

TWO NEW SPECIES OF THE WATER MITE GENUS *ATURUS* (ACARIFORMES: ATURIDAE) FROM RUSSIA

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ABSTRACT: Illustrated descriptions of two new water mite species, *A. simulans* (male, female and deutonymph) from the Asian part of Russia and *Aturus polyporus* (male and female) from the European part of Russia, are given.

KEY WORDS: Aturidae, *Aturus polyporus*, *A. simulans*, water mite, male, female, deutonymph, running waters

INTRODUCTION

In material of water mites sent to me for identification from the Komi Republic in the European part of Russia and from the Russian Far East, I found two new species of the mite genus *Aturus*, described below.

Nomenclature of idiosomal setae follows that of Tuzovsky (1987). The following abbreviations are used: P1–5, 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_1 – i_5 — lyriform organs, n = number of specimens measured.

Type material is deposited in the collection of the Institute for Biology of Inland Waters (Borok, Russia). Measurements are given in micrometers (μm).

Aturus simulans Tuzovskij, sp.n.

Figs 1–5

Male. Body flattened dorsoventrally. Dorsal and ventral shields present. Frontal margin straight, with small, median incision (Fig. 1 a). Setae Fp, Oi and Pi without glandularia, other idiosomal setae associated with glandularia. Setae Fch longer and thicker than proterosomal setae Fp, Vi, Ve and Oi. Setae Fp, Vi and first pair of lyriform organs (i_1) situated on small platelets. Dorsal shield very large, covering almost all dorsum, fused with ventral shield caudally; with transverse ridge and 6 pair of setae: Oi, Sci, Li, Le, Si and Pi; setae Sci thick and bifurcated, other setae thin and hair-like. Bases of setae Li and Le situated behind ridge. Setae Ve, Oe and Hi situated on smooth interscutal membrane. Setae Oe and Hi very long and approximately subequal in length, but setae Oe simple, and setae Hi bifurcated. Second pair of lyriform organs (i_2) situated on smooth membrane between setae Oe and Hi, i_3 on sclerites bearing setae He, i_4 on smooth membrane posterior to Sce, i_5 on dorsal shield near setae Pi. Excretory pore opens on dorsal shield caudally near setae Si. Posterior surface

of dorsum with numerous thin setae, forming usually three transverse rows.

Ventral shield (Fig. 1 b) with deep median cleft and 13–17 genital acetabula along posterior margin on each side. Setae Ci and Se situated near posterolateral margins of venter. Median cleft with 4–5 thin setae on each side. Posterolateral margins of ventral shield with a few thin setae on each side.

Capitulum elongate with short anchoral projection, its anterior and posterior pairs of setae subequal. Trochanter of pedipalp (Fig. 2 a) short, with one dorsodistal seta. Ventral margin of femur slightly convex in distal half. Femur with 2 unequal dorsoproximal and 3 dorsodistal setae. Genu with 2 dorsodistal setae, its ventral margin slightly concave. Tibia moderately long with two ventral setae, short distolateral spine and thin dorsodistal seta; proximal ventral setae thicker and longer than distal one.

Trochanter of leg IV with single short proximal spine and 2 dorsodistal ones. Genu IV (Fig. 2 b) expanded distally, with 2 subequal sword-like setae, with 7 long subequal ventrolateral setae and 4 short unequal dorsal setae. Tibia (Fig. 2 c) with two relatively long distolateral sword-shaped setae, one long ventrodistal seta and a few subequal ventral setae. Tarsus slightly longer than tibia with straight dorsal margin.

Claws (Fig. 2 d) with three denticles: external denticle shorter than other ones, central denticle longer than internal one.

Measurements ($n=5$). Length of body 340–365, width 290–300; length of dorsal shield 305–315, width 250–260; length of capitulum 80–86, width 57–60; length of setae Fch 50–57; length of pedipalpal segments (P1–5) — 19–22, 51–54, 31–35, 60–64, 28–32; length of leg segments: I Leg. 1–6 — 39–42, 42–45, 48–55, 64–67, 68–72, 78–90; II Leg. 1–6 — 42–48, 42–48, 57–63, 78–85, 82–85, 90–95; III Leg. 1–6 —

