



A new species of the genus *Ablabesmyia* Johannsen from the Neotropics and description of the pupa of *Ablabesmyia bianulata* Paggi (Diptera: Chironomidae: Tanypodinae)

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Abstract

The male, pupa and fourth instar larva of *Ablabesmyia platensis* sp. n. from La Plata, Buenos Aires province, Argentina and the pupa of *A. bianulata* Paggi collected in southern Argentina are described and figured. The male adult diagnosis of *A. bianulata* is emended, and the aedeagal complex is redescribed and photographed. Differences in the aedeagal complex and the color pattern of the pupa mainly distinguish these two species. The new species is also compared with the Neotropical *A. oliveirai* Oliveira et Gessner.

Key words: Diptera, Chironomidae, *Ablabesmyia*, new species, taxonomy, Argentina, Neotropics

Introduction

Species belonging to *Ablabesmyia* Johannsen were previously included within Group A of *Pentaneura* Philippi (Edwards 1929), or grouped as a subgenus of the latter genus (Freeman 1955, Roback 1959). The generic status of *Ablabesmyia* was established in the monograph of the European Tanypodinae (Fittkau 1962).

The cosmopolitan *Ablabesmyia* is conformed by four subgenera: *Ablabesmyia* Johannsen, *Asayia* Roback, *Karelia* Roback and *Sartaia* Roback (Roback 1971, 1985; Murray & Fittkau 1989). At present there are 11 species of *Ablabesmyia* known from the Neotropics - eight listed by Spies & Reiss (1996), the remaining three described by Paggi & Añón Suárez (2000), Grund (2005) and Oliveira & Fonseca-Gessner (2006). Four of these were recorded from Argentina: *Ablabesmyia infumata* (Edwards), *A. punctulata* (Edwards), *A. bianulata* Paggi and *A. reissi* Paggi. The first two were originally described by Edwards (1931) as *Pentaneura*.

Ablabesmyia adults are easily identified by the banded legs and cochleariform apex of the gonostylus. However, adults are very difficult to identify at the species level, with a requisite being the use of the aedeagal complex structures to recognize them (Roback 1971, Kobayashi & Kubota 2002).

At present two interesting species were successfully raised to the adult stage from the immatures collected in Argentina. These species belong to the subgenus *Karelia* and much resemble each other in the adult morphology. One of them turned out to be *Ablabesmyia* (*K.*) *bianulata* by comparison with the paratypes deposited in the collection of Instituto de Limnología “Dr. Raúl A. Ringuelet”. The species was described by Paggi (1987), based on the male and female adults. The other is an undescribed species which can be distinguished from *Ablabesmyia* (*K.*) *bianulata* by the male aedeagal complex with stout aedeagal blades. Consequently, the diagnosis of *Ablabesmyia* (*K.*) *bianulata* male is here emended, its pupa is described and the new species is presented in all stages.

Material and methods

Larvae and pupae of *Ablabesmyia platensis* n. sp. were collected using a drift net acting at artificial swimming pools in all seasons. Material were transported alive in separate vials and reared in the laboratory following methods by Epler (2001). The pupa of *Ablabesmyia bianulata* Paggi was collected in a lake with a drift net, and reared in the laboratory. Material was slide-mounted in Canada balsam. Adult terminology follows Roback (1971) and Sæther (1980), except for description of the aedeagal complex which follows Roback (1959, 1983) and Paggi *et al.* (2009). Immatures terminology follows Sæther (1980), except for the wing pad and apical nipple which follows Roback (1985). Measurements are in μm unless otherwise stated. The measurements are given as ranges followed by a mean when three or more measurements are made, followed by the number of measured specimens in parentheses (n). Holotype and paratypes are deposited in the collection of Museo de La Plata (MLP) and Instituto de Limnología "Dr. Raúl A. Ringuelet" (ILPLA) in Argentina.

Description

Ablabesmyia platensis n. sp.

