

A new species of *Paraphrotenia* Brundin, 1966 (Diptera, Chironomidae, Aphroteniinae) from the coastal mountains in southern Chile

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Paraphrotenia valdiviensis sp. n. is described and figured based on a male from Cordillera Pelada in southern Chile. The genus *Paraphrotenia* Brundin, 1966 was erected for three species, *P. excellens* Brundin, 1966 and *P. multispinosa* Brundin, 1966 from southern parts of South America and *P. fascipennis* Brundin, 1966 from Australia. *Paraphrotenia excellens* was described as male, female and pupae, while the description of *P. multispinosa* was based on a young female pupa and a pupa excuvium only. *Paraphrotenia valdiviensis* sp. n. can be separated from *P. excellens* as flagellomere 13 is more than twice the length of flagellomere 12, compared to about as long as flagellomere 12 in *P. excellens*; the venarum ratio (VR) is 1.82; compared to 2.25; and the gonostylus is spoon-shaped, only weakly curved upwards apically and strongly excavated, and have three strong median setae subapically on inner surface; compared to gonostylus strongly curved upwards apically appearing somewhat S-shaped in lateral view, and with inner surface slightly excavated with numerous setae of moderate length.

Key words: Diptera, Chironomidae, Aphroteniinae, *Paraphrotenia*, new species, Chile, Neotropical region.

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Introduction

The subfamily Aphroteniinae was recognized by Brundin (1966) for three genera distributed exclusively in the southern hemisphere. The genus *Aphrotenia* Brundin, 1966 is distributed with one species in Australia and two species in South Africa; *Aphroteniella* with two species in Australia and one pupal type, *A.* species “Peulla” Brundin, 1966, from southern Chile; and *Paraphrotenia* Brundin, 1966 with one species, *P. fascipennis* Brundin, 1966, in Australia and two species, *P. excellens* Brundin, 1966 and *P. multispinosa* Brundin, 1966 in Patagonia and southern Chile (Ashe & O’Connor 2009). Brundin (1983) later described *Anaphrotenia lacustris* Brundin, 1983

based on larvae from Australia, a species which was synonymized with *Aphroteniella filicornis* Brundin, 1966 by Cranston & Edward (1992). All but one species, *Aphrotenia australiensis* Hergstrom in Cranston & Edward, 1992 was described by Brundin (1966) in his monumental work on the austral chironomid fauna.

Aphroteniinae males lack veins R_{2+3} and MCu in the wing, tibial spurs and combs, and megaseta on the gonostylus. The three genera can be separated as *Aphrotenia* has a short cross-vein r-m which forms a distinct angle to vein R_{4+5} , and the costal extension is shorter than vein R_1 . In *Aphroteniella* and *Paraphrotenia* cross-vein r-m is long and continue in the direction of vein R_{4+5} , and the costal extension is longer than vein

R1. The genera *Aphroteniella* and *Paraphrotenia* can be separated as fifth (“fourth”) palpomere is three times as long as fourth (“third”) palpomere in *Aphroteniella*, while in *Paraphrotenia* fifth (“fourth”) palpomere is hardly two times as long as fourth (“third”) palpomere.

The Aphroteniinae species are not common and very little material is available in museum collections. Brundin (1966) described *Paraphrotenia excellens* based on male, female and pupae from Nahuel Huapi National Park in southern Argentina, while the description of *P. multispinosa* was based on a young female pupa and a pupa exuvium from Lago Villarrica in southern Chile only. An adult male of *Paraphrotenia* collected in Cordillera Pelada in the coastal mountains in Región de Los Ríos in southern Chile by Friedrik Reiss in 1969 is described and figured below. The specimen differs from *P. excellens* and might represent the male of *P. multispinosa*, but as no mature male pupa of *P. multispinosa* is available for comparison, the male from Cordillera Pelada is described as a new species.

Material and methods

The specimen is mounted on a slide under 7 coverslips in two rows and with the label on right side. All legs are detached from thorax and mounted pairwise under three coverslips. In the lower row coverslip no. 1 from left is marked p_I with black ink on the slide and coverslip no. 3 from left is marked p_{III} . The remaining pair of legs is mounted under cover slip no. 3 from left in the upper row and must thus be p_{II} . The arrangement of body parts on the slide is: upper row with four coverslips, from left – head and antenna, wings, mid legs, and thorax. Lower row with three coverslips, from left – fore legs, abdomen, and hind legs.

Morphological terminology follows Sæther (1980). The coloration is described based on the slide-mounted specimen. The specimen is housed in the Zoologische Staatssammlung, München, Germany (ZSM).

Paraphrotenia valdiviensis sp. n. (Figures 1–8)

Material examined: male: CHILE, Región de Los Ríos, Provincia de Valdivia, Cordillera Pelada, El Mirador, 40°08’S 73°40’W, 1050 m a.s.l., 16.XI.1969, leg. F. Reiss (ZSM).

