Macropelopia (*Bethbilbeckia*) *chilensis* n. sp. (Diptera, Chironomidae) from Cajón del Maipo, Chile

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Macropelopia (*Bethbilbeckia*) *chilensis* **n. sp.** is described and figured based on pharate male pupae and pupa exuviae collected in the Andes Mountains east of Santiago, Chile, in 1998 and 1999. The pupa possesses the large, spine-like D_1 setae arising from prominent tubercles on tergites II–VII, characteristic for the subgenus *Bethbilbeckia* Fittkau & Murray, 1988. However, the thoracic horn is more similar to the thoracic horn in some *Macropelopia* (s. str.) Thienemann, 1916 species than in the only other species in the subgenus, *M.* (*B.*) *floridensis* Fittkau & Murray, 1988. The male can easily be separated from the male of *M.* (*B.*) *floridensis* by having bi- to multiserial orbitals and a strong comb on the hind leg, characters that are found in *Macropelopia* (s. str.) but not in *M.* (*B.*) *floridensis*, indicating that the status of *Bethbilbeckia* as a separate subgenus should be reconsidered.

Key words: Diptera, Chironomidae, Tanypodinae, *Macropelopia* (*Bethbilbeckia*), new species, Chile, Neotropical region.

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Introduction

Fittkau & Murray (1988) erected the genus *Bethbilbeckia* for *B. floridensis* Fittkau & Murry, 1988 from Florida, U.S.A. According to Fittkau & Murray (1988), the pupa of *Bethbilbeckia* is superficially similar to the pupa of *Macropelopia* Thienemann, 1916, but can easily be distinguished by the prominent, straight D_1 setae that arise from distinct tubercles, larger than those present in any other Macropelopiini. The very short, weak LS setae on segment VIII are also diagnostic for the genus. Fittkau & Murray (1986) had already included the genus as "Tanypodinae Genus I" in the key to the genera of Holarctic Tanypodinae pupae. In the revised key to the genera of Holarctic Tanypodinae larvae, Cranston & Epler (2013) treated *Bethbilbeckia* as a subgenus of *Macropelopia*, stating that it resembles *Macropelopia* in all life stages. This placement within *Macropelopia* has later been supported by several phylogenetic studies based both on morphological and molecular data (Krosch *et al.* 2017, Silva & Ekrem 2016, Siri & Donato 2015).

The subgenus *Bethbilbeckia* is monotypic and the adult male of *M.* (*B.*) *floridensis* differs from all other Macropelopiini, except *Fittkauimyia* Karunakaran, 1969, in the uniserial arrangement of the temporal (inner and outer verticals and postorbitals) setae. In *Macropelopia* (s. str.) inner and outer verticals and postorbitals are all multiserial. *M.* (*B.*) *floridensis* also lacks combs on fore- and hind tibiae, characters that are present in *Macropelopia.*

During fieldwork in the Andes Mountains east of Santiago, Chile, in 1998 and 1999, several pharate pupae and pupae exuviae of a species, which possesses the prominent, spine-like D_1 setae arising from distinct tubercles characteristic for *Bethbilbeckia,* were collected. Most of the

specimens were collected in a small, shallow, rather rapid stream at an altitude of about 1.800 m a.s.l.. Despite repeated field trips to the area, no adults were collected, so the species is described below as *Macropelopia* (*Bethbilbeckia*) *chilensis* n. sp., based on pharate male pupae and pupae exuviae only.

Methods and material

Most pupae were collected in driftnets in a small, rapid stream originating in the hot spring Baños Morales a few hundred meters above the collecting site. The stream is situated at about 1.800 m a.s.l. and is 1–2 m wide, rather shallow, with stone and gravel substrate. A single pupa was also collected in a driftnet in a side channel to Rio Volcán at Lo Valdes at about 2.500 m a.s.l.. At the sampling site, the channel was shallow, with stone and gravel substrate.

The pupae were conserved in ethanol and later mounted on slides in Canada balsam. Measurements are given as ranges in µm, except for the total length of the pupa, which is given in mm; followed by the mean when more than three specimens were measured; followed by the number of specimens measured, (n), in parenthesis. The morphology terminology follows Sæther (1980).

The type material is kept in the entomological collection at the University Museum of Bergen, Bergen, Norway (ZMBN).

