A description of a new water mite species of the genus *Albaxona* Szalay, 1944 (Acariformes: Aturidae) from the Far East of Russia

Описание нового вида водяных клещей рода *Albaxona* Szalay, 1944 (Acariformes: Aturidae) из водоёмов Дальнего Востока России

P.V. Tuzovskij

П.В. Тузовский

P.V. Tuzovskij, Institute for Biology of Inland Waters, Russian Academy of Sciences, Borok, Yaroslavl Province 152742, Russia. E-mail: tuz@ibiw.yaroslavl.ru

A new water mite, *Albaxona orientalis,* based on male, female and deutonymph from running waters of the Far East of Russia is described with illustrations.

Иллюстрированное описание нового вида водяного клеща *Albaxona orientalis* (самец, самки, дейтонимфа) из проточных водоемов Дальнего Востока России.

Key words: Far East of Russia, water mites, Acariformes, Aturidae, Axonopsinae, *Albaxona orientalis*, male, female, deutonymph, new species

Ключевые слова: Дальний Восток России, водяные клещи, Acariformes, Aturidae, Axonopsinae, *Albaxona orientalis*, самец, самка, дейтонимфа, новый вид

INTRODUCTION

The genus *Albaxona* Szalay, 1944 includes two subgenera: *Albaxona* Szalay, 1944 and *Vietsaxona* Motaş et Tanasachi, 1947 (Cook, 1974; Viets, 1987); however Pešić and Gerecke (2003) suppose that *Vietsaxona* should be regarded a synonym of *Albaxona*. No species of the genus *Albaxona* from the territory of the former USSR had been recorded (Sokolow, 1940) before a single member of this genus, *A.* (*Vietsaxona*) *intermedia* Tuzovskij, 1986, was recorded in Russia comparatively recently (Tuzovskij, 1986). Investigations of the water mites fauna of the Russian Far East have revealed that there is an undescribed species of this genus. The aim of the present paper is to present a description of a male, a female and a deutonymph of the new species, *Albaxona orientalis* **sp. nov.**, from the Far East of Russia.

MATERIALS AND METHODS

The examined materials was collected by T.S. Vshivkova in rivers of the Primorskiy Kray of Russia. The specimens were fixed in 3% formalin solution. Most specimens not were dissected, thus preserving the natural shape of the body. For several females and males the gnathosoma was mounted in a position that allowed investigating chelicerae and pedipalps in a lateral view. All specimens were mounted in the Hoyer's medium. Terminology of idiosomal setae and lyriform organs follows Tuzovskij (1987): *Fch* – frontales chelicerarum, *Fp* – frontales pedipalporum, *Vi* – verticales internae, *Ve* – verticales externae, *Oi* – occipitales internae, *Oe* – occipitales externae, *Hi* – humerales internae, *He* – humerales externae, *Hv* – humerales ventralia, *Sci* – scapulares internae, *Sce* – scapulares externae, *Li* – lumbales internae, *Le* – lum-

bales externae, *Si* – sacrales internae, *Se* – sacrales externae, *Ci* – caudales internae, *Pi* – praeanales internae, *Pe* – praeanales externae; *i1–i5* – slit organs. Besides, the following abbreviations are used: P–1–5, pedipalp segments (trochanter, femur, genu, tibia and tarsus); I–Leg. 1–6, first leg, segments 1–6 (trochanter, basifemur, telofemur, genu, tibia and tarsus) i.e. III–Leg. 4 is the genu of the third leg; ac. 1–3, genital acetabula (anterior, median, posterior), n – number of specimens measured. The length of the appendage segments was measured along their dorsal side. All measurements are given in micrometers (μm).