Etymology: Named after Provincia de Valdivia using the Latin suffix *-ensis* denoting the place of origin.

Diagnostic characters: The new species can be separated from *P. excellens* as flagellomere 13 is more than twice the length of flagellomere 12, compared to about as long as flagellomere 12; venarum ratio (VR) is 1.82; compared to 2.25; and gonostylus is spoon-shaped, only weakly curved upwards apically and strongly excavated, and with three strong median setae subapically on inner surface; compared to gonostylus strongly curved upwards apically appearing somewhat S-shaped in lateral view, and with inner surface slightly excavated with numerous setae of moderate length.

Description: Male (n = 1). Small, total length 1.43 mm. Wing length 1.27 mm. Total length / wing length 1.13. Wing length / length of profemur 3.08.

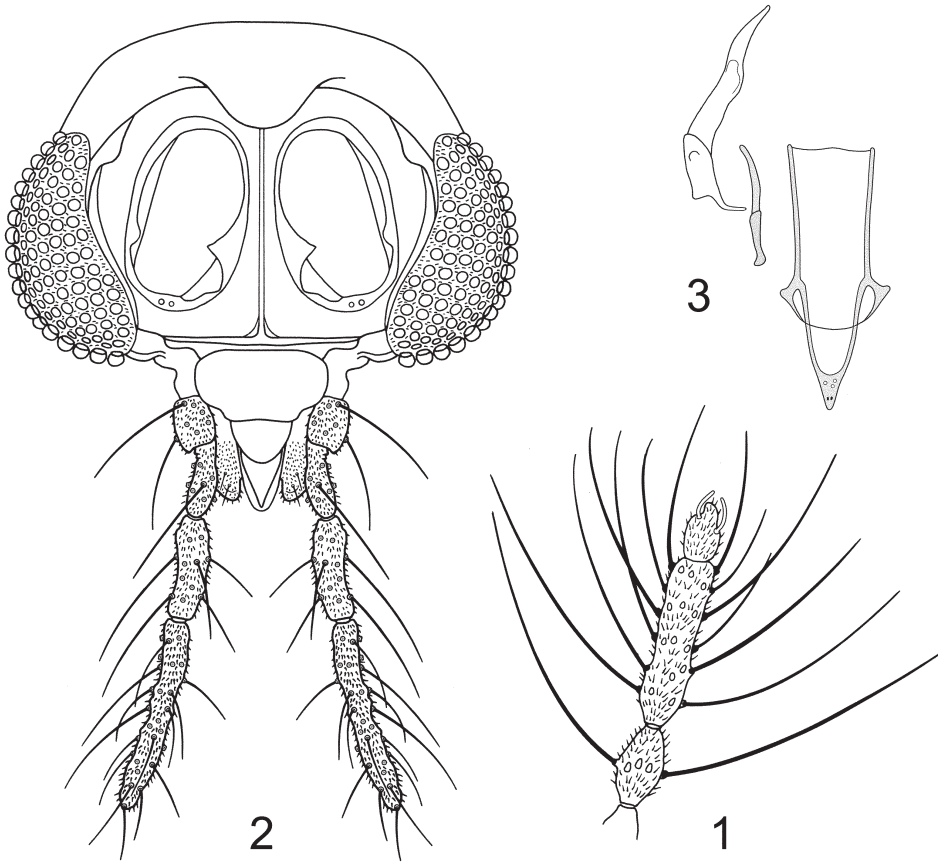
Coloration. Thorax and abdomen brown, legs light brown.

Antenna (Figure 1). With 14 flagellomeres, lengths (in μm) as: 51, 39, 39, 41, 43, 43, 45, 47, 47, 45, 45, 43, 94, 33. Antennal ratio (AR) = 0.24.

Head (Figure 2). Without frontal setae. Eye rounded, with fine, short microtrichia between ommatids. Clypeus without setae. Tentorium, stipes and cibarial pump as in Figure 3; tentorium 90 μm long, 14 μm wide; stipes 54 μm long. Palp with 5 segments, palpomere lengths (in μm) as: 14, 35, 48, 65, 127. Third palpomere without pit or sensilla.

Thorax. Anteprepronotum missing. Acrostichals about 17, biserial, ending in mid scutum; dorsocentrals 19, partly biserial in front; prealars 16. Scutellum apparently with 6 strong setae.