***Macropelopia* (*Bethbilbeckia*) *chilensis* n. sp.**
(Figures 1–10).

Type material: *Holotype:* Pharate male pupae, CHILE, Región Metropolitana, San José de Maipo, Cajon del Maipo, Baños Morales, 33.824151°S 70.062993°W, 1.835 m a.s.l., 18–19 February 1999, drift net, leg. T. Andersen (ZMBN). *Paratypes:* 5 pharate male pupae, 3 pharate female pupae, 3 pupae exuviae, as holotype (ZMBN); 1 pharate female pupa, CHILE, Región Metropolitana, San José de Maipo, Cajon del Maipo, Lo Valdes, Rio Volcán, 33.856273°S 69.982294°W, 2.540 m a.s.l., 10 November 1998, drift net, leg. T. Andersen (ZMBN).

Etymology: Named after the country of origin.

Diagnostic characters: The male can easily be separated from the male of *M.* (*B.*) *floridensis* by having bi- to multiserial orbitals and a strong comb on hind tibia; *M.* (*B.*) *floridensis* has uniserial orbitals and lack comb on hind tibia. The pupa possesses the large, spine-like D_1 setae arising from prominent tubercles on tergites II–VII, which is characteristic for *M.* (*B.*) *floridensis*. However, the thoracic horn is somewhat triangular and curved and is more similar to the thoracic horn in some other *Macropelopia* (s. str.) species than in *M.* (*B.*) *floridensis*.

Description: ***Male (pharate male pupae)*** (n = 5, if not otherwise stated).

Coloration. Brown.

Antenna. Terminal flagellomere (Figure 1) 96–115, 105 µm long; 27–33, 30 µm wide at base.

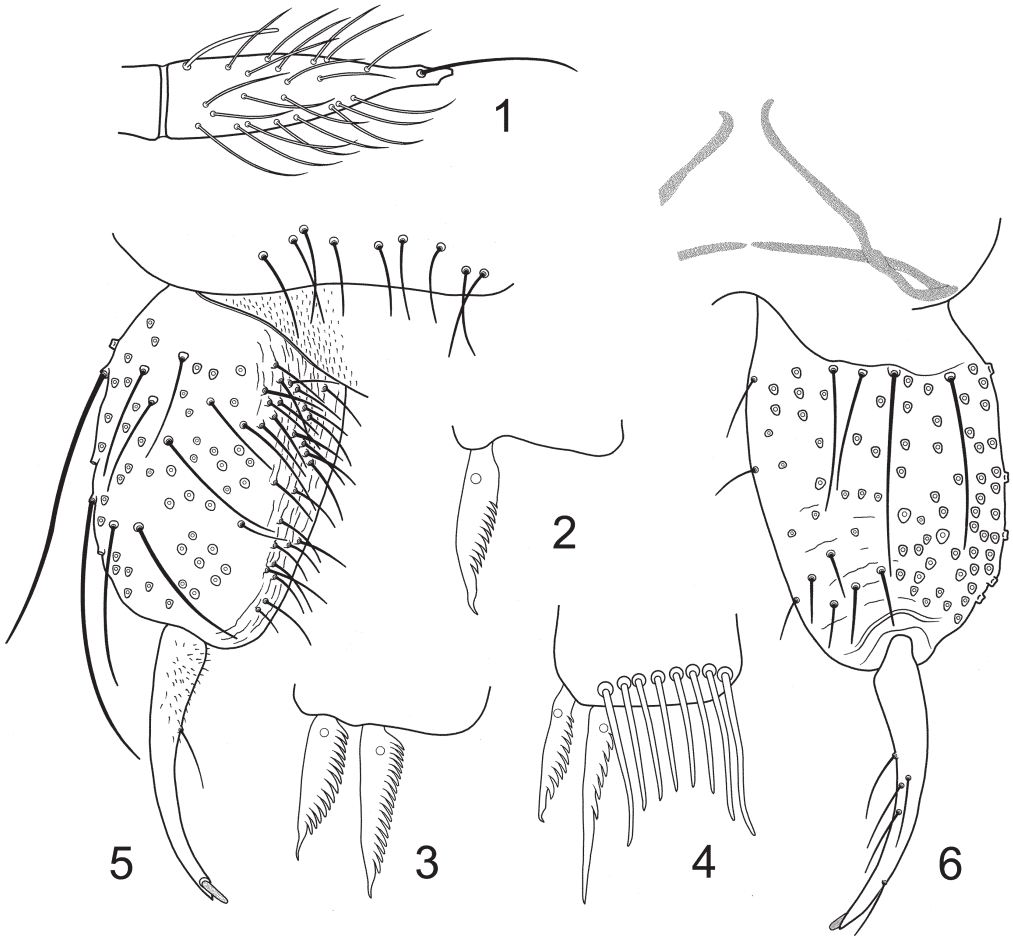
Head. Eye-bridge 4 ocelli wide. Inner verticals 10–14, 12, multiserial; outer verticals 8–13, 10, bi- to triserial; postorbitals 11–14, 12, bi- to triserial.

