

New *Leptogamasus* mite species (Parasitiformes: Parasitidae) from Europe. V. Romania

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Original research

ABSTRACT

Four new species of Parasitidae, originating from Romania (Carpathian Mountains), are described, i.e. *Leptogamasus* (L.) *ojdulaensis* n. sp., *Leptogamasus* (L.) *gurghiuensis* n. sp., *Leptogamasus* (L.) *holdaensis* n. sp. and *Leptogamasus* (L.) *horribilis* n. sp.

Keywords *Leptogamasus* subgenus; mite taxonomy; Mesostigmata; Carpathian Mts; Romanian fauna

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Introduction

Over the recent years, several papers describing the new species of mites belonging to the genus *Leptogamasus* Trägårdh, 1936, the subgenus *Leptogamasus* s. str., have been released. The new species have been encountered in forest litter across Europe (Poland – 3 species, Northern Italy – 4 species, Northern and Central Italy – 5 species, Austria – 3 species) (Witaliński, 2020, 2021a,b, 2022). In the present paper, the four new species from the Romanian Carpathians are described.

Material and methods

The research methods applied in the present study were described in detail in the previous paper in this series (Witaliński, 2020). In particular, all measurements are given in micrometres, and the peritreme length was measured including the stigma. Since the structure of the podonotum in these species is very uniform (21 seta pairs), it is depicted for *L. (L.) ojdulaensis* n. sp. only (Fig. 1), but not described in detail for the remaining species. The system of dorsal, ventral, palpal and leg setal notations was based on Evans and Till (1979), whereas poroidotaxy and adenotaxy on Moraza and Peña (2005), with some necessary adjustments for Parasitidae. Setae abbreviations are explained in caption to Figure 4. In all species both sexes were available for study, and a female was chosen as the holotype, since in the genus *Leptogamasus* the females happen to be the most differentiated ones, and therefore most suitable for species identification. The materials were collected mainly by Dr. Marcin Liana, except some specimens of *L. (L.) ojdulaensis* n. sp. by Prof. Wanda M. Weiner and Dr. Cristina Fiera.

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Systematics

Family Parasitidae Oudemans, 1901

Genus *Leptogamasus* Trägårdh, 1936 sensu Juvara-Balş, 1981

Type species *Leptogamasus suecicus* Trägårdh, 1936: 227.

Some taxonomic remarks on the genus and its subgenera were recently published (Witaliński, 2021a).

Leptogamasus (*Leptogamasus*) Trägårdh, 1936

Type species *Leptogamasus suecicus* Trägårdh, 1936: 227.

Leptogamasus (*Leptogamasus*) *ojdulaensis* n. sp.

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(Figures 1–6)

Diagnosis

Female and male — Idiosoma well sclerotised; opisthonotum with 24 regular setae pairs and one or two supplementary seta pairs (Sx) located marginally; Tr IV with an indistinct, cross-oriented dorsal tubercle.

Female — Gnathotectum trispinate with narrow and acute prongs; presternal plates subtriangular; the sternal shield anterior margin with a shallow concavity; *gv1* located close to the body's axial line; paragynial shields with rounded protrusions located axially; the anterior margins of the epigynial shield straight, the posterolateral ones short and convex, the transversal band of less pigmented cuticle is located subapically, the internal (dorsal) surface of the epigynium with a pair of teeth; endogynial spherules more or less roundish, each one with a tooth-like elevation on the anteroventral surface, endogynial sac usually with a pair of teeth located laterally, the stipule wide and richly dentated on the anterior margin.

Male — Gnathotectum trispinate with dissimilar prongs; genital lamina subrectangular and the anterior corners rounded; presternal plates quadrilateral, with distinct anterior protrusions; corniculi adaxial margin sinuous; cheliceral fixed digit straight, ahead the pilus dentilis two denticles, and one pointed behind it, followed by two rounded denticles; leg II ventrally: femoral main spur relatively short and, similarly to axillary process, curved posterolaterally, genual and tibial spurs axially oriented, spindle-shaped and somewhat asymmetric, genual spur located closer to the anterior article margin than the tibial one; leg II laterally: femoral main spur nearly straight, the axillary process more or less asymmetric, genual and tibial spurs conical.

Description

Female (Figures 1–4, 6C) (n=14)

Idiosoma (Fig. 1) — Moderately sclerotised, oval, paratypes 570–605 x 335–360 (length x width, n=5), holotype 576 x 335. **Podonotum** (Fig. 1) – 21 pairs of setae, setae length in paratypes: 30–38 (*j1*), 34–41 (*j2*), 45–53 (*j3*), 44–50 (*j4*), 35–42 (*j5*), 31–36 (*j6*), 80–84 (*r3*), in holotype 38 (*j1*), 33 (*j2*), 45 (*j3*), 50 (*j4*), 44 (*j5*), 32 (*j6*), 81 (*r3*). **Opisthonotum** (Fig. 1) – with 24 pairs of regular setae plus one or two pairs of supplementary setae (Sx) located in the marginal regions. Setae length from ca. 30 (*R3*, *R4*) up to 50 (*J6*, *S6*). Dorsal setae simple, podonotum not reticulated, opisthonotum with a scale-like reticulation. **Peritreme** – length 133–140 in paratypes and 139 in holotype, ending anteriorly in the midregion of the opening for Co II, at the level of the podonotal setae *r2*.

Ventral idiosoma (Fig. 2) — Setae length in paratypes: 42–47 (*st1*), 44–49 (*st2*), 42–48 (*st3*), 31–34 (*st4*), 36–39 (*st5*), 37–42 (*JVI*), 27–30 (*ZVI*), other opisthogastral setae ca. 25–44, in holotype 41 (*st1*), 51 (*st2*), 47 (*st3*), 33 (*st4*), 38 (*st5*), 39 (*JVI*), 27 (*ZVI*). Ventral setae

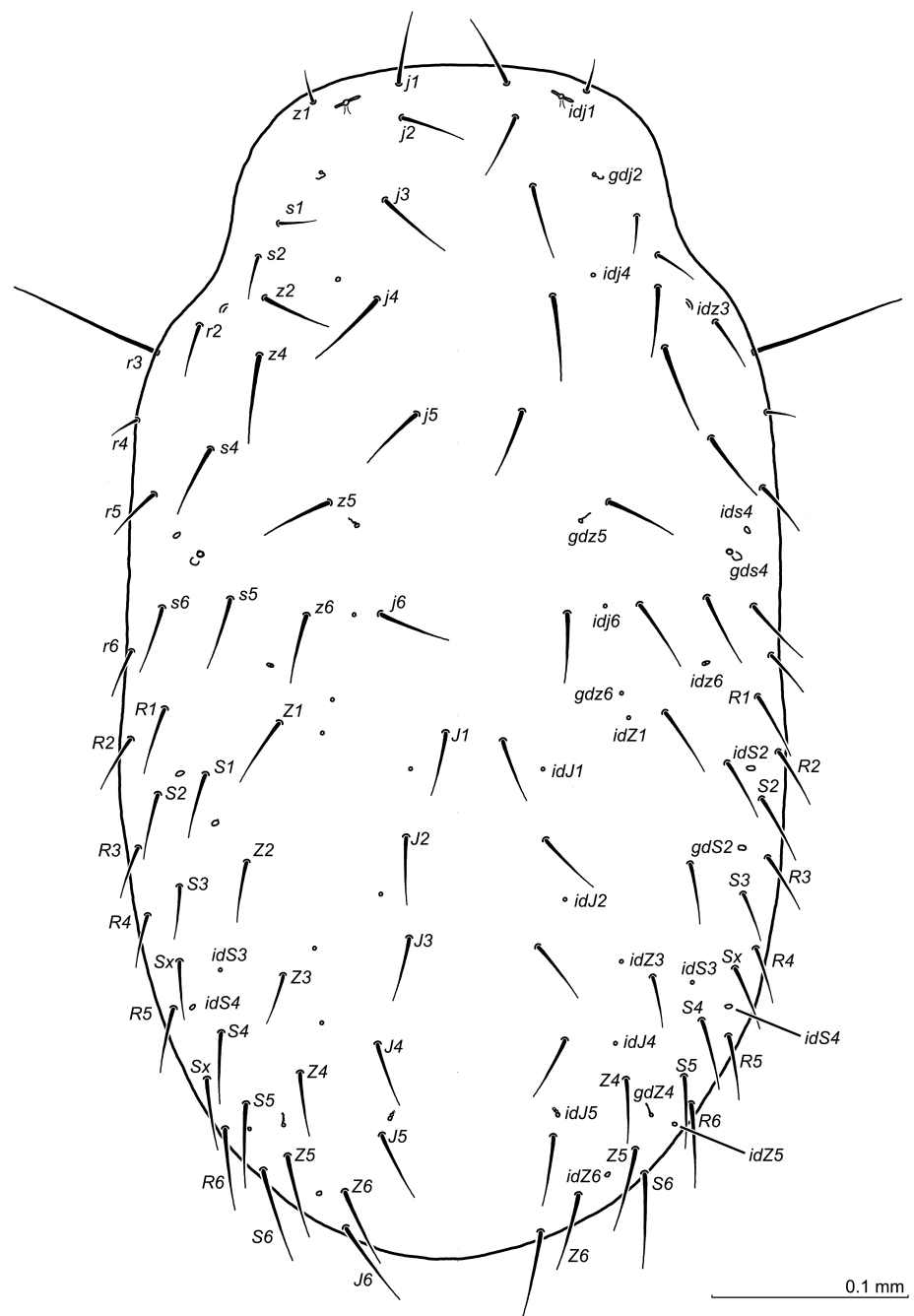


Figure 1 *Leptogamasus (L.) ojdulaensis* n. sp., dorsal side of the female idiosoma. Abbreviations: regular podonotal setae (*j*, *z*, *s*, *r*); opisthonotal setae (*J*, *Z*, *S*, *R*); supplementary setae *Sx*; podonotal and opisthosomal pores (*id*), and dorsal gland pores (*gd*) are marked. Note three supplementary setae (*Sx*).

simple, reticulation of the sternum and opisthogaster scale-like. The anterior margin of the sternal shield with a concavity, the area between the presternal plates and the sternum margin with some weak lines. Presternal plates subtriangular, the anterior protrusions moderately long. Gland pores *gv1* located close to body's axial line (Figs 2, 3A). Paragynial shields (Figs 2, 3B) with narrow and arcuate metagynial sclerites, reaching anteriorly the paragynial anterior margins, posterior margins with characteristic rounded protrusions, located ventrally to the

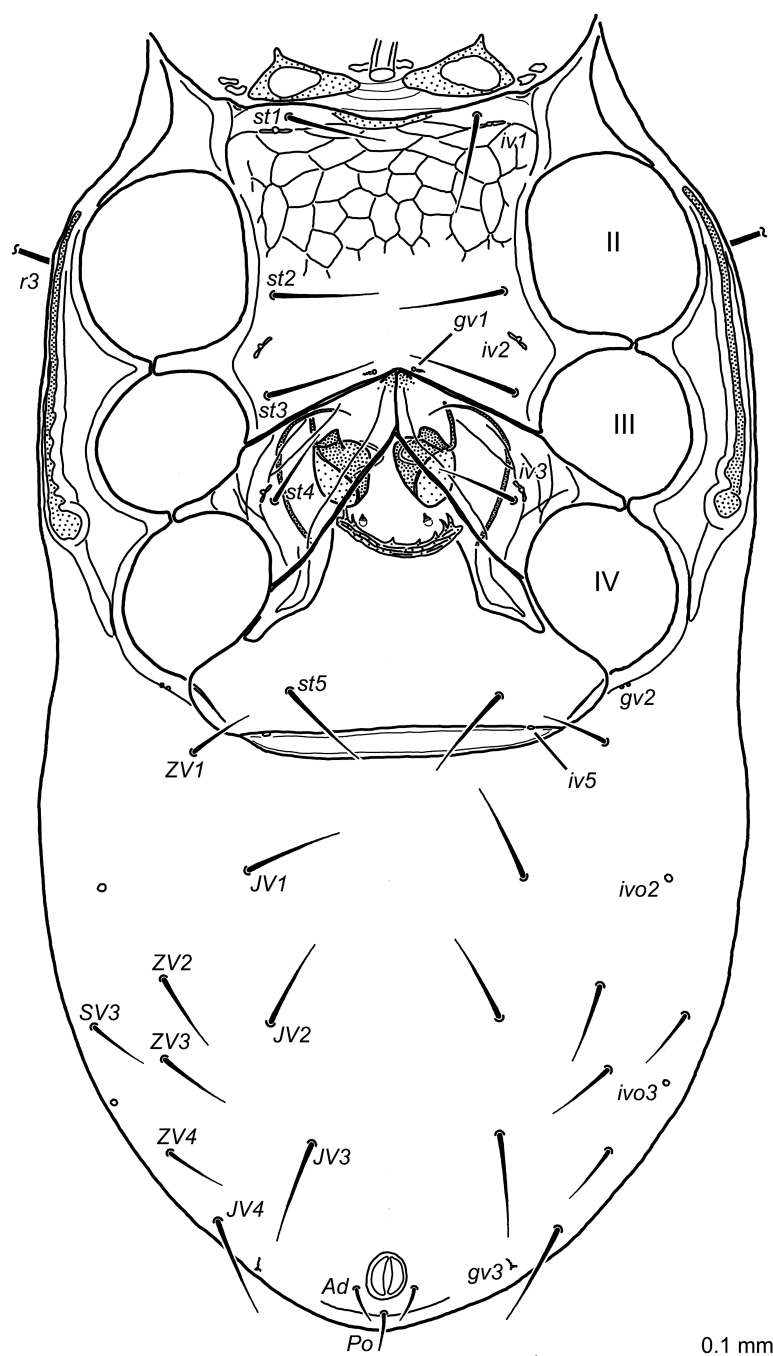


Figure 2 *Leptogamasus (L.) ojdulaensis* n. sp., ventral side of the female idiosoma. Abbreviations: II–IV the openings for coxae II to IV; *r3* podonotal seta; *st1*–*st3* sternal setae; *st4*, *st5* paragynial and epigynial setae, respectively; *JV*, *ZV*, *SV* opisthogastral setae; *Ad*, *Po* adanal and postanal setae, respectively; *gv1*–*gv3* ventral gland pores; *iv1*–*iv5*, *ivo2*, *ivo3* pore openings.

endogynium. Epigynial shield (Figs 2, 3C) with the anterior margins straight, the posterolateral ones short and convex. Less pigmented band of the cuticle runs subapically. A pair of distinct teeth is located behind the less pigmented cuticle on the internal (dorsal) epigynial surface. The

