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Two new *Anchigamasus* mite species and an unknown male in *Anchigamasus halaskovellus* (Athias-Henriot, 1967) (Parasitiformes: Parasitidae)

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Original research

ABSTRACT

Two new parasitid species, *Anchigamasus apuseniensis* n. sp. and *Anchigamasus gardaensis* n. sp. collected in Romania and Italy, respectively, are described. Additionally, in *Anchigamasus halaskovellus* (Athias-Henriot, 1967), a description of an unknown male is provided.

Keywords mite taxonomy; new species; unknown male description; European fauna**Zoobank** <http://zoobank.org/ED61B07E-3EBA-47C5-9BBB-FB313F5FAAA2>

Introduction

Anchigamasus is a small genus comprising seven species, i.e. *Anchigamasus alportus* (Athias-Henriot, 1968), *Anchigamasus crassicornutus* (Willmann, 1954), *Anchigamasus geileri* (Karg, 1968), *Anchigamasus halaskovellus* (Athias-Henriot, 1967), *Anchigamasus siculiger* (Athias-Henriot, 1967), *Anchigamasus tortulatus* (Athias-Henriot, 1979) and *Anchigamasus cansigliensis* Witaliński, 2024, described quite recently.

This study provides a description of two new species, i.e. *A. apuseniensis* n. sp. encountered in Apuseni Mts, Romania, and *A. gardaensis* n. sp. from Garda Lake surroundings, Northern Italy, as well as an undescribed male of *A. halaskovellus* (Athias-Henriot, 1967) encountered in south-western Poland.

Material and methods

The material under study had originally been collected during faunal researches in Romania, Italy, and Poland. All procedures of mite extraction and subsequent processing, as well as the actual methods of measurements and drawing were presented in detail in the recent studies (e.g. Witaliński & Gwiazdowicz, 2023; Witaliński, 2024a). Both the females and males in the newly described species were available, but not their developmental stages.

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Systematics

Family Parasitidae Oudemans, 1901

Subfamily Pergamasinae Juvara-Balş, 1972

Genus *Anchigamasus* Athias-Henriot, 1971

Paragamasus (*Anchigamasus*) Athias-Henriot, 1971: 172

Type species *Anchigamasus geileri* (Karg, 1968), designated by Witaliński, 2024b: 412

The basic characteristics of the genus were provided recently (Witaliński, 2024a).

Anchigamasus apuseniensis n. sp.

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(Figures 1–6)

Diagnosis

Female and male — Idiosoma well sclerotised; podonotum with 22 pairs of setae, opisthonotum with 24 regular setae pairs, but two or three supplementary setae (Sx) may also be encountered; opisthogaster with 9 pairs of setae only (*SV3* is absent).

Female — Gnathotectum central prong at least twice longer than the lateral ones; gland pores *gv1* located at the posterior sternal margin somewhat laterally to setae *st3*; epigynial shield with the central subapical inverted T-shaped thickening with the wing-shaped arms, rounded anterolaterally and protruding backward; the lateral subapical thickenings straight, running backward parallel or somewhat divergently; the endogynium roundish in the ventral perspective, with two conical spherules located laterally, the wall of endogynial sac between the spherules thickened and with many denticles, fine denticles behind the endogynium are also to be found; endogynium diameter (ca. 65–72) is slightly larger than the arms span (ca. 60–62) of the subapical thickening; Co IV with an anterolateral tubercle; Tr IV smooth.

Male — Gnathotectum as in the female; palptrochanter seta *v2* in the distal half barbed on both sides; fixed digit of the chelicera with three teeth, one tooth ahead of the pilus dentilis and two teeth behind it, out of those, the middle one is located by the side of pilus dentilis; in some specimens, the first tooth may be lamellar and arcuate, whereas the last one may be minute or even absent altogether; leg II ventrally: the femoral main spur finger-shaped and frequently obliquely blunt apically, streaked along the dorsal surface, the axillary process conical and curved posterolaterally, the genual and tibial spurs oval; leg II laterally: the femoral main spur arcuate, with a small tubercle at the base ventrally, the axillary process rounded terminally, genual and tibial spurs rounded, the genual spur located on a moderately prominent protrusion of the article; Co IV smooth; Tr IV with a low, indistinct tubercle.

Description

Female (Figures 1–4)

Idiosoma (Figs 1, 2) — Oval, well sclerotised, 710 x 395 in paratype (length x width, n=1), holotype 696 x 405. **Podonotum** (Fig. 1) – 22 pairs of setae (*r1* and *z3* lacking), setae short, in holotype and paratype ca. 32–41, but 18–24 (*s1*, *s2*), 20–27 (*r2*, *r5*, *r6*, *s3*, *s6*), and 64–68 (*r3*). Seta *z6* is present, except for the holotype. **Opisthonotum** (Fig. 1) – with 24 pairs of regular setae, but two or three supplementary setae (Sx) may also be encountered. Opisthonotal setae shorter than the podonotal ones. They range from ca. 23 to 35, but the posterior most marginal setae (*R6*, *S6*, *J6* and *Z5*) may reach 44–50. Dorsal setae simple, podonotum not reticulated, opisthonotum with a scale-like reticulation. **Peritreme** – length 310 in paratype and 307 in holotype, ending anteriorly at the Co I level.

Ventral idiosoma (Figs 2, 3) — Setae length: 40–48 (*st1*, *st2*), 37–38 (*st3*), 31–34 (*st4*), 30–38 (*st5*), opisthogastral setae 29–31 (*JV1*, *JV2*), 38–40 (*JV3*), 48–51 (*JV4*), 18–20 (*ZV1*,

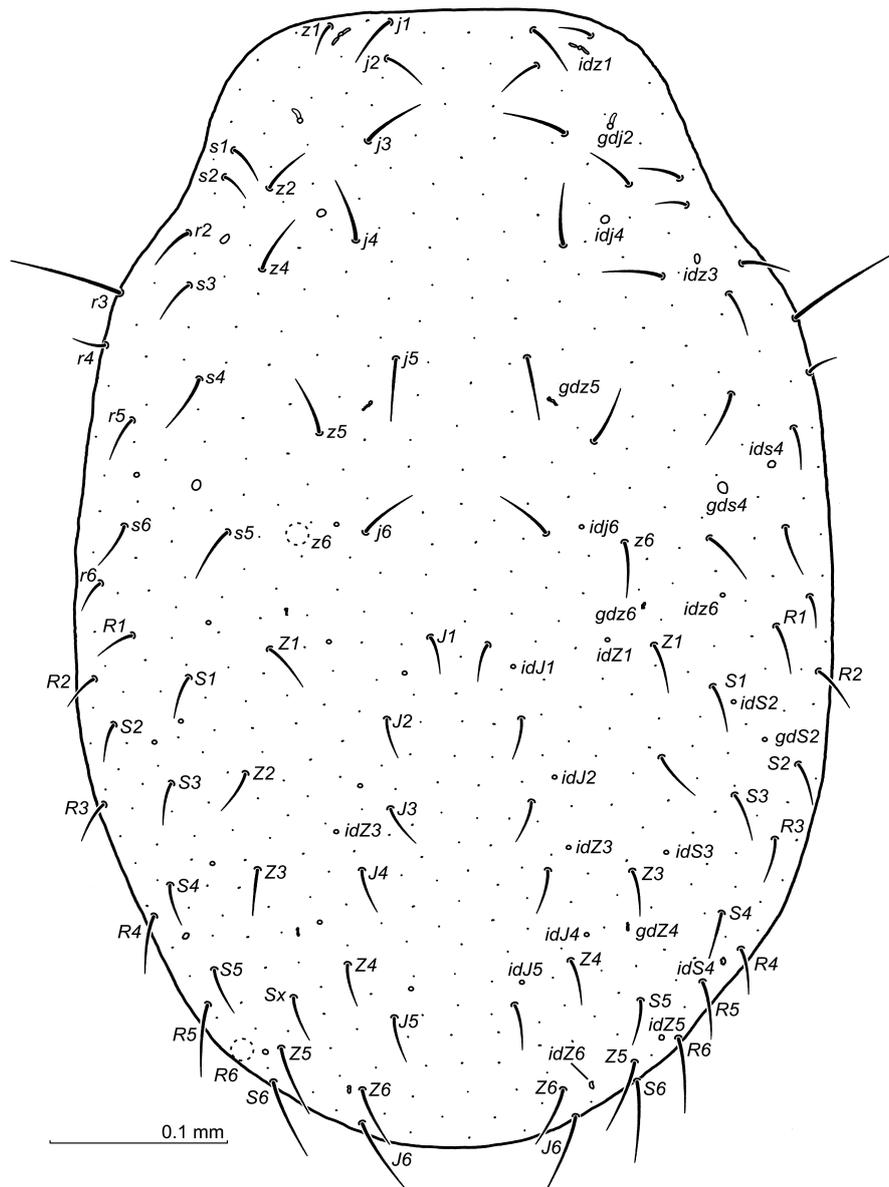


Figure 1 *Anchigamasus apuseniensis* n. sp., female (holotype): dorsal side. Abbreviations: podosomal setae (*j*, *z*, *s*, *r*), opisthosomal regular setae (*J*, *Z*, *S*, *R*) and supplementary setae (*Sx*), podosomal pores (*idj*, *idz*, *ids*) and opisthosomal pores (*idJ*, *idZ*, *idS*), as well as the gland openings (podosomal *gdj*, *gdz*, *gds*, and opisthosomal *gdS*) are marked. Seta *z6* on the left side is lacking in holotype only.

