Zootaxa 3626 (3): 356–362
www.mapress.com/zootaxa/
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Article

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

http://dx.doi.org/10.11646/zootaxa.3626.3.4
http://zoobank.org/urn:lsid:zoobank.org:pub:DC46E152-2F8D-4695-B3A7-9508632ED024

Description of a new genus and species of Eucoilinae (Hymenoptera: Cynipoidea: Figitidae) from Colombia

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Abstract

Fontaliella, a new genus of Eucoilinae (Hymenoptera, Cynipoidea, Figitidae) and *F. colombiensis* **sp. nov.** from Colombia, are described and illustrated. This new genus belongs to the Ganaspini and morphologically resembles *Zamischus* Ashmead, 1903, *Perischus* Weld, 1931 and *Steleucoela* Kieffer, 1908. A key to differentiate these genera and species is given.

Key words: new genus, new species, Figitidae, Eucoilinae, Colombia

Introduction

The Figitidae is a family with a world-wide distribution, and are arguably the most species-diverse family within Cynipoidea (Nordlander 1984; Ronquist 1999; Fontal-Cazalla *et al*. 2002). According to current classification, it includes twelve subfamilies. The Eucoilinae is a diverse and important group of Figitidae with about 85 genera and approximately 1000 species (Buffington 2009). In the Neotropical Region, it represents the most diverse group of Figitidae with 50 genera and 217 species (Díaz *et al*. 2008; Díaz & Gallardo in press). Eucoilines wasps are all koinobiont endoparasitoids of Muscomorpha (Diptera) larvae. Eucoilines are a monophyletic group (Fontal-Cazalla *et al*. 2002; Bufington *et al*. 2007), chiefly characterized by having an elevated plate dorsally on the scutellum.

This paper describes the new monotypic genus *Fontaliella* Pujade-Villar, with a new species from Colombia. This new genus belongs to the 'Neotropical Grade' of Fontal-Cazalla *et al.* (2002). All of the taxa considered members of the Neotropical Grade in Fontal-Cazalla *et al.* (2002) were recovered within the extensive, monophyletic "*Zamischus* group" in five of six combined analyses and molecular-data-only analyses (Bufington *et al*. 2007). The results of the sensitivity analyses indicate that branch support for the "*Zamischus* group" was higher when the morphological data partition is excluded. The new genus described here is morphologically similar to the *Zamischus* + *Perischus* lineage. These two genera are characterized by a series of striking synapomorphies (Fontal-Cazalla *et al*. 2002) such as the posteriorly extended propodeum and a long petiole. The new genus described here has a short petiole just like *Steleucoela* which is also included in Ganaspini and is morphologically similar to the new genus.

Material and methods

The specimens described in this study were collected by the Malaise trap between 2000–2004 as part of the Project "Biodiversidad Insectos de Colombia" associated with the Humboldt Institute (http://www.humboldt.org.co/insectos/logros.html). The material is deposited in the "Instituto Alexander von Humboldt" (IAVH, Villa de Leyva, Colombia) and in the collection Pujade-Villar (UB—University of Barcelona, Barcelona, Spain).

 Accepted by M. Buffington: 31 Jan. 2013; published: 14 Mar. 2013

The specimens were studied using a Nikon SMZ-1 stereomicroscope and a Stereoscan Leica-360 (Cambridge Instruments) environmental scanning electron microscope operated with a low voltage without gold coating of specimens.

Descriptions follow the terminology used by Fontal-Cazalla *et al.* (2002) and Buffington *et al.* (2007). Measurements reported are relative, except for the total length. Measurements and abbreviations used here include: F1–F11, 1st and subsequent flagellomeres; POL (post-ocellar distance) is the distance between the inner margins of the posterior ocelli; OOL (ocellar-ocular distance) is the distance from the outer edge of a posterior ocellus to the inner margin of the compound eye; LOL, the distance between lateral and frontal ocelli. The width of the forewing marginal cell is measured from the margin of the wing to the Rs vein. The antennal formula includes: scape, pedicel and flagellomeres (relative width of each antennomere is indicated and the width between parenthesis).

Results

Fontaliella Pujade-Villar new genus

Diagnosis. Head not wedge-shaped in lateral view, antennal sockets not projecting. Compound eyes with short hairs. Ocellar tubercle not protruding. Posterior margin of pronotal plate almost straight. Mesoscutum partially sculptured with lateral transverse carina. Scutellar plate flat and punctate without glandular release pit. Marginal cell longer, and weakly closed, end of R1 unpigmented in the margin of marginal cell. Shorter petiole. Metasomal syntergum densely hairy at base. For more characters see the above 'Remarks'.

