USDA Animal and Plant Health Inspection Service
U.S. DEPARTMENT OF AGRICULTURE

Importation of Common Fig (*Ficus carica* L.) from Mexico into the Continental United States for Consumption

A Qualitative, Pathway Initiated Pest Risk Assessment

Version 1.0

October 14, 2026

Agency contact
Plant Pest Risk Analysis
Science and Technology
Plant Protection and Quarantine (PPQ)
Animal and Plant Health Inspection Service (APHIS)
United States Department of Agriculture (USDA)
920 Main Campus Drive, Suite 400
Raleigh, NC 27606

Executive Summary

The purpose of this report is to assess the pest risks associated with importing commercially produced fruit of fig, *Ficus carica* L. (Moraceae), from Mexico into the continental United States for consumption.

The pest risk assessment was developed in response to a request submitted by Plant Protection and Quarantine to determine if the known fig pests in Mexico had changed since market access was originally granted and to determine if current mitigation measures are still warranted. We did not consider any production, harvest, post-harvest, shipping, or storage conditions during the development of this risk assessment.

We used scientific literature, port-of-entry pest interception data, and information from the government of Mexico to develop a list of pests with quarantine significance for the continental United States. These are pests that occur in Mexico on any host and are associated with the commodity plant species anywhere in the world. Then we determined the likelihood of introduction for each pest that has a reasonable likelihood of being associated with the pathway.

The following organisms are candidates for pest risk management because they have met the threshold for unacceptable consequences of introduction and can follow the commodity import pathway.

Pest type	Taxonomy	Scientific name	Likelihood of Introduction
Arthropod	Diptera: Lonchaeidae	*Neosilba flavitarsis* MacGowan and Lasa	Low
Arthropod	Diptera: Lonchaeidae	*Neosilba glaberrima* (Wiedemann)	Low
Arthropod	Diptera: Lonchaeidae	*Neosilba recurva* MacGowan and Lasa	Low
Arthropod	Diptera: Lonchaeidae	*Silba adipata* McAlpine*	Low
Arthropod	Diptera: Tephritidae	*Anastrepha fraterculus* (Wiedemann)	Medium
Arthropod	Diptera: Tephritidae	*Ceratitis capitata* (Wiedemann)	High

* This pest is considered quarantine significant for the continental United States. However, APHIS is currently re-evaluating this status.

The detailed examination and choice of appropriate phytosanitary measures to mitigate pest risk are addressed in a separate document.

Table of Contents

Executive Summary **1**

1. Introduction **3**
1.1. Background 3
1.2. Initiating event 3
1.3. Potential weediness of the commodity 3
1.4. Description of the pathway 3

2. Pest List and Pest Categorization **4**
2.1. Pest list 4
2.2. Notes on pests identified in the pest list 7
2.3. Pests considered but not included on the pest list 8
2.4. Pests selected for further analysis 9

3. Assessing Pest Risk Potential **9**
3.1. Introduction 9
3.2. Assessment 10

4. Summary **21**

5. Literature Cited **23**

1. Introduction

1.1. Background

The purpose of this report is to present PPQ's assessment of the pest risk associated with the importation of commercially produced fresh fruit of fig (*Ficus carica* L.) from Mexico (referred to as the export area) into the continental United States (referred to as the pest risk analysis or PRA area) for consumption.

This is a qualitative risk assessment. The likelihood of pest introduction is expressed as a qualitative rating rather than using numerical terms. This methodology is consistent with guidelines provided by the International Plant Protection Convention (IPPC) in the International Standard for Phytosanitary Measures (ISPM) No. 11, "Pest Risk Analysis for Quarantine Pests" (IPPC Secretariat, 2019). The use of biological and phytosanitary terms is consistent with ISPM No. 5, "Glossary of Phytosanitary Terms" (IPPC Secretariat, 2026).

As defined in ISPM No. 11, this document comprises Stage 1 (Initiation) and Stage 2 (Risk Assessment) of risk analysis. Stage 3 (Risk Management) will be covered in a separate document.

1.2. Initiating event

PPQ's Imports, Regulations, and Manuals (IRM) unit requested a current pest risk assessment for Mexican fig to ensure that they had the most current pest information. Specifically, they wanted to know if the known fig pests in Mexico had changed since market access was originally granted to determine if a change in mitigation measures currently in place for black fig fly are still warranted.

1.3. Potential weediness of the commodity

In some cases, an imported commodity could become invasive in the PRA area. If warranted, we analyze the commodity for weed risk. A weed risk analysis is not required when (a) the commodity is already enterable into the PRA area from other countries, (b) the commodity plant species is widely established or cultivated in the PRA area, or (c) the imported plant part(s) cannot easily propagate on its own or be propagated. We determined that the weed risk of fig fruit does not need to be analyzed because the commodity is already enterable from several countries, including Mexico.

1.4. Description of the pathway

A pathway is "any means that allows the entry or spread of a pest" (IPPC Secretariat, 2026). In the context of this document, the pathway is the commodity to be imported, including any conditions or processes the commodity undergoes that may impact pest risk. We determine that an organism follows the pathway if it is associated with the commodity from harvest through all subsequent steps—handling, processing, storage, transport, importation, and distribution—until it reaches its destination. For this specific risk assessment, we considered the pathway to include the commodity, conditions, and processes described in the following sub-sections. Commodities that undergo different production practices, conditions, and processes would be considered to follow a different pathway and would need to be assessed in a separate risk assessment.

1.4.1. Description of the commodity

The specific pathway of concern is the importation of fresh fruit of fig (*Ficus carica* L.) for consumption from Mexico to the continental United States.

1.4.2. Summary of the production, harvest, post-harvest, shipping, and storage conditions considered

Production, harvesting, and post-harvesting procedures and shipping and storage conditions in the export area were not considered during this assessment beyond basic culling of damaged fruit.

2. Pest List and Pest Categorization

The pest list is a compilation of plant pests of quarantine significance to the continental United States. This list includes pests that are present in Mexico on any host and are known to be associated with *Ficus carica* anywhere in the world. Pests are of quarantine significance if they are not present in the PRA area, are actionable at U.S. ports of entry, are federal noxious weeds, are considered for or under federal official control, or require evaluation for regulatory action. Species with a reasonable likelihood of following the pathway into the PRA area are analyzed to determine their pest risk potential.

2.1. Pest list

We developed the pest list based on scientific literature, port-of-entry pest interception data, and information provided by the government of Mexico. We listed the pests that are of quarantine significance to the PRA area in Table 1. For each pest, we provided evidence for presence in the continental United States and its association with *Ficus carica*. We indicated the plant parts with which the pest is generally associated. Pests that are likely to remain associated with the harvested commodity in a viable form are indicated by bolded text. For those pests that we indicate as following the pathway, if applicable, we may include additional information about the organism such as presence in the United States, domestic regulations, etc. to justify continued quarantine treatment. We summarize the pests that follow the pathway in Table 2.

Table 1. List of quarantine pests associated with *Ficus carica* anywhere in the world and present in Mexico on any host.

Pest name	Presence in Mexico	Host association	Plant part(s)[1]	Considered further?[2]
INSECT: Coleoptera: Buprestidae *Chrysobothris distincta* Gory	(López-Martínez et al., 2015)	(López-Martínez et al., 2015)	Branches and stems (López-Martínez et al., 2015)	No.

[1] The plant part(s) listed are those for the plant species under analysis. If the information has been extrapolated, such as from plant part association on other plant species, we note that.

[2] "Yes" indicates simply that the pest has a reasonable likelihood of being associated with the harvested commodity; the level of pest prevalence on the harvested commodity (high, medium, or low) is qualitatively assessed as part of the Likelihood of Introduction assessment (section 3).

Pest name	Presence in Mexico	Host association	Plant part(s)[1]	Considered further?[2]
INSECT: Coleoptera: Buprestidae *Acmaeodera rustica* Fischer	(López-Martínez et al., 2015)	(López-Martínez et al., 2015)	Branches and stems (López-Martínez et al., 2015)	No.
INSECT: Coleoptera: Cerambycidae *Anelaphus piceum* Vlasák	(López-Martínez et al., 2015)	(López-Martínez et al., 2015)	Branches and stems (López-Martínez et al., 2015)	No.
INSECT: Coleoptera: Cerambycidae *Sphaenothecus trilineatus* Dupont	(López-Martínez et al., 2015)	(López-Martínez et al., 2015)	Branches and stems (López-Martínez et al., 2015)	No.
INSECT: Coleoptera: Cerambycidae *Eutrichillus comus* (Bates)	(López-Martínez et al., 2015)	(López-Martínez et al., 2015)	Branches and stems (López-Martínez et al., 2015)	No.
INSECT: Coleoptera: Cerambycidae *Stenosphenus rufipes* Bates	(López-Martínez et al., 2015)	(López-Martínez et al., 2015)	Branches and stems (López-Martínez et al., 2015)	No.
INSECT: Diptera: Lonchaeidae *Neosilba flavitarsis* MacGowan and Lasa	**(Lasa et al., 2025; Macgowan et al., 2025)**	**(Macgowan et al., 2025)**	**Fruit (Macgowan et al., 2025)**	**Yes.**
INSECT: Diptera: Lonchaeidae *Neosilba glaberrima* (Wiedemann)	**(Fernandes and Couri, 2016; Lasa et al., 2025)**	**(Lasa et al., 2025; Raga et al., 2015)**	**Fruit (Lasa et al., 2025; Raga et al., 2015)**	**Yes.**
INSECT: Diptera: Lonchaeidae *Neosilba recurva* MacGowan and Lasa	**(Lasa et al., 2025)**	**(Lasa et al., 2025)**	**Fruit (Lasa et al., 2025)**	**Yes.**
INSECT: Diptera: Lonchaeidae *Silba adipata* McAlpine	**(Lasa et al., 2025; Macgowan et al., 2025)**	**(Katsoyannos, 1983; Lasa et al., 2025; Macgowan et al., 2025; Radonjić et al., 2019a)**	**Fruit (Katsoyannos, 1983; Lasa et al., 2025; Mifsud et al., 2012; Radonjić et al., 2019a)**	**Yes[3].**

[3] This pest is considered quarantine significant for the continental United States. However, APHIS is currently re-evaluating this status.