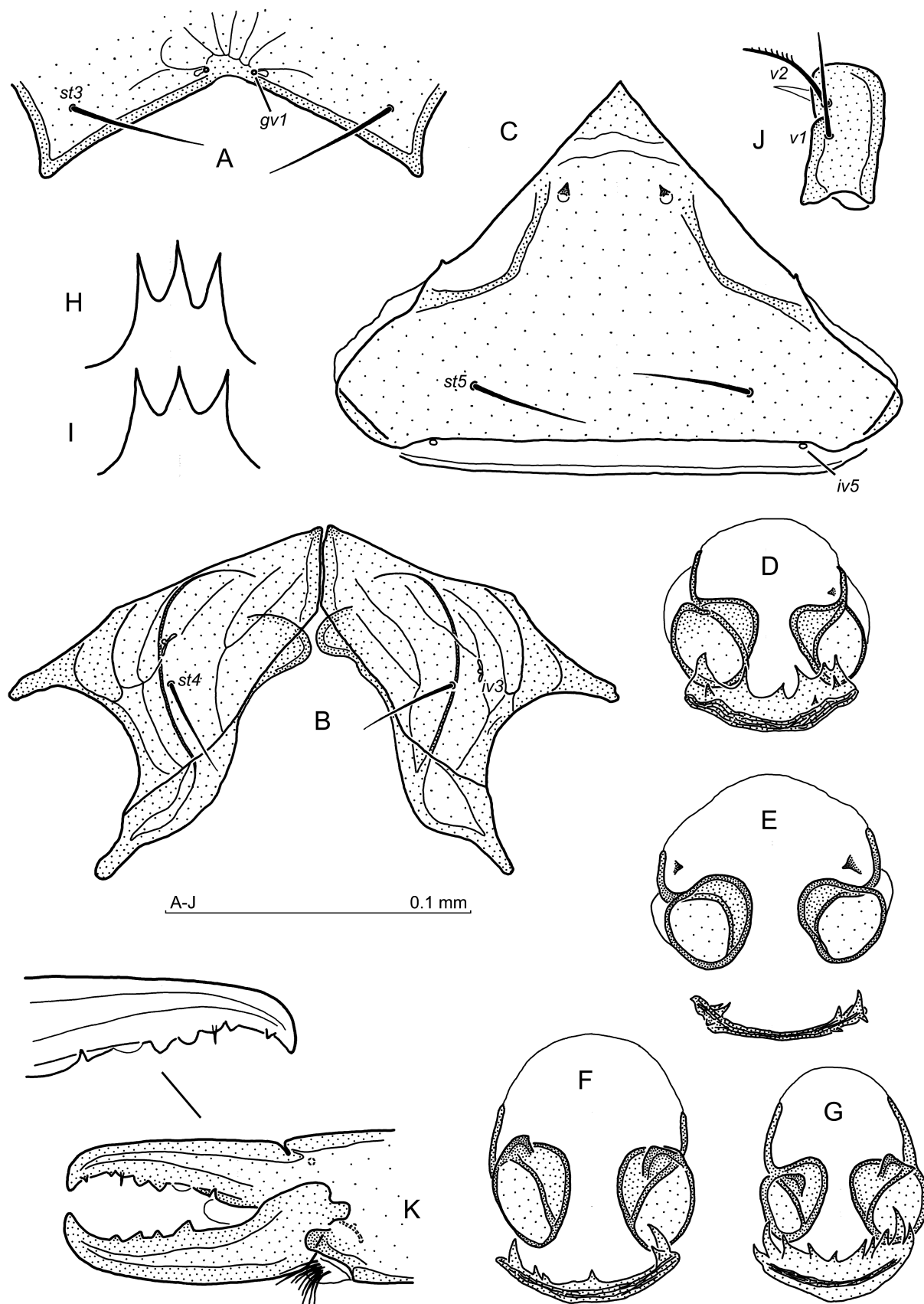


Figure 3 *Leptogamasus (L.) ojdulaensis* n. sp., female: A – sternal posterior margin showing *st3* setae and gland pore *gv1* location; B – paragynia with adaxial protrusions; C – epigynum; D – G – endogynium, different aspects; H, I – gnathotectum, two aspects; J – palpcoxa, ventrally; K – chelicera, adaxially. Abbreviations: *st3*, *st4* and *st5* sternal, paragynial and epigynial seta, respectively; *v1*, *v2* palpcoxal setae; *iv3*, *iv5* pore openings; *gv1* gland pore. D, J – holotype.

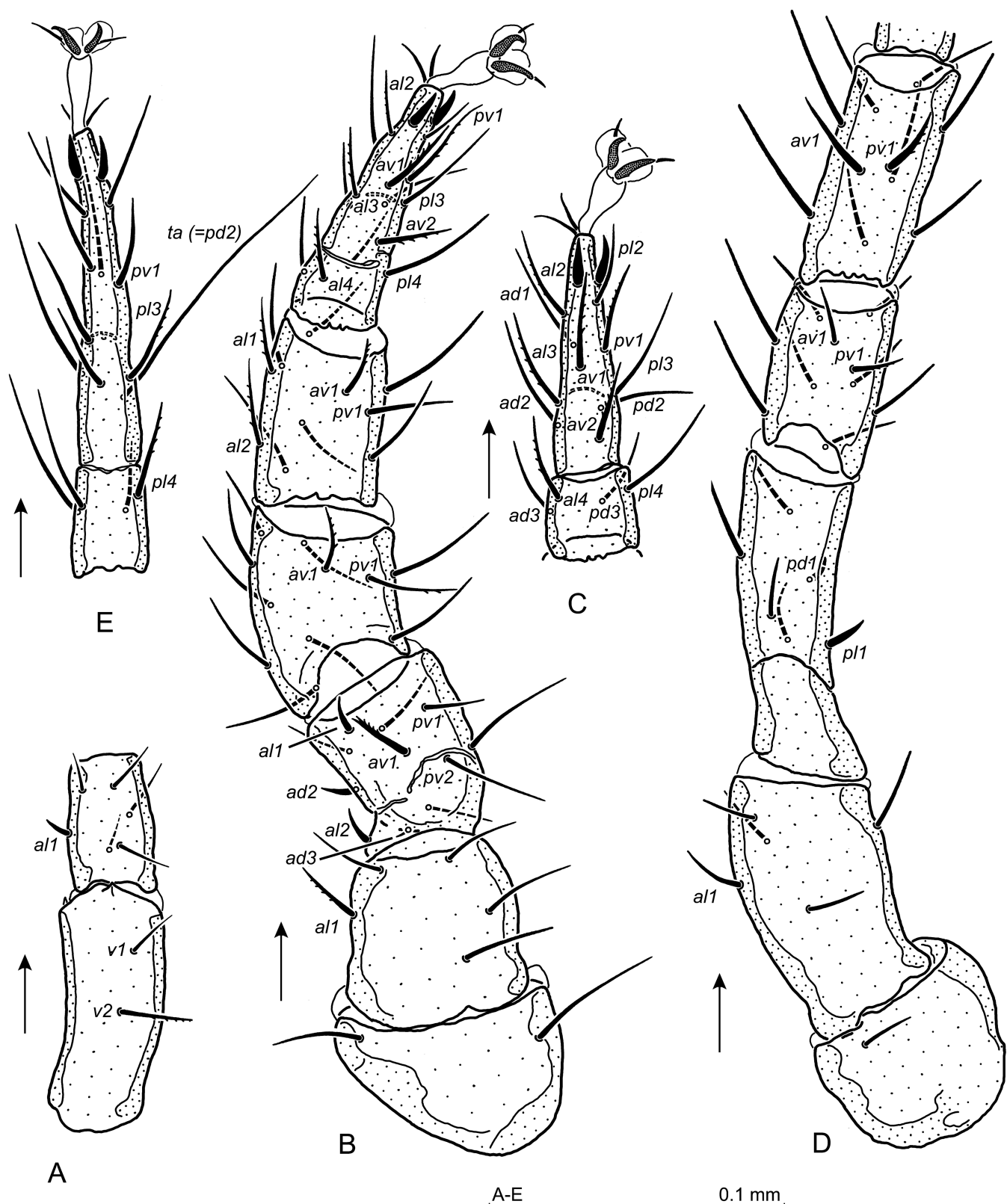


Figure 4 *Leptogamasus (L.) ojdulaensis* n. sp., female, ventrally: A – leg I (Co and Tr); B – leg II (Co, Tr, Fe, Ge, Ti and Ta); C – Ta II, another aspect; D – leg IV (Co, Tr, Fe, Ge and Ti); E – leg IV (Ta). Abbreviations: al, pl, v, av, pv, ad, and pd – anterolateral, posterolateral, ventral, anteroventral, posteroventral, anterodorsal and posterodorsal setae, respectively; ta tactile seta (=pd2). Arrows at the anterolateral side. A, B, D, E – holotype.

spherules of the endogynium (Figs 2, 3D–G) are rounded, usually with more or less distinct tooth-like elevation on the anteroventral surface (Fig. 3F, G). The endogynial sac wall either features some little teeth (Fig. 3D, E), or remains toothless altogether (Fig. 3F, G). The stipule is relatively wide, ending at least in the spherule midregion, showing a lot of teeth on its anterior margin. In some specimens, the stipule may be ventrally oriented (Fig. 3E). Gland pores *gv2* with double openings, pores *iv5* just behind the posterior epigynial margin, *ivo2*, *ivo3*, and *gv3* well discernible.

Gnathosoma — Gnathotectum (Fig. 3H) trispinate with narrow and acute prongs, the central one somewhat longer, or occasionally all prongs tend to be of similar length (Fig. 3I). Corniculi conical, hypostome with 10 rows of weakly visible denticles, hypostomatic setae simple and palpcoxal finely barbed. Palptrochanter (Fig. 3J) *v1* seta simple, *v2* one-sidedly barbed, article anteroventral border with a thickening ending between the ventral setae. In chelicera (Fig. 3K) movable digit with four teeth, the proximal one larger, fixed digit with two distant teeth ahead the pilus dentilis and two rounded teeth behind it, followed by lamellar arcuate tooth, then a more solid, asymmetric tooth and a solid arcuate edge.

Legs — (Fig. 4) Seta *v2* on Co I enlarged and barbed, seta *al* on Tr I somewhat shorter and thicker (Fig. 4A). Leg II (Fig. 4B, C): seta *al* on Tr II finely barbed; setae *all*, *al2*, and *ad2* on Fe II shorter and thicker, seta *ad3* minute, setae *av* on Fe II, Ge II and Ti II thickened and barbed; seta *pv* on Ge II barbed subapically. Some setae on basitarsus and tarsus somewhat thicker and barbed (Fig. 4C). Leg IV (Fig. 4D, E): setae *pl* and *pd* on Fe IV thick and short; *pv* seta on Ge IV and both ventral setae on Ti IV thickened, *pv* setae on the genu and tibia finely barbed; tactile *ta* seta on tarsus thin and long; some *pl* setae on the basitarsus and tarsus finely barbed. Tr IV with indistinct cross-oriented dorsal tubercle (Fig. 6C). Other aspects of legs I–IV unremarkable.

Male (Figures 5, 6A, B, D) (n=6)

Idiosoma — Sclerotised as in the females, paratypes 513–518 x 270–291 µm (length x width, n=2), body laterally incised at the fourth coxae level. **Podonotum** – the length of setae: 25–28 (*j1*), 31–33 (*j2*), 42–44 (*j3*), 37–39 (*j4*), 31–34 (*j5*), 27–29 (*j6*), 73–75 (*r3*). **Opisthonotum** – setae length from *ca.* 26 to 48 (*J6*). **Peritreme** – 124–127 long, ending anteriorly as in the females. Dorsal setae simple, reticulation pattern as in the female.

Ventral idiosoma — Setae length: 33–36 (*st1*), 36–40 (*st2*), 32–34 (*st3*), 27–30 (*st4*), 24–27 (*st5*), 31–34 (*JV1*), 19–22 (*ZV1*), other opisthogastral setae approx. 25 (*SV3*) to 42 (*JV4*). Ventral setae simple. **Sternal region** (Fig. 5A) – genital lamina subrectangular with the rounded anterior corners. Presternal plates (Fig. 5A) subrectangular, with relatively large anterior protrusions. Sternum with gland pores *gv1* somewhat anteriorly to the *st3* setae level, followed by two pairs of moderately distinct, small thickenings of the sternal cuticle, the anterior thickenings elongated, whereas the posterior one rounded. Gland pores *gv2* with a double opening, pores *iv5* slightly shifted toward *st5* setae. Sternum and opisthogaster reticulation scale-like.

Gnathosoma — Gnathotectum (Fig. 5B) central and lateral prongs dissimilar in shape. Corniculi (Fig. 5C) adaxial margin sinuous. Hypostome with 10 rows of weakly visible denticles, the hypostomatic setae simple and the palpcoxal barbed. Palptrochanter (Fig. 5D) *v1* seta simple, *v2* one-sidedly barbed, the article anteroventral border with a thickening ending between the ventral setae. In chelicera, in the ventral perspective the movable digits apically axially curved, whereas the fixed digits straight and somewhat longer. In the lateral view (Fig. 5E), the movable digit with two denticles ahead the pilus dentilis, and one pointed denticle followed by two rounded ones behind it (Fig. 5F).

Legs — Leg II is spurred as follows: when viewed from the ventral side (Fig. 6A), the femoral main spur is relatively short and curved posterolaterally. The axillary process hooked posterolaterally, genual and tibial spurs are axially oriented, spindle-shaped and somewhat asymmetric. The genual spur is located closer to the anterior article margin than the tibial one. When viewed from the lateral side, leg II (Fig. 6B) shows a finger-like straight femoral main spur, axillary process asymmetric, both spurs on the genu and the tibia conical. Most of the

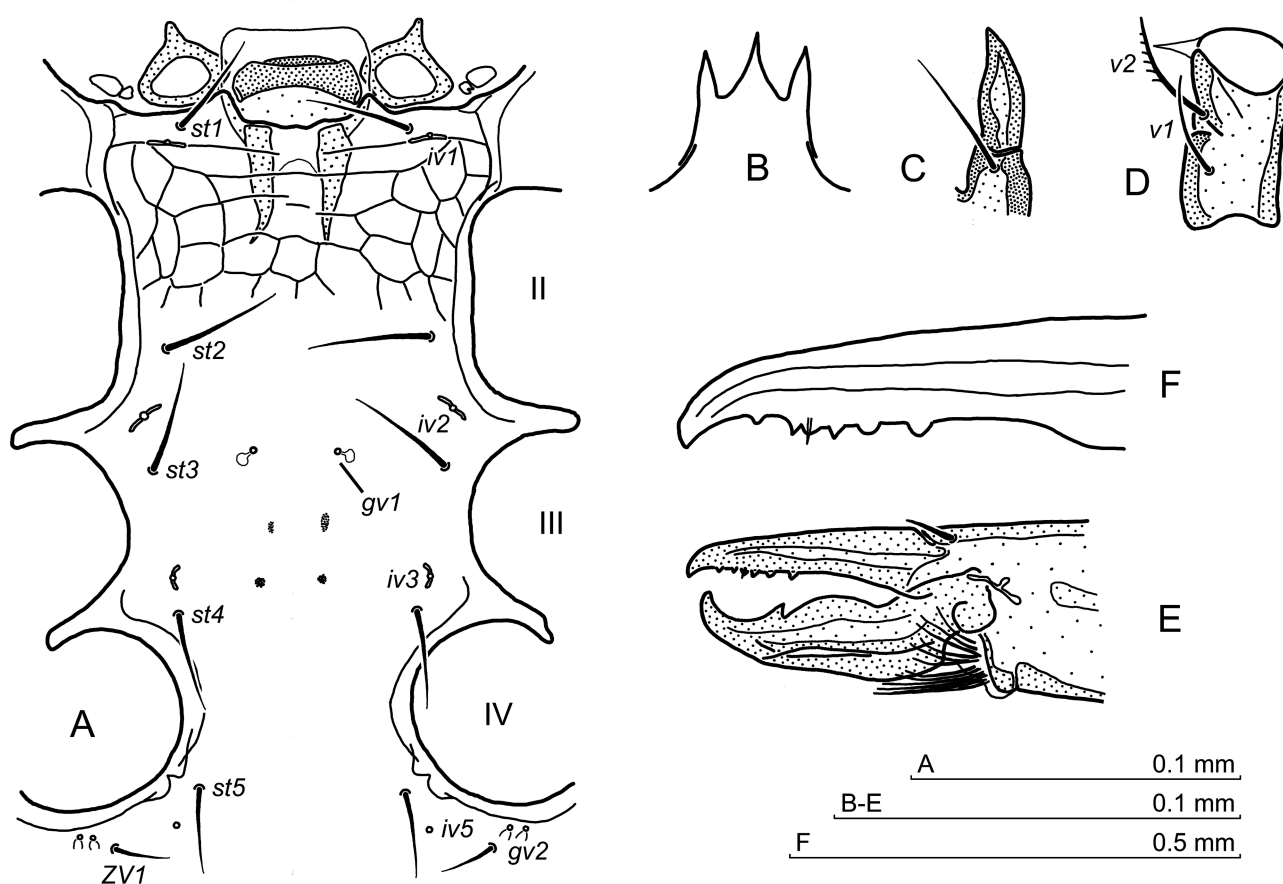


Figure 5 *Leptogamasus (L.) ojdulaensis* n. sp., male: A – presternal plates, genital lamina and sternogenital shield; B – gnathotectum; C – corniculus, ventrally; D – palpcoxa, ventrally; E – chelicera, antiaxially; F – cheliceral fixed digit. Abbreviations: II–IV the openings for coxae II to IV; *st1*–*st5* sternal setae; *ZV1* opisthogastral seta; *v1*, *v2* palptrochanter setae; *gv1*, *gv2* gland pores; *iv1*–*iv5* pore openings.

setae on leg II simple, but the setae *al1* and *al2* on the genu and the tibia barbed; setae *al1*, *al2* and *ad2* on the Fe II shorter and thicker, whereas *ad3* needle-like; setae *al* on the basitarsus and the tarsus somewhat thickened and finely barbed. Setation of legs I and IV as in the female. Tubercle on trochanter IV (Fig. 6D) similar as in the female (Fig. 6C). Other aspects of legs I–IV unremarkable.

