



***Ribautia lewisi* sp. nov., a new centipede from Argentina with unusual tentorial process (Chilopoda: Geophilomorpha, Geophilidae)**

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Abstract

Ribautia lewisi sp. nov. (Chilopoda: Geophilomorpha, Geophilidae) is herein described and illustrated after the holotype (male), paratypes (males and females), and additional non type specimens from Northeastern Argentina (Mesopotamian region). The new species is characterized by having a cluster of coxal organs in each coxopleuron of the ultimate leg-bearing segment and a claw-like pretarsus in the ultimate legs, bearing a very unusual feature, in that the internal limbs of tentorium have a conspicuous tooth-shaped sclerotized process directed inward. *R. lewisi* sp. nov. is only the second confirmed record of the genus *Ribautia* from Argentina, the other being *R. jakulicai* Pereira, 2007 from Northwestern region of the country (Yungas biogeographical province).

Key words: Chilopoda, Geophilomorpha, Geophilidae, *Ribautia*, new species, Neotropical Region

Introduction

The genus *Ribautia* Brölemann, 1909 is one of the most diversified and widespread of the geophilid genera, showing a pantropical pattern of distribution (Pereira *et al.* 1997; Minelli 2006; Pereira 2007, 2008, 2010; Bonato *et al.* 2009). Of the 52 species currently recognized in the taxon, nine occur in Australia (one of which also occurs in New Caledonia and the Loyalty Islands), one in the Arabian Peninsula (Yemen), one in New Zealand, four in New Caledonia only, one in the Loyalty Islands only, nine in mainland Africa, one in Madagascar and 26 in the Neotropics.

Among the Neotropical species, 11 are characterized by having all the coxal organs opening separately: *Ribautia bouvieri* Brölemann, 1909 (from Brazil), *R. donatellae* Pereira, Uliana & Minelli, 2006 (from Brazil), *R. ducalis* Pereira, Minelli & Barbieri, 1995 (from Brazil), *R. fuhrmanni* Ribaut, 1912 (from Colombia and Guyana), *R. onycophaena* Pereira, Foddai & Minelli, 2000 (from Brazil), *R. pacifica* Kraus, 1954 (from Peru), *R. phana* (Chamberlin, 1955) (from Peru), *R. proxima* Pereira, Minelli & Barbieri, 1995 (from Brazil and French Guiana), *R. rossi* Chamberlin, 1957 (from Ecuador), *R. tropica* (Brölemann, 1898) (from Venezuela), and *R. vivasberthieri* Chamberlin, 1941 (from Venezuela).

Of the 15 remaining taxa, *R. combinata* Pereira, Uliana & Minelli, 2006 (from Peru), is distinguished from the others by having an independent, freely opening coxal organ and a cluster of coxal organs in each coxopleuron. For the other 14 (in addition to the new species described below), all the coxal organs are grouped in clusters as follows: one cluster in each coxopleuron in *R. jakulicai* Pereira, 2007 (from Argentina), *R. limaensis* Kraus, 1957 (from Peru), and *R. silvana* Kraus, 1954 (from Peru); two in *R. andecola* Kraus, 1954 (from Peru), *R. colcabensis* Kraus, 1957 (from Peru), and *R. roigi* Pereira, 2008 (from Bolivia); two (or three?) in *R. seydi* Ribaut, 1923 (from Peru); three in *R. carpisha* (Chamberlin, 1957) (from Peru), *R. centralis* (Silvestri, 1907) (from Colombia and Brazil), *R. difficilis* Pereira, Minelli & Barbieri, 1995 (from Brazil), *R. junina* (Chamberlin, 1957) (from Peru), *R. montana* Kraus, 1954 (from Peru), *R. peruana* Verhoeff, 1941 (from Peru), and *R. titicacae* (Turk, 1955) (from Peru).

The purpose of the present contribution is to describe a new species of *Ribautia*, after material collected in Northeastern Argentina (Mesopotamian region), which represents the second confirmed record of the genus from this country.

Material and methods

The holotype and paratypes hereby designated are deposited at the Museum of La Plata (MLP), other non-type material is deposited at the same institution.

Dissections were performed with the aid of a stereomicroscope and standard dissecting tools. The specimens were examined and illustrated in detail, using a compound microscope equipped with a drawing tube attachment, which was used to delineate the figures; measures taken with the aid of a glass stage-micrometer. Temporary mounts have been prepared by direct transfer of the specimens from the preservation liquid (70% ethanol) onto microscope slides, using undiluted 2-Phenoxyethanol (CAS No. 122-99-6) as a clearing agent and mounting medium. No additional steps were carried out before mounting (slides were temporarily stored in hermetic acrylic boxes to avoid evaporation of this fluid). Details of the preparation of microscope slides and dissection procedures are described in Pereira (2000), Foddai *et al.* (2002). All measurements are given in mm. Terminology for external anatomy follows Bonato *et al.* (2010). The following abbreviations were used in the text, tables, and legends of the figures: a.a., antennal article/articles; b.l., body length; l.-b.s., leg-bearing segments.

Results

Family Geophilidae

Genus *Ribautia* Brölemann, 1909

Diagnosis. This genus can be distinguished from all other genera currently recognized in the family Geophilidae by the following combination of features. Second maxillae: united by a small coxosternal bridge only; antero-internal corners of coxosternite with a more or less developed process; prominent distally convergent ridges (*statumina sensu* Crabill 1960) present. Forcipules: pleurocoxosternal sutures extending obliquely to the outer margin; chitin-lines present; medial edge of trochanteropraefemur of telopodites either with a small unpigmented protuberance, with a conspicuous pigmented or unpigmented tooth, with two of these teeth, or without teeth. Sternites with pore-fields. Each coxopleuron of the ultimate leg-bearing segment with coxal organs, distributed in one of the following ways: (1) opening separately, (2) an anterior organ opening separately and all the remaining grouped in a cluster, (3) grouped in one-three clusters. Pretarsus of ultimate legs either claw-like or tubercle-like.

Type species of the genus. *Ribautia bouvieri* Brölemann, 1909, by monotypy.

Ribautia lewisi sp. nov.

(Figs. 1–61)

Diagnosis. A Neotropical species of *Ribautia* characterized by the presence of one cluster of coxal organs in each coxopleuron of the ultimate leg-bearing segment and a claw-like pretarsus in the ultimate legs. Among the Neotropical taxa currently included in the genus, only the present new species, *R. combinata* Pereira, Uliana & Minelli, 2006 (from Peru), and *R. jakulicai* Pereira, 2007 (from Argentina) share these two combined features. *R. lewisi* sp. nov. differs from the two latter by having the following unique traits: female with 45, 47 leg-bearing segments, male with (43?), 45, 47 leg-bearing segments; lateral margins of cephalic plate with a small concavity located anteriorly (Figs. 11, 12: a); internal limbs of tentorium bearing an unusual conspicuous tooth-shaped sclerotized process directed inwards; first and second article of telopodites of second maxillae with a very small distoectal process (Figs. 14, 15: b); pore-fields absent on some sternites of mid-body; sternite of female ultimate leg-bearing segment provided with a narrow band of numerous very small setae near the posterior edge (Fig. 61).

TABLE 1. Differential characters of *Ribautilia lewisi* sp. nov., *R. combinata* Pereira, Uliana & Minelli, 2006 and *R. jakulicai* Pereira, 2007.

	<i>R. lewisi</i>	<i>R. combinata</i>	<i>R. jakulicai</i>
Number of leg-bearing segments	♀: 45, 47 ♂: (43?), 45, 47	♀: 55 ♂: ?	♀: 57, 59 ♂: 55, 57, 59
Body length	26 mm (♀) 20 mm (♂)	9 mm (♀)	28 mm (♀) 23 mm (♂)
Lateral margins of cephalic plate showing a small concavity anteriorly	yes (Figs: 11, 12: a)	no	no
Dorsal side of a.a. IX and XIII bearing type <i>c</i> sensilla	no	yes	no
Antennae of male proportionally longer than those of female	yes	?	no
Ratio of length of male antennae/length of cephalic plate	ca. 4.0: 1	?	ca. 2.40: 1
Labrum mid-piece	with ca. 7 sharp-pointed teeth (Fig. 54)	with ca. 17 short, round-pointed teeth on the middle and ca. 2 + 3 long hyaline filaments on their sides	with ca. five short, round-pointed teeth on the middle and ca. 2 + 2 hyaline filaments on their sides
Internal limb of tentorium bearing a conspicuous sclerotized process directed inwards	yes (Figs. 54-56: a)	no	no
First and second article of telopodites of second maxillae with a very small distoectal process	yes (Figs. 14, 15: b)	no	no
Apical medial edge of forcipular trochanteropraefemur	with a conspicuous round-tipped unpigmented tooth (Figs. 17, 19)	with a conspicuous subtriangular and slightly pigmented tooth	with a small unpigmented protuberance
Ratio of maximum length/maximum width of forcipular trochanteropraefemur	ca. 1.60: 1	ca. 1.27: 1	ca. 1.70: 1
Pore-fields distributed in an uninterrupted series along all the body length	no, fields absent on some sternites of mid-body	yes	yes

continued next page

TABLE 1. (continued)