Family **ATURIDAE** Thor, 1900

Subfamily **AXONOPSINAE** Viets, 1929

Genus ***Albaxona*** Szalay, 1944

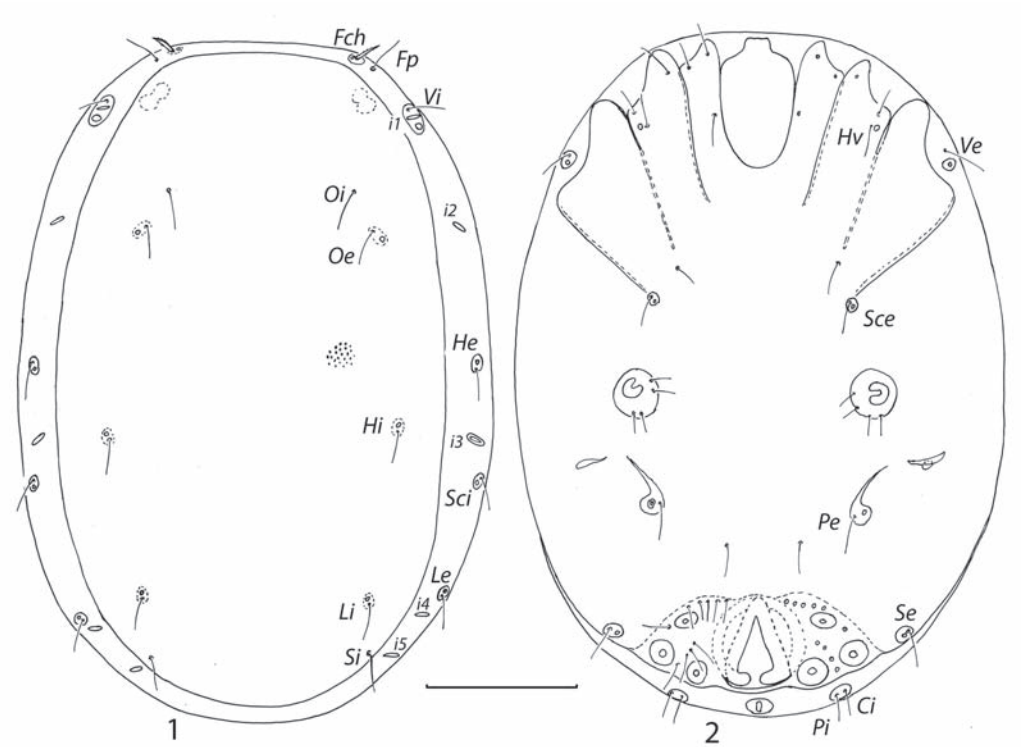
***Albaxona* (*Albaxona*) *orientalis* sp. nov.** (Figs 1–15)

Holotype: male, slide 4934, **Russia**, Far East, Primorskiy Kray, Ussuri National Park, Komarovka River, depth about 0.4 m; substrates: stones, pebbles, sand, 1 June 1984, coll. T.S. Vshivkova. *Paratypes* (3 males, 8 females and 1 deutonymph collected in the some locality as holotype): 1 female 26 July 1977, 1 female 17 July 1983, 2 females 19 July 1983, 1 female and 1 male 29 May 1984, 1 female, 2 males and 1 deutonymph together with holotype 1 June 1984, 2 females 5 July 1984, coll. T.S. Vshivkova. The type material is deposited in the collection of the Institute for Biology of Inland Waters (Borok, Russia).

Diagnosis. *Adults*: idiosoma elongate, compressed dorso-ventrally, with straight anterior margin, setae *Fp, Oi, Si, Ci* and *Pi* without glandularia, ventral setae on pedipalpal tibia placed near middle of segment, leg claws with short external and long internal denticles; *male* – genital field fused with ventral shield, wider than long (ratio length/width 0.38–0.45), with 9–11 pairs of fine setae, fusion of genital field slightly indicated, gonopore triangular with pointed anterior end, setae *Se* placed on ventral shield posterolaterally; *female* – acetabular plates with 5 fine setae each, setae *Se* placed on soft integument between ventral shield and acetabular plates. *Deutonymph*: dorsum with soft integument without dorsal shield or platelets; sclerites, bearing seta and glandularium *Hi*, larger than other sclerites, bearing idiosomal setae and glandularia; bases of setae *Oi* located on small circular sclerites; anterior ends of acetabular plates pointed and fused to each other; excretory pore surrounded by sclerotised ring.

