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Black Fig Fly, *Silba adipata*[1] McAlpine, in Backyards of the State of Mexico

Néstor Bautista-Martínez, Ricardo Meraz-Álvarez*, Jorge Manuel Valdez-Carrasco, and Everardo López-Bautista

The Lonchaeidae family, commonly known as "lance flies", is well-represented in several regions of the world. However, little or nothing is known about the identity and biology of some species (Korytkowski and Ojeda 1971, Nicácio and Uchôa 2011, MacGowan et al. 2012, Rot et al. 2017). Although the larvae of these dipterans are mainly colonizers of decomposing vegetation, a few species are primary invaders of plant material (McAlpine 1981) and some of them are considered potential agricultural pests (MacGowan and Okamoto 2013, Radonjić et al. 2019). One example is the black fig fly, *Silba adipata* McAlpine (Diptera: Lonchaeidae), which is a major pest of fig (*Ficus carica* L.) and is widely distributed in the Mediterranean Basin, Balkan Peninsula, countries of the Middle East, and some parts of southeastern Africa (Giliomee et al. 2007, Rot et al. 2017), as well as Japan (Raz 1998).

In Mexico, commercial figs are cultivated on 1,357 ha distributed in 14 states; 75% of the cultivated area is concentrated at Morelos, Baja California, and Veracruz. The volume of national production is 7,704 tons, with a value of approximately 169 million pesos (SIAP 2018). In April 2015, phytosanitary authorities signed the Appendix of the operational work plan for export of fresh figs from Mexico to the United States (SENASICA 2020), making figs an export crop.

In places such as the State of Mexico, people have fig trees in their backyards to produce fruit mostly for family consumption and occasionally for sale in the local market. Insect-damaged fruits that drop off before reaching maturity were observed at some sites. In this context and considering the increasing importance of the crop, we proposed to identify the species of insect that caused the damage.

From late November 2019 to January 2020, fig fruits were collected from fig trees at several locations (Colegio de Postgraduados 19°27'34.7" N 98°54'12.0" W; San Felipe 19°30'25.0" N 98°53'46.8" W; Boyeros 19°29'57.3" N 98°53'56.9" W; and San Juan Tezontla 19°32'38.7" N 98°48'55.5" W, Texcoco, State of Mexico). The fruit was dissected to obtain larvae and puparia, but some fruits to allow development and emergence of adult specimens were not dissected.

According to illustrations by McAlpine (1956) and keys by MacGowan and Freidberg (2008), the species was identified as *Silba adipata* McAlpine, commonly known as the black fig fly. Fig. 1 shows adults of both sexes, which are very similar

