

## Redescription of *Antennoseius (Vitzthumia) oudemansi* (Acari, Mesostigmata) from Spitsbergen, Svalbard

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Redescriptions of adult female, male and new descriptions of the deutonymph and protonymph stages of *Antennoseius oudemansi* Thor, 1930, collected from *terra tipica* (Spitsbergen in the High Arctic) are presented. Due to the absence of type material (holotype and paratypes), and also the lack of a complete description, new material became the basis for the first detailed description of this species, and female and male neotypes are designated.

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### 1. Introduction

In the genus *Antennoseius*, 60 species have been reported worldwide (Beaulieu *et al.* 2008, Gwiazdowicz & Halliday 2010). Most species of this genus inhabit the surface layers of soil, litter or moss. Some of them prefer saline habitats, such as salt meadows (Gwiazdowicz 2007). Amongst the 29 species of mesostigmatid mites reported from the Svalbard archipelago, only one, *Antennoseius oudemansi* Thor, 1930, belongs to the genus *Antennoseius* (Ávila-Jiménez *et al.* 2011, Coulson *et al.* 2013, 2014).

*Antennoseius oudemansi* was described by Thor in 1930 as *Vitzthumia oudemansi* based on specimens collected from moss and under stones in the area around Barentsburg and Hiorthhamn (Svalbard). In his study, Thor (1930) merely presented an incomplete description of a female and

male with pictures and drawings showing the chelicerae, epistome and opisthotal shield of the female. Current taxonomic analysis requires the use of more detailed data to fully describe a species. Accurate figures showing the details of taxonomic characters are also necessary. Unfortunately, the type material (holotype and paratypes) upon which Thor based his original description of *A. oudemansi* were destroyed after Thor's death in accordance with his will (Lindquist 1963). We here aim to present a complete description (e.g. biometry, chaetotaxy of legs) and illustrations not only of the female and male but also, for the first time, of deutonymph and protonymph from the *terra tipica* – Spitsbergen. Additionally, this study includes a comparison of *A. oudemansi* with its two taxonomically closest relatives *A. janus* Lindquist & Walter, 1989 and *A. granulatus* Willmann, 1949.

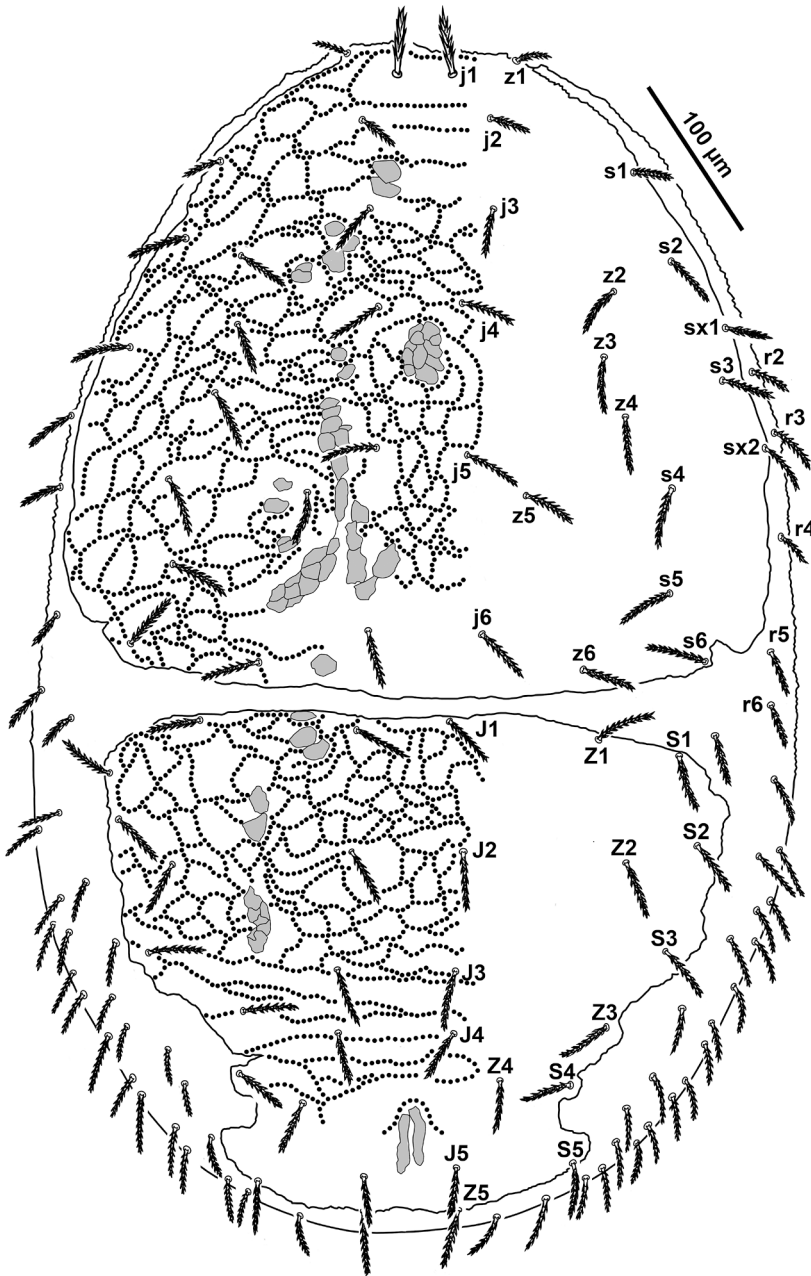


Fig. 1. *Antennoseius oudemansi*, female, dorsal view.

## 2. Material and methods

Chaetotaxy, symbols and the numbering system of setae on the dorsal and ventral sides are after Evans (1963), Lindquist and Evans (1965) and Lindquist (1994).

The description is based on selected 33 females, 16 males, 5 deutonymphs (D below), and 1 protonymph (P below), chosen among all the de-

termined specimens collected from several localities on Spitsbergen: Billefjord (11♀, 9♂) (78° 43'0"N 016° 49'1"E) (August 2008); Bjørndalen (4♀, 1P) (78°13'4"N 015°17'6"E) (17.VIII.2007); Blomstrandhalvøya (3♀, 3♂) (78° 59'10"N 011°59'3"E) (17.VII.2007); Endalen (4♀, 5♂) (78°11'1"N 015°45'5"E) (30.VI.2009); Fjortendejulbukta (18♀, 20♂, 1D) (79° 07'4"N 011°51'3"E) (4.VIII.2007); Grønfyord

