

New data about ptyctimous mites (Acari, Oribatida) in Polish palm houses

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Received: 12.11.2013 • Accepted: 15.03.2014 • Published Online: 14.07.2014 • Printed: 13.08.2014

Abstract: In samples collected in 2012 at the palm house in Poznań, 5 species of ptyctimous mites were found; 3 of them were native species (*Mesotritia nuda*, *Euphthiracarus cribrarius*, *Acrotritia ardua*) and 2 were exotic species, pantropical *Microtritia tropica* and neotropical *Phthiracarus phoxos*. In the samples from the palm house in Łódź, 3 species were found; 2 of them were known from the palm house in Poznań (*Acrotritia ardua* and *Phthiracarus ferrugineus*), and the third has not been reported from Poland before: the very rare species *Mesoplophora michaeliana*, known so far from the southern part of the Western Palearctic. Some juvenile stages of *Mesoplophora* (*M.*) *michaeliana* and *Mesotritia nuda* are also described.

Key words: Acari, Oribatida, ptyctimous mites, juvenile stages, palm houses, Poland

The fauna of Arachnida of palm houses in Poland is poorly known. It has been the subject of only a few papers (see Zawierucha et al., 2013). The fauna is continuously affected by agrotechnological procedures applied to the soil and plants from outside the ecosystem. The disturbances concern the invertebrates introduced with exotic plants, and those of native origin introduced with soil. Among them, an important group of moss mites are ptyctimous mites. Only 2 papers concern the moss mites reported from palm houses in Poland (Skubała et al., 2001; Niedbała, 2010). Ptyctimous mites (Acari, Oribatida) are typical soil invertebrates and occur worldwide wherever there is decaying organic matter. They are a cosmopolitan group, commonly found in all terrestrial ecosystems. However, only recently has their great diversity been described, mainly at the species level.

This paper presents a list of new localities and species found. From among the species found, 2 were represented by a number of juvenile stages. Detailed descriptions of some juvenile stages of *Mesoplophora* (*Mesoplophora*) *michaeliana* Berlese, 1904 and *Mesotritia nuda* (Berlese, 1887) are also given.

The material analyzed was collected by members of the Student Naturalist Society (Invertebrate Section) at Adam Mickiewicz University, from soil, wood, and leaf litter from some pavilions of palm houses in Poznań and Łódź.

Observations, measurements, and illustrations were made using a standard compound microscope. Measurements are given in micrometers. The

morphological terminology is based on Niedbała (2000). The number of examined specimens is given in parentheses following species names.

The considerations presented below are based on the material from the comprehensive work on the Palearctic ptyctimous fauna (Niedbała, 2011), in which the methods of analysis and classification of the material are also given.

List of localities and species found

Palm house in Poznań

Pavilion 1

a) Rotten wood from a log brought in from the communal forest Dębina in Poznań in the years 1990–1995, 13.II.2012, leg. K. Zawierucha.

Species composition: *M. nuda* (ca. 50), *E. cribrarius* (Berlese, 1904) (3).

b) Litter under the log.

Species composition: *M. nuda* (7), *M. tropica* Märkel, 1964 (2), *E. cribrarius* (3).

Pavilion 5

a) Dry leaves under plants, 06.II.2012, leg. K. Zawierucha.

Species composition: *M. nuda* (2), *M. tropica* (10), *P. phoxos* (2).

b) Litter under plants, 06.II.2012, leg. K. Zawierucha.

Species composition: *M. nuda* (12), *M. tropica* (8), *P. phoxos* (4).

c) Rotten wood from a log brought in from the communal forest Dębina in Poznań in 2003, 06.II.2012, leg. K. Zawierucha.

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Species composition: *M. nuda* (3), *A. ardua* (3), *M. tropica* (2).

Pavilion 6

a) Rotten wood from a log brought in from the communal forest Dębina in Poznań in 2003, 02.II.2012, leg. K. Zawierucha.

Species composition: *M. nuda* (1), *E. cribrarius* (3).

Pavilion 7

a) Dry leaves under plants, 06.II.2012, leg. K. Zawierucha.

Species composition: *M. nuda* (2).

Pavilion 8

a) Litter under plants, 02.II.2012, leg. K. Zawierucha.