Description. Both sexes. Idiosoma oval, compressed dorso-ventrally, dorsal and ventral shields present. Dorsal shield elongate, covering nearly all dorsal surface, bearing 5 pairs of setae: *Oi, Oe, Hi, Li, Si* (Fig. 1). Setae *Oi* and *Oe* located in anterior half of dorsal shield, *Hi* distally to middle of shield, *Li* in distal portion of shield, and *Si* very close to posterolateral margins of shield. Setae *Fp, Oi, Si, Ci* and *Pi* without glandularia, others idiosomal setae associated with glandularia. Setae *Fch, Fp, Vi, Ve,He, Sci, Le, Ci, Pi* and all slit organs (*i1–i5*) located on soft interscutal membrane between dorsal and ventral shields: *i1* and seta *Vi* placed on common sclerite on each side, *i2* at level and laterally to *Oe, i3* at level to *Hi*, *i4* posterior to *Le,* and *i5* laterally to *Si*. Setae *Fch* short, thick and serrate, other idiosomal setae thin, hair-like. Ventral shield (Fig. 2) broader than dorsal shield, anterior coxal plates reaching but not projecting beyond anterior margin of ventral shield, suture line between coxal plates II–III distinct developed only their lateral parts. Seta *Hv* located near posterolateral margin of coxal plate II, *Ve* laterally to coxal plates III, *Sce* medially to suture line between coxal plates III and IV, *Pe* more or less equidistant from insertion of leg IV and posterior end of ventral shield, *Se* in posterolateral corner of ventral shield on each side. Setae *Ci* and *Pi* close to each other and usually placed on common sclerite caudally on each side. Dorsal and ventral shields punctate.

Capitulum (Fig. 3) with short rostrum, without anchoral process, dorsal hypostomal setae nearly three times as long as ventral hypostomal setae (Fig. 4). Che-

