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Article

Mites of the families Trachyuropodidae Berlese and Urodiaspididae Trägårdh (Acari: Mesostigmata: Uropodina) from Iran

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Abstract

Herein, two genera, *Urodiaspis* Berlese and *Urojanetia* Berlese, and four species, *Trachyuropoda hirschmanni* Pecina, 1980, *Urodiaspis tecta* (Kramer, 1876), *Urodiaspis pannonica* Willmann, 1951 and *Urojanetia excavata* (Wasmann, 1899), are reported for the first time from Iran. Additionally, *Urodiaspis pannonicasimilis* Bal and Özkan, 2009 is considered as junior synonym of *U. pannonica*, and new morphological data for this species represented.

Key words: Fauna; Monogynaspida; new synonym; soil inhabiting mites; Uropodoidea.

Introduction

The cosmopolitan monogynaspid mites of the infraorder Uropodina include four superfamilies, 35 families, 300 genera and about 2300 described species (Beaulieu *et al.* 2011; Halliday 2015). The families Urodiaspididae Trägårdh, 1944 and Trachyuropodidae Berlese, 1917 currently are classified within the superfamily Uropodoidea (Lindquist *et al.* 2009; Beaulieu *et al.* 2011). The Urodiaspididae includes three genera and 26 species (Beaulieu *et al*. 2011). One of these genera is *Urodiaspis* which was erected by Berlese (1916) to accommodate *U. tecta* (Kramer, 1876) as its type species. The genus was originally described as a member of the family Uropodidae Kramer, 1881 and this classification followed by some subsequent authors (e.g. Hirschmann and Zirngiebl-Nicol 1964; Kadite and Petrova 1977; Krantz and Ainscough 1990). On the other hand, some authors placed *Urodiaspis* in the family Urodinychidae Berlese, 1917 (e.g. Karg 1989; Mašán 2001), or under the family Dinychidae Berlese, 1916 (e.g. Lindquist *et al.* 2009), or in a separate family as Urodiaspididae (e.g. Beaulieu *et al.* 2011; Kontschán 2013). The *Urodiaspis* mites usually occur in habitats with high level of organic materials, such as litter, moss, decaying wood, humus. Also, they have been occasionally collected from nest of vertebrates, ants and bumble-bees (Wiśniewski and Hirschmann 1993; Karg 1989; Mašán 2001). Błoszyk *et al.* (2004) considered *Urodiaspis tecta* and *Urodiaspis pannonica* Willmann, 1951 as reproducing only (or almost exclusively) in parthenogenetic way. The family Trachyuropodidae includes 16 genera (Kontschán 2015), and about 100 described species (Wiśniewski and Hirsch-

mann, 1993; Beaulieu *et al.* 2011), and most of the family members have been reported in association with ants, but several species inhabit in soil, leaf litter and moss (Mašán, 2001; Kontschán and Starý 2013).

Iranian mites of Uropodina are poorly known, and so far only 38 species of this infraorder have been reported from Iran (Kazemi and Kontschán 2007, 2014; Kazemi and Rajaei 2013; Kontschán and Hajizadeh 2013; Arjomandi *et al.* 2013; Arjomandi and Kazemi 2014, 2016; Kazemi and Abolghasemi 2016). Herein, the genera *Urodiaspis* and *Urojanetia* represented by three species and one species of the genus *Trachyuropoda* Berlese, 1888 are reported for the first time from Iran. Additionally, we suggest *Urodiaspis pannonicasimilis* Bal and Özkan, 2009 as junior synonym of *Urodiaspis pannonica* and present new morphological data for this species.

Material and methods

Mite specimens were extracted from forest soil and litter by means of Berlese-Tullgren funnels, cleared in Nesbitt's fluid and then mounted in Hoyer's medium.

Morphological observations, measurements and illustrations were made using a compound microscope equipped with differential interference contrast and phase contrast optical systems and a drawing tube (Olympus BX51). Measurements are given in micrometers (μm). Dorsal and female epigynal shields length and width were taken from the anterior to posterior margins along the mid-line and from the lateral margins at the broadest point, respectively.