Species composition: *M. nuda* (12), *A. ardua* (1), *P. phoxos* (2).

In total, 5 species were found. All of them have been reported from the palm house in Poznań (Niedbała, 2010), and 3 of them are native species: *Mesotritia nuda* (Berlese, 1887), *Euphthiracarus cribrarius* (Berlese, 1904), and *Acrotritia ardua* (C.L. Koch, 1841). There were 2 exotic species, pantropical *Microtritia tropica* Märkel, 1964 and neotropical *Phthiracarus phoxos* Niedbała, 2004, which have been present in the Poznań palm house for at least 3 years (Niedbała, 2010).

Palm house in Łódź

Pavilion I

1. Under rotting banana palm, 15.XII.2012, leg. K. Zawierucha.

Species composition: *A. ardua* (2).

Pavilion II

1. Rotten wood and soil near *Bromelia* sp., 15.XII.2012, leg. K. Zawierucha.

Species composition: *Phthiracarus ferrugineus* (C.L. Koch, 1841) (9).

2. Litter under bamboo trees, 15.XII.2012, leg. K. Zawierucha.

Species composition: *A. ardua* (2), *Hypochthonius luteus* Oudemans, 1917 (1).

3. Soil from under logs near *Bromelia* sp., 15.XII.2012, leg. K. Zawierucha.

Species composition: *Mesoplophora (Mesoplophora) michaeliana* (3), *P. ferrugineus* (4), *H. luteus* (1).

Two of the species (*P. ferrugineus* and *A. ardua*) had already been reported from the palm house in Poznań (Niedbała 2010), and 1 species has been found for the first time in palm houses and in Poland. *Mesoplophora (M.) michaeliana* is generally a very rare southwestern Palearctic (Niedbała 2011) species.

In 2 samples, representatives of another Oribatida species, Palearctic *Hypochthonius luteus*, were found.

Juvenile stages are known only for a few species of ptyctimous mites of all Euptyctima, 2 Phthiracaridae, and 5 Euphthiracaroida (see the review paper by Ermilov,

2011). On the background of the diagnosis of adult species, I have described the tritonymph of a very rare species, *Mesoplophora (Mesoplophora) michaeliana*, from the palm house in Łódź, and the deuto- and tritonymph of a relatively common semicosmopolitan species, *Mesotritia nuda*, found in the palm house in Poznań.

Mesoplophora (Mesoplophora) michaeliana Berlese, 1904

(Figures 1A–1F)

Locality: Pavilion II in the palm house in Łódź.

Diagnosis:

Adult (Figures 1A–1C)

Measurements. Prodorsum: length 215, width 144, height 101, sensillus 104, setae: interlamellar 71, lamellar 73, rostral 61, exobothridial 15; notogaster: length 291, width 230, height 159, setae: c_1 81, $c_1/c_1 - d_1 = 0.7$, e_1 63; genital plate 68×40 , anal plate 61×30 , distance between genital and anal plates = 35.

Color light brown. Integument densely dotted.

Prodorsum without lateral carinae. Sensilla long, setiform covered with 8–10 cilia. Interlamellar, lamellar, and rostral setae similar in shape, rough, flagelliform, attenuate, exobothridial setae very short, slightly shorter than diameter of bothridia.

Notogastral setae flagellate, rough, only setae d_1 , e_1 , and e_2 shorter and covered densely with short cilia. Setae of row c_{1-3} remote equally from anterior margin.

Ventral region. Ventral plate with 9 pairs of setae of unequal length. Genital plates each with 7 setae (6 + 1). Anal plates each with 2 setae. Setation of legs (without tarsi): I: 0–3–3(1)–4(1), II: 0–4–3(1)–3(1), III: 2–2–2(1)–2(1), IV: 2–3–2(0)–2(0).

Tritonymph (Figures 1D–1F).

Measurements. Prodorsum: length 192, width 149, height 83, sensillus 81, setae: interlamellar 53, lamellar 43, rostral 45, exobothridial 10; notogaster: length 263, width 222, height 172, setae: c_1 38, $c_1/c_1 - d_1 = 0.4$, c_3 51; genital plate 94×28 , anal plate 94×18 .

