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## A NEW SPECIES OF THE GENUS *CYMATOSUS* (DIPTERA, ULIDIIDAE) FROM CENTRAL AMERICA, WITH A KEY TO SPECIES

E. P. Kameneva

I. I. Schmalhausen Institute of Zoology, National Academy of Sciences of Ukraine,  
B. Chmielnicky str., 15, Kyiv, 01601 Ukraine  
E-mail: kameneva.elena@gmail.com

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**A New Species of the Genus *Cymatosus* (Diptera, Ulidiidae) from Central America, with a Key to Species.** Kameneva E. P. — *Cymatosus icarus* Kameneva, sp. n. from Costa Rica is described. It differs from the four previously described species by the wing pattern with an additional arcuate hyaline stripe parallel to the wing margin, and a rounded brown spot in the middle of the wing disc, resembling that in *Callistomyia icarus* Osten Sacken (Tephritidae). A key to the species of the genus *Cymatosus* Enderlein and notes on other species are provided.

Key words: Diptera, Ulidiidae, Central America, new species.

**Новый вид рода *Cymatosus* (Diptera, Ulidiidae) из Центральной Америки с таблицей для определения видов.** Каменева Е. П. — Описан *Cymatosus icarus* Kameneva, sp. n. из Коста-Рики, отличающийся от остальных четырех видов рода рисунком крыла с дополнительной дуговидной прозрачной полосой, параллельной наружному краю крыла, и округлым бурым пятном посередине крыловой пластинки, напоминающим таковой у *Callistomyia icarus* Osten Sacken (Tephritidae). Представлены таблица для определения видов рода *Cymatosus* Enderlein и замечания по морфологии ранее описанных видов.

Ключевые слова: Diptera, Ulidiidae, Центральная Америка, новый вид.

### Introduction

*Cymatosus* Enderlein is a poorly studied genus of the tribe Pterocallini (family Ulidiidae) occurring in the Neotropical Region. These small flies have very characteristic wing venation, general appearance and wing pattern (fig. 1, 2–6) similar to that in fruit flies of the Neotropical genus *Polymorphomyia* Snow and can be easily recognized among other pterocallines. Specimens of *Cymatosus* are very rare in entomological collections, with only about 25 specimens known so far.

While treating material in the collection of the Instituto Nacional de Biodiversidad (Santo Domingo, Costa Rica), the odd specimen certainly belonging to this genus attracted my attention. The study of additional material (including types) from the museums listed below of *Cymatosus* species, showed that this male from Costa Rica represents a new undescribed species, which is described below.

### Material

This study is based upon material deposited in the following collections: SDEI — Senckenberg Deutsches Entomologisches Institut Müncheberg (Deutsche Entomologische Institut), Müncheberg, Germany; HMNH — Hungarian Natural History Museum (Termesztudományi Muzeum), Budapest, Hungary; INBio — Instituto Nacional de Biodiversidad, Santo Domingo, Heredia, Costa Rica; MTD — National Museum of Zoology (Staatliches Museum für Tierkunde), Dresden, Germany; NHMW — Natural History Museum of Vienna (Naturhistorisches Museum Wien), Austria; CNCI — Canadian National Collection of Insects, Arachnids and Nematodes, Ottawa, Canada; USNM — United States National Museum of Natural History, Smithsonian Institution, Washington, D. C., USA; ZMHB — Museum of Natural History of the Humboldt University in Berlin (Museum für Naturkunde der Humboldt-Universität zu Berlin), Germany; FSCA — Florida State Collection of Arthropods.

In the label quotation below, / — means new line, // — writing perpendicular to lines, and \ — writing on the underside of the label.

Morphological terminology follows J. F. McAlpine (1981).

*Cymatosus* Enderlein, 1912

Enderlein, 1912: 61; Aczél, 1951: 400; Steyskal, 1968: 54.3.

Type species: *Cymatosus polymorphomyiodes* Enderlein, 1912: 62 (by original designation).