	<i>R. lewisi</i>	<i>R. combinata</i>	<i>R. jakulicai</i>
All pore-fields undivided	no (those on middle and posterior regions of the body divided in two areas, Figs. 26-32)	yes	no (those of mid-body divided in two areas)
Shape of single pore-fields of anterior region of the body	subcircular (Figs. 22-24, 33-39)	subcircular to slightly subovoidal in longitudinal sense	conspicuously subovoidal in longitudinal sense
Posterior limit of ventral pore-field series	penultimate sternite	antepenultimate sternite	penultimate sternite
Anterior legs with setae of different thickness	no	yes (on legs of pairs 1 to 9-10)	no
Sternite of male ultimate leg-bearing segment	with numerous very small setae distributed on the posterior half, remaining surface with few setae of different lengths (Fig. 48)	?	with few setae of different lengths distributed all over the surface
Sternite of female ultimate leg-bearing segment	with numerous very small setae in a narrow band near the posterior edge, remaining surface with few setae of different lengths (Fig. 61)	with few setae of different lengths distributed all over its surface (a little more numerous near the posterior edge)	with very few setae of different lengths distributed all over its surface
Lateral edges of sternite of female ultimate leg-bearing segment	slightly concave on posterior half (Fig. 61)	conspicuously convex	slightly concave
Ratio of length of telopodite of ultimate legs/length of sternite of female ultimate leg-bearing segment	ca. 4.0: 1	ca. 3.60: 1	ca. 3.75: 1
Coxal organs in each coxopleuron	all grouped in a cluster (Figs. 48-50, 61)	an independent opening organ anteriorly, a cluster posteriorly	all grouped in a cluster
Anal organs	absent	present	absent

Other morphological traits included in Table 1 differentiate *R. lewisi* **sp. nov.** from *R. combinata* and *R. jakulicai*.

Remarks. For characters differentiating *R. lewisi* **sp. nov.** from other Neotropical species of *Ribautia*, see Discussion below.

Type material examined. ARGENTINA: Entre Ríos Province: Concordia Department: Concordia, 9 December 2007, L. A. Pereira legit: holotype ♂, 45 l.-b.s., b.l. 20 mm; paratype A (♀), 45 l.-b.s., b.l. 15 mm; paratype B (♀), 45 l.-b.s., b.l. 16 mm; paratype C (♀), 45 l.-b.s., b.l. 16 mm; paratype D (♀), 45 l.-b.s., b.l. 16 mm; paratype E (♀), 45 l.-b.s., b.l. 16 mm; paratype F (♀), 45 l.-b.s., b.l. 17 mm; paratype G (♀), 45 l.-b.s., b.l. 17.5 mm; paratype H (♀), 45 l.-b.s., b.l. 17.5 mm; paratype I (♀), 47 l.-b.s., b.l. 17 mm; paratype J (♀), 47 l.-b.s., b.l. 19 mm; paratype K (♀), 47 l.-b.s., b.l. 20 mm; paratype L (♀), 47 l.-b.s., b.l. 21 mm; paratype M (♀), 47 l.-b.s., b.l. 26 mm; paratype N (♂), 45 l.-b.s., b.l. 17 mm; paratype O (♂), 47 l.-b.s., b.l. 16 mm; paratype P (♂), 47 l.-b.s., b.l. 17 mm.

Depository of types: MLP.

Other material examined. All specimens from the same locality, date and collector as the type series: 2 ♀♀ juv., 45 l.-b.s., b.l. 12 mm (with 9-10 coxal organs in each cluster), and 13 mm (with 11-12 coxal organs in each cluster); 1 ♂ subadult, 45 l.-b.s., b.l. 14 mm (with 9 coxal organs in each cluster); 2 ♂♂ juv., 45 l.-b.s., b.l. 10 mm (in moulting process), and 12 mm (with 9-10 coxal organs in each cluster); 1 ♂ juv., 47 l.-b.s., b.l. 11 mm (with 6 coxal organs in each cluster); 4 juv. (sex unknown), 43 l.-b.s., b.l. 4.5 mm (Specimen A) (with 1+1 coxal organs only), 4.5 mm (with 1 + 1 coxal organs only), 10 mm (with 5 coxal organs in each cluster), and 10 mm (with 5-6 coxal organs in each cluster); 1 juv. (sex unknown), 47 l.-b.s., b.l. 4.5 mm (with 1 + 1 coxal organs only). (MLP).

Description. Male holotype. Forty-five leg-bearing segments, body length 19 mm, maximum body width 0.65 mm, length of cephalic plate 0.67 mm, width of forcipular coxosternite 0.56 mm. Colour (of preserved specimen in alcohol) pale yellow, forcipular segment a little darker (pale ochreous).

Antennae. Relatively long, *ca.* 4.0 times as long as the cephalic plate, distally attenuate, ratio of width of a.a. I/width of a.a. XIV *ca.* 1.68: 1. A.a. I nearly as long as wide, remaining a.a. longer than wide. Ventral chaetotaxy: setae on a.a. I-VII of various lengths and relatively few in number; those of a.a. VIII-XIV progressively shorter and more numerous towards the tip of the appendage (Figs. 1, 2). Dorsal chaetotaxy: similar to the ventral side. A.a. XIV with *ca.* 4-5 claviform sensilla on the external border and *ca.* 2-3 on the internal border; distal end of this a.a. with *ca.* 5-6 very small hyaline specialized sensilla apparently not split apically. Ventral and dorsal surface of a.a. II, V, IX and XIII with very small specialized sensilla. On the ventral side these sensilla are restricted to an internal latero-apical area and are represented by two different types: *a* and *b*. Type *a* sensilla are very thin and not split apically (Fig. 5: a); type *b* sensilla (Fig. 5: b) are very similar to those on the apex of a.a. XIV. Specialized sensilla on dorsal side are restricted to an external latero-apical area and are represented by similar type *a* and *b* sensilla of ventral side (Fig. 9: a, b). Number and distribution of specialized sensilla on ventral and dorsal sides of a.a. II, V, IX and XIII, as in Table 2.

TABLE 2. Number of type *a* and *b* sensilla on antennal articles II, V, IX and XIII in the male holotype of *Ribautia lewisi* **sp. nov.**

	Ventral		Dorsal		Figs.
	a	b	a	b	
II	-	1	1	-	3, 7
V	-	1	1	1	4, 8
IX	1	1	1	2	5, 9
XIII	1	1	1	5	6, 10

Cephalic plate. Distinctly longer than wide (length/width ratio *ca.* 1.64: 1). Lateral margins convergent towards the posterior region, showing anteriorly a small concavity (Figs. 11, 12: a). Anterior margin slightly concave on the middle; posterior margin straight. Shape and chaetotaxy as in Figure 11.

Clypeus. With four setae located on the clypeal area; 1 + 1 anterior-lateral setae, posterior to the latter; and two setae in the middle (Fig. 12). Clypeal area with surface very densely areolated (Fig. 13).

Labrum. Mid-piece well developed, with *ca.* 7 sharp pointed teeth. Side pieces with *ca.* 9 + 10 filaments of different size. (Compare with Figure 54, illustrating the labrum of the female paratype M).

Tentorium. Internal limb bearing a conspicuous tooth-shaped sclerotized process directed inwards. (Compare with Figures 54–56, illustrating the tentoria of female paratype M).

Mandible. Pectinate lamella with *ca.* 22 hyaline teeth. (Compare with Figure 57, illustrating a mandible of female paratype M).

First maxillae. Coxosternite without lappets, telopodites with very small lappets. (Compare with Figure 58 illustrating left side of first maxillae of female paratype M). Coxosternite devoid of setae; coxal projections subtriangular, round tipped and provided with 6 + 5 setae (Fig. 14). Article II of telopodites with 3 + 4 large setae on ventral side, and 2 + 2 small sensilla on the external edge (Fig. 14).

