

## Only in Costa Rica: new Neotropical flower flies (Diptera: Syrphidae)

[Nur in Costa Rica: neue neotropische Schwebfliegen (Diptera: Syrphidae)]

by

F. Christian THOMPSON, Betty J. THOMPSON and Jennifer E. FAIRMAN

Kingstowne (USA)

Waltham (USA)

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<b>Abstract</b>	Three new flower flies are described from Costa Rica ( <i>Allograpta zumbadoi</i> F. C. THOMPSON spec. nov., <i>Syrphus lacyorum</i> B. J. THOMPSON spec. nov., and <i>Sericomyia (Arctophila) fairmanorum</i> FAIRMAN spec. nov.). These species are endemic to the higher elevations in Costa Rica. Keys to the New World <i>Sericomyia (Arctophila)</i> , Neotropical <i>Syrphus</i> and <i>Allograpta (Rhinoprosopa)</i> species are given.
<b>Key words</b>	Neotropics, Costa Rica, new species, Diptera, Syrphidae, endemism, key
<b>Zusammenfassung</b>	Drei neue Schwebfliegenarten aus Costa Rica werden beschrieben: <i>Allograpta zumbadoi</i> F. C. THOMPSON spec. nov., <i>Syrphus lacyorum</i> B. J. THOMPSON spec. nov. und <i>Sericomyia (Arctophila) fairmanorum</i> FAIRMAN spec. nov. Alle drei Arten sind endemisch in den höheren Bergregionen Costa Ricas. Bestimmungsschlüssel zu den neuweltlichen <i>Sericomyia (Arctophila)</i> -Arten, den neotropischen <i>Syrphus</i> - und <i>Allograpta (Rhinoprosopa)</i> -Arten vervollständigen die Arbeit.
<b>Stichwörter</b>	Neotropis, Costa Rica, neue Arten, Diptera, Syrphidae, Endemismus, Schlüssel

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### Introduction

This is a tale of rare flower flies known only from Costa Rica. For some species, especially those adapted to the cooler areas, Middle America is effectively a series of islands. If one considers only those areas above 2,000 meters (see map in THOMPSON 1997), Costa Rica represents a small cluster of islands isolated from other such adjacent islands to the north or south by some 1,000 miles. On these high islands a highly specialized and unique fauna has evolved. The flies described here as well as others (*Eristalis gatesi* & *E. alleni* THOMPSON, 1997) are found only on these elevational Costa Rican islands (THOMPSON 1997). So, as part of the effort to fully document the biodiversity of Costa Rica, we here present the descriptions of a few unique Costa Rican species and take the opportunity to name them after those who have been special to us so these species may be living monuments. Terminology used here follows THOMPSON (1999).

What use are these flies? For those who care to look closely at life, these are beautiful flies, their splendor adding to the richness of the world around us. But beyond beauty, these flies are undoubtedly critical components of their ecosystem. While we know nothing of their biology, we can infer from what we know of related species that they provide useful services in maintaining a diverse environment. All flower flies are pollinators of flowers as adults. The maggots of *Allograpta* and *Syrphus* are predators on plant-sucking bugs (Homoptera), such as aphids. So, they keep these plant pests in check. *Sericomyia* maggots, characterized by their long "rat-tails", are specialized filter-feeders in bogs. So, they cleanse the water of microorganisms and other particulate matter. All stages provide food sources for large vertebrates, such as birds. So, like all little things, these species sustain the environment we see and need; without them the areas around us would be a wasteland.

## Abbreviations of collections and institutions

- AMNH – American Museum of Natural History, New York  
 CNC – Canadian National Collection, Ottawa  
 UCR – Universidad de Costa Rica, San José  
 INBio – Instituto Nacional de Biodiversidad, Santo Domingo  
 BMNH – Natural History Museum, London  
 USNM – United States National Museum, Washington

## Description of species

### *Allograpta (Rhinoprosopa) zumbadoi* F. C. THOMPSON spec. nov.

(Figs 1c-d, 2a-c)

#### Description

**Head:** strongly produced anteriorly, with tubercle abrupt; face yellow, except black medial vitta, with very short almost microscopic black pile; gena yellow, with very short yellow pile; antennal pits separated; frontal lunule black; frontal triangle yellow laterally, black medial 1/3, black pilose; frons yellow except black medial vitta, black pilose; vertex black, black pilose; occiput black on dorsal 3/4, yellow ventrally, yellow pilose on ventral 1/2, black pilose dorsally. Antenna: scape and pedicel brownish orange, black pilose; basoflagellomere brownish black, arista black.

