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## Notes on *Citrogramma* Vockeroth and *Eosphaerophoria* Frey (Diptera: Syrphidae)

XIMO MENGUAL

Zoologisches Forschungsmuseum Alexander Koenig, Leibniz Institut für Biodiversität der Tiere, Adenauerallee 160 D-53113 Bonn, Germany. E-mail: x.mengual@zfmk.de

### Abstract

New taxonomic and distributional data on the genera *Citrogramma* Vockeroth, 1969 and *Eosphaerophoria* Frey, 1946 are presented, including descriptions of the females of *Citrogramma asombrosum* Mengual, 2012, *Citrogramma pennardsi* Mengual, 2012 and *Eosphaerophoria dentiscutellata* (Keiser, 1958). Modifications to published identification keys to accommodate the new information are provided for both genera.

**Key words:** Females, distribution, description, identification key, flower flies

### Introduction

*Eosphaerophoria* Frey, 1946 and *Citrogramma* Vockeroth, 1969 are two flower fly genera (Diptera: Syrphidae) relatively uncommon in entomological collections and poorly recorded. These genera are distributed in the Oriental, Australian and Oceanian Zoogeographic Regions (*sensu* Holt *et al.* 2013). Very little is known about their biology, and only the puparium of *Citrogramma notiale* Vockeroth, 1969 has been described (Mengual 2012).

Mengual & Ghorpadé (2010) review the genus *Eosphaerophoria* and describe eight new species. In their work, they point out the very low number of known specimens of this genus and the need of further field work to understand its diversity better. More recently, Mengual (2012) introduces 17 new species of *Citrogramma* when revising the genus.

In the present paper, new taxonomic and distributional data is presented, resulting from visits to European and North American collections. In addition, females of *Citrogramma asombrosum* Mengual, 2012, *Citrogramma pennardsi* Mengual, 2012 and *Eosphaerophoria dentiscutellata* (Keiser, 1958) are described.

### Material and methods

The main results of the study are grouped by taxon in alphabetic order. In the material examined, the collections where the specimens are deposited are indicated between square brackets after each specimen. Type localities and holotype-holding institutions are specified for each species. Terminology follows Thompson (1999) and Mengual (2012). Identification and location labels are indicated with quotation marks (‘ ’), and each line on the label is separated by a forward slash (/). Handwritten information on labels is indicated in italics.

Illustrations of male and female abdomens were composed using Auto-Montage Pro 5.03 software based on images of pinned specimens taken with a QImaging MicroPublisher 5.0 RTV camera mounted on a Leica Z6 APO. All measurements are in millimetres and were taken using a graticule in a Leica M165C microscope. Body length was measured from the anterior oral margin to the posterior margin of the abdomen in lateral view. Wing length was measured from the wing tip to the basicosta.

The Evenhuis (2009) standard acronyms were used for the following entomological collections: CSCA: California State Collection of Arthropods, Sacramento, USA; INHS: Illinois Natural History Survey, Champaign,

USA; ITLJ: National Institute of Agro-environmental Sciences, Tsukuba, Japan [also known as NIAS]; IRSNB: Institut Royal des Sciences Naturelles de Belgique, Brussels, Belgium; MNHN: Muséum National d'Histoire Naturelle, Paris, France; MZH: Finnish Museum of Natural History, Helsinki, Finland; NHMB: Naturhistorisches Museum, Basel, Switzerland; RMNH: Naturalis Biodiversity Center (formerly Rijksmuseum van Natuurlijke Historie), Leiden, The Netherlands; ZFMK: Zoologisches Forschungsmuseum Alexander Koenig, Bonn, Germany.

## Results

### *Citrogramma asombrosum* Mengual, 2012

Figures 1–3, 8.