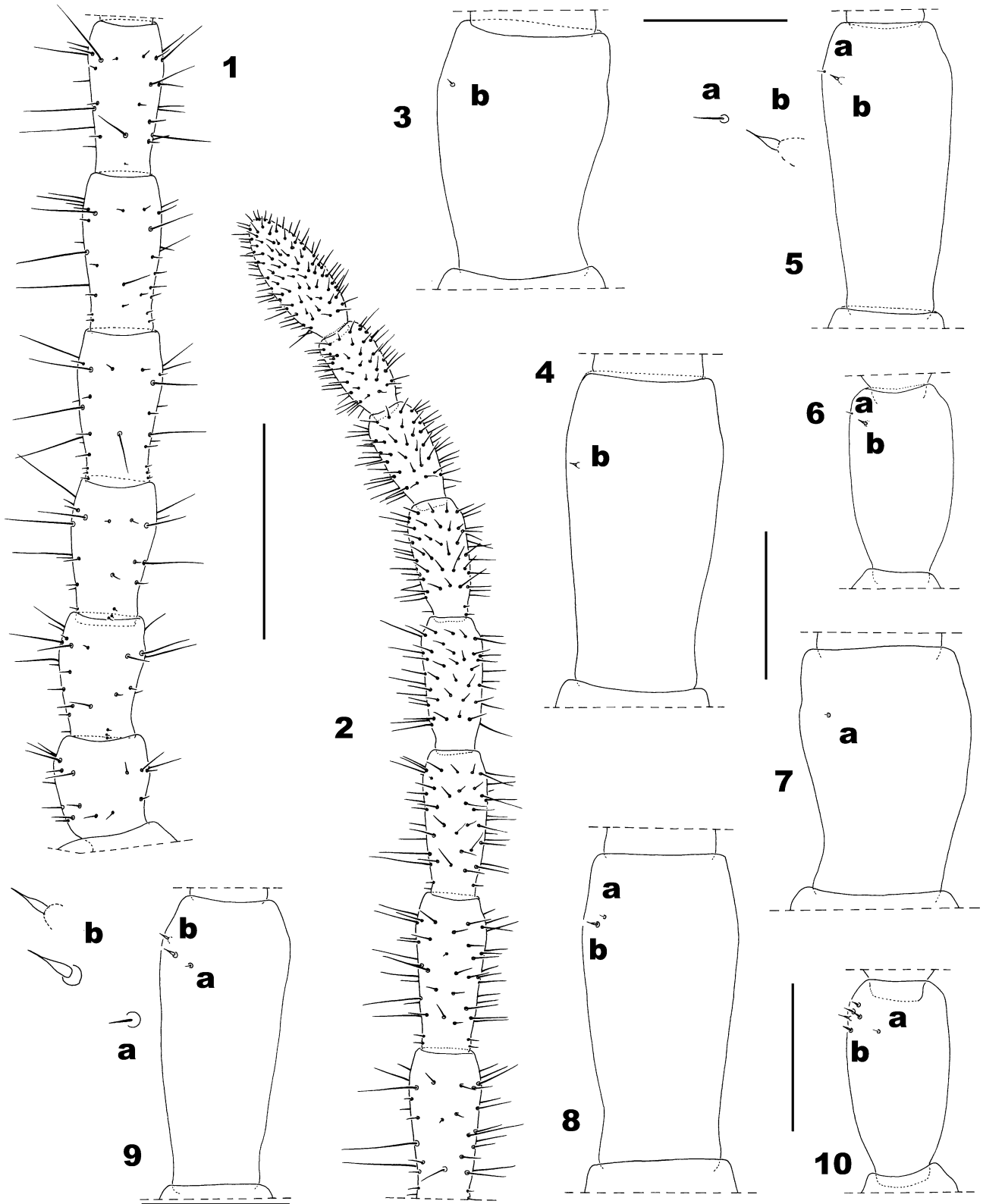
Second maxillae. Coxites medially joined through a narrow, hyaline and non-areolate membranous isthmus and provided with 6 + 7 setae near the internal margin and 2 + 2 small sensilla near the external margin (Fig. 14). Process of antero-internal corners of coxosternite well developed with shape and relative size as in Figures 14, 15: a. Telopodites with setae of uniform thickness; first and second article with a very small distoectal process (Figs. 14, 15: b); apical claw of telopodite well developed, tip curved inward (Figs. 14, 16). Chaetotaxy of coxosternites and telopodites as in Figures 14–16.

Forcipular segment. When closed, the telopodites project slightly beyond the anterior margin of the head. Forcipular tergite trapeziform; chaetotaxy represented by an irregular transverse row of *ca.* 7 setae of different lengths near the posterior margin and a few smaller setae dispersed on the remaining surface (Fig. 11). Coxosternite with incomplete chitin-lines (Fig. 17); middle part of anterior border bearing 1 + 1 small unpigmented denticles, each provided with an apical seta, aspect and relative size as in Figures 17, 18. Telopodites: medial edge of trochanteropraefemur apically with a conspicuous unpigmented round-tipped tooth; proximally near the vestigial suture between trochanter and praefemur with a rudimentary unpigmented round-pointed projection (Figs. 17–19). Femur and tibia without denticles. Tarsungulum basally with a well-developed and pigmented subtriangular denticle (Figs. 17, 19, 20); medial ventral edge of tarsungulum slightly serrate (Figs. 17, 19, 20). Relative size of poison glands as in Figures 17, 19, calyx of poison gland subtriangular (Fig. 21). Chaetotaxy of coxosternite and telopodites as in Figures 11, 17.

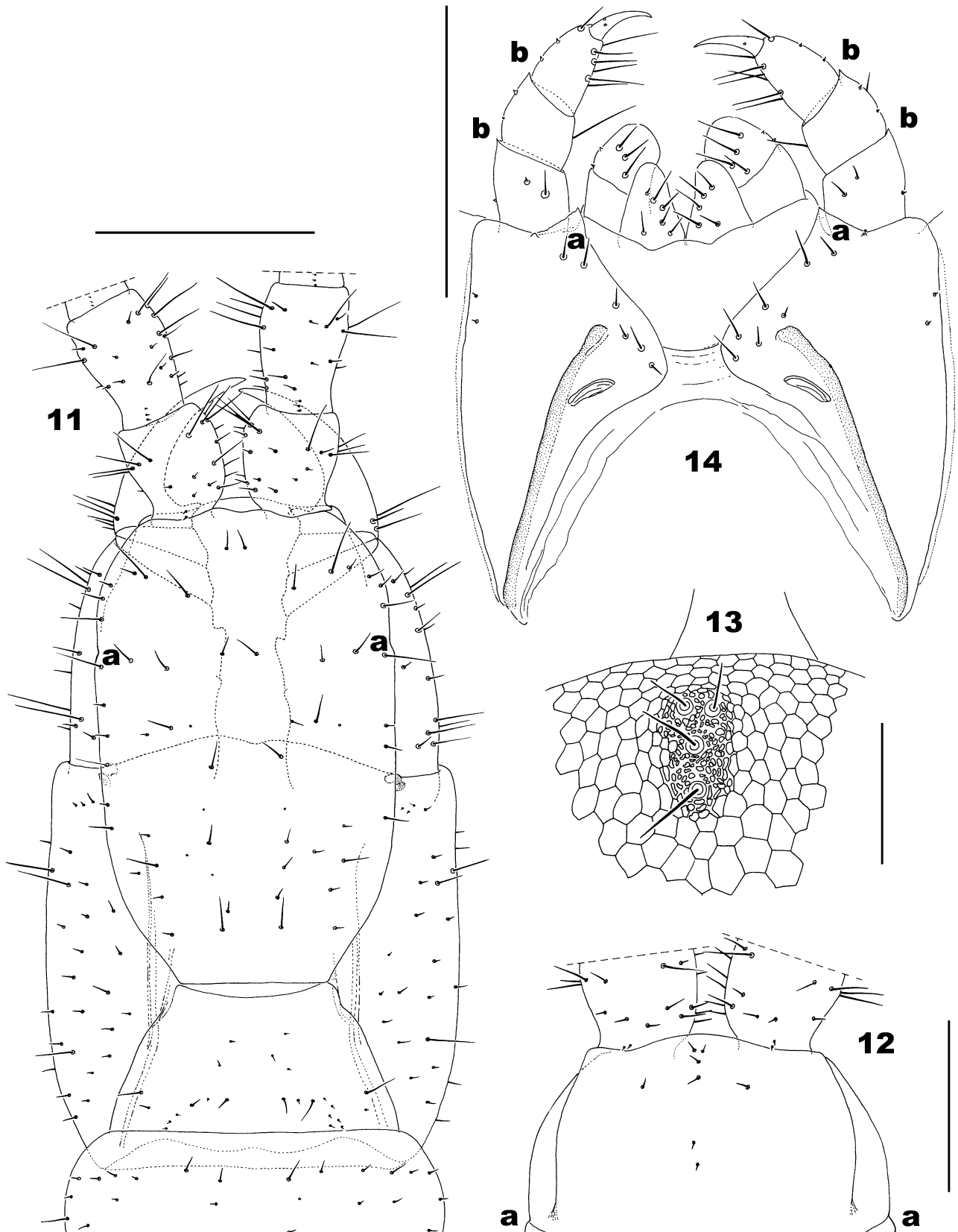
Sternites of leg-bearing segments 1 to penultimate. With a shallow median longitudinal sulcus along all the body length, areolation of its surface as in Figures 25, 27–30). Pore-fields present on sternites 2–22, 26, 30, and 36–44 (penultimate); totally absent on sternites 1, 23–25, 27–29 and 31–35. Sternites 2–12 with undivided pore-fields, subcircular in shape (Figs. 22–25, 33–39); sternites 13 (Fig. 26), 14–16, 19–21, 37 (Fig. 27), 38, and 40–44 (Figs. 28–32) with pore-fields subdivided in two subsymmetrical areas; sternites 17, 18, 22, 26 with pores on the left side only; sternites 30, 36, 39 with pores on the right side only. Shape of pore-fields changes along the trunk as in Figures 22–39. Number of pores as follows: sternite 2 (23); 3 (32); 4 (38); 5 (44); 6 (44); 7 (45); 8 (45); 9 (44); 10 (38); 11 (38); 12 (29); 13 (7 + 8); 14 (3 + 2); 15 (1 + 2); 16 (1 + 1); 17 (0 + 2); 18 (0 + 1); 19 (1 + 3); 20 (2 + 4); 21 (1 + 2); 22 (0 + 1); 26 (0 + 1); 30 (3 + 0); 36 (2 + 0); 37 (1 + 1); 38 (1 + 1); 39 (1 + 0); 40 (3 + 3); 41 (7 + 7); 42 (7 + 8); 43 (6 + 6); 44 (7 + 5).

