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REVIEW OF THE GENUS *GAMASELLODES* ATHIAS-HENRIOT (MESOSTIGMATA: ASCIDAE) IN RUSSIA, WITH A DESCRIPTION OF A NEW SPECIES

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ABSTRACT: A new predatory mite species of the genus *Gamasellodes* Athias-Henriot, 1961 (Mesostigmata: Ascidae), *G. brevisetus* sp.n., is described and illustrated based on morphological characters of adults collected from meadow soils of Eastern Europe, the Caucasus and Western Siberia. The spermatodactyl of the male chelicera is unique among the representatives of this genus, being a thin-walled goffered tube possessing a broad opening. Female spermathecal apparatus is of a laelapid-type, with two unpaired successive chambers. In addition, an identification key to all known Russian species of the genus is presented, including *G. rectiventris* Lindquist, 1971, which was recorded from Russia for the first time.

KEY WORDS: edaphic mites, taxonomy, predatory mites, Parasitiformes, Ascoidea, morphology.

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INTRODUCTION

Mesostigmata (Acari) is a large cosmopolitan order of mites that includes approximately 11,500 described species, which constitutes about 20% of all known mite species (Beaulieu *et al*. 2011). The order embraces an unusually diverse variety of lifestyles and habitats, but the majority of species are free-living predators. Mesostigmatic mites are found in soil, litter, rotting wood, compost, manure, carrions, nests, house dust and similar detritus-based niches. They are also associated with vertebrate and invertebrate animals, plants and fungi (Lindquist *et al*. 2009). The mite family Ascidae includes 17 genera and slightly over 380 described species (Moraes *et al*. 2016; Castro *et al.* 2020; Santos *et al*. 2021; Rueda-Ramírez *et al*. 2022). Within the Ascinae subfamily, the genus *Gamasellodes* Athias-Henriot, 1961 is presumed to be a group of the smallest predatory mites feeding upon nematodes or small arthropods, based on their cheliceral morphology and some limited laboratory observations (Walter 1987; Walter *et al*. 1987; Walter and Ikonen 1989; Halliday *et al*. 1998). Moreover, they can be reared on nematode diet exclusively (Walter 1987; Walter and Stirling 2018), and they are therefore considered potential biocontrol agents of soil-root pests (Walter 2003). The eurybiontic *Gamasellodes bicolor* (Berlese, 1918) can dominate entire Mesostigmata assemblages in mixed forest habitats (Madej *et al*. 2011).

The genus comprises 29 nominal species that occur either in soil and litter habitats or in forest canopy, sod, composts, grasses, ant nests and bark beetle galleries throughout most of the world: Africa (5 species), Asia (9), Australia (3), Europe (3), the Caribbean (1), North America (4) and South America (4) (Moraes *et al*. 2016; Castro *et al.* 2020; Mesa *et al*. 2021; Santos *et al*. 2021; Rueda-Ramírez *et al*. 2022).

Prior to the present study, only three *Gamasellodes* species were reported from Russia (Petrova 1982; Khomyakov 1986; Poletaeva 1998; Makarova 2004, 2009, 2011; Khaustov *et al.* 2018; Marchenko 2012; Vladimirova *et al.* 2021; Bizin and Makarova 2022; Makarova and Ermilov 2022): *Gamasellodes bicolor*, *G. tatricus* Gwiazdowicz and Walter, 2005 and *G. vulgatior* Athias-Henriot, 1961. During a study of the edaphic predatory mites of Russia, a new *Gamasellodes* species was collected from the swards of various meadows and from the excrements of livestock found on pastures. The new species is described and illustrated on the basis of the morphological characters of adult female and male. We also present the first record of *G. rectiventris* Lindquist, 1971 from Russia, previously known only from the USA and Australia (Lindquist 1971; Halliday *et al*., 1998). In addition, an identification key to all known Russian species of the genus is presented.

MATERIALS AND METHODS

Samples were collected over a few years from five different regions of Russia (see the material studied) while searching for edaphic mites. Mites were extracted from soil and excrements using the Berlese-Tullgren funnels, then cleared in lac-

tic acid solution and mounted in Hoyer's medium (Walter and Krantz 2009). The line drawings and the examinations of the specimens were performed with a Zeiss Axio Imager A2 compound microscope equipped with differential interference contrast (DIC) optical systems, attached to a AxioCam 506 color camera, as well as with a camera lucida using a "Leica DMLS" light microscope. Most images were captured in stacks (with the focal depth controlled manually). Selected images were combined using the Helicon Focus 7.6.4 Pro software (Helicon Soft Ltd., 2000). Digital drawings were prepared using the Adobe Photoshop CS2 software based on the original pencil line drawings. Images and morphological measurements were taken via ZEN 2012 software (v. 8.0). Photomicrographs were taken with the AxioCam 506 color camera (Carl Zeiss, Germany). For SEM microscopy, several alcohol preserved mites were dried in a JFD 320 freeze drying device (JEOL, Japan), dusted with gold and scanned with JEOL–JSM-6510LV.

Measurements of structures are expressed as ranges (minimum–maximum) in micrometers (μm). Podonotal and opisthonotal shield lengths were taken along their midlines from the anterior to posterior margins; widths were measured from the lateral margins at the level of dorsal setae *r*3 and at the level of setae *S*3. The length of the sternal shield was measured at midline, width—between mid-coxae II and posterior angles. The length of the epigynal shield was measured along the midline, from the anterior margin of the hyaline extension to the posterior margin of the shield; its width was measured at the broadest point (at the level of setae *st*5). Ventrianal shield was measured along the midline from the anterior to posterior margins, including the cribrum; its width was measured at the broadest point. The length of the second cheliceral segment was measured from its base to the apex of the fixed digit, and that of the movable digit—from the base to the apex. Leg length was measured from the base of the coxa to the apex of the tarsus (excluding the pre-tarsus).

The nomenclature used for the dorsal idiosomal chaetotaxy follows that of Lindquist and Evans (1965); the notations for leg and palp setae follow those of Evans (1963a, b), and other anatomical structures mostly follow Evans and Till (1979). Notations for idiosomal pore-like structures (gland pores and poroids/lyrifissures) and for the peritrematal shield follow mostly Athias-Henriot (1971, 1975), with small additions for gland pores *gvb*1, *gvb*2 (Makarova *et al.,* 2021). The notations for pore-like structures on the sternal shield and for the peritrematal shield region also follow modifications and additions by Johnston and Moraza (1991). The holotype and the paratypes are deposited at the Acarological Collection of the Tyumen State University Museum of Zoology, Tyumen, Russia (TUMZ); other material is kept mainly in the collections of the Laboratory of Synecology of the Severtsov Institute of Ecology and Evolution, RAS, Moscow.

