

A revision of the *striatella* species group
of the genus *Rhagoletis* (Diptera: Tephritidae)

Vicente Hernández-Ortiz
Departamento de Entomología
Instituto de Ecología A.C., Apartado Postal 63
Xalapa, Veracruz 91000, Mexico

and

Daniel Frías L.
Instituto de Entomología, Facultad de Ciencias Básicas
Universidad Metropolitana de Ciencias de la Educación
Casilla 147, Santiago, Chile

Abstract: A taxonomic revision of species of the *striatella* group, including descriptions of three new species from Mexico, Nicaragua and Costa Rica is presented. To date we recognize 6 species in this group: *Rhagoletis striatella*, *R. jamaicensis*, *R. macquartii*, *R. triangularis* n. sp., *R. nicaraguensis* n. sp., and *R. solanophaga* n. sp. Information and records about their distribution, known host plants, and morphological relationships among the species are discussed. A key to the species within the group is presented.

Resumen: Se presenta una revisión taxonómica de las especies del grupo *striatella*, la cual incluye descripciones de tres nuevas especies provenientes de México, Nicaragua y Costa Rica. A la fecha reconocemos 6 especies en este grupo: *Rhagoletis striatella*, *R. jamaicensis*, *R. macquartii*, *R. triangularis* n. sp., *R. nicaraguensis* n. sp., and *R. solanophaga* n. sp.. Se discute información sobre su distribución, plantas hospederas conocidas, y las relaciones morfológicas entre sus especies. Además se presenta una clave para separar todas las especies del grupo.

Introduction

In North America the genus *Rhagoletis* is represented by 24 species widely distributed in temperate regions of Canada and the U.S.A. (Bush, 1966; Berlocher & Bush, 1982; Berlocher, 1984; Foote *et al.*, 1993). Twenty-three species have been recorded from Mexico to South America (in Brazil, Argentina, and Chile) (Foote, 1981; Hernández-Ortiz, 1985 and 1993; Frías, 1992). Of these species only six are shared with North America: *R. striatella* Wulp, *R. cingulata* (Loew), *R. pomonella* (Walsh), *R. completa* Cresson, *R. juglandis* Cresson and *R. boycei* Cresson.

Most of the known species with Central and South American distribution belong to the *nova* group (6 species), the *psalida* group (3 species), the *striatella* group (3 species) and the *ferruginea* group (3 species) (*sensu* Foote, 1981). Our knowledge of their host plants shows that most of them are mainly associated with the Solanaceae (Smyth, 1960;

Bush, 1966; D'Araujo e Silva *et al.*, 1968; Munro, 1968; Foote, 1981; Frías *et al.*, 1984 and 1992).

The *striatella* species group as characterized by Bush (1966) included just one species. But in the later revision of the genus *Rhagoletis* south of the United States by Foote (1981), two other species were recognized from Central and South America.

In this study we make a taxonomic revision of the *striatella* species group (*sensu* Foote, 1981), and describe three new species. We add new locality records and biological data of host plants for one of them. Interspecific relationships within the group are discussed, and a key for segregation of all known species is provided.

Materials and Methods

Specimens examined are from the following regions: states of Chiapas and Veracruz, Mexico; the province of Guanacaste, Costa Rica, and from the Meseta de los Pueblos, Nicaragua.

The general terminology used in the text is based on McAlpine (1981). For specific nomenclature associated with the wing pattern and the terminalia we followed Foote (1981), and Norrbom and Kim (1988). Identification of botanical samples was made by Gonzalo Castillo from the Department of Sistemática Vegetal (IdeE, Xalapa).

Acronyms used in the text correspond to the following institutions: CNIN= National Collections of Insects, Nicaragua; IBUNAM= Instituto de Biología, Universidad Nacional Autónoma de México, México, DF.; IEXA= Instituto de Ecología A.C., Xalapa, Veracruz; INBIO= Instituto Nacional de Biodiversidad, Costa Rica; USNM= United States National Museum, Washington, DC.

The *striatella* species group

Currently the *striatella* group includes three species (*sensu* Foote, 1981): *R. striatella* Wulp, *R. macquartii* (Loew) and *R. jamaicensis* Foote, but to date these have not been fully characterized, mainly because the males and host plant relationships of the latter two species remain unknown. Foote (1981) hypothesized the relationships among species, mainly based on the following characters: the absence of the accessory costal band of wing pattern; by the uneven darkening of the hind tibiae and by the presence of spherical spermathecae. To this we must include the presence of the three complete transverse bands; the anterior and posterior apical bands well developed; apical extreme of the posterior apical band ending away from apex of vein M; and prenisetae located a short distance from the apex of outer surstyli.

