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Three new Uropodina mites from New Zealand

(Acari, Mesostigmata)

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Three new species (*Uroobovella pilosetosa* spec. nov., *Oplitis pusaterii* spec. nov. and *Uropoda thorpei* spec. nov.) are described on the basis of Uropodina specimens collected in the Northern Island of New Zealand.

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Introduction

Uropodina mites are small and medium sized soil-dwelling animals which are distributed all over the world. The maximum of their diversity is found in tropical rain forests (Lindquist et al. 2009). However the Uropodina fauna of the Northern temperate zone is also rich; more than 100 species are presented in each of several extensively studied countries like Poland, Romania, Germany (Wiśniewski 1993), Slovakia (Masán 2001) and Hungary (Kontschán 2008). In contrast, most areas of the southern hemisphere are poorly studied; especially the Uropodina fauna of New Zealand is scarcely investigated.

Up to now, only five Uropodina mites are listed from New Zealand. Michael (1908) described two new species from there [*Polyapis (Calotrachytes) fimbriatipes* (Michael, 1908) and *P. (C.) scerophyllus* (Michael, 1908)], later Womersley (1961) described the males and nymphs of these species. The subgenus *Calotrachytes* Berlese, 1917 seems to be endemic in New Zealand.

In the summarizing work about the mites of New Zealand (Spain & Luxton 1971) five further uropodina taxa are mentioned, one of them – *Uropoda vegetans* (De Geer, 1768) – is identified to species level, the rest to generic level: *Uroobovella* spec., *Oodinychus* spec., *Urodinychus* spec. and *Uropoda* spec.

The present paper contains the descriptions of three new species collected in the Northern Island, near Auckland.

Material and methods

The Uropodina mites described in the present paper were collected by S. E. Thorpe and J. T. Pusateri. Specimens examined were cleared in lactic acid and later stored in 75 % alcohol. Drawings were made with the aid of a drawing tube. Holotypes are stored in 75 % alcohol and deposited in the New Zealand Arthropod Collection (NZAC), the paratypes housed in the mite collection of the Natural History Museum Geneva (NHMG), the Soil Zoology Collections of the Hungarian Natural History Museum, Budapest (HNHM) and the Section Arthropoda varia of the Zoologische Staatssammlung München (ZSM). All measurements are given in micrometres (µm).

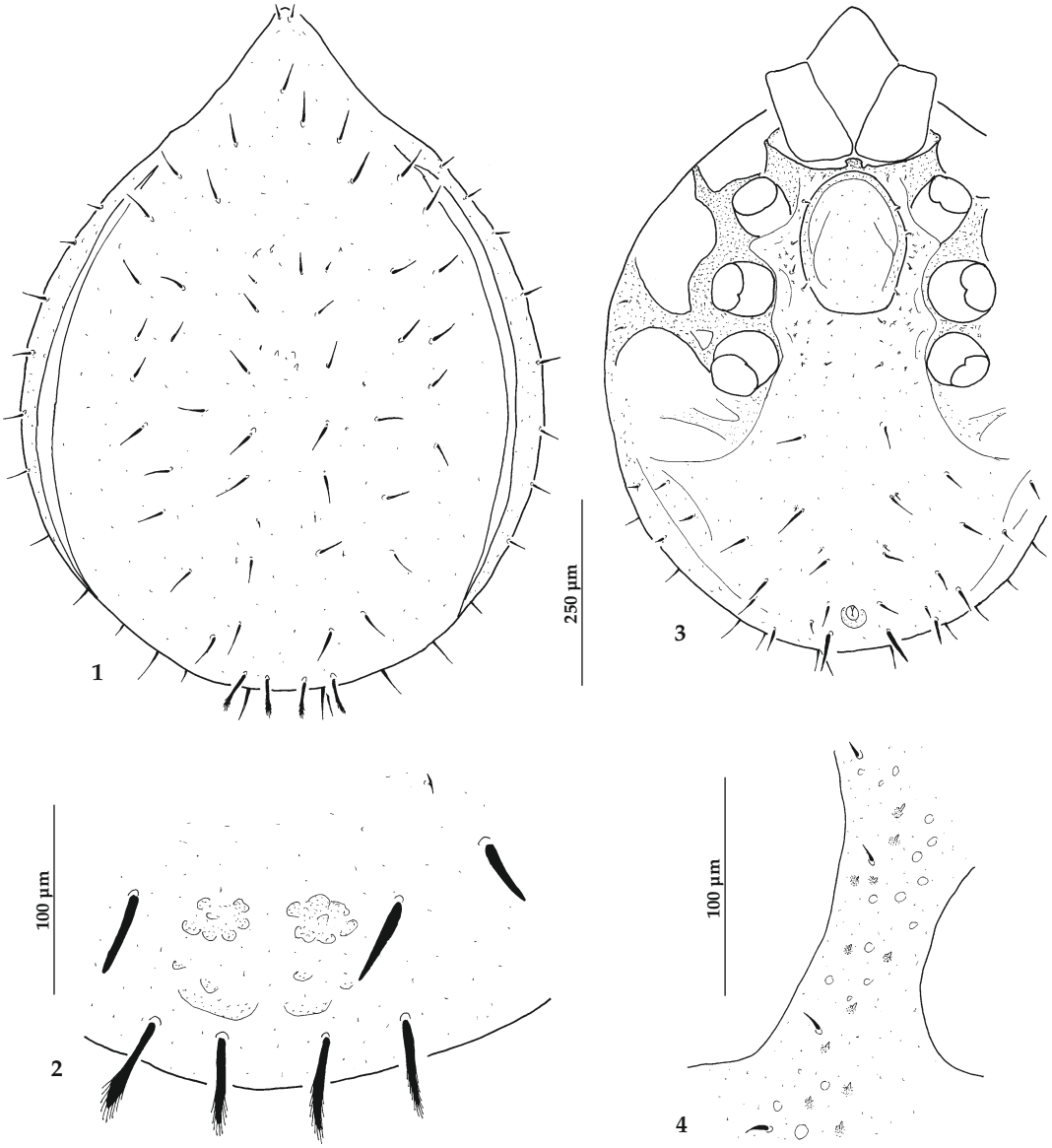
Hirschmann's species groups (Hirschmann 1989, Wisniewski & Hirschmann 1993) were used only for the aid of the identification, because these grouping is not based on phylogenetic analysis.