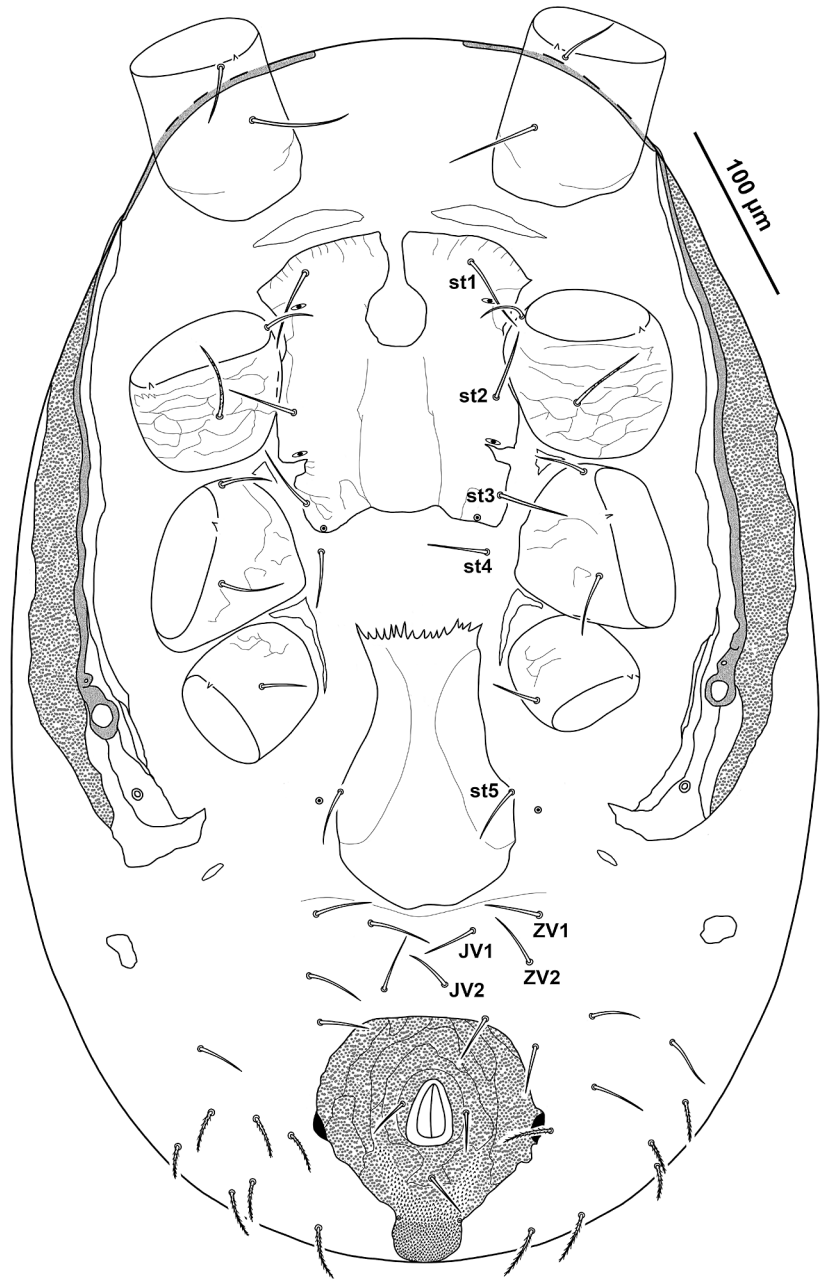


Fig. 2. *Antennoseius oudemansi*, female, ventral view.

(1D) (77°56'6"N 014°25'4"E) (13.VII.2008); Magdalenefjorden (4♀, 2D) (79°33'9"N 010°52'2"E) (11.VII.2008); Vårsolbukta (3♀, 1♂) (77°45'4"N 014°23'3"E) (9.VIII.2008); Vestpynten (1♀) (78°15'0"N, 15°25'3"E) (28.VII.2007); and Nordaustlandet (9♀, 4♂, 1D) (80°03'1"N 018°14'2"E) (17.VIII.2007).

Collected soil was brought to the laboratory in plastic self-seal bags. Samples were placed into

Tullgren funnels and the mites were extracted into 96% alcohol for 3–4 days according to the humidity of the samples. At the end of this process, the contents of the bottles were transferred into petri dishes and mites were separated under a stereomicroscope. They were placed in Hoyer's medium for clearing and were mounted onto permanent microscope slides. The material was examined using the Zeiss Axioskop 2 microscope

with differential interference contrast optics. The material is deposited in the collections of Poznan University of Life Sciences, Department of Forest Protection and in the University Centre in Svalbard (UNIS), Longyearbyen, Svalbard.

### 3. Redescription of female and male, and description of deutonymph and protonymph of *Antennoseius (Vitzthumia) oudemansi* Thor, 1930

*Neotypes*. Neotype female: Vestpynten, heath vegetation composed of *Salix polaris*, grasses, and *Cassiope tetragona*, 78°15'N, 15°25'E, leg. D. J. Gwiazdowicz, 28.VII.2007 (deposited in Department of Forest Protection, Poznan University of Life Sciences (PULS), slide label: Spit 55).

Neotype male: Endalen, *Dryas octopetala* heath, 78°11'13.3N, 15°45'50.8E, leg. D. J. Gwiazdowicz, 30.VI.2009 (deposited in Department of Forest Protection, Poznan University of Life Sciences (PULS), slide label: A 11–1).

Measurements of the neotypes are given in square brackets below.

#### 3.1. Redescription of female

Dorsum (Fig. 1). Idiosoma 630–970 (805±S.D.=100) [760] µm long and 375–620 (500±68) [510] µm wide, with two separate shields; both covered throughout with delicate reticulate sculpture enclosing irregularly-shaped cells, margins of cells punctate; pores obscured by ornamentation, apparently minute. Podonotal shield 350–360 [356] µm long, 375–410 [375] µm wide, with 18 + 1–2 (a supernumerary setae) pairs of setae; vertical setae j1 38–41 [40] µm long, sparsely barbed; other podonotal setae also barbed, somewhat more delicate; paravertae setae z1 the shortest (20–23 [23] µm), other setae as followed: dorsocentral row setae: j2=30–34 [31] µm, j3=34–37 [34] µm, j4=35–38 [35] µm, j5=35–39 [37] µm, j6=38–40 [38] µm; mediolateral setae: z2=30–33 [31] µm, z3=34–36 [36] µm, z4=35–37 [35] µm, z5=33–36 [35] µm, z6=34–36 [36] µm; lateral setae: s1=26–29 [27] µm, s2=28–31 [30] µm, s3=30–34 [31] µm, s4=35–37 [35] µm, s5=35–38 [35] µm, s6=35–36 [35] µm; two

supernumeral paired or unpaired setae located postero-lateral to s2–sx1=27 [27] µm, to s3–sx2=30 [30] µm; none of the marginal row r setae located on the shield, r3=27–30 [27] µm, r4=26–28 [27] µm, r5=27–30 [27] µm, r6=27–31 [27] µm. Opisthonotal shield 275–320 [308] µm long and 320–345 [345] µm wide, with 14 pairs of setae, all slightly barbed. Dorsocentral setae: J1=32–35 [indiscernible] µm, J2=34–35 [34] µm, J3=34–36 [35] µm, J4 µm=30–32 [31] µm, J5=30–31 [31] µm; mediolateral setae: Z1=31–35 [31] µm, Z2=32–36 [35] µm, Z3=30–33 [33] µm, Z4=31–33 [31] µm, Z5=33–37 [32] µm; lateral setae: S1=26–32 [30] µm, S2=32–36 [33] µm, S3=33–35 [32] µm, S4=30–34 [32] µm, S5=31–35 [32] µm. Seta R1 inserted in antero-lateral corner of opisthonotal shield or located on the membrane as remaining r6 and R setae; 23 pairs of R-series setae approx. 26–27 [27] µm long.

Venter (Fig. 2). Base of tritosternum (Fig. 3f) 45–52 [45] µm long, laciniae approximately 68–85 [80] µm long, finely denticulate. Pre-sternal area with two small elongated oval-shaped plates, each 6–8×43–46 [8×45] µm. Sternal shield smooth except for a few weak lateral lines of ornamentation, roundly incised antero-medially, 145–160 [153] µm long, 130–135 [132] µm wide, with three pairs of setae: st1=40–45 [44] µm, st2=35–41 [38] µm, st3=33–38 [34] µm; two pairs of lyrifissures, third pair of pores located on postero-lateral corners of shield. Metasternal setae st4=31–35 [damaged] µm long, inserted in soft cuticle. Genital shield (140–145×90 [143×90] µm) smooth except for two weak longitudinal lines; genital setae st5=28–34 [30] µm long, inserted on edges of genital shield; genital pores in soft membrane adjacent to shield. One pair of small elongated, triangular endopodal plates present between coxae III–IV, and similar, but minute, plates between coxae II–III. Opisthogastric integument posterior to genital shield with two pairs of minute transverse platelets, a pair of bigger oval platelets, and with at least five pairs of smooth to slightly serrated setae: JV1=28–34 [28] µm, JV2=27–30 [27] µm, JV3=27–28 [28] µm, JV4=25–25 [25] µm, JV5=27–31 [27] µm. Anal shield sub-oval (100–120 × 130–135 [120×130] µm), with reticulate ornamentation throughout, typically with three