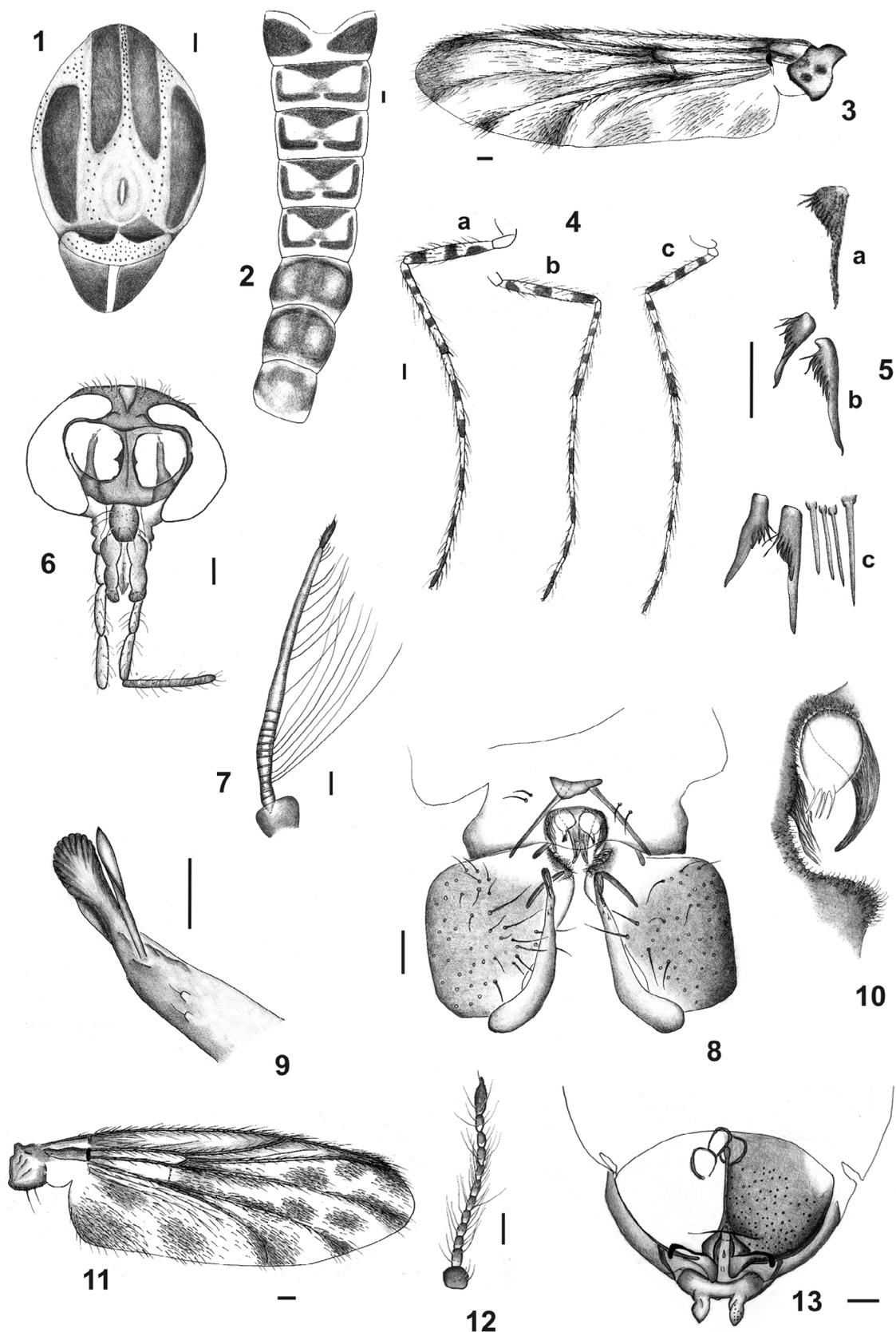
Type material. Holotype: Argentina, Buenos Aires, La Plata, 34° 55' 25.9'' S, 57° 55' 36.2'' W, 31 m. asl., male with larval and pupal exuviae number 5275/1 (MLP), 25-VIII-2009, kick sample, A. Siri. Allotype female with pupal exuviae number 5275/2 (MLP), same location as holotype, 29-III-2009, kick sample, A. Siri. **Paratypes:** Argentina, Buenos Aires, La Plata, 34° 55' 25.9'' S, 57° 55' 36.2'' W, 31 m. asl., male reared from pupa number 5275/3 (MLP), pharate male number 5275/4 (MLP), female reared from larva number 5275/5 (MLP), 2 larvae numbers 5275/6–7 (MLP) collected in March 2008; 2 males reared from pupa numbers 5275/8 (MLP) and (ILPLA), 3 pharate males numbers 5275/9–11 (MLP), 3 females reared from pupa numbers 5275/12–13 (MLP) and (ILPLA), female adult number 5275/14 (MLP), pharate female number 5275/15 (MLP), 7 pupal exuviae number 5275/16 (MLP) collected in March and April 2009; 1 male reared from larva number 5275/17 (MLP), prepupa number 5275/18 (MLP) collected on 25-VIII-2009; all immature specimens from this site were collected by kick sample, A. Siri. **Argentina, Buenos Aires, Gonnet,** 34° 52' 34'' S, 58° 01' 32.4'' W, pupal exuviae number 5275/19 (MLP) collected in March 2004; pharate male with larval exuviae number 5275/20 (MLP) collected on 28-VIII-2005; male reared from pupa number 5275/21 (MLP), female reared from larva number 5275/22 (MLP), pharate female number 5275/23 (MLP), larva number 5275/24 (MLP) collected on 28-XI-2007, larva number 5275/25 (MLP) collected in March 2008; all immatures specimens from this site were collected by kick sample, M. Donato.

