

Original article

Notes on the genus *Eufriesea* in Colombia: Description of the female of *Eufriesea dressleri* (Kimsey, 1977) and extension of the distribution range of four species of the genus

Notas sobre el género *Eufriesea* en Colombia: descripción de la hembra de *Eufriesea dressleri* (Kimsey, 1977) y extensión del rango de distribución de cuatro especies del género

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Abstract

In this paper, we present an update of the information concerning the genus *Eufriesea* for Colombia. We describe the female *Eufriesea dressleri* (Kimsey, 1977), the only female of the *elegans* group not yet described. A taxonomic key is proposed for its identification and the range of distribution of *Ef. dressleri*, *Eufriesea concava*, *Eufriesea magretti*, and *Eufriesea pulchra* is extended for Colombia including new altitudinal records.

Keywords: Orchid bees; *elegans* group; Euglossini; Taxonomic keys.

Resumen

En este documento presentamos una actualización de la información concerniente al género *Eufriesea* para Colombia. Se describe la hembra de *Eufriesea dressleri* (Kimsey, 1977), que era la única hembra del grupo *elegans* aún no descrita. Se propone una clave taxonómica para su identificación y se extiende el rango de distribución de *Eufriesea dressleri*, *Eufriesea concava*, *Eufriesea magretti* y *Eufriesea pulchra* para Colombia, incluidos nuevos registros altitudinales.

Palabras clave: Abejas de las orquídeas; Grupo *elegans*; Euglossini; Claves taxonómicas.

Introduction

Eufriesea Cockerell, 1908, is the second most diverse genus of the tribe Euglossini (Hymenoptera: Apidae: Apinae). The most recent list of species and synonyms of the genus was produced by Nemésio & Rasmussen (2011), who proposed a total of 66 valid names. After this work, Nemésio & Santos-Júnior (2013) described *Eufriesea zhangii* and González & Griswold (2017) described three new species more: *Eufriesea engeli*, *Eufriesea barthelli*, and *Eufriesea oliveri* (González, et al., 2017) thus completing 70 species registered for the genus.

Despite being the second most diverse genus of the tribe Euglossini, the high seasonality of its species, the frequent emergence in the high rainy season, and its long periods of diapause (Kimsey, 1982) makes *Eufriesea* a genus with few representatives in entomological collections (Nemésio, 2011).

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The species *Eufriesea dressleri* (Kimsey, 1977) was described only based on male specimens (holotype and seven paratypes data: Male, Piña area, Canal Zone, Panama, V-18-1968 (R.L. Dressler, UCD)) due to the lack of female specimens. The original description also provided the diagnosis of the species and compared it with *Eufriesea elegans* (Lepeletier, 1841) given its similarity in the coloration patterns of the metasomal segments.

Bonilla-Gómez & Nates-Parra (1992) extended the geographical distribution of the species and reported it for the first time in the Orinoco region of Colombia. Their report, however, didn't include any coordinates data, or the record of the number of specimens found, nor the collections where the specimen were stored. Furthermore, Ramírez, *et al.* (2002) reported the presence of this species in the Orinoco region of Colombia and hypothesized its possible distribution in the Pacific Region of the country. The same document also mentioned that both sexes of the species were known and they were present in two biological collections: the *Museu de Zoologia* at the *Universidade Federal do Paraná*, Curitiba, Brazil (DZUP), and the University of Florida, Herbarium U.S.A (FLAS) suggesting that identifications of female specimens of *Ef. dressleri* had probably resorted to the original male-based description since the species of the “*elegans* group” of *Eufriesea* do not show significant differences in the coloration patterns (other than the genitalia) between males and females of the same species.

It is also possible that *Ef. dressleri* females have been identified in other collections without an official description for the females of the species as happened with *Eufriesea nigrohirta* (Friese, 1899) (see Nemésio, 2005). However, the problem of the lack of a comprehensive description of the female persists, which may result in the misidentification of *Ef. dressleri* females or, conversely, that of females from similar species such as *Ef. elegans* misidentified as *Ef. dressleri*.

Methods

A total of 118 specimens of *Eufriesea* spp. from Colombian entomological collections were examined for this work: *Colección Entomológica de la Universidad de Antioquia* (CEUA) in Medellín (17), the *Museo Entomológico Francisco Luis Gallego* at *Universidad Nacional de Colombia* (MEFLG) in Medellín (97), and the *Museo Entomológico de Piedras Blancas* (MEPB) in Guarne (4).

As for the geographical data, the published information available to update the geographical distribution of species only provides the names of the departments or regions; therefore, to assign a location on the map, we selected the urban areas of these departments as reference points. For the material reviewed in the collections with no coordinates or height above sea level, we used digital elevation model (DEM) maps in the Qgis 3.10.4-A Coruña software to infer these data from the locality recorded on the labels. Inferred data appear in square brackets and the morphological terminology follows Kimsey (1982). We used a Leica EZ4 W stereomicroscope to describe the *Ef. dressleri* female.

