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A revision of the species allied to *Dasyhelea patagonica* Ingram and Macfie (Diptera: Ceratopogonidae)

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The *Dasyhelea patagonica* group is proposed to include seven species from Argentinean and Chilean Patagonia. Four new species, *D. dellapei* Díaz and Spinelli, *D. fueguina* Díaz and Spinelli, *D. gargola* Díaz and Spinelli and *D. ona* Díaz and Spinelli are described and illustrated based on the examination of adults through binocular compound microscope with attached camera lucida. Three previously known species, *D. patagonica* Ingram and Macfie, *D. reynoldsi* Ingram and Macfie and *D. shannoni* Ingram and Macfie are redescribed. *Dasyhelea chilensis* Ingram and Macfie is recognized as a junior synonym of *D. patagonica* Ingram and Macfie (new synonymy). A key to recognition of males and females of the seven species described is included.

Keywords: *Dasyhelea patagonica* group; new species; distribution; Patagonia

Introduction

Biting midges of the genus *Dasyhelea* Kieffer are common and widespread, and are found in all regions of the world in a wide variety of habitats (Wirth and Linley 1990).

Taxonomically, the recognition of subgenera and species groups is still incipient and generally has been applied sporadically only to various regional fauna. With regard to the New World species, Waugh and Wirth (1976) diagnosed the following four groups from the Nearctic region: *cincta*, *grisea*, *leptobranchia* and *mutabilis*. Wirth and Waugh (1976) described five new species from northeastern Brazil that belong to a group that they named *borgmeieri*, with identical characteristics to the *mutabilis* group. Finally, Grogan and Wieners (2006) proposed the *brevicornis* group for two species, one Nearctic and one Neotropical.

Fifty-eight species of this genus are recorded from the Neotropics by Borkent and Spinelli (2007), and Díaz et al. (2009) provided the description of a new Patagonian species of the *cincta* group. Of these, only 10 inhabit Patagonia, the austral-most area of South America: representing the *cincta* group (*D. cincta* (Coquillett), *D. filiductus* Díaz and Spinelli and *D. mediomunda* Minaya) and the *mutabilis* group (*D. andensis* Ingram and Macfie, *D. lacustris* I. and M. and *D. monticola* I. and M.), and the remaining four (*D. chilensis* I. and M., *D. patagonica* I. and M., *D. reynoldsi* I. and M. and *D. shannoni* I. and M.) are very similar and belong to an unidentified group. The purpose of this paper is to propose the *Dasyhelea patagonica* group for these species and to provide its revision, redescribing and illustrating the previously known

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species and describing four new species from the same region. On the basis of the study of types, *Dasyhelea chilensis* is recognized as a junior synonym of *D. patagonica*.

Materials and methods

All specimens were slide mounted in Canada balsam, examined, measured and drawn using a binocular compound microscope with attached camera lucida. Terms for structures of adults follow those in the Manual of Nearctic Diptera (McAlpine et al. 1981).

During this investigation we studied the types of *D. chilensis*, *D. patagonica*, *D. reynoldsi* and *D. shannoni* that are deposited in the Natural History Museum, London, UK (NHM), as well as the specimens collected by Anthony J. Downes in southern Chile, which are housed in the Canadian National Collection of Insects (CNCI). When the specimens belong to the later collection, the collector nomenclature is written after the locality (e.g. JAD 1691/2).

The holotypes of the new species are deposited in the collection of the Division Entomología, Museo de La Plata, Argentina (MLP) and paratypes, as noted, are in the NHM.

Results

Dasyhelea patagonica group

A group of species characterized by their large size and very dark brown colouration. Sternite 9 of male with posteromedian margin characteristic of each species, with or without posterior projection; gonostylus with two or three mesal setae; parameres symmetrical, well sclerotized, with or without posterior projection; aedeagus with body well sclerotized, posterolateral arms short, recurved. Female flagellum elongated; wing with cubital fork at same level of second radial cell; halter brown; subgenital plate well developed, rectangular or triangular; margin of gonopore well sclerotized; two well-developed spermathecae.

Species included

Dasyhelea dellapei Díaz and Spinelli sp. nov.
Dasyhelea fueguina Díaz and Spinelli sp. nov.
Dasyhelea gargola Díaz and Spinelli sp. nov.
Dasyhelea ona Díaz and Spinelli sp. nov.
Dasyhelea patagonica Ingram and Macfie
Dasyhelea reynoldsi Ingram and Macfie
Dasyhelea shannoni Ingram and Macfie

Taxonomic discussion

The *patagonica* group is herein proposed on the basis of the combination of characters listed in the diagnosis, all of them poor for consideration as good synapomorphies.

If our knowledge of the immatures of the genus is improved then we will hopefully be able to find new, valuable characters to properly propose a phylogenetic classification.

Remm (1971) described the subgenus *Sebessia* which includes the *cincta* group, with species in all the mayor biogeographic zones of the World, and the *holosericea* group, represented by Palaearctic species. The characteristic features of the subgenus are the presence of two well-developed spermathecae, the symmetrical parameres and the ventral surface of the aedeagus covered by a hyaline envelope; the last character being a very good synapomorphy (A. Borkent, pers. comm.; P. Dominiak, pers. comm.). As the Patagonian species lack the aedeagal hyaline envelope, we prefer not to include them within *Sebessia*.

Key to species

1. Male 2
   Female 8
2. Posteromedian margin of sternite 9 with crescent-shaped sclerite followed by two stout, reniform processes ..... *D. ona* Díaz and Spinelli sp. nov.
   Posteromedian margin of sternite 9 without crescent-shaped sclerite and reniform processes 3
3. Posteromedian projection of parameres bearing a stout, distally directed process with broad, bifid tip ..... *D. fueguina* Díaz and Spinelli. sp. nov.
   Posteromedian projection of parameres without distally directed process with bifid tip 4
4. Posteromedian margin of sternite 9 arrow-shaped .. *D. shannoni* Ingram and Macfie
   Posteromedian margin of sternite 9 different 5
5. Sternite 9 with trefoil-shaped posteromedian projection; gonostylus with a double curve ..... *D. reynoldsi* Ingram and Macfie
   Sternite 9 without posteromedian projection; gonostylus nearly straight ... 6
6. Posteromedian margin of sternite 9 not excavated, broadly rounded; aedeagus with rounded tip; scutellum with 28–30 long setae and 22–28 shorter ones ..... *D. dellapei* Diaz and Spinelli sp. nov.
   Posteromedian margin of sternite 9 with rounded excavation; aedeagus without rounded tip; scutellum with 14–18 long setae and 10–18 shorter ones 7
7. Posterolateral margins of posteromedian excavation of sternite 9 broad, truncate; basal arms of parameres stout, with conspicuous laterodistal, pointed processes; aedeagus stout 0.7 times longer than greatest width ..... *D. gargola* Díaz and Spinelli sp. nov.
   Posterolateral margins of posteromedian excavation of sternite 9 pointed; basal arms of parameres slender, without laterodistal processes; aedeagus 0.5 times longer than greatest width ..... *D. patagonica* Ingram and Macfie

8. Subgenital plate very high, triangular ..... *D. shannoni* Ingram and Macfie
   Subgenital plate low, subtriangular or rectangular 9

9. Subgenital plate with two short, slender processes arising from laterodistal margins of gonopore; spermathecae pyriform ..... *D. ona* Díaz and Spinelli sp. nov.
   Subgenital plate without slender processes arising from laterodistal margin of gonopore; spermathecae ovoid 10

10. Subgenital plate rectangular 11
    Subgenital plate subtriangular 12

11. Tarsi dark brown; scutellum with 19–20 long setae and 15–16 shorter ones; anterior margin of subgenital plate irregular ..... *D. gargola* Díaz and Spinelli sp. nov.
    Tarsi paler; scutellum with 13–16 long setae and 6–8 shorter ones; subgenital plate rounded anteromesally ..... *D. patagonica* Ingram and Macfie

12. Posterolateral arms of subgenital plate slender, inner margin concave with pointed, mesally directed tip 13
    Posterolateral arms of subgenital plate stout, inner margin with bulbous protuberance ..... *D. reynoldsi* Ingram and Macfie

13. Scutellum with 16–21 long setae and 8–12 shorter ones; spermathecae necks hyaline ..... *D. fueguina* Díaz and Spinelli sp. nov.
    Scutellum with 25–30 long setae and 22–26 shorter ones; spermathecae necks well sclerotized ..... *D. dellapei* Díaz and Spinelli sp. nov.

Dasyhelea dellapei Díaz and Spinelli sp. nov.
(Figures 1, 2)

Diagnosis

The only species of the *patagonica* group in which the posteromedian margin of the sternite 9 is broadly rounded, not excavated or with distal process or projections. The female subgenital plate is subtriangular, the posterolateral arms are slender, and their inner margins are concave with pointed, mesally directed tips. Both sexes with the largest number (approximately 50) of scutellar setae.

Male. Similar to female with usual sexual differences. Flagellum as in Figure 1A. Palpus (Figure 1B) with third segment bearing scattered sensilla; PR 4.94 (4.50–5.13, $n = 4$). Scutellum with 28–30 long setae and 22–28 shorter ones. Wing (Figure 1C) length 1.91 mm (1.82–1.98 mm, $n = 4$), width 0.54 mm (0.48–0.58 mm, $n = 4$), CR 0.52 (0.51–0.54, $n = 4$). Genitalia (Figure 1D): tergite 9 tapering distally, extending to level of apex of gonocoxite, apicolateral process slender, with apical seta; cercus with two or three setae; sternite 9 (Figure 1E) 0.45 times longer than greatest width, posteromedian margin broadly rounded (folded in the available specimens).

