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A NEW SPECIES OF VALDIVIOMYIA VOCKEROTH (DIPTERA: SYRPHIDAE) FROM ARGENTINA

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Abstract.—Valdiviomyia pucara new species is described from Neuquén Province, Argentina. A description of the new species is provided, as is a key for identifying the species of the genus. Type material of all known species, i.e. V. camrasi (Sedman), V. darwini (Shannon), V. edwardsi (Shannon and Aubertin), V. nigra (Shannon), V. ruficauda (Shannon), and holotype of Ocyptamus albimanus Bigot [=V. valdiviana (Philippi)], was studied. Morphological characters of the genus and the subgeneric groupings are discussed.

Key Words: flower flies, hover flies, identification key, description, Andes, Patagonia

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Valdiviomyia Vockeroth is a Neotropical genus with six described species that are known from Chile and Argentina, most of them occurring in Patagonia (Fig. 1); nothing is known about their natural history. Valdiviomyia species are medium to large size flower flies with an elongated, basally constricted abdomen, vein R4+5 straight or only slightly sinuate, crossvein r-m basal to middle of cell dm, bare metasternum, bare eyes, and simple legs (see Thompson 1972). Males of this genus have a tuberculate face (see. Figs. 5, 9, 20), but females may have a facial tubercle (Fig. 11) or may not (Figs. 17, 21). Valdiviomyia is currently placed within the subtribe Temnostomina (Temnostoma group sensu Thompson 1972), tribe Milesiini, subfamily Erystalinae. Other genera included in the subtribe Temnostomina (sensu Thompson 1972, 2006) are Aneriophora Stuardo and Cortes, Korinchia Edwards, Odyneromyia Shannon and Aubertin, Palumbia Rondani, Pterallastes Loew, Takaomyia Hervé-Bazin, Temnostoma Lepeletier and Serville, and Teuchocnemis Osten Sacken.

Vockeroth (in Thompson et al. 1976) proposed the new name Valdiviomyia for the genus Valdivia Shannon because the name used by Shannon (1927) was pre-occupied (White 1847; Ragonot 1888). Shannon (1927) described three new species within his new genus and mentioned that Ocyptamus? [sic] valdivianus Philippi, 1865 may also belong to this genus. In the same work, Shannon (1927)
suggested the possibility that his new species *Valdivia ruficauda* Shannon, 1927 might be the female sex of another of his species, *Valdivia nigra* Shannon, 1927. Later, Shannon and Aubertin (1933), in their revision of the flower flies of Patagonia and south Chile, described a new species and included *Ocyptamus albimanus* Bigot, 1884 in their key for *Valdiviomyia* species (as *Valdivia*). Etcheverry (1963) compiled all the known information for the genus (as *Valdivia*) at the time, including original descriptions, and gave new data on geographical distribution. The last described species was *Valdivia camrasi* Sedman, 1965 from Chile. Sedman (1965) mentioned new information for *V. darwini* Shannon, 1927, which is the type species of the genus, and described his new species pointing out the differences in the male genitalia between them.

Goot (1964) explained a nomenclatural problem that arose with Fluke (1956-57). In his catalogue, all the *Valdiviomyia* species were listed in the second part of the catalogue (Fluke 1957), but Fluke (1956: 265) mixed two different species in his concept of *Baccha valdiviana* (Philippi, 1865). Philippi (1865) described two species with the same specific epithet, *valdivianus*, in two different but usually confused genera, *Baccha* Fabricius and *Ocyptamus* Macquart. Goot (1964) clearly explained that Fluke used the reference page of *Ocyptamus? [sic] valdivianus* Philippi, 1865 instead of the one for *Baccha valdiviana* Philippi, 1865, but Fluke (1956) also listed together the two references that Shannon and Aubertin (1933: 123, 136) made of the two Philippi species. Goot (1964) pointed out that *Ocyptamus albimanus* is a synonym of *Ocyptamus valdivianus*, and gave a new name for *Baccha valdiviana* Philippi, 1865 in order to resolve the confusion, *Baccha confusa* Goot, 1964.

