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Descriptions of *Lasiodiamesa bipectinata* spec. nov. and *Parochlus kiefferi* (GARRETT) BRUNDIN

(Diptera: Chironomidae)

With 14 textfigures

During a study of the chironomids of the Finse area, Norway, two males of a new species of *Lasiodiamesa* and one male *Parochlus kiefferi* were found in material from BARBER traps near Lake Finsevatn (SÆTHER in print). Both species belong to the small and phylogenetically interesting subfamily Podonominae.

Lasiodiamesa bipectinata spec. nov.

Male:

Length 3.8 mm. Wing length 2.6 mm. Coloration fuscous. Lateral margins of mesonotum dusky. Thorax slightly shining. Halteres pale, slightly yellowish. Wings slightly subluteous. Legs pale luteous with very slightly darker coxae, trochanters, femora, and tibiae. Tergites with 3 blackish, longitudinal stripes median, the middle one being the widest; orally and anally the blackish stripes become broader and cover most of the tergites; a larger area than on anterior segments blackish on posterior three segments.

Eyes bare, with a rather long and narrow dorsal projection with 3 ommatids in width (Fig. 1). Vertex bristles uniserial except dorsally where single to double. Longest vertex bristles reaching 124 μ .

Antenna with 15 segments (lacking in one specimen), 1 hair whorl on segment 2, 3 hair whorls on segments 3–13, about 60 on segment 14, and 1 at apex of last segment. Diameter of scapus 164 μ . Length of antennal segments in μ (scapus, segments 2–15): 117, 70, 47, 51, 49, 48, 49, 48, 48, 48, 49, 47, 49, 653, 52. Third to fifth segments about as wide as long, the others longer than wide. $AR = 1.17$. Last segment tapering to apex with 3 long whorl bristles, the longest reaching 94 μ , and numerous, distally strongly curved, hyaline sense bristles measuring

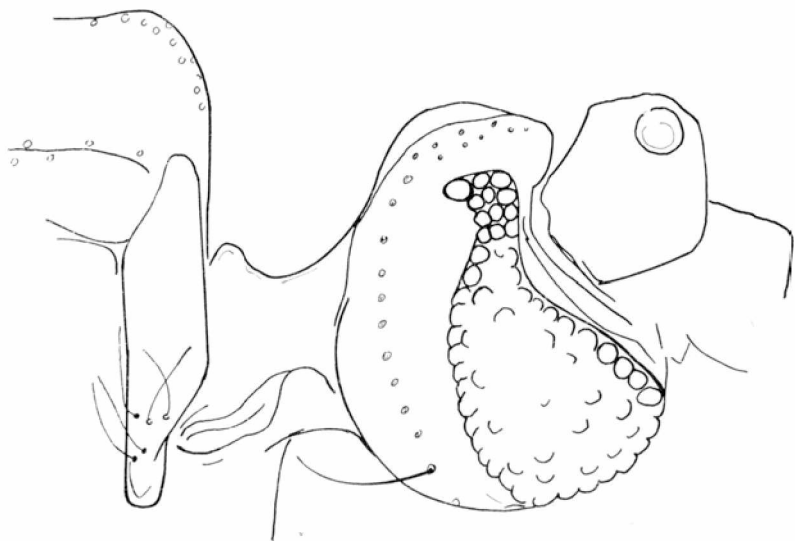


Fig. 1. *Lasiodiamesa bipectinata* spec. nov. ♂. Head and pronotum

35–40 μ (Fig. 2). Longest whorl bristles on antenna reaching 690 μ and shortest about 70 μ .

Clypeus with 15 strong, dark bristles, the longest 148 μ . Bristles of palp not in distinct whorls. Length of segments 1–4 of palp in μ : 88, 94, 102, 213. Number of bristles on segments 1–4: 12, 18, 24, 42.

Lobes of pronotum rather small and widely separated. Thorax with scutum slightly extended over pronotum. Pronotum with 5 bristles (Fig. 1). About 35 dorsomedian bristles, about 16 uniserial dorsolaterals, 5 orolaterals, about 12 prealars, 2 postalars, about 15 strong transverse uniserial scutellars and 8 less strong additional scutellars in front of these (Fig. 3).

Wing as in EDWARDS (1937, fig. 19a). VR (FITTKAU) = 0.99. Wing membranes and veins with 4–8 μ long microtrichia and 18–83 μ long macrotrichia. Two sensory organs below on the proximal margin of rm and two on proximal part of r_{4+5} , i.e. about as in *Buchonomyia thienemanni* FITTKAU (FITTKAU 1955, fig. 7). c with macrotrichia bi-triserial; r_1 dorsally with 105 bi-triserial macrotrichia ventrally with 30; r_{4+5} dorsally with 90 uni-biserial, ventrally with 60 uniserial. On m proximal of rm no macrotrichia, but about 25 ventrally; distal to rm on both sides altogether about 75 small macrotrichia. On cu dorsally 25, ventrally none; on cu_1 altogether 44; on cu_2 altogether 34. On an about 60 dorsally, none ventrally. Squama with only 3–4 strong, dark bristles.