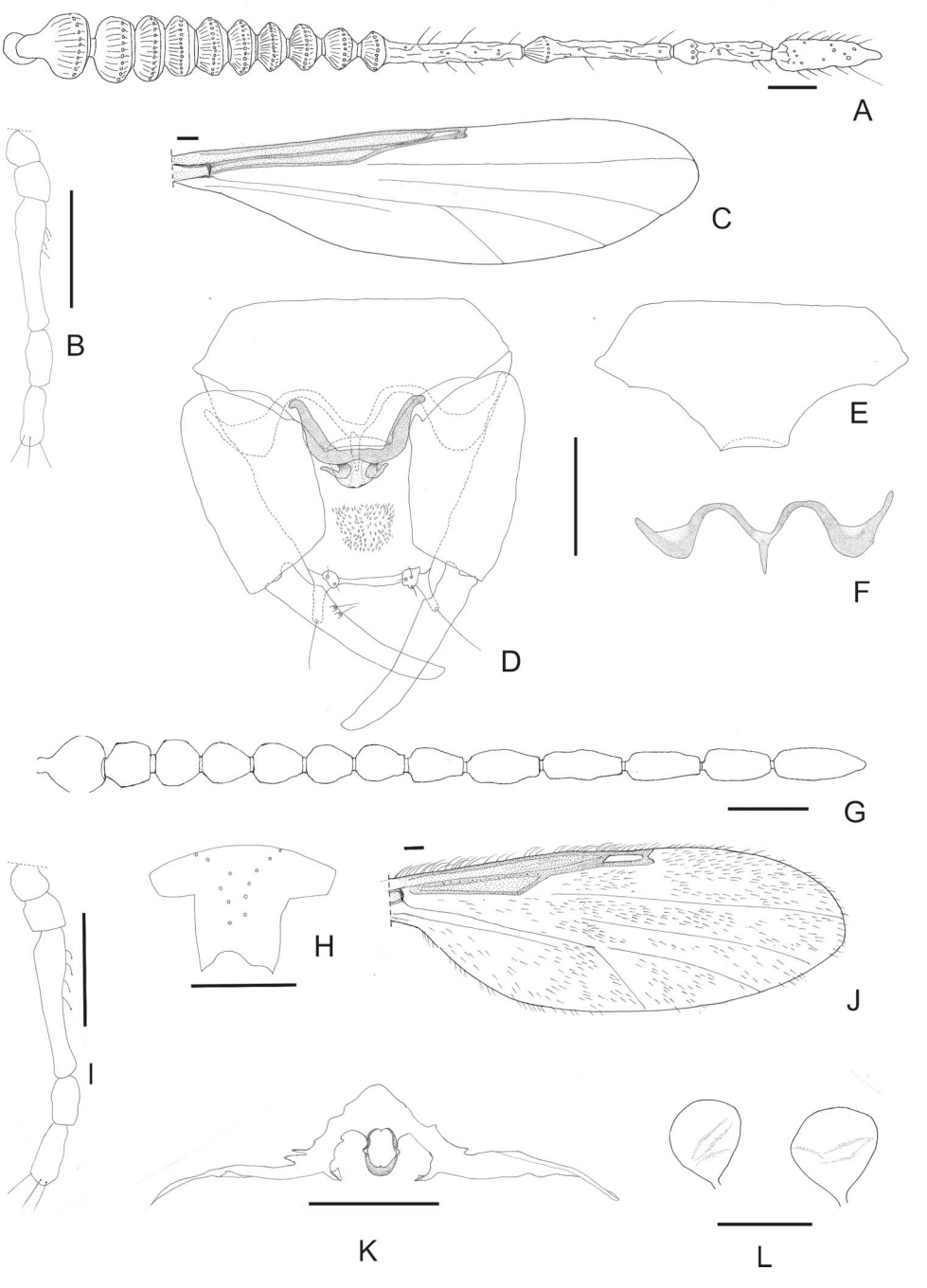

Figure 1. *Dasyhelea dellapei* Díaz and Spinelli sp. nov.: (A–F) male, (G–L) female. (A) Flagellum. (B) Right palpus. (C) Wing. (D) Genitalia (ventral view). (E) Sternite 9. (F) Parameres. (G) Flagellum. (H) Clypeus. (I) Right palpus. (J) Wing. (K) Subgenital plate. (L) Spermathecae. Scale bars 0.05 mm.

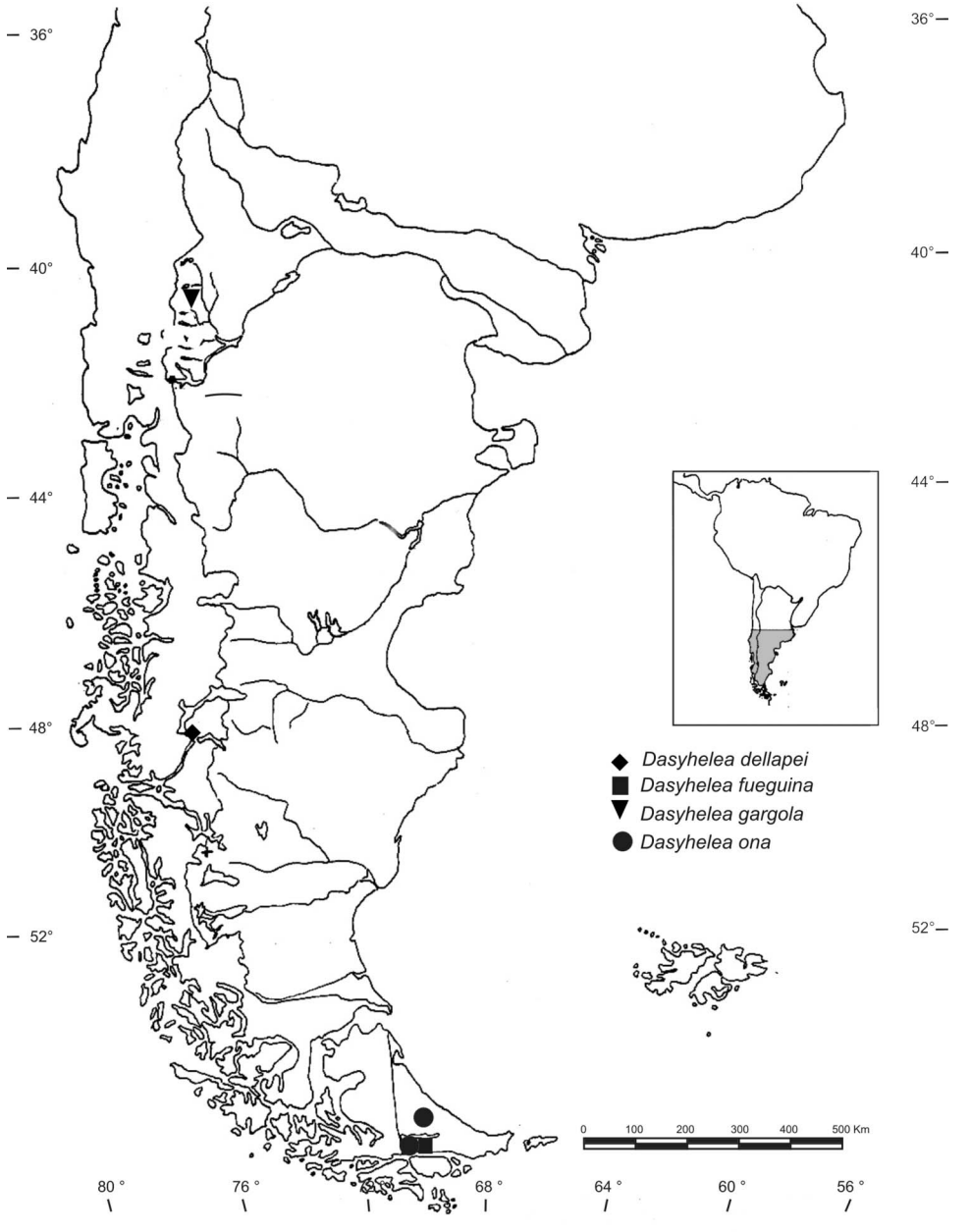

Figure 2. Distribution of *Dasyhelea dellapei*, *Dasyhelea fueguina*, *Dasyhelea gargola* and *Dasyhelea ona*.

Gonocoxite stout, 1.8 times longer than greatest width; gonostylus as long as gonocoxite, narrow base, nearly straight, two basal setae, blunt apex. Parameres (Figure 1F) with basal arms slender, curved; posteromedian projection triangular, extending shortly beyond basal arch of aedeagus, tip pointed. Aedeagus well sclerotized with

rounded tip; 0.65 times longer than greatest width, basal arch extending to 0.55 of total length; basal arms stout, slender, directed anterolaterad; posterolateral arms short, recurved laterad.

Female. Head dark brown. Eyes contiguous by width of one ommatidia. Antenna with flagellum (Figure 1G) dark brown; AR 0.96 (0.91–1.09, $n = 6$). Clypeus (Figure 1H) with 12–17 setae. Palpus (Figure 1I) dark brown; third segment with four sub-basal capitate sensillae; PR 4.49 (4.17–4.86, $n = 6$).

Thorax. Scutum dark brown, scutellum with 25–30 long setae and 22–26 shorter ones. Legs dark brown, including tarsi; hind tibial comb with four spines; prothoracic TR 1.95 (1.70–2.15, $n = 6$), mesothoracic TR 1.95 (1.78–2.12, $n = 6$), metathoracic TR 1.71 (1.57–1.89, $n = 6$). Wing (Figure 1J), length 1.84 mm (1.76–1.92 mm, $n = 5$), width 0.72 mm (0.68–0.76 mm, $n = 5$), CR 0.53 (0.52–0.56, $n = 5$); membrane slightly infuscated, densely covered with macrotrichiae; second radial cell open; cubital fork at same level of anterior portion of second radial cell. Halter dark brown.

Abdomen. Dark brown. Subgenital plate (Figure 1K) subtriangular; posterolateral arms slender, inner margin concave with pointed, mesally directed tip. Two ovoid spermathecae (Figure 1L), subequal, with straight necks, measuring 0.056 by 0.054 mm and 0.052 by 0.046 mm, necks 0.006 mm.

Distribution

Argentina (Santa Cruz).

Type material

Holotype male, Argentina, Santa Cruz prov., Lago del Desierto, 9 December 1996, G. Spinelli, red. Paratypes 3 males, 6 females, as follows: same data as holotype 1 male, 5 females (1 male, 4 female in MLP; 1 female in NHM); Parque Nacional Perito Moreno, Lago Burmeister, 24 November 1999, G. Spinelli - P. Marino, 2 males, 1 female, red (1 male, 1 female in MLP, 1 male in NHM).