In his revision of Neotropical Eristalinae, Thompson (1972) gave a differential diagnosis of *Valdiviomyia* (as *Valdivia*) and listed morphological
characters shared between this genus and Odyneromyia. He concluded that these two genera are sister-groups and quite different from all the other eristalines, and listed a few differences between these two genera and Temnostoma and Takaomyia. Later on, Thompson et al. (1976) listed all the known Valdiviomyia
species in their catalogue (i.e. V. camrasi, V. darwini, V. edwardsi (Shannon and Aubertin), V. nigra, V. ruficauda and V. valdiviana) and synonymized Ocyptamus albimanus Bigot under Valdiviomyia valdiviana (Philippi). It is worth to mention that Bigot (1884) based his new species description on a single female
from Chile and provided a rather short description.

In the present work, a new species of *Valdiviomyia* is described from Neuquén Province, Argentina, based on males and females. This represents the second *Valdiviomyia* species recorded from Argentina (Fig. 1). A full description of the new species is given, as well as a key for identifying all described species of the genus.

The new species is described in full with terminology following Thompson (1999). The abbreviations used for collections follow the standard of the Systema Diptera (Thompson 2013), and their equivalents are given below:

CNC: Canadian National Collection of Insects, Ottawa, Canada.

ZFMK: Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany.

In the description of type labels, the contents of each label is enclosed within double quotation (“ ”), italics denote handwriting, and the individual lines of data are separated by a double forward slash (/ / ). At the end of each record, between square brackets ([ ]) and separated by a comma, the number of specimens and sex, the holding institution, and the unique identifier or number are given.

Google Earth® version 7.1.8 (Google Inc. 2017) was used to get the geographic

Figs. 20–23. Valdiviomyia pucara n. sp., holotype male (scale bar = 1 mm). 20, Frontal view. Valdiviomyia pucara n. sp., paratype female (scale bar = 1 mm). 21, Frontal view. Valdiviomyia nigra, holotype male (scale bar = 1 mm each section). 22, Frontal view. Valdiviomyia camrasi, holotype male. 23, Frontal view (scale not available).
coordinates of the type locality. Simple-Mapprr (Shorthouse 2010) was used to create Figure 1. All measurements are in millimeters and were taken using a reticule in a Leica M165 C microscope. Photographs were composed using the software Zerene Stacker 1.04 (Richland, Washington, USA), based on images of pinned specimens taken with a Canon EOS 7D mounted on a P–51 Cam-Lift (Dun Inc., VA, USA) and with the help of Adobe Lightroom (version 5.6). Body length was measured from the anterior oral margin to the posterior end of the abdomen, in lateral view. Wing length was measured from the wing tip to the basicosta.

**RESULTS**

**KEY TO SPECIES OF VALDIVIOMYIA (MODIFIED FROM SEDMAN 1965)**

1. Femora and tibiae entirely orange (Figs. 5, 7) 2
   - Femora and tibiae partly black or dark brown (Figs. 3, 9, 13) ............................................. 3
2. Antennae dark brown (Fig. 5); scutum with a marginal (lateral and posterior) vitta of silver pollinosity (Figs. 4, 5); metatarsi yellow-orange; subcostal cell hyaline except stigma area dark (Figs. 4, 5). Female with a facial tubercle .......... **_darwini_** (Shannon)
   - Antennae orange; scutum entirely shining black, with some pollinosity between post-pronota (Figs. 6, 7); metatarsi darker, brown to black (Figs. 6, 7); costal and subcostal cells entirely yellow, stigma yellow (Fig. 6). Female with concave facial profile .......... **_edwardsi_** (Shannon)
3. Abdomen entirely reddish (Figs. 2, 3) .......... ................................................................. 4
   - Abdomen darker, almost entirely black (Figs. 8, 10, 12) ............................................. 4
4. Stigma pale yellow (Figs. 8, 9); facial tubercle covered with golden pollinosity, at least in male (Fig. 23) .......... **_camrasi_** (Sedman)
   - Stigma darker, dark brown to black (Figs. 11, 13); facial tubercle shining black (Figs. 20–22) ........................................ 5
   - Vein R4+5 slightly sinuous (Figs. 10, 11); legs entirely black except for the gleaming white tarsi (Figs. 10, 11) .................................
     .............................................. **_valdiviana_** (Philippi)
   - Vein R4+5 straight (Figs. 13, 17); legs partly yellow, sometimes only the union between femur and tibia; tarsi yellow or dark (Figs. 13, 15, 17) ............................................. 6
5. Pro- and mesofemora and tibiae mostly black, yellow only at apical part of femora and basal part of tibiae (Figs. 12, 13); face and genae black (Figs. 3, 22) .........................
   - Pro- and mesofemora and tibiae yellow (Figs. 14–17); face yellow laterally and black medially, genae yellow (Figs. 15, 17, 20, 21) ...................... **_pucara_** n. sp.