Material examined

Holotype — Female (slide no. 2354 A), Harghita Mts. (Covasna County), Eastern Carpathians, Romania, 45.9646°N, 26.3596°E, alt. ca. 1006 m a.s.l., 6 April 2011, litter in mixed forest (spruce and beech).

Paratypes — 6 females, 2 males (slides no. 2354 B–G, I, J), *ibid*.

Other material — 1 female (slide no. 2348 G), Gurghiu Mts, (part of Caliman-Harghita Mts), Eastern Carpathians, Romania, 46.7549°N, 25.0622°E, alt. ca. 612 m a.s.l., 4 April 2011, litter in mixed forest (spruce and beech), leg. Dr. M. Liana; 4 females, 1 male (slide no. 2983), Tinovul Mohoș peat bog, Bodoc Mts (Harghita County), Eastern Carpathians, Romania, 46.1353°N, 25.9000°E, alt. ca. 1051 m a.s.l., 7 June 2022, peat bog with sphagnum, bog rosemary, and blueberries, leg. Prof. W.M. Weiner; 2 females, 3 males (slide no. 2984), Tinovul Mohoș, Bodoc Mts (Harghita County), Eastern Carpathians, Romania, 46.1347°N, 25.8987°E, alt. ca. 1054 m a.s.l., 7 June 2022, litter and soil in a spruce forest, leg. Dr. Cristina

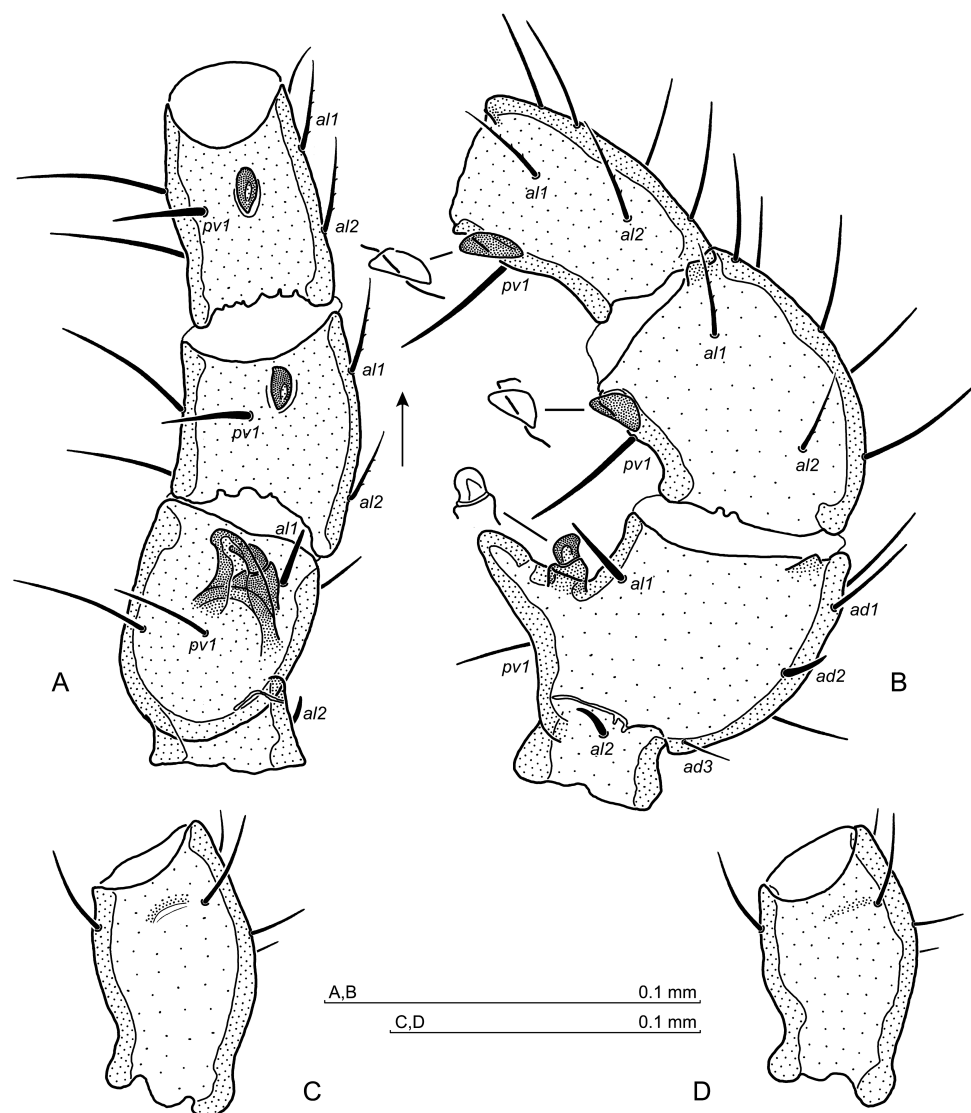


Figure 6 *Leptogamasus (L.) ojdulaensis* n. sp., male (A, B, D) and female (C): A – Fe II, Ge II and Ti II, ventrally; B – Fe II, Ge II and Ti II in the anterolateral perspective (other aspects of the axillary process and the spurs on the genu and tibia are shown). C, D – Tr IV dorsally. Some setae are marked. Arrow at the anterolateral side.

Fiera.

Types were collected by Dr. M. Liana, whereas all other material – as indicated accordingly.

Type deposition — Types are deposited in the Zoological Division of the Nature Education Centre, Jagiellonian University, Kraków, Poland, the remaining material is held in the Author's collection.

Etymology

The specific name *ojdulaensis* refers to Ojdula, the nearest village to area where the material under study was encountered.

Differential taxonomy – general discussion

The *Leptogamasus* (*Leptogamasus*) new species currently described, may be differentiated from the known species owing to a number of characteristic features, usually related to the morphology of the genital orifice in the females. In the males, the structure of chelicera is also a very helpful feature, as well as the armature of second leg, if to a lower extent. Despite the above-referenced characteristics, there are also some other features potentially useful in the identification process. As far as the females are concerned, it is the actual location of gland pore *gv1*. In the presently described species, three possible *gv1* locations are addressed, i.e. just behind setae *st3* (*L. (L.) holdaensis* n. sp.), close to the body's axial line (*L. (L.) gurguiensis* n. sp. and *L. (L.) ojdulaensis* n. sp.), and in the middle position at the setae *st3* level, yet still close to the posterior sternal margin (*L. (L.) horribilis* n. sp.). Most regretfully, however, such characteristics are of a rather limited use, since these pores are simply not referenced in the older literature on the subject.

Differential taxonomy – *Leptogamasus* (*L.*) *ojdulaensis* n. sp.

Leptogamasus (*L.*) *ojdulaensis* n. sp. female main characteristics are as follows: each paragnathum features a conspicuous rounded protrusion directed axially, yet not reported in any other species, *gv1* are located axially, the epigynum features two teeth, the endogynial sperules are subspherical, but usually with a small protrusion located anteroventrally. The stipule is wide and arcuate, with a more solid basal part and the anterior margin lamellar, forming a number of teeth. Very closely similar characteristics are to be encountered in *Leptogamasus* (*L.*) *monteamiatus* Witaliński, 2021, *Leptogamasus* (*L.*) *margarete* Juvara-Balș, 1981, and *Leptogamasus* (*L.*) *nudiglobatus* (Athias-Henriot, 1967), as well as in *Leptogamasus* (*L.*) *montanus* Witaliński, 2020. The evident differences between the respective species are as follows: in *L. (L.) nudiglobatus* and *L. (L.) montanus* the teeth on the epigynial shield are absent, whereas in *L. (L.) margarete* and *L. (L.) monteamiatus* the epigynial teeth featured, in *L. (L.) margarete* *gv1* are located not axially, but at the setae *st3* level, whereas in *L. (L.) montanus* even closer to *st3* setae. In the case of *L. (L.) monteamiatus*, the sperules are sharply protruded rather than rounded anteriorly, as well as the epigynial teeth are large and oriented adaxially, whereas in the newly described species they are small and directed antieriad. Finally, the endogynial sac in *L. (L.) margarete* features two pairs of teeth and a central unpaired tooth in the anterior part of the sac, whereas in *L. (L.) ojdulaensis* n. sp. in the endogynial sac there is one or two (a pair) of little teeth in the sac's midregion, and in *L. (L.) montanus* the endogynial sac is edentate. As far as the males are compared, the armature of the second leg in *L. (L.) ojdulaensis* n. sp. is similar to the one in *L. (L.) margarete*, and *L. (L.) monteamiatus*. The differences consist mainly in the cheliceral fixed digit, which in the newly described species features two teeth in front of the pilus dentilis, and three teeth behind it, the first one of them is pointed and both proximal ones are rounded apically. In *L. (L.) margarete* cheliceral the fixed digit is very narrow and features one tooth behind the pilus dentilis, whereas in *L. (L.) monteamiatus* cheliceral fixed digit features an arcuate lamellar protrusion in front of the pilus dentilis, and a row of approx. 8–9 small teeth behind it. In *L. (L.) montanus* cheliceral fixed digit has a blunt apex, 1–2 small teeth in front, and a row of 8–9 minute denticles behind the pilus dentilis. The second leg armature in the case of *L. (L.) nudiglobatus* and *L. (L.) ojdulaensis* n. sp. is evidently different, as in the former species, the genual and the tibial spurs are elongated and running along the article surface, whereas in the latter species, they are conical.

Leptogamasus (*Leptogamasus*) *gurguiensis* n. sp.

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(Figures 7–10)

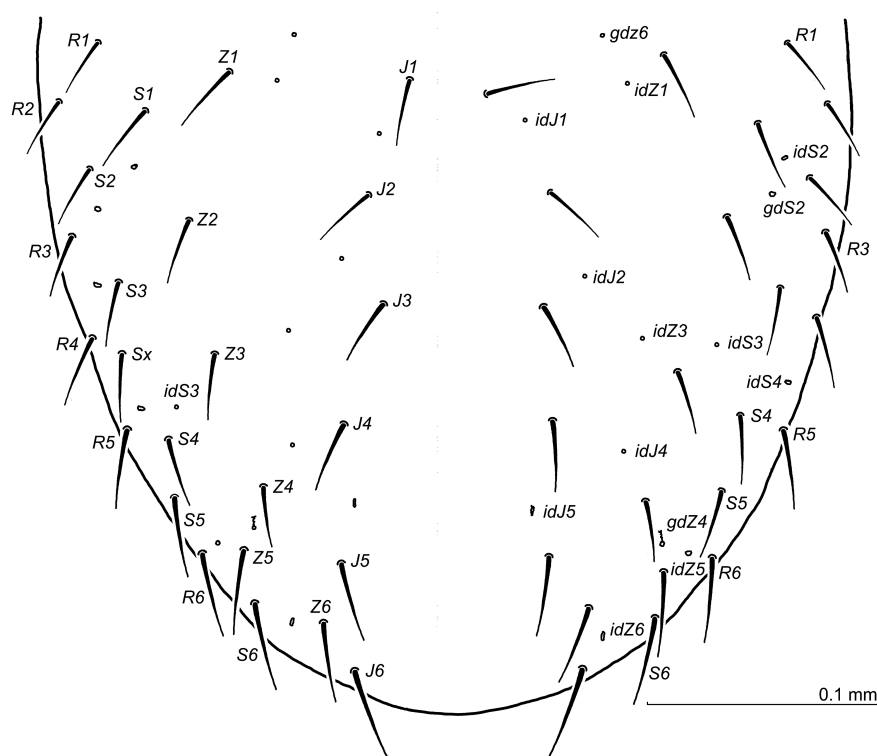


Figure 7 *Leptogamasus (L.) gurghiuensis* n. sp., female: opisthonotum (holotype). Abbreviations: regular setae (J, Z, S, R), supplementary seta Sx, pores (idJ, idZ, idS), and gland openings (gdS, gdZ) are marked.

Diagnosis

Female and male — Idiosoma well sclerotised; opisthonotum with 24 pairs of regular setae, and marginally with one or two supplementary setae (Sx); Tr IV without a tubercle/tooth.

Female — Gnathotectum three-prong type with narrow prongs, the central one longer; the presternal plates with moderately long adaxial protrusions; the sternal shield anterior margin with a shallow concavity; *gv1* close to the body's axial line; the anterior margins of the epigynial shield straight, posterolateral ones short and arcuate, the entire anterior prong less pigmented, or a less pigmented band behind the prong is discernible, the internal (dorsal) surface of the epigynium without teeth; the endogynial spherules elongated axially and culminating anteriorly into two to four acute protrusions; stipule wide but short, armed with many teeth, frequently ventrally directed.

Male — Gnathotectum trispinate with similar triangular prongs; genital lamina with the subrectangular anterior part and the anterior corners rounded; the presternal plates quadrilateral, with relatively long anterior protrusions; corniculi antiaxial margin angular rather than arcuate; cheliceral fixed digit straight and narrow, ahead of the pilus dentilis with two or three denticles, but behind it with five or six similar denticles, an arcuate concavity present just below external (dorsal) margin at the digit midregion; leg II laterally: femoral main spur nearly straight, the axillary process semi-lunar, genual and tibial spurs conical and rounded apically, the former one somewhat smaller and located closer to the distal article margin.