SYSTEMATICS

Family **Ascidae Oudemans Voigts and Oudemans, 1905**

Genus ***Gamasellodes* Athias-Henriot, 1961**
Gamasellodes, Athias-Henriot 1961: 480.
Type species: *Gamasellodes vulgatior* Athias-Henriot, 1961 by original designation.

Diagnosis. The concept of *Gamasellodes* used here is based on that of Moraes *et al*. (2016).

***Gamasellodes brevisetus* sp. n.**
(Figs. 1–6)

Diagnosis (adults). In female, fixed cheliceral digit with five teeth (two large basal and three smaller distal teeth); anterior margin of epistome with three prongs, central prong much shorter than lateral prongs; all podonotal and opisthonotal setae uniform in length and thickness, smooth, acicular and relatively short (podonotal shield with 16 pairs of setae, opisthonotal shield with 15 pairs of setae); *Z*5 slightly longer than other setae and shorter than distance to base of *J*5; unsclerotized cuticle laterad podonotal and opisthonotal shields respectively with six and four pairs of setae (*s*1, *s*2, *r*2–5 and *R*1–4); sternal shield lightly ornate laterally, with three pairs of setae (*st*1–3); epigynal shield almost smooth, with truncate posterior margin; ventrianal shield ellipsoidal, with four pairs of setae in addition to circumanal setae, *Jv*2, *Jv*5 longer than *Jv*3, *Jv*4; unsclerotized opisthogastric cuticle with four pairs of setae (*Jv*1, *Zv*1–3; *Jv*1 longest); peritremes long, reaching to slightly beyond level of *s*1; femur II with 11 setae; genua of legs I–IV with 13, 11, 8 and 9 setae, respectively; tibiae I–IV with 13, 10, 8, 10 setae, respectively (full set for the genus; see Lindquist and Evans 1965; Walter 2003; Moraes *et al*. 2016). In male, dorsal seta *s*1, as in female, inserted on soft lateral cuticle; soft

cuticle laterad opisthonotal shield with three setae in *R* series (*R*2 absent); corniculi very narrow, distally sharp; metapodal platelets absent; a pair of oval sclerites between sternitigenital and ventrianal shields present; ventrianal shield with six pairs of setae in addition to circumanal setae; spermatodactyl tubular, thin-walled, goffered, with broad opening.

Description. *Female* (n=23 specimens), male (n=1). Brownish-yellowish in color.

Female. *Idiosoma* (Figs. 1A, B, 3A, 4A). Length 254–281, width 114–130.

Dorsal idiosoma (Figs. 1A, 2A, 3A, 3C, 3D). Podonotal shield (130–149 long, 107–114 wide), mostly smooth, with weak reticulate ornamentation anteriad seta *j*4, possessed of 16 pairs of relatively short setae (*j*1–6, *z*1–6, *s*3–6), setae *z*1 (5–7) shortest, other setae 8–12 long; setae *s*1, *s*2, *r*2–5 (7–11) on lateral soft cuticle; shield with seven pairs of distinguishable pore-like structures, including four pairs of poroids (*id*1–2, *id*5–6) and three pairs of gland pores (*gd*1–2, *gd*5) (Figs. 1A, 3A, C).

Opisthonotal shield smooth (130–135 long, 112–125 wide), without distinct ornamentation over whole surface, except two short longitudinal lines behind *J*1, arched undulate line posterior to *J*4, and properly transversal fold anterior to *J*4; shield with 15 pairs of relatively short (6–13) and smooth setae (*J*1–*J*5, *Z*1–*Z*5, *S*1–*S*5), ten pairs of distinguishable pore-like structures, including seven pairs of poroids (*idm*1–4, *idm*6, *idl*3–4) and three pairs of gland pores (*gd*6, *gd*8–9) (Figs. 1A, 3A, D); setae *J*5 (6–8) shortest, setae *Z*5 (11–13) longest, without barbs, slightly longer than other setae on both shields and shorter than distance (17–19) to base of *J*5 (Fig. 3D); unsclerotized cuticle along lateral margins of opisthonotal shield with four pairs of setae (*R*1–4, 6–7 long) (Figs. 1A, 3B), and a pair of poroids (*idR*3). Muscle-marks (sigillae) visible mostly on podonotal shield. Shape, position, relative length and thicknesses of setae shown in Figs. 1A, 3A–D.

Ventral idiosoma (Figs. 1B, 2B, 4A–E). Tritosternum with paired pilose laciniae (30–37), fused basally (on distance 4–6); columnar base 11–13 long, 6–9 wide (Figs. 1B, 4E); presternal area lightly sclerotized, finely punctate, without distinct platelets. Most ventral setae with attenuate tip. Sternal shield length 80–85, narrowest between coxae II (45–47), widest between posterior angles (59–63); bearing three pairs of smooth setae (*st*1–3, 12–14 long), two pairs of slit-like lyrifissures (*iv*1, *iv*2), one pair of sub-oval lyrifissure (*iv*3) on posterolateral corners of shield, and sometimes with rudimentary gland pores *gv*1 between them on posterior shield margin (Fig. 2B); endopodals between coxae I–II and II–III fused with sternal shield, distal part of anterior endopodals encompass gland pores *gvb*1 (Fig. 2B); surface of sternal shield without reticulate ornamentation, almost smooth, except some irregular longitudinal lines laterally; anterior shield margin emarginated medially (Figs. 1B, 2B, 4A, B). Setae *st*4 (9–11) on soft cuticle (Fig. 4B). Endopodal strips between coxae III and IV indistinct. Epigynal shield smooth, somewhat vase form, 30–35 long and 65–70 wide, anterior hyaline margin of shield convex (not overlapping posterior area of sternal shield), lateral margins lightly converging posteriad *st*5, posterior margin truncate, setae *st*5 (10–12) on lateral margins of shield (Figs. 1B, 4A, C). Paragenital poroids (*iv*5) located on soft cuticle beside posterolateral margins of shield (near seta *st*5) (Figs. 1B, 4A, C). Ventrianal shield transversally oval (ellipsoidal), 72–80 long and 105–115 wide at level of *Jv*4, with surface smooth throughout, except some coarse punctation; with four pairs of opisthogastric setae (*Jv*2, *Jv*5, 13–15, longer than *Jv*3, *Jv*4, 8–10), a pair of adanal setae (12–14) and postanal seta (18–20); anal opening small; cribrum formed by a single transverse row of denticles, coinciding approximately with anterior margin of six transversely aligned narrow ellipsoidal structures (Figs. 1B, 4A, D). Opisthogastric soft cuticle with faintly sclerotized postgenital platelets behind strip-like postgenital groove, four pairs of setae (*Jv*1, 12–13 long, and *Zv*1–3, 7–10 long), two pairs of well-spaced metapodal platelets (oval lateral pair 8–10 long, 5–8 wide; elongate inner pair with dimensions 10–12 × 3–6), a pair of poroids *ivo*, and gland pores *gv*2 (Figs. 1B, 4A, D). Peritremes long, reaching anteriad to slightly beyond level of *s*1 (Figs. 1B, 2A). Peritrematal shields anteriorly fused with dorsal shield at level between setae *z1* and posteriorly united with exopodal strip extending behind stigma around posterior margin of coxa IV, but free from exopodal fragments alongside coxae II–IV; shields bearing five pairs of discernible pore-like structures: two pairs of gland pores and three pairs of poroids (Figs. 1B, 3B).