Results

We found 11 species of *Eufriesea* out of the approximately 30 estimated for Colombia (Bonilla-Gómez & Nates-Parra, 1992; Ramírez, *et al.*, 2002). The four species presenting new distribution ranges for the country included *Ef. dressleri* with three specimens, two of them females, used to describe the species allotype.

A male *Ef. dressleri* was identified from the material at the *Museo Entomológico Francisco Luis Gallego* (Figures 1A-B) collected by Francisco L. Gallego in 1949, in addition to a female (Figures 1C-D) from the same collection, which resembled the male in its coloration pattern; this specimen was, however, identified as *Eufriesea* aff. *elegans* by A. H. Smith-Pardo and was collected by the same entomologist in 1997 in Porce, Antioquia, Colombia. We also found a female in the CEUA collection, which was erroneously identified as *Eufriesea pulchra* (F. Smith) by L. Elorza.

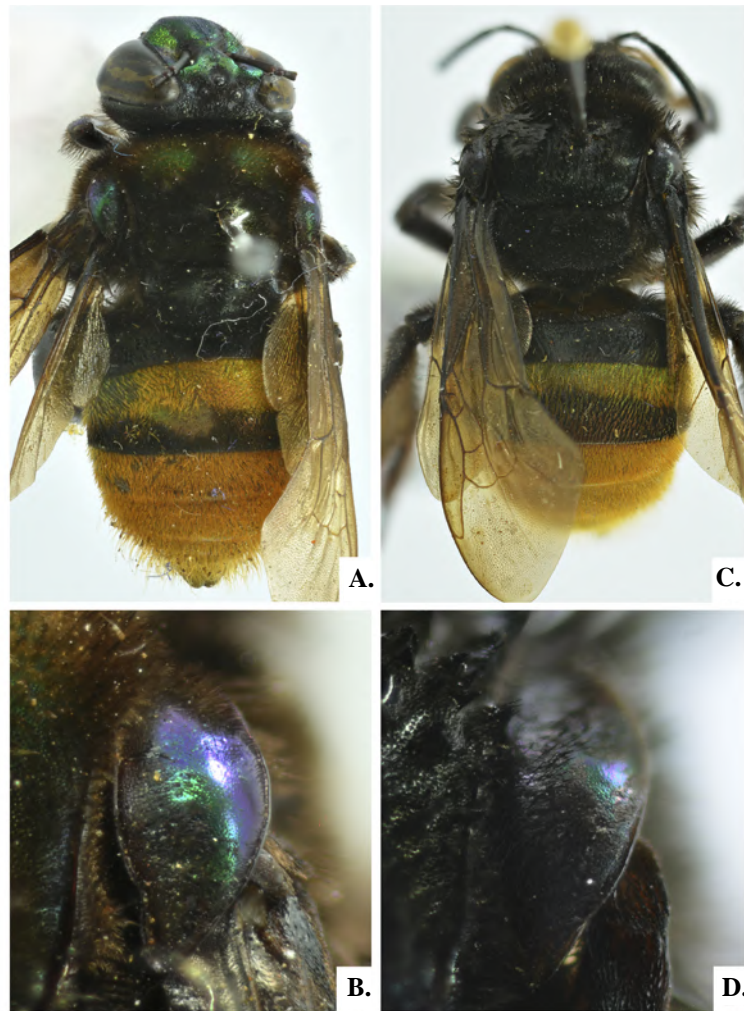


Figure 1. Dorsal habitus and tegulae of *Ef. dressleri*. **A, B.** Male. **C, D.** Female.

In terms of the differences between *Ef. dressleri* and *Ef. elegans*, the latter has a tongue that reaches the second sternite (S2); when we studied the specimen identified as *Eufriesea* aff. *elegans* we found that it did not match this description and that its tongue only reached the midcoxa. Besides, we also observed differences in the metasomal coloration patterns, the body length, the integument coloration, as well as a variation in sculpture and shape of clypeus that made the specimen closer to the description of the *Ef. dressleri* male than to that of the *Ef. elegans* female.

***Eufriesea dressleri* (Kimsey, 1977)**

Euplusia dressleri Kimsey, 1977: 12

Material examined. 1 Male; Colombia, Antioquia, Turbo; [8°5' N, 76°43' W]; [5 m a.s.l.]; ABR-1949; Francisco Luis Gallego, [leg]; *Euplusia* sp.; MEFLG NC 35923. 1 Female; Colombia, Antioquia, Porce, Santa Lucía P; [6°48' N, 75°08' S]; [860 m a.s.l.]; AGO-12-1997; Jama; Allan Smith-Pardo. [leg]; *Eufriesea* aff. *elegans*, Allan Smith-Pardo [Det]; 10-12 hrs; MEFLG NC 34856 • 1 Female; Colombia, Antioquia, Puerto Nare, Vda Caño Seco, Hda La Brasilia; [6°12' N, 74°37' W]; 380 m a.s.l.; OCT-09-2004; T. vannsommer; Castaño & Vélez [legs]; *Eufriesea pulchra*, Liliana Elorza [Det], SEP-30-2001; CEUA 16163.