Description

Female (Figures 7, 8) (n=20)

Idiosoma — Well sclerotised, 600–620 x 300–320 (length x width, n=5), holotype 594

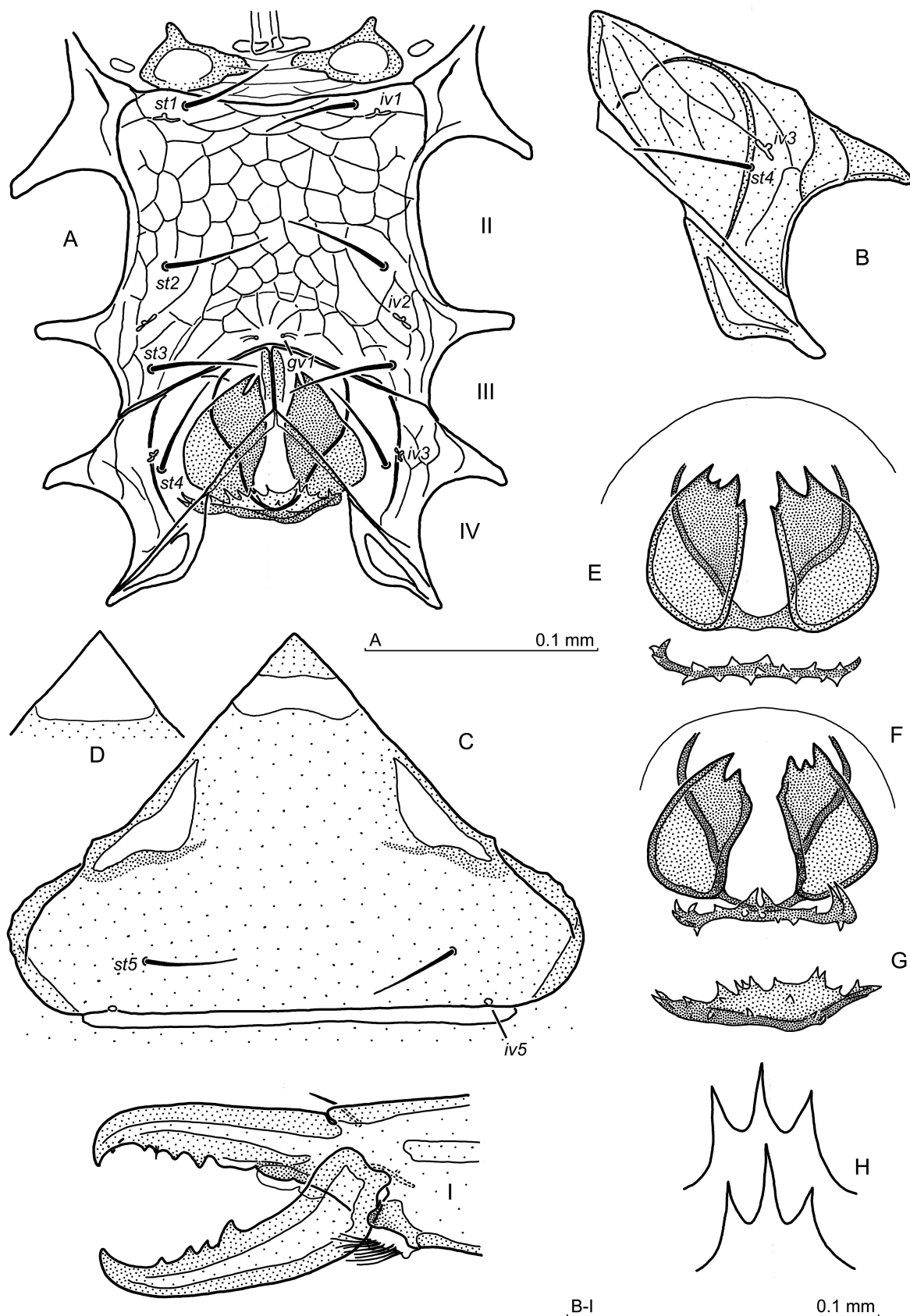


Figure 8 *Leptogamasus (L.) gurghiuensis* n. sp., female: A – sternal region of the idiosoma; B – paragynium; C – epigynum; D – apical part of the epigynum, another specimen; E, F – endogynium, two aspects; G – stipule; H – gnathotectum, two aspects; I – chelicera, adaxially. Abbreviations as in Figure 3; II–IV the openings for coxae II to IV. A, C, G – holotype.

x 309; laterally incised at fourth coxae level; opisthosomal part somewhat wider than the podonotal one. **Podonotum** – 21 pairs of setae, setae length in paratypes: 35–42 (*j1*), 30–34 (*j2*), 30–35 (*j3*), 37–41 (*j4*), 33–39 (*j5*), 27–33 (*j6*), 75–88 (*r3*), in holotype 37 (*j1*), 30 (*j2*), 35 (*j3*), 39 (*j4*), 34 (*j5*), 33 (*j6*), 86 (*r3*). **Opisthonotum** (Fig. 7) – with 24 pairs of regular setae, and one or two supplementary setae (Sx) in the marginal regions. Setae length range from ca. 29 (e.g. *J1–J4*) to 43 (*S6*). Dorsal setae simple, podonotum not reticulated, opisthonotum with a scale-like reticulation. **Peritreme** – length 135–144 in paratypes and 141 in holotype, ending anteriorly in the midregion of the opening for Co II, somewhat anterior to the level of the podonotal setae *r2*.

Ventral idiosoma (Fig. 7A) — Setal length in paratypes: 31–39 (*st1*), 40–47 (*st2*), 43–50 (*st3*), 32–39 (*st4*), 33–37 (*st5*), 37–41 (*JVI*), 22–25 (*ZVI*), and other opisthogastral setae ca. 29–35; in holotype 41 (*st1*), 44 (*st2*), 48 (*st3*), 40 (*st4*), 33 (*st5*), 39 (*JVI*), 25 (*ZVI*), respectively. Ventral setae simple, reticulation of the opisthogastral scale-like. The anterior margin of the sternal shield with a shallow concavity, the area between the presternal plates and the sternum margin with horizontal lines. Presternal plates usually with rather short and obtuse adaxial protrusions and moderately long anterior protrusions. The gland pores *gv1* located close to the axial line of sternum. Paragynial shields (Fig. 8A, B) with narrow and arcuate metagynial sclerites reaching the paragynial anterior margin. Epigynial shield approximately triangle (Fig. 8C) with less pigmented apex or subapically a less pigmented cuticle band (Fig. 8D), the anterolateral margins straight, the posterolateral ones short and arcuate. The internal (dorsal) surface of the epigynium without teeth. Spherules of the endogynium (Fig. 8A, E, F) axially elongated and their anteriorly culminate in two to four acute tooth-like protrusions; stipule located behind the spherules, wide and short, roughly straight or arcuate, and decorated with numerous denticles (Fig. 8A, E–G). Gland pores *gv2* with one opening, *iv5*, *ivo2*, *ivo3*, and *gv3* well discernible.

Gnathosoma — Gnathotectum (Fig. 8H) trispinate, all prongs similar, narrow and acute, and the central one longer. Corniculi conical, hypostome with 11 rows of denticles, hypostomatic and palpcoxal setae simple, subequal in length, but the palpcoxal setae somewhat longer. Palptrochanter *v1* seta simple, *v2* barbed. In chelicera (Fig. 8I) movable digit with four teeth, the proximal one much larger; fixed digit with two visible teeth ahead the pilus dentilis and two bigger teeth behind it, followed by an undulate lamellar, then a more solid arcuate edge.

Legs — Seta *v2* on Co I larger than *v1* and barbed, seta *al* on Tr I somewhat shorter and thicker. Leg II: seta *al* on Tr II finely barbed, setae *all*, *al2*, and *ad2* on Fe II shorter and thicker, seta *av* larger and barbed; setae *al* on Ge II and Ti II finely barbed, whereas *av* setae on on articles thickened and barbed. Some setae on basitarsus and tarsus somewhat thicker and barbed. Leg IV: seta *al* on Tr IV somewhat shorter than other, seta *pl* finely barbed; setae *pl* and *pd* on Fe IV thick and short; *pv* setae on the genu and both ventral setae on tibia thickened, *pv* seta on the tibia finely terminally barbed; tactile *ta* seta on Ta IV thin and long; some *pl* setae on basitarsus and tarsus slightly thickened. Tr IV without a tubercle or a tooth. Other aspects of legs I–IV unremarkable.

Male (Figures 9, 10) (n=12)

Idiosoma — Well sclerotised, 545–565 x 250–260 (length x width, n=5), body more or less laterally incised at fourth coxae level. **Podonotum** – setae length: 24–26 (*j1*), 26–33 (*j2*), 34–39 (*j3*), 31–37 (*j4*), 29–34 (*j5*), 25–29 (*j6*), 76–82 (*r3*). **Opisthonotum** – setae length from ca. 26 up to 42, the longest in the posterolateral parts. Dorsal setae simple. Reticulation of the podonotum non-discernible, opisthonotum with a scale-like reticulation. **Peritreme** length 123–128, ending anteriorly as in the females.

Ventral idiosoma — Setae length: 30–34 (*st1*), 34–41 (*st2*), 31–34 (*st3*), 29–33 (*st4*), 25–27 (*st5*), 30–34 (*JVI*), 20–24 (*ZVI*), other opisthogastral setae ca. 22–31. Ventral setae simple. **Sternal region** (Fig. 9A) – the genital lamina with subrectangular anterior part and anterior corners rounded, its anterior margin straight or slightly concave, whereas the lateral ones with shallow concavities (Fig. 9A). Presternal plates (Fig. 9A, B) quadrilateral, with

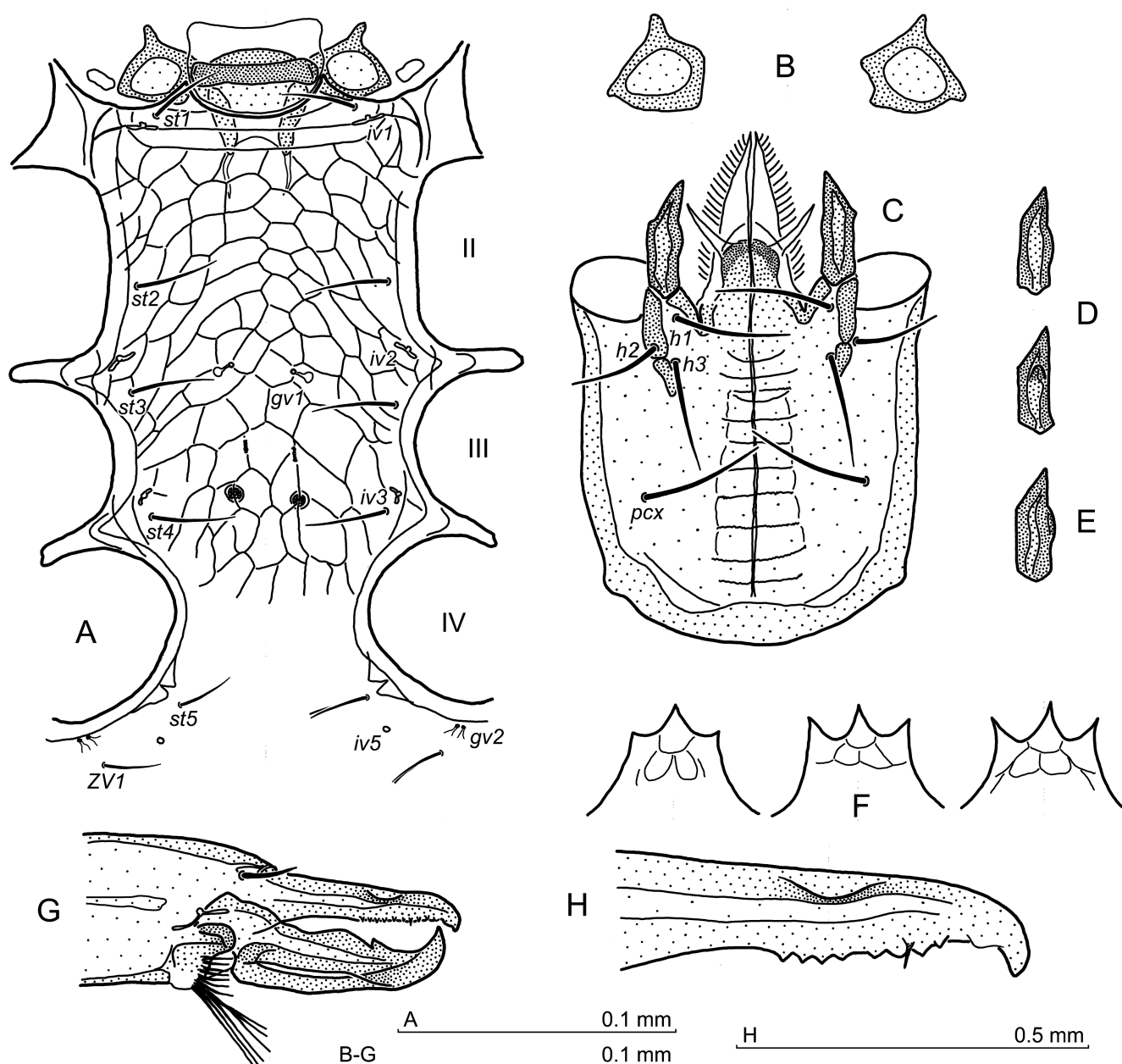


Figure 9 *Leptogamasus* (L.) *gurghiuensis* n. sp., male: A – presternal plates, genital lamina and sternogenital shield; B – presternal plates; C – gnathosoma, ventrally; D – corniculus, ventrally, two aspects; E – corniculus, slightly squashed; F – gnathotectum, three aspects; G – chelicera, antiaxially; H – cheliceral fixed digit. Abbreviations as in Figure 5; *h1*–*h3* and *pcx* hypostomatic and palpal setae, respectively.

relatively long anterior protrusions. Sternum with gland pores *gv1* anteriorly to the *st3* setae level, and the distance between respective pores is smaller than the distance of each pore to the nearest *st3* seta. Gland pores are followed by two pairs of thickenings of the sternal cuticle, the anterior pair is elongated and weakly pronounced, the posterior one is button-like and well visible. Gland pore *gv2* with two openings, pores *iv5* between *st5* and *ZV1* setae, but somewhat closer to *st5*. Pores *ivo2*, *ivo3*, and *gv3* well discernible.

Gnathosoma (Fig. 9C) — Gnathotectum (Fig. 9F) trispinate with all prongs similar and triangular, shorter than in the female. Corniculi (Fig. 9C, D) with angular antiaxial margin and

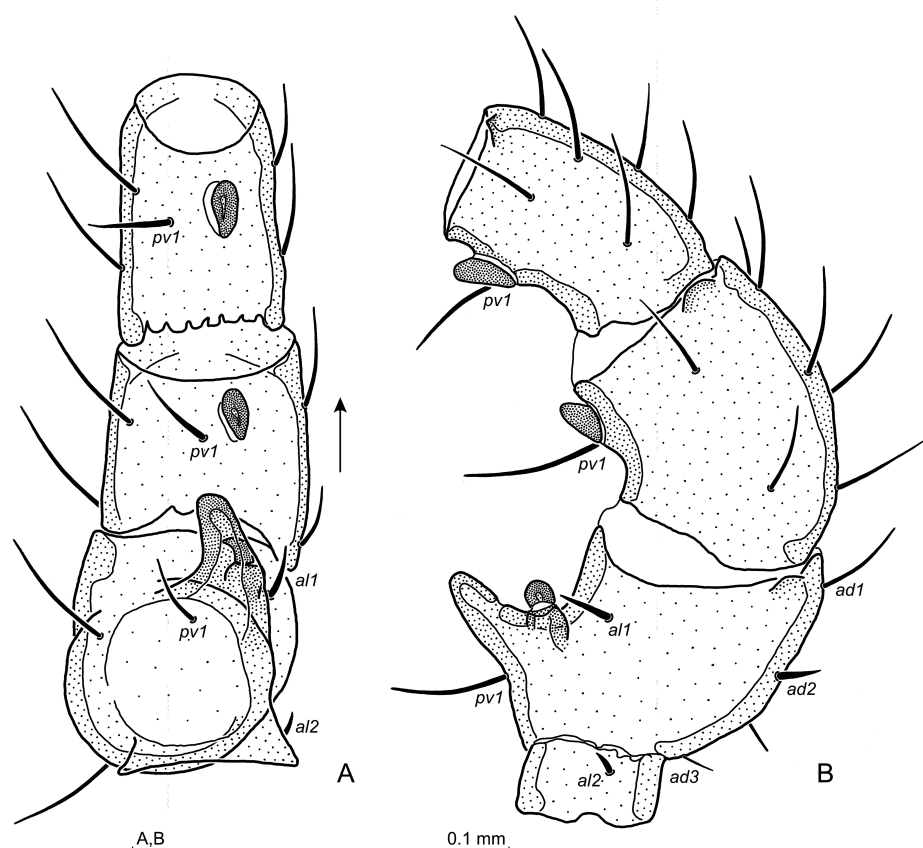


Figure 10 *Leptogamasus (L.) gurghiuensis* n. sp., male: A – Fe II, Ge II and Ti II, ventrally; B – Fe II, Ge II and Ti II in the anterolateral perspective. Some setae are marked. Arrow at the anterolateral side.

nearly straight adaxial edge, if slightly squashed, adaxial edge shows arcuate elevation (Fig. 9E). Hypostome with semi-lunar thickenings between corniculi at the base of the internal malae, followed by 11 rows of denticles, hypostomal and palpcoxal setae simple. Palptrochanter *vl* seta simple, *v2* larger and one-sidedly barbed. In chelicera – when observed from the ventral side, mobile digits curved adaxially, the fixed ones straight. Laterally (Fig. 9G), mobile digit with one small tooth followed by an arcuate edge proximally, fixed digit (Fig. 9G, H) straight and narrow with two or three denticles ahead the pilus dentilis and the row of five or six similar denticles behind it. In the digit midregion, an arcuate concavity just below external (dorsal) margin is discernible (Fig. 9H).