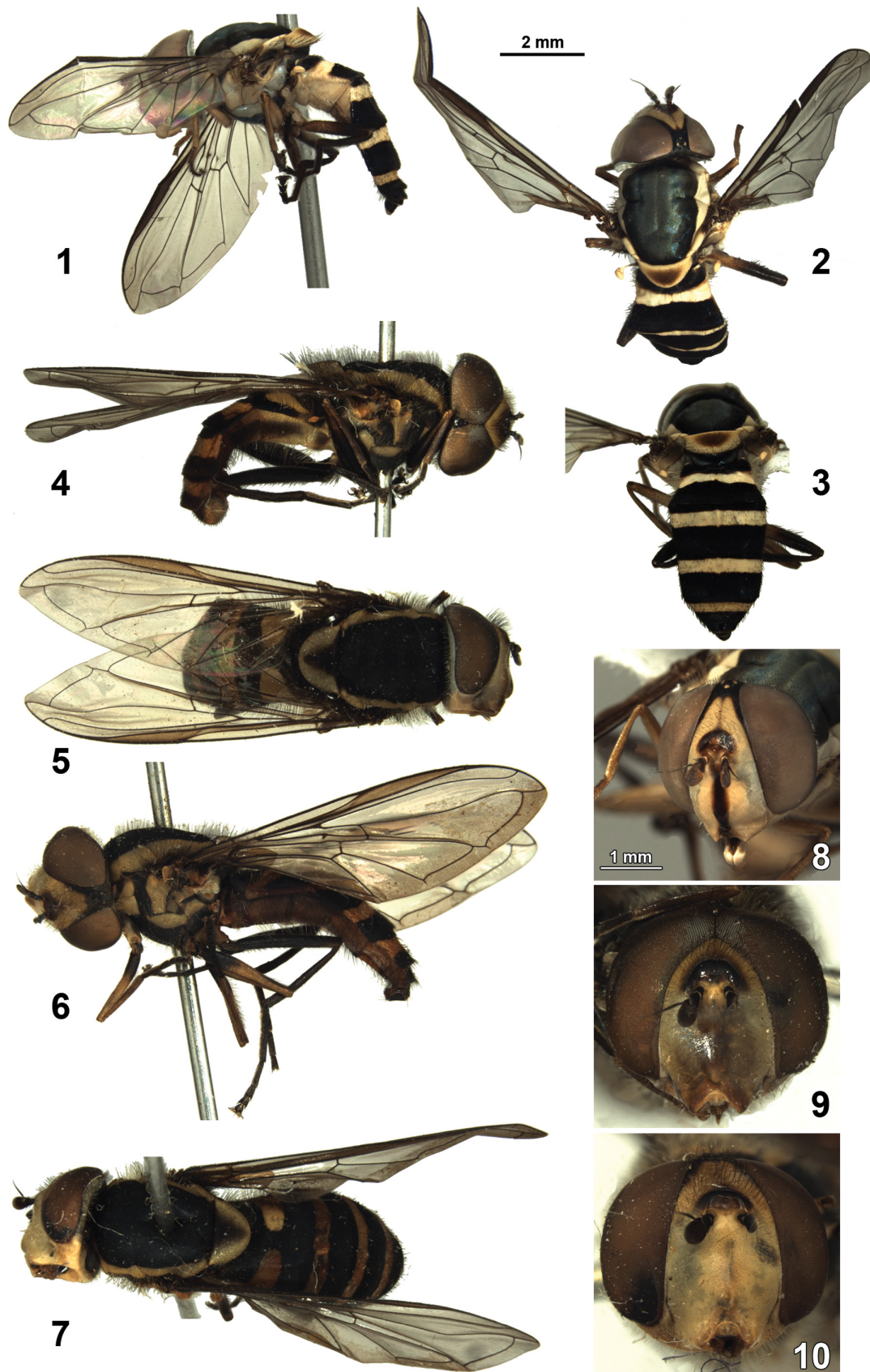
*Citrogramma asombrosum* Mengual, 2012. Zool. J. Linn. Soc. London, 164: 128, descr., figs, key. Holotype: m, New Caledonia: South Province, Nouméa, Mount Koghi [INHS, Champaign] by original designation.

**Differential diagnosis** (based on Mengual 2012). Species only known from New Caledonia, with black facial vitta, triangular black area on frons, costal cell microtrichose, and scutellum with a medial dark macula not reaching anterior margin. *Citrogramma asombrosum* is similar to *C. bicornutum* Vockeroth, 1969, but *C. asombrosum* has cell bm bare on anterobasal section, cell cup is entirely microtrichose and yellow abdominal fasciae are broader than in *C. bicornutum*.

Mengual (2012) described *C. asombrosum* based on a single male from New Caledonia. After the study of the CSCA material, two female specimens of this species from New Caledonia were found. The description of the female of *C. asombrosum* is given below.

**Material examined.** 2 females, NEW CALEDONIA: South Province: Mt. Ningua, 1100 m, 21.746° S 165.156° E, 12–21.xii.2000, ex: Malaise trap, L. J. Boutin [1 female, CSCA; 1 female, ZFMK].

**Description of female.** *Head.* (Fig. 8) Face with facial tubercle, gradually sloping dorsally, more abrupt ventrally, yellow with medial black vitta, from oral apex to antennal base, narrower than yellow lateral areas of face, yellow pilose; gena yellow, yellow pilose; dichoptic; lunule brown; frons yellow with anteromedial black triangular area pointed posteriorly, black pilose; vertical triangle black, black pilose; ocelli yellowish; antenna dark brown, black pilose on scape and pedicel; basoflagellomere orange, dark dorsally; arista brown, with short pili basally, shorter than the arista width; occiput black, silver pollinose on ventral 2/3, golden pollinose on dorsal 1/3, white pilose on ventral 2/3, black pilose on dorsal 1/3. *Thorax.* (Figs 1, 2) Scutum black with dorsomedial area uniformly grey pollinose with bluish metallic iridescence, lateral yellow vitta and sublateral matte black vitta, black and yellow pilose, but notopleuron yellow pilose with some black bristle-like hairs posteriorly; postpronotum yellow; notopleuron yellow continuing until scutellum, with postalar callus entirely yellow and black pilose; scutellum yellow with dorsomedial broad diffuse dark macula not reaching anterior margin, creating narrow yellow margin all around, black pilose. Pleuron mostly black, except anterior anepisternum yellow; proepisternum yellow; posterior anepisternum yellow on posterior 2/3; anepimeron yellow, dark posterodorsally; katepisternum with large dorsal yellow macula; katepimeron and metaepisternum yellow; katatergum yellow, black posteriorly. Pleuron entirely yellow pilose, slightly yellow pollinose. Metasternum yellowish. Calypter yellow, darker ventrally, with brownish hairs on margin; plumula yellow; halter yellow; spiracular fringes yellow. *Wing.* Wing membrane hyaline, stigma dark brown, entirely microtrichose except cell bm anterobasally. Alula microtrichose, broad, broader than cell bm. *Legs.* Procoxa yellow, mesocoxa black, metacoxa yellow; pro- and mesofemur yellow, slightly brownish dorsally, mainly black pilose with yellow hairs basally; pro- and mesotibia yellow, black pilose; pro- and mesotarsus brown; metaleg black, black pilose. *Abdomen.* (Fig. 3) Slightly oval in shape (not strictly parallel-sided), abdominal margin inconspicuous. Dorsum mainly black, black pilose dorsally and laterally except 1st tergum yellow pilose laterally and 2nd tergum yellow pilose laterally on anterobasal 1/2; 1st tergum black, black pollinose; 2nd tergum black with two mesolateral triangular rounded-tip yellow maculae, yellow lateral margin on anterior 1/2; 3rd and 4th terga black with broad yellow fascia (1/3 to 2/5 of tergum length) on anterior 1/2 of tergum, with anterior narrow black fascia; 2nd, 3rd and 4th terga black pollinose except posterior 1/3; 5th tergum black with anterior broad yellow fascia, black pollinose on black areas; sterna yellow, black pilose except 1st tergum yellow pilose, 3rd and 4th sterna brownish laterally.