Mite specimens are deposited in the Acarological Collection, Institute of Science and High Technology and Environmental Sciences, Graduate University of Advanced Technology, Kerman, Iran (ACISTE).

Results

Family Trachyuropodidae Berlese, 1917

Genus *Trachyuropoda* Berlese, 1888

Type species: *Trachyuropoda festiva* Berlese, 1888.

Trachyuropoda hirschmanni Pecina, 1980 (Fig. 1)

Trachyuropoda hirschmanni Pecina, 1980: p. 373.
Trachyuropoda hirschmanni – Mašán (2001): p. 235; Kontschán (2002): p. 53; Kontschán (2007): p. 51.

Studied materials – Two female specimens collected in soil, litter and cow manure in Shorum Forest, Tonekabon (47° 22' 93" N; 40° 63' 24" E), altitude 1318 m a.s.l., 1 June 2015.

Measurements of the Iranian specimens: Length and width of female idiosoma 729–741, 470–482, respectively.

Distribution – Europe (Pecina 1980; Mašán 2001; Kontschán 2002, 2007), and Iran (this study).

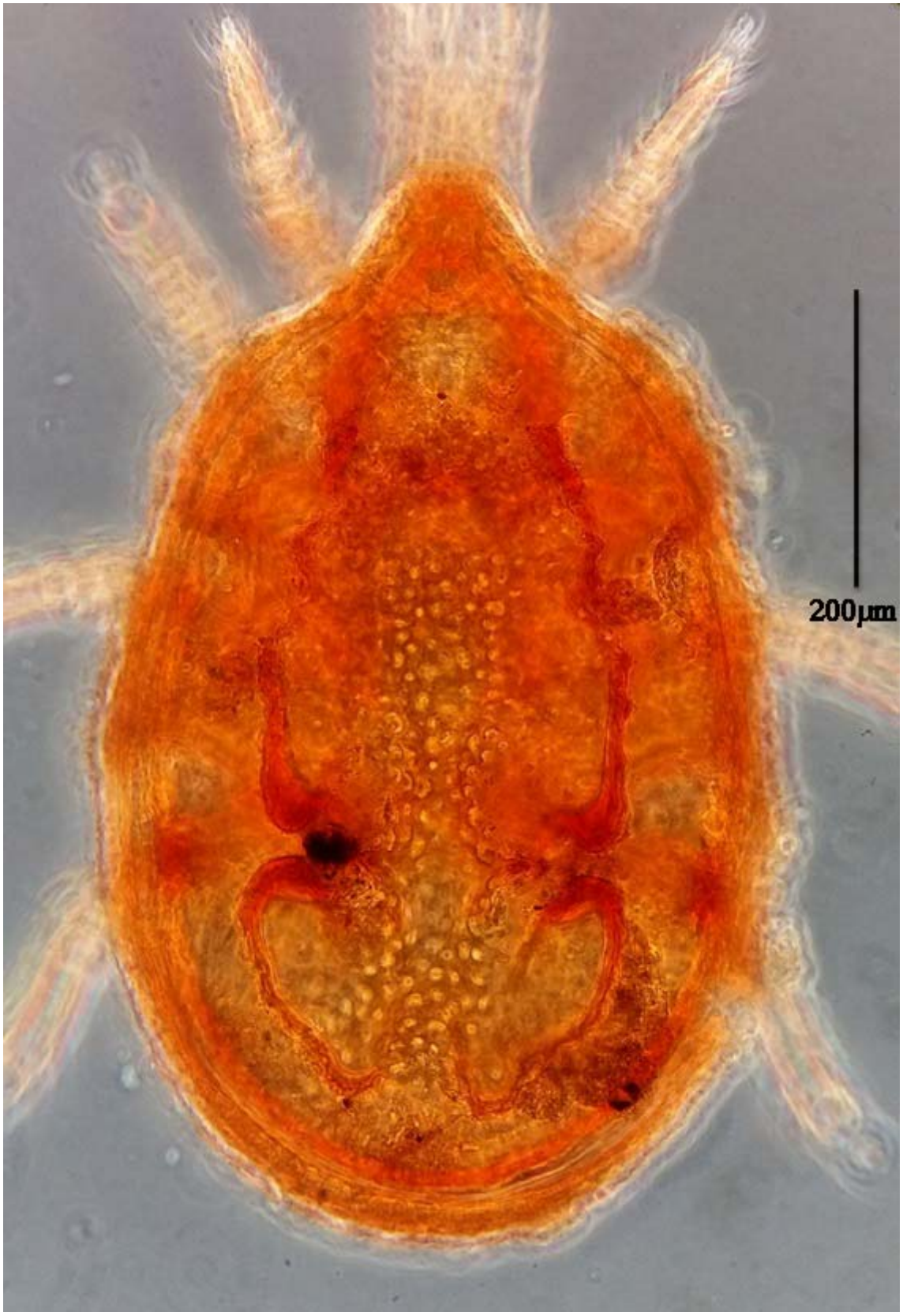


Figure 1. *Trachyuropoda hirschmanni* – Female body (dorsal view).

Genus *Leonardiella* Berlese, 1903

Type species: *Uropoda canestriniana* Berlese, 1891.

Leonardiella riccardiana (Leonardi, 1895)

Note. This species has been reported from Kerman, Iran (Arjomandi and Kazemi 2014) as *Trachyuropoda riccardiana* (Leonardi, 1895), but the species currently transferred to the genus *Leonardiella*, and this genus can be easily distinguished from other genera of Trachyuropodidae by the following morphological characters: idiosoma subtriangular or pentagonal, anterior area of marginal shield broad, and opisthogastric region of ventral idiosoma with a pair of deep furrows (Kontschán 2015).

Genus *Urojanetia* Berlese, 1903

Type species: *Uropoda coccinea* Michael, 1891.