Etymology

This species is named after Dr Pablo M. Dellapé, entomologist of the Museo de La Plata.

Discussion

This very dark brown species is the largest within the *patagonica* group, and can be easily distinguished from the other species by the numerous scutellar setae. The male genitalia are similar to those of *D. patagonica*, but in the latter species the aedeagus is distinctly broader and its distal portion is not rounded.

Dasyhelea fueguina Díaz and Spinelli sp. nov.
(Figures 2, 3)

Diagnosis

The only species of the *patagonica* group with the posteromedian projection of parameres bearing a stout, distally directed process with broad, bifid tip, and the spermathecae with hyaline necks.

Male. Similar to female with usual sexual differences. Flagellum as in Figure 3A. Palpus (Figure 3B) with third segment bearing scattered sensilla; PR 4.06 (3.64–4.28, $n = 3$). Scutellum with 19–22 long setae and eight shorter ones. Wing (Figure 3C) length 1.50 mm (1.42–1.54 mm, $n = 3$), width 0.43 mm (0.42–0.44 mm, $n = 3$), anal lobe narrow, CR 0.53 (0.52–0.54, $n = 3$). Genitalia (Figure 3D): tergite 9 tapering distally, extending nearly to level of apex of gonocoxite, apicolateral process slender, with apical seta; cercus with two or three setae; sternite 9 (Figure 3E) 0.45 times longer than greatest width, posteromedian margin folded, slightly excavated. Gonocoxite stout, 1.8 times longer than greatest width, with elongate, blunt anteromedian process; gonostylus slender, as long as gonocoxite, narrow base, nearly straight, tip pointed. Parameres (Figure 3F) with basal arms stout, the fusion to posteromedian projection slightly sclerotized; posteromedian projection short, well sclerotized anteriorly, bearing a stout, distally directed process with broad, bifid tip. Aedeagus stout, well sclerotized, 0.7 times longer than greatest width, basal arch extending to 0.5 of total length, with rounded tip; basal arms short, recurved; posterolateral arms short, divergent, tips recurved mesad.

Female. Head dark brown. Eyes contiguous by width of one or two ommatidia. Antenna with flagellum (Figure 3G) dark brown; AR 1.05 (0.95–1.13, $n = 5$). Clypeus (Figure 3H) with 8–10 setae. Palpus (Figure 3I) dark brown; third segment with three or four sub-basal capitate sensillae; PR 3.70 (3.07–4.07, $n = 5$).

Thorax. Scutum dark brown, scutellum with 16–21 long setae and 8–12 shorter ones. Legs dark brown, including tarsi; hind tibial comb with four spines; prothoracic TR 2.14 (1.66–2.71, $n = 5$), mesothoracic TR 2.01 (1.71–2.28, $n = 5$), metathoracic TR 1.87 (1.71–2.00, $n = 5$). Wing (Figure 3J), length 1.35 mm (1.10–1.52 mm, $n = 5$), width 0.48 mm (0.44–0.52 mm, $n = 5$), CR 0.53 (0.52–0.55, $n = 5$); membrane slightly infuscated, densely covered with macrotrichiae; second radial cell open; cubital fork at same level of distal portion of first radial cell. Halter dark brown.

Abdomen. Dark brown. Subgenital plate (Figure 3K) subtriangular, anterior margin somewhat rounded, irregular; posterolateral arms slender, inner margin concave with pointed, mesally directed tip. Two ovoid spermathecae (Figure 3L), unequal, with straight, hyaline necks, measuring 0.070 by 0.046 mm and 0.058 by 0.042 mm, necks 0.006 mm.

Distribution

Argentina, only known from its type locality.

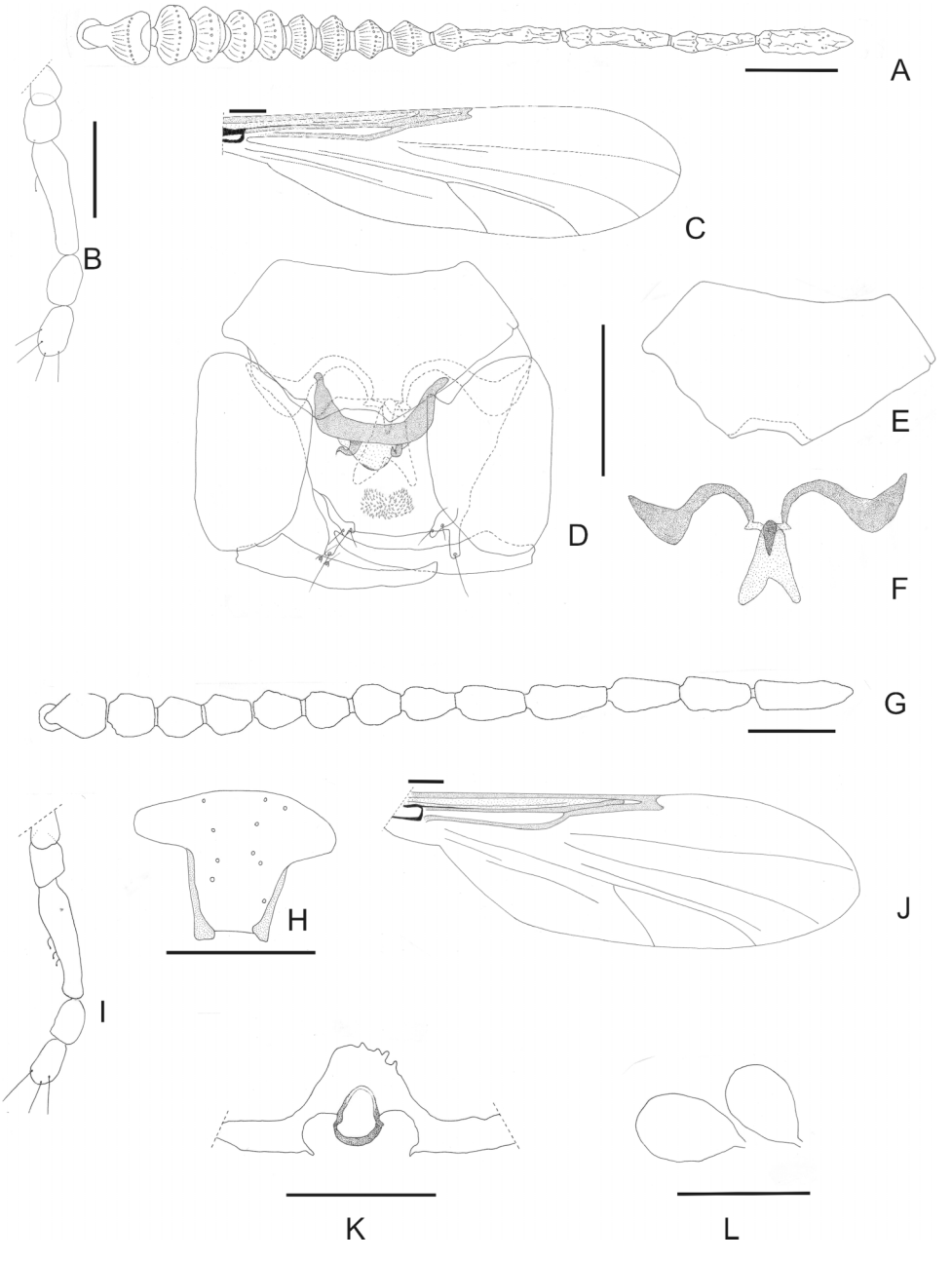

Figure 3. *Dasyhelea fueguina* Díaz and Spinelli sp. nov.: (A–F) male, (G–L) female. (A) Flagellum. (B) Left palpus. (C) Wing. (D) Genitalia (ventral view). (E) Sternite 9. (F) Parameres. (G) Flagellum. (H) Clypeus. (I) Left palpus. (J) Wing. (K) Subgenital plate. (L) Spermathecae. Scale bars 0.05 mm.

Type material

Holotype male, Argentina, Tierra del Fuego, Parque Nacional Tierra del Fuego, río Ovando y ruta nacional no. 3, 54°50′45.3″ S, 68°34′47.7″ W, 1 December 2008, G. Spinelli, red. Paratypes 2 males, 5 females, same data (1 male, 4 females in MLP; 1 male, 1 female in NHM).

Etymology

The specific epithet refers to the province of Tierra del Fuego, where the type series was collected.

Discussion

The aedeagus of *D. fueguina* is very similar to the one of *D. dellapei*, especially by its rounded tip. However, the species can be easily distinguished by the parameres bearing a stout process with broad, bifid tip.

Dasyhelea gargola Díaz and Spinelli sp. nov.
(Figures 2, 4)

Diagnosis

The only species of the *patagonica* group with the posteromedian margin of the male sternite 9 with a deep rounded excavation, and the posterolateral margins of the excavation broad and truncate. The female subgenital plate is rectangular, with irregular anterior margin.

Male. Similar to female with usual sexual differences. Flagellum as in Figure 4A. Palpus (Figure 4B) with third segment bearing scattered sensilla; PR 4.23, fifth segment missing. Scutellum with 18 long setae and 18 shorter ones. Wing (Figure 4C) length 1.74 mm, width 0.50 mm, CR 0.51. Genitalia (Figure 4D): tergite 9 tapering distally, extending to level of apex of gonocoxite, apicolateral process slender, with apical seta; cercus with three or four setae; sternite 9 (Figure 4E) 0.5 times longer than greatest width, posteromedian margin with deep, rounded anteromesal excavation, posterolateral margins of excavation broad, truncate. Gonocoxite stout, 1.9 times longer than greatest width, with short, blunt anteromedian process; gonostylus slender, as long as gonocoxite, narrow base, nearly straight, tip pointed. Parameres (Figure 4F) with basal arms stout, with conspicuous laterodistal, pointed processes; anteromesad projection short, blunt, fused to posteromedian projection, the latter slender, slightly produced beyond distal portion of aedeagus body, with lightly recurved tip. Aedeagus well sclerotized, 0.75 times longer than greatest width, basal arch extending to 0.25 of total length; basal arms stout, short, recurved; body stout with triangular pointed, divergent posterolateral projections; posterolateral arms convergent, tips recurved mesad.

