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## Acanthocera buestani a new species of rare wasp-like horsefly, with notes on the subgenus *Querbetia* from Ecuador

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### ABSTRACT

Horse flies from the Neotropical region include many endemic and rarely collected groups. In this study, we describe a new species of a poorly known genus, *Acanthocera* (*Querbetia*) *buestani*, from Napo, Ecuador. The *Querbetia* subgenus is underrepresented in entomological collections by scarce historical specimens, still this group is one of the most easily recognizable and peculiar Tabanidae thanks to its inflated antennomere. This new species can be distinguished by its proboscis and palpi, longer than the other species of the subgenus *Querbetia* and body coloration pattern. We included an illustrative key to identify this subgenus and its species. Additionally, we report for the first time *A. inopinata* from Ecuador.

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Diptera; taxonomy;  
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### Introduction

The species of the family Tabanidae Latreille, commonly known as horse flies, includes more than 4400 species described, distributed in three subfamilies and 137 genera worldwide [1]. Currently, in the Neotropical region, more than 1200 species are known, included in 71 genera [1,2]. Besides their impressive diversity, horseflies are also of importance to human and veterinary health, as most species are blood-sucking, so they can be vectors of diseases [3].

Tabanids from the Neotropical region include various endemic or rare species poorly known [2]. In Ecuador, about 200 species are registered, belonging to 33 genera, which represent only a fraction of its expected diversity as many groups remain unknown [4,5]. This is the case of *Acanthocera* Macquart, a genus thought to be exclusively distributed to Central and Southern America [6]. This group is characterized by their wasp-like semblance and by having a very distinctive antenna where its first antennal segment is at least 1.5 times the length of the second, and third is always longer than the first and second together [7]. This group is underrepresented in entomological collections, partially because they live in upper strata of tropical forests [6]. These wasp-like tabanids include four subgenera: *Acanthocera* sensu stricto with 11 species, *Mimodynerus* with five species, *Polistimina* with two species and *Querbetia* with two species [1].

The genus *Querbetia* was originally described in 1963 by Fairchild [8] from a single species, *Q. bequaerti*, based on a specimen from Peru with a particular shape of subcallus and the first antennal segment that are unique characteristics within the

family. Posteriorly, Fairchild [9] in 1972 described the species *Q. inopinata* based on a female specimen deposited in the National Canadian Collection in Ottawa, collected from Madre de Dios, Peru. In 1994, Fairchild & Burger [10] reclassified *Querbetia* as a subgenus of *Acanthocera* Macquart, on which various authors agreed with [1,7]. In this reclassification, the species *Q. bequaerti* was renamed to *Acanthocera chainei*, because in the genus *Acanthocera* the specific epithet *bequaerti* already existed previously [10].

Until today, the only register for this subgenus from Ecuador has been published by Cárdenas & Vieira [11] from Río Umbuni at the Napo province, based on a single specimen collected in 1996, belonging to the Jaime Buestan collection (CJB). In this work, we revised the specimens available for *Acanthocera* (*Querbetia*). Here, we register for the first time *Acanthocera* (*Querbetia*) *inopinata* Fairchild in Ecuador, and we describe a third species from this subgenus: *Acanthocera* (*Querbetia*) *buestani* sp. nov. from Puerto Misahualli, Napo, Ecuador.

### Methods

Specimens used in this study belong to a standardized insect collection with modified Malaise traps Townes type (5 m. long, 2.5 m. high) conducted along 12 months, this trap is widely used for the collection of Diptera, showing great effectiveness [12]. Samples were carried out from March 2013 to March 2014 in Puerto Misahualli, Napo, Ecuador (01°02'37"S, 77°40'57"W). The sampled ecosystem corresponds to a patch of secondary amazon rainforest with

approximately 10 years of regeneration. The traps have been revised and collected every 10 days, and posteriorly specimens belonging to Tabanidae were sorted. From more than 2000 horseflies collected, only three specimens have been identified as *Acanthocera*.

Specimens from this sampling have been added to the entomological collection of Instituto Nacional de Biodiversidad [MECN]. These specimens have been identified to genus and subgenus level using dichotomous keys [13] and to species level using their original descriptions [8,9].