**Description.** Head (fig. 1, 1; 2, 1) higher and wider than long (length: height: width ratio = ca. 1 : 1.5 : 2), same in male and female; compound eye large, 4–5 times as high as gena; frons gradually curved anteriorly, forming blunt fronto-facial angle; face flat, vertical or slightly receding; clypeus low, slightly convex; antenna long and wide, flagellomere 1 reaching ventral margin of face; arista conspicuously pubescent; palpus sausage-like, slightly curved dorsally, but not flattened; setae as in most pterocallines: 1 medial vertical, 1 lateral vertical, moderately long postocellar and ocellar setae, 2 reclinate bital (longer posterior and shorter anterior); no frontal setae. Body (fig. 2, 2, 3, 5) uniformly brownish to black, sparsely and uniformly whitish microtrichose; proepisternal seta well-developed; 1 supraalar and 2 dorsocentral setae; prescutellar acrostichal setae absent; 2 pairs of scutellar setae. Wing (fig. 1, 2–6) wide, 1.9–2.1 times as long as wide, 2.9–3.5 mm long, dark brown with hyaline apex and hyaline triangular incisions and round spots; vein Sc sharply turned at right angle before apex; veins  $R_1$  and  $R_{4+5}$  bare,  $R_1$  dipped posteriorly before turning to apex, ending before middle of wing length; vein  $R_{2+3}$  strongly sinuate and ending halfway between apices of veins  $R_1$  and  $R_{4+5}$ ; distal portion of cell bm conspicuously incised into br; crossveins r-m and dm-cu conspicuously shifted basally; crossvein r-m at basal 0.33 of discomedial cell and at level of vein Sc apex; cell bcu with short postero-apical lobe; vein  $A_1+CuA_2$  reaching posterior margin of wing; vein  $A_2$  represented by fold; anal lobe and alula moderately narrow. Abdomen (fig. 2, 4, 6) subshining or with small spots of whitish microtrichia; tergites 3–5 subequal in lengths in both sexes; male with large membranous pouch between tergites 4 and 5 (fig. 3, 4); female tergite 6 well-developed, half as long as tergite 5 and moderately wide, not hidden underneath its margin. Male genitalia: phallus bare, simple; ejaculatory apodeme (fig. 3, 6) elongate, 0.6 times as long as its fan-like portion; wide elliptical epandrium with short triangular surstyli bearing 2 separated prenisetae (fig. 1, 7; 3, 5). Abdominal sternites 4–6 of females not examined; oviscap short, at most as long as tergites 5 and 6 together; aculeus and spermathecae not examined.

**Comments.** *Cymatosus* shares several presumably synapomorphic characters with at least some species of *Megalaemyia* Hendel (Diptera: Ulidiidae), e. g., head shape, bare vein  $R_1$  dipped posteriorly before apex, presence of wide membranous pouch between tergites 4 and 5 in male (fig. 3, 4) and by having short oval epandrium with 2 distantly separated prenisetae (fig. 3, 5). Monophyly of *Cymatosus* is supported by several peculiarities of wing venation (vein Sc sharply turned anteriorly, short and sinuate vein  $R_{2+3}$  and the very proximal position of crossvein r-m) and pattern (apical hyaline band) that do not occur elsewhere in the Pterocallini, whereas monophyly of *Megalaemyia* in its current concept is dubious, the latter genus is believed to be either paraphyletic or polyphyletic and needs careful taxonomic revision, which is beyond the scopes of this paper.

**Key to species of *Cymatosus*****Таблица для определения видов рода *Cymatosus***

1. Wing with apical half dark, with one crescent-like hyaline apical crossband. .... 2
- Wing with apical half having additional arcuate hyaline band parallel to wing margin and separated from it by narrow brown band (fig. 1, 6). Costa Rica. .... *icarus* sp. n.
2. Face whitish on ventral half. Wing pattern yellowish brown: cell dm almost entirely hyaline, except brown shadow on crossvein dm-cu (fig. 1, 3). Abdominal tergites with small spots of white microtrichia Mexico. .... *fenestellatus* (Hendel)
- Face entirely brownish yellow. Wing pattern mostly dark brown: cell dm with one or two large brown spots in basal half (fig. 1, 2). Abdominal tergites various. .... 3