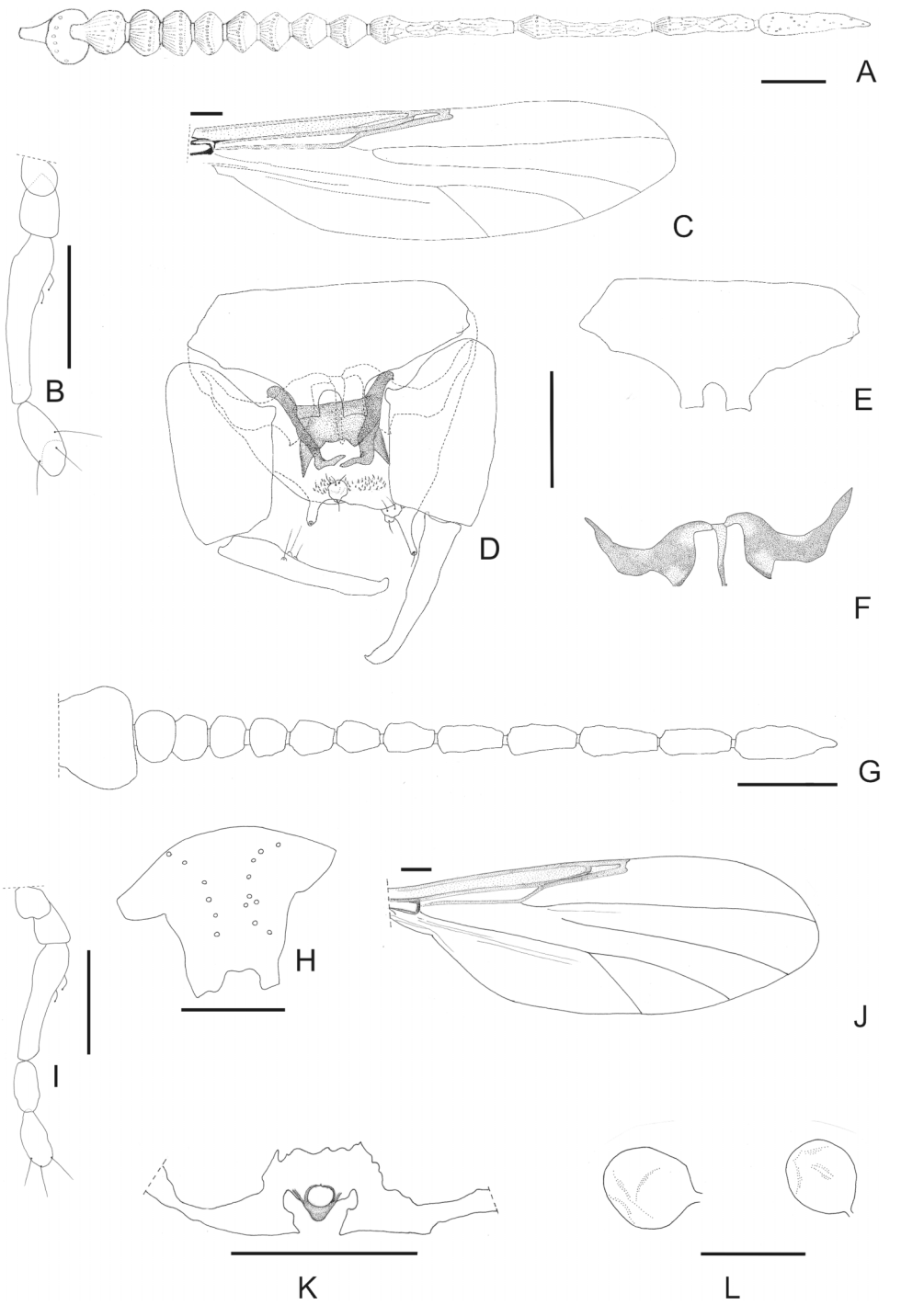

Figure 4. *Dasyhelea gargola* Díaz and Spinelli sp. nov.: (A–F) male, (G–L) female. (A) Flagellum. (B) Right palpus. (C) Wing. (D) Genitalia (ventral view). (E) Sternite 9. (F) Parameres. (G) Flagellum. (H) Clypeus. (I) Right palpus. (J) Wing. (K) Subgenital plate. (L) Spermathecae. Scale bars 0.05 mm.

Female. Head dark brown. Eyes contiguous by width of two to three ommatidia. Antenna with flagellum (Figure 4G) dark brown; AR 1.13 (1.09–1.17, $n = 2$). Clypeus (Figure 4H) with 14–17 setae. Palpus (Figure 4I) dark brown; third segment with four sub-basal capitate sensillae; PR 3.82 (3.71–3.93, $n = 2$).

Thorax. Scutum dark brown, scutellum with 19–20 long setae and 15–16 shorter ones. Legs dark brown, including tarsi; hind tibial comb with five spines; prothoracic TR 1.88, mesothoracic TR 1.90, metathoracic TR 1.87 (1.84–1.90, $n = 2$). Wing (Figure 4J), length 1.46 mm (1.44–1.48 mm, $n = 2$), width 0.58 mm (0.56–0.60 mm, $n = 2$), CR 0.52 ($n = 2$); membrane slightly infuscated, densely covered with macrotrichiae; second radial cell open; cubital fork at same level of anterior portion of second radial cell. Halter dark brown.

Abdomen. Dark brown. Subgenital plate (Figure 4K) rectangular, anterior margin irregular; posterolateral arms stout, posteromedian projection stout, inner margin straight distally. Two ovoid spermathecae (Figure 4L), subequal, with straight necks, measuring 0.048 by 0.042 mm and 0.044 by 0.038 mm, necks 0.004 mm.

Distribution

Argentina, only known from its type locality.

Type material

Holotype male, Argentina, Rio Negro, Parque Nacional Nahuel Huapi, cerro Catedral, laguna Toncek, 41°11′52.2″ S, 71°29′31.2″ W, 1770 m, 20 February 2007, C. Cazorla – M. Donato, red. Paratypes, 2 females, same data (MLP).

Etymology

The specimens herein described as a new species were collected in the laguna Toncek located in the cerro Catedral. The specific epithet refers to the gargoyles that are common sculptures of Cathedrals.

Discussion

The male genitalia of this species are similar to those of *D. ona*, especially by the aedeagus stout body and the triangular pointed, divergent posterolateral projections. However, it can be distinguished from *D. ona* by several other characteristics that may be found in the discussion under the description of the later species.

Dasyhelea ona Díaz and Spinelli sp. nov.
(Figures 2, 5)

Diagnosis

The only species of the *patagonica* group with posteromedian margin of the sternite 9 slightly concave and bearing a crescent-shaped sclerite followed by two reniform,

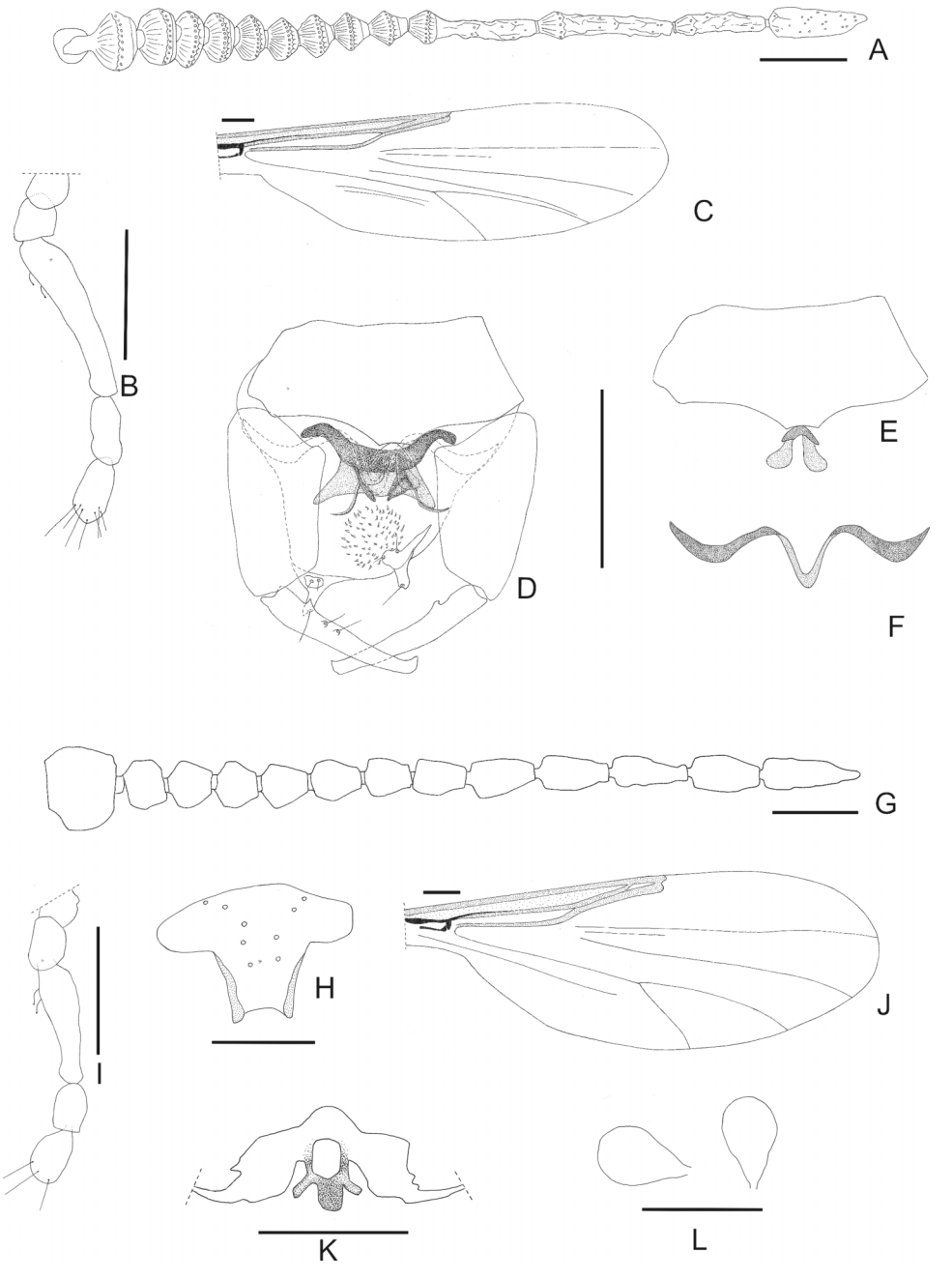

Figure 5. *Dasyhelea ona* Díaz and Spinelli sp. nov.: (A–F) male, (G–L) female. (A) Flagellum. (B) Left palpus. (C) Wing. (D) Genitalia (ventral view). (E) Sternite 9. (F) Parameres. (G) Flagellum. (H) Clypeus. (I) Left palpus. (J) Wing. (K) Subgenital plate. (L) Spermathecae. Scale bars 0.05 mm.

stout processes directed caudad, the parameres lacking posteromedial protection. The female subgenital plate has two slender processes arising from laterodistal margins of gonopore, and the spermathecae are distinctly pyriform.