Color light brown. Prodorsum with number and shape of setae similar to adult form. Ventral plate with 4 pairs of setae, plate Q with 1 and plate P with 2 pairs of setae; genital plates with 6 pairs of setae, adanal plates with 2 and anal plates also with 2 pairs of setae.

Comparison. Tritonymph of *M. (M.) michaeliana* is very similar to that of *Mesoplophora (Parploplophora) pulchra* Sellnick, 1928 (Grandjean, 1933). It is distinguishable only by the shape of sensilli setiform (versus fusiform head) and the presence of 2 pairs of adanal setae (versus 3 pairs).

Distribution. Western Palearctic species known from Spain, Italy, Greece, Georgia, and Iran.

***Mesotritia nuda* (Berlese, 1887)**

(Figures 2A–2E and 3A–3D)

Locality: Pavilion 8 in the palm house in Poznań.

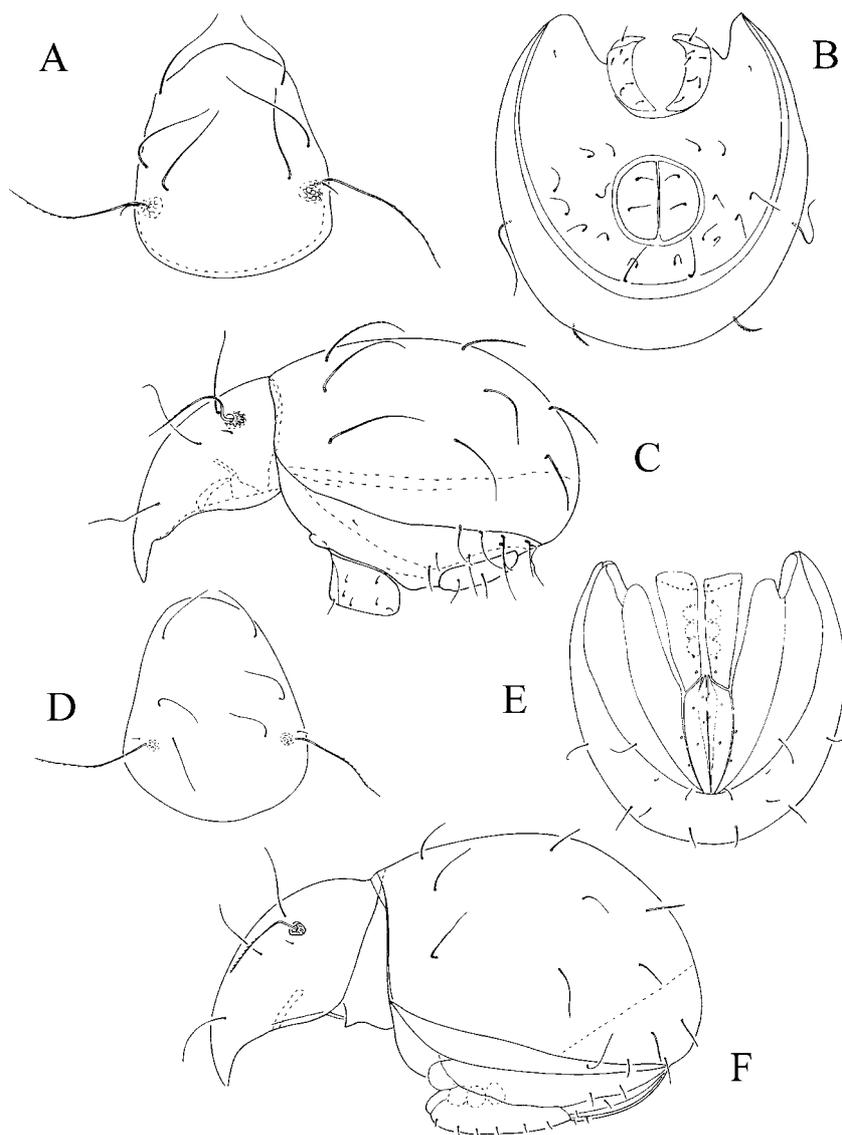


Figure 1. A–C. *Mesoplophora (Mesoplophora) michaeliana* Berlese, 1904, adult. A– pro dorsum, dorsal view, B– ventral side, C– lateral view of body. D–F– tritonymph. D– pro dorsum, dorsal view, E– ventral side, F– lateral view of body.