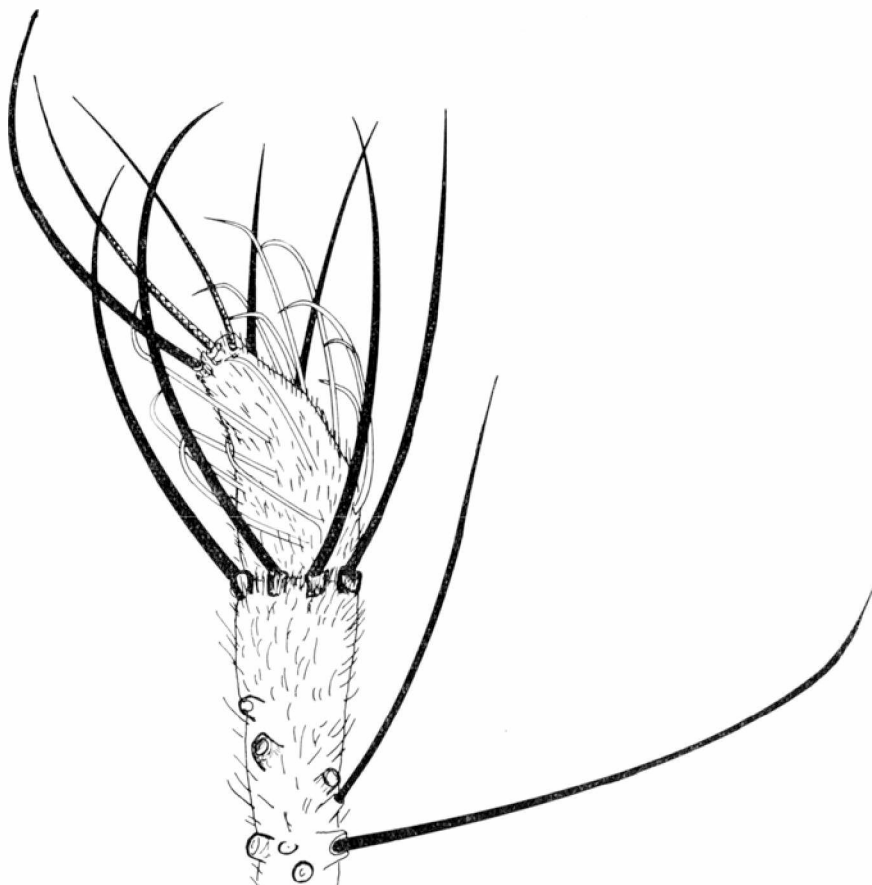


Fig. 2. *Lasiodiamesa bipectinata* spec. nov. ♂. Apex of antenna

Halteres next to microtrichia also with 25–40 μ long macrotrichia in distal half. The macrotrichia are longer and less densely placed than in *Buchonomyia thienemanni* (FITTKAU 1955, fig. 8).

Bristles of legs mostly uniformly dispersed, reaching 0.5–1.5 the width of segment on femora and front tibia, 0.5–2 the width of segment on middle tibiae, 1–3 the width of segment on hind tibiae, 1.5–3.5 the width of segment on front tarsi, 1.5–4 on middle tarsi, hind tarsi lacking. One spur reaching 69 μ on front tibiae, two reaching 62–65 μ on middle tibiae, two reaching 68 μ and 82 μ on hind tibiae (Fig. 4). A double comb present below apex of hind tibia, with 6 spines in distal row measuring 57–70 μ and 3 spines in proximal row reaching 47–50 μ . Empodium measuring about 42 μ . Rudiments of pulvilli present, but reaching only about 20 μ . Claws (Fig. 5) reaching about 65 μ , with 3 longer teeth and 5–7 smaller teeth near base; apex with 4 blunt teeth. *ta*₅ with an enlargement at base beneath (EDWARDS 1937, figs. 19c, 20c).

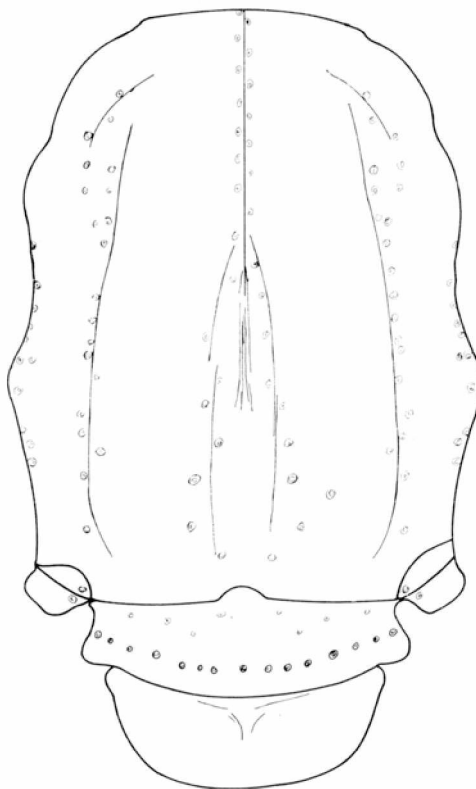


Fig. 3. *Lasiodiamesa bipectinata* spec. nov. ♂.
Mesonotum, scutellum, and metanotum

Lengths (in microns) and proportions of legs:

	<i>fe</i>	<i>ti</i>	<i>ta₁</i>	<i>ta₂</i>	<i>ta₃</i>	<i>ta₄</i>	<i>ta₅</i>	<i>LR</i>	<i>BV</i>	<i>SV</i>
<i>p₁</i>	1391	1451	1066	479	343	208	148	0.73	3.32	2.67
<i>p₂</i>	1383	1389	1043	476	312	192	140	0.75	3.41	2.66
<i>p₃</i>	1519	1560	—	—	—	—	—	—	—	—

The tergites beset with almost uniformly distributed long bristles somewhat more numerous laterally on tergites and on posterior tergites; longest bristles measuring about 310 μ .