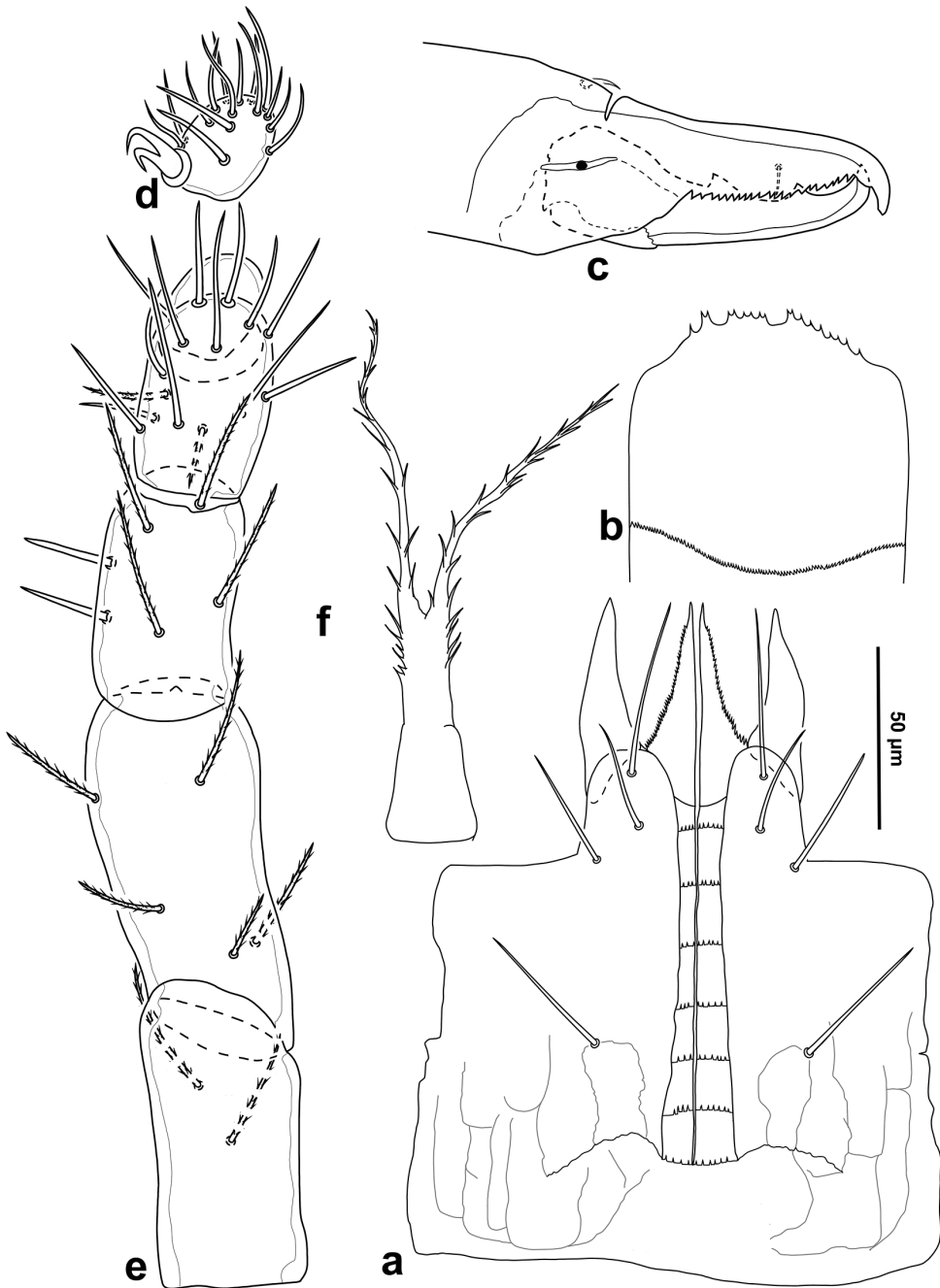


Fig. 3. *Antennoseius oudemansi*, female. – a. Gnathosoma. – b. Tectum. – c. Chelicera, antero-lateral view. – d. Palp tarsus, ventral view. – e. Palp (except tarsal), dorsal view. – f. Tritosternum.

smooth, circum-anal setae: para-anal setae (19–20 [20]  $\mu\text{m}$ ), post-anal seta (24–25 [25]  $\mu\text{m}$ ). Cribrum conspicuous, located posterior to post-anal seta. Metapodal plates oval, smooth (10–11  $\times$  21–25 [11 $\times$ 21]  $\mu\text{m}$ ), located posterior to

peritrematal shields; another smaller pair of plates bearing pores present between metapodal plates and peritrematal shields, and a pair of pores present near posterior edges of coxae IV. Peritrematal shields wide, beginning anterior to



Fig. 4. *Antennoseius oudemansi*, female, dorsal views. – a. Leg I. – b. Leg II. – c. Leg III. – d. Leg IV.

coxae I, extending posterior to stigmata to partially embrace coxae IV; area outside peritremes with multiple short transverse lines; inner area exposing granulate ornamentation, with one pair of large post-stigmatal pores and two pairs of

smaller pores. Peritremes beginning anterior to coxae I, slightly sinuate, stigmata at level of coxae IV.

Gnathosoma. Hypostome with robust horn-like corniculi and four pairs of smooth setae (Fig.

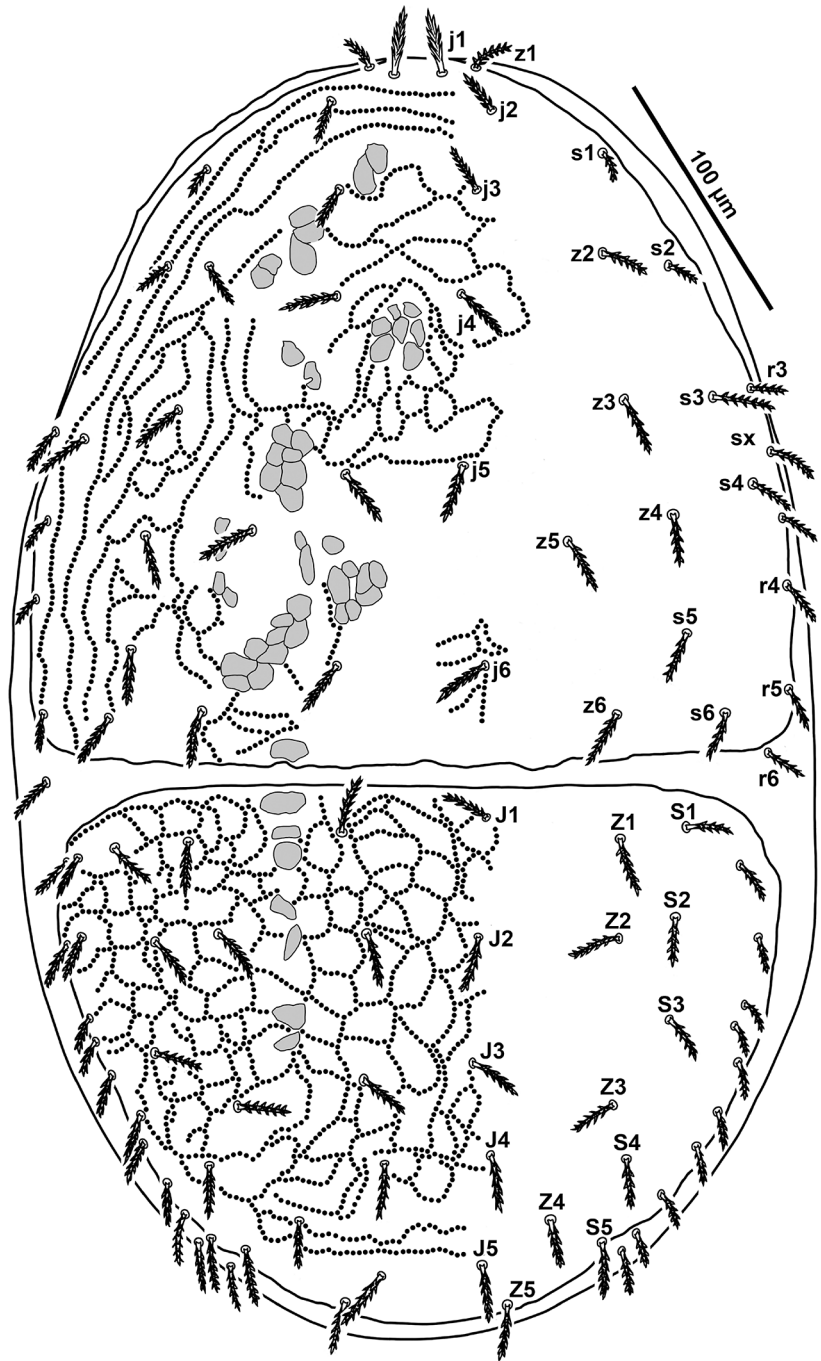


Fig. 5. *Antennoseius oudemansi*, male, dorsal view.