Etymology. The genus is named in honour of our good friend Felix Fontal Cazalla, brilliant young taxonomist of Eucoilinae in the early 2000s.

Gender. Feminine.

Type species. *Fontaliella colombiensis* Pujade-Villar, Díaz & Gallardo **sp. nov.**

Description. Body slender, laterally compressed. Head massive, in anterior view slightly wider than long, broader than mesosoma, posteriorly concave in dorsal view; smooth and polished, with sparse setiferous punctures on face, dense on clypeus, genae and occiput. Compound eyes with short hairs. Antennae filiform, arising far above mid-height of eyes, with 13 segments (female). Toruli not projecting. Ocellar tubercle not prominent. Vertex smooth. Malar sulcus present. Genae rounded. Lateral margin of occiput not defined. Occiput concave. Shape of dorsal margin of pronotal plate in anterior view broadly truncate, highly setose behind genae. Posterior part of pronotal plate smooth with isolated setae; lateral cavities open. Mesoscutum longer than wide, quite flat, without median mesoscutal carinae, laterally striated, with faint rows of punctures in position of notauli; parascutal impressions conspicuous. Shape of posterior part of scutellum in dorsal view rounded; lateral bars broad and striated; dorsal surface of scutellum sculptured; scutellar plate large, flat, without glandular release pit; surface punctate, each puncture with a single seta; scutellar foveae wider than long (transversal). Mesopleural carina present. Anteroventral cavity of metapleuron conspicuous and setose. Wings of normal size, surface pubescent and ciliate on margin; marginal cell closed, longer than broad. Propodeum setose, produced posteriorly into a neck-like process, as long as scutellum, shorter than hind coxae, with two almost parallel carinae. Petiole conspicuous but short; metasoma almost sessile, with a hairy ring at base of syntergum, distally punctate.

Biology. Unknown

Distribution. Neotropical Region: Colombia.

Remarks. *Fontaliella* **n. gen.** is morphologically similar to *Zamischus* Ashmead, 1903, *Perischus* Weld, 1931 and *Steleucoela* Kieffer, 1908. *Fontaliella* differs from *Zamischus* and *Perischus* in having a metasoma with a short petiole (very long in *Zamischus* and *Perischus*) and a hairy ring at base of syntergum (glabrous in *Zamischus* and *Perischus*). Also differs to *Zamischus* but similar to *Perischus* to have the posterior margin of pronotal plate almost flat (with two prominent teeth in *Zamischus*), sculptured mesoscutum (smooth in *Zamischus*), closed marginal cell (open at base as well as on margin in *Zamischus*) and nucha shorter than hind coxae (as long as hind coxae in *Zamischus*). The new genus is also similar to *Steleucoela*, but the head is not wedge-shaped in lateral view; ocellar tubercle is not prominent; antennal sockets are not projecting, the compound eyes are hairy and the genae are rounded; posterior margin of pronotal plate is almost straight; scutellar plate flat and punctate, glandular release pit absent; and marginal cell partially open along front margin and longer.

***Fontaliella colombiensis* Pujade-Villar, Díaz & Gallardo n. sp.**
(Figs. 1–2)

Type material. HOLOTYPE female (deposited IAVH): Colombia: Cundinamarca. PNN Chingasa. Alto de la Bandera 4º 31'N 73º45'W 3660m. Malaise, 12.IV–04.V.2001. L. Cifuentes Leg M1778. PARATYPE female (deposited UB): with the same data as holotype, 30.III–12.IV.04, M1585.

Etymology. In reference to the country where the specimen was collected: Colombia.

Diagnosis. Female. Body black. Head 1.6–1.7 as broad as long from above, 0.8–0.9 times as broad as high. POL 1.4 times as broad as OOL; smooth with some setigerous punctures inferiorly and laterally. OOL 1.4 times as long as length of lateral ocellus and 2.5 times as long as LOL. Malar space 0.54–0.63 as long as height of eye. Antennae filiform with all flagellomeres longer than wide. Dorsal margin of pronotal plate almost straight, lateral cavities open. Mesosoma smooth and shiny; pronotum laterally and mesopleuron partially weakly striated; lateral sides of mesoscutum strongly striated; notulices absent. Propodeal carinae thik, almost straight. Forewings with a marginal cell weakly closed, 4 times as long as broad. Metasoma slightly shorter than head+mesosoma; petiole conspicuous, 1.3 times as long as broad.