Diagnosis:

Deutonymph (Figures 3A and 3B).

Length 480, width 303.

Notogaster with 14 pairs of setae. Two pairs of genital setae and 1 pair of aggenital setae.

Two pairs of anal setae, 3 pairs of adanal setae. Epimera: 3–1–2–1. Chaetome of palps: 1–2–8(1). Chaetome of legs (without tarsi): I: 0–2–3(1)–4(1); II 0–2–2(1)–4; III: 1–2–2–2(1); IV: 0–2–0–1(1).

Tritonymph (Figures 3C and 3D).

Length 586, width 364.

Notogaster with 14 pairs of setae. Five pairs of genital setae and 2 pairs of aggenital setae.

Two pairs of anal setae, 3 pairs of adanal setae. Epimera: 3–1–1–2. Chaetome of palps: 1–2–8(1). Chaetome of legs: I: 0–2–4–6–17; II: 0–3–4–3–13; III: 1–2–3–3–11; IV: 1–2–1–2–10.

Adult (Figures 2A–2E).

All characters the same as in diagnosis of species (Niedbała, 2011); only 1 specimen has 15 notogastral setae on right side (Figure 2D).

Measurements. Pro dorsum: length 369, height 164, width 257, sensillus 78, setae: interlamellar 76, lamellar 109, rostral 101, exobothridial 53; notogaster: length 687, height 525, width 434, setae: c_1 99, $c_1 / c_1 - d_1 = 0.6$, h_1 58, p_1 88; genitoaggenital plate 88×38 , anoadanal plate 180×56 .