ZV2), 33–38 (*ZV3*), 38–44 (*ZV4*), 24–25 (*SV1*). Opisthogaster with nine setae only, since setae *SV3* are absent (Fig. 3). Ventral setae simple, reticulation of the sternum and opisthogaster scale-like. The presternal plates subtriangular, the area between the presternal plates and the sternum margin with 3–4 fine lines (Fig. 2A). The anterior sternal margin with central concavity. The pores *gv1* located at the posterior sternal margin somewhat laterally to the setae *st3*. Paragynial shields (Fig 2B, C) with narrow, arcuate metagynial sclerites. Epigynial shield (Figs 2D, E, 3) with the central prong acute and long, the anterior epigynial margins wavy. The lateral subapical thickenings straight or slightly arcuate, running backward parallel or slightly divergently. The central subapical inverted T-shaped thickening (Figs 2D, E, 3)

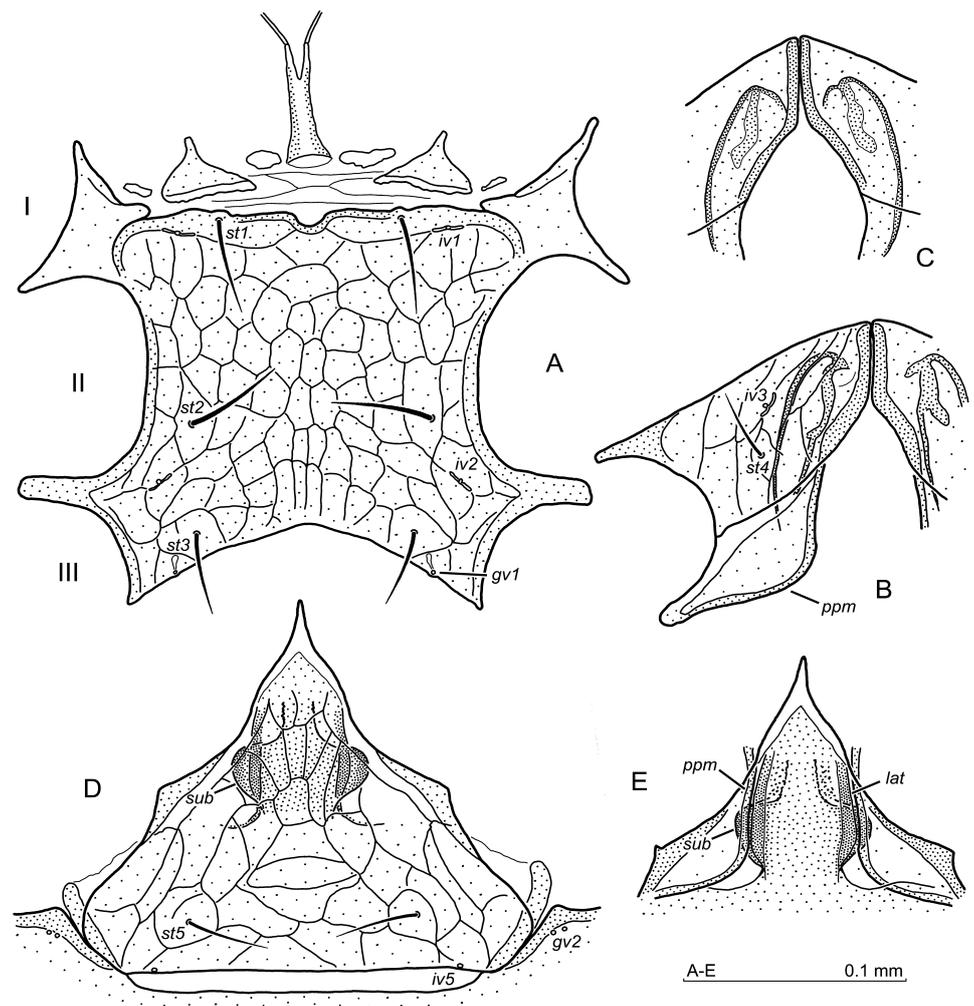


Figure 2 *Anchigamasus apuseniensis* n. sp., female: A – presternal and sternal shields; B – paragnathal shield; C – paragnathal metagnathal sclerites; D – epigynum; E – central prong of the epigynum. A, B, D – holotype. Abbreviations: I–III the openings for coxae I to III; *gv1*, *gv2* gland openings; *iv1*–*iv5* pore openings; *lat* subapical lateral thickening; *ppm* posterior paragnathal margin; *st1*–*st3* sternal setae; *st4*, *st5* paragnathal and epigynal setae, respectively; *sub* subapical inverted T-shaped thickening.

with the wing-shaped arms, rounded anterolaterally and protruding backward. In the intact specimens, the thickened posterior margins of the paragnathal shields run parallel to the lateral subapical thickenings (Fig. 2E). Reticulation on the epigynum behind the central prong shows fan arrangement (Fig. 2D). Endogynium (Fig. 4A) roundish in ventral perspective, with two spherules, conical, located laterally on the endogynial sac wall and directed anteroaxially. Posterior endogynial sac wall between the spherules is thickened and shows many denticles. Behind the endogynium there is an area showing minute denticles. The diameter of the endogynium (ca. 65–72) is slightly larger than the arms span (ca. 60–62) of the T-shaped subapical thickening. Gland pores *gv2* with two distant openings, *iv5*, *ivo2*, *ivo3*, *ivp* pores and *gv3* gland pores well discernible.

Gnathosoma — Gnathotectum (Fig. 4B, C) trispinate, all prongs acute, the central one at least twice longer. Corniculi conical, hypostome with 10–11 discernible rows of denticles, hypostomatic and palpcoxal setae simple, *h2* somewhat shorter than the others. Palptrochanter *v1* seta simple, *v2* in the distal half barbed. Chelicera (Fig. 4D) – movable digit with three

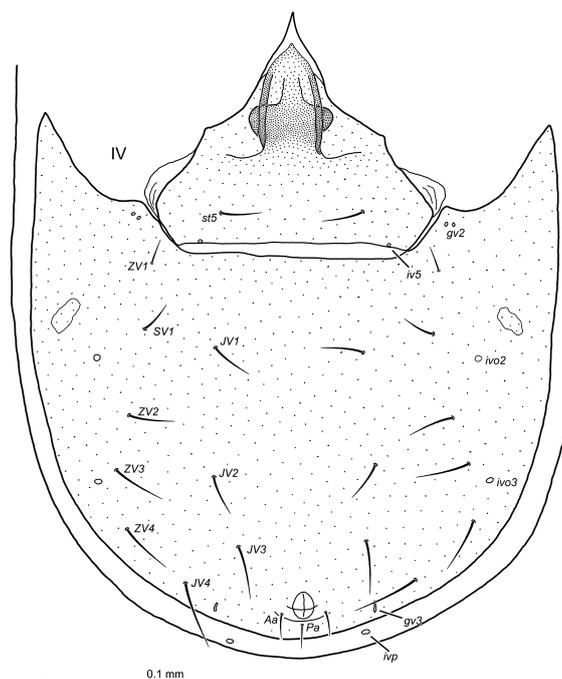


Figure 3 *Anchigamasus apuseniensis* n. sp., female (holotype): the ventral side with epigynial shield and opisthogaster. Abbreviations: IV the opening for coxa IV; *Aa* and *Pa* adanal and postanal setae, respectively; *gv2*, *gv3* gland openings; *iv5*, *ivp*, *ivo2*, *ivo3* pore openings; *JV*, *ZV* and *SV* opisthogastral setae; *st5* epigynial seta.

teeth, the fixed digit with two teeth ahead pilus dentilis followed by two teeth proximally; pilus dentilis located to the side of the obtuse teeth.

Legs — Co I with a low gibbosity of anterolateral surface (Fig. 4E). Seta *al* on Tr I somewhat shorter. Leg IV: tarsal tactile seta *pdI* thin and long (127–131). Tarsal seta *avI* thicker than *pvI*. Coxa IV with an anterolateral tubercle (Fig. 4F), Tr IV smooth. Ta IV 203 (holotype) and 209 (paratype) long.

Male (Figures 5, 6)

Idiosoma — Oval, with a shallow incision at legs III/IV level, well sclerotised, 630–660 x 350–360 (length x width, n=5). **Podonotum** and **opisthonotum** setation like in the female. Dorsal setae simple. Reticulation of the podonotum is not discernible, whereas the reticulation of the opisthonotum is scale-like and well discernible. Dorsal suture present. **Peritreme** — length 275–285, ending anteriorly as in the female.

Ventral idiosoma — Setae length: 44–50 (*st1*), 39–43 (*st2*), 30–36 (*st3*), 28–30 (*st4*), 29–33 (*st5*), opisthogastral setae 33–38 (*JV1*), 33–35 (*JV2*), 38–40 (*JV3*), 46–48 (*JV4*), 21–24 (*ZV1*), 31–33 (*ZV2*), 41–44 (*ZV3*), 42–50 (*ZV4*), 25–27 (*SV1*). Ventral setae simple. **Sternal region** (Fig. 5A) — the genital lamina anterior margin convex, its corners protruding and rounded. Presternal plates subtriangular. The sternum with gland pores *gv1* located laterally, behind setae *st3*. Between the levels of *st4* and *st5* two pairs of indistinct, round thickenings of the sternal cuticle are found. Gland pore *gv2* with two distant openings, pores *iv5* close behind *st5* seta towards seta *ZV1*. Pores *ivo2*, *ivo3*, and *gv3* well discernible.

