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The problems with *Polypedilum* Kieffer (Diptera: Chironomidae), with the description of *Probolum* subgen. n.

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Abstract

A phylogenetic analysis of the genus *Polypedilum* Kieffer utilizing only species with known larvae, and including one additional species presumed to belong to a new subgenus was performed. The subgenera *Tripodura* Townes, 1945, *Pentapedilum* Kieffer, 1913 and *Cerobregma* Sæther *et* Sundal, 1999, were all monophyletic, while *Uresipedilum* Oyewo *et* Sæther, 1998 was monophyletic when the new subgenus *Probolum* was excluded. *Polypedilum s. str.* was never monophyletic even when excluding the atypical *P. nubifer* (Skuse, 1889), but if the relationships between subgenera were unresolved a cladogram as short as the shortest trees could be erected with *Polypedilum s. str.* as monophyletic.

It is proposed to reestablish the genus *Tripedilum* Kieffer, 1921a as a subgenus with the type species *P.* (*T.) fuscipenne* (Kieffer, 1921a) and including *P.* (*T.) nubifer* (Skuse); treat *Polypedilum* Kieffer, 1913 as valid (pending an application to the ICZN to supress *Polypedilum* Kieffer, 1912); reestablish the subgenus *Kribionympha* Kieffer, 1921a with the type species *Polypedilum (Kribionympha) declivis* Kieffer, 1922; give priority to *Tripodura* Townes, 1945 over senior synonyms; and erect the new subgenus *Probolum* Andersen *et* Sæther with *Polypedilum (Probolum) marcondesi* Pinho *et* Mendes **sp. n.** as type species and including at least *P. (Probolum) pedatum excelsius* Townes *sensu* Grodhaus *et* Rotramel, 1980, *P. (Probolum) simantokeleum* Sasa, Suzuki *et* Sakai, 1998 and *P. (Probolum) bullum* Zhang *et* Wang, 2004.

Short diagnoses for the subgenera of *Polypedilum* are presented. *Polypedilum (Probolum) marcondesi* **subgen. n., sp. n.** is described and figured as male, female, pupa and larva. The two subspecies of *P. (Uresipedilum) pedatum* Townes, 1945 are regarded as full species. The male imago of *P. (Uresipedilum) excelsius* Townes, 1945 and the male and female of *P. (Uresipedilum) pedatum* Townes are redescribed.

Key words: Chironomidae, *Polypedilum*, *Probolum*, new subgenus, new species, Brazil

Introduction

The genus *Polypedilum* Kieffer is one of the largest chironomid genera containing about 440 described species. The larvae mostly occur in sediments, but several species are associated with phytotelmata and a few mine aquatic plants or co-inhabit pupal retreats of caddis flies (Ashe & O'Connor 2002; Cranston *et al*. 1989; Bolton 1991; Kobayashi *et al*. 2003). Although the triangular, basally constricted eighth tergite combined with the bifid pulvilli readily distinguish the genus among the Chironomini, further division into subgenera has proven problematic. At present the genus is regarded as having five recognized subgenera: *Polypedilum s. str.* Kieffer, 1912, *Pentapedilum* Kieffer, 1913, *Tripodura* Townes, 1945, *Uresipedilum* Oyewo *et* Sæther, 1998 and *Cerobregma* Sæther *et* Sundal, 1999. The genus *Asheum* Sublette *et* Sublette (Sublette & Sublette 1983) was previously placed in *Polypedilum*, but as the pulvilli are not bilobed and the eighth abdominal segment of the male is not basally constricted it was reestablished as a separate genus by Oyewo and Sæther (2008).

Several phylogenetic analyses of the genus have been performed during the last decade (Oyewo & Sæther 1998; Sæther & Sundal 1999; Bjørlo *et al.* 2000; Vårdal *et al.* 2002; Sæther & Oyewo 2008; Oyewo & Sæther 2008). What they all have in common, however, is that they attempt to test the monophyly of the separate subgenera rather than analyze the genus as a whole. *Pentapedilum*, *Tripodura*, *Uresipedilum* and *Cerobregma* all are indicated as being monophyletic by these analyses while the nominal subgenus is often indicated as paraphyletic or polyphyletic even when excluding the unique *Polypedilum nubifer* (Skuse, 1889).

In spite of the numerous species included in the genus the females and immatures, especially the larvae, are known from a very limited number of species. A major problem with the above mentioned analyses is the unknown character states. Here we attempt to analyze the full genus utilizing only the species with sufficiently known larvae. However, we still lack sufficient female characters to include this stage. In addition to the 53 species in the data matrix the larvae are tentatively or insufficiently known from an additional 3–5 species.

When examining material from Brazil a new species inhabiting phytotelmata, apparently belonging to *Uresipedilum*, was found. In Brazil 51 *Polypedilum* species are recorded (Mendes & Pinho 2008); however, none are from the southern states of Brazil and none belong to *Uresipedilum*. Most species belong in the subgenera *Polypedilum s. str.* and *Polypedilum (Tripodura)* and were described by Bidawid and Fittkau (1995) and Bidawid-Kafka (1996). However, the larva of this new species could not belong to *Uresipedilum*

as presently defined. It was essentially identical to the larva described as *Polypedilum pedatum excelsius* Townes by Grodhaus and Rotramel (1980) from tree-holes in California. Sæther and Oyewo (2008: 31) assumed that the drawing of the ventromental plates in Grodhaus and Rotramel (1980), with the median ends of the ventromental plate not in contact with the outer edge of the first pair of lateral teeth of the mentum, but pointing towards each other, was a misrepresentation. However, the new Brazilian species indicates that the drawing in Grodhaus and Rotramel (1980) is correct. Kawai *et al.* (2006) suggested that *Uresipedilum* is not monophyletic which now indeed seems to be the case. The males of the new Brazilian species has a basal inner projection of the superior volsella also found in the Japanese *P. (U.) simantokeleum* Sasa, Suzuki *et* Sakai (Sasa *et al.* 1998 fig. 12j, k; Sæther & Oyewo 2008 fig. 8C) as well as in the Chinese *P. (U.) bullum* Zhang *et* Wang (Zhang & Wang 2004 fig. 3; Sæther & Oyewo 2008 fig. 10 F, G) which is the only known species with spotted wings assigned to *Uresipedilum*. The Afrotropical *Polypedilum longinervis* (Kieffer) (Kieffer 1922: 79; Freeman 1958: 290) also appears to belong to the same group.

The basal projection is easily overlooked, especially if the hypopygium is not properly cleared, as it is covered by tergite IX (as shown here in Fig. 10, for the Brazilian species). The hypopygium of *P. (U.) pedatum* Townes, 1945 looks exactly like that of the Brazilian species if the basal part is covered by the caudal portion of tergite IX. However, the immature stages of this taxon, described by Grodhaus and Rotramel (1980), may be incorrectly associated. If the association is correct the male imagines of the new subgenus may not always be possible to separate from those of *Uresipedilum*.

The material of Grodhaus and Rotramel (1980) has proven impossible to locate. However, two specimens from Marion Lake, British Columbia, obviously belong to *Polypedilum pedatum excelsius*; these as well as the type material of *Polypedilum pedatum pedatum* Townes are redescribed below together with the new species from Brazil.

Material and methods

The general terminology follows Sæther (1980). The specimens were mounted on slides in Canada balsam following the procedure outlined by Sæther (1969). The measurements are given as ranges, followed by the mean when more than three specimens were measured, followed by the number of specimens measured (n) in parenthesis.

The parsimony analyses used PAUP version 4.0b.10 on a Power Mac G5. The searches were heuristic.

The holotype and most paratypes of *Polypedilum (Probolum) marcondesi* **sp. n.** are deposited in the Museu de Zoologia da Universidade de São Paulo (MZUSP), São Paulo, Brazil; additional paratypes are housed in the Department of Natural History (ZMBN), Bergen Museum, University of Bergen, Norway.

Systematics

Assessment of the phylogenetic relationship involved compilation of a data matrix for 65 characters in 53 species with known larvae plus *P. bullum* and *P. simantokeleum*, which apparently belong to the same group as the new Brazilian species, with *Asheum beckae* (Sublette, 1964), *Stictochironomus* Kieffer, 1919 and *Phaenopsectra* Kieffer, 1921 as outgroups. The constraint that the genus *Polypedilum* is monophyletic was used. Otherwise either *Asheum* or *Phaenopsectra* plus *Stictochironomus* often are inside the cladograms.

The data were analyzed under parsimony with PAUP 4.0b. 10 (Swofford 2002) operating on a Macintosh G5, employing 1,000 random addition sequence replicates. Characters 30, 40 and 62 were ordered. The characters and states used in the phylogenetic analyses are given below, the data matrix showing the character states in Appendix 1. The data matrix is based on Albu (1980), Beck (1962), Beck and Beck (1964), Boesel (1985), Cranston (1996), Cranston *et al.* (1989), Epler (2001), Freeman (1958), Grodhaus and Rotramel (1980), Hirvenoja (1962), Kiknadze *et al.* (1991), Langton and Visser (2003), Lehmann (1979, 1981), Maschwitz and Cook (2000), Niitsuma (1992), Oyewo and Sæther (1998), Pinder and Reiss (1983, 1986),

Roback and Coffman (1983), Rossaro (1985), Sæther and Oyewo (2008), Sæther and Sundal (1999), Sasa (1979, 1985), Sasa and Kikuchi (1995), Sasa and Sublette (1980), Sasa *et al*. (1998), Soponis and Russell (1982), Soponis and Simpson (1992), Sublette (1964), Vårdal *et al*. (2002), Zhang and Wang (2004) and material from the collection of the Department of Natural History, Bergen Museum, University of Bergen. Few species are described in full and several of the character alternatives listed in the data matrix remain questionable. The character alternatives for *Polypedilum excelsius sensu* Grodhaus *et* Rotramel are scored as if the association with the immatures by Grodhaus and Rotramel (1980) is as in *P. excelsius* Townes except for the base of the superior volsella. Additional characters such as the shape of the larval eyes probably are useful, but inadequately known for most species.

Characters and states used in the phylogenetic analysis:

Males

1. *Abdomen*: (0) uniformly colored; (1) banded.
2. *Legs*: (0) unicolored or at most with darker shade at some apices; (1) ringed.
3. *AR*: (0) higher than 1.0; (1) lower than 1.0.
4. *Scutellum*: (0) with 3–12 setae; (1) with 13 or more setae.
5. *Wing membrane*: (0) without markings; (1) with dark spots.
6. *Wing membrane*: (0) without setae; (1) with setae.
7. *Wing vein* R_{2+3}: (0) relatively well separated from R_1; (1) adjacent to R_1.
8. *Setae on* R_{4+5}: (0) less than 41; (1) more than 40.
9. *Setae on M*: (0) present; (1) absent.
10. *Antepronotum*: (0) without setae; (1) with.
11. *Scutal fossal setae*: (0) absent; (1) present.
12. *Setae on squama*: (0) more than 7; (1) 2–7.
13. *Fore tibial scale*: (0) with apical spur; (1) without spur, but may be sharply pointed.
14. *Fore tibial scale*: (0) rounded; (1) triangular, pointed.
15. *Leg ratio*: (0) lower than 2.0; (1) 2.0 or higher.
16. *Pulvilli*: (0) not bifurcate; (1) bifurcate.
17. *Tergite VIII*: (0) not tapered basally; (1) tapered basally.
18. *Superior volsella*: (0) with projection; (1) without.
19. *Superior volsella*: (0) with mostly low base and long apical projection, or large base and no projection; (1) with high and large base and apicomedian projection.
20. *Projection of superior volsella*: (0) at least as long as base; (1) shorter than base; (2) absent.
21. *Projection of superior volsella*: (0) not medially directed and straight, often curved at apex; (1) medially directed, straight, at most slightly curved at blunt apex.
22. *Projection of superior volsella*: (0) not medially directed, straight until abruptly upturned blunt apex; (1) medially directed, straight until abruptly upturned blunt apex.
23. *Projection of superior volsella*: (0) not medially directed, broad-based, curved; (1) medially directed, broad-based, curved.
24. *Projection of superior volsella*: (0) not posterior or posteromedially directed, short, broad-based, tapering to acutely pointed apex; (1) posterior or posteromedially directed, short, broad-based, tapering to acutely pointed apex.
25. *Projection of superior volsella*: (0) not narrow, sickle-shaped, evenly curved and evenly tapering to pointed apex; (1) narrow, sickle-shaped, evenly curved and evenly tapering to pointed apex.
26. *Projection of superior volsella*: (0) with outer seta; (1) without. (Absence of projection scored as ?).
27. *Seta of projection of superior volsella*: (0) placed in basal third; (1) placed in middle third; (2) placed in apical third; (3) absent. (Absence of projection scored as ?).
28. *Base of superior volsella*: (0) without basal inner lobe-like projection; (1) with (only indicated in *P. excelsius*).
29. *Base of superior volsella*: (0) covered with microtrichia; (1) not completely covered with microtrichia; (2)

completely bare.

30. *Base of superior volsella*: (0) with 4 or more inner setae; (1) with 3; (2) with 1–2; (3) without.

[The description of *P. simantokeleum* mentions 10 setae on the basal projection while the drawings show 6. Similarly the description of *P. bullum* mentions 12 setae, while the drawing shows a single seta. The first does not matter for the data matrix, while the second is assumed being a misprint for 1–2 setae.]

31. *Setae of inferior volsella*: (0) simple; (1) some split.
32. *Median setae of tergite IX*: (0) fewer than 10; (1) 10–23; (2) more than 23.
33. *Anal tergite bands*: (0) absent or weak; (1) not fused basal to median setae; (2) fused basal to median setae.
34. *Anal point*: (0) not conspicuously broadened; (1) conspicuously broadened.
35. *Anal point*: (0) without lateral lobes to each side of anal point or on anal point; (1) with.
36. *Setae along inner margin of gonostylus*: (0) not extremely long; (1) extremely long, simple; (2) extremely long, at least some split.

Pupae

37. *Cephalic tubercles*: (0) normal to strongly developed; (1) reduced to low humps or absent.
38. *Cephalic tubercles*: (0) not cone shaped; (1) cone shaped, sometimes fused to form a single structure.
39. *Frontal setae*: (0) long; (1) short or absent.
40. *Thoracic horn*: (0) with 3–8 branches; (1) with 9–20; (2) with more than 20.
41. *Prealar tubercle*: (0) absent; (1) present.
42. *Shagreen of tergites*: (0) T II without anterior band of spinules; (1) with.
43. *Conjunctive III/IV*: (0) with spinules; (1) without.
44. *Pedes spurii A*: (0) present; (1) absent.
45. *Pedes spurii B anterior on segment I*: (0) absent; (1) weak; (2) well developed.
46. *Pedes spurii B on segment II*: (0) absent; (1) weak; (2) well developed.
47. *Taeniate L-setae on segments V–VIII*: (0) as 3:3:4:4 (5); (1) taeniae on V and VI may be reduced in size or number; (2) taeniae on V and sometimes VI absent.
48. *Anal spur or comb*: (0) single with or without accessory teeth or absent; (1) comb present.
49. *Anal spur or comb*: (0) with few teeth or absent; (1) with numerous teeth or spinules.
50. *Fringe of anal lobe*: (0) always more than 20 taeniae; (1) sometimes fewer.
51. *Fringe of anal lobe*: (0) with 45 or fewer taeniae; (1) with more than 45 taeniae.
52. *Dorsal seta of anal lobe*: (0) absent; (1) present.