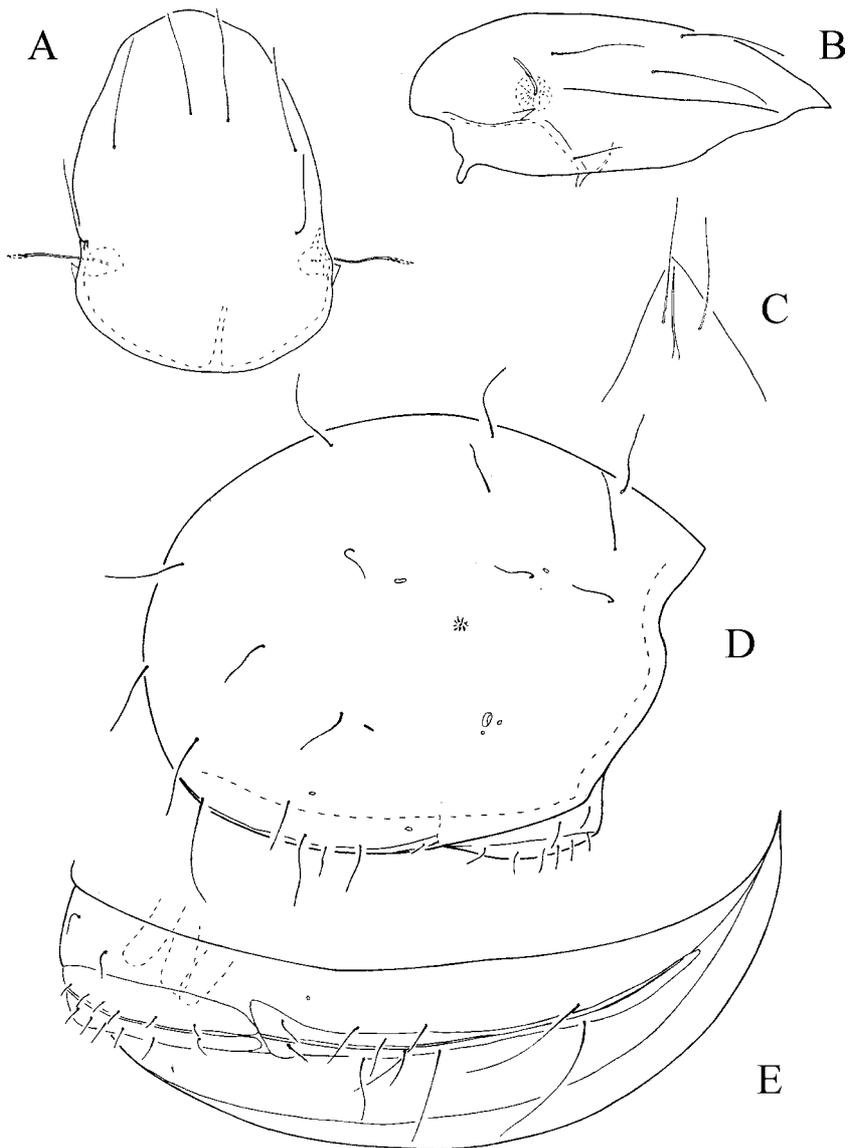


Figure 2. A-E. *Mesotritia nuda* (Berlese, 1887), adult. A- prodorsum, dorsal view, B- prodorsum, lateral view, C- fragment of mentum of subcapitulum, D- lateral view of opisthosoma, E- lateral view of ventral side.

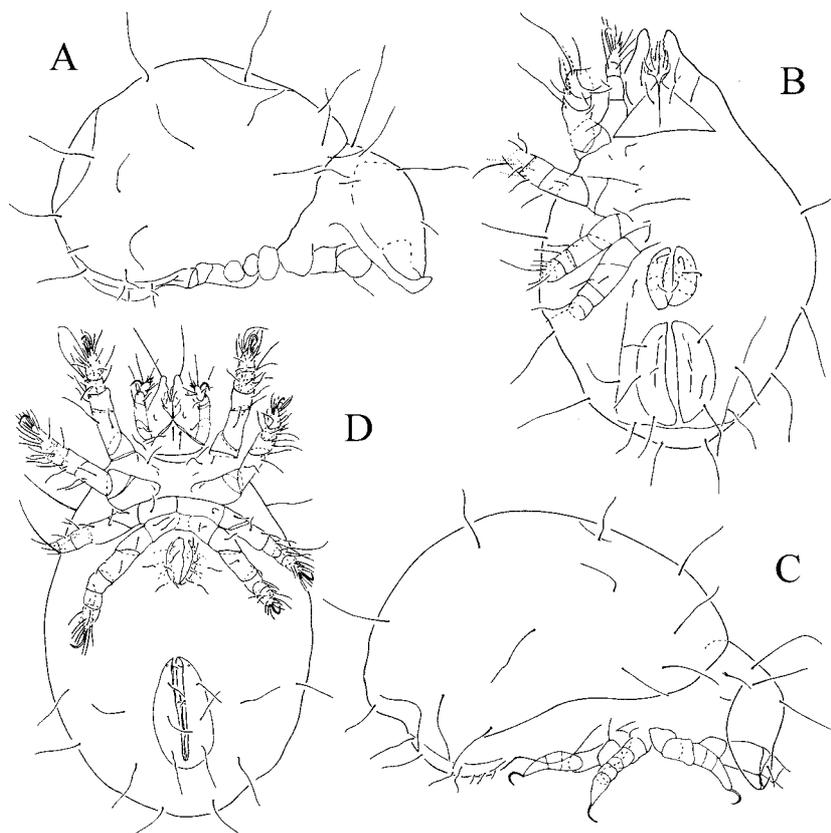


Figure 3. A–D. *Mesotritia nuda* (Berlese, 1887), juvenile stages. A, B– deutonymph. A– lateral view of body, B– ventral view of body. C, D– tritonymph. C– lateral view of body, D– ventral view of body.

Epimera: 3–0–2–3. Chaetome of palps: 2–2–8(1). Chaetome of legs: I: 1–3–4(2)–[4(1)(left leg I) or 5(1)(right leg I)]–17(3); II: 1–4–4(1)–4(1)–14(2); III: 2–3–3(1)–2(1)–11; IV: 2–3–2(0)–2(1)–10.

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Acknowledgements

I am grateful to the members of the Student Naturalist Society (Invertebrate Section) of Adam Mickiewicz University, and especially to K Zawierucha for the collection of material to study. Special thanks are due to the 3 anonymous reviewers for constructive criticism of the manuscript.

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