**Valdiviomyia pucara** Mengual, new species

urn:lsid:zoobank.org:act:9BA3A46B-A0C1-4E09-8709-79F30411942E (Figs. 14–21, 24–26)

Diagnosis.—Large species with pro- and mesolegs entirely pale, metaleg black except tarsomeres 2–5 yellow, and abdomen dark; differing from other species by having the wing stigma black, vein R4+5 straight, gena yellow and facial tubercle shining black.

Description.—**Body length** (4): 14.75 mm (13.00–16.00). Male. **Head** (Figs. 15, 20): facial profile concave below the antennae; face with low distinct facial tubercle, yellow laterally, dark dorsally and medially on the facial tubercle, white-yellow densely pilose and pollinosity, except bare on ventral part and gena, and bare medial vitta on tubercle; gena yellow, shiny, yellow pilose; frontal triangle dark brown, shiny, bare; lunule dark; eye bare, dichoptic; vertical triangle pale pilose, with long pile; antennal basis protruded forward, antenna black, dark pilose, basoflagellomere enlarged,
wider than long; arista dark, bare, thick; occiput dark, slightly white pollinose, pale pilose.

Thorax (Figs. 14, 15): Scutum black, shiny, with short, pale, adpressed pile, white pollinose anteriorly and laterally from postpronotum to the supra-alar area; postpronotum black, pilose; postalar callus lighter, shiny, pilose; scutellum dark, subscutellar fringe absent. Pleuron black, pale pilose on posterior anepisternum and anepimeron; katepisternum and anatergum slightly white pollinose; katepisternal pilose patches well separated; metaepisternum and metasternum bare; calypter reduced, brownish with dark rim; plumula almost absent, dark; halter pedicel yellow, capitulum pale; posterior spiracular fringes brown. Wings: hyaline, brownish apically, with cell sc entirely black, and a small black macula between the RS bifurcation and vein R1; microtrichose apically, bare basally as follows: costal cell bare on basal 4/5, cells r and bm bare, cells r1, r2+3, r4+5, dm, cua1, cup and anal lobe bare basally; alula rectangular, bare. Legs: pro- and mesoleg entirely yellow except procoxa dark very basally and mesocoxa black, yellow pilose; metaleg black, dark brown, except apical four tarsomeres and the very apical part of the meta-basitarsomere.

Abdomen (Figs. 14, 15): Petiolate, unmarginated, black with some paler areas (dark brown), entirely yellow pilose. Sterna dark, pale pilose. Male genitalia: large (Figs. 24–26); 8th segment enlarged and pointed apically; surstylus with a posterodorsal lobe rather short and broad, a bit broadened laterally, and a posteroventral lobe with an dorsoventral incision, which creates an additional lateral lobe.

Female (Figs. 16, 17, 21). Similar to male except for normal sexual dimorphism and as follows: facial profile almost flat; face without tubercle, entirely black except yellow laterally and ventrally, shiny, white pollinose only laterally on eye margin; gena yellow.

Etymology. The specific epithet refers to the type locality, Pucará. Specific epithet to be treated as a noun in apposition.

Type locality.—Argentina: Neuquén Province, Lácar Department, near Lácar Lake, west side, Pucará, 40°10’60” S 71°37’60” W, 700 m.

Geographical distribution.—Species known only from the type locality.