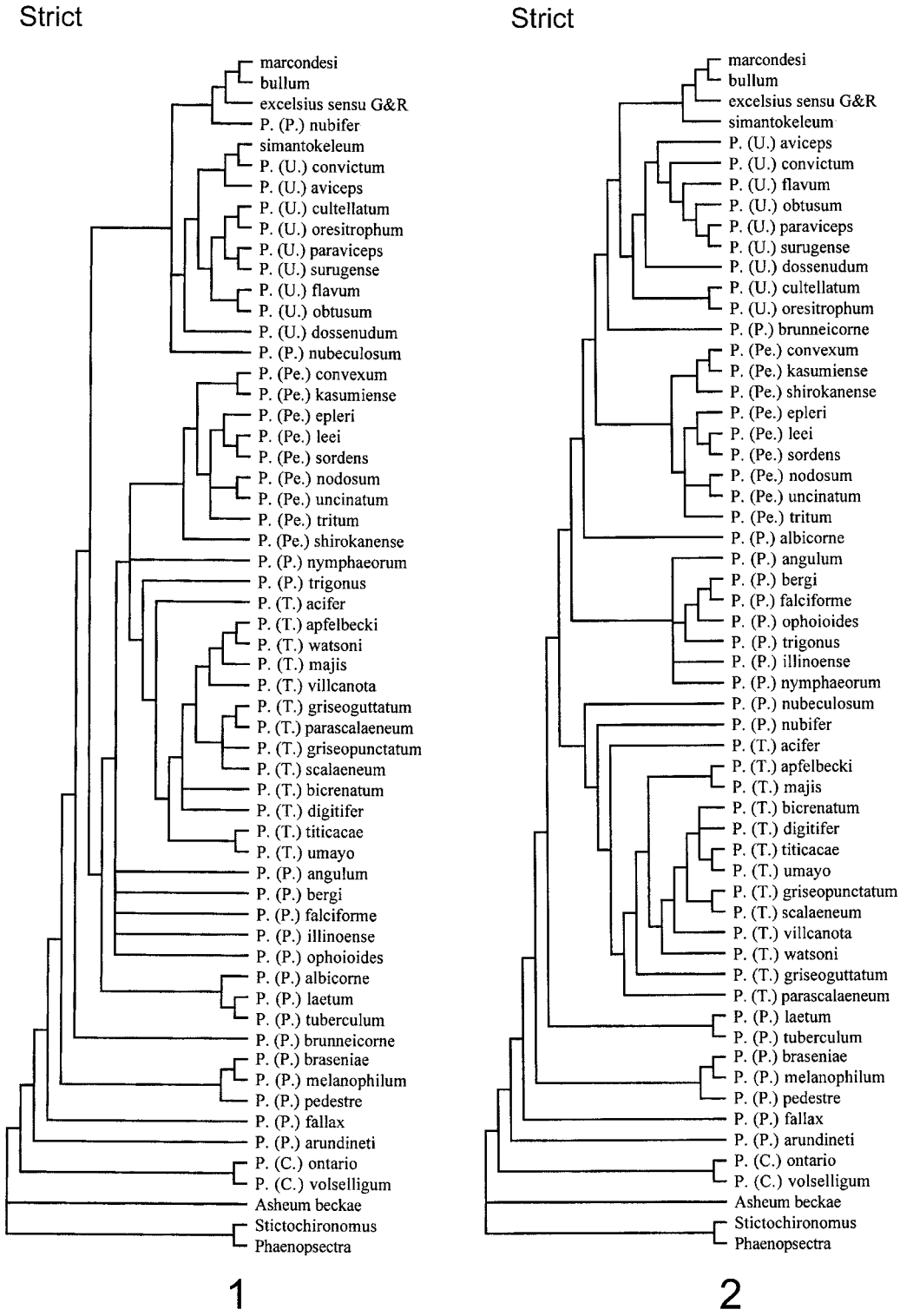
Larvae

53. *Anterior margin of frontoclypeal apotome*: (0) not straight; (1) straight.
54. *Third antennal segment*: (0) relatively long, longer than or only slightly shorter than segment 4; (1) shorter, distinctly shorter than segment 4, or when not, segment 4 also reduced.
55. *Lauterborn organs*: (0) well developed; (1) small, indistinct or absent.
56. *Lauterborn organs*: (0) opposite; (1) alternate.
57. *Antennal blade*: (0) shorter than flagellum; (1) longer.
58. *Pecten epipharyngis*: (0) median scale with 3–5 teeth; (1) median scale with 1–2 teeth.
59. *Mandible*: (0) no dorsal tooth or dorsal tooth weak and spine-like; (1) with well developed dorsal tooth.
60. *Mola*: (0) smooth; (1) serrated.

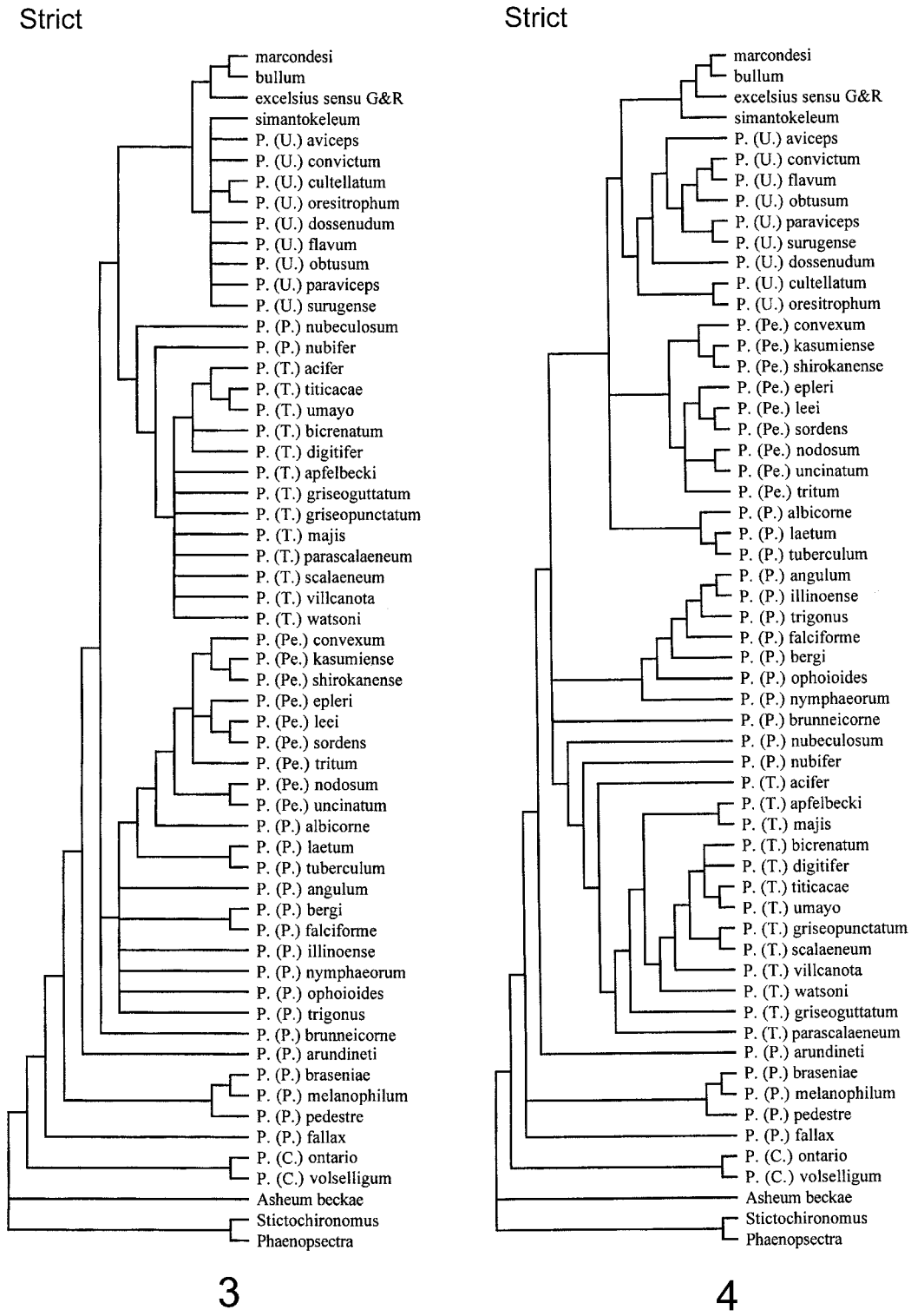
[Except for in *P. (P.) braseniae* (Leathers, 1922), the character state (0) mola smooth is scored based on illustrations. It may be incorrect especially for *P. (Pe.) kasumiense* (Sasa, 1979) and *P. (Pe.) shirokanense* Sasa, 1979.]

61. *Mentum*: (0) first lateral teeth at least as high as median and/or second lateral teeth; (1) first lateral teeth slightly lower than median and/or second lateral teeth; (2) first lateral teeth much lower than median and/or second lateral teeth.
62. *Ventromental plates*: (0) without posterior lobes; (1) posterior lobes indicated; (2) lobes well developed.
63. *Ventromental plates*: (0) less than 3 times as wide as high; (1) at least 3 times as wide as high.
64. *Distance between ventromental plates*: (0) less than width of 4 median teeth; (1) at least as long as combined width of 4 median teeth.

65. *Median ends of ventromental plates*: (0) pointing posterior or towards each other or posteriorly or if pointing slightly anteriorly not attached to second lateral teeth; (1) anteriorly produced and in contact with first lateral teeth.



FIGURES 1–2. Parsimony analyses of *Polypedilum* Kieffer with *Asheum beckae* (Sublette), *Stictochironomus* Kieffer and *Phaenopsectra* Kieffer combined as outgroup. **1**–strict consensus of shortest trees. **2**–strict consensus of shortest trees after successive reweighting according to the rescaled consistency index.



FIGURES 3–4. Parsimony analyses of *Polypedilum* Kieffer with *Asheum beckae* (Sublette), *Stictochironomus* Kieffer and *Phaenopsectra* Kieffer combined as outgroup and some characters weighted as in text. **1**–strict consensus of shortest trees. **2**–strict consensus of shortest trees after successive reweighting according to the rescaled consistency index.

Four hundred and sixty-two trees were obtained each with 509 steps, consistency index (CI) of 0.50, homoplasy index (HI) of 0.84, retention index (RI) of 0.63, and a rescaled consistency index (RC) of 0.32. The strict consensus tree is shown in Figure 1. When the trees were exposed to successive reweighting according to RC, 46 trees each with 516 steps (when the weights were reset to one), CI of 0.56, HI of 0.60, RI of 0.83 and RC of 0.47 were obtained after two reweightings (Fig. 2).

Giving weight 10 to characters 5, 6, 7, 9, 13, 18, 19, 20, 25, 26, 27, 28, 29, 30, 34, 35, 36, 38, 40, 47, 48, 52, 54, 55, 56, 59, 60, 61, 62 and 65 also was attempted. This produced 41,602 trees each with 522 steps (when the weights were reset to one), CI of 0.51, HI of 0.80, RI of 0.74 and RC of 0.38. The strict consensus tree is shown in Figure 3. When the trees were exposed to successive reweighting according to RC, 117 trees each with 518 steps (when the weights were reset to one), CI of 0.52, HI of 0.65, RI of 0.81 and RC of 0.42 were obtained after one reweighting (Fig. 4).

The results both before and after successive reweighting as in Figures 1–4 show the subgenera *Cerobregma*, *Tripodura*, *Pentapedilum* and usually *Uresipedilum* as monophyletic, except that either *P. simantokeleum* sometimes is retained in *Uresipedilum* sometimes in the new subgenus while *Polypedilum s. str.* is never monophyletic even when disregarding *P. nubifer*. The evidence for monophyly of the subgenus *Pentapedilum* to some extent is based on the wing chaetotaxy. However, as shown by Oyewo and Sæther (2008), even when all characters concerning wing chaetotaxy are deleted the subgenus still forms a monophyletic unit, but only after reweighting and with the exception that *P. (P.) albicorne* (Meigen, 1838) may fall inside the subgenus and *P. (Pe.) sordens* (van der Wulp, 1874) outside the subgenus.

However, if *Polypedilum s. str.* minus *P. nubifer* is regarded *a priori* as monophyletic and some of the relationships between subgenera unresolved as shown in Figure 5, the cladogram is 6 steps shorter than in Figure 2 (unweighted after successive reweighting) and 8 steps shorter than the cladogram shown in Figure 4 (weighted and reweighted) as measured in MacClade. (Measured in PAUP, however, the cladogram is longer). The data thus are insufficient to show *Polypedilum s. str.* minus *P. nubifer* as non-monophyletic. Placing *P. nubifer* at the base of any of the other subgenera or as sister group to all *Polypedilum* lengthens the tree shown in Figure 5 with 7 to 10 steps. Choosing different outgroups, adding taxa and characters undoubtedly will give better and somewhat different results, but because of the high degree of homoplasies is unlikely to significantly change the outcome. The female genitalia may show diagnostic differences between the different subgenera as indicated by Sæther (1977: 165), but too few females have been studied in sufficient detail. However, all six to seven examined *Tripodura* have a long parallel-sided dorsomesal lobe clearly overreaching the ventrolateral lobe combined with straight spermathecal ducts; *Polypedilum s. str.* has nearly straight spermathecal ducts, but shorter dorsomesal lobe; *Cerobregma*, *Uresipedilum*, *Pentapedilum* all have spermathecal ducts with a sharp bend of about 90 degrees; the ventrolateral lobe in the three examined *Cerobregma* species is reduced or vestigial, the dorsomesal lobe very large; while *Uresipedilum* and *Polypedilum* are similar to *Polypedilum s. str.* in the lobes of gonapophysis VIII.

Geoffrey Morse, University of San Diego, California (personal communication to P. S. Cranston) has shown based on 3 genes that *P. nubifer* apparently is irretrievably embedded in *Polypedilum*. It thus is not justified to erect a separate genus for *P. nubifer*.

In the parsimony analyses shown here (Figs 1–4) *Polypedilum nubifer* is sister group to *Probolum* when the characters are unweighted and not reweighted (Fig. 1), to *Tripodura* when the characters are reweighted or weighted with the particular weighting scheme chosen (Figs 2–4). It never forms, however, the sister group to all other *Polypedilum* and is always inside the genus.

It seems clear that the present configuration of subgenera is untenable. *Polypedilum nubifer*, the type species of *Polypedilum s. str.* is distinct in all stages and clearly deserves a separate subgenus. Most members of *Uresipedilum* undoubtedly belong together in a subgenus. However, a separate subgenus for those species which do not possess the characteristic larval characters as in *P. marcondesi* **sp. n.** described below and *P. pedatum excelsius sensu* Grodhaus and Rotramel appears warranted.

Polypedilum s. str. with or without *P. nubifer* is never monophyletic. *Polypedilum arundineti* (Goetghebuer, 1921) may not be correctly scored as the only reasonably complete description is by Sasa (1985 fig. 3E–4) and shows about 17 median setae on tergite IX, while the drawing in Langton and Pinder (2007 fig. 230C) shows about 6 setae. *P. nubeculosum* (Meigen, 1804) is rather different and may deserve a separate subgenus. Except for the hairy wings in *Pentapedilum* there are no diagnostic characters separating *Pentapedilum* from *Polypedilum s. str.* with or without *P. nubifer*.

Polypedilum s. str. has been divided into species groups by Sasa and Kikuchi (1995), Sæther and Sundal (1999) and Maschwitz and Cook (2000). Sasa and Kikuchi (1995) divided the subgenus into species with a

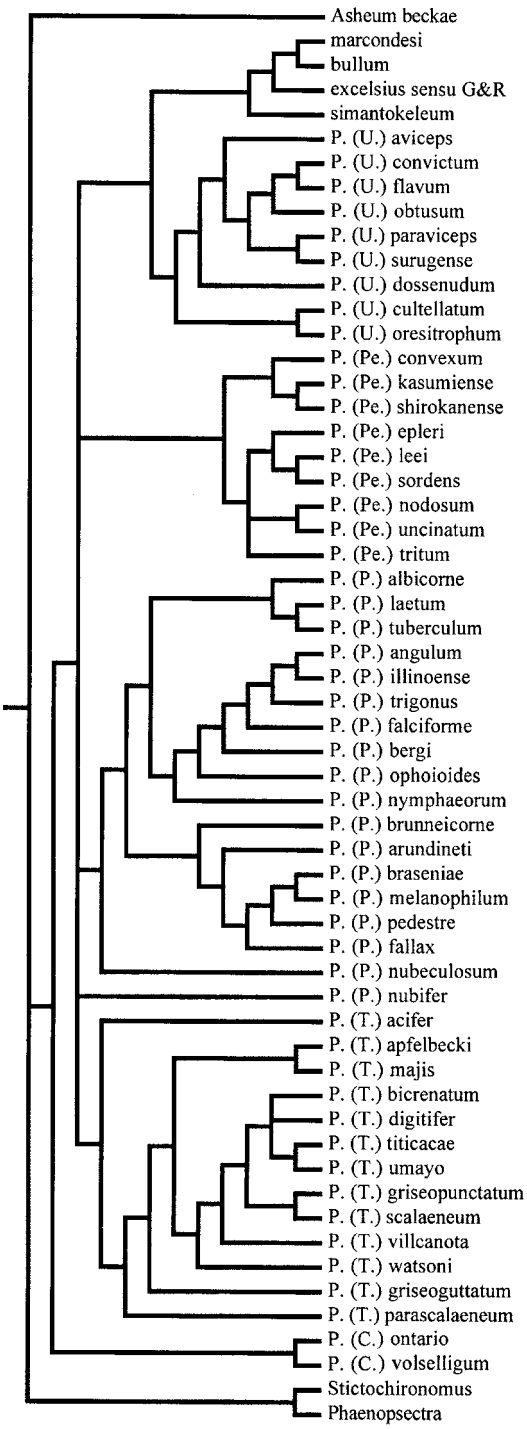


FIGURE 5. Preferred synapomorphy diagram for *Polypedilum* Kieffer and included subgenera.

seta on the projection of the superior volsella, the *nubeculosum* group and species without such a seta, the *nubifer* group. Except for excluding *P. nubifer* from the *nubifer* group (defined by Sasa and Kikuchi (1995) as including species without an outer seta on the projection of the superior volsella) the same division was followed by Sæther and Sundal (1999). However, of the species in *Pentapedilum* and *Polypedilum s. str.* included here only *P. nubifer* and some *P. (Pentapedilum) sordens*, *P. (P.) albicorne* and *P. (P.) fallax* (Johannsen, 1905) lack a seta on the superior volsella projection. A division based on the presence or absence

of the projection seta clearly is not tenable. Maschwitz and Cook (2000) divide the subgenus into a *laetum* group, an *illinoense* group and a *fallax* group with *P. (P.) nubeculosum* and *P. (P.) trigonus* Townes, 1945 perhaps forming a fourth group. There is some evidence for these groups in the parsimony analyses. A *laetum* group also including *P. (P.) albicorne* is indicated, an *illinoense* group excluding *P. (P.) braseniae* and including *P. (P.) trigonus* is found, and a *fallax* group excluding *P. (Cerobregma) ontario* (Walley, 1926) and including *P. (P.) braseniae* is indicated. *Polypedilum (P.) nubeculosum, P. (P.) brunneicorne* Kieffer, 1911 and *P. (P.) arundineti* all fall outside these groups.