Gnathosoma — Gnathotectum (Fig. 5B) similar to the one in the female. Corniculi (Fig. 5C) slim, settled on the arcuate bases (genae). Hypostome between genae more pigmented, followed by 11 rows of denticles, the anterior two arcuate anterior and the posterior one short. Hypostomatic and palpcoxal setae simple, *h2* shorter than the others. Palptrochanter *vl* seta

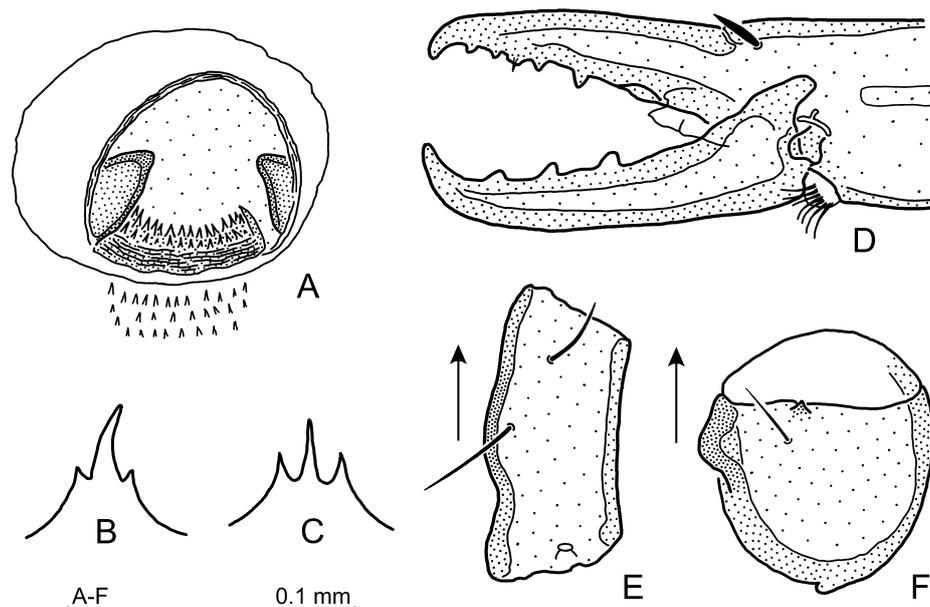


Figure 4 *Anchigamasus apuseniensis* n. sp., female: A – endogynium; B, C – gnathotectum, two aspects; D – chelicera, antiaxial view; E – Co I, ventrally; F – Co IV, ventrally. A, C, E, F – holotype. Abbreviations: arrow at the anterolateral side.

very short and thickened basally, located on the prominent article protrusion, seta $\nu 2$ in the distal half barbed on both sides (Fig. 5C, D). An arcuate lamellar protrusion behind $\nu 1$ seta is present. Chelicerae (Fig. 5E, F) – when observed laterally, mobile digit with two teeth, followed by a tooth-like indentation of the digit's edge (Fig. 5E), fixed digit with three teeth, one tooth ahead of the pilus dentilis and two teeth behind it. The middle tooth is located by the side of pilus dentilis. In other specimens, however, the first and the last teeth may be modified (Fig. 5F), the first tooth arcuate and lamellar, whereas the last one minute or even absent altogether.

Legs — Leg II (Fig. 6) spurred as follows: when viewed from the ventral side (Fig. 6A–E), the femoral main spur is finger-shaped and frequently obliquely blunt apically, streaked along its dorsal surface, the axillary process conical and curved posterolaterally. The genual and tibial spurs oval. From a lateral perspective (Fig. 6F, G), the femoral main spur arcuate, with small tubercle at the base ventrally, the axillary process rounded terminally. Genual and tibial spurs rounded, the genual spur vary in shape (compare Fig. 6F and G), located on a moderately prominent protrusion of the article. Setae on leg II simple, femoral seta *all* shortened and slightly thickened, setae *al2* and *ad2* shortened, whereas *ad3* short and needle-like. Seta *pv1* on the genu located just behind the spur, seta *pv1* on the tibia posterolaterally to the tibial spur (Fig. 6A, D, E). Leg IV: setae *av2*, *av3* and *pv2* on the tarsus slightly thickened, tarsal *pv1* thinner than *av1*. Tactile dorsal seta on Ta IV 122–133 long. Tr IV with a low, indistinct posterolateral tubercle (Fig. 5G). Ta IV 187–195 long.

Material examined

Holotype — Female (slide no. 2248 G), Apuseni Mts, Transylvania, Romania, 46.3295°N, 23.0618°E, alt. ca. 570 m a.s.l., 12 April 2010, litter in common hornbeam forest. Leg. Dr. Marcin Liana.

Paratypes — 1 female (slide no. 2247 A), 5 males (slides no. 2248 H, I, 2257 G), collection data as in the holotype.

Type deposition — Types are deposited in the Zoological Division of the Nature Education

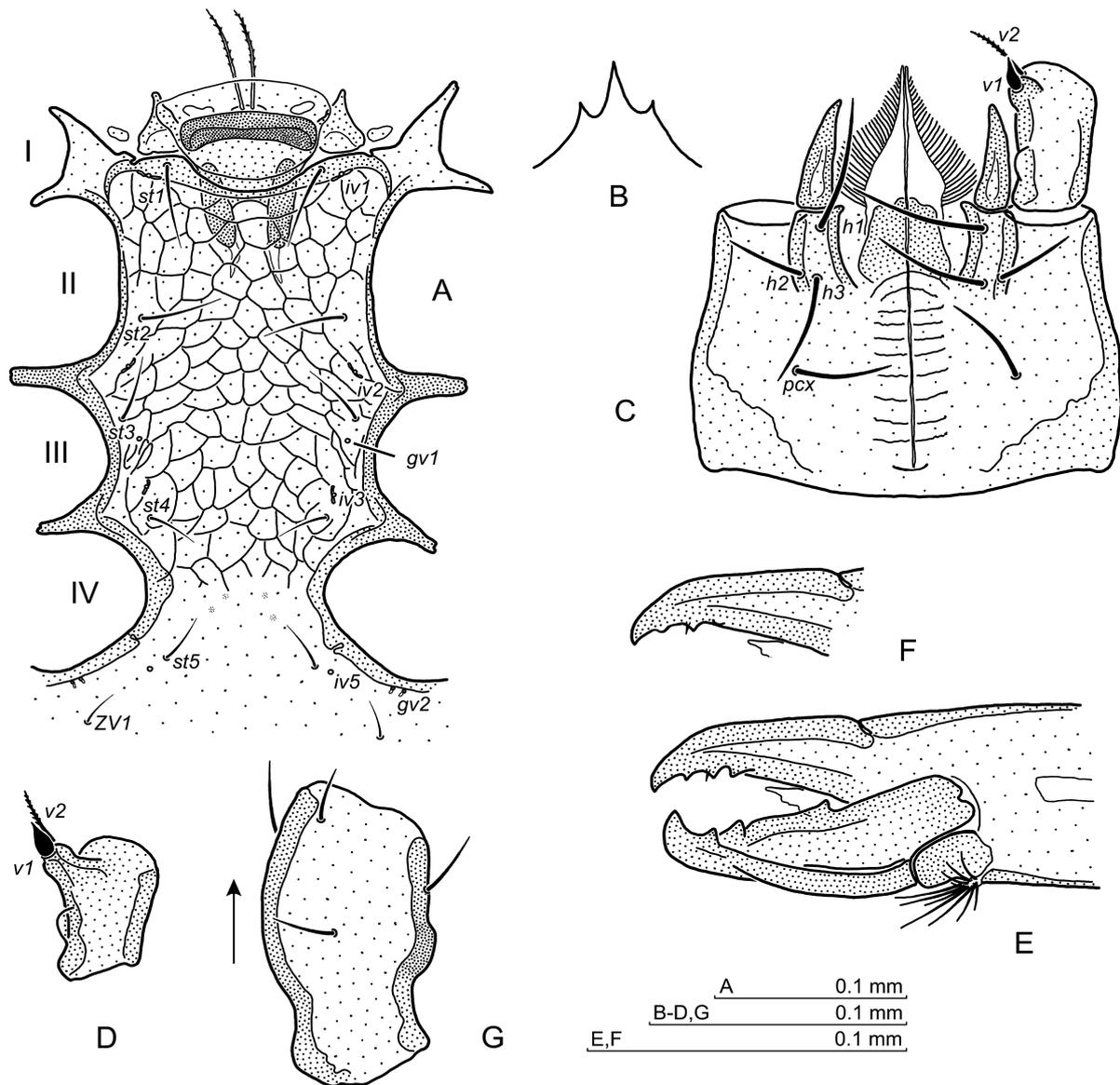


Figure 5 *Anchigamasus apuseniensis* n. sp., male: A – presternal plates, genital lamina and sternogenital shield; B – gnathotectum; C – gnathosoma, ventrally; D – palptrochanter, ventrolateral aspect; E – chelicera, adaxially; F – cheliceral fixed digit, other specimen; G – Tr IV, ventrally. Abbreviations: I–IV the openings for coxae I to IV; *gv1*, *gv2* gland openings; *h1*–*h3* hypostomal setae; *iv1*–*iv5* pore openings; *pcx* palpcoxal seta; *st1*–*st5* sternal setae; *v1*, *v2* palptrochanter ventral setae; *ZV1* opisthogastral seta. Arrow at the anterolateral side.

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Etymology

The specific name *apuseniensis* refers to the locality where the species had originally been collected, i.e. Apuseni Mts, Romania.

Differential taxonomy

Anchigamasus apuseniensis n. sp. is exceptional, since it shows only 9 setae on the opisthogaster rather than 10 setae, as in other *Anchigamasus* species (see species list in Introduction). Despite this key characteristics, the female of this species is similar to *A. si-*