Urojanetia excavata (Wasmann, 1899) (Fig. 2)

Glyphopsis coccinea Wasman var. *excavata* Wasmann, 1899: p. 166.
Urajanetia excavata – Balogh (1938): p. 108; Kontschán (2007): p. 47; Kontschán (2013): p. 111.
Trachyuropoda excavata – Pecina (1980): p. 369; Mašán (2001): p. 235.

Studied material – One male specimen from soil and litter in the Botanical Garden of Nowshahr (36° 38' N; 51° 30' E), altitude -13 m a.s.l., 15 September 2015.

Measurements of the Iranian specimen – Length and width of male idiosoma, respectively, 823, 576.

Distribution – Europe, former USSR (Pecina 1980; Kadite and Petrova 1977; Mašán 2001; Kontschán 2005, 2013), and Iran (this study).

Family Urodiaspididae Trägårdh, 1944

Genus *Urodiaspis* Berlese, 1916

Type species: *Notaspis tectus* Kramer, 1876.

Urodiaspis tecta (Kramer, 1876) (Fig. 3)

Type species: *Notaspis tectus* Kramer, 1876: p. 79.
Urodiaspis tecta – Berlese (1916): p. 25; Pecina (1980): p. 426; Kadite and Petrova (1977): p. 657; Karg (1989): p. 125; Błoszyk (1999): p. 148; Mašán (2001): p. 187; Bal and Özkan (2007): p. 16; Kontschán (2013): p. 11.

Studied materials – Two female specimens from soil and litter in Arasbaran Forest (38° 56' 25" N; 46° 45' 31" E), altitude 1380 m a.s.l., 20 June 2015.

Measurements of Iranian specimens – Length and width of female idiosoma,

respectively, 808–828, 624–638; genital shield length 213–217 and width 132–142.

Figure 2. *Urojanetia excavata* – Male body (dorsal view).

Distribution – Europe, Turkey, former USSR (Pecina 1980; Kadite and Petrova 1977; Karg 1989; Mašán 2001; Fenďa and Košel 2004; Bal and Özkan 2007; Kamczyc and Gwiazdowicz 2009; Kontschán 2013), and Iran (this study).