The larvae and pupae of *P. braseniae* have several unique characters not found in other members of the genus. However, these appear all to be autapomorphies. *Polypedilum braseniae* is the only member of the genus with two small median teeth on the larval mentum, which, however, often are worn down and not discernible.

Polypedilum nubeculosum may deserve a separate group. It is the only *Polypedilum* in addition to the subgenus *Cerobregma* with setae on the antepronotum and the only species with the outer lateral seta of the projection of the superior volsella placed in the apical third. Amongst the species of the enlarged *Pentapedilum* included in the data matrix, wing membrane with spots is found otherwise only in *P. laetum* (Meigen, 1818). The seta anteriores (S I) of the larva appear to have the apex more filamentously branched than in other species.

Polypedilum declivis (Kieffer, 1922) is the only species other than *P. nubifer* which has cephalic tubercles (Freeman 1958: 289). The species is the type species of *Kribionympha* Kieffer. The hypopygium is quite unique and if the species is correctly placed in *Polypedilum*, *Kribionympha* deserves subgeneric status.

If the incomplete description is correct *Chirocladius* Picado, 1913: 288, could belong to *Polypedilum s. str., Uresipedilum* or to the new subgenus described below. However, no *Uresipedilum* as redefined here and few *Polypedilum s. str.* have spotted wings and it is not impossible that *Chirocladius* could be a senior synonym of the new subgenus as also indicated by the bromeliad biotope. The types are supposed to be in the collection of the US National Museum, Washington, but no specimens could be located in the pinned, slide, or alcohol type collections of Chironomidae. Neither did the computer database contain any listings for the type species (Holly B. Williams, personal communication). *Chirocladius* and its type species *Chirocladius pedipalpus* Picado, 1913 thus have to be regarded as *nomina dubia.*

Polypedilum **subgenus** ***Tripedilum*** **Kieffer**

Tripedilum Kieffer, 1921a: 271; 1921c: 28, 47.
Polypedilum Kieffer, 1912; not Kieffer, 1913, (see below).

Type species
Polypedilum (Tripedilum) fuscipenne (Kieffer)
Polypedilum fuscipenne Kieffer, 1921a: 98.
Tripedilum armatifrons Kieffer, 1921b: 47.
Polypedilum longiforceps Kieffer, 1921a: 98.
Microtendipes longiventris Kieffer, 1922: 15.

Other included species
Polypedilum (Tripedilum) nubifer (Skuse)
Chironomus nubifer Skuse, 1889: 249.
Chironomus (Prochironomus) triparticus Kieffer, 1910: 231.
Chironomus ceylanicus Kieffer, 1911: 136.
Polypedilum pelostolum Kieffer, 1912: 41.
Polypedilum pharao Kieffer, 1925: 274.
Chironomus (Polypedilum) albiceps Johannsen, 1932: 515.
Polypedilum pruinosum Goetghebuer, 1934: 37.
Chironomus (Polypedilum) octoguttatum Tokunaga, 1936: 83.

Polypedilum aberrans Chernovskii, 1949: 79.
Chironomus daitobeceus Sasa *et* Suzuki, 2001: 64.
Polypedilum daitoneoum Sasa *et* Suzuki, 2001: 76.
? *Polypedilum flavipes* Kieffer, 1920: 91.

Polypedilum (Tripedilum) lobiferum (Freeman)
Polypedilum lobiferum Freeman, 1954: 22.
Polypedilum (Polypedilum) lobiferum Freeman; Freeman 1958: 289.

Diagnostic characters. The male imagines of the subgenus differ from the males of other subgenera primarily by having distinct frontal tubercles and the projection of the superior volsella without any outer seta. The projection of the superior volsella is very long compared to the short base and the gonostylus is broad with a broad, blunt apex.

The pupa has unique well developed cone-shaped cephalic tubercles, numerous branches (> 20) in the thoracic horn, no pedes spurii A, a well developed comb on the caudolateral margin of segment VIII, and anal lobe with numerous taeniae (about 38–50) and no dorsal setae.

The larva has alternating Lauterborn organs, third antennal segment distinctly longer than fourth, antennal blade shorter than flagellum, mentum with first lateral teeth distinctly lower than second and median teeth and ventromental plates without posterior lobes and with median apices pointing towards each other.

Key to the males

1. Wing with distinct markings, fore tibial scale rounded without spur. ..... *P. (T.) nubifer* (Skuse)
- Wing without distinct markings, fore tibial scale with spur 2
2. Anal point slender, LR > 2.0, fore tarsus not bearded ..... *P. (T.) fuscipenne* (Kieffer)
- Anal point stout, LR about 1.1, fore tarsus bearded. ..... *P. (T.) lobiferum* (Freeman)

Except for the wing markings and the lack of spur on the front tibial scale *P. (T.) nubifer* and *P. (T.) fuscipenne* are essentially identical, while the placement of *P. (T.) lobiferum* is more uncertain.

Polypedilum subgenus *Polypedilum* Kieffer

Polypedilum Kieffer, 1913: 15; not Kieffer (1912: 41).
Kribiocharis Kieffer, 1922: 1.
Pentapelma Kieffer, 1921b: 98; 1921c: 33.
Rosenia Kieffer, 1921a: 275; not Waagen and Wentzel (1887: 943).
Propedilum Lenz, 1937: 13.

Type species
Polypedilum (Polypedilum) nubeculosum (Meigen)
Chironomus nubeculosus Meigen, 1804: 18.
Polypedilum emarginatum Kieffer, 1913: 16.

The genus *Polypedilum* Kieffer was described in 1913 and *Polypedilum emarginatum* Kieffer, 1913 [= *P. nubeculosum* (Meigen, 1818)] designated as the type of the genus (Kieffer 1913: 15). As shown by Ashe (1981), however, the type designation was invalid as two species were assigned to the genus *Polypedilum* in a paper published a year earlier (Kieffer 1912: 41). Of the two species, *P. pelostolum* Kieffer, 1912 and *P. ceylanicum* (Kieffer, 1912), at least the first according to Freeman (1961) is a synonym of *P. nubifer* and was selected as the type species. However, Freeman (1961) stated that *P. nubifer* is without frontal tubercles, while the presence of frontal tubercles is one of the most significant features of the species. Two syntypes of *P. pelostolum* from The Natural History Museum in London were examined. The specimens were lacking wings, antennae, hypopygia and most legs, but one head with frontal tubercles intact remained. Accordingly the

synonymy with *P. nubifer* has to be accepted. As shown here *P. nubifer*, however, should be placed in *Tripedilum*. A case will be made to ICZN for rejecting the type designation of Ashe (1981) and maintaining the type designation of Kieffer (1913).

Diagnostic characters. The male imagines of the subgenus can be distinguished by having no frontal tubercles, bare wing membrane, wing vein R_{2+3} usually relatively well separated from R_1, projection of superior volsella long compared to the short base and nearly always with outer seta and anal point never trifid or with lateral teeth or shoulders to each side of the anal point.

The few female imagines sufficiently described have nearly straight spermathecal ducts and the dorsomesal lobes of gonapophysis VIII are not reaching much caudal of the ventrolateral lobes.

The pupa has no frontal tubercles and no or vestigial cephalic tubercles, less than 20 branches in thoracic horn, single spur on caudolateral margin of segment VIII, taeniae on segments V and VI may be reduced in size or number and anal lobe without dorsal setae.

The larva has opposing Lauterborn organs; third antennal segment distinctly longer to somewhat shorter than fourth; pecten epipharyngis occasionally with less than 3 teeth in median scale, usually 3–5; mandible occasionally without dorsal tooth, usually with; occasionally mola smooth, usually serrate; mentum usually with first lateral teeth distinctly lower than second and median teeth, but often at least as high as median and/or second lateral teeth; and ventromental plates without posterior lobes, with median apices pointing towards each other and distance between plates usually at least as long as combined width of 4 median teeth.

Remarks. The pupae of *Polypedilum s. str.* are not separable from those of *Pentapedilum*, *Uresipedilum* and *Probolum*. Most larvae cannot be distinguished from those of *Pentapedilum*. Some larvae, however, are separable from other known larvae except *P. (Pe.) epleri* Oyewo *et* Jacobsen, 2007, by having first lateral teeth of mentum at least as high as median and/or second lateral teeth. From *P. (Pe.) epleri* they differ by either having mandible with a dorsal tooth, mola without serrations or well developed Lauterborn organs.

Polypedilum subgenus *Pentapedilum* Kieffer

Pentapedilum Kieffer, 1913: 25.

Type species
Polypedilum (Pentapedilum) tritum (Walker)
Chironomus tritus Walker, 1856: 162.
Tanytarsus unicus Becker, 1908: 77.
Calopsectra longiseta Kieffer, 1913: 29.
Pentapedilum stratiotale Kieffer, 1913: 26.
Tanytarsus praeornatus Santos-Abreu, 1918: 229.
Pentapedilum muscicola Kieffer, 1924: 36.
Polypedilum (*Pentapedilum*) *albulum* Townes, 1945: 63.
Not *Polypedilum* (*Pentapedilum*) *muscicola* Oyewo *et* Sæther, 2008: 79.

Diagnostic characters. The male imagines of the subgenus differ from the males of other subgenera primarily by having setae on the wing membrane and on vein M, but no darker markings; wing vein R_{2+3} adjacent to R_1; no frontal tubercles; projection of the superior volsella long compared to the short base and with an outer lateral seta on the projection (may be absent in some specimens of some species).

The few female imagines known have spermathecal ducts with a sharp angle and the dorsomesal lobes of gonapophysis VIII not reaching much caudal of the ventrolateral lobes.

The pupae have no frontal tubercles, reduced or absence of cephalic tubercles, less than 20 branches in the thoracic horn, conjunctive III/IV occasionally without spinules, single spur often with numerous lateral spinules on the caudolateral margin of segment VIII and no dorsal setae.

The larvae have third antennal segment usually longer than fourth; antennal blade usually shorter than flagellum; mentum with first lateral teeth as high as, slightly lower than or mostly distinctly lower than second

and median teeth; mandible occasionally without dorsal tooth and ventromental plates without posterior lobes, occasionally at least 3 times as wide as high, distance between plates nearly always greater than the combined width of the four median teeth and with median apices pointing towards each other.

Remarks. The pupae of *Pentapedilum* are not separable from those of *Polypedilum s. str.*, *Uresipedilum* and *Probolum*. Most larvae cannot be distinguished from those of *Polypedilum s. str.* The larvae of *P. (Pe.) leei* Freeman, 1961 and *P. (Pe) sordens* are distinguished by having the ventromental plates more than 3 times as wide as high, first lateral teeth of mentum only slightly lower than median and second lateral teeth and no dorsal tooth of the mandible. *Polypedilum (Pe.) epleri* also has a mandible without a dorsal tooth, but first lateral teeth of the mentum are as high as median and second lateral teeth.

The revision by Oyewo and Sæther (2008) contains several mistakes. The synonym list of the type species is corrected here. *Polypedilum* (*Pentapedilum*) *muscicola sensu* Oyewo *et* Sæther is based on a mislabeling of a specimen from Institut Royal des Sciences Naturelles de Belgique in Bruxelles, Belgium (IRSN) and could be given a new name. However, since there is just one specimen without locality we will refrain from naming the species. The type specimen of *P. (Pe.) tritum* Walker, 1856 is listed as lectotype on p. 8, but not designated as such on p. 110. The type specimen of *P. (Pe.) uncinatum* Goetghebuer, 1921 from IRSN is listed as holotype, but should have been listed as syntype or selected as lectotype.

Polypedilum subgenus *Tripodura* Townes

Tripodura Townes, 1945: 36.
Kribiotima Kieffer, 1921a: 274.
Kribiophilus Kieffer, 1921c: 30; 1921b: 98; 1922: 43.

Type species
Polypedilum (Tripodura) simulans Townes
Polypedilum (Tripodura) simulans Townes, 1945: 43.

Diagnostic characters. The male imagines of the subgenus either have a broad and often club-shaped superior volsella without an apical projection, or trifid anal point or lateral teeth or shoulders to each side of the anal point or both. The wings often have dark markings and no setae on the wing membrane except for one Afrotropical and two Neotropical species. The anal point is often broad. The superior volsella is almost always covered with microtrichia and normally has setae on distal parts of the outer and inner margin.

Female imagines can be distinguished by the lobes of gonapophysis VIII, of which the dorsomesal lobe is clearly longer than the ventrolateral and straight spermathecal ducts, usually combined with strong wing markings.

Pupae of the subgenus have dorsal setae on the anal lobe; sometimes numerous branches in the thoracic horn; often well-developed cephalic tubercles; sometimes frontal tubercles present and usually with longitudinal anal combs.

Larvae of the subgenus have a long antennal blade reaching well beyond the flagellum. Antennal segment 3 is at most one-third the length of segment 2, antennal segments 3–5 are sometimes all reduced. Normally the first lateral teeth of the mentum are much shorter than the median and second lateral teeth. The ventromental plates sometimes have well developed posterior lobes.

Remarks. A case must be prepared for the ICZN for the priority of *Tripodura* as a subgeneric name.

Polypedilum subgenus *Uresipedilum* Oyewo *et* Sæther

Polypedilum subgenus *Uresipedilum* Sasa *et* Okazawa, 1991: 54, *nomen nudum.*
Polypedilum subgenus *Uresipedilum* Sasa *et* Kikuchi, 1995: 119, *nomen nudum.*
Polypedilum subgenus *Uresipedilum* Oyewo *et* Sæther, 1998: 317.

Type species
Polypedilum (Uresipedilum) convictum (Walker)
Chironomus convictus Walker, 1856: 161.

Diagnostic characters. The male imagines of the subgenus are distinguished by having the basal portion of the superior volsella much longer than wide, with an apicomedian projection without setae arising from the inner margin of the base and directed medially and without prominent inner projection; wing membrane without markings or setae and fore tibial scale nearly always without spur.

Pupae of the subgenus lack dorsal setae on the anal lobe; have few branches in the thoracic horn; reduced cephalic tubercles and mostly single anal spur with few teeth, but often numerous fine lateral spinules. Conjunctive III/IV is often without spinules and pedes spurii A often absent. The anal lobe is nearly always without dorsal setae.

Larvae of the subgenus are distinguished by having the four median teeth set off from the rest of the mentum and in contact with the anteriorly produced median ends of the ventromental plates and with well developed to at least indicated posterior lobes on the ventromental plates. Antennal segment 3 is very slightly to more distinctly shorter than segment 4. The mentum has the first lateral teeth much or only slightly lower than median and/or second lateral teeth.

Remarks. The pupae of *Uresipedilum* are not distinguishable from those of *Polypedilum s. str.*, *Pentapedilum* and *Probolum*.

Uresipedilum as previously defined is not monophyletic as it includes the new subgenus *Probolum* described below. If the association of the immatures described by Grodhaus and Rotramel (1980) with *Polypedilum pedatum excelsius* Townes is correct not all imagines of *Uresipedilum* may be separable from *Probolum*.

Polypedilum subgenus *Cerobregma* Sæther *et* Sundal

Polypedilum subgenus *Cerobregma* Sæther *et* Sundal, 1999: 334.
Chironomini genus C Pinder *et* Reiss, 1986: 362.

Type species
Polypedilum (Cerobregma) ontario (Walley)
Chironomus ontario Walley, 1926: 206.
Chironomus hirtipes Mitchell, 1908: 9 (preoccupied).

Diagnostic characters. The male imagines can be separated from those of other subgenera by having extremely long and strong, split setae along inner margin of gonostylus and gonocoxite with apicolateral bulb-like extension with deep lateral incision between bulb and gonostylus.

The pupa is separable from that of other subgenera by the large cone-shaped cephalic tubercles, the large anal comb with numerous toothlets, the usual absence of anterior bands of stronger spinules on tergites and segments V and VI with all or some setae non-taeniate.

The larva is distinguished by the triangularly shaped head, unusually small mouth-parts, indistinct striae on the approximately triangular ventromental plates and median teeth of mentum of about equal height.

Polypedilum subgenus *Kribionympha* Kieffer

Kribionympha Kieffer, 1921a: 271; 1921c: 29; 1922: 7.

