

Notes on a small collection of mites (Acari), Phoretic on Diptera, mainly Phoridae, from the British Isles.

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Summary

A small collection of mites (Acari) phoretic on Diptera, mainly Phoridae, from the British Isles, is studied. It comprises six species of Mesostigmata, among which a new species, *Macrocheles disneyi* (Macrochelidae) from a Phoridae, *Diplonevra nitidula* (MEIGEN), five species of Prostigmata and one species of Astigmata.

Keys words : Mites (Acari). Phoretic on Diptera. British Isles.

Résumé

Une petite collection d'acariens (Acari) phorétiques sur des Diptères de Grande-Bretagne, principalement des Phoridae, est étudiée. Elle comprend six espèces de Mesostigmata, dont une nouvelle, *Macrocheles disneyi* (Macrochelidae) trouvée sur un Phoridae, *Diplonevra nitidula* (MEIGEN), cinq espèces de Prostigmata et une espèce d'Astigmata.

Mots clé : Acariens (Acari). Phorétiques sur Diptera. Grande Bretagne.

Introduction

Most of the mites which are related herein were collected by Dr Henry Disney, from several localities of England and Scotland.

This collection includes a new species of *Macrocheles*, *M. disneyi* (Macrochelidae). This species is represented by 15 specimens, all found on *Diplonevra nitidula* (MEIGEN) (Phoridae), except one which was collected from an unidentified Phoridae.

The flies bearing this mite were caught in eight localities. Most of these infested flies were found in Malham Tarn (Malham County). Not more than one mite was found per fly except in one case where one fly carried two mites.

All the measurements used here are in micrometers.

Systematic account

MESOSTIGMATA

FAMILY MACROCHELIDAE

Macrocheles disneyi nov. spec.

This species is named for Dr *Henry Disney* who collected most of the mites of the present collection.

Female (holotype) (fig. 1-5) :

Length and width of idiosoma 918 x 660. Dorsal shield 885 long and 600 wide (maximum width); length and width in 5 paratypes : 930 x 612, 895 x 600, 876 x 620, 870 x 582, 850 x 551. Dorsal shield broadly rounded posteriorly with a polygonal reticular network made of either dark lines and small punctations or only by the latter. It bears 28 pairs of setae 15 to 39 long; all these setae are bare except *jl*, *J5*, *Z5* and *S5* which are barbed. There are 21 pairs of idiosomal pores (fig. 1). Soft cuticle of dorsum with 8 pairs of short bare setae 18-25 long.

Gnathotectum with 3 forked elements, 2 laterals and one central, the base is finely serrate (fig. 4).

Venter (figs 2, 5).

The 3 shields are well sclerotized. Sternal shield 165 long (in midline) and 195 wide (at level of the 2d pair of sternal setae), with a characteristic pattern of small punctations and devoid of true striations or *lineae* (*linea media transversa*, *linea arcuata*, *lineae oblique posteriores*). The 3 pairs of sternal setae are bare and 36-40 long. Genital shield wider (240) than long (165) with a pair of setae 40 long and a network of punctations. Metasternal setae on small platelets longer than wide. Ventrianal shield longer (390) than wide (345, including the cribrum) with a well-developed network; the 3 pairs of preanal setae are 27-33 long; the postanal seta is shorter (21) than the paraanal setae (42 long). Peritremes