Hypopygium (Fig. 6) with a complex anal point (Fig. 7) with 4 leaf-shaped setae, 4 longitudinal keels ending in curved points, and 4 bristles; anal point reaching about 80 μ in length. Coxite dorsal with one group of 15 bristles at distal-median corner, proximal to these another group consisting of about 10 bristles; the bristles in these groups measuring about 40 μ . Longest coxite bristles reaching about 160 μ . Stylus with a dark terminal spine reaching 20 μ .

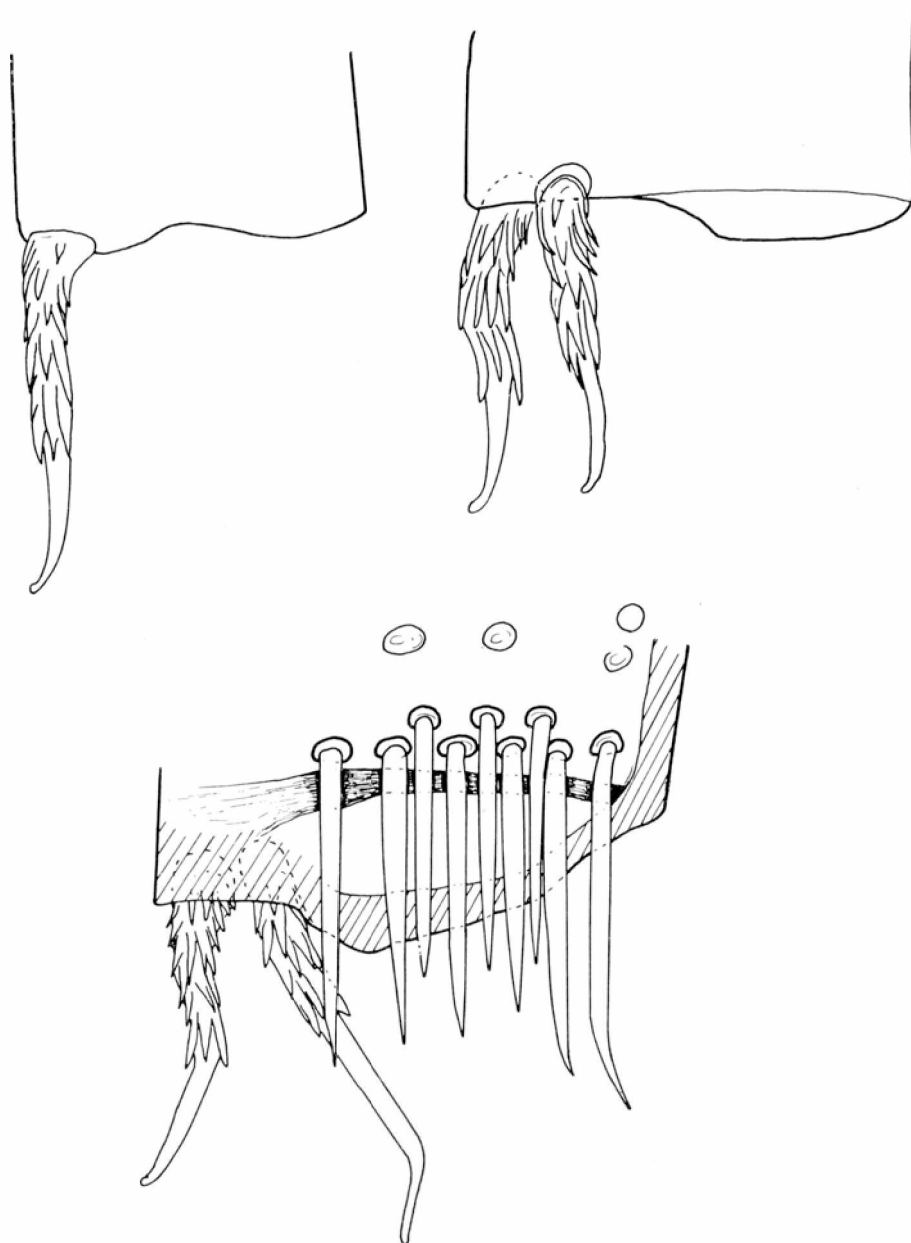


Fig. 4. *Lasiodiamesa bipectinata* spec. nov. ♂. Apices of front, middle, and hind tibiae with spurs and comb



