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A review of Lappodiamesa Serra Tosio, with the description of L. boltoni spec. nov. from Ohio, USA

(Diptera, Chironomidae)

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Abstract

The genus *Lappodiamesa* Serra-Tosio is emended. *Lappodiamesa brundini* Serra-Tosio is regarded as a junior synonym of *L. vidua* (Kieffer) comb. nov. The female of *L. vidua* and the male and female imagines, pupa and larva of *Lappodiamesa boltoni* spec. nov. are described in full detail. The genus apparently forms the sister group of *Pseudodiamesa* Goetghebuer.

Introduction

The previously monotypic genus *Lappodiamesa* was described by Serra-Tosio (1968) from two males collected by L. Brundin in N.-Sweden, close to the Norwegian border. The immature stages were unknown when the keys and diagnoses to the Holarctic Diamesinae were elaborated by Oliver (1983, 1986). After the initial description of *L. brundini* Serra-Tosio no additional records were made of the species until Makarchenko (1983) described the male, pupa and larva from the Chukotskii Peninsula. Having the opportunity to describe all stages of a recently discovered Nearctic species, we decided to examine putative types of *Syndiamesa vidua* Kieffer, a species which for a while has been suspected to represent a synonym of *L. brundini*. Through the courtesy of Dr. E. Makarchenko, we also were able to reexamine some specimens used in his description.

Methods

The material was mounted in Canadabalsam (Sæther, 1969) or in Euparal. Terminology follows Sæther (1980). In the descriptions measurements are given as ranges. When more than 4 specimens have been measured, the range is followed by a mean and the number of specimens measured in parenthesis.

Lappodiamesa Serra-Tosio, 1968, emended

Diagnosis

Male antenna plumose, female antenna with six or seven flagellomeres. Eyes with weak or strong pubescence, in male moderately extended medially. Frontal and orbital setae absent. Maxillary palp about as long as width of head, with weak indication of sensilla capitata on segment three or devoid of sensilla capitata. Antepronotum deeply notched dorsally. Acrostichals present or absent, dorsocentrals uniserial or biserial posteriorly. Wing membrane almost smooth (Makarchenko, 1983) or punctated with microtrichia, R_1 distinctly arched, FCu clearly proximal to FR, MCu slightly proximal of RM, R_{4+5} with a few setae distally, anal lobe prominent. Fourth tarsal segment of legs cylindrical and subequal in length to fifth segment. Male hypopygium with anal point and pars ventralis, with or with-

out rounded and setose superior volsella, and with weekly delineated inferior volsella. Female genitalia with 3 rounded seminal capsules, gonocoxite IX with moderate projection and tergite IX clearly divided into two setigerous protrusions. Pupa with rugulose cephalothorax, thoracic horn absent; abdomen reticulate with strong and dark apophyses on tergites and sternites, L-setae simple or bifid and mostly subequal; anal lobe overreaching genital sac, with 3 anal macrosetae, without fringe or median setae, with or without pointed apical tubercle. Larva with 2 pairs of serrate labral lamellae, labral sensilla S I–S III simple, pecten epipharyngis with 7 scales, premandible with 4–5 teeth, mentum with 1 median and 8–9 lateral teeth, body setae pale and moderately long, procercus about as long as wide with 8–9 anal setae and 2 subapical setae.

Lappodiamesa vidua (Kieffer) comb. nov.

Figs 1 A–C

Syndiamesa vidua Kieffer, 1922: 23–24, fig. 15.
Lappodiamesa brundini Serra-Tosio, 1968: 140–145, pl. 5. syn. nov.

Diagnosis

Female with 6 flagellomeres. Acrostichals present. R_{2+3} of wing ending close to R_1; male without superior volsella; female apparently without sensilla chaetica on front and middle legs. Pupa with distinct apical tubercle on anal lobe. Larva with first lateral teeth of mentum about equally wide as median tooth.

Male imago

Scutellum with more than 30 setae in 2–3 irregular rows. LR_1 0.64, LR_2 0.47, LR_3 0.57; BV_1 3.72, SV_1 2.72, SV_2 2.20, SV_3 3.38. Tergite IX (Fig. 1 A) with 22 setae, laterosternite with 14 setae; transverse sternapodeme 131 μm long, with or without distinct orolateral corners; phallapodeme 120 μm long, pars ventralis 34 μm long, gonocoxite 304 μm long, gonostylus 165 μm long. Otherwise about as in descriptions by Kieffer (1922), Serra-Tosio (1968) and Makarchenko (1983).

Female imago (n = 2)

Total length 4.53–4.58 mm. Wing length 3.37–3.58 mm. Total length/wing length 1.28–1.34. Wing length/length of profemur 3.64–3.68.