- 3. Wing pattern: costal cell with 2 hyaline incisions; hyaline incision in cell m not extending anteriorly into cell  $r_{4+5}$ , latter with round hyaline spot (fig. 1, 2, 5). ..... 4
- Wing pattern: costal cell with 1 hyaline incision, cell base entirely dark; hyaline incision in cell m slightly extending anteriorly into cell  $r_{4+5}$ , latter without round hyaline spot (fig. 1, 4). Peru. .... *marginatus* (Hendel)
- 4. Wing pattern: cell  $cua_1$  with dark arcuate crossband almost reaching apex of vein  $A_1+CuA_2$  (fig. 1, 2). Abdominal tergites uniformly subshining brown. Ecuador, Peru. .... *bestifer* (Hendel)
- Wing pattern: cell  $cua_1$  with dark wide bar only reaching half of cell width (fig. 1, 5). Abdominal tergites with small spots of white microtrichia. Southern Brazil. .... *polymorphomyioides* Enderlein

***Cymatosus bestifer* (Hendel, 1909) (fig. 1, 2; 2, 1–4)**

Hendel, 1909 a: 7; 1909 b: pl. 1, fig. 12 (*Megalaemyia*); Enderlein, 1912: 61, 63; Aczél, 1951: 400; Steyskal, 1968: 54.3 (*Cymatosus*).

Material. Type. Syntypes: ♂: PERU: Peru, Meshagua / Urubamba fl. // 27.09.03, Megalaem. \ *bestifer* H. det. F. Hendel, “Paratype” [yellow cardboard], “Syntype ♂ *Megalaemyia bestifer* Hendel 1909 des. Korneyev & Kameneva 2001” (NHMW); ♀: Peru, Meshagua / Urubamba fl. // 27.09.03, Megalaem. \ *bestifer* H. det. F. Hendel, Cotypus [red label], ♂ and ♀: Peru, Meshagua / 30.09.03 / Urubamba fl., Megalaem. \ *bestifer* H. det. F. Hendel, Cotypus [red label] (MTD). Non-type: PERU: Amazonas, Aramango, 16.03.1968, 2 ♂ (P. G. Cassanova C.) (USNM); Peru, Urubamba fl., 14.09.1903, ♀ (FSCA); Quincemi, Cuzco, 780 m, 13–31.08.1962, ♂ (L. Pena) (CNC). ECUADOR: Cubaratza, Zamora, 700 m., 30–31.03.1965, ♀

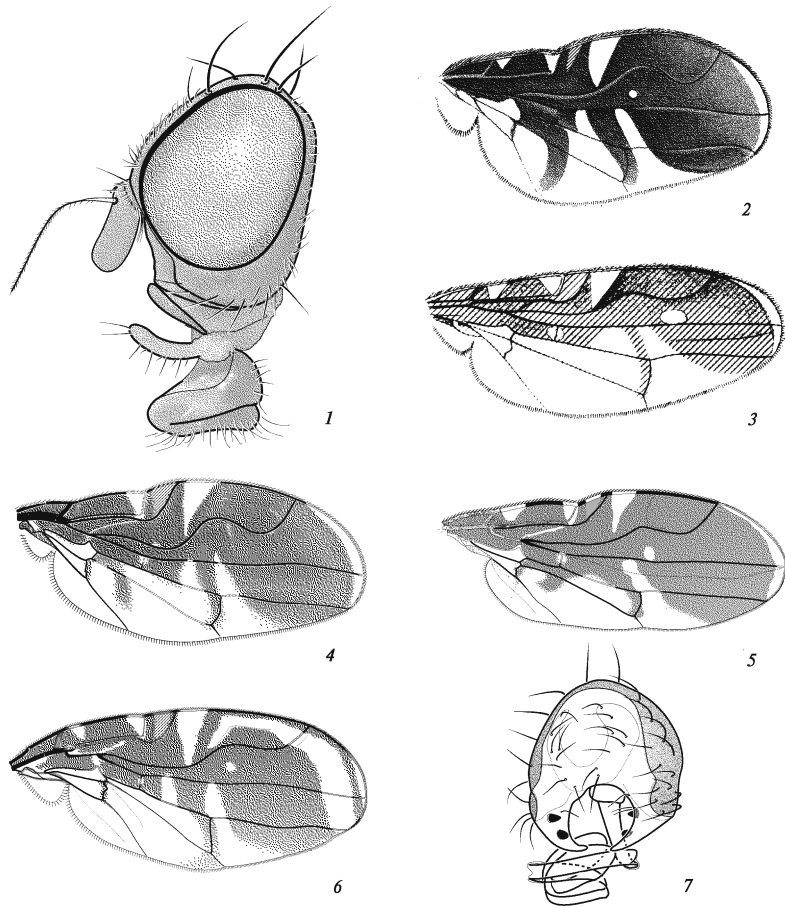


Fig. 1. *Cymatosus*, head (1), wing (2–6) and male genitalia, posterior (7): 1, 5 – *C. polymorphomyioides*; 2 – *C. bestifer*; 3 – *C. fenestellatus*; 4 – *C. marginatus*; 6–7 – *C. icarus* sp. n. (2, 3 – redrawn from Hendel, (1909 b).

