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# First record of *Oribatula variaporosa* (Acari, Oribatida, Oribatulidae) from Ukraine

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## Abstract

First record of *Oribatula variaporosa* (Acari, Oribatida, Oribatulidae) from Ukraine. *Oribatula variaporosa* lordansky, 1991 is recorded for the first time in Ukraine. A supplementary description of this species is presented, based on an adult collected from dry meadow steppe in Dudari village, Rzhyschiv CATC, Kyiv region. A key to *Oribatula* mites of Ukraine was prepared.

Key words: Oribatida, mites, Oribatulidae, Grasslands, Morphology, Taxonomy

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## Resumen

Primer registro de *Oribatula variaporosa* (Acari, Oribatida, Oribatulidae) en Ucrania. Primer registro de *Oribatula variaporosa* lordansky, 1991 en Ucrania. Se presenta una descripción complementaria de esta especie basada en un ejemplar adulto recolectado en la estepa de pradera seca del pueblo de Dudari, CATC de Rzhyschiv, región de Kyiv. Se ha preparado una clave de los ácaros *Oribatula* de Ucrania.

Palabras clave: Oribatida, Ácaros, Oribatulidae, Pastos, Morfología, Taxonomía

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## Resum

Primer registre d'*Oribatula variaporosa* (Acari, Oribatida, Oribatulidae) a Ucraïna. Primer registre d'*Oribatula variaporosa* lordansky, 1991 a Ucraïna. Es presenta una descripció complementària d'aquesta espècie basada en un exemplar adult recol·lectat a l'estepa de praderia seca del poble de Dudari, CATC de Rzhyschiv, regiò de Kíiv. S' ha preparat una clau dels àcars *Oribatula* d'Ucraïna.

Paraules clau: Oribatida, Àcars, Oribatulidae, Pastures, Morfologia, Taxonomia

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## Introduction

Oribatulidae are cosmopolitan mites, represented by 206 species from 16 genera (Subías, 2004). They occur in various habitats, both forest and meadow, inhabiting mosses and lichens. Some species are resistant to soil salinity (Weigmann, 2006; Schatz et al., 2021). In Ukraine, the family includes 33 species, which is about 16% of the world's Oribatulidae fauna and about 5% of the species composition of oribatid mites of Ukraine (Yaroshenko 2000). According to Yaroshenko 2000, in Ukraine the genus *Oribatula* is represented by five species: *O. tibialis* (Nicolet, 1855), *O. pannonica* Willmann, 1949, *O. pallida* Banks, 1906, *O. vera* (Bulanova–Zachvatkina, 1967), *O. angustolamellata* lordansky, 1991.

During the determination of material from the Kyiv region, Ukraine, a specimen of *Oribatula variaporosa* was discovered. Here we report the first finding of this species for the territory of Ukraine. The genus *Oribatula* in Ukraine is now represented by six species. Previously, it was recorded only from the Volgograd region (Russia) (lordansky, 1991). Our finding is the most western sighting for this species. It should be noted that the species composition of oribatids of Ukraine is not complete, and is constantly being updated (Hushtan, 2018; Hushtan et al., 2021). This paper aims to provide new first record of *O. variaporosa* from Ukraine and present data on its morphology.

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## Material and methods

In the faunal study of territory of Rzhyschiv CATC (Kyiv region, Ukraine) oribatid mites were extracted from soil samples using Berlese–Tullgren funnel (Walter and Krantz, 2009). Mites were selected using an Olympus SZX10 stereomicroscope. Species identification of oribatids was performed using an Olympus BX51 light microscope and keys (lordansky, 1991; Weigmann, 2006).

Morphological photographs were taken with an Olympus DP72 camera and quick Photo2.3 MICRO programme software. All body measurements are presented in micrometers. Morphological terminology used follows Travé and Vachon (1975), Norton (1977) and Norton and Behan–Pelletier (2009). Key to *Oribatula* species of Ukraine modified from lordansky (1991) and Weigmann (2006).