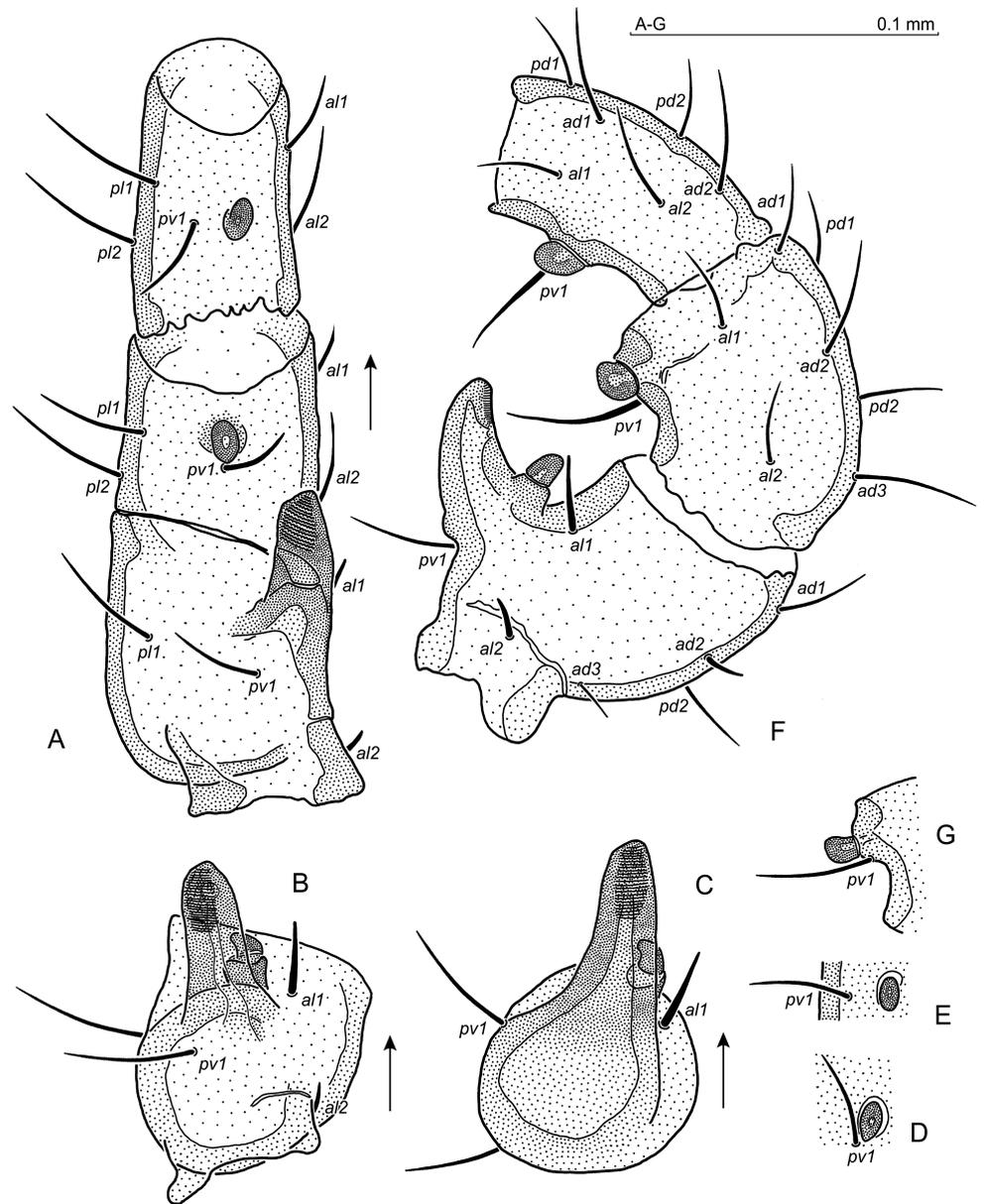


Figure 6 *Anchigamasus apuseniensis* n. sp., male: A – Fe, Ge and Ti of leg II, ventrally; B, C – Fe II in ventral perspective, two aspects; D, E – genual and tibial spurs, ventrally; F – Fe, Ge and Ti of leg II, anterolaterally; G – genual spur, posterolaterally. Abbreviations: *al*, *pl*, *ad*, *pd* and *pv* anterolateral, posterolateral, anterodorsal, posterodorsal and posteroventral setae, respectively. Arrow at the anterolateral side.

culiger female in respect of the epigynial shield with central prong long and narrow, but the endogynia in both species are completely different. In *A. apuseniensis* n. sp. it possesses many denticles on the posterior endogynial sac wall, not present in *A. siculiger*. As far as *A. apuseniensis* n. sp. male is considered, the armature on its second leg differs from that in *A. siculiger*, mainly to long and pointed axillary process, as well as a distally pointed tibial spur in the latter species. The second leg in *A. apuseniensis* n. sp. male is most similar to that in the newly described *A. halaskovellus* male, rather than to other *Anchigamasus* species, as in both species the main femoral spur is finger-shaped and arcuate in the lateral perspective, the

axillary process rather short and conical, the genual and tibial spurs are short and roundish. The main differences between the compared species are as follows: Tr I in *A. apuseniensis* n. sp. is smooth, whereas in *A. halaskovellus* possesses a triangular tubercle anteroventrally, palptrochanter in *A. apuseniensis* n. sp. shows a lamellar arcuate protrusion in a midway between *v1* seta and the article proximal edge, which is not present in *A. halaskovellus*.

***Anchigamasus gardaensis* n. sp.**

Zoobank: [D9FF3390-3365-4B10-BBB6-82C542B03FFF](https://doi.org/10.24349/vtyn-syp0)

(Figures 7–12)

Diagnosis

Female and male — Idiosoma well sclerotised; podonotum with 22 pairs of setae, opisthonotum with 24 regular setae pairs, but three or four supplementary setae (*Sx*) may also be encountered; opisthogaster with 10 pairs of setae.

Female — Gnathotectum central prong twice longer than the lateral ones; gland pores *gv1* located at the posterior sternal margin somewhat laterally to setae *st3*; the epigynial shield central prong acute, long and narrow, the lateral subapical thickenings straight, the central subapical inverted T-shaped thickening with wing-shaped arms, rounded laterally and with backward protrusions; endogynium usually with a straight posterior wall, flanked by two pairs of spherular protrusions, ventral pair larger and rounded apically, whereas the dorsal one smaller and usually pointed; fine denticles behind the epigynial subapical thickening are also found; endogynium diameter (ca. 110–130) is approx. twice larger than the arms span (ca. 53–61) of the subapical thickening; Co IV with an anterolateral tubercle; Tr IV smooth.

Male — Gnathotectum as in the female; palptrochanter seta *v2* barbed on one side; fixed digit of chelicera with two teeth ahead of the pilus dentilis and four teeth behind it, the anterior most tooth may be rounded or pointed; leg II ventrally: the femoral main spur stout and wide, its dorsal edge streaked on distal half, the axillary process conical, slightly curved posterolaterally; the genual and tibial spurs oval; laterally, the femoral main spur with the ventral edge arcuate, the axillary process wedge-like, ending at the level of main spur tip and femoral distal margin, genual and tibial spurs protruding somewhat anteriorly, with more or less rounded external margins; both genual and tibial spurs located on the article protrusions; Co IV smooth, Tr IV with several low tubercles on the posterolateral surface.

Description

Female (Figures 7–9)

Idiosoma (Fig. 7) — Oval, well sclerotised, 760–800 x 455–487 (length x width, *n*=5), holotype 770 x 485. **Podonotum** (Fig. 7) — 22 pairs of setae (*r1* and *z3* lacking), setae short like in *A. apuseniensis* n. sp., but 21–26 (*s1*, *s2*), and 87–90 (*r3*). **Opisthonotum** (Fig. 7) — with 24 pairs of regular setae, but three or four supplementary setae (*Sx*) may also be found. Opisthonotal setae somewhat shorter than the podonotal ones. They range from ca. 30 to 33, but the posterior most marginal setae (*J6*, *Z5*, *S6* and *R6*) may reach 41–49. Dorsal setae simple, podonotum not reticulated, opisthonotum with a scale-like reticulation. **Peritreme** — length 337 in holotype and 330–346 in paratypes, ending anteriorly at the Co I level.

Ventral idiosoma (Figs 8, 9A) — Setae length: 48–54 (*st1–st3*), 38–43 (*st4*, *st5*), opisthogastral setae 35–42 (*JV1*, *JV2*, *JV3*), 61–72 (*JV4*), 34–47 (*ZV1–ZV3*), 60–63 (*ZV4*), 30–32 (*SV1*, *SV3*). Opisthogaster shows ten setae, as setae *SV3* are also present (Fig. 9A). Ventral setae simple, reticulation of the sternum and opisthogaster scale-like. The presternal plates subtriangular with irregular posterior margins, the area between the presternal plates and the sternum margin with 3–4 fine lines (Fig. 8A). Anterior sternal margin with a small central concavity. The pores *gv1* located at the posterior sternal margin somewhat laterally to setae *st3*. Paragynial shields (Fig 8B, C) with narrow, arcuate metagynial sclerites. Epigynial shield (Figs 8C, D, 9A) with the central prong acute, long and narrow. The lateral subapical thickenings