Descriptions

Uroobovella pilosetosa spec. nov.

Figs 1–14

Material examined. Holotype: female, New Zealand, Lynfield, Wattle Bay, collected under driftwood on beach 16.08.2010, leg. S. E. Thorpe (NZAC). – **Paratypes**: male, same locality and date as holotype (NZAC); two females in NHMG, three females in HNHM and one female in ZSM, same locality and date as holotype.



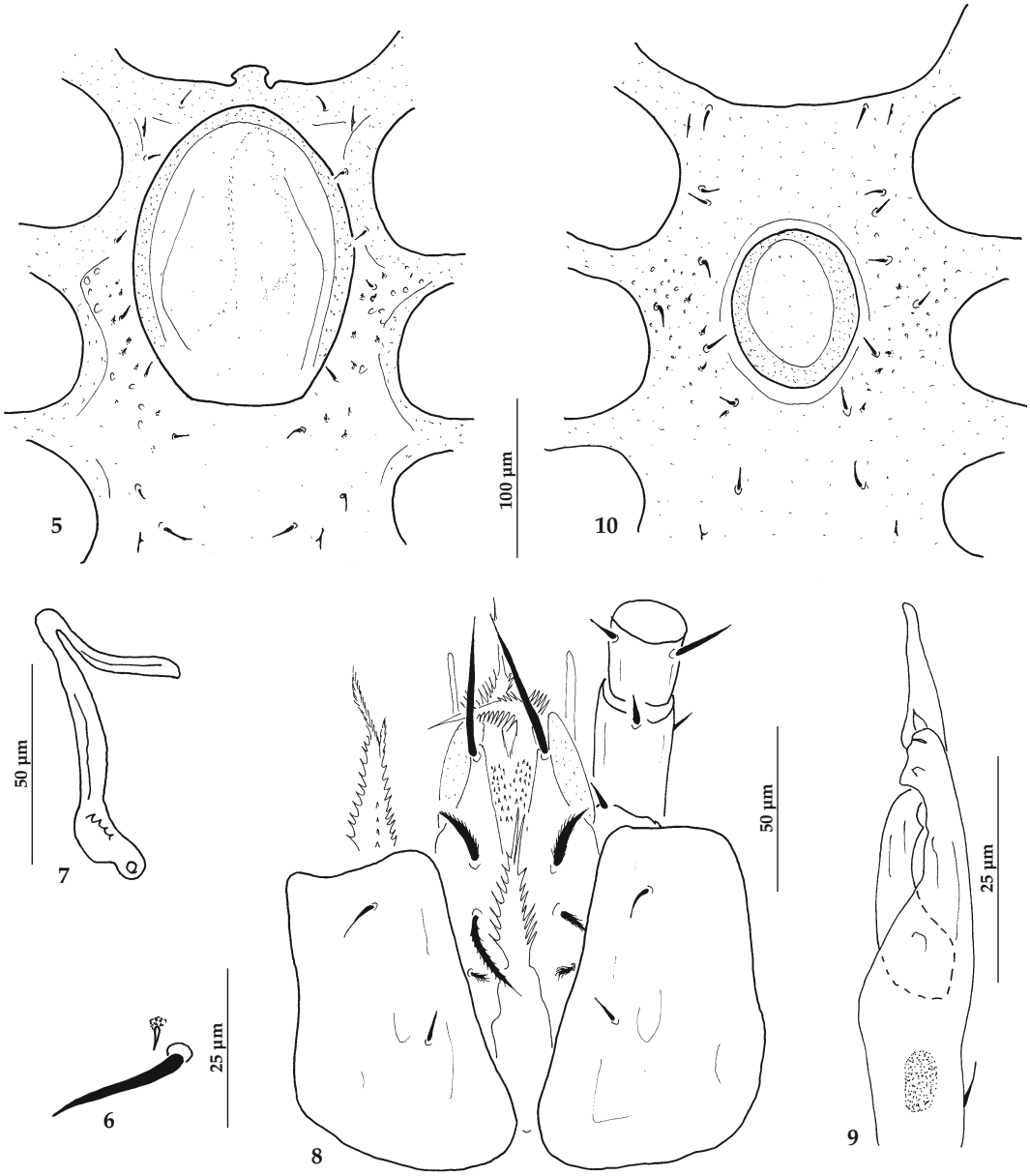
Figs 1-4. *Uroobovella pilosetosa* spec. nov., female. **1.** Dorsal view of idiosoma. **2.** Caudal region of dorsal shield. **3.** Ventral view of idiosoma. **4.** Sternal setae.

Description

Female. Length of idiosoma 800–910 µm, width 670–710 µm (n = 7). Shape of idiosoma oval.

Dorsal aspect of idiosoma (Fig. 1): Marginal and dorsal shields fused anteriorly. All dorsal setae smooth and needle-like (c. 35–40 µm), except two pairs near caudal margin, which are pennate (Fig. 2). Marginal setae similar in shape and length to dorsal setae. Dorsal and marginal shields without sculptural pattern.