Description. Length female: 2.6–3.2 mm; male unknown.

Colour. General coloration black; mandibles, legs (except coxae and trocanters) and veins reddish brown; basal part of middle and hind femur and last tarsal segments darker.

Head. Head massive, broader than mesosoma, posteriorly concave in dorsal view from; 1.6–1.7 as broad as long from above, 0.8–0.9 times as broad as high. Smooth and polished, with sparse setigerous punctures on face, dense on clipeus, basal genae and lateral occiput. Area bellow toruli smooth or finely striate longitudinally almost smooth (Fig. 1d–e); area between toruli and inner edge of eyes slightly concave. Compound eyes shortly and sparse hairy, inner margin convergent. Toruli not proyecting. Ocellar tubercle not prominent; POL 1.4 times as broad as OOL; OOL 1.4 times as long as length of lateral ocellus and 2.5 times as long as LOL. Vertex smooth. Malar space 0.54–0.63 as long as height of eye; malar sulcus present. Genae rounded. Lateral margin of occiput not defined. Occiput concave. Shape of dorsal margin of pronotal plate in anterior view broadly truncate, highly setose behind genae.

Antenna. Filiform, arising far above middle of eyes, with 13 articles: F1 straight, as long as scape plus pedicellus, with few setae; F2–F11 cylindrical, becoming more setose and placodeal sensilia F5–F11; antennal formula: 6(2.2): 3(2): 6(2): 7(1.5): 7(1.5): 7(1.5): 7(1.5): 7(2): 6(2): 6(2): 5(2): 5(2): 8(2).

Mesosoma. Pronotal plate smooth, sparsely pubescent laterally; shape of dorsal margin anterior view almost straight; lateral cavities open. Sides of pronotum finely striated, posterodorsal area smooth and polished. Mesoscutum smooth and shiny, antero-admedian signum present, without median mesoscutal carinae and notaules with faint rows of punctures in position of notauli; parascutal impressions conspicuous; laterally strongly striated occupying 2/3 basal parts. Scutellum longer than wide (12x9); dorsal surface of scutellum finelly reticulate, with dense puntate setiferous; shape of dorsoposterior part of scutellum in dorsal view rounded; scutellar foveae present, transversally elongated, delimited posteriorly, bottom shiny, with some rugae; scutellar plate weakly protruding, twice longer than wide, flat and punctuate, each puncture with a single seta, without glandular release pit. Mesopleuron smooth above mesopleural carina; area bellow this and mesopleural triangle striate. Dorsal half of metapleura striate. Propodeum setose, produced backward into a neck, as long as scutellum, shorter than hind coxae; propodeal carinae present, almost straight, longitudinally sculptured, wider in the anterior part and joining basally forming plaque that occupies 1/3 the length of the propodeum.

Legs. Tarsal claws simple.

Forewing. Longer than body. Surface pubescent and ciliate on margin; marginal cell weakly closed, end of marginal vein unpigmented, 4 times as long as broad.

Metasoma. Slightly shorter than head+mesosoma. Petiole conspicuous but short, 1.3 times as long as broad dorsally smooth, laterally striated. Syntergum with a hairy ring at base, distally punctuate.

Distribution. Colombia.