The descriptions of morphological characters follow the terminology of McAlpine [14] adapted to the genus *Acanthocera* by Henriques & Rafael [6]. Using a stereomicroscope Olympus SZ61R, morphological measures and photographic records were made, adapted with a digital camera (The Imaging Source DFK23UX236) using the IC Measure v. 2.0.0.161 software. The following measurements have been taken: Total Body Length, Wing Length, Frons Length, Head Height, and Maximum Proboscis Length. All measures were performed three times with IC Measure, the means of these measures are presented here and are given in millimeters (mm). Final images were then focus stacked in Helicon Focus and edited in Adobe Photoshop CS5.

## Results

### Taxonomy

#### Genus *Acanthocera* Macquart Subgenus *Querbetia* Fairchild

**Diagnosis (modified from Fairchild [8]).** Eyes bare, with green or red bands in life. Frons broad, frons as wide as basal callus. Callus covering basal half of frons. Vertex with vestigial ocelli. Proboscis with theca and labella extensively sclerotized and shiny. Subcallus with middle groove that divides it into two semi-spherical halves. Antennae with first segment greatly inflated, bare and shiny, second segment short, with a standard dorsal spine pointing forward, typical of most genera of the Diachlorini tribe. Third segment almost twice as long as the first and second segments together. Wings with basicosta lacking strong setae. Abdomen with second segment narrowed, giving a wasp-waisted appearance. Legs without hind tibial spurs or hind tibial fringes.

Key to species of *Acanthocera* (*Querbetia*) based on females

1. Scape semi-spherical and shiny, subcallus greatly inflated..... subgenus *Querbetia*, 2  
- Scape and subcallus slender, not inflated .....
- ..... Other subgenera of *Acanthocera*
2. First abdominal segment with a constriction on

- posterior half; wings yellowish on anterior half, hyaline posteriorly ..... 3  
- First abdominal segment without constriction: wings smoky black (Figure 2) .....  
..... *chaineyi* Fairchild & Burger  
3. Proboscis distinctly shorter than height of head; frons, vertex and palpi brown; palpi relatively short, less than 2/3 of the height of head (Figure 3) ..... *inopinata* (Fairchild)  
- Proboscis as long as height of head; frons, vertex and palpi black; palpi long, at least 2/3 of the height of head (Figure 4) ..... *buestani* sp. nov.

### Species of *Acanthocera* (*Querbetia*) in Ecuador

#### *Acanthocera* (*Querbetia*) *chaineyi* Fairchild & Burger

##### Diagnosis

Frons black. Frontal callus black. Frontoclypeus with patches of yellowish pruinosity. Palpi black. First antennal segment shiny black, with some scarce setae ventrally and on basal half, also present on interior base and sutures of scape. Proboscis shorter than height of head. Palpi slender. Anterior portion of wing opaque, smoky, yellowish posteriorly. Abdomen reddish with golden pruinosity mostly on distal half of each tergite. Second segment slightly thinner than the others (Figure 2).

##### Localities

Ecuador, Napo, Río Umbuni (1°01'55"S 77°43'54"W), 400 m. 1 ♀ [11], (CJB); Napo, Puerto Misahuallí, Bosque Venecia (01°02'37"S, 77°40'57"W). 400 m. 1 ♀ (MECN) (Figure 1).

