USDA Animal and Plant Health Inspection Service
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Importation of fresh mango (*Mangifera indica*) fruit from the Philippines into the United States for consumption

A Qualitative, Pathway Initiated Pest Risk Assessment

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Executive Summary

The purpose of this report is to assess the pest risks associated with importing commercially produced fresh fruit of mango, *Mangifera indica* (Anacardiaceae), from the Philippines into the United States for consumption.

Based on the market access modification request submitted by the Philippines, we considered the pathway to include the following processes and conditions: washing and culling. The pest risk ratings depend on the application of all conditions of the pathway as described in this document; fruit produced under different conditions were not evaluated and may pose a different pest risk.

We used scientific literature, port-of-entry pest interception data, and information from the government of the Philippines to develop a list of pests with quarantine significance for the United States. These are pests that occur in the Philippines on any host and are associated with the commodity plant species anywhere in the world.

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	Coleoptera: Curculionidae	*Sternochetus frigidus* (Fabricius)	Medium
Arthropod	Diptera: Tephritidae	*Bactrocera frauenfeldi* (Schiner)	High
Arthropod	Diptera: Tephritidae	*Bactrocera occipitalis* (Bezzi)	Medium

The following organisms are likely to follow the pathway but were not assessed in this document because they have already been determined to pose an unacceptable risk to the United States. Domestic regulations are in place for these pests:

Pest type	Taxonomy	Scientific name	Code of Federal Regulations
Arthropod	Diptera: Tephritidae	*Bactrocera dorsalis* (Hendel)	7CFR § 301.32, 2024
Arthropod	Diptera: Tephritidae	*Zeugodacus cucurbitae* (Coquillett)	7CFR § 301.32, 2024

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

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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 mango (*Mangifera indica* L.) from the Philippines (referred to as the export area) into the United States[1] (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, 2019). The use of biological and phytosanitary terms is consistent with ISPM No. 5, "Glossary of Phytosanitary Terms" (IPPC, 2024).

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

The Philippines has historical market access into the United States for mango fruit exported under an APHIS Preclearance Program. Due to a shift to irradiation upon arrival and a seven-year lapse in exports, PPQ needs a pest risk assessment to understand the present pest complex on mango in the Philippines to decide if market access should be maintained or modified.

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 (native or naturalized) 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 mango does not need to be analyzed because it is already enterable into the United States from other countries and is naturalized in Florida, Hawaii, Puerto Rico, and the U.S. Virgin Islands (NRCS, 2024).

1.4. Description of the pathway

A pathway is "any means that allows the entry or spread of a pest" (IPPC, 2024). In the context of this document, the pathway is the commodity to be imported. The following description includes those conditions and processes the commodity undergoes from production through importation and distribution that may have an impact on pest risk and therefore were considered in our assessment. Commodities produced under different conditions were not considered.

[1]The *United States* includes all states, the District of Columbia, Guam, the Northern Mariana Islands, Puerto Rico, the U.S. Virgin Islands, and any other territory or possession of the United States.

1.4.1. Description of the commodity
The specific pathway of concern is the importation of fresh fruit of mango for consumption.

1.4.2. Summary of the production, harvest, post-harvest, shipping, and storage conditions considered
We assumed all fruit would be washed and damaged fruit would be culled as post-harvest procedures.

2. Pest List and Pest Categorization

The pest list is a compilation of plant pests of quarantine significance to the United States. This list includes pests that are present in the Philippines on any host and are known to be associated with *Mangifera indica* anywhere in the world. Pests are considered quarantine significant if they (a) are not present in the PRA area, (b) are actionable at U.S. ports of entry, (c) are regulated non-quarantine pests, (d) are under federal official control, or (e) require evaluation for regulatory action. Consistent with ISPM No. 5, pests that meet any of these definitions are considered "quarantine pests" and are candidates for analysis. 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 the Philippines. We listed the pests that are of quarantine significance to the PRA area in Table 1. For each pest, we provided evidence for the pest's presence in the Philippines and its association with *Mangifera indica* anywhere in the world. We indicated the plant parts with which the pest is generally associated and, if applicable, provided information about the pest's distribution in the United States. Pests that are likely to remain associated with the harvested commodity in a viable form are indicated by bolded text and are listed separately in Table 2.

Table 1. List of quarantine pests associated with *Mangifera indica* anywhere in the world and present in the Philippines on any host

Pest name	Presence in the Philippines	Host association	Plant part(s) [2]	Considered further?[3]
MITE: Trombidiformes: Tenuipalpidae *Brevipalpus californicus* (Banks)	(Corpuz-Raros, 2001)	(Nassar and Ghai, 1981)	Leaves (based on feeding behavior on other hosts) (Monjarás-Barrera et al., 2016)	No. Present in the United States in Florida (Childers, 1994) and Texas (Chen et al., 2006).

[2] 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.
[3] "Yes" indicates simply that the pest has a reasonable likelihood of being associated with the harvested commodity;

Pest name	Presence in the Philippines	Host association	Plant part(s) [2]	Considered further?[3]
MITE: Trombidiformes: Tetranychidae *Oligonychus biharensis* (Hirst)	(Bolland et al., 1998)	(Bolland et al., 1998)	Leaves (Jeppson et al., 1975)	No. Present in the United States in Hawaii and American Samoa (Bolland et al., 1998)
MITE: Trombidiformes: Tetranychidae *Oligonychus coffeae* Nietner	(Bolland et al., 1998)	(Bolland et al., 1998)	Leaves (based on feeding behavior on other hosts) (Wongsiri, 1991)	No. Present in the United States in Florida (CABI, 2024) and Hawaii (Bolland et al., 1998).
MITE: Trombidiformes: Tetranychidae *Tetranychus urticae* Koch	(Bolland et al., 1998)	(Bolland et al., 1998)	Leaves, whole plant (based on general biology) (Jeppson et al., 1975)	No. Present in the United States in more than five states in the contiguous United States and Hawaii (CABI, 2024). It occurs externally (Jeppson et al., 1975) and would likely be removed by washing and culling.
MITE: Trombidiformes: Tuckerellidae *Tuckerella knorri* Baker & Tuttle	(Vacante, 2010)	(Ochoa, 1989)	Leaves (Ochoa, 1989)	No. *Tuckerella knorri* occurred externally on the fruit of other hosts (Ochoa, 1989) and would likely be removed by washing and culling if it occurs on mango fruit.
INSECT: Coleoptera: Bostrichidae *Heterobostrychus hamatipennis* (Lesne)	(Park et al., 2015)	(Butani, 1993)	Stem (Butani, 1993)	No. Present in the United States in Florida (Beiriger, 2010).
INSECT: Coleoptera: Bostrichidae *Sinoxylon conigerum* Gerstaecker	(Peres Filho et al., 2006)	(Peres Filho et al., 2006)	Wood, roots (based on feeding behavior on other hosts) (Peres Filho et al., 2006)	No. Present in the United States in Florida, Hawaii, and American Samoa (CABI, 2024).

the level of pest prevalence on the harvested commodity (low, medium, or high) is qualitatively assessed as part of the Likelihood of Introduction assessment (section 3).

Pest name	Presence in the Philippines	Host association	Plant part(s) [2]	Considered further?[3]
INSECT: Coleoptera: Bostrichidae *Xylopsocus capucinus* Fabricius	(Woodruff et al., 2000)	(Woodruff et al., 2000)	No. Branches, roots, stems (based on feeding behavior on other hosts) (Woodruff et al., 2000)	No. Present in the United States in Florida (Woodruff et al., 2000).
INSECT: Coleoptera: Cerambycidae *Batocera numitor* Newman	(Sundholm, 1998)	(Butani, 1993)	Branches, stems, trunks (based on *Batocera* spp. feeding behavior) (Butani, 1993)	No
INSECT: Coleoptera: Cerambycidae *Batocera rubus* (Linnaeus)	(Heffern, 2005)	(Butani, 1993)	Branches, stems, trunks (based on *Batocera* spp. feeding behavior) (Butani, 1993)	No
INSECT: Coleoptera: Cerambycidae *Epepeotes luscus* (Fabricius)	(Woodworth , 1922)	(Reddy and Sreedevi, 2016)	Branches, stems, trunks (based on feeding behavior on other hosts) (Butani, 1978)	No
INSECT: Coleoptera: Cerambycidae *Gnoma luzonica* Erichs.	(Woodworth , 1922)	(Woodwort h, 1922)	Branches, trunks (Wester, 1920)	No
INSECT: Coleoptera: Cerambycidae *Niphonoclea albata* (Newman) syn.	(Waterhouse , 1993)	(Waterhous e, 1993)	Twigs (Waite, 2002)	No
INSECT: Coleoptera: Cerambycidae *Niphonoclea capito* Pascoe	(González-Fernández and Hormaza, 2020)	(González-Fernández and Hormaza, 2020)	Twigs (Waite, 2002)	No

Pest name	Presence in the Philippines	Host association	Plant part(s) [2]	Considered further?[3]
INSECT: Coleoptera: Cerambycidae *Olenecamptus bilobus* Fabricius	(Woodworth, 1922)	(Baradevanal et al., 2021)	Branches, leaves, shoots (based on general feeding behavior) (Baradevanal et al., 2021)	No
INSECT: Coleoptera: Cerambycidae *Plocaederus ruficornis* (Newman)	(Woodworth, 1922)	(Woodworth, 1922)	Branches, trunks (Oanh and Duc, 2020)	No
INSECT: Coleoptera: Cerambycidae *Trirachys holosericeus* (Fabricius)	(CABI, 2024)	(Sunitha et al., 2022)	Branches, trunks (Sunitha et al., 2022)	No
INSECT: Coleoptera: Curculionidae *Arixyleborus grandis* (Schedl)	(Sittichaya, 2012)	(Sittichaya, 2012)	Branches, trunks (Sittichaya, 2012)	No
INSECT: Coleoptera: Curculionidae *Coccotrypes medius* Wood & Bright	(Beaver, 1976)	(Sittichaya, 2012)	Branches, trunks (Sittichaya, 2012)	No
INSECT: Coleoptera: Curculionidae *Eccoptopterus spinosus* Wood & Bright	(Cognato, 2008)	(Beaver, 1987)	Branches (Beaver, 1987)	No
INSECT: Coleoptera: Curculionidae *Euwallacea fornicatus* (Eichhoff)	(Rabaglia et al., 2006)	(Yamaguchi et al., 2006)	Branches (based on feeding behavior on other hosts) (Kumar et al., 2011)	No. Members of the *Euwallacea fornicatus* species complex are present in the United States in California, Florida, and Hawaii (Stouthamer et al., 2017).
INSECT: Coleoptera: Curculionidae *Euwallacea interjectus* (Blandford)	(Beaver and Liu, 2010)	(Wood and Bright, 1992a)	Trunks (based on occurrence on other hosts) (Huang et al., 2003)	No. Present in the United States in Florida (Halbert et al., 2011) and Hawaii (Beaver and Liu, 2010).
INSECT: Coleoptera: Curculionidae *Euwallacea perbrevis* (Schedl)	(Gomez et al., 2019)	(Kendra et al., 2023)	Branches (based on general biology) (Kendra et al., 2023)	No. Present in the United States in Florida, Hawaii, and American Samoa (Gomez et al., 2019).