Ventral aspect of idiosoma (Fig. 3): Sternal setae short (c. 9–10 µm), smooth and needle-like. St1 placed on level of anterior margin of genital shield, St2 on level of anterior margin of coxae II, St3 on level of posterior margin of coxae II, and St4 on level of anterior margin of coxae III, St5 on level of central area of coxae III, St6 situated near basal margin of genital shield, St7 on level of central area of coxae IV. Surface of sternal shield mostly smooth, but several

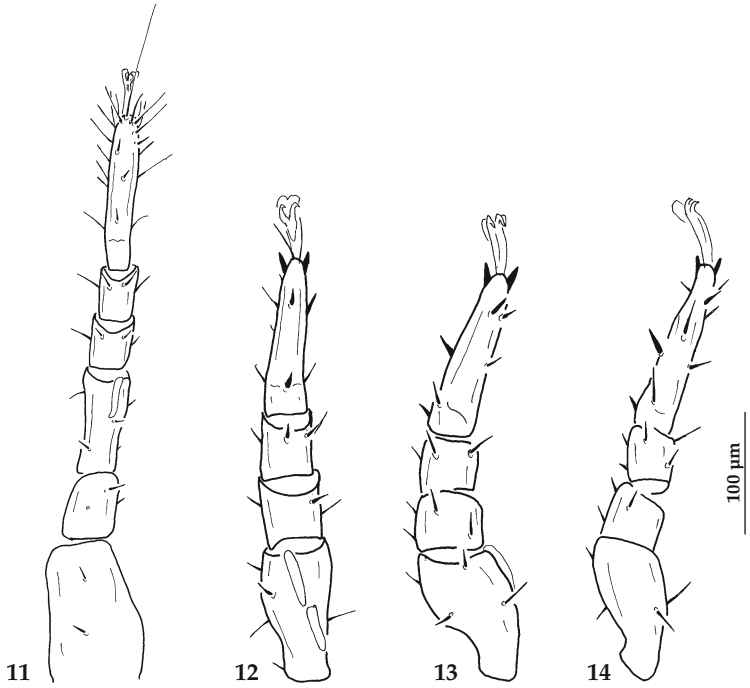


Figs 5-9. *Uroobovella pilosetosa* spec. nov., female. **5.** Intercoxal region. **6.** Ventral seta. **7.** Peritreme. **8.** Tritosternum, ventral view of gnathosoma and palp, epistome and coxae I. **9.** Apical part of chelicera.
Fig. 10. *Uroobovella pilosetosa* spec. nov., male; intercoxal region.

oval pits and sensory organs present on area of coxae III and IV (Fig. 4). Ventral shield without sculptural pattern, all ventral setae smooth and needle-like (c. 40 µm). Several setae on central area associated with short sensory hairs (Fig. 6). Adanal setae smooth and needle-like, ad1 (c. 35 µm) shorter than ad2 (c. 40 µm), postanal seta absent. Genital shield oval (Fig. 5), without any process and pattern. Genital shield placed between coxae II and III. Peritremes 7-shaped (Fig. 7).

Tritosternum (Fig. 8) with narrow basis, tritosternal laciniae marginally pilose, apically divided into two short and smooth branches.

Gnathosoma (Fig. 8): Corniculi horn-like, in-



Figs 11-14. *Uroobovella pilosetosa* spec. nov., female's left legs. **11.** Leg I. **12.** Leg II. **13.** Leg III. **14.** Leg IV.

ternal malae marginally pilose. Hypostomal setae h1 long (c. 40 µm) and smooth, h2 (c. 20 µm), h3 (c. 30 µm) and h4 (c. 6 µm) marginally pilose. Central region of hypostoma covered by several small teeth between h1 and h2. Fixed digit of chelicerae longer than movable digit and bearing long sensory organ on fixed digit. Cheliceral nodes and dorsal seta present (Fig. 9). Epistome marginally pilose.

Legs (Figs 11–14): Bearing smooth and simple setae, the first leg with ambulacral prolongation.

Male. Length of idiosoma 910 µm, width 610 µm (n = 1). Shape, dorsal aspect of idiosoma similar to that of female.

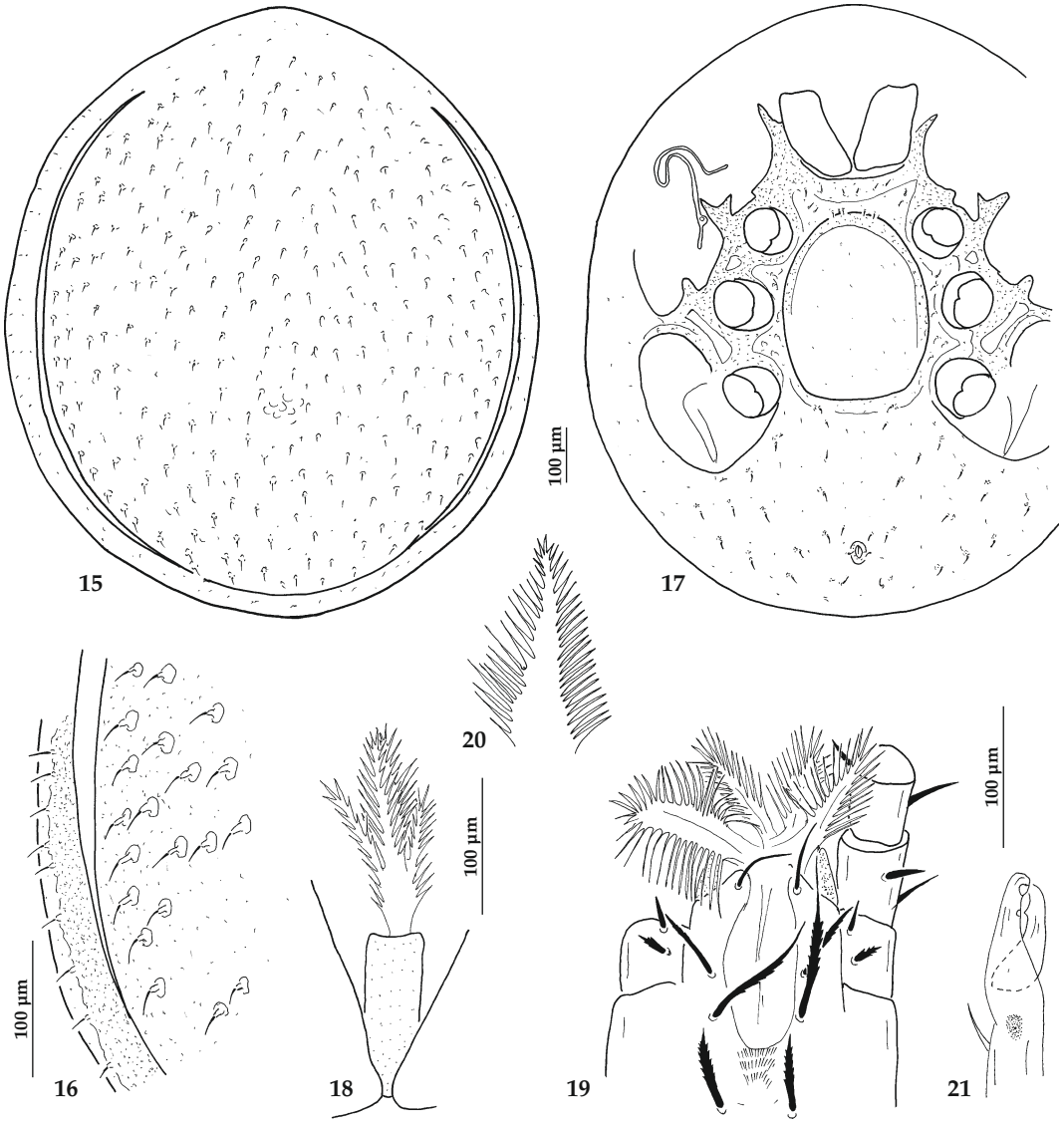
Ventral aspect of idiosoma (Fig. 10). Sternal setae short (c. 12 µm), smooth and needle-like. St1 placed near anterior margin of sternal shield, St2 and St3 on level of central area of coxae II, St4 and St5 on level of posterior margin of coxae II, St6 on level of central area of coxae III, St7 situated near basal margin of genital shield, St8 on level of central area of coxae IV. Surface of sternal shield mostly smooth, but several oval pits and sensory organs presented on area of coxae III and IV. Genital shield circular, without sculptural pattern and situated between coxae III.