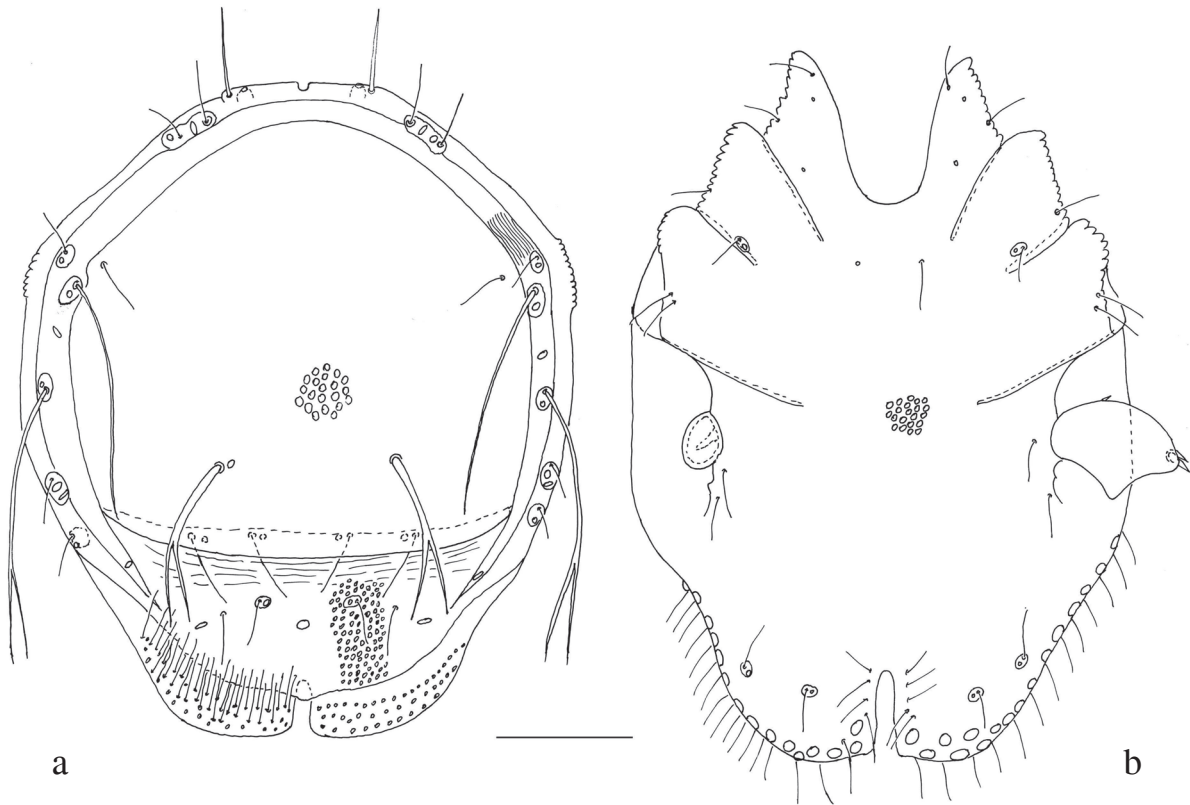


Fig. 1. *Aturus simulans*, male: a — dorsal view; b — ventral view. Scale bar: a, b = 100.

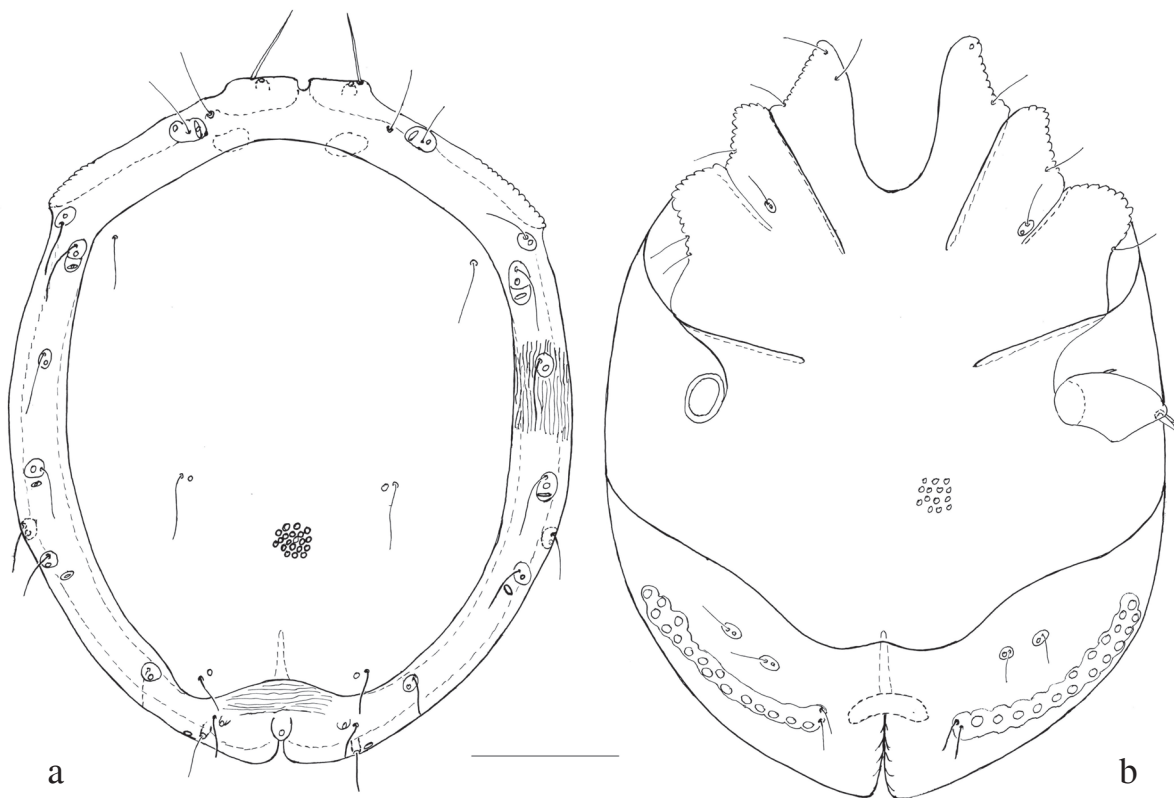


Fig. 3. *Aturus simulans*, female: a — dorsal view; b — ventral view. Scale bar: a, b = 100.

