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## Review of the mainly Neotropical genus *Caladomyia* Sæwedal, 1981, with descriptions of seven new species

(Insecta, Diptera, Chironomidae, Tanytarsini)

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Neotropical *Caladomyia* Sæwedal, 1981 are reviewed in the adult male stage, and the genus diagnosis is redefined. The distinction of two species groups (Sæwedal 1981) is considered unwarranted. Seven new species are described: *Caladomyia erikae*, *fittkaui*, *hero*, *hoefleri*, *orellanai*, *reissi*, and *riotarumensis*. A key to all 18 known species is given, including one species being described elsewhere. New morphological characters and interpretations are discussed, based on SEM examinations.

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### Introduction

In 1981, Sæwedal erected the Tanytarsini genus *Caladomyia* and described eight species in one of two proposed species groups. Although its members are apparently quite common in the South American chironomid fauna, only two more *Caladomyia* species have since been described: *C. pistra* Sublette & Sasa, 1994, and *C. friederi* Trivinho-Strixino & Strixino, 2000 (this volume).

In the present paper the genus is reviewed in the light of new insight gained from SEM imaging and studies of Sæwedal's material and additional specimens. This publication continues the investigations of Amazonian Tanytarsini collected by E. J. Fittkau in 1960–63, and by F. Reiss in 1969 and 1971–72.

Most of the species newly described here are named in honour of persons who have enabled me to complete this work.

### Material, methods and terminology

Apart from the voluminous *Caladomyia* holdings at Zoologische Staatssammlung Munich (ZSM), the holotypes of all previously established species were examined, except for *C. friederi* of which only 2 males have been studied, one of them a paratype. The holotypes of Sæwedal's (1981) species are deposited at the Instituto Nacional de Pesquisas da Amazônia (INPA) in Manaus, Brazil, that of *C. pistra* Sublette & Sasa is presently in the private collection of Prof. J. E. Sublette in Tucson, Arizona, USA.

About 80 % of the *Caladomyia* adults examined were infested with nematode parasites. It is a well-known fact that internal damage from such infestations can have effects on external morphology, e.g. on the male AR. The latter is sometimes difficult to measure in this genus, because boundaries between

flagellomeres tend to become indistinct and even undetectable.

The terminology, where applicable, follows Sæther (1980) and the additions of Säwedal (1981). However, the “anal point bar ratio” (AnPBR) has to be computed in a way different from Säwedal’s explanation (1981: 124) which was distorted by a typographic error. The AnPBR is the length ratio of the longitudinal anal tergal band (length “Y” in Säwedal 1981: fig. 4) to the anal point bars (length “A”). For this, length Y is measured as the distance from the junction of the three anal tergal bands to the beginning of the anal point bars, even though the longitudinal anal tergal band does not always extend that far posterior. In most species, the origin of the anal point bars is covered by a roof-like structure, best seen by SEM-imaging (e.g. Säwedal, 1981: fig. 3). As this structure is often barely recognizeable in slide-mounted specimens, the measurement of length A begins at the obvious origin of the anal point

Tab. 1. Character data for four new *Caladomyia* species. M = median; n = number of measurements.

character (adult male)	<i>orellanai</i> , spec. nov.	<i>reissi</i> , spec. nov.	<i>erikae</i> , spec. nov.	<i>hoeffleri</i> , spec. nov.
wing length [mm]	0.92-0.96 (M=0.93; n=6)	0.88	0.74-0.78 (M=0.78; n=3)	0.92
temporal setae	4-6 in 1 row	6(?) in 1 row	4-5(?) in 1 row	6 in 1 row
frontal tubercle length [ $\mu$ m]	8	?	5-10	not available
AR	0.52-0.62 (n=6)	0.54/0.57	0.40-0.43 (n=2)	0.82
clypeus setae	8-13	10	9	10
palpomere lengths 2-5 [ $\mu$ m]	28,67,71,124	28,68,81,122	23,56,64,106	26,67,74,134
acrostichal setae	6(?) in 2 rows	?	3(?) - 6(?) in 2 rows	10(?) in 2 rows
dorsocentral setae	4 in 1 row	3(?) in 1 row	3-4 in 1 row	3 in 1 row
prealar setae	1	1	1	1
scutellar setae	3-4 in a V-shaped row	2 apical (?)	2 apical	4 in a V-shaped row
wing macrotrichia	on all veins <u>except</u> Sc,R <sub>2+3</sub> ,RM	only on distal ½ of M <sub>1+2</sub>	on all veins <u>except</u> Sc,R <sub>2+3</sub> ,RM,M,Cu	on all veins <u>except</u> Sc,R <sub>2+3</sub> ,RM,M,Cu,An
VR	1.20-1.31 (n=5)	1.38 / 1.44	1.39-1.45 (n=3)	1.24
brachiolum setae	1	1(?)	1	1
LR <sub>1</sub>	3.23-3.49 (M=3.40; n=6)	3.38 (n=1)	2.78-3.00 (n=2)	–
LR <sub>2</sub>	0.55-0.61 (M=0.59; n=6)	0.67 (n=1)	0.60-0.61 (M=0.60; n=3)	0.61
LR <sub>3</sub>	0.66-0.72 (M=0.71; n=6)	–	0.66-0.68 (n=2)	0.66
mid ta <sub>1</sub> sensilla chaetica	0-1 in pos. 5	2 in pos. 5	2 in pos. 5	2 in pos. 5
pulvilli	absent (?)	present	absent	absent
tibial spurs	normal	normal	normal	normal
AnPR	2.9	4.9	2.5-3.8	4.6
Y [ $\mu$ m]	15-21 (M=17; n=7)	35	32-34 (n=2)	41
A [ $\mu$ m]	26-31 (M=29; n=7)	11	9-10 (M=10; n=3)	13
ALR	46.4-51.7 (M=48.7; n=6)	15.9	14.8-18.5 (M=16.7; n=3)	20.3
AnPBR	0.5-0.8 (M=0.6; n=7)	3.2	3.2-3.8 (n=2)	3.4
digitus length [ $\mu$ m]	30-31 (n=6)	4	?	27
median volsella length [ $\mu$ m]	25-27 (n=6)	18	20 (n=3)	27
Gc/Gs length ratio	1.20 (n=6)	0.96	0.91-1.20 (n=2)	1.03

bars. Where the distal bar ends are bent outwards, A is measured only to the bend.

A new term is here introduced: Anal point ratio (AnPR) means the ratio of anal point length (measured from its readily recognizeable beginning on the anal tergite to the distal end of its dorsal part) to anal point width (measured at its narrowest).

In the species descriptions, characters not specifically mentioned are as given for the genus (Säwedal 1981: 125, and emendation below). To facilitate direct species comparisons, the information on many characters is presented in Tables 1 and 2; data contained there are repeated in the individual descriptions only in special cases.

Tab. 2. Character data for three new *Caladomyia* species. M = median; n = number of measurements.

character (adult male)	<i>riotarumensis</i> , spec. nov.	<i>fittkaui</i> , spec. nov.	<i>hero</i> , spec. nov.
wing length [mm]	1.41-1.50 (n=2)	0.86-1.05 (M=1.01; n=4)	0.86-0.95 (M=0.9; n=5)
temporal setae	9 in 1 row	5-7 in 1 row	5-6(?) in 1 row
frontal tubercle length [ $\mu$ m]	7	6-9	4-5
AR	1.15-1.28 (n=2)	0.58-0.70 (n=3)	0.56-0.60 (n=5)
clypeus setae	11	12	10(?) -12
palpomere lengths 2-5 [ $\mu$ m]	40,104,101,198	27,82,83,145	23,64,78,119
acrostichal setae	?	7(?) in 2 rows	6(?) in 2 rows
dorsocentral setae	3-5 in 1 row (n=2)	3-4 in 1 row	3(?) -4 in 1 row
prealar setae	1	1	1
scutellar setae	4 in a V-shaped row	2 apical	2 apical (?) to 4 in a V-shaped row
wing macrotrichia	many, on all veins <u>except</u> Sc,R <sub>2+3</sub> ,RM,M,Cu	on all veins <u>except</u> Sc,R <sub>2+3</sub> ,RM,M,Cu	on all veins <u>except</u> Sc,R <sub>2+3</sub> ,RM
VR	1.18-1.25 (n=2)	1.28-1.30 (n=4)	1.29-1.34 (n=3)
brachiolum setae	1	1	1
LR <sub>1</sub>	3.47 (n=1)	3.50-3.69 (n=3)	3.44-3.68 (n=3)
LR <sub>2</sub>	0.70-0.73 (n=2)	0.49-0.61 (M=0.55; n=5)	0.57 (n=2)
LR <sub>3</sub>	0.79-0.80 (n=2)	0.59-0.76 (M=0.67; n=5)	0.67-0.72 (n=3)
mid ta <sub>1</sub> sensilla chaetica	6-8 in pos. 5	2 in pos. 5	1-2 in pos. 5
pulvilli	present (minute)	present (?) (minute)	present (minute)
tibial spurs	on PII only slightly differing	normal	normal
AnPR	2.0-2.8 (n=5)	3.2-3.4 (n=2)	3.0-3.5 (n=2)
Y [ $\mu$ m]	37-45 (M=41; n=6)	23-38 (M=33; n=5)	24-29 (n=3)
A [ $\mu$ m]	31-39 (M=37; n=6)	36-46 (M=42; n=5)	19-21 (n=3)
ALR	50.7-55.7 (n=2)	59.0-84.0 (M=80.7; n=5)	33.3 (n=1)
AnPBR	1.1-1.5 (M=1.2; n=6)	0.6-1.0 (M=0.8; n=5)	1.1-1.4 (n=3)
digitus length [ $\mu$ m]	31-35 (n=6)	27-29 (n=2)	25-27 (n=2)
median volsella length [ $\mu$ m]	36-41 (n=6)	24-27 (n=2)	23-24 (n=2)
Gc/Gs length ratio	0.94-1.08 (n=6)	0.94-1.10 (n=4)	0.90-0.97 (n=3)