Gnathosoma (Figs. 1C–E, 4E, 5A–C). Anterior margin of epistome with three prongs, central

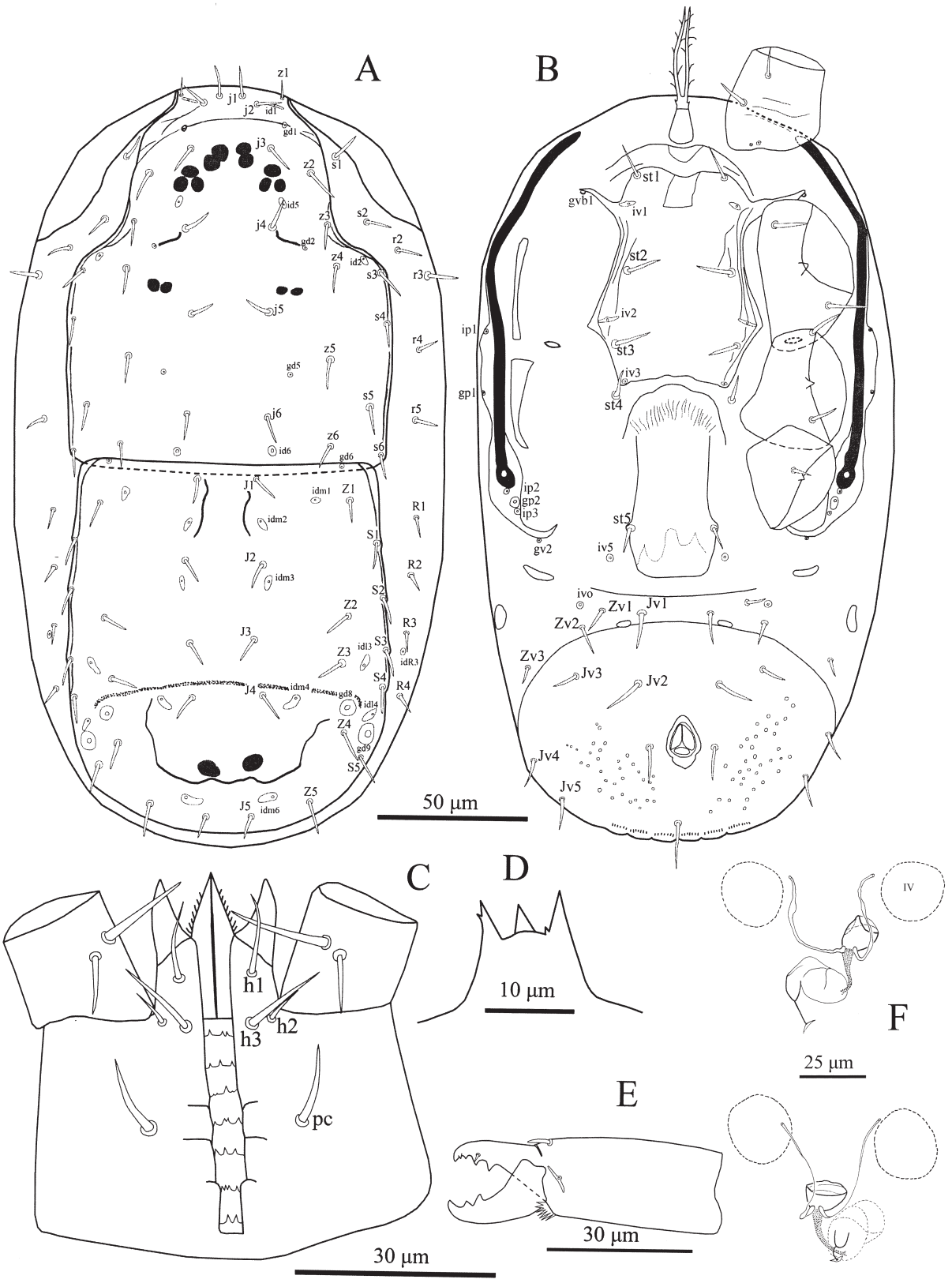

Fig. 1. *Gamasellodes brevisetus* sp.n., female. A—dorsal idiosoma; B—ventral idiosoma; C—subcapitulum; D—epistome; E—chelicera, without basal segment; F—insemination structures.