3a). Rostral setae h1 longest (43–47 [43] μm), external posterior setae h2 short (28–31 [30] μm), internal posterior setae h3 of similar length (27–32 [28] μm), palp coxal setae of medium length (30–35 [35] μm). Hypostomal groove with seven rows of denticles, with 10, 8, 8, 8, 9, 10, 10

denticles per row. Anterior margin of tectum rounded, denticulate, with 18–20 denticles (Fig. 3b), dorsal surface with an undulating posterior transverse line of approx. 90 denticles. Fixed digit of chelicera multidentate with a row of twenty-one small teeth, a larger blunt distal tooth

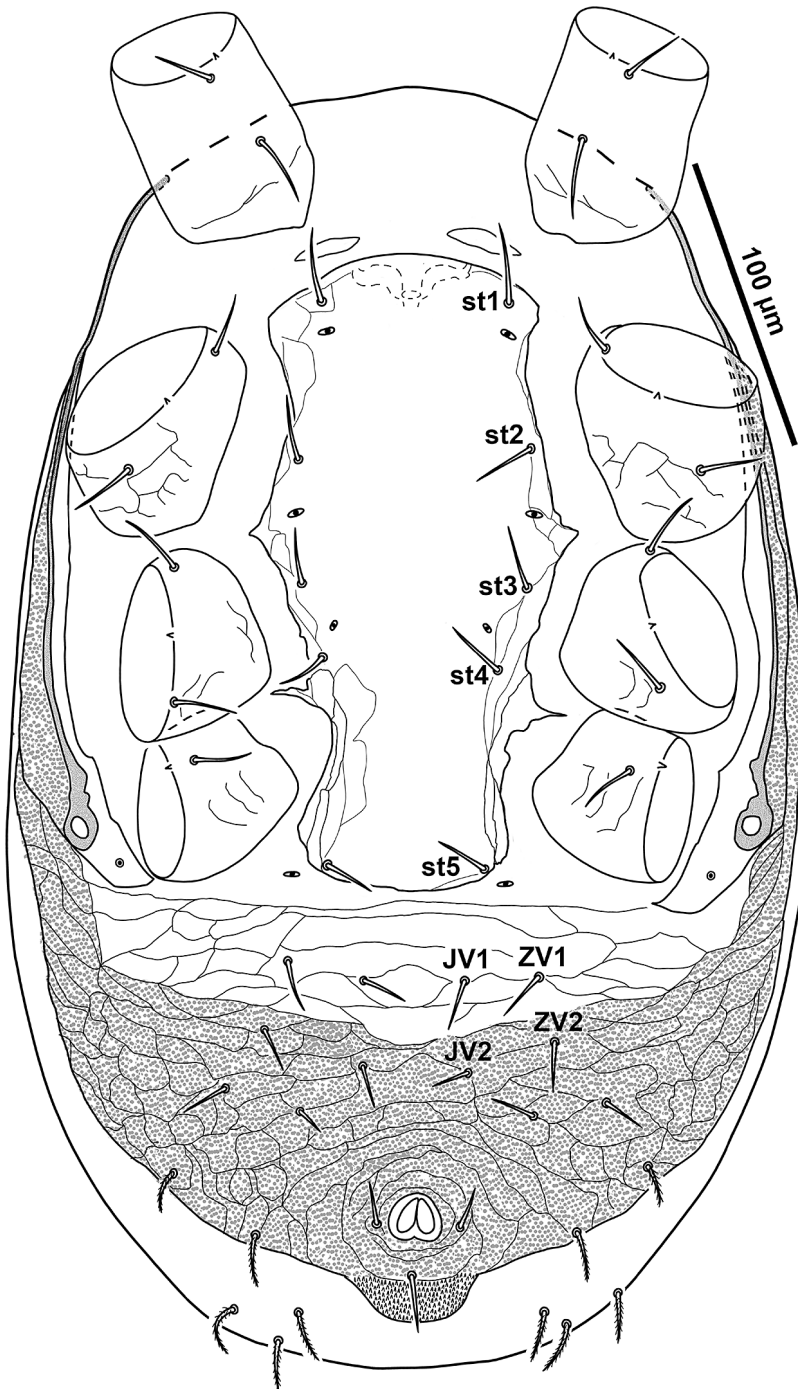


Fig. 6. *Antennoseius oudemansi*, male, ventral view.

and a minute pilus dentilis; movable digit 67–73 [68] μm with a small distal tooth and two larger medial teeth (Fig. 3c). Palps (Fig. 3e) 244–249 [249] μm long, palp tarsal claw two-tined (Fig. 3d).

Legs (Fig. 4a–d). Lengths: I=760–795 [790] μm, II=530–563 [563] μm, III=513–540 [535] μm, IV=675–720 [710] μm. Trochanter I with setae *ad* and *pd* serrated; femur I with *ad1*, *ad2*, *ad3*, *pd1* and *pd2* serrated as well, other leg setae



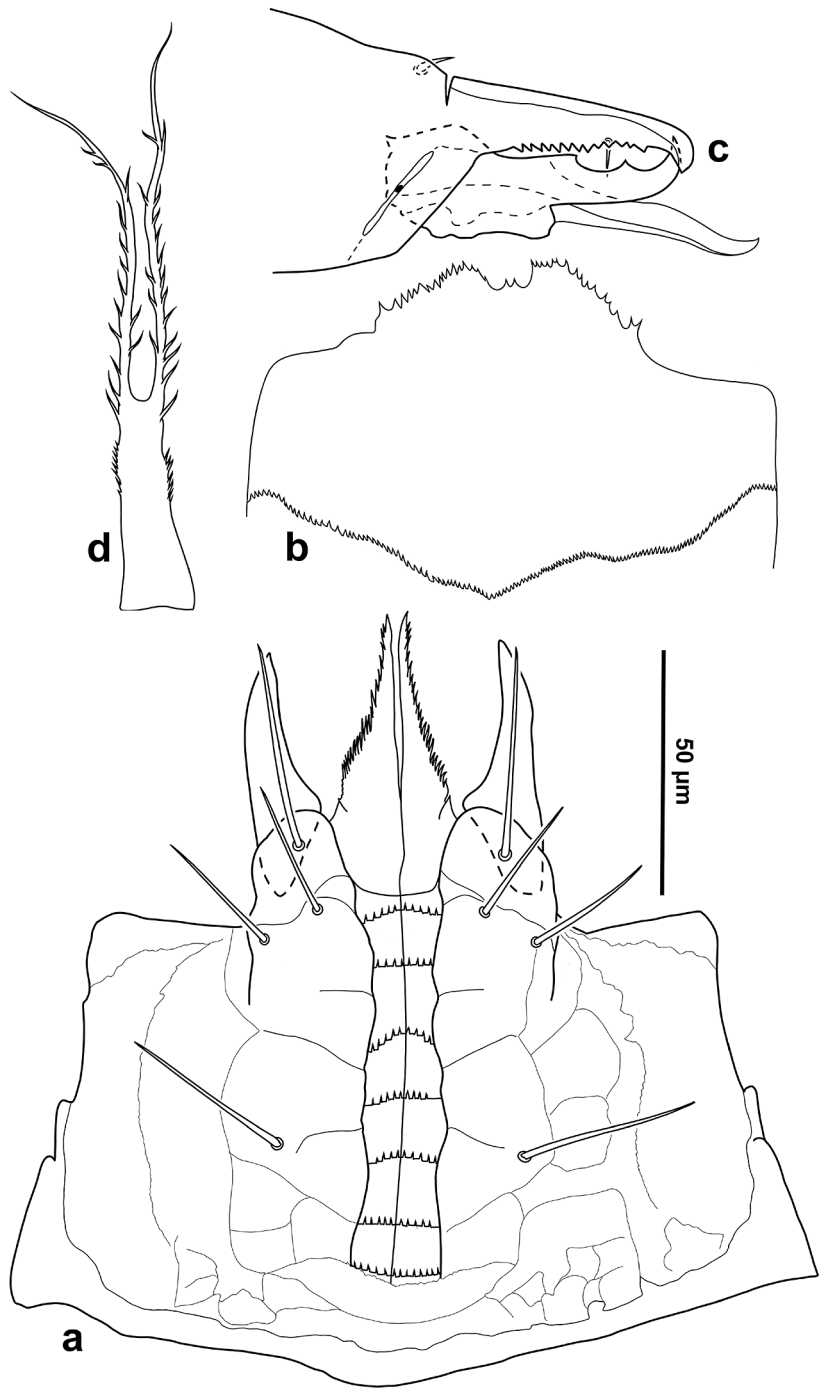


Fig. 7. *Antennoseius oudemansi*, male. – a. Gnathosoma. – b. Tectum. – c. Chelicera, antero-lateral view. – d. Tritosternum.