Type species
Polypedilum (Kribionympha) declivis (Kieffer)
Kribionympha declivis Kieffer, 1922: 7.

Other possibly included species
Polypedilum unigaquartum Sasa
Polypedilum unigaquartum Sasa, 1985: 41.

Diagnostic characters. The male imagines can be separated from those of other subgenera by having frontal tubercles, the superior volsella with an inner lobe nearly as long as the curved lobe and a tapering projection carrying an outer seta, the fore tibial scale triangular with short spur and the wing membrane unmarked without setae.

Remarks. The combination of characters is quite unique within *Polypedilum*. The superior volsella shows some resemblance with *Uresipedilum* and the new subgenus described below, but those subgenera do not have any seta on the projection of superior volsella, a dissimilar inner lobe on the base and no frontal tubercles. There also is resemblance with *Tripedilum* in the presence of frontal tubercles and the stout gonostylus. However, there is some doubt whether the type species as redescribed by Freeman (1958: 289) is identical to the species described by Kieffer. The type material must be considered as lost. However, rather than regard *Kribionympha* and *P. (K.) declivis* as *nomina dubia* we here regard the redescription by Freeman as correct in order to retain the subgeneric name.

Polypedilum unigaquartum Sasa, 1985 has frontal tubercles, the superior volsella projection carries an outer seta, the front tibial scale is triangular with spur and the wings unmarked without setae. However, the general shape of the hypopygium is more like most *Polypedilum s. str.* The species can belong here, to *Tripedilum* or to *Polypedilum s. str.*

Polypedilum **subgenus** ***Probolum*** **Andersen *et* Sæther subgen. n.**

Type species
Polypedilum (Probolum) marcondesi **Pinho *et* Mendes sp. n.**

Other included species
Polypedilum (Probolum) excelsius Townes *sensu* Grodhaus *et* Rotramel
Polypedilum pedatum excelsius Townes *sensu* Grodhaus *et* Rotramel, 1980: 70.
Polypedilum (Probolum) simantokeleum Sasa, Suzuki *et* Sakai
Polypedilum (Uresipedilum) simantokeleum Sasa, Suzuki *et* Sakai, 1998: 59.
Polypedilum (Uresipedilum) simantokeleum Sasa, Suzuki *et* Sakai; Sæther and Oyewo (2008: 4).
Polypedilum (Probolum) bullum Zhang *et* Wang
Polypedilum (Uresipedilum) bullum Zhang *et* Wang, 2004: 7.
Polypedilum (Uresipedilum) bullum Zhang *et* Wang; Sæther and Oyewo (2008: 3).
probably *Polypedilum longinervis* (Kieffer)
Microtendipes longinervis Kieffer, 1922: 10.
Polypedilum (Polypedilum) longinervis (Kieffer); Freeman (1958: 290).
possibly *Polypedilum (Uresipedilum) excelsius* Townes **stat. n.**
Polypedilum pedatum excelsius Townes, 1945: 55.
Polypedilum (Uresipedilum) pedatum excelsius Townes; Sæther and Oyewo (2008: 3).

Etymology. From Greek *probolos*, any projecting or jutting object or prominence, referring to the inner basal projection of the superior volsella. Also Afro-American slang for a problem.

Diagnostic characters. The male imagines of the subgenus differ from the males of other subgenera primarily by having the base of the superior volsella much longer than wide with the apicomedian projection directed inwards, i.e. as in *Uresipedilum*, but with an additional inner lobe carrying 1–6 (10?) setae (or perhaps sometimes without the inner lobe).

The pupa has thoracic horn with 3–9 branches; lacks well developed frontal warts, but has relatively well developed cephalic tubercles with short frontal setae; often prealar tubercle; well developed pedes spurii A and B; transverse band of shagreen anteriorly on tergites II–V; conjunctives III/IV–V/VI with spinules; segment VIII with 4–5 taeniae and anal lobe without dorsal setae.

The larva has third antennal segment distinctly to slightly shorter than fourth; antennal blade slightly shorter than flagellum; accessory blade less than half as long; premandible bifid, with prominent premandibular brush; mentum with median teeth only slightly higher than first lateral pair and ventromental plates without posterior lobes and with median apices pointing towards each other.

Imago. Moderately sized species, wing length about 1.1–2.7 mm (or to 3.0 mm if *P. longinervis* is included). Thorax entirely pale or brown with darker markings. Abdomen entirely pale or broadly banded. Legs pale, femora and tibia with or without rings. Wing membrane with or without markings.

Antenna. AR higher than 1 (1.1–1.8 or 2.8 if *P. longinervis* is included).

Head. Eyes bare, frontal tubercles absent. Third palpomere bearing 3–4 lanceolate sensilla clavata. Temporals consisting of inner and outer verticals and few postorbitals.

Thorax. Antepronotum reduced, widely separated, without setae. Scutal tubercle present or possibly absent. Acrostichals long, dorsocentrals uniserial, supraalars absent. Scutellars uniserial.

Wing. Membrane bare, clear or with several darker spots. Brachiolum with 1 seta, R, R_1 and R_{4+5} each with several setae, other veins bare. Squama with few to several (3–15) setae.

Legs. Fore tibial scale rounded, with or possibly sometimes without apical spur. Mid and hind tibiae with broad, unspurred anterior comb separated from posterior (narrower) comb with elongate spur. Sensilla chaetica absent.

Hypopygium. Anal tergite band well developed, fused basal to median anal tergite setae, several long median anal tergal setae, weaker apical anal tergite setae present lateral to anal point. Anal point narrow, parallel-sided, sometimes slightly spatulate. Superior volsella much longer than wide with apicomedian projection directed inwards, i.e. as in *Uresipedilum*, but with an additional inner microtrichiose lobe carrying 1–6 (10?) setae; base covered by microtrichia or with median part bare, with long outer seta; projection bare without setae or microtrichia. Inferior volsella slightly broadened subapically or more or less distinctly apically divided, with several sometimes apically split setae, long apical seta arising from tubercle.

Pupa. Small to medium sized, 4–7 mm long. Exuviae pale, marked with brown on margins of cephalothorax and abdomen, anal spur brown.

Cephalothorax. Frontal apotome smooth. Cephalic tubercles comparatively well-developed, frontal tubercles absent, frontal setae short. Prealar tubercle present or absent. Antepronotum with 1 median and 2 lateral antepronotals. Thoracic horn with 3(?)–9 branches. All thoracic setae short. Anterior dorsocentral (Dc_1) close together with Dc_2, Dc_3 and Dc_4 also close together.

Abdomen. Tergite I and IX without spines and shagreen; T II with broad anterior band of spinules, sometimes divided medially, otherwise with or without shagreen; T III–VI with broad anterior band of strong spinules, central line of sparse and weak to more numerous spinules which may be absent on T III, and posterior band of spinules. T VII and sometimes T VIII with bands of weak anterior spinules, otherwise bare. Sternites VI–VIII with or without weak anterior spinules. Tergite II with caudal hooklets arranged in single row. Spinules on conjunctives III/IV and IV/V in several rows, on conjunctive V/VI medially interrupted and in fewer rows. Pedes spurii A present on segment IV. Pedes spurii B well developed anterior on segment I and posterior on segment II.

Segments II–IV with 3 hair-like L setae; V and VI with 3, VII with 4, VIII with 4–5 taeniae; occasionally the number of taeniae reduced in some specimens. Anal spur single with lateral and basal denticles. Anal lobe well developed with complete fringe of about 20–60 long taeniae, dorsal taenia absent.

Larva. Medium sized larvae. Head capsule yellowish brown with mentum and apex of mandible dark brown and postoccipital margin black.

Antenna. Five segmented, third segment distinctly to slightly shorter than fourth; antennal ratio about 1.0 or slightly higher. Basal antennal segment with ring organ near base, blade slightly shorter than flagellum, accessory blade less than half as long. Style well developed, Lauterborn organs vestigial.

Dorsal surface of head. Frontoclypeal apotome anteriorly broadened into lateral rounded lobes on which S3 is situated, anterior margin straight.

Labro-epipharyngeal area. S I broad, apically plumose; S II very finely plumose on both sides. Labral lamella well developed, with about 50 teeth. Labrum with 2–3 weak spinulae and 4–5 weak chaetae. Pecten

epipharyngis distinctly divided into 3 platelets, median with 3–5 teeth, lateral plates with 5–6 teeth. About 6–7 curved, simple, pointed chaetulae laterales. Premandible bifid, with prominent premandibular brush.

Mandible. With 1 dorsal, 1 apical and 2 inner teeth. Seta subdentalis well developed, long. Seta interna consisting of 4 main branches with secondary numerous branches. Pecten mandibularis of about 6 setae.

Mentum. Median teeth and second laterals subequal in height, both slightly longer than first laterals. Ventromental plates without posterolateral lobes, median apices pointing towards each other.

Abdomen. Body setae inconspicuous. Anal lobe more or less well developed. Claws of posterior parapods all simple. Procercus short, bearing about 9 medium to long anal setae. Supraanal seta well developed, slightly less than half as long as anal setae. Anal tubules short, subequal.

Remarks. The pupae of *Probolum* are not separable from those of *Polypedilum s. str.*, *Pentapedilum* and *Uresipedilum*. The known larvae may be separable by the combination of having mentum with median teeth only slightly higher than first lateral pair, ventromental plates without posterior lobes and mandible with dorsal tooth.

Polypedilum (Probolum) marcondesi Pinho *et* Mendes sp. n.

(Figs 6–25)

Polypedilum sp 1 Pinho *et al*., 2005.

Type material. Holotype male reared from larva (in Canada balsam). **BRAZIL:** Santa Catarina State, Florianópolis, Unidade de Conservação Ambiental Desterro (U.C.A.D.), 12.i.2004, in *Vriesea vagans* (H23), L.C. Pinho & C.B. Marcondes (MZUSP). Paratypes: 1 male, Santa Catarina State, Florianópolis, Unidade de Conservação Ambiental Desterro (U.C.A.D.), 04–19.ix.2003, emergence trap over *Nidularium innocentii*, L.C. Pinho (MZUSP); 1 male with larval and pupal exuviae, as previous except 14.xi.2003, (B13) (MZUSP); 1 male with larval and pupal exuviae, as previous except 06.x.2003, (138) (ZMBN); 1 male with larval and pupal exuviae, as previous except 06.iii.2004, (S26) (MZUSP); 1 male with pupal exuviae, as previous except 12.x.2003, (B3) (MZUSP); 1 male with pupal exuviae, as previous except 03.x.2003, (S5) (MZUSP); 1 male with pupal exuviae, as previous except 15.iv.2002, (A16) (ZMBN); 1 male with pupal exuviae, as previous except 05.vi.2002, (AR 44), L.C. Pinho & C.B. Marcondes (MZUSP); 1 female with larval and pupal exuviae, as previous except 05.iii.2004, (B26) (MZUSP); 1 female with larval and pupal exuviae, as previous except 06.iii.2004, (S27) (ZMBN); 1 female with larval and pupal exuviae, as previous except 29.ii.2004, (B29) (ZMBN).

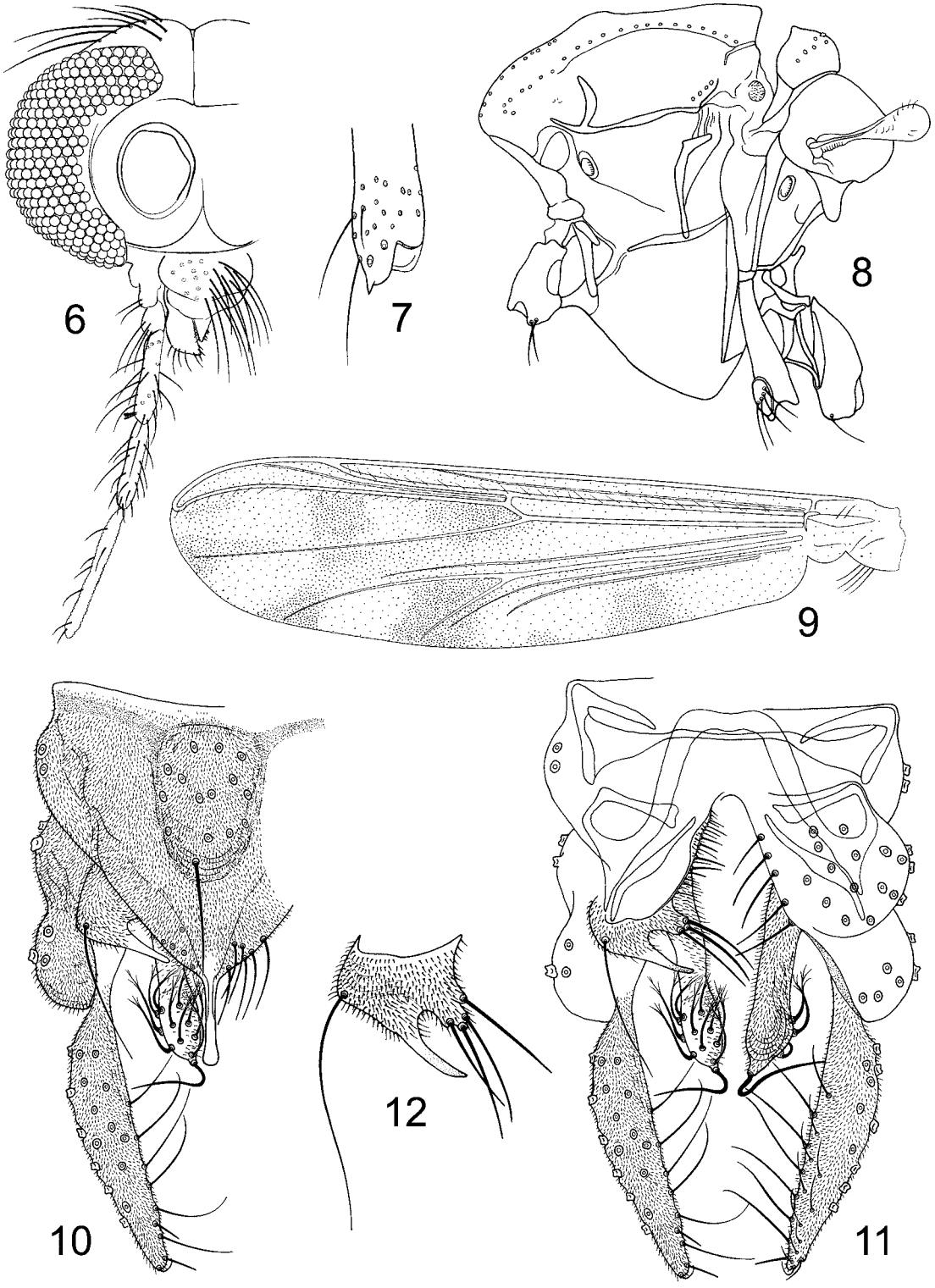
Etymology. Named for professor Dr. Carlos B. Marcondes, who led the project "Fauna associada a bromélias em Mata Atlântica em Santa Catarina" (CNPq 690143/01–0).

Diagnostic characters. The presence of a scutal tubercle together with the split setae on the inferior volsella and the shape of the superior volsella will separate the male from other *P. (Probolum)* species. The pupa differs from that of *P. (Pr.) excelsius sensu* Grodhaus *et* Rotramel by having less extensive shagreen including bare sternites VI–VIII. The larva has an AR of 1.0–1.1 against about 1.4 in *P. excelsius* and the distance between the ventromental plates is clearly less than the width of the four median teeth combined, while it is about as long as the four median teeth combined in *P. excelsius*.