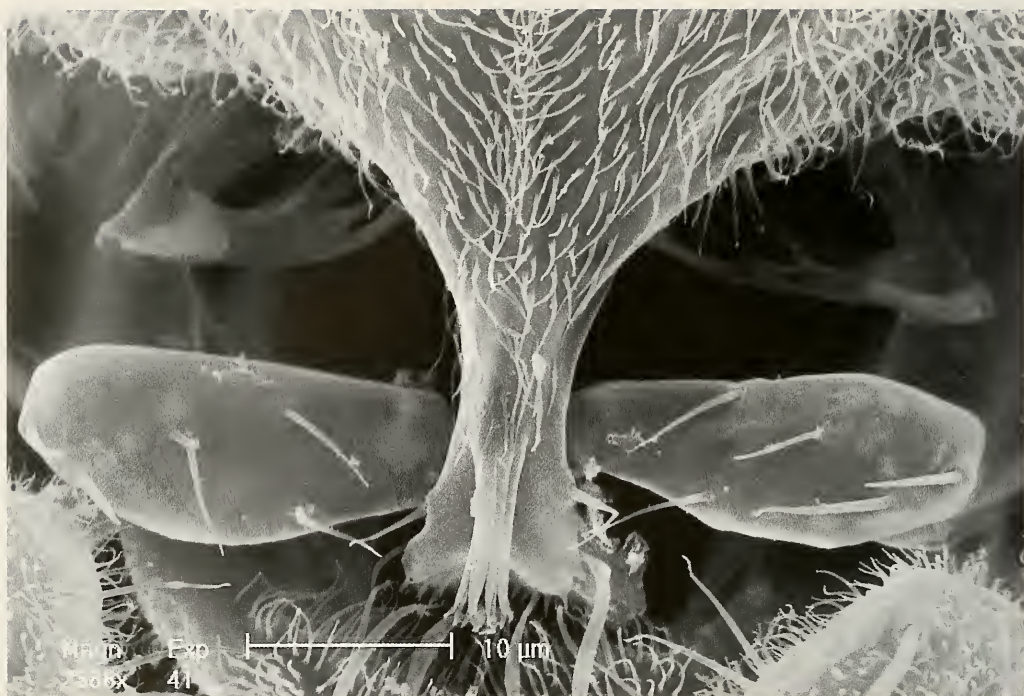


Fig. 1. *Caladomyia erikae*, spec. nov.; adult male anal point, etc., from anterodorsal angle. SEM.

### Genus *Caladomyia* S w dal, 1981: 124

**Type species.** *C. spixi* S w dal, 1981: 127, by original designation.

The material collected by E. J. Fittkau also contains adult males of several species which possess very long projections of the anal tergite arranged similarly as in *Caladomyia*, but which lack an obvious anal point. These projections are very long and, contrary to the anal point bars of *Caladomyia*, rather broad and flattened. The superior volsellae also being of very different shape, these specimens are here considered to require a new genus.

Material collected in Brazil by S. Wiedenbrug contains males which closely resemble *Caladomyia* (esp. *C. reissi*, spec. nov.), but lack anal point bars. Instead, anal point crests are present. S w dal states in his generic description (op. cit.: 125) that anal crests are always absent in *Caladomyia*.

Yet another specimen seen possesses an anal-point-bar-like projection resembling a stout seta, but also a superior volsella rather different from known *Caladomyia* species, and gonostyli with double ends.

None of the above forms are here included in the genus as emended below.

The material at ZSM contains several *Caladomyia* pharate male specimens inside their pupal exuviae. Unfortunately, nearly all are in too poor preservation condition to allow positive identification of the species and/or detailed description of the pupa. However, it has become evident that pupae in *Caladomyia* show wide variations in armament of abdominal terga and the anal comb, similar to those known from the genus *Tanytarsus* van der Wulp. Furthermore, two special characters described from the tentatively associated pupa of *C. spixi* S w dal can not be confirmed as diagnostic for the genus: multiple spinules in the abdominal armament (S w dal 1981: fig. 9) are not present on all *Caladomyia* pupae, and have been found outside of this genus as well (S. Wiedenbrug, pers. comm.); and the long, tubular projection reportedly arising anterior to the wing sheath of *C. spixi* (op. cit.: fig. 8) could not even be observed on all specimens of that species. No character can be given at this time to separate *Caladomyia* pupae from all similar *Tanytarsini*.



**Fig. 2.** *Caladomyia erikae*, spec. nov.; adult male anal point, etc., from posterodorsal angle (same specimen as in Fig. 1). SEM.

**Emendation of diagnosis:** Adult males in the genus *Caladomyia* differ from those of all other chironomid genera in having two pairs of posteriorly directed anal point bars (one pair on top of the other, the lower pair sometimes being hard to detect, e.g. S  wed  l 1981: fig. 6), and an anal point characteristically combining two elements: a horizontally expanded dorsal part (in dorsal view a proximal, wide section) and a vertically expanded ventromedian part (in dorsal view a distal, narrow section).

**Species groups:** S  wed  l (1981) divided the genus into the “*spixi*” and the “*orellanai*-group”, but in each already indicated one exceptional species respectively showing one of the two group-separating characters in the ‘wrong’ configuration for its group (op. cit.: key couplet 1.).

The main criterion was the length of the ventromedian part of the anal point relative to the tip(s) of the dorsal part, leading to the anal point in dorsal aspect showing either “one tip” (*spixi* group) or “three tips of nearly equal length” (*orellanai* group). The ventromedian part of the anal point is bent and directed downward (e.g. S  wed  l 1981: fig. 7). Thus, its visible length is very much dependent on the overall slope and orientation of the hypopygium in the slide mount (op. cit.: figs 11 and 13), and on the pressure exerted on the coverslip during preparation. The same restriction applies to the dorsal parts of the anal point. Figs 1 and 2, made from the same specimen, show that depending on hypopygium slope the distal margin of the anal point may appear either as two tips beside a deep median emargination in the dorsal part, with the ventromedian part not visible (Fig. 1), or as a rounded contour with little emargination but a distinct ventromedian part underneath (Fig. 2).

S  wed  l’s second group-dividing character, the curvature in dorsal aspect of the anal point outer margins (convex, straight, or concave), obviously also varies with the treatment (maceration, compression) the specimen is subjected to.

Upon examination of specimens identified to either group by S  wed  l, neither above criterion has proven to yield consistent, taxonomically meaningful separations. Therefore, the two species groups are here no longer employed.



# Emended description of adult male

Characters likely correlated with body size: wing length range extended up to 2.13 mm, frontal tubercle length up to 18  $\mu$ m, brachiolum setae up to 2 in number, prealars up to 3 (all observed in *C. sp.* Eisenbeis); mid tarsus 1 sensilla chaetica up to 8 (*C. riotarumensis*, spec. nov.).

Wing. macrotrichia may occur over more or less whole surface, increasing in numbers towards wing tip (*C. pistr*a Sublette & Sasa, *riotarumensis*, spec. nov., sp. Eisenbeis); strong false veins present along  $M_{3+4}$ ,  $Cu$  and  $Cu_1$  (all species); anal lobe obsolete (all species); squama bare (all specimens with intact squamae).

Legs. pulvilli may be present (*C. reissi*, *riotarumensis*, *hero*, and possibly *fittkaui*, species novae).

Hypopygium. tergite IX lateral teeth, although often not visible in cleared slide mounts, appeared present on all specimens studied with SEM; the superior volsella may have microtrichia on its lateral margin (Fig. 10), its anteromedian corner up to 3 setae (*C. reissi*, spec. nov., *riotarumensis*, spec. nov.); median volsella length extended up to 41  $\mu$ m (*C. riotarumensis*, spec. nov.).

**Further taxonomic remarks.** Säwedäl (1981: 127), in the key couplet defining his “*orellanai*-group”, gives a character as unique to only one species which is identified with an apparent scientific binomen. Although the publication contains no further information on this taxon, all criteria for the establishment of a valid species name by the standards of the International Code for Zoological Nomenclature (ICZN 1999) have been met. However, no specimen or notes under this name could be found among the voluminous material left by Säwedäl at ZSM. Moreover, the supposedly identifying character in the present author’s opinion does not define any single recognizable species.

Säwedäl (1981) did not affix an expression such as “n. sp.” to the name in question, did not list the latter in his abstract along with those of his newly described species, and repeatedly stated that the “*orellanai*-group” species “will be treated in a separate paper” (op. cit.: 123, 126). The nomenclatorial solution that is both formally correct and taxonomically meaningful thus is to consider the problematic name not “used as valid” (ICZN Article 11.5.) by Säwedäl, and hence not available.

**Distribution.** The genus *Caladomyia* is distributed mainly in the Neotropical region, but also has members in the southern part of the Nearctic. According to J. E. Sublette (pers. comm.), the record of *C. pistr*a from California (Lothrop & Mulla 1995, Spies & Reiss 1996) was a misidentification, but three undescribed species morphologically similar to *C. pistr*a have been taken in several states of the southwestern and southern USA.

The material at ZSM contains many more *Caladomyia* specimens than are treated here, including some which probably represent still undescribed species. However, their poor state of preservation has precluded treatment in the present paper. Material collected by several colleagues (pers. comms. from A. Eisenbeis, H. W. Riss, S. Trivinho-Strixino) suggests the existence of further new species. It is thus assumed that at least 25 species of *Caladomyia* occur in the Neotropic and Nearctic regions.

## Key to adult males of *Caladomyia* Säwedäl, 1981

Note. *C. sp.* Eisenbeis from the Colombian Andes is being described by its collector in a separate paper.

1. Anal tergal setae flattened, with ridges, somewhat hyaline. Anal tergite with posterolateral corners roundly protruding to caudal. Anal point broad in basal  $\frac{2}{3}$ . AnPBR about 0.7 ..... *C. poppigi* Säwedäl
- Not with above combination. Anal tergal setae stout and seta-like, not flattened ..... 2.
2. Digitus reaching well beyond median margin of superior volsella ..... 3.
- Digitus at most barely reaching beyond volsella ..... 7.
3. Anteromedian corner of superior volsella drawn out into a marked point. Digitus very long and strong, tip broadly rounded. AR about 0.4 ..... *C. adalberti* Säwedäl
- Anteromedian corner of superior volsella not drawn out into a marked point, posteromedian corner either drawn out into a short tip or into a pronounced lobe ..... 4.