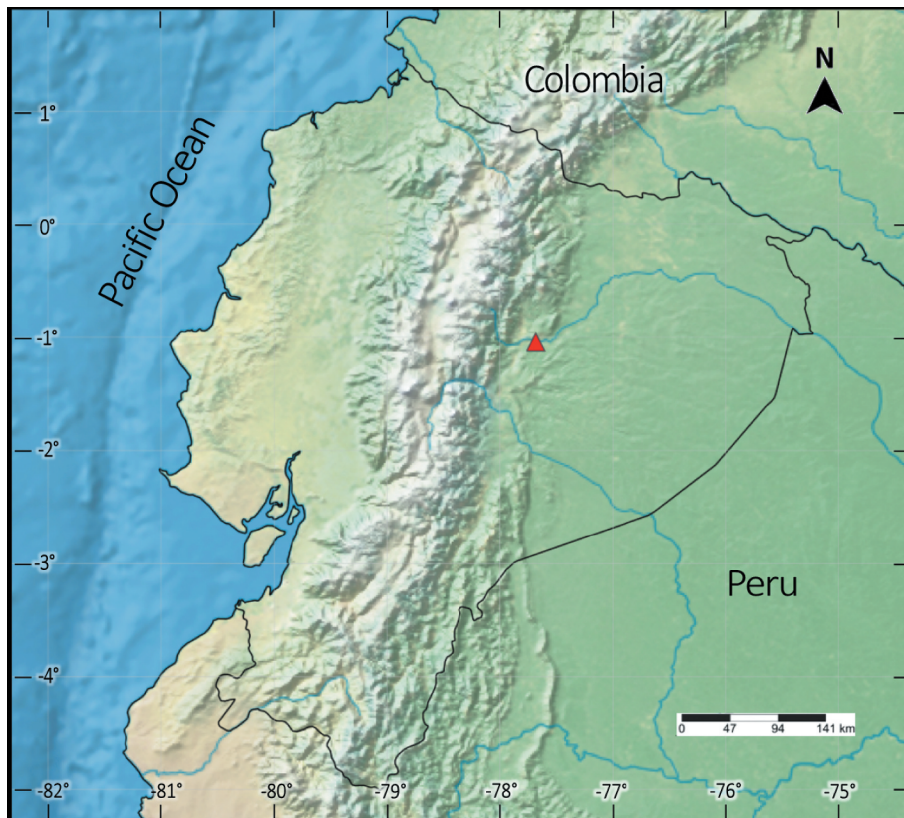
##### Commentaries

The male of this species remains unknown. This species had been registered only twice, besides the type specimen one from Río Umbuni, and the second one in Puerto Misahuallí, both in the Napo Province in Ecuador. All the specimens collected so far are restricted to the Amazon forests of Peru and Ecuador.

#### *Acanthocera* (*Querbetia*) *inopinata* (Fairchild)

##### Diagnosis

Frons light brown-yellowish. Frontal callus brown. Frontoclypeus with golden pruinosity patches and bare areas yellowish. Palpi yellowish. First antennal segment dark brown, anterior base and sutures of scape yellowish, basal plate light brown-yellowish.



**Figure 1.** Map of Ecuador showing the type locality of *Acanthocera (Querbetia) buestani* sp. nov. and locality of first record of *Acanthocera (Querbetia) inopinata* (Fairchild) in Ecuador (red triangle).

Proboscis shorter than height of head. Palpi relatively short and stout. Anterior portion of wings yellow, hyaline posteriorly. Abdomen brown with grey pruinosity uniformly distributed, first tergite posteriorly incised by a median sulcus (Figure 3).

#### Localities

Ecuador, Napo, Puerto Misahuallí, Bosque Venecia (01° 02'37"S, 77°40'57"W). 400 m. 1 ♀ (MECN).

#### Commentaries

The male of this species remains unknown. Species previously known from Avispas, Madre de Dios, Peru [9] (CNC), later registered from Villa Tunari, Cochabamba, Bolivia in 1983 [15] (FSCA). This is the first report of this species from Ecuador.

#### *Acanthocera (Querbetia) buestani* Pazmiño-Palomino, Andreocci & Inclán sp. nov.

LSID: urn:lsid:zoobank.org:act:BBECFF06-B425-4A4C-804D-F3D90554A792

#### Material examined

One female, "Ecuador. Napo. Tena./Pto Misahuallí. BP Venecia. -1.0436, -77.6825./400 m. Malaise. 18-aug -/2013. J. Buestán", "*Acanthocera*/sp. nov./det. J. Buestán", "MECN-EN-DIP/4875" (MECN).

