Anales de Biología 39: 223-226, 2017
DOI: http://dx.doi.org/10.6018/analesbio.39.23

SHORT REPORT

First record of *Coenosia attenuata* Stein, 1903 (Diptera: Muscidae) in Venezuela

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Received: 7 July 2017
Accepted: 17 November 2017
Published on-line: 13 December 2017

Resumen

Primer registro de Coenosia attenuata *Stein, 1903 (Diptera: Muscidae) en Venezuela*

La mosca tigra, *Coenosia attenuata* Stein, 1903 es un importante depredador de insectos pequeños como moscas blancas, moscas del mantillo, minadores, y otros pequeños hemípteros y lepidópteros. El objetivo de esta investigación es reportar la presencia de esta especie por primera vez en Venezuela, donde ha sido observada en casas de cultivo ubicadas en el estado Miranda, depredando adultos de *Trialeurodes vaporariorum* (Westwood, 1856) y de moscas de los géneros *Bradysia* Winnertz, 1867 y *Liriomyza* Mik, 1894 sobre crisantemo (*Chrysanthemun* sp.), gerbera (*Gerbera jamesonii* Bolus y Hook), lechuga (*Lactuca sativa* L.) y pimentón (*Capsicum annuum* L.). La presencia de la mosca tigra en Venezuela subraya la necesidad de investigaciones sobre su uso potencial como un agente de biocontrol de insectos plaga.

Palabras clave: Control biológico, Mosca tigre, Depredador.

Abstract

The tiger-fly *Coenosia attenuata* Stein, 1903 is an important predator of small insects such as whiteflies, fungus gnats, leafminers, and other small Hemiptera and Lepidopters. The aim of this research is to report the occurrence of this species for first time in Venezuela, where it has been observed in greenhouses located in Miranda state, predating adults of *Trialeurodes vaporariorum* (Westwood, 1856) and of the fly genera *Bradysia* Winnertz, 1867 and *Liriomyza* Mik, 1894 on chrysanthemum (*Chrysanthemum* sp.), gerbera (*Gerbera jamesonii* Bolus ex Hook), lettuce (*Lactuca sativa* L.) and pepper (*Capsicum annuum* L.). The occurrence of the tiger-fly in Venezuela underlines the necessity for researches into its potential use as a biocontrol agent of insect pests.

Key words: Biological control, Tiger-fly, Predator.

Introduction

Coenosia attenuata Stein, 1903 (Diptera: Muscidae), known as the "tiger-fly" or "killer-fly", is a species described from Egypt and is now distributed in many countries of Europe, Africa, Asia and Oceania (Pont 1977, 1980, 1989, Couri & Salas 2010, Pohl *et al.* 2012, Seabra *et al.* 2014). This fly has been shown to be an important natural enemy as both the larvae and the adults are predators. The adult is polyphagous and can catch and kill prey even when not hungry (Martinez & Cocquempot 2000, Sensenbach 2004). As a result, various researches have been conducted to study the adaptability of *C. attenuata* to laboratory rearing in order to produce it in large numbers for release among commercial crops (Martins *et al.* 2012, 2015).

Tiger-fly adults are characterized by the manner in which they attack any potential prey that flies near them. The fly catches its prey in mid-air with its front legs and then takes it to a nearby surface where it uses its proboscis to make a hole in the neck area and to suck the body contents of the prey. Bodies can be found with a hole in the dorsal part of the occiput (towards the thorax) or decapitated (Mateus 2012, Martins *et al.* 2012). The characteristics of the attack have been studied by Mateus (2012) and Wardill *et al.* (2015) who have described how *C. attenuata* can move towards its prey when this is located at a distance of 7.9 to 30 cm.

Among the species recorded as the prey of *C. attenuata* are the following: *Bemisia tabaci* (Gennadius, 1889) and *Trialeurodes vaporariorum* (Westwood, 1856) (Hemiptera: Aleyrodidae), *Bactericera cockerelli* Sulc, 1909 (Hemiptera: Triozidae), *Bradysia* spp. (Diptera: Sciaridae), *Liriomyza* spp. (Diptera: Agromyzidae) and *Tuta absoluta* (Meyrick, 1917) (Lepidoptera: Gelechiidae), which are common on plants grown in greenhouses (Téllez & Tapia 2005, Mateus 2012, Martins *et al.* 2012, Bautista-Martínez *et al.* 2017).