Additionally, we reviewed photographs of the paratype of *Eufriesea dressleri* (**Figure 2**)

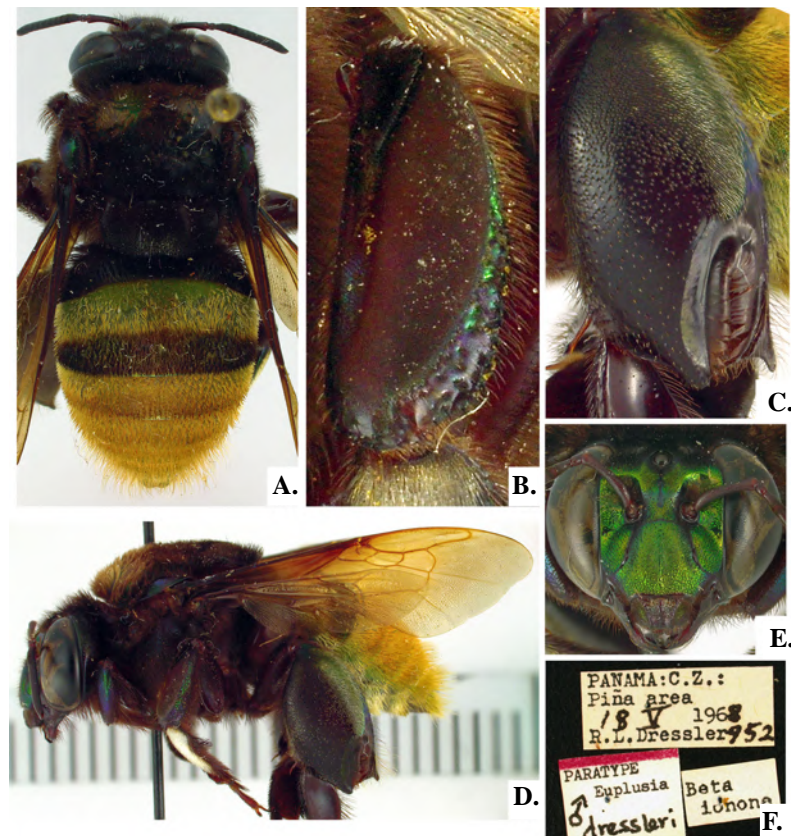


Figure 2. Paratype of *Ef. dressleri*. **A.** Dorsal habitus. **B.** Mid tibia. **C.** Hind tibia. **D.** Lateral habitus. **E.** Face. **F.** Labels.

Males:

Length = *approx.* 20 mm, maximum width of the mesosoma = 7.5 mm, length of the forewing = *approx.* 15 mm. Tegulae green (**Figure 1B**), face and clypeus green with slight coppery hues, covered with scattered brown setae, labrum black (**Figure 3A**) with green hues in lateral areas and brown setae scattered in the discal region and denser in the sides (**Figure 3B**), rest of the head black with black setae. Antennal depression with light yellow setae in the antenocular area. Mesoscutal patches green with light brown setae, rest of mesoscutum dark green to black covered with dark brown to black setae. Mesoscutellum black with green highlights and black short setae. Mesopleura entirely dark green with brown setae.

Description Female:

General color and vestiture. Clypeus dark green (**Figure 3C**), covered with scattered dark brown setae of different lengths (**Figure 3D**), some as long as the vertex setae. Labrum black with metallic highlights in the basal half and covered with dense dark brown setae of different lengths. The base of the mandibles black with light metallic highlights. Frons and vertex black with bronze hues, gena black with purple hues and dark brown setae, vertex with long black setae (2,5 ocellar diameter -OD-), frons, and vertex black with bronze hues and long black setae. Antennal depression with light brown setae on the antenocular area. Mesoscutum dark green, almost black, with dense black setae and bronze highlights. Mesoscutellum dark purple with bronze-green hues and black setae, setae longer in the distal half. Tegulae dark green with almost half black (**Figure 1D**). Mesopleura black with black setae. First tergite (T1) dark brown with black setae. T2 with the anterior half green with yellow hues covered with yellow setae and the posterior half copper with copper