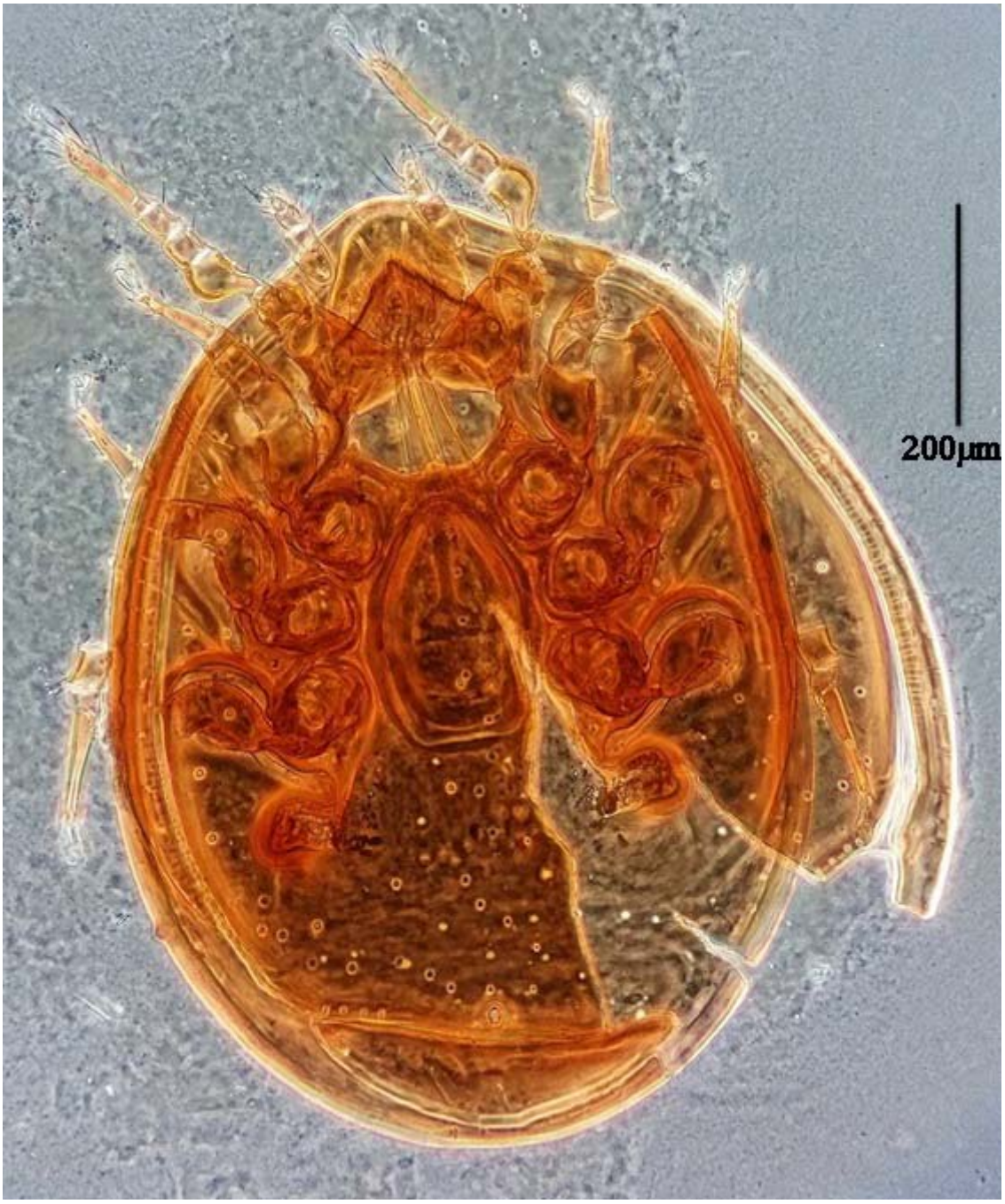
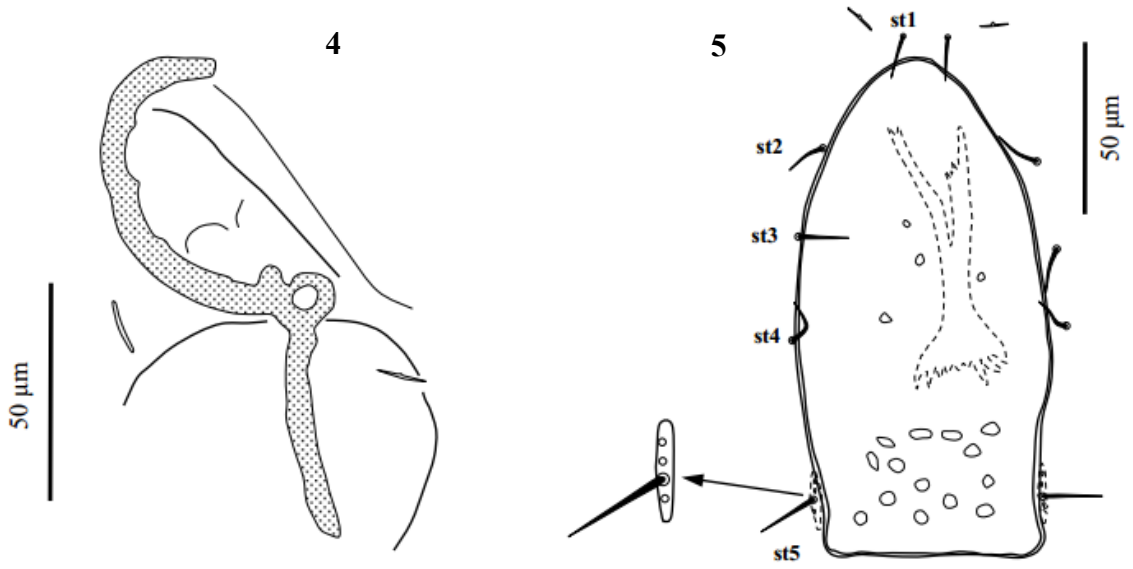