Legs (pair 1 to penultimate). First pair shorter than the second (ratio *ca.* 0.85: 1). Legs with setae of uniform thickness, chaetotaxy similar throughout the entire body length. Distribution, number, and relative size of setae as in Figures 40–45. Claws with two thin and pale accessory spines ventrobasally, one anterior and one posterior, of similar size (Fig. 46: a, b).

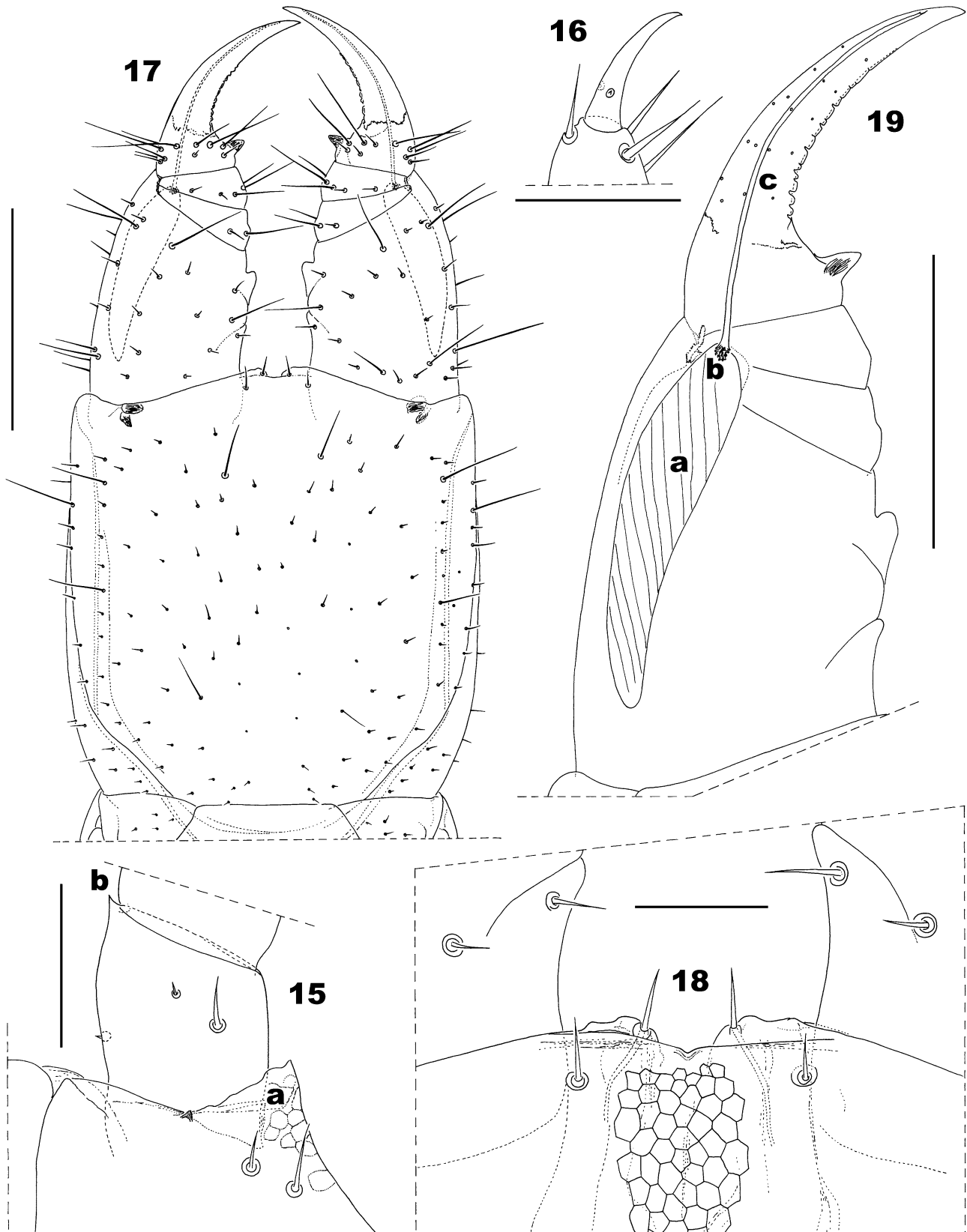
Ultimate leg-bearing segment. Intercalary pleurites absent at both sides of the ultimate pretergite (Fig. 47); ultimate presternite divided along the sagittal plane (Fig. 48). Length/width ratio of tergite, *ca.* 0.80: 1; length/width ratio of sternite, *ca.* 0.74: 1. Shape and chaetotaxy of tergite and sternite as in Figures 47, 48. Coxopleura very slightly protruding at their distal-internal ventral ends, setae small and numerous on the distal-internal ventral area, the remaining coxopleural surface with few larger setae (Figs. 47, 48). Each coxopleuron with all coxal organs grouped in a cluster opening in the membrane between coxopleuron and sternite, partially or totally covered by the latter (Figs. 48–50). Each cluster with *ca.* 18 organs arranged as in Figures 49, 50. Ultimate legs inflated, composed of seven articles. Ratio of length of telopodites of ultimate legs/length of sternite *ca.* 3.52: 1. Shape and chaetotaxy of ultimate legs as in Figures 47, 48. Ultimate pretarsus unguiform, relatively smaller than those of the preceding legs, bearing a single internal spine ventrobasally.



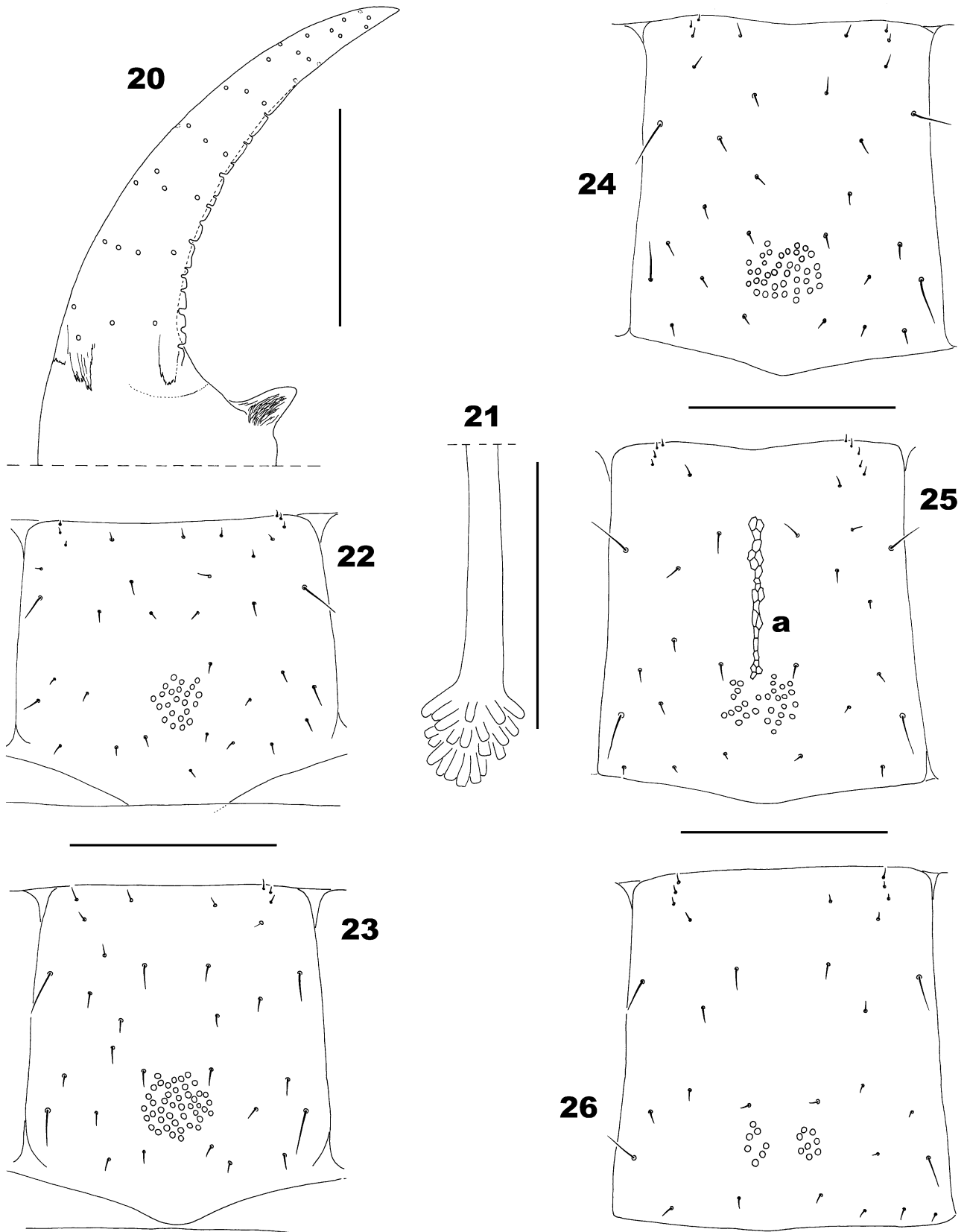
FIGURES 1–10. *Ribautia lewisi* sp. nov. (male holotype; ARGENTINA: Entre Ríos Province: Concordia Department): (1) Left a.a. I–VI, ventral. (2) Left a.a. VII–XIV, ventral (claviform sensilla not drawn). (3). Left a.a. II, ventral (b: *b* type sensilla). (4) Left a.a. V, ventral (b: *b* type sensilla). (5) Left a.a. IX, ventral (a, b: *a*, *b* type sensilla). (6) Left a.a. XIII, ventral (a, b: *a*, *b* type sensilla). (7) Left a.a. II, dorsal (a: *a* type sensilla). (8) Left a.a. V, dorsal (a, b: *a*, *b* type sensilla). (9) Left a.a. IX, dorsal (a, b: *a*, *b* type sensilla). (10) Left a.a. XIII, dorsal (a, b: *a*, *b* type sensilla). Scale bars: 0.1 mm (3–10); 0.3 mm (1, 2).