Head: Pedicel with 3–4 setae. Length of flagellomeres (μm): 83, 56–64, 53–56, 45–49, 49, 150–165. AR 0.57–0.59. Flagellomeres 1–3 with 1–2 apical sensilla coeloconica dorsally, ultimate flagellomere with about 20 sensilla chaetica and a few sensilla coeloconica. Ultimate flagellomere with 1–2 subapical setae. Coronal suture faint or reduced. Temporal setae 17–20, including 6–8 postorbitals, 7–9 inner- and 3–4 outer verticals. Eyes with strong pubescence (sensu Sæther, 1980). Clypeus with 5–7 setae. Palp segments 4 and 5 fused in one specimen; palp segments length (μm) in normal specimen: 45, 64, 131, 116, 154; about 4–5 sensilla clavata observed on palp segment 3. Tentorium 180–214 μm long. Stipes length/width 191/60–68 μm.

Thorax: Antepronotum with 9–12 lateral setae. Dorsocentrals 16–17, acrostichals 13–16, supraalars absent, prealars 10–13. Scutellars 38–43, in 3–6 rows.

Wing: VR 0.92–0.96. Costa produced 83–90 μm beyond R_{4+5}. Anal lobe with well developed projection. Microtrichia of wing membrane visible under 100× magnification. R with 10–13 setae, R_1 with 7–9, R_{4+5} with 6–9 setae. Alula with 4–5 setae. Squama with 40–50 setae. Subcosta with 3 sensilla campaniformia, R_1 with 1, R_{2+3} with 2 and R_{4+5} without sensilla campaniformia.

Legs: Spur of front tibia 68–71 μm, spurs of middle tibia 49 μm and 53–58 μm, of hind tibia 45–51 μm and 77–85 μm long. Width at apex of front tibia 64–71 μm, of middle tibia 60 μm, of hind tibia 79–86 μm. Comb on hind tibia with 7–9 setae 45–60 μm long. Middle and hind legs with following numbers of pseudospurs on ta_{1+3} respectively: 4–9 plus 0–2 apical, 0, 0 (P_2); 6–8 plus 2