Figure 3. *Urodiaspis tecta* – Female body (ventral view).

***Urodiaspis pannonica* Willmann, 1951 (Figs. 4–7)**

Urodiaspis pannonica Willmann, 1951: p. 126.
Urodiaspis pannonica – Berlese (1916): p. 25; Pecina (1980): p. 426; Kadite and Petrova (1977): p. 654; Karg (1989): p. 125; Błoszyk (1999): p. 152; Mašán (2001): p. 187; Kontschán (2013): p. 11.
Urodiaspis pannonicasimilis **syn. nov.** – Bal and Özkan (2009): p. 334.



Figures 4–5. *Urodiaspis pannonica* (female) – 4. Peritreme; 5. Genital shield region.

Studied materials – Two female specimens from soil and litter in Arasbaran Forest (38° 53' 65" N; 46° 47' 64" E), altitude 1700 m a.s.l., 10 July 2015; three females from rotten woods, in Arasbaran Forest (38° 54' 67" N; 46° 47' 91" E), altitude 1250 m a.s.l., 8 August 2015.

Measurements of Iranian specimens – Length and width of female idiosoma, 504–530, 317–350 respectively; genital shield length 132–146 and width 70–80.

Distribution – Europe, former USSR, Turkey (Pecina 1980; Kadite and Petrova 1977; Karg 1989; Mašán 2001; Bal and Özkan 2009; Kontschán 2013), and Iran (this study).

Note. Kadite and Petrova (1977) stated that sternal setae *st5* are inserted in soft cuticle, but our examination of dissected specimens indicates that these setae are inserted on minute and narrow platelets laterad to sternal shield (Figs. 5, 7) which has been confirmed by the examination of European specimens (personal communication of Peter Mašán with the senior author, and the senior author personal observation of *U. pannonica* collected in Slovakia).

Bal and Özkan (2009) described *U. pannonicasimilis* from Turkey and although mentioned that it was very similar to *U. pannonica* they diagnosed the new species based on low value morphological differences and zoogeographical distribution. In comparison between the original description of *U. pannonicasimilis* with female specimens of *U. pannonica* collected in northwestern Iran (near Turkey), and some females and one deutonymph of *U. pannonica* collected in Slovakia, and also the original description of *U. pannonica* and some other related papers, we could not find any diagnostic character to separate these species. Therefore, we suggest *U. pannonicasimilis* as junior synonym of *U. pannonica*.