Pest name	Presence in the Philippines	Host association	Plant part(s) [2]	Considered further?[3]
INSECT: Coleoptera: Curculionidae *Euwallacea xanthopus* Wood & Bright	(Cognato, 2008)	(Cognato, 2008)	Branches (based on feeding behavior on other hosts) (Nel et al., 2024)	No
INSECT: Coleoptera: Curculionidae *Hypomeces squamosus* Fabricius	(Hill, 1983)	(Muniappan et al., 2012)	Leaves (Muniappan et al., 2012)	No
INSECT: Coleoptera: Curculionidae *Sternochetus frigidus* (Fabricius) syn. *Cryptorhynchus frigidus* (Fabricius), *Sternochetus gravis* (Fabricius)	**(Muniappan et al., 2012)**	**(Muniappan et al., 2012)**	**Fruit (internal feeder) (Muniappan et al., 2012)**	**Yes. See assessment in section 3.2.3 Mango fruit weevil causes rotting fruit flesh with no signs of entry on the outside of the fruit (Muniappan et al., 2012) indicating washing and culling are unlikely to prevent its movement on the commodity. Adult emergence causes small exit holes on the fruit (Muniappan et al., 2012).**
INSECT: Coleoptera: Curculionidae *Xyleborinus andrewesi* (Blandford)	(Okins and Thomas, 2009)	(Wood and Bright, 1992b)	Branches, twigs (based on general feeding behavior (Okins and Thomas, 2009)	No. Present in the United States in Hawaii (Okins and Thomas, 2009)
INSECT: Coleoptera: Curculionidae *Xyleborus perforans* Wood & Bright	(CABI, 1973); (iBol, 2024)	(Wood and Bright, 1992b)	Bark, heartwood (based on feeding behavior on other hosts) (Thu et al., 2021)	No. Present in the United States in Hawaii, American Samoa, Guam, and the Northern Mariana Islands (CABI, 2024).

Pest name	Presence in the Philippines	Host association	Plant part(s) [2]	Considered further?[3]
INSECT: Coleoptera: Curculionidae *Xyleborus similis* Ferrari	(Wood and Bright, 1992a)	(Wood and Bright, 1992b)	Heartwood and sapwood (based on feeding behavior on other hosts) (Mathew, 1987)	No. Present in the United States in Texas, Guam, and the Northern Mariana Islands (CABI, 2024).
INSECT: Coleoptera: Curculionidae *Xylosandrus morigerus* (Blandford)	(Dole and Cognato, 2010)	(Beaver, 1988)	Stems, twigs (based on general feeding behavior) (Beaver, 1988)	No. Present in the United States in Hawaii, American Samoa, Guam, Puerto Rico, and the Northern Mariana Islands (CABI, 2024).
INSECT: Diptera: Cecidomyiidae *Procontarinia frugivora* Gagné	(Gagné and Medina, 2004; Kolesik et al., 2015; Medina et al., 2015)	(Kolesik et al., 2015; Medina et al., 2015)	Immature fruit (Gagné and Medina, 2004; Jiao et al., 2018)	No. Larvae leave fruit before fruit maturation; causes most fruit to drop to the ground and the rest to not be commercially marketable (Gagné and Medina, 2004; Jiao et al., 2018).
INSECT: Diptera: Cecidomyiidae *Procontarinia pustulata* Kolesik	(Kolesik et al., 2015; Medina et al., 2015)	(Kolesik et al., 2015; Medina et al., 2015)	Leaves (Kolesik et al., 2015), shoots (Medina et al., 2015)	No
INSECT: Diptera: Tephritidae *Bactrocera dorsalis* (Hendel) syn. *Bactrocera philippinensis* (Drew and Hancock)	**(Jalani et al., 2015; Williams et al., 2009)**	**(Allwood et al., 1999; Anjum et al., 2000; Jalani et al., 2015; Pena et al., 2009; Williams et al., 2009)**	**Fruit (Anjum et al., 2000; Jalani et al., 2015; Pena et al., 2009; Williams et al., 2009)**	**Yes. *Bactrocera dorsalis* (Oriental fruit fly) is a domestic quarantine species and is regulated by the U.S. Code of Federal Regulations (7CFR § 301.32, 2024).**
INSECT: Diptera: Tephritidae *Bactrocera frauenfeldi* (Schiner) syn. *Bactrocera albistrigata* (de Meijere)	**(Doorenweerd et al., 2023)**	**(Allwood et al., 1999; Leblanc et al., 2012; Leblanc et al., 2004)**	**Fruit (Leblanc et al., 2004)**	**Yes. See assessment in section 3.2.1. *Bactrocera albistrigata* was recently synonymized with *B. frauenfeldi* (Doorenweerd et al., 2023).**

Pest name	Presence in the Philippines	Host association	Plant part(s) [2]	Considered further?[3]
INSECT: Diptera: Tephritidae *Bactrocera occipitalis* (Bezzi) syn. *Dacus occipitalis* (Bezzi)	**(Cortaga and Sison, 2021; Hardy, 1974; Jalani et al., 2015)**	**(Allwood et al., 1999; Jalani et al., 2015)**	**Fruit (Jalani et al., 2015)**	**Yes. See assessment in section 3.2.2**
INSECT: Diptera: Tephritidae *Zeugodacus cucurbitae* (Coquillett) syn. *Bactrocera cucurbitae* Coquillett, *Dacus cucurbitae* Coquillett	**(Boontop et al., 2017; Hardy, 1974; Rejesus et al., 1991)**	**(Kunprom and Pramual, 2017; Peña and Moyhuddin, 1997; White and Elson-Harris, 1994)**	**Fruit (Kunprom and Pramual, 2017; Peña and Moyhuddin, 1997)**	**Yes. *Bactrocera cucurbitae* (melon fruit fly) is a domestic quarantine species and is regulated by the U.S. Code of Federal Regulations (7CFR § 301.32, 2024).**
INSECT: Hemiptera: Aleyrodidae *Aleurocanthus woglumi* Ashby	(Nguyen, 2024)	(Butani, 1993; Pena et al., 2009)	Leaves (Butani, 1993; Pena et al., 2009)	No. Present in the United States (Florida, Hawaii, Puerto Rico, Texas) (Nguyen, 2024).
INSECT: Hemiptera: Aleyrodidae *Aleurodicus destructor* Mackie	(CABI, 2024; Evans, 2007)	(Dooley, 2007)	Leaves (CABI, 2024)	No
INSECT: Hemiptera: Aleyrodidae *Aleurolobus marlatti* (Quaintance)	(Evans, 2008; Mound and Halsey, 1978)	(Evans, 2008)	Leaves (Al-Jalal and Al-Dulaimy, 2023; Hill, 1983) (based on feeding behavior on hosts in general)	No
INSECT: Hemiptera: Alydidae *Leptocorisa acuta* (Thunberg)	(Waterhouse, 1993)	(Lal and Mukharji, 1975)	Leaves (Lal and Mukharji, 1975)	No

Pest name	Presence in the Philippines	Host association	Plant part(s) [2]	Considered further?[3]
INSECT: Hemiptera: Aphididae *Aphis odinae* (van der Goot) syn. *Toxoptera odinae* Van der Goot	(Blackman et al., 2011; CABI, 2024)	(CABI, 2024; Reddy et al., 2022);(Blackman and Eastop, 2000; Blackman et al., 2011)	Leaves, shoots (CABI, 2024); flowers (Reddy et al., 2022)	No
INSECT: Hemiptera: Aphididae *Toxoptera citricidus* (Kirkaldy) syn. *Aphis citricidus* (Kirkaldy), *Toxoptera citricida* (Kirkaldy)	(CABI, 2024; Waterhouse, 1993)	(Blackman and Eastop, 2000)	Leaves, flowers (CABI, 2024) (based on feeding behavior on hosts in general)	No. Present in the United States (Florida, Hawaii, U.S. Virgin Islands) (CABI, 2024; Foottit et al., 2012).
INSECT: Hemiptera: Cicadellidae *Idioscopus clypealis* (Lethierry)	(Corey et al., 1989; Viraktamath, 1989; Waterhouse, 1993) (Fägerström, 2024)	(Corey et al., 1989; Viraktamath, 1989; Waite, 2002; Williams et al., 2009)	Flowers, leaves (TNAU, 2024; Waite, 2002); flowers, leaves, shoots (Corey et al., 1989); flowers (Williams et al., 2009)	No
INSECT: Hemiptera: Cicadellidae *Idioscopus nitidulus* (Walker) syn. *Idioscopus niveosparsus* (Lethierry)**,** *Chunra niveosparsus* (Lethierry)	(Viraktamath, 1989; Waterhouse, 1993) (Orrell, 2024)	(Dakshinamurthy, 1984; Reddy et al., 2022; Srivastava, 1997; Verghese et al., 2000; Viraktamath, 1989; Waterhouse, 1993)	Flowers, leaves (Srivastava, 1997) (TNAU, 2024); leaves (Dakshinamurthy, 1984)	No