Etymology: The specific epithet "*platensis*" refers to La Plata city, the type locality.

Adult male (n = 6–10, except when otherwise stated) (Figs. 1–10, 14)

Total length 4.52–5.08, 4.82 mm. Total length / wing length 2.05–2.18, 2.10 (5). Wing length / length of profemur 2.27–2.55, 2.41 (5).

Coloration: Thorax (Fig. 1) yellowish, vittae, posnotum, anepisternum and preepisternum brown. Prescutelar area and scutellum yellow, except by 2 brown spots covering the posterior region of prescutelar area and the anterior of the scutelar area. Postscutellum brown. Abdomen (Fig. 2): segment I mostly brownish; segments II–V with anterior band projecting medially, lateral band and incomplete posterior band; segments VI–VII mostly brownish, with no discernible color pattern; wing spots as in Fig. 3. Legs: fe of p_1 with 3 bands (Fig. 4a); the proximal one incomplete, in some specimens not very clear, connected to the middle band by a vertical band; ti of p_1 with 5 bands, the middle one incomplete, located at the anterior margin, sometimes difficult to see in laterally mounted legs; ta_1 with 2 bands, ta_{2-4} with 1 apical band, ta_5 pigmented. Band pattern of mid and hind legs (Figs. 4b and 4c respectively) as in fore leg, except tibia with 4 bands. Hypopygium yellow, apical region of gonocoxite and basal region brown.



FIGURES 1–13. *Ablabesmyia platensis* n. sp. adults. Male. 1: thorax in dorsal view; 2: abdomen in dorsal view; 3: wing; 4: leg banding: a - fore leg, b - mid leg, c - hind leg; 5: spurs: a - fore leg, b - mid leg, c - spurs and tibial comb of hind leg; 6: head in dorsal view; 7: antenna; 8: hypopygium; 9: apex of gonostylus with pointed megaseta; 10: aedeagal complex in dorsal view. Female. 11: wing, 12: antenna, 13: genitalia in ventral view. Scale bars = 20 µm for Figs. 9, 10; 50 µm for Figs. 5, 6, 13; 100 µm for Figs. 1–3, 7, 8, 11, 12; 200 µm for Fig. 4.

Head (Fig. 6). Antenna with 14 flagellomeres (Fig. 7); AR 2.01–2.11, 2.07. Ultimate flagellomere 122–132, 127; penultimate 656–747, 694. Temporal setae 73–95, 81; postorbitals 16–20, 18. Clypeus with 28–42, 35 setae. Tentorium 199–216, 208 long. Length of palpomeres 1-5: 64–71, 65; 102–149, 123; 149–191, 168; 164–208, 178; 257–357, 299 (5).

Thorax. Anteprenotum with 12–15, 13; humerals 12–21, 16; dorsocentrals 24–32, 26; acrostichals 90–99, 94 (3); prealars 23–37, 28; supraalar 1; scutellars 61–68, 64 (3).

Wing with macrotrichia; length 2.12–2.45, 2.28 mm (5); width 0.62–0.79, 0.71 mm (5). Width / length = 0.29–0.32, 0.31 (5). VR 0.82–0.83, 0.83 (3). C not produced beyond R_{4+5} . Brachiolum with 7–9, 8 setae. Squama with 67–76, 70 setae (4).

Legs. Spurs of fore leg 69–83, 75 long (Fig. 5a); mid leg 65–83, 74 and 47–59, 53 long (Fig. 5b); hind leg 71–83, 77 and 51–65, 56 long (Fig. 5c). Comb with 4 spiniform setae. Two pseudospurs on ta_{1-3} of all legs; presence of a row of distinctive spines along the inner margin of ta_{1-3} of mid and hind legs. Lengths and proportions of legs in Table 1.