Male. Similar to female with usual sexual differences. Flagellum as in Figure 5A. Palpus (Figure 5B) with third segment bearing scattered sensilla; PR 4.18 (3.57–4.83, $n = 8$). Scutellum with 16–20 long setae and 6–14 shorter ones. Wing (Figure 5C) length 1.45 mm (1.40–1.52 mm, $n = 7$), width 0.44 mm (0.42–0.48 mm, $n = 7$), CR 0.49 (0.47–0.51, $n = 7$). Genitalia (Figure 5D): tergite 9 tapering distally, extending to level of apex of gonocoxite, apicolateral process slender, with apical seta; cercus with two or three setae; sternite 9 (Figure 5E) 0.6 times longer than greatest width, posteromedian margin slightly concave, with crescent-shaped sclerite followed by two reniform, stout processes directed caudad. Gonocoxite stout, 2.2 times longer than greatest width, with short, blunt anteromedian process; gonostylus slender, 0.9 times longer than gonocoxite, narrow base, nearly straight, tip pointed. Parameres (Figure 5F) without posteromedian projection; basal arms slender, fused distally, with blunt tip. Aedeagus well sclerotized, 0.55 times longer than greatest width, basal arch extending to 0.3 of total length; basal arms stout, elongated, recurved; posterolateral arms triangular, distal margin slightly concave, with posteriorly directed, recurved filament with pointed tip.

Female. Head dark brown. Eyes contiguous by width of two ommatidia. Antenna with flagellum (Figure 5G) pale brown; AR 0.94 (0.88–1.05, $n = 9$). Clypeus (Figure 5H) with eight or nine setae. Palpus (Figure 5I) pale brown; third segment with two subbasal capitate sensillae; PR 3.66 (3.00–4.25, $n = 9$).

Thorax. Scutum dark brown, scutellum with 14–20 long setae and 10–22 shorter ones. Legs dark brown, tarsi slightly paler; hind tibial comb with five spines; prothoracic TR 1.86 (1.61–2.06, $n = 9$), mesothoracic TR 1.86 (1.57–2.25, $n = 8$), metathoracic TR 1.99 (1.75–2.11, $n = 9$). Wing (Figure 5J), length 1.28 mm (1.12–1.42 mm, $n = 9$), width 0.52 mm (0.46–0.60 mm, $n = 9$), CR 0.49 (0.47–0.54, $n = 9$); membrane slightly infuscated, densely covered with macrotrichiae; second radial cell open; cubital fork at same level of distal portion of first radial cell. Halter pale brown.

Abdomen. Dark brown. Subgenital plate (Figure 5K) rectangular with rounded anteromesal margin, posterolateral arms stout; two short, slender processes arising from laterodistal margin of gonopore. Two pyriform spermathecae (Figure 5L), subequal, with straight, stout necks, measuring 0.056 by 0.042 mm and 0.052 by 0.038 mm, necks 0.006 mm.

Distribution

Argentina (Tierra del Fuego).

Type material

Holotype male, Argentina, Tierra del Fuego prov., Parque Nacional Tierra del Fuego, laguna Negra (turbera), 54°50′42.1″ S, 68°35′17.9″ W, 15 m, 4–7 December 2008, M. Donato - G. Spinelli, Malaise trap. Paratypes 7 males, 9 females, as follows: same data as holotype 6 males, 5 females (5 males, 4 females in MLP; 1 male, 1 female

in NHM); same data except 1 female, red. Tierra del Fuego prov., ruta complementaria a (turbera), 54°21′42.3″ S, 66°39′42.4″ W, 40 m, 3 December 2008, G. Spinelli, 3 females, red (MLP); Lago Yehuin, 54°21′39.6″ S, 67°46′44.4″ W, 45 m, 5 December 2008, G. Spinelli, 1 male, red (MLP).

Etymology

The species is named after the Ona indians, early inhabitants of Tierra del Fuego island.

Discussion

The male genitalia of this new species are similar to *D. gargola*. However, the latter species lacks the posteromedian crescent-shaped sclerite and reniform processes of the sternite 9, and the parameres show a distinct slender posteromedian projection that is produced beyond the aedeagus body. The female is clearly distinguished from other species by the pyriform spermatheca and by the presence in the subgenital plate of two slender processes arising from laterodistal margins of gonopore.

Dasyhelea patagonica Ingram and Macfie, 1931
(Figures 6, 7)

Dasyhelea patagonica Ingram and Macfie, 1931: 182 (male, female, Argentina); Wirth, 1974: 17 (in catalogue of south USA species); Spinelli and Wirth, 1993: 30 (in list; Argentina); Borkent and Wirth, 1997: 57 (in World catalogue); Spinelli, 1998: 325 (in list; Argentina); Borkent and Spinelli, 2000: 25 (in catalogue of south USA species); Borkent and Spinelli, 2007: 60 (in Neotropical catalogue); Borkent, 2009: 68 (online catalogue).
Dasyhelea chilensis Ingram and Macfie, 1931: 186 (female, Chile); Wirth, 1974: 17 (in Neotropical catalogue); Borkent and Wirth, 1997: 53 (in World catalogue); Borkent and Spinelli, 2000: 25 (in catalogue of south USA species); Borkent and Spinelli, 2007: 60 (in Neotropical catalogue), Borkent, 2009: 61 (online catalogue). NEW SYNONYMY.

Diagnosis

The only species of the *patagonica* group with at most 28 scutellar setae and the tarsi paler than femora. The posteromedian margin of the male sternite 9 has a deep rounded excavation and the posterolateral margins of the excavation are pointed.

Male. Similar to female with usual sexual differences. Flagellum as in Figure 6A. Palpus (Figure 6B) with third segment narrowed at midportion, with scattered sensilla; PR 4.18 (3.84–4.54, $n = 3$). Scutellum with 14–18 long setae and 10 shorter ones. Wing (Figure 6C) length 1.25 mm (1.18–1.34 mm, $n = 3$), width 0.37 mm (0.36–0.40 mm, $n = 3$), CR 0.47 (0.45–0.50, $n = 3$). Genitalia (Figure 6D): tergite 9 rounded distally, extending to level of apex of gonocoxite, apicolateral process slender, with apical seta; cercus with three or four setae; sternite 9 (Figure 6E) 0.45 times longer than

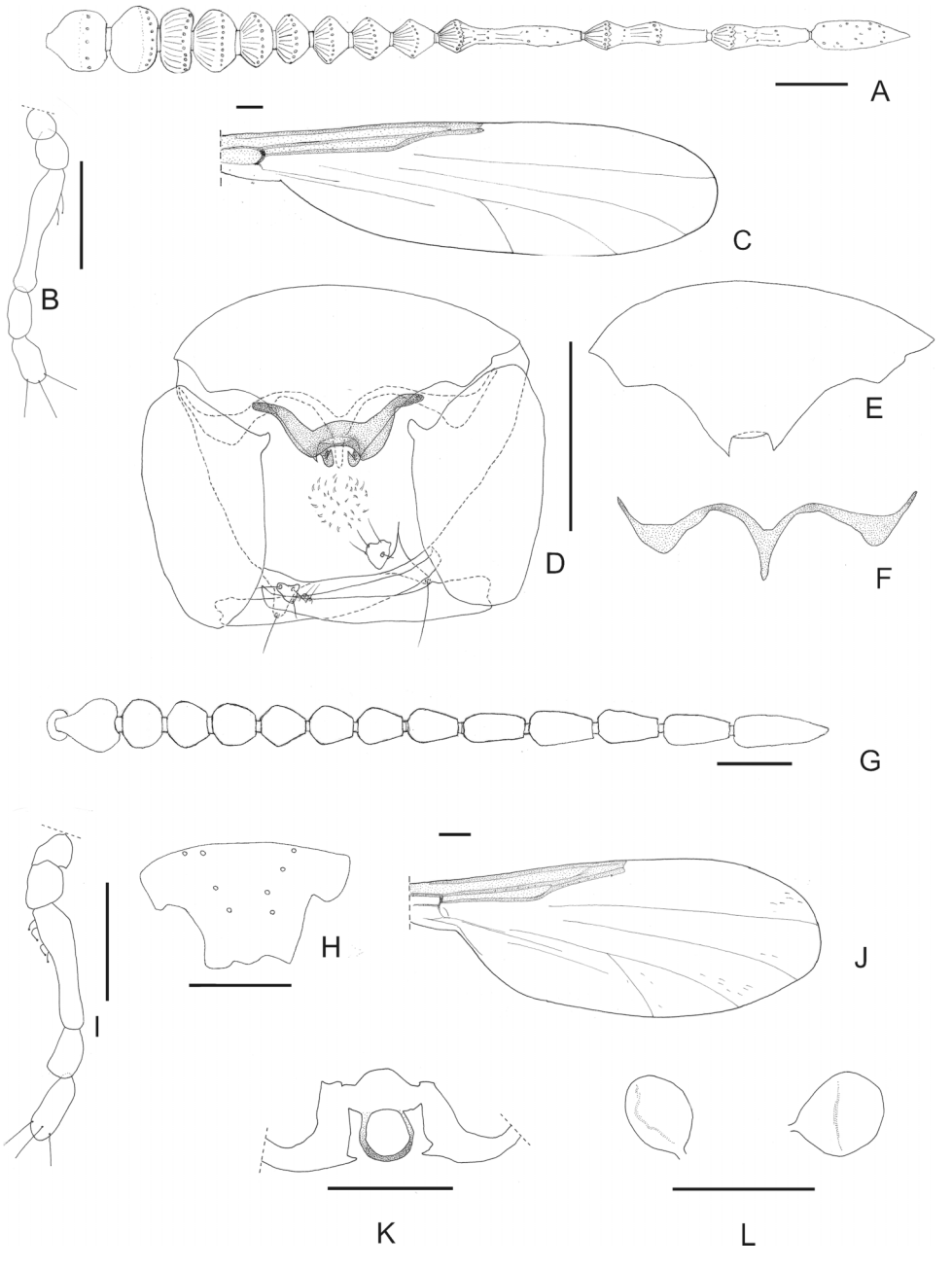

Figure 6. *Dasyhelea patagonica* Ingram and Macfie: (A–F) male, (G–L) female. (A) Flagellum. (B) Right palpus. (C) Wing. (D) Genitalia (ventral view). (6) Sternite 9. (F) Parameres. (G) Flagellum. (H) Clypeus. (I) Left palpus. (J) Wing. (K) Subgenital plate. (L) Spermathecae. Scale bars 0.05 mm.