4. Superior volsella with posteromedian corner not projecting. Inferior volsella with tip slightly folded to dorsal. Hind tibial spurs strongly uneven in length. Wing macrotrichia restricted to veins R and  $M_{1+2}$ , cells  $r_{4+5}$  and distal  $m_{1+2}$ . Wing length about 1.2 mm. AR about 0.8.  $LR_1$  about 2.7 ..... *C. friederi* Trivinho-Strixino & Strixino
- Not with above combination (Posteromedian projection of superior volsella indistinct only in some *C. ortonii* Sawedal) ..... 5.
5. Tip of digitus very pointed. Wing length 1.31-1.49 mm. AR 1.03-1.29. AnPBR 1.4-2.3 ..... *C. ortonii* Sawedal
- Tip of digitus bluntly rounded ..... 6.
6. Posteromedian corner of superior volsella drawn out into a distinct, more or less bluntly rounded lobe. Digitus with about  $\frac{1}{4}$  of its length reaching beyond superior volsella. Anal point short. AnPBR 3.8-5.3. Large species: wing length 1.78-2.13 mm. AR 0.60-0.65 ..... *C. sp.* Eisenbeis
- Posteromedian corner of superior volsella drawn out into a short pointed tip. Digitus with about  $\frac{1}{5}$  of its length reaching beyond volsella. Anal point long and slender, AnPR 2.88. AnPBR 0.5-0.8. Wing length 0.92-0.96 mm. AR 0.52-0.62 ..... *C. orellanai*, spec. nov.
7. Anal point bars very short (8  $\mu$ m), not reaching middle of anal point. Junction of anal tergal bands on mid tergite. Anal tergal setae absent ..... *C. kraussi* Sawedal
- Anal point bars short or long, but always reaching beyond middle of anal point. Anal tergal setae present or absent ..... 8.
8. AnPBR 1.5-2.0 **and** anal point bars rather short (< 20  $\mu$ m). Digitus short, not reaching median margin of superior volsella, barely surpassing  $\frac{2}{3}$  of volsella length. Anal point bars in dorsal view curved like a pair of brackets ..... *C. spixi* Sawedal
- AnPBR normally < or > 1.5-2.0. If AnPBR within range 1.5-2.0, then anal point bars longer than 20  $\mu$ m **and**/ordigitus almost reaching median margin of superior volsella ..... 9.
9. Anal point bars very short (< 15  $\mu$ m) ..... 10.
- Anal point bars relatively long ( $\geq$  15  $\mu$ m) ..... 14.
10. Digitus short, not reaching median margin of superior volsella, barely surpassing  $\frac{2}{3}$  of volsella length, or barely recognizeable ..... 11.
- Digitus long, at least almost reaching median margin of superior volsella, longer than  $\frac{2}{3}$  volsella length ..... 12.
11. Anal point very long and slender, with parallel margins; AnPR 4.9. Anal tergal setae present, in asymmetrical lateral positions on anal point base. Anal point bars seta-like, extending over approximately middle  $\frac{1}{3}$  of anal point. Superior volsella almost rectangular, posterior and median margins nearly straight. Digitus clearly recognizeable ..... *C. reissi*, spec. nov.
- Anal point more compact (AnPR < 4), with slightly concave margins. Anal tergal setae absent. Anal point bars stronger, extending from middle of anal point dorsal part to distal margin. Superior volsella elongate ovoid, posterior margin convex, median margin concave. Digitus not clearly recognizeable ..... *C. erikae*, spec. nov.
12. Superior volsella with angularly projecting posteromedian corner (Sawedal 1981: fig. 17), often resulting in indented posterior margin. Contrary to Sawedal's figure anal point dorsal part almost square (AnPR around 1.2) and anal point bar origins covered by a pointed, roof-like structure (Fig. 3; in cleared, slide-mounted specimens only visible by careful examination) ..... *C. castelnaui* Sawedal
- Posteromedian corner of superior volsella not angular, but may be drawn out into a tip to median; distal margin of volsella without definite indentation. Anal point longer than wide. Origin of anal point bars covered by a rounded to truncated roof-like structure ..... 13.
13. Anal tergal setae present. Posteromedian corner of superior volsella drawn out into a rounded tip. Junction of anal tergal bands in anterior half of anal tergite ..... *C. mulleri* Sawedal

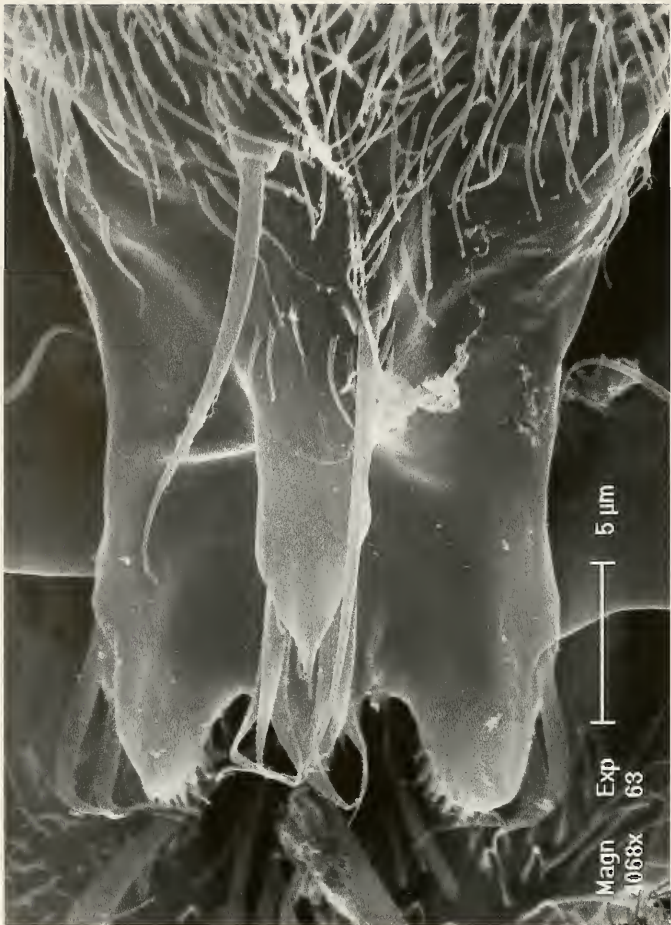


Fig. 3. *Caladomyia* cf. *castelnaui* Sæwedal; adult male anal point. SEM.

- Anal tergal setae absent. Posteromedian corner of superior volsella ending in a broad, triangular extension. Junction of anal tergal bands in posterior half of tergite. Anal point elongate (31 µm long, AnPR 4.6) ..... *C. hoefleri*, spec. nov.
- 14. Digitus short, reaching about middle of superior volsella **and** anal point trough-like with lateral margins bent upward (as in Fig. 4), the latter structure in light microscopy only visible with careful examination. Anal point bars long (31-37 µm). Junction of anal tergal bands in anterior part of anal tergite ..... *C. humboldti* Sæwedal
- Lateral margins of anal point not bent upward to form a trough-like structure. Digitus (except in *C. pistra*) longer, at least exceeding 2/3 of superior volsella length ..... 15.
- 15. Anal point compact (AnPR < 3). Wing covered with many membrane macrotrichia. .... 16.
- Anal point more slender and elongate (AnPR ≥ 3). Wing with membrane macrotrichia only in distal 1/5 ..... 17.
- 16. Anal point very compact (AnPR 2.0-2.8), with straight to slightly concave outer margins. Anal point bars reaching distinctly beyond distal margin of anal point dorsal part; ventromedian part of anal point very long. Superior volsella ovoid, with only slight posteromedian projection; 3 anteromedian setae on a ventral lobe, one of these inserting toward middle of volsella. Inferior volsella slightly twisted. Large species: wing length 1.41-1.50 mm. AR 1.14-1.30 ..... *C. riotarumensis*, spec. nov.



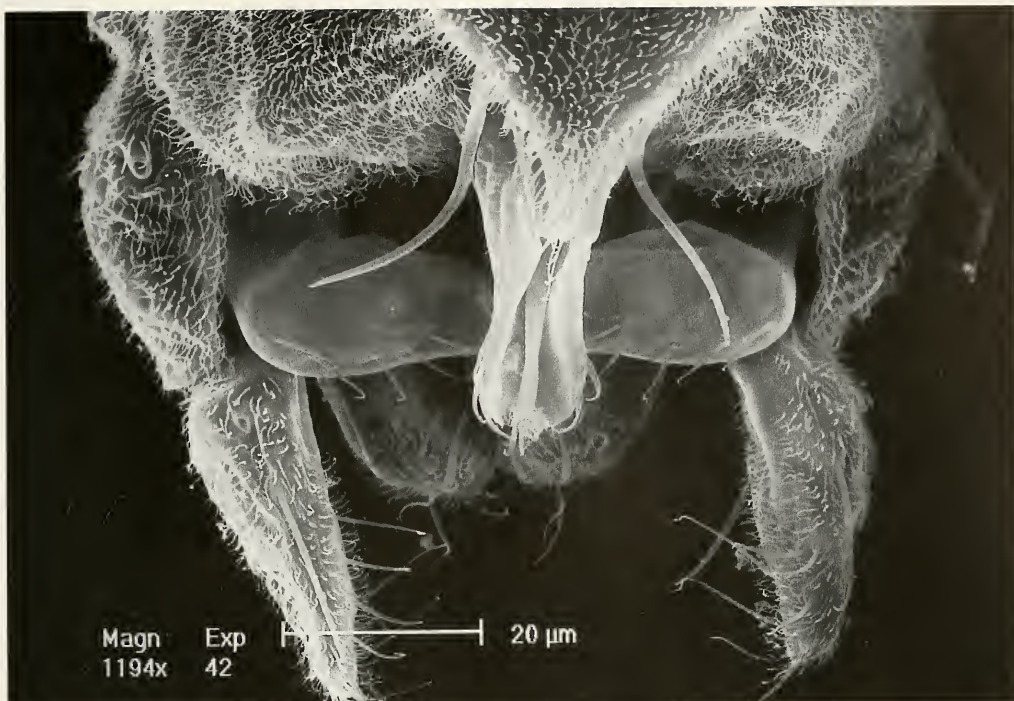


Fig. 4. *Caladomyia* spec.; adult male hypopygium. SEM. Note the trough-like anal point.

- Anal point somewhat rectangular. Anal point bars reaching at most slightly beyond distal margin of anal point dorsal part; ventromedian part of anal point not very long. Superior volsella almost square, with pronounced posteromedian lobe ending in blunt tip; 3 median setae evenly spaced along margin. Inferior volsella almost straight. Wing length 1.06 mm. AR 0.42 ..... *C. pistra* Sublette & Sasa
- 17. Anal point bars very long (33–46 µm), reaching clearly beyond distal end of dorsal part of anal point ..... *C. fittkaui*, spec. nov.
- Anal point bars shorter (19–23 µm), at most slightly reaching beyond dorsal part of anal point ..  
..... *C. hero*, spec. nov.

*Caladomyia orellanai*, spec. nov.

Fig. 5

**Types.** Holotype: adult ♂, slide mounted in Canada balsam; Brazil, Amazon area, Igarapé Cachoeira, 26.XI.1962, leg. E. J. Fittkau (sample A431). – Paratypes (Brazil, Amazon area, leg. E. J. Fittkau): 4♂♂ (labeled N5; U292; U296; U300), as holotype; 1♂ (K97), Igarapé Cachoeira (A413), 23.XI.1962; 1♂ (U997), Rio Cuieiras at outflow of Rio Branquinho (A307), 20.XII.1961 (All in ZSM, Munich, Germany).