TABLE 1. Lengths (μm) and proportions of male legs of *Ablabesmyia platensis* n. sp. (n = 6)

	fe	ti	ta_1	ta_2	ta_3
p_1	872–1037, 944	1017–1231, 1103	809–934, 868	477–573, 507	407–498, 438
p_2	975–1141, 1041	975–1141, 1038	757–934, 811	415–498, 451	349–390, 364
p_3	851–1079, 979	1245–1473, 1322	1038–1224, 1110	564–685, 610	432–515, 481
	ta_4	ta_5	LR	BV	SV
p_1	266–332, 299	166–208, 184	0.76–0.85, 0.82	1.99–2.15, 2.04	2.25–2.43, 2.36
p_2	228–270, 247	166–193, 177	0.74–0.82, 0.78	2.24–2.51, 2.33	2.44–2.64, 2.57
p_3	232–332, 304	166–208, 187	0.79–0.90, 0.84	2.10–2.25, 2.16	1.94–2.18, 2.07

Hypopygium (Fig. 8). Setae on tergite IX, 2–3, 3. Phallapodeme 71–75, 72 long (5); transverse sternapodeme 67–76, 72 wide (3). Gonocoxite 177–224, 188 long. Gonostylus 191–220, 202 long; apex of gonostylus 35–41, 38 long; pointed megaseta 35–41, 38 long (Fig. 9). Aedeagal complex (Fig. 10, 14): BL slightly curved, 53–65, 60 long; width of BL 10–14, 12 at base, 16–20, 19 at 1/4, 10–16, 13 at 1/2, 6–10, 7 at 3/4, 2 at 9/10; DL 40–54, 45 long, with 5–6, 5 terminal setae. BDL 53–73, 62 long. BL / BDL 0.79–0.90, 0.84. LL absents. HR 0.90–1.02, 0.93; HV 2.26–2.54, 2.38.

Adult female (n = 3–6, except when otherwise stated) (Figs. 11–13)

Coloration: Thorax and leg pattern coloration as in male. Wing spots Fig. 11.

Total length 3.49–4.8, 3.98 mm. Total length / wing length 1.66–2.12 (2). Wing length / length of profemur 2.53–2.65 (2).

Head. Antenna with 11 flagellomeres (Fig. 12), AR 0.24–0.29, 0.27. Temporal setae 59–86, 77. Clypeus with 37–69, 51 setae. Length of palpomeres 1-5: 60–71, 66; 102–125, 115; 141–166, 153; 166–174, 172; 270–337, 308. Tentorium 182–199, 190 long.

Thorax. Anteprenotum with 14–19, 16 setae. Dorsocentrals 24–33, 28; humerals 18–31, 24; acrostichals 101 (1); prealars 34–54, 43; supraalar 1; scutellars 85–115, 95.

Wing with macrotrichia; length 2.02–2.26, 2.14 mm; width 0.78–0.89, 0.84 mm; width / length = 0.37–0.42, 0.39. VR 0.85–0.95, 0.90. Costa not produced beyond R_{4+5} . Brachiolum with 9–10, 9 setae. Squama with 57–87, 67 setae.

Legs. Spur of fore leg 61–70, 65 long; mid leg 60–71, 64 and 47–57, 51 long; hind leg 67–76, 70 and 51–55, 53 long. Comb with 4 spiniform setae. Lengths and proportions of legs in Table 2.

TABLE 2. Lengths (μm) and proportions of female legs of *Ablabesmyia platensis* n. sp. (n = 6–7)

	fe	ti	ta ₁	ta ₂	ta ₃
p ₁	689–892, 808	821–975, 916	697–768, 735	365–407, 388	291–332, 319
p ₂	830–1038, 971	872–1121, 1020	664–830, 765	357–457, 415	291–374, 329
p ₃	739–934, 873	1038–1370, 1235	955–1121, 1065	523–631, 576	415–481, 449
	ta ₄	ta ₅	LR	BV	SV
p ₁	216–241, 229	149–183, 165	0.78–0.80, 0.79	2.25–2.64, 2.22	2.35–2.44, 2.40
p ₂	216–232, 224	158–183, 168	0.73–0.78, 0.75	2.39–2.88, 2.52	2.55–2.65, 2.60
p ₃	274–307, 288	166–199, 181	0.82–0.88, 0.84	2.12–2.47, 2.21	1.97–2.11, 2.03

**FIGURE 14.** Comparison of aedeagal complex of *Ablabesmyia platensis* n. sp. (left) and *Ablabesmyia bianulata* Paggi (right). BL: larger arrow; DL: shorter arrow; BDL: arrowhead. Scale bar = 20 μm .

