

## A revision of the Patagonian predaceous midges of the genus *Palpomyia* Meigen (Diptera: Ceratopogonidae)

Gustavo R. Spinelli<sup>a,\*</sup>, William L. Grogan, Jr.<sup>b</sup> and María M. Ronderos<sup>a</sup>

<sup>a</sup>División Entomología, Museo de La Plata,

Paseo del Bosque s/n, 1900 La Plata, Argentina

<sup>b</sup>Department of Biological Sciences, Salisbury University,

Salisbury, MD 21801, USA

\*Corresponding author, e-mail: spinelli@fcnym.unlp.edu.ar

This revision of the predaceous midges in the genus *Palpomyia* Meigen inhabiting the Patagonian region of Argentina and Chile recognizes eight species, provides diagnoses, descriptions, illustrations and a key to all species, as well as new distributional records of previously described species. Four new species are described and illustrated: *P. mapuche*, *P. marinoi*, *P. septentrionalis* and *P. yamana* (spp. n.). *Palpomyia patagonica* Ingram and Macfie and *P. subfuscata* I. and M. are redescribed and illustrated, the previously unknown male of *P. patagonica* is described and illustrated, and *P. subaspera* (Coquillett) is recorded for the first time from Patagonia. *Palpomyia chilensis* Ingram & Macfie is transferred to *Austrosphaeromias* Spinelli (n. comb.).

### Keywords

Taxonomy, *Palpomyia*, Patagonia, new species, distribution

### Introduction

The predaceous midges of the genus *Palpomyia* Meigen are usually common inhabitants of streams, lakes, and ponds, swamps, marshes and sphagnum bogs (Grogan & Wirth 1975, 1979). The genus occurs in all major biogeographic regions of the World except for Antarctica, and 46 species are currently known from the Neotropics (Borkent & Spinelli, 2007).

Only six species of *Palpomyia* have previously been described from Patagonia, all by Ingram & Macfie (1931): *P. aculeata*, *P. apricans*, *P. chilensis*, *P. patagonica*, *P. sentior* (as a variety of *P. apricans*) and *P. subfuscata*. Subsequent to the publication of this pioneering work, *P. aculeata*, *P. chilensis*, *P. patagonica*, and *P. subfuscata* have not been studied further, other than being cataloged (Wirth 1974; Borkent & Wirth 1997; Borkent & Spinelli 2000, 2007) or listed (Spinelli & Wirth 1993; Spinelli 1998; Muzón et al. 2005).

Spinelli (1997) recently transferred *P. apricans* and *P. sentior* to the new genus, *Austrosphaeromias*, in the related tribe, Sphaeromiini. Examination of specimens of *P. chilensis* revealed that it and another undescribed Patagonian species also belong in *Austrosphaeromias*. We will address these two species in another study.

During the past 20 years, several collecting trips in the Argentinean and Chilean portions of Patagonia yielded small to moderate-sized collections of adult *Palpomyia*. Herein, we present a taxonomic revision of Patagonian *Palpomyia* based on specimens in the Museo de La Plata, Argentina (MLPA), the Canadian National Collection (CNCI), and the Natural History Museum, London (BMNH).

## Material and methods

Specimens were collected with Malaise and light traps or by sweeping flowers and other vegetation along the margins of rivers, streams and lakes. Due to the oligotrophic nature of nearly all streams and lakes in Patagonia, our collecting efforts typically produced only one to several specimens from most sites. All specimens were preserved in 70% ethanol and subsequently cleared, dissected and mounted onto microscope slides in Canada balsam for more detailed study. They were examined and measured at 40–400× with a binocular compound microscope and drawings of certain diagnostic characters were prepared with an attached camera lucida.

Types of our new species are deposited in the entomological collection in the Museo de La Plata, Argentina (MLPA). When available, paratypes will be deposited in the US National Museum of Natural History, Washington, DC (USNM), the Natural History Museum, London (BMNH), and in the Canadian National Collection of Insects (CNCI). Terminology of major structures follows those in the Manual of Nearctic Diptera (McAlpine et al. 1981). Specific terms of Ceratopogonidae including their genitalia and wing venation are those by Downes and Wirth (1981) in the same manual except for recent modifications of wing veins and cells proposed by Szadziewski (1996), which were summarized in a table by Spinelli and Borkent (2004). Species group definitions are from the revisions of the Nearctic species of *Palpomyia* by Grogan and Wirth (1975, 1979) with modifications as noted herein for the *distincta* group.

## Results

Key to the Patagonian species of *Palpomyia* (males of *P. marinoi*, *P. septentrionalis*, and *P. yamana* are unknown)

1. Female with spines on all femora (Fig. 3); sternite 8 without prominent setose lobes arising from anterolateral margins of sternite; 5th tarsomeres with two ventrolateral rows of stout bristle-like setae; mid and hind claws enlarged, longer than fore claws (Fig. 4); wing with distal portion of costa curved or straight, costal ratio 0.88–0.91 (Fig. 5); head broader than long in anterior view, flattened dorsoventrally (Fig. 55). Male genitalia elongate, tilted dorsally 45°; gonocoxite without

- mesoventral lobe; parameres completely divided with recurved tips (Figs 8, 9) (*tibialis* group)..... 2
- Female fore femur spinose, mid and hind femur with spines present or absent; sternite 8 with prominent setose lobes arising from anterolateral margins of sternite (Figs 14, 22, 28, 37, 44, 53); 5th tarsomeres with or without two ventrolateral rows of stout, bristlelike setae; claws equal- or nearly equal-sized (Figs 35, 42); wing with distal portion of costa straight, costal ratio <0.80 (Figs 13, 21, 27, 36, 43, 52); head round in anterior view (Figs 56–61). Male genitalia shorter, not tilted dorsally at 45°; gonocoxite with setose mesoventral lobe; parameres divided or fused, with rounded tips (Figs 16, 17, 30, 31, 46, 47) (*distincta* group)..... 3
2. Female legs yellow with distal 1/4–1/5 of hind femur and apex of hind tibia dark brown (Fig. 3); wing with distal portion of costa and radius curved; costal ratio 0.89–0.91 (Fig. 5). Male parameres completely divided with recurved tips bearing minute spicules (Fig. 9)..... *P. subaspera* (Coquillett)
- Female legs brown, distal 1/3–1/2 of fore and mid and all of hind femur dark brown; wing with distal portion of costa and radius straight, costa slightly shorter, costal ratio 0.87. Male unknown..... *P. aculeata* Ingram & Macfie
3. Scutum without anterior tubercle ..... 4
- Scutum with anterior tubercle ..... 5
4. Female legs dark brown, broad bases of fore and mid femora, and broad mid portion of tibiae lighter brown (Fig. 26); flagellomeres 9–12 1.6× longer than flagellomere 8 (Figs 24, 58). Male parameres with distal 1/3 divided, bulbous..... *P. patagonica* Ingram & Macfie
- Female fore and mid legs golden brown, femorotibial joints and apices of tibiae dark brown, hind femur and tibia dark brown (Fig. 20); flagellomeres 9–12 2.4× longer than flagellomere 8 (Figs 18, 57). Male unknown ..... *P. marinoi* sp. n.
5. Female 5th tarsomeres without ventral setae (Fig. 12). Male gonocoxite with elongate mesoventral lobe (Fig. 16) ..... *P. mapuche* sp. n.
- Female 5th tarsomeres of at least hind leg with 2 rows of ventral setae (Figs 35, 42, 51). Male gonocoxite with short ventral lobe (Fig. 46) ..... 6
6. Female eyes very broadly separated (Fig. 59); 5th tarsomeres of all legs with ventral setae with straight tips; claws small, equal sized (Fig. 35); sternite 8 with small anterior semicircular tuft of 8–9 setae (Fig. 37); base of M broadly sessile (Fig. 36). Male unknown ..... *P. septentrionalis* sp. n.
- Female eyes narrowly separated (Figs 60–61); only 5th tarsomeres of hind leg with ventral setae with curved tips (Figs 42, 51); hind claws longer than fore and mid claws (Fig. 51); sternite 8 without anterior semicircular tuft of setae (Figs 44, 53); base of M narrowly sessile (Figs 43, 52). Male gonocoxite with short mesoventral lobe; parameres partially divided (Figs 46, 47) (male of *P. yamana* sp. n. unknown)..... 7
7. Female: legs dark brown, bases of fore femur and tarsi slightly paler; fore femur slightly swollen with 7–11 ventral spines (Fig. 41); hind claws moderately elongate; abdomen with one pair of gland rods. Male parameres with proximal 2/3

- subdivided, distal 1/3 completely divided with apical portion slightly bulbous ..... *P. subfuscata* Ingram & Macfie
- Female: legs bright yellow, femorotibial joints dark; fore femur greatly swollen with 20–22 ventral spines; hind claws greatly elongate (Fig. 50); abdomen with four pairs of gland rods. Male unknown..... *P. yamana* sp. n.

### ***Tibialis* Group**

Diagnosis. Female 5th tarsomeres with two ventrolateral rows of stout bristle-like setae, mid and hind claws larger than fore claws, head broader than long, flattened dorsoventrally, and wing with costa extending 0.87–0.91 of wing length. Male genitalia elongate, tilted dorsally 45° and parameres divided with recurved tips.

### ***Palpomyia subaspera* (Coquillett) (Figs 1–9, 55)**

*Ceratopogon subasper* Coquillett, 1901: 606 (female; USA)

*Palpomyia subasper*: Malloch, 1914: 22 (combination); Johannsen, 1943: 784 (in list of USA species); Johannsen, 1952: 166 (in key); Snow et al., 1957: 34 (habitat notes); Wirth, 1965: 140 (distribution).

*Palpomyia subaspera*: Grogan & Wirth, 1975: 10 (lectotype designation; redescription); Grogan & Wirth, 1979: 23 (description, adults, pupa; distribution; *P. essigi* as synonym); Spinelli & Wirth, 1993: 68 (*P. maculicrus* as synonym); Borkent & Wirth, 1997: 134 (in World catalog); Spinelli, 1998: 326 (in list of Argentinean species); Borkent & Spinelli, 2000: 64 (in catalog of species south of USA); Borkent & Spinelli, 2007: 96 (in Neotropical synopsis).

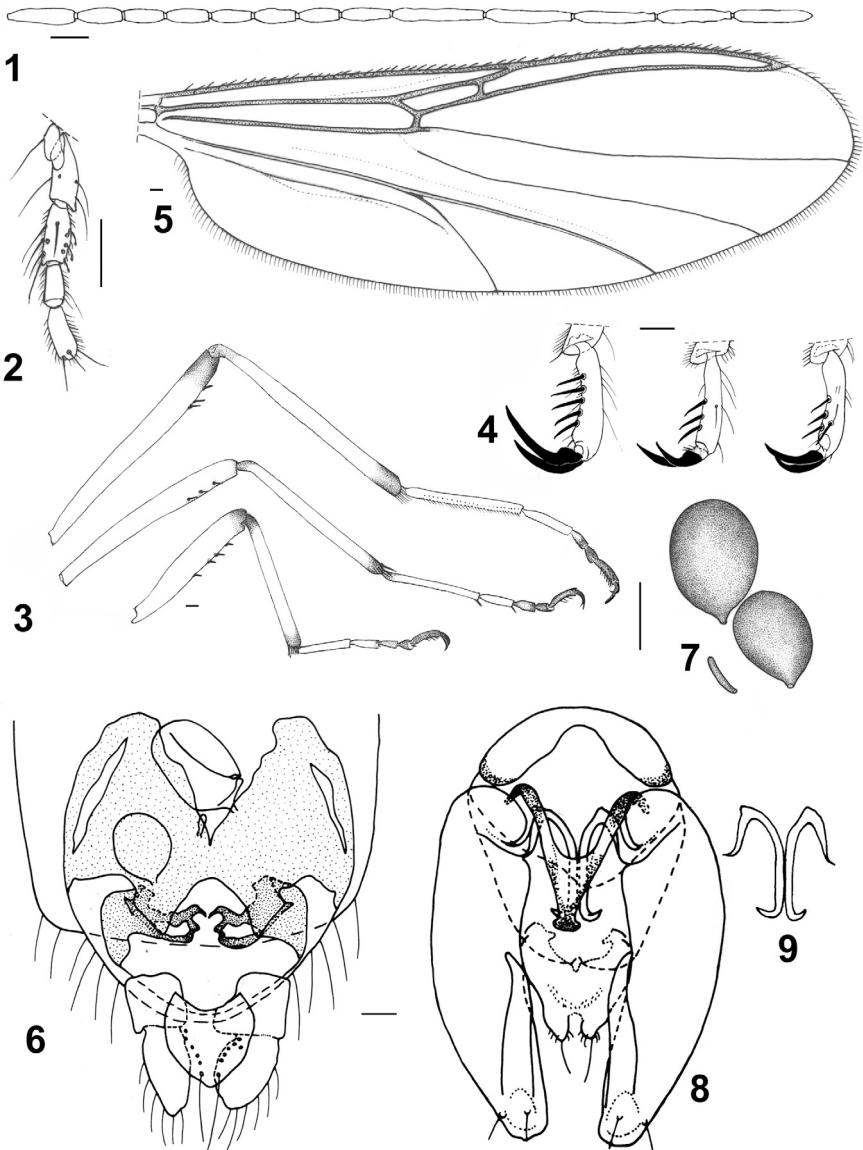
*Palpomyia essigi* Wirth, 1952: 225 (female, male; California); Wirth, 1965: 140 (distribution).