#### Diagnosis

Frons black. Frontal callus black. Frontoclypeus with a patch of yellowish pruinosity. Palpi black. First antennal segment shiny black, with some scarce setae ventrally and on basal half, also present on interior base and sutures of scape. Anterior portion of wings yellow, hyaline posteriorly. Proboscis longer than height of head. Palpi long, at least 2/3 of the height of head. Abdomen black with yellow-greenish pruinosity on posterior margin of tergites, first tergite posteriorly incised by a median sulcus.

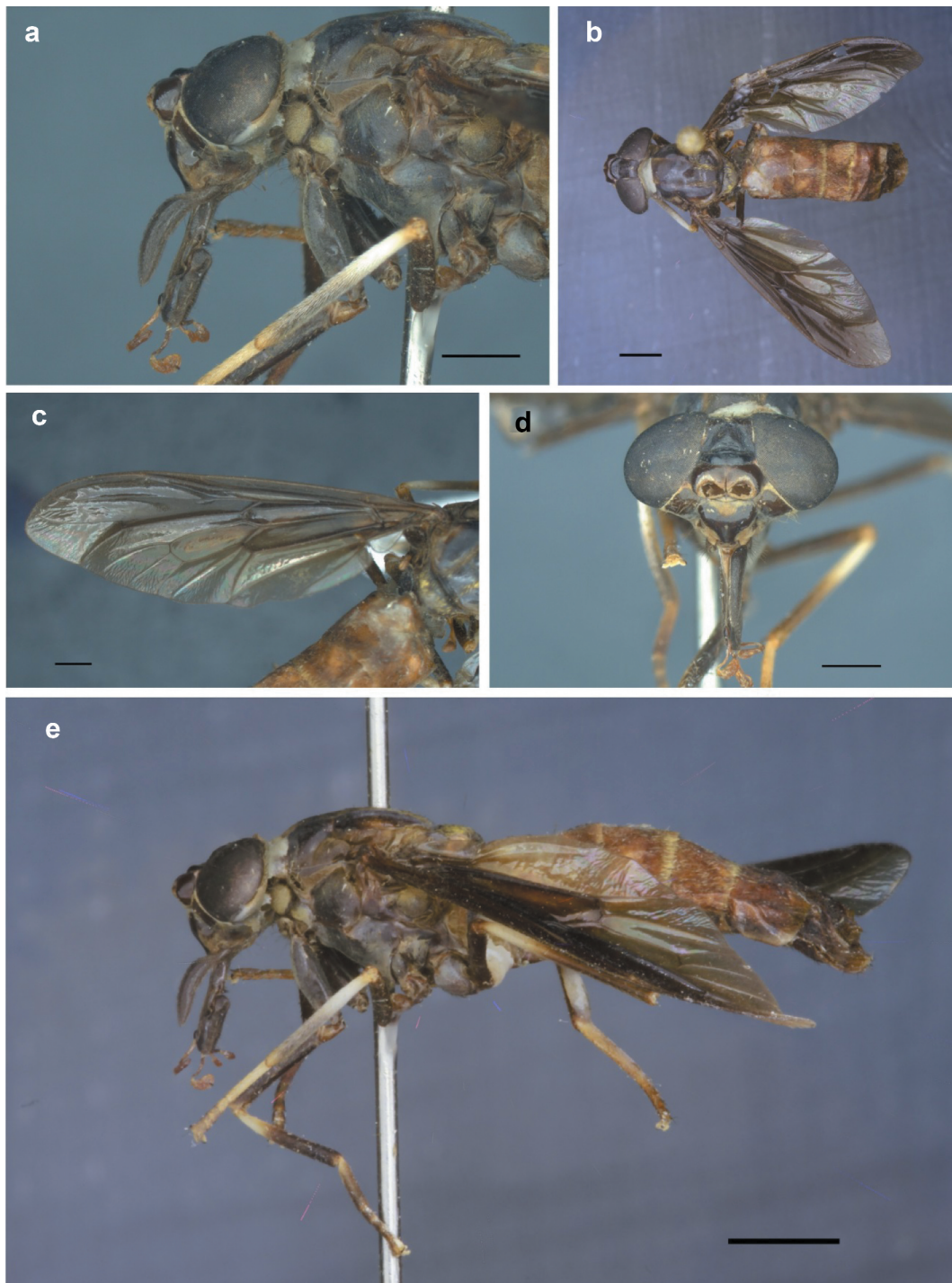
#### Measurements

Total Body Length: 12.48 mm; Wing Length: 12.41 mm; Frons Length: 0.38 mm; Head Height 2.19 mm; Maximum Proboscis Length 2.15 mm.