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## Results

### Taxonomy

#### Family Oribatulidae Thor, 1929

#### Genus *Oribatula* Berlese, 1896

#### *Oribatula variaporosa* lordansky, 1991

Diagnosis: body size: 442 × 291–295. Rostrum rounded. Lamellae with small rounded cusps. Rostral, lamellar and interlamellar setae setiform, barbed; *ro* shortest, *in* longest. Bothridial setae club-shaped. Anterior notogastral margin interrupted medially. Notogaster with 14 pairs of setiform, barbed setae. Notogastral porose areas *Aa* oval, smaller than rounded *A1*, *A2*, *A3*. Epimeral and anogenital setae short, simple.

#### Supplementary description

Measurements: body length: 442, notogaster width: 291.

Integument: body color light brown. Body surface microfoveolate. Lateral parts of prodorsum between bothridia and acetabula I–IV with microgranulate cerotegument. Anogenital region foveolate.

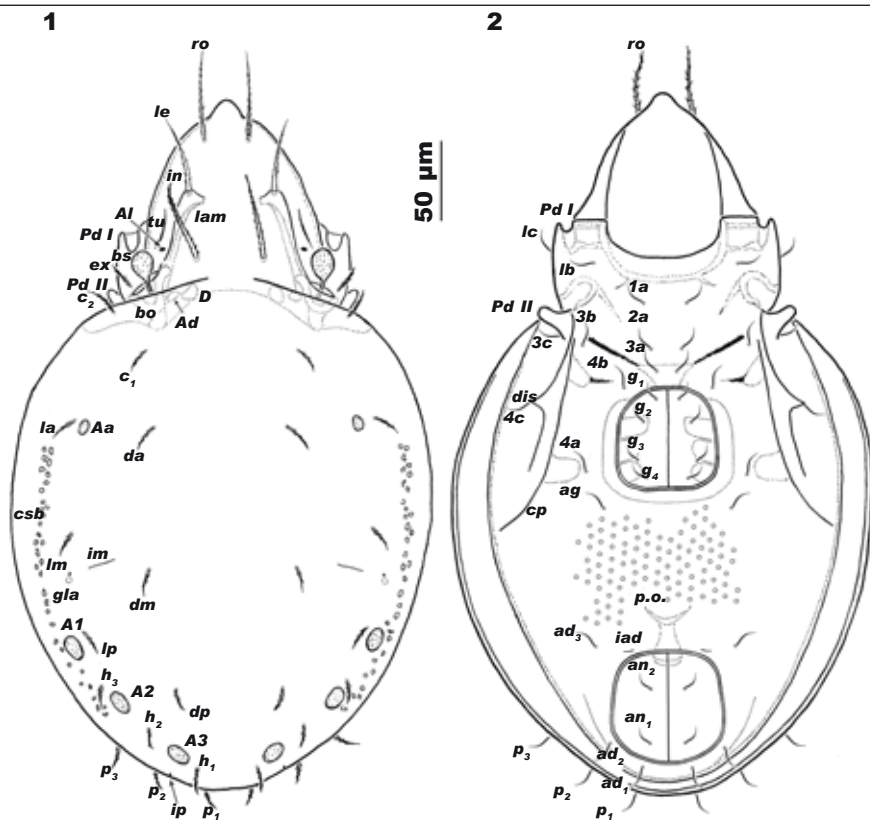


Fig. 1–2. *Oribatula variaporosa*, adult (gnathosoma and legs not shown): 1, dorsal view; 2, ventral view.

Fig. 1–2. *Oribatula variaporosa*, adulto (no se muestran el gnathosoma ni las patas): 1, vista dorsal; 2, vista ventral.

Prodorsum  $113 \times 164$  (fig. 1, 7): rostrum rounded. Lamellae (*lam*: 84), have small rounded cusps (fig. 1, 10). Translamella absent, but there are cuticular thickenings on the inner side of the apex of the lamellae. Tutoria (*tu*: 47) ridge-like. Rostral (*ro*: 49), lamellar (*le*: 68) and interlamellar (*in*: 59) setae setiform, barbed. Bothridial setae (*bs*: 33) club-shaped, barbed (fig. 1, 8). Exobothridial setae (*ex*: 13) setiform, thin. Dorsosiphagmata (*D*) semi-oval. Dorsosejugal porose areas (*Ad*:  $14 \times 3$ ) elongate oval.

