

## A new genus and species of Richardiidae (Diptera) from Hispaniola

DANIEL E. PEREZ-GELABERT<sup>1</sup> & F. CHRISTIAN THOMPSON<sup>2</sup>

<sup>1</sup>Department of Entomology, National Museum of Natural History, Smithsonian Institution, Washington, D. C. 20560 USA. E-mail: perezd@si.edu

<sup>2</sup>Systematic Entomology Laboratory, PSI, Agricultural Research Service, U. S. Department of Agriculture, NHB-0169, Smithsonian Institution, Washington, D. C. 20560 USA. E-mail: cthomps@sel.barc.usda.gov

### Abstract

A new genus and species of richardiid flies are described from the Neotropical biotic region (*Johnrichardia* Perez-Gelabert & Thompson, type species, *vockerothi* Perez-Gelabert & Thompson (Dominican Republic)).

**Key words:** Taxonomy, Richardiidae, Neotropical Region

### Introduction

The family Richardiidae is a small group of semitropical to tropical flies restricted to the New World. They are related to the true fruit flies (Tephritidae). What is known of their biology indicates that the maggots are plant feeders or saprophages in decaying plant material (Ferrar 1987). One species (*Melanoloma viatrix* Hendel) has been reported as a pest of pineapple (Peñeranda & Ospina 1995, Martinez *et alia* 2000). Another species (*Epiplatea hondurana* Steyskal) was reported from diseased coconut palm (Steyskal 1958). The family consists of 30 genera and 175 species (Thompson 2004). The last keys to World genera were published by Hendel (1911a, b), although Steyskal (1958, 1987) published keys to the genera found in America north of Mexico. Catalogs have been published by Aczél (1950) and Steyskal (1968). Various authors (Griffiths 1972, Hennig 1958, McAlpine 1989, Korneyev 1999) have published on the phylogenetic relationships of the family and all have placed it among the basal groups of the Tephritoidea. In the most recent and only parsimony analysis (Korneyev 1999), however, the Richardiidae were an unresolved polytomy with respect to the derived (=higher of Korneyev) tephritoids and the more primitive ones (=lower of Korneyev).

A striking new form of Richardiidae was recently found in the Dominican Republic. At first, this fly was mistaken for a flower fly as it appears much like *Salpingogaster* Schiner (Syrphidae). This new genus and species differs from all other richardiids in the loss of orbital and lateral vertical setae. However, the taxon agrees well with the more derived richardiids, subfamily Richardiinae, in having all femora armed with an apicoventral row of spinose setae and a broad postmetacoxal bridge. The genus belongs among those genera with an abbreviated anal vein (vein A1) and a key is presented to separate these genera.

Terminology follows McAlpine (1981) as modified in part by White et alia (1999) and Steyskal (1984). Also, the Latin terms for hair / hairs / hairy (pile, pili, pilose) are used as they are more broadly understood, having been used by Linnaeus, and refer to macrotrichia. Pollen, pollenose, pollinosity are used to describe microtrichia (see Thompson 1999: 349).

#### Key to genera related to *Odontomera*

*Odontomera* and related genera differ from all other Richardiidae by the following combination of characters: Femora with apicoventral rows of spinose setae; postmetacoxal bridge complete; anal vein (A1) short, not reaching wing margin.

1. Head without orbital setae and lateral vertical seta; size large: body 15 mm, wing 11 mm ..... *Johnrichardia* **gen. nov.**
- Head with orbital and lateral vertical setae; size smaller: body less than 10 mm, wing less than 6 mm ..... 2
2. Crossveins r-m and dm-cu coincident or at least not as far part as length of crossvein dm-cu; scutellar setae 2 pairs ..... *Antineuromyia* Hendel
- Crossveins r-m and dm-cu farther apart than length of crossvein dm-cu; scutellar seta 1 pair ..... 3
3. Frons, in lateral view, strongly developed dorsoanteriorly on ventral 1/2, with produced portion almost as long as eye is wide (fig. 4) ..... *Oedematella* Hendel
- Frons not so produced, never more than 1/4 as long as eye width (figs. 3, 5) ..... 4
4. Occiput, in lateral view, broad dorsally, as broad on dorsal 1/4 as on ventral 1/3 (fig. 5) ..... *Sepsisoma* Johnson
- Occiput, in lateral view, narrow dorsally, much narrower on dorsal 1/4 than on ventral 1/3 (fig. 3) ..... 5
5. Postpronotal seta present; ocellar triangle base (posterior margin) well anterior to posterior eye margin ..... *Macrostenomyia* Hendel
- Postpronotum without seta; ocellar triangle base more or less in line with posterior eye margin ..... *Odontomera* Macquart

## Note on key

*Macrostenomyia* Hendel (1907) (a replacement name for *Stenomicra* Loew (1873: 180) was incorrectly placed by Hendel (1911a & b) in his keys to the genera as he apparently did not study specimens of the genus. *Macrostenomyia* has the occiput reduced dorsally as in *Odontomera* and other genera, not expanded as in *Sepsisoma*. We have studied vouchers of the type species (*Sepsis guerinii* Bigot (1857: 822) compared to those used by Loew and to Bigot's original species description.