Legs — Leg II (Fig. 10A, B) spurred as follows: when viewed from the ventral side (Fig. 10A), the femoral main spur is moderately long and directed somewhat posterolaterally, the axillary process with the apex directed posterolaterally, the genual spur droplet-shaped, the tibial one droplet-shaped or lenticular. The genual spur located closer to the article margin than the tibial one. From a lateral perspective (Fig. 10B), the femoral main spur nearly straight. The axillary process semi-lunar. Genual and tibial spurs conical and rounded apically, the former one somewhat smaller and located closer to the distal article margin. Setae on leg II simple, femoral setae *al1*, *al2* and *ad2* thicker and shorter, whereas *ad3* short and needle-like. Setation of legs I and IV as in the female. Tr IV without tubercle or tooth. Other aspects of legs I–IV unremarkable.

Material examined

Holotype — Female (slide no. 2348 A), Gurghiu Mts, (part of Caliman-Harghita Mts), Eastern Carpathians, Romania, 46.7549°N, 25.0622°E, alt. ca. 612 m a.s.l., 4 April 2011, litter in mixed forest (spruce and beech).

Paratypes — 16 females, 9 males (slides no. 2348 B-F, 2349), *ibid.*

Other material — 2 females (slide no. 2283), Harghita Mts (close to Lacul Roșu), Eastern Carpathians, Romania, 46.7770°N, 25.7706°E, alt. ca. 1030 m a.s.l., 16 April 2010, litter in spruce forest bordering with a pasture; 1 female, 3 males (slide no. 2347, 2348 G), data as in holotype.

Type deposition — Types are deposited in the Zoological Division of the Nature Education Centre, Jagiellonian University, Kraków, Poland, whereas all the remaining material is held in the Author's collection.

Etymology

The specific name *gurghiuensis* refers to the Gurghiu Mts where the holotype along with the paratypes were encountered.

Differential taxonomy

Leptogamasus (*L.*) *gurghiuensis* **n. sp.** female shares some similarities with *Leptogamasus* (*L.*) *silvestris* Witaliński, 2021, and also with *Leptogamasus distinctellus* (Berlese, 1906). In all these species the endogynial spherules are elongated anteriorly, and their anterior poles form several protrusions. In *L. (L.) gurghiuensis* **n. sp.**, there are two to four acute protrusions, whereas in *L. distinctellus* each spherule culminates into two little finger-shaped protrusions (Plate XVII, fig. 13 in Berlese, 1906). However, in *L. (L.) gurghiuensis* **n. sp.** the endogynium is armed in a prominent stipule. By way of a contrast, in *L. distinctellus* endogynium no stipule is discernible whatsoever. The stipule structure differs evidently in *L. (L.) gurghiuensis* **n. sp.** and *L. (L.) silvestris* females: in the former species, the stipule is wide, overlapping the basal parts of the spherules, whereas in *L. silvestris*, it is relatively small, located between the spherular bases. *L. (L.) gurghiuensis* **n. sp.** male differs from *L. (L.) silvestris* in respect of the second leg structure, since in the former species, the genual and tibial spurs are similar in shape and size, whereas in *L. (L.) silvestris*, the genual spur is small and tubercular, whereas the tibial one larger and conical. The comparison of males between *L. (L.) gurghiuensis* **n. sp.** and *L. distinctellus* is not feasible, owing to a rather scarce original description of the latter species.

Leptogamasus (*Leptogamasus*) *holdaensis* **n. sp.**

Zoobank: EFDCEF33-46A4-4968-BC1E-479F22059C60

(Figures 11–15)

Diagnosis

Female and male — Gnathotectum trispinate with pointed prongs; opisthonotum with 24 pairs of setae plus either four (two pairs) or three (one pair and one unpaired) supplementary setae; Tr IV without a tubercle.

Female — The central prong of gnathotectum longer, the lateral ones slightly curved; presternal plates subtriangular, with variably pronounced adaxial protrusions; anterior margin of the sternal shield with an axial shallow concavity; gland pores *gv1* located behind *st3* sternal setae; epigynial shield with two teeth on the internal (dorsal) surface, anterior margins straight and more pigmented, posterior margin forms a shallow concavity; the spherules of the endogynium pointed anteriorly and tear-shaped, the walls of endogynial sac visible as the four sides of the hexagon, featuring a pair of small teeth, stipule minute.

Male — Gnathotectum prongs triangular and shorter than in the female; genital lamina with the rounded anterior corners, anterior margin undulate, lateral sides concaved; presternal plates subrectangular, with moderately large anterior protrusions; corniculi with the adaxial margin

slightly sinuous; cheliceral fixed digit moderately narrow, with an arcuate tooth between the apex and the pilus dentilis, followed by a row of approx. seven denticles behind the pilus dentilis; leg II: as viewed from the ventral side, the femoral main spur is moderately long and terminally obtuse, the axillary process hooked posterolaterally, genual and tibial spurs lenticular and axially oriented, genual spur somewhat smaller and closer to the distal article margin; as viewed from the lateral side, leg II shows finger-like femoral main spur, axillary process curved toward the article, both spurs on the genu and tibia conical, with somewhat rounded tips, genual spur smaller than the tibial one, and located closer to the article distal margin than the tibial one.

Description

Female (Figures 11–13) (n=2)

Idiosoma — Well sclerotised, paratype 623 x 340 (length x width, n=1), holotype 615 x 319. **Podonotum** — 21 pairs of setae, setae length in paratype: 33 (*j1*), 26 (*j2*), 27 (*j3*), 34 (*j4*), 30 (*j5*), 27 (*j6*), 85 (*r3*), in holotype 29 (*j1*), 30 (*j2*), 30 (*j3*), 35 (*j4*), 30 (*j5*), 26 (*j6*), 81 (*r3*). **Opisthonotum** (Fig. 11) — 24 pairs of setae, plus two pairs of supplementary setae (*Sx*) (paratype, Fig. 11B) or one pair plus one supplementary seta (holotype, Fig. 11A). In the holotype the two opisthonotal setae are also missing. Setae moderately long, length from approx. 20 (some lateral setae) up to 34 (*J6*), holotype 20–34. Dorsal setae simple, reticulation of the podonotum not discernible, opisthonotum with a scale-like reticulation, the margin of podonotum distinctly separated. **Peritreme** — length 131, (holotype 129), anterior tip located in the midregion of the opening for Co II, at the level of the podonotal setae *r2*.

Ventral idiosoma (Fig. 12) — Setae length: 33 (*st1*), 38 (*st2*), 39 (*st3*), 34 (*st4*), 30 (*st5*), 35 (*JV1*), 22 (*ZV1*), other opisthogastral setae ca. 20–34, in holotype 29 (*st1*), 35 (*st2*), 37 (*st3*), 38 (*st4*), 37 (*st5*), 38 (*JV1*), 22 (*ZV1*), other opisthogastral setae approx. 21–34. Ventral setae simple, reticulation of the sternum and opisthogaster scale-like. Anterior margin of the sternal shield with a shallow concavity in the central part (Fig. 12), the area between the presternal plates and the sternum with transversal lines. Presternal plates subtriangular in outline, with arcuate posterior margin and adaxial protrusions non-distinct and obtuse (holotype, Fig. 12), or only somewhat better pronounced (paratype) (Fig. 13A). The gland pores *gv1* located behind setae *st3* (Fig. 12). Paragynial shields (Figs 12, 13B) metagynial sclerites narrow and arcuate, anteriorly running far behind the anterior paragynial margin. The anterior epigynial margins straight and more pigmented, the posterior margin slightly concaved, the posterolateral margins short and convex (Figs 12, 13C). A pair of distinct teeth on the internal (dorsal) epigynial surface is discernible. Endogynium (Figs 12, 13D–F) with oval spherules, each pointed anteriorly, forming a tear-like shape. The walls of endogynial sac forming four sides of the hexagon, well discernible posteriorly, and featuring a pair of small teeth (Fig. 13E). Stipule (Fig. 13D) very small and variable in shape. Gland pores *gv2* with one hardly visible opening; pores *iv5* just behind the epigynial shield, *ivo2* and *gv3* well discernible, whereas *ivo3* poorly visible.

Gnathosoma — Gnathotectum (Fig. 13G) trispinate, with central prong longer and more slender, whereas lateral ones somewhat curved. Corniculi conical, hypostome with 11 rows of denticles, hypostomal and palpcoxal setae simple, subequal in length, but the *h2* setae are shorter. Palptrochanter *v1* seta simple, *v2* barbed. In chelicera (Fig. 13H) movable digit with four teeth, the proximal one larger. Fixed digit with two distant teeth ahead the pilus dentilis, and two behind it, followed by a low lamellar projection with an irregular edge, and a more solid arcuate edge located proximally.

Legs — Seta *v2* on Co I larger than *v1* and finely barbed, seta *al* on Tr I shorter and thicker. Leg II: setae *al1*, *al2*, and *ad2* on Fe II shorter and thicker, seta *av* somewhat larger and barbed; setae *al* on Ge II and Ti II finely barbed, whereas *av* setae on on both articles terminally finely barbed. Some setae on basitarsus and tarsus somewhat thicker and finely barbed. Leg IV: *pd* and *pl* setae on the femur thick and short; *pv* setae on Ge IV and both ventral setae on Ti IV slightly enlarged, *pv* seta on the tibia finely terminally barbed; tactile *ta* seta on Ta IV thin and

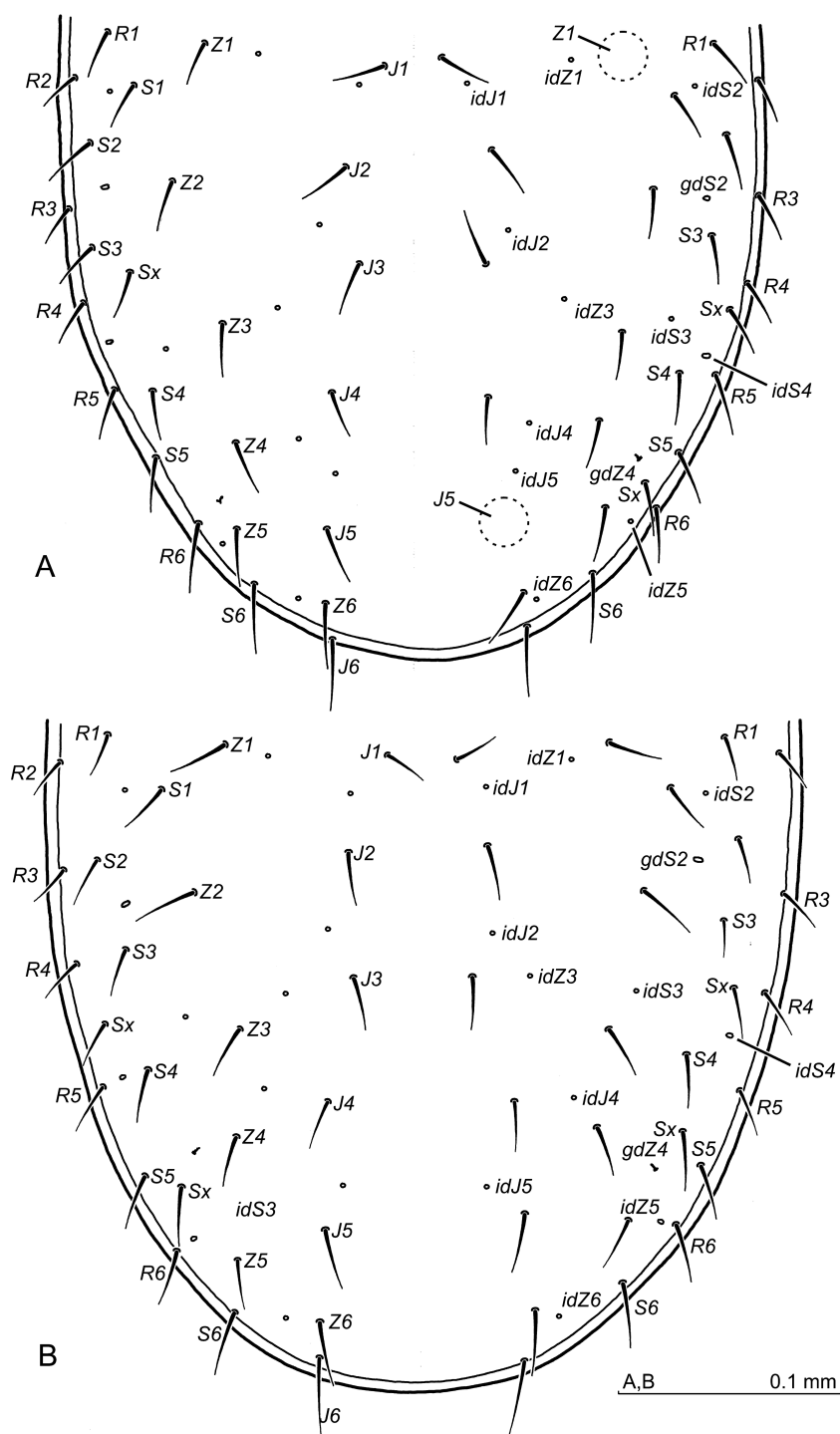


Figure 11 *Leptogamasus (L.) holdaensis* n. sp., opisthonotum of the female (A – holotype, B – paratype). Abbreviations as in Figure 7. Note three supplementary setae (Sx) featured, and two setae (Z1, J5) missing in A, whereas two pairs of Sx setae are found in B.

long; some setae on basitarsus and tarsus slightly thickened, sometimes terminally barbed. Tr IV without the dorsal tubercle. Other aspects of legs I–IV unremarkable.