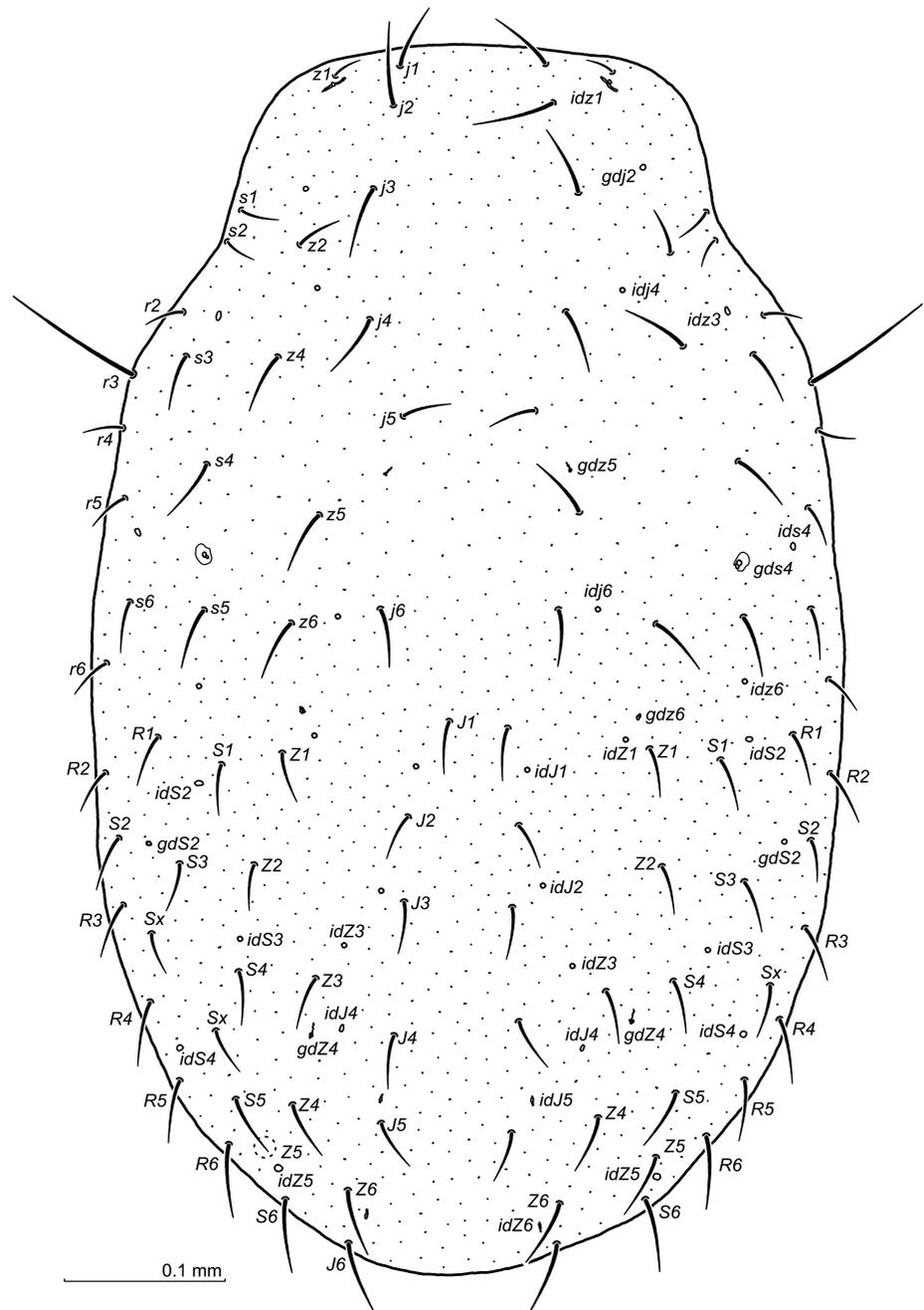


Figure 7 *Anchigamasus gardaensis* n. sp., female: dorsal side. Abbreviations: as in Figure 1.

straight, running backward parallel (Fig. 8C, D) or are slightly arcuate (Fig. 9A). The central subapical inverted T-shaped thickening (Figs 8C, D, 9A) with the arms wing-shaped, rounded laterally and with backward protrusions. In the intact specimens (Fig. 8C), the thickened posterior margins of paragnathal shields run parallel to the lateral subapical thickenings. Endogynium (Fig. 8B, E–G) with a straight or somewhat arcuate posterior wall, flanked by two pairs of spherular protrusions: protrusions located more ventrally (Fig. 8B, F, G) are larger and rounded apically, whereas the dorsally located ones are smaller and usually pointed. Behind the epigynal subapical thickening an area with minute denticles may be seen (Fig. 8C). The

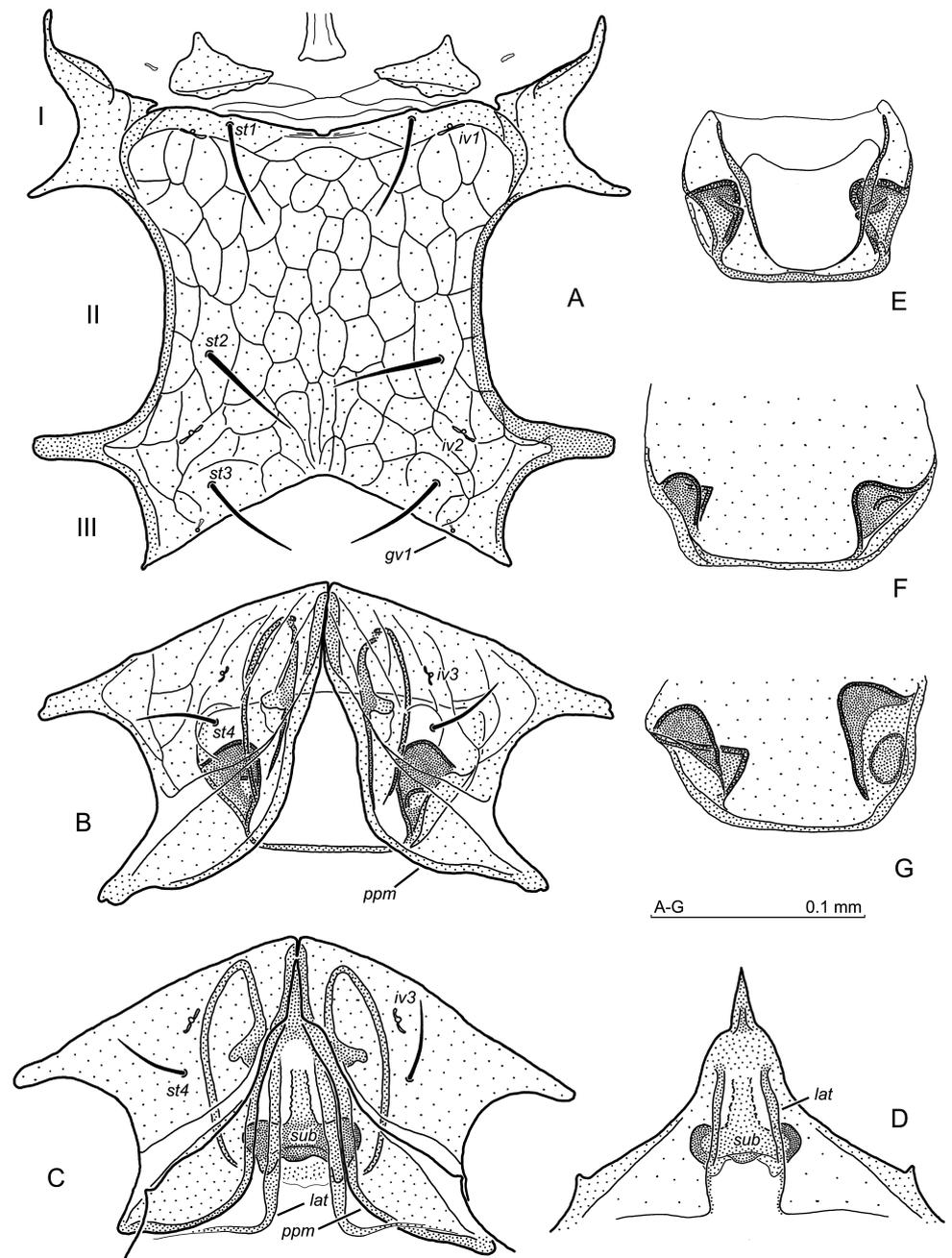


Figure 8 *Anchigamasus gardaensis* n. sp., female: A – presteral and sternal shields; B – paragnathal shields with the endogynium outline; C – paragnathal shields and central prong of the epigynum; D – epigynum central prong; E–G – endogynium: dorsal view (E), ventral view (F, G). D – holotype. Abbreviations: *gv1* gland opening. Other abbreviations as in Figure 2.

diameter of the endogynium (ca. 110–130) is approx. twice larger than the arms span (ca. 53–61) of the T-shaped subapical thickening. Gland pores *gv2* with two distant openings, *iv5*, *ivo2*, *ivo3*, *ivp* pores and *gv3* gland pores well discernible.

Gnathosoma — Gnathotectum (Fig. 9B, C) trispinate, all prongs acute, the central one twice longer. Corniculi conical, hypostome with 10–11 discernible rows of denticles, hypostomatic and palpcoxal setae simple, *h2* somewhat shorter than the others. Palptrochanter

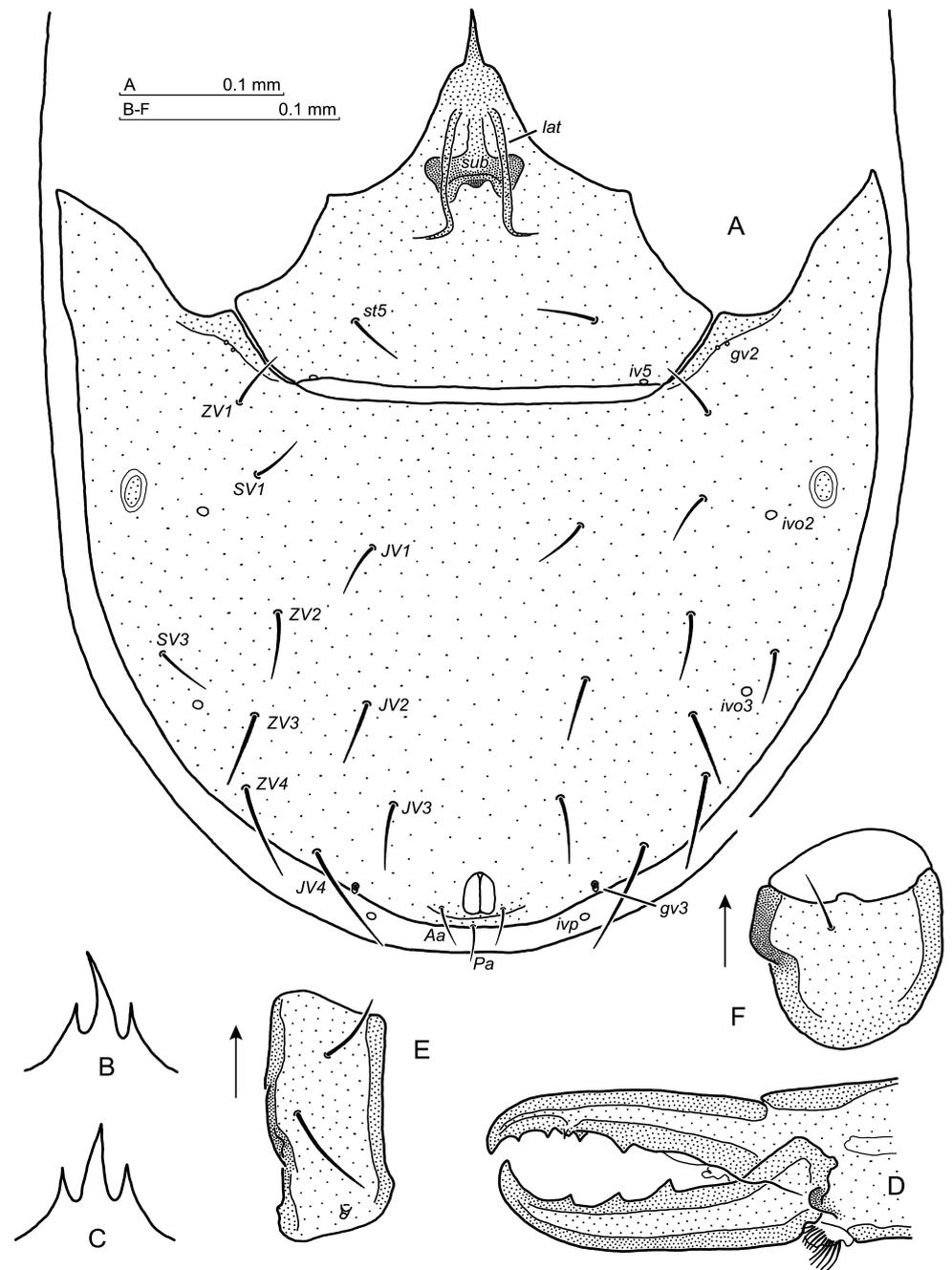


Figure 9 *Anchigamasus gardaensis* n. sp., female: A – the ventral side with the epigynal shield and opisthogaster; B, C – gnathotectum, two aspects; D – chelicera, adaxially; E – Co I ventrally; F – Co IV, ventrally. A, C, E, F – holotype. Abbreviations as in Figure 3. Arrow at the anterolateral side.