Pest name	Presence in Mexico	Host association	Plant part(s)[1]	Considered further?[2]
INSECT: Diptera: Tephritidae *Anastrepha fraterculus* (Wiedemann)	**(Aluja et al., 2003; Baker, 1945; Hernández-Ortiz et al., 2012)**	**(Nasca et al., 1996)**	**Fruit (Nasca et al., 1996)**	**Yes.**
INSECT: Diptera: Tephritidae *Ceratitis capitata* (Wiedemann)	**(APHIS, 2015; EPPO, 2025a)**	**(Argov and Gazit, 2008; Mifsud et al., 2012; Nasca et al., 1996; Radonjić et al., 2019a)**	**Fruit (Argov and Gazit, 2008; Mifsud et al., 2012; Nasca et al., 1996; Radonjić et al., 2019a)**	**Yes.**
INSECT: Hemiptera: Rhizoecidae *Geococcus coffeae* Green	(Garcia Morales et al., 2016)	(Garcia Morales et al., 2016)	Roots (Capinera, 2008)	No.
INSECT: Hemiptera: Pseudococcidae *Maconellicoccus hirsutus* (Green)	(Garcia Morales et al., 2016)	(Chang and Miller, 1996; Chong et al., 2015; Garcia Morales et al., 2016)	Plant at flowering and fruit set (Chang and Miller, 1996)	No. See Section 2.2.
INSECT: Lepidoptera: Crambidae *Azochis gripusalis* Walker	(Robinson et al., 2023; Vanegas-Rico, 2017)	(Ben-Yakir and Costa, 2022)	Shoots, branches (Ben-Yakir and Costa, 2022)	No.
INSECT: Lepidoptera: Nymphalidae *Lycorea ilione* Cramer	(Navarro-Sigüenza, 2025; Savela, 2009)	(Robinson et al., 2023; Savela, 2009)	Foliage (Córdoba-Alfaro, 2011)	No.
INSECT: Lepidoptera: Sphingidae *Pachylia syces* (Hübner)	(Donahue, 1989)	(de Figueiredo and de Queiroz, 1993; Donahue, 1989)	Foliage (de Figueiredo and de Queiroz, 1993)	No.

Pest name	Presence in Mexico	Host association	Plant part(s)[1]	Considered further?[2]
NEMATODE *Croserinema palmatum* (Siddiqui & Southey) Khan, Chawla & Saha syn. *Ogma palmatum* (Siddiqi & Southey)	(Luna-Guerrero et al., 2011)	(de O. Abrantes et al., 2008)	Root (de O. Abrantes et al., 2008)	No.
FUNGUS *Daldinia caldariorum* Henn.	(Barbosa-Reséndiz et al., 2020)	(Barbosa-Reséndiz et al., 2020)	Wood (Reyes et al., 2025)	No.
FUNGUS *Dematophora bunodes* (Berk. & Broome) C. Lambert, K. Wittstein & M. Stadler syn. *Rosellinia bunodes* (Berk. & Broome) Sacc., *Rosellinia echinata* Massee	(Alvarez, 1976)	(Wellman, 1977)	Root (Wellman, 1977)	No.
FUNGUS *Dendrocorticium polygonioides* (P. Karst.) M.J. Larsen & Gilb.	(Tapia et al., 2016)	(Tellería et al., 1997)	Wood (based on general behavior) (Loizides, 2018)	No.
FUNGUS *Lasiodiplodia brasiliensis* M.S.B. Netto, M.W. Marques & A.J.L. Phillips syn. *Lasiodiplodia brasiliense* M.S.B. Netto, M.W. Marques & A.J.L. Phillips	(Bautista-Cruz et al., 2018)	(Nur-Shakirah et al., 2022)	Stem, leaf (Nur-Shakirah et al., 2022)	No.
VIRUS *Closterovirus* Fig leaf mottle-associated virus 1 (FLMaV-1)	(Ortega-Acosta et al., 2022)	(Ortega-Acosta et al., 2022; Preising et al., 2020)	Systemic (Fuchs et al., 2020)	No. See section 2.2.

2.2. Notes on pests identified in the pest list

Hemiptera: Pseudococcidae: *Maconellicoccus hirsutus* (Green). The pink hibiscus mealybug is present in Mexico and the United States (Garcia Morales et al., 2016) and is listed as a pest of various fruit species including figs (Chang and Miller, 1996; Chong et al., 2015; Garcia Morales et al., 2016); however, we did not find direct evidence that this mealybug is associated with fig fruit. Chang and Miller (1996) considered it rarely found with fig plants and never causing serious damage to them during their pathway assessment of the mealybug from the Caribbean. With no direct evidence of the mealybug being associated with the fruit, we did not consider *M.*

hirsutus being associated with the commodity and following the pathway (Garcia Morales et al., 2016).

Closterovirus Fig leaf mottle-associated virus 1 (FLMaV-1). This virus is graft transmissible (Fuchs et al., 2020); although transmission by the scale vector *Ceroplastes rusci* has been demonstrated (Yorganci and Açıkgöz, 2019), the scale is not known to be present in Mexico. While *C. rusci* is present in some areas of the United States (Garcia Morales et al., 2016), the sequence of events required for FLMaV-1 to establish through this pathway is highly unlikely, as a scale would need to encounter infected fig fruit for consumption being imported from Mexico, successfully acquire the virus, and then survive to successfully transmit it to a propagative host.

2.3. Pests considered but not included on the pest list

2.3.1. Organisms with non-quarantine status

We found evidence of organisms that are associated with fig and are present in Mexico; however, they are not of quarantine significance for the United States and were not considered further.

Armored scales (Hemiptera: Diaspididae): These insects are highly unlikely to establish via the fruits or vegetables for consumption pathway due to their very limited ability to disperse to new host plants (Miller et al., 1985; PERAL, 2007). Also, diaspidids on fruits and vegetables for consumption are considered non-actionable at U.S. ports of entry (NIS, 2024). For these reasons, armored scales are not included in Table 1, even if they are not present in the PRA area.

2.3.2. Quarantine pests considered but not included on the pest list

Diptera: Lonchaeidae *Neosilba pendula* (Bezzi).

Neosilba pendula is present in Mexico (Fernandes and Couri, 2016) and is considered a secondary pest of various fruits (McAlpine and Steyskal, 1982), including *Ficus insipida* (Uchôa and Nicácio, 2010) and *Ficus* sp. (Raga et al., 2015). However, we found no evidence that *N. pendula* use fig (*Ficus carica*) as a host; therefore, was not included on Table 1.

Diptera: Tephritidae *Anastrepha ludens* (Loew). The Mexican fruit fly is present in Mexico (Foote and Blanc, 1963) and is a pest of various fruit species; however, we did not find direct evidence that this fly naturally oviposits in figs. Foote and Blanc (1963), states that *A. ludens* will use figs as a host in the laboratory, but without validated evidence of this species using figs as a host in nature we did not include *A. ludens* on Table 1.

Diptera: Tephritidae *Anastrepha obliqua* (Macquart). The West Indian fruit fly is present in Mexico (Aluja et al., 2003) and is a pest of various fruit species; however, we did not find direct evidence that this fly naturally oviposits in figs. Norrbom and Kim (1988) noted some evidence of *A. obliqua* synonyms associating with "figs," but we found no credible field records confirming *Ficus carica* a host aside from one publication stating laboratory oviposition in caged host trials (Mcalister, 1936). Therefore, we did not include *A. obliqua* on Table 1.

Diptera: Tephritidae *Anastrepha serpentina* (Wiedemann). The serpentine fruit fly is present in Mexico (Aluja et al., 2003) and is a pest of various fruit species; however, we did not find direct

evidence that this fly naturally oviposits in figs (*Ficus carica*). Shaw (1947) and Wasbauer (1972) state that fruit from an unknown *Ficus* species is a larval host, but without direct evidence of *F. carica* as a host we did not include it on Table 1.

Fungus: *Fusarium incarnatum* (Desm.) Sacc. syn. *Fusarium semitectum* Berk. & Ravenel. We did not include this species on the pest list because we found only a single report of it on fig in or prior to 1970 in Iran (USDA Fungal Databases, 2025). We did not consider this sufficient evidence this species is a pest of fig. *Fusarium incarnatum* is present in Mexico (García-Estrada et al., 2020; Gómez-Cornelio et al., 2016). Although it is a quarantine pest for the continental United States (ARM, 2026), it is present in several states (USDA Fungal Databases, 2025).

2.4. Pests selected for further analysis

We identified the following quarantine pests for further analysis (Table 2).

Table 2. Pests selected for further analysis.

Pest type	Taxonomy	Scientific name
Arthropod	Diptera: Lonchaeidae	*Neosilba flavitarsis* MacGowan and Lasa
Arthropod	Diptera: Lonchaeidae	*Neosilba glaberrima* (Wiedemann)
Arthropod	Diptera: Lonchaeidae	*Neosilba recurva* MacGowan and Lasa
Arthropod	Diptera: Lonchaeidae	*Silba adipata* McAlpine
Arthropod	Diptera: Tephritidae	*Anastrepha fraterculus* (Wiedemann)
Arthropod	Diptera: Tephritidae	*Ceratitis capitata* (Wiedemann)

3. Assessing Pest Risk Potential

3.1. Introduction

Risk is described by the likelihood of introduction, the potential consequences, and the associated uncertainty. For each pest, we determined if an endangered area exists within the United States. The endangered area is defined as the portion of the PRA area where ecological factors favor the pest's establishment and where the pest's presence will likely result in economically important impacts. If a pest causes an unacceptable impact, that means it could adversely affect agricultural production. Examples include causing a yield loss of 10 percent or greater, increasing U.S. production costs, impacting an environmentally important host, or impacting international trade. After the endangered area is defined, we assessed the pest's likelihood of introduction into that area via the imported commodity.

The likelihood of introduction represents the combined potential for a pest to enter and establish within the United States. This evaluation is qualitative and uses the categorical ratings *High*, *Medium*, and *Low*. Each component of the analysis (entry and establishment) is also assigned an uncertainty rating. Definitions for likelihood ratings and uncertainty ratings are provided below.

Likelihood Ratings

High: The outcome is highly likely because the required events occur frequently.
Medium: The outcome is possible; however, the combination of required events does not occur frequently.