**FIGURES 1–3.** *Citrogramma asombrosum*, female (scale 2 mm). 1. Lateral view; 2. Dorsal view, habitus; 3. Posterior view, abdomen. **FIGURES 4–7.** *Citrogramma pennardsi* (scale 2 mm). 4. Lateral view, male; 5. Dorsal view, male; 6. Lateral view, female; 7. Dorsal view, female. **FIGURES 8–10.** Frontal view, face (scale 1 mm). 8. *Citrogramma asombrosum*, female; 9. *Citrogramma pennardsi*, male; 10. *Citrogramma pennardsi*, female.

**Variation.** One of the two females is lighter, with metafemur yellowish on basal 1/3. This lighter female also has the two yellow maculae on 2nd tergum slightly joined medially.

**Length** (N = 2). Body, 8.3 mm (8.0–8.6); wing, 7.7 mm (7.9–7.5).

**Geographical distribution.** New Caledonia.

**Remarks.** One morphological characteristic is unusual: a bare metasternum. This character state is not common in this genus, and it is only found otherwise in *Citrogramma quadricornutum* Vockeroth, 1969 from Papua New Guinea. The interesting fact is that the holotype male has a pilose metasternum (Mengual 2012), suggesting that the pili of the metasternum of these females were rubbed off in the Malaise trap, or during mounting. Mengual (2012: 132) found a female of *Citrogramma chola* Ghorpadé, 1994 also with a bare metasternum.

### ***Citrogramma clarum* (Hervé-Bazin, 1923)**

*Olbiosyrphus clarus* Hervé-Bazin, 1923. Bull. Soc. entomol. Fr., 1923: 25. Lectotype: m, Vietnam: Chapa [MNHN, Paris] designated by Hervé-Bazin 1926; Hervé-Bazin, 1926: 67, descr., figs; Frey 1946: 163, descr.

*Syrphus clarus*. Curran 1928: 198; Curran 1931a: 313; Curran 1931b: 350.

*Xanthogramma fasciatum* Shiraki, 1930. Mem. Fac. Agric. Taihoku imp. Univ., 1: 410, key, figs. Syntypes: m, Taiwan: Kosempo, f, Taiwan: Rakuraku [ITLJ, Tsukuba]; Hull 1949: 290, cit. Synonym by Mengual 2012.

*Citrogramma clarum*. Vockeroth 1969: 95, cit.; Knutson *et al.* 1975: 311, cat.; Wyatt 1991: 158, descr. key; Ghorpadé 1994: 9, key; Mengual 2012: 136, key, figs. Huo & Pan 2012: 626, dist.

*Xanthogramma fasciata*. Knutson *et al.* 1975: 320, cat.

*Citrogramma clarum* is a widespread species in the Oriental Region, recorded from Vietnam, Thailand, Borneo, Philippines, Taiwan, Java, and the Malay Peninsula (Pahang). Mengual (2012) provides illustrations of the male genitalia as well as photographs to differentiate the taxa from other similar species of the same species complex.

*Citrogramma clarum* was described by Hervé-Bazin (1923) from material collected in Laos, Tonkin (northern Vietnam), and Java by M. R. Vitalis de Salvaza. As no original type designation was made, all the studied specimens are considered syntypes. Hervé-Bazin (1926) extends his original description and provides figures. In addition, he designates a male type and several cotypes from Chapa (Tonkin) and Laos, and by giving no details excludes the specimen from Java because it was not in good condition. Following the International Code of Zoological Nomenclature (ICZN 1999), the type from Chapa must be considered the lectotype, and the rest of the originally studied material, designated as cotypes by Hervé-Bazin (1926), constitute paralectotypes, including the specimen from Java.