v1 seta simple, *v2* in the distal half barbed. Chelicera (Fig. 9D) – movable digit with three teeth, the fixed digit with two teeth ahead of the pilus dentilis, followed by two teeth and a lamellar arcuate digit margin proximally; pilus dentilis located to the side of the obtuse teeth.

Legs — Co I with a low eminence of anterolateral surface (Fig. 9E). Seta *al* on Tr I somewhat shortened. Leg IV: tarsal tactile seta *pd1* thin and long (152–159). Tarsal seta *av1* thicker than *pv1*. Co IV with an anterolateral tubercle (Fig. 9F), Tr IV smooth. Ta IV 229

(holotype) and 233–238 (paratypes) long.

Male (Figures 10–12)

Idiosoma — Oval, well sclerotised, 780–795 x 410–460 (length x width, n=4). **Podonotum** and **opisthonotum** setation like in the female. Dorsal setae simple. Reticulation of the podonotum is not discernible, whereas the reticulation of the opisthonotum is scale-like and well discernible. Dorsal suture present. **Peritreme** – length 335–348, ending anteriorly, as in the female.

Ventral idiosoma — Setae length: 52–55 (*st1*), 47–53 (*st2*), 38–42 (*st3*), 29–33 (*st4*), 25–32 (*st5*), opisthogastral setae 32–34 (*JV1*), 31–34 (*JV2*), 39–41 (*JV3*), 51–55 (*JV4*), 24–26 (*ZV1*), 38–43 (*ZV2*), 45–48 (*ZV3*), 46–47 (*ZV4*), 24–26 (*SV1*, *SV3*). Ventral setae simple.

Sternal region (Fig. 10A) – the genital lamina anterior margin convex, its corners rounded. Presternal plates subtriangular, posterior corners rounded. The sternum with gland pores *gv1* located laterally, behind setae *st3*. Between the levels of *st4* and *st5* two pairs of small, round thickenings of the sternal cuticle are found. Gland pore *gv2* with two distant openings, pores *iv5* behind *st5* seta at one-fourth distance towards seta *ZV1*. Pores *ivo2*, *ivo3*, and *gv3* well discernible.

Gnathosoma — Gnathotectum (Fig. 10B) similar to the one in the female. Corniculi (Fig. 10C) slim, settled on the slightly arcuate bases (genae). Hypostome between genae more pigmented, followed by 11 rows of denticles, the anterior two arcuate anteriorly and the posterior one short. Hypostomal rows of denticles at the level of postcoxal setae longer than the others. Hypostomatic and palpcoxal setae simple, *h2* shorter than the others. Palptrochanter *v1* seta short and thickened, located on the article protrusion, seta *v2* in the distal half barbed on one side (Fig. 10C, D). In a half distance between seta *v1* and proximal palptrochanter margin a little tubercle is found. Chelicerae (Fig. 10E) – laterally, mobile digit with two teeth, followed by a tooth-like indentation of the digit's edge, fixed digit obtuse terminally, with two teeth ahead of the pilus dentilis and four teeth behind it. The anterior most tooth may be rounded or pointed.

Legs — Leg II spurred as follows: when viewed from the ventral side (Fig. 11A, B), the femoral main spur is stout and wide, its dorsal edge is streaked on distal half, the axillary process conical, slightly curved posterolaterally. The genual and tibial spurs more or less oval. From a lateral perspective (Fig. 12A, B), the femoral main spur with ventral edge arcuate, the axillary process wedge-like, ending at the level of the main spur tip and femoral distal margin. Genual spur asymmetric protruding anteriorly, with more or less rounded external margin, whereas tibial spur also protruding anteriorly, but more roundish. Both genual and tibial spurs located on the article protrusions. Setae on leg II simple, femoral seta *all* shortened and slightly thickened, setae *al2* and *ad2* shortened, whereas *ad3* short and needle-like. Seta *pv1* on the genu located just behind the spur protrusion, seta *pv1* on the tibia posterolaterally to the spur (Fig. 11B). Seta *all* on the tibia located on distinct tubercle. Leg IV: setae *av2*, *av3* and *pv2* on the tarsus slightly thickened, tarsal *pv1* thinner than *av1*. Tactile dorsal seta on Ta IV (150–155), as in the female. Co IV without a tubercle, but Tr IV with several tubercles on posterolateral surface (Fig. 10F). Ta IV 227–233 long.

Material examined

Holotype — Female (slide no. 2685 E), east of Lago di Garda, near road SP89 between Foppiano and Matassone, Trentino, northern Italy, 45.8182°N, 11.0722°E, alt. ca. 820 m a.s.l., 1 Sept. 2015, litter in a beech forest. Leg. Leszek Dumnicki.

Paratypes — 8 females, 4 males (slides no. 2685 F–H; 2687 B), collection data as in the holotype.

Type deposition — Types are deposited in the Zoological Division of the Nature Education Centre, Jagiellonian University, Kraków, Poland.

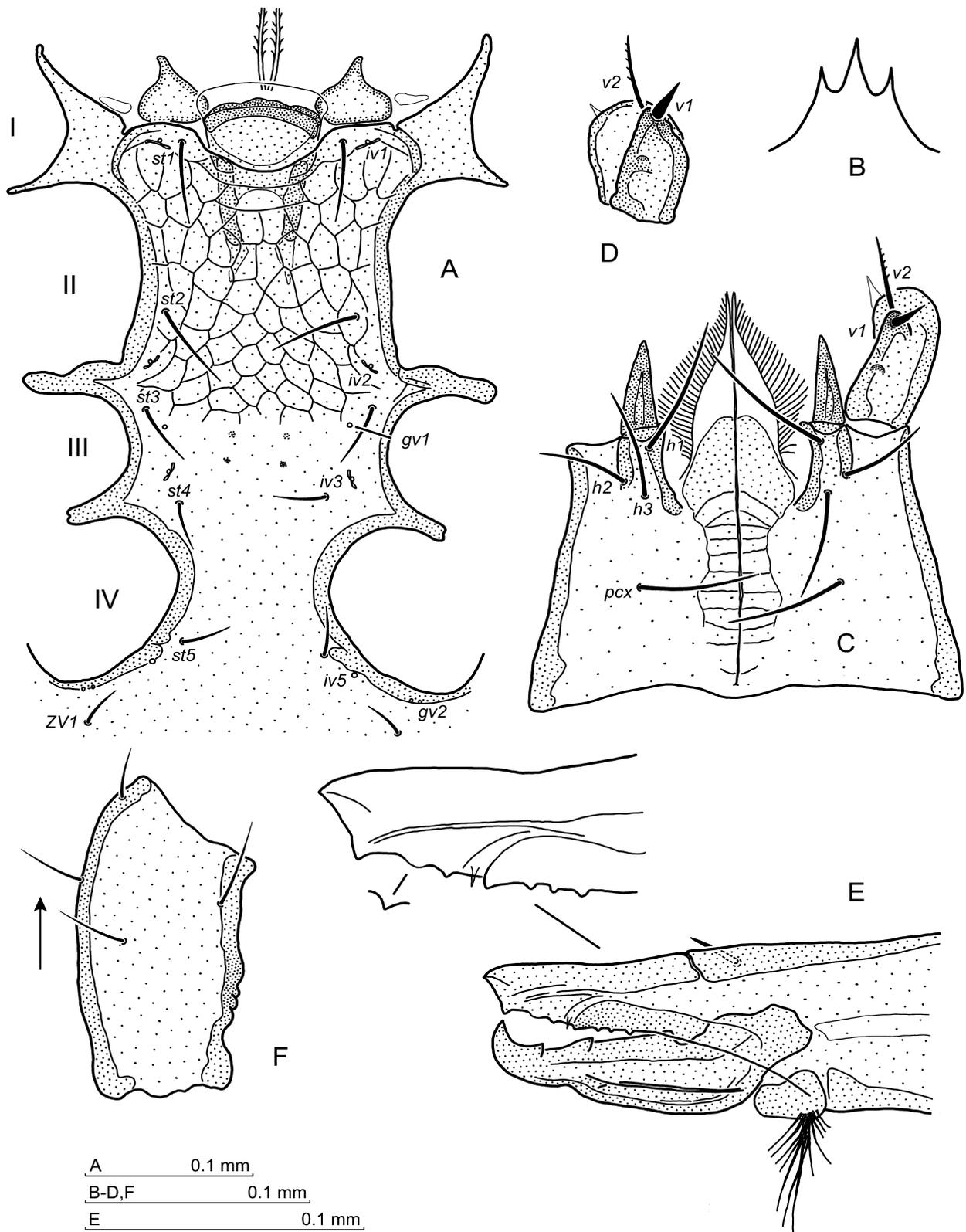


Figure 10 *Anchigamasus gardaensis* n. sp., male: A – presternal plates, genital lamina and sternogenital shield; B – gnathotectum; C – gnathosoma, ventrally; D – palprochanter, ventrolateral aspect; E – chelicera, adaxially; F – Tr IV, ventrally. Abbreviations as in Figure 5.