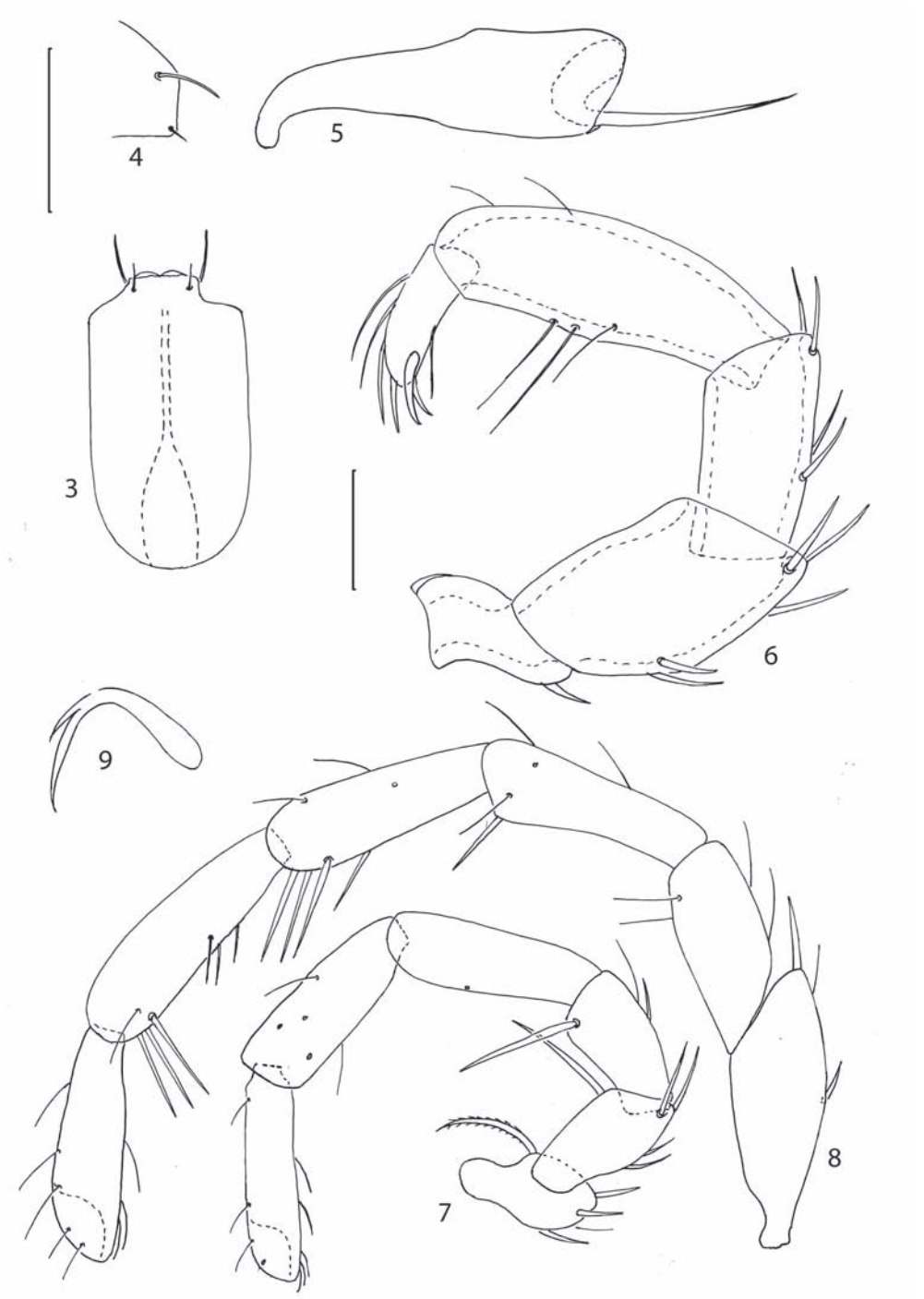


Figs 1–2. *Albaxona orientalis* **sp. nov.**, male: **1**, dorsal view; **2**, ventral view. Scale bar: 100 μm.

licerae with large basal segment and long, thin stylet (Fig. 5). Pedipalps moderately slender (Fig. 6): P–1 relatively short with single dorsodistal seta; P–2 with straight or slightly convex ventral margin, with 2 unequal dorsoproximal setae and 3 approximately subequal dorsosodistal setae; P–3 with slightly concave ventral margin, with 2 dorsoproximal and 2 dorsodistal approximately subequal setae, all these setae considerably shorter than dorsal margin of segment; P–4 slender, with 3 rather long ventral setae near middle of segment and 2 short dorsodistal setae.

First legs slightly longer than second legs; I–Leg.1 (Fig. 7) with 1 thin seta and 3 strong subequal dorsal setae, distoventrally with a curved blade-like serrate seta as long as dorsal length of segment; I–Leg. 2 and 3 with stout blade-like setae distoventrally and dorsally, I–Leg. 4–6 without such setae; II–Leg. 1–5 and III– Leg. 3–5 with many stout blade-like setae; IV–Leg. 1 (Fig. 8) with 1 short, spine-like seta near middle of segment, 1 thin seta and 1 rather long stout blade-like dorsodistal seta, IV–Leg. 2 and IV–Leg. 6 without stout setae, IV–Leg. 3 to 5 with several stout setae. Leg claws (Fig. 9) thin hook-like, with long internal denticle and short external spur, claw lamella not developed.

Male. Dorsal shield elongate (ratio length/width 1.40–1.65). Acetabular plates fused to each other and fused with ventral shield, fusion of genital field slightly indicated, setae *Se* placed on ventral shield posterolaterally (Fig. 2). Genital field wider than long (ratio length/width 0.38–0.45), with 3 acetabula (located in triangular) and 9–11 fine setae on each side, gonopore triangular with pointed anterior end; all acetabula relatively small, but anterior acetabulum a little lesser than both posterior acetabula; distance between anterior and



Figs 3–9. *Albaxona orientalis* **sp. nov.**, male: **3**, capitulum, ventral view; **4**, anterior part of capitulum, lateral view; **5**, chelicera, lateral view; **6**, pedipalp, lateral view; **7**, Leg I; **8**, leg IV; **9**, claw of leg IV. Scale bars: 50 μm (3–5, 7–8); 20 μm (6, 9).