Pest name	Presence in the Philippines	Host association	Plant part(s) [2]	Considered further?[3]
INSECT: Hemiptera: Coccidae *Ceroplastes rubens* Maskell	(García Morales et al., 2016)	(García Morales et al., 2016; Medina Gaud and Garcia Tuduri, 1977; Peña and Moyhuddin, 1997; Srivastava, 1997)	Leaves (Medina Gaud and Garcia Tuduri, 1977; Peña and Moyhuddin, 1997); leaves, leaf stalks, shoots (Srivastava, 1997)	No. Present in the United States (Florida, Hawaii, Puerto Rico, U.S. Virgin Islands) (García Morales et al., 2016)
INSECT: Hemiptera: Coccidae *Ceroplastes sinensis* Del Guercio	(García Morales et al., 2016)	(García Morales et al., 2016)	Stems, shoots (Pollet, 1972) (based on feeding behavior on hosts in general)	No. Present in the United States (California, Florida, North Carolina, Pennsylvania, Virginia) (García Morales et al., 2016).
INSECT: Hemiptera: Coccidae *Protopulvinaria longivalvata* Green	(Ben-Dov, 1993; García Morales et al., 2016)	(Ben-Dov, 1993; García Morales et al., 2016)	Leaves (Posada, 1989; Tapia, 1967) (based on feeding behavior on hosts in general)	No. Present in the United States (Puerto Rico, U.S. Virgin Islands) (Ben-Dov, 1993; García Morales et al., 2016).
INSECT: Hemiptera: Coccidae *Pulvinaria polygonata* Cockerell syn. *Chloropulvinaria polygonata* (Cockerell)	(Ben-Dov, 1993; García Morales et al., 2016)	(Ben-Dov, 1993; García Morales et al., 2016; Srivastava, 1997)	Leaves, twigs, branches (Srivastava, 1997)	No
INSECT: Hemiptera: Coreidae *Leptoglossus gonagra* (Fabricius)	(Waterhouse, 1993)	(Mitchell, 2000)	Fruit (Mitchell, 2000) (based on feeding behavior on hosts in general)	No. Coreids are external feeders (Borrer et al., 1989); standard harvesting and packinghouse mitigations would remove them from mangos. Present in the United States (U.S. mainland and Puerto Rico) (Martorell, 1976; Mitchell, 2000).

Pest name	Presence in the Philippines	Host association	Plant part(s) [2]	Considered further?[3]
INSECT: Hemiptera: Kerriidae *Kerria greeni* (Chamberlin)	(García Morales et al., 2016)	(García Morales et al., 2016)	Stems (Waite, 2005) (based on feeding behavior of congeners on hosts in general)	No
INSECT: Hemiptera: Monophlebidae *Icerya aegyptiaca* (Douglas)	(García Morales et al., 2016; Lit Jr et al., 2006; Woodworth, 1922)	(García Morales et al., 2016; Nebie et al., 2016)	Leaves, twigs, blossoms, fruit (Nebie et al., 2016)	No. Mealybugs feed externally on host material (Borrer et al., 1989); standard packinghouse mitigations would remove them from mangos.
INSECT: Hemiptera: Monophlebidae *Icerya pulchra* (Leonardi) syn. *Icerya pulcher* Morrison	(García Morales et al., 2016)	(Butani, 1993; García Morales et al., 2016; Watson et al., 2014)	Leaves, stems (Srivastava, 1997) (based on feeding behavior of a congener)	No
INSECT: Hemiptera: Monophlebidae *Icerya seychellarum* (Westwood)	(García Morales et al., 2016; Woodworth, 1922)	(García Morales et al., 2016; Williams and Watson, 1990)	Leaves (Peña and Moyhuddin, 1997)	No
INSECT: Hemiptera: Oxycarenidae *Oxycarenus hyalinipennis* (Costa)	(Hill, 1983; Schaefer and Panizzi, 2000)	(Shah et al., 2016)	Overwinters on the tree (Shah et al., 2016)	No. Present in the United States (Puerto Rico, U.S. Virgin Islands) (NAPPO, 2010; NAPPO, 2014; Segarra-Carmona et al., 2020).
INSECT: Hemiptera: Pseudococcidae *Dysmicoccus lepelleyi* (Betrem)	(García Morales et al., 2016; Lit Jr, 1997; Williams, 2004)	(García Morales et al., 2016; Williams, 2004)	Leaves (García Morales et al., 2016) (based on feeding behavior on hosts in general)	No

Pest name	Presence in the Philippines	Host association	Plant part(s) [2]	Considered further?[3]
INSECT: Hemiptera: Pseudococcidae *Exallomochlus hispidus* (Morrison) syn. *Cataenococcus hispidus* (Morrison)	(García Morales et al., 2016; Lit Jr, 1997)	(García Morales et al., 2016)	Stems, leaves (García Morales et al., 2016); leaves, stems, fruit (Khoo et al., 1991) (based on feeding behavior on hosts in general)	No. Mealybugs feed externally on host material (Borrer et al., 1989); standard packinghouse mitigations would remove them from mangos.
INSECT: Hemiptera: Pseudococcidae *Geococcus coffeae* Green	(Calilung, 2000; García Morales et al., 2016)	(García Morales et al., 2016)	Roots (Ben-Dov, 1994; Williams, 2004) (based on feeding behavior on hosts in general)	No. Present in the United States (Hawaii, Puerto Rico, U.S. Virgin Islands) (García Morales et al., 2016).
INSECT: Hemiptera: Pseudococcidae *Maconellicoccus hirsutus* (Green)	(Ben-Dov, 1994; García Morales et al., 2016; Lit and Calilung, 1994)	(García Morales et al., 2016; Marotta et al., 2001; Rosas-Garcia and Parra-Bracamonte, 2011)	Leaves, stems, buds, fruit, roots (Hoy et al., 2020; Rosas-Garcia and Parra-Bracamonte, 2011) (based on feeding behavior on hosts in general)	No. Mealybugs feed externally on host material (Borrer et al., 1989); standard packinghouse mitigations would remove this pest from mangos. Present in the United States (Alabama, California, Florida, Georgia, Hawaii, Louisiana, New York, North Carolina, Oklahoma, Puerto Rico, South Carolina, Texas, U.S. Virgin Islands) (CABI, 2024; García Morales et al., 2016).
INSECT: Hemiptera: Pseudococcidae *Nipaecoccus viridis* (Newstead)	(García Morales et al., 2016; Lit and Calilung, 1994)	(Ben-Dov, 1994; García Morales et al., 2016; Reddy et al., 2022; Srivastava, 1997)	Leaves, stems, fruit (Ben-Dov, 1994); leaves, stems, fruit, flowers (García Morales et al., 2016) (based on feeding behavior on hosts in general)	No. Mealybugs feed externally on host material (Borrer et al., 1989); standard packinghouse mitigations would remove this pest from mangos. Quarantine for American Samoa and Puerto Rico only; present in the United States (Florida, Hawaii) (García Morales et al., 2016).

Pest name	Presence in the Philippines	Host association	Plant part(s) [2]	Considered further?[3]
INSECT: Hemiptera: Pseudococcidae *Paracoccus interceptus* Lit	(García Morales et al., 2016; Lit Jr, 1997)	(García Morales et al., 2016; Germain et al., 2010)	Leaves, stems, fruit (Germain et al., 2010)	No. Mealybugs feed externally on host material (Borrer et al., 1989); standard packinghouse mitigations would remove this pest from mangos.
INSECT: Hemiptera: Pseudococcidae *Planococcus lilacinus* (Cockerell)	(Ben-Dov, 1994; Cox, 1989; García Morales et al., 2016; Lit and Calilung, 1994)	(Cox, 1989; García Morales et al., 2016)	Leaves, flower, fruit (Wen et al., 2002); roots, shoots (Chacko and Sreedharan, 1981); fruit, stems (CABI, 2024); leaves (Khoo et al., 1991) (based on feeding behavior on hosts in general)	No. Mealybugs feed externally on host material (Borrer et al., 1989); standard packinghouse mitigations would remove this pest from mangos.
INSECT: Hemiptera: Pseudococcidae *Pseudococcus cryptus* Hempel	(García Morales et al., 2016; Lit Jr, 1997)	(García Morales et al., 2016)	Roots, leaves (García Morales et al., 2016); leaves (Lit Jr et al., 2006); fruit, stems, shoots, leaves (Elekcioglu and Olculu, 2017) (based on feeding behavior on hosts in general)	No. Mealybugs feed externally on host material (Borrer et al., 1989); standard packinghouse mitigations would remove this pest from mangos. Present in the United States (Hawaii, U.S. Virgin Islands) (García Morales et al., 2016).