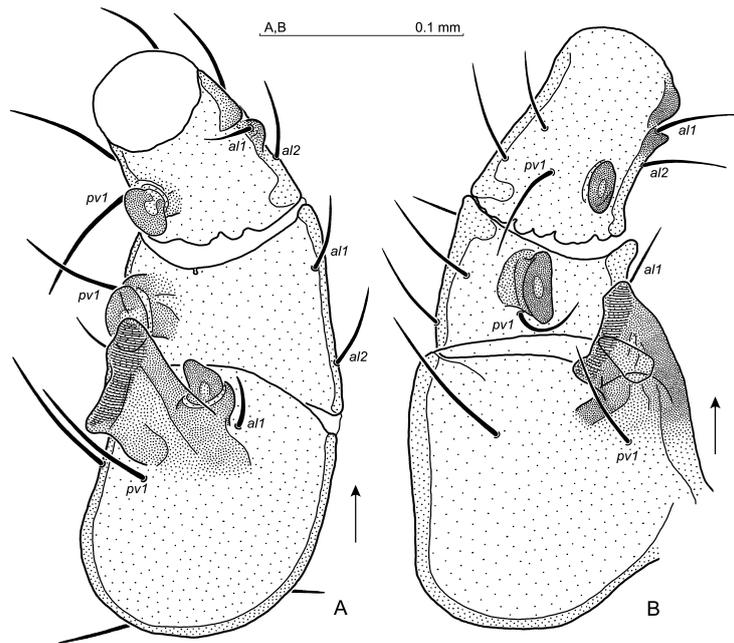


Figure 11 *Anchigamasus gardaensis* n. sp., male: A – Fe, Ge and Ti of leg II, in two ventral perspectives. Abbreviations as in Figure 6.

Etymology

The specific name *gardaensis* refers to the surroundings of the Garda Lake, northern Italy, where the species had originally been collected.

Differential taxonomy

Females and males in *Anchigamasus gardaensis* n. sp. possess 10 opisthogastral setae like other *Anchigamasus* species (mentioned in the Introduction) except *A. apuseniensis* n. sp. The females of *A. gardaensis* n. sp. are characterized by an acute, narrow central prong of the epigynium and the endogynium with two pairs of spherular organs. Similar epigynium is encountered in *A. cansigliensis* and *A. geileri*, although in both species the endogynia possess one pair of spherules only. Also the shape of subapical structure in both cases is different. The only *Anchigamasus* species with two pairs of protrusions in the endogynium is *A. halaskovellus*, even though either the endogynium structure or the epigynial subapical structure are quite different. As far as the leg II armature is concerned, the male of *A. gardaensis* n. sp. can be compared with *A. cansigliensis*, since in both species the legs II are similar in the lateral view. On the other hand, in *A. gardaensis* n. sp. the main spur on the femur II in the ventral view is wider at the base than in the apical part, whereas in *A. cansigliensis* the main spur is rhombic in shape, not widened basally.

Anchigamasus halaskovellus (Athias-Henriot, 1967) male

Pergamasus halaskovellus Athias-Henriot, 1967: 48 (female only)

= *Pergamasus neoruncatellus* Schweizer, 1961: 57 sensu Micherdziński, 1969: 289 (Athias-Henriot, 1971: 174)

(Figures 13, 14)

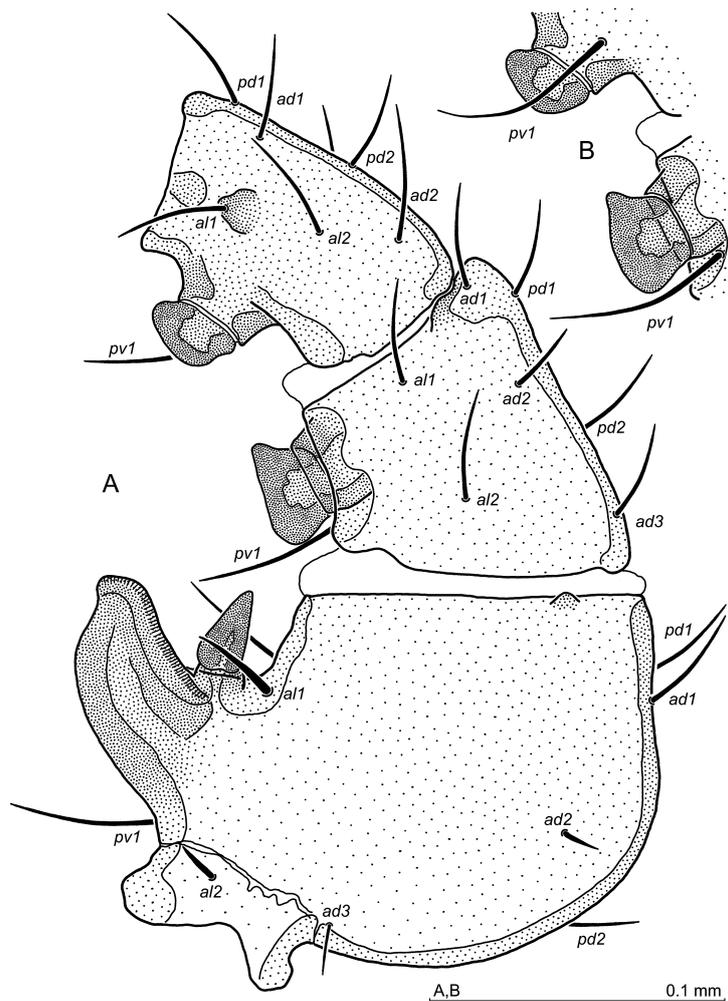


Figure 12 *Anchigamasus gardaensis* n. sp., male: A – Fe, Ge and Ti of leg II, anterolaterally; B – spurs on the genu and tibia, posterolateral view in the other specimen. Abbreviations as in Figure 6.

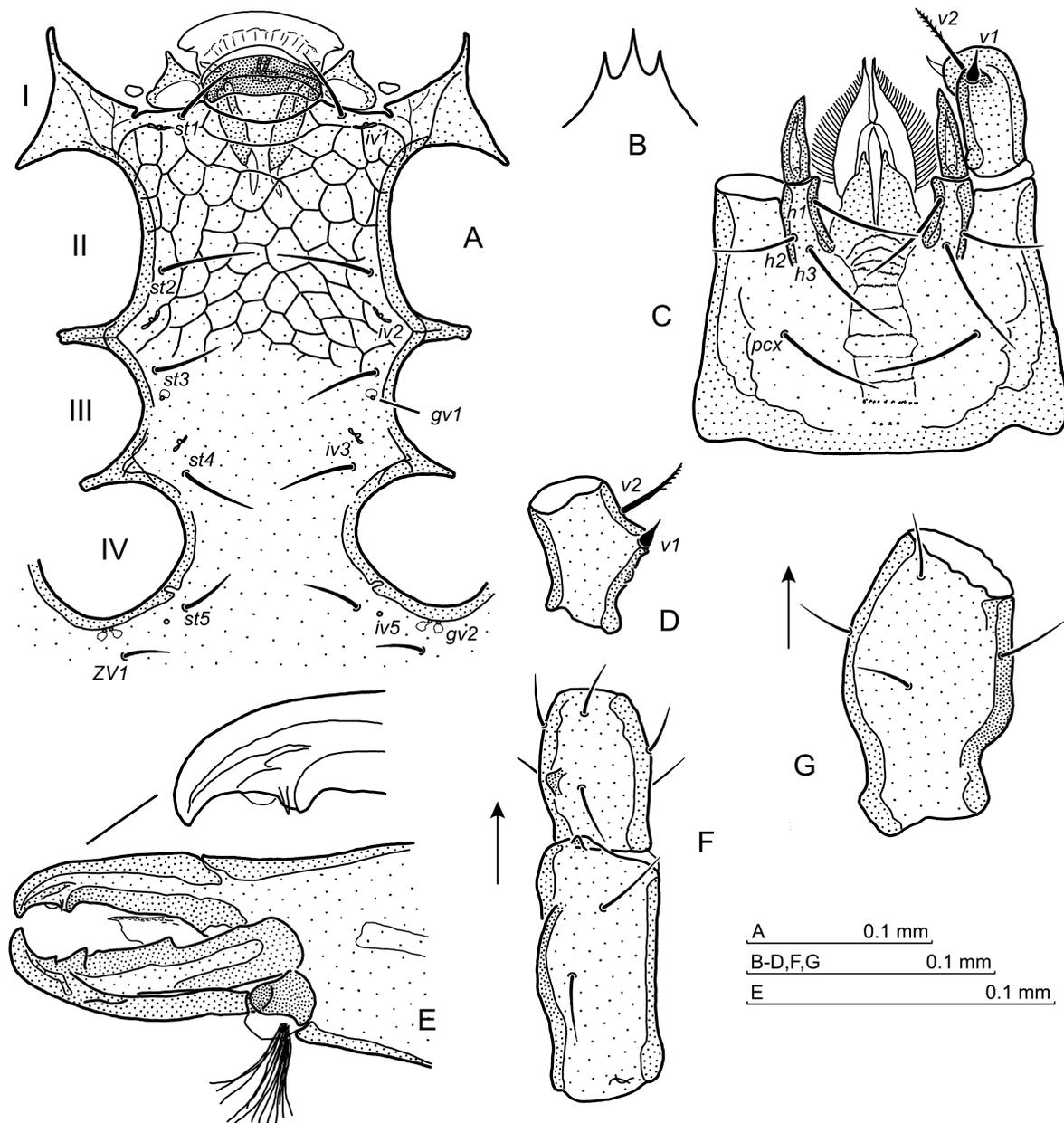
Diagnosis

Male — Gnathotectum central prong twice longer than the lateral ones; palptrochanter *v1* seta short and bulbous basally, located on the article protrusion and followed proximally with an indistinct tubercle, seta *v2* barbed on both sides; fixed digit of chelicera with a lamellar, arcuate protrusion just ahead of the pilus dentilis and one tooth just behind it; leg II ventrally: the femoral main spur finger-shaped and arcuate, the axillary process conical and curved posterolaterally; the genual and tibial spurs oval; laterally, the femoral main spur arcuate, the axillary process curved towards the article and pointed, genual and tibial spurs rounded, the genual one located on the article protrusion; Co I with anterolateral long and low eminence, Tr I with a triangular protrusion anteroventrally; Tr IV with an indistinct posterolateral gibbosity.