Genitalia (Fig. 13). Cercus 73–78, 76 long. Seminal capsule 77–99, 88 long; notum 199–220, 210 long; sternite X with 12–15, 14 setae.

Pupa (n = 15–20, except when otherwise stated) (Figs. 15–20)

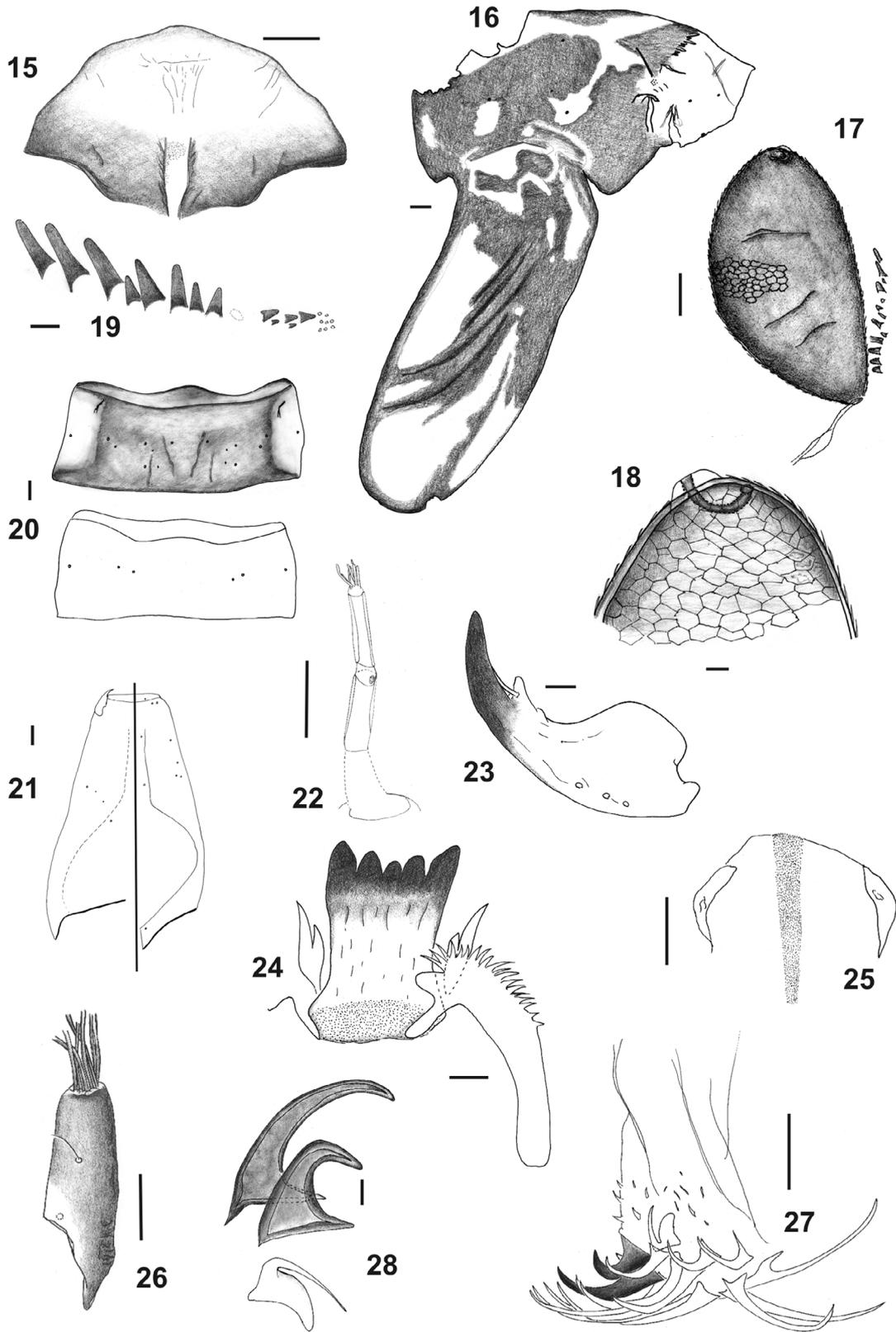
Total length 4.36–6.60, 5.92 mm.

Cephalothorax. Frontal apotome as in Fig. 15. Wing pad pattern with fused spots (Fig. 16) and incomplete veins which are not clearly distinguished.