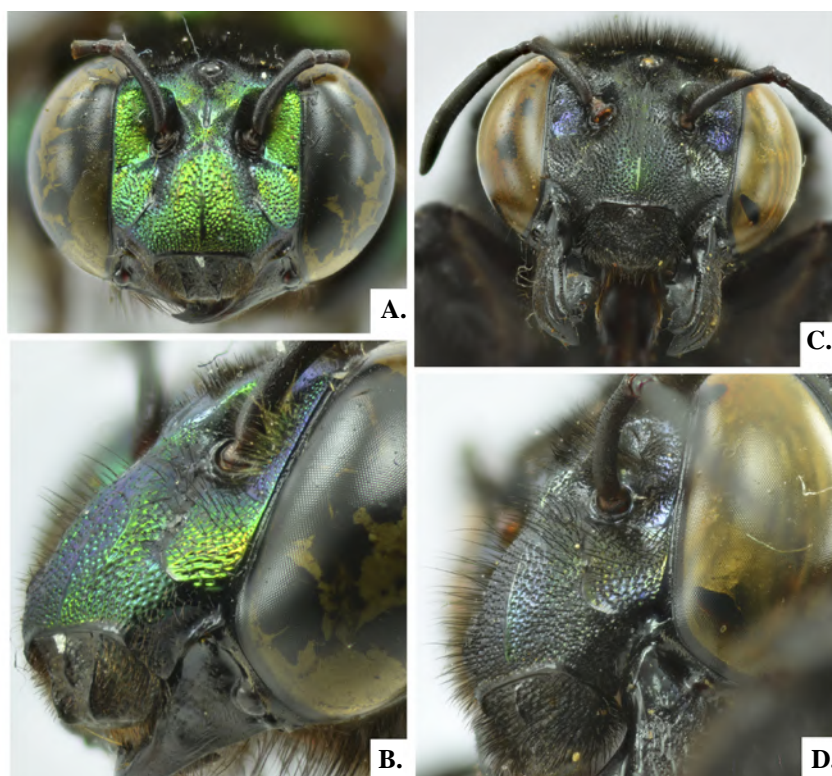


Figure 3. Face of *Ef. dressleri*. **A, B:** Male. **C, D:** Female

highlights covered with black setae. The first fourth of T3 red copper with yellow setae. Last three-fourths of T3 to T6 bronze with yellow setae; T5 and T6 setae twice as long as T3 setae. S2 with basal two-thirds dark brown and covered with scattered yellow setae interspersed with some brown setae. Last one-third of S2 and S3-S6 with yellow setae. Setae on the sides of S6 longer and more erect than its discal setae.

Head. Clypeus with a thin ridge without puncture and two barely visible welts. Labrum with a ridge in the first basal third; maximum head width 6.5 mm. Upper inter-orbital distance = 3.1 mm, eye length = 4.3 mm, scape length = 1.8 mm, tongue in repose = 6.8 mm and reaching the midcoxa. Mandibles with four teeth, basal tooth very small and about half as wide as the second one. Epistomal suture under the tentorial pits strongly projected and forming a ridge (**Figure 3D**).

Body. Total length *aprox.* = 18 mm, maximum width of the metasoma = 7.6 mm, mesoscutellum = 4.3 mm wide and 1.8 mm long, anterior wing *ca.* = 14.5 mm.

Punctuation. Vertex with large rounded punctures, about 7 to 10 times the size of the micropunctures located in the circum-ocellar region. Punctures in frons of two different sizes, the smaller ones minute in relation to the larger ones. Clypeus with rounded punctures, integument between the epistomal suture and subantennal suture striated. Mesoscutum with dense punctures, of two sizes, the larger ones almost twice the size of the smaller ones, but more broadly distributed. Mesoscutellum with punctures of two sizes, larger ones almost three times the size of the smaller ones, distributed in equal proportions.

Male legs. Hind tibia black with a green stripe on the posterior margin and with a group of yellow setae appressed on the posterior margin (**Figure 4A**). Fore tibia and mid tibia brown with anterior side with strong hues (**Figure 4B**).

Female legs. Hind tibia brown with minute yellow setae and metallic highlights in the basal area (**Figure 4C**). Maximum width of the hind tibia = 3.0 mm. Fore tibia and mid tibia brown with green and purple highlights on the outside (**Figure 4D**).