Mengual (2012) designates the lectotype of *C. clarum* as the male collected from Chapa (Vietnam) on 8.vii.1916 and labelled ‘*Olbiosyrphus / clarus / Hervé-Bazin / Type ♂*’ [blue, handwritten]. The lectotype designation by Mengual (2012) was unnecessary, as Hervé-Bazin (1926) illustrates and mentions the "type male" specimen, the specimen from Chapa (Vietnam). His designation makes this specimen the lectotype and all other material included in the original series into paralectotypes. This designation by Hervé-Bazin (1926) makes the lectotype designation by Mengual (2012) automatically invalid.

In his revision, Mengual (2012) states that he could not find a paratype from Chapa (11.vii.1918) and another paratype from Louang-Prabang (12.ii.1915), Laos, at the Muséum National d'Histoire Naturelle (hereafter MNHN) (Paris, France). During a visit to the IRSNB, two *Citrogramma* specimens were found which proved to be the two lost paralectotypes from the Hervé-Bazin series. A careful study of both specimens showed that they belong to two different species. The male from Chapa (11.vii.1918) belongs to *C. amarilla* Mengual, 2012, and the other male from Louang-Prabang is identified as *C. clarum*.

The paralectotype from Louang-Prabang is in poor general condition, with the head shrunk and fungi grown over the entire body. A crucial characteristic for identification of the species, the yellow posterior anepisternum (Mengual 2012, couplet 18), is not well defined in this specimen due to its poor condition. The rest of the characteristics fit with the lectotype. Thus of the original type series, only the lectotype male and this paralectotype belong to *C. clarum*.

**Material examined.** 1 male belonging to *C. amarilla*, labelled: ‘*Chapa / 11-7-18*’ ‘*Olbiosyrphus / clarus / Hervé-Bazin / Cotype ♂*’ [blue] ‘R. Mus. Hist. Nat. / Belg. 11.161’ ‘det *Hervé-Bazin / Olbiosyrphus / clarus H. B.*’

‘Ex-Typis’ [red font] ‘*Etiquette de localite non / reprise a la diagnose*’ ‘*C. Bull. Soc. Ent. / France 1923 p. 25*’ ‘*Citrogramma / amarilla / det. X. Mengual 2013*’ [IRSNB]. The other male belongs to *C. clarum* and is labelled: ‘12-2-15 / Vitalis’ ‘*Louang / Prabang*’ ‘*Olbiosyrphus / clarus / Hervé-Bazin / Cotype ♂*’ [blue] ‘det Hervé-Bazin / *Olbiosyrphus / clarus H. B.*’ ‘*R. Mus. Hist. Nat. / Belg. 11.161*’ ‘Ex-Typis’ [red font] ‘*Etiquette de localite non / reprise a la diagnose*’ ‘*C. Bull. Soc. Ent. / France 1923 p. 25*’ ‘*Citrogramma / clarum / det. X. Mengual 2013*’ [IRSNB]. Its genitalia are in a plastic vial with glycerin.

### ***Citrogramma pennardsi* Mengual, 2012**

Figures 4–7, 9–10

*Citrogramma pennardsi* Mengual, 2012. *Zool. J. Linn. Soc. London*, 164: 154, descr., figs, key. Holotype: m, Indonesia: West Java, near Tjibodas, Mount Gedeh, Lebak Saät [RMNH, Leiden] by original designation.

Mengual (2012) describes *C. pennardsi* based on two males from Java. In a recent visit to the RMNH collection, another three specimens of this species (two males and one female) were found. The description of the female specimen of *C. pennardsi* is given below.

**Differential diagnosis** (based on Mengual 2012). Species with yellow face, posterior anepisternum partly black, anepimeron partly black, scutellum with a diffuse or sharply defined macula, metafemur black and large male genitalia. Very distinct from *Citrogramma schlingeri* Thompson in Mengual, 2012 although they key together, with very large male genitalia and pro- and mesofemur yellow, dark on basal 1/3–1/2. It differs from *C. variscutatum* (Curran, 1928) by having the sterna yellow, very large male genitalia, and the yellow fascia on 3rd tergum not markedly narrowed posteromedially.

**Material examined.** The label information for the three specimens is: ‘Museum Leiden / J.v.d. Vecht / Lebak / Saät 2400 m. / 29–VI–1937’ ‘*Citrogramma / pennardsi / Det.: X. Mengual 2013*’ [1 male and 1 female, RMNH; 1 male, ZFMK].