*Palpomyia maculicrus* Ingram & Macfie, 1931: 230 (female; Argentina); Wirth, 1974: 55 (in catalog of species south of USA).

Diagnosis. The only Patagonian *Palpomyia* in the *tibialis* group in which females have spinose femora, yellow legs with the distal ¼ of hind femur and apex of the hind tibia dark brown, and a wing with the distal portion of costa and radius curved and elongate (costal ratio 0.89–0.91). Male have elongate genitalia that are tilted dorsally 45° and divided parameres with recurved tips bearing minute spicules.

### *Description of female*

Head (Fig. 55). Brown. Eyes widely separated, by diameter of 2–3 ommatidia. Antennal flagellum (Fig. 1) dark brown; flagellomeres slender, 10–13 2–3× longer than 1–8; antennal ratio 1.48 (1.40–1.60,  $n=10$ ). Palpus (Fig. 2) lighter brown, slender; palpal ratio 2.17–2.80. Mandible heavily sclerotized; inner margin with 10–14 long, sharply pointed teeth.



**Figs 1–9.** *Palpomyia subaspera*. 1–7, female, 8 and 9, male. 1, flagellum; 2, palpus; 3, legs (top to bottom: hind, mid, fore); 4, 5th tarsomeres and claws (left to right: hind, mid, fore); 5, wing; 6, female genitalia (segments 8–10), in ventral view; 7, spermathecae; 8, male genitalia; 9, parameres. Scale bars: 0.05 mm.

Thorax. Dark reddish brown to dark brown. Legs (Fig. 3) with femora and tibiae yellow, distal  $\frac{1}{4}$  of hind femur and apex of hind tibia dark brown; fore femur, with 6–10 spines, mid femur with 2–5 spines, hind femur with 2–6 spines; tarsi with proximal 3 tarsomeres yellow, distal 2 brown; 5th tarsomeres of mid and hind legs (Fig. 4) with 2 ventrolateral rows of stout, bristle-like setae with curved tips; claws

large, hind longer than mid, mid longer than fore. Wing (Fig. 5) length 3.08 (2.96–3.22,  $n = 10$ ) mm, width 0.97 (0.90–1.00,  $n = 10$ ) mm; costal ratio 0.90 (0.89–0.91,  $n = 10$ ); membrane hyaline; anterior veins darker brown than posterior veins; M sessile, distance between bases of r-m crossvein and  $M_2$  the same length of r-m; 2nd radial cell elongate,  $3.25\times$  (3.19–3.35,  $n = 10$ ) longer than 1st, distal portion curved; costa very long, curved distally. Halter brown.

Abdomen. Dark reddish brown; with up to 4 pairs of gland rods. Genitalia as in Fig. 6. Sternite 8 moderately sclerotized; anterior margin with deep V-shaped excavation that is  $1/2$ – $2/3$  of total length; lateral portions with narrow, elongate openings; posterior margin with cleft about  $1/4$  of total length. Sternite 9 more heavily sclerotized; each half with pointed, hook-like apex and narrow, posterior open area. Sternite 10 shield-shaped, anterior margin concave; with 6 or more pairs of large setae. Two spermathecae (Fig. 7) moderately large, unequal-sized, ovoid to subspherical with short, narrow necks, measuring 111 (106–120,  $n = 10$ ) by 78 (75–82,  $n = 10$ )  $\mu$ , and 80 (77–82,  $n = 10$ ) by 60 (58–62,  $n = 10$ )  $\mu$ ; plus a rudimentary third spermatheca.

Male. Similar to female with the following notable sexual differences. Smaller; mandible slender, with only a few small apical teeth; femora, tibiae more diffused with brown; 2–4 fore, 0–3 mid and 0–4 hind femoral spines; 5th tarsomeres with fewer, smaller ventrolateral setae; wing length 1.55 (1.52–1.58,  $n = 2$ ) mm; width 0.51 (0.50–0.52,  $n = 2$ ) mm; costal ratio 0.76 (0.75–0.77,  $n = 2$ ); 2nd radial cell  $2.35\times$  (2.20–2.50,  $n = 2$ ) longer than 1st. Abdomen brown. Genitalia as in Fig. 8. Tergite 9 tapering slightly distally to rounded apex, cercus moderately long, setose; sternite 9  $3.5\times$  broader than long, base greatly curved with a deep caudomedian excavation. Gonocoxite curved, elongate, about  $4\times$  longer than broad, extending considerably beyond apex of tergite 9; gonostylus about  $1/2$  length of gonocoxite, gradually tapering distally, tip curved, apex pointed. Parameres (Fig. 9) divided, heavily sclerotized; basal arm slender, recurved about  $120^\circ$ ; distal portion slender, with recurved, narrow tips bearing minute spicules. Aedeagus heavily sclerotized, triangular; basal arm recurved over  $90^\circ$ ; distal portion gradually tapering distally, apex broader, somewhat crescent-shaped.

Distribution. North America (Alberta to Ontario, south to California, Florida), Mexico, Haiti, Cuba, Paraguay, Chile and Argentina (Fig. 62).

Type material. Lectotype female, USA, New Mexico, Doña Ana County, Mesilla, 15-VII-1897, T.D.A. Cockerell (Type no 59958, USNM, examined).

Other specimens examined. Argentina: Río Negro prov., Villa Regina, 16-I-2006, W. Grogan-G. Spinelli, 2 females, sweep net; Rincón de Comi-Co,  $41^\circ 08' 35.1''$  S,  $67^\circ 27' 34.6''$  W, 1000 m, 7-II-2006, G. Spinelli, 1 female, Malaise trap; Chubut prov., provincial route 35, 33 km SW Cushamen, 520 m, 10-II-2006, G. Spinelli, 2 females, 2 males, sweep net.

Chile: Valparaiso prov., Los Perales at río Marga, 330 m, 3-II-1967, M.E. Irwin, 12 females.

Biology. In the Nearctic region, this species can be very abundant along the margins of streams, ponds and lakes, but has only been reared infrequently. The pupa was described by Grogan & Wirth (1979). In Argentinean Patagonia, *P. subaspera* was

collected in Villa Regina from the margins of the large Río Colorado, and a deep pond alongside a road in northern Chubut province.

Remarks. This is the first record of this widely distributed species from Chile.

### ***Palpomyia aculeata* Ingram & Macfie**

*Palpomyia aculeata* Ingram & Macfie, 1931: 215 (female; Chile); Wirth, 1974: 54 (in catalog of species south of USA); Borkent & Wirth, 1997: 130 (in World catalog); Borkent & Spinelli, 2000: 62 (in catalog of species south of USA); Borkent & Spinelli, 2007: 95 (in Neotropical synopsis).

Diagnosis. The only Patagonian *Palpomyia* in the *tibialis* group in which females are very large (wing length >4.0 mm), have dark brown legs, and a wing with a straight, moderately short costa (costal ratio ca. 0.87). Male unknown.

#### *Redescription of female (modified from Ingram & Macfie, 1931)*

Head. Very dark brown. Eyes separated by a narrow wedge-shaped space. Antenna dark brown; flagellomeres 2–8 subcylindrical, of subequal lengths; flagellomeres 9–12 elongate, approximately 2.5× longer than flagellomere 8; flagellomere 13 considerably longer than flagellomeres 9–12 with somewhat conical tip; antennal ratio 1.80. Palpus dark brown, segments cylindrical; segment 3 not inflated, only slightly longer than segment 5; segment 4 small (short), about ½ length of segment 3.

Thorax. Amber brown, slightly paler at shoulders. Scutum shiny, with small, pointed anterior tubercle, numerous short setae and 3–4 supralar setae; scutellum lighter brown than scutum with numerous small setae, 6 larger setae. Legs uniformly dark brown, base of fore femur paler; fore femur slightly swollen with 30 spines, mid femur with 1–2 and hind femur with 3–4 spines; 5th tarsomeres on all legs armed with 4–8 stout, dark setae. Wing length ca. 4.7 mm, width 1.3 mm; costal ratio ca. 0.87; membrane slightly infuscated; M broadly sessile, distance between r-m crossvein and base of M<sub>2</sub> 3× longer than r-m. Halter knob yellowish.

Abdomen. Light brown, slightly darker posteriorly. Presence of gland rods and shapes of spermathecae undetermined.

Male Unknown.

Distribution. Known only from the type-locality on Chiloe Island, Chile (Fig. 62).

Type material. Holotype female, Chile: Chiloe Island, Ancud, -XII-1926, F. & M. Edwards (BMNH, examined).

Remarks. The pinned female holotype is badly damaged with only the thorax, legs and one wing remaining. This wing was mounted in Canada balsam on a small piece of glass and examined, and therefore, we can confirm the original description of this structure by Ingram & Macfie (1931). Our inclusion of this species in the *tibialis* group is tentative, but we are somewhat confident that it belongs in this group due to its large size (wing length ca. 4.0 mm) and 5th tarsomeres with ventrolateral stout setae. As noted above, the wing length and costal ratio in the original description by Ingram & Macfie (1931) are probably inaccurate because these measurements were

likely based on total wing length as measured from its attachment site on the thorax, not from the basal arculus, as is modern practice.

Spinelli (1997) proposed the new Patagonian predaceous sphaeromiine genus, *Austrosphaeromias*, that included a species described by Ingram & Macfie (1931), *Palpomyia apricans*, from Argentina and Chile (+ its synonym, *P. sentior* I. & M.) and the new species, *A. wirthi* Spinelli, from the female holotype from Argentina. We have tentatively assigned *P. aculeata* to the *tibialis* group. However, Spinelli considered the possibility that this species may actually be a member of *Austrosphaeromias*, but it is impossible to presently determine its true status until more specimens are discovered.

Additionally, an examination of several specimens of *Palpomyia chilensis* Ingram & Macfie from Patagonia revealed that both sexes do not possess any of the characters of the four species groups of *Palpomyia* proposed by Grogan & Wirth (1975, 1979). Conversely, these specimens exhibit several characters that indicate that this species is actually a member of *Austrosphaeromias*, and we transfer it to that sphaeromiine genus (new combination).

### ***Distincta* Group**

Diagnosis. Female with sternite 8 with a pair of prominent setose lobes arising from anterolateral margins of sternite, the proximal portion of sternite usually separate from distal portion and with scattered setae, distal portion of sternite hyaline and divided or partially divided posteriorly, mid and hind femora with or without spines, 5th tarsomeres with or without 2 ventrolateral rows of stout setae, and with a round head. Male gonocoxite usually with setose mesobasal lobe, aedeagus broadly triangular and apex with underlying hyaline, arrowhead-shaped tip.