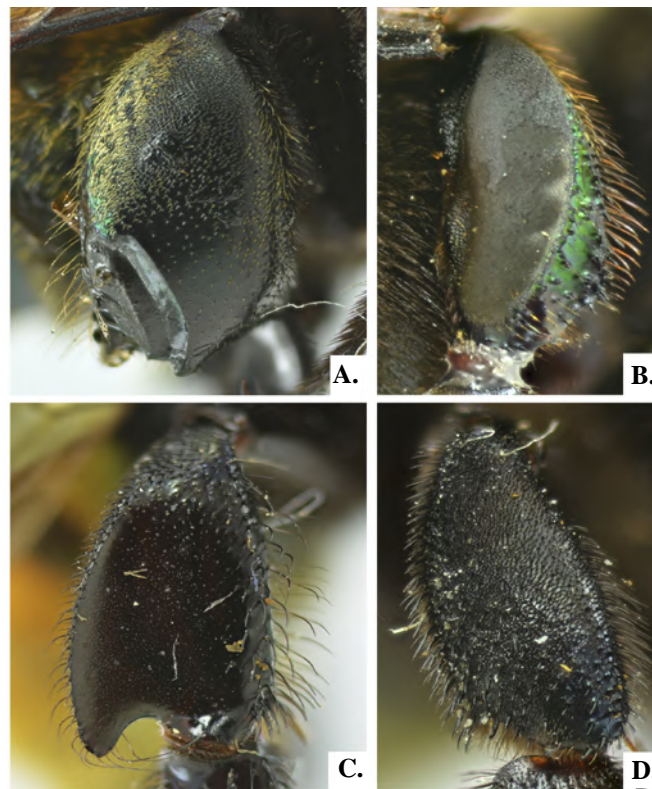


Figure 4. Legs of *Ef. dressleri*. **A-B:** Male legs: **A.** Hind tibia. **B.** Mid tibia. **C-D.** Female legs: **C.** Hindtibia. **D.** Midtibia.

Diagnosis. This species is similar to *Ef. elegans* but can be distinguished because the length of the tongue does not exceed the midcoxa (in *Ef. Elegans* it reaches S2). Additionally, the posterior band of T2 occupies no more than the last two-thirds of the tergite, whereas in *Ef. elegans* it occupies three-quarters.

This species is also similar to *Eufriesea eburneocincta* (Kimsey, 1977) but can be distinguished by the black setae of T1 (pale yellow in *eburneocincta*) and by the color patterns of the bands of T2, which in *Ef. dressleri* has an anterior band green with yellow setae, whereas in *Ef. eburneocincta* the anterior band is brown with black setae and the posterior band is copper with orange-yellow setae.

Conservation status. The Red Book of Colombian Invertebrates (Amat-García, et al., 2007) and Resolution 1912 of 2017 issued by the Colombian Ministry of the Environment place *Ef. dressleri* in the category of critically endangered (CR) species for Colombia.

Keys for *elegans* species group (females) adapted from Kimsey (1982)

- 1. Tongue in repose, reaching S2 or beyond..... 2
- Tongue in repose, not reaching S2..... 3
- 2. First 1/4 of T2 green with yellow setae, last 3/4 of T2 brown coppery to black with black setae..... *elegans* (Lepeletier)
- First 1/4 of both T2 and T3 blackish or dark greenish with black setae, last 3/4 of T2 yellowish green to brassy with yellow setae..... *duckei* (Friese)
- 3. T2 banded, anterior half blackish with black setae, posterior half coppery to brassy with yellowish setae..... *eburneocincta* (Kimsey)
- T2 banded, anterior half brassy with yellow setae, posterior half brown to copper with blackish setae and some copper hues..... *dressleri* (Kimsey)

Extension of the distribution range of some *Eufriesea* species in Colombia:***Eufriesea concava* (Friese, 1899)***Euglossa (Eulema) mexicana concava* Friese, 1899

Material examined. 1 Male; Colombia, Antioquia, Porce, San Ignacio; [6°48' N, 75°08' S]; [860 m a.s.l.]; AGO-29-1997; pescado; Allan Smith-Pardo, *leg*; *Eufriesea* aff. *concava*, Allan Smith-Pardo, Det; MEFLG NC 34835 • 5 Females; same data as for preceding, Picardía; OCT-01-1997; pescado; Allan Smith-Pardo, *leg*; rastrojo alto; *Eufriesea concava*, Allan Smith-Pardo, Det; MEFLG NC 34840, 34846, 34848, 34850, 34851 • 3 Females; same data as for preceding; OCT-09-1997; Jama; MEFLG NC 34844, 34855, 34863 • 1 Male; same data as for preceding; MEFLG NC 34857 • 1 Female; same data as for preceding; OCT-01-1997; MEFLG NC 34841 • 2 Females; same data as for preceding, Cancana; SEP-26-1997; MEFLG NC 34836, 34853 • 2 Females; same data as for preceding, San Ignacio; AGO-29-1997; Bosque; MEFLG NC 34838, 34847 • 2 Females; same data as for preceding, Tenche; OCT-03-1997; Jama; MEFLG NC 34839, 34849 • 1 Female; same data as for preceding; Escencia; OCT-10-1997; MEFLG NC 34845 • 1 Female; same data as for preceding; Normandía; Jama; OCT-30-1997; MEFLG NC 34837 • 1 Female; same data as for preceding; pescado; SEP-18-1997; MEFLG NC 34854 • 2 Females; same data as for preceding; Fosforito; SEP-24-1997; MEFLG NC 34842, 34843 • 1 Female; same data as for preceding; La Calandria; OCT-31-1997; MEFLG NC 34852 • 2 Males; Colombia, Antioquia, Ciudad Bolívar; 5°48'52" N, 76°1'38" W; 1474 m a.s.l.; SEP-26-2009; Eucalipto; R.I Vélez *leg*; 10:00-12:00 hrs; *Eulaema tropica*, Allan Smith-Pardo, OCT-06-2009; MEFLG NC 35891, 35892 • 1 Female; Colombia, Santander, Cimitarra, Vda Primavera, Km4, Hda el Bosque; [6°18' N, 73°57' W]; [150 m a.s.l.]; OCT-09-2001; VSR pescado; Castaño and Vélez [*leg*]; CEUA 18367 • 3 Females; Colombia, Risaralda, La Florida, Santuario de Flora y Fauna Otún Quimbaya; [4°44' N, 75°34' W]; [1900 m a.s.l.]; MAY- 05-2002; VSR Pescado; CO24; CEUA 116195-116197 • 1 Male; Colombia, Antioquia, Andes, Los Farallones; [5°39' N, 75°52' W]; 1800 m a.s.l.; OCT-18-2014; Jama; J. Castro, *leg*; MEFLG NC 34879.