fine, smooth, pointed. Tibia III with nine setae, *pl2* present (1 2/1 2/1 2). Tarsi I–IV all with a pair of well-developed claws with rounded pulvilli. Pre-tarsus lengths: I=45 [45] µm, II=34–35 [34] µm, III=35–38 [36] µm, IV=46–48 [47] µm.

### 3.2. Redescription of male

Dorsum (Fig. 5). Idiosoma 475–605 (531 ± S.D.=40) [475] µm long and 310–370 (335 ± 19) [330] µm wide. Podonotal and opisthotal

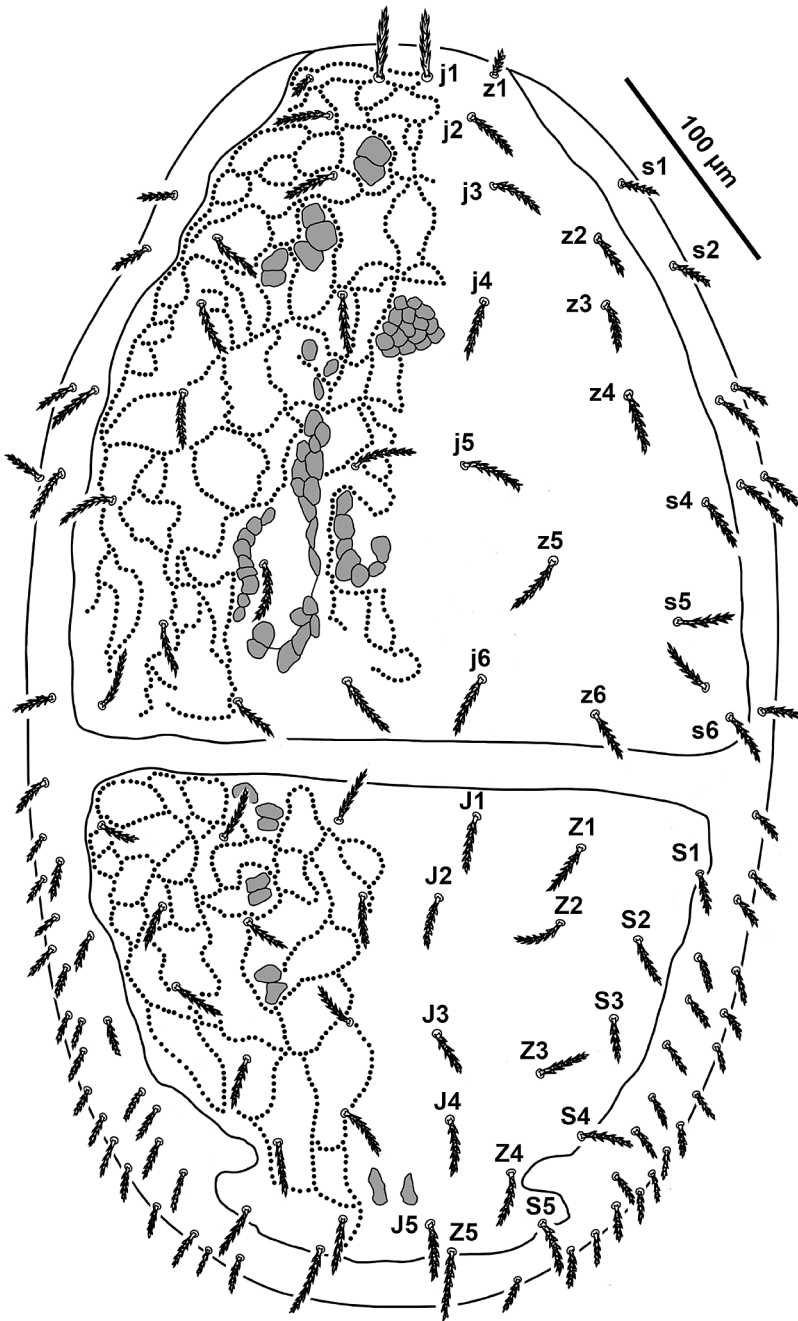


Fig. 8. *Antennoseius oudemansi*, deutonymph, dorsal view.

shields separate, of the same length/width ratio approximately 0.92, ornamentation as for female. Podonotal shield 280–308 [300] µm long and 308–338 [310] µm wide with 22 + 1–2 pairs of setae including four r-series setae, setae otherwise as for female. Opisthonotal shield 200–255 [213] µm long and 263–308 [270] µm wide with

23–25 pairs of setae including R series; setae 20–27 [20–26] µm long.

Venter (Fig. 6). Tritosternum (Fig. 7d) and pre-sternal plates (ca. 35 × 7 µm) as for female. Sterno-genital shield (243–265 [265] µm) smooth except for a few weak lateral lines and fused conspicuous endopodal plates at the level