**Differential diagnosis.** The male differs from all other *Caladomyia* by possessing an ovoid superior volsella with a pointed tip in its posteromedian corner, a long digitus ending in a blunt tip and with about 1/5 of its length reaching beyond the volsella, and a long and slender anal point (AnPR 2.88). Unique to this species is a tube-like structure – combining with the more common “roof” to cover the anal point bar origins – which has distinctive lateral margins that also extend proximal toward the bases of the anal tergal setae. AnPBR 0.5–0.8.

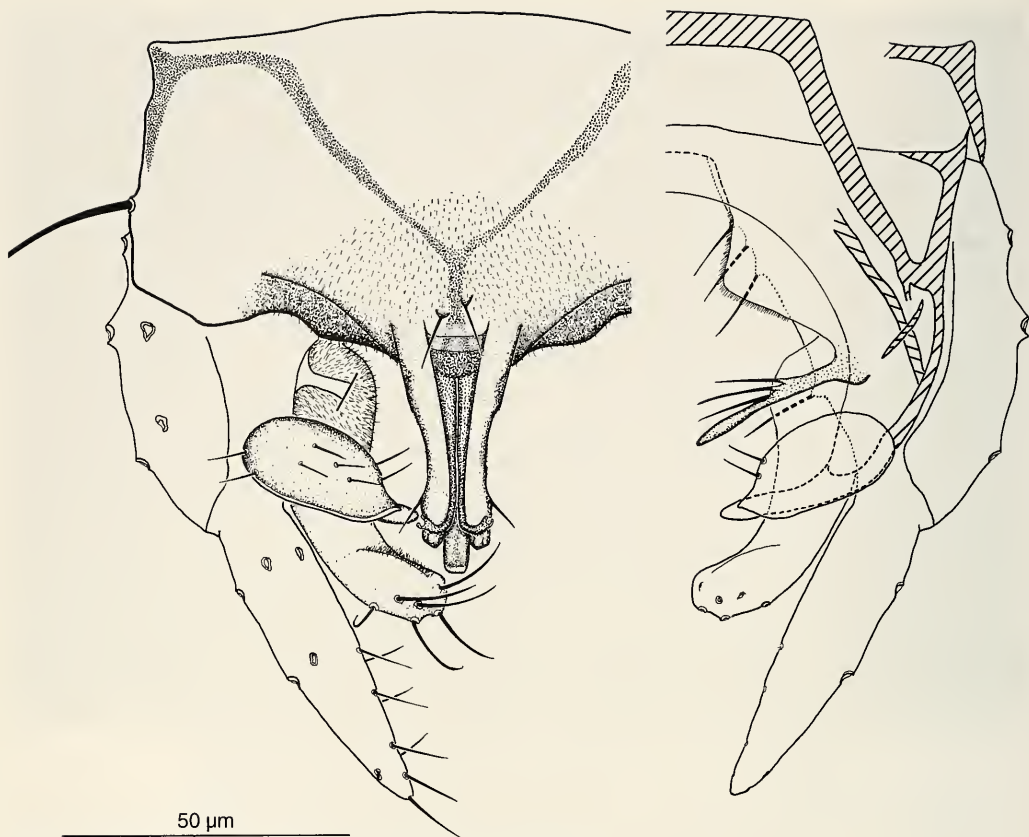


Fig. 5. *Caladomyia orellanai*, spec. nov.; adult male hypopygium.

Description

Adult male (see Tab. 1).

Size. Wing length 0.92-0.96 mm (n=6).

Colour (in Canada balsam). Whole body yellowish-green.

Wing. Membrane macrotrichia limited to a few on distal 1/5, except for a row between R<sub>4+5</sub> and M. Vein macrotrichia absent from basal 1/5-1/3 of R<sub>4+5</sub> and basal 1/3 of M<sub>1+2</sub>, on M and Cu present only apically.

Legs. Lengths of segments in µm:

	fe	ti	ta <sub>1</sub>	ta <sub>2</sub>	ta <sub>3</sub>	ta <sub>4</sub>	ta <sub>5</sub>
P <sub>1</sub>	498/494	195/195	650	326	258	204	100
P <sub>2</sub>	462	362	—	—	—	—	—
P <sub>3</sub>	485/476	435/444	313	186	168	104	59

Fore tibia with long spur (12-15 µm). Mid and hind tibiae each with two combs and two long spurs. Spurs on outer combs slightly longer (about 19 vs 18 µm).

Hypopygium (Fig. 5). Anal tergite with two setae in posteromedian part. Lateral teeth absent. Anal tergal bands Y-shaped, junction on mid tergite. Anal point bar apices claw-like, ending proximal of distal margins of anal point dorsal parts; origins of bars on base of anal point, covered by a roof-like and a more anterior tube-like structure, the latter with distinctive lateral margins which also extend proximal toward the bases of the anal tergal setae. Anal point slender, with nearly parallel to slightly concave margins; apex in dorsal view appearing trifid due to dorsal part with two pointed to truncated apices and a ventromedian part with truncated apex reaching a little beyond dorsal tips. Anal point with 1 pair of setae distolaterally on dorsal part, and 2 pairs ventrally on ventromedian part. Superior

volsella rectangular to ovoid, with obliquely transverse orientation; distal margin more or less straight, more strongly chitinized; posteromedian corner with triangular tip to median, anteromedian corner rounded; 3-4 dorsal setae (often in a row parallel to proximal margin), 2 or 3 setae in anteromedian corner, 2 setae posterolaterally. Digitus long, about 1/3 of its length beyond posteromedian volsellar corner, about 2.5-3 µm wide, with rounded to weakly pointed tip, sometimes with nose-like apex. Inferior volsella bent in an S-shape, of about even width throughout, apex with an elongate, rectangular to ovoid swelling; setae on apex rather strong and long (about 15 µm). Median volsella with simple lamellar setae apically and 2-3 regular setae anteriorly. Gonostylus rather short, median margin nearly straight, lateral margin weakly convex; tip weakly pointed.

**Etymology.** Named after the Spanish captain Francisco de Orellana who was the first European to navigate the whole Amazon (Grabert 1991: 8).

**Distribution and ecology.** All collection sites are located in the region of the lower Rio Negro northwest of Manaus.

*Caladomyia reissi*, spec. nov.  
Fig. 6

**Types.** Holotype: adult ♂, slide mounted in Euparal; Brazil, Amazonas, Lago Cabaliana, Drift S IV, 6.VI.1971, leg. F. Reiss (ZSM).

**Differential diagnosis.** The adult male differs from all other *Caladomyia* with short digitus (not longer than 2/3 of superior volsella), short anal point bars (< 15 µm) and high AnPBR (3.2) by the following characters: Anal point bars reaching beyond middle of anal point (*C. kraussi* Säwedal has very short anal point bars (8 µm) extending over less than proximal half of anal point, and also lacks anal tergal setae). Anal point very long and slender (AnPR 4.9), with parallel margins. Anal tergal setae present, in asymmetrical positions laterally on anal point base, not near junction of anal tergal bands. Anal point bars very thin, seta-like. Superior volsella in dorsal aspect almost rectangular, and with distinctive ventral part ending in an anteromedian lobe (almost as in sp. Eisenbeis).

**Description**

**Adult male** (see Tab. 1).

- Size. Wing length 0.88 mm (n=1).
- Colour (in Euparal). Whole body yellowish-green.
- Head. Frontal tubercles not recognizeable.
- Thorax. Acrostichals not recognizeable. Only 2 apical scutellars visible.
- Wing. Membrane largely bare of macrotrichia, except for a row along distal margin, and a few scattered in distal 1/3 of r<sub>4+5</sub>. Brachiolum seta not recognizeable.
- Legs. Lengths of segments in µm:

	fe	ti	ta <sub>1</sub>	ta <sub>2</sub>	ta <sub>3</sub>	ta <sub>4</sub>	ta <sub>5</sub>
P <sub>1</sub>	430	161	544	258	213	168	82
P <sub>2</sub>	417	296	199	75	44	27	27
P <sub>3</sub>	444	387	–	–	–	–	–

- Fore tibia with long spur (about 12 µm).
- Hypopygium (Fig. 6). Anal tergite with two setae in asymmetrical positions laterally on anal point base. Lateral teeth not recognizeable. Orolateral spines of laterosternite IX present. Anal tergal bands Y-shaped, junction on mid tergite, longitudinal band bifurcates and ends 8 µm proximal of anal point bars. Anal point bars short, seta-like, tips with bifid, pointed apices; bars extending from proximal 1/3 to distal 1/3 of anal point. Anal point very long and slender (width 5.6 µm), with parallel margins; in dorsal view with dorsal part truncated, ventromedian part slightly projecting, with pointed apex; dorsal part with 1 mediolateral and 2 more distal setae, ventromedian part with 1 pair of setae ventrally. Superior volsella almost rectangular, with slightly obliquely transverse orientation; distal margin straight to slightly convex; dorsomedian margin with one median seta; volsella with distinct ventral part leading to slightly projecting anteromedian corner bearing two setae directed to median;