Male (Figures 14, 15) (n=3)

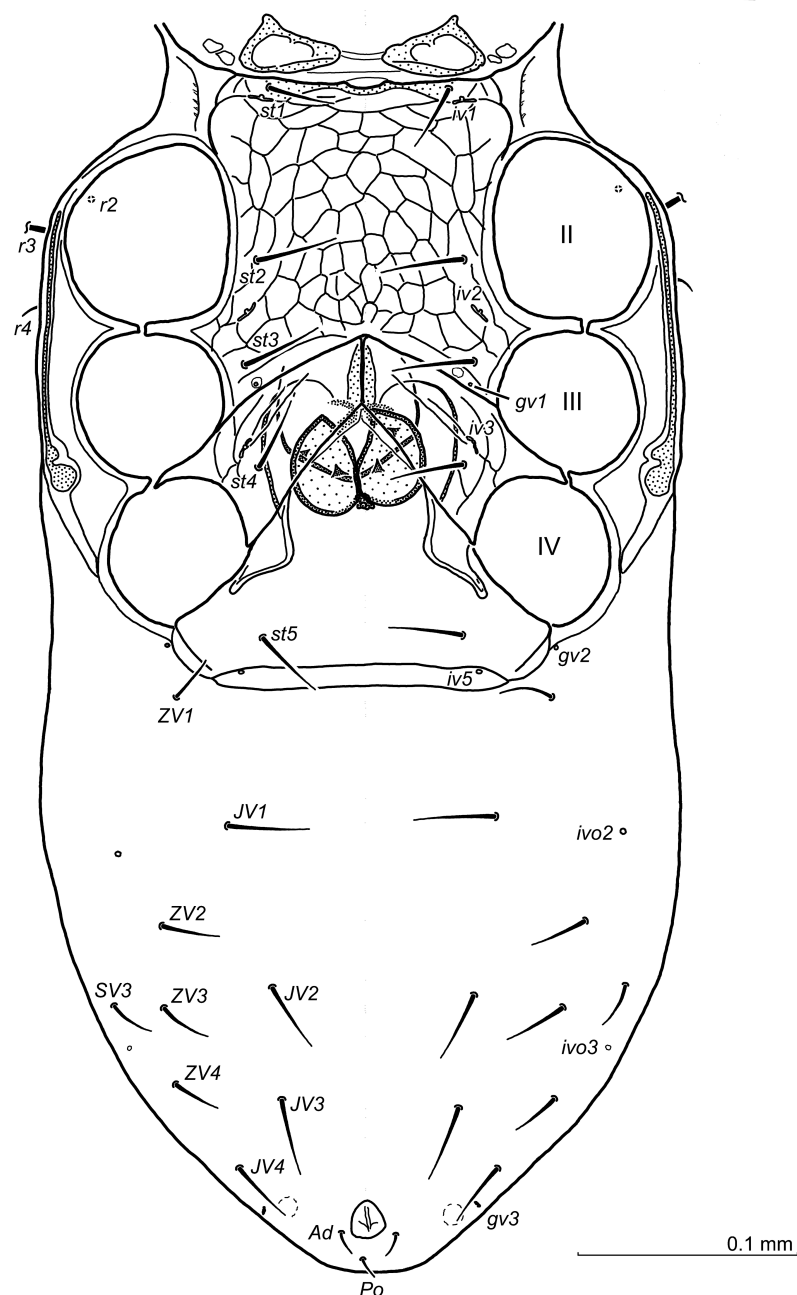


Figure 12 *Leptogamasus (L.) holdaensis* n. sp., ventral side of the female idiosoma (holotype). Abbreviations as in Figure 2; r2–r4 podonotal setae.

Idiosoma — Sclerotised as in the female, 580–610 x 290–305 µm (length x width, n=3), body oval in outline. **Podonotum** – the length of setae: 33–37 (*j1*), 24–29 (*j2*), 33–37 (*j3*), 31–34 (*j4*), 27–30 (*j5*), 21–25 (*j6*), 84–86 (*r3*). **Opisthonotum** – setae length from ca. 24 to 38 (*J6*). **Peritreme** – 124–135 long, ending anteriorly as in the females. Dorsal setae simple, reticulation pattern as in the female.

Ventral idiosoma — Setae length: 35–41 (*st1*), 35–41 (*st2*), 28–34 (*st3*), 22–27 (*st4*), 29–34 (*st5*), 30–34 (*JV1*), 21–24 (*ZV1*), other opisthogastral setae ca. 21–37. Ventral setae

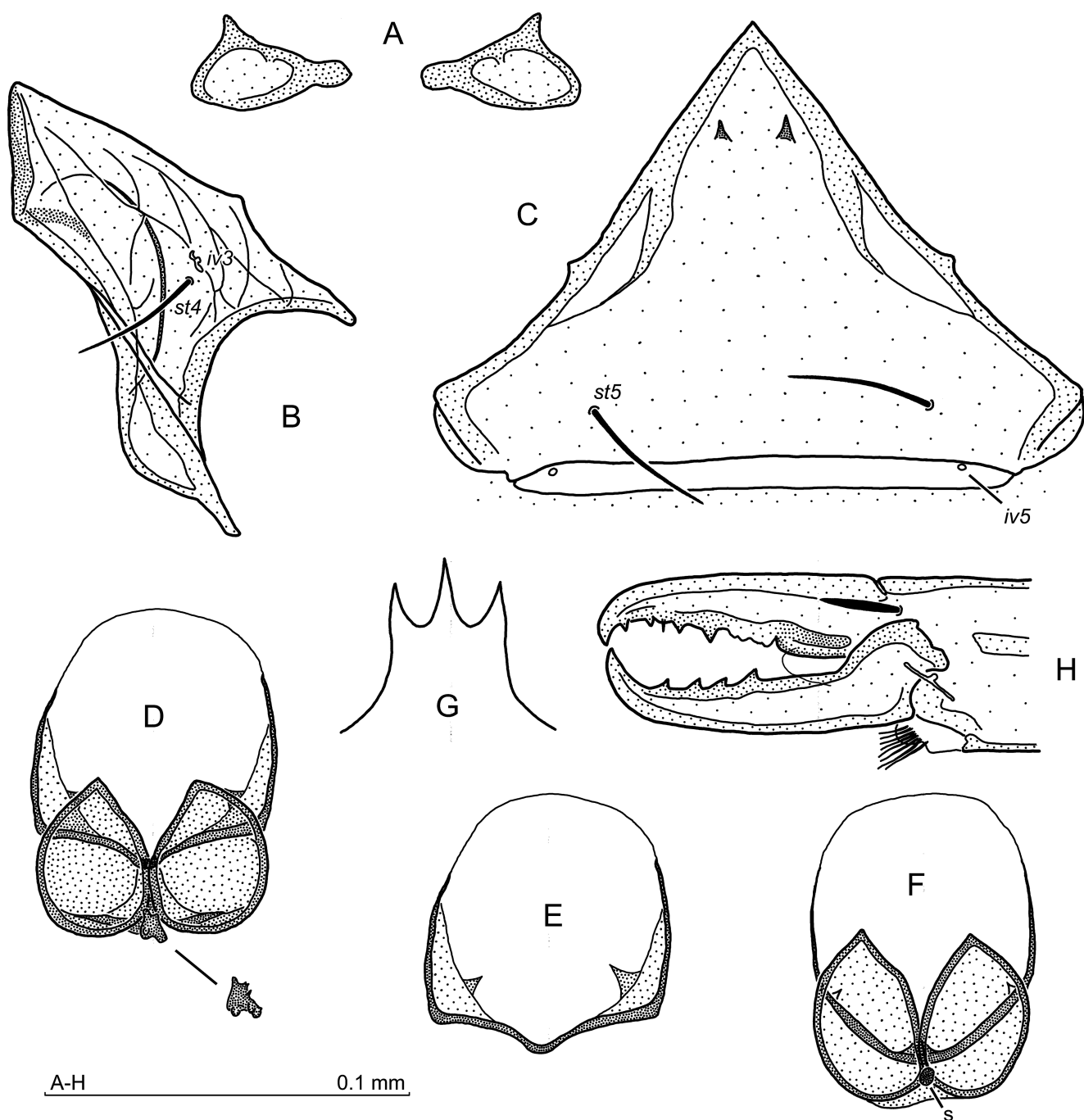


Figure 13 *Leptogamasus (L.) holdaensis* n. sp., female: A – presternal plates; B – paragnathum; C – endogynium; D, F – endogynium, different aspects; E – endogynial sac; G – gnathotectum; H – chelicera, antiaxially. Abbreviations: *st4*, *st5* paragnathal and epigynal setae, respectively; *iv3*, *iv5* pore openings; *s* stipule. C, D, E, G – holotype.

simple. **Sternal region** (Fig. 14A) – genital lamina (Fig. 14A, C) with the rounded anterior corners, anterior margin undulate, lateral sides concaved. Presternal plates (Fig. 14A, B) subrectangular, with moderately large anterior protrusions. Sternum (Fig. 14A), with the gland pores *gv1* close to the *st3* setae level, followed by two pairs of moderately distinct, small thickenings of the sternal cuticle, the former one elongated and the latter one button-shaped, and located much laterally. Gland pores *gv2* with a double opening, pores *iv5* slightly shifted

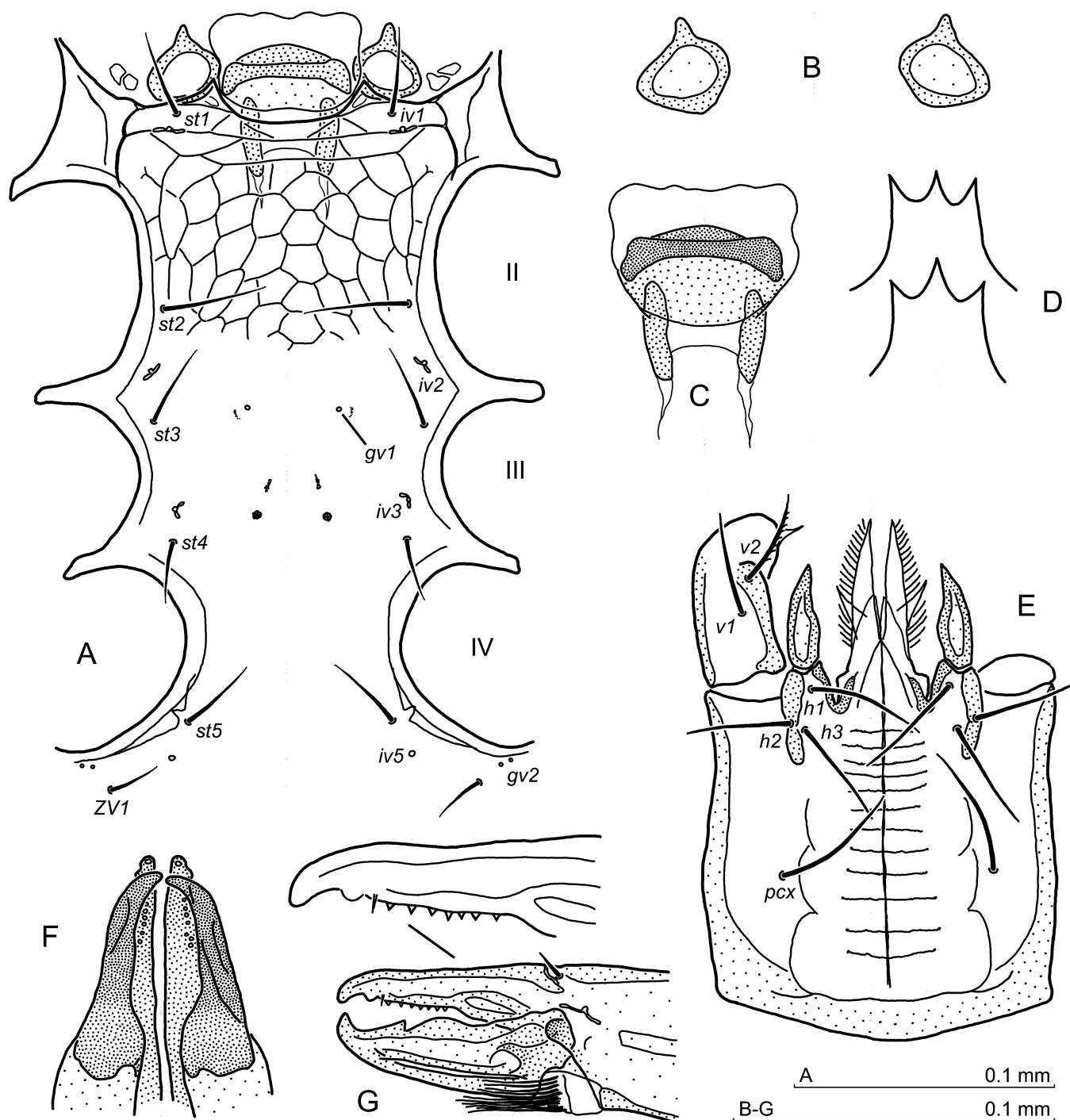


Figure 14 *Leptogamasus (L.) holdaensis* n. sp., male: A – presternal plates, genital lamina and sternogenital shield; B – presternal plates; C – genital lamina; D – gnathotectum, two aspects; E – gnathosoma, ventrally; F – chelicerae, ventrally; G – chelicera, antiaxially. Abbreviations as in Figure 5; *h1*–*h3* and *pcx* hypostomatic and palpcoxal setae, respectively.

toward *st5* setae. Sternum and opisthogaster reticulation scale-like.

Gnathosoma — Gnathotectum (Fig. 14D) prongs triangular and shorter than in the female. Corniculi (Fig. 14E) antiaxial margin arcuate, adaxial one somewhat sinuous. Hypostome

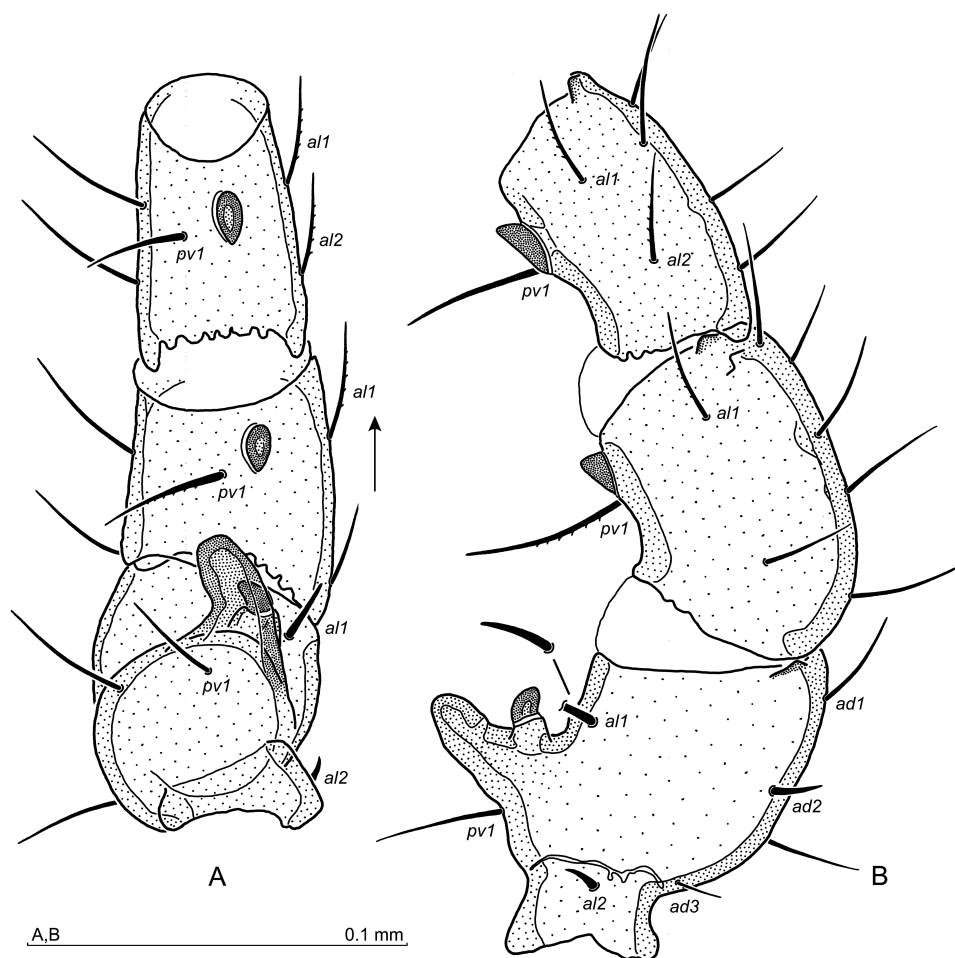


Figure 15 *Leptogamasus (L.) holdaensis* n. sp., male: A – Fe II, Ge II and Ti II, ventrally; B – Fe II, Ge II and Ti II in the anterolateral perspective. Some setae are marked. Arrow at the anterolateral side.

with 10–12 rows of denticles, hypostomatic and palpcoxal setae simple. Palptrochanter *v1* seta simple, *v2* seta one-sidedly barbed. In chelicera (Fig. 14F, G) in ventral perspective (Fig. 14F), the movable digits apically axially curved whereas the fixed digits straight and somewhat longer. In lateral view (Fig. 14G), the movable digit with one tooth followed by an arcuate edge, fixed digit moderately narrow, with arcuate tooth between the apex and the pilus dentilis, followed by a row of approx. seven denticles behind the pilus dentilis.