Ramírez, et al. (2002) proposed a possible distribution of *Ef. concava* (**Figures 5A-B**) in the Colombian Pacific and Amazon regions at a maximum altitudinal distribution of 1100 m.a.s.l., whereas **Parra & Nates-Parra** (2012) proposed distribution of this species in the departments of Amazonas, Chocó, Nariño, and Putumayo. The only report of this species for the country is by **Smith-Pardo** (1999) in his Master's degree thesis, which was unknown to the previous authors. The report was for Yolombó, Antioquia, at the altitudinal range mentioned by **Ramírez, et al.** (2002).

Eufriesea dressleri* (Kimsey, 1977)Euplusia dressleri* Kimsey, 1977

Material examined. 1 Female; Colombia, Antioquia, Porce, Santa Lucía P; [6°48' N, 75°08' S]; [860 m a.s.l.]; AGO-12-1997; Jama; Allan Smith-Pardo. [*leg*]; *Eufriesea* aff. *elegans*, Allan Smith-Pardo [Det]; 10-12 hrs; MEFLG NC 34856 • 1 Female; Colombia, Antioquia, Puerto Nare, Vda Caño Seco, Hda La Brasilia; [6°12' N, 74°37' W]; 380 m a.s.l.; OCT-09-2004; T. van Sommer; Castaño & Vélez [*legs*]; *Eufriesea pulchra*, Liliana Elorza [Det], SEP-30-2001; CEUA 16163. 1 Male; Colombia, Antioquia, Turbo; [8°5' N, 76°43' W]; [5 m a.s.l.]; ABR-1949; Francisco Luis Gallego, [*leg*]; *Euplusia* sp.; MEFLG NC 35923.

This species was reported in Colombia for the Orinoquía region by **Ramírez, et al.** (2002); **Parra & Nates-Parra** (2012) reported it for the departments of Meta (Orinoquía region) and Valle del Cauca (Pacific region).

Eufriesea magretti* (Friese, 1899)Euglossa (Eumorpha) magretti* Friese, 1899*Euglossa (Eumorpha) andina* Friese, 1925 (Synonymy by Kimsey (1982))

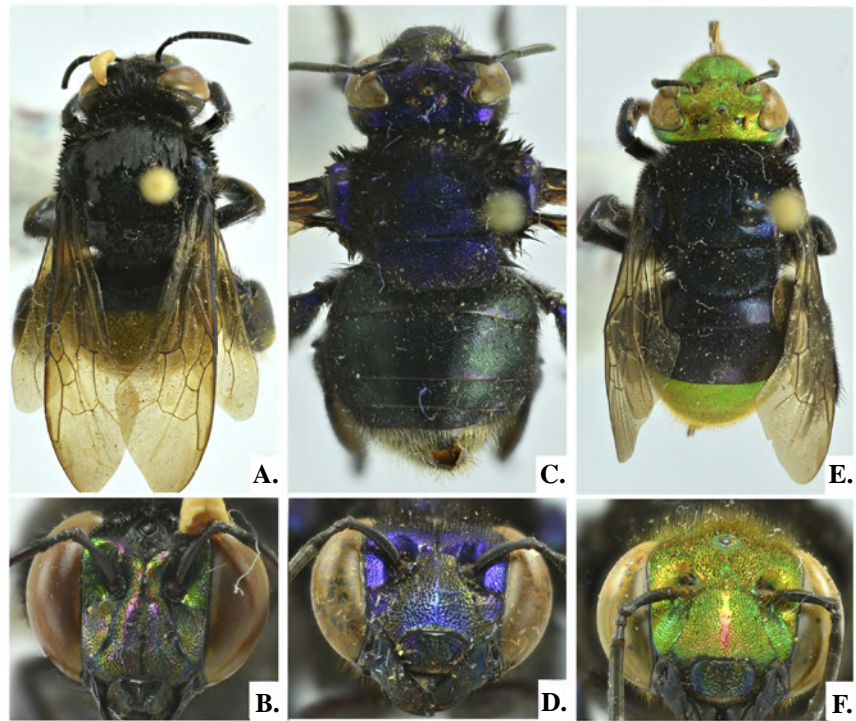


Figure 5. Dorsal and frontal habitus of *Eufriesea* spp. **A, B.** *Ef. concava* (male). **C, D.** *Ef. magretti* (female). **E, F.** *Ef. pulchra* (female)

Material Examined. 2 females; Colombia, Antioquia, Vereda el Carbono; 6°20' 38,8" N, 76°07' S; 1879 m a.s.l; AGO-12-2007; Jama; A.L. Montoya G [leg]; CEUA 116199,116200. • 1 Female; Colombia, Santander, Carmen del Chucurí, Vereda Alto Cascajales; [6°41'53.84"N, 73°30'40.18" W]; 1200 m a.s.l; OCT-19-2000; VSR, Pescado; Duque y A. Vélez [leg]; CEUA 45053.

