



Two new neotropical genera of the shore-fly tribe Ephydrini Zetterstedt (Diptera: Ephydriidae)

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Abstract

Two new shore-fly genera, *Paraephydra* **gen. nov.** and *Neoephydra* **gen. nov.**, from the Neotropical Region are described. *Paraephydra* is revised and includes *P. freitasi* (Oliveira), **comb. nov.** and *P. stauros*, **sp. nov.** For the genus *Neoephydra*, *N. araucaria*, **sp. nov.**, is described and new combinations are made for most Neotropical species previously placed in *Dimecoenia*. The tribe Ephydrini is characterized and a key to the genera of this tribe is presented.

Key words: Ephydriidae, Ephydrini, Neotropical Region, new genera and two new species

Introduction

The purposes of this paper are to characterize the tribe Ephydrini, to present a key to the genera, including two new genera from the Neotropical Region, and to describe these new genera. Although I have a more comprehensive treatment of Neotropical Ephydrini in progress, the names of these two new genera and the resultant new combinations are needed now for inclusion in the forthcoming *Manual of Central American Diptera*. The first new genus, *Paraephydra*, is revised more comprehensively, as it only includes two known species. The second new genus, *Neoephydra*, includes most Neotropical and one Afrotropical species that were described previously in *Dimecoenia*. These congeners in *Neoephydra* are made new combinations, but only the type species of this genus, *N. araucaria*, is described herein.

Materials and methods

I have generally followed the descriptive format and procedures established in previous papers (Mathis and Simpson 1981). Five head and three venational ratios that are used in the descriptions are defined below (all ratios are based on three specimens - the largest, smallest, and one other).

Head Ratio: Head width/head height. Both measurements are maximum distances and are taken from the head in anterior view.

Frontal Ratio: Frontal width/frontal length. The width measurement is taken at the level of the anterior ocellus. The length measurement is taken between the level of the posterior ocelli and the anterior margin. Both measurements are maximum distances.

Facial Ratio: Facial width/facial height. Facial width is the narrowest distance between the compound eyes. Facial height is the distance between the ptilinal suture and the oral margin, as measured in a straight line between the antennal bases. Both measurements are maximum distances and are measured from the head in anterior view.

Eye Ratio: Eye width/eye height. Both measurements are taken from the eye in lateral view and represent maximum distances.

Gena-to-Eye ratio: genal height measured at the maximum eye height divided by the eye height.

Wing Ratio: Wing width/wing length.

Costal vein ratio: the straight line distance between the apices of veins R_{2+3} and R_{4+5} /distance between the apices of veins R_1 and R_{2+3} .

M vein ratio: the straight line distance along vein M between crossveins (dm-cu and r-m)/distance apical of dm-cu.

The descriptive terminology, with the exceptions noted in Mathis (1986) and Mathis and Zatwarnicki (1990a), follows that published in the *Manual of Nearctic Diptera* (McAlpine 1981). Because specimens are small, usually less than 3.5 mm in length, study and illustration of the male terminalia required use of a compound microscope. Although I followed the terminology for most structures of the male terminalia that other workers in Ephydriidae have used (see references in Mathis 1986, Mathis and Zatwarnicki 1990a, 1990b), Zatwarnicki (1996) now uses alternative terms (medandrium, transandrium) that are based on the "hinge" hypothesis for the origin of the eremoneuran hypopygium. The species descriptions are composite and not based solely on holotypes. In the synonymical bibliographies, each entry, with the exception of the original description, is annotated within brackets, and these are self explanatory, i.e., [catalog], [revision], etc.

Although most specimens are in the National Museum of Natural History (USNM), Smithsonian Institution, Washington, D. C., I also studied numerous specimens from the following collections: California Academy of Sciences, San Francisco, California (CAS); Canadian National Collection, Ottawa, Canada (CNC); Instituto Oswaldo Cruz, Rio de Janeiro, Brazil (IOC; collection now in MZUSP); and Museu de Zoologia da Universidade de São Paulo, Brazil (MZUSP).

Tribe Ephydrini Zetterstedt

Ephydrini Zetterstedt 1837: 48 [as Ephydrinae]. Wirth and Stone 1956: 45 [first formal use and diagnosis as a tribe].
Mathis and Zatwarnicki 1995: 235–254 [world catalog].

Diagnosis. Specimens of Ephydrini may be distinguished from other Ephydriidae by the following combination of character states.

Adult: Head: Mesofrons subquadrate, slightly wider posteriorly, with shiny, metallic luster; frequently with convergent, intrafrontal setae inserted near anterior margin of mesofrons; dorsum of interfoveal hump usually shiny, with metallic luster, concolorous with mesofrons; fronto-orbital setae laterocline, 2 or more; face protrudent, setulose to densely pilose, marginal setae larger; dorsum of interfoveal hump sometimes shiny; eye bare, usually as long as high, oval, and generally oriented obliquely to plane of epistoma; gena high, bearing a large genal seta and evenly covered with smaller setae; facial setae along oral margin usually dense and long; oral opening large, gaping, usually concealing clypeus. Thorax: Dorsocentral setae 4–5 (1+3, 2+3), some setae sometimes weakly developed, the posteriormost seta displaced laterally from alignment of others; intrapostalar seta well developed, at least equal to 1/2 length of postalar seta; postsutural supra-alar seta well developed, subequal to postalar seta; notopleuron sparsely setulose; proepisternum setulose; prosternum setose, usually more evident along posterior margin near forecoxae; anepisternum bearing 1 large seta near middle along posterior margin, several smaller setae or setulae may also be present; anepimeron, meron, and metapleuron bare of setae; hindcoxal strap setose; pulvilli rudimentary or lacking; tarsal claws shallowly curved and usually elongate; costal vein extended to vein M; vein R_{2+3} long, terminated at approximately same distance from vein R_{4+5} as tip of vein M is from vein R_{4+5} . Abdomen: Male with 5 visible abdominal tergites, 5th tergite distinctly trapezoidal or triangular; female with 6, sometimes 7, visible tergites, 5th tergite subtrapezoidal, not triangular.

Third-Instar Larva: Mouthhooks not joined together basally, each mouthhook spatulate and dentate marginally; anterior spiracles with 2–8 marginal papillae; posterior spiracles borne distally on bifid, retractile respiratory tube, tube 1/3–1/6 total body length; spiracular caps each bearing 4 spiracular openings (or series of openings), openings slitlike, oval, each bordered basally by hydrofuge interspiracular process; segments 5–12 with ventral prolegs bearing crochetlike spines in well-defined rows; dorsal patterns composed of flattened spines usually present; if prolegs and dorsal patterns absent, then spiracular openings subdivided and spiracular caps elongate.

Discussion. Larvae of most Ephydrini are easily recognized by their elongate respiratory tube, ventral prolegs, and dorsal pattern of spines. The larvae of *Dimecoenia* Cresson are exceptional in not having conspicuous prolegs but can be distinguished by the shape of their mouthparts, the unique structure of the posterior spiracles, and their habitat distribution (salt marshes).