Legs — Leg II spurred as follows: when viewed from the ventral side (Fig. 15A), femoral main spur is moderately long, curved posterolaterally and terminally obtuse. The axillary process hooked posterolaterally, genual and tibial spurs are lenticular and axially oriented. The former spur is somewhat smaller and closer to the distal article margin than the tibial one. When viewed from the lateral side, leg II (Fig. 15B) shows the finger-like femoral main spur, axillary process curved toward the article, both spurs on the genu and tibia conical, with somewhat rounded tips. Genual spur smaller than the tibial one, and its apex terminated closer to the article margin level, whereas the tibial one ends at some distance from the article margin. Most of the setae on leg II are simple, but setae *al1* and *al2* on the tibia, as well as *al1* and *pv* on the genu may be barbed; setae *al1*, *al2* and *ad2* on the femur shorter and thicker, whereas *ad3* – needle-like; setae *al* on the basitarsus and the tarsus thickened and finely barbed. Setation of legs I and IV as in the female. Tubercle on Tr IV absent. Other aspects of legs I–IV

unremarkable.

Material examined

Holotype — Female (slide no. 2273 A), encountered ca. 1 km from Holda village (Suceava County), Eastern Carpathians, Romania, 47.2627°N, 25.6665°E, alt. ca. 655 m a.s.l., 16 April 2010, litter in the pine forest.

Paratypes — 1 female, 3 males (slides no. 2273 B, C, 2277 A, B), *ibid.*

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

Etymology

The specific name *holdaensis* refers to Holda, the village located nearest to the material collection site.

Differential taxonomy

Leptogamasus (*L.*) *holdaensis* **n. sp.** females feature rather large, tear-shaped edentate endogynial spherules and a very small stipule. A similar combination of features may be encountered in *Leptogamasus* (*L.*) *digiticornis* Witaliński, 2021, and to some extent, also in *Leptogamasus* (*L.*) *paracarpaticus* Juvara-Balş, 1981 and *Leptogamasus* (*L.*) *chelatus* Witaliński, 2022. The main differences are as follows: epigynial shield in *L.* (*L.*) *holdaensis* **n. sp.** features two teeth, which are not to be found in *L.* (*L.*) *paracarpaticus* and *L.* (*L.*) *chelatus*. In *L.* (*L.*) *digiticornis* epigynium features a pair of teeth, but the spherules are convergent anteriorly, whereas in *L.* (*L.*) *holdaensis* **n. sp.** they are divergent, and moreover, in the former species the endogynial sac shows a distinct shape of the four walls of a hexagon, with two little teeth located in its posterior part, whereas in *L.* (*L.*) *digiticornis* the sac is edentate and not distinct. Finally, stipule in *L.* (*L.*) *digiticornis* is evidently larger and different than in *L.* (*L.*) *holdaensis* **n. sp.** Male in *L.* (*L.*) *holdaensis* **n. sp.** differs evidently from *L.* (*L.*) *digiticornis* in many respects: in *L.* (*L.*) *holdaensis* **n. sp.** cheliceral fixed digit is straight in the lateral perspective, and features an arcuate tooth in front of the pilus dentilis, and a row of approx. seven denticles behind the pilus dentilis; in *L.* (*L.*) *digiticornis* a fixed digit is wavy and edentate. In *L.* (*L.*) *digiticornis* movable cheliceral digit shows a pointed protrusion directed antiaxially when viewed from the ventral side, whereas in *L.* (*L.*) *holdaensis* **n. sp.** such protrusion does not exist. Besides, corniculi in *L.* (*L.*) *digiticornis* does not feature a ventral protrusion whatsoever in *L.* (*L.*) *holdaensis* **n. sp.** As far as males of *L.* (*L.*) *paracarpaticus* and *L.* (*L.*) *chelatus* are concerned, both species differ from *L.* (*L.*) *holdaensis* **n. sp.**, since their cheliceral fixed digits are edentate behind the pilus dentilis.

Leptogamasus (*Leptogamasus*) *horribilis* **n. sp.**

Zoobank: 042D5123-63DD-4D31-B55C-38A55C95D402

(Figures 16–20)

Diagnosis

Female and male — Idiosoma moderately to well sclerotised; the gnathotectum three-prong type with similar prongs, the central one slightly longer; opisthonotum with 24 regular setae pairs plus one pair of supplementary setae (Sx), located laterally; Tr IV with a non-distinct low tubercle dorsally.

Female — The sternal shield anterior margin concaved; presternal plates with non-distinct adaxial protrusions and arcuate posterior margin; *gv1* located adaxially at the *st3* sternal setae level; paragynial shields with metagynial sclerites narrow and arcuate, ending anteriorly far from the anterior paragynial margin, and posteriorly in a midway of posterior paragynial lobe, axial and posterior margins of the posterior paragynial lobe join at a right angle; the anterior

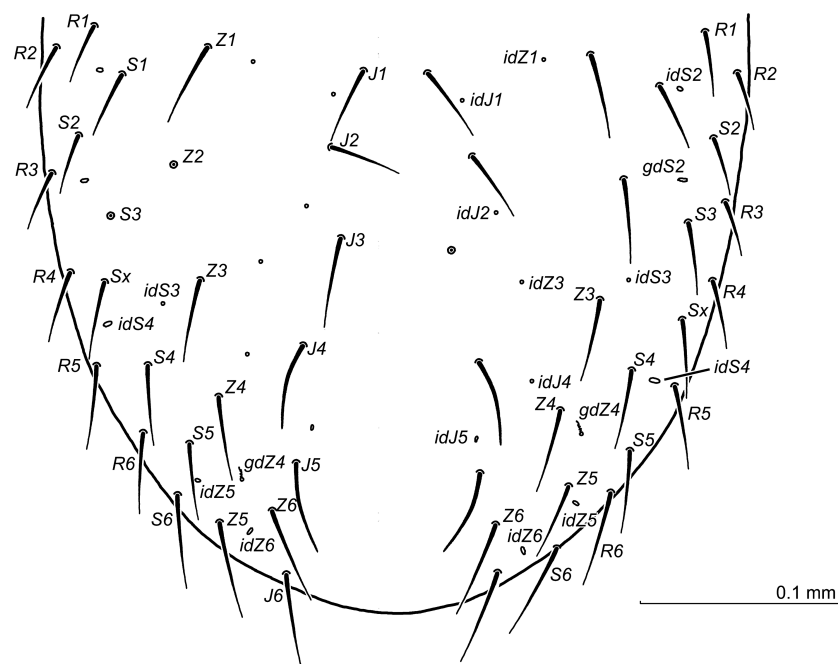


Figure 16 *Leptogamasus (L.) horribilis* n. sp., opisthonotum of the female (holotype). Abbreviations as in Figure 7. Note a pair of supplementary setae (Sx).

margins of the epigynial shield straight, the apex separate from the rest of the epigynial shield by a transversal band of less pigmented cuticle, the internal (dorsal) surface of the epigynium with a pair of distinct teeth; endogynial spherules circular, stipule large and richly dentated, the walls of endogynial sac with many centripetal teeth, both on the ventral margin and the sac walls.

Male — Genital lamina with anterior corners and lateral margins rounded; presternal plates quadrilateral, with distinct anterior protrusions; corniculi adaxial margin with a protrusion; cheliceral fixed digit straight, with one-two low tubercular teeth, and a lamellar arcuate protrusion in front of the pilus dentilis, followed by a row of approx. nine, somewhat irregularly distributed denticles; leg II laterally: femoral main spur moderately long, the axillary process slightly asymmetric, genual spur conical and rounded apically, whereas the tibial one rather elliptic, the genual spur located closer to the distal article margin than the tibial spur.

Description

Female (Figures 16–18, 20B) (n=12)

Idiosoma — Moderately to well sclerotised, 605–640 x 320–345 (length x width, n=5), holotype 628 x 346. **Podonotum** – 21 pairs of regular setae, setae length in paratypes: 33–37 (j1), 27–31 (j2), 37–41 (j3), 37–42 (j4), 37–43 (j5), 29–31 (j6), 85–89 (r3), in holotype 34 (j1), 28 (j2), 40 (j3), 42 (j4), 41 (j5), 32 (j6), 86 (r3). **Opisthonotum** (Fig. 16) – 24 pairs of setae and one supplementary pair, or only one supplementary seta located at the level between setae R4 and R5. Setae length from approx. 34 (some lateral) up to 51 (posterior setae). Dorsal setae simple, reticulation of podonotum absent, opisthonotum with a scale-like reticulation. **Peritreme** (Fig. 17) – length in paratypes 149–157, in holotype 150, ending anteriorly at the level of the podonotal setae r2.

Ventral idiosoma (Fig. 17) — Setae length in paratypes: 37–41 (st1), 39–45 (st2), 45–

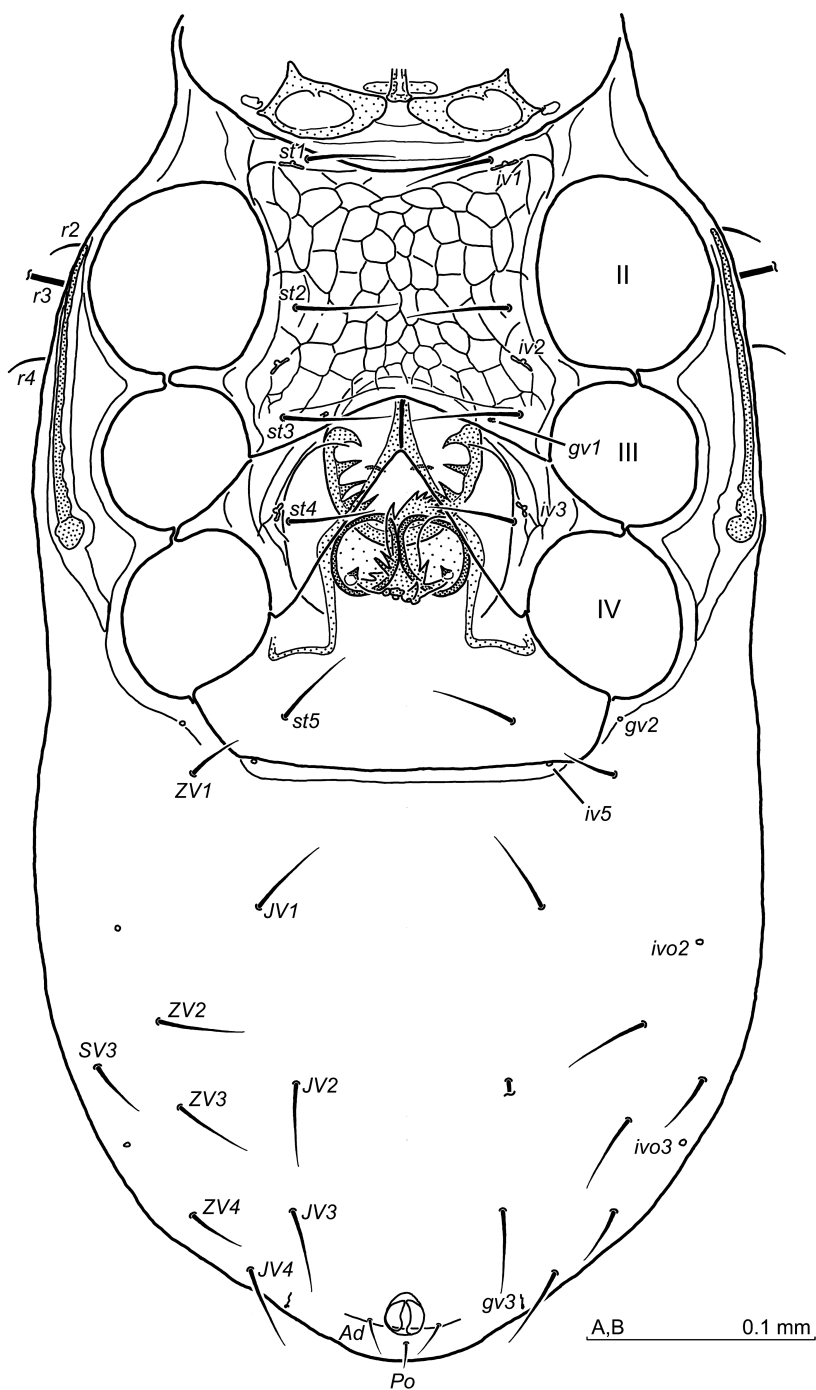


Figure 17 *Leptogamasus* (*L.*) *horribilis* n. sp., ventral side of the female idiosoma (holotype). Abbreviations as in Figure 12.

50 (*st3*), 37–41 (*st4*), 38–42 (*st5*), 37–42 (*JV1*), 26–31 (*ZV1*), other opisthogastral setae ca. 26–39. In holotype 38 (*st1*), 45 (*st2*), 48 (*st3*), 38 (*st4*), 38 (*st5*), 38 (*JV1*), 25 (*ZV1*). Ventral setae simple, reticulation of the opisthogaster scale-like. The anterior margin of the sternal shield concaved, the area between the presternal plates and sternum with horizontal lines (Fig. 17) or reticulated (Fig. 18A). Presternal plates with non-distinct, obtuse adaxial protrusions,

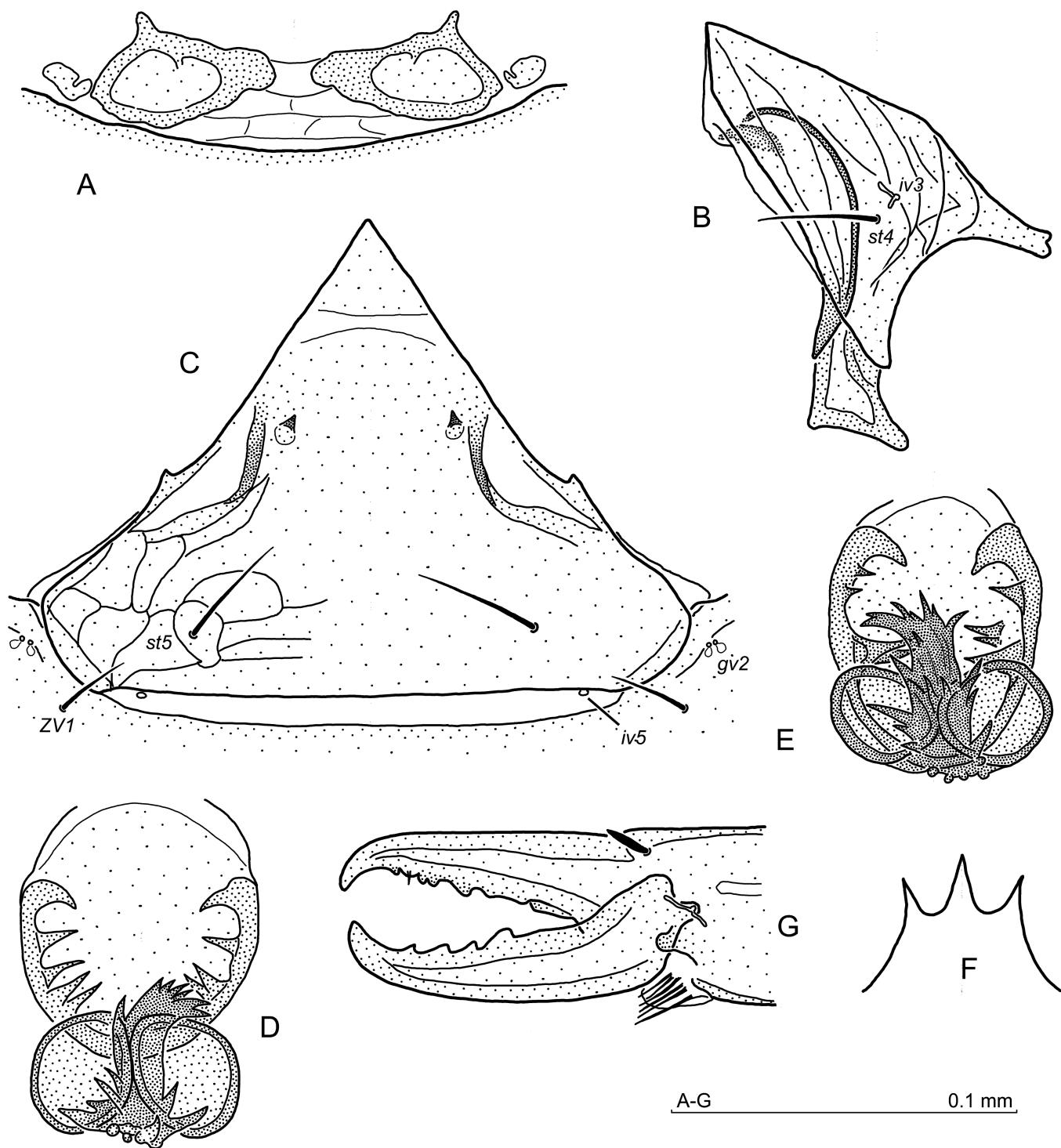


Figure 18 *Leptogamasus (L.) horribilis* n. sp., female: A – presternal plates; B – paragynium; C – epigynum; D, E – endogynium, two aspects; F – gnathotectum; G – chelicera, antiaxially. Abbreviations as in Figure 13; ZV1 opisthogastral seta; gv2 gland pore. D – holotype.