Type material.—Holotype, male, pinned with genitalia in microvial, deposited in the MNHN (Paris, France) and labelled: “26-XII-68 // PUCARA // Neuquen-Arg. // Lg. Schajovskoi” “MUS // COL DURET // 788/93” [green] “HOLOTYPE // Valdiviomyia // pucara // des. X. Mengual” [yellow] [1♂, ZFMK, ZFMKDIP 00018040].

Examined Material From Other Species


**DISCUSSION**

Thompson (1972) argued that Takaoomyia, Odyneromyia and Valdiviomyia belong to subtribe Temnostomina (Milesiini), and not to the subtribe Spheginina (Brachyopini) as suggested by Hull (1949) because of the presence of a subscutellar fringe, bright pollinose markings, tuberculate faces in males, and the absence of thoracic bristles. Thompson (1972) also gave a differential diagnosis for Valdiviomyia and compared it with other members of the Temnostomina. Among his arguments to consider Valdiviomyia and Odyneromyia sister-groups, Thompson (1972) mentioned five morphological characters shared by both genera: 1) tuberculate faces in males, 2) simple legs, 3) bare and underdeveloped metasternum, 4) subscutellar fringes and lack of apical emarginate scutellar rims, and 5) constricted abdomens. Interestingly, the species described here, V. pucara, has no ventral pile fringe in the scutellum, contradicting the genus diagnosis given by Thompson (1972).

Sedman (1965: 198, figs. 1–8) pointed out some differences in the male genitalia between V. camrasi and V. darwini, type species of the genus. Although the epandria of these two species are obviously similar, the aedeagi differ remarkably. The male genitalia of V. pucara is rather different from the ones of these two species, with a shorter and broader posteroventral lobe and a more elaborated and broader posteroventral lobe (Figs. 24–26). Nevertheless, the aedeagus of V. pucara is more similar to the aedeagus of V. darwini than to V. camrasi. Sedman (1965) suggested the possibility of recognizing subgenera within Valdiviomyia, but he argued for further morphological studies to explore this hypothesis. Thompson (1972) agreed with Sedman (1965) on the lack of study on this genus, but he pointed out other morphological characteristics that may correlate with the genitalic differences: 1) most species (V. edwardsi, V. ruficauda, V. nigra, and V. camrasi) have an incomplete postmetacoxal bridge, whereas V. darwini has a complete postmetacoxal bridge; and 2) V. darwini has a facial tubercle in both sexes, whereas V. edwardsi and V. ruficauda, the only other species of which the female was known at the time, lack the tubercle in the female (Thompson 1972).

The new species, V. pucara, has a complete postmetacoxal bridge but females of this species do not have a facial tubercle. More remarkably, a studied male identified as V. nigra (CNC, see above) has a complete postmetacoxal bridge, with metapleura connected posterior of metacoxae, but the male holotype of V. nigra has a membranous postmetacoxal area in agreement with Thompson (1972), and confirmed by T. Dikow (USNM; written confirmation). The postmetacoxal bridge has been used to separate larger groups of taxa, such as genera, i.e. Spheginobaccha Meijere from the other genera of Microdontinae (Reemer and Stähls 2013), or groups of genera (Thompson 1999). This morphological character is also important among species of the same genus, i.e. species of Leucopodella Hull (Thompson 1981). The variability of this character for V. nigra resembles the case of Leucopodella and suggests further study. Hence, there is no clear subgeneric grouping for
Valdiviomyia based on the current knowledge of the available specimens.

The majority of the Valdiviomyia species were described based on a single specimen and only the type series of V. edwardsi comprises three males and two females. The type series of V. pucara is also large with two males and three females. Considering that Philippi (1865) had at least one male and one female for the description of V. valdiviana (exact number unknown, not mentioned), the total number world-wide of known specimens for Valdiviomyia is 24, including those of V. pucara. It is difficult to assess the utility of some morphological characters above species level with these very low numbers, as they might not represent the entire variability of the species. This genus needs a deeper survey in order to study the characteristics of male genitalia and the molecular variability among species, although for DNA studies new specimens via additional sampling are needed.

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