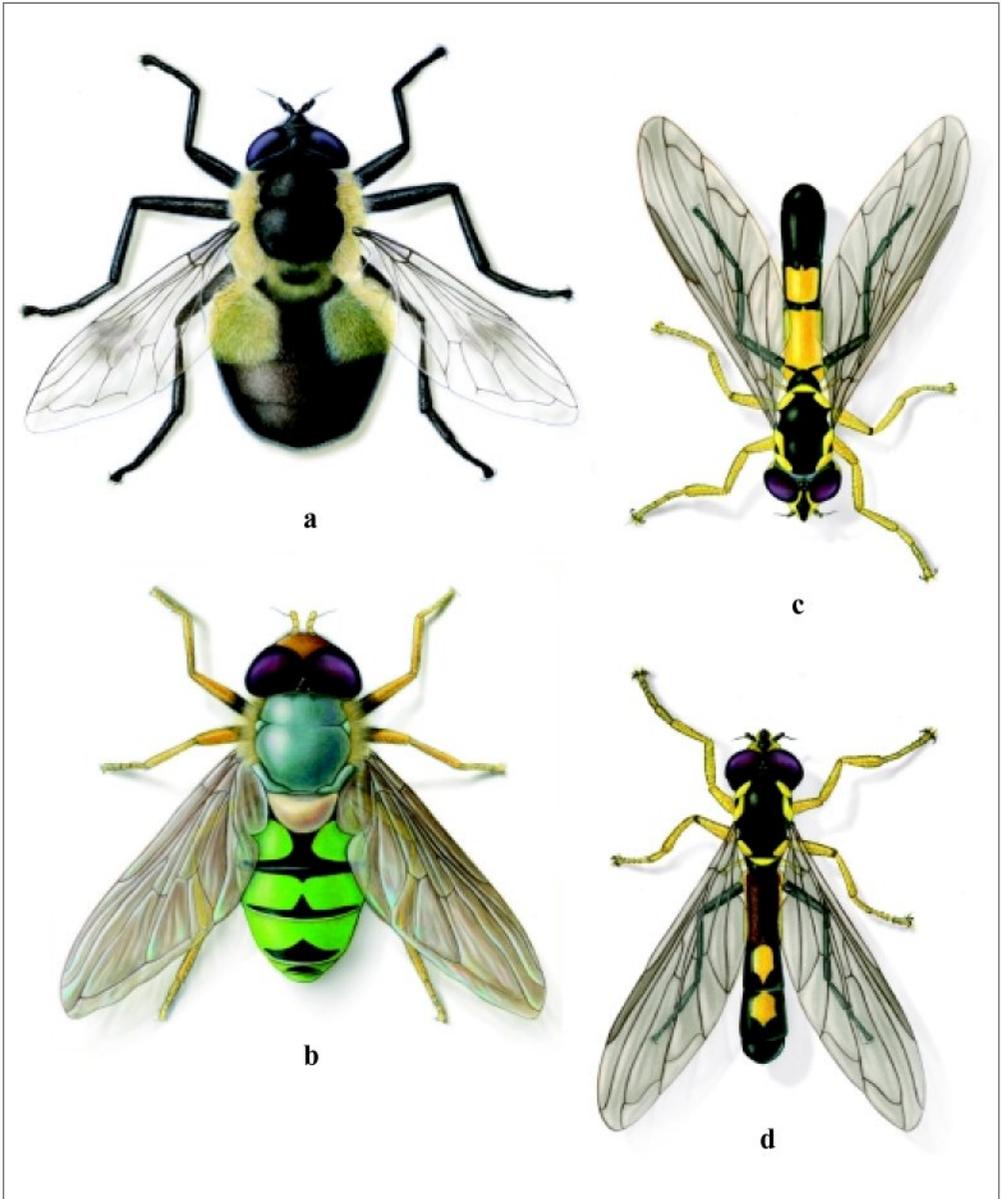
**Thorax:** postpronotum yellow; scutum black, dull black pollinose except yellow anterolaterally to transverse suture, short black pilose except long yellow pilose on notopleuron; postalar callus yellow, yellow pilose except some black pile anteriorly; scutellum black except narrowly yellow basally, without ventral fringe, black pilose; pleuron black except yellow posterior anepisternum and with yellow macula on katapisternum, short, sparse yellow pilose; halter brown with yellow capitulum; calypter black; metasternum black, bare; katapimeron bare; metathoracic pleuron bare. **Legs:** coxae and trochanters black; pro and mesolegs yellow except black on tips of femora, black pilose; metaleg black, black pilose.

**Wing:** light brownish yellow, microtrichose; alula narrow, slightly narrower than cell R.

**Abdomen.** Male: slightly constricted at apex of 3rd and base of 4th terga; 1st tergum yellow except narrowly black apicomediaally, yellow pilose; 2nd tergum black except yellow lateral margin on basal 5/6, long yellow pilose basolaterally, black pilose apicolaterally, with thick flattened long reddish-brown pile elsewhere; 3rd tergum black except for medial yellow macula on basal 3/4, black pollinose except shiny apical margin, black pilose; 4th tergum same as 3rd except yellow macula broader; 5th tergum black, black pollinose except shiny apical margin. Female: parallel-sided; 1st tergum yellow, except narrowly black apicomediaally, yellow pilose; 2nd tergum yellow except narrowly black apically, yellow pilose except black pilose apically; 3rd tergum black except for large yellow quadrate macula occupying basal 2/3 except macula isolated from basal margin, black pilose; 4th, 5th & 6th terga black, black pollinose on basal 3/4, shiny apically, black pilose; sterna 1, 2 & 3 yellow, yellow pilose; sterna 4, 5 & 6 brownish yellow, black pilose; terminalia yellow.

**Material.** **Holotype** male: **Costa Rica, San José,** Parque Nacional Braulio Carrillo, Estacion Barva, 2,500 m, 15 January 1997 (F. C. THOMPSON), deposited in INBio, Santo Domingo.

**Paratypes** (21 ♂♂, 9 ♀♀). **Costa Rica. Cartago:** Rio Macho, 3 km E de Villa Mills, Camino Principal del Cattie, 2,750 m, LS390400 498100, 6 July 1996, A. PICADO, Lot# 7719 (1 ♀ INBIOCR1002444117 USNM); R. F. Rio Macho, Estacion Ojo de Agua, alrededor de la Estacion 3,000-3,017 m, LS 396600 482600, 17 September 1997, B. GAMBOA, Lot# 47752 (1 ♀ INBIOCR1002572006 INBIO); ... 2,980 m, LS 396800 482400, 9 December 1997, E. ALFARO, Lot# 48825 (1 ♀ INBIOCR1002408387 INBIO); ... Sendero a Torre 47, 2,960 m, LS 396700 482800, 28



**Fig. 1a-d:** Habitus, dorsal view. – **a:** *Sericomyia (Arctophila) fairmanorum* FAIRMAN spec. nov.; – **b:** *Syrphus laceyorum* B. J. THOMPSON spec. nov.; – **c-d:** *Allograpta zumbadoi* F. C. THOMPSON spec. nov.; c – female, d – male.