Pest name	Presence in the Philippines	Host association	Plant part(s) [2]	Considered further?[3]
INSECT: Hemiptera: Pseudococcidae *Pseudococcus elisae* Borchsenius	(Lit and Jr, 1994)	(Peña and Moyhuddin, 1997; Williams and Granara de Willink, 1992)	Leaves (Peña and Moyhuddin, 1997)	No. Mealybugs feed externally on host material (Borrer et al., 1989); standard packinghouse mitigations would remove this pest from mangos. Present in the United States (Florida, Texas, Puerto Rico) (García Morales et al., 2016; Williams and Granara de Willink, 1992).
INSECT: Hemiptera: Pseudococcidae *Pseudococcus gilbertensis* Beardsley	(García Morales et al., 2016)	(García Morales et al., 2016)	Roots (Mille et al., 2016) (based on feeding behavior on hosts in general)	No
INSECT: Hemiptera: Pseudococcidae *Rastrococcus invadens* Williams	(Ben-Dov, 1994; García Morales et al., 2016; Williams, 1986)	(García Morales et al., 2016; Williams, 1986)	Leaves (Williams, 1986); leaves, fruit (Pena et al., 2009); buds, leaves, fruit (Peña and Moyhuddin, 1997)	No. Mealybugs feed externally on host material (Borrer et al., 1989); standard packinghouse mitigations would remove this pest from mangos.
INSECT: Hemiptera: Pseudococcidae *Rastrococcus spinosus* (Robinson) syn. *Puto spinosus* (Robinson)	(García Morales et al., 2016; Otanes, 1936; Woodworth, 1922)	(García Morales et al., 2016; Otanes, 1936; Waterhouse, 1993; Woodworth, 1922)	Flowers, stems, twigs, leaves (Otanes, 1936)	No
INSECT: Hemiptera: Pseudococcidae *Rastrococcus tropicasiaticus* Williams	(García Morales et al., 2016)	(García Morales et al., 2016)	Leaves, trunks, branches (Zarkani et al., 2021) (based on feeding behavior on hosts in general)	No

Pest name	Presence in the Philippines	Host association	Plant part(s) [2]	Considered further?[3]
INSECT: Hemiptera: Pyrrhocoridae *Dysdercus cingulatus* Fabricius	(Encarnacion, 1970; Waterhouse, 1993)	(Tandon and Lal, 1977)	Flowers, leaves (Tandon and Lal, 1977)	No
INSECT: Hemiptera: Tachardiidae *Paratachardina minuta* (Morrison)	(Butani, 1993; García Morales et al., 2016)	(Butani, 1993; García Morales et al., 2016)	Leaves (García Morales et al., 2016) (based on feeding behavior on hosts in general)	No
INSECT: Hymenoptera: Formicidae *Anoplolepis gracilipes* (Smith)	(CABI, 2024)	(CABI, 2024; ISSG, 2024)	Nests at base and crown of plant (ISSG, 2024); feeds on honeydew secreted by plant-feeding hemipterans (Mau and Kessing, 1992) (based on behavior on crop plants in general)	No. Present in the United States (Hawaii) (Mau and Kessing, 1992).
INSECT: Lepidoptera: Crambidae *Conogethes punctiferalis* (Guenée); syn. *Dichocrocis punctiferalis* (Guenée)	(Waterhouse, 1993)	(Butani, 1993); (Zhang, 1994)	Fruit (Butani, 1993); (Kannan and Rao, 2007)	No. See Section 2.2. Notes on pests identified in the pest list.
INSECT: Lepidoptera: Crambidae *Deanolis sublimbalis* Snellen; syn. *Deanolis albizonalis* Hampson, *Noorda albizonalis* (Hampson)	(Waterhouse, 1993); (Williams et al., 2009)	(Waterhouse, 1993); (Williams et al., 2009); (Zhang, 1994)	Fruit (Butani, 1993); (Waterhouse, 1993); (Williams et al., 2009)	No. See Section 2.2. Notes on pests identified in the pest list.
INSECT: Lepidoptera: Crambidae *Leucinodes orbonalis* Guenée	(Chang, 2016)	(Dhankar, 1988)	Shoots (Dhankar, 1988); fruits and buds (Khanal, 2021)	No. See Section 2.2. Notes on pests identified in the pest list.

Pest name	Presence in the Philippines	Host association	Plant part(s) [2]	Considered further?[3]
INSECT: Lepidoptera: Crambidae *Maruca vitrata* (Fabricius); syn. *Maruca testulalis* (Geyer)	(Ulrichs and Mewis, 2004)	(Butani, 1993)	Flowers and leaves (Butani, 1993)	No. Larvae feed within a webbed tent of flowers and leaves (Butani, 1993)
INSECT: Lepidoptera: Erebidae *Achaea janata* (Linnaeus)	(Zhang, 1994)	(Butani, 1993)	Fruit (Butani, 1993)	No. Moths pierce fruit for juice (Butani, 1993) but would not associate with mangos during harvest.
INSECT: Lepidoptera: Erebidae *Aloa lactinea* (Cramer); syn. *Amsacta lactinea* (Cramer)	(Černý, 2011)	(Butani, 1993)	Leaves (Butani, 1993); (Swafvan and Sureshan, 2022)	No.
INSECT: Lepidoptera: Erebidae *Eudocima phalonia* (Linnaeus); syn. *Othreis fullonia* (Clerck)	(Zhang, 1994)	(Butani, 1993); (Zhang, 1994)	Fruit (Waterhouse, 1993); (Zhang, 1994)	No. Moths pierce fruit for juice (Butani, 1993); (Zhang, 1994) but would not associate with mango during harvest. Semilooper caterpillars feed on leaves.
INSECT: Lepidoptera: Erebidae *Eudocima salaminia* (Cramer)	(Morris, 2024)	(Peña et al., 2002)	Fruit (Peña et al., 2002); (Waterhouse, 1993)	No. Moths pierce fruit for juice (Zhang, 1994) but would not associate with mango during harvest.
INSECT: Lepidoptera: Erebidae *Olene mendosa* Hübner; syn. *Dasychira mendosa* (Hubner)	(Waterhouse, 1993)	(Butani, 1993); (Zhang, 1994)	Leaves (Butani, 1993)	No.
Lepidoptera: Erebidae *Orgyia postica* Walker	(Waterhouse, 1993); (Woodworth, 1923); (Zhang, 1994)	(Waterhouse, 1993); (Woodworth, 1923); (Zhang, 1994)	Leaves (Waterhouse, 1993); fruit surface (Gupta and Singh, 1986)	No. Tussock moth larvae may occasionally attack fruit, but they are conspicuous, and their surface feeding makes the fruit unmarketable (Gupta and Singh, 1986); they would not follow the pathway.
INSECT: Lepidoptera: Euteliidae *Chlumetia transversa* (Walker)	(Waterhouse, 1993); (Woodworth, 1923); (Zhang, 1994)	(TNAU, 2024); (Waterhouse, 1993); (Woodworth, 1923); (Zhang, 1994)	Shoots, stems (Butani, 1993); (TNAU, 2024); (Waterhouse, 1993)	No. Mango shoot borer caterpillars bore into shoots and stems (Butani, 1993), but we found no evidence that they attack fruit.

Pest name	Presence in the Philippines	Host association	Plant part(s) [2]	Considered further?[3]
INSECT: Lepidoptera: Euteliidae *Penicillaria jocosatrix* Guenée	(Nafus, 1991); (Zhang, 1994)	(Butani, 1993); (Nafus, 1991)	Leaves (Butani, 1993); flowers, and fruits (Nafus, 1991)	No. Mango shoot borer caterpillars are conspicuous surface feeding pests that prefer leaves but may feed on young mangos (Nafus, 1991); (Abraham Verghese and Rashmi, 2023); however, they would not follow the pathway.
INSECT: Lepidoptera: Geometridae *Hyposidra talaca* Walker	(ZSM, 2024)	(Kuroko and Lewvanich, 1993)	Leaves (Kuroko and Lewvanich, 1993)	No. Typical looper caterpillars that pupate underground (Peña et al., 2002) and would not follow the pathway.
INSECT: Lepidoptera: Limacodidae *Parasa lepida* Cramer; syn. *Latoia lepida* (Cramer)	(Waterhouse , 1993); (Zhang, 1994)	(Butani, 1993); (Waterhouse, 1993); (Zhang, 1994)	Leaves (Butani, 1993); (Waterhouse, 1993)	No.
INSECT: Lepidoptera: Limacodidae *Parasa semperi* Holloway	(Robinson et al., 2023); (Zhang, 1994)	(Robinson et al., 2023); (Zhang, 1994)	Leaves [based on congener] (Butani, 1993); (Waterhouse, 1993)	No.
INSECT: Lepidoptera: Limacodidae *Thosea sinensis* Walker	(Waterhouse , 1993)	(Waterhouse, 1993)	Leaves (Waterhouse, 1993)	No.
INSECT: Lepidoptera: Lycaenidae *Rapala manea* Hewitson	(Nagashima, 2023)	(Butani, 1993); (Zhang, 1994)	Flowers (Butani, 1993); (Banerjee et al., 2023)	No.
INSECT: Lepidoptera: Noctuidae *Eublemma versicolor* (Walker); syn. *Autoba versicolor* Walker	(Waterhouse , 1993)	(Hill, 1983); (TNAU, 2024)	Flowers (Butani, 1993); (Hill, 1983)	No. Caterpillars web mango flowers together and bore holes in inflorescence stalks (TNAU, 2024).
INSECT: Lepidoptera: Noctuidae *Helicoverpa armigera* Hübner; syn. *Heliothis armigera* (Hübner)	(EMBL-EBI, 2024)	(Butani, 1993)	Leaves and fruit (Butani, 1993)	No. See Section 2.2. Notes on pests identified in the pest list.

Pest name	Presence in the Philippines	Host association	Plant part(s) [2]	Considered further?[3]
INSECT: Lepidoptera: Noctuidae *Spodoptera litura* Fabricius	(Tojo et al., 2008)	(Lwin et al., 2019); (Morris and Waterhouse, 2001)	Leaves (Lwin et al., 2019)	No.
INSECT: Lepidoptera: Notodontidae *Stauropus alternus* Walker; syn. *Neostauropus alternus* Walker	(Hill, 1983)	(Butani, 1993)	Leaves (Butani, 1993); (Hill, 1983)	No.
INSECT: Lepidoptera: Nymphalidae *Euthalia alpheda* Godart	(Robinson et al., 2023); (Purti et al., 2023)	(Robinson et al., 2023); (Purti et al., 2023)	Leaves (Purti et al., 2023)	No.
INSECT: Lepidoptera: Nymphalidae *Melanitis leda* (Cramer)	(Takahashi and Kimura, 2024)	(Aripin et al., 2021)	Leaves (Hill, 1983)	No.
INSECT: Lepidoptera: Stathmopodidae *Stathmopoda auriferella* Walker	(Hua, 2005)	(Badr et al., 1986); (Zhang, 1994)	Flowers (Badr et al., 1986)	No.
INSECT: Lepidoptera: Pyralidae *Citripestis eutraphera* Meyrick	(iBol, 2024)	(Soumya et al., 2016)	Fruit (Soumya et al., 2016)	No. See Section 2.2. Notes on pests identified in the pest list.
INSECT: Lepidoptera: Pyralidae *Orthaga melanoperalis* Hampson	(Woodworth, 1923)	(Woodworth, 1923)	Flowers and fruits [based on congener] (Hill, 1983)	No. Mango webworms web flowers and fruits together (Hill, 1983) and would not follow the pathway since the infested fruits would likely be noticed and culled.
INSECT: Lepidoptera: Pyralidae *Tirathaba mundella* Walker	(Alouw et al., 2005)	[*Mangifera andamanica*] (Bhumannavar, 1990)	Flowers (Alouw et al., 2005); (Waterhouse, 1993); fruit [*Mangifera andamanica*] (Bhumannavar, 1990)	No. See Section 2.2. Notes on pests identified in the pest list.