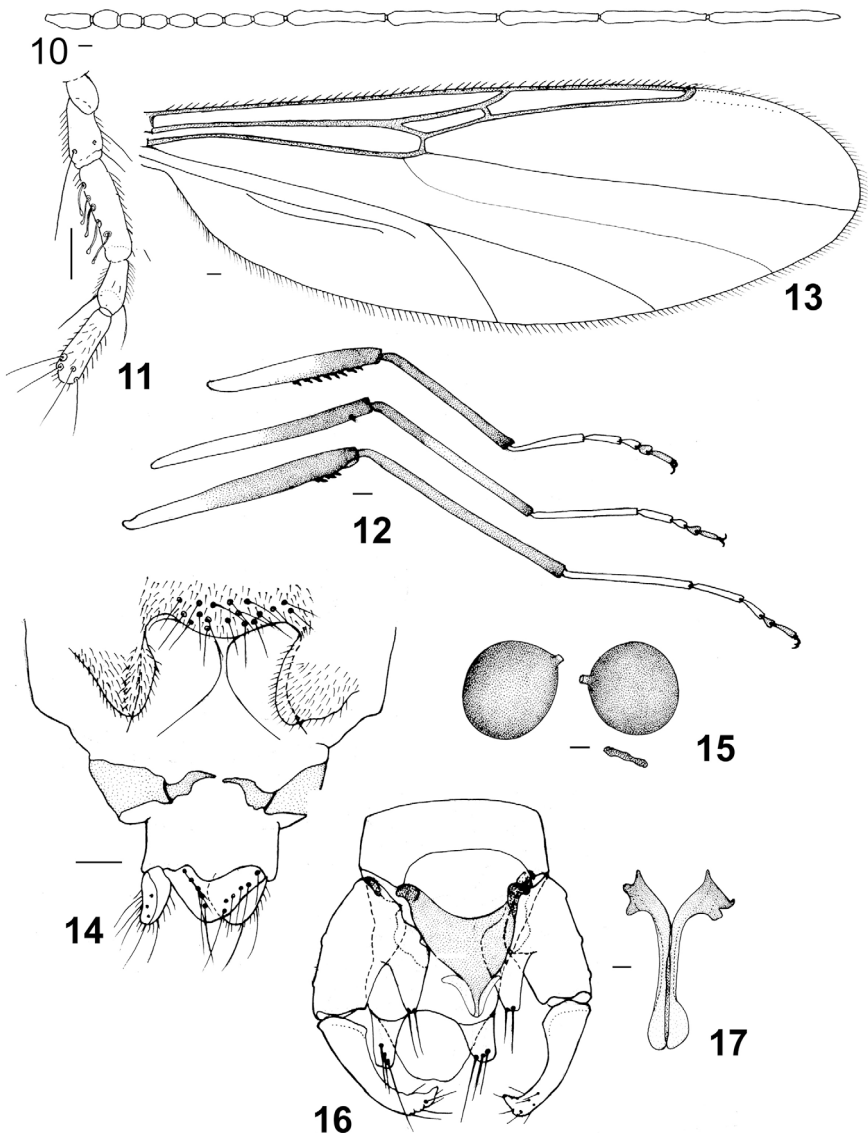
### ***Palpomyia mapuche* Spinelli, Grogan & Ronderos sp. n. (Figs 10–17, 56)**

Diagnosis. Only Patagonian *Palpomyia* of the *distincta* group with a scutum with a short anterior tubercle and female with fore femur slender, the fore and hind femora and often mid-femur with spines, and 5th tarsomeres without ventral setae. Male with legs mainly dark brown, a gonocoxite with greatly elongate mesoventral lobe, parameres divided, and a gonostylus as long as gonocoxite.

#### *Description of female*

Head (Fig. 56). Dark brown, clypeus slightly paler. Eyes separated by diameter of 2 ommatidia. Antennal flagellum (Fig. 10) dark brown (bases of flagellomeres slightly paler in one specimen); flagellomeres 2–8 vasiform, short; flagellomeres 9–12 of subequal lengths, each approximately 3.1× longer than 8; flagellomere 13 slightly longer than 12 with somewhat conical tip; antennal ratio 2.22 (2.08–2.36,  $n = 10$ ). Palpus (Fig. 11) slightly paler than flagellum; segment 3 slender with about 5 capitate sensilla. Mandible with 7–9 ( $n = 10$ ) large teeth.





**Figs 10–17.** *Palpomyia mapuche* sp. n. 10–15, female, 16 and 17, male. 10, flagellum; 11, palpus; 12, legs (top to bottom: fore, mid, hind); 13, wing; 14, female genitalia (segments 8–10) in ventral view; 15, spermathecae; 16, male genitalia; 17, parameres. Scale bars: 0.05 mm.

Thorax. Dark brown. Scutum with very small anterior tubercle, sparsely covered with short setae and 2–3 supralar setae; scutellum with 4–6 setae. Legs (Fig. 12) pale yellowish, brown on distal 1/5 of hind femur, narrow apices of fore and hind tibia, femoro-tibial joints dark brown; tarsomeres 1–3 pale, 4–5 brownish; fore femur slender; femora with 5–8 (foreleg), 0–2 (midleg), 2–3 (hindleg) ventral spines, ventral palisade setae in two rows on tarsomeres 1–2 of hindleg; 5th tarsomeres without ventral setae. Wing (Fig. 13) length 2.74 (2.24–3.08,  $n = 8$ ) mm, width 0.89 (0.76–1.00,  $n = 10$ ) mm;

costal ratio 0.76 (0.74–0.79,  $n = 8$ ); membrane very slightly infuscated, anterior veins pale brown; M sessile, distance between r-m crossvein and base of  $M_2$  slightly longer than r-m; 2nd radial cell  $2.35\times$  (2.25–2.65,  $n = 10$ ) longer than 1st. Halter pale brown.

Abdomen. Dark brown. One pair of gland rods extending to anterior margin of tergite 5 (these structures poorly developed in two specimens). Genitalia as in Fig. 14. Sternite 8 with tuft of setae anterior to hyaline plates; two large, blunt setose lobes extend onto hyaline plates. Sternite 9 moderately sclerotized with pair of slender, pointed, mesally directed arms. Sternite 10 stout, with 5–6 pairs of large setae. Two globular, slightly unequal spermathecae (Fig. 15) with narrow, moderately long necks (one spermatheca is rudimentary in one specimen), measuring 64 (60–68,  $n = 8$ ) by  $55\ \mu\text{m}$  (50–58,  $n = 10$ ), and 57 (52–60,  $n = 10$ ) by  $51\ \mu\text{m}$  (46–56,  $n = 10$ ); plus a rudimentary 3rd spermatheca.

Male. Similar to female with the following notable sexual differences. Lengths of flagellomeres 10–13 in proportion of 9:21:22:29. Legs dark brown, base of femora pale, broad midportion of mid-tibia slightly paler, tarsomeres 1–2 pale, 3–5 darker. Wing length 1.90 (1.82–2.00,  $n=8$ ) mm, width 0.56 (0.54–0.62,  $n=8$ ) mm; costal ratio 0.71 (0.70–0.72,  $n=8$ ); 2nd radial cell  $2.0\times$  (1.8–2.1,  $n = 4$ ) longer than 1st. Genitalia as in Fig. 17. Tergite 9 narrowing slightly distally, posterior margin somewhat notched, cerci elongate extending beyond gonocoxites; sternite 9  $2.3\times$  broader than long, with moderately deep posteromedian excavation. Gonocoxite straight,  $1.6\times$  longer than broad with elongate, pointed mesoventral lobe bearing 3 large subapical setae; gonostylus as long as gonocoxite, curved distally with slightly pointed tip. Parameres (Fig. 17) divided, moderately sclerotized; basal arm short, trifurcate, distal portion with expanded, rounded tip. Aedeagus triangular, as long as broad, moderately sclerotized; basal arm short, heavily sclerotized; basal arch extending 0.2 of total aedeagus length; distal portion narrowed distally with underlying, hyaline arrowhead-shaped tip.

Distribution. Argentina (western Neuquen and Río Negro provinces); Chile (Valdivia province) (Fig. 63).

Type material. Holotype male, allotype female, Argentina: Neuquen prov., Lanin National Park, Hua-Hum, 28-I-1988, G. Spinelli, sweep net; paratypes, 10 males, 17 females, as follows: same data as holotype, 1 male; same data except 17-I-2006, W. Grogan-G. Spinelli, 3 males; Neuquen prov., Lanin National Park, arroyo Quechu-Quina and lago Lacar, 18-I-2006, W. Grogan-G. Spinelli, 2 females, sweep net; Neuquen prov., Nahuel Huapi National Park, northern shore lago Espejo, 12-I-2004, G. Spinelli, 1 male, sweep net (BMNH); Neuquen prov., Junín de los Andes, río Chimehuin, 17-I-2006, W. Grogan-G. Spinelli, 1 male, 1 female, sweep net (USNM); Río Negro prov., Nahuel Huapi National Park, río Guillermo, 20-I-2006, W. Grogan-G. Spinelli, 1 female, sweep net; Río Negro prov., Nahuel Huapi National Park, Bariloche, lago Escondido, 3-XII-1988, D. Añon Suarez, 1 male, 1 female, CDC light trap; Río Negro prov., El Bolsón, 28-XI-1999, G. Spinelli, 2 females, at light; Río Negro prov., Nahuel Huapi National Park, río Manso Superior,  $41^{\circ}14'8.1''\text{S } 71^{\circ}46'58.5''\text{W}$ , 845 m, 7-II/2-III-2007, Garre-Montes de Oca, 1 female, Malaise trap (BMNH); Río Negro

prov., Nahuel Huapi National Park, Biological Station Puerto Blest, 41°01'34.4"S 71°48'55.7"W, 791 m, 1/5-II-2007, Garre-Montes de Oca, 1 female, at light.

Chile: Valdivia prov., Lanco, río Las Cruces, 2-I-1966, Flint & Cekalovic, 1 male; Osorno prov., Aguas Calientes (JAD 1591/7), no other data, 1 female (CNCI); Osorno prov., around Osorno (JAD 1687/3), 31-XII-1984, 1 male, 1 female, J. Downes, sweep net (CNCI); Malleco prov., Malleco river bridge in Angol-Collipulli road (JAD 1679/1), 23-XII-1984, J. Downes, 1 male, 2 females, sweep net (CNCI); same data except 27-XII-1984, 1 female (JAD 1683/1); Llanquihue prov., around Ralún (JAD 1696/5), 12-I-1985, J. Downes, 1 female; Chiloe Is., 1.8 km S Huillinco (JAD 1690/3), 3-I-1985, 42° 39" S, 73° 52" W, 65 m, J. Downes, 1 female (CNCI); same data except 4-I-1985, 1 female (JAD 1691/2).

Derivation of specific epithet. The species name is a reference to the Mapuche Indians, early inhabitants of the type-locality and surrounding area.

Remarks. Females of this new species are readily distinguished from other Patagonian congeners in the *distincta* group by their mainly pale yellowish legs and slender fore femur. Males have dark legs, characteristic genitalia with the mesoventral lobe of the gonocoxite greatly elongate and a gonostylus as long as gonocoxite.