[1]Diptera: Lonchaeidae

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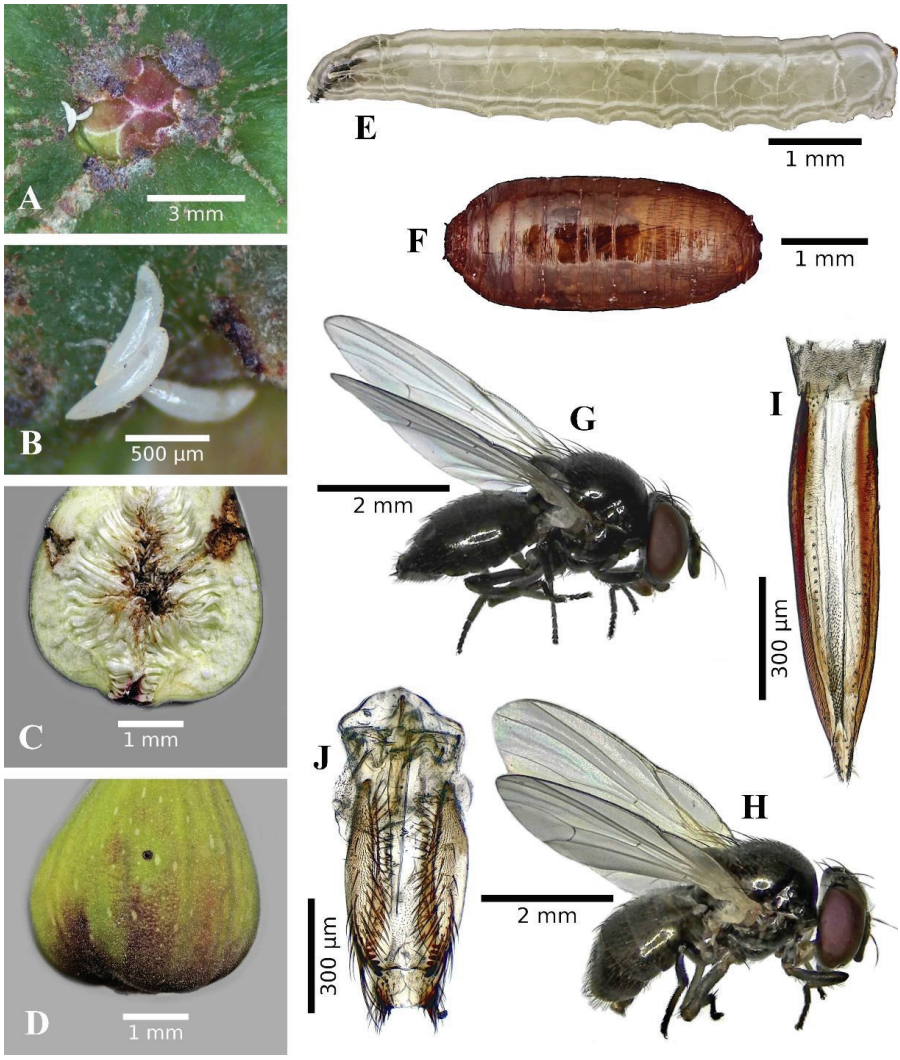

Fig. 1. A) Eggs laid in the ostiole, generally hidden among the fruit scales; B) Closeup of eggs; C) Internal damage caused by feeding larvae; D) Orifice through which the larva exits to pupate in the soil; E) *S. adipata* third instar larva; F) Puparium; G) Female; and H) Male *S. adipata* with their genitalia: I) Aculeus and J) Terminalia, respectively.

and differ only in the shape of the last abdominal segment: in females it is tapered in the distal part and in males it is rounded. Shown are genitalia used to support identification of the species, the larva, and the puparium characteristic of acalyptratae dipterans. Also shown are images of the site of oviposition on the fruit, as well as

internal damage to the fruit and the orifice exit where the larva exits to drop to the ground to pupate. Specimens were deposited in the entomological collection of the Colegio de Postgraduados Campus Montecillo, Texcoco, State of Mexico.

Silba adipata is a monophagous, multivoltine species with four to six generations per year (Katsoyannos 1983). It usually lays eggs in the ostiole of immature fruit; larvae feed on the tissue just below the epidermis where they form galleries and cause the fruit to drop before ripening (Katsoyannos and Guerin 1984). The insect is known in Spain (Mallorca), Italy, Greece, Cyprus, the Canary Islands, Syria, Israel, Jordan, Egypt, Iraq, and South Africa (MacGowan and Freidberg 2008). However, the insect also has been reported in other regions such as Murcia (Carles-Tolrá and Lencina 2010), Malta (Mifsud et al. 2012), Turkey (Tutmus 2013), Slovenia (Rot et al. 2017), Montenegro (Radonjić et al. 2019), and Portugal (Pereira 2019), where it caused economic damage to fig production.

In Mexico, this is the first record of the species. Its geographical distribution and behavior in Mexico are not precisely known, and therefore, it is necessary to broaden sampling to learn aspects to implement phytosanitary measures, if necessary, to prevent fig-producing regions from being affected. According to Nicácio and Uchôa (2011), Tephritidae and Lonchaeidae fruit flies are the principal pests in the neotropical region.

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