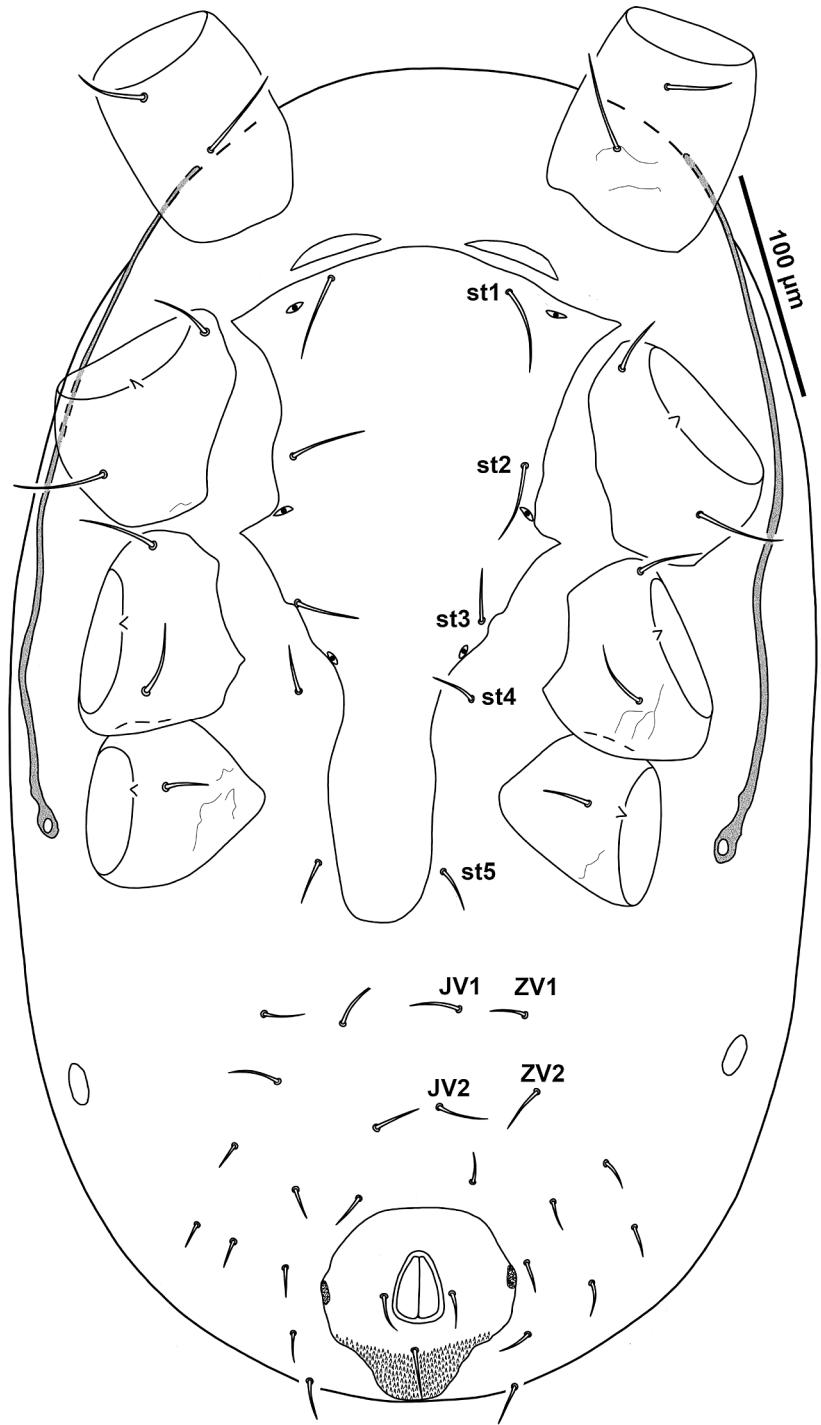


Fig. 9. *Antennoseius oudemansi*, deutonymph, ventral.

of coxa IV, with five pairs of simple slender setae; the longest first pair st1=29–33 [29] μm, four succeeding pairs gradually shorter st2=28–32 [28] μm, st3=26–28 [26] μm, st4=23–25 [23] μm,

st5=22–25 [22] μm; width ranges from 115–123 [115] μm at the level of st1 pair, and about 138–148 [138] μm in the halfway of pair st2–st3 setae; postero-laterally fused with endopodal plates

residing between coxa III and IV. Genital opening between setae st1. Ventri-anal shield large (155–165 × 290–305 [160 × 300]  $\mu\text{m}$ ), united completely with peritrematal shields, with reticulate ornamentation throughout covering the major part – from the level of a lineation between first and second pairs of setae JV and ZV up to the posterior border, with seven pairs of ventral setae (20–23 [20–23]  $\mu\text{m}$  long) and three circum-anal setae 14–18 [16]  $\mu\text{m}$ , post-anal seta the longest (18–21 [damaged]  $\mu\text{m}$ ). Additional unpaired setae may be present. Peritremes reaching coxa I, slightly sinuate as in female; covered with lineate patterning on the inner side adjacent to peritremes, on the outer side with granular ornamentation, combined with that of ventri-anal shield.

Gnathosoma. Hypostome (Fig. 7a) and tectum (Fig. 7b) as for female. Corniculi reaching 43–47 [43]  $\mu\text{m}$ . Hypostome setae h1=29–33 [30]  $\mu\text{m}$ , external posterior setae h2=22–27 [23]  $\mu\text{m}$ , internal posterior setae h3=20–23 [23]  $\mu\text{m}$ , palp coxal setae h4=27–30 [27]  $\mu\text{m}$ . Fixed digit of chelicera multidentate with a row of twenty-one small teeth, a larger blunt distal tooth and a minute pilus dentilis; movable digit 43–50 [46]  $\mu\text{m}$  with a small distal tooth and two larger medial teeth, spermatodactyl (39–43 [40]  $\mu\text{m}$ ) shorter than movable digit (Fig. 7c). Palps 198–212 [198]  $\mu\text{m}$  long, palp tarsal claw two-tined.

Legs as for female, although shorter, unarmed. Measures: leg I=513–637 [637]  $\mu\text{m}$ , leg II=390–478 [478]  $\mu\text{m}$ , leg III=361–458 [458]  $\mu\text{m}$ , leg IV=478–603 [603]  $\mu\text{m}$ , each with well-developed ambulacrum measuring I=25–36 [25]  $\mu\text{m}$ , II=23–31 [23]  $\mu\text{m}$ , III=23–32 [23]  $\mu\text{m}$ , IV=28–36 [28]  $\mu\text{m}$ , respectively.

### 3.3. Description of deutonymph

Dorsum (Fig. 8). Idiosoma 470–840 (614  $\pm$  S.D.=85)  $\mu\text{m}$  long and 470–840 (400  $\pm$  56)  $\mu\text{m}$  wide. Podonotal shield (295–305 × 295–303  $\mu\text{m}$ ) with 15 pairs of setae and opisthonotal shield (200–215 × 218–245  $\mu\text{m}$ ) with 15 pairs of setae. Both, as in adult stages, covered with granular ornamentation in the background, and more conspicuous granules forming a net, giving it a granulate-reticulate patterning. All setae finely barbed. Vertical setae j1=27–31  $\mu\text{m}$  long,

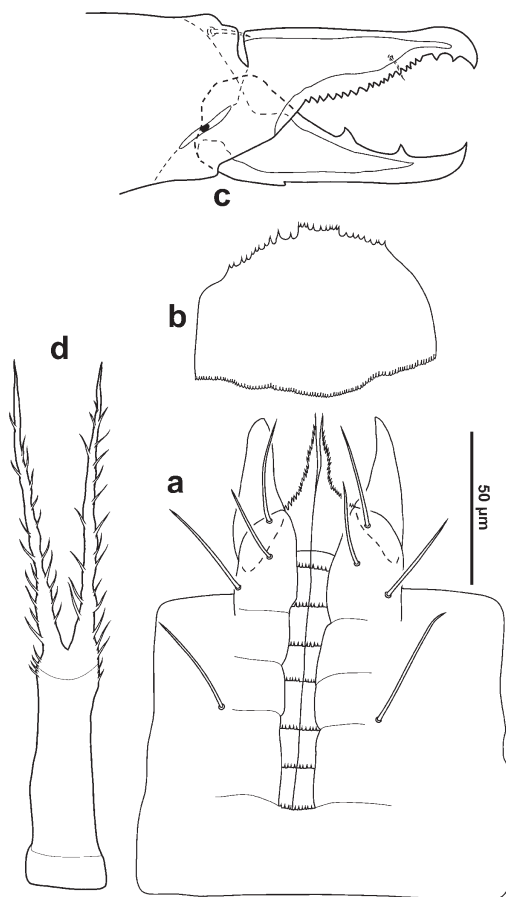


Fig. 10. *Antennoseius oudemansi*, deutonymph. – a. Gnathosoma. – b. Tectum. – c. Chelicera, antero-lateral view. – d. Tritosternum.

paraverticilar setae z1 the shortest (11–15  $\mu\text{m}$ ), other setae as followed: dorsocentral row setae: j2=23–27  $\mu\text{m}$ , j3=24–28  $\mu\text{m}$ , j4=26–29  $\mu\text{m}$ , j5=27–28  $\mu\text{m}$ , j6=27–32  $\mu\text{m}$ ; mediolateral setae: z2=21–26  $\mu\text{m}$ , z3=24–28  $\mu\text{m}$ , z4=25–30  $\mu\text{m}$ , z5=25–29  $\mu\text{m}$ , z6=22–27  $\mu\text{m}$ ; lateral: s3=30–34  $\mu\text{m}$ , s4=25–29  $\mu\text{m}$ , s5=26–29  $\mu\text{m}$ , s6=24–25  $\mu\text{m}$ ; one supernumerary paired either unpaired setae located postero-lateral to s3–sx2=25  $\mu\text{m}$ ; lateral setae: s1=16–20  $\mu\text{m}$ , s2=16–18  $\mu\text{m}$  located outside podonotal shield and none of the marginal setae (five to six pairs) located on the shield; humeral seta r3 the longest ca. 20–25  $\mu\text{m}$ , other r-row setae 15–21  $\mu\text{m}$ . Opisthonotal shield bearing 15 pairs of barbed setae. Dorsocentral setae: J1=23–25  $\mu\text{m}$ , J2=21–25  $\mu\text{m}$ , J3=21–25  $\mu\text{m}$ , J4  $\mu\text{m}$ =23–25  $\mu\text{m}$ , J5=20–26  $\mu\text{m}$ ; mediolateral setae: Z1=22–25  $\mu\text{m}$ , Z2=21–25  $\mu\text{m}$ , Z3=21–24