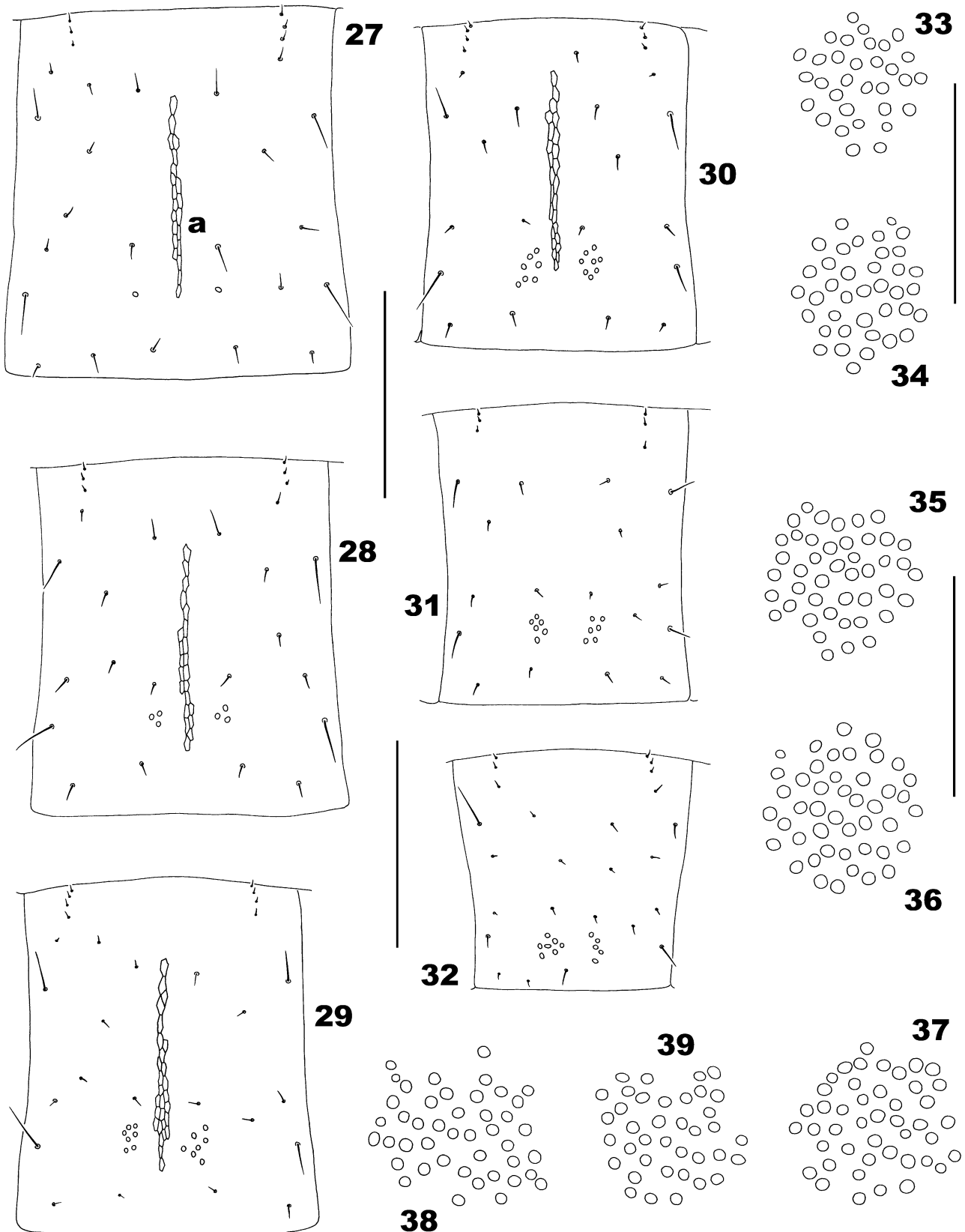
FIGURES 11–14. *Ribautia lewisi* sp. nov. (male holotype; ARGENTINA: Entre Ríos Province: Concordia Department): (11) Dorsal view of anterior region of the body, showing cephalic plate, bases of antennae, forcipular segment, and anterior portion of leg-bearing segment 1 (a: concavity on lateral margins of cephalic plate). (12) Clypeus and bases of antennae (a: concavity on lateral margins of cephalic plate). (13) Clypeal area. (14) First and second maxillae, ventral (a: process of antero-internal corners of coxosternite; b: distoectal process of telopodites). Scale bars: 0.05 mm (13); 0.2 mm (12, 14); 0.3 mm (11).



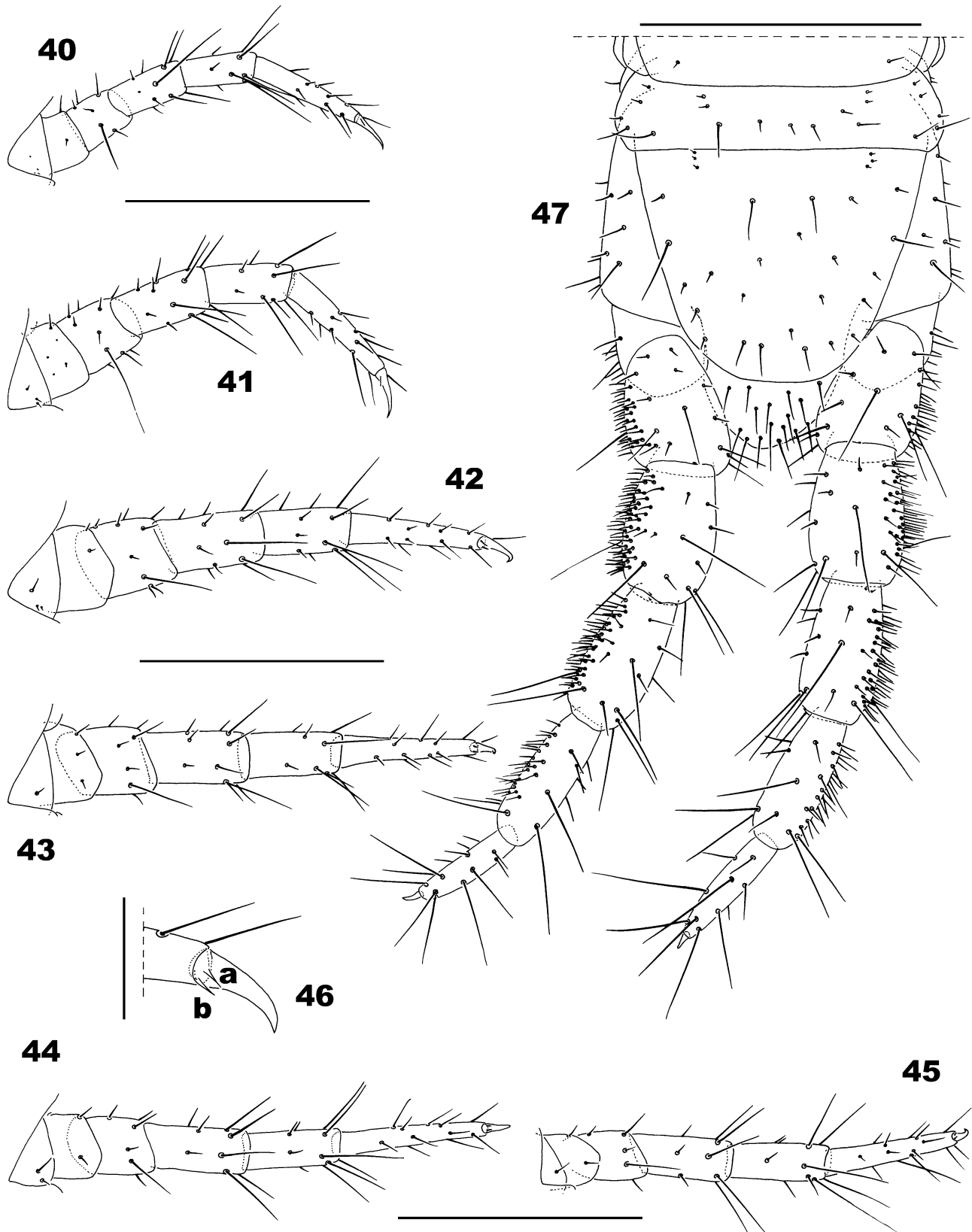
FIGURES 15–19. *Ribautia lewisi* sp. nov. (male holotype; ARGENTINA: Entre Ríos Province: Concordia Department): (15) Detail of first article of telopodite and antero-internal corner of coxosternite, right side of second maxillae, ventral (a: process of coxosternite, b: distoectal process of telopodite). (16) Claw of right telopodite of second maxillae, ventral. (17) Forcipular segment, ventral. (18) Middle part of anterior border of forcipular coxosternite showing unpigmented denticles, ventral. (19) Detail of poison gland (a), calyx (b), and duct (c) of venom apparatus in right forcipular telopodite, ventral. Scale bars: 0.05 mm (15, 16, 18); 0.2 mm (19); 0.3 mm (17).