Notogaster (fig. 1): length: 357, with very small humeral projections. Anterior notogastral margin shortly interrupted medially. Fourteen pairs (20–23) of setiform, barbed setae (fig. 9). Porose areas *Aa* oval ( $11 \times 8$ ), smaller than rounded *A1*, *A2*, *A3* (16–18). Lyrifissures, opisthonotal gland openings, circumgastric scissure and circumgastric sigillar band distinct.

Gnathosoma: generally, it is similar to the other species of Oribatulidae (Shtanchaeva et al., 2012; Ermilov and Liao, 2018). Subcapitulum size:  $112 \times 70$ . Subcapitular setae (*a*: 8; *m*: 13; *h*: 17) setiform, barbed. Palps (length: 53–57) with typical setation: 0–2–1–3–9(+ $\omega$ ). Chelicerae length: 98.



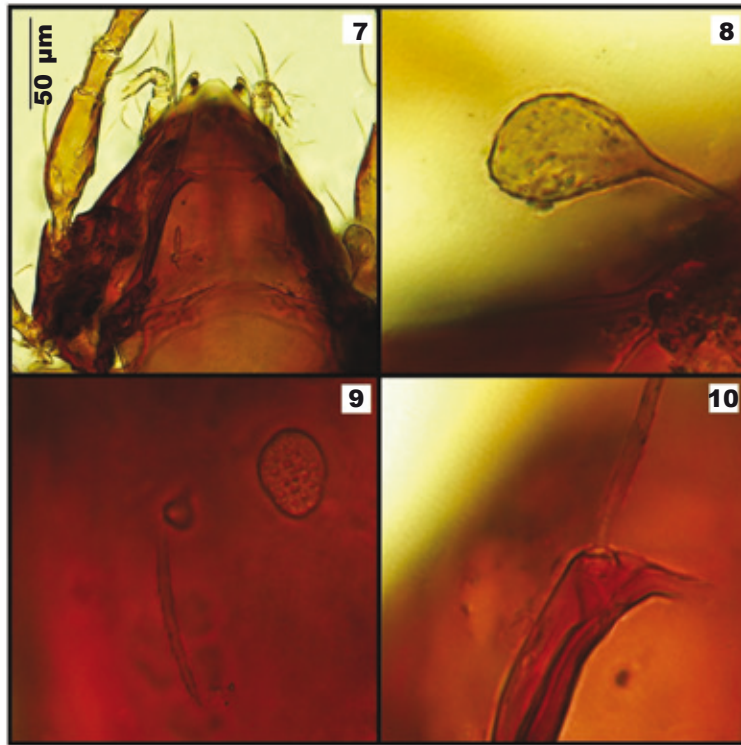


Fig. 7–10. *Oribatula variaporosa*, adult: 7, prodorsum; 8, bothridial seta; 9, notogastral seta and porose area Aa; 10, cusp of lamella.

Fig. 7–10. *Oribatula variaporosa*, adulto: 7, prodorso; 8, seta botridial; 9, seta notogastral y zona porosa Aa; 10, cúspide de la lamella.

Epimeral region (fig. 2): epimeral setal formula: 3–1–3–3, all epimeral setae (13–23) thin, setiform, smooth. Pedotecta I (*Pd I*) and II (*Pd II*) represented by small laminae. Discidia (*dis*) triangular. Circumpedial carinae (*cp*) long, directed to *Pd II*.

Anogenital region (fig. 2): anogenital setal formula 4–1–2–3. Genital ( $g_1$ – $g_4$ , 8–13), ag-genital (*ag*, 16), anal ( $an_1$ ,  $an_2$ , 12–14), and adanal ( $ad_1$ – $ad_3$ , 11–12) setae setiform, thin, smooth. Adanal lyrifissures (*iad*) located close and anterior to anal plates. Adanal setae  $ad_1$  in posterior,  $ad_2$  in posterolateral,  $ad_3$  in anterolateral positions to anal aperture. Distance between genital (54 × 54) and anal (79 × 72) apertures: 107.