Thoracic horn (Figs. 17, 18) 560–664, 611 long; 257–374, 313 wide; apical nipple 12–20, 15 (5) long; length of thoracic horn / apical nipple = 0.019–0.032, 0.024. Reticulum distinct, with external spines. End of aeropile "c" shape. Thoracic comb with 15–18, 17 conical spines (Fig. 19), plus short spines near the insertion of the thoracic horn.

Abdomen. Shagreen with very small simple spines in arch, very difficult to discern. Chaetotaxy and coloration pattern as in Fig. 20. Anal lobe length 498–656, 570.

Male genital sac 398–448, 421 (13) long. Position of first lateral setae / segment length = 0.37–0.47, 0.42 on segment VII; 0.30–0.36, 0.34 on segment VIII; 0.38–0.49, 0.44 on anal lobe.



FIGURES 15–28. *Ablabesmyia platensis* n. sp. immatures. Pupa. 15: frontal apotome; 16: cephalothorax; 17: entire thoracic horn; 18: detail of the apex of thoracic horn; 19: thoracic comb; 20: tergite and sternite of IV abdominal segment. Fourth-instar larva. 21: cephalic setation in ventral (left) and dorsal view (right); 22: maxillary palps; 23: mandibule; 24: hypopharyngeal complex; 25: M appendage; 26: procercus; 27: posterior parapod; 28: details of the darker and hooked claws. Scale bars = 20 μ m for Figs. 15, 18, 19; 50 μ m for Figs. 22–26, 28; 100 μ m for Figs. 16, 17, 20, 21, 27.

Fourth-instar larva (n = 7–10, except when otherwise stated) (Figs. 21–28)

Total length 7.3–7.5 mm (2);

Head. Cephalic setation Fig. 21, capsule 892–996, 950 long; 726–872, 792 wide. Antenna: AR 5.90–7.70, 6.41; basal segment 498–581, 529 long. Maxillary palp with two segments (Fig. 22); basal 41–51, 50 long; apical 41–55, 50 long; basal / apical 0.96–1.09, 1.01. Mandible (Fig. 23) 184–215, 198 long. Basal antennal segment / mandible 2.45–2.92, 2.68. Hypopharyngeal complex (Fig. 24): Ligula 99–120, 112 long, with five teeth forming a concave margin, the outer and inner teeth slightly outcurved; Paraligula bifid, 52–61, 56 long; pecten hypopharyngis with 16–17, 17 teeth (4). Appendage M Fig. 25.

Abdomen. Procercus (Fig. 26) 141–183, 163 long; with seven setae 670–847, 780 long. Posterior parapods (Figs. 27, 28): two darker claws, the largest 81–112, 100 high, 71–85, 80 wide; the shorter 67–81, 73 high, 71–81, 75 wide; one hooked claw 37–55, 43 high, 66–81, 73 wide. Claws not (or slightly) pectinate.

***Ablabesmyia bianulata* Paggi**

Ablabesmyia bianulata Paggi, 1987: 329

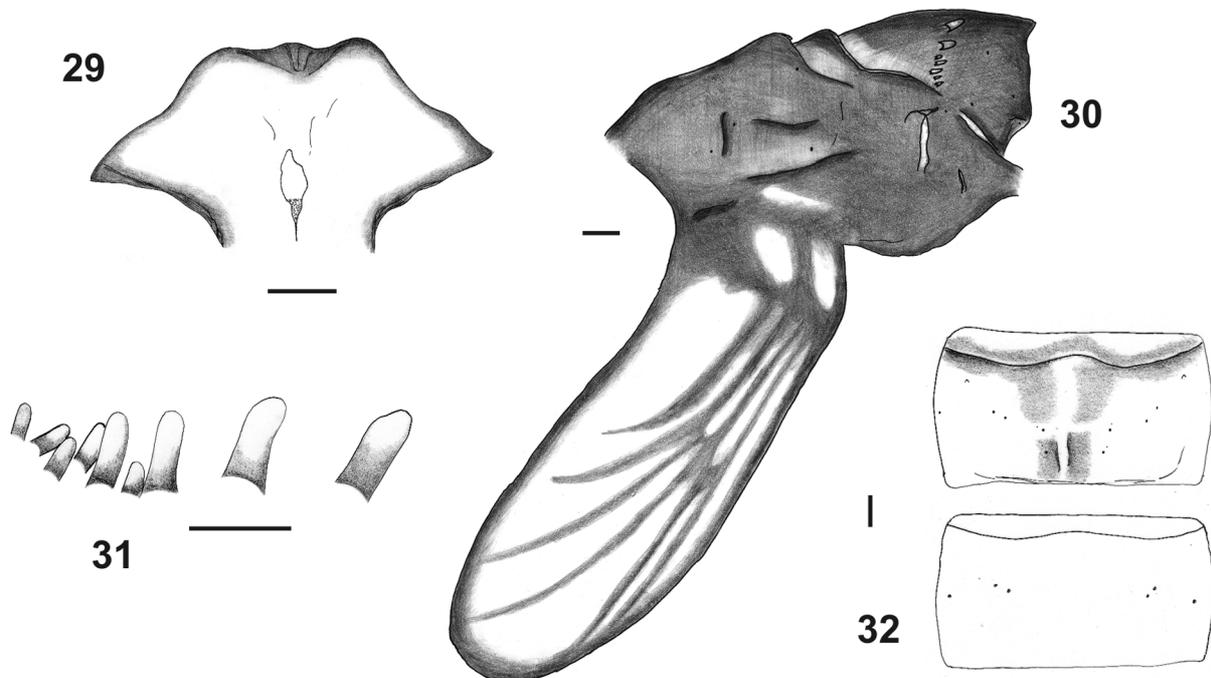
Material examined. Argentina. Neuquen, Ramos Mexía reservoir, male associated with pupal exuviae (ILPLA), 06-XI-1983, kick sample, F. Kaisin. Neuquen, Mari Menuco lake, 5 males (Paratypes), 19-III-1978, S. Coscarón.