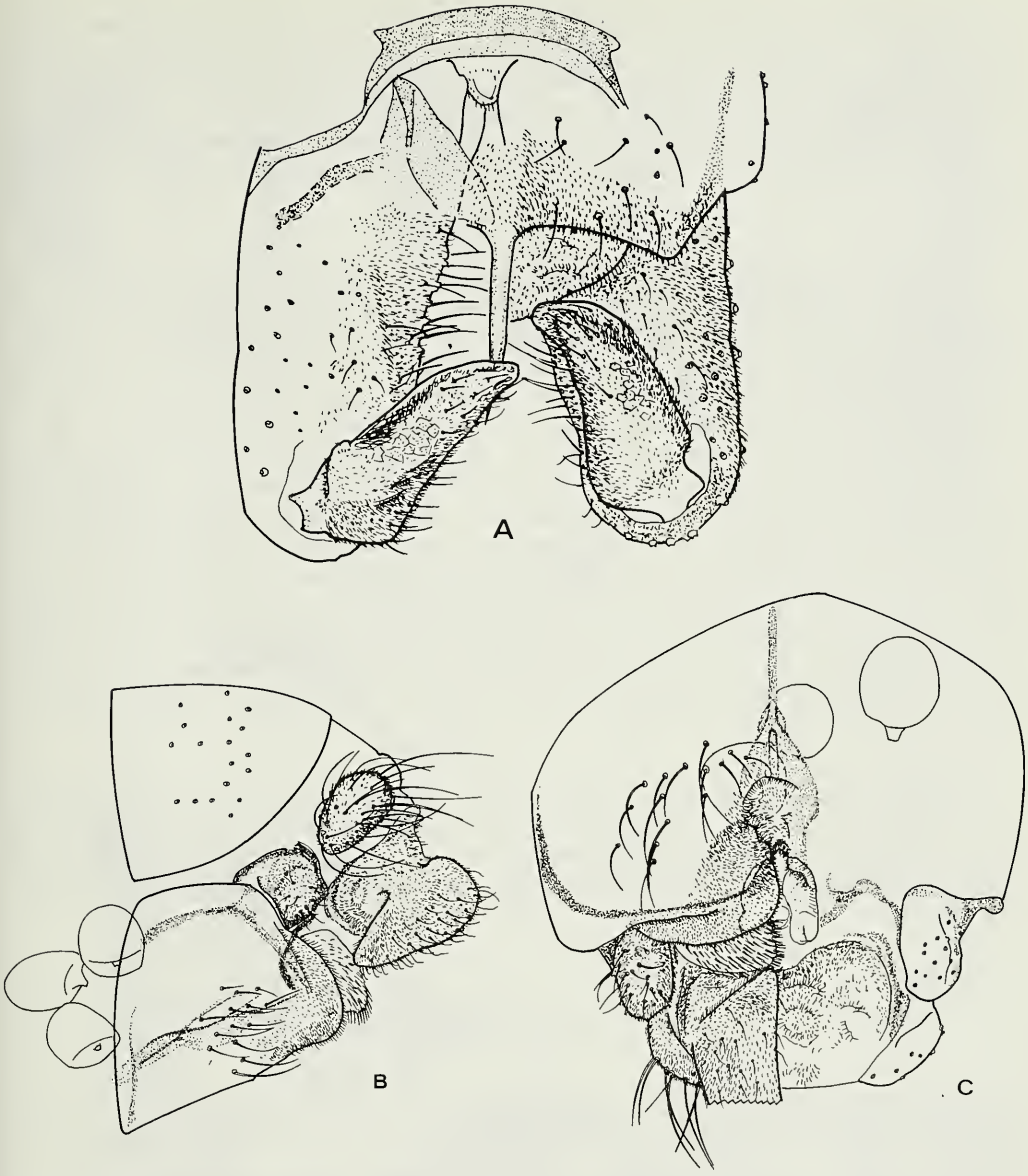

Fig. 1. *Lappodiamesa vidua* (Kieffer) comb. nov., imago. – A. Male hypopygium. – B–C. Female genitalia, lateral (B) and ventral (C) view (cerci damaged).

apical, 0, 0 (P_3). Front and middle ta_1 without sensilla chaetica; hind ta_1 with 18 sensilla chaetica distributed from 0.29–0.39 to 0.83–0.88. Lengths (μm) and proportions of legs:

	fe	ti	ta_1	ta_2	ta_3	ta_4	ta_5	LR	BV	SV	BR
P_1	926- 973	1106-1181	728-751	383 (1)	236 (1)	161 (1)	137 (1)	0.64-0.66	3.17 (1)	2.79-2.87	2.6 (1)
P_2	1096-1143	1001-1158	576-595	293-321	208-217	132	113-123	0.51-0.52	3.65-3.72	3.81-3.87	2.9 (1)
P_3	1247	1351-1427	756-832	389-444	265-288	142 (1)	142 (1)	0.56-0.58	3.59 (1)	3.22-3.44	2.2 (1)

Genitalia (Figs 1 B–C): Sternite VIII with a total of 28–49 setae in a more or less contiguous distribution; gonocoxapodeme strongly sclerotized. Seminal capsules rounded, 98–132 μm long inclusive 19–23 μm long neck, width 79–86 μm; surface with possible indication of scattered, tubercle-like microtrichia. Notum 109–120 μm long, rami long and curved towards midline. Flap (Willassen, 1982) poorly developed. Ventrolateral lobe large with dense lanceolate microtrichia. Apodeme lobe ill-defined. Gonocoxite rounded with 15–16 setae. Tergite IX clearly divided with a total of 35–50 setae.

Remarks

Kieffer based his original description on two males and one female collected by Dr. Økland on Novaja Semlja. According to Kieffer (1922: 24) one male and the female were collected on 10th August and labelled No. 239. The second male was collected 23th August and was labelled No. 258. After completing his first description of *Syndiamesa vidua*, Kieffer received a second batch of specimens which he published on later (see Kieffer, 1923: 4, 11): two males plus one female collected on 19th August, labelled No. 239, and three females with No. 228 and collection date 17th August.

We have studied one male and two females which according to the labels seem to belong to the second batch of Kieffers specimens. However, they are all labelled "Types" and the male carries two additional labels: one reading "*Diamesa vidua*" det. D. R. Oliver, the other "lectotypus det. D. R. Oliver". According to curator Mr. J. E. Raastad (personal communication to E. W.) four males (No. 239, 19th August) and one female (No. 228, 17th August) in addition to the ones examined here remain in Museum of Oslo, and he indicates that "10th August" is an error which should read "19th August". Unfortunately, this does not seem to solve the problem of authenticity satisfactory and thus our question of the validity of the lectotype-designation remains open. Nevertheless, based on the available specimens and the detailed description of Serra-Tosio (1968) it seems clear that *Lappodiamesa brundini* is a synonym of *S. vidua*.

Material studied

Lectotype, male: *Diamesa vidua* (Kieffer) (D. R. Oliver det.) USSR: Novaj. Semlja, Ökland leg., Pankratjef Peninsula, 19. Aug. No. 239, (with additional numbers: Gl 2772 and 12463); Litselustina Bay, 17. Aug., No. 228 (with additional numbers 12461 and 12462), 2 females; in coll. Mus. Zool., Oslo. Chukotka, Chegitun River, 4. Aug. 1981, E. Makarchenko, 2 male hypopygia, 3 pupal exuviae, 3 larvae; 8. Aug. 1981, 1 larva; in coll. Mus. Zool. Bergen.

Lappodiamesa boltoni spec. nov.
Figs 2–4

Type locality: USA, Ohio, Franklin County, Sharon Woods Park.

Holotype: Pharate male pupa labeled: USA, Oh., Franklin Co. Sharon Woods Pk, 3/25/86, leg. M. J. Bolton, ZMBN No. 114.