Рис. 1. *Cymatosus*, голова (1), крыло (2–6) и гениталии самца, вид сзади (7): 1, 5 – *C. polymorphomyioides*; 2 – *C. bestifer*; 3 – *C. fenestellatus*; 4 – *C. marginatus*; 6–7 – *C. icarus* sp. n. (2, 3 – по: Hendel (1909 b) с изменениями).

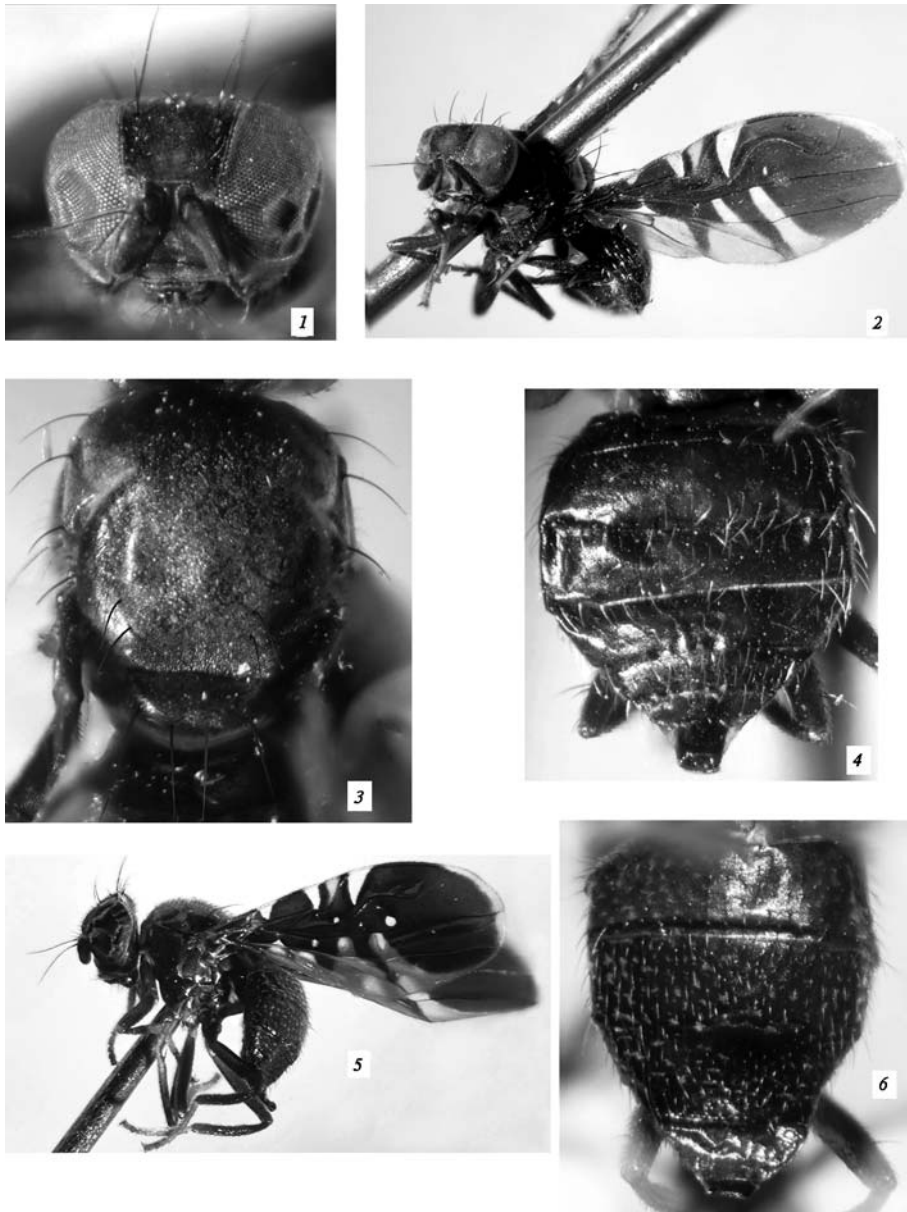


Fig. 2. *Cymatosus bestifer* (1–4) and *C. polymorphomyioides* (5, 6): 1 – head, anterior; 2, 5 – total female, left; 3 – mesonotum, dorsally; 4, 6 – abdomen, dorsal view.