Fig. 5. *Lasiodiamesa bipectinata* spec. nov. ♂. Claw of front leg

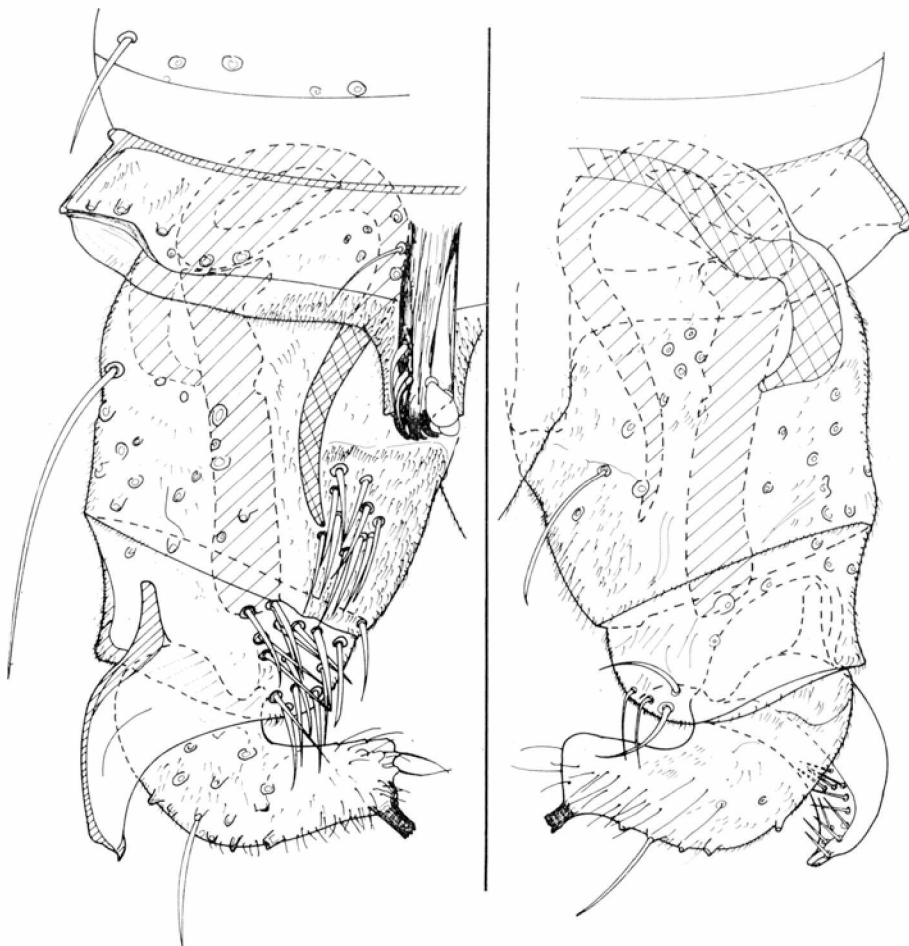


Fig. 6. *Lasiodiamesa bipectinata* spec. nov. Hypopygium, dorsal and ventral aspect



Fig. 7. *Lasiodiamesa bipectinata* spec. nov. Anal point

in length, 9μ in width, and with 5 small irregular teeth at apex. Dorsal appendix, which is a prolongation of the coxite, ventrally with about 13 anteriomedian-directed spine-like bristles measuring about 17μ . $HV = 2.25$; $HR = 1.64^1$.

BRUNDIN (1967, p. 315—326) gives a review and redescriptions of the known species of *Lasiodiamesa*. Although this new species seems closely related to *L. sphagnicola* (KIEFFER) EDWARDS, it differs in having a wing length of 2.6 mm (3.0—3.2 mm in *L. sphagnicola*), a dark terminal spine of stylus not developed in *L. sphagnicola*, a twisted anal point which makes the lateral view of the other known *Lasiodiamesa* the dorsal in this species (may be only a monstrosity), the anal point is shorter than in *L. sphagnicola*, and the longitudinal keels end in strongly curved points. This new species seems, however, also to differ from all the other known *Lasiodiamesa* by having segment 14 of male antenna 12.6 times as long as segment 15 (in other species segment 14 is 10—12 times as long as segment 15), a double comb of hind tibia (present perhaps also in some other species), rudiments of bases of pulvilli, claws with 8—10 teeth (only 4 teeth in the other species), and the *LR* on middle legs are higher than on front legs.

***Parochlus kiefferi* (GARRETT) BRUNDIN**

Paratanypus kiefferi GARRETT, 1925: 8.

Podonomus peregrinus EDWARDS, 1929: 296.

Podonomus peregrinus EDWARDS, GOETGHEBUER 1936: 23.

Podonomus (Paratanypus) kiefferi (GARRETT), EDWARDS 1937: 101, pro parte.

$$^1 HV = \frac{\text{length of male}}{\text{length of stylus} \times 10}; \quad HR = \frac{\text{length of coxite}}{\text{length of stylus}} \quad (\text{SAETHER in print}).$$

Podonomus peregrinus EDWARDS, GOETGHEBUER 1939: 3.

Podonomus (*Paratanypus*) *kiefferi* (GARRETT), COE 1950: 134.

Parochlus kiefferi (GARRETT) BRUNDIN, BRUNDIN 1967: 140.

nec *Podonomus peregrinus* EDWARDS, EDWARDS 1931: 256 (= *Parochlus edwardsi* (BRUNDIN),
comb. nov. = *Podonomus edwardsi* (BRUNDIN), 1956: 220 = *Parochlus auraucaus*
BRUNDIN, 1967: 140).

nec *Podonomus kiefferi* (GARRETT), WIRTH 1952: 94 (= *P. edwardsi* (BRUNDIN)).

nec *Podonomus kiefferi* (GARRETT), FREEMAN 1961: 631.

Male:

Length 2.5 mm. Wing length 2.2 mm. Coloration dark brown with uniform dark luteous legs. Head fuscous, scapus brown, flagellum more luteous. Halteres dusky with dirtyish yellow knobs. Thorax slightly shining. Wings greyish.