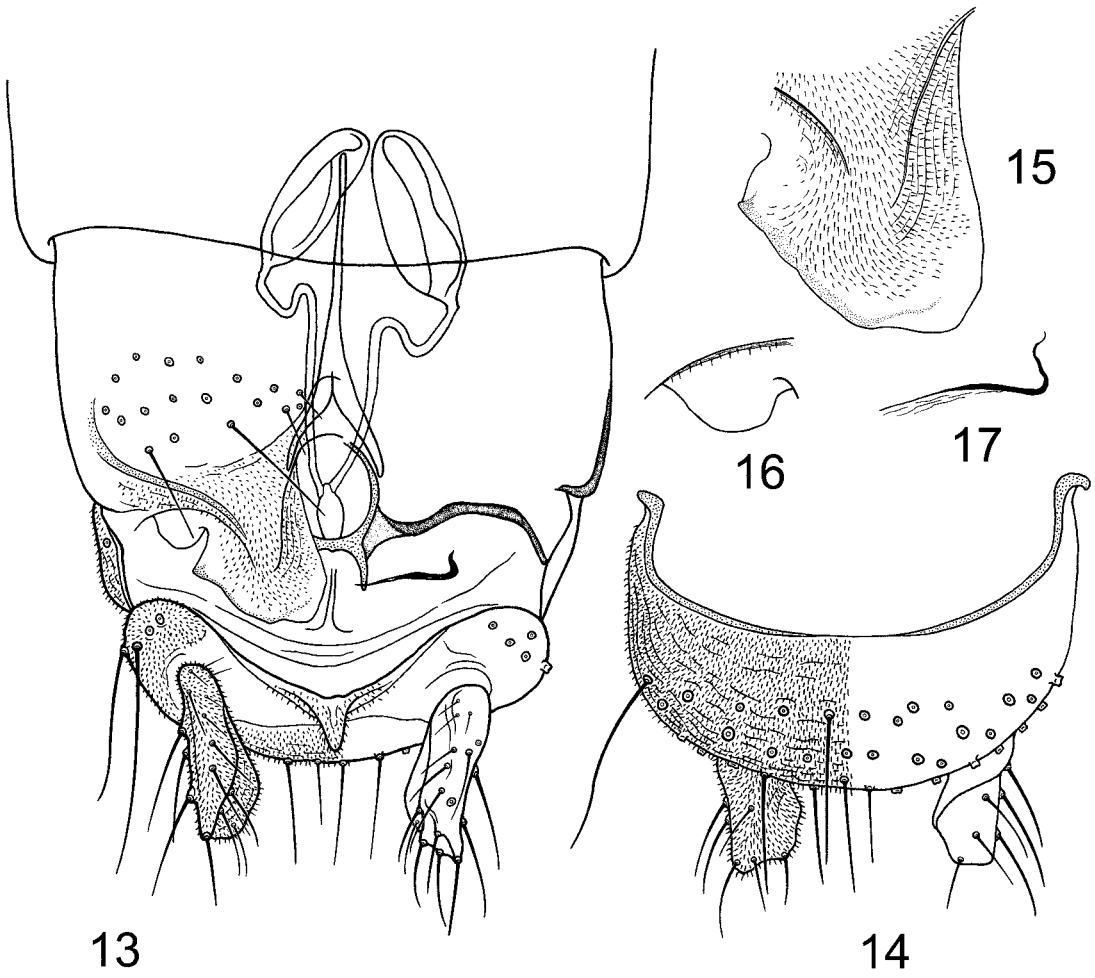
Male (n = 5–6, except when otherwise stated). Total length 2.55–3.78, 3.05 mm. Wing length 1.13–1.81, 1.64 mm. Total length / wing length 2.04–2.27, 2.11. Wing length / length of profemur 1.67–1.78, 1.73.

Coloration. Thorax brown with darker vittae, postnotum, preepisternum and much of anepisternum. Legs pale with darker rings. Fore femur with brown rings at about 0.10–0.35, 0.50–0.65 and 0.85–0.95; mid femur with rings at 0.05–0.25, 0.35–0.50 and 0.75–0.90; hind femur with rings at 0.05–0.25, 0.49–0.65 and 0.80–0.85. Fore tibia with rings at 0.10–0.50 and 0.90 to apex; mid tibia with rings at 0.10–0.25, 0.50–0.65 and 0.90 to apex; hind tibia with rings at 0.05–0.25, 0.50–0.65 and 0.90 to apex. Base and apex of ta_1 and apex of ta_2–ta_4 brown. Wing with weak dark spots, one anterior and one posterior spot in each of cells r_{4+5}, m_{1+2}, m_{3+4} and an. Abdomen broadly banded, darker in anterior two thirds.

Head (Fig. 6). AR = 1.07–1.34, 1.19. Ultimate flagellomere 364–610, 537 μm long. Temporal setae 11–13, 11 including 3–4, 4 inner verticals; 3–5, 5 outer verticals and 3–4, 3 postorbitals. Clypeus with 16–27, 21 setae. Tentorium 105–169, 134 μm long; 26–34, 30 μm wide at sieve pore. Stipes 120–150, 139 μm long; 38–49, 42 (4) μm wide. Palpomere lengths (in μm): 19–45, 35; 30–53, 43; 86–146, 129; 90–150, 133; 135–233, 190 (4). Third palpomere with 4–6 lanceolate sensilla clavata in small pit; longest 15–19, 18 (4) μm long.



FIGURES 6–12. *Polypedilum (Probolum) marcondesi* Pinho *et* Mendes **sp. n.**, male. **6**–head. **7**–spur of foretibia. **8**–thorax. **9**–wing. **10**–hypopygium, dorsal view. **11**–hypopygium with tergite IX and anal point removed, dorsal view left, ventral view right. **12**–superior volsella.



FIGURES 13–17. *Polypedilum* (*Probolum*) *marcondesi* Pinho *et* Mendes **sp. n.**, female. **13**–genitalia, ventral view. **14**–tergite IX. **15**–dorsomesal lobe. **16**–ventrolateral lobe. **17**–apodeme lobe.

Thorax (Fig. 8). Acrostichals 10–14, 12; dorsocentrals 13–22, 16; prealars 3–5, 4. Scutellum with 6–12, 9 setae.

Wing (Fig. 9). VR 0.99–1.06, 1.03. R_{2+3} well separated from R_1. R_{4+5} strongly curved at apex, ending at wing tip. Brachiolum with 1–2, 1 seta, R with 12–26, 21; R_1 with 14–20, 17; R_{4+5} with 18–31, 27 setae, M bare. Squama with 4–5, 4 setae.

Legs. Scale on fore tibia (Fig. 7) 49–56, 53 μm long; with 4–8, 7 μm long apical spur. Spur of mid tibia 41–75, 61 μm long including comb; unspurred comb 23–38, 36 μm long. Spur on hind tibia 33–86, 75 μm long including comb; unspurred comb 30–38, 33 μm long. Width at apex of fore tibia 38–64, 52 μm; of mid tibia 41–60, 57 μm; of hind tibia 45–71, 64 μm. Length and proportions of legs as in Table 1.

Hypopygium (Figs 10–11). Tergite IX with 12–18, 14 strong median setae and 5–7, 6 setae to each side of base of anal point. Anal point 49–64, 57 μm long, nearly parallel-sided medially, with weakly spatulate, 9–11, 10 μm wide apex. Transverse sternapodeme present in 3 specimens, 30–34 μm long, other 3 specimens with completely rounded sternapodeme; phallapodeme 98–120, 108 μm long. Gonocoxite 110–188, 174 μm long. Gonostylus 135–180, 164 μm long, with 1–2 short, stout setae subapically and 6–8 long setae along inner margin. Superior volsella (Fig. 12) 45–83, 67 μm long; base covered with microtrichia, with 45–86, 68 μm long apicolateral seta; apical projection 26–44, 35 μm long; inner basal protrusion 15–30, 23 μm high, 15–26, 21 μm wide, with 3–4 setae. Inferior volsella 101–131, 120 μm long, nearly parallel-sided with slightly swollen distal one-third, with strong apical setae and 8–13, 11 dorsal, mostly split setae. HR 1.00–1.11, 1.06. HV 1.89–2.18, 2.06.

TABLE 1. Lengths (in μm) and proportions of legs of *Polypedilum (Probolum) marcondesi* Pinho *et* Mendes **sp. n.**, male (n = 6, except 5 for hind tarsi and 3–5 for BR).

	fe	ti	ta_1	ta_2
p_1	633–1058, 955	359–633, 560	690–1229, 1078	406–794, 687
p_2	633–1049, 953	373–822, 732	274–605, 533	151–321, 271
p_3	709–1229, 1090	558–936, 841	680–813, 762	378–454, 431
	ta_3	ta_4	ta_5	LR
p_1	302–548, 469	227–387, 342	90–146, 125	1.85–1.98, 1.92
p_2	132–227, 197	66–142, 118	47–57, 55	0.71–0.74, 0.73
p_3	293–359, 335	194–227, 214	57–80, 71	0.82–0.87, 0.85
	BV	SV	BR	
p_1	1.52–1.66, 1.60	1.38–1.48, 1.41	2.4–3.7	
p_2	3.23–3.67, 3.48	3.08–3.67, 3.20	3.8–5.1, 4.3	
p_3	2.58–2.79, 2.69	2.38–2.78, 2.71	3.9–6.0, 5.0	

Female (n = 1–3). Total length 2.69–2.95 mm. Wing length 1.47–1.73 mm. Total length / wing length 1.76. Wing length / length of profemur 1.63–1.76.

Coloration. As in male except much paler.

Head. AR = 0.28–0.62. Flagellomere lengths (in μm): 140–144, 99–101, 94–97, 45–54, 115–151. Longest sensilla chaeticae on ultimate flagellomere 65–72 μm long. Temporal setae 9–11. Clypeus with 18–20 setae. Tentorium 141–147 μm long, 18–24 μm wide at sieve pore. Stipes 143 μm long. Palpomere lengths (in μm): 27, 41–52, 113–137, 109–134, 177–207. Third palpomere with 5–9 lanceolate sensilla clavata in small pit, longest 23–25 μm long.

Thorax. Acrostichals 9–14, dorsocentrals 15–20, prealars 4–7. Scutellum with 9–10 uniserial setae.

Wing. VR 1.06–1.09. R_{2+3} well separated from R_1. Brachiolum with 1 seta, R with 20–26, R_1 with 14–22, R_{4+5} with 34–48 setae. Squama with 5–8 setae.

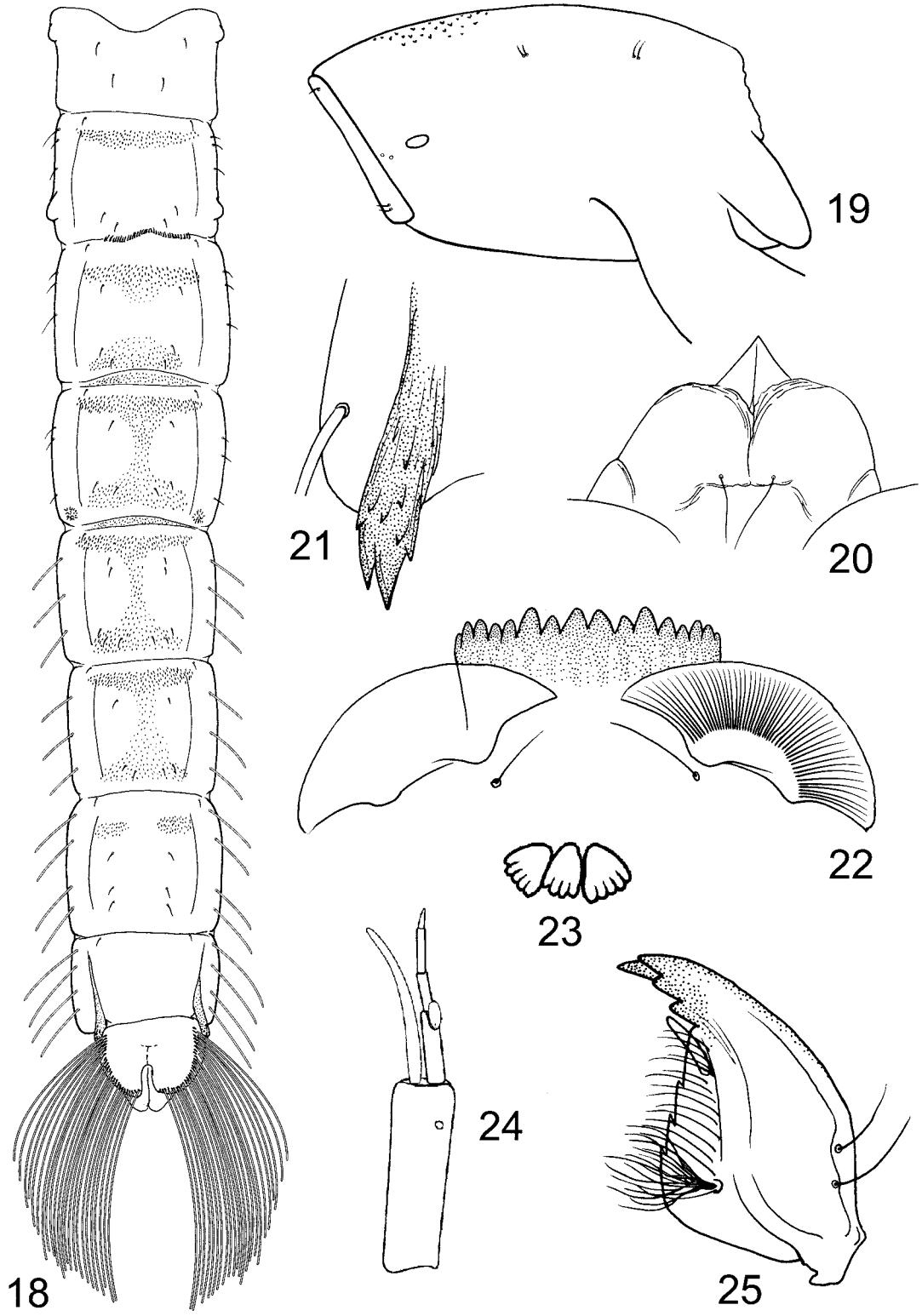
Legs. Scale on fore tibia 23–38 μm long, with 7–9 μm long spur. Spur of mid tibia 34–48 μm long including comb, unspurred comb 23–27 μm long. Spur on hind tibia 59–64 μm long including comb, unspurred comb 23–34 μm long; one specimen with a 27 μm long spur including comb. Width at apex of fore tibia 45–57 μm, of mid tibia 50–59 μm, of hind tibia 27–64 μm. Length and proportions of legs as in Table 2.

TABLE 2. Lengths (in μm) and proportions of legs of *Polypedilum (Probolum) marcondesi* Pinho *et* Mendes **sp. n**., female (n = 1–3).

	fe	ti	ta_1	ta_2	ta_3	ta_4
p_1	903–985	497–589	884–1041	580–723	393–484	258–341
p_2	866–995	663–774	451–549	212–258	129–166	92–101
p_3	1022–1124	709–866	626	318	267	147
	ta_5	LR	BV	SV	BR	
p_1	92–138	1.77–1.84	1.56–1.73	1.50–1.58	3.0–3.3	
p_2	37–46	0.68–0.71	4.03–4.16	3.23–3.39	3.0–3.8	
p_3	55	0.88	2.99	2.76	4.5	

Genitalia (Fig. 13). Gonocoxapodeme curved, ending on base of dorsomesal lobe. Gonocoxite IX with 0–2 setae. Tergite IX (Fig. 14) with 27–42 setae. Segment X with 5–9 setae to each side. Cercus 95–100 μm long. Seminal capsule ovoid, 95–118 μm long, not including 6–9 μm long neck. Notum 143–179 μm long.

Dorsomesal lobe (Fig. 15) 66–71 μm long from base of vagina to apex, 39–41 μm wide near apex. Ventrolateral lobe (Fig. 16) 11–14 μm long, 16–18 μm wide, without microtrichia. Apodeme of apodeme lobe as in Figure 17.



FIGURES 18–25. *Polypedilum (Probolum) marcondesi* Pinho *et* Mendes **sp. n.**, pupa (18–21) and larva (22–25). **18**–tergites. **19**–thorax. **20**–frontal apotome. **21**–anal comb. **22**–mentum. **23**–pecten epipharyngis. **24**–antenna. **25**–mandible.

Pupa (n = 3, unless otherwise stated). Total length 3.73–5.10 mm.

Coloration. Exuviae pale brown with margins of wing sheath golden brown, mesal paratergites margins of segments VI–VII and caudal spur brown.

Cephalothorax (Fig. 19). Frontal apotome as in Figure 20, frontal setae 38–56 µm long. Prealar tubercle present in 2 larger specimens, absent in smaller. Thoracic horn apparently with only 3 branches, longest 244–319 µm long, middle 120 (1) µm, shortest 98 (1) µm long. Thoracic setae about 40–75 µm long.

Abdomen (Fig. 18). Tergite I, VIII and IX without spines and shagreen. T II with 6–8 rows of spinules in anterior band, otherwise without shagreen; T III–VI each with 6–8 rows of strong spinules in anterior band, central line of sparse and weak spinules which may be absent on T III and posterior band of spinules. T VII with weak anterior spinules, otherwise bare. Tergite II with 41–70 caudal hooklets in single row. Sternites VI–VIII bare. Spinules on conjunctives III/IV and IV/V in 5 rows, on conjunctive V/VI medially interrupted and at most in 4 rows. Pedes spurii A well developed on segment IV. Pedes spurii B well developed anterior on segment I and posterior on segment II. Segment I without lateral setae, S II–IV with 3 hair-like lateral setae; S V–VI with 3 taeniae; S VII with 3–4 taeniae, S VIII with 4–5 taeniae. Anal spur (Fig. 21) single with almost none to several lateral and basal denticles. Anal lobe with 37–58 taeniae, up to 0.6–0.7 mm long.

Larva (n = 3, unless otherwise stated). Total length not measurable. Head capsule 0.41–0.47 mm long. Postmentum 168–192 µm long.

Coloration. Mentum and mandible brown, postoccipital margin black.

Head. AR 1.00–1.10. Antenna as in Figure 24; antennal segment lengths (in µm): 52–57, 19–21, 11–12, 14–17, 5–8. Basal antennal segment 17 µm wide, ring organ about 12 (1) µm from base, blade 40–50 µm long. Pecten epipharyngis as in Figure 23. Premandible 71–78 µm long. Mandible (Fig. 25) 123–135 µm long, seta subdentalis 17–24 µm long, pecten mandibularis of 6 setae. Mentum (Fig. 22) 97–109 µm wide, ventromental plate 109–119 µm wide, distance between plates 12–19 µm, about 50 striae. Setae submenti situated just below inner posterior corner of ventromental plates.