moderately long anterior protrusions and arcuate posterior margin. The gland pores *gv1* located at the level of *st3* setae. Paragynial shields (Figs 17, 18B) with narrow and arcuate metagynial sclerites ending anteriorly far from the anterior paragynial margin, and posteriorly reaching

half way of the axial margin of the posterior paragynial lobe. Axial and posterior margins of posterior paragynial lobe join at a right angle. Epigynial shield (Fig. 18C) with the anterior margins straight, posterolateral ones short and arcuate. The apex is separated from the rest of the shield by a narrow band of less pigmented cuticle. The internal (dorsal) surface of the epigynium features two distinct teeth. Spherules of the endogynium (Figs 17, 18D, E) are circular. Stipule is prominent and richly dentated, the margin of endogynial sac is distinctly visible and armed with many teeth directed centripetally. The anterior tips terminate with the largest and curved teeth. In some cases, several teeth can be located deeper on the endogynial sac walls (Fig. 18E). Gland pores *gv2* with one (Fig. 17) or two (Fig. 18C) openings, pores *iv5* moderately pronounced, whereas *ivo2*, *ivo3*, and *gv3* well discernible.

Gnathosoma — Gnathotectum (Fig. 18F) trispinate, all prongs similar, the central one longer and the lateral slightly divergent. Corniculi conical, hypostome with 11 rows of denticles, hypostomatic and palpcoxal setae simple, subequal in length, but palpcoxal setae somewhat longer. Palptrochanter *v1* seta simple, *v2* barbed. In chelicera (Fig. 18G) movable digit with four teeth, the proximal one larger, fixed digit with one tooth ahead the pilus dentilis, followed by the two closely located and one more distant tooth behind it. Further proximal digit margin is undulate.

Legs — Seta *v2* on Co I finely barbed and somewhat larger than *v1*, seta *al* on Tr I short. Leg II: setae *al1*, *al2*, and *ad2* on Fe II shorter and thicker, seta *av* enlarged and barbed; ventral setae on Ge II and Ti II somewhat enlarged, *av* setae finely barbed. Leg IV: *pd* and *pl* setae on the femur thick and short; *av* and *pv* setae on Ti IV enlarged, *pv* seta finely terminally barbed; tactile *ta* seta on Ta IV thin and long; some setae on basitarsus and tarsus slightly thickened, sometimes terminally barbed. The trochanter with a low tubercle dorsally (Fig. 20B). Other aspects of legs I–IV unremarkable.

Male (Figures 19, 20A, C) (n=1)

Idiosoma — Sclerotised and reticulated as in the female, 607 x 275 (length x width, n=1), body laterally incised at fourth coxae level. **Podonotum** – setae length: 30 (*j1*), 27 (*j2*), 37 (*j3*), – (*j4*), 37 (*j5*), 29 (*j6*), 78 (*r3*). **Opisthonotum** setae length from ca. 29 up to 42. Dorsal setae simple. **Peritreme** – length 145, ending anteriorly, as in the female.

Ventral idiosoma — Setae length: 38 (*st1*), 38 (*st2*), 31 (*st3*), 36 (*st4*), 32 (*st5*), 31 (*JV1*), 25 (*ZV1*), other opisthogastral setae ca. 25–33. Ventral setae simple. **Sternal region** (Fig. 19A) – the genital lamina with the anterior corners and lateral margins rounded and arcuate sclerite. Presternal plates quadrilateral, with distinct anterior protrusions;

Presternal plates quadrilateral, with relatively long anterior protrusions. Sternum with gland pores *gv1* somewhat anteriorly to the *st3* setae level, distance between respective pores is similar to the distance between each pore and the nearest *st3* seta. Gland pores are followed by two pairs of thickenings of the sternal cuticle, the anterior pair is elongated and weaker, the posterior one is button-like and well-visible, located at *iv3* pores level. Gland pore *gv2* with two distinct openings, pores *iv5* between *st5* and *ZV1* setae, but somewhat closer to *st5*. Pores *ivo2*, *ivo3*, and gland pore *gv3* well-discernible.

Gnathosoma — Gnathotectum (Fig. 19B) trispinate with all the prongs triangular, similar to those in the female. Corniculi with elevation on the ventral surface located adaxially (Fig. 19C), its shape changes, when gnathosoma is pressed (Fig. 19D, E). Hypostome with 11 rows of denticles, hypostomal and palpcoxal setae simple. Palptrochanter *v1* seta simple, *v2* thicker and one-sidedly barbed. In chelicera (Fig. 19F, G) mobile digit with one tooth followed by an arcuate edge proximally (Fig. 19F), fixed digit (Fig. 19F, G) straight, with one-two low tubercular teeth and a lamellar arcuate protrusion ahead the pilus dentilis, followed by a row of approx. nine somewhat irregularly distributed denticles (Fig. 19G) behind it.

Legs — Leg II (Fig. 20A) from the lateral perspective spurred as follows: femoral main spur moderately long, the axillary process slightly asymmetric, genual spur conical but rounded apically, whereas the tibial one rather elliptic. The genual spur located closer to the distal article margin than the tibial one. Seta *v2* on Co I barbed and larger than *v1*, seta *al* on Tr I short. Setae on leg II simple, except for the genual seta *al1* and tibial setae *al1*, *al2*, which are finely

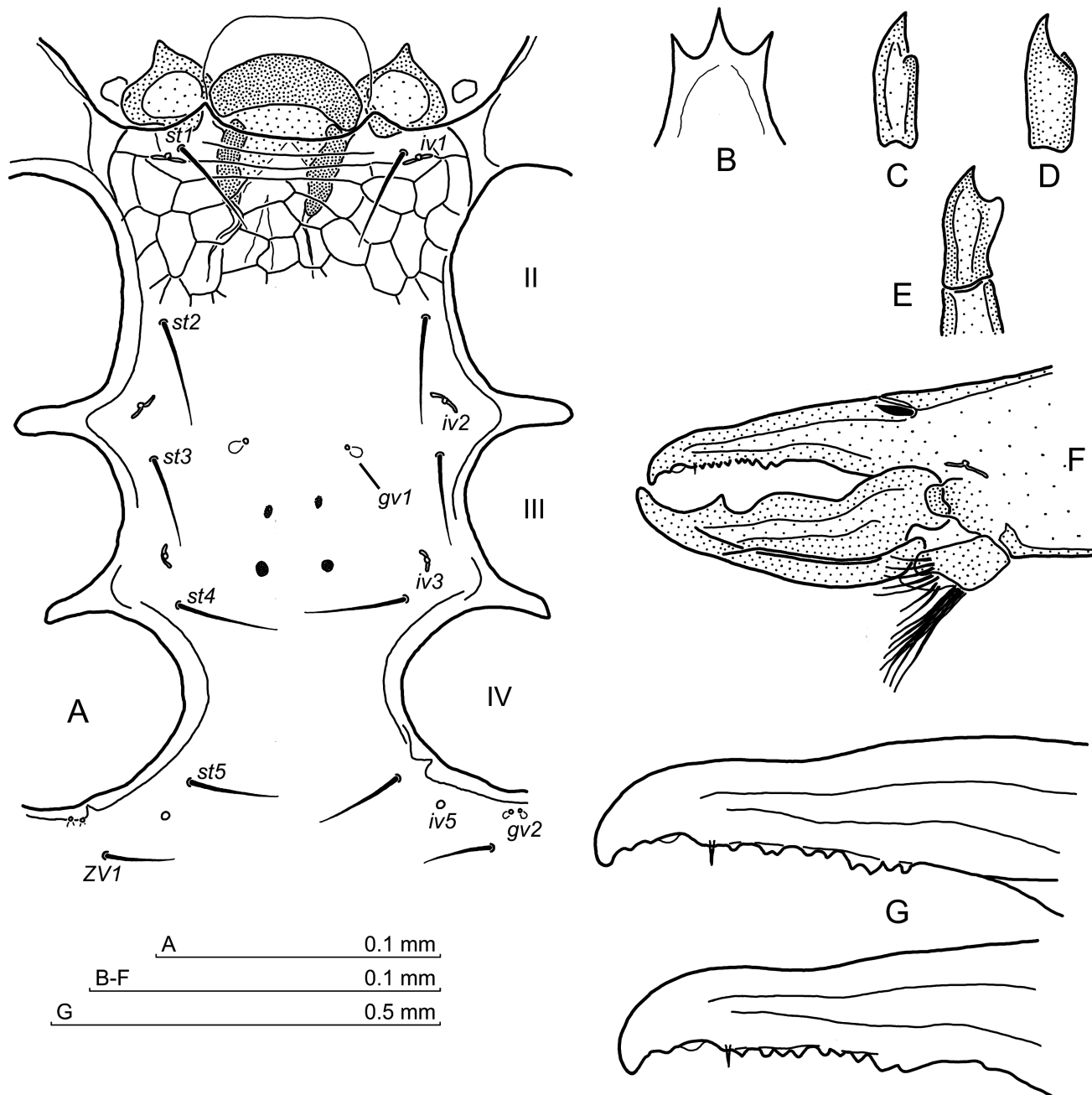


Figure 19 *Leptogamasus* (*L.*) *horribilis* n. sp., male: A – presternal plates, genital lamina and sternogenital shield; B – gnathotectum; C – corniculus, ventrally; D, E – corniculus, squashed, two aspects; F – chelicera, antiaxially; G – cheliceral fixed digits in one specimen. Abbreviations as in Figure 5.

barbed. Femoral seta *all* thicker, setae *al2* and *ad2* thicker and shorter, whereas *ad3* short and needle-like. Setation of leg IV as in the female. Trochanter with low tubercle dorsally (Fig. 20C). Other aspects of legs I–IV unremarkable.

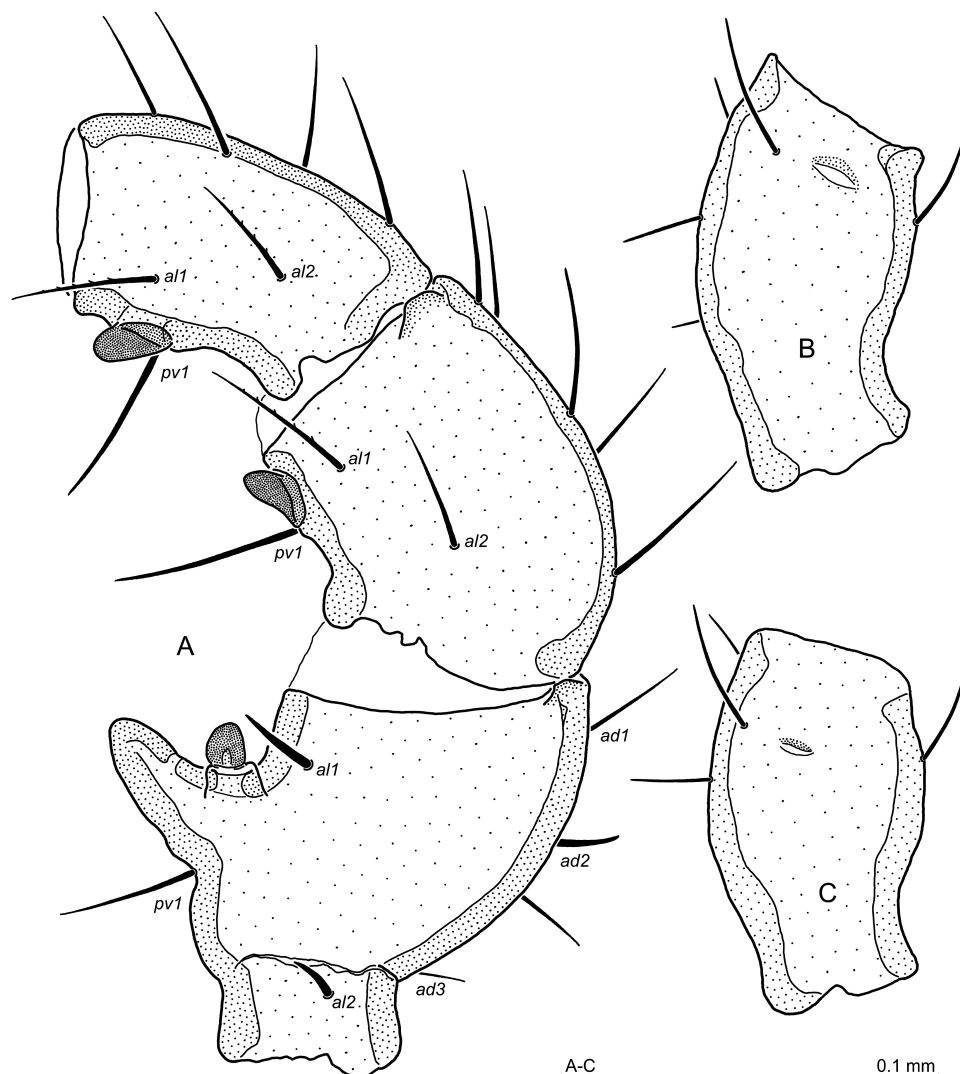


Figure 20 *Leptogamasus (L.) horribilis* n. sp., male (A, C) and female (B): A – Fe II, Ge II and Ti II in the anterolateral perspective. B, C – Tr IV dorsally. Some setae are marked.

Material examined

Holotype — Female (slide no. 2260), 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.

Paratypes — 11 females, 1 male (slides no. 2248 A-D, 2257 A-F), *ibid.*

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

Etymology

The specific name *horribilis* (lat. *horribilis* means frightening) refers to the endogynium in the female genitalia, armed with numbers of teeth and thorns.

Differential taxonomy

Leptogamasus (L.) horribilis n. sp. endogynium shows plentiful teeth, both on the stipule and the endogynial sac. A similar endogynial structure is encountered in *Leptogamasus (L.)*

kaposvarensis (Athias-Henriot, 1967). The main difference consists in the actual form of the stipule: in *L. (L.) horribilis* **n. sp.** it is very prominent and features plenty of teeth, whereas in the latter species, the stipule is moderately sized, not covered with any teeth, wider anteriorly than basally, and its anterior margin shows a number of indentations. *L. (L.) horribilis* **n. sp.** male differs from *L. (L.) kaposvarensis* in cheliceral fixed digit dentation: in the former species, the fixed digit features one-two low tubercular teeth and a lamellar arcuate protrusion in front of the pilus dentilis, followed by a row of approx. nine, somewhat irregularly distributed denticles. In *L. (L.) kaposvarensis* cheliceral the fixed digit features a single, distinct tooth just behind the digit apex, and a row of dozen or so uniform denticles behind the pilus dentilis.

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