**Description of female.** *Head.* (Fig. 10) Face with facial tubercle, gradually sloping dorsally, more abrupt ventrally, entirely yellow, yellow pilose with black pile dorsolaterally; gena yellow, black pilose, yellow pilose posteriorly; dichoptic; lunule dark brown; frontal triangle yellow, with lateral black vitta on posterior 1/2 on eye margin (see Mengual 2012: figs. 75, 106), black pilose; vertical triangle black, black pilose; ocelli brown; antenna black, black pilose on scape and pedicel; occiput black, silver pollinose, pale pilose on ventral 2/3, golden pollinose, black pilose on dorsal 1/3. *Thorax.* (Figs 6, 7) Scutum black, with lateral yellow vitta, black pilose except notopleuron yellow pilose on anterior 1/2, densely black pilose on lateral notopleuron and supra-alar area; postpronotum yellow; notopleuron yellow continuing until scutellum, with postalar callus entirely yellow; scutellum yellow with dorsomedial triangular black macula, black pilose, with almost complete subscutellar fringe with black pile. Pleuron yellow, except posterior anepisternum black on anterior 1/2, katepisternum black with dorsal yellow macula, posterior anepimeron black, dorsomedial anepimeron yellow, and anterior anepimeron yellow with black borders, and meron black, entirely yellow pilose; metasternum pilose; calypter yellow with yellow pile on margin; plumula yellow; halter yellow; spiracular fringes yellow. *Wing.* Wing membrane brownish yellow, entirely microtrichose. Alula microtrichose, broad, broader than cell bm. *Legs.* Coxa yellow, partly black, mesocoxa black, trochanter dark, yellow and black pilose; pro- and mesofemur yellow, black on basal 1/3; pro- and mesotibia yellow, black pilose; pro- and mesotarsus black; metaleg black, black pilose. *Abdomen.* (Fig. 7) Slightly oval, margin inconspicuous. Dorsum mainly black, black pilose dorsally and laterally except 1st tergum yellow pilose laterally and 2nd tergum yellow pilose laterally on anterobasal 1/2; 1st tergum black; 2nd tergum black with 2 mesolateral rounded-tip yellow maculae, laterally extending forward to anterolateral tergal margin (like “golf club” shaped spots), yellow lateral margin on anterior 1/3; 3rd and 4th terga black with medial sinuate broad yellow fascia (about 1/3 of tergum length), reaching lateral margins, with lateral margin yellow on anterior 1/3; 5th tergum similar to 3rd and 4th terga, but lateral margin yellow on anterior 1/2; sterna yellow, black pilose except 1st, 2nd yellow pilose and 3rd sternum yellow pilose medially.

**Length** (N = 1). Body, 10.2 mm; wing, 9.7 mm.

**Geographical distribution.** Java.

**Material examined.** 1 female, INDONESIA: West Java, Lebak Saat, 2400 m., 29.vi.1937, J.v.d. Vecht [RMNH].

**Remarks.** All three specimens found at RMNH are much darker than the holotype and paratype (see Figs 4–7). Based on this new material, it seems possible that Mengual (2012) based his description on two immature adults, with dark body areas not fully developed. Both males have yellow gena with a black macula ventrad to the eye (Fig. 5), but the female does not have this pattern. All three have the scutellum with a sharply defined basal black triangle (Figs 5, 7), which means that they do not key properly in couplet 35 of Mengual (2012). In addition, the pleura of the male specimens are much darker (anterior anepisternum black, anepimeron black except yellow medially, and katatergum black with a broad yellow macula) and the legs are much darker too (coxae black, pro- and mesofemur black, metaleg entirely black) (Figs 4–7). Although the coloration of these specimens is much darker, the genitalia are identical to those of the type material.

### Modification to the key to *Citrogramma* species

In order to identify these darker specimens accurately, the identification key in Mengual (2012) needs to be modified. Figure numbers follow the numbers as originally published (Mengual 2012).

- 1–44 No change.
45. Pro- and mesofemur black on basal third. Notopleuron yellow and black pilose ..... 45b  
 – Pro- and mesofemur entirely yellow. Notopleuron only yellow pilose. Male: face with lateral hairs extensively yellow (Fig. 99) ..... 46
- 45b. Sterna yellow medially with a broad black fascia on posterior and lateral margins. Yellow fascia on 3rd tergum markedly narrowed medially (Fig. 93). Male genitalia small (Malaysia, Sumatra, Java) ..... *C. variscutatum* (Curran)  
 – Sterna entirely brownish yellow. Yellow fascia on 3rd tergum not markedly narrowed medially (Fig. 8). Male genitalia large, with 5th sternum reduced and cerci extremely large (Figs 10, 147, 148) (Java) ..... *C. pennardsi* Mengual
- 46–52 No change.

### *Eosphaerophoria dentiscutellata* (Keiser, 1958)

Figures 11–13

*Tambavanna dentiscutellata* Keiser, 1958. Rev. Suisse Zool., 65: 202, figs. habitus, head, wing. Holotype: m, Sri Lanka: Kandy, Deiyannawela [NHMB, Basel] by original designation.

*Eosphaerophoria dentiscutellata*. Vockeroth, 1969: 135 (new comb., species misidentified from Vietnam); Knutson *et al.* 1975: 313, cat. cit.; Ghorpadé 1994: 5 (key reference, citation); Claussen & Weipert 2003: 354, key; Mengual & Ghorpadé 2010: 55, descr., key, figs.

Mengual & Ghorpadé (2010) re-describe this species based on the only known specimen, the male holotype from Sri Lanka. In the RMNH collection, a female specimen was found which is described below.

**Differential diagnosis** (based on Mengual & Ghorpadé 2010). Species characterized by a medial tooth in the posterior margin of the scutellum (broken in this female specimen, Fig. 12), like *Eosphaerophoria adornata* Mengual in Mengual & Ghorpadé, 2010 and *E. hermosa* Mengual in Mengual & Ghorpadé, 2010. *Eosphaerophoria dentiscutellata* differs from both in having 2nd tergum black with lateral margin yellow (Figs 11, 12) and 5th tergum with two lateral yellow maculae (see Mengual & Ghorpadé 2010: 56, Figs. 32 and 34).

**Material examined.** 1 female, INDIA: Kerala State, Anamalai hills, Cinchona, 150 m, xi.1959, P. Susai Nathan, ex. coll. V.S.v.d. Goot [RMNH].