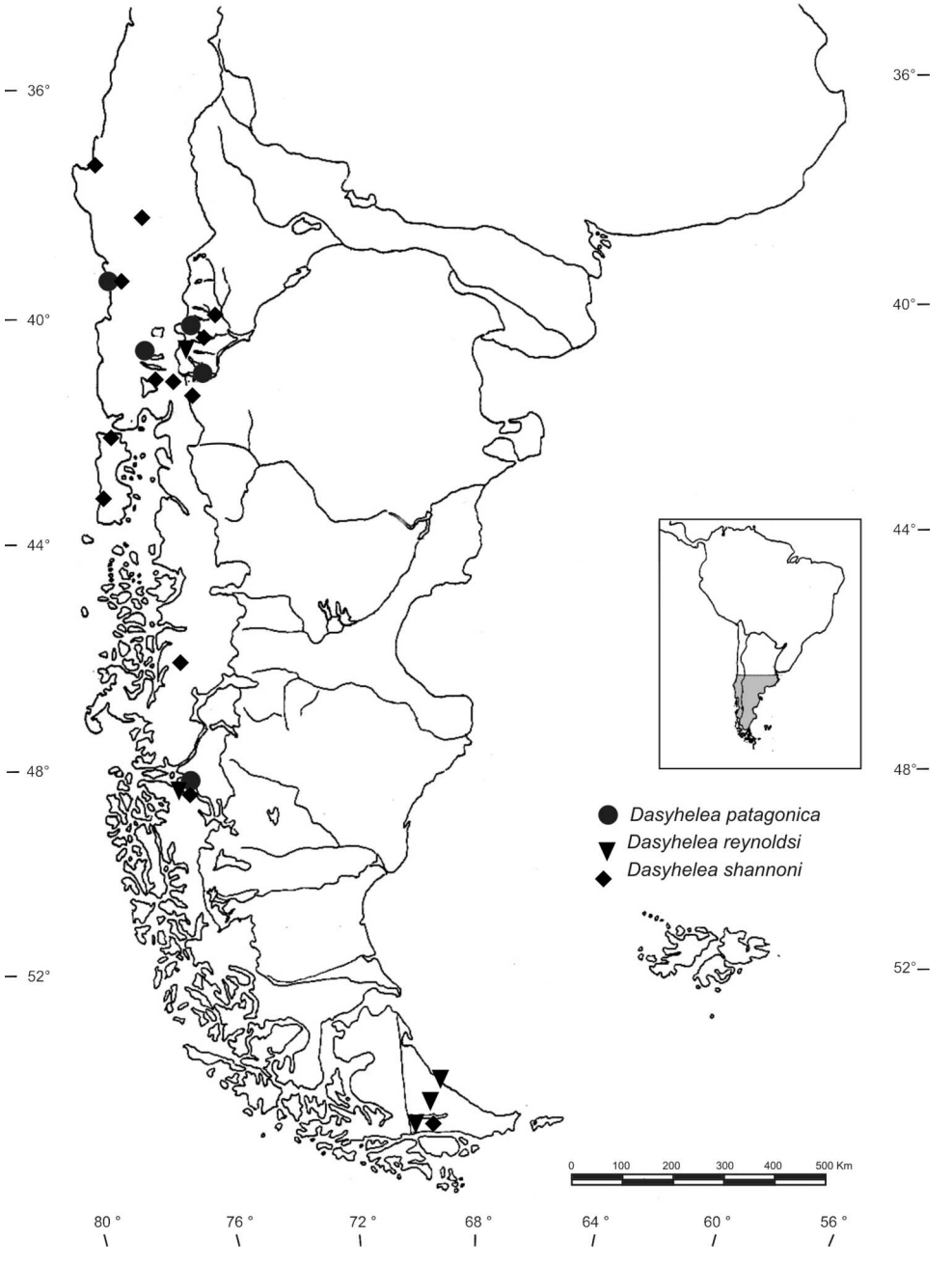

Figure 7. Distribution of *Dasyhelea patagonica*, *Dasyhelea reynoldsi* and *Dasyhelea shannoni*.

greatest width; posteromedian margin with deep rounded excavation, posterolateral margins of excavation pointed. Gonocoxite stout, 2.0 times longer than greatest width, with conspicuous anteromedian process, directed anteromesad; gonostylus 0.9 times longer than gonocoxite, narrow base, slender, nearly straight, tip pointed. Parameres

(Figure 6F) with basal arms slender; posteromedian projection slender, reaching distal portion of aedeagus, tip blunt. Aedeagus strongly sclerotized, 0.4 times longer than greatest width, basal arch extending to 0.4 of total length; basal arms slender, directed laterad; posterolateral arms with recurved, ventrally directed tips.

Female. Head dark brown. Eyes contiguous by width of one or two ommatidia. Antenna with flagellum (Figure 6G) dark brown, AR 0.96 (0.88–1.00, $n = 8$). Clypeus (Figure 6H) with seven to nine setae. Palpus (Figure 6I) dark brown; third segment with four sub-basal capitate sensillae; PR 3.79 (3.23–4.16, $n = 10$).

Thorax. Scutum dark brown, scutellum with 13–16 long setae and six to eight shorter ones. Legs dark brown, tarsi paler; hind tibial comb with five spines; prothoracic TR 1.82 (1.73–2.00, $n = 10$), mesothoracic TR 1.90 (1.76–2.06, $n = 10$), metathoracic TR 1.91 (1.75–2.23, $n = 10$). Wing (Figure 6J), length 1.12 mm (1.00–1.42 mm, $n = 10$), width 0.47 mm (0.42–0.58 mm, $n = 10$), CR 0.49 (0.48–0.52, $n = 10$); membrane slightly infuscated, densely covered with macrotrichiae; cubital fork at same level of middle length of second radial cell. Halter dark brown.

Abdomen. Dark brown. Subgenital plate (Figure 6K) rectangular, anterior margin rounded mesally; posterolateral arms straight, with pointed, mesally directed tip. Two ovoid spermathecae (Figure 6L), subequal, with straight necks, measuring 0.050 by 0.044 mm and 0.046 by 0.034 mm, necks 0.040 mm.

Distribution

Argentina (Neuquen, Río Negro), Chile (Llanquihue, Osorno, Valdivia).

Type material

Dasyhelea patagonica. Holotype male, Argentina, Río Negro prov., Lago Gutiérrez; 3–14 November 1926, F. and M. Edwards; allotype female, same data except Bariloche, 1 December 1926, F. and M. Edwards (NHM, examined).

Dasyhelea chilensis. Holotype female, Chile, Llanquihue prov., Casa Pangue, 4–10 December 1926, F. and M. Edwards (NHM, examined).

Other specimens examined

Argentina: Neuquen prov., lago Curruhe, 20 November 1994, G. Spinelli, 1 male, 2 females (MLP). Río Negro prov., Parque Nacional "Nahuel Huapi", lago Villarino, 5 December 1992, G. Spinelli, 2 males, 1 female (MLP); Parque Nacional Nahuel Huapi, Manso Medio, La Cantera, 41°21′16″ S, 71°42′27.3″ W, 764 m, 15 January to 7 February 2007, Garré- Montes de Oca, 2 females, Malaise trap (MLP); same date except 11–30 December 2007, Garré- Montes de Oca, 2 females, Malaise trap (MLP).

Chile: Valdivia prov., Mehuin, 27 December 1992, G. Spinelli, 1 female, red. Osorno prov., camino a Pucatrihue, 29 November 1992, G. Spinelli, 2 females, red (MLP).

Discussion

This species, restricted to northern Patagonia, is the smallest of the *patagonica* group and is the one with fewer scutellar setae (at most 28). The female subgenital plate is similar to that of *D. gargola*, another north patagonian species. Characters to distinguish the male genitalia from those of *D. dellapei* may be found in the key and in the discussion under the description of the later species.

The synonymy of *D. chilensis* under *D. patagonica* is based on the examination of the types of both species. They only differ in the tarsi colouration, very slightly darker in the female holotype of *D. chilensis*, something in itself that is insufficient to recognize another species.

Dasyhelea reynoldsi Ingram and Macfie, 1931
(Figures 7, 8)

Dasyhelea reynoldsi Ingram and Macfie, 1931: 185 (male, female, Argentina); Wirth, 1974: 18 (in catalogue of south USA species); Borkent and Wirth, 1997: 57 (in World catalogue); Spinelli, 1998: 325 (in list; Argentina); Borkent and Spinelli, 2000: 26 (in catalogue south USA species), Borkent and Spinelli, 2007: 61 (in Neotropical catalogue); Borkent, 2009: 69 (online catalogue).

Diagnosis

The only species of the *patagonica* group with the sternite 9 of male bearing a posterior trefoil-shaped projection and the gonostylus with a double curve.