Eyes bare, reniform, the dorsal portion broad (Fig. 8). Vertex bristles biserial, reaching about 62 μ .

Antenna with 15 segments. Two hairs measuring 22 μ on scapus, 1 hair whorl on segment 2, 2 on segment 3, 3 on segments 4–9, 4 on segments 10–13, 16 on

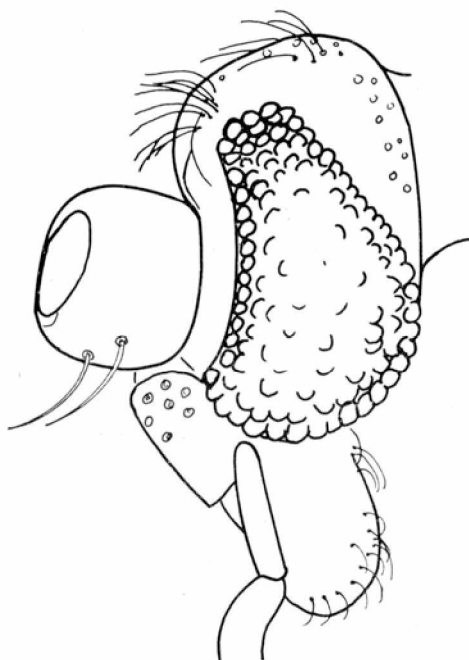


Fig. 8. *Parochlus kiefferi*, ♂. Head

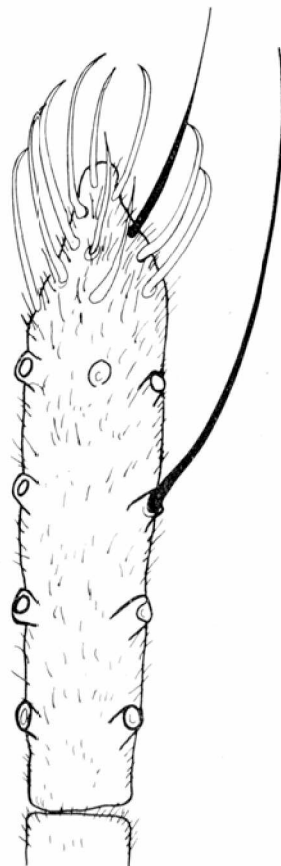


Fig. 9. *Parochlus kiefferi*, ♂. Apex of antenna

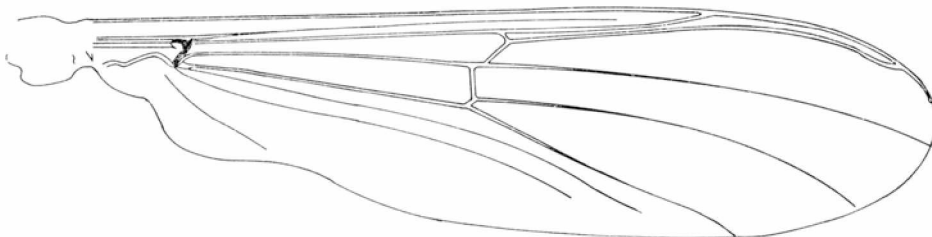
segment 14, and 4 and a single apical bristle on segment 15. Diameter of scapus 133 μ . Length of antennal segments in microns (scapus, segments 2–15): 118, 73, 47, 42, 44, 55, 55, 55, 55, 59, 57, 60, 61, 222, 112. Second segment 39 μ wide, third segment 36 μ wide, fourth segment 29 μ , and fifth segment 31 μ . $AR = 0.51$. Last segment with 45–95 μ long whorl bristles and 28–37 μ long, distally strongly curved, hyaline sensory bristles at apex (Fig. 9).

Clypeus with 8 (?) hairs. Longest bristles (on first segment) of palpi reaching 130 μ ; about 10 bristles on first and fourth segment, about 20 on second and third segment. Length of segments 1–4 of palpi in μ : 109, 133, 109, 140.



Fig. 10. *Parochlus kiefferi*, ♂. Thorax, lateral aspect

Pronotum much reduced, not visible dorsally, with 10 bristles (Fig. 10). About 80 dorsomedian bristles, mostly biserial, diverging on the prescutellar area. About 50 dorsolaterals (including orolaterals) on each side, irregularly tri-serial to quinquese-serial anteriorly, biserial in the middle, and uniserial on the prescutellar area. 22–25 suprapleural, 28–30 prealar, 9–10 postalar, 3–4 mesopleural, and 7 mesosternal (Fig. 10). About 10 strong uniserial scutellars

Fig. 11. *Parochlus kiefferi*, ♂. Wing

and about 8 less strong additional bristles in front of these. Metanotum with 1–2 very feeble and indistinct hairs.

Wing (Fig. 11). $VR = 0.97$. r_1 ending in distal third of the wing and more than half as long as r_{4+5} . Costa produced and practically reaching wing-tip. Vein *Ax* fairly distinct and reaching the margin. *rm* and *mcu* equal in length and two-third the length of the extended part of *c*. Wing membrane and veins with about 5- μ -long microtrichia and 30–155- μ -long macrotrichia. Macrotrichia mostly triserial on *c*, mostly biserial on r_1 and *r*, uniserial to biserial on r_{4+5} , uniserial proximally and biserial distally on m_1 and *cu*. 32 bristles on extended part of *c*. Squama with 9 long bristles.