April 1997, A. PICADO, Lot# 46830 (1 ♀ INBIOCRI002541972 INBIO). **Heredia:** Parque Nacional Braulio Carrillo, Estacion Barva, 2,600-2,700 m, LS 234100 523200 11 June 1997, M. A. ZUMBADO, Lot# 46833 (2 ♂ ♂ INBIOCRI002555061-2 INBIO); ... Sendero Laguna Barva, 2,600-2,800 m, LS 234100 523200, 11 June 1997, M. A. ZUMBADO, lot# 46834 (1 ♂ INBIOCRI00555090 USNM); ... 2,500 m, LN 233400 523200, 24 January 1993, M. A. ZUMBADO (1 ♀ INBIOCRI001304987 USNM); 20 km SE Empalme, 2,800 m, August 1988, P. HANSON, Malaise trap (3 ♀ ♀ UCR, USNM), ... November 1988, P. HANSON, Malaise trap (1 ♀ UCR). **San José:** Paramo Cerro Estaquero, Km 94 Carretera Interam., 9 36 25N 83 46 04 W, 3,200 m, 20 May 1997, A. L. NORRBOOM (1 ♂ USNM ENT 00050150

USNM); Estacion Cuerici, Sendero el Carbon, 5 km E. de Villa Mills, 2,700 m, LS390100 500100, 8 January 1996, A. PICADO Lot# 6811 (1 ♀ INBIOCR1002367903 USNM); ... 4.6 km E Villa Mills, alrededor de Estacion, LS 389400 499600, 2,600 m, 28 October 1995, A. PICADO, Lot# 6323 (1 ♂ INBIOCR1002348208 USNM); ... LS 389400 499600, 31 March 1996, A. PICADO, Lot# 7928 (1 ♂ INBIOCR1002394363 USNM); ... LS 389700 499600, 2,700 m, 25 October 1995, A. PICADO, Lot# 6316 (1 ♀ INBIOCR1002363049 USNM); Estacion Cuerici, Camino a la Auxiliadora, 3.5 km E de Villa Mills, 2,700 m, LS 389500 499000, 8 July 1996, A. PICADO, Lot# 7721 (5 ♂ ♂ INBIOCR1002467122-25 INBIO, USNM); ... 27 August 1996, A. PICADO, Lot# 8368 (2 ♂ ♂ INBIOCR1002472870-1 INBIO, USNM); ... 7 June 1996, A. PICADO, Lot# 7686 (1 ♂ INBIOCR1002446184 INBIO); ... 22 August 1996, A. PICADO, Lot# 8363 (2 ♂ ♂ INBIOCR1002472560-1 INBIO, USNM); ... 29 September 1996, A. PICADO, Lot# 8393 (2 ♂ ♂ INBIOCR1002457209-10 INBIO); ... Sendero al Mirador, 4.6 km E de Villa Mills, 2,700 m, LS 389700 499600, 27 September 1996, A. PICADO, Lot# 8391 (1 ♂ INBIOCR1002457057 INBIO); ... Alrededores de la Estacion, 2600 m, LS 389400 499600, 17 September 1995, A. PICADO, Lot# 6303 (1 ♂ INBIOCR1002568230 INBIO); ... Sendero al Mirador, 4.6 km E. de Villa Mills, 2,640-2,700 m, LS 389700 499600, 19 January 1996, B. GAMBOA, Lot# 6784 (1 ♂ INBIOCR1002378696 USNM); ... LS 389700 499600, 27 September 1996, A. PICADO, Lot# 8391 (1 ♀ INBIOCR1002457056 INBIO); ... Sendero al Mirador, alrededores de la Estacion, 4.6 km al E. de Villa Mills, 2,600 m, LS 389400 499600, 11 January 1996, B. GAMBOA, Lot# 6777 (1 ♀ INBIOCR1002392421 INBIO); Reserva Forestal Rio Macho, Estacion Ojo de Agua, 3,000 m, LS 396500 482050 Lot# 46240, 12-19 May 1997, M. SEGURA (1 ♀ INBIOCR1002538893 USNM).

## Remarks

Manuel ZUMBADO has dedicated his life to ensure that the World know the flies of Costa Rica. For years he has served as host and guide to foreign scientists who visit Costa Rica to study Diptera. He is the first curator of Diptera at Instituto Nacional de Biodiversidad, but most importantly he has trained and worked with a large cadre of parataxonomists to amass the largest collection of Diptera in the neotropics. So, with great pleasure I (FCT) dedicate this species to him, so he may forever look to his Costa Rica's mountains and know that they are the home to a species bearing his name.

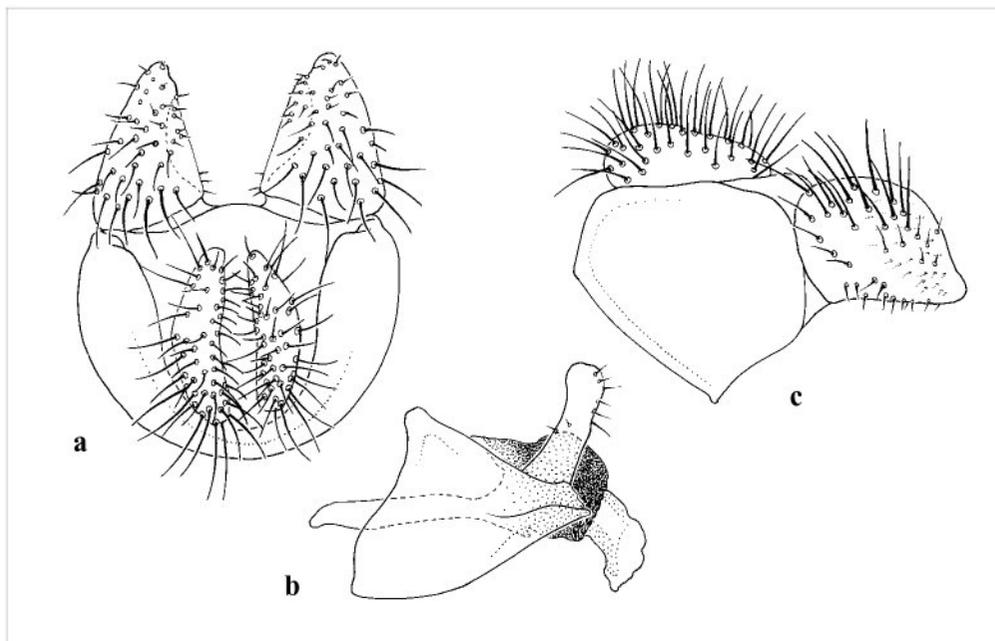


Fig. 2a-c: *Allograpta zumbadoi* F. C. THOMPSON spec. nov., male genitalia, – a: 9th tergum and associated structure, dorsal view; – b: 9th sternum and associated structure, lateral view; – c: 9th tergum and associated structures, lateral view.