***Johnrichardia* Perez-Gelabert & Thompson, gen. nov.**

Type-species: *Johnrichardia vockerothi* Perez-Gelabert & Thompson

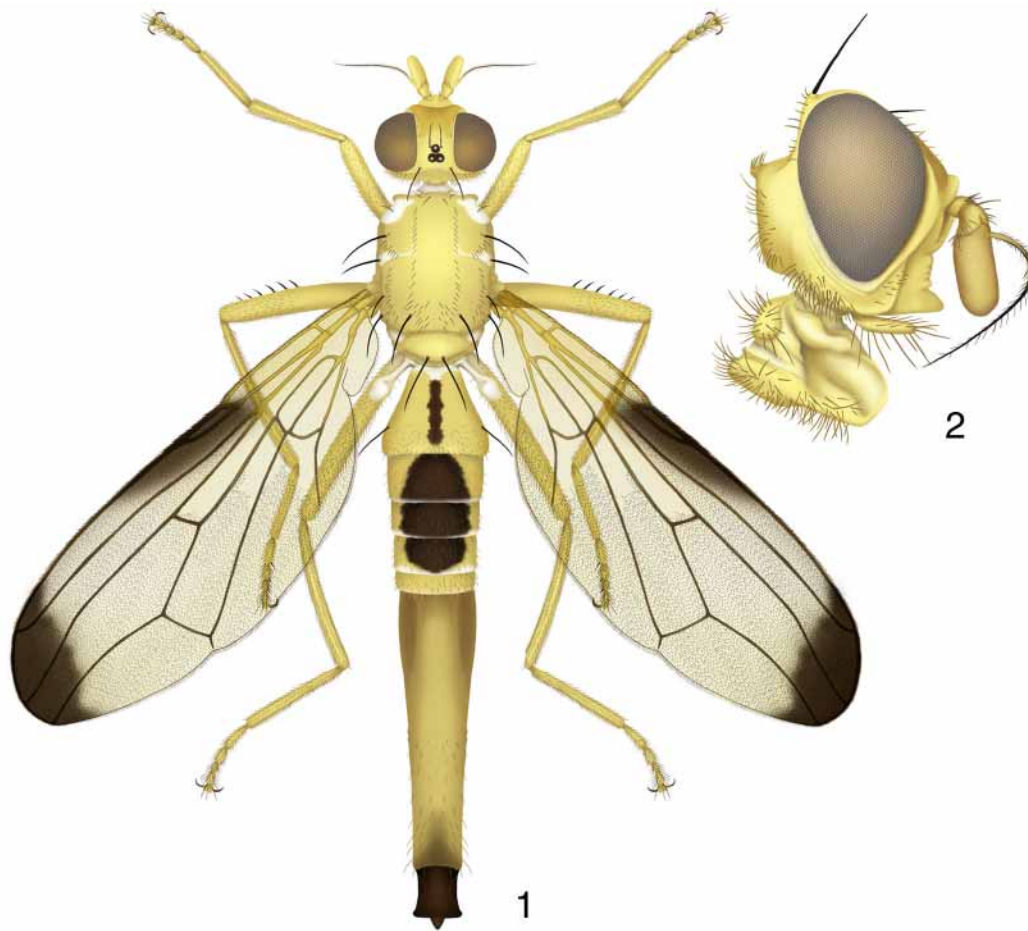
**Head:** Clypeus well developed; arista pubescent; frons normal, not produced; without orbital seta; with only medial vertical seta and proclinate ocellar seta; occiput narrow in lateral view on dorsal 1/2 (fig. 2).