Key to genera and subgenera of Ephydrini Zetterstedt

1. Prosternum setulose on at least posterior portion. Pulvilli much reduced or absent; tarsal claws long and nearly straight2
 - Prosternum bare. Pulvilli well developed; tarsal claws short and distinctly curved..... 11
2. Basal flagellomere bearing a large lateral seta just below insertion of arista.....*Setacera* Cresson
 - Basal flagellomere without a lateral seta3
3. 3 or more well-developed fronto-orbital setae.....4
 - 2 well-developed fronto-orbital setae present. Anterior presutural supra-alar seta absent or much reduced, much smaller than posterior notopleural seta7
4. 5–6 well-developed fronto-orbital setae *Neoephydra*, **gen. nov.**
 - 3–4 well-developed fronto-orbital setae5
5. 2 presutural dorsocentral setae, anterior seta sometimes rather short. Face very thickly setulose; arista short, weakly haired, thicker on its basal half; usually 2 posteriorly directed rows of well-developed cruciate interfrontal setae present, with these rows closer to orbital setae than to each other. Male with basitarsomere of foreleg bearing ventral tuft of long setulae near tip..... *Ephydra* (*Hydropyrus* Cresson)
 - 1 presutural dorsocentral seta. Face with 1 well-developed row of facial setae and 1 of oral setae, otherwise thinly short-haired; arista without markedly swollen basal region; usually not more than 1 pair of interfrontal setae situated as close to each other as to orbital setae. Male with basitarsomere of foreleg without ventral tuft of setulae6
6. 1 well-developed interfrontal seta present; palpus well developed. Crossvein dm-cu making nearly a right angle with vein CuA₁ *Ephydra* (*Ephydra* Fallén)
 - Interfrontal seta weak or absent; palpus small. Crossvein dm-cu forming an acute angle with vein CuA₁...
.....*Ephydra* (*Halephydra* Wirth)
7. Cruciate intrafrontal setae present8
 - Cruciate intrafrontal setae absent.....10
8. Dorsocentral setae 4 (1+3). Arista bearing subpectinate dorsally-branching rays on basal 1/2.....
..... *Paraephydra*, **gen. nov.**
 - Dorsocentral setae 5 (1+4). Arista at most minutely haired on basal 1/2.....9
9. Aristal rays long, length subequal to width of pedicel. Hindfemur of male not differing markedly from fore- or midfemur, lacking stout setae as above; hindtibia of male lacking tuft of setulae; hindtarsi of male cylindrical, normal..... *Dimecoenia* Cresson
 - Aristal rays short, length approximately 1/2 width of pedicel. Hindfemur of male conspicuously swollen, bearing short row of 4-5 stout setae along anteroventral surface toward base; hindtibia of male with ventroapical tuft of setulae; hindtarsi of male variously modified..... *Cirrula* Cresson

10. A well-developed prescutellar acrostichal seta; 2 postpronotal setae, dorsal seta about ½ length of ventral seta; prosternal setulae few (Australasian) *Ephydrella* Tonnoir and Malloch
- Lacking a well-developed prescutellar acrostichal seta; 1 postpronotal seta; prosternal setulae numerous (Neotropical)..... *Neoephydra*, **gen. nov.**
11. Dorsocentral setae 4 (1+3) present; postpronotal seta(e) either weak, at most 1/4 length of posterior notopleural seta, or lacking. Hindcoxa bare posteriorly12
- Dorsocentral setae 5 (1+4) present (anterior setae reduced in *Austrocoenia*); postpronotal seta distinct, at least 1/2 as long as posterior notopleural seta. Hindcoxa bare or with a row of setae posteriorly13
12. Arista bearing long hairs dorsally, length of longest hairs subequal to height of basal flagellomere; frons only moderately to sparsely microtomentose, especially subshiny mesofrons (Holarctic).....
- *Coenia* Robineau-Desvoidy
- Arista either almost bare or bearing short hairs dorsally, length of longest hairs about 1/2 height of basal flagellomere; frons uniformly and densely microtomentose, dull, mesofrons little differentiated from parafrons (Neotropical)..... *Notiocoenia* Mathis
13. Paraverticilar seta large, at least 1/3 length of medial vertical seta14
- Paraverticilar seta small, generally subequal to setae of postocular row16
14. R stem vein bearing 1–2 setulae dorsally, inserted beyond transverse septum. Scutellar disc convex. Hindcoxa with row of setae along posteroventral margin *Paracoenia* Cresson
- R stem vein bare dorsally. Scutellar disc almost flat. Hindcoxa bare posteriorly along ventral margin (Genus *Calocoenia* Mathis).....15
15. Larger species, body length over 3.25 mm. Gena-to-eye ratio 0.25 or larger. Costal setulae well developed, projected anteriorly from ventral and dorsal surfaces..... Subgenus *Calocoenia* Mathis
- Smaller species, body length under 2.75 mm. Gena-to-eye ratio 0.20 or smaller. Costal setulae weakly developed, only on dorsal surface Subgenus *Leptocoenia* Mathis
16. Frons mostly lacking setulae and with coloration and vestiture generally uniform, microtomentose, dull; arista long, nearly double length of basal flagellomere. 1 interalar seta inserted just posterior of transverse suture..... *Notiocoenia* Mathis
- Mesofrons tan to brown, generally distinct from gray parafrons, microtomentum denser, conspicuously setulose, especially laterally; arista short, subequal to length of basal flagellomere. Interlar seta lacking *Austrocoenia* Wirth

***Paraephydra*, gen. nov.**

Type species: *Paraephydra freitasi* (Oliveira), by present designation.

Diagnosis. *Paraephydra* is distinguished from other genera of Ephydrini by the following combination of characters: Moderately small to medium-sized shore flies, body length 2.40–3.80 mm; setation normally developed, not generally appearing pilose.

Head: Mesofrons shiny, with metallic luster, differentiated from microtomentose parafrons; cruciate intra-frontal setae 1; laterocliniate, fronto-orbital setae 2; antennal groove distinct but not deeply impressed; basal flagellomere lacking large seta inserted on lateral surface; arista as long or slightly longer than combined length of 1st 3 antennal segments, gradually tapered from base to apex, with subpectinate, dorsally branching rays on basal 2/3; postocular setae normally developed, not conspicuous; larger facial setae extended from interfoveal hump with 1–2, distinctly porrect to anaclinate.

Thorax: Females with 1 prescutellar, acrostichal setae; dorsocentral setae 4 (1+3), all well developed; supra-alar seta present; posthumeral seta lacking; intrapostalar seta either weakly developed or lacking; disc of scutellum concolorous with posterior portion of scutum; females lacking dense patch of setae between pos-

terior 2 dorsocentral setae. Hindtibia with apical, anteroventral seta, length equal to or larger than width of tibia at widest point.