Pest name	Presence in the Philippines	Host association	Plant part(s) [2]	Considered further?[3]
INSECT: Lepidoptera: Saturniidae *Attacus atlas* (Linnaeus)	(Nässig and Treadaway, 1998) (Zhang, 1994)	(Morris and Waterhouse, 2001); (Zhang, 1994)	Leaves (Peña et al., 2002)	No.
INSECT: Lepidoptera: Saturniidae *Cricula trifenestrata* Helfer	(de Vos and Creuwels, 2024); (Nässig and Treadaway, 1998) (Zhang, 1994)	(Zhang, 1994)	Leaves (Butani, 1993);	No.
INSECT: Lepidoptera: Sphingidae *Acherontia styx* (Westwood)	(NHM (London), 2024a); (Zhang, 1994)	(Butani, 1993)	Leaves (Butani, 1993)	No.
INSECT: Lepidoptera: Sphingidae *Agrius convolvuli* (Linnaeus)	(Purdue University, 2023)	(Butani, 1993)	Leaves (Butani, 1993)	No.
INSECT: Lepidoptera: Sphingidae *Amplypterus panopus* Cramer	(Slieker et al., 2023)	(Morris and Waterhouse, 2001)	Leaves (Lee and Lim, 2021)	No.
INSECT: Lepidoptera: Tortricidae *Adoxophyes privatana* (Walker)	(Meijerman and Ulenberg, 2000)	(Meijerman and Ulenberg, 2000)	Young fruits, leaves, and buds (Meijerman and Ulenberg, 2000)	No. See Section 2.2. Notes on pests identified in the pest list.
INSECT: Lepidoptera: Tortricidae *Dudua aprobola* Meyrick	(Kuznetzov, 2003)	(Kuroko and Lewvanich, 1993); (Zhang, 1994)	Fruit, shoots, leaves (Butani, 1993); (Srivastava, 1997)	No. Caterpillars of the mango flower webworm are leaf-rollers and larvae feed within a conspicuous webbed nest (Kuznetzov, 2003). Larvae may attack fruit; however, damage is obvious, and harvesters would cull the fruit.

Pest name	Presence in the Philippines	Host association	Plant part(s) [2]	Considered further?[3]
INSECT: Lepidoptera: Tortricidae *Homona coffearia* Nietner	(Hill, 1983)	(Kuroko and Lewvanich, 1993)	Leaves (Kuroko and Lewvanich, 1993); (Waterhouse, 1993)	No.
INSECT: Phasmatodea: Heteropterygidae *Trachyaretaon echinatus* (Stål)	(Lit and Eusebio, 2008)	(Lit and Eusebio, 2008)	Leaves (Lit and Eusebio, 2008)	No.
INSECT: Phasmatodea: Phasmatidae *Pharnacia ponderosa* Stål; syn. *Pharnacia magdiwang* Lit & Eusebio	(Lit and Eusebio, 2008)	(Lit and Eusebio, 2008)	Leaves (Lit and Eusebio, 2008)	No.
INSECT: Thysanoptera: Phlaeothripidae *Haplothrips gowdeyi* Franklin	(Reyes et al., 2020); (Reyes, 1994)	(Reyes et al., 2020)	Flowers, fruits, and young leaves (Reyes et al., 2020)	No. Thrips are surface feeding pests and packinghouse mitigations would wash them from smooth skinned mangos. Although some thrips may lay their eggs in the pericarp of mangos, this creates bronzing and cracking of the fruit surface (Reyes et al., 2020), which would result in culling. Present in the United States in Florida, Georgia, Hawaii, and New York (CABI, 2024).
INSECT: Thysanoptera: Thripidae *Anaphothrips sudanensis* Trybom	(Becker-Burns and Mallalieu, 2024)	(Butani, 1993)	Leaves and flowers (Butani, 1993)	No.
INSECT: Thysanoptera: Thripidae *Megalurothrips distalis* (Karny)	(Reyes, 1994)	(Ramasubbarao and Thammiraju, 1994)	Flowers and leaves (Peña et al., 2002); (Ramasubbarao and Thammiraju, 1994)	No. Non-quarantine for continental United States and quarantine for Hawaii and Puerto Rico (ARM, 2024).

Pest name	Presence in the Philippines	Host association	Plant part(s) [2]	Considered further?[3]
INSECT: Thysanoptera: Thripidae *Megalurothrips usitatus* (Bagnall)	(NHM (London), 2024b); (Reyes et al., 2020)	(Aliakbarpour and Rawi, 2012); (Reyes et al., 2020)	Panicles [flowers] (Aliakbarpour and Rawi, 2012); (Reyes et al., 2020)	No. Non-quarantine for continental United States and quarantine for Hawaii and Puerto Rico (ARM, 2024).
INSECT: Thysanoptera: Thripidae *Scirtothrips dobroskyi* Moulton	(Grinter et al., 2024); (Hoddle and Mound, 2003)	(Hoddle and Mound, 2003)	Leaves (Hoddle and Mound, 2003)	No.
INSECT: Thysanoptera: Thripidae *Selenothrips rubrocinctus* (Giard)	(Reyes, 1994)	(Peña et al., 2002); (Reyes, 1994)	Leaves (Peña et al., 2002), (Reyes, 1994) shoots (Sengupta and Behura, 1957)	No. Non-quarantine for continental United States and present in Hawaii (Peña et al., 2002). No evidence that it occurs in Puerto Rico.
INSECT: Thysanoptera: Thripidae *Thrips hawaiiensis* (Morgan)	(Reyes et al., 2020)	(Reyes et al., 2020)	Flowers, fruits, and young leaves (Reyes et al., 2020)	No. Thrips are surface feeding pests and packinghouse mitigations would wash them from smooth skinned mangos. Although some thrips may lay their eggs in the pericarp of mangos, this creates bronzing and cracking of the fruit surface (Reyes et al., 2020), which would result in culling. Present in the United States in more than five states in the contiguous United States, Hawaii, and Guam (CABI, 2024). No evidence that it occurs in Puerto Rico.
INSECT: Thysanoptera: Thripidae *Thrips palmi* Karny	(NHM (London), 2024b)	(Aliakbarpour and Rawi, 2012)	Panicles [flowers] (Aliakbarpour and Rawi, 2012)	No.
INSECT: Thysanoptera: Thripidae *Thrips parvispinus* (Karny)	(Ahmed et al., 2023)	(Ahmed et al., 2023)	Leaves, flowers, fruits (Ahmed et al., 2023)	No. Thrips are surface feeding pests that prefer flowers. Washing would likely remove them, and they are unlikely to follow the pathway.

Pest name	Presence in the Philippines	Host association	Plant part(s) [2]	Considered further?[3]
MOLLUSK: Stylommatophora: Achatinidae *Lissachatina fulica* (Bowdich)	(Rosenberg, 2024)	(Chandaragi et al., 2018)	All above ground parts (Chandaragi et al., 2018)	No. Giant African snails are external feeders on mangos, causing significant cosmetic damage that renders the fruit unmarketable. The snails are conspicuous and lay large, calcified eggs in the soil.
BACTERIUM: *Xanthomonas citri* pv. *mangiferaeindicae* (Patel, Moniz & Kulkarni) Constantin, Cleenwerck, Maes, Baeyen, Van Malderghem, De Vos, Cottyn syn.: *Xanthomonas axonopodis* pv. *mangiferaeindicae* Patel, Kulkarni, and Moriz; *Xanthomonas campestris* pv. *mangiferaeindicae* (Patel et al.) Robbs et al.	(Ah-You et al., 2007); (Gagnevin et al., 1997)	(Haggag, 2010)	Fruit, leaves (Haggag, 2010)	No. See Section 2.2. Notes on pests identified in the pest list.
FUNGUS: *Botryosphaeria dothidea* (Moug. : Fr.) Ces. & De Not.	(Kobayashi and de Guzman, 1988)	(Mo et al., 2013); (Rabari et al., 2016)	Branches (Mo et al., 2013); fruit of other plant hosts (Cedeno et al., 1998); (Delgado-Cerrone et al., 2016); (Van Campenhout et al., 2017), leaves (Rabari et al., 2016)	No.
FUNGUS: *Chaetoscorias vulgaris* W. Yamam. syn:. *Antennellopsis vulgaris* (W. Yamam.) Bat. & Cif.	(Kobayashi and de Guzman, 1988)	(Kobayashi and de Guzman, 1988)	Leaves (Kobayashi and de Guzman, 1988)	No.
FUNGUS: *Colletotrichum theobromicola* Delacr.	(Dela Cueva et al., 2021)	(Dela Cueva et al., 2021)	Leaves (Dela Cueva et al., 2021)	No.