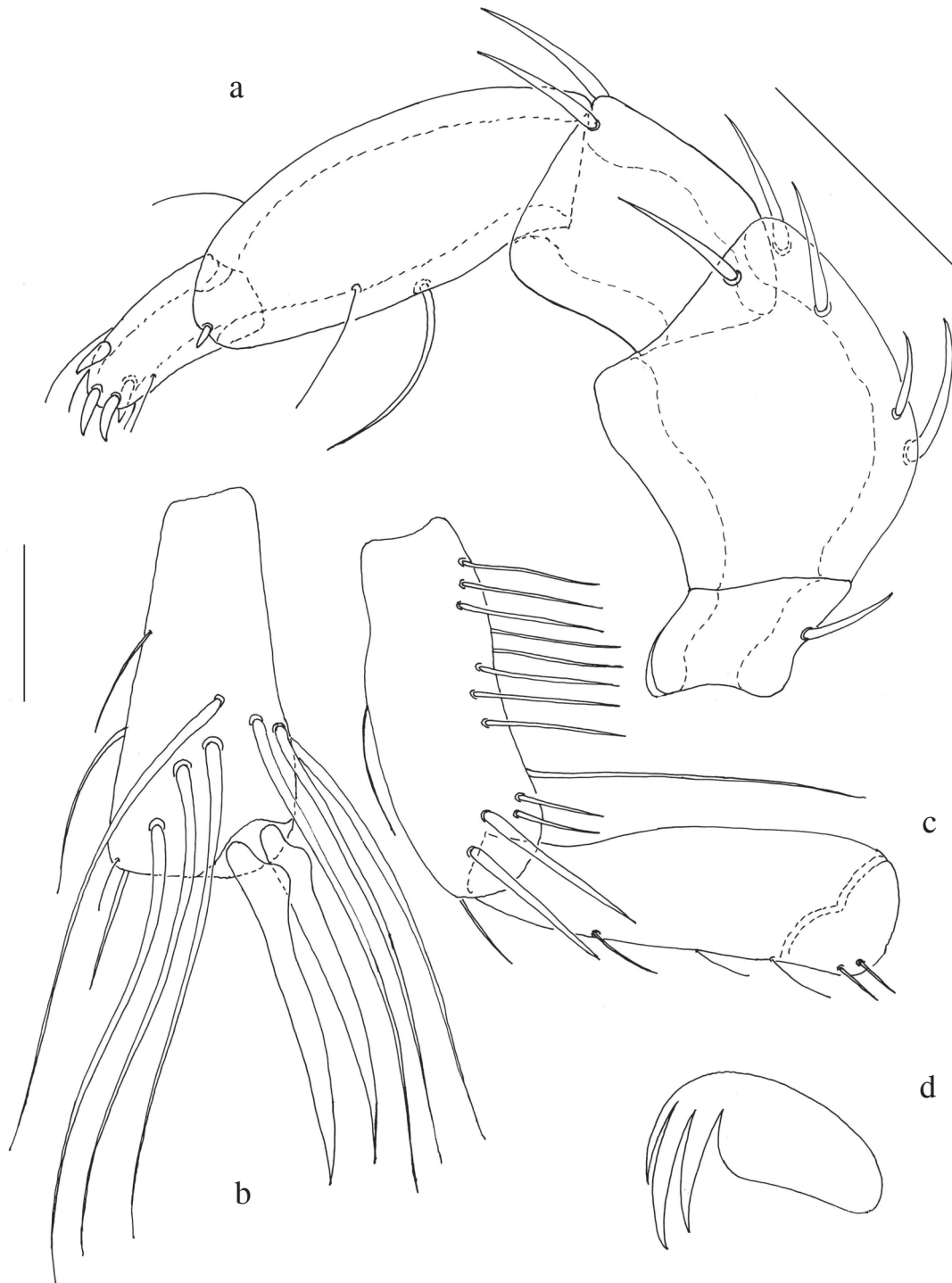


Fig. 2. *Aturus simulans*, male: a — pedipalp, lateral view; b — genu of leg IV, lateral view; c — tibia and tarsus of leg IV, lateral view; d — claw. Scale bars: a, d = 25; b, c = 50.

45–57, 48–54, 60–65, 100–108, 105–115, 107–115; IV Leg. 1–6 — 72–85, 85–96, 78–90, 114–120, 108–122, 120–128.

Female. Body flat. Dorsal and ventral shields present. Frontal margin straight, with small median incision (Fig. 3 a). Setae Fp, Oi and Pi without glandularia; other idiosomal setae associated with glandularia. Setae Fch and Oe longer and thicker

than proterosomal setae Fp, Vi, Ve and Oi. Setae Fp free, setae Vi and first pair of lyriform organs (i_1) situated on small platelets. Dorsal shield very large, covering almost all dorsum, without transverse ridge, with three pairs of setae: Oi, Sci, Li. All idiosomal setae simple. Setae Hi, He, Sce, Le, Si, Ci and Pi situated on smooth interscutal membrane, setae Hi, He and Sci longer than other ones.