Thorax. Dorsocentrals irregularly biserial; acrostichals tri- to multiserial; scutellum with transverse row of 15–22, 18 strong setae and 7–13, 12 weaker setae anterodorsally; postnotum apparently with altogether about 13 (1) setae, biserial; other setae difficult to observe. Scutal tubercle apparently low, difficult to observe in the slides.

Wing. Not measurable.

Legs. Width at apex of fore tibia 73–77 (3) µm; of mid tibia 70–76, 73 µm; of hid tibia 80–82, 81 µm. Spur of fore tibia 80–86 (3) µm long with 9–14 side teeth (Figure 2); long spur of mid tibia 66–77, 73 µm long with 17–19, 18 side teeth, short spur 57–68, 63 µm long with 11–16, 14 side teeth (Figure 3); long spur of hind tibia 80–89, 86 µm long with 6–9, 8 side teeth, short spur 57–65, 62 µm long with 9–12, 11 side teeth (Figure 4). Fore tibia apparently without comb. Comb of hind tibia with 8 strong setae, longest 69–76, 73 (4) µm long; shortest 48–52, 50 (4) µm long. Claws on all legs long and slender, distally pointed, spinulate in basal 1/3.

Hypopygium (Figures 5–6). Tergite IX with 9–13 (3) setae in single to partly biserial posterior row. Gonocoxite 154–160 (3) µm long; gonostylus slender, 139–146 (3) µm long; megaseta 12–14 (3) µm long.



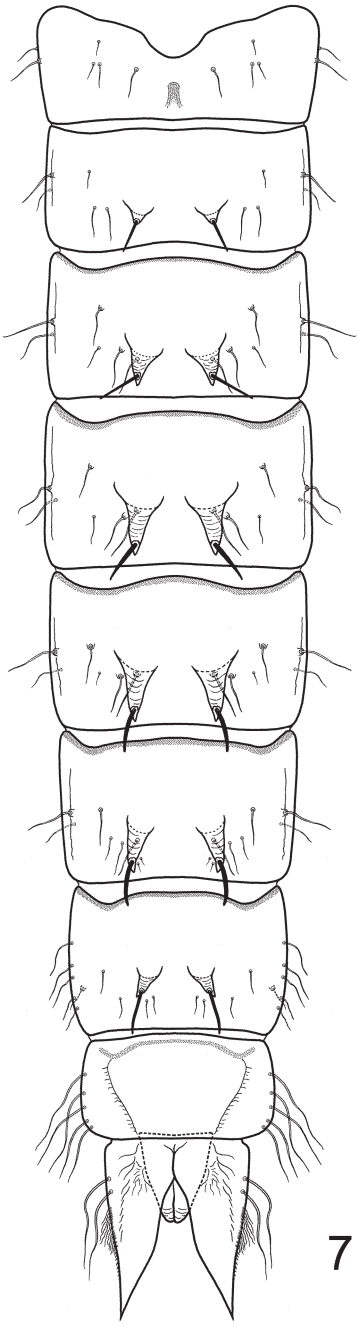
FIGURES 1–6. *Macropelopia* (*Bethbilbeckia*) *chilensis* n. sp., male. **1**. Terminal antennal flagellomere. **2**. Tibial spur of fore leg. **3**. Tibial spurs of mid leg. **4**. Tibial spurs and comb of hind leg. **5**. Hypopygium, dorsal aspect. **6**. Hypopygium, ventral aspect.