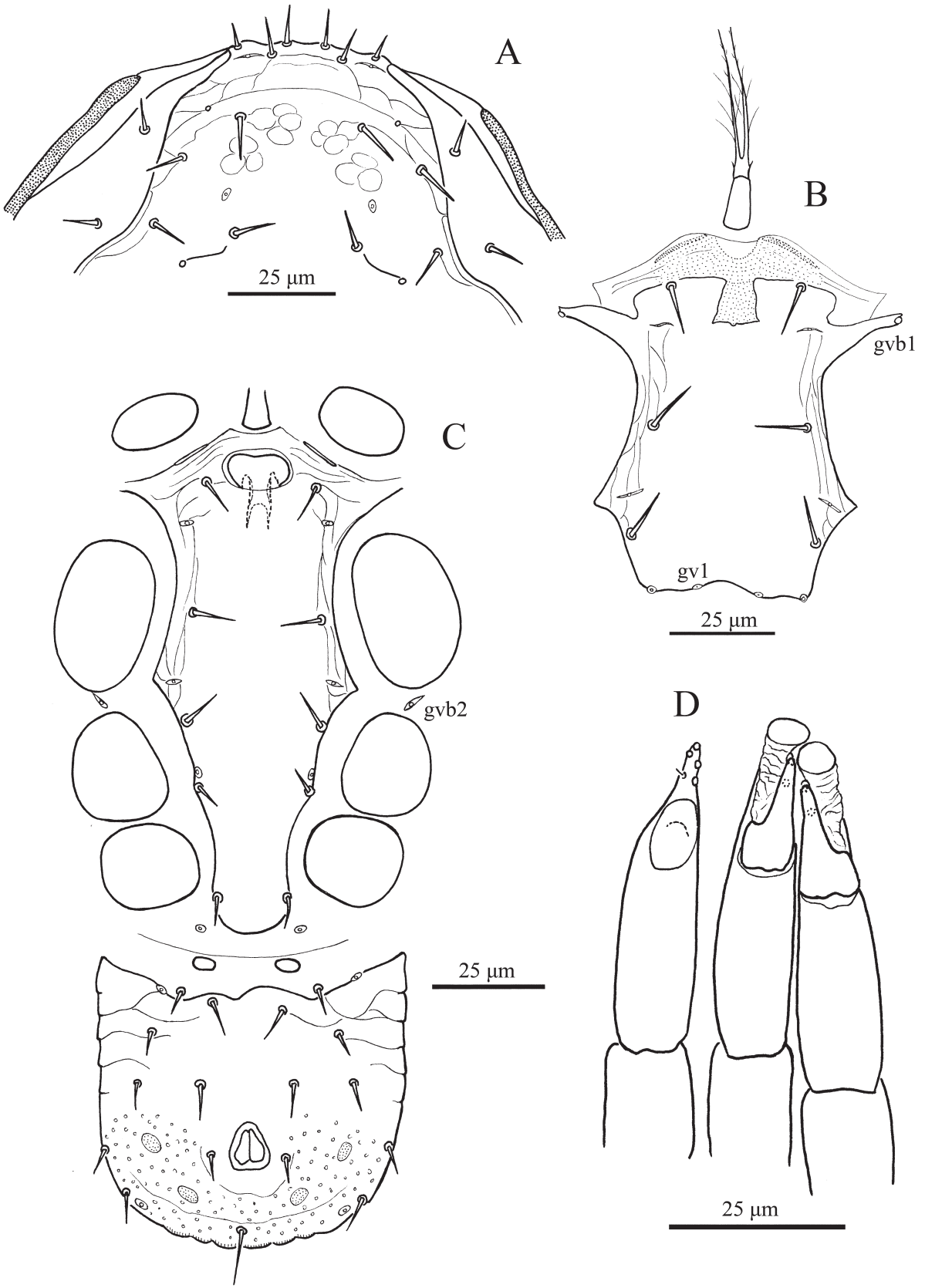

Fig. 2. *Gamasellodes brevisetus* sp.n. A, B—female; A—anterior region of idiosomal dorsum; B—sternal region; C, D—male; C—ventral idiosoma; D—chelicerae, ventral view, left image with movable digit removed.

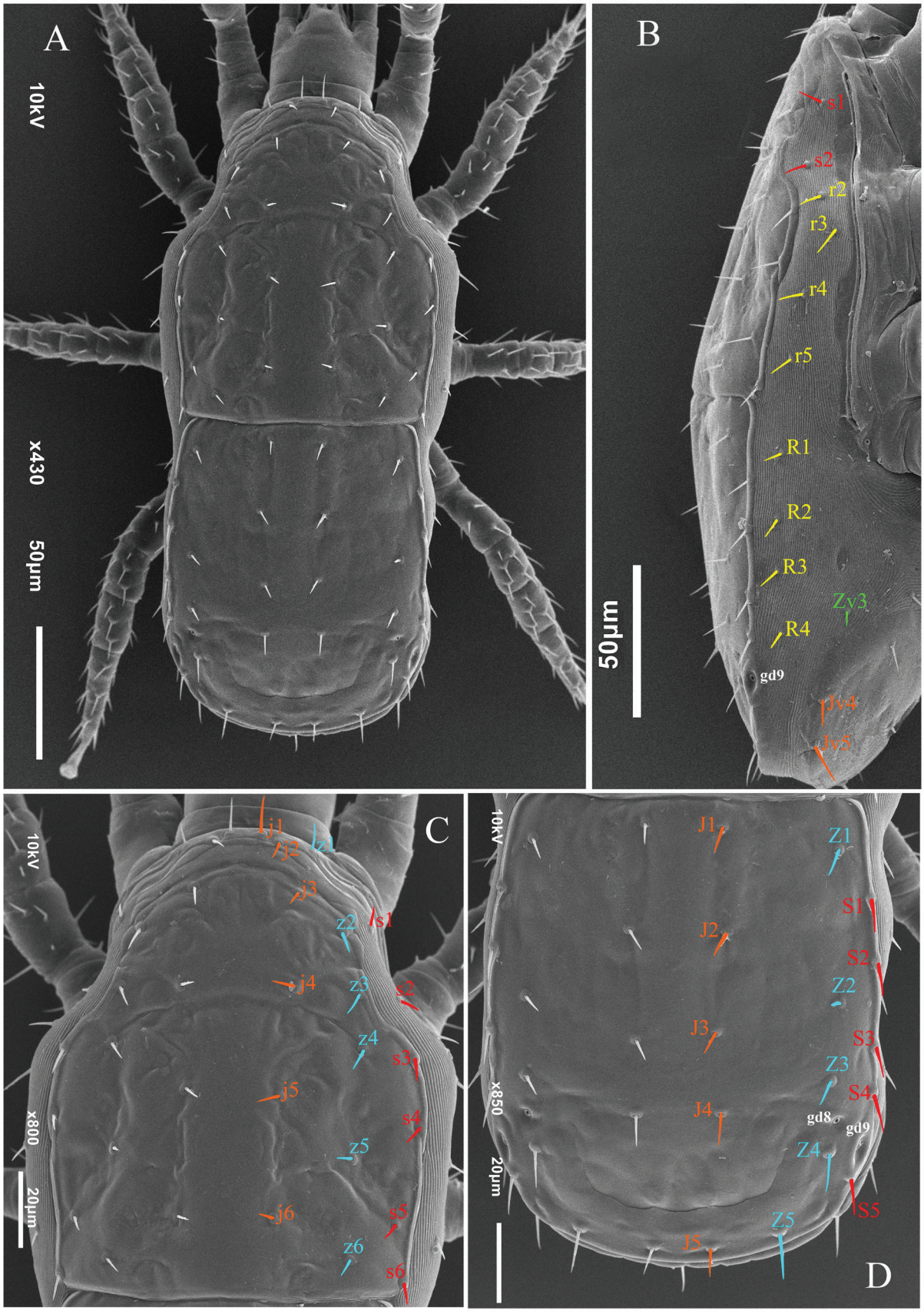

Fig. 3. SEM micrographs of *Gamasellodes brevisetus* sp.n., female. A—idiosoma, dorsal view; B—unsclerotized cuticle along lateral margin of idiosoma; C—podonotal shield; D—opisthonotal shield.