This species (**Figure 5C-D**) was reported for Colombia by **Kimsey** (1982) in the department of Magdalena. **Ramírez, et al.** (2002) indicated the presence of this species in the Atlantic and Orinoco regions while **Parra & Nates-Parra** (2012) confirmed **Kimsey's** record (1982) for the department of Magdalena and recorded it for the first time for Norte de Santander.

***Eufriesea pulchra* (Smith, 1854)**

Euglossa pulchra Smith, 1854

Material examined. 1 Male; Colombia, Antioquia, San Luis; [6°02' N, 74°59' S]; [1080 m a.s.l]; DIC-1982; Eugenol; A. Molina P. [leg]; *Eufriesea* sp.; MEFLG NC 34870 • 1 Male; Colombia, Antioquia, río Cocorná; AGO-1982; Salicilato de metilo; *Eufriesea pulchra*, A. Molina P. [Det]; MEFLG NC 34869 • 1 Female; same data as for preceding, Porce; [6°48' N, 75°08' S]; [860 m a.s.l]; AGO-26-1997; pescado; Allan Smith-Pardo, leg; *Eufriesea purpurata*, Allan Smith-Pardo, Det; MEFLG NC 34866 • 1 Male; Colombia, Chocó, Nuquí, Finca Pjivá; [5°42' N, 77°16' S]; [0 m a.s.l]; JUL-09-2005; Manual; P. Duque [leg]; *Eufriesea fasciata*, Smith and González, 2006, [Det]; MEPB 9279 • 2 Males; Colombia, Antioquia, Sonsón, R.N Cañon del Río Claro; 350 m a.s.l; NOV-06-2007; Salicilato de metilo; A. Vélez [leg]; *Eufriesea sp.*, J. Jaramillo Silva [Det]; MEPB 11624 - 11625 • 1 Male; same data as for preceding; San Luis, Cañon del Río Claro; 5°53'6,87" N, 74°5'4,88" W; [890 m a.s.l]; NOV-06-2007; Salicilato de metilo; A. Vélez, N. Uribe And A. Vahos [legs]; CEUA 109357 • 1 Male; same data as for preceding; Anorí, El Roble, El Arrierito Antioqueño; 1600-1700 m a.s.l; 6°59'5,3" N, 75°6'42,0" W; MAY-25/27-2012; VSR pescado; En Bosque; CEUA

63731 • 1 Male; same data as for preceding; Jama; En Bosque; CEUA 63733 • 1 Female; Colombia, Antioquia, Puerto Nare, Vda La Mina; [6°12' N, 74°37' W]; 220 m a.s.l.; SEP-2001; VSR; Castaño And Vélez [*legs*]; CEUA 116193 • 1 Female; Colombia, Risaralda, La Florida, Santuario de Flora y Fauna Otún Quimbaya; [4°44' N, 75°34' W]; [1900 m a.s.l.]; MAY-07-2002; VSR Pescado; CO24 Cód; CEUA 116194.

Kimsey (1982), **Fernández** (1995), and **Ramírez, et al.** (2002) had pointed at the distribution of this species for the Amazon region, the latter adding the Orinoco region. **Parra & Nates-Parra** (2012) reported this species (**Figure 5E-F**) in the departments of Amazonas, Boyacá, Chocó, Guainía, Meta, Nariño, Valle del Cauca, and Vaupés.

Most of the records of *Ef. pulchra* are below 1000 m.a.s.l., only one specimen deposited in the Snow Entomological Collection from Tarata, Bolivia, collected in 1900, has a label with an altitude near 2800 m.a.s.l (**Bentley, A. & Thomas, J., 2021**). The location registered here for the facilities of the Otún Quimbaya Flora and Fauna Sanctuary has an altitude of 1900 m.a.s.l. However, it should be noted that the label did not have coordinates, so the height inferred for this place corresponds to the Sanctuary's hotel facilities, but within a 5 km radius from them, there are altitudes over 3100 m.a.s.l. Considering that species of this genus can travel up to 25 km in search of food and provisions for the nest (**Janzen, 1971**), this could be the greatest altitudinal record known for this species. For the time being, it is the highest altitude record of this species in Colombia.