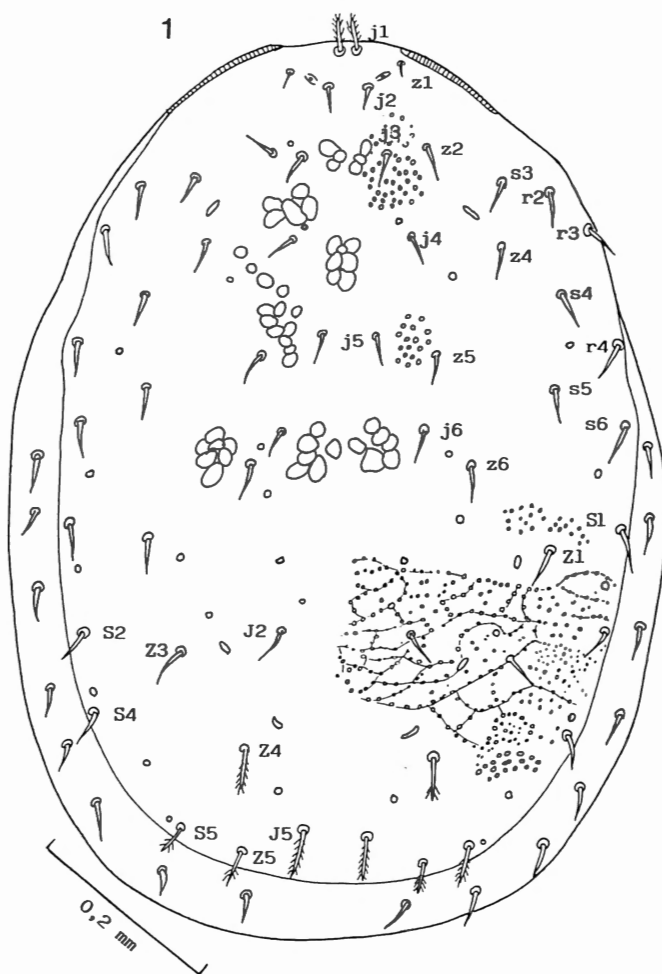


Fig. 1 – *Macrocheles disneyi* n.sp. Female in dorsal view.

typical for the genus. Gnathosoma : corniculi relatively narrow and long.

Chelicerae :

The two digits with 3 teeth; a short pilus dentilis on the fixed digit; arthrodial membrane with a brush longer than half the length of movable digit. (fig. 3). Inseminating organ of the laelapine type (Fain, 1963).

Host and locality :

Most of the mites were attached below the abdomen base of the fly.

The names of the counties are between brackets.

Holotype female from *Diplonevra nitidula* (MEIGEN) (female), Phoridae, from Kitchen Garden Wood, Malham Tarn (Malham), 26 July 1983).

Paratypes female : 13 paratypes, all from the same fly as the holotype but from the following localities : Tarn Close Malham Tarn, male fly, 24/25 July 1983 : 1 paratype; Tarn House, Lawn, Malham Tarn, female fly, 26/27 July 1983 : 1 paratype; Highscoll Wood, Malham Tarn, 3 female flies, July and August 1983 : 3 paratypes; Horseshoe Wood, 1 female fly, 22 July 1976 : 1 para-

type; Hawthorn Dene (Durham), female fly (coll. Bruce), 28 September 1980 : 1 paratype; E. Shoreline, Woodslitter (Malham), female fly, 25 July 1975 : 1 paratype; Cambridge 38 Metcalfe Road, 2 female flies, 1/8 October 1985 : 2 paratypes, DA Sheffard, Stoneleigh, Warwicks (Warwickshire), female fly, 6/25 June 1983 (Coll. Malaise) : 1 paratype; N. Yorks Wood, female fly, August 1990, 1 paratype; R.A.F. Cottesmore, Leics (Leicestershire), female fly, 3/10 August 1981 : 1 paratype. Another paratype female was found from an unidentified Phoridae from Woodseavers Scrub (Staffordshire), 22 June 1989 (Coll. M.C. Brian).

Holotype and 2 paratypes in the British Museum (Nat. Hist.). Other paratypes in the Institut royal des Sciences naturelles de Belgique, Bruxelles.

Remarks :

According to Hyatt and Emberson (1988), the genus *Macrocheles* LATREILLE is represented in the British Isles by 23 species. The new species which is described herein presents the following main characters : Scutal setae short, straight and bare except *j1*, *J5*, *Z4*, *Z5* and *S5* which are barbed; absence of postgenital platelets; ventrianal shield strongly developed, slightly longer than wide and bearing 3 pairs of preanal setae; sternal shield without *linea arcuata*, and *linea media transversa* but with a pattern of punctations. This combination of characters separate *M. disneyi* from all the other species recorded from England and other countries.

At first aspect this species could be confused with *M. matrius* (HULL), however in this species all the dorsal setae are barbed, the sternal shield presents a pattern of lines and the outer margins of the lateral elements of the gnathotectum are serrate. It differs from *M. robustulus* (BERLESE), *M. glaber* (MÜLLER) and *M. rotundiscutatus* BREGETOVA and KOROLEVA by the absence of barbed setae in the anterior part of the dorsal shield and several other characters.