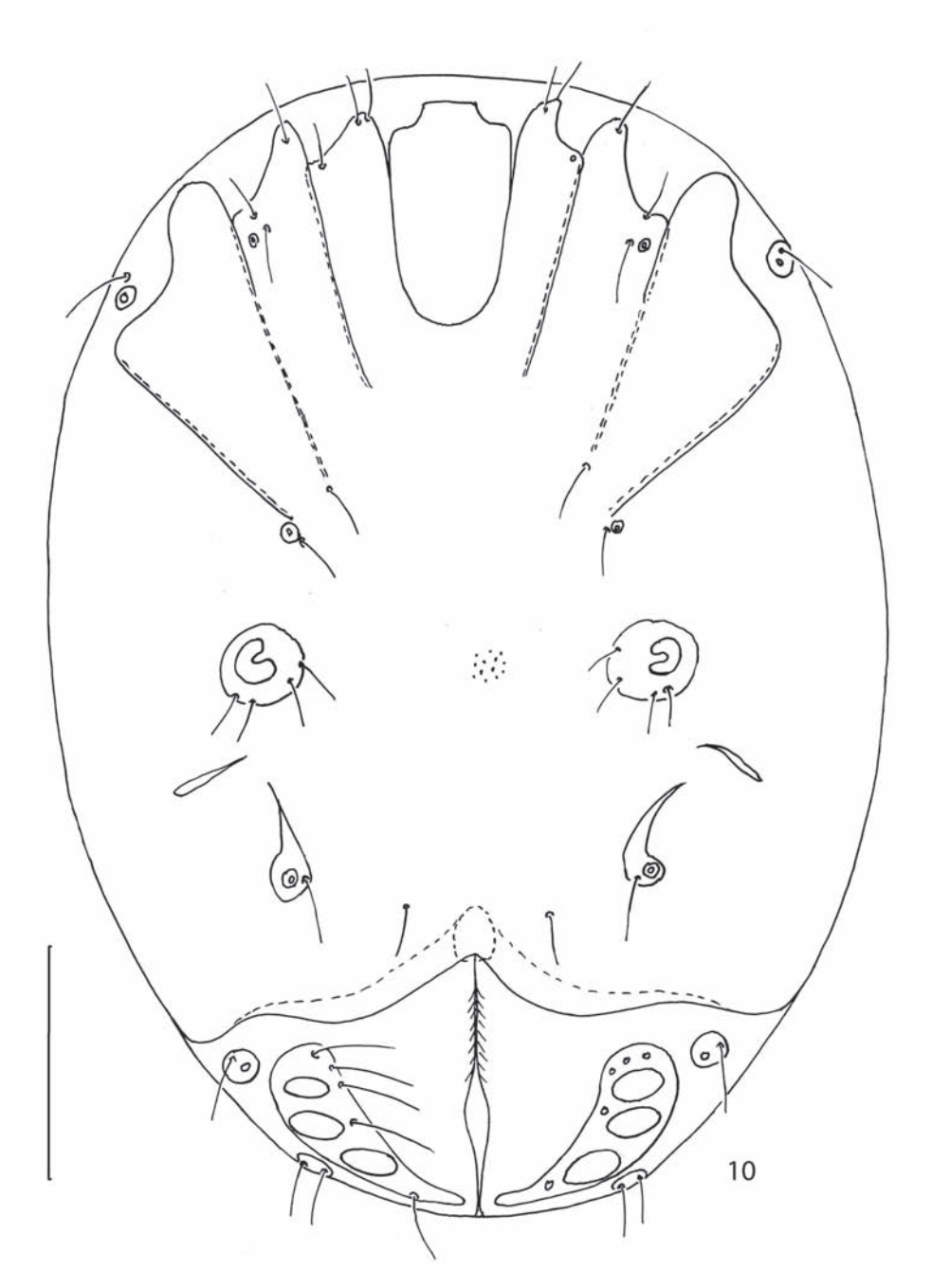
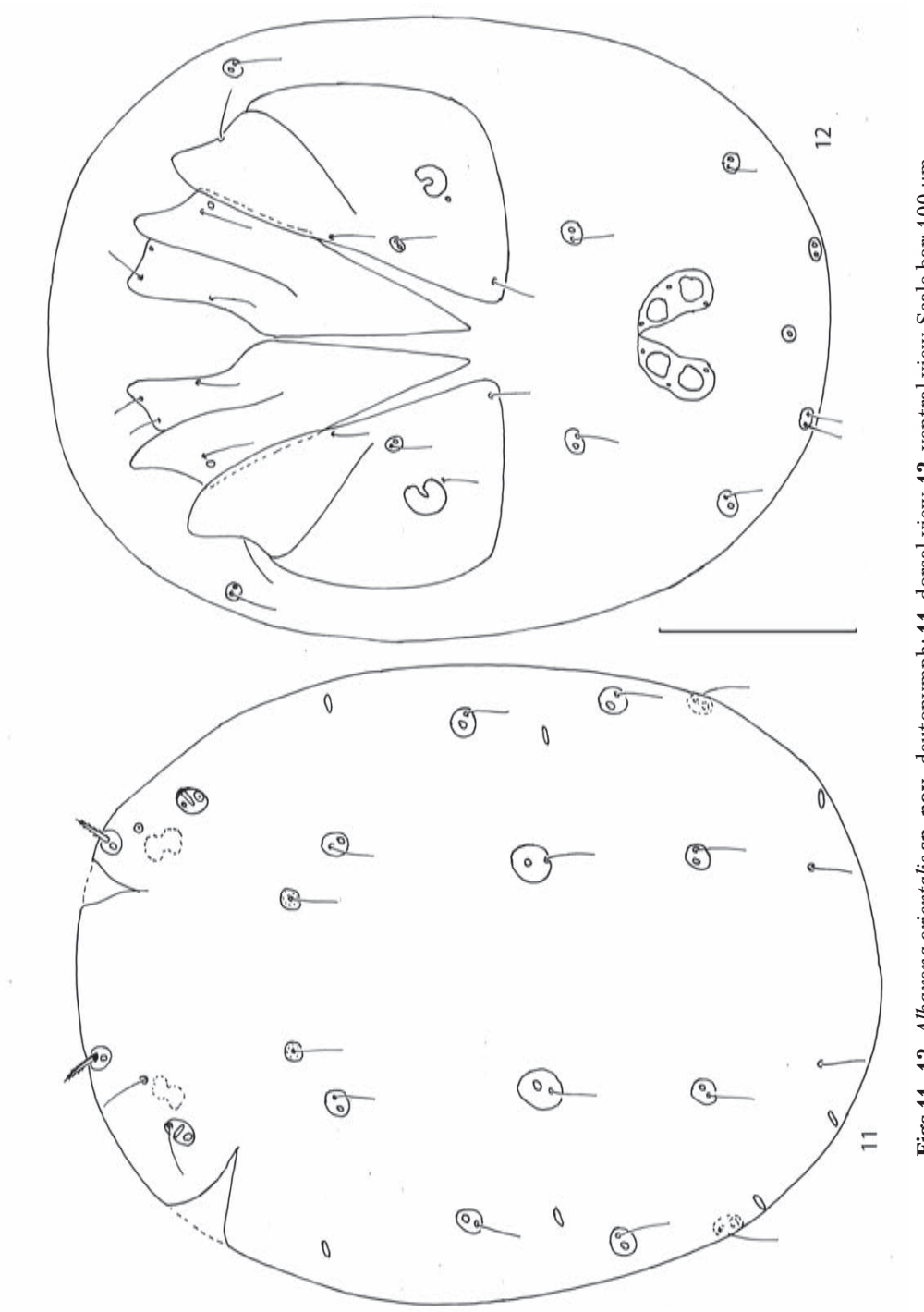