Pest name	Presence in the Philippines	Host association	Plant part(s) [2]	Considered further?[3]
FUNGUS: *Colletotrichum tropicale* Rojas, Rehner & Samuels	(Dela Cueva et al., 2021); (Evallo et al., 2023)	(Dela Cueva et al., 2021); (Lima et al., 2013)	Fruit (Lima et al., 2013), leaves (Dela Cueva et al., 2021)	No. See Section 2.2. Notes on pests identified in the pest list.
FUNGUS: *Fusarium oxysporum* Schltdl. : Fr.	(Aguilar-Hawod et al., 2019; Cumagun et al., 2008)	(Kausar et al., 2021)	Fruit (Kausar et al., 2021)	No. *Fusarium oxysporum* is established in the United States (Berg et al., 2017; Garcia et al., 2018; Shiraishi et al., 2012) and is considered a quarantine pest at ports of entry. However, without knowing the *F. oxysporum* subspecies associated with mango in the Philippines, we could not consider it further.
FUNGUS: *Necator salmonicolor* (Berk. & Broome) K.H. Larss., Redhead & T.W. May syn:. *Corticium salmonicolor* Berk. & Broome, *Erythricium salmonicolor* (Berk. & Broome) Burds.	(Kobayashi and de Guzman, 1988)	(Prakash and Misra, 2001)	Branches, twigs (Prakash and Misra, 2001)	No.
FUNGUS: *Neofusicoccum mangiferae* (Syd. & P. Syd.) Crous	(Nepomuceno et al., 2023)	(Nepomuceno et al., 2023)	Fruit (Nepomuceno et al., 2023)	No. See Section 2.2. Notes on pests identified in the pest list.
FUNGUS: *Phomopsis mangiferae* S. Ahmad	(AQIS, 1999)	(Ko et al., 2009)	Fruit (Ko et al., 2009)	No. See Section 2.2. Notes on pests identified in the pest list.
FUNGUS: *Phyllosticta citricarpa* (McAlpine) Aa syn:. *Guignardia citricarpa* Kiely	(CABI, 2024)	(McMillan Jr, 1986)	Fruit (EPPO, 2020), leaves (McMillan Jr, 1986)	No. See Section 2.2. Notes on pests identified in the pest list.

2.2. Notes on pests identified in the pest list

Adoxophyes privatana (Lepidoptera: Tortricidae)

The larvae of this leaf curling moth feed gregariously, covering leaves, flowers, and young fruits in a silken tent; however, when disturbed they wiggle and drop out of the webbed nest (Meijerman and Ulenberg, 2000). Mango does not appear to be a preferred host (Hill, 1983; Khoo et al., 1991; Kuroko and Lewvanich, 1993; Waterhouse, 1993). Due to their preference to

feed on leaves or fruit surfaces that will be washed and their high conspicuity, they would not follow the pathway.

Citripestis eutraphera (Lepidoptera: Pyralidae)
Mango fruit borer larvae burrow into immature fruit, forming visible holes, exuding frass from within, and often lead to fruit drop (Soumya et al., 2016; Venkata Rami Reddy et al., 2018). The fruit is often blackened around the holes and may exhibit splitting (Hiremath et al., 2017; Jayanthi et al., 2014; Venkata Rami Reddy et al., 2018). The young larvae scrape the fruit skin, resulting in noticeable scabbing. This damage is easily detected in the field, where infested fruits are discarded by harvesters (Jayanthi et al., 2014). Given the clear signs of infestation and the tendency for larvae to pupate in soil or decaying fruit, we determined this pest as unlikely to associate with the commercially produced fruit or follow the pathway.

Colletotrichum tropicale
This fungus is reported from Florida (Doyle et al., 2013) and is known to cause symptoms on mango fruit (Lima et al., 2013; Tovar-Pedraza et al., 2020). Because this fungus is associated with mango fruit, we consider the likelihood of entry as medium. *Colletotrichum* spp. are dispersed by rain-splash (Nicholson and Moraes, 1980; Yang et al., 1990) which takes place on a very small scale (McCartney, 1994; Ntahimpera et al., 1997; Yang et al., 1990). Conditions required for dispersal are unlikely to be met once fruit enters the United States. Fruit for consumption is unlikely to be introduced in close enough proximity to hosts and under the right environmental conditions for establishment to occur. Additionally, most fruit will be consumed or, if disposed, go to a commercial landfill. Taken all together, evidence indicates that the likelihood of establishment is very low (negligible). Therefore, the likelihood of introduction of this fungus into the United States via commercial mango fruit is negligible.

Conogethes punctiferalis (Lepidoptera: Crambidae)
Larvae of the castor capsule borer may burrow into mango fruit near the stalk end, resulting in a conspicuously dark brown ring and black frass around the entrance hole. Eventually fruit rot develops, leading to fruit drop and loss of marketability for the fruit left on the tree (Butani, 1993; Singh et al., 2002; Srivastava, 1997). Pupation occurs in the fruit, but pupae are unlikely to follow the commodity pathway because of premature fruit drop, fruit rot, and other symptoms. Both (Venkata Rami Reddy et al., 2018) and (Srivastava, 1997) stated that mangos are not a preferred host. Due to the extent of such damage and that we consider the packinghouse mitigation of washing mangos to remove sap, we have determined this pest as unlikely to be associated with commercially produced fruit.

Deanolis sublimbalis Snellen (synonyms include *Deanolis albizonalis, Noorda albizonalis*) (Lepidoptera: Crambidae)
Moths of the red-banded mango borer lay eggs on young mango fruit, immediately after their formation (Krull and Basedow, 2006; Sengupta and Behura, 1957; Srivastava, 1997). The conspicuous red and white larvae burrow into the immature fruit from the distal end, causing a dark brown ring around the entrance hole. As larvae mature, they tunnel inside the fruit collapsing it and completely degrading the marketability (Golez, 1991). Secondary infection by fungi and bacteria is common and causes the fruit to collapse and become unfit for consumption (Bhattacharya, 2014; Tenakanai et al., 2006). Damaged fruit eventually fall from trees (and are

not harvested). Although the feeding is internal, the damage to mango fruit is conspicuous. (Golez, 1991) describes fruit damage as including longitudinal cracking of the fruit and "bursting" at the apex of the fruit. Sap oozes from the larval entry point, accumulates on the apex or the drip point of the fruit, and darkens. Pupation typically occurs in the fruit and the moths emerge from the now thoroughly rotted, original entrance hole (Sengupta and Behura, 1957). Consequently, infested fruit are highly unlikely to be packed for export. Due to the extent of the damage and that we are considering the packinghouse mitigation of washing mangos to remove sap, we have determined this pest as unlikely to be associated with commercially produced fruit.

Helicoverpa armigera (Lepidoptera: Noctuidae)
Old world bollworms are vastly polyphagous but may attack unripened mango fruit (Bharati et al., 2007; Grové and De Beer, 2015). Larvae typically feed on leaves during the first few instars, as the caterpillars mature, they move into various fruits. When feeding on mango, the caterpillars inflict visible damage, such as superficial scars or deep holes, and the fruit usually drops from the tree (Grové and De Beer, 2015). Because the larvae cause the fruit to be unmarketable, are conspicuous, and pupate in the soil, we determined the old world bollworm would not follow the pathway.

Leucinodes orbonalis (Lepidoptera: Crambidae)
The only report of *L. orbonalis* feeding on mango is from an abstract of (Hutson, 1931), stating: 'the shoot-borer, *Leucinodes orbonalis*, Gn., and the pentatomid, *Coptosoma siamica*, Wlk. (Hemiptera: Pentatomidae), on mango'. This abstract refers to a 17-page typescript article that was apparently never published. Mango has not been confirmed as a larval host of *L. orbonalis* by any other resource; therefore, we consider it an erroneous host plant (Bragard et al., 2024).

Neofusicoccum mangiferae
This fungal pest is reported from California, Florida (Chitambar, 2016; Mayorquin et al., 2012), and Puerto Rico (Serrato-Diaz et al., 2014) and causes fruit rot of mango (Nepomuceno et al., 2023; Ni et al., 2010). Because this fungus is associated with mango fruit, we consider the likelihood of entry as medium. Dispersal occurs by rain-splash on a small scale (Baskarathevan et al., 2013). Conditions required for dispersal are unlikely to be met once fruit enters the United States. Fruit for consumption is unlikely to be introduced in close enough proximity to hosts and under the right environmental conditions for establishment to occur. Additionally, most fruit will be consumed or, if disposed, go to a commercial landfill. Taken all together, evidence indicates that the likelihood of establishment is very low (negligible). Therefore, the likelihood of introduction of this fungus into the United States via commercial mango fruit is negligible.

Phomopsis mangiferae
This fungal pest has not been reported in the United States. *Phomopsis mangiferae* causes stem-end rot and post-harvest decay of mango (Johnson et al., 1991a; Ko et al., 2009; Punithalingam, 1993). While damaged fruit are unlikely to be harvested, latent infections can occur (Schilder, 2006), with symptoms not appearing for a week or more after infection (Johnson et al., 1991a). Because this fungus could enter undetected on mango fruit, we consider the likelihood of entry as medium. *Phomopsis* spp. spores can disperse by rain splash (Javadi and Banihashemi, 2005; Manda et al., 2020; Rosskopf et al., 2000); however, fruit for consumption is unlikely to be introduced into the limited endangered area and be exposed to the conditions necessary for

spores to transfer to a host because fruit will be consumed or, if disposed, go to a commercial landfill. The likelihood of establishment is considered very low (negligible). Therefore, the likelihood of introduction of this fungus into the United States via commercial mango fruit is negligible.

Phyllosticta citricarpa
This fungus is reported from the continental United States (Hendricks et al., 2017; McMillan Jr, 1986) but there is conflicting information concerning if it is present in Hawaii (CABI, 2024; Nishijima, 1993). The fungus may produce spores on infected fruit, but they are short-lived and disperse by rain-splash (CABI, 2024; Perryman and West, 2014; Timmer et al., 2000). Because this fungus is associated with mango fruit, we consider the likelihood of entry as medium. Fruit for consumption is unlikely to be introduced into the limited endangered area and be exposed to the conditions necessary for spores to transfer to a host because fruit will be consumed or, if disposed, go to a commercial landfill. Taken all together, evidence indicates that the likelihood of establishment is very low (negligible). Therefore, the likelihood of introduction of this fungus into the United States via commercial mango fruit is negligible.