Paratypes: 5 males, 2 females, 1 pharate female pupa with associated larval exuviae, 4 pupal exuviae, 1 larva; as holotype. Types in coll. Museum of Zoology, University of Bergen, Norway.

Diagnosis

Female with 7 flagellomeres. Acrostichals absent. Wing punctated with microtrichia visible under 30× magnification, R_{2+3} ending in middle between R_1 and R_{4+5}, hind leg without distinct tibial comb, female with sensilla chaetica on ta_1 of all legs. Pupa without apical tubercle on anal lobe. Larva with first lateral teeth of mentum clearly narrower than median tooth.

Descriptions

Male imago (n = 5, unless otherwise stated)

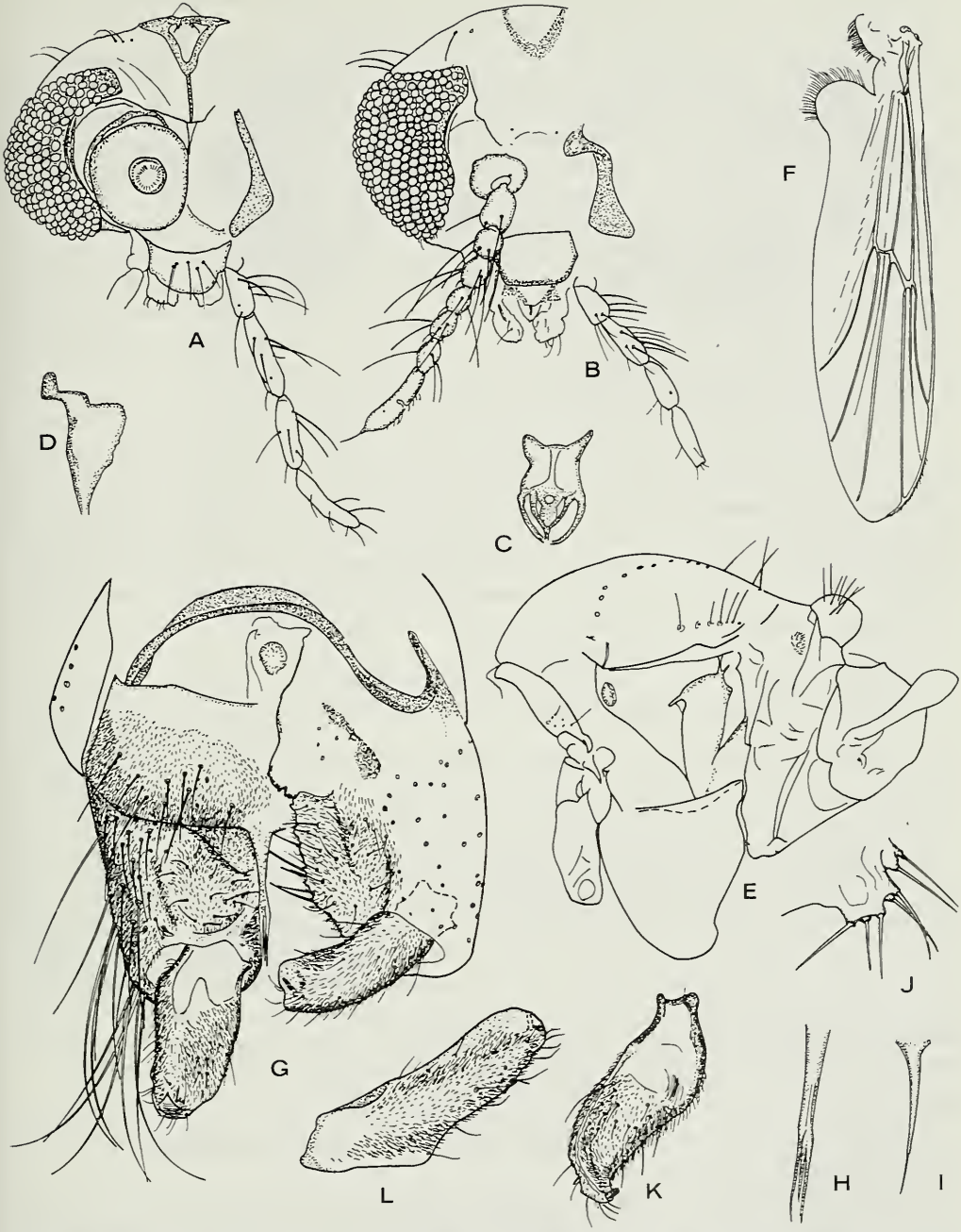

Fig. 2. *Lappodiamesa boltoni* spec. nov., imago. – A. Male head. – B. Female head. – C. Cibarial pump. – D. Stipes. – E. Thorax. – F. Male wing. – G–L. Male hypopygium with variation of anal point (H–I), details of superior volsella (J), and gonostyli (K–L).

Total length 4.37–4.82, 4.58 mm. Wing length 2.63–2.84, 2.69 mm. Total length/wing length 1.68–1.81, 1.72. Wing length/length of profemur 2.55–2.75, 2.65.