Halteres with microtrichia and distal macrotrichia reaching about 50 μ .

Bristles of legs mostly uniformly dispersed reaching 0.5–1.5 the width of segment on front femora, 0.5–2 on middle and hind femora, 1–2 on front and middle tibiae, 1–2.5 on hind tibia, 1–3.5 on tarsi. One spur reaching 52 μ on front tibia, two reaching 42 μ and 52 μ on middle tibia, two reaching 48 μ and 66 μ on hind tibia (Fig. 12). An annular mark is present about one-fourth from base on all tibial spurs. Comb of hind tibia with 10 spines measuring 26–49 μ in length (Fig. 12). Empodium present, reaching 31 μ on front leg. Pulvilli lacking. Claws (Fig. 13) reaching about 42 μ , with 3 long ventral hairs at base, 4–5 shorter dorsal hairs, and 4–5 blunt apical teeth. ta_1 slightly flattened and slightly produced beneath at tip. ta_4 and ta_5 on hind tarsi lacking. Lengths (in microns) and proportions of legs:

	<i>fe</i>	<i>ti</i>	ta_1	ta_2	ta_3	ta_4	ta_5	<i>LR</i>	<i>BV</i>	<i>SV</i>
p_1	885	928	494	338	177	94	88	0.53	3.31	3.67
p_2	910	894	377	273	166	78	83	0.43	3.70	4.78
p_3	980	1147	577	341	195	—	—	0.50	—	3.69

The tergites beset with long and densely placed bristles reaching 40–110 μ .

Hypopygium (Fig. 14) with stylus split into two parts; one flattened, with rounded tip, not much darkened, with 2 ventral hairs (*t* bristles of BRUNDIN 1967) measuring 8 μ in length and standing 9 and 21 μ from apex, with a strong dorsal spine at base reaching 70 μ in length and almost 5 μ in width (*p* bristle of BRUNDIN 1967), and with a thin ventral spine at base difficult to observe as often covered

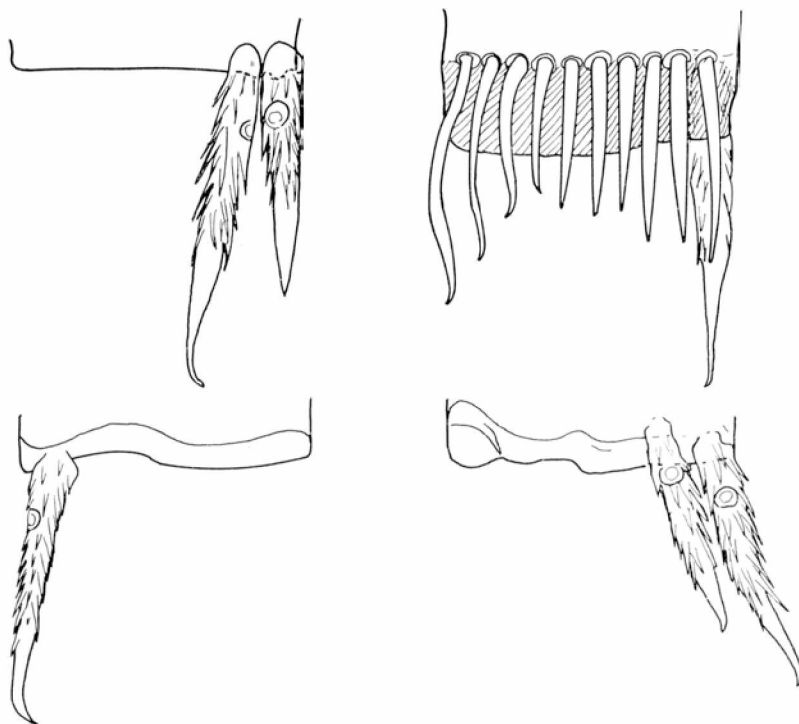


Fig. 12. *Parochlus kiefferi*, ♂. Spurs of front, middle, and hind tibiae, and comb of hind tibia

by the stylus and reaching $26\ \mu$ in length (*y* bristle of BRUNDIN); the other part rather long, curved, pointed, black, and with only about 12 faint hairs beneath base, the apical *t* bristle apparently lost. The common base of the two parts with about 15 strong bristles dorsally measuring $50\text{--}70\ \mu$. Coxite without strong bristles on inner side, bristles dorsally on inner side measuring about $25\ \mu$, the longest strong bristles ventrally and dorsally on outer side reaching $100\ \mu$. $HV = 2.36$; $HR = 1.72$.

EDWARDS (1929, p. 196) seems to have overlooked the teeth at the apex of male claws and two of the three hairs arising from the base of the claws.

P. kiefferi may perhaps differ from the closely related *P. edwardsi* (BRUNDIN) (EDWARDS 1931, p. 258, figs. 39a, 40a (as *Podonomus peregrinus*), WIRTH 1952, p. 94, fig. 2i (as *Podonomus kiefferi*)) by having comb of hind tibia composed of 10 spines (6 in *P. edwardsi*) and longer spur of hind tibia slightly longer than tibial diameter.