#### Head

Eye bare, with green-reddish band on lower half when alive; frons almost twice as long as wide on upper part (vertex). Callus black. Two triangle-shaped areas with yellow pruinosity between frons and callus. Three vestigial ocelli visible on lower vertex. Subcallus shiny black with yellow pruinosity in lower margins, greatly inflated and divided medially in two spherical halves. Frontoclypeus and gena light brown, smooth and shiny divided by a patch of golden pruinosity. First antennal segment greatly inflated,



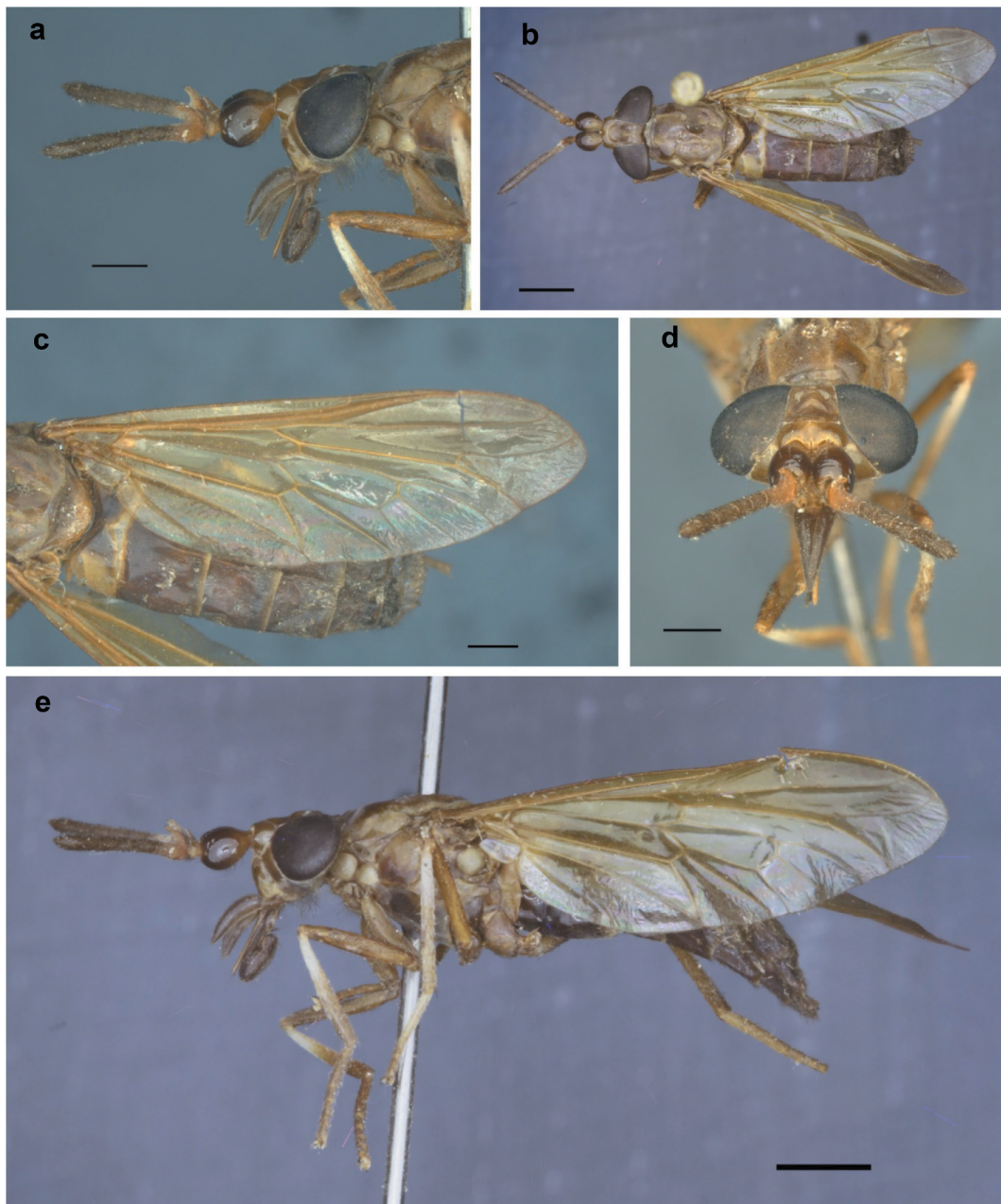


**Figure 2.** *Acanthocera (Querbetia) chaineyi* Fairchild & Burger. A - Head in lateral view; B - Full body in dorsal view; C - Left wing; D - Head in frontal view; E - Full body in lateral view (A - C - D scale bars = 1 mm; B - E scale bars = 2 mm).

shiny black with scarce black hairs on basal and ventral portion. Second segment shiny black with strong dorsal spur and many black hairs. Third antennal segment as long as frons and first two segments combined. First flagellomere (basal plate) brown with stout dorsal spur, the style dark brown with fine black hairs. Palpi 2/3 to 3/4 of the total height of head, black with fine black hairs on dorsal surface and longer yellowish hairs on ventral surface. Proboscis black, theca and base of labella sclerotized and shiny (Figure 4(a,d)).