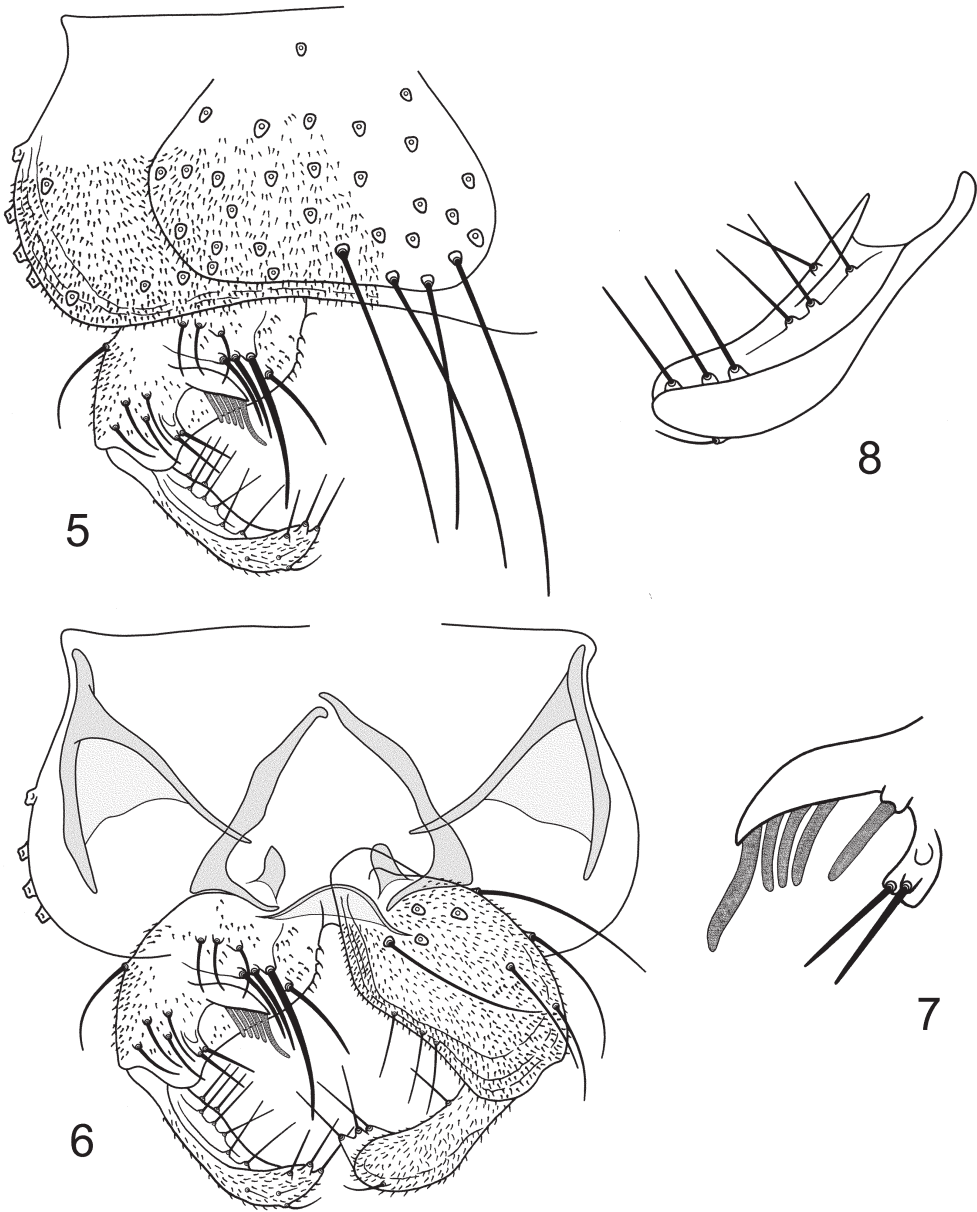
Wing (Figure 4). Venarum ratio (VR) = 1.82. Apically broadly rounded, basally tapered without anal lobe. Densely microtrichiose and with macrotrichia along most veins and apically in most cells. Costal extension 278 μm long. Brachiolum with 4 setae and apparently with 2



FIGURES 1–3. *Paraphrotenia valdiviensis* sp. n., male. 1. Antennal flagellomeres 12–14. 2. Head. 3. Tentorium, stipes and cibarial pump.



FIGURE 4. *Paraphrotenia valdiviensis* sp. n., male. Wing. Photo Hege Avsnes Dale.



FIGURES 5–8. *Paraphrotenia valdiviensis* sp. n., male. **5.** Hypopygium, dorsal view. **6.** Hypopygium with tergite IX removed, dorsal aspect to the left and ventral aspect to the right. **7.** Right volsella. **8.** Gonostylus, median view.

sensilla campaniformia basally, 3 above setae and 9 apically. Squama with 5 setae.

Legs. Tibiae without spurs and comb. Width of fore tibia 25 µm, of mid tibia 29 µm, of hind tibia 30 µm. Pulvilli is lacking. Lengths and proportion of legs as in Table 1.