Emended diagnosis. Male diagnosis of *Ablabesmyia bianulata* Paggi should be emended as follows: antenna with 14 flagellomeres; tibial comb of hind leg with 5–7 spiniform setae; number of setae on tergite IX = 2–3.

Aedeagal complex redescription: BL (Fig. 14) clearly curved, 25–30, 29 long, width 12–18, 16 at base, 6–10, 8 at 1/4, 6–8, 7 from 1/2 to 3/4, 2 at 9/19; BL produced beyond BDL (BL / BDL ratio: 1.11–1.20, 1.17). The shape of DL is cylindrical with abundant long and thin terminal filaments. LF long and wavy. LL absent.

Pupa (n = 1) (Figs 29–32)

Total length 4.92 mm.



FIGURES 29–32. Pupa of *Ablabesmyia bianulata* Paggi. 29: frontal apotome, 30: cephalothorax, 31: thoracic comb, 32: tergite and sternite of abdominal IV segment. Scale bars = 20 μ m for Fig. 29, 100 μ m for Figs. 30–32.

Cephalothorax. Frontal apotome as in Fig. 29. Wing pad with distinct veins as in Fig. 30.

Thoracic horn 556 long, reticulation distinct, with external spines. Thoracic comb with 12 cylindrical spines (Fig. 31) plus short spines near the insertion of the thoracic horn.

Abdomen. Shagreen with very evident simple spines in arch. Chaetotaxy and coloration pattern Fig. 32.

Anal lobe 457 long, with short spinules bordering the insertion of the first lateral setae.

Male genital sac 374 long. Position of first lateral setae / segment length 0.35 on segment VII; 0.35 on segment VIII; 0.42 on Anal lobe.

Remarks and discussion

The subgenus *Karelia* was erected by Roback (1971) who included the species into the *illinoensis* group of *Ablabesmyia* (Roback 1959). *Ablabesmyia platensis* n. sp. belongs to the subgenus *Karelia* according to the following features: sharp megaseta in the gonostylus of the adult male; distinct reticulation of the thoracic horn and shagreen with simple spines in arch of pupa; maxillary palp with two segments in larva. Although *A. platensis* fits the subgeneric diagnosis of *Karelia*, the apex of the aeropile tube of the thoracic horn is not T-shaped, as it is typical in this subgenus (Roback 1985). However, the significance of this character in the subgeneric placement is uncertain (Caldwell 1993). The apex of the aeropile of *A. bianulata* is broken in the specimen studied, and could not be described.

The male adult of *A. platensis* resembles *A. (Karelia) bianulata*, which was also cited and described from Argentina. These two species can be distinguished by the DL shape and by the BL which is stouter, slightly curved and not produced beyond the BDL in *A. platensis*. These species also differ in the color pattern of thorax and abdomen, in the number of bands on femora (four in *A. bianulata*), as well as in the apex of gonostylus, which is just slightly denticulate in *A. bianulata*. In addition, *A. platensis* has LR₁ and LR₂ higher (0.72–0.74, 0.73 and 0.70–0.73, 0.72 in *A. bianulata*), lower SV I, longer spurs (p₁: 54, p₂: 56 and 43; p₃: 57 and 45 in *A. bianulata*), lower number of spines in the tibial comb of p₃ and higher number of squamals (35–39, 36 in *A. bianulata*).