Male. Similar to female with usual sexual differences. Flagellum as in Figure 8A brown. Palpus (Figure 8B) brown; with third segment bearing scattered sensilla; PR 5.23 (4.53–6.08, $n = 10$). Scutellum with 24–34 long setae and 12–16 shorter ones. Wing (Figure 8C), length 1.81 mm (1.72–1.94 mm, $n = 9$), width 0.52 mm (0.50–0.56 mm, $n = 9$), CR 0.50 (0.49–0.51, $n = 9$). Genitalia (Figure 8D): tergite 9 not reaching to level of apex of the gonocoxite, tip broad, truncate, apicolateral process slender, with apical seta; cercus with four or five short setae; sternite 9 (Figure 8E) 0.65 times longer than greatest width, posteromedian margin narrow, slightly concave, with posterior projection trefoil-shaped slightly produced beyond aedeagus tip. Gonocoxite stout, 2.2 times longer than greatest width, with conspicuous anteromedian process directed anteromesad; gonostylus as long as gonocoxite, slender, with a double curve, tip pointed. Parameres (Figure 8F) with basal arms slender, curved; posteromedian projection triangular with blunt tip, reaching midlength of aedeagus. Aedeagus strongly sclerotized, 0.5 times longer than greatest width, basal arch extending to 0.4 of total length; basal arms slender, curved directed laterad; posterolateral arms stout recurved ventrad.

Female. Head dark brown. Eyes contiguous by width of two ommatidia. Antenna with flagellum (Figure 8G) very dark brown, AR 1.01 (1.00–1.08, $n = 10$). Clypeus (Figure 8H) with seven or eight setae. Palpus (Figure 8I) dark brown; third segment with two sub-basal capitate sensillae; PR 4.21 (3.33–4.57, $n = 10$).

Thorax. Scutum very dark brown, scutellum with 20–26 long setae and 14–22 shorter ones. Legs very dark brown, except tarsis pale brown; hind tibial comb with

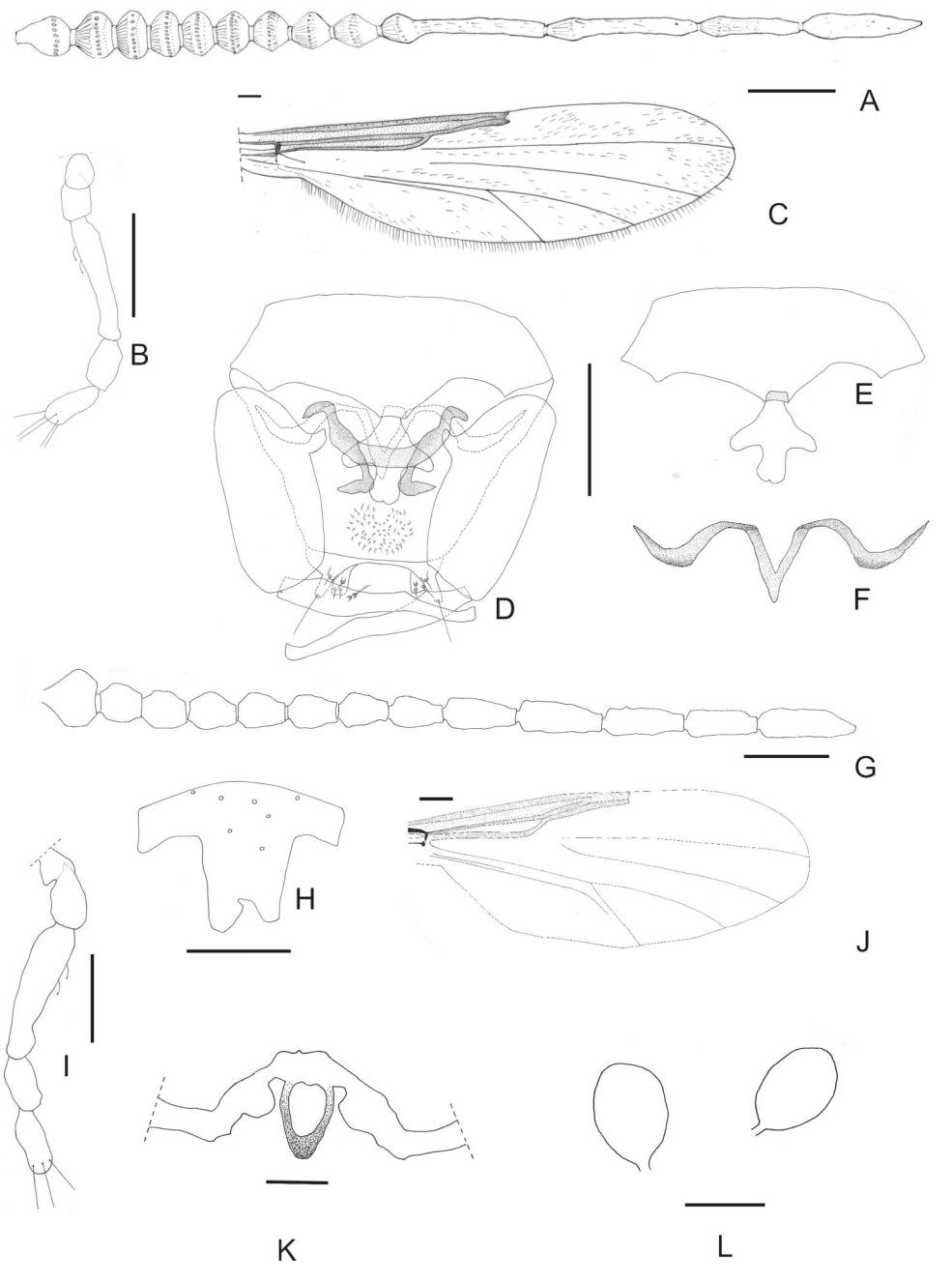

Figure 8. *Dasyhelea reynoldsi* Ingram and Macfie: (A–F) male, (G–L) female. (A) Flagellum. (B) Left palpus. (C) Wing. (D) Genitalia (ventral view). (E) Sternite 9. (F) Parameres. (G) Flagellum. (H) Clypeus. (I) Right palpus. (J) Wing. (K) Subgenital plate. (L) Spermathecae. Scale bars 0.05 mm.

six spines; prothoracic TR 1.80 (1.59–2.00, $n = 10$), mesothoracic TR 1.90 (1.76–2.27, $n = 10$), metathoracic TR 1.79 (1.71–1.85, $n = 10$). Wing (Figure 8J), length 1.68 mm (1.52–1.78 mm, $n = 10$), width 0.67 mm (0.64–0.74 mm, $n = 10$), CR 0.53 (0.51–0.55, $n = 10$); membrane slightly infuscated, densely covered with macrotrichiae; cubital fork at same level of anterior portion of second radial cell. Halter dark brown.

Abdomen. Dark brown. Subgenital plate (Figure 8K), subtriangular; posterolateral arms stout, inner margin with bulbous protuberance. Two ovoid spermathecae (Figure 8L), subequal, with straight necks, measuring 0.056 by 0.038 mm and 0.054 by 0.038 mm, necks 0.004 mm.

Distribution

Argentina (Santa Cruz, Tierra del Fuego).

Type material

Holotype male, allotype female, Argentina, Tierra del Fuego prov., Río Grande, estancia Viamonte, 1930, P. W. Reynolds (NHM, examined).

Other specimens examined

Argentina, Santa Cruz prov., Lago del Desierto, 9 December 1996, G. Spinelli, 3 males (MLP). Tierra del Fuego prov., 40 km west of Río Grande, 3 December 2005, G. Spinelli, 1 male, red (MLP); Parque Nacional Tierra del Fuego, Río Ovando y ruta nacional no. 3, 54°50′45.3″ S, 68°34′47.7″ W, 1 December 2008, G. Spinelli, 1 male, red (MLP); laguna Negra (turbera), 54°50′2.1″ S, 68°35′17.9″ W, 15 m, 4–7 December 2008, M. Donato - G. Spinelli, 4 males, Malaise trap (MLP); Lago Yehuin, 54°21′39.6″ S, 67°46′44.4″ W, 45 m, 5 December 2008, G. Spinelli, 1 female, red (MLP); río San Pablo y ruta complementaria a, 54°17′59.5″ S, 66°42′42.5″ W, 12 m, 3 December 2008, G. Spinelli, 1 male, red (MLP); ruta complementaria a (turbera), 54°21′42.3″ S, 66°39′42.4″ W, 40 m, 3 December 2008, G. Spinelli, 8 females, red (MLP).

Discussion

This species, restricted to southern Patagonia, is very similar to *D. shannoni*. However, the latter species is smaller, the sternite 9 of the male is arrow-shaped, the posterolateral arms of the aedeagus are convergent and the female subgenital plate is higher.

The type-locality of *D. reynoldsi* is located in the Argentinean side of the island of Tierra del Fuego, not in Chile as stated by Wirth (1974) and followed by Borkent and Wirth (1997) and Borkent and Spinelli (2000, 2007). On the other hand, Spinelli (1998) properly recorded the species from Argentina.

Dasyhelea shannoni Ingram and Macfie, 1931
(Figures 7, 9)

Dasyhelea shannoni Ingram and Macfie, 1931: 183 (male, female, Chile); Wirth, 1974: 18 (in catalogue of south USA species); Borkent and Wirth, 1997: 57 (in World catalogue); Borkent and Spinelli, 2000: 26 (in catalogue of south USA species); Borkent and Spinelli, 2007: 61 (in Neotropical catalogue); Borkent, 2009: 70 (online catalogue).