Low: The outcome is unlikely because the specific combination of required events seldom occurs.

Uncertainty Ratings

High: Reliable evidence is not available.
Moderate: Additional or more reliable evidence may or may not change the rating.
Low: Additional or more reliable evidence is unlikely to change the rating.
Negligible: Additional or more reliable evidence is very unlikely to change the rating.

3.2. Assessment

3.2.1. *Neosilba flavitarsis*, *N. glaberrima*, and *N. recurva* (Diptera: Lonchaeidae)

Lonchaeidae (lance flies) have been known to infest several fruit species of economic interest (Raga et al., 2015). Larvae of *Neosilba* spp. develop inside fruit, where their feeding causes decay and loss of marketability (Ben-Yakir and Costa, 2022). However, lance flies are generally considered secondary pests that take advantage of oviposition sites created by tephritid fruit flies or damage from other pests (Korytkowski and Ojeda, 1971; Lasa et al., 2025; McAlpine and Steyskal, 1982). Although harvesters would cull any visibly damaged fruit, the oviposition holes and discoloration of the fig could go unnoticed, allowing internally feeding larvae to go undetected and potentially follow the pathway into the United States.

The endangered area for *Neosilba flavitarsis*, *N. glaberrima*, and *N. recurva* within the continental United States

Geographic potential:

Neosilba flavitarsis and *N. recurva* have only been identified in Mexico (Lasa et al., 2025; Macgowan et al., 2025), in areas corresponding to Plant Hardiness Zones 10-12 (Takeuchi et al., 2018).

Neosilba glaberrima has been identified in **North America**: Mexico; **Central America:** Costa Rica, El Salvador, Guatemala, Honduras, Panama; and **South America**: Brazil, Colombia, Ecuador, Peru, Trinidad and Tobago (Esquivel R., 2009; McAlpine and Steyskal, 1982; Urrutia Araujo, 2004), in areas corresponding to Plant Hardiness Zones 10-13 (Takeuchi et al., 2018)

Hosts in PRA area:

Neosilba glaberrima has been identified from **Anacardiaceae:** *Anacardium occidentale* (cashew), *Mangifera indica* (mango), *Spondias mombin* (yellow mombin), *Spondias purpurea* (purple mombin) (Adaime et al., 2017; Korytkowski and Ojeda, 1971; Rocha Barreto et al., 2023); **Annonaceae:** *Annona montana* (mountain soursop), *A. muricata* (soursop) (Adaime et al., 2017; Rocha Barreto et al., 2023); **Combretaceae:** *Terminalia catappa* (tropical almond) (Uchôa and Nicácio, 2010); **Fabaceae:** *Inga laurina* (sacky sac bean) (Rocha Barreto et al., 2023); **Malpighiaceae:** *Malpighia emarginata* (Barbados cherry) (Adaime et al., 2017); **Moraceae:** *Artocarpus altilis* (breadfruit) [as *A. communis* in (Strikis et al., 2011)], *A. heterophyllus* (jackfruit), *Ficus carica* (fig) (Lasa et al., 2025; Macgowan et al., 2025; Rocha Barreto et al., 2023; Strikis et al., 2011); **Myrtaceae:** *Psidium cattleianum* (strawberry guava), *P. guajava* (guava), *Syzygium jambos* (Malabar plum) (Adaime et al., 2017; Rocha Barreto et al., 2023; Uchôa and Nicácio, 2010); **Olacaceae:** *Ximenia americana* (tallow wood) (Uchôa and

Nicácio, 2010); **Oxalidaceae:** *Averrhoa carambola* (carambola) (Adaime et al., 2017); **Rosaceae:** *Prunus persica* (peach) (Souza-Filho et al., 2009); **Rubiaceae:** *Coffea arabica* (coffee), *Genipa americana* (jagua) (Aguiar-Menezes et al., 2007; Nicácio and Uchôa, 2011; Souza et al., 2005; Uchôa and Nicácio, 2010); **Rutaceae:** *Citrus* × *aurantiifolia* (lime), *Citrus* × *aurantium* var. *sinensis* (sweet orange) [as *C. sinensis* in (Ferreira Louzeiro et al., 2021)], *C. reticulata* (tangerine) (Ferreira Louzeiro et al., 2021; Strikis et al., 2011); and **Solanaceae:** *Capsicum annuum* var. *annuum* (cayenne pepper) [as *C. frutescens* in (Korytkowski and Ojeda, 1971)].

Neosilba flavitarsis and *N. recurva* have only been recently described and have been found in **Lauraceae:** *Persea americana* (avocado) (Lasa et al., 2025; Macgowan et al., 2025); and **Moraceae:** *Ficus carica* (fig) (Lasa et al., 2025; Macgowan et al., 2025)

Economically important hosts[4]*:* Economically important hosts infested by *Neosilba glaberrima* include mango, cayenne pepper, coffee, fig, peach, lime, sweet orange, tangerine, and fruit species native to Florida: jagua, mountain soursop, soursop, sacky sac bean, tallow wood, and yellow mombin. For *Neosilba flavitarsis* and *N. recurva*, economically import hosts are avocado and fig.

Potential consequences on economically important hosts at risk: Neosilba flavitarsis and *N. recurva* have only been recently identified, so information on impacts is scarce. *Neosilba* spp. in general are considered secondary invaders in fig production, but in some hosts they may be primary invaders (Lasa et al., 2025).

Neosilba glaberrima is usually found in damaged fruit that is already infested with *Anastrepha* spp. (Batista Lopes et al., 2008). More specifically, it either attacks fallen fruit (which are not economically important) or attacks fruit through the oviposition stings of other Tephritidae (Korytkowski and Ojeda, 1971; McAlpine and Steyskal, 1982). However, there is uncertainty regarding the nature of its association with some hosts; it seems to be a primary invader in jagua and sweet orange (Ferreira Louzeiro et al., 2021; Nicácio and Uchôa, 2011), which may potentially increase the economic damage to these hosts in the continental United States.

Endangered area: The area endangered by *Neosilba flavitarsis*, *N. glaberrima*, and *N. recurva* comprises Plant Hardiness Zones 10-13 where suitable hosts are produced.

The likelihood of entry of *Neosilba flavitarsis*, *N. glaberrima*, and *N. recurva* into the endangered area via fresh figs imported from Mexico

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Pest prevalence on the harvested commodity	Low	Moderate	*Neosilba* spp. are generally considered secondary invaders that take advantage of oviposition sites created by other insects (Korytkowski and Ojeda, 1971; Lasa et

[4] As defined by ISPM No. 5, potential economic importance applies to crops, the environment (ecosystems, habitats, or species), and to other specified values such as tourism, recreation and aesthetics (IPPC, 2022).

			al., 2025; Macgowan et al., 2025; McAlpine and Steyskal, 1982). Lasa et al., (2025) did note that emergence of *Neosilba* spp. decreased once fruit were harvested compared to *Silba adipata*, which supports the prevalence on the harvest commodity being low. We rated the uncertainty as moderate due to the lack of literature on *Neosilba* spp., including their biology and impacts.
Likelihood of surviving post-harvest processing before shipment	Low	Low	No post-harvest practices beyond basic culling were considered; however, basic culling does not remove all infested fruit, so we did not change the previous rating.
Likelihood of surviving shipping and storage conditions of the consignment	Low	Low	We did not consider transport or storage conditions, so we did not change the previous rating.
Overall Likelihood of Entry	Low	n/a	n/a

The likelihood of establishment of *Neosilba flavitarsis*, *N. glaberrima*, and *N. recurva* into the endangered area via fresh figs imported from Mexico

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	Low	Moderate	Although *Neosilba* spp. flies are generally considered secondary invaders of fruit, they can be primary invaders in some crops (Lopes et al., 2008; Raga et al., 2004; Souza-Filho et al., 2009; Uchôa-Fernandes et al., 2003). This can increase the likelihood of successful infestation of host material in new areas. However, it is unknown to what extent, if any, *Neosilba* spp. behave as primary pests. Hosts for *Neosilba* species can be found throughout Plant Hardiness Zones 10-13 of the continental United States where hosts are grown. However, if larvae are transported with the fruit, they would need to find suitable pupation sites. Since lance flies need to pupate in the soil, we can assume that pupation without soil will be detrimental to the development of pupae, adult emergence rate, and life span, as is seen with tephritid fruit flies (Celedonio et al., 1999; Langley et al., 1972; Tapia Rangel, 1989; Vargas et al., 1986). Therefore, while there are hosts in the endangered area, we rated likelihood of establishment Low due to the attrition that would likely occur due to the suboptimal environment that insects would encounter initially to complete development. We had moderate uncertainty due to limited information on *N. flavitarsis* and *N. recurva.*
Overall Likelihood of Establishment	Low	n/a	n/a

The likelihood of introduction (combined likelihoods of entry and establishment) of *Neosilba flavitarsis*, *N. glaberrima*, and *N. recurva* into the endangered area via fresh figs imported from Mexico is Low.

3.2.2. *Silba adipata* (Diptera: Lonchaeidae)

Silba adipata is a pest of figs in areas in which it is established throughout Europe and has also established in Mexico, South Africa, and the United States (California) (McAlpine and Steyskal, 1982; Paniagua-Jasso et al., 2024; Wohlfarter et al., 2011). It can have four to six generations a year (Katsoyannos, 1983). Larvae cause damage by feeding on the flesh of the fig fruit. Adult

females cannot oviposit directly into the fruit (Abbes et al., 2021; Drouet, 2021; Katsoyannos, 1983), but they do lay eggs (up to 100) in the ostiole (eye) of unripe figs (Katsoyannos, 1983).

The endangered area for *Silba adipata* within the PRA area

Geographic potential: *Silba adipata* is established in **Africa:** Egypt, South Africa, Tunisia (Abbes et al., 2021; McAlpine, 1956; Wohlfarter et al., 2011); **Asia:** Egypt, Iran, Iraq, Israel, Syria, Turkey; **Europe:** Croatia, Cyprus, France, Greece, Italy, Malta, Montenegro, Portugal, Slovenia, Spain (Carles-Tolrá, 1990; Lasa et al., 2026; MacGowan et al., 2016; McAlpine, 1956; Radonjić et al., 2019b; Rot et al., 2017; Withers and Macgowan, 2014); **North America:** Mexico, the United States (California) (Britt, 2022; Lasa et al., 2026; NAPPO, 2020). These areas correspond to Plant Hardiness Zones 7-12 (Takeuchi et al., 2018).