### ***Palpomyia marinoi* Spinelli, Grogan & Ronderos, sp. n. (Figs 18–23, 57)**

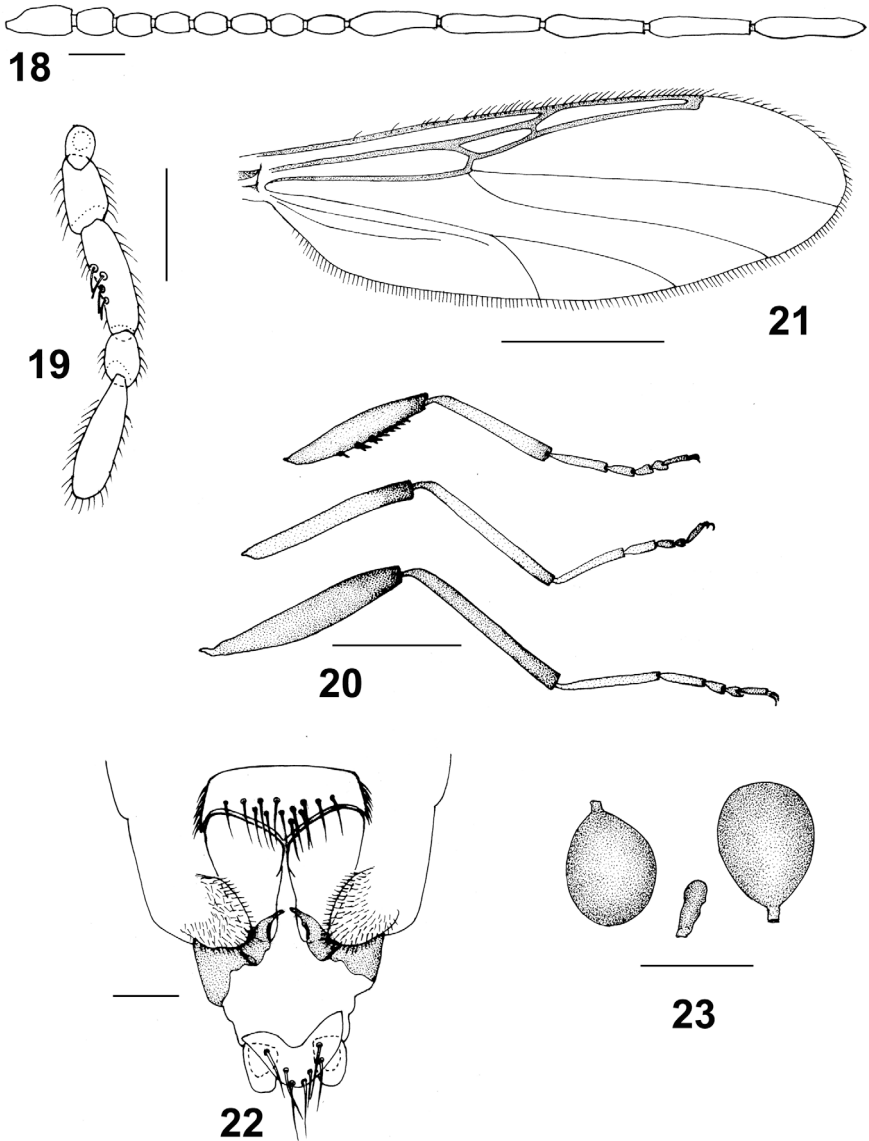
Diagnosis. The only Patagonian *Palpomyia* of the *distincta* group with females that lack a scutal tubercle, with fore and mid legs mainly golden and hind leg dark brown, and flagellomeres 9–12 2.4× longer than flagellomere 8. Male unknown.

#### *Description of female*

Head (Fig. 57). Very dark brown. Eyes separated by diameter of 2.5 ommatidia. Antennal flagellum (Fig. 18) uniformly dark brown; flagellomeres 2–8 vasiform, flagellomeres 9–12 of subequal lengths, each ca. 2.4× longer than 8; flagellomere 13 slightly longer than 9–12 with somewhat conical tip; antennal ratio 1.58 (1.48–1.66,  $n = 3$ ). Palpus (Fig. 19) dark brown; segment 3 slender with about 4 capitate sensilla. Mandible with 6–8 ( $n = 5$ ) large teeth.

Thorax. Very dark brown. Scutum without anterior tubercle, sparsely covered with short setae and 3 supralar setae; scutellum with 5 setae. Fore, mid legs (Fig. 20) golden brown, hind leg (Fig. 20) dark brown; femorotibial joints, narrow apex of tibiae darkish; tarsomeres 1–2 pale brown, 3–5 darker; fore femur slender with 8–10 ventral spines; hind tarsomere 1 with ventral palisade setae in two rows; 5th tarsomeres without ventral setae. Wing (Fig. 21) length 1.92 (1.78–2.10,  $n = 5$ ) mm, width 0.66 (0.62–0.72,  $n = 5$ ) mm; costal ratio 0.77 (0.76–0.79,  $n = 5$ ); membrane infuscated, anterior veins brown, posterior veins paler; M sessile, distance between bases of r-m crossvein and  $M_2$  as long as or slightly shorter than r-m; 2nd radial cell 2.3× (2.25–2.4,  $n = 5$ ) longer than 1st. Halter pale brown.

Abdomen. Dark brown, with one pair of very short gland rods. Genitalia as in Fig. 22. Tergite 8 with proximal portion with more or less 2 rows of large setae,



**Figs 18–23.** *Palpomyia marinoi*, female. 18, flagellum; 19, palpus; 20, legs (top to bottom: fore, mid, hind); 21, wing; 22, female genitalia (segments 8–10) in ventral view; 23, spermathecae. Scale bars: 0.05 mm.

distolateral margins with tufts of dense shorter setae; 2 large, setose lobes extending near apices of distal portion; distal portion divided. Sternite 9 moderately sclerotized with pair of slender, pointed, anteromesally directed arms. Sternite 10 stout, with 3–4 pairs of large setae. Two large, pyriform, slightly unequal sized spermathecae (Fig. 23) with moderately long necks, measuring 55 (50–60,  $n = 4$ ) by 43  $\mu\text{m}$  (40–44,  $n = 4$ ), and 47 (40–54,  $n = 4$ ) by 39  $\mu\text{m}$  (36–42,  $n = 4$ ); plus a rudimentary 3rd spermatheca.

Male Unknown.

Distribution. Argentina (Lanin, Nahuel Huapi and Lago Puelo National Parks) (Fig. 62).

Type material. Holotype female. Argentina: Río Negro prov., Lago Puelo National Park, 24-II-1994, G. Spinelli, sweep net. Paratypes, 5 females, as follows: same data as holotype, 3 females; Neuquen prov., Lanin National Park, Hua-Hum, 28-I-1988, G. Spinelli, 1 female, sweep net (USNM); Río Negro prov., Nahuel Huapi National Park, La Cantera, 41°21'16"S 71°42'27.3"W, 764 m, 15-I/7-II-2007, Garre-Montes de Oca, 1 female, Malaise trap (BMNH).

Derivation of specific epithet. This species is named after our good friend and colleague, Pablo I. Marino, in recognition of his valuable contributions to the taxonomy of Patagonian Ceratopogonidae.

Remarks. The only other Patagonian species in the *distincta* group that lacks a scutal spine is *P. patagonica*, the females of which have flagellomeres 9–12 only 1.6× longer than flagellomere 8, a broadly sessile vein M and mid and hind femora often with spines.

### ***Palpomyia patagonica* Ingram & Macfie (Figs 24–31, 58)**

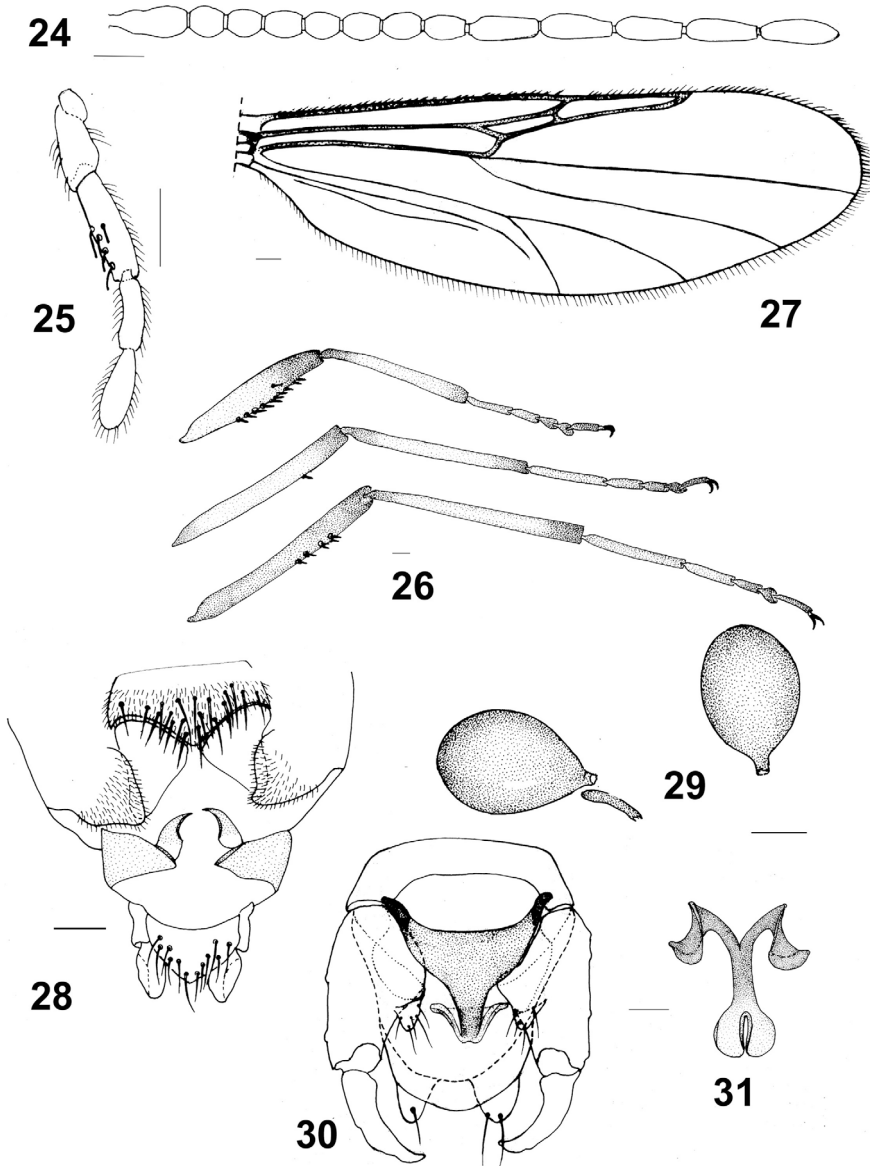
*Palpomyia patagonica* Ingram & Macfie, 1931: 222 (female; Argentina); Wirth, 1974: 55 (in catalog of species south of USA); Borkent & Wirth, 1997: 133 (in World catalog); Spinelli, 1998: 326 (in list of Argentinean species); Borkent & Spinelli, 2000: 64 (in catalog of species south of USA); Muzón et al., 2005: 59 (Somuncura plateau record); Borkent & Spinelli, 2007: 96 (in Neotropical synopsis).

Diagnosis. The only Patagonian *Palpomyia* of the *distincta* group lacking a scutal tubercle and having females with flagellomeres 9–12 only 1.6× longer than flagellomere 8, and males with parameres fused on anterior 2/3 and the distal 1/3 divided and bulbous.

#### *Description of female*

Head (Fig. 58). Very dark brown. Eyes widely separated, by diameter of 4–5 ommatidia. Antennal flagellum (Fig. 24) uniformly dark brown or with bases of flagellomeres slightly lighter brown; flagellomeres 2–8 short, barrel-shaped, flagellomeres 9–12 cylindrical, subequal, each approximately 1.6× longer than 8; flagellomere 13 slightly longer than 12 with bluntly rounded tip; antennal ratio 1.17 (1.00–1.25,  $n = 10$ ). Palpus (Fig. 25) lighter than flagellum; segment 3 slender with about 5 capitate sensilla. Mandible with 6–9 ( $n = 10$ ) large teeth.