Ventral setation, processes of gnathosoma and legs same as in female.

Nymphs and larva. Unknown.

Etymology. The name of the new species refers to the pilose setae on caudal area of dorsal shield.

Remarks. The new species belongs to the *Uroobovella vinicolora*-group (Hirschmann 1989) on the basis of the presence of seven pairs of sternal setae in the females. Currently the group consists of nine species, but two species are known only as deutonymph (*U. wichmanni* (Vitzthum, 1923) and *U. michiganensis* (Vitzthum, 1926), hence they cannot be compared to the new species. The marginal shield reduced on the caudal region of the body in *U. neoamericana* Hirschmann, 1972, *U. feideri* Huţu, 1976 and *U. erlangensis* Hirschmann & Zirngiebl-Nicol, 1962. In contrary the new as well as the rest of the known species have a single marginal shield on the caudal region. The new species has a smooth ventral shield, which is covered by reticulate pattern in *U. vinicolora* (Vitzthum, 1926) and *U. baloghi* Hirschmann & Zirngiebl-Nicol, 1962. The last two known species (*U. rubra* Athias-Binche, 1983 and *U. bistellaris* (Vitzthum, 1935) with smooth ventral shield have hook-like peritremes (which is 7-shaped in the new one) and they bear smooth caudal setae on the dorsal shield, but these setae are pilose in the new one.

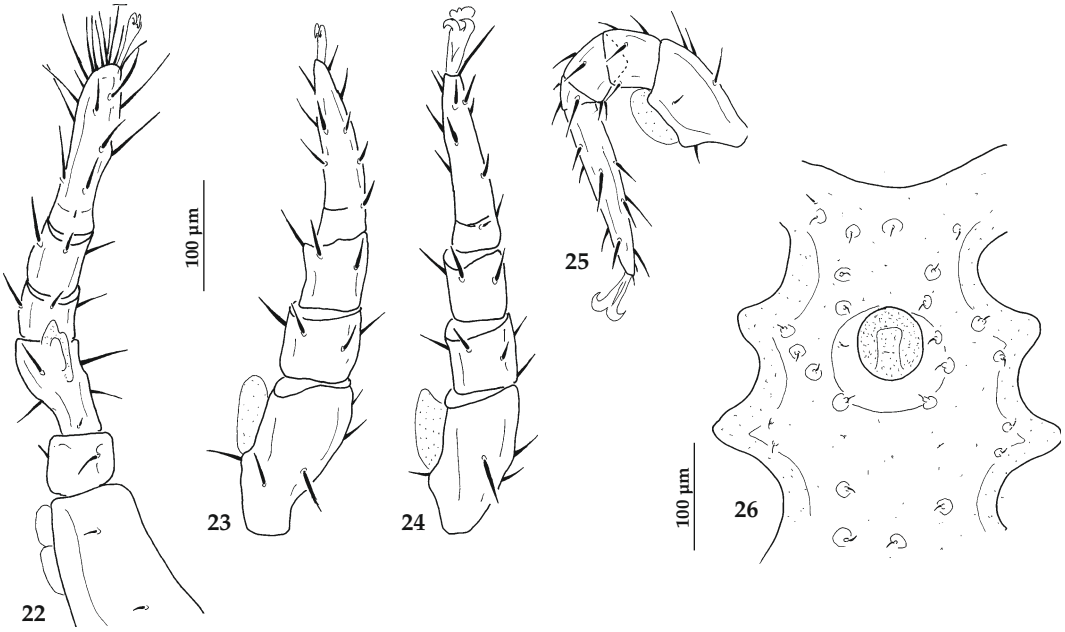


Figs 15-21. *Oplitis pusaterii* spec. nov., female. **15.** Dorsal view of idiosoma. **16.** Dorsal and marginal setae. **17.** Ventral view. **18.** Tritosternum between coxae I. **19.** Ventral view of gnathosoma and palp. **20.** Epistome. **21.** Chelicera (see above).

Oplitis pusaterii spec. nov.

Figs 15–26

Material examined. Holotype: female, New Zealand, Laingholm, 129 Laingholm Drive, pitfall trap, 29.10. 2007, leg. J. T. Pusateri (NZAC). – **Paratypes**: male, locality and date same as holotype (NZAC); one male and two females: New Zealand, Laingholm, 129 Laingholm Drive, pitfall trap, 3.12.2007, leg. J. T. Pusateri (NHMG); male: New Zealand, Laingholm, 129 Laingholm Drive, pitfall trap, 19.05.2007, leg. J. T. Pusateri (NHMG); two females: New Zealand, Laingholm, 129 Laingholm Drive, pitfall trap, 29.10.2007, leg. J. T. Pusateri (HNHM); two females: New Zealand, Laingholm, 129 Laingholm Drive, pitfall trap, 19.05.2007, leg. J. T. Pusateri (HNHM); one male: New Zealand, Laingholm, 129 Laingholm Drive, pitfall trap, 29.10.2007, leg. J. T. Pusateri (ZSM).