Hosts in PRA area: *Silba adipata* is host specific to **Moraceae:** *Ficus carica* (fig) (Britt, 2022). There have been reports of *S. adipata* on **Solanaceae:** *Capsicum frutescens* (cayenne pepper) (Yuliadhi et al., 2024). However, genetic analysis of the fly specimens from this study are below the acceptable range for identification and thus are likely a misidentification (Lasa et al., 2026).

Economically important hosts[4]*:* Fig is the only confirmed host for *S. adipata*.

Potential consequences on economically important hosts at risk: This fly oviposits on developing fruit, and the larvae bore into the fruit to feed on the flesh. This feeding damages the fruit and can also cause the fruit to prematurely drop (Abbes et al., 2021; Britt, 2022; Lasa et al., 2026; Rot et al., 2017), thus reducing yield. In Turkey, 20 to 60 percent fruit drop has been documented (Tutmuş and Akşİt, 2021), while infestations of up to 88 percent have been reported from Tunisa (Abbes et al., 2021) and up to 90 percent from Mexico (Lasa et al., 2025; Paniagua-Jasso et al., 2024).

Endangered area: The area endangered by *S. adipata* includes areas of the continental United States within Plant Hardiness Zones 7-12 where figs are grown. However, in the United States, commercial fig production is mainly in California. Therefore, the endangered area is fairly limited to fig production areas of California.

The likelihood of entry of *Silba adipata* into the endangered area via fresh figs imported from Mexico

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Pest prevalence on the harvested commodity	Medium	Moderate	*Silba adipata* oviposits onto developing fruit, and larvae bore into and feed inside the developing fruit (Britt, 2022; Lasa et al., 2026). There are four to six generations a year (Katsoyannos, 1983; Lasa et al., 2026), so continuous presence in fig orchards is possible. This fly primarily infests small immature figs, which leads to premature fruit drop (Abbes et al., 2021; Britt, 2022; Lasa et

			al., 2026; Rot et al., 2017). However, mature fruit can be attacked after harvest when small fig availability is limited (Lasa et al., 2026). We rated likelihood of entry Medium because while infestation causes premature fruit drop before harvest, flies can oviposit on mature fruit.
Likelihood of surviving post-harvest processing before shipment	Medium	Low	No post-harvest practices beyond basic culling were considered; however, basic culling does not remove all infested fruit, so we did not change the previous rating.
Likelihood of surviving shipping and storage conditions of the consignment	Medium	Low	We did not consider transport or storage conditions, so we did not change the previous rating.
Overall Likelihood of Entry	Medium	n/a	n/a

The likelihood of establishment of *Silba adipata* into the endangered area via fresh figs imported from Mexico

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	Low	Low	*Silba adipata* is host-specific to figs. California accounts for over 90 percent of the fig production in the United States, and *S. adipata* is currently established in that state (Britt, 2022). It can be found throughout regions where hosts are grown. However, if larvae are to be transported with the fruit, they would need to find suitable pupation sites. Lasa et al. (2026) does state they suspect that sacks used to transport figs from plantations to neighboring states may be a pathway for introduction. However, importation to the United States would not occur in sacks. Therefore, while there are hosts in the endangered area, we rated likelihood of establishment Low because figs are the only known host and fig production is located primarily in California where this insect is already established. Entry into other endangered areas will have a low

		likelihood of establishment due to limited host availability.
Overall Likelihood of Establishment Low	n/a	n/a

The likelihood of introduction (combined likelihoods of entry and establishment) of *Silba adipata* into the endangered area via fresh figs imported from Mexico is Low.

3.2.3. *Anastrepha fraterculus* (Diptera: Tephritidae)
Anastrepha fraterculus is a species complex containing eight morphotypes, including the Mexican which is the only morphotype known to occur in Mexico. *Anastrepha fraterculus senso lato* has a broad host range; however, the Mexican morph has been linked to a narrower host range and their preference for Myrtaceae species (Aluja et al., 2000; Baker, 1945; Hernández-Ortiz et al., 2004).

Recent research has linked *A. fraterculus* Mexican morph to *Anastrepha zenildae*, leading the authors to suggest that the Mexican morph *A. zenildae* are the same species (Norrbom et al., 2026). Given this new information, we considered host evidence for both the Mexican morph and *A. zenildae* for the purposes of this analysis. However, *A. zenildae* has not been documented in Mexico.

The endangered area for *Anastrepha fraterculus* within the PRA area
Geographic potential: *Anastrepha fraterculus* species complex occurs in North, Central, and South America and the Caribbean, ranging from northern Mexico to Argentina (Hernández-Ortiz et al., 2015a; Simões Dias and Lucky, 2021). The Mexican morph is currently distributed in **Caribbean:** Trinidad and Tobago; **Central America:** Guatemala andPanama; **North America:** Mexico; **South America:** Colombia, Suriname, and Venezuela (Hernández-Ortiz et al., 2012; Norrbom et al., 2026).. This distribution corresponds to global Plant Hardiness Zones 8-13 (Takeuchi et al., 2018).

Hosts in PRA area: *Anastrepha fraterculus* complex feeds on multiple genera in multiple plant families, including: **Actinidiaceae:** *Actinidia deliciosa* (kiwifruit) (Hickel and Schuck, 1993); **Anacardiaceae:** *Mangifera indica* (mango), *Spondias dulcis* (Jewish plum), *S. mombin* (hog-plum); **Annonaceae:** *Annona cherimola* (cherimoya), *A. rugulosa* (custard apple), *A. muricata* (soursop); **Combretaceae:** *Terminalia catappa* (Tropical-almond); **Ebenaceae:** *Diospyros kaki* (persimmon), **Juglandaceae:** *Juglans australis* (nogal criollo), **Lauraceae:** *Persea americana* (avocado), **Moraceae:** *Ficus carica* (fig), **Myrtaceae:** *Eugenia brasiliensis* (Brazil-cherry), *E. uniflora* (Suriname cherry), *Psidium* spp. (guava), *Syzygium jambos* (rose apple), *S. malaccense* (Malay-apple), **Oleaceae:** *Olea europaea* (olive); **Oxalidaceae:** *Averrhoa carambola* (starfruit); **Punicaceae:** *Punica granatum* (pomegranate), **Rosaceae:** *Cydonia oblonga* (quince), *Eriobotrya japonica* (loquat), *Fragaria × ananassa* (strawberry, hybrid), *F. vesca* (strawberry, European), *Malus domestica* (apple), *Prunus* spp. (prunus, cherry, peach, plum, etc.), *Pyrus communis* (European pear), *Rubus* spp. (blackberry, raspberry); **Rubiaceae:** *Coffea arabica* (coffee arabica), *C. canephora* (coffee robusta); **Rutaceae:** *Citrus* spp. (citrus, grapefruit, kumquat, lemon, etc.); **Sapotaceae:** *Manilkara zapota* (sapodilla), *Pouteria obovate* (lucmo), **Solanaceae:**

Solanum quitoense (naranjilla), and **Vitaceae:** *Vitis vinifera* (grape) (Norrbom and Kim, 1988; Ovruski et al., 2003; Simões Dias and Lucky, 2021; Stone, 1942; White and Elson-Harris, 1992).

However, the *A. fraterculus* Mexican morph has been linked to a narrower host range and their preference for Myrtaceae species (Aluja et al., 2000; Baker, 1945; Hernández-Ortiz et al., 2004). There is some evidence infesting peach (Baker, 1945; Hernández-Ortiz et al., 2012) and from peach fruit collected from 'medium evergreen forests'(Berrones-Morales et al., 2020), however no evidence of the Mexican morph infesting commercial peaches has been documented.

Economically important hosts[4]*:* The *A. fraterculus* species complex can infest important crops such as apple, citrus, grapes, and peach (Norrbom and Kim, 1988; Stone, 1942; White and Elson-Harris, 1992). Mexican morph is primarily a pest of guava (Aluja et al., 2000; Baker, 1945; Hernández-Ortiz et al., 2004), with peaches being a potential host, but with high uncertainty.

Potential consequences on economically important hosts at risk: This pest is likely to cause unacceptable consequences if introduced because the *A. fraterculus* species complex damages economically important plants (Simões Dias and Lucky, 2021). The oviposition punctures leave a gateway for pathogenic microorganisms to begin the host fruit decomposition; then the larvae feed on the pulp, which favors the processes of oxidation and premature ripening of the fruit, causing the fruit to rot and rendering it unsuitable for the market (SINAVIMO, 2026).

While *A. fraterculus* (Mexican morph) is widely distributed in Mexico and infests guava and peach, it is 'not considered as a phytosanitary risk' (Berrones-Morales et al., 2020)

Endangered area: The area endangered by *A. fraterculus* (Mexican morph) comprises of guava and possibly fig and peach crops in areas of the continental United States within global Plant Hardiness Zones 8-13.