Tirathaba mundella (Lepidoptera: Pyralidae)
Larvae of the oil palm bunch moth typically attack palms and bore in to the fruit, feeding on the pulp and seed, but Andaman mango (*Mangifera andamanica*) has been observed as an alternative host (Bhumannavar, 1990; Srivastava, 1997). Larval feeding results in premature fruit drop, surface scarring, and a single larva may affect multiple fruits by webbing them together (Bhumannavar, 1990; Khoo et al., 1991; Srivastava, 1997). Given the clear signs of infestation, the preference for palm fruits, and because larvae pupate in soil, we determined this pest as unlikely to associate with the commercially produced fruit or follow the pathway.

Xanthomonas citri pv. *mangiferaeindicae* (*Xcm*)
This bacterium causes fruit drop and stem-end rot of harvest fruit of mangos (Gagnevin and Pruvost, 2001), with yield losses ranging from 10 to 85 percent (Haggag, 2010; Johnson et al., 1991b). Early fruit drop would limit the prevalence of the pathogen on harvested fruit. Furthermore, this pathogen also causes storage rot (5-100% losses) (Haggag, 2010). Infected fruit would likely be detected via visual inspection during processing as fruit showing cankers or water-soaked lesions are unmarketable, making an introduction unlikely. In addition, xanthomonads are generally poor colonizers of the plant surface (Swings and Civerolo, 1993); epiphytic bacteria on fruit surfaces decrease rapidly to levels insufficient to cause disease to develop (Roberts et al., 1998; Stefani and Giovanardi, 2011). This bacterium also has a restricted host range (mango and macadamia), and hosts are limited in the endangered area (Gagnevin and Pruvost, 2001; McLaughlin et al., 2017; Mossler and Nesheim, 2002; NASS, 2024; Viana et al., 2007); therefore, it is unlikely to come into contact with host material by way of the fruit for consumption pathway. Further, seed transmission of *Xcm* has not been demonstrated (Gagnevin and Pruvost, 2001). Taken all together, evidence indicates that the introduction of this bacterium via commercial, export-quality mango fruit is unlikely (i.e., negligible).

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 mango and are present in the export area; however, they are not of quarantine significance for the PRA area (see Appendix).

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 included in the Appendix rather than 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

Bactrocera latifrons (Hendel) syn. *Dacus latifrons* (Hendel) (Diptera: Tephritidae) has been reported in the Philippines (Vargas and Nishida, 1985), and mango has been listed as a host in some non-primary sources, e.g., (Srivastava, 1997; Waterhouse, 1993). However, we found no primary field evidence of mango as a host. From 1984 to 2024, there was one interception of *B. latifrons* on *Mangifera indica* in passenger baggage at a U.S. port of entry (ARM, 2024; McQuate and Liquido, 2013); however, we consider a single interception in baggage insufficient evidence of host association. Some authors report the host status of mango as "questionable", "in need of validation" (Liquido et al., 1994), and "doubtful" (White and Elson-Harris, 1994). Furthermore, in a fruit fly survey of mango orchards in Myanmar, *B. latifrons* was not detected in mango fruit despite its confirmed presence in the area (Nakahara et al., 2019). Based on all this, we consider there is insufficient evidence for this fruit fly's association with the commodity and did not include it on the pest list.

Bactrocera pedestris (Bezzi) syn. *Dacus pedestris* (Bezzi) is present in the Philippines (Clarke et al., 2005; Hardy, 1973; Hardy and Adachi, 1954; White and Elson-Harris, 1994). Mango is listed as a host in three sources (Hardy, 1973; Hardy, 1974; Rejesus et al., 1991). However, these sources are host listings only, with no primary evidence provided. Based on the references cited in these sources, it appears Rejesus et al. (1991) lists mango based on Hardy (1974), and Hardy (1973; 1974) lists mango based on (Hardy and Adachi, 1954). Hardy and Adachi (1954) lists only one *B. pedestris* specimen collected from “mango” (in Borneo in 1951). This source uses only the plant common name “mango” and does not give the plant part or the fruit fly life stage collected; hence, there is uncertainty as to whether the fruit fly was infesting fruit of *Mangifera indica*. We found no other evidence for mango as a host. According to more recent sources, *B. pedestris* does not attack economically important hosts (Clarke et al., 2005) and is a “very rare species” (White and Elson-Harris, 1994). Additionally, we found no evidence of impacts caused by *B. pedestris* on any hosts or even mention of it as a “pest”. Based on all this, we concluded there is insufficient evidence for *B. pedestris* being associated with commercial mango fruit, and we did not include it on the pest list.

Bactrocera zonata (Saunders) (Diptera: Tephritidae) attacks mango (De Meyer et al., 2014; Duyck et al., 2008; Syed et al., 1970). De Meyer et al (2014) reports this species as present in the Philippines along with other southeast Asian countries. However, this reference does not provide the basis for this statement, such as specimen collection data or a primary reference we could verify, and we found no other evidence of this fruit fly in the Philippines. For example, other references documenting geographic distributions of tephritid fruit fly species in the Philippines

(Hardy, 1974; Rejesus et al., 1991), southeast Asia (Drew and Romig, 1997), and globally (Doorenweerd et al., 2018; White and Elson-Harris, 1994) do not report *B. zonata* in the Philippines. Additionally, of the >1,500 preserved and vouchered *B. zonata* specimens represented in the Global Biodiversity Information Facility, none were reported in the Philippines (GBIF, 2023a) Without clear evidence that this species is in the Philippines, we did not include it on the pest list.

Marasmius crinis-equi F. Muell. ex Kalchbr. is a fungal species reported from mango (CABI, 2024). However, only one reference was found reporting this species from the Philippines (Balfour-Browne, 1968). This species and genus are not listed in ARM (ARM, 2024).

Mictis longicornis Westwood (Hemiptera: Coreidae) is reported in the Philippines by CABI (2024), citing Waterhouse (1993). However, Waterhouse (1993) does not list this species in the Philippines; this source only reports it in Malaysia, Singapore, Brunei, and Indonesia. We found no other evidence of presence in the Philippines. Therefore, we did not include this species on the pest list.

Phomopsis fukushii Tanaka & S. Endô is reported from mango (Choi et al., 2017). Dissanayake et al. (Dissanayake et al., 2024) suggest that *P. fukushii* is part of the *Diaporthe eres* complex. While *P. fukushii* is not reported from the Philippines, *D. eres* is present (Kobayashi and de Guzman, 1988). *Diaporthe eres* is present in the continental United States (Klein-Gordon et al., 2023)

Scolecostigmina mangiferae (Koord.) U. Braun & Mouch. syn:. *Cercospora mangiferae* Koord. is a fungal species reported from mango (Videira et al., 2017). However, the only references we found reporting this species from the Philippines are listed in the USDA Fungal Databases and from 1918, 1919, and 1937 (Farr and Rossman, 2024). This species is Quarantine for the continental United States and Hawaii but uncategorized for Puerto Rico (ARM, 2024).

Sternochetus mangiferae syn. *Cryptorrhynchus mangiferae* (Coleoptera: Curculionidae) was reported as present in the Philippines (Woodworth, 1922). However, more recent evidence concluded its presence there was based on invalid records (EPPO, 2024), and extensive surveys for mango weevils in the mango producing areas in the Philippines have not detected *S. mangiferae,* resulting in APHIS recognizing them as free of this weevil (APHIS, 2012; BPI, 2024). Additionally, of the >500 preserved and vouchered *S. mangiferae* specimens represented in the Global Biodiversity Information Facility, none were reported in the Philippines (GBIF, 2023b). Therefore, we excluded *S. mangiferae* from the pest list due to a lack of recent evidence regarding its presence in the Philippines.

Rhynchophorus ferrugineus (Coleoptera: Dryophthoridae) is host specific to palms (Hill, 1983); however, adult weevils may feed on ripe mango. Mango is a weak experimental host for the red palm weevil (Mogahed, 2010), and we did not find additional evidence of mango being a host. We excluded *R. ferrugineus* from the pest list due to uncertainty regarding mango's host status.

Zeugodacus tau (Walker) syn. *Bactrocera tau* (Walker), *Dacus tau* (Walker), *Dacus hageni* de Meijere (Diptera: Tephritidae) attacks mango (Butani, 1993; Srivastava, 1997), and some non-

primary literature sources indicate *Z. tau* occurs in the Philippines (e.g., (Liu and Ji, 2024). However, these reports in the Philippines are erroneous (Doorenweerd et. al., 2024). While *Z. tau* was previously identified in the Philippines (Hardy, 1974; Hardy and Adachi, 1954), it has since been determined to be a separate new species, *Zeugodacus tapervitta* Mahmood, in the *Z. tau* species complex (Mahmood, 1999). Therefore, recent taxonomic treatments do not report *Z. tau* in the Philippines (Doorenweerd et. al., 2024; Drew and Romig, 2013), and we found no other primary evidence of *Z. tau* in the country. For example, of the >1,200 preserved and vouchered *Z. tau* specimens represented in the Global Biodiversity Information Facility, none were reported in the Philippines (GBIF, 2023b). Furthermore, we found no evidence of mango being a host for *Zeugodacus tapervitta*. Consequently, neither species was included on the pest list.

2.3.3. Organisms identified only to the genus level

In commodity risk assessments, the taxonomic unit for pests selected for evaluation beyond the pest categorization stage is usually the species (IPPC, 2019). Generally, we do not assess risk for organisms identified only to the genus level, especially if the genus is reported in the PRA area. Many genera contain multiple species, and we cannot know if the unidentified species occurs or is regulated in the PRA area. Because the organism has not been fully identified, we cannot properly assess the likelihood and consequences of its introduction. However, if the genus is absent from the PRA area or is actionable at U.S. ports of entry, the genus can be regulated as a quarantine pest.