*Allograpta zumbadoi* is readily distinguished from all other *Allograpta* species by its facial shape. Likewise, the overall color pattern is unique. Some might want to place *zumbadoi* in a new subgenus of *Allograpta* because of the unique facial shape but I (FCT) leave it in the subgenus *Rhinoprosopa* as it is clearly derived from this clade. A key to the related species of *Allograpta* is presented below. *Allograpta zumbadoi* is unique among the higher elevational flower fly endemics as it seems to be unrelated to anything else. The other endemics described here, as well as the *Eristalis* species (*alleni* and *gatesi*), are members of north temperate clades which extend south towards and beyond the equator along these elevational islands.

### Key to some Neotropical species of *Allograpta*

- 1 Face straight, not produced forward; oral margin distinctly less prominent than antennal bases; oral opening only about 2 times as long as broad; facial tubercle usually (except *armillata* FLUKE, 1942) low, not differentiated dorsally; metasternum pilose ..... *Allograpta (sensu stricto)*
- Face produced forward; oral margin distinctly more prominent than antennal bases; oral opening 3 or more times longer than broad; facial tubercle usually high, distinctly differentiated; if not, metasternum bare ..... 2
- 2 Metasternum pilose ..... *Allograpta (sensu stricto)*
- Metasternum bare ..... 3
- 3 Wing extensively bare basally; alula broad, broader than cell BM (subgenus *Antillus*) (Hispaniola)..... *ascita* VOCKEROTH, 1969
- Wing completely microtrichose; alula narrow, narrower than 2nd basal cell ..... (subgenus *Rhinoprosopa*) 4
- 4 Scutellum partially brownish black; anepimeron black ..... 6
- Scutellum and anepimeron pale, yellow to white ..... 5
- 5 Face with abrupt tubercle; abdomen parallel-sided; 2nd tergum yellow except narrowly black apically (♀) and covered with thick red pile (♂); 3rd tergum with large medial yellow macula (Costa Rica) ..... *zumbadoi* F. C. THOMPSON spec. nov.
- Face with indistinct tubercle; abdomen petiolate, mainly dark with paired oblique yellow fasciae (Ecuador) ..... *lucifer* HULL, 1943
- 6 Katepimeron with at least dorsal portion yellow; metapleura almost completely yellow ..... 8
- Katepimeron and pleurotergite brownish black ..... 7
- 7 Alula narrow, about as wide as cell C and only 1/2 as wide as cell BM (Peru) ..... *flavophylla* HULL, 1943
- Alula broader, almost twice as wide as cell C and about as wide as cell BM (Costa Rica) ..... *sycorax* HULL, 1947
- 8 Abdomen petiolate, at its widest more than twice as wide as its narrowest point (Mexico) ..... *nasuta* BIGOT, 1884
- Abdomen with parallel sides, about same width throughout (West Indies)..... *aenea* HULL, 1937

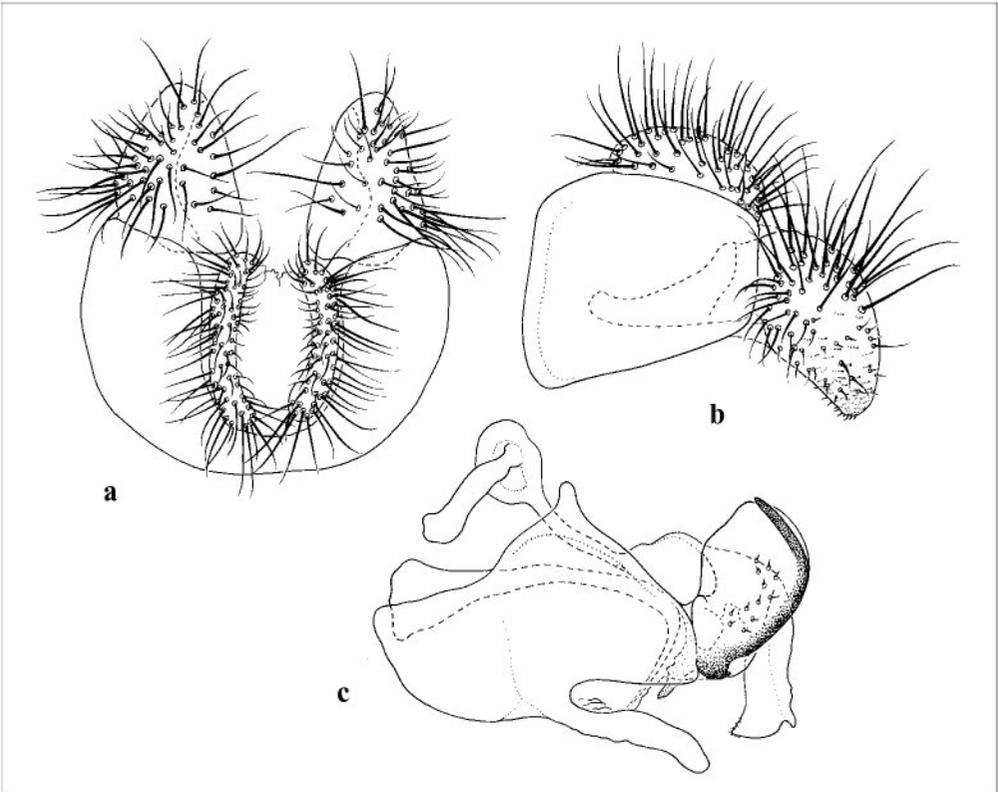
*Syrphus laceyorum* B. J. THOMPSON spec. nov.