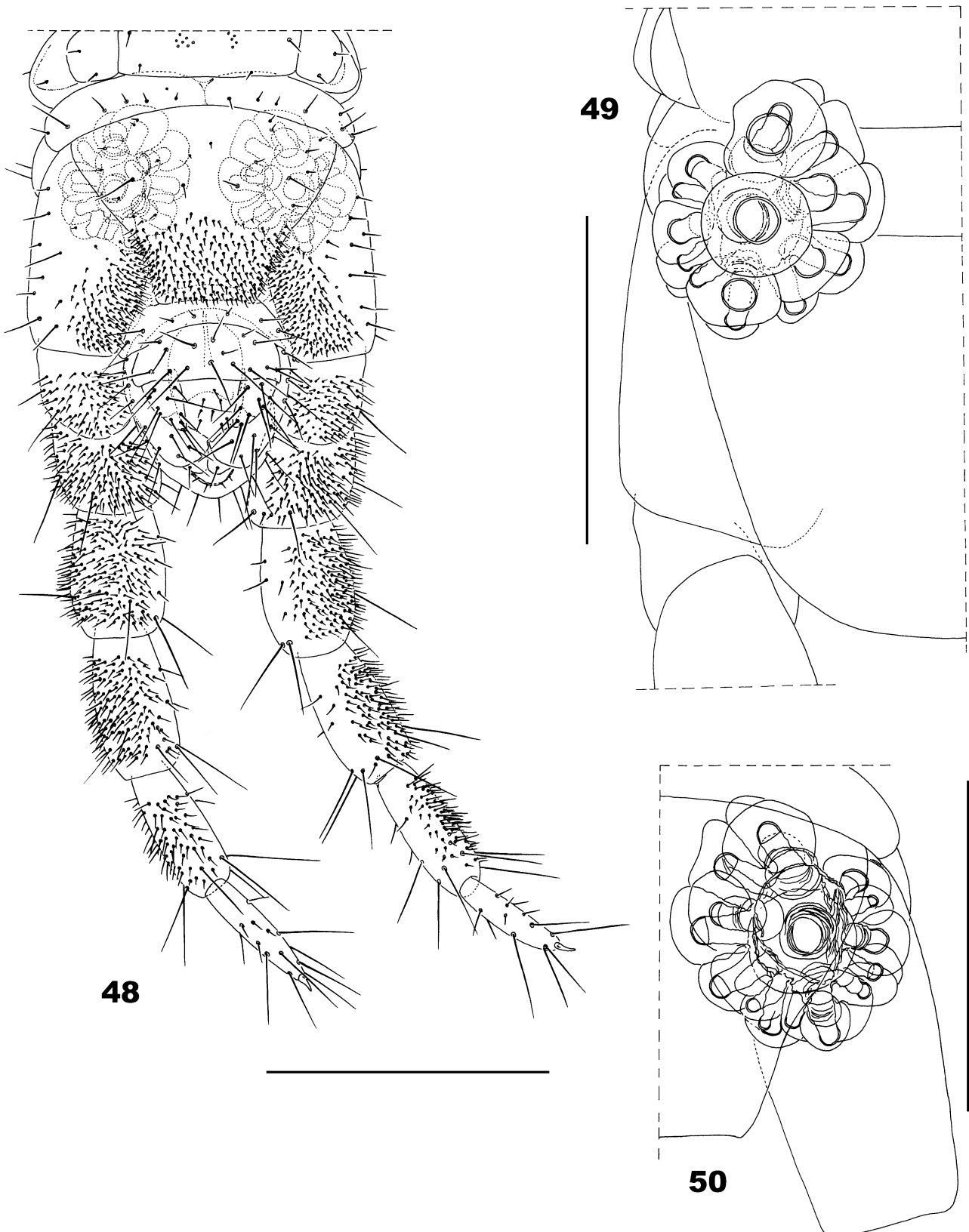
FIGURES 20–26. *Ribautia lewisi* sp. nov. (male holotype; ARGENTINA: Entre Ríos Province: Concordia Department): (20) Detail of right forcipular tarsungulum, showing medial ventral edge slightly serrate. (21) Detail of calyx of poison gland in right forcipular telopodite, ventral. (22) Sternite 2. (23) Sternite 6. (24) Sternite 11. (25) Sternite 12 (a: areolation on median longitudinal sulcus). (26) Sternite 13. Scale bars: 0.03 mm (21); 0.1 mm (20); 0.2 mm (22–26).



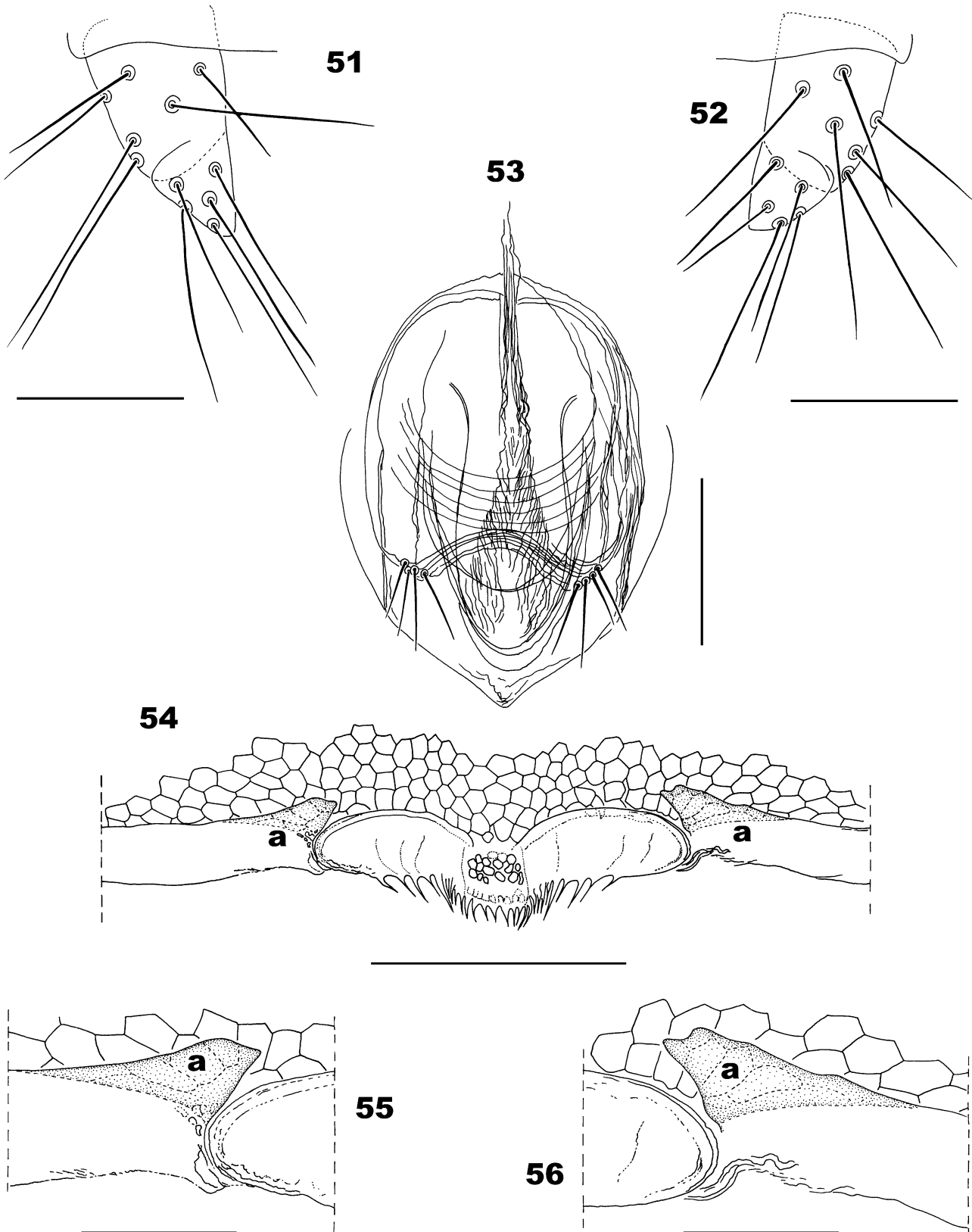
FIGURES 27–39. *Ribautia lewisi* sp. nov. (male holotype; ARGENTINA: Entre Ríos Province: Concordia Department): (27) Sternite 37 (a: areolation on median longitudinal sulcus). (28) Sternite 40. (29) Sternite 41. (30) Sternite 42. (31) Sternite 43. (32) Sternite 44. (33) Pore-field on sternite 3. (34) Pore-field on sternite 4. (35) Pore-field on sternite 5. (36) Pore-field on sternite 7. (37) Pore-field on sternite 8. (38) Pore-field on sternite 9. (39) Pore-field on sternite 10. Scale bars: 0.1 mm (33–39); 0.2 mm (27–32).