### **Thorax**

Mesonotum blackish, subshiny with grey pruinosity. Two yellowish dorsolateral stripes with scarce black hairs. Notopleural lobes yellowish externally with golden pruinosity. Pleura blackish with golden pruinosity, denser towards the abdomen. Scutellum black, brown at the apex, with many golden hairs and golden pruinosity. Coxa and femur black, trochanter and base of femur brownish. Femur covered in small black hairs. Anterior tibia white with white hairs at base, distal tibia and



**Figure 3.** *Acanthocera (Querbetia) inopinata* (Fairchild). a – Head in lateral view; b – Full body in dorsal view; c – Left wing; d – Head in frontal view; e – Full body in lateral view (a – c – d scale bars = 1 mm; b – e scale bars = 2 mm).

tarsi brown. Median tibia and tarsi white, slightly darker distally. Posterior tibia as anterior one (Figure 4(e)). Wing yellow, clearer posteriorly (Figure 4(c)).

#### Abdomen

Abdomen slender, black and subshiny. First segment with a deep posterior median sulcus, laterally with many fine yellow hairs. Second, third and fourth abdominal segments with small black hairs and a band of golden pruinosity on posterior margin. Fifth to seventh segments with many black hairs. Abdomen ventrally black and subshiny, all

sternites covered by short and thin yellowish hairs. Sternites 2–4 with posterior golden pruinosity band, sternites 5–7 with black hairs laterally (Figure 4(e)).