Abdomen. Tergites II–VII with two transverse bands of strong setae, each with 2–4 setae. Tergite II: both anterior and posterior band with 4 setae; tergite III: anterior band with 3 setae, posterior with 4 setae; tergite IV: anterior band with 2 setae, posterior with 3 setae; tergite V: both anterior and

TABLE 1. Lengths (in μm) and proportions of legs of *Paraphrotenia valdiviensis* sp. n., male. (n = 1). LR = Leg ratio, BV = “Bein-Verhältnisse”, SV = “Schenkel-Schiene-Verhältnis”, BR = Bristle ratio.

	fe	ti	ta1	ta2	ta3	ta4	ta5	LR	BV	SV	BR
p1	412	432	160	108	84	56	40	0.370	3.486	5.275	4.39
p2	468	396	136	80	64	48	44	0.343	4.237	6.353	4.15
p3	424	496	248	152	112	72	48	0.500	3.042	3.710	4.07

posterior band with 3 setae; tergite VI and VII: anterior band with 2 setae, posterior with 3 setae. Tergite VIII with posterior band of 6 strong setae. Sternites III–VII with group of 3–5 strong median setae. Sternite III with 2 setae; sternites IV, V and VI with 4 setae; sternite VII with 5 setae. Sternite VIII with posterior band of 5 strong setae.

Hypopygium (Figures 5–6). Tergite IX large with concave posterior margin, covered with long, elongate, stout setae. Gonocoxite stout, 76 μm long, 48 μm wide medially, with groups of setae basally and distally, basal group with altogether 7 setae, the 3 strongest on ridge, longest setae 33 μm long. Volsella apparently consisting of basal, narrowly triangular lobe with comb of 5 flattened setae, apical seta slightly sigmoid, 14 μm long, proximal setae 8 μm long, weakly curved; and with weaker rectangular distal lobe with two setae. The right volsella slightly different as the proximal, flattened setae is separated from the other 4 (Figure 7). Gonostylus spoon-shaped, 61 μm long, without megaseta, with 3 strong median setae subapically (Figure 8).

Immatures and female: Unknown.

Distribution: The species is only known from Cordillera Pelada in southern Chile, where it was taken at a small stream at 1050 m a.s.l.

Discussion

Although detailed, Brundin’s (1966: 354) description of the male of *P. excellens* do not give many exact measurements or counts of various characters. Further, only a single adult male was available to Brundin, so nothing is known about the variation within the species. The size of the specimen from Chile, with a wing length of 1.27 mm, is the same as for *P. excellens* with a wing length of 1.2–1.3 mm. According to Brundin

(1966: 354, fig. 510) *P. excellens* has 15-segmented antennae, consisting of a globose pedicel and a 14 segmented flagellum; flagellomere 13 is about as long as flagellomere 12 and flagellomere 14 is shorter than flagellomere 13. In *P. valdiviensis* n. sp. flagellomere 13 is more than twice the length of flagellomere 12, and nearly three times the length of flagellomere 14. Further, according to Brundin (1966: 354) in *P. excellens* the “cubital fork is displaced far apicad and situated at the level of distal end of R_1 ”, and it has an “extremely high” venarum ratio of 2.25. In the specimen from Chile the cubital fork is situated at the level of the proximal end of R_1 (fig. 4) and the venarum ratio (VR) is only 1.82. There are differences in other measurements or counts too, but these are minor and might fall within the natural variation of *P. excellens*.

Comparing the hypopygium of *P. excellens* (Brundin 1966: figs 511–512) with the hypopygium of the specimen from Chile (fig. 5), it appears that the posterior margin of tergite IX is less strongly excavated in the male from Chile; according to Brundin (1966: 354) *P. excellens* has a “strongly sinuous posterior margin”. The armament on the gonocoxite seems to be quite similar in the two specimens, but according to Brundin (1966: 354) in *P. excellens* the gonostyli are “strongly curved upwards apically appearing somewhat S-shaped in lateral view; their inner surface slightly excavated; inner and outer surface with numerous setae of moderate length, those of outer surface being strongly curved.” In the specimen from Chile the gonostylus (figs 6, 8) appears to be more spoon-shaped, only weakly curved upwards apically and more strongly excavated, and it has 3 strong median setae subapically.

The Aphroteninae species appears to be very elusive, and there seems to be no new records of *P. multispinosa* after it was described by Brundin

in 1966. The new species might represent the male of *P. multispinosa*, but as no mature male pupa is available for comparison, the male from Valdivia is described as a new species. It was collected at a small stream at about 1000 m altitude in the coastal mountain range in southern Chile, while *P. multispinosa* was collected in a brook near the northern shore of Lago Villarrica, a large lake in the foothills of the Andean Mountains.

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