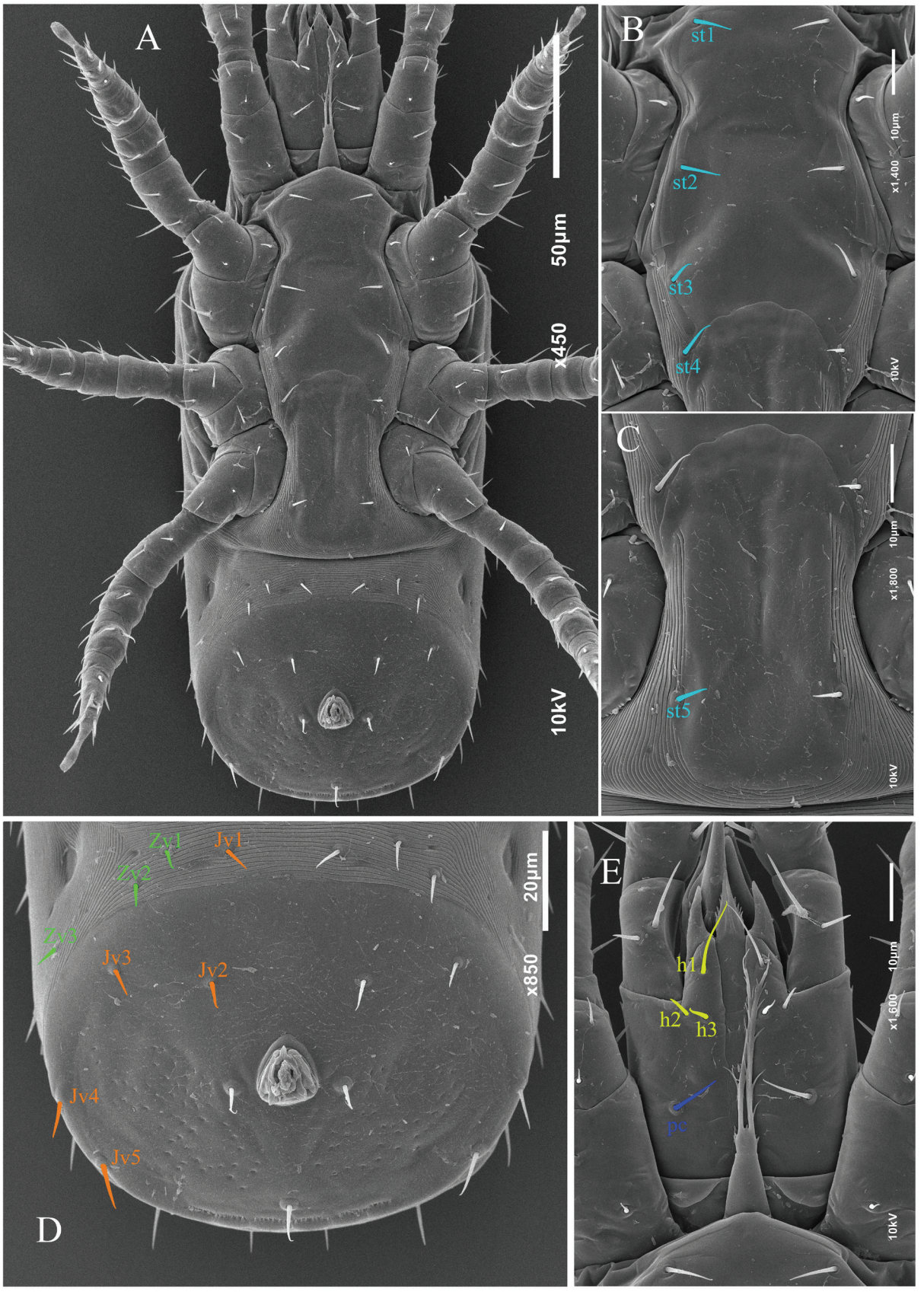

Fig. 4. SEM micrographs of *Gamasellodes brevisetus* sp.n., female. A—idiosoma, ventral view; B—sternal shield; C—epigynal shield; D—opisthogastric area, ventrianal shield; E—subcapitulum and tritosternum.