Head (Figs 2A, C–D): AR 2.32–2.53, 2.46. Ultimate flagellomere 732–860, 819 μm long. Coronal suture complete. Temporal setae 12–21, 15 (6) including 6–11 postorbitals, 3–6, 5 outer verticals and 1–5, 3 inner verticals. Eyes pubescent (not hairy) between all ommatids. Clypeus with 0–8, 3 (6) setae. Palps with long setae, sensilla clavata not apparent. Palp segments length (μm): 38–43, 40; 90–113, 99; 150–169, 156; 116–137, 122; 124–154, 142. Tentorium 203–244, 231 μm long. Cibarial pump as in Fig. 2C. Stipes (Fig. 2D) length/width 158–188, 168/49–68, 57 μm.

Thorax (Fig. 2E): Antepronotum deeply notched; with 3–10, 6 lateral setae. Dorsocentrals 14–26, 17 (4); supraalars and acrostichals absent; prealars 4–11, 6; Scutellars 14–17 (2), more or less biserial.

Wing (Fig. 2F): VR 0.81–0.89, 0.84. Costa produced 94–113, 99 μm beyond R_{4+5}. R_{2+3} in middle between R_1 and R_{4+5}. Microtrichia of wing membrane visible under 30× magnification. Brachiolum with 1–2, 2 (4) delicate setae. R with 8–10, 9 setae; R_1 with 2–6, 4; R_{4+5} with 2–3, 2 setae. Squama with 22–55, 40 (6) setae. Subcosta with 3 sensilla campaniformia, R_1 with 1, R_{2+3} with 3 and R_{4+5} without sensilla campaniformia. Anal lobe with well developed projection.

Legs: Spur of front tibia 71–83, 77 (4) μm long; spurs of middle tibia 45–68, 54 and 44–49, 44 (4) μm; of hind tibia 64–68, 65 and 41–47, 43 (4) μm long. Width at apex of front tibia 53–73, 66 (6) μm; of middle tibia 60–71, 65 μm; of hind tibia 68–79, 74 μm. Apex of hind tibia with somewhat irregularly dispersed setae, but without distinct setal comb. Middle and hind legs with the following numbers of pseudospurs on ta_{1-2} respectively: 8–15, 11 plus 2 apical; 0–4, 2 plus 2 apical (P_2); 6–14, 11 plus 2 apical; 1–4, 3 plus 0–2 apical (P_3). Other tarsal segments without pseudospurs. Posterior ta_1 with 6–13, 10 sensilla chaetica distributed from 0.66–0.83, 0.77 to 0.93–0.95, 0.94. Pulvilli weak.

Lengths (μm) and proportions of legs:

	fe	ti	ta_1	ta_2	ta_3	ta_4	ta_5	LR	BV	SV	BR
P_1	983-1049 1015	1210-1266 1249	888-945 910	369-397 384	255-284 267	142-161 148	104-123 113	0.72-0.75 0.73	3.32-3.64 3.49	2.39-2.53 2.49	3.0-4.4 3.9
P_2	1088-1134 1101	1134-1200 1164	633-661 647	279-302 294	208-217 213	123-132 128	98-113 106	0.54-0.58 0.56	3.87-4.03 3.94	3.41-3.66 3.50	2.7-4.0 3.1
P_3	1229-1380 1304	1436-1539 1500	805-841 814	416-444 428	265-321 289	142-175 158	104-118 112	0.52-0.56 0.54	3.60-3.77 3.67	3.32-3.66 3.44	4.6-5.2 4.9

Hypopygium (Figs 2G–L): Tergite IX with 20–30, 25 setae. Laterosternite with 8–14, 10 setae. Anal point (Figs 2G–I) 53–105 μm, (apparently broken in 3 of 6 specimens), slender with delicate apical hair sensillum or more stout with double to triple apical spines. Transverse sternapodeme approximately 95–150 μm wide, without oral projections. Aedeagal lobe broad, rhomboid to spatulate; phallapodeme well sclerotized, 101–180, 151 μm long; pars ventralis (Fig. 2G) small and knoblike. Gonocoxite 296–360, 338 μm long; basally with rounded, setigerous superior volsellae (Figs 2G, J); inferior volsellae weakly delineated. Gonostylus (Figs 2G, K–L) 150–210, 173 μm long; with well developed crista dorsalis, macroseta relatively short. HR 1.71–2.20, 1.97. HV 2.27–2.95, 2.67.

Female imago (n = 2)

Total length 5.06–5.39 mm. Wing length 2.86–2.94 mm. Total length/wing length 1.77–1.83. Wing length/length of profemur 3.46.