The likelihood of entry of *Anastrepha fraterculus* into the endangered area via fresh figs imported from Mexico

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Pest prevalence on the harvested commodity	Low	High	While there is evidence of *A. fraterculus* infesting figs (Abib et al., 2026; Ovruski et al., 2003), we found no evidence of this association specifically with the Mexican morph. However, recent research suggests possible synonymy between *A. fraterculus* Mexican morph and *A. zenildae* (Norrbom et al., 2026). There has been one occurrence of *A. zenildae* emerging from fig (Araujo et al., 2015), but the authors did not distinguish if the fruit it emerged from was from commercial production or backyard trees. Therefore, we rated this element as Low, with High uncertainty

			due to limited association with *Ficus carica* as well as uncertainty in the synonymy of the pest.
Likelihood of surviving post-harvest processing before shipment	Low	n/a	We did not consider any post-harvest practices that would reduce the prevalence of this species. Fruit infested with fruit flies is highly likely to escape detection during culling (White and Elson-Harris, 1992); therefore, we kept the risk rating at Low.
Likelihood of surviving shipping and storage conditions of the consignment	Low	n/a	We did not consider transport or storage conditions.
Overall Likelihood of Entry	Low	n/a	n/a

The likelihood of establishment of *Anastrepha fraterculus* into the endangered area via fresh figs imported from Mexico

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	Medium	High	The *A. fraterculus* complex has a wide host range, and while the Mexican morph has a smaller host range (guava and potentially peaches and figs) than the entire complex, the hosts they can infest encompasses a potentially wide area at risk for establishment. However, a hurdle that can limit establishment of this fruit fly is the ability of mature larvae to pupate if transported. Mature larvae of *A. fraterculus* exit the fruit to pupate in the soil (Tapia Rangel, 1989). In the absence of soil, flies can still pupate, but doing so is detrimental to the development of pupae, adult emergence rate, and life span (Celedonio et al., 1999; Langley et al., 1972; Tapia Rangel, 1989; Vargas et al., 1986). Given the known and potential hosts grown in the United States resulting in a potentially wide endangered area but due to the attrition individuals are likely to face to complete development, we rate the likelihood for establishment as Medium. We have uncertainty surrounding our

			rating because the record for fig is from *A. zenildae* which means that the establishment of *A. fraterculus* Mexican morph is only possible via this pathway if these two species are considered synonyms.
Overall Likelihood of Establishment	Medium	n/a	n/a

The likelihood of introduction (combined likelihoods of entry and establishment) of *Anastrepha fraterculus* into the endangered area via fresh figs imported from Mexico is Medium.

3.2.4. *Ceratitis capitata* (Diptera: Tephritidae)

The Mediterranean fruit fly is a highly invasive species that has been established in many parts of the world. This fruit fly is highly polyphagous (De Meyer et al., 2002; Liquido et al., 1990). Females oviposit on fruit and the hatched larvae feed on the pulp, leaving the fruit unmarketable (Thomas et al., 2005). The introduction of the fruit fly into the United States (outside of Hawaii, where the pest is already established) triggers eradication programs to prevent widespread damage (NAPPO, 2022; NAPPO, 2023; NAPPO, 2024; NAPPO, 2025).

The endangered area for *Ceratitis capitata* within the PRA area

Geographic potential: Mediterranean fruit fly is widely distributed in Africa, the Mediterranean region, South and Central America, west Asia, and Australia (CABI, 2026; EPPO, 2025b; White and Elson-Harris, 1992). Based on its current distribution, we estimate that Mediterranean fruit fly could establish in areas of the United States corresponding to Plant Hardiness Zones 8 to 13 (Takeuchi et al., 2018).

Hosts in PRA area: Mediterranean fruit fly potentially feeds on hundreds of hosts (CABI, 2026; Liquido et al., 1990; Thomas et al., 2005; White and Elson-Harris, 1992), many of which are present within Plant Hardiness Zones 8 to 13 in the United States (NRCS, 2026; Takeuchi et al., 2018). Examples include **Cactaceae:** *Opuntia ficus-indica* (Barbary fig); **Caricaceae:** *Carica papaya* (papaya); **Cucurbitaceae:** *Momordica charantia* (balsampear); **Moraceae:** *Ficus carica* (edible fig); **Myrtaceae:** *Psidium guajava* (guava); **Juglandaceae:** *Juglans nigra* (black walnut), *Juglans regia* (English walnut); **Rosaceae:** *Eriobotrya japonica* (loquat), *Prunus persica* (peach), *Pyrus communis* (pear), *Rubus lucidus* (manatee dewberry); **Rutaceae:** *Citrus* × *aurantiifolia* (lime), *Citrus* × *paradisi* (grapefruit), *Citrus reticulata* (mandarin), *Citrus* × *sinensis* (orange); and **Solanaceae:** *Capsicum annuum* (pepper), *Solanum lycopersicum* (tomato), *Solanum melongena* (eggplant) (Liquido et al., 1990).

Economically important hosts[4]*:* Economically important hosts include fig, grape, grapefruit, lime, mandarin, orange, peach, pear, pepper, plum, tomato, and walnut.

Potential consequences on economically important hosts at risk: This pest is likely to cause unacceptable consequences if introduced because damage to fruit crops may reach 100 percent

on unprotected hosts (Thomas et al., 2005). Larvae feed on the fruit pulp, leaving the fruit unmarketable (Thomas et al., 2005).

Endangered area: The endangered area includes areas where host plants are present in Plant Hardiness Zones 8 through 13 within the continental United States.

The likelihood of entry of *Ceratitis capitata* into the endangered area via fresh figs imported from Mexico

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Pest prevalence on the harvested commodity	Medium	Moderate	Although fig is not as favorable a host as eggplant, mango, peach, or walnut (Carey, 1984; Liquido et al., 1990), larvae can fully develop within the fruit before exiting for pupation (Carey, 1984; Wohlfarter et al., 2011). Based on this information, we rated pest prevalence as Medium with moderate uncertainty based on lack of additional information.
Likelihood of surviving post-harvest processing before shipment	Medium	Low	We did not consider any post-harvest practices that would reduce the prevalence of this species on the commodity. Fruit infested with fruit flies is highly likely to escape detection during culling (White and Elson-Harris, 1992); therefore, we kept the risk rating at Medium
Likelihood of surviving shipping and storage conditions of the consignment	Medium	Low	We did not consider transport or storage conditions.
Overall Likelihood of Entry	Medium	n/a	n/a

The likelihood of establishment of *Ceratitis capitata* into the endangered area via fresh figs imported from Mexico

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	High	Negligible	Mediterranean fruit fly has an expansive host range (Liquido et al., 1990) and suitable hosts are widely distributed (NRCS, 2026) throughout the endangered area, making host plants widely available. The Mediterranean fruit fly is capable of flight over short distances and can be dispersed by wind over a mile (Thomas et

			al., 2005), which would allow the fruit fly to locate new hosts. Females lay multiple eggs within a host (McDonald and McInnis, 1985; Thomas et al., 2005), allowing for the possibility that one infested fruit could produce multiple offspring that could mate with each other after emergence and potentially establish a population. Each female can lay several hundred eggs (Thomas et al., 2005), allowing for a population to build up quickly. The Mediterranean fruit fly has been introduced into many countries on multiple continents (CABI, 2026), demonstrating its ability to invade new areas. It has been introduced into the United States multiple times, prompting costly eradication programs (NAPPO, 2022; NAPPO, 2023; NAPPO, 2024; NAPPO, 2025). Therefore, we consider the likelihood of establishment to be High.
Overall Likelihood of Establishment	High	n/a	n/a

The likelihood of introduction (combined likelihoods of entry and establishment) of *Ceratitis capitata* into the endangered area via fresh figs imported from Mexico is High.

4. Summary

The following pests are considered quarantine significant for the United States. The pests have a reasonable likelihood of following the commodity pathway and would likely cause unacceptable consequences if introduced into the PRA area (Table 3). Thus, the pests are candidates for risk management.

Table 3. Summary of quarantine pests that are candidates for risk management.

Pest type	Scientific name	Likelihood of Introduction	Notes
Arthropod	*Neosilba flavitarsis* MacGowan and Lasa	Low	n/a
Arthropod	*Neosilba glaberrima* (Wiedemann)	Low	n/a
Arthropod	*Neosilba recurva* MacGowan and Lasa	Low	n/a
Arthropod	*Silba adipata* McAlpine	Low	n/a
Arthropod	*Anastrepha fraterculus* (Wiedemann)	Medium	n/a
Arthropod	*Ceratitis capitata* (Wiedemann)	High	n/a

Our assessment of risk is contingent on the application of all components of the pathway as described in section 1.4. The detailed examination and choice of appropriate phytosanitary measures to mitigate pest risk are addressed in a separate document.

5. Literature Cited

Abbes, K., Hafsi, A., Harbi, A., Mars, M. and Chermiti, B., 2021. The black fig fly *Silba adipata* (Diptera: Lonchaeidae) as an emerging pest in Tunisia: preliminary data on geographic distribution, bioecology and damage. Phytoparasitica, 49: 49–59.

Abib, G., Demari, C., Medeiros, L., Araújo, A., Savaris, M., Zucchi, R. and Nava, D., 2026. Expanding the menu: new host plants of fruit flies (Diptera: Tephritidae) in southern Brazil. Brazilian Journal of Biology, 86: e304065.

Adaime, R., de Sousa, M.d.S.M., de Jesus-Barros, C.R., de Deus, E.d.G., Pereira, J.F., Strikis, P.C. and de Souza-Filho, M.F., 2017. Frugivorous flies (Diptera: Tephritidae, Lonchaeidae), their host plants, and associated parasitoids in the extreme north of Amapá State, Brazil. Florida Entomologist, 100(2): 316–324.

Aguiar-Menezes, E.L., Souza, S.A., Santos, C., Resende, A.L., Strikis, P.C., Costa, J.R. and Ricci, M.S., 2007. Susceptibilidade de seis cultivares de café arábica às moscas-das-frutas (Diptera: Tephritoidea) em sistema orgânico com e sem arborização em Valença, RJ. Neotropical Entomology, 36(2): 268–273.

Aluja, M., Piñero, J., López, M., Ruiz, C., Zúñiga, A., Piedra, E., Díaz-Fleischer, F. and Sivinski, J., 2000. New host plant and distribution records in Mexico for *Anastrepha* spp., *Toxotrypana curvicauda* Gerstacker, *Rhagoletis zoqui* Bush, *Rhagoletis* sp., and *Hexachaeta* sp.(Diptera: Tephritidae). Proceedings of the Entomological Society of Washington, 102: 802–815.

Aluja, M., Rull, J., Sivinski, J., Norrbom, A.L., Wharton, R.A., Macías-Ordóñez, R., Díaz-Fleischer, F. and López, M., 2003. Fruit flies of the genus *Anastrepha* (Diptera: Tephritidae) and associated native parasitoids (Hymenoptera) in the tropical rainforest biosphere reserve of Montes Azules, Chiapas, Mexico. Environmental Entomology, 32(6): 1377–1385.

Alvarez, M.G., 1976. Primer catalogo de enfermedades de plantas Mexicanas. [First catalog of diseases of Mexican plants]. Fitofilo 71: 1–169.