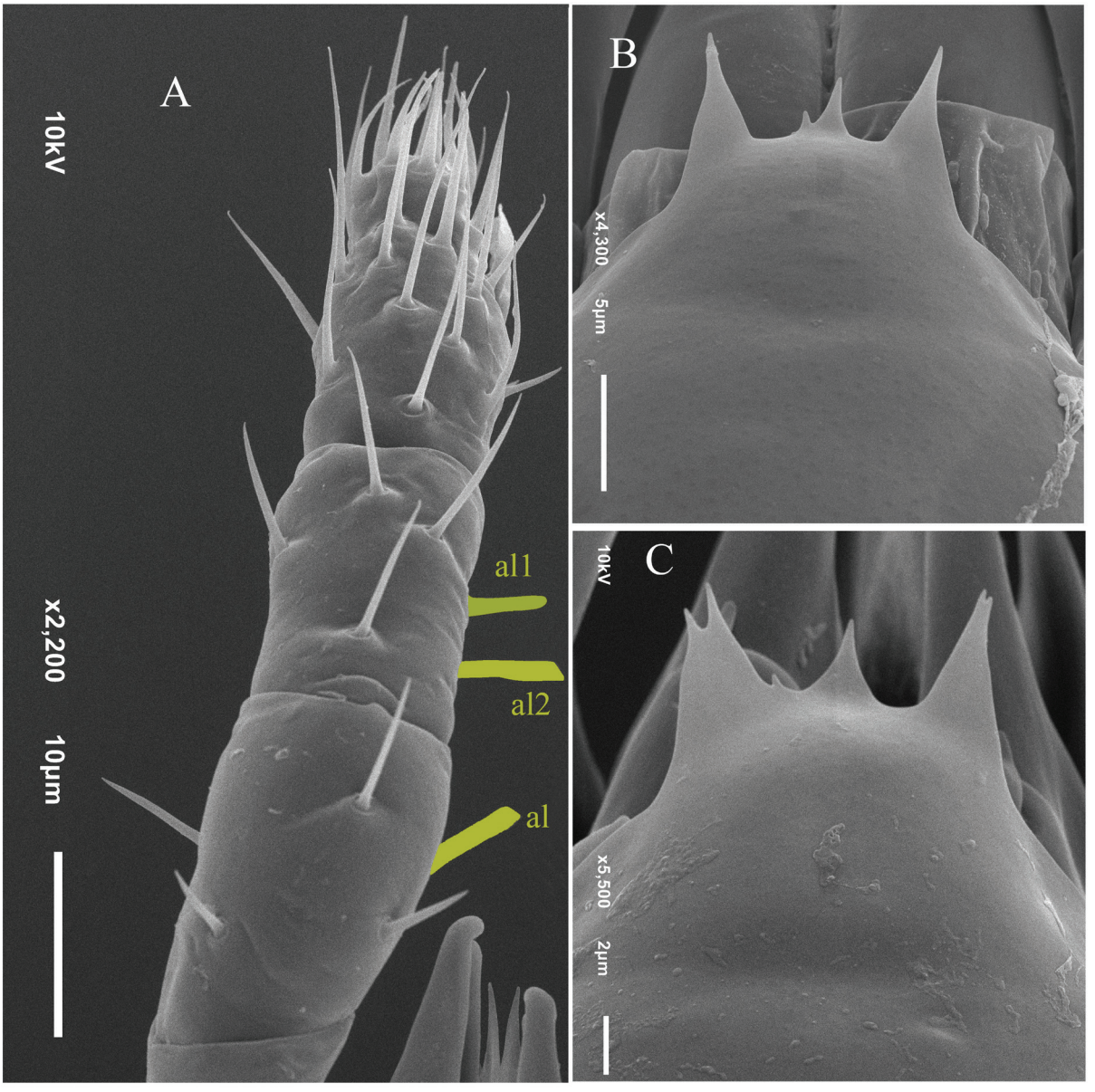

Fig. 5. SEM micrographs of *Gamasellodes brevisetus* sp.n., female. A—distal portion of palp; B, C—variations in epistome.

prong (often pointed and smooth) shorter than lateral prongs (bifurcate or not) (Figs. 1D, 5B, C). Hypostomal groove with seven transverse rows of denticles (each row with 2–4 denticles), with smooth anterior and posterior transverse lines, delimited by subparallel lateral lines, slightly converging posteriorly (Figs. 1C, 4E). Hypostome with four pairs of smooth setae, *h3*=*h1*(11–13) > *pc* (10–12) > *h2* (8–10). Corniculi robust and horn-like, with bluntly pointed tips, subequal in length with internal malae, their tips barely extending beyond palptrochanter (Figs. 1C, 4E). Supralabral process not distinguishable. Internal malae with one pair of fimbriate projections (Figs. 1C, 4E); labrum longer than internal malae with pilose surface. Palptarsal claw two-tined, all setae on palps smooth and needle-like except setae *al* on femur, *al*1–2 on genu somewhat stout and spatulated; palptarsus without long setae (Fig. 5A). Second segment of chelicera (including the fixed digit) 57–60 long; fixed digit of chelicera with an offset distal tooth (gabelzahn), followed by two small and two larger teeth and a spine-like pilus dentilis; dorsal cheliceral seta thick, prostrate; arthrodial membrane fringed, coronet-like; cheliceral lyrifissures distinct; movable digit of chelicera (22–