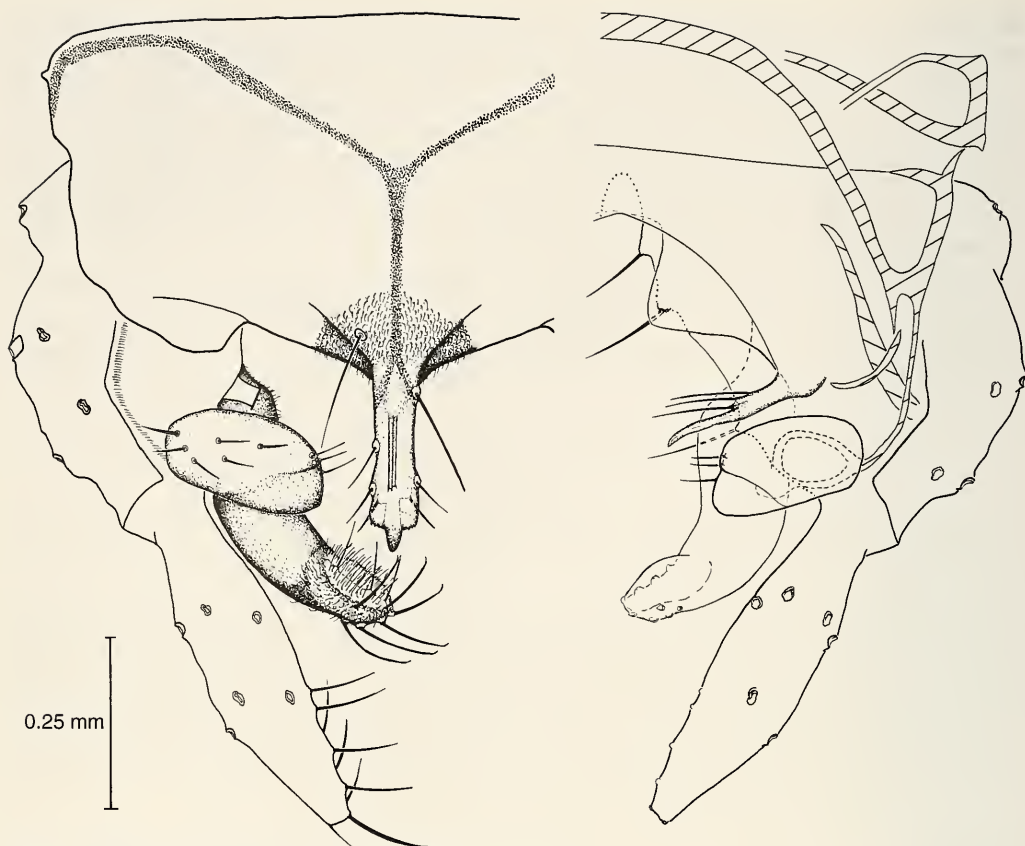


Fig. 6. *Caladomyia reissi*, spec. nov.; adult male hypopygium.

3-4 dorsal setae in two rows and 2 setae anterolaterally. Digitus very short, blunt, barely reaching distal  $\frac{1}{3}$  of superior volsella. Inferior volsella bent in an S-shape, basally rather wide, slightly tapering distally; apex with an elongate, ovoid swelling bearing numerous microtrichia; volsellar setae of normal strength. Median volsella with simple lamellar setae apically and about 3 regular setae anteriorly. Gonostylus rather short ( $55 \mu\text{m}$ ) and relatively wide ( $13 \mu\text{m}$ ), its median margin nearly straight, the lateral margin rather strongly convex; tip weakly pointed.

**Etymology.** Named in honour of Dr. Friedrich Reiss who initiated and supported my studies on the genus *Caladomyia*.

**Distribution and ecology.** The type locality is a large lake (surface area  $103 \text{ km}^2$ ) near Rio Solimões, west of Manaus (Reiss 1976: 124).

#### *Caladomyia erikae*, spec. nov.

Figs 1, 2, 7

**Types.** Holotype: adult ♂, slide (U299) mounted in Canada balsam; Brazil, Amazon area, Igarapé Cachoeira, 26.XI.62, at light, leg. E. J. Fittkau (sample A431). – Paratypes (Brazil, Amazon area, leg. E. J. Fittkau): 1♂, Pará, Rio Cururu, at house at Missão Cururu, 6.II.61, at light (A88-11); 1♂, as holotype, except sample A426; hypopygium on SEM stub, rest on slide in Euparal (all ZSM).

**Differential diagnosis.** This species very much resembles both *Caladomyia mulleri* Sæwedal and *C. hoefleri*, spec. nov. All three species are characterized by a medium-sized, relatively slender anal point with

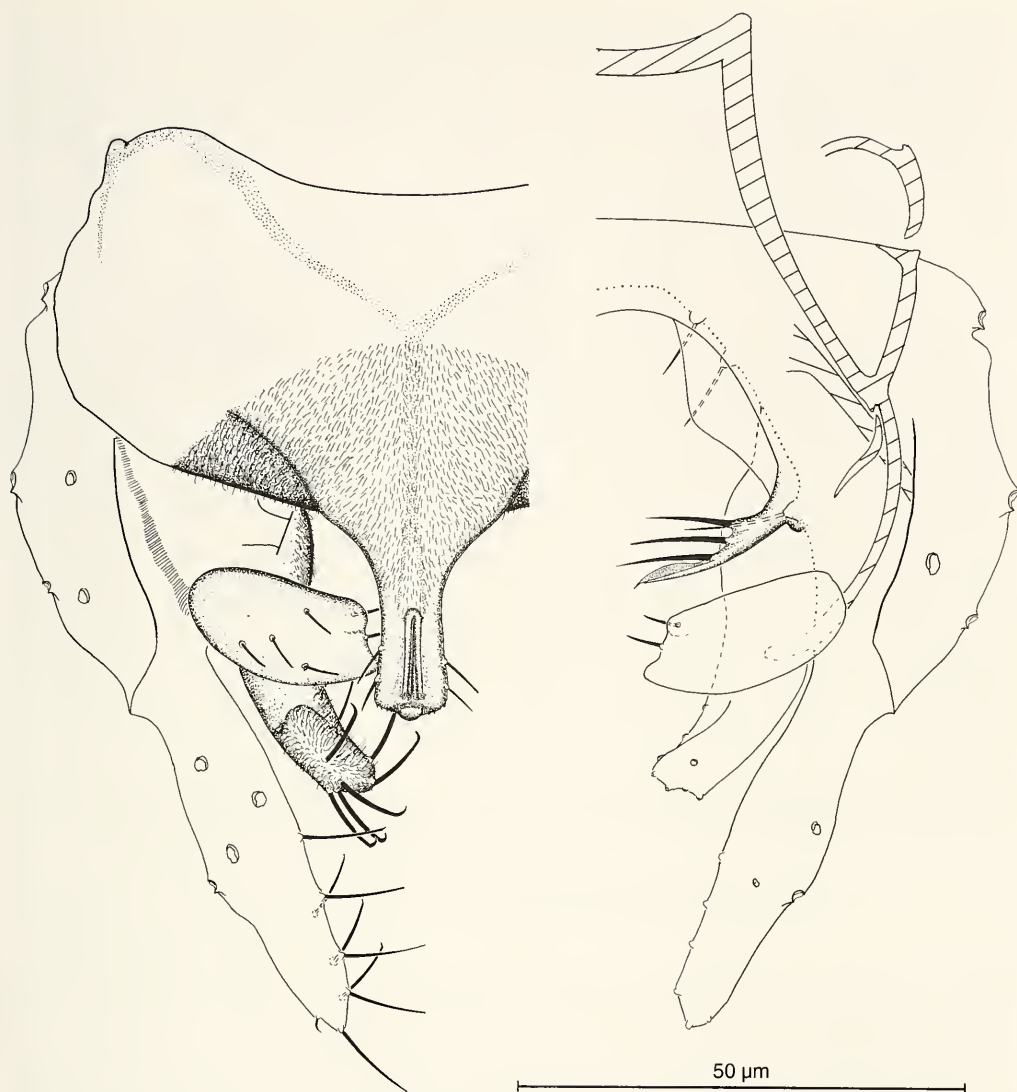


Fig. 7. *Caladomyia erikae*, spec. nov.; adult male hypopygium.

slightly concave margins (AnPR 2.5-4.6), very short, straight anal point bars that almost reach the distal end of the anal point dorsal part, AnPBR around 3, and a digitus at most reaching only slightly beyond the median margin of the superior volsella. Although it is conceivable that additional material may bridge the morphological gaps recognized here, the three species are at this time separated as follows: Anal tergal setae are absent in *C. erikae* and *C. hoefleri*, in *C. mulleri* two setae are present far posterior on the anal tergite. *C. erikae* differs from *C. mulleri* and *C. hoefleri* in having a very short digitus as well as a very long and ovoid superior volsella. *C. erikae* is also slightly smaller by wing length, and has a lower AR (that may correlate with lower body size).

## Description

**Adult male** (see Tab. 1).

Size. Wing length 0.74-0.78 mm (n=3).

Colour (in Canada balsam). Whole body yellowish-green.

Thorax. Anteprenotum broken. Acrostichals apparently only a few in two rows; dorsocentrals end near scutellum.

Wing. Membrane macrotrichia limited to few on distal  $\frac{1}{5}$ , except for a row between  $R_{4+5}$  and M, and a short row between distal half of  $M_{1+2}$  and  $M_{3+4}$ . Vein macrotrichia absent from basal  $\frac{1}{3}$  of  $R_{4+5}$ , basal  $\frac{1}{3}$  of  $M_{1+2}$ , and basal  $\frac{1}{2}$  of  $M_{3+4}$ .

Legs. Lengths of segments in  $\mu\text{m}$  (Holotype):

	fe	ti	ta <sub>1</sub>	ta <sub>2</sub>	ta <sub>3</sub>	ta <sub>4</sub>	ta <sub>5</sub>
P <sub>1</sub>	371	159	442	222	186	140	72
P <sub>2</sub>	392	274	164	65	38	28	27
P <sub>3</sub>	401	351	231	127	124	72	43

Fore tibia with long spur (about 11  $\mu\text{m}$ ).

Hypopygium (Fig. 7). Anal tergite without setae. Lateral teeth present on on SEM specimen. Anal tergal bands Y-shaped, junction anterior of mid tergite, longitudinal band ending about 8  $\mu\text{m}$  proximal of anal point bars. Anal point bars relatively short, bases situated near middle of anal point, apices forked, ending just before margin of anal point dorsal part. Anal point relatively long and slender, with slightly concave margins; in dorsal aspect not trifid, dorsal portion more or less broadly rounded, with numerous microtrichia at distal end; ventromedian part with slightly tapered apex, very little projecting beyond dorsal part. Anal point with 2 pairs of setae in distal half of dorsal part. Superior volsella elongate, with transverse orientation; posteromedian corner drawn out into triangular tip, median margin concave, anteromedian corner rounded; 4 dorsal setae in two rows, 1 median and 1 anteromedian seta, and 2 setae anterolaterally. Digitus not recognizeable. Inferior volsella rather wide, especially its base; apex with an ovoid swelling bearing numerous microtrichia. Median volsella with simple lamellar setae apically, and 3-4 regular setae anteriorly. Gonostylus rather short, inner margin nearly straight, lateral margin rather weakly convex; tip weakly pointed.

**Etymology.** The name is given to thank my mother-in-law, Erika Reiff, for her invaluable help with caring for my children.

**Distribution and ecology.** Two of the three specimens of *C. erikae* were collected in the region of the lower Rio Negro northwest of Manaus, the third in Pará near the border to Mato Grosso.

### *Caladomyia hoefleri*, spec. nov.

Fig. 8

**Types.** Holotype: adult  $\delta$ , slide (U954) mounted in Canada balsam; Brazil, Amazonas, Lower Rio Solimões, Parana da Terra Nova, 15.III.1961, leg. E. J. Fittkau (sample A135) (ZSM).