Head (Fig. 2B): Pedicel without setae. Length of flagellomeres (μm): 79–83, 45–53, 53–60, 45–53, 45–56, 49–62, 120–161; 7th flagellomere partially divided 45–68 μm from base. AR 0.32. Flagellomeres 1–6 with 1 pair of apical sensilla chaetica dorsally and 0–2 sensilla chaetica ventrally; ultimate flagellomere with 18 sensilla chaetica; ringed sensilla coeloconica absent. Ultimate flagellomere with 1–2 subapical setae. Coronal suture incomplete or faint. Temporal setae 6–7, including 2–3 postorbitals, 2 inner- and 2 outer verticals. Eyes with weak pubescence which is mostly concealed by overlying ommatid lenses. Clypeus with 0–4 setae. Palp segments length (μm): 41–45, 83–90,

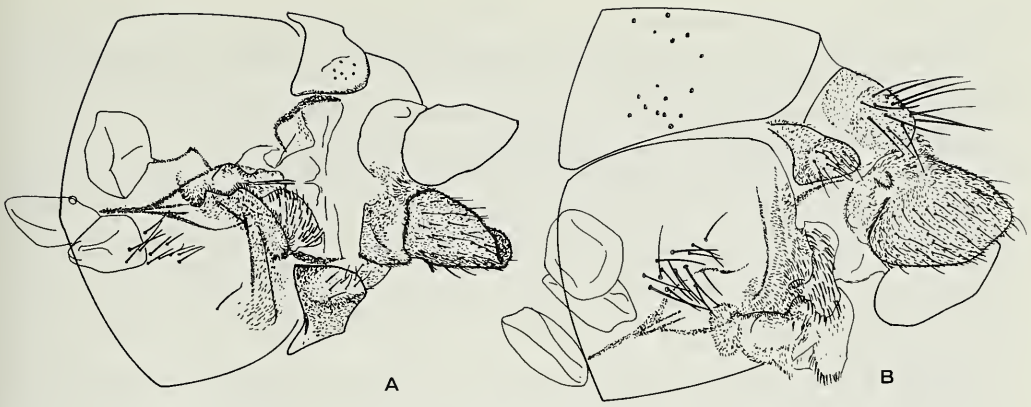

Fig. 3. *Lappodiamesa boltoni* spec. nov., female genitalia. – A. Ventral view. – B. Lateral view.

94–98, 83–90, 109–128; no sensilla clavata observed on palp. Tentorium 191 μm (1) long. Stipes length/width 154/71 μm.

Thorax: Antepronotum with 4–6 lateral setae. Dorsocentrals 16–17, supraalars and acrostichals absent, prealars 7. Scutellars 22–32, in biserial pattern.

Wing: VR 0.92–0.94. Costa produced 98–116 μm beyond R_{4+5}. Projection of anal lobe slightly less developed than in male. Microtrichia of wing membrane visible under 30× magnification. Brachiolum with 1–2 weak seta. R with 10–11 setae, R_1 with 5–7, R_{4+5} with 5–6 setae. Alula with 5 setae. Squama with 36–44 setae. Subcosta with 4 sensilla campaniformia, R_1 with 1, R_{2+3} with 3 and R_{4+5} without sensilla campaniformia.

Legs: Spur of front tibia 60–64 μm, spurs of middle tibia 45 μm and 49–56 μm, of hind tibia 45 μm and 60–64 μm long. Width at apex of front tibia 64 μm, of middle tibia 64–68 μm, of hind tibia 71–75 μm. Comb on hind tibia absent. Middle and hind legs with following numbers of pseudospurs on ta_{1-3} respectively: 7–10 plus 2 apical, 3–5 plus 2 apical, 0–1 (P_2); 7–8 plus 2 apical, 0–3 plus 0–2 apical, 0 (P_3). Front ta_1 with 4–9 sensilla chaetica distributed from 0.51–0.64 to 0.84–0.85; middle ta_1 with 17–21 sensilla chaetica from 0.23–0.38 to 0.86–0.91; hind ta_1 with 8–18 sensilla chaetica from 0.52–0.54 to 0.90–0.94.

Lengths (μm) and proportions of legs:

	fe	ti	ta_1	ta_2	ta_3	ta_4	ta_5	LR	BV	SV	BR
P_1	827- 851	973-1002	628-643	260-284	180-194	118-132	104-113	0.64-0.65	3.45-3.67	2.86-2.88	2.0-2.1
P_2	983-1011	1044-1063	473-501	208-246	146-170	104-128	95-113	0.45-0.47	3.92-4.52	4.14-4.29	1.9-2.0
P_3	1096-1125	1257-1323	647-652	340	227-246	137-151	113-123	0.49-0.52	3.60-3.67	3.64-3.75	2.7

Genitalia (Figs 3A–B): Sternite VIII with 12–16 setae to each side of midline; gonocoxapodeme narrow. Seminal capsules rounded, 139–154 μm long inclusive 8 μm long neck, width 113–128 μm; surface covered with dense, very fine microtrichia (500×) and scattered, tubercle-like microtrichia. Notum 94–101 μm long, rami long and curved towards midline. Flap (Willassen, 1982) poorly developed. Ventrolateral lobe large with dense lanceolate microtrichia. Apodeme lobe with microtrichia. Gonocoxite rounded with 14–16 setae. Tergite IX divided with 30–48 setae.