Fig. 13. *Parochlus kiefferi*, ♂.
Claw of front leg

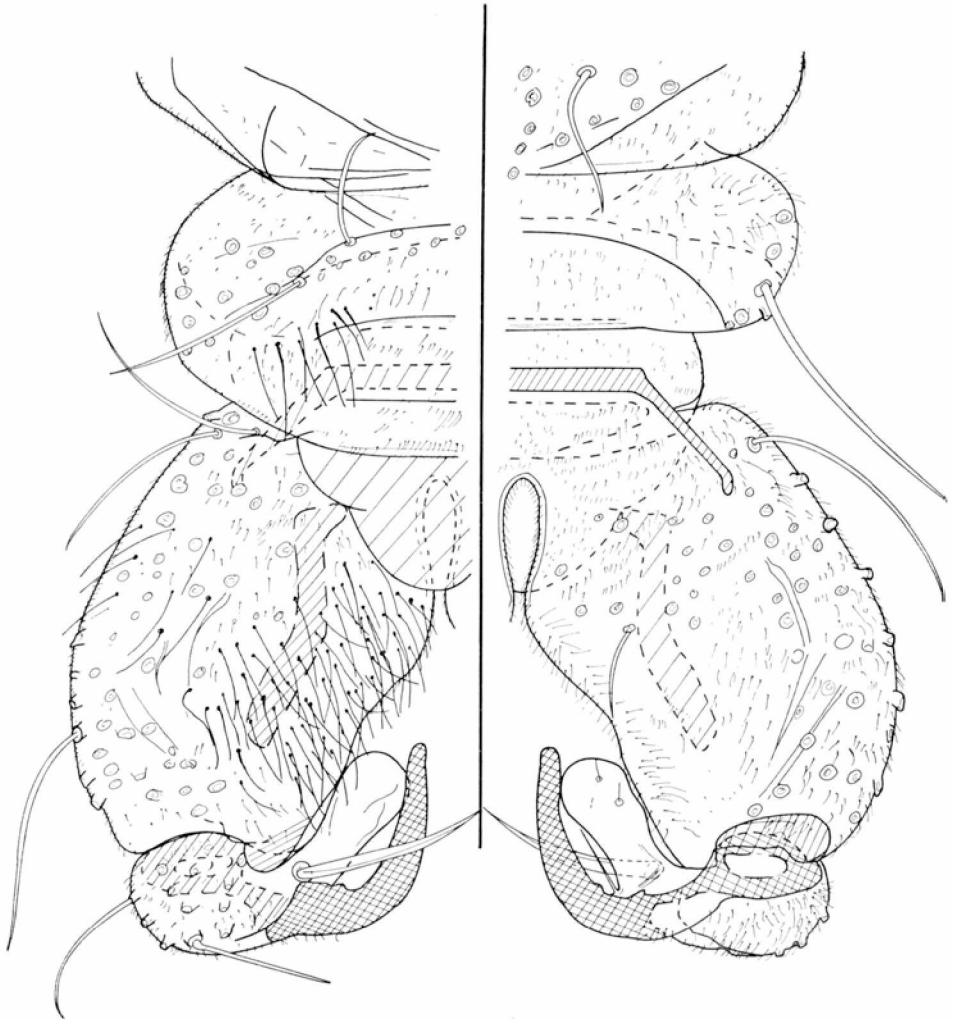


Fig. 14. *Parochlus kiefferi*. Hypopygium, dorsal and ventral aspect

Systematic position²

The imagines of the subfamily Podonominae have been distinguished by EDWARDS from other subfamilies by the absence of r_{2+3} even though r_1 and r_{4+5} are well separated, the rounded metanotum without any trace of the median longitudinal keel, furrow or fissure, and the wings which in a position of rest are completely superposed over the back. A complete absence of r_{2+3} with well separated r_1 and r_{4+5} , however, is found in the Tanypodinae, for instance in

² When this manuscript was in print, BRUNDIN's excellent publication on transantarctic relationships appeared. Some of the points of view have thus already been mentioned by BRUNDIN.

Nilotanypus which also has a rounded metanotum, but with a median furrow. In *Buchonomyia* might have a furrow on the metanotum according to FITTKAU (1955, p. 413). The Clunionini also lack a median furrow on the metanotum. The position of wings at rest, the one other usable character, cannot be used on preserved material such as the specimen of *Buchonomyia* and those here described.