Abdomen: Female ventral receptacle with operculum flat, disclike. Male terminalia: symmetrical; epan-drium longer than wide, narrowed ventrally, fused almost imperceptibly with base of united surstyli; surstyli fused medially except near apex; posterior surstyler process only slightly longer than lateral process; both processes apical; gonite, hypandrium, and apparently aedeagus fused to form 1 compact structure, curved anteriorly, wide basally, tapered to rounded apex.

Distribution. *Neotropical*; widespread but scarce, from Puerto Rico south through Brazil to Chile. None of the congeners is known to be sympatric.

Natural History. Like other ephydrines, *Paraephydra* occurs in wetlands. In southern Chile (Osorno Province), I collected specimens of *P. stauros* in a sedge meadow near the margins of small but apparently permanent ponds. Nothing is known about the immature stages or the microhabitat of the genus.

Discussion. *Paraephydra* is proposed to accommodate *Ephydrella freitasi* Oliveira and *P. stauros*, which is similar and closely related (see "Remarks" section under *P. freitasi* for further comments on the classifica-tory history and placement of that species).

Sexual dimorphism is evident in the chaetotaxy of *Paraephydra*. Females, unlike males, have a prescutel-lar acrostichal seta that is larger than other acrostichal setulae. Based on this character, Oliveira (1954a) described *P. freitasi* in the genus *Ephydrella*, as that genus, unlike *Dimecoenia*, sensu Neotropical species, lacks these setae.

Key to species of *Paraephydra*

1. Femora of at least foreleg and usually hindleg bicolored, darker basally; gena high, gena-to-eye ratio larger than 0.55 (Chile)..... *P. stauros*, new species
- Femora unicolorous, yellow to yellowish orange; gena shorter, gena-to-eye ratio less than 0.40
..... *P. freitasi* (Oliveira)

Paraephydra freitasi (Oliveira), comb. nov.

Fig. 1–9

Ephydrella freitasi Oliveira 1954b: 292. Wirth 1968: 23 [Neotropical catalog]. Mathis and Zatwarnicki 1995: 247 [world catalog].

Diagnosis. Specimens of *P. freitasi* may be distinguished from congeners of *Paraephydra* by the following combination of characters: Mesofrons brown; face white to silvery white; gena short, gena-to-eye ratio 0.31–0.38; femora completely yellow; tarsi with basal tarsomeres mostly yellowish, becoming darker brown apically; and conformation of male terminalia, especially the more elongate and narrow fused surstyler plate.

Description. Moderately small shore flies, body length 2.75 mm (holotype); dorsum generally dark or bluish green to gray, subshiny to shiny, pale colored, gray to yellowish.

Head (Fig. 1): Head ratio 0.62–0.69; frontal ratio 0.56–0.57; mesofrons mostly shiny, with metallic luster, brown, becoming greenish blue laterally; ocelli in isosceles triangle, distance between medial ocellus and either posterior ocellus longer than distance between posterior ocelli; microtomentose, with small strip near vertex of parafrons along tract of vertical and fronto-orbital setae shinier, more or less concolorous with lateral margins of mesofrons. Antenna brown to black; basal flagellomere slightly grayer, appearing more microto-mentose. Facial ratio 1.01–1.07; face mostly microtomentose, white to silvery white. Eye ratio 0.92–0.95; gena-to-eye ratio 0.31–0.38; gena moderately high, more or less unicolorous with face.



FIGURES 1–6. *Paraephydra freitasi* (Oliveira). 1. Head, anteroblique view. 2. Thorax, dorsal view. 3. External male terminalia (epandrium, cerci, surstyler plate), posterior view. 4. Same, lateral view. 5. Enlargement (ca. 50%) of surstylus, lateral view. 6. Internal male terminalia (fused hypandrium, gonite, aedeagus).

Thorax (Fig. 2): Scutum dull gray to shiny, dark, bluish green, shinier posteriorly, dull coloration restricted to anterior portion anterior of 1st dorsocentral seta; scutellum shiny, unicolorous, concolorous with posterior portion of scutum; pleural areas brownish or bluish gray to whitish gray, dull, microtomentose; coloration change between scutum and pleural areas rather marked. Wing length 2.61–2.85 mm; costal vein ratio 0.23–0.31; M vein ratio 0.72–0.74; wing mostly hyaline. Legs more or less concolorous; femora unicolorous, pale, yellow to yellowish orange; tibiae nearly concolorous with femora but slightly darker apically and ventrally; tarsi with basal tarsomeres mostly brown to dark brown apically, basitarsomere sometimes yellowish basally and ventrally.

Abdomen: Tergites generally unicolorous although metallic luster of anterior segments tends to be more concolorous with scutum, bluish green; posterior tergites becoming progressively more brownish in color; lateral margins duller, more microtomentose, grayer. Male terminalia (Figs. 3–6): epandrium (Figs. 3–4) elliptical to obovate but more or less truncate ventrally, lateral margins shallowly curved to sinuous, especially toward venter; base of fused surstyli with partial suture to indicate fusion with venter of epandrium; posterior surstyler processes very slightly divergent; length of fused surstyler plate (Figs. 3–5) more than twice width; internal genitalia much reduced and compact; phallopodeme apparently lacking or fused with base of aedeagus and hypandrium; aedeagus (Fig. 6) moderately wide throughout its length, elongate, shallowly curved; female ventral receptacle with a short, flattened cap and a robust, C-shaped extension.

Type Material. The holotype female is labeled “[Brazil] Bodoquena[,] Mato Grosso XI-1941 [Nov 1941] Com. I O C/COL. INST.O.CRUIZ NO. 719/HOLOTYPE *Ephydrella freitasi* Oliveira [red].” Three female paratypes are labeled with the same label data as the holotype except for collection numbers, which are 718, 720, and 721. The type series is in the IOC. The holotype is glued to a paper point and is in good condition. Two of the paratypes lack abdomens but otherwise the specimens are in good condition. The third paratype is missing its head, and the left wing has been removed and is glued apart from the remainder of the specimen.

Type Locality. Brazil. Mato Grosso do Sul: Bodoquena (19°51'S, 56°58'W).

Other Specimens Examined. ARGENTINA. *Entre Ríos*: Rio Paraná, Ibicuy, Puerto Ibicuy (33°44'S, 59°11'W), 10 Dec 1979, C. M. and O. S. Flint (1♂; USNM).

PARAGUAY. *Nueva*: Ascunción (20°48'S, 61°55'W), 21–25 Mar 1986, M. Pogue, A. Solis (1♂; USNM).

PERU. *Lima*: Lima, Lagunas de Villa (12°03.3'S, 77°03'W), 14 Feb 1984, W. N. Mathis (20♂, 20♀; USNM).

WEST INDIES. Puerto Rico. Laguna Cartagena (S Mayaguez; 18°0.1'N, 67°06.1'W), 8 Apr 1972, L. V. Knutson (2♂, 1♀; USNM).