APHIS, 2015. The Mediterranean fruit fly fact sheet. USDA Animal and Plant Health Inspection Service. Queried 10/17/2025: https://www.govinfo.gov/content/pkg/GOVPUB-A101-PURL-gpo116368/pdf/GOVPUB-A101-PURL-gpo116368.pdf.

Araujo, E.L., Fernandes, E.C., Silva, R.I.R., Ferreira, A.D.C.L. and Costa, V.A., 2015. Parasitoides (Hymenoptera) de moscas-das-frutas (Diptera: Tephritidae) no semiárido do estado do Ceará, Brasil. Revista Brasileira de Fruticultura, 37(3): 610–616.

Argov, Y. and Gazit, Y., 2008. Biological control of the Mediterranean fruit fly in Israel: introduction and establishment of natural enemies. Biological Control, 46: 502–507.

ARM, 2026. Agricultural Risk Management System (ARM). United States Department of Agriculture, Animal and Plant Health Inspection Service. https://arm.aphis.usda.gov/.

Baker, E.W., 1945. Studies on the Mexican fruitfly known as *Anastrepha fraterculus*. Journal of Economic Entomology, 38(1): 95–100.

Barbosa-Reséndiz, A., Valenzuela, R., Sánchez-Flores, M., Bautista-Hernández, S., Cobos-Villagrán, A. and Pérez-Valdespino, A., 2020. El género *Daldinia* (Sordariomycetes, Ascomycota) en México. Acta Botánica Mexicana, 127: e1600.

Batista Lopes, E.B., Batista, J.d.L., Albuquerque, I.C.d. and Brito, C.H.d., 2008. Moscas frugívores (Tephritidae e Lonchaeidae): ocorrência em pomares comerciais de tangerina (*Citrus reticulata* Blanco) do município de Matinhas, Estado da Paraíba. Acta Scientiarum - Agronomy, 30(Suplemento Especial): 639–644.

Bautista-Cruz, M.A., Almaguer-Vargas, G., Leyva-Mir, S.G., Colinas-León, M.T., Correia, K.C. and Camacho-Tapia, M., 2018. Phylogeny, distribution, and pathogenicity of *Lasiodiplodia* species associated with cankers and dieback symptoms of Persian lime in Mexico. Plant Disease, 103: 1156–1165.

Ben-Yakir, D. and Costa, A., 2022. Pests of Fig Trees. In: M.A. Flaishman and U. Aksoy (Editors), Advances in Fig Research and Sustainable Production. CABI International, Oxfordshire, UK, pp. 259–278.

Berrones-Morales, M., Vanoye-Eligio, V., Coronado-Blanco, J.M., Gaona-Garcia, G. and Sanchez-Ramos, G., 2020. Species diversity of fruit flies (Diptera: Tephritidae) through different ecosystems in a Neotropical transition zone in Mexico. Journal of Insect Conservation, 24: 219–231.

Britt, K.E., Gordon, P.E., Faber, B.A., Rios, S.I. and Wilson, H., 2022. First report of black fig fly, *Silba adipata* (Diptera: Lonchaeidae), in the United States. Journal of Integrated Pest Management, 13(1): 12.

CABI, 2026. Crop Protection Compendium, Commonwealth Agricultural Bureau International (CABI), Wallingford, U.K.

Capinera, J.L. (Editor), 2008. Encyclopedia of Entomology (2nd ed.). Springer, Dordrecht, 4346 pp.

Carey, J., 1984. Host-specific demographic studies of the Mediterranean fruit fly *Ceratitis capitata*. Ecological Entomology, 9(3): 261–270.

Carles-Tolrá, M., 1990. New and interesting records of Diptera Acalyptrata from Spain. Part IV. Micropezidae, Psilidae, Lonchaeidae, Otitidae, Ulidiidae, Platystomatidae, Pallopteridae and Piophilidae. Bollettino del Museo Civico di Storia Naturale di Venezia, 14: 207–218.

Celedonio, H.H., Enkerlin, H.W. and Bruzzone, D., 1999. Preliminary studies for the colonization of *Anastrepha obliqua* and *Anastrepha serpentina* (Diptera: Tephritidae), Proceedings of a Workshop Organized by the FAO/IAEA Division of Nuclear Techniques in Food and Agriculture: The South American fruit fly, *Anastrepha fraterculus* (Wied.); Advances in Artificial Rearing, Taxonomic Status, and Biological Studies, Viña del Mar, Chile, pp. 33–41.

Chang, L.W.H. and Miller, C.E., 1996. Pathway Risk Assessment: Pink mealybug from the Caribbean, Animal and Plant Health Inspection Service, United States Department of Agriculture.

Chong, J.-H., Aristizábal, L.F. and Arthurs, S.P., 2015. Biology and management of *Maconellicoccus hirsutus* (Hemiptera: Pseudococcidae) on ornamental plants. Journal of Integrated Pest Management, 6(1): 5.

Córdoba-Alfaro, J., 2011. Observaciones sobre *Lycorea ilione* albescens (Nymphalidae: Danainae) en Costa Rica. Estudiante de la Escuela de Biología, Facultad de Ciencias Exactas y Naturales, Universidad Nacional de Costa Rica.

de Figueiredo, R.A. and de Queiroz, J.M., 1993. Herbivory on an ornamental fig by a neotropical moth. Journal of the Elisha Mitchell Scientific Society, 109(4): 197–199.

De Meyer, M., Copeland, R.S., Lux, S.A., Mansell, M., Quilici, S., Wharton, R., White, I.M. and Zenz, N.J., 2002. Annotated Check List of Host Plants for Afrotropical Fruit Flies (Diptera:Tephritidae) of the Genus *Ceratitis*. Documentation Zoologiques, 27. Royal Museum for Central Africa, Tervuren, Belgium, 91 pp.

de O. Abrantes, I.M., dos Santos, M.C.V., da Conceicao, I.L.P.M., de A. Santos, M.S.N. and Vovlas, N., 2008. Root-knot and other plant-parasitic nematodes associated with fig trees in Portugal. Nematologia Mediterranea, 36(2): 131–136.

Donahue, J.P., 1989. The Sphingidae (Lepidoptera) of Baja California, Mexico. Journal of the Lepidopterists' Society, 43(3): 184–209.

Drouet, F., 2021. *Silba adipata* McAlpine: English Synthesis. Agence des Medias Numeriques. https://www.silba-adipata.fr/Black-Fig-Fly-Silba-adipata-English-synthesis.html.

EPPO, 2025a. *Ceratitis capitata* distribution details in Mexico. European and Mediterranean Plant Protection Organization Global Database. Queried 10/17/2025: https://gd.eppo.int/taxon/CERTCA/distribution/MX.

EPPO, 2025b. EPPO Global Database. European and Mediterranean Plant Protection Organization (EPPO). https://gd.eppo.int/

Esquivel R., E.A., 2009. Observaciones sobre la mosca del fruto del aji (*Capsicum* spp.), *Neosilba glaberrima* (Wiedemann, 1830) (Diptera: Acalyptratae: Lonchaeidae) en Panama, Agrociencia Panamensis. https://agrociencia-panama.blogspot.com/2009/09/observaciones-sobre-la-mosca-del-fruto.html.

Fernandes, J.M. and Couri, M.S., 2016. Family Lonchaeidae. Zootaxa, 4122(1): 566–575.

Ferreira Louzeiro, L.R., de Souza-Filho, M.F., Raga, A. and Gisloti, L.J., 2021. Incidence of frugivorous flies (Tephritidae and Lonchaeidae), fruit losses and the dispersal of flies through the transportation of fresh fruit. Journal of Asia-Pacific Entomology, 24(1): 50–60.

Foote, R.H. and Blanc, F.L., 1963. The fruit flies or Tephritidae of California. Bulletin of the California Insect Survey, 7: 1–117.

Fuchs, M., Bar-Joseph, M., Candresse, T., Maree, H.J., Martelli, G.P., Melzer, M.J., Menzel, W., Minafra, A. and Sabanadzovic, S., 2020. ICTV Virus Taxonomy Profile: Closteroviridae. Journal of General Virology, 101: 364–365.

García-Estrada, R.S., Márquez-Zequera, I., Tovar-Pedraza, J.M. and Cruz-Lachica, I., 2020. First report of cucumber fruit rot caused by *Fusarium incarnatum* in Mexico. Plant Disease, 105(2): 497.

Garcia Morales, M., Denno, B., Miller, D., Miller, G., Ben-Dov, Y. and Hardy, N., 2016. ScaleNet: a literature-based model of scale insect biology and systematics. ScaleNet. http://scalenet.info.

Gómez-Cornelio, S., Ortega-Morales, O., Morón-Ríos, A., Reyes-Estebanez, M. and Rosa-García, S.d.l., 2016. Changes in fungal community composition of biofilms on limestone across a chronosequence in Campeche, Mexico. Acta Botánica Mexicana, 117: 59–77.

Hernández-Ortiz, V., Bartolucci, A.F., Morales-Valles, P., Frías, D. and Selivon, D., 2012. Cryptic species of the *Anastrepha fraterculus* complex (Diptera: Tephritidae): A multivariate approach for the recognition of South American morphotypes. Annals of the Entomological Society of America, 105(2): 305–318.

Hernández-Ortiz, V., Canal, N.A., Salas, J.O.T., Ruíz-Hurtado, F.M. and Dzul-Cauich, J.F., 2015a. Taxonomy and phenotypic relationships of the *Anastrepha fraterculus* complex in the Mesoamerican and Pacific Neotropical dominions (Diptera, Tephritidae). Zookeys, 540: 95–124.