The two species here described show many relationships to the Tanypodinae. The eyes of *Lasiodiamesa* with their projection are of a type often found in the Tanypodinae, while those of *P. kiefferi* without projection are not found in the subfamily. (*Monopelopia*, however, has reduced projections.) Both kinds of eyes are found in the subfamily Orthocladiinae. Antennae with 15 segments in the male are found only in Tanypodinae and Podonominae. *L. bipectinata*, however, has no hairs on scapus, *P. kiefferi* has 2 hairs, *Buchonomyia* 1 hair, while the Tanypodinae always seem to have many. Last antennal segment in *L. bipectinata* is of Pentaneurini type, but there are 3, not 1, apical bristles beside the sensory bristles. *P. kiefferi* has 4 hair whorls on last antennal segment, never found in the Tanypodinae, and a strong apical bristle. *Buchonomyia*, *Podonomus* and *Rheochlus*, however, lack strong bristles on last segment. On the other antennal segments there are mostly 3 hair whorls in *L. bipectinata* and *P. kiefferi*, while 2 hair whorls are most common in the Tanypodinae. Mesopleural and mesosternal bristles as found in *P. kiefferi* are found only in *Anatopynia*, Macropelopiini and a few Pentaneurini (*Natarsia*) of the Tanypodinae, and in *Protanypus*, *Hydrobaenus*, and *Heleniella*. In both described species pronotal, mesonotal, and scutellar bristles are of Pentaneurini type. Postalar bristles as found in the Tanypodinae and in *Protanypus*, *Prodiamesa*, *Odontomesa*, *Eurycnemus*, and *Brillia* are present in both species as in other Podonominae. *mcu* is present on wings of Podonominae, Tanypodinae, and Diamesinae. *fcu* is proximal to *rm* in the present species, *Anatopynia*, Pentaneurini, *Protanypus*, Diamesini, and *Telmatogeton*. r_{2+3} is absent in several genera and species both in the Tanypodinae and in the Orthocladiinae (for instance *Monopelopia*, *Nilotanypus*, *Telmatogeton*, *Eukiefferiella coerulea* group). A distinct axial vein as found in *P. kiefferi* is found for instance in *Cardiocladius*. In the Tanypodinae as in the present species there are macrotrichia on knob of halteres, and a hair fringe on the squama. The leg ratios are small as in Tanypodinae and Orthocladiinae, bristles and tibial combs as in most of the Tanypodinae. The tibial spurs, however, distinguish the Podonominae from all Tanypodinae except *Anatopynia*. *P. kiefferi* has tibial spurs which are exactly as in *Anatopynia*, while the spurs of *L. bipectinata* are more of the type found in plesiomorph Orthocladiinae. The claws of *L. bipectinata* are similar to those of *Guttipelopia*, those of *P. kiefferi* more similar to *Anatopynia*. The claws of Orthocladiinae, however, are probably of similar shape (cfr. *Adactylocladius*, SÆTHER in print). Chaetotaxy of abdomen of the described species is more or less as in the Tanypodinae. The chironomid hypopygium which seems to resemble that of *Lasiodiamesa* most is that of *Protanypus*, but a subterminal

stylus is also found in some Tanypodinae. A double stylus as found in *P. kiefferi* is known among the Diamesinae and the Orthocladiinae in *Prodiamesa olivacea*, some species of *Heptagyia*, *Brillia*, *Austrobrillia*, *Eurynemus*, and *Diploccladius*, i.e. plesiomorph genera. In the Tanypodinae double styli are unknown, but propensities to basal bifurcation are present, for instance in *Procladius*.

The imagines here described show relationships to the plesiomorph genera of Diamesinae, Orthocladiinae and Tanypodinae and most to *Protanypus* and *Anatopynia*. A parallel and convergent development with some Pentaneurini, as between *Boreochleus* and *Krenopelopia* (FITTKAU 1960, p. 409; 1962, p. 265), is found in both species, especially in the chaetotaxy and shape of claws. The hypopygia show a similar convergence with the plesiomorph Diamesinae and Orthocladiinae.

FITTKAU (1962, p. 57) mentions that the branching off of the Podonominae probably is considerably older than the ramification of the Tanypodinae. At least the impression of THIENEMANN (1937, p. 99): „Man hat den Eindruck, daß die Podonominen eine alte Chironomidengruppe darstellen, die den ‚Ur-Chironomiden‘ nähersteht als die übrigen Chironomidenunterfamilien“, is confirmed.

According to the different particulars mentioned by FITTKAU (1960, 1962) in describing the most plesiomorph type of the subfamily Tanypodinae, *Parochlus* is the most plesiomorph European genus of the Podonominae which is also confirmed by BRUNDIN (1967). The larva has the lowest procerci, hairs on abdomen and thorax, and unserrated claws of posterior prolegs. The pupa has the distally broadest horn with the largest sieve plate and the most ceratopogonid-like abdomen with the shortest anal thorns. The plesiomorph position of the imago is seen by the presence of mesosternal, mesopleural, and metanotal bristles, the hair whorls on last antennal segment, the low *LR*, the venation of wings, the tibial spurs, and the shape of claws. On the basis of the larvae and pupae as well as on that of the imagines *Parochlus* seems to be the most plesiomorph genus, *Boreochleus* and *Paraboreochleus* more apomorph, and *Lasiodiamesa* and *Trichotanypus* the most apomorph European genera. The larvae of *Lasiodiamesa* and *Trichotanypus* have serrated claws on posterior prolegs and the longest procerci and tubuli anales of the Podonominae. In the shape of pupal prothoracic horn and sieve plate there is a clear gradual line from *Paratanypus* to *Trichotanypus* which has a slender thoracic horn with small sieve plate. Also in the shape of the anal segment there seems to be a continuum from the small anal thorns of *Parochlus* to the greater ones of *Boreochleus* and *Paraboreochleus* and, finally, to the anal fins of *Lasiodiamesa* and *Trichotanypus*.

Summary

Descriptions of *Lasiodiamesa bipectinata* spec. nov. and *Parochlus kiefferi* (GARRETT) BRUNDIN are given. The phylogenetic position of the Podonominae and of the described species is discussed.

Zusammenfassung

Es werden Beschreibungen von *Lasiodiamesa bipectinata* spec. nov. und *Parochlus kiefferi* (GARRETT) BRUNDIN gegeben. Die phylogenetische Stellung der Podonominae sowie der deskribierten Arten wird erörtert.

Резюме

Дополняются и исправляются ранние описания *Lasiodiamesa bipectinata* spec. nov. и *Parochlus kiefferi* (GARRETT) BRUNDIN. Обсуждается филогенетическое положение Podonominae и вновь описанных видов.

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