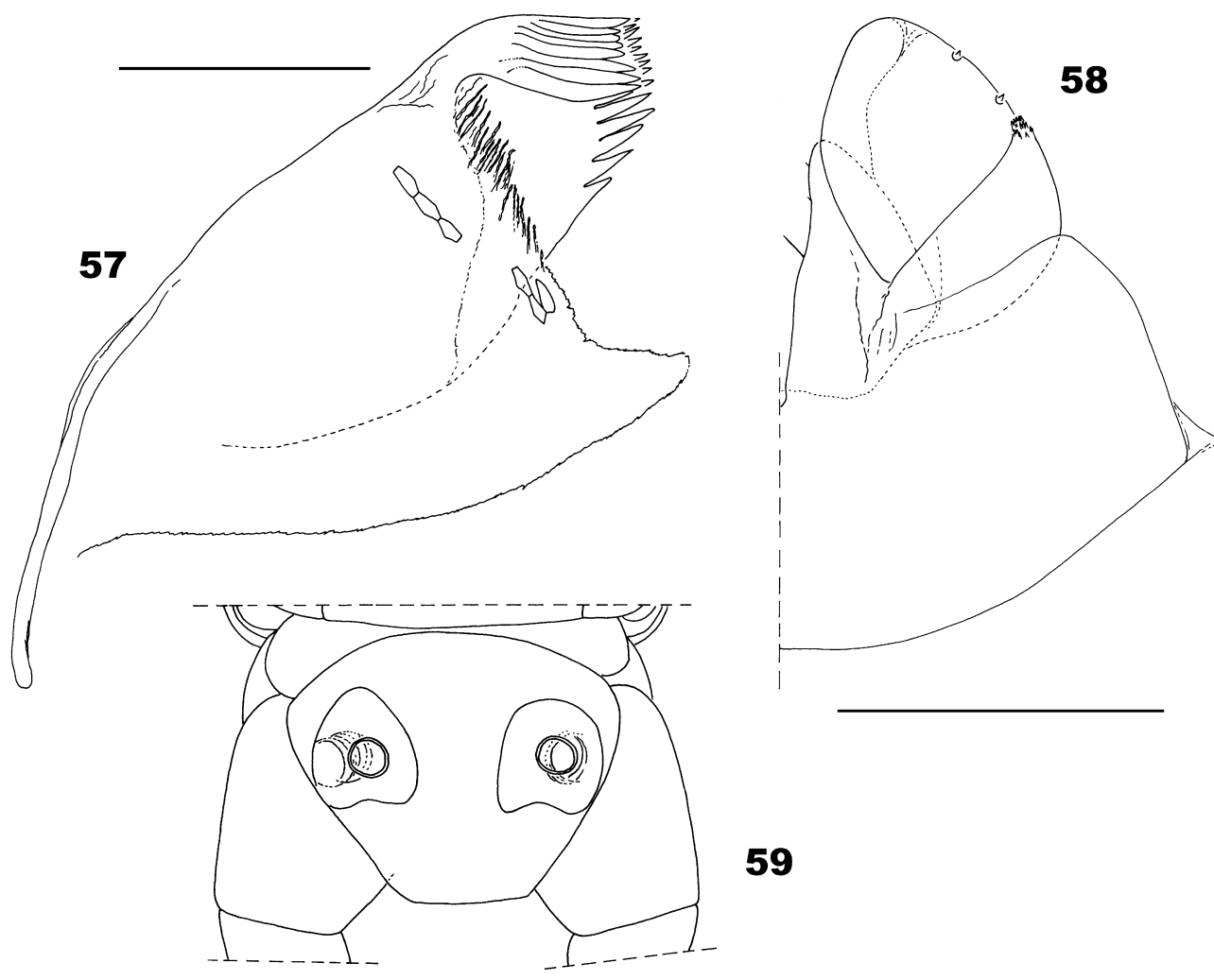
FIGURES 40–47. *Ribautia lewisi* sp. nov. (male holotype; ARGENTINA: Entre Ríos Province: Concordia Department): (40) Left leg (pair 1), ventral. (41) Left leg (pair 2), ventral. (42) Left leg (pair 5), ventral. (43) Left leg (pair 12), ventral. (44) Left leg (pair 27), ventral. (45) Left leg (pair 44), ventral. (46) Claw of the left leg (pair 26), anterior-ventral view (a: anterior spine, b: posterior spine). (47) Ultimate leg-bearing segment and postpedal segments, dorsal. Scale bars: 0.05 mm (46); 0.3 mm (40–45, 47).



FIGURES 48–50. *Ribautia lewisi* sp. nov. (male holotype; ARGENTINA: Entre Ríos Province: Concordia Department): (48) Ultimate leg-bearing segment and postpedal segments, ventral. (49) Left cluster of coxal organs, dorsal. (50) Left cluster of coxal organs, ventral. Scale bars: 0.2 mm (49, 50); 0.3 mm (48).



FIGURES 51–56. (51–53). *Ribautia lewisi* sp. nov. (male holotype; ARGENTINA: Entre Ríos Province: Concordia Department): (51) Right gonopod, ventral. (52) Left gonopod, ventral. (53) Penis, dorsal. (54–56). *Ribautia lewisi* sp. nov. (female paratype (M); ARGENTINA: Entre Ríos Province: Concordia Department): (54) Labrum (a: sclerotized process on internal limb of tentorium). (55) Detail of sclerotized process (a) on internal right limb of tentorium. (56) Detail of sclerotized process (a) on internal left limb of tentorium. Scale bars: 0.03 mm (55, 56); 0.05 mm (51–53); 0.1 mm (54).



FIGURES 57–59. (57–58). *Ribautia lewisi* sp. nov. (female paratype (M); ARGENTINA: Entre Ríos Province: Concordia Department): (57) Left mandible. (58) Right side of first maxillae, dorsal. (59) *Ribautia lewisi* sp. nov. (juvenile (sex unknown) (Specimen A); ARGENTINA: Entre Ríos Province: Concordia Department): Contour of ultimate leg-bearing segment showing 1 + 1 coxal organs, ventral. Scale bars: 0.05 mm (57); 0.1 mm (58, 59).

Postpedal segments. Posterior margin of intermediate tergite convex (Fig. 47), posterior margin of intermediate sternite concave (Fig. 48). Posterior margin of first genital sternite very slightly concave at level of gonopods and in the middle (Fig. 48). Gonopods biarticulate, basal article with 5 setae, apical article with 6 setae (Figs. 51, 52); penis dorsally with 4 + 4 apical setae (Fig. 53). Anal organs absent.

Female (paratype K). Forty-seven leg-bearing segments, body length 20 mm, maximum body width 0.68 mm.

Antennae. With similar chaetoxaxy than in the male and proportionally shorter (*ca.* 3.0 times as long as the cephalic plate).

Remaining features similar to those in the male except for the shape and pilosity of the ultimate leg-bearing segment and postpedal segments.