Remarks on the biology of Diplonevra nitidula :

Diplonevra nitidula and *D. pilosella* are among the most abundant species of Phoridae obtained in emergence traps set over pasture soils in England (Disney, 1991). It had been thought so far that Phoridae exhibit mainly carrion-breeding habits. Actually the females of these flies visit carrion to obtain a protein-rich meal. Recent observations tend to show that some of these flies are parasites of earthworms. Disney (loc.cit.) observed a larva of *D. nitidula* emerging from an autotomized section of an earthworm.

***Macrocheles muscaedomesticae* (SCOPOLI, 1772)**

One female of this species was found on the body of *Syrirta pipiens* (L.) (Syrphidae). The locality of the host was not precised (Coll. Dr. M.C. Brian, 14 June 1988).

FAMILY PARASITIDAE

Gamasodes bispinosus (HALBERT, 1915)

A single deutonymph was found from *Conicera dauci* (MEIGEN) (Phoridae) from Norwich Castle (Norfolk), 30 July 1979 (Coll. A. Irwin).

FAMILY UROPODIDAE

Uroseius acuminatus (C.L. KOCH, 1847)

Eight deutonymphs of that species were found from the following Phoridae. From *Conicera dauci* (MEIGEN) (2 male flies): 2 nymphs attached to the base of the abdomen, from Norwich Castle Battlements (Norfolk), 14 June 1979 and 1 nymph from a fly from Cambridge, 38 Metcalf Road, 25/26 October 1984.

From *Megaselia rufipes* (MEIGEN) (female): 2 nymphs. Locality E. Norfolk, Norwich. Leg. P.A. Irwin, 12 August 1983.

From *Anevrina thoracica* (MEIGEN): 2 nymphs attached to the abdomen, one from Glen Brerachon 21/28 May 1982, the other from Laggan Bridge, Inverness (Invernesshire).

From *Triphleva distinguenda* (STROBL) (female): 1 nymph from Westside Wood (Malham), 17/19 June 1981.

Uroobovella marginata (C.L. KOCH, 1839)

We found 3 phoretic deutonymphs of this species from *Syritta pipiens* (L.) (Syrphidae) Locality unknown (n° SJ 8936). Coll. Dr. M.C. Brian, 14 June 1988. This mite was identified by Dr. W. Hirschmann, Nurnberg.

Uroobovella fimicola (BERLESE, 1903)

We found 5 phoretic deutonymphs of this species. They were fixed on *Syritta pipiens* (L.) from Trew Breye, 13 August 1989. This mite has been identified by Dr. W. Hirschmann of Nurnberg.

PROSTIGMATA

FAMILY ERYTHRAEIDAE

Leptus sp.

We found a single larva of the genus *Leptus*, attached to *Megaselia flavicoxa* ZETTERSTEDT (Phoridae) from Pallet Crag (Durham), 31 July 1981. This specimen differs from *Leptus killingtoni* TURK, 1945, described from England, by the shape of the sensillae which are

barbed in their apical half or two thirds, whilst in the species of Turk these sensillae are completely barbed. It differs from *L. beroni* FAIN, 1991 mainly by the smaller number of dorsal setae (about 100 setae, instead of 70-82 in *L. beroni*). It is to be noted that in our specimen the two pairs of sensillae were lost during the process of remounting. These sensillae measured 70, whilst in *L. beroni* the anterior and posterior sensillae are 81 and 72 long respectively. More material is needed before we can identify this species with certainty.

FAMILY TROMBIDIIDAE

Three larvae representing three different species in the family Trombidiidae were found on Phoridae. We prefer not to name them at the specific level but wait until new material becomes available.

SUBFAMILY TROMBIDIINAE

Trombidium sp.

One single larva has been collected from *Triphleva distinguenda* (STROBL), from Malham Tarn, N. edge E. Fen, 28/29 June 1984. (Coll. H. Disney).

This specimen is the most close to *Trombidium rhopalium* (VERCAMMEN-GRANDJEAN and POPP, 1967) described from an hymenopteran from W. Germany. It differs from the latter by the different shape of the body, strongly attenuated posteriorly and the different number and situation of the dorsal setae.