Distribution. *Neotropical*: Argentina (*Entre Ríos*), Brazil (Mato Grosso do Sul), Chile (Osorno, Valdivia), Paraguay (*Nueva*), Peru (Lima), West Indies (Puerto Rico).

Remarks. Oliveira (1954b) tentatively placed this species in the genus *Ephydrella*, awaiting males to further clarify its generic status. Using the brief descriptions of *Ephydrella* species for comparison, Oliveira noted that *P. freitasi*, like species of *Ephydrella*, have a well-developed, prescutellar, acrostichal seta. But Oliveira lacked males for critical study of postabdominal structures and was unable to satisfactorily resolve the generic affinity of this species. As an added complication, it has now been discovered that not all members of *Ephydrella* have prescutellar, acrostichal setae, and that their occurrence in species related to *P. freitasi* is limited to females. With discovery of additional specimens of this species and of the new species described below, however, I am transferring this species to *Paraephydra*, as characterized above.

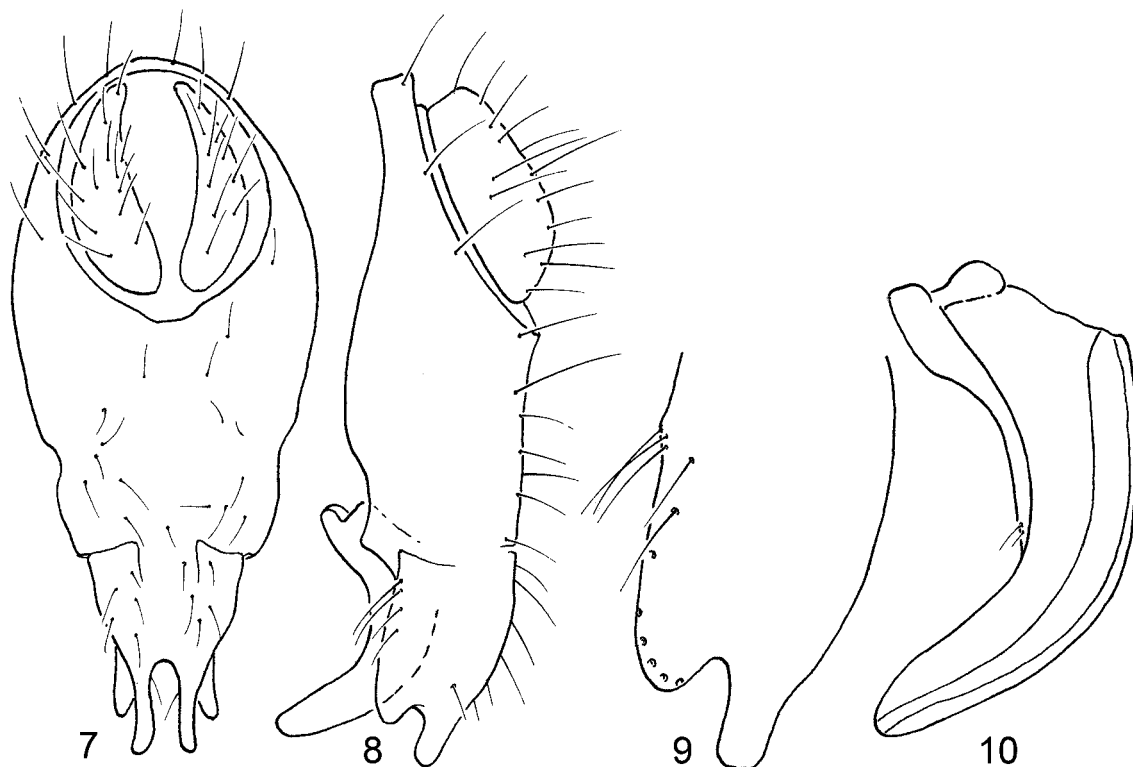
Identification of this species remains somewhat suspect, as males from the type locality or from a site nearby are still lacking, and structures of the male terminalia provide important characters for species recognition in this tribe, including *Paraephydra*. In part, I am basing the identification of this species on the distributional information, with this species apparently being the more widespread Neotropical species, especially east of the Andes.

Discovery of *P. freitasi* in Puerto Rico was unexpected, as its congeners are mostly from southern South America. This finding leads me to suspect that the distribution of *Paraephydra* will be discovered to be more widespread than is presently known and that it would not be surprising to discover representatives of the genus in northern South America and Central America, perhaps even Mexico.

Paraephydra stauros, sp. nov.

Figs. 7–10

Diagnosis. This species is similar to *P. freitasi* but is distinguished from it and other congeners by the following combination of characters: Mesofrons metallic green; face mostly unicolorous, grayish white to silvery white; gena comparatively high, gena-to-eye ratio 0.57–0.58; forefemur two toned, bluish gray basally, dull, microtomentose, becoming paler, less microtomentose and yellowish orange apically; tarsi brown to brownish black; shape of structures of male terminalia distinctive.



FIGURES 7–10. *Paraephydra stauros*, sp. nov. 7. External male terminalia (epandrium, cerci, surstylar plate), posterior view. 8. Same, lateral view. 9. Enlargement (ca. 50%) of surstylus, lateral view. 10. Internal male terminalia (fused hypandrium, gonite, aedeagus).

Description. Moderately small to medium-sized shore flies, body length 2.40–3.60 mm (averaging 3.02 mm); generally dark dorsally, dull, olivaceous brown to shiny, metallic green becoming paler in color ventrally, mostly gray.

Head: Head ratio 0.65–0.66; frontal ratio 0.49–0.50; subquadrate mesofrons narrowed slightly anteriorly, shiny with metallic green luster, anterior portion with some smaller, generally inconspicuous setae in addition to larger, cruciate, intrafrontal setae; ocelli in isosceles triangle, distance between medial ocellus and either posterior ocellus longer than distance between posterior ocelli; fronto-orbits slightly shinier with faintly evident metallic green luster. Antenna mostly unicolorous, basal flagellomere slightly browner and less gray; arista long, longer than combined length of segments 1–3, with dorsal, subpectinate branching on basal 2/3. Facial ratio 1.05–1.70; area immediately between antennal bases brown, otherwise face mostly unicolorous, grayish white to silvery white. Eye ratio 0.93; gena-to-eye ratio 0.57–0.58; gena high, concolorous with face.

Thorax: Scutum gray to olivaceous brown anteriorly, microtomentose, dull, becoming shinier posteriorly, less microtomentose and more greenish to dark greenish blue in coloration; scutellum shiny with metallic dark greenish blue luster. Pleural areas grayish brown to brown dorsally, becoming paler, bluish gray to gray ventrally. Wing hyaline or slightly infumate; costal vein ratio 0.41–0.43; M vein ratio 0.76–0.79. Legs mostly

concolorous; forefemora and usually hindfemora two-toned, bluish gray basally, dull, microtomentose, becoming paler, less microtomentose and yellowish orange apically; tibiae concolorous with apices of femora basally, becoming browner apically; tarsi mostly brown to brownish black.