This group has a certain resemblance in the wing pattern with species of the *cingulata* group, which differs in several characters such as spermathecae elongated; prenisetae located at middle of length of outer surstyli; a different shape of apical appendage of distiphallus; and the apical extreme of the posterior apical band touching the apex of vein M.

Meanwhile, the species of Central and South American distribution within the *nova*, *psalida* and *ferruginea* groups differ by the presence of the accessory costal band developed, and the anterior and posterior apical bands, or both usually are incomplete or absent.

Key to the *Rhagoletis* species of the *striatella* group

1. Scutellum whitish with sides of base black and a triangular shaped spot of same color along middle base of disc (Fig. 2A-B); males and females with fore femora and coxae blackish; hyaline area between anterior and posterior apical bands just reaching to vein R_{4+5} (Fig. 1E-F) 2
- 1'. Scutellum completely whitish or with a transverse band along base of disc contiguous to scuto-scutellar suture; fore femora and coxae yellow (at least in females in some species); hyaline area between anterior and posterior apical bands usually extending anterior to vein R_{4+5} (Figs. 1A-D) 3
- 2(1). Mesonotum black with a whitish pollinosity pattern forming two well-defined, conspicuous broad bands (Fig. 2A); discal band usually very narrow at posterior extreme (in cell CuA_1); discal and subapical bands separated along vein CuA_1 , but sometimes weakly joined at posterior extreme of both bands *R. striatella* Wulp
- 2'. Mesonotum black, scarcely provided with whitish pollinosity but not forming a well defined pattern (Fig. 2B); discal band usually parallel-sided along entire length; discal and subapical bands very close and touching along vein CuA_1 *R. triangularis* Hernández & Frías, n. sp.
- 3(1'). Mesonotum distintively red-yellowish and with a weak pollinosity pattern of four longitudinal stripes (Fig. 2C); second costal cell hyaline on apical third near pterostigma (only with a small spot at proximal base); sub-basal and discal bands completely separated along entire length; discal and subapical bands broadly joined along most of width of cell CuA_1 *R. solanophaga* Hernández & Frías, n. sp.
- 3'. Mesonotum black with whitish pollinosity pattern forming four longitudinal stripes; discal and subapical bands connected or separated at posterior margin of wing; second costal cell with black spots in proximal and distal portions; hyaline fascia between anterior and posterior apical bands usually originates at middle of width of cell r_3 4
- 4(3'). Pollinosity pattern of mesonotum with all stripes completely separated; sub-basal and discal bands broadly connected along entire length forming a big compact spot; second costal cell mostly blackish; anterior apical band with a slender hyaline fascia along costal margin of cell r_3 (Fig. 1A) *R. macquartii* (Loew)
- 4'. Pollinosity pattern of mesonotum with stripes connected anteriorly in pairs but separated in