Pupa (n = 5, unless stated otherwise):

Total length 5.98–6.51, 6.20 mm. Exuviae brownish grey. Thorax rugulose. Abdomen with dark brown, strongly delineated apophyses.

Cephalothorax: Frontal apotome weakly rugose, without frontal warts or cephalic tubercles. Frontal setae 71–98, 80 μm long (4); postorbital seta 38–90, 58 μm long (4).

Median antepronotals 75–95, 86 μm and 41–68, 54 μm long; lateral antepronotal seta 75–90 μm long (3). Anterior precorneal seta 45–83, 68 μm long; median precorneal 79–98, 90 μm; posterior precorneal seta 49–68, 59 μm long. Distance between anterior and median precorneals 19–28, 26 μm; between median and posterior precorneals 23–56, 41 μm. Thoracic horn absent. Dorsocentral setae Dc_1 41–53, 41 μm long; Dc_2 23–56, 37 μm long; distance between Dc_1 and Dc_2 143–236, 189 μm. Metanotal seta (only one?) 15–38 μm long (3). Supraalar seta 23–26 μm long (3). Wing sheath nearly smooth.

Abdomen (Figs 4 A–B): Tergite I more or less bare, but reticulate; T II with weak median shagreen, T III–IX with anterior, median and more extensive posterior shagreen composed of slightly coarser spinules; conspicuous polygonous reticulation laterally. Sternites I and IX bare, S II–VIII with anteromedian shagreen. O-setae absent. Some tergal connectives with a few anteriorly directed spinules. T II–VII with 5 pairs of subequal, thin and simple D-setae. Segment I with 3 L-setae, segment II–VII with 4 ventral subequal, simple or bifid L-setae, L-setae of segment VIII displaced dorsomedially.

Anal lobe 488–525, 499 μm long (6); overreaching genital sac by 30–56 μm in male (2); 90–101, 94 μm in female, without apical tubercle. Length of anal macrosetae 289–308, 297 μm.

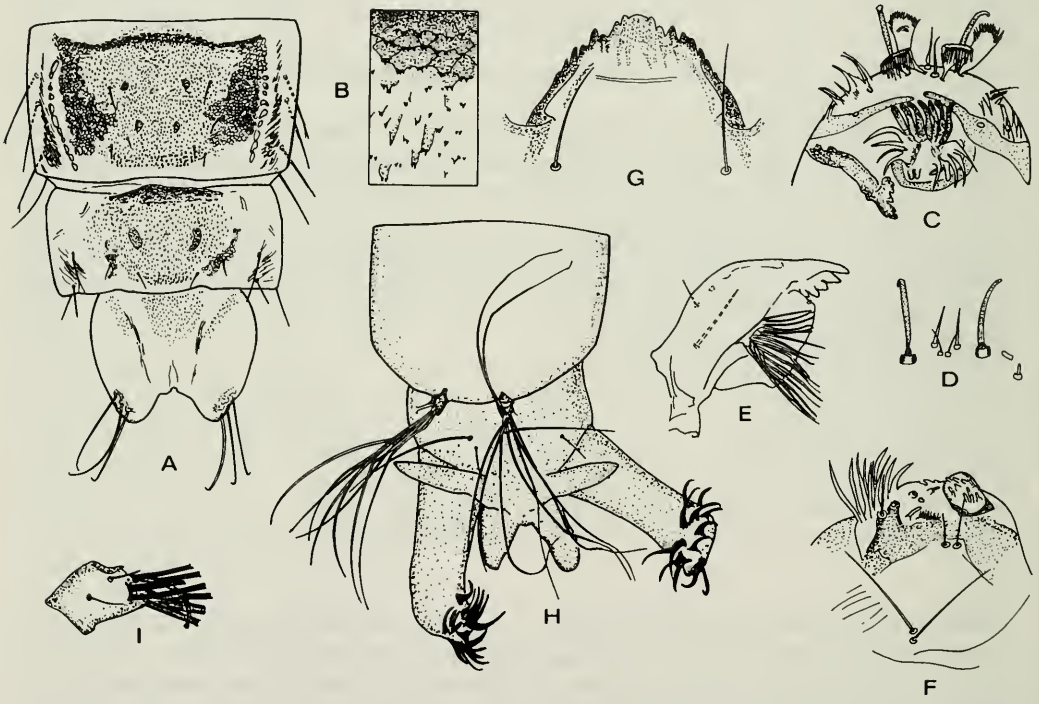

Fig. 4. *Lappodiamesa boltoni* spec. nov., immatures. – A–B. Pupa, tergites VII–IX (A) with detail of shagreen near apophysis (B). – C–I. Larva; labrum and epipharynx (C) with detail of SI – SIV (D), mandible (E), maxilla (F), mentum (G), posterior body segments (H) and detail of procercus (I).