Abdomen: Dorsum of tergites microtomentose to subshiny; basal tergites subshiny medially, mostly greenish blue, lateral margins becoming duller, grayer; apical tergites subshiny medially although less so than basal ones, with more brownish coloration, lateral margins also becoming grayer and more microtomentose. Male terminalia (Figs. 7–10): epandrium (Figs. 7–8) obovate but more or less truncate ventrally, lateral margins slightly sinuate, especially toward venter; base of fused surstyli with partial suture to indicate fusion with venter of epandrium; length of surstyler plate (Figs. 7–9) only slightly greater than width; apical surstyler prongs mostly parallel, deeply emarginate; phallopodeme, aedeagus and hypandrium greatly reduced and compacted; aedeagus (Fig. 10) mostly wide throughout its length; aedeagus conspicuously curved.

Type Material. The holotype male is labeled “CHILE: Osorno Pr. Anticura (1 km. W) 432 m. elev.[,] 1–3 Feb. 1978[,] WNMathis/HOLOTYPE ♂ *Paraephydra stauros* Mathis USNM [red].” The holotype is double mounted (minuten in a block of plastic elastomer), is in excellent condition (abdomen has been removed, dissected; parts are in an attached microvial), and is deposited in the USNM. The allotype female bears the same locality label data as the holotype. Other paratypes are as follows: CHILE. Valdivia: Valdivia (7 Km S; 39°49'S, 73°14'W), 4 Jun 1969, P. and P. Spangler (2♂, 4♀; USNM).

Type Locality. Chile. Orsono: Anticura (1 km W; 40°39'S, 72°10'W; 432 m).

Distribution. *Neotropical:* Chile (Osorno, Valdivia).

Etymology. The specific epithet, *stauros*, is a masculine Greek noun meaning cross and refers to the prominent pair of cruciate, intrafrontal setae of this species. The name is a noun in apposition to the generic name.

Remarks. Although some intraspecific variation in color is evident, the color of the legs, as noted in the key and description, seems to vary little. The sampling of this species, however, is based on the few specimens listed previously.

***Neophydra*, gen. nov.**

Dimecoenia in part of authors [misidentification], not Cresson 1916: 152. Wirth 1968: 23 [catalog of South American species, distribution]. Lizarralde de Grosso 1989: 57–58 [fauna of Argentina]. Mathis and Zatwarnicki 1995: 238–240 [world catalog].

Type species: *Neophydra araucaria* Mathis, **sp. nov.**, by present designation.

Diagnosis. *Neophydra* is distinguished from other genera of Ephydrini by the following characters: medium-sized to large shore flies, body length 3.00–5.30 mm.

Head: Mesofrons with vestiture variable; lacking cruciate, intrafrontal setae; laterocline, fronto-orbital setae either 2 or 5–6, not 3; basal flagellomere lacking large seta inserted on lateral surface; arista moderately short, thickened basally, with macropubescent vestiture dorsally, apical half stylelike, bare; postocular setae variable; large facial setae declinate; gena moderately high to high, gena-to-eye ratio 0.30 or larger.

Thorax: No well-developed acrostichal setae; dorsocentral setae 5 (1+4), development variable; supra-alar seta variable; posthumeral seta lacking; intrapostalar seta present, although sometimes weak; hindtibia lacking apical seta.

Abdomen: Male terminalia symmetrical, epandrium longer than wide; surstyli fused medially except near apices and with 1–2 lateral projecting processes or prongs in addition to apical prominences; aedeagus shallowly crescent-shaped and generally quite slender, at least apically; female ventral receptacle with small papillalike operculum.

Distribution. Members of *Neoephydra* are known only from the Neotropics, where they are widespread and occur in habitats similar to those of the Holarctic genera *Ephydra* Fallén and *Setacera* Cresson.

Natural History. Like many taxa of the subfamily Ephydrinae, specimens of *Neoephydra* inhabit diverse and what would appear to be environments inimical to life. Oliveira (1954a) noted that Dr. Herman Lent found larvae, pupae, and adults of a Chilean species in the hot effluent of a high altitude, hot water geyser located at El Tatio (5200 m), near San Pedro de Atacama. Although the temperature of the water was not taken, Dr. Lent stated that it was sufficiently hot to cook an egg. Dr. Lent also observed a small, predatory toad, *Telmatobius peruvianus* Wiegmann, whose diet consisted solely of freshly emerged, adult flies.

Numerous larvae and pupae of a second species, collected in southern Brazil, were found to inhabit warm, algae-covered, and often saline water that had accumulated in depressions of large rocks near the sea shore (Oliveira 1954a, 1958). Water evaporation from the shallow depressions is rapid, accounting for the concentration of salts.

Hennig (1943) and Oliveira (1954a, 1958) described and illustrated the larvae of four species belonging to this genus. Based on these illustrations, larvae of *Neoephydra* are typical of the tribe, with eight pairs of claw-bearing prolegs on the ventral surface, the terminal pair being larger and with crochets opposable to those of the other prolegs. The posterior spiracles are borne on a long respiratory tube which bifurcates posteriorly.

Discussion. *Neoephydra* is a new generic name for most of the South American species that had been placed in the genus "*Dimecoenia*." As noted by Steyskal (1970) and Wirth (1971), the Neotropical species, which were treated as members of *Dimecoenia* (Wirth 1968), are structurally dissimilar from the Nearctic species. After studying structures of the male terminalia, I concur with Steyskal and Wirth's findings and am proposing the new generic name, *Neoephydra*, for these taxa. Particular attention should be paid to structures of the male terminalia and female ventral receptacle.

The Neotropical and single Afrotropical species that are transferred to *Neoephydra* as new combinations are the following (list taken from Mathis and Zatwarnicki 1995 and Mathis 1995): *N. abrupta* (Cresson), *N. caesia* (Wulp), *N. carrerai* (Oliveira), *N. chilensis* (Macquart), *N. ciligena* (Rondani), *N. coltaensis* (Cresson), *N. densepilosa* (Hendel), *N. grumanni* (Oliveira), *N. lenti* (Oliveira), *N. lopesi* (Oliveira), *N. prionoaptera* (Thomson), *N. travassosi* (Mello and Oliveira), *N. tristanensis* Frey (Afrotropical), *N. venteli* (Oliveira), *N. zurcheri* (Hendel).

Neoephydra araucaria, sp. nov.

(Figs. 11–16)

Diagnosis. Specimens of *N. araucaria* are distinguished from similar congeners by the following characters: generally appearing moderately dark; face moderately setose; gena moderately short; and structures of male terminalia with distinctive conformation.