Рис. 2. *Cymatosus bestifer* (1–4) и *C. polymorphomyioides* (5, 6): 1 – голова, вид спереди; 2, 5 – общий вид самки, слева; 3 – среднеспинка, сверху; 4, 6 – брюшко, вид сверху.

(L. Pena) (CNC); NAPO, Res. Ethnica Waorani, 1 km S Onkone Gare Camp, Trans. Ent., ? 01.1996, 00°39'10"S 076°26'W, 220 m, insecticidal fogging of mostly bare green leaves, some with covering of lichenous or bryophytic plants in terre firme forest, at Trans. 2, Sta 3 Project MAXUS lot 1433, (T. L. Erwin et al.) (USNM ENT 00054635) (USNM).

Comments. Hendel (1909 a) noted in his description that vein r-m has no hyaline spot on it. However, the specimens from Ecuador, which otherwise fit Hendel's description, have a small white spot on the crossvein r-m. The female is similar to male, with wing pattern and venation not dimorphic. Genitalia of both sexes were not dissected.



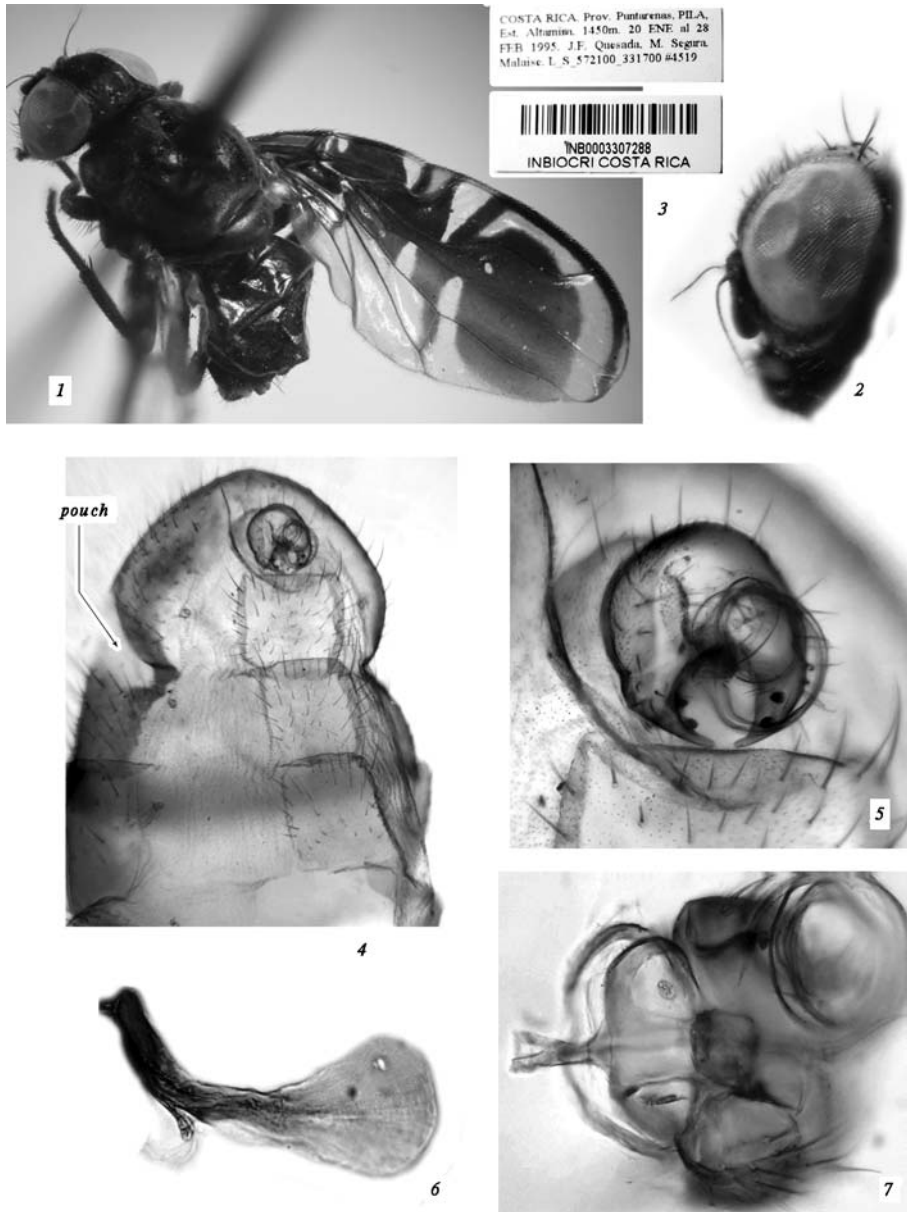


Fig. 3. *Cymatosus icarus* sp. n., holotype: 1 — total dorsal and left; 2 — head, left; 3 — labels; 4 — abdomen, ventral (*pouch* — area of invaginated membrane between tergites 4 and 5); 5 — epandrium, posterior view; 6 — sperm pump; 7 — hypandrium, ventral view.

Рис. 3. *Cymatosus icarus* sp. n., holotype: 1 — общий вид сверху и слева; 2 — голова, вид слева; 3 — этикетки; 4 — брюшко, снизу (*pouch* — участок ввернутой внутрь мембраны между 4-м и 5-м тергитами); 5 — эпандрий, вид сзади; 6 — эякулятор; 7 — гипандрий, вид снизу.

***Cymatosus fenestellatus* (Hendel, 1909) (fig. 1, 3)**

Hendel, 1909 a: 8; 1909 b: pl. 1, fig. 5; Enderlein, 1912: 61 (*Megalaemyia fenestellata*); Aczél, 1951: 400 (*Cymatosus fenestellata*); Steyskal, 1968: 54.3 (*Cymatosus fenestellatus*).