**Thorax:** Postpronotum with distinct, but short and weak seta; propleuron with short pile dorsad to procoxa; notopleuron with 2 long strong setae; scutum with 1 long strong supra-alar seta, 1 long strong postalar seta, 1 long strong dorsocentral seta slightly anterior to scutellum and aligned with postalar seta, 1–2 short weak scapular setae on anterior margin of scutum, with a row of distinct pili running long dorsocentral line; scutellum with 1 pair subapical seta; anepisternum with 1 strong and 1 weak posterodorsal setae, with some pile on ventral posterior portion; katepisternum with a few scattered pili dorsally, longer and denser pili anterior to mesocoxa; anepimeron with row of short pile on posterior 1/2; meron bare; katatergum with long pili dorsad to spiracle; metasternum pilose; postmetacoxal bridge complete, broad. Legs: long; all femora with apicoventral rows (anterior and posterior) of black setae (5–8 setae per row)[anterior row on mesofemur of holotype are projected anteriorly so as to be visible dorsally]; mesotibia with long strong posteroapical seta. Wing. Subcostal break distinct; costa without long setae except 1 on basicosta; veins bare; vein R1 slightly but distinctly expanded subapically; crossvein r-m slightly beyond midpoint of cell dm; vein A1 short, only reaching half way to margin; alula normal.

**Abdomen:** Petiolate; 1 long strong seta on lateral margin of syntergum 1+2 near mid-length; 7th segment (oviscape) slightly longer than rest of abdomen.

**Etymology.** The name, *Johnrichardia*, is an arbitrary combination of letters created to be similar to the first names of the distinguished dipterist, John Richard Vockeroth. The name is to be treated as feminine.

*Johnrichardia* is readily distinguished from all other richardiids by the loss of orbital and lateral vertical setae. The large size (15 mm) is also unusual as most richardiids are less than 10 mm long.

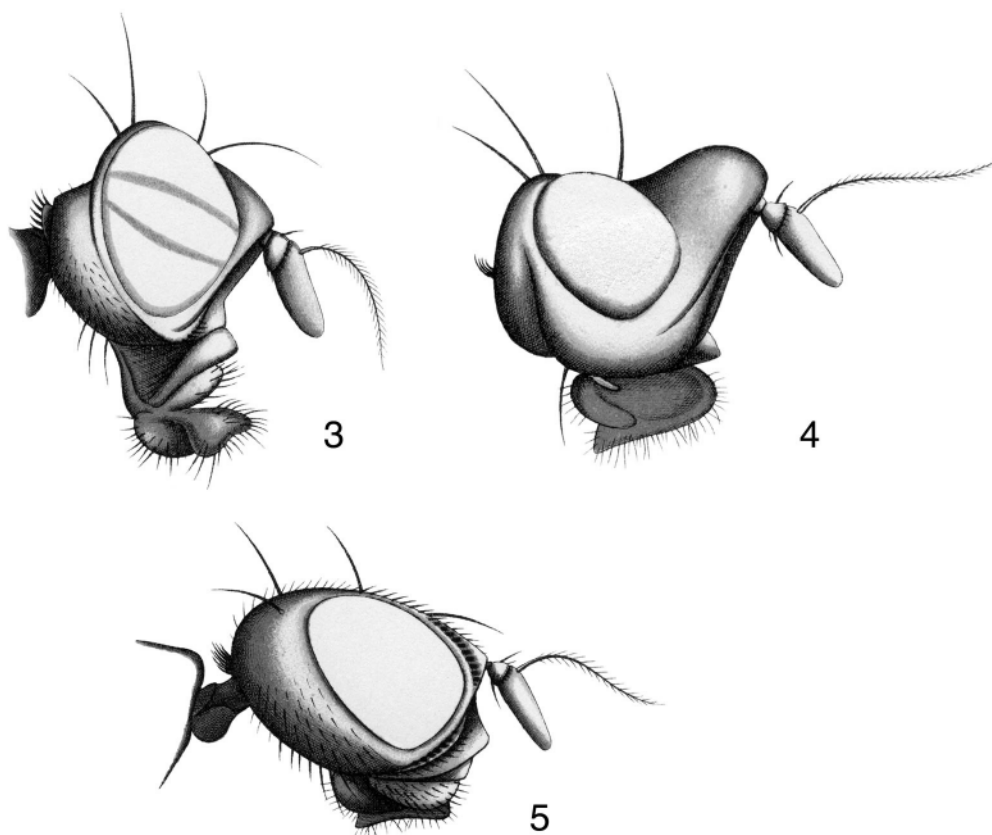


FIGURES 1–2. *Johnrichardia vockerothi*, gen. et sp. nov. 1. Habitus, dorsal view. 2. Head, lateral view.

*Johnrichardia vockerothi* Perez-Gelabert & Thompson, sp. nov.

Yellow with black maculae on first 5 terga; wing hyaline except for enlarged brownish black stigmal and apical maculae.