Fourth instar larva (n = 3, unless stated otherwise):

Total length 8.96–9.92 mm. Head capsule length 0.44–0.52 mm.

Head: Antenna with 5 segments. Length of antennal segments (μm): 60–73, 17–22, 9–12, 3–4, 3–4. AR 1.74–1.85. Basal antennal segment 20–21 μm wide; distance from base to ring organ 13–20 μm, to basal mark of seta 17–34 μm, to distal mark 31–53 μm; blade 28–29 μm long, accessory blade 15 μm (1). Apical style of second segment 8–9 μm long. Third segment with about 7 annuli. Lengths of setae S 1–S 10 respectively (μm): 45 (1), 56 (2), 45, 75–105, 120–131, 86–120, 120–135, 158–184, 139–150. Labrum and epipharynx as in Figs. 4C–D; labral lamella consisting of 2 pairs of pectinate lobes, each pair respectively with about 16–25 and 21–30 branches; SI simple and hairlike, SII (Fig. 4D) stouter with scalelike base, SIII very weak and simple, SIV a short and conelike with cuplike base, SI Vb small and digitiform without cuplike base; 14 simple chaetae, some very short, and 8 spinulae present. Pecten epipharyngis consisting of 7 elongate scales, chaetulae laterales 4, chaetulae basales 2. Premandibles (Fig. 4C) 41–49 μm (2) long, with 5 teeth; lateral spine not apparent. Mandible (Fig. 4E) 116–128 μm long, seta interna with 17–18 branches including 10 plumose branches; seta subdentalis short. Maxilla as in Fig. 4F. Mentum (Fig. 4G) with broad median tooth and 8 (9?) lateral teeth, first lateral teeth equally high as median tooth, but distinctly narrower.

Abdomen: Shorter claws of anterior parapods with 2–4 inner teeth. Body setae moderately long. Procercus 68–79 μm long, 45–53 μm wide; with 8–9 numbers of 533–555 μm long anal setae; lateral setae 49–56 μm long. Supraanal setae 338–356 μm long. Posterior parapods 469–488 μm long. Longest anal tubulus 248–281 μm long, 94 μm wide at base, 53–60 μm wide at middle.

Remarks:

The peculiar furcate anal point in two males of the material studied apparently is a dimorphism. The few males available appear to fall into two groups regarding the numbers of setae on the squama (52–55 and 22–30 respectively) and the HR ratio (1.71–1.88 and 2.00–2.20 respectively). The more normal-looking anal point is somewhat similar to those of *Pseudodiamesa* Goetghebuer and *Pseudokiefferiella parva* (Edwards), i. e with a delicate apical hair sensillum. The hypopygium is similar to *L. vidua* apparently differing only in the slightly more massive and less acute shape of the gonostyli, but the diagnostic characters will otherwise suffice to separate the two species.

The female genitalia of *L. boltoni* are quite "normal-looking". The pattern of microtrichia on the genitalia is somewhat similar to some *Potthastia* species. The microsculpture on the seminal capsules may be unique, and the presence of sensilla chaetica on the front leg will separate the species from all other known female Diamesinae.

The pupa differs most conspicuously from *L. vidua* by lacking apical tubercles on the anal lobe. Also, the L-setae are apparently much longer.

According to Makarchenko (1983) the labral sensillum S I is pectinate in the larva of *L. vidua*. Reexamination of his material, however, shows that he misidentified S I and that this structure actually belongs to the labral lamella, thus making both S I, S II and S III simple in this species, just like in *L. boltoni*. The scale at the base of S II both in *L. boltoni* and *L. vidua* is similar to that found on S II in *Pseudokiefferiella parva* and in the *Diamesa latitarsis* group (see Ferrarese & Rossaro, 1981: figs 15, 35). Reexamination of *L. vidua* also shows that this species has 7 scales in the pecten epipharyngis. The larva of *L. vidua* apparently differs from *L. boltoni* by having the first lateral teeth of the mentum about equally wide as the median tooth. The median tooth area, however, is highly variable and asymmetric in all the specimens.

Lappodiamesa was regarded as the sister group of *Diamesa* Meigen, *Sympotthastia* Pagast and *Potthastia* Kieffer combined by Serra-Tosio (1968). Later the genus was placed provisionally as the sister group of *Diamesa* (Serra-Tosio, 1973). The immature stages as well as the male imagines, however, will key out near *Pseudodiamesa* in the keys of Oliver (1983, 1986, 1988). A good synapomorphy for *Lappodiamesa* plus *Pseudodiamesa* appears to be the seven elongate scales of the pecten epipharyngis and we are convinced that *Lappodiamesa* at least belongs in the same group as *Pseudodiamesa* together

with *Arctodiamesa* Makarchenko, *Pagastia* Oliver, *Potthastia,* and *Sympotthastia.* The overall similarities of the larvae with *Pseudokiefferiella* Zavřel probably are symplesiomorphies.

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