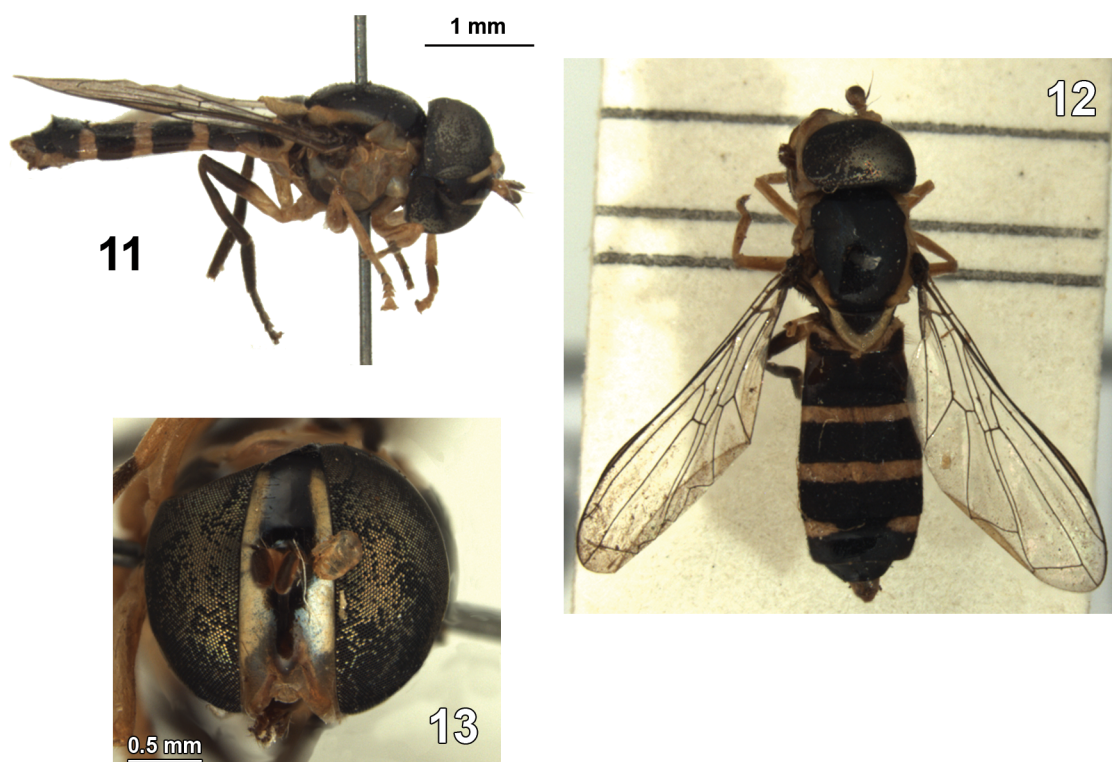
**Description of female.** *Head.* (Fig. 13) Face straight, narrow, parallel-sided, with distinct round tubercle, yellow with medial black vitta fading below tubercle and not reaching oral margin, yellow pilose; gena yellow; lunula black; frons completely black on dorsal 1/4–1/3 (length between anterior ocellus and lunula), yellow on ventrolateral 2/3–3/4 with medial broad black vitta (about 3/5 of frons width); dichoptic; vertex and vertical triangle shiny black, black pilose; ocelli brownish; antenna yellow, basoflagellomere brown dorsally, oval; arista brown; occiput mainly black, yellow ventrally, yellow pilose ventrally, black pilose dorsally. *Thorax.* (Fig. 11) Scutum mainly black, shiny medially, black pollinose anteriorly and posteriorly, yellow laterally with lateral broad yellow stripe from postpronotum to scutellum, narrower after transverse suture with ventral black area, pale pilose; postpronotum yellow; notopleuron yellow with distinct posterolateral obtuse protuberance; scutellum triangular, with a tooth on medial posterior margin, yellow with dorsomedial triangular black area continuing from posterior

mesonotum, golden brown pilose; propleuron, anepisternum and anepimeron entirely yellow; katepisternum black with dorsal yellow macula; meron black; katepimeron yellow; katatergum mainly yellow, black posteriorly; calypter dark brown; halter yellowish. *Wing*. Wing membrane hyaline, stigma yellowish, bare basomedially. *Legs*. Pro- and mesoleg entirely yellow, except probasitarsomere slightly brownish laterodorsally, yellow pilose except tarsi with short black setulae ventrolaterally; metacoxa and trochanter yellow, yellow pilose; metafemur yellow on basal 1/2, black on distal 1/2, yellow and brown pilose, with two ventral rows (anteroventral and posteroventrally) of short strong black spine-like setulae on the apical 2/3; metatibia black, golden brown pilose; metatarsus black, golden yellow and brown pilose. *Abdomen*. (Fig. 12) Similar to that in male; 1st tergum black with anterior and lateral yellow margin, medially reaching the anterior margin of 2nd tergum dividing the black area in two triangular maculae; 2nd tergum black dorsally, narrowly yellow laterally on basal 1/2 continuing the yellow margin of 1st tergum; 3rd and 4th terga black with basomedial very narrow black fascia not reaching margins and with sub-basal yellow fascia, about 1/4–1/3 of tergum length, yellow on anterior 3/5 of lateral margin; 5th tergum black with two lateral small rounded yellow maculae on basal 1/3; 6th tergum black; genitalia yellow.