Abdomen. Procercus weak, with about 9 anal setae up to 469 (1) µm long. Supraanal seta 206 (1) µm long. Ratio of supraanal setae / anal setae 0.44 (1). Posterior parapods and anal tubules not measurable.

Distribution and biology. Known only from the type locality on Ilha de Santa Catarina, Santa Catarina State, southern Brazil. Adults were taken in a Malaise trap while larvae were collected from leaf-axils of bromeliads (*Nidularium innocentii* Lemaire and *Vriesea vagans* L.B. Smith) (see Pinho *et al*. 2005).

***Polypedilum (Probolum) excelsius* Townes *sensu* Grodhaus *et* Rotramel**

Polypedilum pedatum excelsius Townes *sensu* Grodhaus *et* Rotramel, 1980: 70.

Diagnostic characters. The pupa differs from that of *P. (Pr.) marcondesi* by having more extensive shagreen including shagreen spinules anterior on tergite VIII and on sternites VI–VIII. The larva has an AR of about 1.4 against 1.0–1.1 in *P. (Pr.) marcondesi* and the distance between the ventromental plates is about as long as the four median teeth combined, while it is clearly less than the width of the four median teeth combined in *P. (Pr.) marcondesi*.

Description. The immatures are described in detail by Grodhaus and Rotramel (1980).

***Polypedilum (Uresipedilum) excelsius* Townes stat. n.**

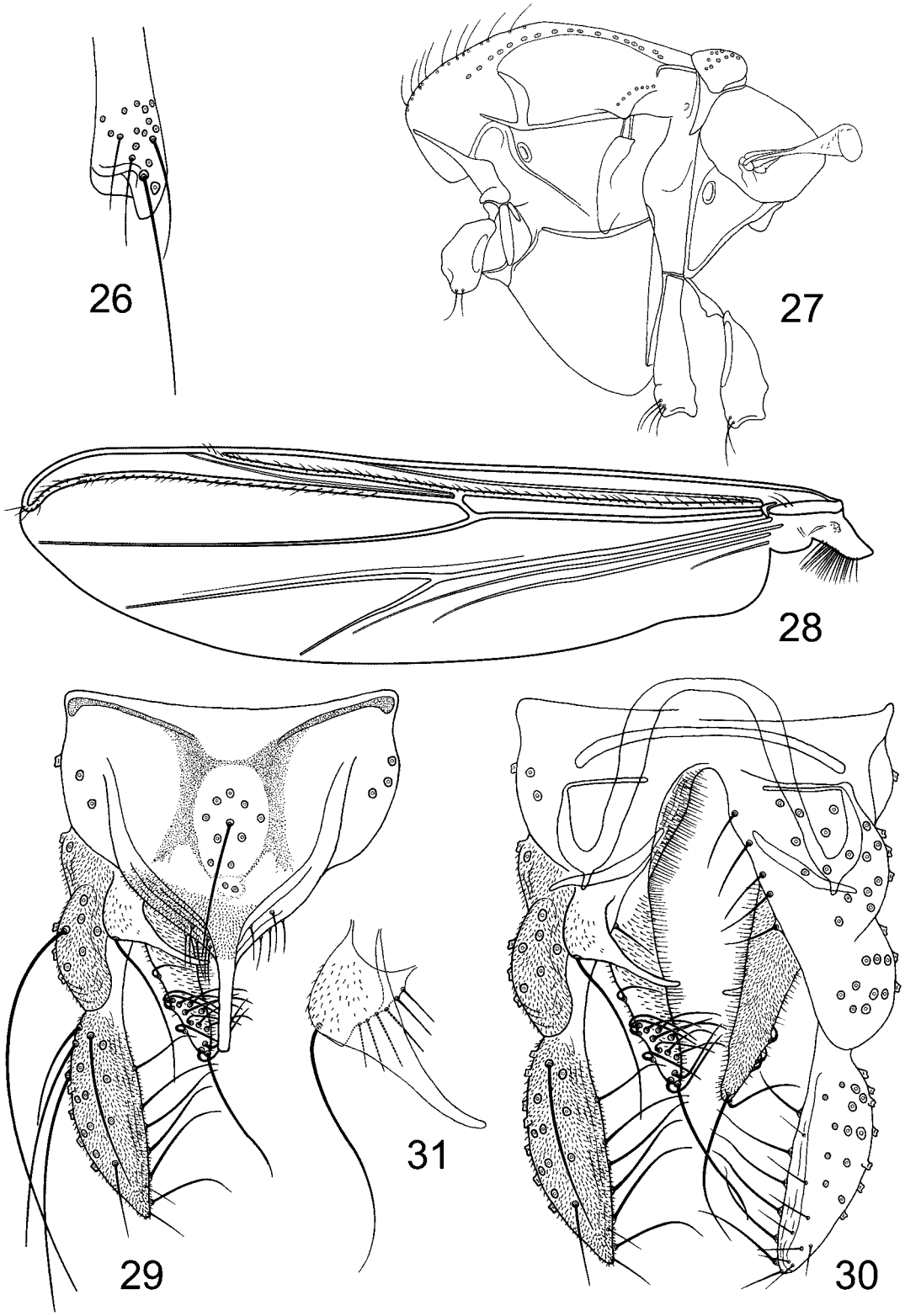
Figs 26–31

Polypedilum pedatum excelsius Townes, 1945: 55.

Material examined. CANADA: British Columbia, Marion Lake at dock and on west shore, 2 males, 7 & 25.v.1965, A.L. Hamilton (ZMBN).

Diagnostic characters. The males apparently differ from *P. pedatum* by having R_{4+5} reaching apex of wing, projection of superior volsella clearly longer than base, third palpomere with 2–3 lanceolate sensilla clavata, squama with about 16 setae and M without setae.

Male (n = 2, except when otherwise stated). Total length 4.39–4.75 mm. Wing length 2.70–3.01 mm. Total length / wing length 1.58–1.63. Wing length / length of profemur 2.47–2.51.



FIGURES 26–31. *Polypedilum (Uresipedilum) excelsius* Townes, 1945, male. **26**–spur of foretibia. **27**–thorax. **28**–wing. **29**–hypopygium, dorsal view. **30**–hypopygium with tergite IX and anal point removed, dorsal view left, ventral view right. **31**–superior volsella.

Coloration. Thorax brown with darker vittae, postnotum, preepisternum and much of anepisternum; scutellum pale. Legs beyond coxae pale brown. Abdomen brown, gonocoxite and gonostylus pale.

Head. AR 1.04–1.12. Ultimate flagellomere 633–671 μm long. Temporal setae 12–16 including 3–4 inner verticals, 3–5 outer verticals and 6–7 postorbitals. Clypeus with 25–26 setae. Tentorium 128–150 μm long, 56–68 μm wide at sieve pore. Stipes 150–165 μm long, 45 μm wide. Palpomere lengths (in μm): 41–45, 56–68, 221–244, 135–165, 229–263. Third palpomere with 2–3 lanceolate sensilla clavata, longest 23 μm long.

Thorax (Fig. 27). Acrostichals 20 (1); dorsocentrals 17–23, including 2 scutal fossal setae in one specimen; prealars 7–8. Scutellum with 22–24 setae.

Wing (Fig. 28). VR 1.15–1.29. R_{2+3} well separated from R_1. R_{4+5} strongly curved at apex, ending at wing tip. Brachiolum with 2 setae, R with 28–31, R_1 with 28–35, R_{4+5} with 46–55 setae, M bare. Squama with 16 setae.

Legs. Scale on fore tibia (Fig. 26) 38–45 μm long, rounded, without spur. Spur of mid tibia 60–64 μm long including comb, unspurred comb 26 μm long. Spur on hind tibia 64–71 μm long including comb, unspurred comb 30–34 μm long. Width at apex of fore tibia 38–45 μm, of mid tibia 64–68 μm, of hind tibia 71–74 μm. Length and proportions of legs as in Table 3.

TABLE 3. Lengths (in μm) and proportions of legs of *Polypedilum (Uresipedilum) excelsius* Townes, male (n = 2).

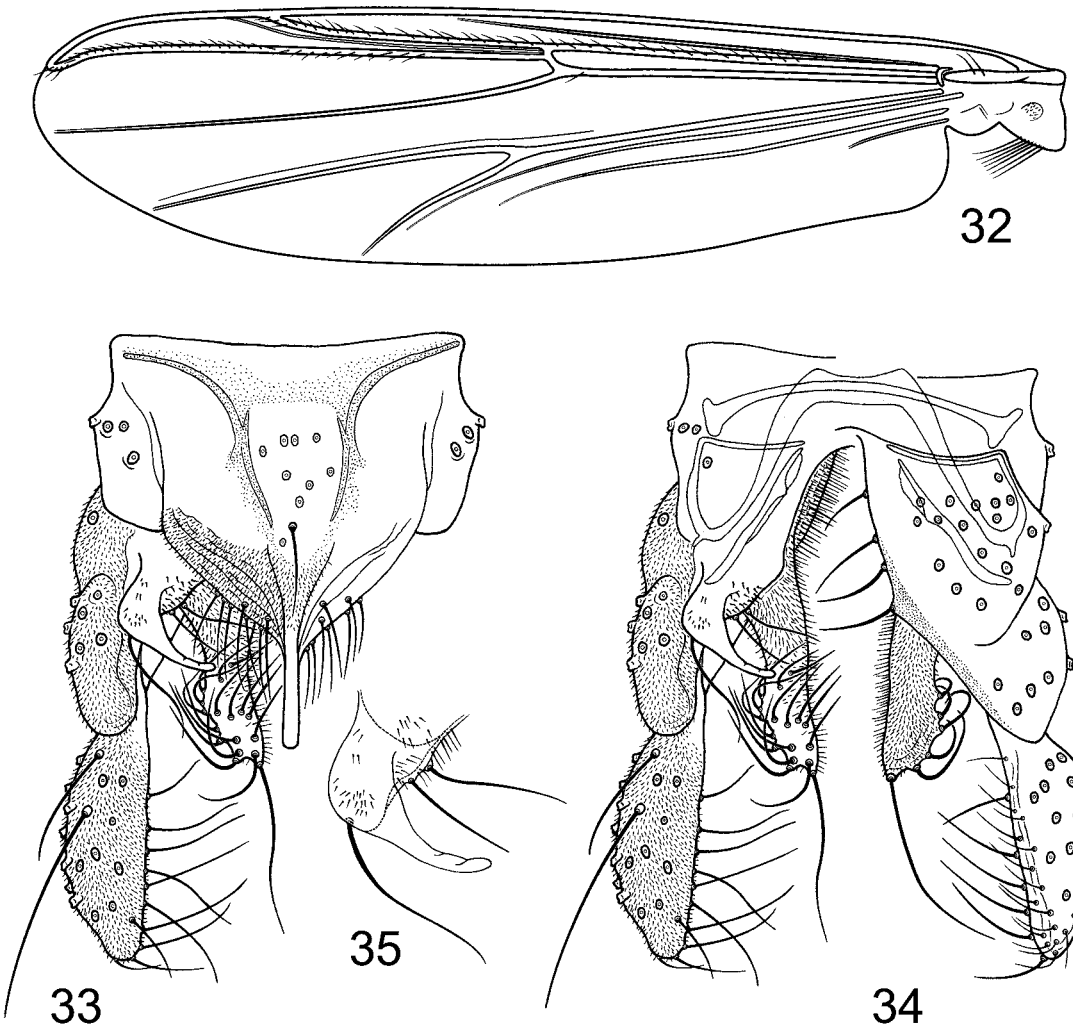
	fe	ti	ta_1	ta_2	ta_3	ta_4
p_1	1096–1200	945–1096	1106–1171	728–794	614–680	473–491
p_2	1229–1436	1087–1200	567–614	378–416	302–321	170
p_3	1370–1531	1276–1436	879–983	529–586	482–510	279–284
	ta_5	LR	BV	SV	BR	
p_1	189–194	1.07–1.17	1.57–1.61	1.84–1.96	3.6–4.0	
p_2	95	0.51–0.52	3.05–3.25	4.08–4.29	4.4–6.7	
p_3	113–132	0.68–0.69	2.52–2.61	3.01–3.02	4.0–6.3	

Hypopygium (Figs 29–30). Tergite IX with 10–13 strong median setae and altogether 8–10 setae to each side of base of anal point. Anal point 79–90 μm long, parallel-sided. Transverse sternapodeme 68 μm long, phallapodeme 116 μm long. Gonocoxite 184–214 μm long. Gonostylus 165–191 μm long, with 1 apical seta and 4–6 long setae along inner margin. Base of superior volsella (Fig. 31) sparsely covered with microtrichia, 45–49 μm long; with 75–86 μm long apicolateral seta and and row of 6 baso-ventral, inner setae; apical projection 56–60 μm long, upturned at apex. Inferior volsella 135–143 μm long, tapering, with 14–15 setae. HR 1.11–1.12. HV 2.49–2.66.

Remarks. Maschwitz and Cook (2000: 106) synonymized the two subspecies of *P. pedatum* since they found intermediates in the extent of the downturned curvature of the apical part of wing vein R_{4+5}. In our specimens R_{4+5} reaches the wing tip in *P. excelsius*, but ends distinctly before the wing tip in *P. pedatum*. The projection of the superior volsella is distinctly longer than the base in *P. excelsius*, at most as long as base in *P. pedatum*. We found several other differences in measurements making us believe that the two subspecies should be regarded as separate species rather than be synonymized. However, the differences in the number of setae on squama, the number of sensilla clavata on third palpomere, presence or absence of setae on vein M and the other differences in measurements found may not hold up when associated material can be examined.

***Polypedilum (Uresipedilum) pedatum* Townes**
(Figs 32–43)

Polypedilum pedatum pedatum Townes, 1945: 55.



FIGURES 32–35. *Polypedilum (Uresipedilum) pedatum* Townes, 1945, male. **32**–wing. **33**–hypopygium, dorsal view. **34**–hypopygium with tergite IX and anal point removed, dorsal view left, ventral view right. **35**–superior volsella.

Material examined. USA: New York, Tompkins Co., McLean Bogs Reserve, holotype male, hypopygium on separate slide in Canada balsam (Cornell University, Dept. of Entomology, Type No. 2671). Paratypes: as holotype, 3 males, 2 females (Cornell University, Dept. of Entomology, Types No. 2671.6, 2671.7, 2671.8, 2671.9, 2671.10).

Diagnostic characters. The male imagines apparently differ from *P. excelsius* by not having R_{4+5} reaching apex of wing, projection of superior volsella at most as long as base, third palpomere with 4–7 lanceolate sensilla clavata, squama with 6–10 setae and M often with apical seta.

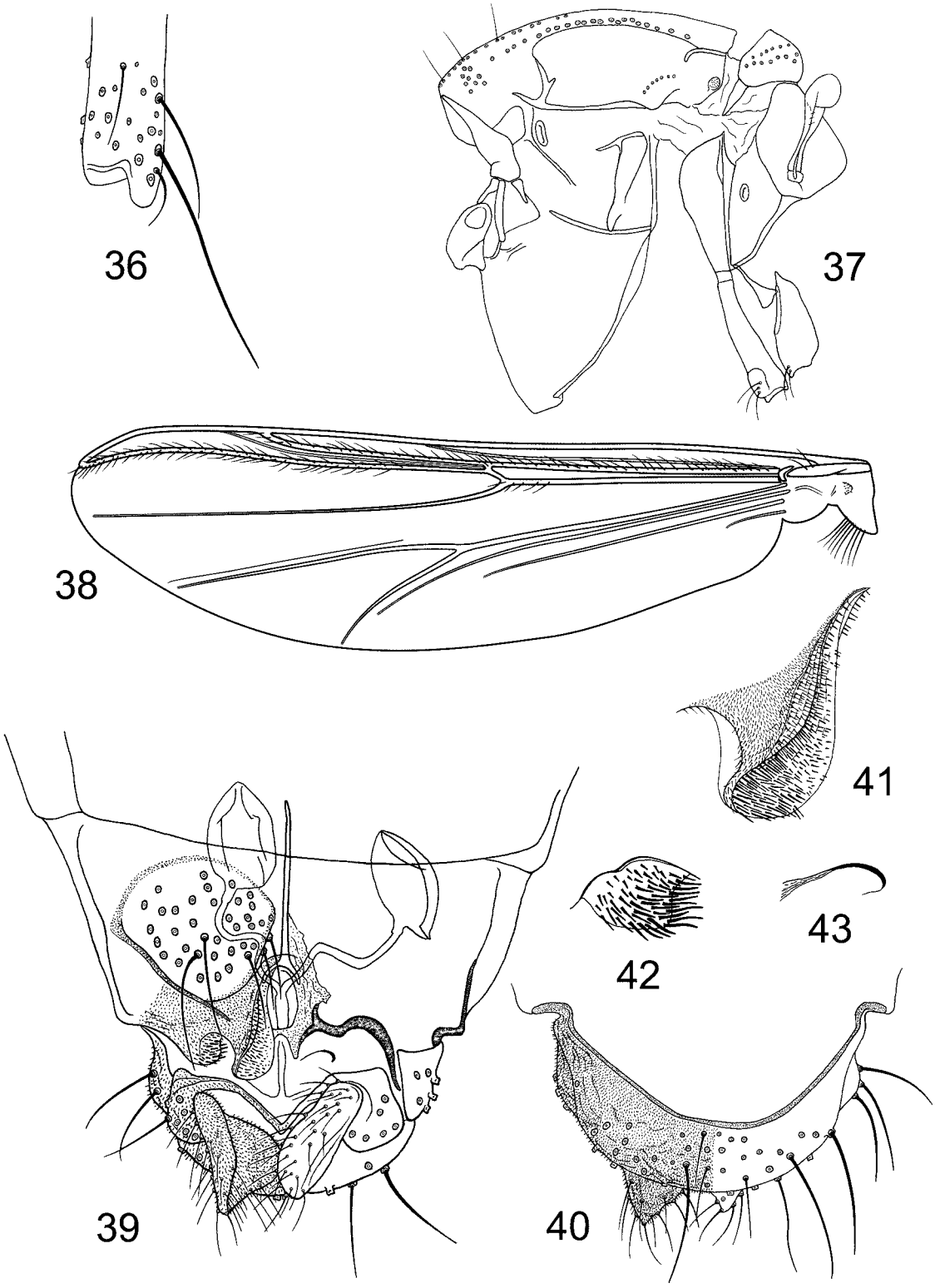
Male (n = 3–4, except when otherwise stated). Total length 3.15–4.01, 3.57 mm. Wing length 1.79–2.21 mm. Total length / wing length 1.80–1.86. Wing length / length of profemur 2.20–2.48.