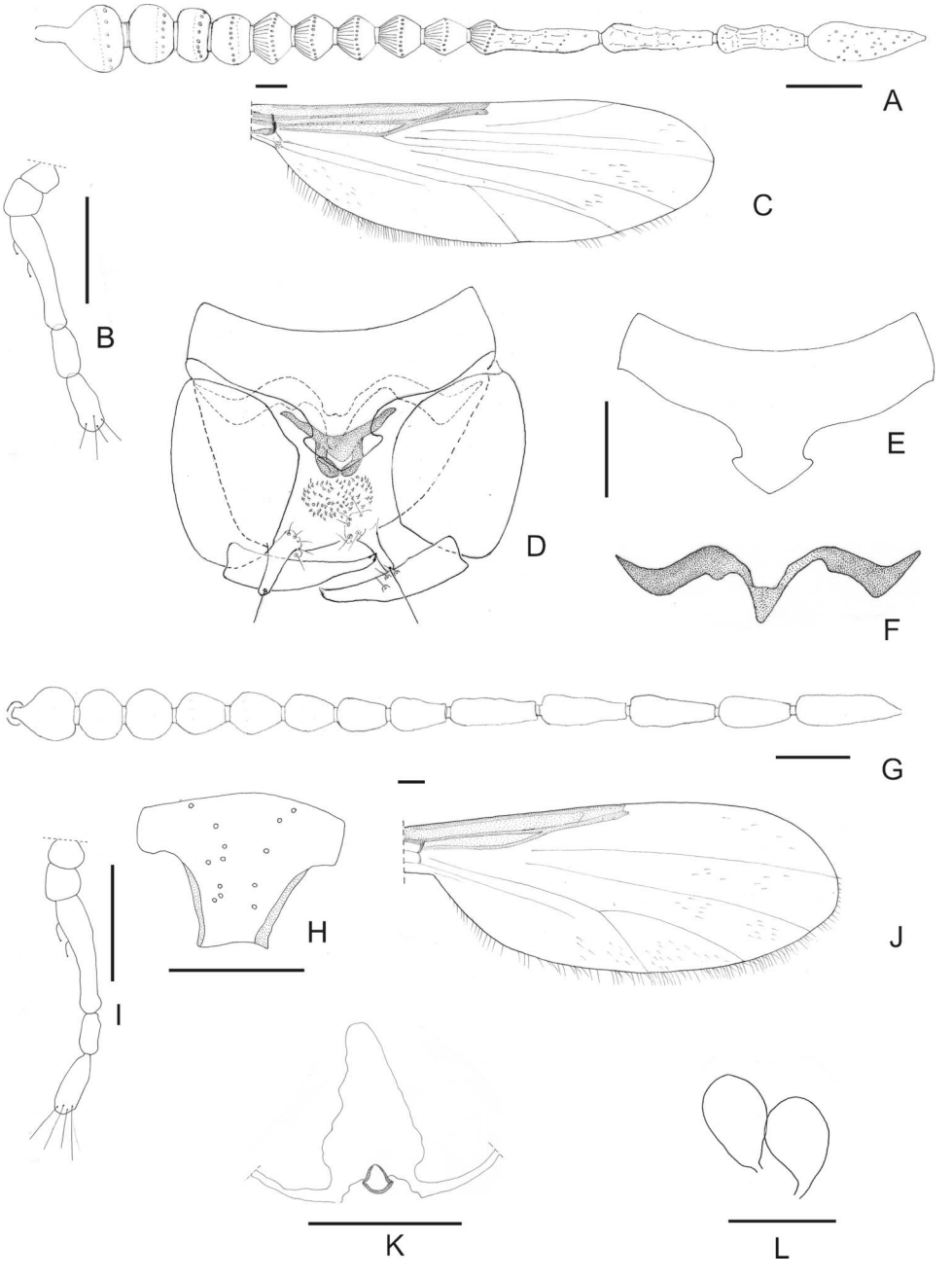

Figure 9. *Dasyhelea shannoni* Ingram and Macfie: (A–F) male, (G–L) female. (A) Flagellum. (B) Left palpus. (C) Wing. (D) Genitalia (ventral view). (E) Sternite 9. (F) Parameres. (G) Flagellum. (H) Clypeus. (I) Left palpus. (J) Wing. (K) Subgenital plate. (L) Spermathecae. Scale bars 0.05 mm.

Diagnosis

The only species of the *patagonica* group with arrow-shaped posteromedian of male sternite 9, and female subgenital plate triangular and very high.

Male. Similar to female with usual sexual differences. Flagellum as in Figure 9A. Palpus (Figure 9B) with third segment bearing scattered sensilla; PR 4.36 (4.00–5.00, $n = 10$). Scutellum with 14–19 long setae and 10–14 shorter ones. Wing (Figure 9C); length 1.26 mm (1.20–1.32 mm, $n = 7$), width 0.39 mm (0.36–0.42 mm, $n = 7$), CR 0.49 (0.48–0.50, $n = 7$). Genitalia (Figure 9D): tergite 9 rounded distally, not reaching level of apex of gonocoxite, apicolateral process slender, with apical seta; cercus with four or five setae; sternite 9 (Figure 9E) 0.5 times longer than greatest width, with posteromedian margin arrow-shaped, reaching aedeagus apex. Gonocoxite stout, 1.5 times longer than greatest width; gonostylus 0.8 longer than gonocoxite, width base, nearly straight, tapering to pointed apex. Parameres (Figure 9F) with basal arms slightly curved; posteromedian projection triangular, short, reaching aedeagus midlength. Aedeagus very sclerotized, 0.6 times longer than greatest width, basal arch extending to 0.3 of total length; basal arms elongate, directed laterad; posterolateral arms convergent, slender, apex recurved directed ventrad.

Female. Head dark brown. Eyes contiguous by width of one or two ommatidia. Antenna with flagellum (Figure 9G) pale; AR antennal 1.01 (0.84–1.07, $n = 10$). Clypeus (Figure 9H) with 9–13 setae. Palpus (Figure 9I) brown; third segment with three sub-basal capitate sensillae; PR 3.91 (3.50–4.45, $n = 10$).

Thorax. Scutum dark brown, scutellum with 16–19 long setae and 10–18 shorter ones. Legs dark brown; hind tibial comb with five spines; prothoracic TR 1.85 (1.72–2.00, $n = 10$), mesothoracic TR 1.88 (1.71–2.22, $n = 10$), metathoracic TR 1.76 (1.44–1.95, $n = 10$). Wing (Figure 9J), length 1.23 mm (1.10–1.38 mm, $n = 10$), width 0.50 mm (0.44–0.58 mm, $n = 10$), CR 0.50(0.49–0.52, $n = 10$); membrane slightly infuscated, densely covered with macrotrichiae; cubital fork at same level of middle length of second radial cell. Halter dark brown.

Abdomen. Dark brown. Subgenital plate (Figure 9K) stout, triangular, extending to anterior margin of eighth segment; posterolateral arms short, slender. Two pyriform spermathecae (Figure 9L), subequal, with slender, straight necks, measuring 0.042 by 0.032 mm and 0.036 by 0.030 mm, necks 0.004 mm.

Distribution

Argentina (Neuquen, Santa Cruz); Chile (Arauco, Cautin, Chiloé, Coihaique, Llanquihue, Malleco, Valdivia).

Type material

Holotype male, Chile, Llanquihue prov., Ensenada, 14/15 December 1926, F. and M. Edwards; allotype female, Chile, Chiloe Islands, Ancud, 17–19 December 1926, F. and M. Edwards (NHM, examined).

Other specimens examined

Argentina: Neuquen prov., 20 km north of lago Aluminé, 13 February 1994, G. Spinelli, 1 male (MLP); Hua-Hum, 11 February 1989, G. Spinelli, 1 male, red (MLP); 6–7 km south of San Martín de los Andes, 900 m, 26 November 1984, G. Spinelli, 1 female (MLP); Parque Nacional Nahuel Huapi, río Pichitraful, 40°42′46″ S, 71°47′23″ W, 789 m, 4–23 February 2008, A. Garre – F. Montes de Oca, 1 male, Malaise trap (MLP). Río Negro prov., Parque Nacional Nahuel Huapi, río Manso superior, 41°14′8.1″ S, 71°46′58.5″ W, 845 m, 7 February to 2 March 2007, A. Garré – F. Montes de Oca, 3 males, 1 female, Malaise trap (MLP). Santa Cruz prov., lago del Desierto, 19 January 1995, I. Garda, 1 male, 1 female, red (MLP), same data except 9 December 1996, G. Spinelli, 1 male (MLP). Tierra del Fuego prov., Parque Nacional Tierra del Fuego, Río Ovando y ruta nacional no. 3, 54°50′45.3″ S, 68°34′47.7″ W, 1 December 2008, G. Spinelli, 4 males, red (MLP).

Chile: Arauco prov., Pata de Gallina, 7 December 2003, G. Spinelli, 2 males, red. Malleco prov., Parque Nacional Nahuelbuta (JAD 1682/2), 26 December 1984, J. A. Downes, 1 male, red (CNCI). Cautin prov. 10 km E Villarrica, 27 December 1992, G. Spinelli, 1 male; 17 km southwest Villarrica, 6 December 2003, G. Spinelli, 1 male, red. Valdivia prov., Puringue Pobre, comarca Mariquita (JAD 1692/1), 8 January 1985, J. A. Downes, 3 males, 1 female, red (CNCI); Fundo San Martín (JAD 1669/1), 15 December 1984, J. A. Downes, 1 female, red (CNCI). Llanquihue Prov., Ensenada (JAD 1723/1), 8 February 1985, J. A. Downes, 1 females, red (CNCI); same date except 9 February 1985, 1 male; same data except Lago Verde, (JAD 1696/5), 12 January 1985, 2 males, 1 female (CNCI); Parque Nacional Vicente Pérez Rosales, río Petrohue (JAD 1695/1), 11 January 1985, J. A. Downes, 1 female, red (CNCI); río Peulla, Casa Pangue, 41°02′55.0″ S, 71°52′31.2″ W, 366 m, 18 February 2008, M. Donato, 10 males, Malaise trap; same data except 2 females, red. Chiloé prov., Huillinco (JAD 1690/3), 3 January 1985, J. A. Downes, 1 male, red (CNCI); same data except (JAD 1691/2), 4 January 1985, 1 female, (CNCI); same data except (JAD 1722/1), 8 February 1985, 2 males, (CNCI). Coihaique prov., Coihaique (JAD 1717/1), 3 February 1985, J. A. Downes, 1 male (CNCI).

Discussion

Characters to distinguish *D. shannoni* from *D. reynoldsi* may be found in the key and in the discussion under the description of the latter species.

Acknowledgements

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