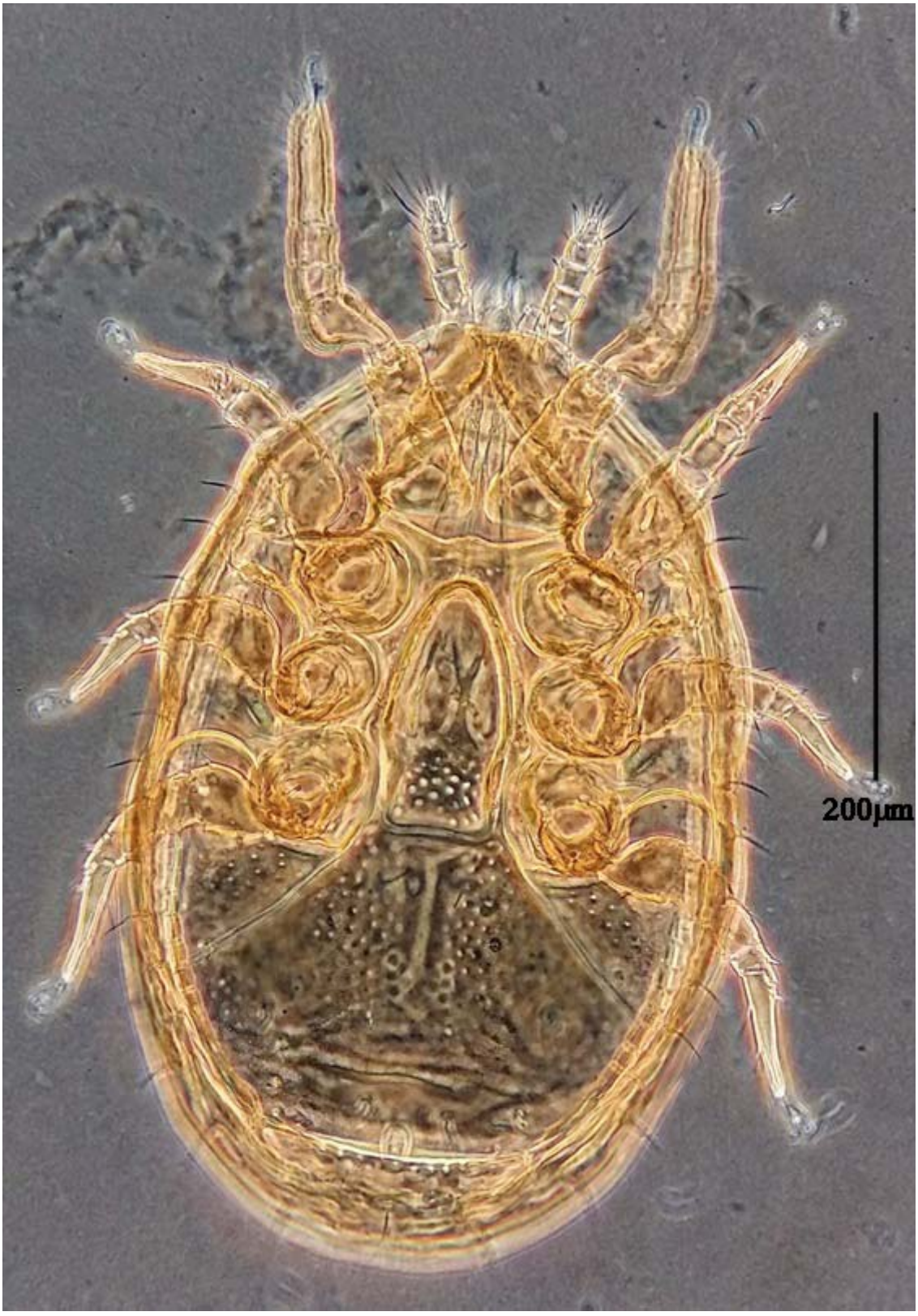


Figure 6. *Urodiaspis pannonica* – Female body (ventral view).