Material. Type. Holotype ♀: MEXICO: Bilimek / Mexico / 1871 / Orizaba, Novb., *Megalaemyia fenestellata* det. F. Hendel, Type [red cardboard], "HOLOTYPE ♀ *Megalaemyia fenestellata* Hendel, 1909 Korneyev & Kameneva des. 2001" (NHMW).

**Comments.** Hendel (1909 a, b) described and figured this as a species of the genus *Megalaemyia*. So far, it is known only from the holotype. Cell bm has sparse microtrichia; abdominal tergites are shallowly pitted, with whitish spots of short microtrichia. The aculeus (exposed in the holotype) is moderately narrow, somewhat flattened, with a rounded cercal unit bearing short setae.

***Cymatosus marginatus* (Hendel, 1909) (fig. 1, 4)**

Hendel, 1909 a: 72 (*Megalaemyia*); Enderlein, 1912: 61 (*Megalaemyia marginata*); Aczél, 1951: 401 (*Cymatosus marginata*); Steyskal, 1968: 54.3 (*Cymatosus marginatus*).

**Material.** Type. Holotype ♂: PERU: Peru / Callanga; Typus [red cardboard] (HMNH).

**Comments.** Hendel (1909 a) described this species without any illustrations, and I provide here a figure of the holotype wing.

***Cymatosus polymorphomyiodes* Enderlein, 1912 (fig. 1, 1, 5; 2, 5–6)**

Enderlein, 1912: 62, fig. 1; Aczél, 1951: 401; Steyskal, 1968: 54.3 (*Cymatosus*).

**Material.** Type. Syntypes: ♂ and ♀: BRAZIL: Santa Catharina, Lüderwaldt (not located; Warsaw?). Non-type. BRAZIL: Nova Teutonia, 27°11'B 52°23'L, 3.07.1951, ♂ [as ♀, error] (Plaumann) (SDEI); idem, 16.09.1961, ♂, ♀ (Plaumann) (CNC); idem, 300–500 m, 4.05.1977, ♀ (Plaumann) (USMN); idem, Sta Catharina, 23.02.1954, ♂, 28.02.1954, 2 ♂, ♀, 8.05.1954, ♀, 9.11.1955, ♂ (Plaumann) (ZMHB); Esp. Santo, ♂ (HMNH).