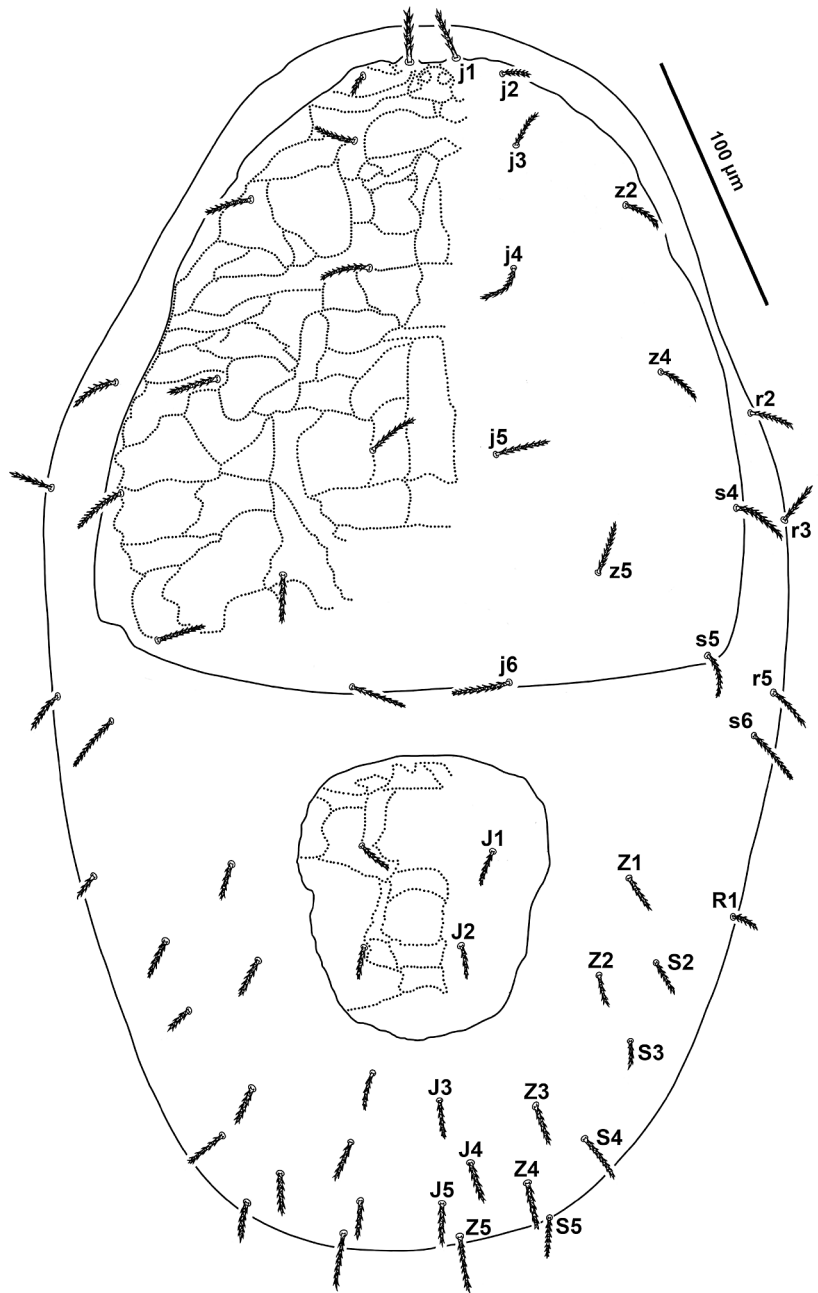


Fig. 11. *Antennoseius oudemansi*, proto-nymph, dorsal view.

µm, Z4=21–27 µm, Z5=25–31 µm; lateral setae: S1=16–20 µm, S2=23–25 µm, S3=24–25 µm, S4=22–23 µm, S5=23–26 µm.

Venter (Fig. 9). Tritosternum as for mature forms. Pre-sternal plates slender, reaching approximately 35 × 4 µm. Sterno-genital shield (260–270 µm long and 138–150 µm wide at the level of st1 pair) plain, with three pairs of simple

slender setae; the first pair longest st1=36–40 µm, four succeeding pairs gradually shorter st2=30–31 µm, st3=28–31 µm, st4=22–24 µm, st5=21–24 µm; anal shield sub-oval (75–85 × 80–85 µm) with three circum-anal setae of similar length (16–21 µm). Additional unpaired setae may be present. Peritremes reaching coxa I, slightly sinuate as in adult forms.

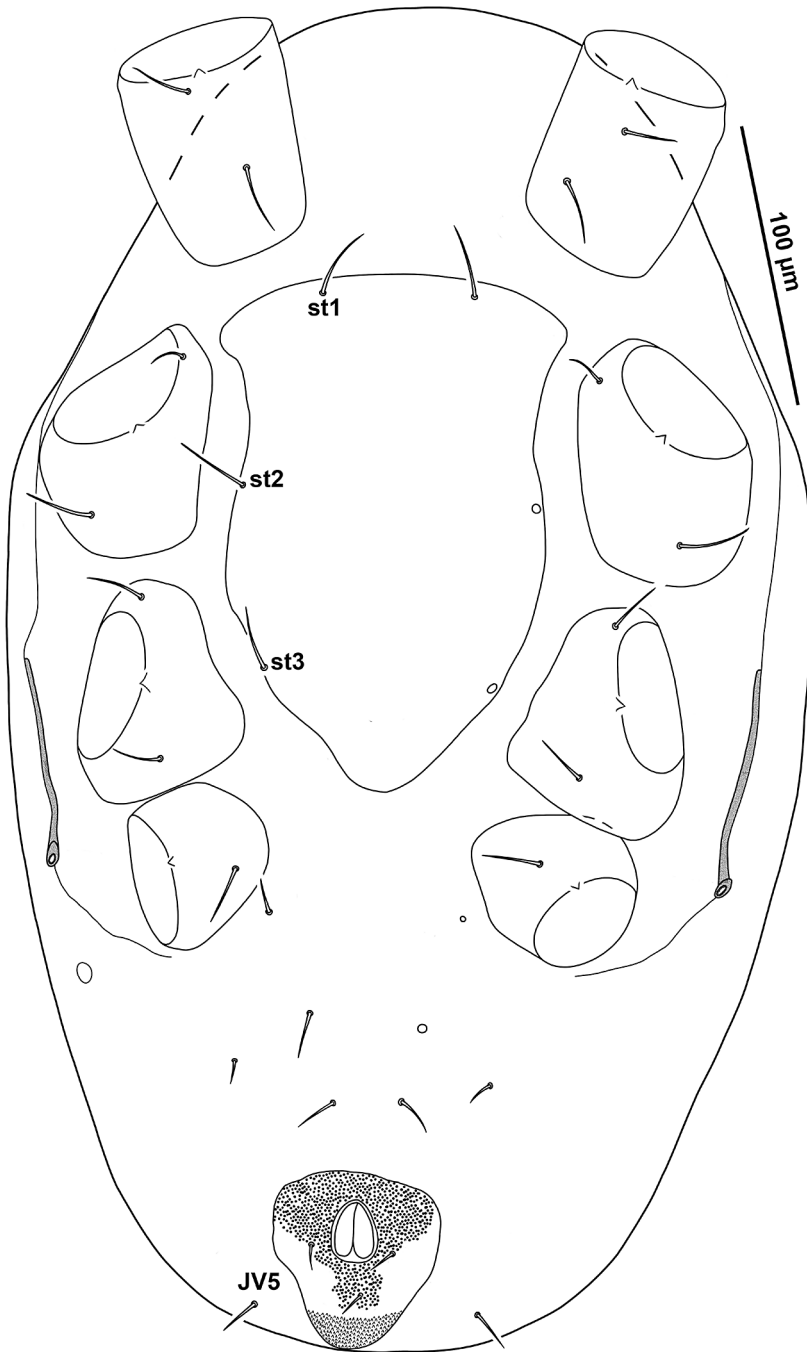


Fig. 12. *Antennoseius oudemansi*, proto-nymph, ventral view.