Figs 22-25. *Oplitis pusaterii* spec. nov., female's right legs. **22.** Leg I. **23.** Leg II. **24.** Leg III. **25.** Leg IV.
Fig. 26. *Oplitis pusaterii* spec. nov., male; intercoxal region.

Description

Female. Length of idiosoma 1120–1210 µm, width 1030–1080 µm (n = 7). Shape of idiosoma: Oval.

Dorsal aspect of idiosoma (Fig. 15): Marginal and dorsal shields fused anteriorly. All setae on dorsal and marginal shields smooth and needle-like (c. 15–19 µm), placed on small protuberances (Fig. 16). Dorsal and marginal shields without sculptural pattern.

Ventral aspect of idiosoma (Fig. 17): Sternal setae short (c. 16–18 µm), smooth and needle-like, with several supplementary setae (14 pairs), situated on small protuberances, their position presented in Fig. 17. Surface of sternal shield smooth. Ventral shield without sculptural pattern, all ventral setae (13–14 pairs) smooth and needle-like (c. 15–20 µm), situated on small protuberances. Adanal setae similar in shape and length to ventral setae, postanal seta absent. Genital shield oval, without any process and pattern, but a perigenital line present near basis of genital shield. Genital shield placed between coxae II and III. Peritremes hook-shaped.

Tritosternum (Fig. 18) with narrow basis, tritosternal laciniae divided into three marginally pilose branches.

Gnathosoma (Fig 19): Corniculi horn-like, internal malae divided into marginally pilose branches. Hypostomal setae h1 short (c. 50 µm) and smooth, h2 (c. 55 µm), h3 (c. 120 µm) and h4 (c. 55 µm) marginally pilose. Epistome marginally pilose (Fig. 20). Fixed digit of chelicerae longer than movable digit, cheliceral nodes and dorsal seta present (Fig. 21). Palp trochanter with one smooth and one serrate setae, other setae on palp smooth.

Legs (Figs 22–25): Bearing smooth and simple setae, the first leg with ambulacral prolongation.

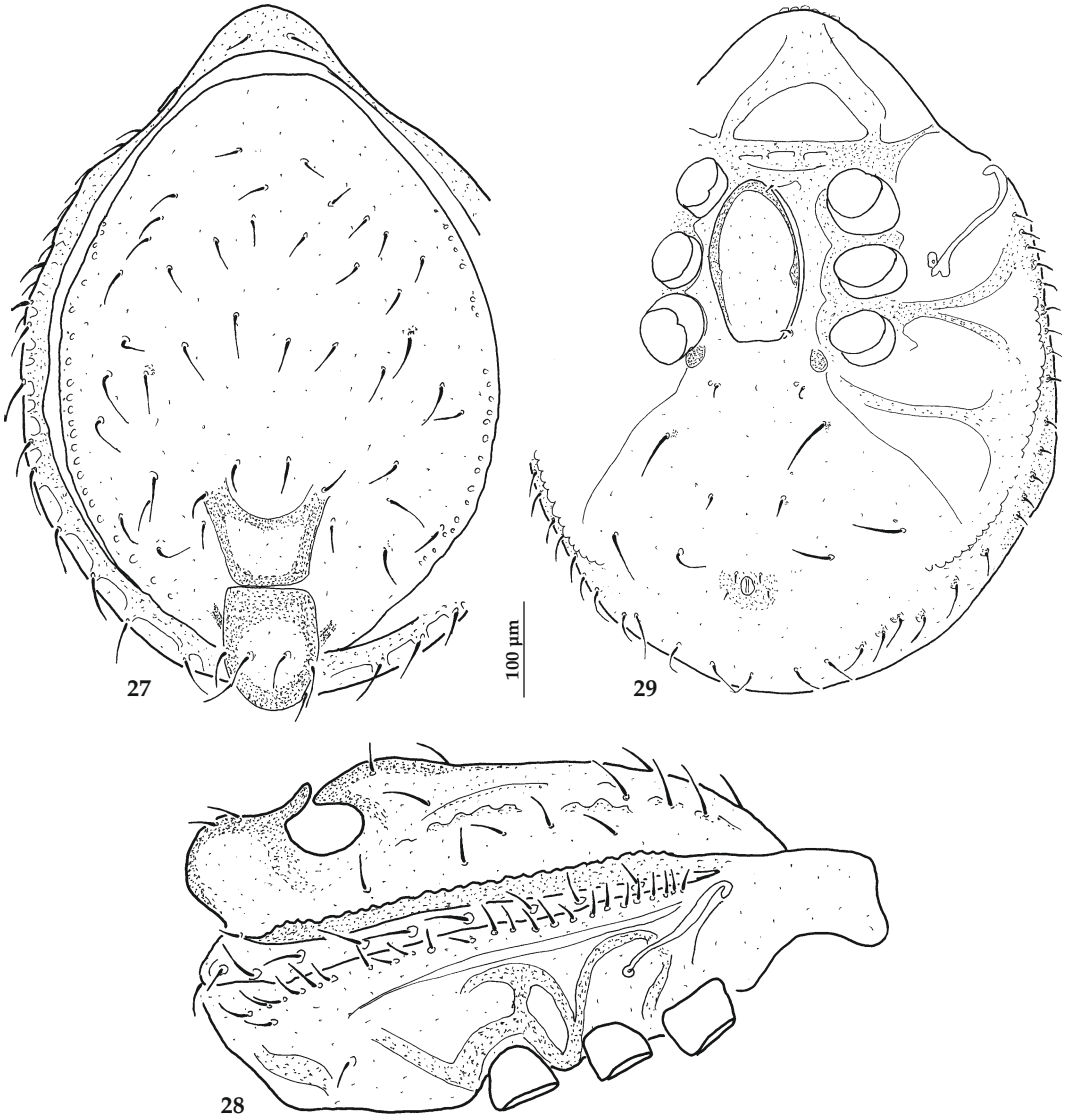
Male. Length of idiosoma 1140–1220 µm, width 950–1020 µm (n = 3). Shape, dorsal aspect of idiosoma same as in female.