Description

Male (Figures 13, 14)

Idiosoma — Oval, well sclerotised, 696 x 361 (length x width, n=1). **Podonotum** – 22 pairs of setae (*r1* and *z3* lacking), length 33–42, but 22–24 (*s1*, *s2*), 27 (*r2*, *r4*), 71 (*r3*) and 24 (*r6*). **opisthonotum** setae length 26–33, only posterior most setae longer, 40–52. Dorsal setae simple.



A 0.1 mm
 B-D,F,G 0.1 mm
 E 0.1 mm

Figure 13 *Anchigamasus halaskovellus*, male: A – presternal plates, genital lamina and sternogenital shield; B – gnathotectum; C – gnathosoma, ventrally; D – palptrochanter, anterolateral aspect; E – chelicera, adaxially; F – Co I and Tr I, ventrally; G – Tr IV, ventrally. Abbreviations as in Figure 5.

Reticulation of the podonotum not discernible, the reticulation of the opisthonotum scale-like and well discernible. Dorsal suture present. **Peritreme** – length 330, ending anteriorly at the Co I level.

Ventral idiosoma — Setae length: 42 (*st1*), 42 (*st2*), 38–42 (*st3*), 35–38 (*st4*), 27–30 (*st5*), opisthogastral setae 38 (*JV1*), 50 (*JV2*), 44 (*JV3*), 56 (*JV4*), 22 (*ZV1*), 43–48 (*ZV2–ZV4*), 29–30 (*SV1, SV3*). Ventral setae simple. **Sternal region** (Fig. 13A) – the genital lamina anterior margin convex, its corners protruding laterally. Presternal plates subtriangular, posterior corners rounded, the anterior one pointed. The sternum with gland pores *gv1* located laterally, behind setae *st3*. Gland pore *gv2* with two openings, pores *iv5* behind *st5* seta at two-fives

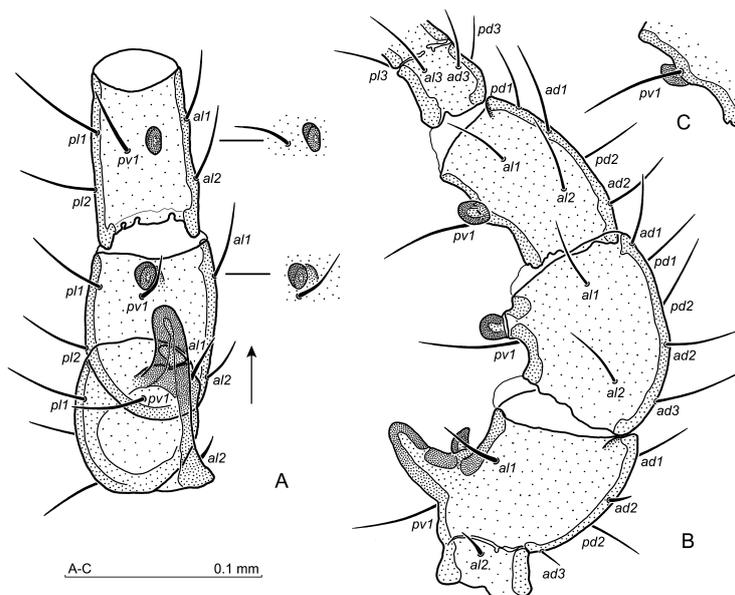


Figure 14 *Anchigamasus halaskovellus*, male: A – Fe, Ge and Ti of leg II, ventrally, tibial and genual spurs on the second leg are also shown; B – Fe, Ge, Ti and basitarsus of leg II, anterolaterally; C – spur on the tibia, posterolateral view on the second leg. Abbreviations as in Figure 6.

distance towards seta *ZV1*. Pores *ivo2*, *ivo3*, and *gv3* well discernible.

Gnathosoma — Gnathotectum (Fig. 13B) prongs acute and the central one twice longer. Corniculi (Fig. 13C) slim, settled on the arcuate bases (genae). Hypostome between the genae more pigmented, followed by 11 rows of denticles, three anterior rows arcuate anteriorly and the posterior one short, comprising several denticles only. Hypostomatic and palpcoxal setae simple, *h2* shorter than the others. Palptrochanter *v1* seta short and bulbous basally, located on article protrusion and followed proximally with an indistinct tubercle, seta *v2* barbed on both sides (Fig. 13C, D). Chelicerae (Fig. 13E) –laterally, mobile digit with two teeth, followed by a tooth-like indentation of the digit's edge, fixed digit with a lamellar, arcuate protrusion just ahead of the pilus dentilis and one tooth just behind it.

Legs — Co I with a low and long eminence on anterolateral side (Fig. 13F), Tr I with a triangular tubercle anteroventrally. Leg II spurred as follows: when viewed from the ventral side (Fig. 14A), the femoral main spur is finger-shaped and slightly arcuate, whereas the axillary process conical and curved posterolaterally. The genual and tibial spurs more or less oval. From a lateral perspective (Fig. 14B), the femoral main spur arcuate, the axillary process curved towards the article and pointed, genual spur rounded and located on the article protrusion, whereas the tibial spur rounded or somewhat projected distally (Fig. 14C). Setae on leg II simple, femoral seta *al1* slightly thickened, setae *al2* and *ad2* shortened, whereas *ad3* short and needle-like. Seta *pv1* on the genu located just behind the spur protrusion (Fig. 14A, B), seta *pv1* on the tibia posterolaterally to the spur (Fig. 14A, C). Leg IV: tibial ventral setae and setae *av2*, *av3* and *pv2* on the tarsus somewhat thickened, tarsal *pv1* thinner than *av1*. Tactile dorsal seta on Ta IV 139 long. Tr IV with an indistinct gibbosity on posterolateral surface (Fig. 13G). Ta IV 229 long.

Material examined

One male (slide no. 3298 A/1–4), Śnieżnik Massif, Czarna Góra, Sudetes Mts, south-western Poland; 50.2510°N, 16.8047°E, alt. ca. 1185 m a.s.l.; 1 Oct. 2023; spruce and blueberries litter.

Other material — 1 female (slide no. 742), The Ojców National Park, southern Poland, 50.2147°N, 19.8168°E, alt. ca. 452 m a.s.l., 10 March 1977, beech forest litter; 1 female (slide no. 2592), The Ojców National Park, southern Poland, 50.2040°N, 19.8109°E, alt. ca. 395 m a.s.l., 21 March 2015, beech and pine mixed forest litter; 1 female (slide no. 2358), Owl Mts, Central Sudetes, south-western Poland, 50.6750°N, 16.5089°E, alt. ca. 842 m a.s.l., 2 June 2011, spruce and beech mixed forest litter; 1 female (slide no. 3306), Śnieżnik Massif, Sudetes Mts, south-western Poland, 50.2140°N, 16.8343°E, alt. ca. 1165m a.s.l., 1 Oct. 2023, moss in a gutter along the road.

Material deposition — 1 male (slide no. 3298 A/1–4) and 1 female (slide 3306) are deposited in the Zoological Division of the Nature Education Centre, Jagiellonian University, Kraków, Poland.

Taxonomic remarks

Anchigamasus halaskovellus (Athias-Henriot, 1967: 48), has been described as *Pergamasus halaskovellus* by Athias-Henriot based on one female collected in Rychlebské Hory (a part of the Sudetes Mts, a range close to Czech-Polish frontier). Later, Athias-Henriot (1971: 174) suggested that *Pergamasus neoruncatellus* Schweizer, 1961: 57 redescribed by Micherdziński (1969: 289) was erroneously identified and is a synonym of *P. halaskovellus* Athias-Henriot. Moreover, Athias-Henriot stated also that *P. neoruncatellus* Schweizer sensu Micherdziński belongs to genus *Paragamasus* and subgenus *Anchigamasus* (now genus *Anchigamasus*).

Micherdziński (1969) based his redescription on 4 females and 2 males from The Ojców National Park, as well as 1 male from the Sudetes Mts., and identified the male as *P. neoruncatellus* mainly due to a similarity of leg II armature in both species, as well as a characteristic seta *v2* (actually *v1* seta) on palptrochanter. However, leg II armature in the redescribed species is not characteristic enough for sure identification. Moreover, shortened seta *v1* is present not only in *Anchigamasus*, but also in most of *Anidogamasus* species. In a female, the endogynium showing by Schweizer is different than those in *A. halaskovellus*.

In conclusion, *P. neoruncatellus* Schweizer, 1961 seems to belong to *Anidogamasus* rather than *Anchigamasus*, but the species should be re-examined in a more detailed manner.

The females of *P. neoruncatellus* in Micherdziński's redescription are evidently *A. halaskovellus*. In my own material I found several females and one male (see: Material examined). All females belong to *A. halaskovellus* and the male corresponds to the male described by Micherdziński as *P. neoruncatellus* (e.g. leg II armature, chelicera structure). Therefore, I provided its description in order to supplement the data on the *A. halaskovellus* species.

Anchigamasus halaskovellus male is similar to the male of the presently described *A. apuseniensis* n. sp., since the armature of the second leg is similar. However, in *A. halaskovellus* there is a tubercle on Tr I which is absent in *A. apuseniensis* n. sp. Moreover, on palptrochanter in *A. apuseniensis* n. sp. an arcuate lamellar protrusion behind *v1* seta is present, not present in *A. halaskovellus*.

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