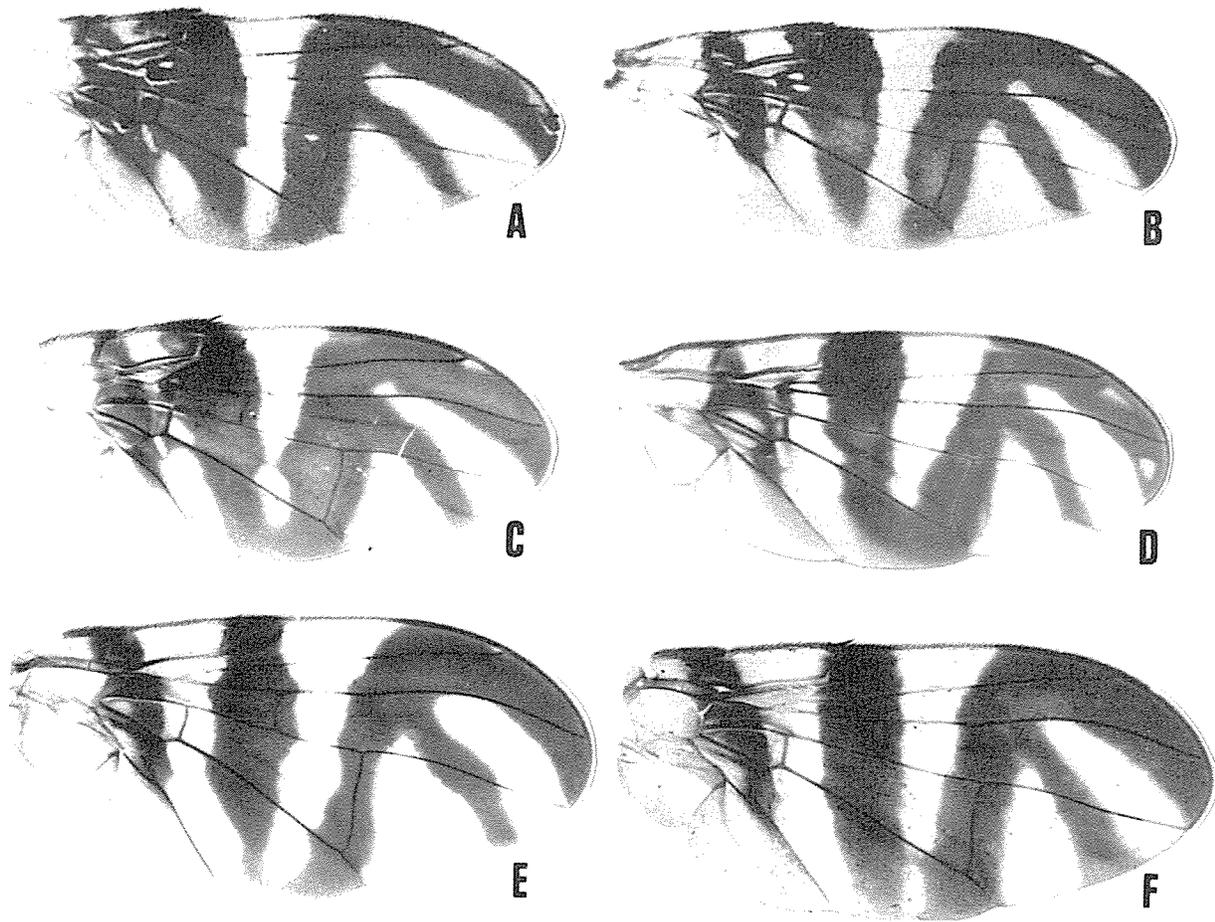


Figure 1. Wing pattern of *Rhagoletis* species of the *striatella* group: A) *R. macquartii*; B) *R. jamaicensis*; C) *R. nicaraguensis* n. sp.; D) *R. solanophaga* n. sp.; E) *R. striatella*; F) *R. triangularis* n. sp. (Figures A-B after Foote, 1981).

the middle; sub-basal and discal bands partially connected just at the base of radial sector with both bands differentiated; anterior apical band completely extended to distal margin of cell r_3 (along costal vein), except by a small hyaline spot at end of vein R_{2+3} (Figs. 1B-C) 5

- 5(4'). Discal and subapical bands broadly connected at posterior margin of wing in most of cell CuA_1 ; subapical and posterior apical bands broadly connected throughout width of cell r_5 (Fig. 1C); scutellum mostly whitish with only very narrow black fascia along scuto-scutellar suture (Fig. 2D)
 *R. nicaraguensis* Hernández & Frias, n. sp.
- 5'. Discal and subapical bands separated along entire length; connection of posterior apical band to subapical band narrower than total width of cell r_5 (Fig. 1B); scutellum whitish with a broad black spot occupying approximately one third of discal base *R. jamaicensis* Foote

***Rhagoletis striatella* Wulp**

Fig. 1E, 2A

Rhagoletis striatella Wulp, 1899: 408. Biologia Centrali Americana Zool. Insecta, Diptera Vol 2.

Known distribution. CANADA: Ontario. U.S.A.: Michigan, Wisconsin, Illinois, Iowa, New Mexico and Texas (Bush 1966: 518). MEXICO: Guerrero, Amula (Wulp 1899: 408); México, El Yukón, 8800 ft, 4-VIII-1962 ex. *Physalis* sp.; Agua Bendita, Tenango del Valle; Tlaxcala, Huamantla (Bush 1966: 516,518). Jalisco, Guadalajara, 15 mi NE, 17-IX-1970, G.E., R.M. Bohart; Durango, Navíos, 26 mi E El Salto, 2-VIII-1964, 8000 ft, J. F. McAlpine (Foote (1981: 37).