Coloration. Thorax brown with darker vittae, postnotum, preepisternum and much of anepisternum; scutellum pale. Legs beyond coxae pale brown. Abdomen brown, gonocoxite and gonostylus pale.

Head. AR 1.07–1.16, 1.11. Ultimate flagellomere 548–614, 578 μm long. Temporal setae 15–20 including 5–8 inner verticals; 6 outer verticals and 4–6, 5 postorbitals. Clypeus with 13–19 setae. Tentorium 148–165, 151 μm long; 38–45, 42 μm wide at sieve pore. Stipes 135–161 μm long, 38–49 μm wide. Palpomere lengths (in μm): 41–45, 44; 53–60, 56; 135–180, 161; 131–169, 154; 191–278, 231. Third palpomere with 4–7 lanceolate sensilla clavata, longest 26 μm long.

Thorax. Acrostichals 16–18, 17; dorsocentrals 16–18, 17, including 1 scutal fossal setae in one specimen; prealars 6–8. Scutellum with 15–17, 16 biserial setae.

Wing (Fig. 32). VR 1.07–1.25. R_{2+3} well separated from R_1. Apical part of R_{4+5} curved near apex, ending nearer apex of M_{1+2} than to wing tip. Brachiolum with 2 setae, R with 19–25, R_1 with 14–22, R_{4+5} with 26–33, M with 0–1 setae. Squama with 6–10 setae.



FIGURES 36–43. *Polypedilum (Uresipedilum) pedatum* Townes, 1945, female. **36**–spur of foretibia. **37**–thorax. **38**–wing. **39**–genitalia, ventral view. **40**–tergite IX. **41**–dorsomesal lobe. **42**–ventrolateral lobe. **43**–apodeme lobe.

Legs. Scale on fore tibia 30–38, 36 μm long, rounded, without spur. Spur of mid tibia 49–53 μm long including comb, unspurred comb 26–30 μm long. Spur on hind tibia 56 μm long including comb, unspurred comb 30 μm long. Width at apex of fore tibia 41–56, 49 μm; of mid tibia 49–56 μm; of hind tibia 64 μm. Length and proportions of legs as in Table 4.

Hypopygium (Figs 33–34). Tergite IX with 6–11, 9 strong median setae and altogether 14–20, 17 setae to each side of base of anal point. Anal point 53–68, 60 μm long, parallel-sided. Transverse sternapodeme 34–49, 38 μm long; phallapodeme 101–120, 109 μm long. Gonocoxite 169–210, 188 μm long. Gonostylus 128–158, 148 μm long, with 1 apical seta and 6–8 long setae along inner margin. Base of superior volsella (Fig. 35) sparsely covered with microtrichia, 34–41, 37 μm long; with 53–56, 55 μm long apicolateral seta and 2 basal inner setae; apical projection 30–39, 34 μm long, upturned at apex. Inferior volsella 113–131, 122 μm long, nearly parallel-sided with slightly divided apex, with 14–17, 15 setae. HR 1.17–1.33, 1.28. HV 1.99–2.69, 2.43.

Female (n = 1–2). Total length 3.52–3.64 mm. Wing length 2.21–2.34 mm. Total length / wing length 1.55–1.83. Wing length / length of profemur 2.13.

Coloration. Thorax brown with darker vittae, postnotum, preepisternum and much of anepisternum; scutellum pale. Legs beyond coxae pale brown. Abdomen brown, gonocoxite and gonostylus pale.

TABLE 4. Lengths (in μm) and proportions of legs of *Polypedilum (Uresipedilum) pedatum* Townes, male (n = 2–4 for fe and ti, 1–3 for ta).

	fe	ti	ta_1	ta_2	ta_3	ta_4
p_1	813–1011, 917	652–813, 754	1068	690	520	345
p_2	917–1115, 1016	869–964, 910	473–520	274–312	208–227	118–137
p_3	1058–1106	992–1058	–	–	–	–

	ta_5	LR	BV	SV	BR
p_1	142	1.35	1.68	1.67	3.1
p_2	66–85	0.53–0.54	3.27–3.42	4.00–4.06	4.5–5.5
p_3	–	–	–	–	–

Head. AR = 0.38. Flagellomere lengths (in μm): 143, 105, 94, 71, 150. Longest sensilla chaeticae on ultimate flagellomere 71 μm long. Temporal setae 18–20 including 6–9 inner verticals, 6 outer verticals and 5–6 postorbitals. Clypeus with 18–20 setae. Tentorium 154–184 μm long, 30 μm wide at sieve pore. Stipes 154 μm long, 45 μm wide. Palpomere lengths (in μm): 45–56, 60–64, 176–184, 158–173, 278–308. Third palpomere with 6–7 lanceolate sensilla clavata, longest 26 μm long.

Thorax (Fig. 37). Acrostichals 20–22; dorsocentrals 25–30, including 5–9 scutal fossal setae; prealars 7. Scutellum with 18–20 biserial setae.

Wing (Fig. 38). VR 1.16–1.19. R_{2+3} well separated from R_1. Brachiolum with 2 setae, R with 28–31, R_1 with 22–28, R_{4+5} with 40–56, M with 5–7 setae. Squama with 8–9 setae.

Legs. Scale on fore tibia (Fig. 36) 38 μm long, rounded, without spur. Spur of mid tibia 49–53 μm long including comb, unspurred comb 23–26 μm long. Spur on hind tibia 49–56 μm long including comb, unspurred comb 23–26 μm long. Width at apex of fore tibia 64 μm, of mid- and hind tibia both 71 μm. Length and proportions of legs as in Table 5.

TABLE 5. Lengths (in μm) and proportions of legs of *Polypedilum (Uresipedilum) pedatum* Townes, female (n = 1–2).

	fe	ti	ta_1	ta_2	ta_3	ta_4	ta_5	LR	BV	SV	BR
p_1	1040	765	–	–	–	–	–	–	–	–	–
p_2	1002–1106	964–983	501	293	217	151	85	0.51–0.52	3.47	3.92–4.17	4.0
p_3	1238	1096–1125	737	–	–	–	–	–	–	–	–

Abdomen. Number of setae on tergites I–VIII as: 46–67, 47–77, 48–70, 35–56, 27–46, 30–46, 42–46, 29–36. Number of setae on sternites I–VIII as: 0, 3–4, 10–26, 25–34, 22–33, 26–33, 32–33, 45–69.

Genitalia (Fig. 39). Gonocoxapodeme completely straight to slightly curved, ending on base of dorsomesal lobe. Gonocoxite IX with 3–6 setae. Tergite IX (Fig. 40) with 36–44 setae. Segment X with 4–6 setae to each side. Cercus 124 μm long. Seminal capsule ovoid, 90–101 μm long, 70 μm wide, with 15–19 μm long neck. Notum 139–150 μm long. Dorsomesal lobe (Fig. 41) 98–105 μm long from base of vagina to apex, 53–56 μm wide near apex. Ventrolateral lobe (Fig. 42) 30–38 μm long, 30–38 μm wide. Apodeme of apodeme lobe as in Figure 43.

***Polypedilum* spp.**
(Figs 44–45)

Material examined. USA: Missouri, Atherton, 2 female paratypes of *P. pedatum pedatum*, 7.v.1916 & 7.v. 1922, C.F. Adams (Cornell University, Dept. of Entomology, Types No. 2671.2, 2671.3); Louisiana, opposite Orange, Sabine River Ferry, 1 female paratype of *P. pedatum pedatum*, 20.vi.1917, Cornell Biol. Exped. (Cornell University, Dept. of Entomology, Type No. 2671.1).

Three female paratypes from Missouri and Louisiana although belonging to *Polypedilum* cannot belong to *P. pedatum* as they have a quite different ventrolateral lobe of gonapophysis VIII. They have R_{4+5} strongly curved at apex and ending at wing tip and M is bare. Thus according to the description by Townes they should have been listed under *P. pedatum excelsius* and not under *P. pedatum pedatum.* However, all three specimens have a spine on the fore tibial scale and thus do not belong to *P. excelsius.* The three specimens differ from each other both in the genitalia and in the front tibial scale and apparently consist of at least two different species. The genitalia of both are illustrated in Figures 44–45. Both have the highly unusual, rounded ventrolateral lobe with weak or no microtrichia as in *P. (Probolum) marcondesi* and not the brush-like lobe typical for other *Polypedilum*. They thus could very well belong to the subgenus *Probolum*.

FIGURES 44–45. *Polypedilum (Uresipedilum)* spp., females. **44**–genitalia, ventral view of paratype of *Polypedilum (Uresipedilum) pedatum* Townes, 1945, from Missouri. **45**–genitalia, ventral view of paratype of *P. (U.) pedatum* from Louisiana.

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APPENDIX 1. Character states for characters 1–65 in species of *Polypedilum* Kieffer, and the genera *Asheum* Sublette *et* Sublette, *Stictochironomus* Kieffer and *Phaenopsectra* Kieffer. Polymorphies: A = 0&1; B = 0&1&2; C = 1&2.

Characters	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
marcondesi	1	1	0	0	1	0	0	0	1	0	1	1	0	0	0	1	1	0	1	1	1
excelsius sensu G & R	0	0	0	1	0	0	0	1	1	0	A	0	1	0	0	1	1	0	1	0	0
bullum	0	0	0	1	1	0	1	0	1	0	?	0	0	1	0	1	?	0	1	1	0
simantokeleum	0	0	0	1	0	0	1	A	1	0	?	0	1	0	?	1	1	0	1	1	0
P. (U.) aviceps	0	0	0	1	0	0	1	0	1	0	0	0	1	0	0	1	1	0	1	1	0
P. (U.) convictum	0	0	0	1	0	0	1	1	1	0	0	0	1	0	0	1	1	0	1	1	0
P. (U.) cultellatum	0	0	0	1	0	0	1	1	1	0	1	0	1	1	0	1	1	0	1	1	0
P. (U.) dossenudum	0	0	0	0	0	0	1	0	1	0	0	A	1	0	1	1	1	0	1	1	0
P. (U.) flavum	0	0	0	1	0	0	1	0	1	0	0	A	1	0	0	1	1	0	1	1	0
P. (U.) obtusum	0	0	0	1	0	0	A	0	1	0	0	0	0	0	0	1	1	0	1	1	0
P. (U.) oresitrophum	0	0	1	?	0	0	1	?	1	0	?	?	1	0	0	1	1	0	1	1	0
P. (U.) paraviceps	0	0	0	1	0	0	1	?	1	0	?	0	1	0	0	1	1	0	1	1	0
P. (U.) surugense	0	0	0	1	0	0	1	?	1	0	?	0	1	0	0	1	1	0	1	1	0
P. (Pe.) convexum	0	0	0	0	0	1	1	1	0	0	0	0	0	1	1	1	1	0	0	0	0
P. (Pe.) epleri	0	0	A	A	0	1	1	1	0	0	0	A	0	0	0	1	1	0	0	0	0
P. (Pe.) kasumiense	0	0	0	0	0	1	1	1	0	0	?	1	0	1	0	1	1	0	0	0	0
P. (Pe.) leei	0	0	0	1	0	1	1	1	0	0	0	0	0	0	A	1	1	0	0	0	0
P. (Pe.) nodosum	0	0	1	0	0	1	1	1	0	0	?	1	1	0	0	1	1	0	0	0	0
P.(Pe.) shirokanense	0	0	0	0	0	1	1	1	0	0	?	A	0	1	0	1	1	0	0	0	0
P. (Pe.) sordens	A	0	0	A	0	1	1	1	0	0	A	0	0	1	0	1	1	0	0	0	A
P. (Pe.) tritum	0	0	0	A	0	1	1	1	0	0	0	A	0	0	0	1	1	0	0	0	0
P. (Pe.) uncinatum	0	0	0	A	0	1	1	1	0	0	0	A	1	0	0	1	1	0	0	0	0
P. (P.) albicorne	0	0	0	A	0	0	1	0	1	0	1	A	0	0	0	1	1	0	0	0	0
P. (P.) angulum	0	0	0	A	0	0	1	0	1	0	A	A	0	0	0	1	1	0	0	0	0
P. (P.) arundineti	1	0	0	0	0	0	0	?	1	0	?	1	1	0	0	1	1	0	0	0	1
P. (P.) bergi	0	0	0	1	0	0	A	A	1	0	A	0	0	0	0	1	1	0	0	0	0
P. (P.) braseniae	0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	1	1	0	0	0	0
P. (P.) brunneicorne	0	0	0	1	0	0	0	0	1	0	A	0	1	0	A	1	1	0	0	0	0
P. (P.) falciforme	0	0	0	A	0	0	0	0	1	0	0	0	0	0	A	1	1	0	0	0	0
P. (P.) fallax	0	0	0	1	0	0	1	0	1	0	1	0	1	1	0	1	1	0	0	0	0
P. (P.) illinoense	0	0	0	1	0	0	1	A	1	0	1	0	A	0	0	1	1	0	0	0	0
P. (P.) laetum	0	0	0	1	1	0	0	A	1	0	1	0	0	0	0	1	1	0	0	0	0
P. (P.) melanophilum	0	0	A	1	0	0	0	A	1	0	A	A	0	0	0	1	1	0	0	0	0

P. (P.) nubeculosum	0	0	0	1	1	0	0	1	1	1	0	0	A	0	0	1	1	0	0	0	0
P. (P.) nubifer	0	0	0	1	1	0	0	0	1	0	0	0	1	0	0	1	1	0	0	0	0
P. (P.) nymphaeorum	0	0	0	A	0	0	A	0	1	0	A	0	0	1	0	1	1	0	0	0	0
P. (P.) ophoioides	0	0	0	1	0	0	A	0	1	0	A	0	0	?	0	1	1	0	0	0	0
P. (P.) pedestre	0	0	0	1	0	0	1	A	1	0	1	0	0	1	0	1	1	0	0	0	0
P. (P.) trigonus	1	0	0	0	0	0	0	0	1	0	0	A	0	1	0	1	1	0	0	0	1
P. (P.) tuberculum	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	1	1	0	0	0	0
P. (C.) ontario	1	0	0	1	0	0	0	1	1	1	1	0	1	1	0	1	1	0	0	0	1
P. (C.) volselligum	1	1	A	1	1	0	0	1	1	1	1	0	1	1	?	1	1	0	0	0	1
P. (T.) acifer	0	1	A	0	0	0	?	0	1	0	?	1	0	1	A	1	1	0	0	2	0
P. (T.) apfelbecki	0	0	1	0	1	0	?	0	1	0	1	?	0	?	1	1	1	1	0	2	0
P. (T.) bicrenatum	1	0	0	1	0	0	0	0	1	0	?	?	?	?	0	1	1	1	0	2	1
P. (T.) digitifer	0	0	0	1	0	0	0	0	1	0	0	0	0	1	0	1	1	1	0	2	0
P. (T.) griseoguttatum	A	1	0	A	1	0	0	0	1	0	A	A	A	1	A	1	1	1	0	2	A
P. (T.) griseopunctatum	0	1	0	1	1	0	0	0	1	0	0	?	0	1	0	1	1	1	0	2	0
P. (T.) majis	0	0	1	1	1	0	0	?	1	0	0	1	0	?	0	1	1	1	0	2	0
P. (T.) parascalaeneum	0	1	0	?	1	0	0	?	1	0	0	?	?	?	?	1	1	1	0	2	0
P. (T.) scalaeneum	1	1	0	1	1	0	0	0	1	0	0	A	0	0	0	1	1	1	0	2	1
P. (T.) titicacae	0	0	1	1	0	0	?	?	1	0	0	1	0	0	0	1	1	1	0	2	0
P. (T.) umayo	0	0	0	A	0	0	?	?	1	0	0	?	0	0	0	1	1	1	0	2	0
P. (T.) villcanota	0	0	1	1	?	0	?	?	1	0	0	?	0	?	0	1	1	1	0	2	0
P. (T.) watsoni	0	0	0	?	1	0	0	?	1	0	?	?	?	?	1	1	1	1	0	2	0
Asheum beckae	1	0	0	1	0	0	0	?	1	0	1	0	A	0	0	0	0	0	1	1	1
Stictochironomus	0	A	0	1	A	0	0	A	0	0	A	0	1	0	0	0	0	0	0	0	0
Phaenopsectra	0	0	0	1	0	1	A	1	A	0	A	A	A	0	0	0	0	0	0	0	0

APPENDIX 1. Continued.