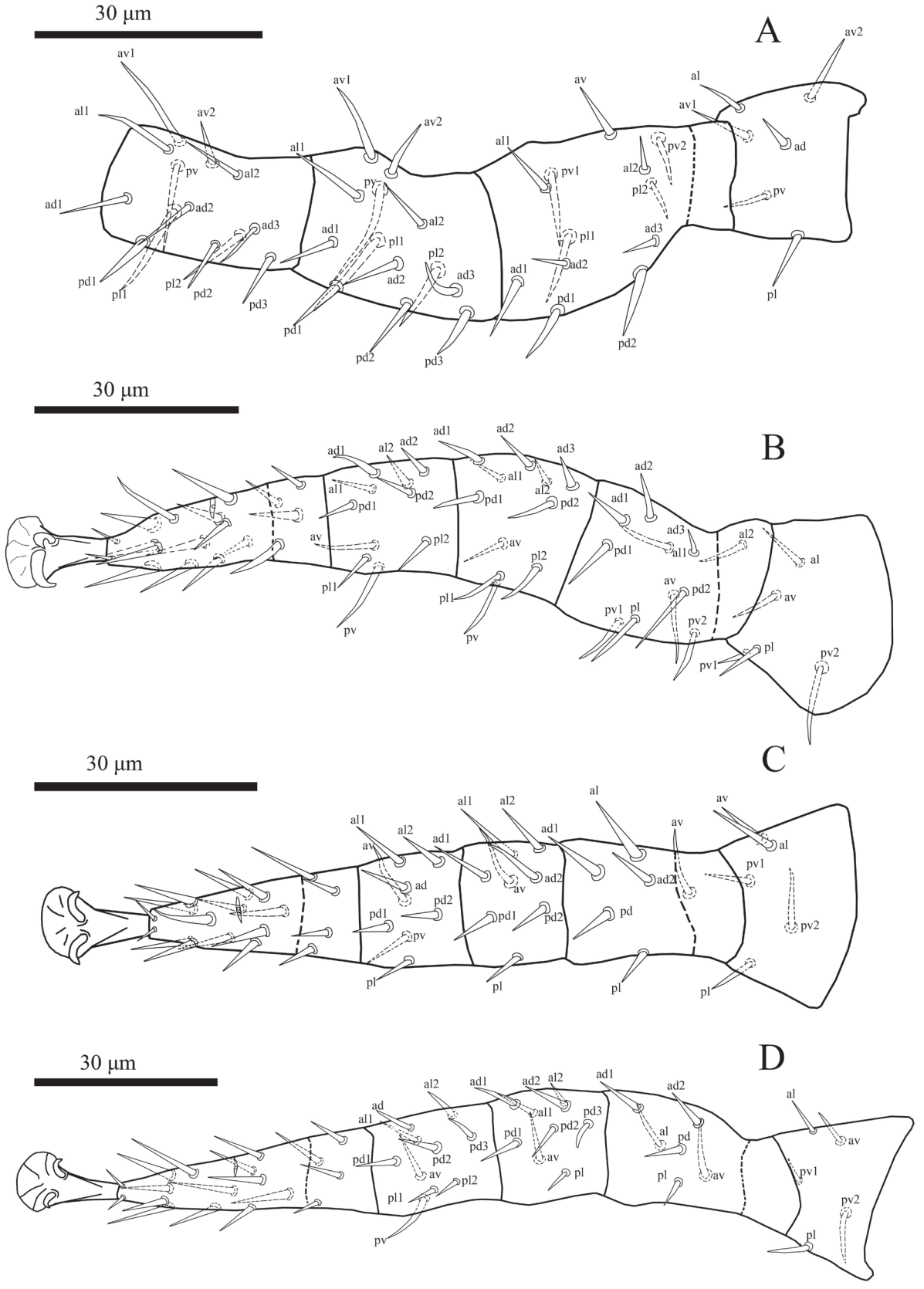

Fig. 6. *Gamasellodes brevisetus* sp.n., female. A—leg I (trochanter-tibia); B—leg II; C—leg III; D—leg IV.

25 long) with two well-spaced teeth in addition to apical hook (Fig. 1E).

Legs (Figs. 6A–D). Legs II (142–147) and III (130–135) short, I (175–190) and IV (160–173) longer. Chaetotaxy (legs I–IV): Leg I (Fig. 6A): coxa 0-0/1, 0/1-0, trochanter 1-1/2, 0/1-1, femur 2-3/1, 2/2-2, genu 2-3/2, 3/1-2, tibia 2-3/2, 3/1-2. Leg II (Fig. 6B): coxa 0-0/1, 0/1-0, trochanter 1-0/1, 0/2-1, femur 2-3/1, 2/2-1, genu 2-3/1, 2/1-2, tibia 2-2/1, 2/1-2. Leg III (Fig. 6C): coxa 0-0/1, 0/1-0, trochanter 1-0/1, 0/2-1, femur 1-2/1, 1/0-1, genu 2-2/1, 2/0-1, tibia: 2-1/1, 2/1-1. Leg IV (Fig. 6D): coxa 0-0/1, 0/0-0, trochanter 1-0/1, 0/2-1, femur 1-2/1, 1/0-1, genu 2-2/1, 3/0-1, tibia 2-1/1, 3/1-2. Tarsi II–IV with 18 setae (3-3/2, 3/2-3 + *mv, md*). Some femoral dorsal setae slightly thickened. All legs without macrosetae, with pretarsi, including a pair of claws and pulvilli with median section rounded, claws on pretarsi I (6) slightly smaller than on other legs (7). Tarsus I distally with seven thickened solenidia, six of them rod-like (four apical, two subapical), one solenidium (apical, most dorsal) with lanceolate tip.

Insemination structures (Fig. 1F). Spermathecal apparatus of laelapid-type, weakly sclerotized, consisting of a pair of thin soft tubules (passing into rami) beginning from coxae IV area (and possibly opening in their acetabulum dorsally), two unpaired successive chambers (i.e., filmy sacculus foemineus and membranous sperm reservoir connected by densely granulated, narrowing sperm duct) and unpaired very thin tube terminating in saucer-like mouth.

Male. *Idiosoma* 205 long, 93 wide. *Dorsal idiosoma.* Podonotal shield 112 long, 87 wide; opisthonotal shield 89 long, 74 wide; shields' ornamentation, chaetotaxy, length of setae, set of gland pores and lyrifissures generally as in female but many setae apically attenuate; unsclerotized cuticle along lateral margins of podonotal shield with six pairs of setae (*s*1, *s*2, *r*2–5; *r*3 longest, 9), and along lateral margins of opisthonotal shields with three pairs of setae (*R*1, *R*3, *R*4), seta *R*2 absent.

Ventral idiosoma (Fig. 2C). Tritosternum as in female, slightly smaller. Presternal region weakly sclerotized, lineate, without punctation. Sternitigenital shield united with endopodal platelets developed between coxae I–II and II–III; its anterior margin medially concave, tightly abutting transversally oval genital valve (8×15), posterior shield margin roundish convex; shield length 102, width before coxae II unclear, width at midlevel of coxae II 35, width at level of middle angles 48, width at midlevel of coxae IV 16. Endocoxal platelets between coxae III–IV undeveloped. Sternitigenital shield with lateral lineate ornamentation between setae *st*1 and *st*3, three pairs of lyrifissures *iv*1–3, and setae *st*1–3 (8–9) slightly longer than *st*4 and *st*5 (7); glands *gvb*1 and *gv*1 not discernible, gland pore *gvb*2 associated with small (5×1) narrowly oval exopodal platelet between coxae II–III. Poroids *iv*5 inserted on soft cuticle between sternitigenital and ventrianal shields anteriad a pair of small (3×6), transversally oval platelets. Metapodal platelets absent. Ventrianal shield subtrapezoidal in form, 66 long and 71 wide, with clear anterolateral transversal lineation and coarse punctation behind setae *Jv*2; anterior shield margin concave, undulate, possessed of a pair of lyrifissures. Ventrianal shield with six pairs of opisthogastric setae (*Jv*1–5, *Zv*2), three circumanal setae and well developed openings of glands *gv*3; cribrum narrow; seta *Zv*1 on soft cuticle. Among opisthogastric setae, *Jv*1, *Jv*2 longer (8) than others (6–7); adanal setae twice shorter (6) than postanal seta (12). Peritrematal shield and peritreme as in female.

Gnathosoma (Fig. 2D). Form of gnathotectum and deutosternum similar to female; subcapitulum with corniculi very narrow (15×3) and sharp apically. Chelicera length without basal segment 46; fixed digit of chela with three teeth and tiny needle-like pilus dentilis; movable digit (16) with one tooth and tubular, thin-walled, goffered spermatodactyl (15 long) terminating with broad (6) opening; arthrodial membrane smooth.

Legs shorter than idiosoma (I 150, II 121; III 106, IV 127), without dimorphically modified setae. Claws I (5) and II–IV (5–6) almost of the same size.

Immatures. Unknown.

Type material. Holotype, female, Russia, city of Tyumen, Gagarin Park, 57°10′ N 65°36′ E, dry meadow, in sod, 9 April 2023, A.A. Khaustov coll. Paratypes, nine females, same data as holotype.