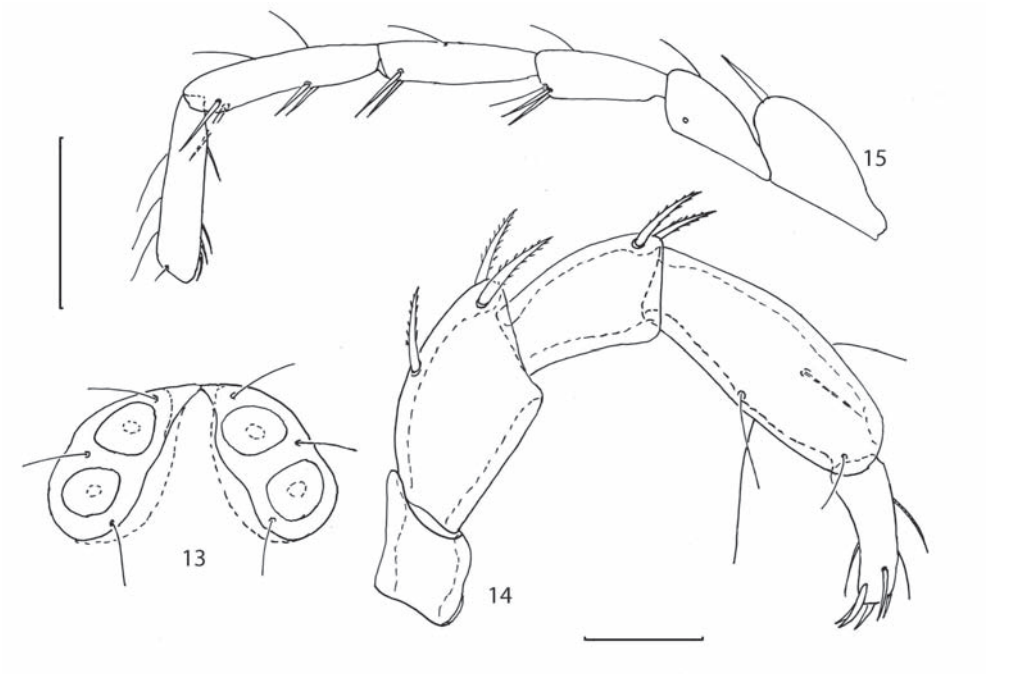