(Figs 1b, 3a-c)

**Description**

**Head:** Face orange, yellow pilose (female) or black pilose laterally (male), broadly shiny medially, sparsely yellow pollinose laterally, swollen with tubercle low and indistinct; gena orange, yellow pollinose and pilose; frontal lunule yellow anteriorly, black posteriorly; frontal triangle orange, black pilose; frons orange on lower 4/5, black dorsally, pollinose, black pilose; ocellar triangle black, black pilose; occiput black, white pollinose ventrally becoming yellow dorsally, yellow pilose with a row of black cilia on dorsal 1/4; eye bare. Antenna: scape orange, black pilose; pedicel orange except black dorsally, black pilose; basoflagellomere oval, slightly longer than broad, rounded apically, orange except black dorsal 1/2; arista orange basally, black apically.

**Thorax:** black, greenish gray pollinose, yellow pilose except with black pile intermixed on mesonotum; postalar callus orange, orange pilose; scutellum orange, black pilose; halter yellow; calypter yellow with orange fringe, with yellow and black pile on ventral lobe. **Legs:** coxae, trochanters black, yellow pilose; pro and mesofemora black on basal 1/4, orange apically, yellow pilose except black pilose posteriorly; metafemur black on basal 1/5, orange apically, black pilose basally and on apical 1/2, yellow pilose medially; pro and mesotibiae



**Fig. 3a-c:** *Syrphus laceyorum* B. J. THOMPSON spec. nov., male genitalia. – **a:** 9th tergum and associated structure, dorsal view; – **b:** 9th tergum and associated structure, lateral view; – **c:** 9th sternum and associated structures, lateral view.

orange, orange pilose; metatibia orange, black pilose; tarsi dark brown to black except basitarsomere orange on basal 2/3, black pilose. **Wing** smoky, entirely microtrichose.

**Abdomen:** 1st tergum black, orange pilose; 2nd tergum with large green/orange maculae covering entire lateral margin and extending to medial 1/6 with only slight narrowing, with basal and apical margin narrowly black, yellow pilose basally, black pilose apically; 3rd and 4th terga with broad green/orange fasciae covering 5/6 of tergum, with fasciae incised posteromedially, black pilose; 5th tergum green/yellow except black apicomediaally, black pilose; venter green/yellow, yellow pilose.

**Material. Holotype** male: **Costa Rica**, San José, Parque Nacional Braulio Carillo, Estacion Barva, LN 233400 523200, 24 January 1993, M. A. ZUMBADO, (INBIOCRI001304974), deposited in INBio, Santo Domingo.

**Paratypes** (4 ♂, 1 ♀): same data as holotype (1 ♂ INBIOCRI001304975 USNM, 1 ♂ INBIOCRI001304973 INBio); same locality as holotype, 15 January 1997, Betty THOMPSON (1 ♂ USNM ENT 00030144 USNM); El Mirador, Estacion Cuerici, 4 km al E. Villa Mills, 2900 m, LS 390450 500100, Lot# 8369, 19 August 1996, B. GAMBOA (1 ♂ INBIOCRI002472946 INBio); San José, Cerro de la Muerte, 2,800 m, 20 km south Empalme, March-April 1990, P. HANSON, Malaise Trap (1 ♀ USNM ENT 00030145 USNM).

### Remarks

To JESSIE SELLERS and JOHN LACY, my parents, I (BJT) dedicate this species as a small token of my indebtedness to them for all their love and support.

*Syrphus laceyorum* is readily distinguished from all other known *Syrphus* species in life and sometimes thereafter by the bright green maculae on the abdomen. Unfortunately, in specimens preserved in alcohol and some pinned specimens, this green color transforms to yellow or orange. However, no other New World *Syrphus* species has such large abdominal maculae. The following key was prepared years ago by J. R. VOCKEROTH, but over the years the key has been tested, the terminology to changed to that of THOMPSON (1999) and new species added. His new species have been left in, specimens of which may be found in both the CNC and USNM. Someday these species may be described. *Syrphus laceyorum* runs to VOCKEROTH'S species 5, which is restricted to the high mountains of central Mexico, but is quite different from this species as noted in the key.

*Syrphus laceyorum* may be more wide ranging. After this manuscript was prepared, J. R. VOCKEROTH pointed out that he had seen a specimen of it or a similar species from Ecuador [Rio Blanco, 1,600 m, 13 June 1968, E. VELASTEGUI (SEDMAN Collection)]. Unfortunately, the specimen is damaged, lacking basoflagellomeres, and is a female. It differs from *laceyorum* in having the postalar callus partially black pilose, the halter with black capitulum, the pro- and mesocoxae and trochanters black pilose and the dorsal lobe of calypter brown. Until more material is discovered, the status of the Ecuadorian populations cannot be determined.

### Key to the Neotropical Species of *Syrphus*

- |   |   |    |
|---|---|----|
| 1 | Abdomen with maculae on 3rd & 4th terga (Chilean).....  | 10 |
| – | Abdomen with fasciae on 3rd & 4th terga .....   | 2  |
| 2 | Femora entirely yellow to orange.....   | 8  |
| – | Femora at least narrowly black basally; hind femur usually extensively black .....  | 3  |
| 3 | Cell C bare on basal 3/4 or more; basoflagellomere rounded apically; metafemur black on basal 4/5; frons only obscurely darkened above antenna (Mexico) ..... |    |
|   | ..... <i>sonorensis</i> VOCKEROTH, 1983   |    |
| – | Cell C entirely microtrichose or bare on basal 1/6 or less.....   | 4  |