**Comments.** The syntypes of this species were deposited in the Nature Museum of Stettin (now Szczecin, Poland) and may now be deposited in the collection of the Institute of Zoology, Polish Academy of Sciences, Warsaw, as many of Enderlein's Tephritidae type specimens were found to be there (e. g., Hardy, 1973). I was unable to examine the types; however, Enderlein's original description is quite complete and provided a picture of the wing. This allows recognizing *C. polymorphomyiodes* easily. Another peculiar character is the presence of whitish spots of short microtrichia (or shining spots among a mottled white microtrichia pattern) on shallowly pitted abdominal tergites. Genitalia were not dissected.

***Cymatosus icarus* Kameneva, sp. n. (fig. 1, 6–7; 3)**

**Material.** Type. Holotype ♂: COSTA RICA: Puntarenas. PILA, Est. Altamira, 1450 m, 20 Ene al 28 Feb. 1995. J. F. Quesada, M. Segura. Malaise. L. S. 572100 331700 # 4519; INB0003307288 / INBIOCRI COSTA RICA (INBio) (3 right legs missing; abdomen dissected, in microvial pinned underneath the specimen).

**Description.** Head (fig. 3, 2) length: height: width ratio = 1 : 1.5 : 2.0. Frons dark brown, matt, with black setulae. Face flat, matt brown, with white microtrichose ventral margin. Antenna brown to black; pedicel with moderately deep dorsolateral incision and uniformly short setulae on dorsal side, without longer dorsal seta; ventro-apically with 2 very long marginal setulae half as long as flagellomere 1; flagellomere 1 dark brown, densely brown microtrichose, 1.8 times as long as wide, widely rounded at apex. Clypeus black. Palpus dark yellow, sausage-like, neither widened nor flattened, with numerous fine setulae along its ventro-apical margin, but without apical seta.

**Thorax** (fig. 3, 1) brown, sparsely and uniformly whitish microtrichose and with black setulae. All mesonotal setae missing, but sockets visible.

**Wing** (fig. 1, 6) 3.5 mm long, 2.1 times as long as wide, mostly brown, with dark brown basicostal cell; costal cell with 2 triangular hyaline spots; pterostigma with yellowish triangular spot; cell  $r_1$  apical of vein  $R_1$  apex with narrow triangular spot; hyaline C-shaped band in cells  $r_1$ ,  $r_{2+3}$ ,  $r_{4+5}$  and m; wing apex with very narrow arcuate hyaline band in cells  $r_{2+3}$  and  $r_{4+5}$ ; base of cell m with hyaline spot extending deep into cell  $r_{4+5}$  as triangular incision; middle of wing disc in apical half with round brown spot joined to basal brown portion in cell  $r_{2+3}$  and including small pupil-like hyaline spot; cells bm,

dm and bcu hyaline, with narrow brown-bordered crossveins bm-cu and dm-cu and vein Cu<sub>2</sub>, respectively; crossvein r-m with small hyaline spot; basal half of cell r<sub>4+5</sub> with hyaline spot between crossveins r-m and dm-cu. Halter white.

Legs mainly brownish yellow, with dark brown femora and brown tibiae.

Abdomen dark brown, tergites subshining brown, smooth, with very sparse and short microtrichia not forming patches, and with long light brown setulae. Membrane between tergites 4 and 5 forming large pouch (fig. 3, 4). Sternites 3–5 subquadrate.

Epandrium as in fig. 3, 5. Hypandrium (fig. 3, 7) short, with two sensillar fields at base of phallus.

Comments. *C. icarus* sp. n. is somewhat similar to *C. fenestellatus* in having cell dm almost entirely hyaline, but differing by the face and abdomen being uniformly brown, without white areas or microtrichose spots, respectively; it also can be readily differentiated from all known species of the genus by having an additional arcuate hyaline band parallel to the wing margin.

Etymology. The species name refers to Icarus (Greek: Ἴκαρος, Latin: Íkaros), a character in Greek mythology, the son of Daedalus known for his attempt to escape Crete by flight, ending in a fall to his death. This name also reflects similarity of the wing pattern to *Callistomyia icarus* Osten Sacken, a peculiar fruit fly (Tephritidae), and is a noun in apposition.

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