Hernández-Ortiz, V., Gómez-Anaya, J.A., Sánchez, A., McPheron, B.A. and Aluja, M., 2004. Morphometric analysis of Mexican and South American populations of the *Anastrepha*

fraterculus complex (Diptera: Tephritidae) and recognition of a distinct Mexican morphotype. Bulletin of Entomological Research, 94: 487–499.
Hickel, E.R. and Schuck, E., 1993. Occurrence of fruit flies *Anastrepha fraterculus* (Diptera: Tephritidae) in kiwifruit. Pesquisa Agropecuária Brasileira, 28(11): 1345–1347.
IPPC Secretariat, 2019. Pest Risk Analysis for Quarantine Pests. International Standards for Phytosanitary Measures, Publication No. 11. Food and Agriculture Organization of the United Nations, Secretariat of the International Plant Protection Convention (IPPC), Rome, Italy, 36 pp.
IPPC Secretariat, 2026. International Standards for Phytosanitary Measures No. 5: Glossary of Phytosanitary Terms. Food and Agriculture Organization on behalf of the Secretariat of the International Plant Protection Convention (IPPC), Rome, Italy. https://www.ippc.int/en/publications/622/, pp. 38.
Katsoyannos, B.I., 1983. Field observations on the biology and behavior of the black fig fly *Silba adipata* McAlpine (Diptera, Lonchaeidae), and trapping experiments. Zeitschrift für angewandte Entomologie, 95(1-5): 471–476.
Korytkowski, C.A. and Ojeda, D., 1971. Revisión de las especies de la familia Lonchaeidae en el Perú (Diptera: Acalyptratae). [Review of the species of the Lonchaeidae family in Peru (Diptera: Acalyptratae)]. Revista Peruana de Entomología, 14(1): 87–116.
Langley, P.A., Maly, H. and Ruhm, F., 1972. Application of the sterility principle for the control of the Mediterranean fruit fly (*Ceratitis capitata*): pupal metabolism in relation to mass-rearing techniques. Entomologia Experimentalis et Applicata, 15(1): 23–34.
Lasa, R., MacGowan, I., Bartual, J. and Williams, T., 2026. The black fig fly, *Silba adipata* (Diptera: Lonchaeidae): Current knowledge and future research needs for an invasive pest of fig production. Insects, 17(3): 247.
Lasa, R., Navarro-de-la-Fuente, L., MacGowan, I. and Williams, T., 2025. A complex of lance flies (Diptera: Lonchaeidae) infesting figs in Veracruz, Mexico, with the description of a new species. Insects, 16(5): 458.
Liquido, N.J., Cunningham, R.T. and Nakagawa, S., 1990. Host plants of Mediterranean fruit fly (Diptera: Tephritidae) on the island of Hawaii (1949-1985 survey). Journal of Economic Entomology, 83(5): 1863–1878.
Loizides, M., 2018. Diversity of wood-inhabiting aphyllophoraceous basidiomycetes on the island of Cyprus. Mycotaxon, 132(4): 985–986.
Lopes, E.B., Batista, J.d.L., Albuquerque, I.C.d. and Brito, C.H.d., 2008. Moscas frugívores (Tephritidae e Lonchaeidae): ocorrência em pomares comerciais de tangerina (*Citrus reticulata* Blanco) do município de Matinhas, Estado da Paraíba. [Frugivorous flies (Tephritidae and Lonchaeidae): occurrence in commercial tangerine (Citrus reticulata Blanco) orchards in the municipality of Matinhas, State of Paraíba]. Acta Scientiarum - Agronomy, 30(Suplemento Especial): 639–644.
López-Martínez, V., Vargas, O.R., Alia-Tejacal, I., Toledo-Hernández, V.H., Corona-López, A.M., Delfín-González, H., Guillen-Sánchez, D. and Jiménez-García, D., 2015. Xylophagous Beetles (Coleoptera: Buprestidae and Cerambycidae) from *Ficus carica* L. (Moraceae) in Morelos, Mexico. The Coleopterists Bulletin, 69(4): 780–788.
Luna-Guerrero, A.Y., Montes-Belmont, R., Talavera-Rubia, M.F., Flores-Moctezuma, H.E. and Bravo-Luna, L., 2011. Estudio preliminar de los factores bióticos y abióticos asociados a la muerte del duraznero en Morelos, México. Nematropica, 41(2): 254–262.

MacGowan, I., Andrade, R. and Gonçalves, A.R., 2016. Notes on the Lonchaeidae (Insecta, Diptera) of Portugal with a description of a new species. Boletín de la Asociación Española de Entomología, 40(1-2): 175–183.
Macgowan, I., Navarro-de-la-fuente, L., Williams, T. and Lasa, R., 2025. A new species of *Neosilba* (Diptera, Lonchaeidae) associated with fig orchards in Mexico. Zootaxa, 5583(1): 195–200.
Mcalister, J., LC, 1936. Observations on the West Indian Fruit Fly at Key West in 1932-33. Journal of Economic Entomology, 29(2): 440–445.
McAlpine, J., 1956. Old world lonchaeids of the genus *Silba* Macquart (= *Carpolonchaea* Bezzi), with descriptions of six new species (Diptera: Lonchaeidae). The Canadian Entomologist, 88(9): 521–544.
McAlpine, J.F. and Steyskal, G.C., 1982. A revision of *Neosilba* McAlpine with a key to the world genera of Lonchaeidae (Diptera). Canadian Entomologist, 114(2): 105–137.
McDonald, P.T. and McInnis, D.O., 1985. *Ceratitis capitata*: Effect of host fruit size on the number of eggs per clutch. Entomologia Experimentalis et Applicata, 37(3): 207–211.
Mifsud, D., Falzon, A., Malumphy, C., Lillo, E.D., Vovlas, N. and Porcelli, F., 2012. On some arthropods associated with *Ficus* species (Moraceae) in the Maltese Islands. Bulletin of the entomological Society of Malta, 5: 5–34.
Miller, D.R., Blackburn, V.L., Davidson, J.A. and Gimpel, W.F., Jr., 1985. Pest risk assessment of armored scales on certain fruit [report submitted to USDA, Animal and Plant Health Inspection Service, Plant Protection and Quarantine], United States Department of Agriculture (USDA), Agricultural Research Service, Beltsville, MD.
NAPPO, 2020. Detection of black fig fly (*Silba adipata* McAlpine) in the municipality of Ayala, State of Morelos, North American Plant Protection Organization (NAPPO), Phytosanitary Alert System, Mexico.
NAPPO, 2022. *Ceratitis capitata* (Mediterranean Fruit Fly): APHIS Establishes Quarantine Area in San Bernardino and Los Angeles Counties, California, North American Plant Protection Organization (NAPPO), Phytosanitary Alert System.
NAPPO, 2023. APHIS Establishes Mediterranean Fruit Fly and Queensland Fruit Fly Quarantines in California, North American Plant Protection Organization (NAPPO), Phytosanitary Alert System.
NAPPO, 2024. *Ceratitis capitata* (Mediterranean Fruit Fly): APHIS Establishes a Quarantine in Alameda and Santa Clara Counties, California, North American Plant Protection Organization (NAPPO), Phytosanitary Alert System.
NAPPO, 2025. *Ceratitis capitata* (Mediterranean Fruit Fly): APHIS Establishes and Expands the Quarantine in Santa Clara County, California, North American Plant Protection Organization (NAPPO), Phytosanitary Alert System.
Nasca, A.J., Zamora, J.A., Vergara, L.E. and Jaldo, H.E., 1996. Hospederos de moscas de Jos frutos en el Valle de Antinaco-Los Colorados, provincia de La Rioja, República Argentina. CIPRON, Revista de Investigacion, 10(1-4): 19–24.
Navarro-Sigüenza, A.G., 2025. Comisión nacional para el conocimiento y uso de la biodiversidad. Apoyo a las colecciones biológicas de la Facultad de Ciencias de la UNAM: Fase 1 (Lepidopterológica). Version 1.10. Comisión nacional para el conocimiento y uso de la biodiversidad. Occurrence dataset https://doi.org/10.15468/se4paj accessed via GBIF.org on 2025-10-20. https://www.gbif.org/occurrence/3306336547.

Nicácio, J. and Uchôa, M.A., 2011. Diversity of frugivorous flies (Diptera: Tephritidae and Lonchaeidae) and their relationship with host plants (Angiospermae) in environments of South Pantanal Region, Brazil. Florida Entomologist, 94(3): 443–466.

NIS, 2024. Revised phytosanitary action exemption policy for armored scales (Hemiptera: Diaspididae) intercepted from non-propagative articles (NIS action policy, Sept. 25, 2024), United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine, National Identification Services (NIS).

Norrbom, A.L. and Kim, K.C., 1988. A list of the reported host plants of the species of *Anastrepha* (Diptera: Tephritidae) (APHIS 81-52). United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine, 114 pp.

Norrbom, A.L., Rodriguez, E.J., Steck, G.J., Cassel, B.K., Ruiz-Arce, R., Muller, A., Gangadin, A., Savaris, M., Nolazco, N., Troya, H., Rodriguez, P., Barria, Y.P., Picado, J.M., Clavijo, P.A.R., Moore, M.R., Branham, M., Sutton, B.D., Raszick, T., Cattle, E. and Wiegmann, B.M., 2026. A new phylogeny of *Anastrepha* (Diptera: Tephritidae) based on nuclear loci obtained by phylogenomic methods. Systematic Entomology, 51(1).

NRCS, 2026. PLANTS Database. United States Department of Agriculture, Natural Resources Conservation Service (NRCS).

Nur-Shakirah, A.O., Khadijah, M.S., Kee, Y.J., Huda-Shakirah, A.R., Mohd Hafifi, A.B., Nurul-Aliyaa, Y.A., Chew, B.L., Zakaria, L., Mohamed Nor, N.M.I., Sreeramanan, S., Leong, Y.-H. and Mohd, M.H., 2022. Characterization of *Lasiodiplodia* species causing leaf blight, stem rot and fruit rot of fig (*Ficus carica*) in Malaysia. Plant Pathology, 71(7): 1594–1605.

Ortega-Acosta, C., Ochoa-Martínez, D.L. and Muratalla-Lúa, A., 2022. Viruses and '*Candidatus* Phytoplasma asteris' detection in fig plants showing fig mosaic disease in Mexico. Journal of Plant Pathology, 104(2): 477–486.

Ovruski, S., Schliserman, P. and Aluja, M., 2003. Native and introduced host plants of *Anastrepha fraterculus* and *Ceratitis capitata* (Diptera: Tephritidae) in Northwestern Argentina. Journal of Economic Entomology, 96(4): 1108–1118.

Paniagua-Jasso, E., Tejeda-Reyes, M.A., Martínez-Castillo, A.M., Figueroa-de la Rosa, J.I., García-Banderas, D.V., Palma-Castillo, L.J., Illescas-Riquelme, C.P. and Pineda-Guillermo, S., 2024. Bioecological parameters of the black fig fly, *Silba adipata* (Diptera: Lonchaeidae), collected from fig crops in Mexico. Insects, 15(11): 883.