- 4 Frons with a pair of distinct, isolated, rounded, partly confluent, shiny black maculae above antenna; metabasitarsus entirely dark dorsally; ♂ with fasciae on 3rd & 4th terga not reaching lateral margin (Mexico) ..... **nov. spec. 4 (VOCKEROTH)**  
 – Frons only obscurely darkened above antennae, or if blackish, black area extends length of frons; metabasitarsus orange basally and dark apically on dorsal surface; ♂ with fasciae on 3rd & 4th terga reaching lateral margin at least anteriorly ..... 5
- 5 Basoflagellomere elongate, much longer than broad, distinctly narrowed apically ..... 7  
 – Basoflagellomere short, as long as broad, evenly rounded apically (Mexico) ..... 6
- 6 Wing completely microtrichose; abdominal maculae very broad, encompassing 5/6 of terga and reaching lateral margin in their full width (Costa Rica) .....  
 ..... ***laceyorum* B. J. THOMPSON spec. nov**  
 – Wing bare basomedially, cell R bare and anterobasal 1/3 cell BM bare; abdominal maculae narrow, encompassing only 1/3 of tergal width and greatly constricted laterally (Mexico) ..... **nov. spec. 5 (VOCKEROTH)**
- 7 Maculae on 2nd tergum narrowly reaching lateral margin; fasciae on 3rd & 4th terga broader and reaching lateral margins in their full width (Mexico to Ecuador) .....  
 ..... ***shorae* FLUKE, 1950**  
 – Maculae on 2nd tergum not reaching lateral margin; fasciae on 3rd & 4th terga narrower, strongly narrowed at lateral margins (Brazil to Argentina) .....  
 ..... ***phaeostigma* WIEDEMANN, 1830**
- 8 Basal cells (cells R & BM) more than 1/2 microtrichose (Chilean) .....  
 ..... ***reedi* SHANNON, 1927**  
 – Basal cells almost entirely bare ..... 9
- 9 Basoflagellomere rounded apically (Mexico) ..... ***opinator* OSTEN SACKEN, 1877**  
 – Basoflagellomere acute apically (Jamaica) ..... ***vockerothi* THOMPSON, 1981**
- 10 Wing virtually bare, only with a few scattered microtrichia ..... ***pallipes* BIGOT, 1884**  
 – Wing almost entirely microtrichose ..... 11
- 11 Eye with very short sparse pile ..... ***octomaculatus* WALKER, 1837**  
 – Eye with abundant and distinct pile ..... 12
- 12 Basoflagellomere yellow-orange ventrally; calypter with abundant hairs on dorsal surface of ventral lobe; usually large species ..... ***poecilogaster* PHILLIP, 1865**  
 – Basoflagellomere entirely black; calypter bare or with at most 2-3 hairs; small species ..... **nov. spec. 2 (VOCKEROTH)**

***Sericomyia (Arctophila) fairmanorum* FAIRMAN spec. nov.**

(Figs 1a, 4a-c)

**Description**

**Head:** Black; face shiny except broad sublateral silvery-yellow pollinose vitta (♂), (♀) dark reddish brown, (♂) black; paraface distinct, silvery pollinose, black pilose; gena sparsely silvery pollinose, white pilose; lunule orange; frontal triangle shiny except brownish pollinose laterally, black pilose; frons shiny on anterior 1/3, brownish-black pollinose posterior-

ly, black pilose; vertical triangle brownish-black pollinose, black pilose; occiput silvery-white pollinose, black pilose anteriorly and yellow pilose posteriorly; antenna black, black pilose; eyes holoptic, with area of contact about as long as ocellar triangle.

**Thorax:** Black; postpronotum yellow pilose; mesonotum brownish-black pollinose, mainly black pilose, with yellow pile narrowly along anterior margin and on notopleuron; postalar callus and scutellum yellow pilose; pleuron sparsely gray pollinose, yellow pilose; posterior anepimeron bare; meron bare; metasternum pilose; plumula brownish yellow; calypter with dorsal lobe brown, ventral lobe orange. **Legs:** black, black pilose except for a few yellow pili basoposteriorly on pro and mesofemora; femora swollen; mesofemur with small subapical posterior flange; mesotibia slightly produced dorsoapically; metatibia with long apical spur on posterior side. **Wing:** hyaline except brownish anteromedially, microtrichose.

**Abdomen:** Black; terga shiny except gray pollinose on 1st, black pilose except yellow pilose on 1st and on basolateral 1/3 of 2nd terga; sterna shiny, long yellow pilose on 1st-3rd sterna; 4th sternum black pilose; terminalia black and yellow pilose.

**Material. Holotype** male: Costa Rica, San José, Reserva Forestal Rio Macho, Estacion Ojo de Agua, 3,000 m., LS 396500 482050 Lot# 46240, 12-19 May 1997, M. SEGURA (1 ♂ INBIOCRI002538886) deposited in INBio, Santo Domingo