**Differential diagnosis.** This species is one of several characterized by a medium-sized, relatively slender anal point with slightly concave margins (AnPR 2.5-4.6), very short and straight anal point bars almost reaching the distal end of the anal point dorsal part, AnPBR around 3, and a digitus reaching at most slightly beyond the median margin of the superior volsella (also see remarks under *C. erikae*, spec. nov.). *C. hoefleri*, spec. nov. differs from other such species by the following combination: Anal tergal setae absent (present in *C. mulleri* Säwedal); junction of anal tergal bands in posterior half of tergite (in anterior half in similar species); anal point longer (AnPR 4.6) and with margins more concave than in the other species; digitus distinctive, reaching median margin of superior volsella (contrary to *C. erikae*); larger than *C. erikae*; AR higher than in the other species (possibly body size related).

### Description

**Adult male** (see Tab. 1).

Size. Wing length 0.92 mm (n=1).

Colour (in Canada balsam). Whole body yellowish-green.

Head. Frontal tubercles present, length not measurable.

Thorax. Acrostichals reaching anteprenotum. Row of dorsocentrals ends near scutellum, does not reach anteprenotum.

Wing. Membrane macrotrichia limited to few on distal  $\frac{1}{5}$ , except for a row between  $R_{4+5}$  and M.





Fig. 8. *Caladomyia hoeferi*, spec. nov.; adult male hypopygium.

Vein macrotrichia absent from basal  $\frac{1}{2}$  of  $R_{4+5}$ , basal  $\frac{1}{2}$  of  $M_{1+2}$ , and basal  $\frac{1}{2}$  of  $M_{3+4}$ .

Legs. Lengths of segments in  $\mu\text{m}$ :

	fe	ti	ta <sub>1</sub>	ta <sub>2</sub>	ta <sub>3</sub>	ta <sub>4</sub>	ta <sub>5</sub>
P <sub>1</sub>	439	195	—	—	—	—	—
P <sub>2</sub>	444/448	342/344	208	91/95	63/66	39/41	34/36
P <sub>3</sub>	453	430	283/285	163	145	95	50

Fore tibia with long spur (about 14  $\mu\text{m}$ ).

Hypopygium (Fig. 8). Anal tergal setae absent. Lateral teeth not recognizeable. Anal tergal bands Y-shaped, junction in posterior half of tergite, longitudinal band (length Y) about 41  $\mu\text{m}$  long (n=1). Anal point bars short, apices split into two branches with rounded tips; bars extending from middle of anal point almost to distal margin of dorsal part. Anal point long and slender with concave margins, in dorsal aspect with three rounded apices; dorsal part with two microtrichiose tips, ventromedian part not projecting; one pair of setae at about  $\frac{1}{3}$  length of dorsal part, one to two pairs more ventrally and distally. Superior volsella almost rectangular, with obliquely transverse orientation; median margin concave, posteromedian corner broadly drawn out into a slightly pointed tip; 2 or 3 dorsal setae, 3 setae in anteromedian corner (1 very small, inserting dorsally; 2 larger, on a ventral lobe), and 2 setae posterolaterally. Digitus of medium length, barely reaching beyond volsellar margin, distal end tapering to a pointed tip. Inferior volsella slightly bent in an S-shape, long and slender, of almost even width throughout; apex with a rounded, microtrichiose swelling. Median volsella rather short and stout, with simple lamellar setae apically and 4-5 strong regular setae along entire anterior margin. Gonostylus rather short, its median margin nearly straight, the lateral weakly convex; tip weakly pointed to rounded.

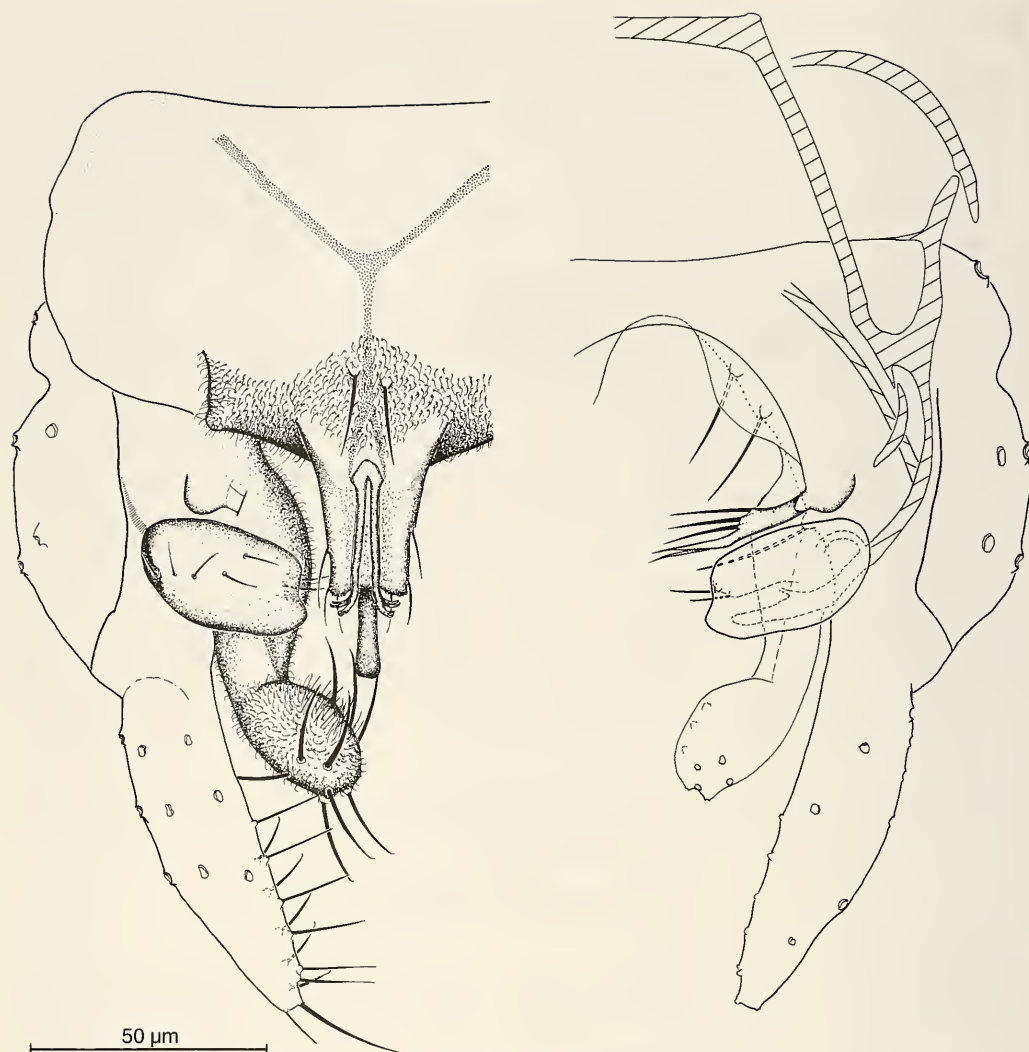


Fig. 9. *Caladomyia riotarumensis*, spec. nov.; adult male hypopygium.

**Etymology.** Dedicated to Mr. Franz Höfler, on the occasion of his 80th birthday and to thank him for his invaluable help with caring for my children.

**Distribution and ecology.** The type locality is located in the Amazon lowland on the lower Rio Solimões near Manaus.

*Caladomyia riotarumensis*, spec. nov.

Figs 9, 10

**Types.** Holotype: adult ♂, slide (U1042) mounted in Canada balsam; Brazil, Amazonas, lower Rio Negro, Rio Taruma, Sucuuba, Lancha-Endpoint (endpoint), at light, 16.XI.1962, leg. E. J. Fittkau (sample A403). – Paratypes (Brazil, Amazonas): 3♂♂ (U1037, U1047, U1048), as holotype; 1♂, Calado, SXIII, reared, 30.I.1972, leg. F. Reiss; 1♂ as previous, except shore, 15.II.1972 (all ZSM)



Fig. 10. *Caladomyia riotarumensis*, spec. nov.; adult male hypopygium. SEM.

**Differential diagnosis.** The male very much resembles *Caladomyia pistra* Sublette & Sasa. Both species have two normal anal tergal setae, a rather compact anal point (AnPR around 2), long anal point bars reaching at least to the distal margin of the anal point dorsal part, and a digitus not projecting beyond the superior volsella. In both species, the wing membrane bears many macrotrichia, whereas in most other species membrane setation is sparse. The only existing specimen of *C. pistra* having been squashed during slide-making, the species' exact morphology can not be determined. As far as can be verified, the following differences exist: The ventromedian part of the anal point in *C. riotarumensis* is very long and bears only one pair of setae, whereas in *C. pistra* it is short with three pairs of setae. The superior volsella of *C. pistra* shows a definite nose-like lobe in the posteromedian corner, and rather stout setae evenly spaced on the median margin. In *C. riotarumensis* there is normally no indication of a posteromedian projection, and the median setae are smaller and projecting from an anteroventral lobe, two of them close together near the median volsellar margin, the third originating toward the middle of the volsella. The digitus appears smaller in *C. pistra*. The inferior volsella of *C. riotarumensis* is slender and slightly twisted, that of *C. pistra* wide and almost straight (possibly due to compression). Other differences could be functions of body size: *C. riotarumensis* wing length 1.41-1.50, AR 1.14-1.30, mid  $ta_1$  sensilla chaetica 6-8; *C. pistra* wing length 1.06, AR 0.42, mid  $ta_1$  sensilla chaetica 2.

*C. pistra* is known only from the Guatemalan holotype (regarding Nearctic records see above "Further taxonomic remarks" on the genus), *C. riotarumensis* from the Amazon lowlands. Collections from regions inbetween may lead to a different decision regarding synonymy.



**Description****Adult male** (see Tab. 2).

Size. Large species. Wing length 1.41-1.50 mm (n=2).

Colour (in Canada balsam). Whole body yellowish-green.

Thorax. Acrostichals not recognizable.

Wing. Membrane with many macrotrichia on distal  $\frac{1}{2}$ . Vein macrotrichia absent from basal  $\frac{1}{3}$  of  $R_{4+5}$ .