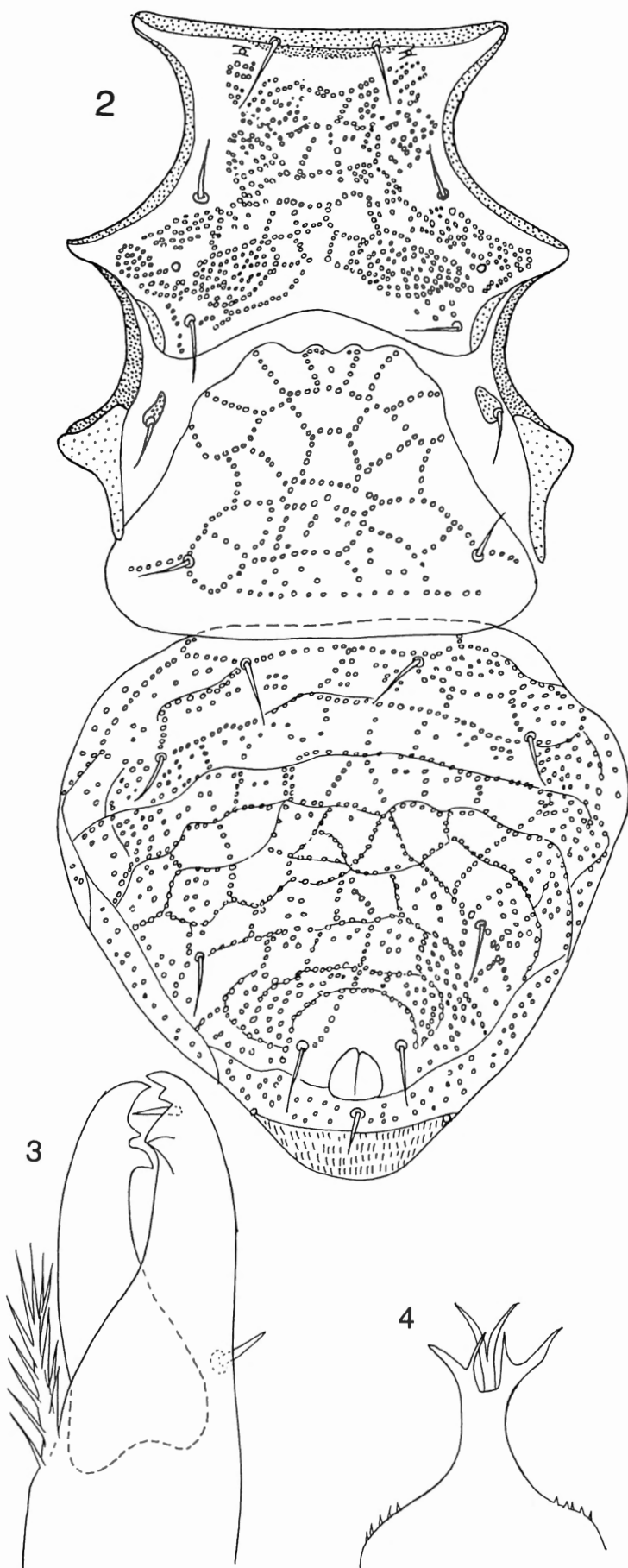
SUBFAMILY MICROTROMBIDIIDAE

Microtrombidium sp. A

One larva attached to *Megaselia pusilla* (MEIGEN) (Phoridae); from Heacham, 29 June 1982 (Coll. A. Irvin). This larva resembles that of *M. fasciatum* (C.L. KOCH) (= *M. demeijerei* (OUDEMANS, 1909)) but the antero-median shield is longer than wide and striated only in its lateral regions, moreover the internal seta of coxa I is bare. The mouth is surrounded by a large strongly dentate ring open anteriorly.

Microtrombidium sp. B

One larva found on *Megaselia badia* SCHMITZ (male) (Phoridae), from Kitchen Garden, Malham Tarn Wood, 26/28 July 1983. It differs from the species A by the shape of the anterodorsal shield which is about as wide as long and almost completely striated except in its very anterior part. The second dorsomedian shield is completely striated longitudinally.



Figs 2-4 – *Macrocheles disneyi* n.sp. Female: ventral shields (2), chelicerae (3) and gnathotectum (4).