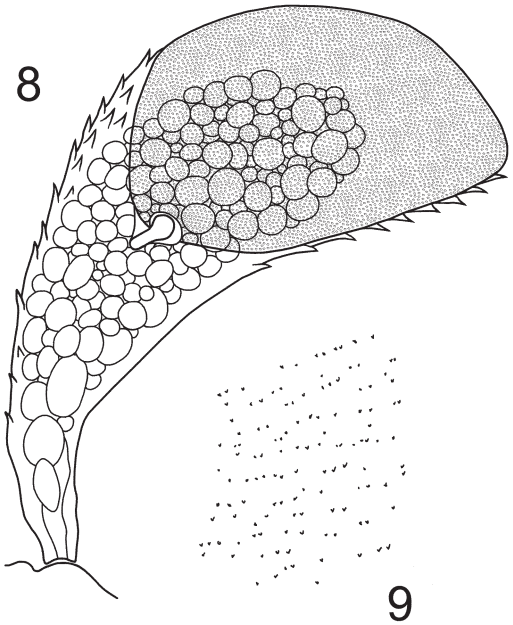
Pupa (n = 8–10). Total length 5.25–6.98, 6.03 mm.

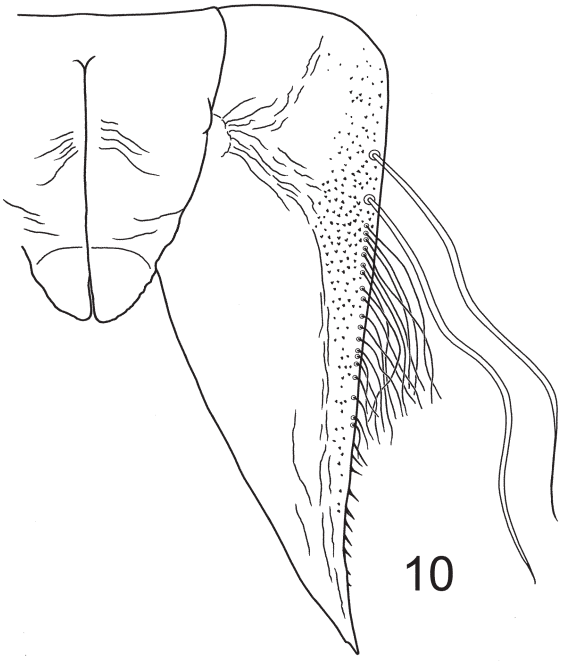
Coloration. Brown.

Cephalothorax. Thoracic horn (Figure 8), somewhat triangular, curved; 372–448, 404 µm long; 140–176, 160 µm wide at its widest point; plastron plate 196–256, 214 µm long; external membrane with distinct spines; horn sac not quite filling horn lumen. Thoracic membrane with transverse ridges extending to median suture. Thoracic setae Dc_1 simple, pointed, about 60 µm long; Dc_2 not discernable; Sa simple, pointed, about 160 µm long.

Abdomen (Figure 7). Scar on tergite I elongate and pigmented. Shagreen spines (Figure 9) short, blunt, and partially serially arranged in groups of 2–4. Abdominal setae D_1 on tergites II–VII large, spine-like and arising from large, prominent tubercles; tergite II: D_1 100–128, 112 µm long, tubercle 88–120, 103 µm long measured along inner margin; tergite III: D_1 116–136, 127 µm long, tubercle 160–188, 174 µm long; tergite IV: D_1 140–160, 151 µm long, tubercle 192–236, 217 µm long; tergite V: D_1 140–160, 151 µm long,







FIGURES 7–10. *Macropelopia* (*Bethbilbeckia*) *chilensis* n. sp., pupa. **7**. Abdominal tergites and anal lobe. **8**. Thoracic horn. **9**. Shagreen. **10**. Anal lobe and male genital sac.

tubercle 212–256, 227 µm long; tergite VI: D_1 140–160, 153 µm long, tubercle 188–220, 199 µm long; tergite VII: D_1 136–164, 153 µm long, tubercle 112–136, 139 µm long. Remaining D and V setae of varying size; D_2 and D_3 on tergite III–V arising from small tubercles. Segments I–VI with 2 L setae; segment VII with 4 short LS setae; segment VIII with 5 LS setae, longest about the length of the segment.