Description. Medium-sized to moderately large shore flies (Fig. 11), body length 3.04–4.38 mm; generally dull, grayish with some subshiny areas dorsally.

Head (Fig. 11): Head ratio 0.69–0.72; frontal ratio 0.54–0.55; mesofrons with dark, greenish blue to brassy luster, inconspicuously pilose; ocellar triangle differing little from mesofrons in color or vestiture; fronto-orbital setae 2. Antenna mostly concolorous, dark, blackish brown. Facial ratio 0.90–0.93; mostly densely setulose, particularly along oral margin and toward posteroventral portions of face; dorsum of interfoveal hump with subshiny area more or less concolorous with mesofrons, otherwise face densely microtomentose, grayish brown to golden brown, gradually paler ventrally. Eye ratio 1.07–1.10; gena-to-eye ratio 0.32–0.35; gena moderately short, coloration immediately below eye whitish gray, slightly more tannish posteriorly.

Thorax (Fig. 11): Scutum thinly microtomentose, subshiny, mostly dark brown, darker and shinier posteriorly; anterior margin slightly more microtomentose, grayer, especially postpronotum and 2 partial, microtomentose stripes laterad of acrostichal track; lateral margins of scutum slightly more microtomentose, more grayish brown; scutellum concolorous with posterior portion of scutum; pleural areas paler, grayer ventrally; anepisternum with dorsal and posterior margins more brownish, otherwise mostly gray; anepimeron mostly concolorous with posterior margin of anepisternum; other pleural areas including coxae whitish gray, concolorous. Wing length averaging 3.55–3.80 mm; faintly infuscate; costal vein ratio 0.20–0.22; M vein ratio 0.69–0.71. Legs generally dark; femora microtomentose, grayish blue to green, only slightly darker than ventral pleural areas; tibiae and tarsi orangish yellow, with blackish tinges apically.

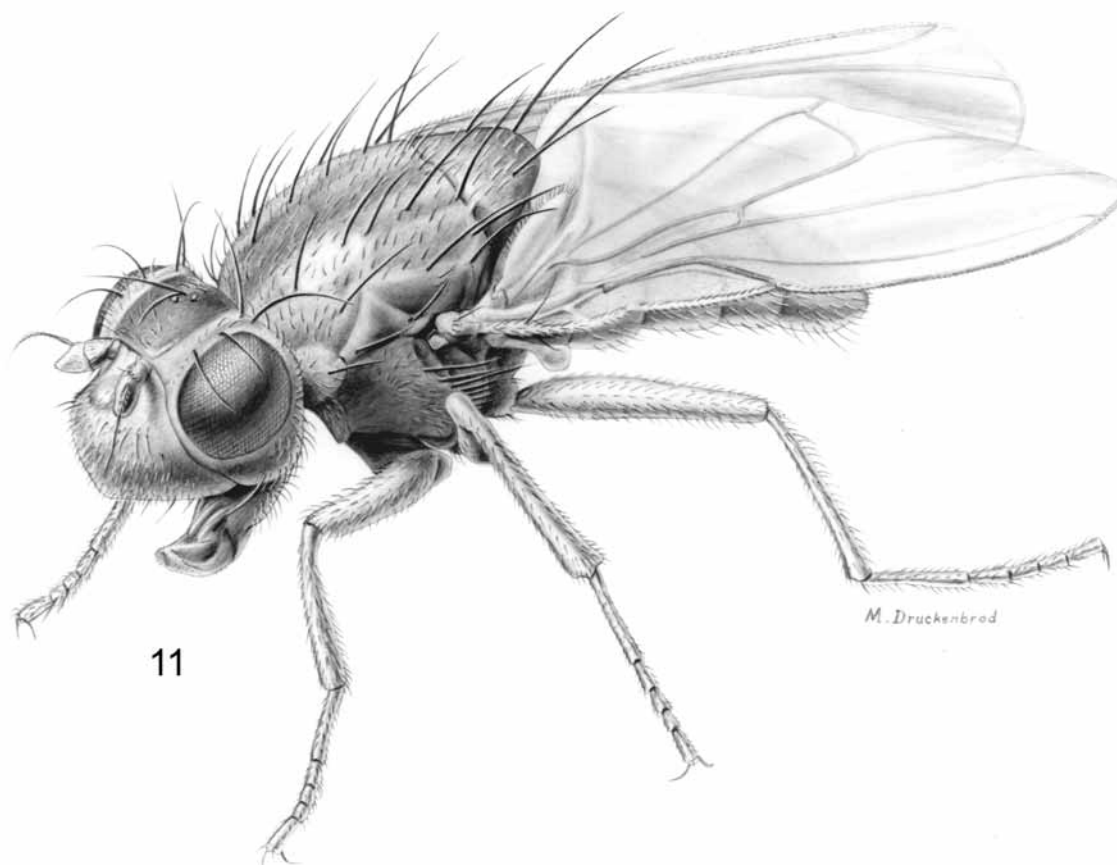
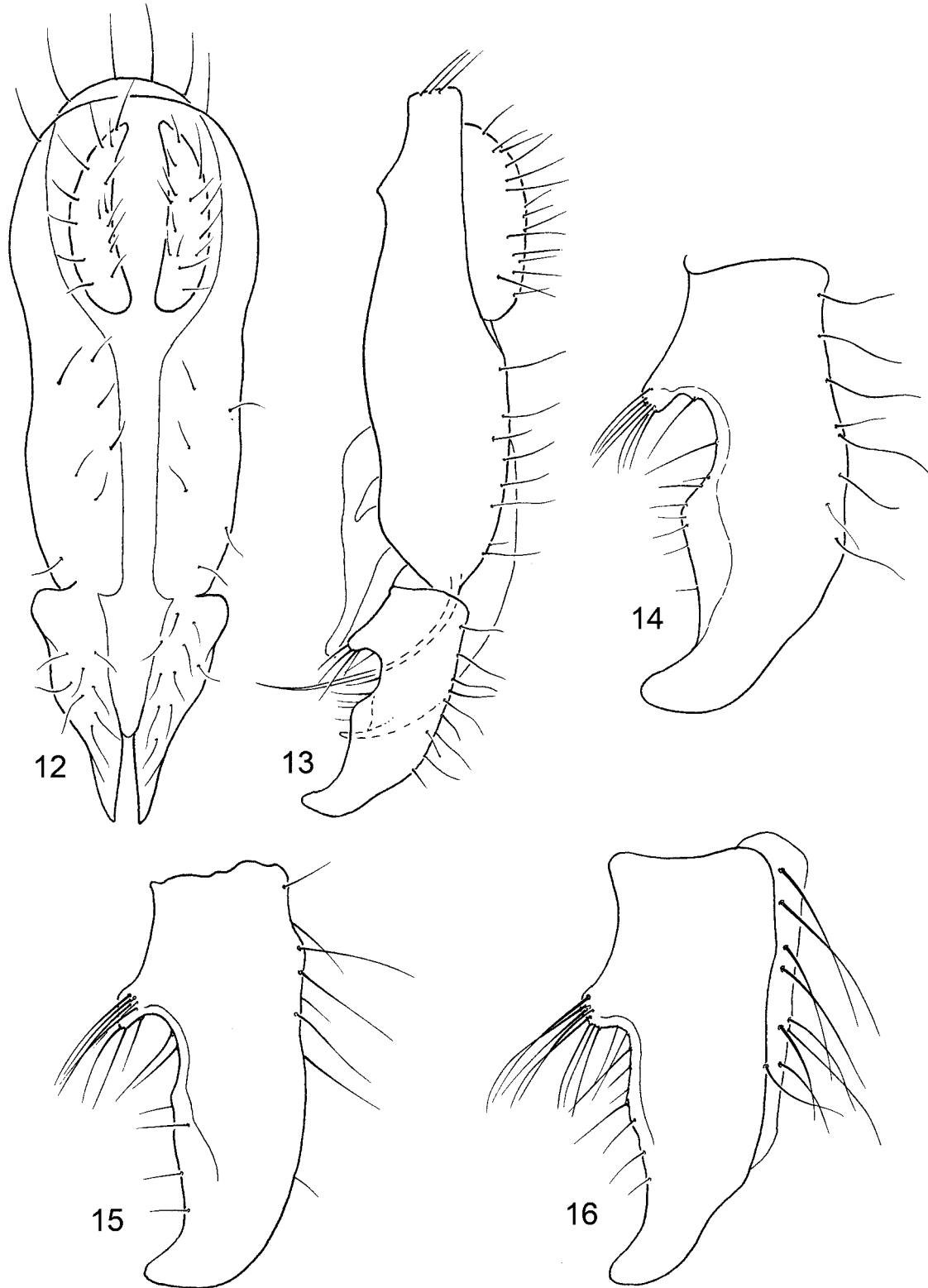