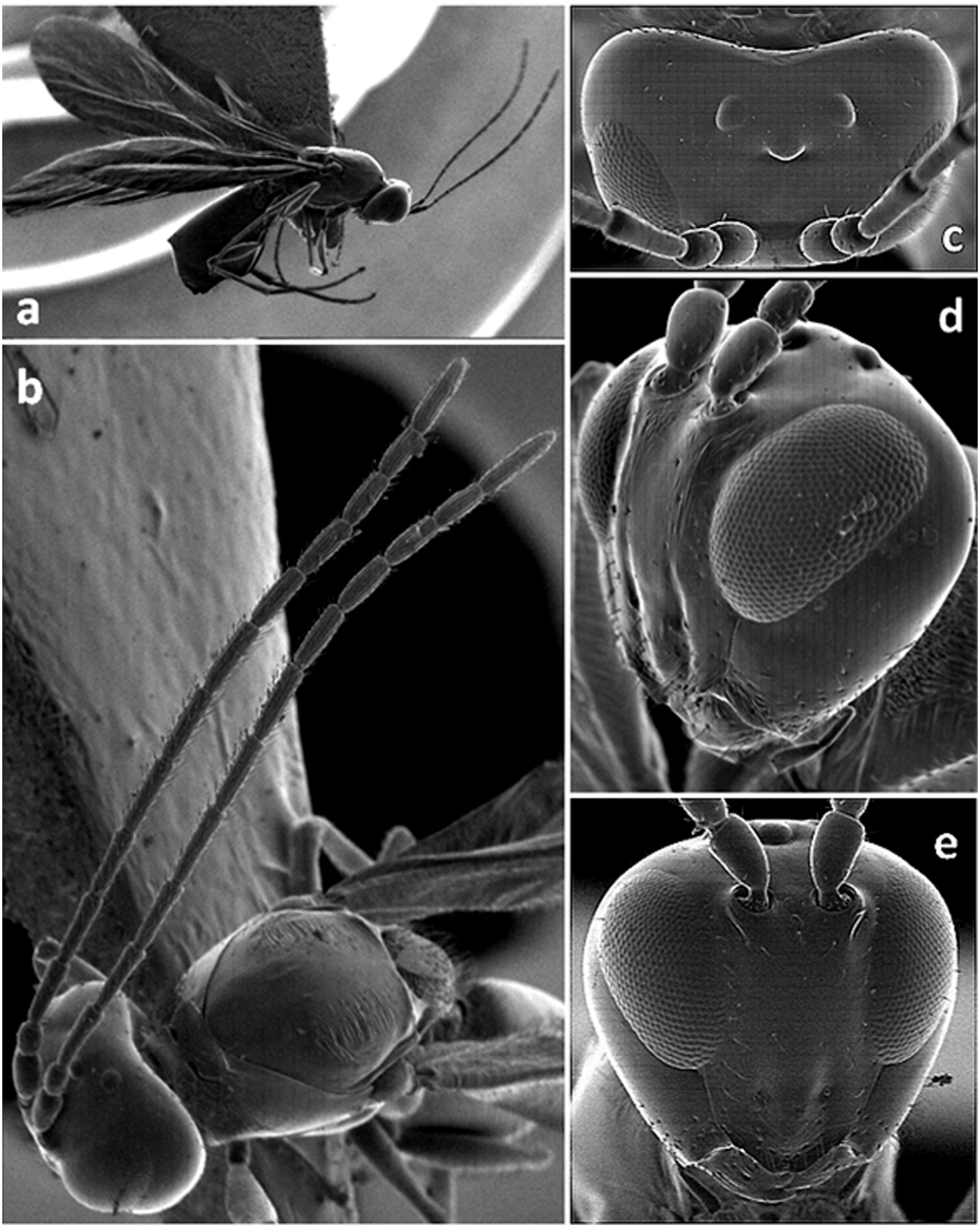

FIGURE 1. *Fontaliella colombiensis* ♀ **n. sp.**: (a) general view of body, (b) antenna, (c) head in dorsal view, (d) head in lateral view, and (e) head in frontal view.

Biology. Host unknown.

Remarks. The only difference between holotype and paratype is the presence or absence of an area below toruli that is smooth or almost smooth but finely striate longitudinally. The specimens are collected in the same

place in the similar data. We do not doubt that these specimens belong to the same species, and probably this difference is due to the size difference; the longer specimen (holotype) has the almost smooth area.