On the American continent, the tiger-fly was recorded for the first time in Ecuador (2002) in greenhouses and in the field in Peru (Martínez-Sánchez *et al.* 2002). Since then, *C. attenuata* has invaded different countries such as the United States (2002), Canada (2004), Argentina (2005), Colombia (2006), Costa Rica (2008), Chile (2010) and México (2017) where it has been reported feeding on the insect pests of crops grown in those regions (Hoebeke *et al.* 2003, Sensenbach 2004, Tellez & Tapia 2005, Pérez 2006, Roy & Fréchette 2006, Hernández 2008, Couri & Salas 2010, Bautista-Martínez *et al.* 2017). This pattern of dispersal suggests that the tiger-fly is also present in other countries of South America because of its ability to adapt to different climatic conditions and to spread through the export of vegetable material (Martínez-Sánchez *et al.* 2002, Hernández 2008). According to Carvalho *et al.* (2005), 39 species of *Coenosia* Meigen, 1826 are recorded from the Neotropical region, and to date the only other species of this genus known from Venezuela is *Coenosia plumiseta* Stein, 1911 (Cova-García 1964).

Description of *Coenosia attenuata*

The fly is small, about 2.5-4.0 mm in length. The male has yellow antennae and legs (Fig. 1B), and the face and frons are strikingly silvery-white. The female is slightly larger and darker than the male, has black antennae, the femora largely black, and the abdomen with distinct black bands (which are absent in the male) (Fig. 1A). The female frons is brownish, contrasting with the golden colour of the ocellar triangle (Martinez & Cocquempot 2000, Couri & Salas 2010).

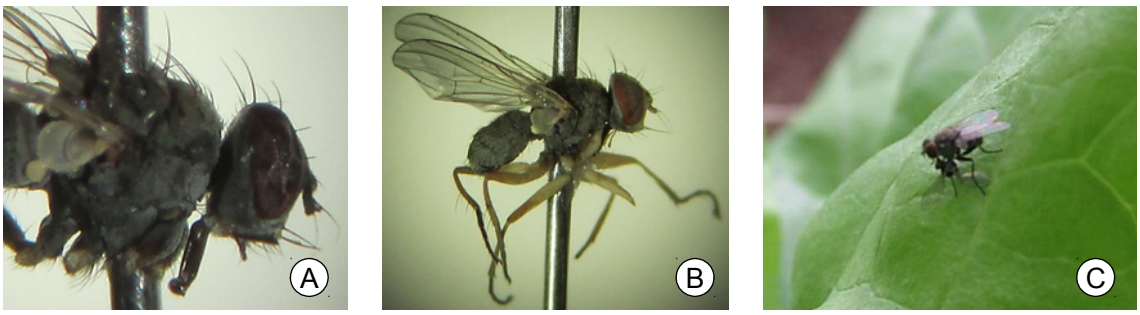

Figura 1. *Coenosia attenuata*. **A:** Probóscide de la hembra; **B:** Macho, lateral; **C:** Adulto depredando a *Liriomyza* sp.

Figure 1. *Coenosia attenuata*. **A:** Female proboscis; **B:** Male, lateral; **C:** Adult predating *Liriomyza* sp.

Results

Adults of *C. attenuata* were collected feeding on whiteflies (*T. vaporariorum*) and adults of *Bradysia* and *Liriomyza* (Fig. 1C), on chrysanthemum (*Chrysanthemum* sp., Asteraceae), gerbera (*Gerbera jamesonii* Bolus ex Hook, Asteraceae), lettuce *(Lactuca sativa* L., Asteraceae) and pepper (*Capsicum annuum* L., Solanaceae) which were grown in greenhouses in El Jarillo (Guaicaipuro municipality, Miranda state-Capital Region) at 1550 m. This is the first report of *C. attenuata* in Venezuela, and its entry may have been in gerbera plants from Holland or Russia or through a natural entry from Colombia.

The presence of a large number of tiger-flies feeding on *Bradysia* and *Liriomyza* on crops grown in the Capital Region, suggests that this predator has the potential to control other insect pests such as whiteflies, fungus gnats, leafminers, and other small Hemiptera and Lepidopters, not only those associated with greenhouses but also in open field on crops such as tomato (*Lycopersicon esculentum* Mill.), onion (*Allium cepa* L.) and potato (*Solanum tuberosum* L.), grown in other regions of Venezuela.

Material examined: El Jarillo, Miranda. Venezuela. (1550 msnm) (10º21'01''N, 67º02'20''W), 23-II-2016 (Y. Solano & Y. Goyo): 2f, 1m. Specimens deposited in the Museo José M. Osorio. UCLA (Venezuela), with 1m 1f in the Natural History Museum, London, United Kingdom.

Acknowledgements

We would like to express our thanks to the Fondo Nacional de Ciencia, Tecnología e Innovación (FONACIT) for funding project 2013002127, and to Lcda. Milagros Parra, CDCHT-UCLA project 022-AG-2013, Ing. Walter Morillo (INSUBIOL) and Ing. Raquel Chico for their assistance in carrying out this project.

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