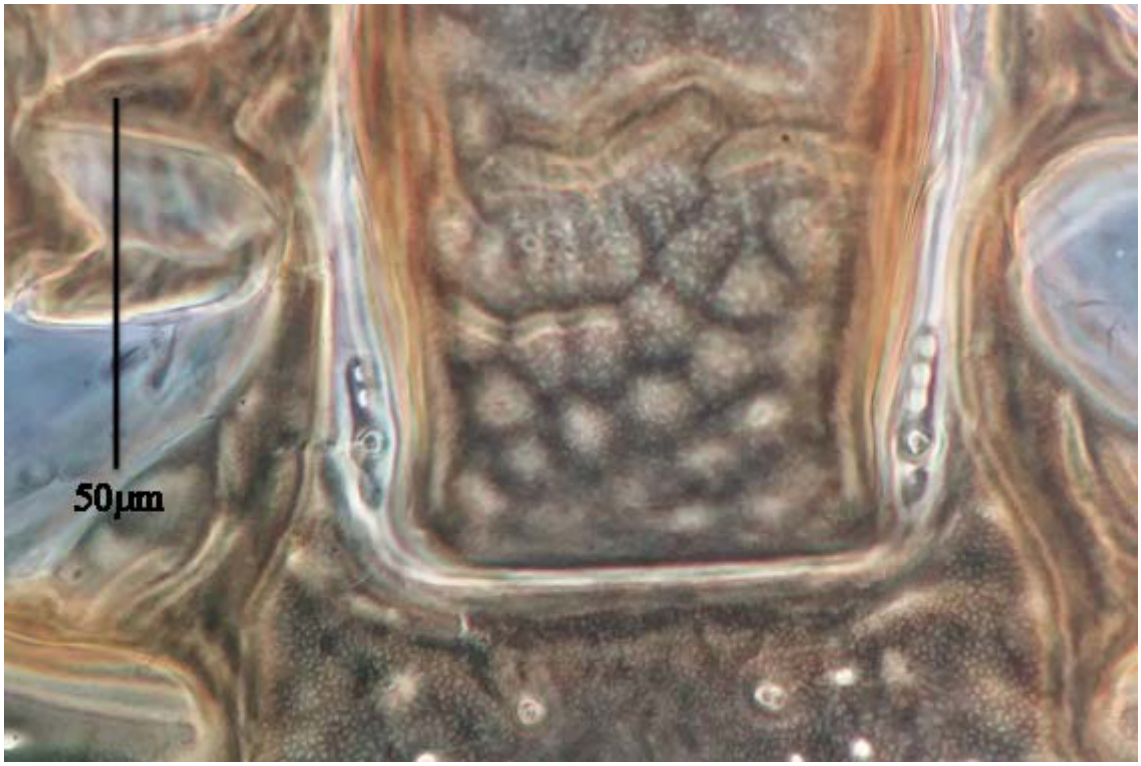


Figure 7. *Urodiaspis pannonica* (female) – Details of posterior region of genital shield.

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کنه‌های خانواده‌های Trachyuropodidae Berlese و Urodiaspididae (Acari: Mesostigmata: Uropodina) Trägårdh از ایران

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چکیده

در اینجا دو جنس *Urodiaspis* Berlese و *Urojanetia* Berlese و چهار گونهٔ *Trachyuropoda hirschmanni* Pecina, 1980، *Urodiaspis pannonica* Willmann, 1951، *Urodiaspis tecta* (Kramer, 1876) و *Urojanetia excavata* (Wasmann, 1899) برای نخستین بار از ایران گزارش می‌شوند. افزون بر این، گونهٔ *Urodiaspis pannonicasimilis* Bal and Özkan, 2009 به عنوان مترادف گونهٔ *U. pannonica* معرفی و صفات ریخت‌شناسی جدیدی برای آن ارایه می‌شود.

واژگان کلیدی: فون؛ Monogynaspida ؛ مترادف جدید؛ کنه‌های خاکزی؛ Uropodoidea.

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