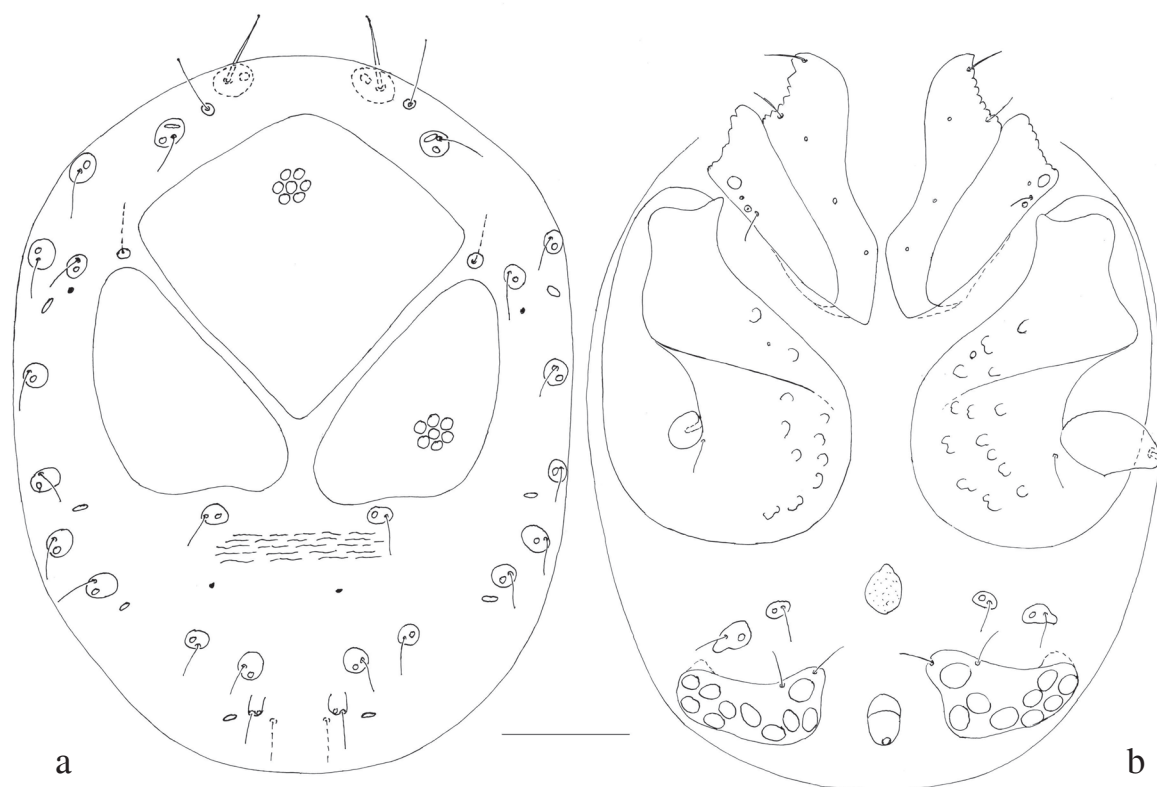


Fig. 4. *Aturus simulans*, deutonymph: a — dorsal view; b — ventral view. Scale bar: a, b = 50.

Second pair of lyriform organs (i_2) situated on sclerites bearing setae Oe. Third pair of lyriform organs (i_3) situated on interscutal membranes or fused with sclerites bearing setae He, i_4 on smooth membrane posterior to setae Le, i_5 near setae Pi. Excretory pore opens in small sclerite between setae Ci.

Coxal shield (Fig. 3 b) large, covering about 4/5 ventral surface. Setae Se and Pe situated between posterior margin of coxal shield and genital plates. Anterior genital sclerite well developed. Genital acetabula 13–19 situated on narrow plates along posterior margin of each side, each genital plate provided with 2 median thin setae.

Legs IV not modified. Pedipalps similar those of male.

Measurements. Length of body 342–410, width 270–330; length of dorsal shield 305–348, width 252–276; length of capitulum 85–93, width 60–64; length of setae Fch 42–50; length of basal segment of chelicera 168–175, length of cheliceral stylet 53–55; length of pedipalpal segments (P1–5) — 19–25, 50–55, 35–40, 62–65, 32–35; length of leg segments: I Leg. 1–6 — 35–37, 39–42, 41–43, 54–58, 57–60, 70–74; II Leg. 1–6 — 36–42, 42–45, 45–48, 58–62, 65–70, 72–78; III Leg. 1–6 — 39–42, 39–42, 48–51, 72–76, 84–88, 85–93; IV Leg. 1–6 — 60–66, 53–55, 60–67, 90–94, 92–96, 95–100.