FIGURE 11. *Neoephydra araucaria*, sp. nov. 11. Habitus, laterodorsal view.

Abdomen: Generally thinly microtomentose to microtomentose; tergites fasciate, anterior margin brownish to brassy, more thinly microtomentose, posterior margin grayish olivaceous green to gray, paler toward lateral margins, some specimens with faint bluish tinges of metallic luster; ventral surface of tergites frequently whitish gray. Fifth tergite of male triangular, nearly equilateral. Male terminalia (Figs. 12–16): margins of epandrium in posterior view (Fig. 12) parallel below cerci, rounded dorsally; surstyli in posterior view roughly forming isosceles triangle, apices of posterior processes forming ventral angle with narrow gap between; surstylus in lateral view (Figs. 14–16) with posterior process wide on basal 2/3, thereafter tapered to anteriorly curved, rounded apex, anterior margin irregularly shaped, posterior margin more regular; lateral process short, bluntly rounded, with patch of long, medioapical setulae.



FIGURES 12–16. 12. External male terminalia (epandrium, cerci, surstyler plate), posterior view. 13. Same, lateral view. 14. Enlargement (ca. 50%) of surstylus, lateral view (Chile. Palo Colorado). 15. Same, lateral view (Chile. Rio Bueno, N of Orsono). 16. Same, lateral view (Chile. Termas de Puyehue).

Type Material. The holotype male is labeled “CHILE: Osorno Pr. Anticura (1 km. W) 430 m 1–3 Feb. 1978 W N Mathis/♂/HOLOTYPE ♂ *Neophydra araucaria* Mathis USNM [red].” The holotype is double

mounted (minuten in a plastic elastomer block), is in excellent condition, and is deposited in the USNM. The allotype female and 123 paratypes (71♂, 52♀; USNM) bear the same locality label data as the holotype. Other paratypes are as follows (all in USNM): *CHILE*. *Bio Bio*: Santa Barbara (25 km E; 37°40'S, 72°01'W; 350 m), 24 Jan 1978, W. N. Mathis (21♂, 11♀; USNM). *Curico*: Estero Potrero Grande (3 km E Potrero Grande; 35°11'S, 71°07'W; 400 m), 8 Feb 1987, C. M. and O. S. Flint (5♂, 5♀; USNM). *Malleco*: Victoria (11 km N; 38°13'S, 72°20'W; 300 m), 25 Jan 1978, W. N. Mathis (15♂, 8♀; USNM). *Maule*: Constitución (35°20'S, 72°30'W), 16 Dec 1976, A. Gurney, Barria (1♂; USNM). *Nuble*: Río Perquilauquen, Parral (12 km S; 36°10'S, 71°50'W; 160 m), 24 Jan 1978, W. N. Mathis (5♂, 3♀; USNM). *O'Higgins*: Río Claro (5 km N Rengo; 34°24'S, 70°52'W; 300 m), 23 Jan 1978, W. N. Mathis (9♂; USNM). *Osorno*: Termas de Aguas Calientes (1 km SE; 40°41'S, 72°21'W; 530 m), 7–8 Feb 1978, W. N. Mathis (12♂, 3♀; USNM); Anticura (4 km W; 37°40'S, 72°01'W; 400 m), 3 Feb 1978, W. N. Mathis (2♂, 3♀; USNM); Anticura (1 km W; 40°39'S, 72°10'W; 430 m), 5–6, 11–12 Feb 1978, W. N. Mathis (6♂, 1♀; USNM); Lago Puyehue (SE shore; 40°45'S, 72°25.2'W), 6–10 Feb 1978, W. N. Mathis (23♂, 20♀; USNM); Lago Puyehue, Entre Lagos (40°45.2'S, 72°34.8'W), 14 Feb 1978, W. N. Mathis (40♂, 24♀; USNM); Lago Rupanco, El Encanto (40°49'S, 72°28'W), 6 Feb 1978, W. N. Mathis (2♂, 3♀; USNM); Laguna El Pato (41°10'S, 73°40'W; 1100 m), 13 Feb 1978, W. N. Mathis (5♂, 12♀; USNM); Laguna El Toro (41°09'S, 73°28'W; 780 m), 8 Feb 1978, W. N. Mathis (1♂, 2♀; USNM); Salto del Río Pilmaiquen (40°08'S, 71°59'W), 14 Feb 1978, W. N. Mathis (15♂, 14♀; USNM). *Palena*: Termas El Amarillo, (30 km SE Chaitén; 42°52.9'S, 72°21.4'W; 250 m), 22 Jan 1987, C. M. and O. S. Flint (3♂, 7♀; USNM). *Santiago*: El Alfalfal (33°30'S, 70°11'W; 1320 m), 22 Jan 1978, W. N. Mathis (20♂, 5♀; USNM); Lampa (22 km NW Santiago; 33°17'S, 70°54'W), 21 Jan 1978, W. N. Mathis (5♂, 9♀; USNM). *Talca*: Río Lircay (11 km N Talca; 35°23'S, 71°39'W; 85 m), 23 Jan 1978, W. N. Mathis (3♂, 1♀; USNM).