In the present study, we report *Ef. concava* for the first time for the departments of Santander and Risaralda (**Figure 6A**) extending its distribution 230 km to the south and nearly 100 km to the east of the country. It also extends its altitudinal distribution to 1900

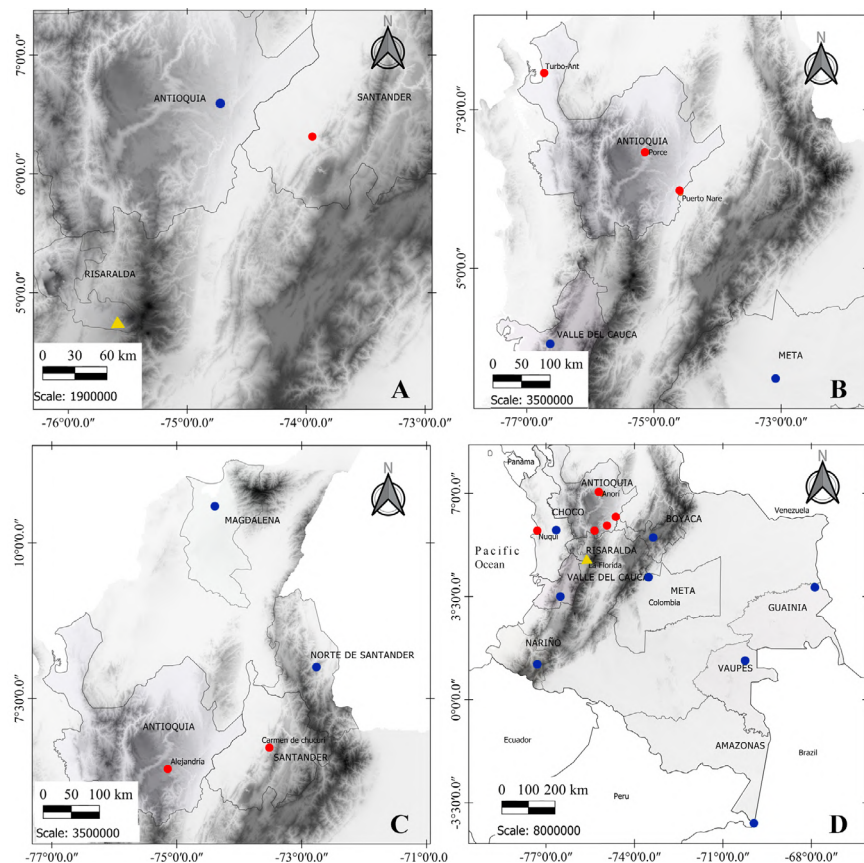


Figure 6. Distribution of species of *Eufriesea* in Colombia. Blue dots indicate literature reports, red dots are new records, yellow triangles represent new altitudinal distribution for the country. **A.** *Ef. concava*. **B.** *Ef. dressleri*. **C.** *Ef. magretti*. **D.** *Ef. pulchra*

m a.s.l. Also, the three new records of *Ef. dressleri* herein correspond to the department of Antioquia (**Figure 6B**). These records extend *Ef. dressleri* range of distribution 525 km north of Colombia and constitute the first ones for the Andean region.

Here we report *Ef. magretti* for the first time for the departments of Santander and Antioquia extending its range of distribution 320 km southwest of Colombia (**Figure 6C**). Besides, these new records increase its altitudinal distribution to 1879 m.a.s.l. Previously, **Ramírez, et al.** (2002) had registered an altitudinal distribution for the species of 110-1600 m.a.s.l. As well as we report *Ef. pulchra* for the first time for the departments of Risaralda and Antioquia (**Figure 6D**) and extend its distribution 70 km west to the Pacific coast and 140 Km to the north of the country.

Discussion

Nearly 50% of the holotypes of *Eufriesea* are females. For 90% of these species, the association and description of males has been possible (**Nemésio, 2005; Nemésio, 2011; Le Goff, 2012**) thanks to the use of chemical compounds as attractants. On the other hand, only 65% of the species with a male as holotype has a description of females, which makes it difficult to identify *Eufriesea* spp. females overall and explains why many female specimens of this genus deposited in collections have no identification at species level.

Furthermore, the high seasonality of the species in this genus, as well as their sensitivity to changes in their ecosystem (**Kimsey, 1982**) and their scarce representation in collections (**Nemésio, 2011**) make it really difficult to be certain of accurate distribution ranges allowing for their exact location in the Neotropics.

We believe that more rigorous studies and revisions of the specimens deposited in collections worldwide, as well as further descriptions of undescribed females to allow successful associations between males and females of the same species are a fundamental tool to increase the knowledge of the diversity of this genus and that of the country's fauna by means of the construction of accurate distribution maps of the different species by using males and/or females for their plotting.

Author contributions

CALC examined and identified the material and provided the photographs. AHSP assisted in the identification and taxonomic confirmation of specimens. SIUS helped to interpret results, reviewed, and corrected the document. All authors contributed to the writing of the manuscript.

Conflicts of interests

None of the authors have any conflicts of interests to disclose.

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