Deutonymph. Body oval, with 3 plates on dorsum and covering about half of dorsal surface (Fig. 4 a). Anterior plate large, trapezoidal; posterior plates relatively small and more or less triangular. All dorsal setae situated on smooth integument. Setae Fch longer and thicker than other idiosomal setae. First pair of lyriform organs and setae Vi situated on common sclerites. Others lyriform organs free: i_2 posterior to Ve and Oe, i_3 between setae He and Sce, i_4 near setae Le, and i_5 lateral to Ci. Dorsal plates with cell-shaped reticulation, smooth integument striated.

Coxal plates arranged into four groups (Fig. 4 b). Anterior groups are close to each other, while posterior coxal groups are distinctly separated. Coxae I with short narrow apodemes. Setae Hv situated on coxae II posterolaterally. Suture line between coxae III–IV incomplete. Each genital plate with 9–10 acetabula and 2 thin setae. Pre-genital sclerite rather large, situated between posterior margin coxae III–IV and genital plate. Sclerites bearing setae Se larger than sclerites bearing setae Pi. Excretory pore plate lying in venter near posterior body margin.

Capitulum with convex ventral margin (Fig. 5). Chelicera with large basal segment and short stylet. Pedipalpal trochanter without seta, femur with slightly concave ventral margin, provided by

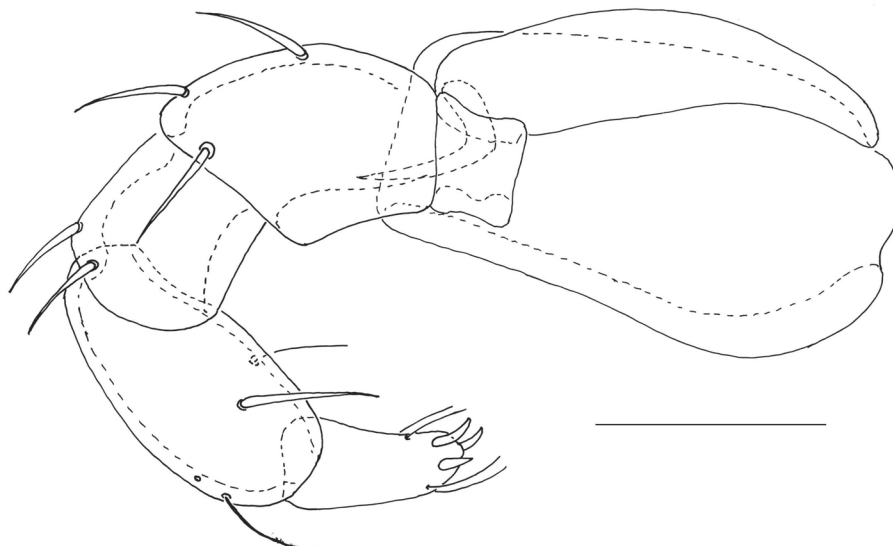


Fig. 5. *Aturus simulans*, deutonymph: gnathosoma, lateral view. Scale bar: 25.

1 proximal and 2 dorsodistal setae; genu with 2 dorsodistal setae. Pedipalpal tibia with 2 unequal ventral setae and 2 thin dorsodistal setae.

Measurements. Length of body 320, width 245; length of anterior dorsal plate 130, width 148; length of posterior plates 93, width 70; length of setae Fch 42; length of basal segments of chelicera 65, length of cheliceral stylet 22; length of pedipalpal segments (P1–5) — 15, 39, 27, 44, 24; length of leg segments: I Leg. 1–6 — 29, 29, 30, 38, 48, 56; II Leg. 1–6 — 32, 29, 30, 41, 51, 60; III Leg. 1–6 — 35, 32, 35, 51, 60, 64; IV Leg. 1–6 — 48, 38, 42, 60, 67, 67.

Type material. Holotype: male, slide 4984, Russia, Primorskiy Kray, Ussuri National Park, Komarovka river, 20.09.1984. Paratypes (1 male, 5 female, 1 deutonymph): 1 female collected together with holotype, 20.09.1984; 1 male, 3 female and 1 deutonymph collected 1.06.1984 and 1 female collected 22.08.1983 (coll. T.S. Vshivkova).

Additional material: 3 males and 3 females, Russia, Khabarovskiy Kray, Vaninsky District, Chistovodnaya river, 6.09.2008, coll. S.E. Sirotsky and K.E. Semenchenko.

Differential diagnosis. The new species is closely related to *Aturus miyashitai* Uchida, 1934. The adult mites of *A. simulans* differ from *A. miyashitai* by the following characters (character states of the male of *A. miyashitai* follow Enami (1940) and Imamura (1953 a, b) and given in parenthesis): male — setae Oe simple (bifurcated), the body is broad, ratio length/width = 1.15–1.18 (elongated, ratio length/width = 1.30–1.35), tibia of leg IV with one long ventrodorsal seta (without

the long ventrodorsal seta), the genital field with 13–17 acetabula on each side (10); female — the genital field with 15–19 acetabula on each side (11), the genital acetabula arranged in two lateral rows (in one row only). The deutonymph of *A. miyashitai* has four genital acetabula on each side (Imamura 1954), while the deutonymph of *A. simulans* has 9–10 genital acetabula on each side.