Fig. 10. *Albaxona orientalis* **sp. nov.**, female, ventral view. Scale bar: 100 μm.



Figs 11–12. *Albaxona orientalis* **sp. nov.**, deutonymph: **11**, dorsal view, **12**, ventral view. Scale bar: 100 μm.



Figs 13–15. *Albaxona orientalis* **sp. nov.**, deutonymph: **13**, genital plates; **14**, pedipalp, lateral view; **15**, leg IV. Scale bars: 50 μm (13, 15), 20 μm (14).

second acetabula less than length anterior acetabulum, distance between anterior and posterior acetabula longer than length anterior acetabulum. Excretory pore sclerotised, placed in space between genital field and posterior margin of idiosoma.

Measurements (n=4). Length of body 385–420, width 300–310; distance between setae *Fch* 102–120; length of dorsal shield 360–395, width 235–250; length of genital field 55–60, width 130–150; length of genital acetabula (ac. 1–3): 18–22, 18–25, 18–25; length of capitulum 72–84, width 42–48; length of basal segment of chelicera 78–85, length of cheliceral stylet 38–42; length of pedipalpal segments (P–1–5): 20–25, 35–42, 30–34, 53–55, 21–24; lengths of leg segments I–Leg.1–6: 35–40, 35–40, 54–58, 60–66, 60–70, 65–72; II–Leg.1–6: 35–42, 38–42, 36–42, 47–50, 60–66, 63–69; III–Leg.1–6: 35–42, 35–43, 42–45, 48–60, 65–69, 60–69; IV–Leg.1–6: 84–90, 54–60, 72–76, 73–78, 78–85, 60–72.

Female. Dorsal shield elongate (ratio length/width 1.70 –1.85). Acetabular plates separate, narrowed posteriorly, longer than wide (ratio length/width 2.1–3.5), with relatively wide rounded anterior margin, bearing 3 acetabula (located in an arc line) and 5 fine setae each (Fig. 10); all acetabula small and more or less oval, but anterior acetabulum a little less than both posterior acetabula. Sclerite, bearing seta and glandularia *Se*, located on soft integument between posterior end of ventral shield and acetabular plate on each side, sometimes these sclerites fused with acetabular plates.

Measurements (n=9). Length of body 420–440, width 330–345; distance between setae *Fch* 80–85; length of dorsal shield 440–410, width 220–235; length of genital plate 80–95, width 30–36; length of genital acetabula (ac. 1–3): 15–18, 18–24, 18–24; length of capitulum 90–96; length of basal segment of chelicera 95–100, length of cheliceral stylet 58–63; length of pedipalpal

segments (P–1–5): 21–24, 36–42, 35–37, 56–60, 27–30; lengths of leg segments I–Leg.1–6: 36–42, 36–39, 50–54, 65–72, 65–72, 65–70; II–Leg.1–6: 42–48, 36–42, 39–42, 46–49, 63–67, 65–72; III–Leg.1–6: 42–48, 42–50, 42–48, 50–55, 65–70, 65–75; IV–Leg. 1–6: 85–95, 57–60, 72–77, 78–83, 84–90, 81–90.