Ventral aspect of idiosoma (Fig. 26): Sternal setae short (c. 8–12 µm), smooth and needle-like with several supplementary setae (10–13 pairs), situated on small protuberances. Surface of sternal shield smooth. Genital shield circular, without sculptural pattern and situated between coxae III. Ventral setation, processes of gnathosoma and legs same as in female.

Nymphs and larva. Unknown.

Etymology. I dedicate the new species to J. T. Pusateri, who collected several nice Uropodina mites in New Zealand.

Remarks. Following Hirschmann's (Wiśniewski & Hirschmann 1993) subgeneric system, this species with the perigenital line on basal margin of genital

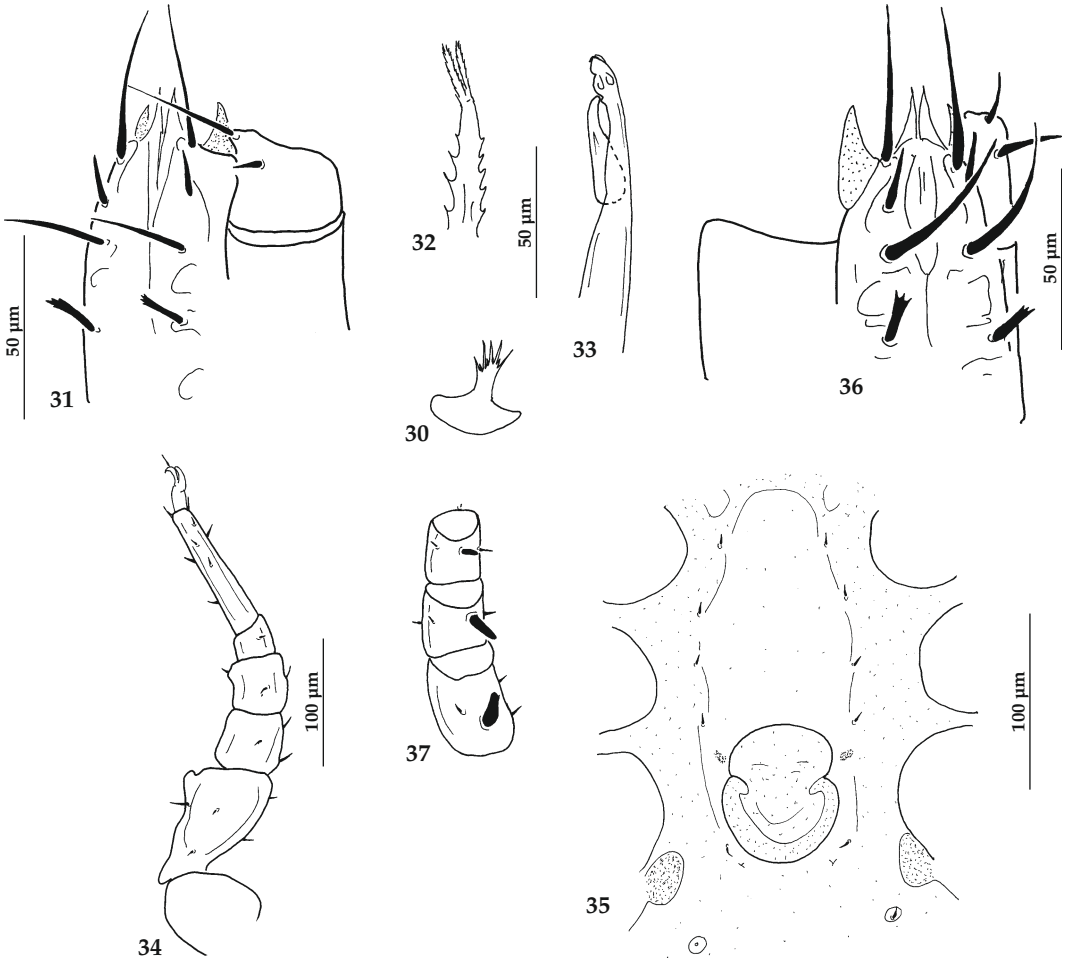


Figs 27-29. *Uropoda thorpei* spec. nov., female. **27.** Dorsal view. **28**. Lateral view. **29.** Ventral view of idiosoma.

shield of female belongs to the *Oplitis nitida*-group. Two species are known from this group, the first one is described from Borneo (*O. mollis* Hiramatsu, 1983), this species has reticulate sculptural pattern on dorsal shield, this pattern is missing on the dorsal shield of the second known and the new species. The other one is known from Australia [*O. nitida* (Womersley, 1959)], the latter species is similar to the new species, but the new species is bearing 14 pairs of ventral setae (10–11 pairs ventral setae in *O. nitida*) and the anterior part of the peritremal hook shorter in the new species.

***Uropoda thorpei* spec. nov.**
Figs 27–37

Material examined. Holotype: female, New Zealand, Laingholm, 129 Laingholm Drive, pitfall trap, 06.01. 2008, leg. J. T. Pusateri (NZAC). – **Paratypes**: one male, locality and date same as holotype (NHMG); one male in HNHM and one male in ZSM, locality and date same as holotype.



Figs 30-34. *Uropoda thorpei* spec. nov., female. **30.** Tritosternum. **31.** Ventrolateral view of gnathosoma and palp trochanter. **32.** Epistome. **33.** Chelicerae. **34.** Leg I.
Figs 35-37. *Uropoda thorpei* spec. nov., male. **35.** Intercoxal region. **36.** Ventral view of gnathosoma. **37.** Trochanter, femur and genu of leg I.

Description

Female. Length of idiosoma 710 µm, width 510 µm (n = 1). Shape oval, highly domed.