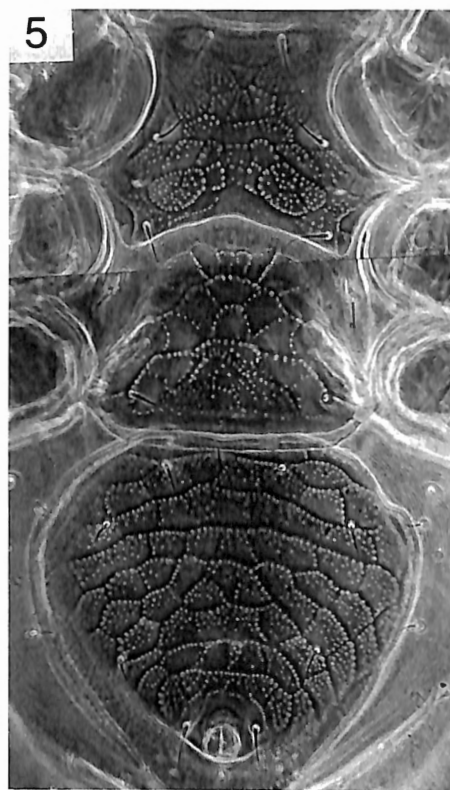


Fig. 5 – *Macrocheles disneyi* n.sp. Female: Ventral shields (microphotograph in phase contrast).

FAMILY TETRANYCHIDAE

Petrobia latens (MÜLLER, 1776)

We found one female of this species attached to *Phorastictica* MEIGEN (male) (Phoridae), from Kitchen Garden, Malham Tarn, 28/30 July 1984.

ASTIGMATA

FAMILY HISTIOSTOMATIDAE

Probonomoia pini (SCHEUCHER, 1957)

Five hypopi of that species were collected from the abdomen of *Medetera ambigua* ZETTERSTEDT (male) (Dolichopodidae), from Bucks, Stoke Common, 29 August 1989.

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References

- BREGETOVA, N.G. & KOROLEVA, E.V. 1960 - The Macrochelid Mites (Gamasoidea, Macrochelidae) in the USSR. - Parazitologicheskii Sbornik, 19 : 32-154.
- DISNEY, R.H.L. 1991 - Scuttle flies (Diptera : Phoridae) as parasites of earthworms (Oligochaeta : Lumbricidae) - British Journal of Entomology, Nat. Hist., 4 : 11-13.
- FAIN, A. 1963 - La spermathèque et ses canaux adducteurs chez les acariens mesostigmatiques parasites des voies respiratoires. - Acarologia, 5 :463-479.
- FAIN, A. 1991 - Two new larvae of the genus *Leptus* LATREILLE, 1796 (Acari, Erythraeidae) from Belgium - Int. J. Acarol. 17 : 107-111.
- HIRSCHMANN, W. 1962 - Acarologie, Folge 5, S. 58, Taf. 29-30, Abt. 1-2.
- HIRSCHMANN, W. 1989 - Acarologie, Folge 36, S. 103 und 130.
- HULL, J.E. 1918 - Terrestrial Acari of the Tyne Province. - Transactions of the Natural History Society of Northumberland. 5, 1 : 13-88.
- HYATT, K.H. & EMBERSON, R.M. 1988 - A review of the Macrochelidae (Acari : Mesostigmata) of the British Isles. - Bulletin of the British Museum (Nat. Hist.) Zoology ser. 54 : 63-125.
- OUDEMANS, A.C. 1912 - Die bis jetzt bekannten Larven von Thrombidiidae und Erythraeidae mit besonderer Berücksichtigung der für den Menschenschädlichen Arten. - Zoologische Jahrbücher Abt. 1 Suppl. XIV, n° 1 :1-230.
- THOR, S. & WILLMANN, C. 1947 - "Thrombidiidae". In "Das Tierreich". Eine Zusammenstellung und Kennzeichnung der rezenten Tierformen, 3 (71b) : 187- 541.
- VERCAMMEN-GRANDJEAN, P.H. & POPP, E. 1967 - *Atomus rhopalicus* n.sp. a parasite of *Rhopalicus tutela* WALKER (Hymenoptera), from Germany (Trombidiidae, Acarina). - Opuscula zoologica, n° 95 : 1-8.

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