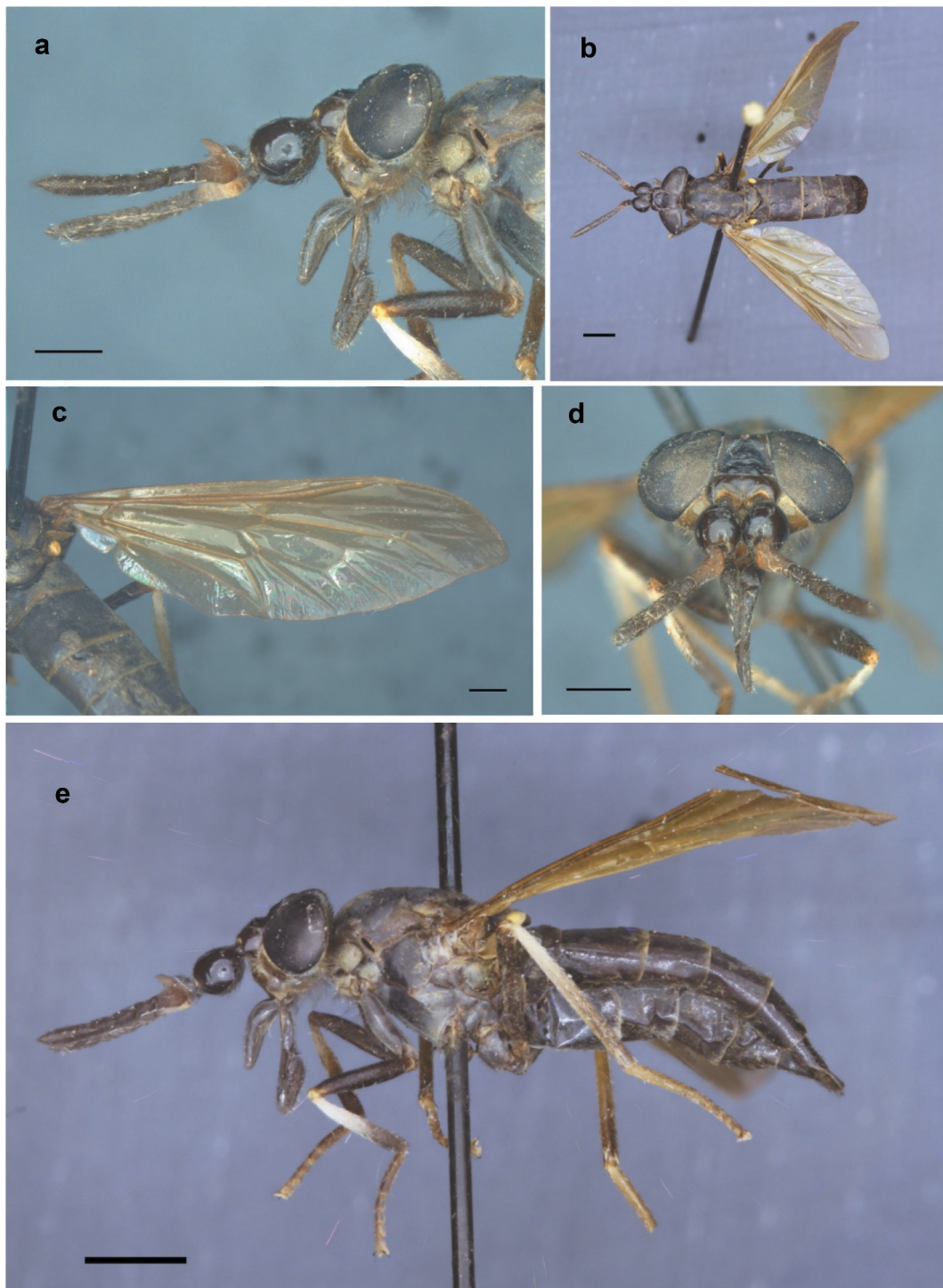
#### Male

Unknown.

#### Etymology

The specific epithet *buestani* is derived from Jaime Buestan, collector and identifier of holotype. Entomologist who devoted his professional life to the knowledge of Tabanidae from Ecuador. It must be treated as a Latin adjective.





**Figure 4.** *Acanthocera (Querbetia) buestani* sp. nov. a – Head in lateral view; b – Full body in dorsal view; c – Left wing; d – Head in frontal view; e – Full body in lateral view (a – c – d scale bars = 1 mm; b – e scale bars = 2 mm).

### Discussion

The *Querbetia* group remains poorly known for its scarce specimens in entomological collections, still they are one of the most easily recognizable and peculiar Tabanidae thanks to their inflated antenno-mere [1,12].

This new species *Acanthocera (Querbetia) buestani* shares common characters with both the other species

of the subgenus, the yellow wings and median sulcus in first abdominal tergite of *A. inopinata*, and the head and legs coloration of *A. chaineyi*, but can be distinguished for its general black colour, in contrast to the yellow of *A. inopinata* and the red abdomen of *A. chaineyi*, and its proboscis, the longest in this subgenus (relatively to the height of head).

The first record from Ecuador for *A. inopinata*, after being registered from Peru and Bolivia,

suggests that this group has a distribution related to the Amazonian biome, a world hotspot even for horse flies' diversity [4,7].

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### Disclosure statement

No potential conflict of interest was reported by the author(s).

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