Legs. Lengths of segments in  $\mu\text{m}$  (SEM specimen / mean of two Calado paratypes):

	fe	ti	ta <sub>1</sub>	ta <sub>2</sub>	ta <sub>3</sub>	ta <sub>4</sub>	ta <sub>5</sub>
P <sub>1</sub>	761/835	298/336	1116/1227	482/549	400/465	330/394	140/170
P <sub>2</sub>	685/747	507/562	342/399	146/171	101/117	63/66	51/56
P <sub>3</sub>	729/817	653/732	-/579	-/324	-/288	-/184	-/93

Fore tibia with long spur (about 23  $\mu\text{m}$ ).

Hypopygium (Figs 9, 10). Anal tergite with two posteromedian setae. Lateral teeth present in SEM specimen. Anal tergal bands Y-shaped, junction on mid tergite or slightly more distal. Anal point bars originating on anal point base, their apices reaching beyond dorsal part of anal point, each bar tip split into 2 apices. Anal point wide with nearly straight margins; distal margin of dorsal part straight to concave; ventromedian part often very long with truncated apex, projecting beyond dorsal part by about 16  $\mu\text{m}$ ; dorsal part with one pair of setae at about  $\frac{2}{3}$  length, and two more distal and ventral pairs; ventromedian part with one pair of setae. Superior volsella rectangular to ovoid, with obliquely transverse orientation; median margin slightly concave, posterior corner with a low lobe; 4-6 dorsal setae, 3 anteromedian setae projecting from a ventral volsellar lobe (2 of these close together near median volsellar margin, the third originating toward middle of volsella), 2 lateral setae. Digitus not reaching median margin of volsella, gradually tapering to weakly pointed tip. Inferior volsella bent in a twisted S-shape, narrowest in middle; apex with a pad-like swelling bearing numerous microtrichia. Median volsella long, with simple lamellar setae apically, and about 3 regular setae anteriorly. Gonostylus rather short (96  $\mu\text{m}$ ), its median margin nearly straight, the outer weakly convex; tip weakly truncated.

**Etymology.** Named after the type locality.

**Distribution and ecology.** All collection sites are located near larger bodies of water within a limited central Amazon lowland area around Manaus.

*Caladomyia fittkaui*, spec. nov.

Figs 11, 12, 13

**Types.** Holotype: adult ♂, slide (U900) mounted in Canada balsam Brazil, Amazonas, Rio Preto, Tiririca, at light, 7.VII.1962, leg. E. J. Fittkau (sample A396). – Paratypes (Brazil, Amazonas, at light, leg. E. J. Fittkau): 1 ♂ (U903), as holotype; 2 ♂♂ (H116, H121), Rio Parú de Oeste, Igarapé Okueima, at light, 18.IV.1962 (A371-1); 1 ♂ (H382), region terminus Rio Marauá, at light, 26.I.1963 (A498) (all ZSM).

**Differential diagnosis.** *C. fittkaui*, spec. nov. differs from all other *Caladomyia* with normal, seta-like anal tergal setae, long and slender anal point ( $\text{AnPR} \geq 3$ ), and medium-sized digitus (reaching at most slightly beyond median margin of superior volsella) in having very long anal point bars (33-46  $\mu\text{m}$ ).

**Description****Adult male** (see Tab. 2).

Size. Wing length 0.86-1.05 mm ( $M=1.01$ ,  $n=5$ ).

Colour (in Canada balsam). Whole body yellowish-green.

Thorax. Acrostichals almost reaching antepnotum. Dorsocentrals ending near scutellum, not reaching antepnotum.

Wing. Membrane macrotrichia limited to distal  $\frac{1}{5}$ , except for one row each between  $R_{4+5}$  and  $M_{1+2}$ ,  $M$  and  $Cu/M_{3+4}$ . Vein macrotrichia absent from basal  $\frac{1}{2}$  of  $R_{4+5}$ , basal  $\frac{1}{2}$  of  $M_{1+2}$ , basal  $\frac{1}{2}$  of  $M_{3+4}$  and basal  $\frac{1}{4}$  of  $Cu_1$ .



Fig. 11. *Caladomyia fittkauui*, spec. nov.; adult male hypopygium. SEM.

Legs. Lengths of segments in  $\mu\text{m}$  (holotype):

	fe	ti	ta <sub>1</sub>	ta <sub>2</sub>	ta <sub>3</sub>	ta <sub>4</sub>	ta <sub>5</sub>
P <sub>1</sub>	519	204	752	349	285	199	109
P <sub>2</sub>	507	381	204	95	61	35	32
P <sub>3</sub>	510	458	307	181	163	100	54

Fore tibia with long spur (about 12  $\mu\text{m}$ ).

Hypopygium (Figs 11-13). Anal tergite with two posteromedian setae. Lateral teeth present. Anal tergal bands Y-shaped, junction slightly anterior to mid tergite, longitudinal band with distal end forked. Anal point bars very long, originating at very base of anal point, their apices deeply split and reaching beyond anal point dorsal part. Anal point slender with slightly concave margins; distal margin of dorsal part slightly concave; one pair of setae laterally near middle of dorsal part, and two pairs ventrally at distal end; ventromedian part with rounded to truncated apex, projecting beyond dorsal part by a short distance. Superior volsella oval, slightly elongate, with obliquely transverse orientation; posterior margin more or less straight; posteromedian corner with a more or less projecting lobe (sometimes with nose inside); 3-4 dorsal setae, 3 anteromedian setae (2 arising from a ventral lobe, close together near median volsellar margin, 1 of these a little further to middle of volsella; the third median seta farther posterior on median volsellar margin); 2 lateral setae. Digitus medium-sized, at most only very slightly projecting beyond median margin of volsella, gradually tapering to weakly pointed tip. Inferior volsella bent in an S-shape, widest proximally; apex with a prominent triangular swelling bearing microtrichia. Median volsella relatively long, with simple lamellar setae apically, about 3 regular setae anteriorly. Gonostylus relatively long (about 77  $\mu\text{m}$ ) and slender, its inner margin straight, the outer slightly convex; tip rounded to truncated.

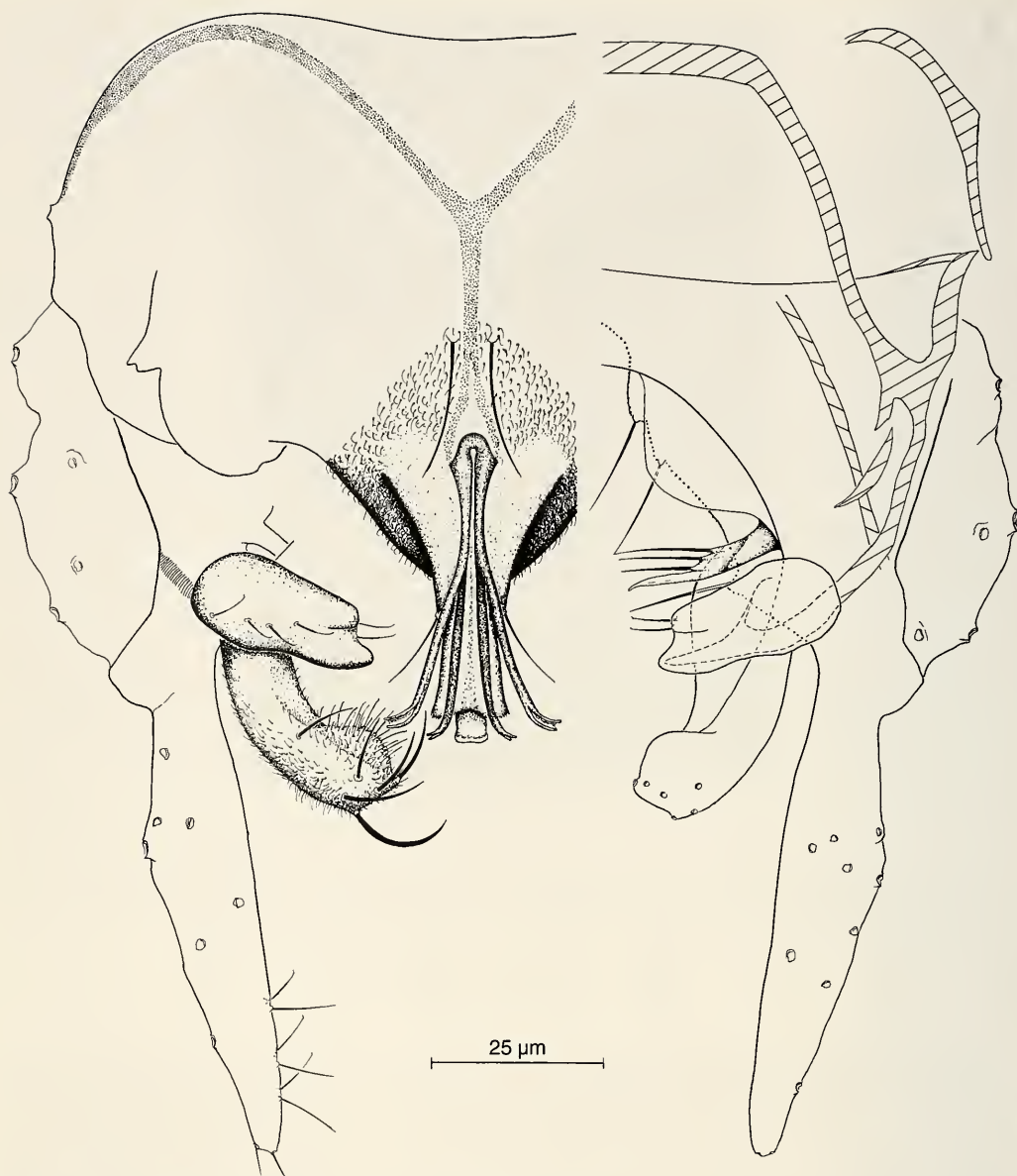


Fig. 12. *Caladomyia fittkaui*, spec. nov.; adult male hypopygium.

**Variation.** In most paratypes the superior volsella shows somewhat different shape, with the median margin almost straight and the posteromedian lobe less distinct (see Fig. 13). One paratype from a mountain brook in the upper Rio Negro region near Rio Marauíá (sample A498; slide H382) has shorter anal point bars ( $A = 36 \mu\text{m}$ ) which insert somewhat distal of the anal point base, and slightly higher  $LR_2$  and  $LR_3$  (0.61 and 0.76, respectively), therefore also a lower ALR (59.0). The paratypes from near a brook in the upper Rio Parú de Oeste region (A371-1; H116, H121) show slightly lower leg ratios ( $LR_1$  3.50,  $LR_2$  0.49,  $LR_3$  0.60) than the holotype ( $LR_1$  3.83,  $LR_2$  0.55,  $LR_3$  0.67).

**Etymology.** Named after Prof. Dr. Ernst Josef Fittkau who collected most of the *Caladomyia* material and introduced me into the study of chironomids.