Hypostome (Fig. 10a) and tectum (Fig. 10b) as for mature forms. Corniculi reaching 40–46  $\mu\text{m}$ . Hypostome setae  $h1=36\text{--}41$   $\mu\text{m}$ , external posterior setae  $h2=27\text{--}31$   $\mu\text{m}$ , internal posterior setae  $h3=25\text{--}28$   $\mu\text{m}$ , palp coxal setae  $h4=30\text{--}42$   $\mu\text{m}$ . Fixed digit of chelicera multidentate, pilus

dentilis present; movable digit 46–54  $\mu\text{m}$  with a small distal tooth and two larger medial teeth (Fig. 10c). Palps 197–210  $\mu\text{m}$  long, palp tarsal claw two-tined.

Legs as for adults. Measures: leg I=513–628  $\mu\text{m}$ , leg II=390–470  $\mu\text{m}$ , leg III=361–433  $\mu\text{m}$ ,

leg IV=478–545  $\mu\text{m}$ , each with well-developed ambulacra measuring I=25–36  $\mu\text{m}$ , II=23–31, III=23–32, IV=28–36, respectively.

### 3.4. Description of protonymph

Dorsum (Fig. 11). Idiosoma 460  $\mu\text{m}$  long and 275  $\mu\text{m}$  wide. Pronotal shield (185  $\times$  175  $\mu\text{m}$ ) with 11 pairs of setae and pygidial shield (60  $\times$  60  $\mu\text{m}$ ) with 2 pairs of setae. As in all stages, covered with granular, yet delicate, ornamentation. All setae finely barbed. Vertical setae  $j_1=22\text{--}25$   $\mu\text{m}$  long, paraverticilar setae  $z_1$  the shortest (11–13  $\mu\text{m}$ ), other setae as following: dorsocentral row setae:  $j_3=19\text{--}20$   $\mu\text{m}$ ,  $j_4=23$   $\mu\text{m}$ ,  $j_5=21\text{--}22$   $\mu\text{m}$ ,  $j_6=23\text{--}25$   $\mu\text{m}$ ; mediolateral setae:  $z_2=19\text{--}20$   $\mu\text{m}$ ,  $z_4=20\text{--}23$   $\mu\text{m}$ ,  $z_5=20$   $\mu\text{m}$ ; lateral:  $s_4=23\text{--}25$   $\mu\text{m}$ ,  $s_5=19\text{--}20$   $\mu\text{m}$ ;  $s_6=19\text{--}20$   $\mu\text{m}$  located outside pronotal shield and marginal setae:  $r_2=21$  and  $r_3=17$   $\mu\text{m}$ . Pygidial shield bearing 16–17  $\mu\text{m}$  J1 and J2 pairs of setae. Remaining 13 pairs of setae, located in a soft cuticule, reaching 15–19  $\mu\text{m}$ , except the shortest R1=10  $\mu\text{m}$  and the longest Z5=21  $\mu\text{m}$ .

Venter (Fig. 12). Tritosternum as for mature forms, although smaller. Tritosternal base 39  $\mu\text{m}$  with 65–70  $\mu\text{m}$  laciniae. Sternal shield (185  $\mu\text{m}$  length and 105  $\mu\text{m}$  width at the level of  $st_1$  pair) plain, with three pairs of simple slender setae: first pair  $st_1=27$   $\mu\text{m}$ ,  $st_2=29$   $\mu\text{m}$ ,  $st_3=26$   $\mu\text{m}$ , in a soft membrane a genital setae  $st_5=15$   $\mu\text{m}$ ; anal shield sub-oval (50  $\times$  50  $\mu\text{m}$ ), with three circum-anal setae of similar length (13–15  $\mu\text{m}$ ). Peritremes not reaching coxa II, stigmata at the level of IV coxa.

Hypostome (Fig. 13a) and tectum (Fig. 13b) as for mature forms. Corniculi reaching 39–40  $\mu\text{m}$ . Hypostome setae  $h_1=30$   $\mu\text{m}$ , external posterior setae  $h_2=20$   $\mu\text{m}$ , internal posterior setae  $h_3=25$   $\mu\text{m}$ , palp coxal setae  $h_4=28$   $\mu\text{m}$ . Fixed digit of chelicera multidentate, pilus dentilis present; movable digit 43–45  $\mu\text{m}$  with a small distal tooth and two larger medial teeth (Fig. 13c). Palps 170–171  $\mu\text{m}$  long, palp tarsal claw two-tined.

Legs as for adults. Measures: leg I=565  $\mu\text{m}$ , leg II=400  $\mu\text{m}$ , leg III=360  $\mu\text{m}$ , leg IV=462  $\mu\text{m}$ , each with well-developed ambulacrum measuring I=25–36  $\mu\text{m}$ , II=23–31  $\mu\text{m}$ , III=23–32  $\mu\text{m}$ , IV=28–36  $\mu\text{m}$ , respectively.

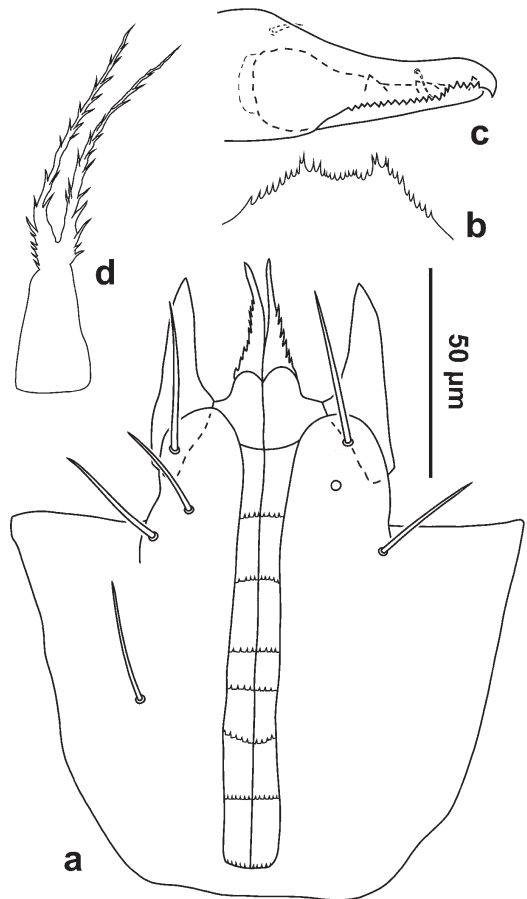


Fig. 13. *Antennoseius oudemansi*, protonymph. – a. Gnathosoma. – b. Tectum. – c. Chelicera, antero-lateral view. – d. Tritosternum.

### 4. Occurrence

In Svalbard, *A. oudemansi* has been reported from Barentsburg, Hiorthhamn (Thor 1930), Adventdalen, Bjørndalen, Endalen, Florabukta, Magdalenefjorden and Petuniabukta (this study). The species has been found in the surface layer of soil, between roots of many bryophyte and grass species and also in plant communities dominated by *Dryas octopetala* L., *Cassiope tetragona* (L.) D. Don or *Salix polaris* Wahlenb. (Ávila-Jiménez *et al.* 2011, Coulson *et al.* 2011, Gwiazdowicz & Coulson 2011).

### 5. Differential diagnosis

*Antennoseius oudemansi* resembles two species: *A. janus* and *A. granulatus*. The main distinguish-

ing characters from *A. janus* is the size of idiosoma, which, due to its broad size range should be treated with caution since the smallest specimens of *A. oudemansi* almost overlap with the largest *A. janus*. Measurements of the dorsal shields (characters without great size ranges) and the number of setae on the podonotal shield are more reliable. *Antennoseius oudemansi* is the largest species among the whole family with females reaching lengths of up to 1,000 µm. In contrast to the 13–17 pairs of setae on the posterior dorsal shield of *A. janus*, *A. oudemansi* bears a reduced number of setae (13–14 pairs).

*Antennoseius oudemansi* differs from the second similar species, *A. granulatus*, by the granular patterning of the dorsal shields. All known stages of *A. oudemansi* are covered with a fine granular ornamentation in the background and with more conspicuous granules forming a net, providing a granulate-reticulate patterning, while in *A. granulatus* this patterning forms only a uniform background surface, without any trace of reticulation.

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