Thorax. Very dark brown. Scutum without anterior tubercle, densely covered with short setae, 5 large supralar setae; scutellum with 6–7 setae. Legs (Fig. 26) dark brown, broad bases of fore, mid femora, broad midportion of tibiae light brown; tarsomeres 1–2 light brown (darker in some specimens), 3–5 dark brown; fore femur slightly swollen; femora armed with 5–14 fore, 0–3 mid, 0–6 hind ventral spines; hind tarsomere 1 with ventral palisade setae in two rows; 5th tarsomeres without ventral



**Figs 24–31.** *Palpomyia patagonica*. 24–29, female, 30 and 31, male. 24, flagellum; 25, maxillary; 26, legs (top to bottom: fore, mid, hind); 27, wing; 28, female genitalia (segments 8–10) in ventral view; 29, spermathecae; 30, male genitalia; 31, parameres. Scale bars: 0.05 mm.

setae. Wing (Fig. 27) length 2.08 mm (1.86–2.31,  $n = 10$ ), width 0.69 mm (0.63–0.75,  $n = 10$ ); costal ratio 0.73 (0.70–0.76,  $n = 10$ ); membrane slightly infuscated; anterior veins brown; M with distance between r-m crossvein and base of  $M_2$  equal to length of r-m; 2nd radial cell 1.88 $\times$  (1.50–2.42,  $n = 10$ ) longer than 1st. Halter pale.

Abdomen. Dark brown; gland rods not visible. Genitalia as in Fig. 28. Sternite 8 with proximal portion sclerotized posteriorly, pubescent, with numerous large setae on

distal ½, anterior margin hyaline, posterior margin V-shaped, the two large, setose lobes with broadly pointed apices, extending just beyond posterior plates; distal portion divided into 2 hyaline plates. Sternite 9 moderately sclerotized with pair of pointed anteromesally directed arms. Sternite 10 triangular, with 3–7 pairs of large setae. Two pyriform, slightly unequal sized spermathecae (Fig. 29) with moderately long necks, measuring 50 by 40 µm ( $n = 10$ ), and 44 (40–50,  $n = 10$ ) by 34 µm (30–40,  $n = 10$ ); plus a rudimentary third spermatheca.

Male. Similar to female with the following notable sexual differences. Flagellomeres 10–13 with lengths in proportion of 7:12:10:13. Femora entirely dark brown. Wing length 1.68 mm (1.59–1.77,  $n = 6$ ), width 0.48 mm (0.45–0.51,  $n = 6$ ); costal ratio 0.69 (0.64–0.71,  $n = 6$ ); 2nd radial cell 1.43× (1.05–1.71,  $n = 6$ ) longer than 1st. Genitalia as in Fig 30. Tergite 9 tapering slightly on proximal ½, with broadly round apex, cerci stout extending beyond gonocoxites with 1–2 large subapical setae; sternite 9 moderately short with broad, deep posteromedian excavation. Gonocoxite straight, 1.8× longer than broad, with moderately elongate mesoventral lobe bearing several large setae; gonostylus 0.66 length of gonocoxite, curved, tapering slightly distally, with slightly pointed tip. Parameres (Fig. 31) fused, heavily sclerotized on proximal 2/3; basal arm very heavily sclerotized, recurved, distal portion wing-shaped; distal portion divided, more lightly sclerotized, bulbous, apex round. Aedeagus broadly triangular, slightly broader than long, heavily sclerotized, basal arch extending 0.25 of total length; basal arm more heavily sclerotized, slightly curved; distal portion narrowed abruptly on apical 1/3, with underlying, broad, arrowhead-shaped tip.

Distribution. Argentina, in forest and steppe areas of Neuquen, Río Negro, Chubut and Santa Cruz provinces; Chile (Aisen, Magallanes) (Fig. 64).

Type material. Holotype female, Argentina: Río Negro prov., Bariloche, 1-XII-1926, F. & M. Edwards (BMNH, examined).

Other specimens examined. Argentina: Neuquen prov., Lanin National Park, 15 km E Caviahue, 13-XI-1994, G. Spinelli, 1 female; Neuquen prov., Lanin National Park, 16 km S San Martín de los Andes, 4-II-1986, G. Spinelli, 1 male; Río Negro prov., Rincón de Comi-Co, 41°08'35.1"S, 67°27'34.6"W, 1000 m, 7-XII-2006, G. Spinelli, 2 females, Malaise trap; Río Negro prov., 5 km NW Paraje Chasicó, 6/7-XII-2006, G. Spinelli, 1 male, sweep net; Río Negro prov., Somuncurá plateau, Estancia El Rincón, 30-XI/3-XII-1999, J. Muzón, 1 male, 2 females, Malaise trap; Río Negro prov., arroyo Las Bayas, 1-XII-1999, G. Spinelli, 1 female, sweep net; Río Negro prov., 18 km S Pailemán, 10-XII-2005, G. Spinelli, 1 female, sweep net; Chubut prov., Esquel, laguna la Z, 19-I-1988, G. Spinelli, 1 male, 1 female, sweep net; Chubut prov., northern shore Lago La Plata, 13-XII-1995, 1 male, 1 female, G. Spinelli, sweep net; Santa Cruz prov., Río Pinturas, 15-I-1988, G. Spinelli, 1 female, sweep net; Santa Cruz prov., Perito Moreno National Park, Estancia La Oriental, 25-XI-1999, G. Spinelli-P. Marino, 2 males, 2 females, sweep net.

Chile: Aisen prov, 5 km W Chile Chico, 400 m, 22-XI-1966, E.I. Schlinger-M.W. Irwin, 3 males, 6 females; Magallanes, laguna Amarga, Natales E Mount Payne, 200 m, 14/20-XII-1969, L. Peña, 2 females.

Remarks. *Palpomyia patagonica* is the most widely distributed species in Patagonia and is most similar to *P. marinoi*. Characters to distinguish both species are provided in the key and in the Remarks section of *P. marinoi*.

***Palpomyia septentrionalis* Spinelli, Grogan & Ronderos, sp. n. (Figs 32–38, 59)**

Diagnosis. The only Patagonian *Palpomyia* of the *distincta* group with a scutum bearing a short anterior tubercle, females with eyes broadly separated, 5th tarsomeres of all legs with 2 ventrolateral rows of large setae with pointed tips, and sternite 8 with a small anteromedian excavation bearing a marginal row of 8–9 large setae. Male unknown.

*Description of female*

Head (Fig. 59). Very dark brown. Eyes broadly separated by diameter of 5.5 ommatidia. Antennal flagellum (Fig. 32) uniformly dark brown; flagellomeres 2–8 vasiform, 9–12 of subequal lengths, each ca. 2.2× longer than 8; flagellomere 13 slightly longer than 12 with somewhat conical tip; antennal ratio 1.60 ( $n = 2$ ). Palpus (Fig. 33) dark brown; segment 3 slender, slightly curved with about 3 mesoventral capitate sensilla. Mandible with 6–7 ( $n = 2$ ) large teeth.

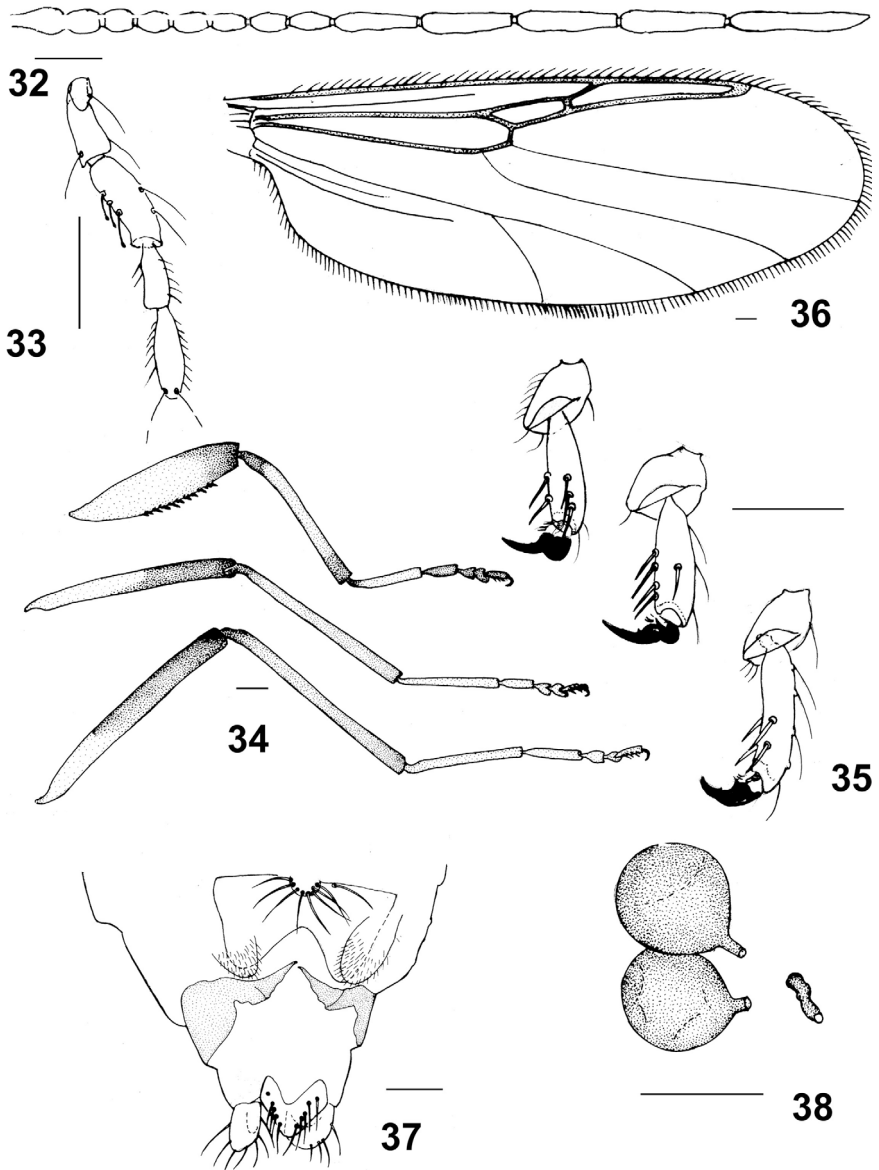
Thorax. Very dark brown. Scutum with small, pointed anterior tubercle, sparsely covered with short setae and 3 supralar setae; scutellum with 5 setae. Legs (Fig. 34) golden brown; distal 1/4 of fore femur, distal 1/2 of mid femur, distal 2/3 hind femur and apices of fore, hind tibiae darker brown; fore tarsi darker than mid and hind tarsi; fore femur moderately swollen with 18–20 ventral spines; tarsomeres 1–2 of hind leg with ventral palisade setae in 2 rows; 5th tarsomeres (Fig. 35) with row of 2–3 pairs of short, stout ventrolateral setae, tips pointed. Wing (Fig. 36) length 2.12 mm ( $n = 2$ ), width 0.81 mm ( $n = 2$ ); costal ratio 0.81 ( $n = 2$ ); membrane slightly infuscated; anterior veins brown; M with distance between bases of r-m crossvein and  $M_2$  slightly longer than r-m; 2nd radial cell 2.2× ( $n = 2$ ) longer than 1st. Halter dark brown.

Abdomen. Dark brown. Gland rods not visible. Genitalia as in Fig. 37. Sternite 8 poorly sclerotized with small anteromedian excavation bearing a marginal row of 8–9 large setae; posterior margin with deep triangular-shaped excavation; setose lobes extending to or just beyond apices of plate. Sternite 9 moderately sclerotized with pair of pointed anteromesally directed arms. Sternite 10 V-shaped, with 5–6 pairs of large setae. Two subspherical, slightly subequal sized spermathecae (Fig. 38) with slender, moderately elongate necks, measuring 60 ( $n = 2$ ) by 56  $\mu\text{m}$  ( $n = 2$ ), and 56 ( $n = 2$ ) by 50  $\mu\text{m}$  ( $n = 2$ ); plus a rudimentary 3rd spermatheca.

