω with a triple eupathidium at the tip of tarsus.

Tydaeolus cf. tenuiclaviger (Thor, 1931) (Figs. 49–53)

ADULT FEMALE (Fig. 44): Length of body (excluding gnathosoma) 176 ± 6 μm; width 82 ± 3 μm. Dorsal body setae simple, smooth and sharp distally (Fig. 45) except for trichobothrium (Figs. 46–47) which is clavate with many small bristles (in most specimens the tip is pointed, Fig. 46, but sometimes rounded, Fig. 47). Setal measurements: p1 12 μm, p2 7 μm, p3 20 μm, s 24 μm, d1 and d2 subequal 9 μm, d3 11 μm, d4 13 μm, d5 15 μm, l1 16 μm, l2 19 μm, l3 22 μm, h1 11 μm, h2 14 μm, ps 9 μm.

Genital organotaxy (Fig. 53), epimeral formula, and leg chaetotaxy (Figs. 49–52) as for the genus. Solenidion I and II club-like, seta k on tibia I simple (Figs. 49–50). Setal pattern of palp (3 - 2 - 2) + ω (Fig. 48).

Collection data: 6 females from Nyteboda (Loc. 12), ex moss on soil surface; 2 females from Norrekås (Loc. 11), ex moss and lichen on tree, Pinus sp.

Remarks: The type of T. atomus Berlese was studied by Baker (1965). Obviously the type was in bad condition, and many details were impossible to discern. In addition to the type, three other taxa have been assigned to the genus Tydaeolus (André, 1980). Of these T. sphaeroclaviger Kuznetzov, 1972, has serrate dorsal body setae (Kutznetzov & Livshitz, 1972, their figure 2,5 [erroneously marked 3,5]), the other two species both have simple, pointed setae. Baker (1965) was able to identify T. tenuiclaviger (Thor) from T. frequens (Grandjean, 1938) (called T. frequans by Baker) by differences in the number of body divisions; T. tenuiclaviger having the “body divided into three distinct regions by transverse sutures”, a character not mentioned by Thor (1931, 1933). Baker (1965) also mentioned differences in leg chaetotaxy between the two species, T. tenuiclaviger having four setae on tibia I as opposed to 5 in T. frequens.

In his description, Thor (1931) pointed out that the trichobothrium of T. tenuiclaviger is
club-like, “thin, longish (elliptic), pointed...” (our translation). Grandjean (1938) depicted a much more rounded, but still elliptic, trichobothrium (his figure 3 A), as compared to the one Thor described.

In our material from South Sweden, we have six specimens with pointed trichobothrium (Fig. 46) and two specimens with rounded tip (Fig. 47).

We conclude that the specimens we have all represent one species, with intraspecific variation in the shape of the trichobothrium, which might be the same as Thor’s species T. tenuiclaviger. Thor’s type material is no longer available for study. Thus, we cannot establish if and, if so, how T. tenuiclaviger and T. frequens differ. The species called T. tenuiclaviger (from Mexico) by Baker (1965) is probably another species.

Kuznetzov & Livshitz (1972) reported five setae on the palp tarsus in the genus. André (1980), however, observed only two (plus solenidion). In our material there are three setae on the palp tarsus plus a solenidion.

Genus Microtydeus Thor, 1931 sensu Baker, 1965

Type species: Microtydeus constans Thor, 1931 by original designation.


Epimeral formula (Ad): (3 - 1 - 4 - 3); leg chaetotaxy (Ad): I (11 - 5 - 4 - 6 - 1), II (8 - 2 - 4 - 4 - 1), III (7 - 2 - 1 - 3 - 1), IV (7 - 2 - 1 - 2 - 0); solenidotaxy: 3; palp (6 - 2 - 2) + ω with vestigial and a triple eupathidium at the tip of tarsus.

Microtydeus bellus Livshitz & Kuznetzov, 1973

4 females, Nyteboda (Loc. 12) from moss on the soil surface.

Notes: M. bellus was described from Crimea, on cornelian cherries (Livshitz & Kuznetzov, 1973).

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