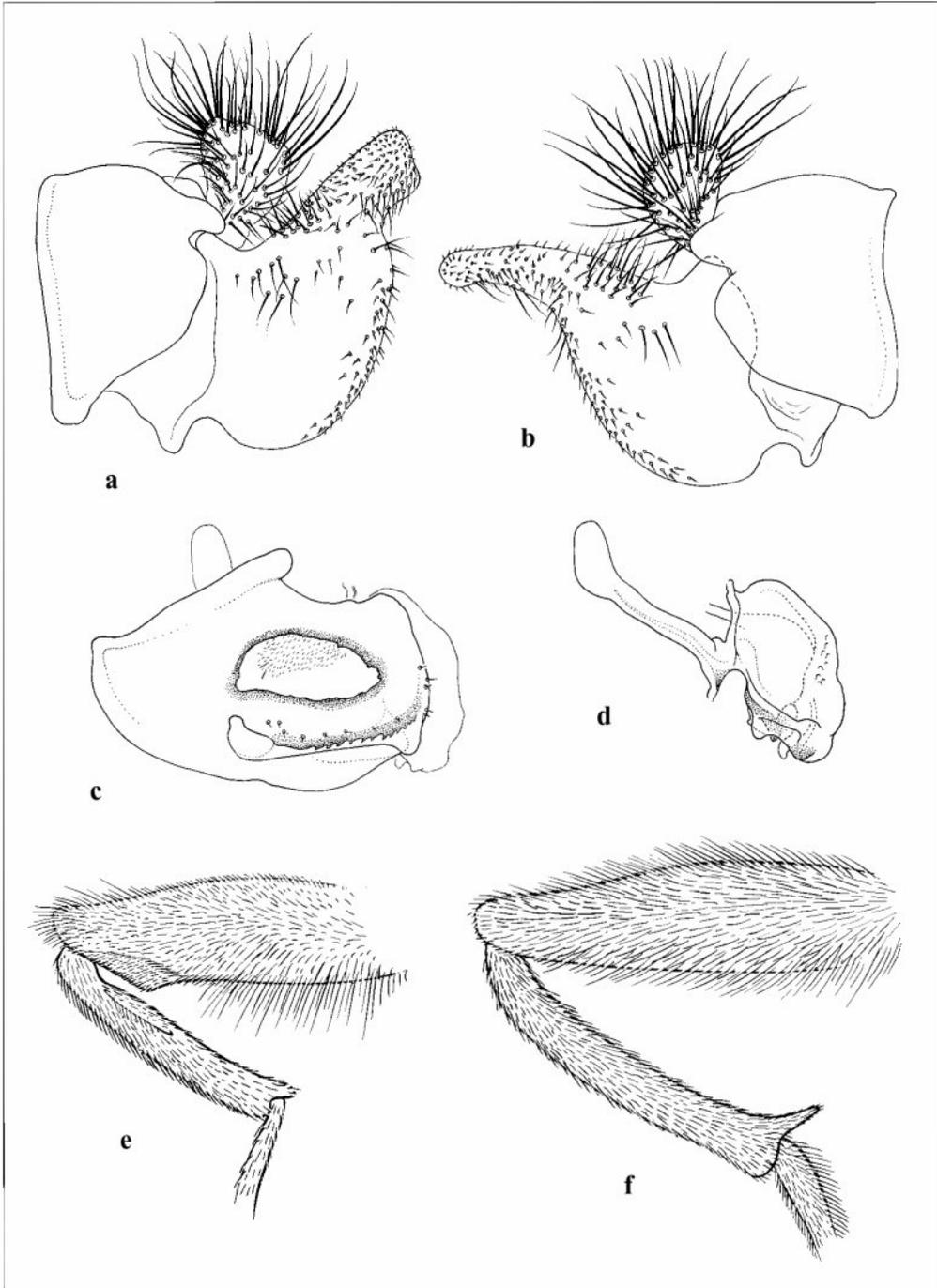
**Paratypes** (6 ♂♂, 18 ♀♀): Costa Rica. Cartago: Rio Macho, Estacion Ojo de Agua, Camino a Torre 46, 2,760 m, LS 396700 482550, 12 April 1997, B. GAMBOA, Lot# 46759 (1 ♂ INBIOCRI002565334 INBIO). San José: Reserva Forestal Rio Macho, Estacion Ojo de Agua, 3,000 m., LS 396500 482050, January 1997, M. SEGURA (1 ♂ INBIOCRI005535146 USNM); ... 8 April-23 May 1997, Malaise Trap, B. GAMBOA, Lot#46763 (6 ♀♀ INBIOCRI002565455-60 INBIO, USNM); ... 12-19 May 1997, M. SEGURA, Lot#46240 (1 ♀ INBIOCRI00253887 USNM); ..., Calle a Providencia, 3,000 m., LS 395800 483100, 25 March 1997, A. PICADO, Lot# 45539 (1 ♂ INBIOCRI002537699 INBIO); ... 29 March 1997, A. PICADO, Lot #45545 (2 ♀♀ INBIOCRI002537851-2 INBIO); Sendero a Cerro Uran, 3,000-3,200 m., LS 387200 510500, 30 April 1997, A. PICADO, Lot# 46213 (1 ♂ INBIOCRI002504275 USNM); Highway #2, Kilometer mark 93, 3,200 m, 83 45'W 9 36'N, 7 April 1985, H. GOULET & L. MASNER (1 ♂ USNM ENT 00030135 CNC); Villa Mills, Km 84 Inter-American Highway, 3,100 m, 14-16 Feb 1992, D. M. WOOD (1 ♂ USNM ENT 00030136 USNM); Cerro de la Muerte, 20 km S Empalme, 2,800 m, March-April 1989, P. HANSON (1 ♀ USNM ENT 00030137 UCR), ... March-April 1990, P. HANSON (1 ♀ USNM ENT 00030138 UCR); ... 16 km S Empalme, 2,600 m, March-April 1990, P. HANSON (1 ♀ USNM ENT 00030139 BMNH); ... 6 km W Villa Mills, Inter-American Highway, 3,340 m, 29 September 1971, 0700-0900 hours, E. R. HEITHAUS (#8929), on flower of *Senecio orestedeanus* BENTH. #234 (1 ♀ USNM ENT 00030140 USNM); ... 26 November 1971, 0910-1015 hours, E. R. HEITHAUS (#14044), on flower of *Senecio orestedeanus* BENTH. #234 (1 ♀ USNM ENT 00030141 USNM); ... 3 Jan 1972, 0900-1100 hours, E. R. HEITHAUS (#15930-1), on flower of *Senecio orestedeanus* BENTH. #234 (2 ♀♀ USNM ENT 00030142, ...37868 CNC, USNM); ... 22 Jul 1971, 1330-1445 hours, E. R. HEITHAUS (#4569), on flower of *Vaccinium consanguinum* K. #225 (1 ♀ USNM ENT 00030143 USNM). **Heredia:** PNBC, Sendero Laguna Barva, 2,600-2,800 m, LN 234100 523200, 11 June 1997, M. A. ZUMBADO, Lot# 46834 (1 ♀ INBIOCRI002555072 USNM).

## Remarks

I (JEF) dedicated this species to my parents, Richard Alan and Jane S. FAIRMAN, for all of their love and support.

Only one other *Sericomyia* (*Arctophila*) species is known from south of the United States (three other species are known from Canada and USA). *Seriocmyia* (*Arctophila*) *meyeri* FLUKE is readily distinguished from *fairmanorum* by its longer face, dichoptic eyes in male, lack of apical spur on metatibia, reddish pile on 3rd and 4th terga and partially bare wing.