Deutonymph. Deutonymph is similar to adult mites but differ from them mainly smaller size, by the structure of dorsum, ventrum, genital area, and the number of setae on pedipalpal and legs segment are fewer than in adult mites. Idiosoma oval, compressed dorso-ventrally, dorsum with soft integument, without dorsal shield or plates (Fig. 11). Setae *Fch* short, thick and serrate, other idiosomal setae thin, hair-like. Sclerites, bearing setae and glandularia *Hi*, larger than other sclerites, bearing idiosomal setae and glandularia. Bases of setae *Oi* located on small circular sclerites. Setae *Fp, Oi, Si, Ci* and *Pi* without glandularia, others idiosomal setae associated with glandularia. Coxal plates in two groups (Fig. 12). Coxal plates I and II fused to each other completely, suture line between them incomplete obliterated medially, with straight, long medial margin and tapering distally, setae *Hv* located near posterolateral corner of coxal plates II. Coxal plates III and IV fused to each other completely, suture line between them incomplete obliterated medially; medial and posterior margins of coxal plate IV forming acute corner, seta *Sce* placed anteromedially in coxal plate IV on each side; coxal plates II and III fused to each other laterally but separated medially.

Acetabular plates (Fig. 13) elongate (ratio length/width 2.16), with 2 acetabula and 3 fine setae each, anterior ends of these plates pointed and fused to each other, gonopore absent. Excretory pore surrounded by sclerotised ring. Setae *Ci* and *Pi* placed on common sclerite on each side caudally. Pedipalp rather slender (Fig. 14): P–1 relatively short, without setae; P–2 with straight ventral margin, with 1 dorsoproximal seta and 2 approximately subequal dorsosodistal setae; P–3 with slightly concave ventral margin, with 2 relatively short dorsodistal setae; P–4 slender, with 2 unequal ventral setae near middle of segment (proximal seta nearly twice as short as distal one), 1 distolateral seta and 2 dorsal fine setae distally to middle of segment. Legs is similar to that adults, but with a lesser number of setae. I–Leg.1 (Fig. 15) with single dorsodistal thick seta, I–Leg. 2 and I–Leg. 4 with 2 ventrodistal, and I–Leg. 5 with 4 (2 ventroproximal and 2 ventrodistal) such setae; I–Leg. 2 and I–Leg. 6 without thick setae.

Measurements (n=1). Length of body 365, width 300; length of setae *Fch* 19; length of genital plate 40, width 18; length/width of genital acetabula (ac. 1–2): 15/12, 15/12; length of capitulum 60, width 36; length of pedipalpal segments (P–1–5): 20, 32, 25, 45, 17; length of leg segments I–Leg.1–6: 30, 26, 32, 48, 51, 54; II–Leg.1–6: 32, 26, 29, 35, 50, 55; III–Leg.1–6: 32, 35, 35, 38, 50, 55; IV–Leg.1–6: 50, 37, 45, 52, 65, 75.

Comparison. The new species is morphologically closest to *Albaxona dubia* Kim et Chung 1996, which was described based only on a male from the South Korea (Kim & Chung, 1996). The male of *A. dubia* is characterised by the following features: the anterior coxal plates extending beyond anterior margin of the body, the suture line between the ventral shield and the genital field distinct, the gonopore wide, oval with rounded anterior end, setae *Ci* with glandularia (Kim & Chung, 1996). In contrast, in the male of *A. orientalis* **sp. nov.** the anterior coxal plates only reaching but not extending beyond anterior margin of the body, the suture line between the ventral shield and the genital field slightly indicated, the gonopore triangular with pointed anterior end, setae *Ci* without glandularia. The representatives of the genus *Albaxona* are known as adult mites and only in *Albaxona lundbladi* Motaş et Tanasachi, 1947 a deutonymph is described (Pešić & Gerecke, 2003). The deutonymph of *A. orientalis* **sp. nov.** especially well differs from the deutonymph of *A. lundbladi* by size of

the sclerites bearing setae *Oi* and the structure of the genital area. The sclerites bearing setae *Oi* in deutonymph of *A. lundbladi* are larger than sclerites bearing setae *Hi*; the anterior ends of the genital plates are connected by a rather wide bridge (Pešić & Gerecke, 2003). In contrast, the sclerites bearing setae *Oi* in the deutonymph of *A. orientalis* **sp. nov.** are considerably smaller than the sclerites bearing setae *Hi,* and the anterior ends of the genital plates are connected by a narrow bridge.

Etymology. The species epithet *orientalis* means "from the Orient".

Habitat. Running waters.

Distribution. Asia: Russia, Far East (the Pacific Ocean basin), Primorsky Kray.

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