Anal lobe (Figure 10) 458–572, 515 µm wide, 580–669, 641 µm long. With simple spine shagreen laterally. Outer border with fringe of setae-like spinules gradually reduced to indistinct spines at the distal end; inner border divergent, without fringe, but with few, small, indistinct spines preapically in some specimens. Anal macrosetae arise from basal 1/4, about 0.75 times segment length.

Larva. Unknown.

Discussion

The new species is placed in the subgenus *Bethbilbeckia* due to the prominent, spine-like D_1 setae arising from large tubercles on tergites II–VII. Also in most other features, the pupa is very similar to the pupae of *M.* (*B.*) *floridensis.* However, the thoracic horn is somewhat triangular and curved and more similar to the thoracic horn of some *Macropelopia* (s. str.) species. The male differs from the male of *M.* (*B.*) *floridensis* in several key characters as it has bi- to multiserial orbitals and a strong comb on the hind tibia, characters that are found in *Macropelopia* (s. str.) but not in *M.* (*B.*) *floridensis*. As no adult males of the new species from Chile were collected, several characters, like the scutal tubercle, are difficult to observe. However, based on the material at hand the species shows a mixture of characters found either in the subgenus *Bethbilbeckia* or in *Macropelopia* (s. str.), indicating that the status of *Bethbilbeckia* as a separate subgenus should be reconsidered.

Pupae and larvae of *Bethbilbeckia* have been recorded from Argentina (García *et al.* 2007, Krosch *et al.* 2017). At present, there are no named *Macropelopia* species from South America, but Ashe & O'Connor (2009) list several South American Tanypodinae as "unplaced valid". Most of these species were described based on adult material collected in Patagonia and Chile by Edwards (1931). However, the description of none of these species seems to fit the new species from Chile.

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References

Ashe, P. & O'Connor, J.P. 2009. *A world catalogue of Chironomidae (Diptera). Part 1. Buchonomyiinae, Chilenomyiinae, Podonominae, Aphroteniinae, Tanypodinae, Usambaromyiinae, Diamesinae, Prodiamesinae and Telmatogetoninae*. 445 pp. Irish Biogeographical Society and National Museum of Ireland, Dublin.

Cranston, P.S. & Epler, J.H. 2013. 5. The larvae of Tanypodinae (Diptera: Chironomidae) of the Holarctic region – Keys and diagnoses. In: Andersen, T., Cranston, P.S. & Epler, J.H. (Eds). Chironomidae of the Holarctic region. Keys and diagnoses – Larvae. *Insect Systematics & Evolution*, Supplement 66, 39–136.

Edwards, F.W. 1931. Chironomidae. *Diptera of Patagonia and South Chile* 2, 233–331.

Fittkau, E.J. & Murray, D.A. 1986. 5. The pupae of Tanypodinae (Diptera: Chironomidae) of the Holarctic region – Keys and diagnoses. In: Wiederholm, T. (Ed.). Chironomidae of the Holarctic region. Keys and diagnoses. Part 2. Pupae. *Entomologica scandinavica*, Supplement 28, 31–113.

Fittkau, E.J. & Murray, D.A. 1988. *Bethbilbeckia floridensis*: a new genus and species of Macropelopiini from the South Eastern Nearctic (Diptera: Chironomidae). *Spixiana*, Supplement 14, 253–259.

García, P.E. & Suárez, D.A.A. 2007. Community structure and phenology of chironomids (Insecta: Chironomidae) in a Patagonian Andean stream. *Limnologia* 37, 109–117.

Krosch, M.N., Cranston, P.S., Bryant, L.M., Strutt, F. & McCluen, S.R. 2017. Towards a dated molecular phylogeny of the Tanypodinae (Chironomidae,

Diptera). *Invertebrate Systematics* 31, 302–316.
Sæther, O.A. 1980. Glossary of Chironomid morphology terminology (Diptera: Chironomidae). *Entomologica scandinavica*, Supplement 14, 1–51.
Silva, F.L.D. & Ekrem, T. 2016. Phylogenetic relationships of nonbiting midges in the subfamily Tanypodinae (Diptera: Chironomidae) inferred from morphology. *Systematic Entomology* 41, 73–92.
Siri, A. & Donato, M. 2015. Phylogenetic analysis of the tribe Macropelopiini (Chironomidae: Tanypodinae): adjusting homoplasies. *Zoological Journal of the Linnean Society* 174, 74–92.

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