**Length** (N = 1). Body, 6.5 mm; wing, 5.0 mm.

**Geographical distribution**. Sri Lanka, south India.

**Remarks**. The holotype male of *E. dentiscutellata* has a yellow face, while the female specimen described here has a medial black vitta not reaching oral margin (Fig. 13). Due to this sexually dimorphic characteristic, the females of *E. dentiscutellata* do not key out properly in the identification key provided by Mengual & Ghorpadé (2010).



**FIGURES 11–13.** *Eosphaerophoria dentiscutellata*, female. 11. Lateral view (scale 1 mm); 12. Dorsal view, habitus (scale 1 mm); 13. Frontal view, face (scale 0.5 mm).

### *Eosphaerophoria marginata* Frey, 1946

*Eosphaerophoria marginata* Frey, 1946. Not. Entomol., 25 [1945]: 169. Lectotype: m, Philippines: Luzon, Mt. Banahao [MZH, Helsinki] designated by Mengual & Ghorpadé 2010; Knutson *et al.* 1975: 313, cat. cit.; Claussen & Weipert 2003: 354, figs; Mengual & Ghorpadé 2010: 63, descr., figs, key.

Mengual & Ghorpadé (2010) re-describe the male and female of *E. marginata*, and provide an identification key and figures of wing, thorax, abdomen, and male genitalia.

While visiting the IRSNB, a female specimen of *E. marginata* from Vietnam was found. This represents the first published record of this genus for 20 years, and the most recent individual of *E. marginata* collected during the last 30 years. It also extends the distribution area of this species from the Philippines and Thailand to Vietnam. The number of *Eosphaerophoria* species from Vietnam increased to three, other species occurring are *E. symmetrica* Mengual in Mengual & Ghorpadé, 2010 and *E. vietnamensis* Mengual in Mengual & Ghorpadé, 2010.

Mengual & Ghorpadé (2010) state that nothing is known about the biology of *Eosphaerophoria*, except that Keiser (1958: 204) collected his specimen in the grass in a swampy locality. They also state that more species and specimens might be found in the future, especially when using Malaise traps. In fact, this new *E. marginata* specimen from Vietnam was collected with a Malaise trap at Nui Pia Oac Nature Reserve, which was decreed as a nature reserve in 1986, centred on Mount Pia Oac, 1,931 masl (Tordoff *et al.* 2000). Nui Pia Oac Nature Reserve supports low, medium and high altitude montane broadleaf evergreen forests (Tordoff *et al.* 2000). The new specimen of *Eosphaerophoria* was collected near the summit of the Mount Pia Oac, in a clearing of high altitude montane evergreen forest (J. Constant, personal communication), a habitat clearly differing from the swampy locality of Keiser (1958).

Interestingly, the female from Vietnam shares the abdominal pattern with the female from Thailand, which is a bit different from the abdominal pattern of the female paratype from the Philippines (see Mengual & Ghorpadé 2010: 58, Figs. 40–41). Mengual & Ghorpadé (2010) state that more material will be needed to re-assess the status of the *E. marginata* population outside the Philippines. Nothing more can be strongly affirmed, but females from Vietnam and Thailand share a common abdominal pattern, which is slightly different from the one of the paratype females.

**Material examined.** 1 female, 'VIETNAM: Pia-Oac / Mt. NR (Malaise Trap) / 22°36'N 105°53'E / 04–06.viii.2010 / Leg.: J. Constant & / P. Limbourg I.G.31.668' [IRSNB].

### Modification to the key to *Eosphaerophoria* species

In order to identify accurately the female of *E. dentiscutellata*, the identification key in Mengual & Ghorpadé (2010) needs to be modified. Figure numbers represent the numbers as originally published (Mengual & Ghorpadé 2010).

1–4 No change.

- 5 2nd abdominal tergum black, yellow on anterobasal margins only (Fig. 33); 5th abdominal tergum with 2 small lateral yellow maculae (Fig. 33) (Sri Lanka, south India) . . . . . *dentiscutellata* (Keiser)
  - 2nd abdominal tergum black with basal yellow fascia with a posterior median triangular projection, narrowly separated from anterior margin by a black fascia (Figs. 32, 34); 5th abdominal tergum with subbasal yellow fascia (Figs. 32, 34) . . . . . 6
  - 6 1st abdominal tergum yellow with posteromedial narrow black fascia (Fig. 32); face yellow with medial black vitta (Indonesia, Halmahera Island) . . . . . *hermosa* Mengual
  - 1st abdominal tergum black dorsomedially, yellow on anterior and lateral margins (Fig. 34); face entirely yellow (Papua New Guinea, Normanby Island) . . . . . *adornata* Mengual
- 7–10 No change.