Male Unknown.

Distribution. Known only from the type-locality in northern Neuquen province, near the northernmost limits of the *Nothofagus* forests of Argentinean Patagonia (Fig. 63).





**Figs 32–38.** *Palpomyia septentrionalis*, female. 32, flagellum; 33, palpus; 34, legs (top to bottom: fore, mid, hind); 35, 5th tarsomeres and claws (left to right: fore, mid, hind); 36, wing; 37, female genitalia (segments 8–10) in ventral view; 38, spermathecae. Scale bars: 0.05 mm.

Type material. Holotype female, Argentina: Neuquen prov., Laguna Epulaufquen, 22-II-2001, G. Spinelli, sweep net. Paratype female, same data as holotype.

Derivation of specific epithet. The specific name, *septentrionalis*, Latin for “northern”, refers to the type-locality in the northernmost *Nothofagus* forests in Argentinean Patagonia.

Remarks. There are three other Patagonian species in the *distincta* group with an anterior scutal tubercle that could possibly be confused with females of *P. septentrionalis*. Of these, *P. mapuche*, readily differs in having a slender fore femur, a spinose hind femur and 5th tarsomeres that lack ventral setae. Females of *P. subfuscuscula* differ in having dark brown femora and tibiae, only hind 5th tarsomere with ventral setae and sternite 8 with a separate proximal portion with dense posteromarginal setae. Females of *P. yamana* differ in having bright yellow femora and tibiae, only hind 5th tarsomeres with ventral setae and elongate claws, and sternite 8 with a separate proximal portion bearing about 10 large central setae.

### ***Palpomyia subfuscuscula* Ingram & Macfie (Figs 39–47, 60)**

*Palpomyia subfuscuscula* Ingram & Macfie, 1931: 216 (female; Argentina); Wirth, 1974: 55 (in catalog of species south of USA); Borkent & Wirth, 1997: 134 (in World catalog); Spinelli, 1998: 326 (in list of Argentinean species); Borkent & Spinelli, 2000: 64 (in catalog of species south of USA); Borkent & Spinelli, 2007: 97 (in Neotropical synopsis).

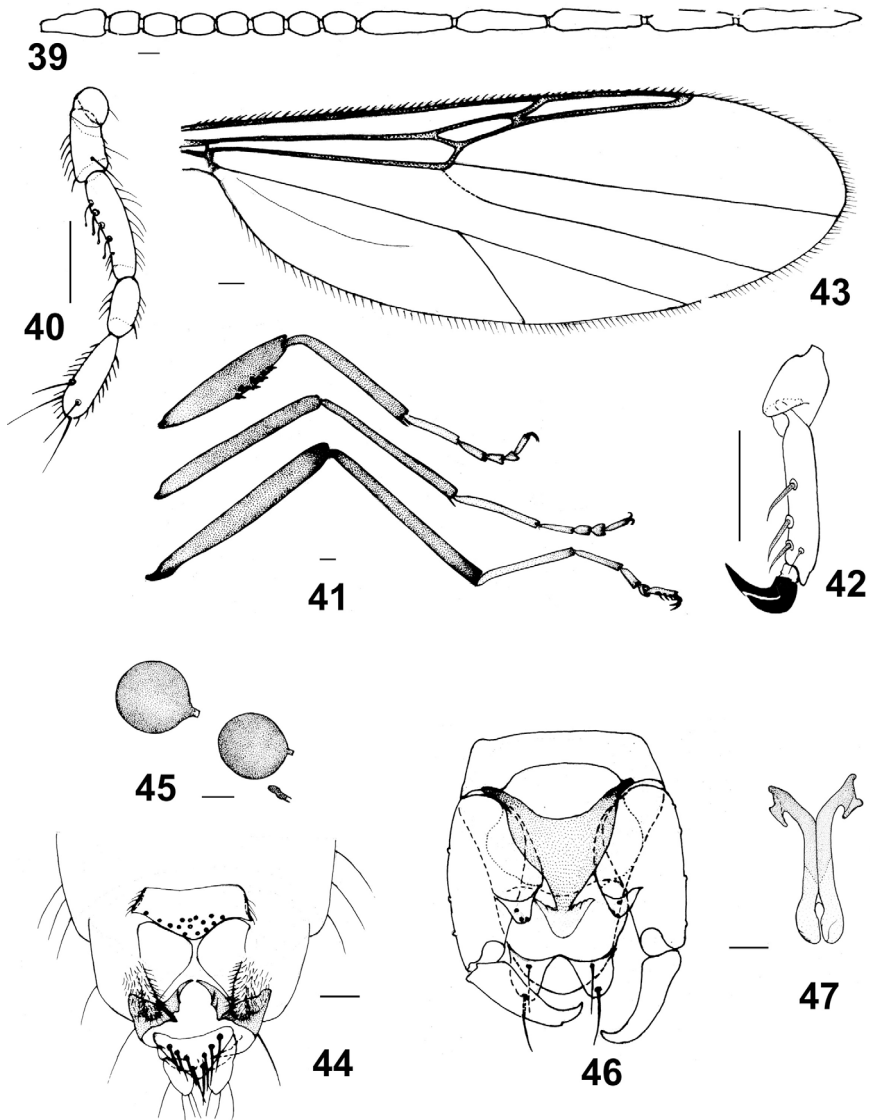
Diagnosis. The only Patagonian *Palpomyia* of the *distincta* group with a scutum bearing a short anterior tubercle, females with legs mainly dark brown femora and tibiae, fore femur slightly swollen with 7–11 ventral spines, hind 5th tarsomere bearing 2 ventrolateral rows of large setae with recurved tips, and only one pair of abdominal gland rods. Males with parameres subdivided on proximal 2/3 and distal 1/3 completely divided with a slightly bulbous apical portion.

#### *Description of female*

Head (Fig. 60). Very dark brown. Eyes moderately separated, by diameter of 2.5 ommatidia. Antennal flagellum (Fig. 39) uniformly dark brown; flagellomeres 2–8 short, vasiform, flagellomeres 9–12 longer, subcylindrical; flagellomere 9 2.8× longer than 8; flagellomere 13 slightly longer than 12 with slightly conical tip; antennal ratio 2.03 (1.61–2.33,  $n = 10$ ). Palpus (Fig. 40) uniformly dark brown; segment 3 slender, slightly curved with about 4 mesal capitate sensilla. Mandible with 7–8 ( $n = 10$ ) large teeth.

Thorax. Very dark brown. Scutum with small anterior tubercle, densely covered with short setae and 2 supralar setae; scutellum with 4 stout setae. Legs (Fig. 41) dark brown, base of fore femur, tarsi slightly paler; fore femur slightly swollen with 7–11 ventral spines; tarsomeres 1–2 of hind leg with ventral palisade setae in 2 rows on tarsomeres, 5th tarsomere of hind leg (Fig. 42) with 2–3 ventrolateral rows of large setae with recurved tips. Wing (Fig. 43) length 1.91 mm (1.59–2.25,  $n = 10$ ), width 0.64 mm (0.54–0.75,  $n = 10$ ); costal ratio 0.74 (0.67–0.83,  $n = 10$ ); membrane slightly infuscated; anterior veins dark brown; M with distance between bases of r-m cross-vein and  $M_2$  as long as r-m; 2nd radial cell 2.4× (1.9–3.0,  $n = 10$ ) longer than 1st. Halter pale.

Abdomen. Dark brown. Usually 2–4 pairs of abdominal gland rods (only 1 pair in slide mounted paratype). Genitalia as in Fig. 44. Sternite 8 with anterior portion with dense short marginal setae, distal 1/3 with more or less 2 rows of larger setae, most



**Figs 39–47.** *Palpomyia subfuscata*. 39–45, female, 46 and 47, male. 39, flagellum; 40, palpus; 41, legs (top to bottom: fore, mid, hind); 42, 4th and 5th tarsomeres and claws of hind leg; 43, wing; 44, female genitalia (segments 8–10) in ventral view; 45, spermathecae; 46, male genitalia; 47, parameres. Scale bars: 0.05 mm.

heavily sclerotized posteriorly, anterior margin hyaline, posterior margin convex; posterior portion hyaline, divided; the large, pointed, setose lobes extending considerably past hyaline posterior portion. Sternite 9 moderately sclerotized with pair of pointed anteromesally directed arms. Sternite 10 triangular with 4–6 pairs of large setae. Two spherical subequal sized spermathecae (Fig. 45) with short, narrow necks, diameter of each measuring 39 (30–40,  $n = 10$ )  $\mu$ ; plus a rudimentary 3rd spermatheca.

Male. Similar to female with the following notable sexual differences. Flagellomeres 10–13 with lengths in proportion of 7:12:10:13. Femora entirely dark brown. Wing length 1.47 mm (1.23–1.74,  $n = 10$ ), width 0.44 mm (0.36–0.51,  $n = 9$ ); costal ratio 0.68 (0.64–0.72,  $n = 10$ ); 2nd radial cell 1.9× (1.55–2.45,  $n = 10$ ) longer than 1st. Genitalia as in Fig. 46. Tergite 9 progressively tapering moderately distally, apex ending beyond gonocoxite, cerci stout with sub-basal, subapical large setae; sternite 9 moderately short, 2.5× broader than long with moderately deep, broad posteromedian excavation. Gonocoxite straight, twice as long as broad with slightly elongate mesoventral lobe bearing a few large setae; gonostylus 0.6 the length of gonocoxite, tapering slightly distally, distal 2/3 slightly curved, apex more greatly curved, tip pointed. Parameres (Fig. 47) heavily sclerotized, subdivided on anterior 2/3; distal 1/4–1/3 divided, apex slightly swollen, rounded. Aedeagus triangular, slightly broader than long, ventral membrane spiculate, basal arch extending to 1/3 of total length; basal arm heavily sclerotized, slightly curved; distal portion progressively narrowing posteriorly with hyaline arrowhead-shaped tip.

Distribution. Argentina (Neuquen and Río Negro provinces); Chile (Ñuble, Concepción, Valdivia, Casa Pangué, Chiloe and Mechuque Islands) (Fig. 65).

Type material. Holotype female, Chile: Casa Pangué, 4/10-XII-1926, F. & M. Edwards (BMNH, examined).

Other specimens examined. Argentina: Neuquen prov., road San Martín de los Andes-Bariloche (JAD 1654/2), 27-XI-1984, J. Downes, 1 female, sweep net (CNCI); Neuquen prov., Lanin National Park, Hua-Hum, 11-II-1989, G. Spinelli, 1 male, sweep net; Neuquen prov., Lanin National Park, arroyo Quechu-Quina and lago Lacar, 18-I-2006, W. Grogan-G. Spinelli, 1 female, sweep net; Neuquen prov., Nahuel Huapi National Park, Villa La Angostura, 11/15-I-2004, G. Spinelli, 2 females, at light; Río Negro prov., Bariloche, XI-1926, R. & E. Shannon, 1 male, 3 females; Río Negro prov., Bariloche, F. & M. Edwards, 1 male, 1 female (paratypes, BMNH); Río Negro prov., Nahuel Huapi National Park, Cascada Los Alerces, 24-I-1988, G. Spinelli, 1 male, sweep net; Río Negro prov., Nahuel Huapi National Park, La Cantera, 41°21'16"S 71°42'27.3"W, 764 m, 11/30-XII-2006, Garre-Montes de Oca, 1 male, 1 female, Malaise trap; same data except 15-I/7-II-2007, 1 female; Río Negro prov., Nahuel Huapi National Park, Mallín la Cortadera, 41°05'13"S 71°48'26"W, 769 m, 8-I/3-II-2007, Garre-Montes de Oca, 1 male, 3 females, Malaise trap; Río Negro prov., Nahuel Huapi National Park, Río Manso Superior, 41°14'8.1"S 71°46'58.5"W, 845 m, 7-II/2-III-2007, Garre-Montes de Oca, 1 female, Malaise trap.