Other material (all from Russia): one female, Kaluzhskaya Oblast, bank of the Oka River, vicinity of the Andreevskoye village, 54°23′ N 36°12′ E, flooded meadow, old cow droppings, 12 July 1986, O.L. Makarova; one female, Kaluzhskaya Oblast, Peremyshlsky District, vicinity of the Gremyachevo village, 54°15′ N 36°15′ E eutrophied meadow on slope, 24 July 1986, O.L. Makarova; one female, vicinity of Rostov-on-Don, arable fal-

low field, May 1986, A. Stas; ten females, one male, Caucasus, Dagestan, Dagestan State Reserve, Samoor Forest, sandy sea coast, turf of *Typha angustifolia*, 6 April 2021, O.L. Makarova.

Etymology. The specific name originates from the structure of the dorsal chaetome (all setae short) and is derived from the Latin words "brevis" (short) and "seta" (bristle).

Distribution and ecology. *Gamasellodes brevisetus* sp.n. dwells in rather warm temperate landscapes (nemoral forests, forest-steppe, steppe, temperate-subtropical forest), where it was found only in open biotopes (dry and flooded meadows, slope eutrophied grassland, arable field, maritime beach).

Differential diagnosis. *Gamasellodes brevisetus* sp.n. most closely resembles *G. vermivorax* Walter, 1987 (couplet 16 in the identification key to the world species of *Gamasellodes* provided by Castro *et al.* 2020; modified by Mesa *et al*. 2021 and Rueda-Ramírez *et al*. 2022), due to the ventrianal shield with four pairs of setae in addition to circumanal setae, peritreme extending anteriorly slightly beyond level of *s*1, with more than two pairs of *R* setae on unsclerotized cuticle laterad of opisthonotal shield, podonotal and opisthonotal shields with uniform length of setae and *Z*5 slightly longer than other setae (shorter than the distance to the base of *J*5), and epigynal shield posteriorly truncate. *G. vermivorax* was originally described from west of Cheyenne, USA (Walter 1987) where it was found in sod. *Gamasellodes brevisetus* sp.n. differs from *G. vermivorax* in smaller body size, 320–330 long (from the tip of the corniculi to the end of the body) and in having smooth setae *Z*5. *G. vermivorax*, on the other hand, has a larger body size (about 459) and *Z5* with 2–4 minute barbs. In *G. brevisetus* sp.n., the unsclerotized cuticle laterad of opisthonotal shield with four pairs of *R* setae, while in *G. vermivorax*, the *R* series is complete (*R*1–7). Furthermore, in *G. brevisetus* sp.n., the anterior margin of the epistome with central prong shorter than the lateral ones while in *G. vermivorax*, the three (sometimes four) anterior projections of the epistome are usually of similar sizes. Males of the above two species have very different spermatodactyls: a tubular, thin-walled, goffered one with a broad opening (in *G. brevisetus* sp.n.) vs., as common for the genus, a stem-like, distally narrowing spermatodactyl with an apical hook (in *G. vermivorax*).

Gamasellodes vermivorax has been reported as a predator of nematodes (Walter 1987). The ghathosomal morphology of *G. brevisetus* sp.n. is similar to that of *G. vermivorax*, including the chelicera structure, as well as the form and the sclerotization of the corniculi. This may suggest that *G. brevisetus* sp.n. may be a predator of nematodes, like its congeners in the USA and Australia (Walter 1987; Halliday *et al*. 1998; Walter and Stirling 2018). We stress that further comprehensive field studies and experimental work are needed to find more species of this genus and establish the role of this mite in its respective ecosystems.

***Gamasellodes rectiventris* Lindquist, 1971**

Gamasellodes rectiventris Lindquist, 1971: 935.

Material examined. A single female, Kola Peninsula, Khibiny Mountains, East Petrelius Pass, 600 m a.s.l., lichen dwarf willow tundra, 67°44′ N 33°32′ E, 28 June 2006, leg. A.B. Babenko.

Remarks. *Gamasellodes rectiventris* was described from the southern United States (Lindquist 1971) where it was found in association with several species of pine bark beetles. The species has also been recorded from pine forests (mild temperate area) in Australia, where it was possibly accidentally introduced with pines and/or bark beetles (Halliday *et al*., 1998; E.E. Lindquist, personal communication, 2020). We have recorded it from the Kola Peninsula, for the first time in Russia, on a lichen-dwarf willow heath lacking any trees. Its female is easily recognized by short, smooth acicular dorsal-shield setae, except for *Z*5, which is long (longer than the distance to the base of *J*5) and barbed; dorsal shields smooth except for weak semi-transverse lines between setae *j*2 and *j*3 and between setae *J*4 and *J*5; posterior dorsal shield flanked laterally by four pairs of marginal *R* setae (*R*4 absent); anterior margin of ventrianal shield broad and nearly straight, shield strongly punctate posterior to *Jv*2 and *Jv*3; anterior margin of epistome smoothly triramous. Male of *Gamasellodes rectiventris* with seta *s*1 inserted on dorsal shield, ventrianal shield bearing 6–7 opisthogastric setae. Ventrianal shield of both sexes with seta *Jv*2 at least 7/10 as long as seta *Jv*5.

The following key is based on a direct examination of all species. The original description of *Gamasellodes bicolor* (Berlese, 1918) is not sufficiently detailed. In the course of the creation of

the key, we based our data on the redescription provided by Bernhard (1963).

Key to the *Gamasellodes* species known from Russia (females)

1. With bell-shaped anal shield, bearing only circumanal setae; peritreme extending anteriorly to mid-level of coxa II …… …… *G. tatricus* Gwiazdowicz and Walter, 2005
— With ventrianal shield, bearing 3–4 pairs of setae in addition to circumanal setae; peritreme extending anteriorly at least to level of *s*1 …… 2
2. Podonotal and opisthonotal setae of about similar length, short, with *Z*5 only slightly longer than other setae and much shorter than distance to base of *J*5 …… *G. brevisetus* sp. n.
— Not all podonotal and opisthonotal setae short; at least *Z*5 distinctly longer than others and at least as long as distance to base of *J*5 …… 3
3. Anterior margin of ventrianal shield about transversely straight between bases of *Zv*2 setae; lateral margins of epigynal shield parallel-side …… …… *G. rectiventris* Lindquist, 1971
— Anterior margin of ventrianal shield uniformly arched between bases of *Zv*2 setae; lateral margins of epigynal shield flared …… 4
4. Seta Jv5 about twice as long as post-anal seta; opisthonotal shield posterior to setae J4 with porous ornament …… *G. vulgatior* Athias-Henriot, 1961
— Seta Jv5 slightly longer than post-anal seta; opisthonotal shield posterior to setae J4 with two garland lines …… *G. bicolor* (Berlese, 1918)

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