Dorsal idiosoma (Fig. 27): Marginal and dorsal shields completely separated. Caudal region of dorsal shield elevated from the other parts of dorsum, but one deep, transversal furrow situated near caudal margin (Fig. 28). Dorsal setae smooth and needle-like (c. 35–40 µm), dorsal shield covered by oval pits near margins, other areas of this shield smooth. Marginal shield not reduced, without sculptural pattern and bearing smooth and needle-like setae (c. 35–40 µm). Margins of idiosoma with c. 30 µm long and needle-like setae (Fig. 28).

Ventral idiosoma (Fig. 29): Ornamentation on sternal shield absent. Sternal setae short (c. 5–7 µm), smooth and needle-like. St1 situated near anterior margin of genital shield, St5 near edges of basal margin of genital shield (other sternal setae not visible on single female). One pair of oval, deep depressions present near posterior margins of coxae IV. Two pairs of long (c. 45–50 µm) needle-like setae situated near metapodal lines, two pairs of short (c. 8–11 µm) and one pair of longer (c. 50 µm) setae situated in central area of ventral shield. Near caudal margins of ventral idiosoma bearing numerous, c. 28–35 µm long and needle-like setae. Ventral shield without sculptural pattern. Adanal setae short (c. 25 µm) and needle-like. Stigmata situated between coxae II

and III. Peritremes long and apically bent. Genital shield linguliform, without sculptural pattern and process on its apical margin. Base of tritosternum wide, tritosternal laciniae short with several smooth branches (Fig. 30).

Gnathosoma (Fig. 31). Corniculi horn-like, internal malae smooth and longer than corniculi. Hypostomal setae: h1 smooth, long (c. 40 µm) and situated near the anterior margin of gnathosoma, h2 (c. 12 µm) and h3 (c. 28 µm) smooth, h4 (c. 15 µm) marginally serrate. Base of epistome with serrate margins, apical part divided into two pilose branches (Fig. 32). Movable digit shorter than fixed digit, internal sclerotized node absent (Fig. 33). Palp trochanter with a long, smooth and a short, smooth setae.

Legs: Leg I with ambulacral claws (Fig. 34), all of legs with smooth and needle-like setae.

Male. Length of idiosoma 680–690 µm, width 530–540 µm (n = 3). Shape, dorsal aspect of idiosoma same as female.

Ventral aspect of idiosoma (Fig. 35). Sternal setae short (c. 7–8 µm), smooth and needle-like. Positions of sternal setae presented on Fig. 35. One pair of oval, deep depressions present near posterior margins of coxae IV. Genital shield oval, without sculptural pattern and without setae, situated between coxae IV. Ventral setation, processes of gnathosoma (Fig. 36) and legs same as in female, except three segments of leg I, which bearing robust setae on ventral side (Fig. 37).

Nymphs and larva. Unknown.

Etymology. I dedicate the new species to Stephen Thorpe, who collected several very attractive Uropodina mites and he is doing an excellent work on the Uropodina mites of the Wikispecies.

Remarks. *Uropoda* species with the presence of the highly domed dorsal shield with transversal furrow are discussed as *Uropoda gibba*-group in Hirschmann's system (Wiśniewski & Hirschmann 1993). The new species can be distinguished from the similar species with the same dorsal characters on the basis of the smooth internal malae (pilose in the known species) and the presence of a marginal shield (reduced in the known species). So far eight species are known from this group occurring in Japan, New Guinea and Vietnam (Wiśniewski & Hirschmann 1993), I suppose the similarity of dorsal characters are caused by convergent evolution.

References

Hirschmann, W. 1989. Gangsystematik der Parasitiformes, Teil 509. Die Ganggattung *Uroobovella* Berlese 1903 –Artengruppen – Bestimmungstabellen – Diagnosen (Dinychini, Uropodinae). Acarologie, Schriftenreihe für Vergleichende Milbenkunde 36: 84–196.

Michael, A. D. 1908. Unrecorded Acari from New Zealand. The Journal of the Linnean Society of London (Zoology) 30 (197): 134–149.

Kontschán, J. 2008. Magyarország korongatkái (Acari: Mesostigmata: Uropodina). [Turtle mites of Hungary.] Állattani Közlemények 93 (1): 3–15 (in Hungarian).

Lindquist, E. E., Krantz, G. W. & Walter, D. E. 2009. Order Mesostigmata. Pp. 124–232 in: Krantz, G. W. & Walter, D. E. (eds). A manual of acarology. 3rd edition, Austin, Texas (University Press).

Mašán, P. 2001. Mites of the cohort Uropodina (Acari, Mesostigmata) in Slovenska. Annotationes Zoologicae et Botanicae 223: 1–320.

Spain, A. V. & Luxton, M. 1971. Catalog and bibliography of the Acari of the New Zealand subregion. Pacific Insects Monograph 25: 179–226.

Wiśniewski, J. 1993. Gangsystematik der Parasitiformes Teil 549. Die Uropodiden der Erde nach Zoogeographischen Regionen und Subregionen geordnet (mit Angabe der Länder). Acarologie, Schriftenreihe für Vergleichende Milbenkunde 40: 221–291.

– – & Hirschmann, W. 1993. Gangsystematik der Parasitiformes Teil 548. Katalog der Ganggattungen, Untergattungen, Gruppen und Arten der Uropodiden der Erde. Acarologie, Schriftenreihe für Vergleichende Milbenkunde 40: 1–220.

Womersley, H. 1961. A new record of the little known *Calotrachytes sclerophyllus* (Michael, 1908) from New Zealand (Acarina, Polyaspidae) with description of male and nymph. Records of the South Australian Museum 14 (1): 125–129.

Buchbesprechung

1. van Harten, Antonius (ed.) 2011. Arthropod fauna of the United Arab Emirates, volume 4. – Dar Al Ummah Printing, Abu Dhabi, UAE, 816 + 16 Seiten. ISBN 978-9948-16-116-5.