While the subgenus *Arctophila* is clearly a phenetic, not cladistic, group, we have continued to recognize it until a phylogenetic analysis of *Sericomyia* as a whole can be done. The species included in *Arctophila* are easily separated from those included in *Sericomyia* as they are all *Bombus* mimics. The New World species of the subgenus *Arctophila* are distinguished by the following key.



**Fig. 4a-f:** *Sericomyia (Arctophila) fairmanorum* FAIRMAN spec. nov. – **a:** 9th tergum and associated structure, right side, lateral view; – **b:** 9th tergum and associated structure, left side, lateral view; – **c:** 9th sternum and associated structure, lateral view; – **d:** aedeagus, lateral view; – **e:** mesoleg, posterior lateral view; – **f:** metaleg, lateral view.

**Key to the New World Species of *Sericomyia* (*Arctophila*)**

- 1 Scutellum yellow pilose ..... 3  
 – Scutellum black pilose ..... 2
- 2 Face black; postalar callus yellow pilose; scutum entirely yellow pilose (northcentral North America) ..... **nov. spec.**  
 – Face brownish-yellow, with brown vitta; postalar callus black pilose; scutum broadly black pilose anterior to scutellum (Pacific Northwest) ..... *harveyi* OSBURN, 1908
- 3 Face yellow; antenna orange; anepimeron pilose posteriorly (western North America) ..... *flagrans* OSTEN SACKEN, 1875  
 – Face and antenna dark, reddish brown to black; anepimeron bare posteriorly ..... 4
- 4 Abdomen extensively yellow to reddish pilose on 3rd and 4th terga; wing bare basomedially; face produced ventrally; male dichoptic; male metatibia without apical spur (central Mexico) ..... *meyeri* FLUKE, 1939  
 – Abdomen black pilose on 3rd and 4th terga; wing microtrichose; face not produced ventrally; male holoptic; male metatibia with apical spur (fig. 4e) (Costa Rica) ..... *fairmanorum* FAIRMAN **spec. nov.**

**Acknowledgements**

We thank David GRIMALDI (AMNH); J. CUMMINGS & J. R. VOCKEROTH (CNC); Paul HANSON (UCR); Manuel ZUMBADO (INBio); for permission to study material in their care. Special thanks are also due J. R. VOCKEROTH for sharing his knowledge of flower flies freely with all. We are indebted to Titana LITWAK for the illustrations of the male genitalia. The color habitus drawings were done by the last author, Jennifer FAIRMAN, and as copyright holder of these images she hereby makes them available for non-commercial and scientific use only. We also thank Drs. Neal EVENHUIS, Bishop Museum, Honolulu (BBM); Stephen GAIMARI, Department of Entomology, Smithsonian Institution, Washington; Allen L. NORRBOM and Steven W. LINGAFELTAR, Systematic Entomology Laboratory, USDA, Washington; for their critical reviews of the manuscript. We acknowledge with great thanks the James Smithson Society, Smithsonian Institution, for providing a grant which allowed us to visit Costa Rica and study its unique flower fly fauna.

The taxonomy and writing of this manuscript were done by the senior author, the junior authors are responsible for the species they described.

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**Authors' addresses**

Betty J. & F. Christian THOMPSON  
 6611 Green Glen Court  
 Kingstowne, VA 22315  
 USA

Jennifer E. FAIRMAN  
 44 Hammond St., Apt A  
 Waltham, MA 02451  
 USA

Accepted on 10 March 2000.

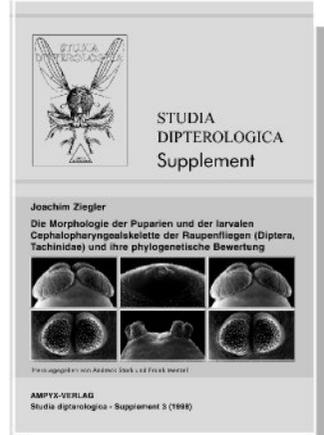
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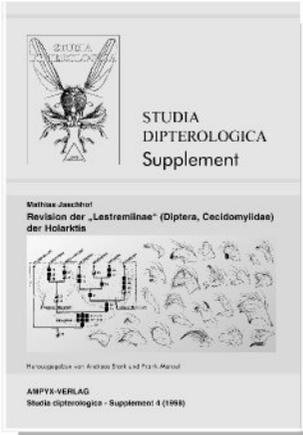
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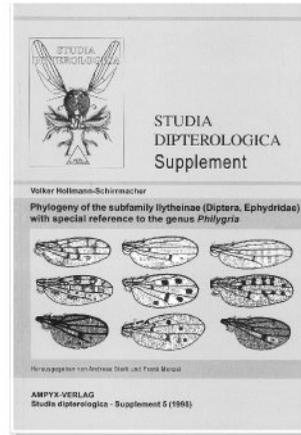
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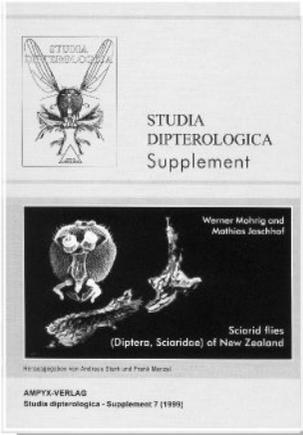
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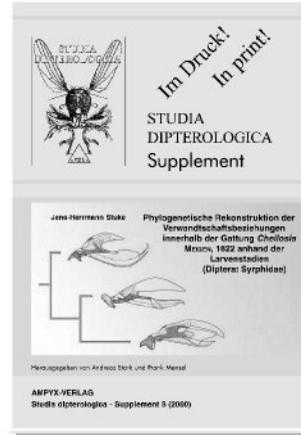
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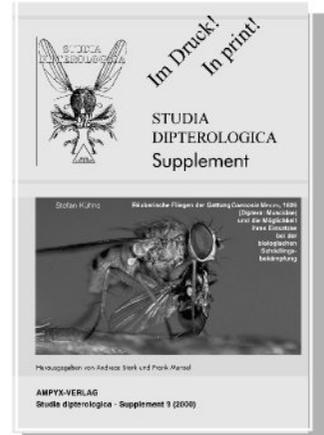
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