Legs (figs 3–6, table 1): legs heterotridactylous, median claws distinctly thicker than laterals, dorsally barbed. Dorsal porose areas on tarsi I, ventral porose areas on tarsi I–IV, ventral porose areas on tibia I–IV, dorsoparaxial porose areas on femora I–IV well visible. Leg setal formulas: I (1–5–3–4–20) [1–2–2], II (1–5–2–4–15) [1–1–2], III 2–3–1–3–15 [1–1–0], IV (1–2–2–3–12) [0–1–0]. Famulus looks like small conical projection on tarsus I.

Table 1. Leg setation and solenidia of *Oribatula variaporosa*.

Tabla 1. Setación de las patas y solenidios de *Oribatula variaporosa*.

| Leg | Trochanter | Femur             | Genu          | Tibia  | Tarsus   |
|-----|------------|-------------------|---------------|--|--|
| I   | v'         | d, (l), bv'', v'' | (l), v',<br>σ | (l), (v),<br>φ <sub>1</sub> , φ <sub>2</sub> | (ft), (tc), (it), (p), (u), (a), s,<br>(pv), l', (pl), l'', e, ω <sub>1</sub> , ω <sub>2</sub> |
| II  | v'         | d, (l), bv'', v'' | (l),<br>σ     | (l), (v),<br>φ                               | (ft), (tc), (it), (p), (u), (a), s,<br>(pv), ω <sub>1</sub> , ω <sub>2</sub>                   |
| III | l', v'     | d, l', ev'        | l',<br>σ      | l', (v),<br>φ                                | (ft), (tc), (it), (p), (u), (a), s,<br>(pv)  |
| IV  | v'         | d, ev'            | d, l'         | l', (v), φ                                   | ft'', (tc), (p), (u), (a), s, (pv)   |

Material examined

The adult specimen was found in a forest–steppe zone of Ukraine: Kyiv region, Rzhyshevskiy CATC, Dudari village, dry meadow steppe, 49.886858 °N 31.249387 °E, 19.06.2021, collected by Hushtan K. V.

Distribution

South of the East European Plain

Ecology

Dry steppe (Iordansky, 1991). The new record from the territory of Ukraine was discovered in the dry meadow steppe.

**Discussion**

*Oribatula variaporosa* is similar in body size and morphology of lamellae to *Oribatula angustolamellata* Iordansky, 1991 and variations of *Oribatula interrupta* (Willmann, 1939) (Iordansky, 1991; Weigmann, 2006), but differs from them by the barbed notogastral setae, size of porose areas A1–A3 larger than Aa and the interrupted medially anterior margin of notogaster. Also *O. variaporosa* has club-shaped bothridial setae, compared to *O. angustolamellata*.

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## Key to *Oribatula* mites of Ukraine

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|---|---|
| 1. Anterior notogastral margin interrupted medially;<br>bothridial setae short, club-shaped;<br>porose areas A1, A2, A3 larger than Aa;<br>notogastral setae barbed, body size:<br>442 × 291–295 µm | <i>Oribatula variaporosa</i> lordansky, 1991      |
| Anterior notogastral margin no interrupted<br>medially; bothridial setae long, is other forms   | 2   |
| 2. Lamellae wide  | 3   |
| Lamellae thin   | 6   |
| 3. Humeral projections small  | 4   |
| Humeral projections large   | 5   |
| 4. Large mites, body length 410–530 µm;<br>ront rounded cusps not or very little protruding;<br>translamella not expressed  | <i>Oribatula tibialis</i> (Nicolet, 1855)         |
| Small mites, body length about 370 µm;<br>cusps–small, round tubercles; lamellae<br>have small internal protrusions–rudimentary<br>translamella   | <i>Oribatula pallida</i> Banks, 1906              |
| 5. Humeral projections semicircular in shape;<br>interlamellar setae barbed; bothridial setae<br>slightly barbed body size 408 × 288 µm   | <i>Oribatula caliptera</i> Berlese, 1902          |
| 6. Lamellae without internal protrusions on the<br>distal, without translamella and prolamella<br>interlamellar setae longer than lamellar<br>setae; body length 350–470 µm                         | <i>Oribatula pannonica</i> Willmann, 1949         |
| Lamellae with internal protrusions on the<br>distal part (hints at translamella); lamellar<br>setae longer than interlamellar setae;<br>body length 445 µm  | <i>Oribatula angustolamellata</i> lordansky, 1991 |

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