Chile: Ñuble prov, Recinto, 800 m, 22-I-1979, D. & M. Davis–D. Akerbergs, 1 male; Concepción, 13 km N Salto del Laja, 7-XI-1966, M. Irwin-E.I. Schlinger, 3 males, 7 females; Valdivia prov., route n° 5, 17 km S Valdivia (JAD 1685/1), 29-XII-1984, J. Downes, 1 male (CNCI); Valdivia, Mehuin, 27-XI-1992, G. Spinelli, 1 male, 5 females; Valdivia, Panguipulli, 100 m, 26-XI-1992, G. Spinelli, 2 males; Llanquihue prov., around Ralún (JAD 1696/5), 12-I-1985, J. Downes, 1 female, sweep net (CNCI); Chiloe Is., 4 km S Chonchi (JAD 1689/1), 2-I-1985, J. Downes, 2 females, sweep net (CNCI); Chiloe Is., 1.8 km S Huillinco (JAD 1690/3), 42° 39' S, 73° 52' W, 65 m, 3-I-1985, J. Downes, 2 males, 3 females (CNCI); same data except 4-I-1985 (JAD 1691/2),

2 males, 2 females (CNCI); Chiloe Is., Castro, 20/22-XI-1926, F. & M. Edwards, 1 female (allotype, BMNH); Chiloe Is., Ancud, XII-1926, R. & E. Shannon, 1 female.

Remarks. Of the other three Patagonian species in the *distincta* group with a scutum bearing an anterior tubercle, this new species most closely resembles *P. yamana* in having only the hind 5th tarsomere with ventrolateral setae with recurved tips. Females of *P. yamana* also differ from those of *P. subfuscuscula* by their bright yellow femora and tibiae a greatly swollen fore femur with 20–22 ventral spines, and greatly enlarged hind claws.

### ***Palpomyia yamana* Spinelli, Grogan & Ronderos sp. n. (Figs 48–54, 61)**

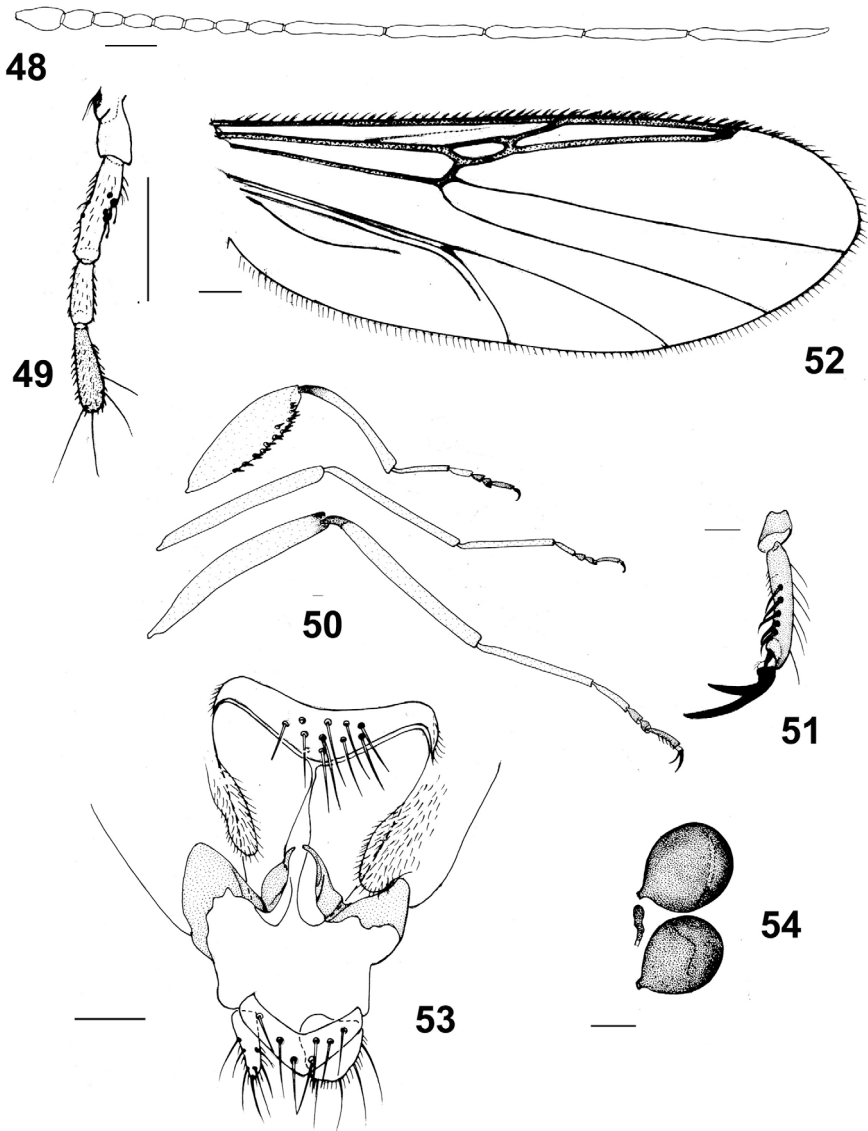
Diagnosis. The only Patagonian *Palpomyia* of the *distincta* group with females having an anterior scutal tubercle, bright yellow femora and tibiae, a greatly swollen fore femur with 20–22 spines, and only the hind 5th tarsomere with ventrolateral setae with recurved tips and enlarged claws. Males unknown.

#### *Description of female*

Head (Fig. 61). Dark brown, clypeus yellowish. Eyes narrowly separated, by diameter of one ommatidium. Antennal flagellum (Fig. 48) dark brown, extreme bases of flagellomeres slightly lighter in color; flagellomeres 2–8 short, vasiform, flagellomeres 9–12 of subequal lengths, approximately 3× longer than flagellomere 8; flagellomere 13 slightly longer than 12 with narrowed, conical tip; antennal ratio 1.93. Palpus (Fig. 49) brown, segment 5 darkest; segment 3 slender, elongate with 2–3 capitate sensilla. Mandible with 9 large teeth.

Thorax. Very dark brown. Scutum with small anterior tubercle, sparsely covered with short seta, 2 supralar setae; scutellum with 4 setae. Legs (Fig. 50) including coxae, trochanters bright yellow; femorotibial joints, tarsomeres 3–5 darkish; fore femur greatly swollen with 20–22 ventral spines, tarsomeres 1–2 of hind leg with 2 rows of ventral palisade setae; tarsomere 5 of hind leg (Fig. 51) with 4–5 pairs of ventrolateral setae with recurved tips; hind claws enlarged, longer than fore, mid claws, each talon 0.85 the length of hind tarsomere 1. Wing (Fig. 52) length 2.00 mm, width 0.74 mm; costal ratio 0.80; membrane slightly infuscated; anterior veins brown; vein M with distance between bases of r-m crossvein and  $M_2$  the same length of r-m; 2nd radial cell 3.2× longer than 1st. Halter pale.

Abdomen. Dark brown with four pairs of gland rods. Genitalia as in Fig. 53. Sternite 8 with anterior portion lightly sclerotized, with short, dense lateral setae and about 10 larger, central setae, anterior margin hyaline, posterior margin convex; posterior portion hyaline, completely divided, each plate elongate and gradually tapering posteriorly; the 2 elongate, setose lobes extend only  $\frac{3}{4}$  of plate length. Sternite 9 moderately sclerotized with a pair of pointed, anteriorly directed arms. Sternite 10 V-shaped with 3–4 pairs of large setae. Two slightly pyriform, subequal sized spermathecae (Fig. 54) with narrow, moderately short necks, measuring 68 by 58  $\mu\text{m}$ , and 64 by 52  $\mu\text{m}$ ; plus a rudimentary 3rd spermatheca.



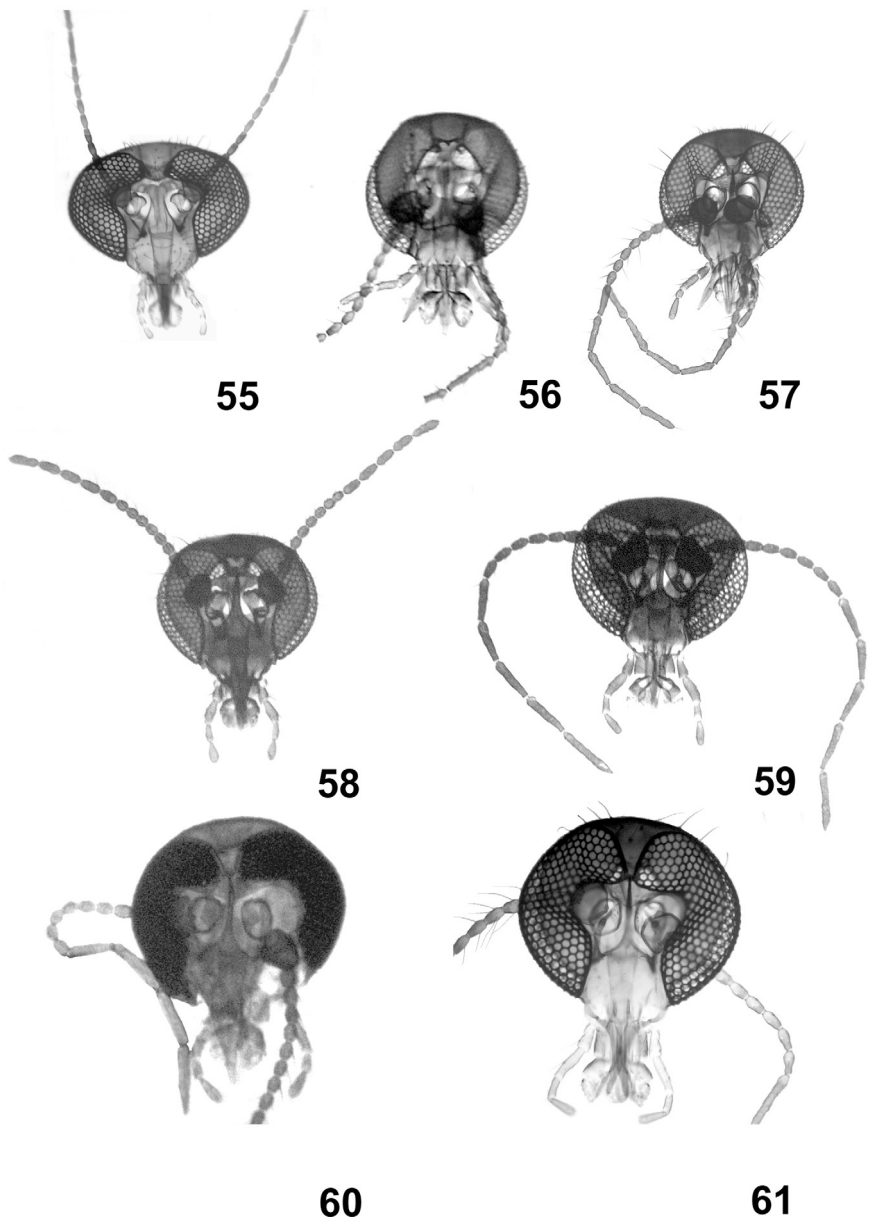
**Figs 48–54.** *Palpomyia yamana*, female. 48, flagellum; 49, palpus; 50, legs (top to bottom: fore, mid, hind); 51, 4th and 5th tarsomeres and claws of hind leg; 52, wing; 53, female genitalia (segments 8–10) in ventral view; 54, spermathecae. Scale bars: 0.05 mm.

Male Unknown.

**Distribution.** Known only from the type-locality in Tierra del Fuego National Park, in the southernmost province of Argentina (Fig. 64).

**Type material.** Holotype female, Argentina: Tierra del Fuego prov., Tierra del Fuego National Park, 5/7-XII-2005, G. Spinelli, Malaise trap.

**Derivation of specific epithet.** This species name is a reference to the Yamana Indians, early inhabitants of the type-locality region.