***Aturus polyporus* Tuzovskij, sp.n.**

Figs 6–8

Description of female. Body flat. Dorsal and ventral shields present. Frontal margin slightly convex or straight, with small median incision (Fig. 6 a). Setae Fp, Oi, Ve and Pi without glandularia; other idiosomal setae associated with glandularia. Setae Fch longer and thicker than other proterosomal setae. Setae Fp free, setae Vi and first pair of lyriform organs (i_1) situated on small sclerites. Second pair of lyriform organs, setae Ve and Oe close to each other and situated on common sclerites, but occasionally i_2 free. Dorsal shield very large, covering almost all dorsum, with four pairs of setae: Oi, Sci, Li and Si. Hysterosomal setae Hi, He, Sce, Le, Si, and Pi situated on smooth interscutal membrane, setae Ci situated on posterior sclerotized extension of dorsal shield. Third pair of lyriform organs (i_3) situated free on interscutal membranes or fused with sclerites bearing setae He, i_4 fused with sclerites bearing setae Le, i_5 near setae Ci and Pi. Excretory pore opens on posterior extension of dorsal shield between setae Ci.

Coxal shield (Fig. 6 b) large covering about 4/5 ventral surface. Setae Se and Pe situated be-

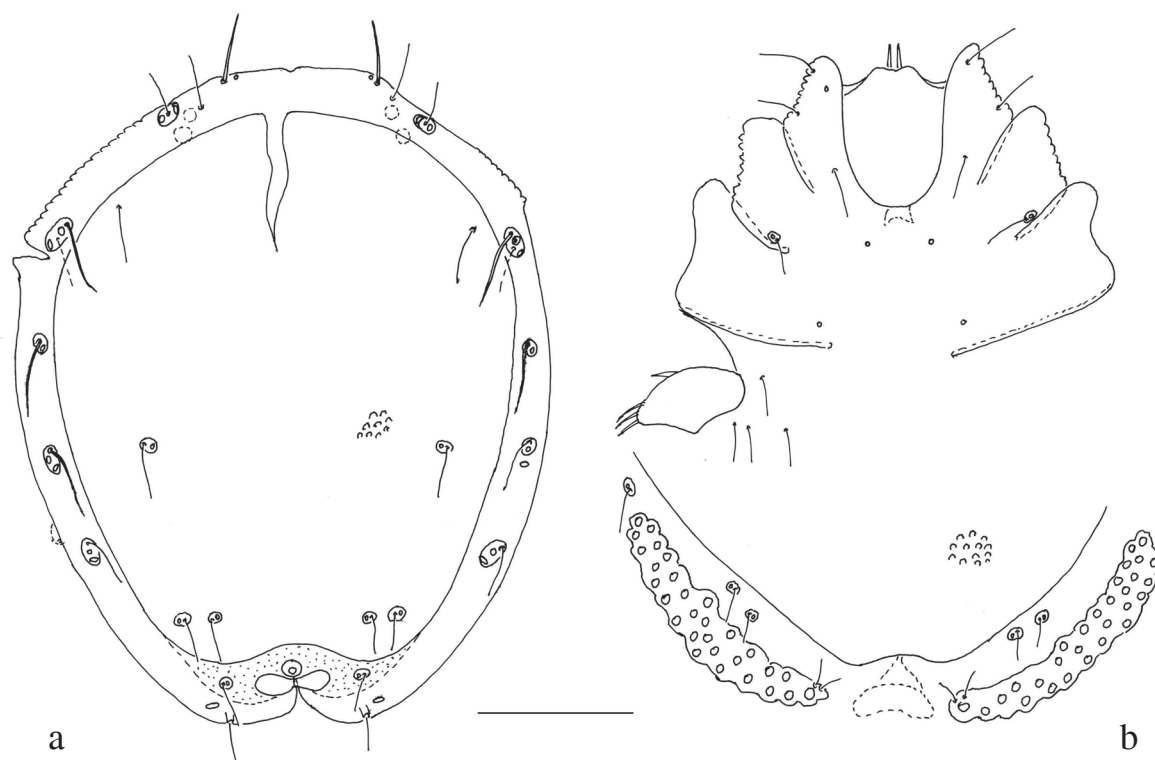


Fig. 6. *Aturus polyporus*, female: a — dorsal view, b — ventral view. Scale bar: a, b = 100.

tween posterior margin of coxal shield and genital plates. Anterior genital sclerite well developed. Genital acetabula 23–32 situated along posterior margin and arranged into 2–3 rows on each side, each genital plate has 2 median thin setae.

Capitulum elongate, with short anchoral projection. Chelicera with large basal segment and short pointed stylet (Fig. 7 a). Trochanter of pedipalp (Fig. 7 b) short, with one dorsodistal seta. Pedipalpal femur with straight or slightly convex ventral margin, with 2 proximal and 3 dorsodistal setae. Pedipalpal genu with 2 subequal dorsodistal setae, its ventral margin straight. Tibia moderately long with 2 unequal ventral setae, short distolateral spine and thin dorsodistal seta; proximal ventral seta thicker and longer than distal one.