Fig. 13. *Caladomyia fittkaui*, spec. nov.; adult male hypopygium. Paratype, Rio Marauíá.

**Distribution and ecology.** This species has been collected mainly near flowing waters, in three different regions: at a river northwest of Manaus, and at different brooks at higher elevation (about 400 m a.s.l.) near the northern border of Brazil.

#### *Caladomyia hero*, spec. nov.

Fig. 14

**Types.** Holotype: adult ♂, slide (H253) mounted in Canada balsam; Brazil, Amazonas, Rio Parú, Mission Tiriyo, 21.IV.1962, at light, leg. E. J. Fittkau (sample A361-10). – Paratypes (Brazil, Amazonas, at light, leg. E. J. Fittkau): 1♂ (H263), as holotype; 1♂ (U1079), as holotype, except 31.III.1962 (A361-7); 1♂ (U291), Igarapé Cachoeira, 26.XI.1962 (A431); 1♂ (U916), Rio Preto, 7.VII. 1962, Tiririca (A396); 1♂, upper Rio Negro, Rio Marauíá, terminus, 25.I.1963 (A496) (all ZSM).

**Differential diagnosis.** *C. hero*, spec. nov. differs from all other *Caladomyia* species with normal, seta-like anal tergal setae, long and slender anal point ( $AnPR \geq 3$ ), and medium-sized digitus (at most slightly reaching beyond volsella) in having medium-sized anal point bars (19-21 µm).

#### Description

**Adult male** (see Tab. 2).

Size. Wing length 0.86-0.95 mm (n=5).

Colour (in Canada balsam). Whole body yellowish-green.

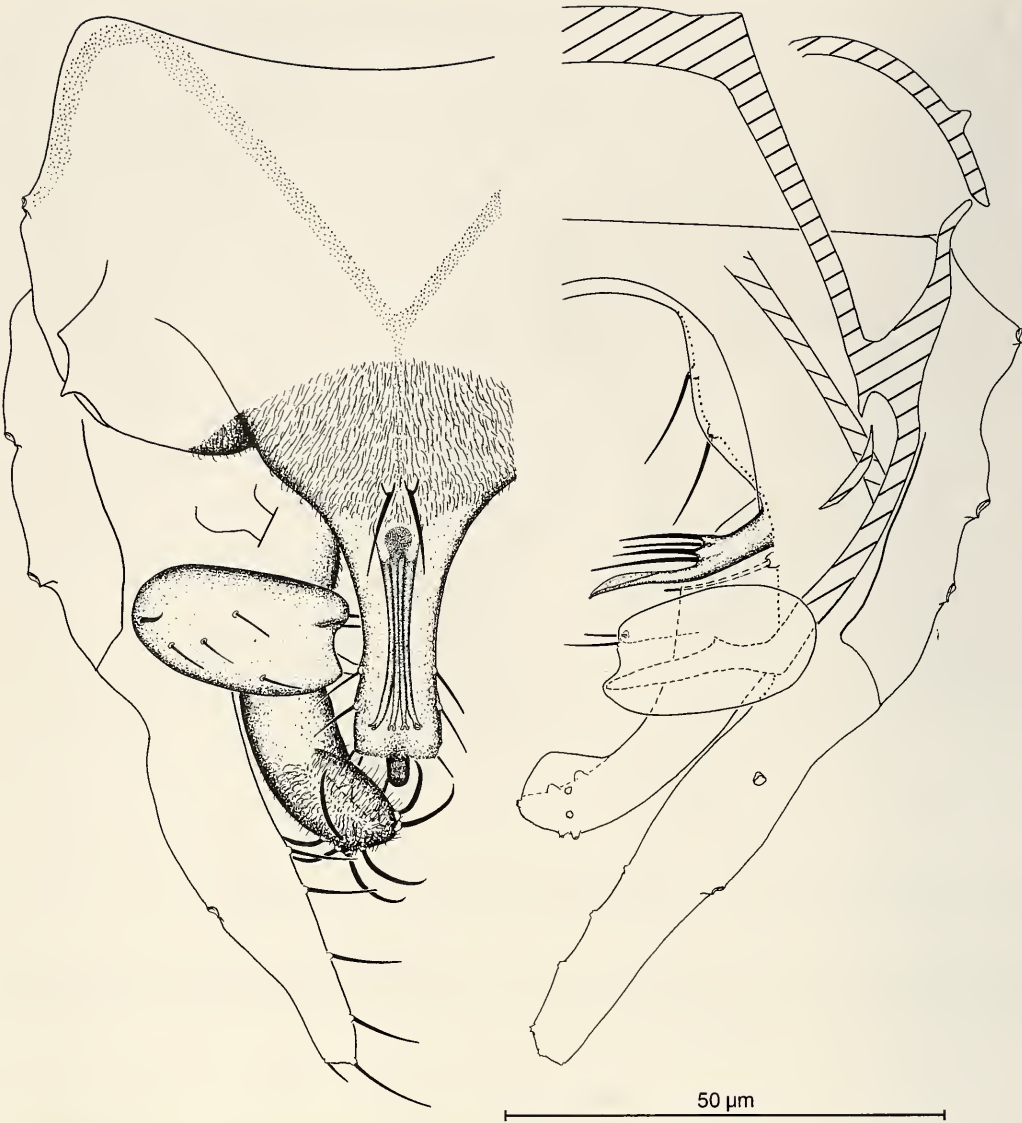


Fig. 14. *Caladomyia hero*, spec. nov.; adult male hypopygium.

Thorax. Acrostichals reaching antepronotum. Dorsocentrals ending near scutellum, not reaching antepronotum.

Wing. Membrane macrotrichia limited to a few on distal 1/5 to 1/4, except for a row between  $R_{4+5}$  and M. Vein macrotrichia absent from basal 1/2 of  $R_{4+5}$ , almost whole M, basal 1/2 of  $M_{1+2}$ , almost whole Cu.

Legs. Lengths of segments in µm:

	fe	ti	ta <sub>1</sub>	ta <sub>2</sub>	ta <sub>3</sub>	ta <sub>4</sub>	ta <sub>5</sub>
P <sub>1</sub>	462(?)	181	634	281	245	177	86
P <sub>2</sub>	456	340	—	—	—	—	—
P <sub>3</sub>	460	409	—	—	—	—	—

Fore tibia with long spur (about 16 µm).

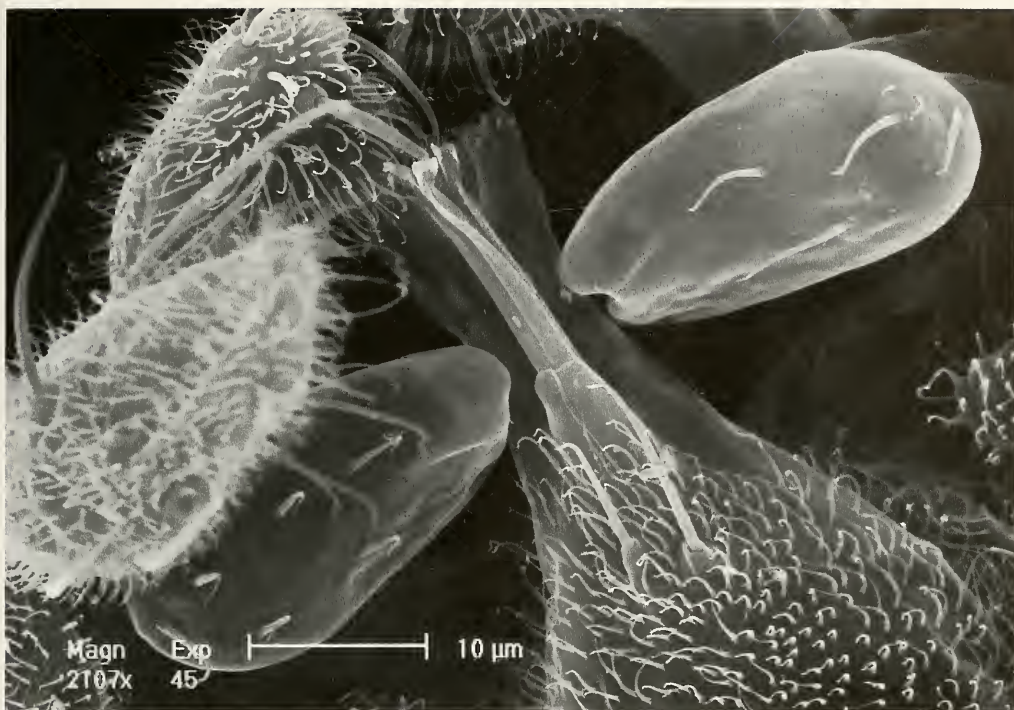


Fig. 15. *Caladomyia* cf. *hero*, spec. nov.; adult male hypopygium. SEM.

Hypopygium (Fig. 14). Anal tergite with two posteromedian setae. Lateral teeth present. Anal tergal bands Y-shaped, junction on mid tergite, longitudinal band ending about  $3\text{ }\mu\text{m}$  proximal of anal point bars. Anal point bars of medium length, originating on base of anal point, apices with forked ends proximal of distal margin of anal point dorsal part. Anal point slender with nearly parallel to slightly concave margins; distal margin of dorsal part truncated, ventromedian part rounded, projecting beyond dorsal part by a short distance; 2 pairs of subapical dorsolateral setae, 1 pair more distally and ventrally. Superior volsella elongate ovoid, with transverse orientation; median margin slightly concave, posterior corner with a faint lobe; 4-5 dorsal setae, 2 setae on anteromedian corner (one of them on a ventral volsellar lobe); 2 posterolateral setae. Digitus medium-sized, at most only very slightly reaching beyond median volsellar margin, gradually tapering to weakly pointed tip. Inferior volsella bent in an S-shape, of about even width throughout; apex with a pad-like swelling bearing numerous microtrichia. Median volsella relatively short, with simple lamellar setae apically, about 3-4 regular setae anteriorly. Gonostylus rather short, somewhat conical, its inner margin weakly convex, the lateral convex; tip truncated to rounded.

**Etymology.** The species epithet is an abbreviation of the first names of my parents, Dr. med. Herbert Piskora and Maren-Veronika (Ronny) Piskora, to thank them for their invaluable help with caring for my children.

**Distribution and ecology.** *C. hero* was found in the same regions as *C. fittkaui*: at higher elevation (about 400 m a.s.l.) near the northern border of Brazil (regions of upper Pará de Oeste and upper Rio Negro), and along rivers in the Amazon lowlands northwest of Manaus.



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