**Figs 55–61.** *Palpomyia* females, head photomicrographs. 55, *P. subaspera*; 56, *P. mapuche* sp. n.; 57, *P. marinoi*; 58, *P. patagonica*; 59, *P. septentrionalis*; 60, *P. subfuscula*; 61, *P. yamana*.

Remarks. Among the other three Patagonian species in the *distincta* group with a scutal tubercle, females of this new species are most similar to *P. subfuscula*, the females of which differ in having dark femora and tibiae and only one pair of abdominal gland rods.

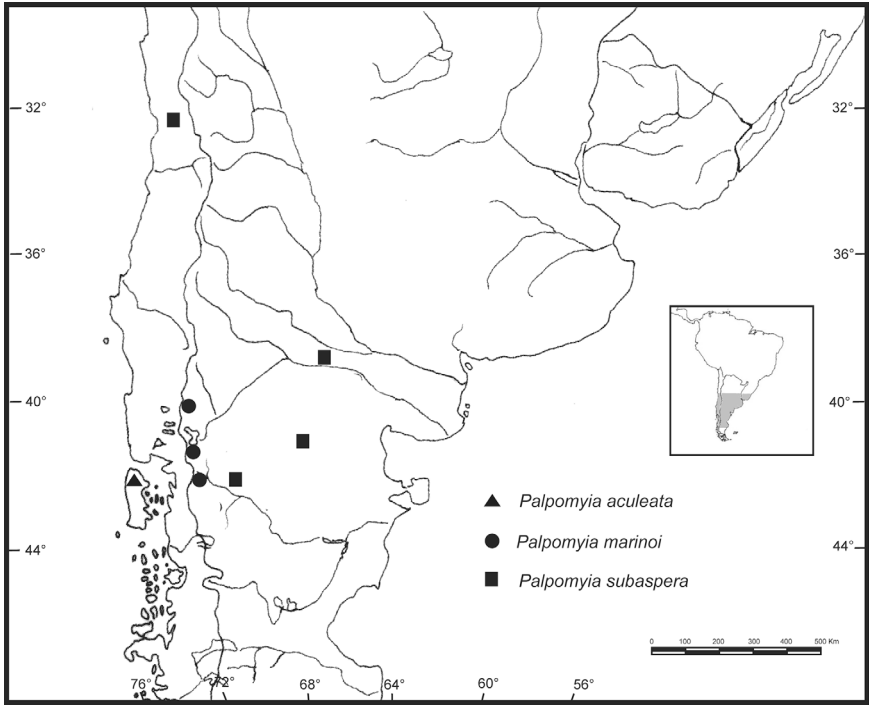


Fig. 62. Distribution of *Palpomyia aculeata*, *P. subaspera* and *P. marinoi* (only patagonian localities are marked for *P. subaspera*).

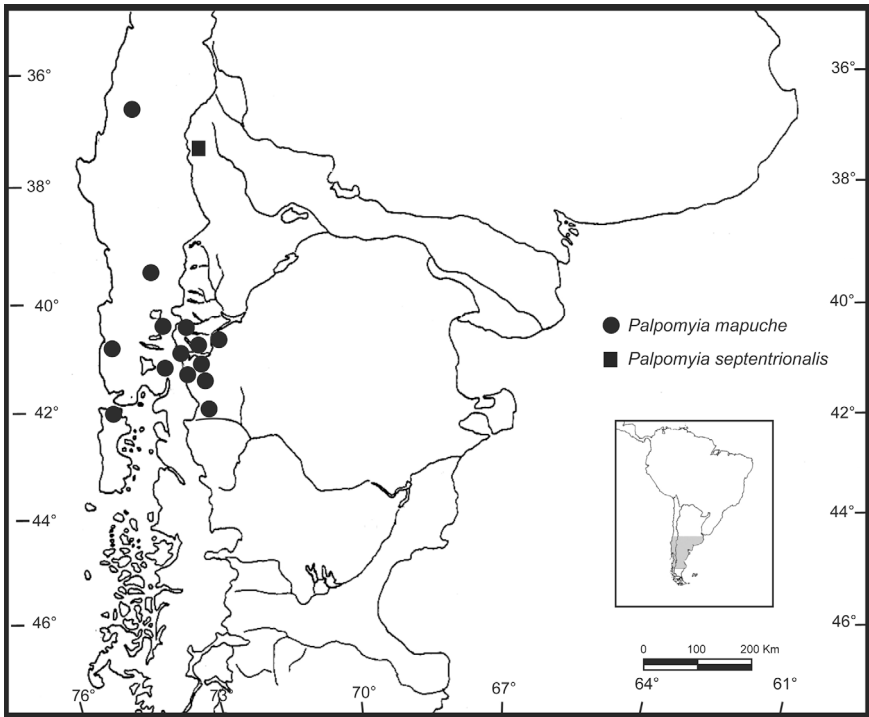


Fig. 63. Distribution of *Palpomyia mapuche* and *P. septentrionalis*.



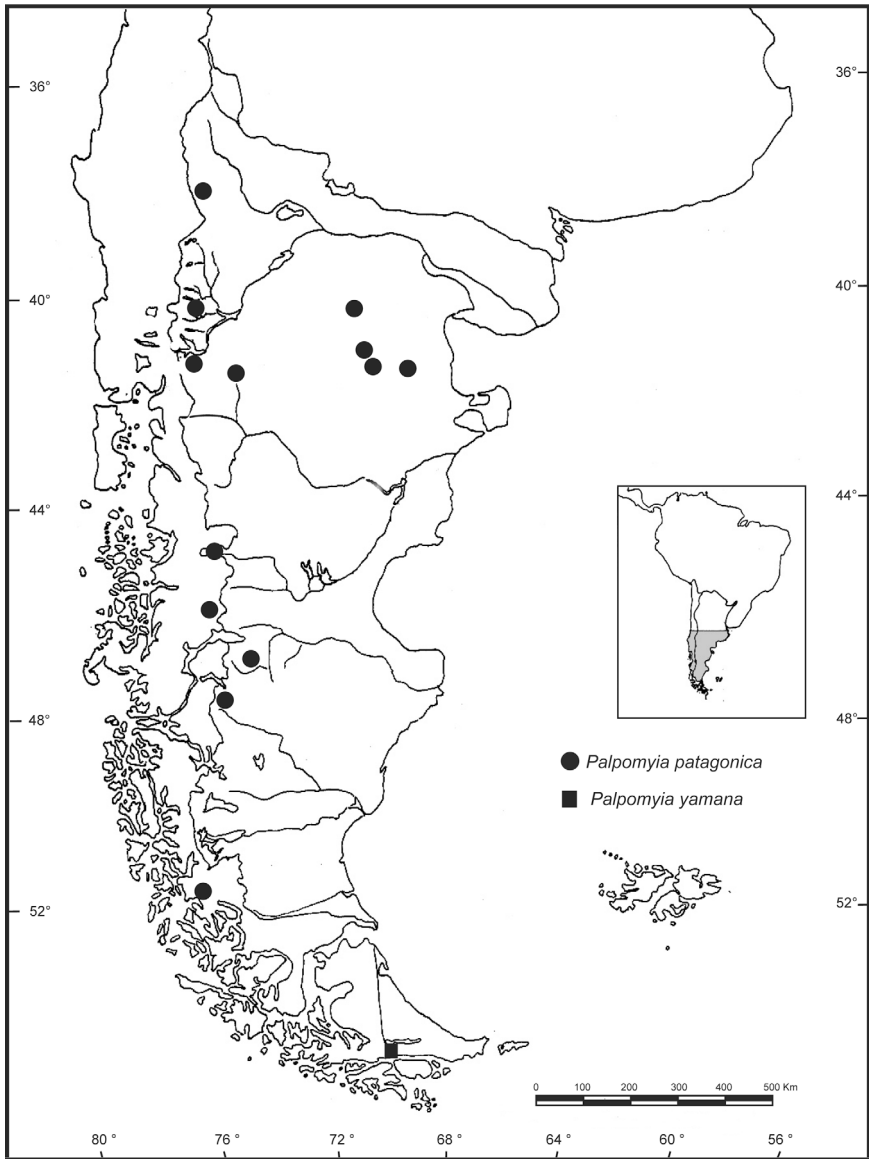
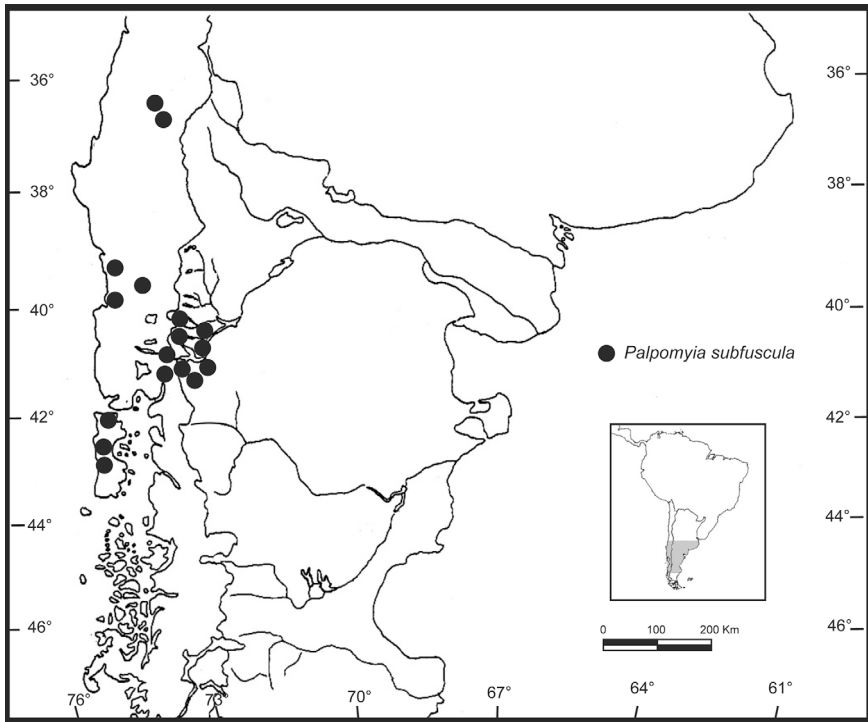


Fig. 64. Distribution of *Palpomyia patagonica* and *P. yamana*.

## Discussion

The predaceous midges of the genus *Palpomyia* are poorly represented in Patagonia as only two of the four species groups defined by Grogan & Wirth (1975, 1979) are apparently present in this region, the *tibialis* and *distincta* groups, whereas all four species groups are represented in North America. Species of the *lineata* group apparently only occur in the Nearctic and Palearctic regions. Conversely, species of the *flavipes* group (= *Palpomyia sensu stricto*) are present in the Holarctic, Afrotropical and Australasian regions as well as at least the northern Neotropics.



**Fig. 65.** Distribution of *Palpomyia subfuscula*.

At present, about 100 species of Ceratopogonidae are known inhabitants of Patagonia, of which, 85 are endemic, primarily in the *Nothofagus* forests of the eastern and western slopes of the Andes (Spinelli, pers. obs.). This pattern is also exhibited by the *Palpomyia* fauna of this area, with 7 endemic species and one species (*P. subaspera*) widely distributed in the Nearctic and Neotropical regions. During the spring and summer of 2007–2008, intensive collecting took place in the Nahuel Huapi National Park, but no additional species were encountered. Therefore, we do not expect to discover many additional undescribed species, at least within northern Patagonia. However, the situation may be different in the extreme southern portion of Patagonia, particularly in the poorly explored Magellanic forests and moorelands.

### Acknowledgements

This work is a contribution of the Darwin Initiative project: “Capacity building for biodiversity studies of freshwater insects in Argentina”. We extend our gratitude to Nélica Caligaris for technical assistance. We also appreciate Pablo I. Marino for reviewing an earlier version of the manuscript. Dr. Art Borkent made numerous helpful suggestions for the improvement of the submitted version of the paper.

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