Measurements. Length of body 370–390, width 300–310; length of dorsal shield 310–335, width 250–260; length of capitulum 75–80, width 55–58; length of setae Fch 32–36; length of basal segment of chelicera 54–57, length of cheliceral stylet 27–30; length of pedipalpal segments (P1–5) — 20–24, 42–48, 30–36, 50–57, 24–27; length of leg segments: I Leg. 1–6 — 33–36, 33–36, 35–37, 49–52, 54–57, 66–72; II Leg. 1–6 — 39–42, 39–42, 36–45, 48–54, 60–64, 66–72; III Leg. 1–6 — 42–45, 42–45, 38–42, 58–61, 72–78, 84–88; IV Leg. 1–6 — 53–55, 50–54, 52–55, 78–85, 88–92, 88–92.

Male. Body flattened dorsoventrally. Dorsal and ventral shields present. Dorsal shield (Fig. 8 a) very large, covering almost all dorsum, fused with ventral shield caudally, with 4 pairs of setae: Oi, Sci, Li, Le; setae Sci thick, long and bifurcated, other setae thin, short and hair-like. Nearly 2/3 of anterior surface of dorsal shield with small papillae; posterior portion of this shield with transverse strips. Excretory pore opens on dorsal shield caudally.

Ventral shield (Fig. 8 b) with relatively deep median cleft. Genital acetabula (30–32), situated on plates along posterior margin and forming 2–3 rows on each side. Median cleft with 2–3 thin setae on each side, each genital plate has 2 median thin setae.

Mouthparts similar to those of female.

Trochanter of leg IV with single short proximal spine and two dorsodistal ones. Genu (Fig. 7 c) expanded distally with 2 unequal sword-shaped setae, with 5 thin relatively long ventrolateral setae, with 4 long and 2 short thick setae and 1–2 thin filiform setae. Tibia with a few proximal and distal unequal setae. Tarsus slightly expanded distally.

Measurements (n=1). Length of body 330, width 285; length of dorsal shield 270, width 245; length of capitulum 75, width 55; length of setae Fch 45–48; length of pedipalpal segments (P1–5) — 24, 48, 30, 54, 30; length of leg seg-