The female of *A. platensis* differs from *A. bianulata* by the higher ratio between total length / wing length. As in the male, the LR, SV values are higher and spurs are longer in *A. platensis*. In addition, VR, BV, LR are slightly higher and the cercus is longer in *A. platensis* than in *A. bianulata*.

The pupa is distinct by the pattern of the wing pad, with complete venation and without spots in *A. bianulata*, but with fused spots and incomplete venation in *A. platensis*. The shagreen in *A. platensis* is very smooth and very difficult to discern, while in *A. bianulata* is clearly evident. Moreover, *A. bianulata* has fewer spines in the thoracic comb, they are longer, stouter and apically rounded.

Ablabesmyia platensis n. sp. is also similar to the Neotropical *A. oliveirai* Oliveira *et* Gessner, differing in the coloration pattern of thorax and abdomen. Moreover, in the later species the tibia of fore leg is four banded, the DL (VoM in Oliveira & Fonseca-Gessner 2006) demonstrates numerous long and thin terminal filaments, the tip of BL is rounded (VoS in Oliveira & Fonseca-Gessner 2006), the BL does not reach the BDL, the LR₁ is lower and the LR₂, LR₃ are higher (0.73, 0.88 and 0.90 in *A. oliveirai* for p₁, p₂ and p₃ respectively), the tibial spurs are shorter (52–67 in p₁; 59–63 and 37–58 in p₂; 50–67 and 65–89 in p₃ of *A. oliveirai*) and the AR is higher (2.1–2.38 in *A. oliveirai*, C. Oliveira pers. comm). Additional slight differences between these species are as follow: coloration of ta₅ (pale in all legs in *A. oliveirai*); number of humerals (8 in *A. oliveirai*), scutelars (16–28 in *A. oliveirai*) and squamals (28–30 in *A. oliveirai*), as well as a slightly different HR value (1.0–1.1 in *A. oliveirai*).

The pupa differs mainly by the color pattern of the wing pad, with fused spots and veins not well distinguishable in the new species, and clear venation and no spots in *A. oliveirai*. The abdominal segments of the pupa of *A. oliveirai* are completely yellowish to brownish, while in *A. platensis* there is a central dark brownish band, which extends laterally in the posterior region (C. Oliveira, pers. comm). Also, the lateral margin of the frontal apotome of *A. oliveirai* are concave, but convex in *A. platensis*. Concerning larvae, the presence of a hooked claw in the posterior parapods, absent in *A. oliveirai*, helps to separate both species

(Roback 1985, Epler 2001). In addition, the outer margin of apical claws of the posterior parapods is clearly serrated in *A. oliveirai*.

As in *A. electrohispaniolana* Grund, *A. bianulata* and *A. oliveirai*, the fourth palpomere in adult of *A. platensis* is subequal to the third (prior to Saether 1980, third and second palpomeres respectively) (Roback 1971, Murray & Fittkau 1989). This is unusual, because in the remaining species of *Ablabesmyia* the fourth palpomere is shorter than the third (Paggi *et al.* 2009).

Ablabesmyia (*K.*) *cinctipes* Roback shares with *A. platensis* and *A. bianulata* the five banded ti_1 , but the male differs in the coloration of ti_3 , and in the lower LR_1 and the higher LR_2 . The main differences between these species were found in the larva, in which *A. cinctipes* has three darker claws in the posterior parapods and lacks the strong acute hooked claw in the posterior parapods (Caldwell 1993). Furthermore, the AR is higher in *A. platensis* and the pattern coloration of pupal abdominal segments also differs.

A revision of all life stages of *Ablabesmyia* is strongly needed in order to find consistent, reliable diagnostic characters for all species.

Acknowledgments

The authors wish to thank Dr. Caroline Neubern de Oliveira (Universidade Federal do Paraná - UFPR, Brasil) for her valuable contribution in the discussion of the brasilian material; to unknown reviewers for their valuable comments on the manuscript; Dr. Mariano Donato (LASBE-CONICET) for providing the samples from Gonnet and Mrs. Mónica Caviglia (ILPLA, CCT-La Plata, CONICET, UNLP) for kindly helping with the English version of the manuscript, which is a Scientific Contribution N° 873 of the Institute of Limnology "Dr. R.A. Ringuelet" (ILPLA, CCT-La Plata, CONICET, UNLP).

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