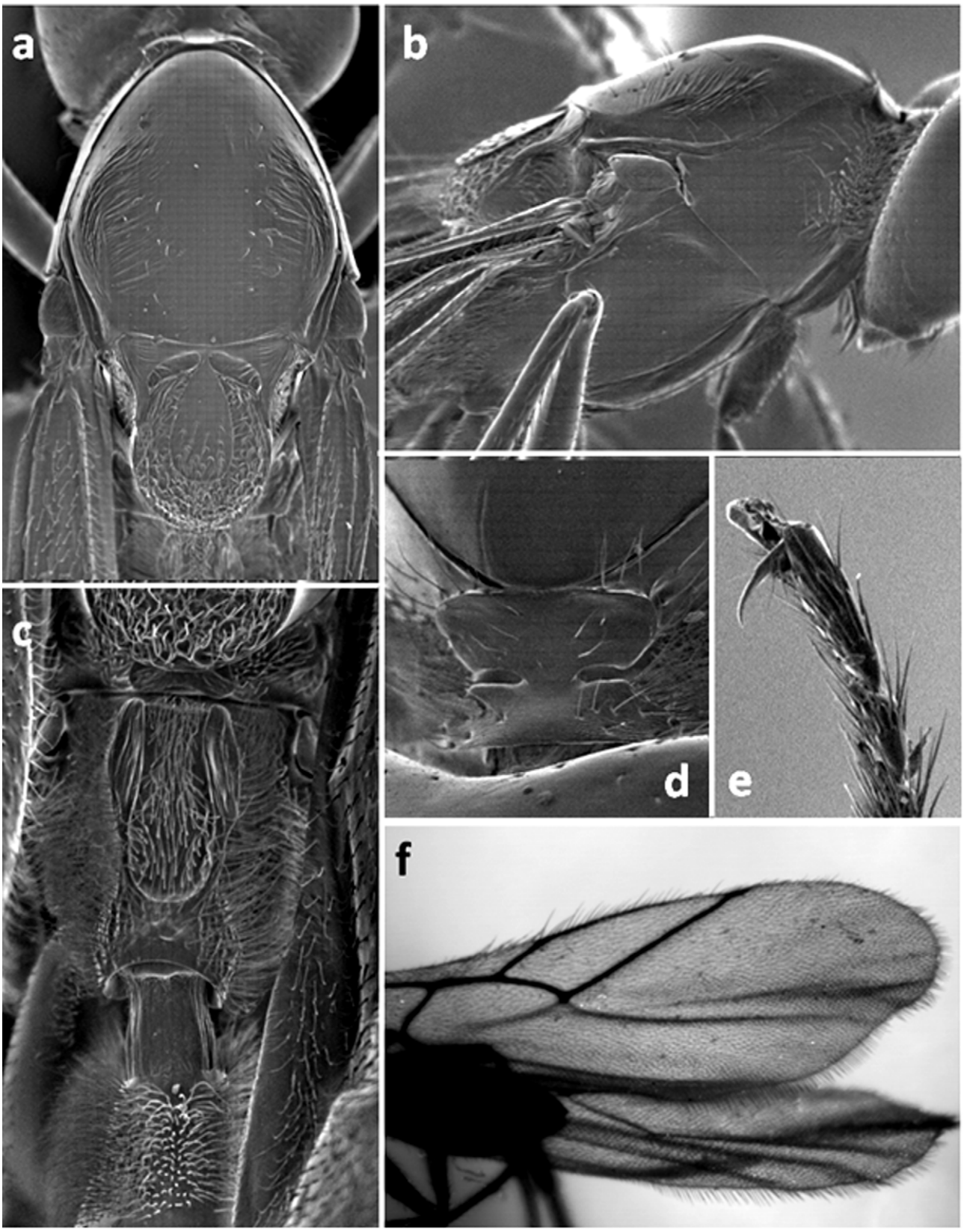

FIGURE 2. *Fontaliella colombiensis* ♀ **n. sp.**: (a) mesosoma in dorsal view, (b) mesosoma in lateral view, (c) propodeum, petiole and basal part of syntergum, (d) pronotal plate, (e) tarsal claw and (f) forewings- marginal cell.

Discussion

According to Forshage and Nordlander (2008), the Ganaspini Belizin, 1961, coincides with the "*Zamischus* group", thus uniting the "*Ganaspis* group" and the "Neotropical grade" plus the majority of "*Chrestosema* group" from the analysis of Fontal-Cazalla *et al.* (2002). Within Ganaspini, *Fontaliella* is morphologically similar to *Zamischus*, *Perischus* and *Steleucoela*, since all these genera have a propodeum have an nucha and head massive, broader than thorax (see more details in diagnosis). All these genera, distributed in the Neotropical Region, are very poorly known: *Zamischus* includes three described species (*Z. brasiliensis* Ashmead, 1903, *Z. elongatus* Yoshimoto, 1971 and *Z. aquilesi* Díaz & Gallardo, 2011, from Brazil); *Perischus* includes two species (*P. boliviensis* Weld, 1931 from Bolivia and *P. carinatus* Ros-Farré & Pujade-Villar, 2005 from Brazil described in Pujade-Villar *et al*. 2005); *Steleucoela* two species (*S. piriformis* Kieffer, 1908 from Nicaragua and *S. brasiliensis* Gallardo, Díaz & Marchiori, 2003 from Brazil described in Gallardo *et al.* 2003); *Fontaliella* the only species described here from Colombia. Only in *Z. brasiliensis*, *Z. elongates*, *S. piriformis* and *S. brasiliensis* the males are known. *Fontaliella* and a recent described genus Diaz *et al*. (2009), *Hydrelliaeucoila*, are the only genus without glandular release pit in the scutellar plate; nevertheless both genera are very different (scutellar plate punctuate in *Fontaliella* but smooth and shiny in *Hydrelliaeucoila*; mesoscutum partially sculptured with lateral transversal carinae in *Fontaliella* but smooth and shiny in *Hydrelliaeucoila*; radial cell closed in *Fontaliella* but opened in *Hydrelliaeucoila*, among other characters).