Type Locality. Chile. Osorno. Anticura (1 km W; 40°39'S, 72°10'W).

Additional Specimens Examined. *ARGENTINA*. *Buenos Aires*: Médanos (38°49'S, 62°41'W), 11 Nov 1946, K. Hayward (1♂; USNM). *Mendoza*: Uspallata (9 mi W; 32°40'S, 69°25'W), 6 Feb 1951, E. S. Ross, A. E. Michelbacher (1♂; CAS). *Río Negro*: Bariloche (49°09'S, 71°18'W), Nov 1926, R. and E. Shannon (5♂, 1♀; USNM).

CHILE. *Aconcagua*: Guardia Vieja (E; 32°54'S, 70°17'W), 3 Dec 1976, A. Gurney, G. Barria (1♂; USNM). *Antofagasta*: Pocos (23°15'S, 68°04'W; 2800 m), Des Atacama, Apr 1954, L. E. Peña (1♂; USNM). *Bio Bio*: El Abanico (37°20'S, 71°31'W), 31 Dec 1950, E. S. Ross, A. E. Michelbacher (1♂; USNM). *Cautin*: Temuco (20 km E; 38°44'S, 72°35'W), 7 Jan 1951, E. S. Ross, A. E. Michelbacher (39♂, 46♀; USNM). *Concepción*: Cosmito (36°46'S, 73°01'W), 31 Dec 1966, O. S. Flint, Jr., T. Cekalovic (1♂, 1♀; USNM); San Rosendo (37°16'S, 72°43'W), Dec 1926, R. and E. Shannon (1♂; USNM). *Coquimbo*: Bosque de Nague-Los Vilos (31°54.7'S, 71°30.8'W), Nov 1969, L. E. Peña (2♂, 1♀; USNM); Tilama, El Naranjo (32°05'S, 71°10'W), Oct 1967, L. E. Peña (2♂, 2♀; USNM); Freirina (28°30.3'S, 71°04.6'W), Oct 1969, L. E. Peña (4♂, 13♀; USNM); Hda Illapel (31°37.8'S, 71°09.9'W; 600–1200 m), 24–30 Oct–19 Dec 1954–1966, M. E. Irwin, L. E. Peña, E. Schlinger (4♂, 2♀; USNM); La Serena (50 km S; 29°55'S, 71°15.2'W), 1 Dec 1950, E. S. Ross, A. E. Michelbacher (2♂; CAS); Ovalle (20 mi SE; 30°36'S, 71°11'W), 12 Dec 1950, E. S. Ross, A. E. Michelbacher (4♂, 11♀; USNM); Río Colorado-Pichidarquí (32°52'S, 72°25'W), 7–11 Aug 1960, L. E. Peña (2♂, 1♀; CNC); Port Tres Cruces (Portuzuelo; 29°22.3'S, 70°56'W), 30 Oct 1957, L. E. Peña (2♂, 2♀; CNC). *Curico*: Cajon de Río Claro-SE Los Queñes (35°0.1'S, 70°49.1'W; 1100 m), 8 Dec 1966, E. I. Schlinger (1♂, 1♀; USNM). *Llanquihue*: Frutillar (41°07'S, 73°03'W), 22 Jan 1953, P. G. Kuschel (4♂; USNM). *Malleco*: Angol (37°48'S, 72°43'W), 28 Nov–1 Jan 1926–1932, D. S. Bullock (3♂; USNM). *Maule*: Curanipe (35°50'S, 72°38'W), 4 Dec 1953, L. E. Peña (1♂; USNM). *Nuble*: San Carlos (18 km E; 36°20'S, 71°44'W), 24 Dec 1950, E. S. Ross, A. E. Michelbacher (1♀; CAS); San Carlos (40 km E; 36°20'S, 71°43'W), 23 Dec 1950, E. S. Ross, A. E. Michelbacher (1♂, 1♀; USNM). *O'Higgins*: Rancagua (23 km N; 34°09'S, 70°45'W), 21 Dec 1950, E. S. Ross, A. E. Michelbacher (30♂, 26♀; USNM). *Osorno*: Río Bueno-N Osorno (40°19'S, 72°58'W), 14 Jan 1951, E. S. Ross, A. E. Michelbacher (30♂, 38♀; USNM); Termas de Puyehue (40°42'S, 72°18'W), 7

Jun 1940, G. H. Schwabe (2♂, 1♀; USNM). *Santiago*: Baños de Morales (33°50'S, 70°03'W), 12 Jul 1940, G. H. Schwabe (1♂; USNM); Chacabuco, Tiltil (33°04.3'S, 70°58.3'W; 950 m), 18–19 Jan 1999, P. and M. Kerr (1♂, 1♀; USNM); Refugio Lo Valdés (33°48'S, 70°03'W), Jun 1954, L. E. Peña (2♂, 4♀; USNM); Los Maitenes (33°32'S, 70°16'W; 1200–1300 m), 19 Oct 1954, L. E. Peña (1♂; USNM); Cantillana (33°58'S, 70°58'W; 2000 m), Dec 1969, L. E. Peña (2♂, 1♀; USNM). *Talca*: Talca (29.5 km N; 35°25'S, 71°25'W), 22 Dec 1950, E. S. Ross, A. E. Michelbacher (1♀; CAS); Vegas del Flaco (34°56'S, 70°02'W; 1350 m), Nov 1969, L. E. Peña (1♂; USNM). *Valparaiso*: Islas Juan Fernandez: Mas-a-Tierra (33°38'S, 78°52'W), 15 Jan–24 Mar 1951–1973, G. Barria, L. Cartagena, P. G. Kuschel, L. E. Peña (47♂, 53♀; CNC, USNM); Isla Más Afuera (33°45'S, 80°46'W), 31 Jan 1973, L. E. Peña (51♂, 68♀; CNC); Isla Santa Clara (33°42'S, 79°W), 1 Jun–30 Dec 1952–1954, P. J. Kuschel, P. G. Kuschel (7♂, 3♀; USNM).

Distribution. *Neotropical*: Argentina (Buenos Aires, Mendoza, Rio Negro) and Chile (Antofagasta, Bio Bio, Cautin, Concepción, Coquimbo, Curico, Llanquihue, Malleco, Maule, Nuble, O'Higgins, Osorno, Santiago, Talca, Valparaiso), between 28°–42°S and 62°–79°W.

Etymology. The specific epithet, *araucaria*, is taken from the name of a native American tribe that lived in southern Chile. The epithet is a noun in apposition to the generic name.

Remarks. This is a common and widespread species in southern South America. Specimens are abundant, and large numbers are frequently collected in marshy habitats.

Some variation is evident in the shape of the surstylus. This variation (Figs. 14–16), which I interpret to be intraspecific, is best viewed laterally and is expressed within and among populations of this species.

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