Ultimate leg-bearing segment. Tergite and sternite trapezoidal, length/width ratio of tergite, *ca.* 0.77: 1; length/width ratio of sternite, *ca.* 0.72: 1. Shape and chaetotaxy of tergite and sternite as in Figures 60, 61. Coxopleura very slightly protruding at their distal-internal ventral ends, setae small and numerous on the distal-internal ventral area, the remaining coxopleural surface with few larger setae (Figs. 60, 61). Each cluster of coxal organs with *ca.* 21 organs (Fig. 61). Articles of ultimate legs not inflated, much thinner than those of the male (Figs. 60, 61). Ultimate legs proportionally a little longer than those of the male, with ratio of length of telopodites/length of sternite *ca.* 4.0: 1. Shape and chaetotaxy of ultimate legs as in Figures 60, 61.

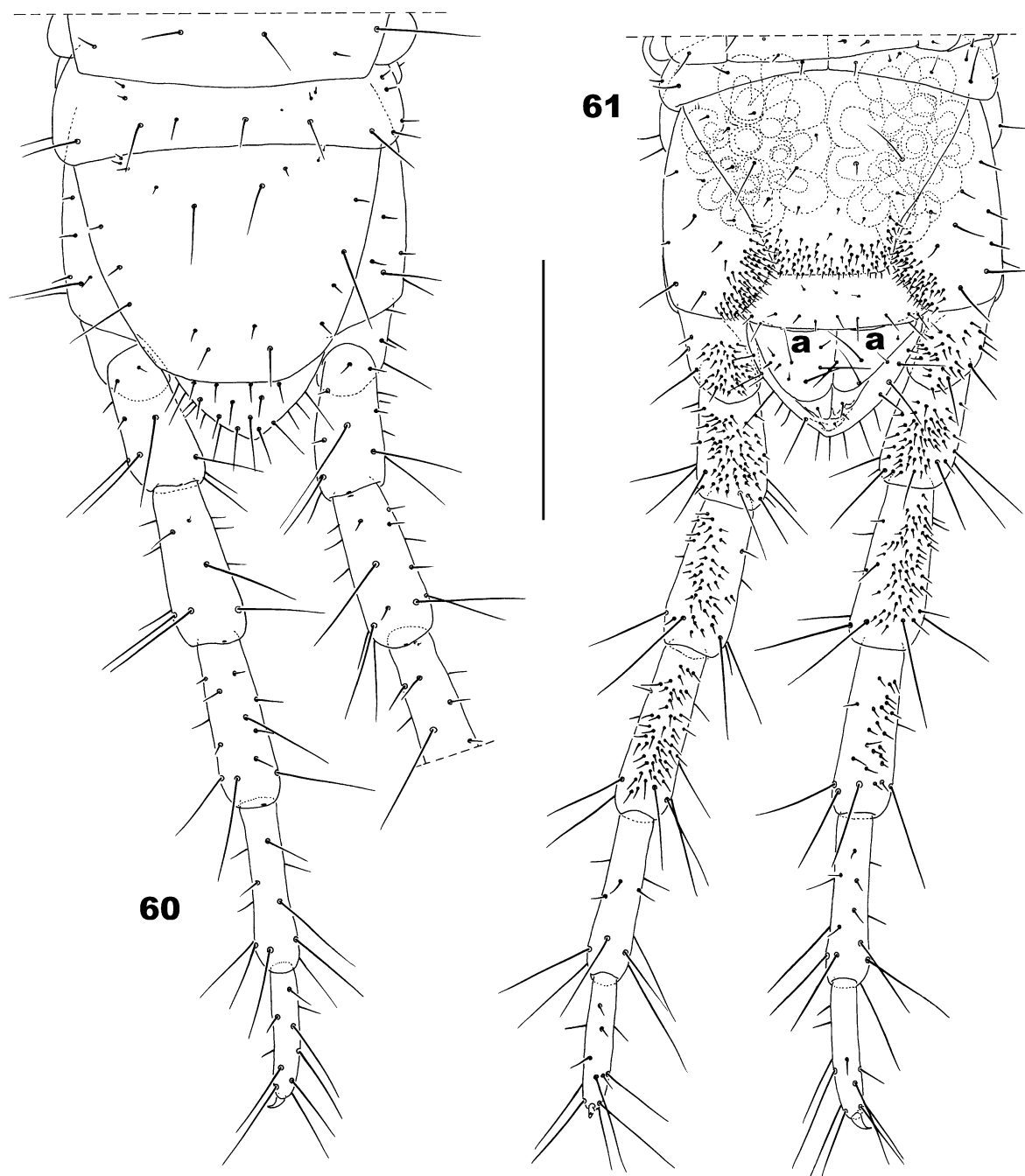
Postpedal segments. Intermediate tergite with posterior margin strongly convex, (Fig. 60), intermediate sternite seemingly covered by the sternite of the ultimate leg-bearing segment (Fig. 61), posterior border of the first genital sternite slightly convex (Fig. 61). Gonopods uniaarticulate, very poorly developed, vestigial (Fig. 61: a).

Remarks. The adult condition of all type specimens is indicated by mature spermatozoa in the tubula seminifera of the males and spermatozoa in the spermathecae of the females.

In the preceding description, the labrum, mandible, and dorsal side of first maxillae were illustrated on the basis of the female paratype M, because those of the male holotype were not positioned in such a way on the microscope slides to allow the corresponding illustrations to be made properly.

Aspect of the unique 1 + 1 coxal organs present in a tiny juvenile specimen with sex unknown (Specimen A), as in Figure 59.

All specimens examined without anal organs.



FIGURES 60–61. *Ribautia lewisi* sp. nov. (female paratype (K); ARGENTINA: Entre Ríos Province: Concordia Department): (60) Ultimate leg-bearing segment and postpedal segments, dorsal. (61) Ultimate leg-bearing segment and postpedal segments, ventral (a: vestigial gonopods). Scale bar: 0.3 mm.

Etymology. This species is respectfully dedicated to Dr. John G.E. Lewis (Taunton, Somerset, United Kingdom) as a personal recognition for all the generous help and expert advice that he has provided me during many years of research on Chilopoda Geophilomorpha.

Ecology. The specimens were collected in the soil (to a depth of about 10–40 cm) in a gallery forest environment adjacent to the west bank of the Uruguay River. (Floristic composition of this vegetation, extension along the water course, and significance on the geographical distribution of diverse groups of vertebrates are described in Arzamendia & Giraudó 2009, Costa 2003, Nores *et al.* 2005).

Type locality. ARGENTINA: Entre Ríos Province: Concordia Department: Concordia.

Known range. Only known from the type locality.

Discussion

Among the material of *R. lewisi* examined herein, the number of 43 leg-bearing segments is only recorded in four tiny juvenile specimens with no discernible sexual characters, according to the general pattern of variation of segment number in geophilomorph centipedes, this number could correspond to males.

Ribautia lewisi **sp. nov.**, is herein compared in detail with *R. combinata* and *R. jakulicai* which share with it a claw-like pretarsus in the ultimate legs and the presence of a cluster of coxal organs in each coxopleuron of the ultimate leg-bearing segment. The other two Neotropical species provided with 1 + 1 clusters of coxal organs (*i.e.*, *R. limaensis* and *R. silvana*) have instead a tubercle-like ultimate pretarsus. The new species can be also confidently differentiated from these latter by means of the following additional traits (the corresponding features for *R. lewisi* are given in parentheses).

R. limaensis: male with 55 leg-bearing segments; tentorium without process; telopodites of first maxillae without lappets; apical medial edge of forcipular trochanteroprefemur with a small unpigmented protuberance; all pore-fields undivided. (*R. lewisi*: male with (43?), 45, 47 leg-bearing segments; internal limb of tentorium bearing a conspicuous sclerotized process; telopodites of first maxillae with lappets; apical medial edge of forcipular trochanteropraefemur with a conspicuous round-tipped unpigmented tooth (Figs. 17, 19); pore-fields on middle and posterior regions of the body divided in two areas, Figs. 26–32).

R. silvana: male with 49 leg-bearing segments; tentorium without process; telopodites of first maxillae without lappets; anterior border of forcipular coxosternite completely unarmed; apical medial edge of forcipular trochanteroprefemur with a well developed and deeply pigmented tooth; all pore-fields undivided; anal organs present. (*R. lewisi*: anterior border of forcipular coxosternite bearing 1 + 1 small unpigmented denticles in the middle part (Figs. 17, 18); anal organs absent; other traits as mentioned above).

R. lewisi is the second confirmed record of the genus *Ribautia* from Argentina, next to *R. jakulicai* (from Northwestern region, Yungas biogeographical province). A further very poorly known nominal species from this country, originally described by Filippo Silvestri in the genus *Orinophilus* Cook, 1896 (*i.e.*, *O. platensis* Silvestri, 1898, from Buenos Aires Province), could possibly belong to *Ribautia*, but no definite generic allocation is possible without the examination of the type material (Foddai *et al.* 2000; Pereira 2007).

Acknowledgements

Alessandro Minelli (University of Padova) contributed with a careful review which helped to improve the final version of the manuscript. Hernán Lucas Pereira and José Luis Pereira (La Plata) prepared the electronic versions of the figures.

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