Wieder hat es kaum mehr als ein Jahr gedauert, bis in schöner Regelmäßigkeit der nunmehr vierte Band der Serie über die Arthropodenfauna der Vereinigten Arabischen Emirate im Postfach liegt. Nach den positiven Erfahrungen mit seinen Vorgängern erwarten wir keine Überraschungen sondern mehr desselben: Die fortgeführte Dokumentation der Biodiversität eines Landes, dauerhaft finanziert durch einen Staatsmann der erkannt hat, wie wichtig es ist, die Landesfauna zu erforschen und zu schützen. Dieses Wissen ist nicht nur für die United Arab Emirates (UAE) selbst von überragender Bedeutung, sondern auch für andere Länder der Region, die noch nicht so weit in der Erforschung ihrer Biodiversität vorangekommen sind, und natürlich für die weltweite Systematik im Allgemeinen, die ja keine Landesgrenzen kennt.

Nach den Besprechungen der vorangegangenen Bände lassen sich kaum neue, bessere Worte finden, um das gleichbleibend hohe Niveau zu beschreiben, das der Herausgeber beim Voranschreiten des Projektes zu halten vermag.

Am aktuellen Band haben 57 Autoren aus 18 Ländern mitgewirkt. Die Beiträge basieren wiederum ganz wesentlich auf den breit angelegten, reichen Aufsammlungen von Antonius van Harten. Diese werden durch Material ergänzt, das von verschiedenen Spezialisten meist im direkten Zusammenhang mit diesem Projekt in den UAE gesammelt wurde. In einigen Kapiteln werden auch in der Literatur publizierte Angaben zu Vorkommen in den UAE verarbeitet. Es werden 57 Familien abgehandelt, von denen 29 das erste Mal von den UAE erwähnt sind. Drei Gattungen und 103 Arten werden als neu für die Wissenschaft beschrieben. Insgesamt beläuft sich der Zuwachs von den aus den UAE bekannten Arten auf 469.

Das Buch enthält wieder ein Vorwort von Seiner Hoheit Sheikh Tahnoon Bin Zayed Al Nahyan, dem verlässlichen Sponsor der Serie, und eine Einleitung des Herausgebers. Es folgen 37 taxonomische Kapitel, die diesmal die beiden Spinnenfamilien Zoodariidae und Salticidae (2. Teil), die Milbenfamilie Trachyuropodidae, die Asselunterordnung Oniscidea und fünf Insektenordnungen behandeln.

Die Neuroptera sind mit je einem Kapitel über Ascalaphidae und Nemopteridae vertreten. Von den Hemiptera werden die aquatischen und semiaquatischen Wanzen (Heteroptera) und zwei Familien der Langkopfzikaden (Issidae, Caliscelidae) abgehandelt. Eine kleine Inkonsistenz hat sich bei den beiden letzteren eingeschlichen. Während die Familien im Text korrekt den Hemiptera zugeordnet werden, laufen sie im Inhaltsverzeichnis unter dem heute aus Gründen von Paraphylie nicht mehr verwendeten Namen “Homoptera”. Was ebenfalls ungewohnt ist, ist die Behandlung der exopterygoten Hemiptera nach den endopterygoten Planipennia. Nach phylogenetischen Gesichtspunkten würde man die umgekehrte Reihenfolge erwarten. Der Rest des Bandes ist den drei artenreichen Ordnungen Coleoptera, Hymenoptera und Diptera gewidmet. Für die Käfer liegen Bearbeitungen der adephagen Gyrinidae, Dytiscidae und Carabidae (Nachtrag) sowie der polyphagen Staphylinidae (Pselaphinae), Buprestidae, Nitidulidae, Silvanidae, Latridiidae (Nachtrag) und Chrysomelidae vor. Den letzteren sind zwei Kapitel gewidmet, von denen das erste einen Nachtrag zu den Unterfamilien Cassidinae, Chrysomelinae, Galerucinae, Alticinae, Cryptocephalinae und Eumolpinae darstellt, während das zweite die Unterfamilie Bruchinae behandelt. Die Hymenoptera sind diesmal deutlich am stärksten repräsentiert, nehmen sie doch mit ca. 350 von insgesamt etwa 800 Seiten fast die Hälfte des Bandes ein. Es handelt sich um die beiden Familien Braconidae (Agathidinae) und Megaspilidae (Gattung *Dendroceros*) der Parasitica sowie die sechs Familien Bethylidae (Mesitiinae), Formicidae, Ampulicidae, Crabronidae (zwei Beiträge), Sphecidae und Apidae (Gattung *Braunsapis*). Bei den Diptera werden von den Nematocera die drei Familien Ceratopogonidae, Cecidomyiidae (Lestremiinae, Micromyinae) und Limoniidae sowie von den Brachycera die Asilidae, Empididae, Diopsidae, Tephritidae (Nachtrag), Odiniidae, Chloropidae und mit Menschen assoziierte Muscomorpha (Calliphoridae, Sarcophagidae, Oestridae, Gasterophilidae und Hippoboscidae) abgehandelt.

Der Aufbau der einzelnen Kapitel, die alle ausgesprochen üppig und qualitativ meist hochwertig bebildert sind, folgt wieder dem bewährten Schema. In der Einleitung werden für Nichtspezialisten einige einführende Informationen zur jeweiligen Gruppe gegeben. In Material und Methoden finden sich technische Angaben wie Erklärung von Abkürzungen oder Angabe der Institutionen, in denen das Material aufbewahrt wird. Der “Systematic account” ist das eigentliche Kernstück jeder Arbeit, gefolgt von Danksagungen und Literaturangaben. Die einzelnen Arten werden so abgehandelt, dass zuerst das untersuchte Material aufgelistet wird, nach einheitlichem Stil im ganzen Buch: Fundort, Anzahl Tiere, Sammeldatum, Sammelmethode und, falls nicht von A. van Harten gesammelt, auch der Sammler. Es schließen sich je nach Erfordernis Beschreibungen, Bemerkungen und Verbreitungsangaben an. Manche Kapitel enthalten zudem Bestimmungsschlüssel und/oder eine Diskussion biogeografischer Aspekte. Insgesamt 442 meistenteils exzellente Farbtafeln, 125 Zeichnungen und diverse Fotos illustrieren den Text prächtig.

Eine Liste mit den geografischen Koordinaten der 80 Fundorte, eine Liste mit den im Buch neu beschriebenen Taxa und anderen nomenklatorischen Änderungen sowie ein zoologischer Index schließen den Band ab.

Fortsetzung Seite 28