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## References

- Claussen, C.J. & Weipert, J. (2003) Zur Schwebfliegenfauna Nepals (Insecta: Diptera: Syrphidae) unter besonderer Berücksichtigung Westnepals. In: Hartmann, M. & Baumach, H. (Eds.), *Biodiversität und Naturlausstattung im Himalaya*. Verein der Freunde und Förderer des Naturkundemuseums Erfurt e.V., Erfurt, pp. 343–380, pls IX–XVI.
- Curran, C.H. (1928) The Syrphidae of the Malay Peninsula. *Journal of the Federated Malay States Museums*, 14, 141–324.
- Curran, C.H. (1931a) Additional records and descriptions of Syrphidae from the Malay Peninsula. *Journal of the Federated Malay States Museums*, 16, 290–338.
- Curran, C.H. (1931b) Records and descriptions of Syrphidae from North Borneo including Mt Kinabalu. *Journal of the Federated Malay States Museums*, 16, 333–376.
- Evenhuis, N.L. (2009) The insect and spider collections of the world website [online]. Available from: <http://hbs.bishopmuseum.org/codens/> (accessed 28 February 2013)
- Frey, R. (1946) Übersicht der Gattungen der Syrphiden-Unterfamilie Syrphinae (Syrphinae + Bacchinae). *Notulae Entomologicae*, 25 [1945], 152–172.
- Ghorpadé, K. (1994) Diagnostic keys to new and known genera and species of Indian subcontinent Syrphini (Diptera: Syrphidae). *Colemania, Insect Biosystematics*, 3, 1–15.
- Hervé-Bazin, J. (1923) Diagnoses de Syrphides [Dipt.] nouveaux du Laos (Indo-Chine française). *Bulletin de la Société entomologique de France*, 1923, 25–28.
- Hervé-Bazin, J. (1926) Syrphides de l'Indo-Chine Française. *Encyclopédie Entomologique, Série B II*, 3, 61–110.
- Holt, B.G., Lessard, J.P., Borregaard, M.K., Fritz, S.A., Araújo, M.B., Dimitrov, D., Fabre, P.H., Graham, C.H., Graves, G.R., Jönsson, K.A., Nogués-Bravo, D., Wang, Z., Whittaker, R.J., Fjeldså, J. & Rahbek, C. (2013) An Update of Wallace's Zoogeographic Regions of the World. *Science*, 339, 74–78.  
<http://dx.doi.org/10.1126/science.1228282>
- Hull, F.M. (1949) The morphology and inter-relationship of the genera of syrphid flies, recent and fossil. *Transactions of the Zoological Society of London*, 26, 257–408.  
<http://dx.doi.org/10.1111/j.1096-3642.1949.tb00224.x>
- Huo, K.K. & Pan, Z.H. (2012) Note on the genus *Citrogramma* Vockeroth from China (Diptera, Syrphidae). *Acta Zootaxonomica Sinica*, 37, 623–631.
- Keiser, F. (1958) Beitrag zur Kenntnis der Syrphidenfauna von Ceylon (Dipt.). *Revue Suisse de Zoologie*, 65, 185–239.
- Knutson, L.V., Thompson, F.C. & Vockeroth, J.R. (1975) Family Syrphidae. In: Delfinado, M.D. & Hardy, D.E. (Eds.), *A catalog of the Diptera of the Oriental Region. Volume II, Suborder Brachycera through Division Aschiza, Suborder Cyclorrhapha*. The University Press of Hawaii, Honolulu, pp. 307–374.
- ICZN [International Commission on Zoological Nomenclature] (1999) *International Code of Zoological Nomenclature. Fourth edition adopted by the International Union of Biological Sciences*. International Trust for Zoological Nomenclature, London, 306 pp.
- Mengual, X. & Ghorpadé, K. (2010) The flower fly genus *Eosphaerophoria* Frey (Diptera, Syrphidae). *ZooKeys*, 33, 39–80.  
<http://dx.doi.org/10.3897/zookeys.33.298>
- Mengual, X. (2012) The flower fly genus *Citrogramma* Vockeroth (Diptera: Syrphidae): illustrated revision with descriptions of new species. *Zoological Journal of the Linnean Society*, 164, 99–172.  
<http://dx.doi.org/10.1111/j.1096-3642.2011.00750.x>
- Shiraki, T. (1930) Die Syrphiden des Japanischen Kaiserreiches mit Berücksichtigung benachbarter Gebiete. *Memoirs of the Faculty of Science and Agriculture, Taihoku Imperial University*, 1, xx + 1–446.
- Thompson, F.C. (1999) A key to the genera of the flower flies of the Neotropical Region including the descriptions of genera and species and a glossary of taxonomic terms. *Contributions on Entomology, International*, 3, 319–378.
- Tordoff, A.W., Vu, V.D., Le, V.C., Tran, Q.N. & Dang, T.L. (2000) *A rapid field survey of five sites in Bac Kan, Cao Bang and Quang Ninh provinces, Vietnam: A review of the Northern Indochina subtropical forests ecoregion*. BirdLife International Vietnam Programme (Conservation report No. 14), Hanoi, i–xvi + 1–106.
- Vockeroth, J.R. (1969) A revision of the genera of the Syrphini (Diptera: Syrphidae). *Memoirs of the Entomological Society of Canada*, 62, 1–176.  
<http://dx.doi.org/10.4039/entm10162fv>
- Wyatt, N.P. (1991) Notes on *Citrogramma* Vockeroth (Diptera: Syrphidae) with descriptions of five new species. *Oriental Insects*, 25, 155–169.  
<http://dx.doi.org/10.1080/00305316.1991.10432224>