PERAL, 2007. Phytosanitary risks associated with armored scales in commercial shipments of fruit for consumption to the United States, Revision Original, United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine, Center for Plant Health Science and Technology, Plant Epidemiology and Risk Analysis Laboratory (PERAL), Raleigh, NC.

Preising, S., Borges, D.F., de Queiroz Ambrósio, M.M. and da Silva, W.L., 2020. A fig deal: A global look at fig mosaic disease and its putative associates. Plant Disease, 105(4): 727–738.

Radonjić, S., Hrnčić, S. and Perović, T., 2019a. Overview of fruit flies important for fruit production on the Montenegro seacoast. Biotechnology, Agronomy, Society and Environment, 23(1): 46–56.

Radonjić, S., Hrnčić, S. and Perović, T., 2019b. Overview of fruit flies important for fruit production on the Montenegro seacoast. Biotechnology, Agronomy, Society and Environment (BASE), 23(1): 46–56.
Raga, A., Prestes, D.A., Souza, M.F., Sato, M.E., Siloto, R.C., Guimaraes, J.A. and Zucchi, R.A., 2004. Fruit fly (Diptera: Tephritoidea) infestation in citrus in the state of Sao Paulo, Brazil. Neotropical Entomology, 33(1): 85–89.
Raga, A., Souza-Filho, M.F., Strikis, P.C. and Montes, S.M.N.M., 2015. Lance fly (Diptera: Lonchaeidae) host plants in the State of São Paulo, Southeast Brazil. Entomotropica, 30: 57–68.
Reyes, P.E., Pinzón, J.P., Valenzuela, R., Raymundo, T. and Tun-Garrido, J., 2025. Taxonomic revision of the Hypoxylaceae (Ascomycota, Xylariales) from the Yucatan Peninsula biotic province, Mexico. Check List, 21(2): 347–367.
Robinson, G.S., Ackery, P.R., Kitching, I., Beccaloni, G.W. and Hernández, L.M., 2023. HOSTS (from HOSTS - a Database of the World's Lepidopteran Hostplants). Natural History Museum. https://data.nhm.ac.uk/dataset/hosts/resource/877f387a-36a3-486c-a0c1-b8d5fb69f85a.
Rocha Barreto, M., Ben-Hur, R., do Socorro Miranda de Sousa, M. and Adaime, R., 2023. First records of *Neosilba* spp.(Diptera: Lonchaeidae) in the state of Mato Grosso, Brazil. Nativa, 11(1): 71–74.
Rot, M., Žežlina, I., Jančar, M. and Seljak, G., 2017. Črna Figova Muha (*Silba adipata* McAlpine, 1956 [Diptera, Lonchaeidae]) Je Zastopana Tudi V Sloveniji (black fig fly (*Silba adipata* McAlpine, 1956 Diptera, Lonchaeidae) is present also in Slovenia). Ljubljana, Društvo za varstvo rastlin Slovenije (Plant Protection Society of Slovenia), 7(8): 47–52.
Savela, M., 2009. Lepidoptera and Other Life Forms: *Lycorea ilione*. https://www.nic.funet.fi/pub/sci/bio/life/insecta/lepidoptera/ditrysia/papilionoidea/nymphalidae/danainae/lycorea/index.html#NL4A.
Shaw, J.G., 1947. Hosts and distribution of *Anastrepha serpentina* in northeastern Mexico. Journal of Economic entomology, 41(1): 34–40.
Simões Dias, V. and Lucky, A., 2021. South American fruit fly - *Anastrepha fraterculus* (Wiedemann), University of Florida Institute of Food and Agricultural Sciences, Florida Department of Agriculture and Consumer Services, Gainesville, FL.
SINAVIMO, 2026. *Anastrepha fraterculus*. Sistema Nacional Argentino de Vigilancia y Monitoreo de Plagas. https://www.sinavimo.gob.ar/plaga/anastrepha-fraterculus, Buenos Aires, Argentina.
Souza-Filho, M.d., Raga, A., Azevedo-Filho, J., Strikis, P., Guimarães, J. and Zucchi, R.A., 2009. Diversity and seasonality of fruit flies (Diptera: Tephritidae and Lonchaeidae) and their parasitoids (Hymenoptera: Braconidae and Figitidae) in orchards of guava, loquat and peach. Brazilian Journal of Biology, 69: 31–40.
Souza, S.A., Resende, A.L., Strikis, P.C., Costa, J.R., Ricci, M.S. and Aguiar-Menezes, E.L., 2005. Natural infestation by frugivorous flies (Diptera: Tephritoidea) in shaded and unshaded arabic coffee under organic management in Valença, RJ, Brazil. Neotropical Entomology, 34(4): 639–648.
Stone, A., 1942. The Fruitflies of the Genus *Anastrepha*, United State Department of Agriculture, Washington, DC.

Strikis, P.C., Deus, E.d.G., da Silva, R.A., Pereira, J.D.B., de Jesus, C.R. and Marsaro Júnior, A., 2011. Conhecimento sobre Lonchaeidae na Amazônia brasileira. In: R.A. da Silva, W.d.P. Lemos and R.A. Zucchi (Editors), Moscas-das-frutas na Amazônia brasileira: diversidade, hospedeiros e inimigos naturais. Embrapa Amapá, Macapá, Brazil, pp. 205–215.

Takeuchi, Y., Fowler, G. and Joseph, A.S., 2018. SAFARIS: Global Plant Hardiness Zone Development. North Carolina State University, Center for Integrated Pest Management; United States Department of Agriculture, Animal and Plant Health Inspection Service, Plant Protection and Quarantine, Science and Technology, Plant Pest Risk Analysis. https://safaris.cipm.info/safarispestmodel/StartupServlet?phz, Raleigh, NC.

Tapia, F., Chacón, S. and Pérez-Gorjón, S., 2016. Hongos corticioides (Agaricomycetes) citados de México. Acta Botánica Mexicana, 114: 15–50.

Tapia Rangel, G., 1989. Relación del estado fenológico del mango papayo e infestación por moscas de la fruta en Capira, Panamá, Universidad de Panamá. Vicerrectoría de Investigación y Postgrado, Panama City, Panama.

Tellería, M., Melo, I. and Dueñas, M., 1997. An annotated list of the Aphyllophorales of the Balearic Islands. Mycotaxon, 65: 353–377.

Thomas, M.C., Heppner, J.B., Woodruff, R.E., Weems, H.V., Steck, G.J. and Fasulo, T.R., 2005. Mediterranean Fruit Fly, *Ceratitis capitata* (Wiedemann) (Insecta: Diptera: Tephritidae) (EENY214), University of Florida, Institute of Food and Agricultural Sciences, Gainesville, FL.

Tutmuş, E. and AkşİT, T., 2021. Siyah İncir sineği'nin (*Silba adipata* Mcalpine, Diptera: Lonchaeidae) Aydın İlinde İncir bahçelerinde bulunma oranı, popülasyon değişimi ve bazı biyolojik özellikleri. Journal of Adnan Menderes University, Agricultural Faculty, 18(2): 311–319.

Uchôa-Fernandes, M.A., Oliveira, I.d., Molina, R. and Zucchi, R.A., 2003. Populational fluctuation of frugivorous flies (Diptera: Tephritoidea) in two orange groves in the state of Mato Grosso do Sul, Brazil. Neotropical Entomology, 32(1): 19–25.

Uchôa, M.A. and Nicácio, J., 2010. New records of Neotropical fruit flies (Tephritidae), lance flies (Lonchaeidae) (Diptera: Tephritoidea), and their host plants in the South Pantanal and adjacent areas, Brazil. Annals of the Entomological Society of America, 103(5): 723–733.

Urrutia Araujo, F.d.M., 2004. Revisión taxonómica parcial del género *Neosilba* McAlpine (Diptera: Lonchaeidae) en la región neotropical, Universidad de Panamá, Panama City, Panamá.

USDA Fungal Databases, 2025. USDA Fungal Databases. United States Department of Agriculture (USDA) Agricultural Research Service. https://fungi.ars.usda.gov/.

Vanegas-Rico, J.M., 2017. *Azochis gripusalis*. Boletin de la Sociedad Mexicana de Entomologia 3(1): 4–6.

Vargas, R.I., Chang, H.B.C., Komura, M. and Kawamoto, D.S., 1986. Evaluation of two pupation methods for mass production of Mediterranean fruit fly (Diptera: Tephritidae). Journal of Economic Entomology, 79: 864–867.

Wasbauer, M.S., 1972. An annotated host catalog of the fruit flies of America north of Mexico (Diptera: Tephritidae). Occasional Papers, no. 19, 89 pp. Sacramento, CA: Bureau of Entomology, Department of Agriculture.

Wellman, F.L., 1977. Dictionary of Tropical American Crops and Their Diseases. The Scarecrow Press, Metuchen, NJ, 495 pp.
White, I.M. and Elson-Harris, M.M., 1992. Fruit Flies of Economic Significance: Their Identification and Bionomics. Commonwealth Agricultural Bureau International (CABI), Australian Centre for International Agricultural Research (ACIAR), Wallingford, UK 601 pp.
Withers, P. and Macgowan, I., 2014. A preliminary account of the lance flies (Diptera: Lonchaeidae) of continental France, with the description of a new species. Studia Dipterologica, 21(1): 3–10.
Wohlfarter, M., Giliomee, J.H., Venter, E. and Storey, S., 2011. A survey of the arthropod pests and plant parasitic nematodes associated with commercial figs, *Ficus carica* (Moraceae), in South Africa. African Entomology, 19(1): 165–172.
Yorganci, S. and Açıkgöz, S., 2019. Transmission of fig leaf mottle-associated virus 1 by *Ceroplastes rusci*. Journal of Plant Pathology, 101(4): 1199–1201.
Yuliadhi, K.A., Merta, I.N.M., Suriani, N.L. and Susila, I.W., 2024. Geographical distribution, population density, and fruit damage due to pest, *Silba adipata* McAlpine (Diptera: Lochaeidae) on cayenne pepper in Bali, Indonesia, IOP Conference Series: Earth and Environmental Science. IOP Publishing, pp. 012016.