**Head.** Clypeus yellow; palpus yellow; face yellow, slightly more brownish on ventral 1/2; parafacial stripe yellow, white pollinose; gena yellow, orange pilose; lunule yellow; frons light yellowish brown except narrowly yellow along eye margin; occiput yellow, orange pilose; antenna yellowish orange, orange pilose; basoflagellomere elongate, about twice as long as broad, about 3 times as long as pedicel, with small basoventral round sensory pit on lateral surface; arista long, slightly more than twice as long as rest of antenna.



FIGURES 3–5. Heads, lateral view. 3. *Odontomera nitens* (Schiner), from Hendel 1911b: fig. 54; 4. *Oedematella czernyi* Hendel, from Hendel 1911b: fig. 68; 5. *Sepsisoma geniculatum* (Schiner), from Hendel 1911b: fig. 58.

**Thorax.** Prothorax yellow; setae black except orange postpronotal and anepisternals; meso- and metathorax orangish yellow; calypter white with margin yellow; halter white. Legs: yellow except tarsi orange, pale pilose. Wing: hyaline except costal cell yellow, stigma and adjacent area of cell R1 and apex brownish black, with apical dark macula extending basad of apex of vein R2+3; microtrichose except for bare costal cell except apex, cell R, cell BM, basal 1/3 of cell DM, cell BCU, basal 1/3 of cell CU1, basal 1/2 of anal lobe, alula.

**Abdomen.** Sterna yellowish white, pale pilose; syntergum 1+2 yellow except narrow black medial vitta, pale pilose except black pilose apicomediaally; 3rd–5th terga yellow on lateral 1/4, black on medial 1/2, pale pilose laterally, black pilose medially; 6th tergum yellow, pale pilose laterally, black pilose medially; oviscape orange, pale pilose.

**Length:** body, 15 mm; wing, 11 mm.

Holotype female: **DOMINICAN REPUBLIC.** La Vega: Parque Nacional Armando Bermúdez, La Ciénaga—Los Tablones, 1,100–1,270 m, 19°E 04.044°N 70°E 51.789°W, 17 July 2004, D. Perez (USNM ENT 00038283); deposited in United States National

Museum, Smithsonian Institution, Washington. Paratype female: Dominican Republic, La Vega, La Ciénaga de Manabao, 3,000 ft., 3–5 July 1999, R. E. Woodruff (USNM ENT 00033202) deposited in Florida State Collection of Arthropods, Gainesville.

**Etymology:** The epithet, *vockerothi*, is a noun in the genitive case and derived from the last name of the distinguished dipterist, John Richard Vockeroth (1928).

As the only known species of its genus, *vockerothi* is not likely to be confused with other species. Obviously, the division of generic and specific characters is arbitrary and based merely on what are usually generic / species characters in other groups of Richardiidae.

The type-locality is near the trail to Los Tablones, just across the bridge for pedestrians at La Ciénaga. This is the most visited trail in Parque Nacional Armando Bermúdez as this is the most accessible route to Pico Duarte. At this site (1,100 m), the humid mountain forest consists of large pines (*Pinus occidentalis*) mixed with a dense lower layer of other trees and shrubs. The proximity of the Rio de los Guanos and its confluence with the Yaque del Sur make the area especially humid. Although large portions of the trail are heavily shaded, the fly was collected in a forest clearing on low shrubs.

### Acknowledgements

The senior author was responsible for the field work and the junior for the taxonomy. We are especially indebted to our late colleague, George C. Steyskal, who left copious notes, keys, and other documents on Richardiidae without which our research would have been much more difficult. Thanks to Robert Woodruff, Florida State Collection of Arthropods, Gainesville (FSCA) for loaning us the paratype. Field work and the color habitus drawing were supported in part by a grant from the S. W. Williston Diptera Research Fund, Smithsonian Institution. Special thanks are due to Taina Litwak who prepared the excellent color habitus drawing.

We also thank Irina Brake, Smithsonian Institution, Washington; Geoffrey Hancock, University of Glasgow; Michael Schauff, Allen Norrbom, and Eric Grissell, Systematic Entomology Laboratory, USDA, Washington; for their critical reviews of the manuscript.