We can differentiate the mentioned genera and their species with the following key:

1	Propodeum posteriorly extended such that the nucha is at least as long as scutellum. 2
-	Propodeum shorter . . . . . other Eucoilinae, not covered here
2	Petiole long, more than 2.5 times as long as broad. Metasomal syntergum glabrous at base. 3
-	Petiole shorter, less than 2 times as long as broad. Metasomal syntergum densely hairy at base. 7
3	Marginal cell open, R1 absent. Mesoscutum smooth with some piliferous points. Posterior margin of pronotal plate with two prominent teeth. Petiole sulcate . . . . . *Zamischus...* 4
-	Marginal cell closed, R1 and marginal vein present. Mesoscutum transversely sculptured. Posterior margin of pronotal plate without teeth. Petiole dull, striate . . . . . *Perischus...* 6
4	Petiole short, metasoma elongate . . . . . *Z. elongatus*
-	Petiole very long, metasoma short 5
5	Antenna filiform. Scutellar plate large and densely punctate . . . . . *Z. aquilesi*
-	Antenna widened toward apex. Scutellar plate small with peripheral row of setiferous punctures. . . . . *Z. brasiliensis*
6	Ocellar tubercle protruding. Transversal carinae of mesoscutum strongly impressed. Notauli absent, with faint rows of punctures in their position. Lateral face of pronotum strongly punctate. Scutellar foveae big, longer than distance to transscutal fissure. Scutellar plate long. Propodeal carinae straight. F1 of female antennae curved, F2 and F3 straight. . . . . *P. carinatus*
-	Ocellar tubercle not protruding. Transversal carinae of mesoscutum weakly impressed. Notauli effaced. Lateral face of pronotum almost smooth. Scutellar foveae small, shorter than distance to transscutal fissure. Scutellar plate shorter. Propodeal carinae basally curved and dorsally straight. F1 to F3 of female antennae curved. . . . . *P. boliviensis*
7	Head not wedge-shaped in lateral view, antennal sockets not projecting (Fig. 1d). Ocellar tubercle not protruding. Mesoscutum partially sculptured with lateral transversal carinae (Fig. 2a). Scutellar plate flat and punctate, glandular release pit absent (Fig. 2a). Posterior margin of pronotal plate almost straight (Fig. 2d). Marginal cell longer, four times as long as broad, and weakly closed, end of R1 unpigmented in the margin of marginal cell (Fig. 2f) . . . . . *Fontaliella colombiensis* **n. gen.** & **n. sp.**
-	Head wedge-shaped in lateral view, antennal sockets projecting (Gallardo *et al.* 2003: Fig. 1). Ocellar tubercle protruding. Mesoscutum smooth (Gallardo *et al.* 2003: Fig. 6). Scutellar plate convex and smooth, glandular release pit present (Gallardo *et al.* 2003: Figs 6–7). Posterior margin of pronotal plate incised (Gallardo *et al.* 2003: Fig. 5). Marginal cell shorter, twice as long as broad, and open (Gallardo *et al.* 2003: Fig. 9). . . . . *Steleucoela* 8
8	Face coriaceous on either side of a median smooth area. Mesoscutum quite flat specially behind with faint rows of punctures in position of notauli, finely aciculate but shining . . . . . *S. piriformis*
-	Face entirely smooth. Mesoscutum arched, entirely smooth and shining. . . . . *S. brasiliensis*

Acknowledgements

We thank Palmira Ros-Farré (Barcelona University, Spain) for taking the SEM pictures included in this study. Also, we are grateful to the "Consejo Nacional de Investigaciones Científicas y Técnicas" (CONICET), the "Comisión de Investigaciones Científicas de la Provincia de Buenos Aires" (CIC), and the "Universidad Nacional

de La Plata" (UNLP)—Argentina, for their constant support. To Daniel Aquino (CONICET) and Cecilia Gorretta (CIC) for technical support. This research was supported by the projects CGL2008-00180 and CGL2011-22889 of the "Ministerio de Ciencia e Innovación" (Spain). Finally, we are very grateful to Claudia A. Medina (IAvH) to send us the specimens mentioned in this study; to Mattias Forshage and Matt Buffington for their criticism, comments and suggestions on earlier versions of this paper.

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