Characters	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
marcondesi	0	0	0	0	1	3	1	0	A	1	1	2	0	0	1	0	0	0	0	A	1
excelsius sensu G & R	0	0	0	0	1	3	1	0	2	0	1	2	0	0	1	0	0	0	0	?	1
bullum	0	0	0	0	1	3	1	0	2	0	1	2	0	0	1	?	?	?	?	?	?
simantokeleum	0	0	0	0	1	3	1	1	0	0	1	2	0	0	1	?	?	?	?	?	?
P. (U.) aviceps	0	1	0	0	1	3	0	1	2	0	1	2	1	0	1	1	0	1	0	0	1
P. (U.) convictum	1	0	0	0	1	3	0	1	1	0	1	2	0	0	1	1	0	0	1	0	0
P. (U.) cultellatum	1	0	0	0	1	3	0	0	C	0	0	0	0	0	1	1	0	1	0	1	1
P. (U.) dossenudum	1	0	0	0	1	3	0	1	2	0	A	2	0	0	1	1	0	1	0	0	1
P. (U.) flavum	1	0	0	0	1	3	0	1	2	0	1	2	0	0	1	1	0	1	0	0	1
P. (U.) obtusum	0	1	0	0	1	3	0	1	2	0	1	2	1	0	1	1	0	1	0	0	1
P. (U.) oresitrophum	0	1	0	0	1	3	0	0	1	0	?	?	0	0	1	1	0	1	0	1	1
P. (U.) paraviceps	0	0	0	0	1	3	0	1	B	0	0	2	1	0	1	1	0	1	0	1	1
P. (U.) surugense	0	0	0	0	1	3	0	1	2	0	0	2	1	0	1	1	0	1	0	1	1
P. (Pe.) convexum	0	0	1	0	0	0	0	1	A	0	1	2	1	0	1	1	0	1	?	0	1
P. (Pe.) epleri	0	0	0	0	0	1	0	1	B	0	A	2	0	0	1	1	0	1	?	0	1
P. (Pe.) kasumiense	0	0	1	0	0	1	0	0	A	0	1	?	1	0	1	1	0	?	0	0	1
P. (Pe.) leei	0	0	0	0	0	C	0	2	A	0	1	2	0	0	1	1	0	1	?	0	1
P. (Pe.) nodosum	0	0	0	0	0	1	0	2	C	0	2	2	0	0	1	1	0	?	?	0	1

P. (Pe.) shirokanense	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	1	0	1	0	0	1
P. (Pe.) sordens	0	0	0	0	A	A	0	2	A	0	1	2	0	0	1	1	0	1	1	0	1
P. (Pe.) tritum	0	0	0	0	0	1	0	1	A	0	A	2	0	0	1	1	0	1	1	0	1
P. (Pe.) uncinatum	0	0	0	0	0	A	0	1	A	0	A	2	0	0	1	1	0	1	1	0	1
P. (P.) albicorne	0	0	0	0	A	1	0	2	C	0	0	2	0	0	1	1	0	A	1	0	1
P. (P.) angulum	0	0	0	0	0	0	0	1	B	0	0	1	0	0	1	1	0	1	0	0	1
P. (P.) arundineti	0	0	0	0	0	0	0	1	1	0	A	2	0	0	1	A	0	1	1	0	1
P. (P.) bergi	0	0	0	1	0	0	0	1	B	0	A	1	0	0	1	1	0	1	?	1	1
P. (P.) braseniae	0	0	0	1	0	0	0	1	A	0	A	2	0	0	1	1	0	1	?	0	1
P. (P.) brunneicorne	0	0	0	0	0	1	0	1	A	0	1	2	0	0	1	1	0	1	0	?	1
P. (P.) falciforme	0	0	0	1	0	A	0	1	C	0	0	1	0	0	1	1	0	1	?	1	1
P. (P.) fallax	0	0	0	0	A	1	0	1	A	0	A	2	0	0	1	1	0	1	0	0	1
P. (P.) illinoense	0	0	0	0	0	A	0	1	A	0	0	1	0	0	1	1	0	1	0	0	1
P. (P.) laetum	0	0	0	0	0	?	0	1	B	0	0	2	0	0	1	1	0	1	0	0	1
P. (P.) melanophilum	0	0	0	0	0	1	0	1	1	0	1	2	0	0	1	1	0	1	0	?	0
P. (P.) nubeculosum	0	0	0	0	0	2	0	1	2	0	1	2	0	0	1	1	0	0	0	0	1
P. (P.) nubifer	0	0	0	0	1	3	0	0	C	0	A	2	0	0	1	0	1	1	2	0	1
P. (P.) nymphaeorum	0	0	0	0	0	1	0	1	A	0	A	1	0	0	1	1	0	1	0	0	1
P. (P.) ophoioides	0	0	0	1	0	1	0	1	A	0	0	1	0	0	A	1	0	1	0	0	1
P. (P.) pedestre	0	0	0	0	0	1	0	1	C	0	1	2	0	0	1	1	0	0	1	0	1
P. (P.) trigonus	0	0	0	0	0	0	0	1	B	0	0	1	0	0	1	1	0	1	0	0	1
P. (P.) tuberculum	0	0	0	0	0	1	0	1	C	0	0	2	0	0	1	1	0	1	0	0	1
P. (C.) ontario	0	0	0	0	0	1	0	1	0	1	2	2	1	0	2	0	1	1	0	0	0
P. (C.) volselligum	0	0	0	0	0	1	0	1	0	1	2	2	0	0	2	0	1	1	0	0	0
P. (T.) acifer	0	0	0	0	0	1	0	0	3	0	0	1	1	1	1	0	0	1	1	?	1
P. (T.) apfelbecki	0	0	0	0	?	?	0	0	3	0	1	1	0	A	1	0	0	0	0	0	1
P. (T.) bicrenatum	0	0	0	0	?	?	0	0	3	0	0	1	1	1	1	0	0	0	0	0	1
P. (T.) digitifer	0	0	0	0	?	?	0	0	3	0	0	1	1	1	1	0	0	0	?	?	1
P. (T.) griseoguttatum	0	0	0	0	?	?	0	0	3	0	A	1	A	1	1	0	0	0	?	?	1
P. (T.) griseopunctatum	0	0	0	0	?	?	0	1	3	0	0	2	1	1	1	0	0	1	?	?	1
P. (T.) majis	0	0	0	0	?	?	0	0	2	0	1	1	1	0	1	0	0	0	0	?	1
P. (T.) parascalaeneum	0	0	0	0	?	?	0	0	3	0	?	?	1	0	1	?	0	?	?	?	1
P. (T.) scalaeneum	0	0	0	0	?	?	0	0	2	0	1	1	1	1	1	0	0	0	0	1	1
P. (T.) titicacae	0	0	0	0	?	?	0	0	3	0	0	?	1	1	1	?	0	?	2	?	1
P. (T.) umayo	0	0	0	0	?	?	0	0	3	0	1	?	1	1	1	?	0	?	2	?	1
P. (T.) villcanota	0	0	0	0	?	?	0	0	3	0	0	?	1	0	1	?	0	?	0	?	1
P. (T.) watsoni	0	0	0	0	?	?	0	0	3	0	?	?	0	0	1	1	0	0	?	?	1
Asheum beckae	0	1	0	0	0	3	0	1	0	0	A	1	0	0	1	0	0	1	2	0	1
Stictochironomus	0	0	0	0	0	2	0	1	0	0	A	C	0	0	0	0	1	0	2	1	1
Phaenopsectra	0	0	0	0	0	1	0	1	B	0	B	2	0	0	0	0	1	1	A	?	1

APPENDIX 1. Continued.

Characters	4	4	4	4	4	4	4	5	5	5	5	5	5	5	5	5	6	6	6	6	6	6	6
	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5
marcondesi	0	0	2	2	0	0	A	0	A	0	1	0	1	0	0	0	1	1	1	0	0	0	0
excelsius sensu G & R	0	0	2	2	0	0	0	0	0	0	1	0	1	0	0	0	1	1	1	0	0	A	0

bullum	?	?	?	?	?	?	?	?	?	?	1	?	?	?	?	?	?	?	?	?	?	?	?
simantokeleum	?	?	?	?	?	?	?	?	?	?	1	?	?	?	?	?	?	?	?	?	?	?	?
spitzkopfei	0	0	2	2	0	0	0	1	0	0	1	1	1	0	0	0	1	1	2	2	0	1	1
P. (U.) aviceps	1	0	0	2	0	0	0	A	0	1	1	1	0	0	1	0	1	1	1	2	0	1	1
P. (U.) convictum	0	0	1	1	0	0	0	0	0	0	1	1	0	0	0	0	1	1	2	1	0	1	1
P. (U.) cultellatum	0	0	2	2	0	0	0	0	0	0	1	?	?	0	?	0	1	1	2	1	0	1	1
P. (U.) dossenudum	1	1	1	0	0	0	0	0	A	0	1	0	0	0	1	0	1	1	2	2	0	1	1
P. (U.) flavum	1	1	1	1	0	0	0	0	A	0	1	0	0	0	1	0	1	1	2	2	0	1	1
P. (U.) obtusum	0	1	1	A	0	0	0	0	0	0	1	0	1	0	1	0	1	1	2	1	0	1	1
P. (U.) oresitrophum	A	1	1	1	0	0	0	0	1	0	1	1	0	0	0	0	1	1	2	2	0	1	1
P. (U.) paraviceps	A	1	1	1	0	0	0	0	A	0	1	0	0	0	0	0	1	1	2	2	0	1	1
P. (U.) surugense	0	?	2	2	0	0	?	1	0	0	1	0	1	0	0	0	1	1	2	0	0	1	0
P. (Pe.) convexum	0	0	0	2	0	0	1	0	0	0	1	0	1	0	0	0	0	1	0	0	0	1	0
P. (Pe.) epleri	0	0	?	?	0	0	0	?	?	0	1	0	1	0	0	0	1	0	2	0	0	1	0
P. (Pe.) kasumiense	1	?	1	1	0	0	?	0	1	0	1	0	1	0	0	0	0	1	1	0	1	1	0
P. (Pe.) leei	0	?	1	1	0	0	0	0	0	0	1	1	1	0	1	0	1	1	2	0	0	1	0
P. (Pe.) nodosum	0	0	?	?	0	0	0	0	0	0	1	0	1	0	0	0	1	0	2	0	0	1	0
P. (Pe.) shirokanense	1	1	?	2	0	A	1	0	A	0	1	0	1	0	0	0	0	1	1	0	1	0	0
P. (Pe.) sordens	0	0	?	2	0	0	0	A	0	0	1	0	1	0	0	0	1	1	2	0	A	1	0
P. (Pe.) tritum	0	0	?	2	0	0	0	0	A	0	1	1	1	0	0	0	1	1	2	0	0	1	0
P. (Pe.) uncinatum	0	0	2	2	1	0	0	A	0	A	1	1	1	0	0	0	1	1	2	0	0	1	0
P. (P.) albicorne	0	0	1	C	0	0	0	0	0	0	1	1	0	0	A	0	1	1	2	0	0	1	0
P. (P.) angulum	0	0	0	0	0	0	A	1	0	0	1	?	?	0	?	0	0	1	2	0	0	1	0
P. (P.) arundineti	0	1	2	2	0	0	0	0	1	0	1	0	0	0	0	1	1	1	2	0	0	1	0
P. (P.) bergi	0	1	1	0	1	0	0	0	0	0	1	0	1	0	0	1	0	0	0	0	0	1	0
P. (P.) braseniae	0	0	2	1	0	0	0	0	0	0	1	?	?	0	?	0	1	1	2	0	0	1	0
P. (P.) brunneicorne	0	0	1	C	0	0	0	0	0	0	1	0	0	0	1	0	1	1	2	0	0	1	0
P. (P.) falciforme	0	0	1	1	0	0	1	0	A	0	1	0	0	0	0	0	0	1	0	0	A	1	0
P. (P.) fallax	0	0	1	C	0	0	0	0	0	0	1	0	0	0	A	0	1	1	2	0	0	1	0
P. (P.) illinoense	0	0	2	2	0	0	1	A	0	0	1	1	1	0	0	0	1	1	0	0	0	1	0
P. (P.) laetum	0	0	2	1	0	0	0	0	0	0	1	0	1	0	1	0	0	0	0	0	0	1	0
P. (P.) melanophilum	0	0	C	2	0	0	1	0	0	0	1	0	0	0	0	0	1	1	2	0	0	1	0
P. (P.) nubeculosum	0	1	2	2	0	1	1	0	1	1	1	0	0	1	0	0	1	1	2	0	0	0	0
P. (P.) nubifer	0	0	1	C	0	0	0	0	0	0	1	0	0	0	0	A	1	1	2	0	0	1	0
P. (P.) nymphaeorum	0	1	A	A	0	0	0	0	0	0	1	1	0	0	A	0	1	1	2	0	0	1	0
P. (P.) ophoioides	0	A	2	2	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	0
P. (P.) pedestre	1	A	C	2	0	0	0	0	0	0	1	0	0	0	1	0	1	1	2	0	0	0	0
P. (P.) trigonus	0	0	1	1	0	0	1	0	0	0	1	1	1	0	0	0	1	1	0	0	0	1	0
P. (P.) tuberculum	1	0	0	0	2	1	1	0	1	0	1	1	0	0	0	0	0	1	1	0	0	A	0
P. (C.) ontario	1	0	0	0	2	1	1	0	1	0	1	1	0	0	0	0	0	1	1	0	0	A	0
P. (C.) volselligum	0	0	?	2	0	0	1	1	0	1	1	1	0	0	1	0	1	1	2	0	0	1	0
P. (T.) acifer	0	?	?	?	0	1	1	0	0	1	1	1	1	0	1	0	1	1	2	0	?	0	0
P. (T.) apfelbecki	0	0	?	2	0	1	0	0	0	1	1	1	0	0	1	0	1	1	2	1	0	0	0
P. (T.) bicrenatum	0	?	?	1	0	1	?	0	?	1	1	1	1	0	1	0	1	1	2	1	?	0	0
P. (T.) digitifer	0	0	?	2	0	1	0	0	1	1	1	1	1	0	1	0	1	1	1	0	1	0	0
P. (T.) griseoguttatum	0	?	?	?	0	1	?	0	?	1	1	1	0	0	1	0	1	1	2	1	?	0	0

P. (T.) griseopunctatum	0	0	1	1	0	1	1	?	0	1	1	1	1	0	1	0	1	1	2	?	0	1	0
P. (T.) majis	0	?	?	?	0	1	0	1	0	1	1	1	0	0	1	0	1	1	2	0	0	0	0
P. (T.) parascalaeneum	0	0	?	1	0	1	0	A	0	1	1	1	0	0	1	0	1	1	2	1	0	0	0
P. (T.) scalaeneum	0	0	?	2	0	1	0	0	0	1	1	1	0	0	1	0	1	1	2	1	0	1	0
P. (T.) titicacae	0	0	?	2	0	1	0	?	?	1	1	1	0	0	1	1	1	1	2	?	0	?	0
P. (T.) umayo	0	0	?	2	0	1	0	0	0	1	1	1	0	0	1	A	1	1	2	1	0	0	0
P. (T.) villcanota	0	?	2	2	0	1	0	0	0	1	1	1	1	0	1	0	1	1	2	1	0	0	0
P. (T.) watsoni	1	1	0	0	2	1	1	0	0	0	1	0	0	0	0	0	0	1	0	0	1	0	0
Asheum beckae	0	0	0	2	0	1	1	0	1	0	0	A	0	1	A	0	1	1	0	0	0	0	1
Stictochironomus	0	0	1	1	0	1	0	0	A	0	0	0	0	0	A	0	1	0	0	0	0	1	1
Phaenopsectra	0	0	2	2	0	0	A	0	A	0	1	0	1	0	0	0	1	1	1	0	0	0	0