### References

- Aczél, M. (1950) Catálogo de la subfamilia americana "Richardiinae" (Dipt. Acalypt. "Otitidae"). *Acta Zoologica Lilloana*, 9, 5–47. [1950. ???]
- Bigot, J.M.F. (1857) Order des Diptères, Latr. Pp. 783–829, pl. 20. In Sagra, R. de la (ed.), *Historie physique, politique et naturelle de l'île de Cuba*. Animaux articulés à pieds articulés. A. Bertrand, Paris, lxxxii + 868 pp. [after 1857.10.10]
- Griffiths, G.C.D. (1972) The phylogenetic classification of the Diptera Schizophora with special reference to the structure of the male postabdomen. *Series entomologica*, 8, 340 pp., W. Junk,

- The Hague. [1972.06.??]
- Hendel, F. (1907) Nomina nova für mehrere Gattungen der acalyptraten Musciden. *Wiener Entomologische Zeitung*, 26, 98. [1907.03.31]
- Hendel, F. (1911a) Die Arten der Dipteren-Subfamilie Richardiinae. *Deutsche Entomologische Zeitschrift* 1911, 181–212 [1911.03.11], 239–270 [1911.05.04], 367–396 [1911.06.26].
- Hendel, F. (1911b). Diptera. Fam. Muscaridae, Subfam. Richardiinae. *Genera Insectorum*, 113, 56 pp., 3 pls. [1911.09.09]
- Hennig, W. (1958) Die Familien der Diptera Schizophora und ihre phylogenetischen Verwandtschaftsbeziehungen. *Beiträge zur Entomologie*, 8, 505–688. [1958.12.??]
- Korneyev, V.A. (1999) Phylogenetic relationships among the families of the superfamily Tephritoidea. Pp. 3–22. In Aluja, M. & Norrbom, A. L. (eds.), *Fruit flies (Tephritidae): Phylogeny and evolution of behavior*. xvi + 944 pp. CRC Press, Boca Raton. [1999.12.20]
- Loew, H. (1873) Monographs of the Diptera of North America. Part III. *Smithsonian Miscellaneous Collection*, 11 [=No. 256], vii + 351 + XIII pp., 4 pls. [1873.12.??]
- Martinez, N.B.de, Rosales, C.R. & Godoy, F. (2000) La Mosca del fruto de la Piña *Melanoloma viatrix* (Diptera: Richardiidae) nuevo insecto plaga en Venezuela. *Agronomia Tropical*, 50, 135–40. [2000.??.??]
- McAlpine, J.F. (1981) Morphology and terminology—Adults. Pp. 9–63. In McAlpine, J. F. (ed.), *Manual of Nearctic Diptera*. Vol. 1, pp. vi + 1–674. *Research Branch, Agriculture Canada, Monograph*, 27. [1981.03.16]
- McAlpine, J.F. (1989) Phylogeny and classification of the Muscomorpha. Pp. 1397–1518. In McAlpine, J. F. (ed.), *Manual of Nearctic Diptera*. Vol. 3, pp. vi + 1333–1581. *Research Branch, Agriculture Canada, Monograph* 32. [1989.03.15]
- Peñeranda, E.A. & Ospina, M.A.O. (1995) Consideraciones generales sobre *Melanoloma viatrix* Hendel, una nueva plaga de la pina. *Revista Colombiana de Entomología*, 21, 1–8. [1995.??.??]
- Steyskal, G.C. (1958) Notes on the Richardiidae, with a review of the species known to occur in the United States (Diptera, Acalyptratae). *Annals of the Entomological Society of America*, 51, 302–310. [1958.05.15]
- Steyskal, G.C. (1968) Family Richardiidae. *A catalogue of the Diptera of the Americas south of the United States*, 53, 26 pp. [1968.04.21]
- Steyskal, G.C. (1984) A synoptic revision of the genus *Aciurina* Curran, 1932 (Diptera, Tephritidae). *Proceedings of the Entomological Society of Washington*, 86, 582–598. [1984.07.17]
- Steyskal, G.C. (1987) Family Richardiidae. Pp. 833–837. In McAlpine, J. F. (ed.), *Manual of Nearctic Diptera*. Vol. 2, pp. vi + 675–1332. *Research Branch, Agriculture Canada, Monograph*, 28. [1987.03.31]
- Thompson, F.C. (1999) A key to the genera of the flower flies (Diptera: Syrphidae) of the Neotropical Region including descriptions of new genera and species and a glossary of taxonomic terms. *Contributions on Entomology, International*, 3, 321–378. [1999.08.23]
- Thompson, F.C. (2004) Family Richardiidae. 259 records in BioSystematic Database of World Diptera. Version 6.5. <http://www.diptera.org/biosys.htm> (accessed 11 September 2004)
- White, I.M., Headrick, D.H., Norrbom, A.L. & Carroll, L.E. (1999) Glossary. Pp. 881–924. In Aluja, M. & Norrbom, A. L. (eds.), *Fruit flies (Tephritidae): Phylogeny and evolution of behavior*. xvi + 944 pp. CRC Press, Boca Raton. [1999.12.20]