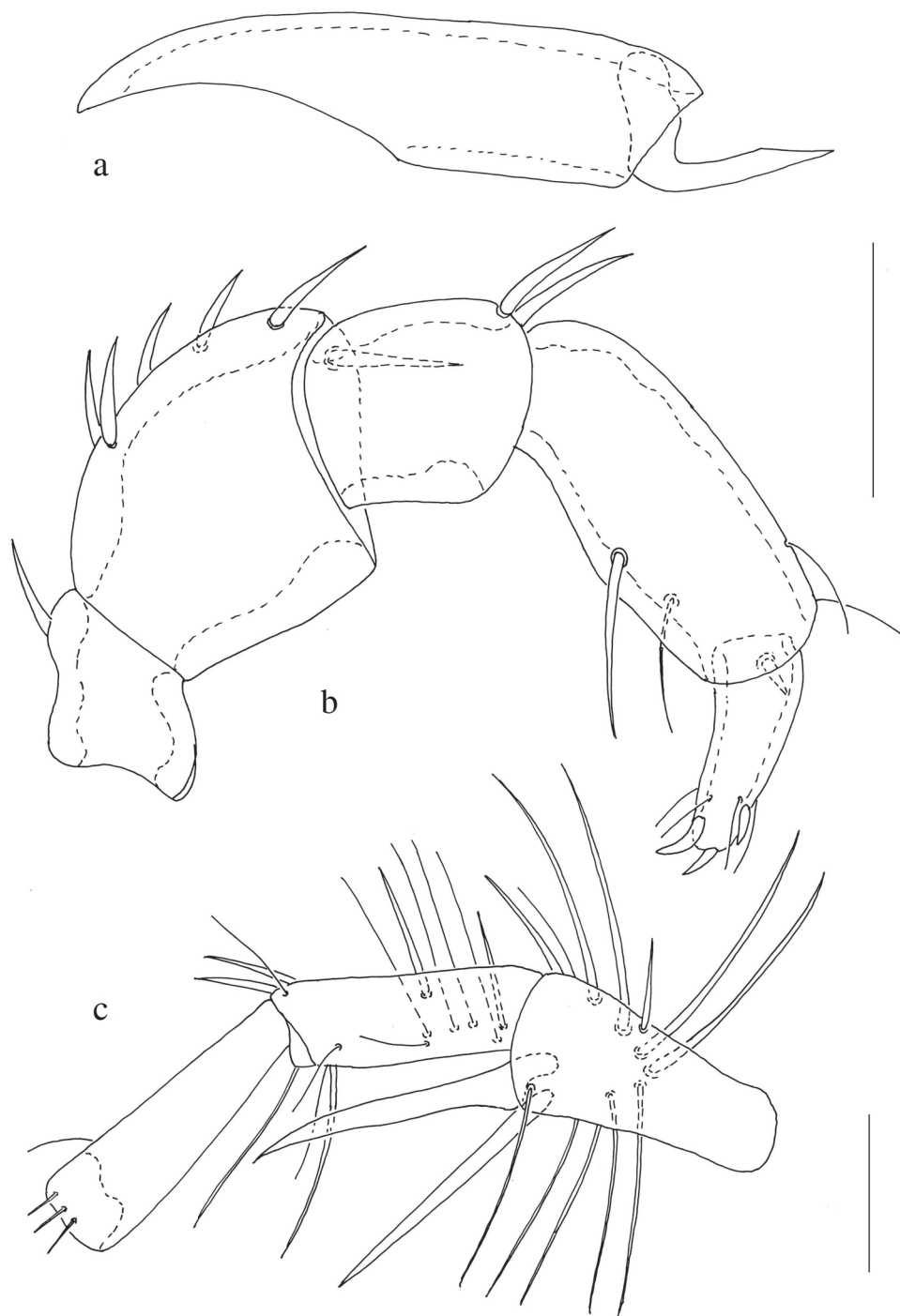


Fig. 7. *Aturus polyporus*, adults: a — chelicera, lateral view; b — pedipalp, lateral view; c — genu, tibia and tarsus of leg IV, lateral view; a-b — female, c — male. Scale bars: a-b = 25, c = 50.

ments: I Leg. 1-6 — 33, 39, 45, 54, 66, 72; II Leg. 1-6 — 36, 45, 48, 60, 75, 90; III Leg. 1-6 — 442, 48, 45, 75, 90, 90; IV Leg. 1-6 — 66, 78, 63, 86, 90, 98.

Type material. Holotype: female, slide 6809; Russia, Komi Republic, Shchugor river (inflow of the Pechora river), 4.09.1988. Paratypes (1 male, 2 female) collected in Shchugor river, 20.08.1991 (coll. O.S. Tsember).

Differential diagnosis. The combination of the following characters separate *Aturus polyporus* **sp. n.** from all other species of the genus *Aturus*: the genital field with numerous acetabula, the pedipalpal femur with six dorsal setae and almost straight ventral margin in both sexes; the male's dorsal shield with the small papillae anteriorly and with the transverse strips posteriorly, the genu of leg IV of with two ventrodistal pointed sword-like setae.

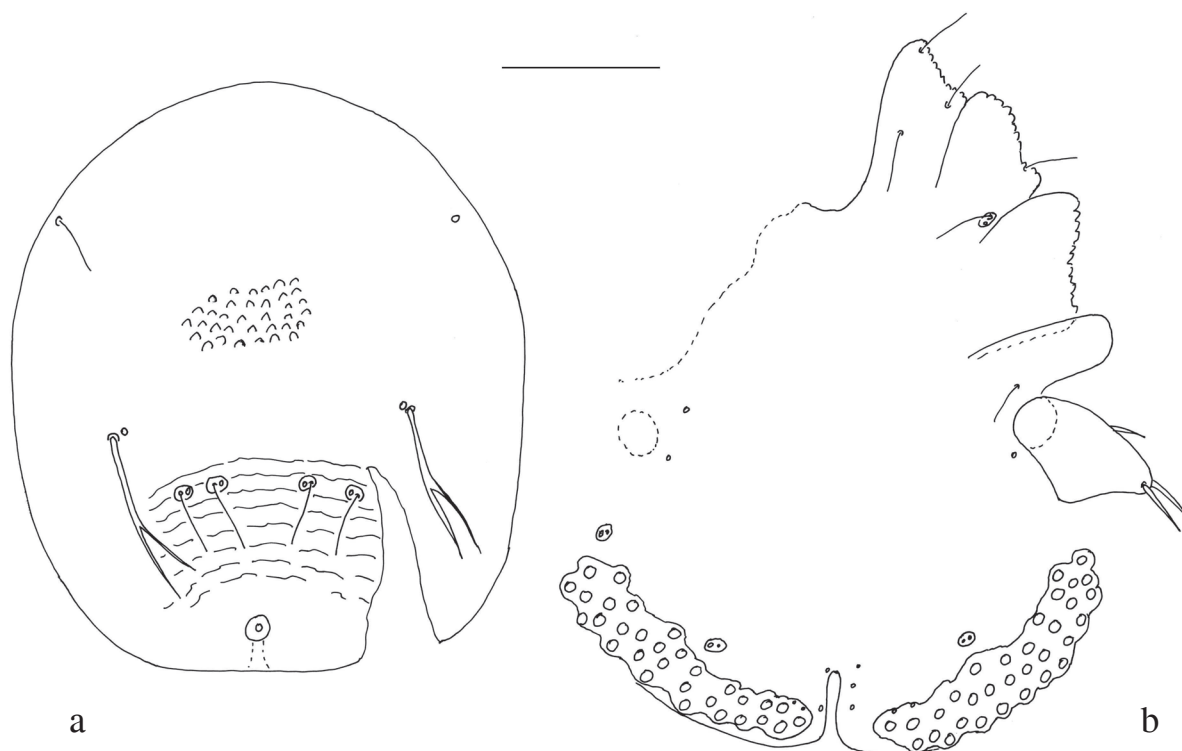


Fig. 8. *Aturus polyporus*, male: a — dorsal view; b — ventral view. Scale bar: a, b = 100.

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