We found evidence that the following organisms identified only to the genus level are reported on *Mangifera indica* in the Philippines: *Coptotermes* sp. (Blattodea: Rhinotermitidae) (CABI, 2024), *Phyllophaga* sp. (Coleoptera: Scarabaeidae) (CABI, 2024).

We identified no quarantine genera that could follow the commodity pathway.

2.4. Pests selected for further analysis or already regulated

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

Table 2. Pests selected for further analysis

Pest type	Taxonomy	Species names
Arthropod	Diptera: Tephritidae	*Bactrocera frauenfeldi*
Arthropod	Diptera: Tephritidae	*Bactrocera occipitalis*
Arthropod	Coleoptera: Curculionidae	*Sternochetus frigidus*

The following pests can follow the commodity pathway. However, they were not assessed because they were previously determined to pose an unacceptable risk to the PRA area and domestic regulations are in place. These pests are candidates for risk mitigation.

Pest type	Scientific name	Code of Federal Regulation
Arthropod	*Bactrocera dorsalis* (Hendel)	7CFR § 301.32, 2024
Arthropod	*Zeugodacus cucurbitae* (Coquillett)	7CFR § 301.32, 2024

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 by causing a yield loss of 10 percent or greater, by increasing U.S. production costs, by impacting an environmentally important host, or by 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 is based on the potential entry and establishment of a pest. We qualitatively assessed this using the ratings: Low, Medium, and High. The elements comprising the likelihood of introduction are interdependent; therefore, the model is multiplicative rather than additive. We defined the ratings as follows:

> **High**: This outcome is highly likely to occur because the events required occur frequently.
> **Medium**: This outcome can occur; however, the combination of required events occurs only occasionally.
> **Low**: This outcome is less likely because the exact combination of required events seldom occur or rarely align properly in time and space.

We addressed uncertainty associated with each element as follows:

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

3.2. Assessment

3.2.1. *Bactrocera frauenfeldi* (Diptera: Tephritidae)

Bactrocera albistrigata was recently synonymized with *B. frauenfeldi* (Doorenweerd et al., 2023; FACS, 2022); therefore, we assessed this species by evaluating the literature under both names. This species oviposits its eggs into host fruits, including mango. Each fruit could harbor numerous maggots, which completely degrade the marketability of the commodity (Peña and Moyhuddin, 1997). Specific biological information pertaining to *B. frauenfeldi* (and *B. albistrigata*) is sparse, but in general, fruit flies living under tropical and subtropical conditions tend to have several generations each year and are not known to undergo diapause (Bateman, 1972; Christenson and Foote, 1960). *Bactrocera albistrigata* is listed as an important economic pest in several references (Ranganath and Veenakumari, 1999; Vijaysegaran and Loke, 2000; White and Elson-Harris, 1994); however, we found no information regarding the specific impacts of infestations under this name. *Bactrocera frauenfeldi*, however, has been documented causing economic damage by infesting 91 percent of guava, 37 percent of breadfruit, 20 percent

of citrus, and 8 percent of mango during a harvest in the Federated States of Micronesia (Leblanc, 1997). Additionally, in 2009, the pest was introduced in Los Angeles, California and required several thousand traps distributed over 15 square miles to achieve eradication (Chitambar, 2015; NAPPO, 2010), demonstrating its ability to spread to new geographic areas.

The endangered area for *Bactrocera frauenfeldi* within the United States

Climatic suitability: *Bactrocera frauenfeldi* (synonyms *B. albistrigata, Dacus frauenfeldi*) is present in **Asia:** Christmas Island (Drew and Romig, 2013), India [Nicobar (Ranganath and Veenakumari, 1996) and Andaman Islands (Drew and Romig, 2013)], Indonesia, Malaysia, the Philippines (FACS, 2022); (Tan and Lee, 1982), Thailand (Drew and Romig, 2013), and Timor-Leste (Oliviera et al., 2016), **Oceania:** Australia (Royer et al., 2016), Federated States of Micronesia, and Papua New Guinea (Leblanc, 2013). These localities correspond with Plant Hardiness Zones 10-14 (Takeuchi et al., 2018). In the United States, these zones occur in Hawaii, Puerto Rico, the U.S. Virgin Islands, other tropical or subtropical U.S. territories in the Pacific like Guam and American Samoa, and a small area in the continental United States. They occur in a narrow strip in the southeastern states along the Atlantic Ocean, the southern half of Florida, and west alongside the coast of the Gulf of Mexico into southern Texas. On the west coast, zones 10-14 exist in a narrow strip along the Pacific coast of Northern California, much of Southern California, and southwestern Arizona.

Hosts in PRA area: *Bactrocera frauenfeldi* has a diverse host range of mostly tropical fruits (Leblanc, 1997). Some hosts of *B. frauenfeldi* that are present in the United States (NRCS, 2025) include: **Anacardiaceae:** *Mangifera indica* (mango) (Allwood et al., 1999); (Leblanc, 2013), **Annonaceae:** *Annona muricata* (soursop) (Secretariat of the Pacific Community, 2002), **Cariacaceae:** *Carica papaya* (papaya) (Secretariat of the Pacific Community, 2002), **Combretaceae:** *Terminalia catappa* (tropical almond) (Allwood et al., 1999), **Lauraceae:** *Persea americana* (avocado) (Secretariat of the Pacific Community, 2002), **Moraceae:** *Artocarpus altilis* (breadfruit) (Secretariat of the Pacific Community, 2002), **Musaceae:** *Musa* spp. (banana) (Secretariat of the Pacific Community, 2002), **Myrtaceae:** *Eugenia uniflora* (Surinam cherry) (Secretariat of the Pacific Community, 2002), *Psidium guajava* (guava) (Allwood et al., 1999), and *Syzygium jambos* (Malabar plum) (Allwood et al., 1999) and other *Syzygium* spp. apples (Secretariat of the Pacific Community, 2002), **Oxalidaceae:** *Averrhoa carambola* (starfruit) (Secretariat of the Pacific Community, 2002), **Rutaceae:** *Citrus aurantium* (sour orange), *Citrus maxima* (pomelo), *Citrus* x *paradisi* (grapefruit), *Citrus reticulata* (mandarin), *Citrus sinensis* (orange), *Fortunella japonica* (kumquat) (Secretariat of the Pacific Community, 2002).

Economically important hosts[4]: In the United States, mango, papaya, avocado, starfruit, and citrus are economically important hosts (NASS, 2024) and/or are grown within the endangered area (NRCS, 2025).

Potential consequences on economically important hosts at risk: This pest is likely to cause unacceptable consequences because Tephritidae fruit flies oviposit eggs into fruit, which leads to loss of marketability and can have international trade impacts (Peña and Moyhuddin, 1997). The

[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).

Secretariat of the Pacific Community (2002) provided data on percent of ripe edible fruits infested by *B. frauenfeldi* larvae in its native range. Infestation percentages include guava (31-91%), tropical almond (69%), Surinam cherry (61%), avocado (57%), *Syzygium* spp. apples (38-51%), breadfruit (37%), soursop (28%), tangerine (20%), carambola (18%), mango (8%), orange (4%), mandarin (0.5%), ripe papaya (15%), and ripe banana (0.5%). The United States produced over six million pounds of banana in 2017 (NASS, 2024), five million tons of citrus in 2024 (NASS, 2024), 1.7 million pounds of guava in 2014 (NASS, 2024), nearly 128 million tons of avocado in 2023 (NASS, 2024), and 4,770 tons of papaya in 2023 (NASS, 2024). These tropical fruit hosts are grown throughout the subtropical regions of CONUS and grown widely in Hawaii and U.S. territories (NRCS, 2025).

***Endangered area*:** The endangered area for *B. frauenfeldi* in the United States includes Plant Hardiness Zones 10 to 14 where suitable hosts occur. Hosts are likely to exist in gardens, in the wild, or commercially throughout the endangered area.

The likelihood of entry of *Bactrocera frauenfeldi* into the endangered area via fresh mango fruit imported from the Philippines

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Pest prevalence on the harvested commodity	High	Low	*Bactrocera frauenfeldi* is commonly called the mango fruit fly. The species has been found to naturally infest mangos in the field (Allwood et al., 1999; Chinajariyawong, 2000; Leblanc, 2013). This includes 8 percent of mangos infested during a harvest in the Federated States of Micronesia (Leblanc, 1997). Based on this evidence, we rated this risk element High.
Likelihood of surviving post-harvest processing before shipment	High	Low	Due to the necessity to wash *Mangifera* sap from the fruit, we considered washing and culling as post-harvest mitigations. Infested fruit degrades quickly, and fly oviposition sites may be visible during culling; however, washing will likely have little effect on the larvae inside the fruit. Therefore, we left our risk rating as High.
Likelihood of surviving transport and storage conditions of the consignment	High	Low	We did not consider any transport or storage conditions for this assessment, so we kept the risk rating High.
Overall Likelihood of Entry	High	n/a	n/a

The likelihood of establishment of *Bactrocera frauenfeldi* into the endangered area via fresh mango fruit imported from the Philippines

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	High	Moderate	*Bactrocera frauenfeldi* attacks a wide range of tropical fruit hosts, and many of the hosts grow in the United States (see "Hosts in PRA area"). Therefore, it is possible that numerous fruit fly larvae could follow the pathway inside a single infested mango, emerge as adults, and find a mate and a host within the endangered area. Therefore, we rated this risk element High.
Overall Likelihood of Establishment	High	n/a	n/a

The likelihood of introduction (combined likelihoods of entry and establishment) of *Bactrocera frauenfeldi* into the endangered area via fresh mango fruit imported from the Philippines is High.

3.2.2. *Bactrocera occipitalis* (Bezzi) (Diptera: Tephritidae)

Commonly known as the Philippine fruit fly, *B. occipitalis*, is a member of the *Bactrocera dorsalis* species complex (EPPO, No Date; ITP, 2024). These genetically similar species all oviposit their eggs into host fruits. Each fruit could harbor numerous maggots, which completely degrade the marketability of the commodity (Sumalde and Mendioro). In general, fruit flies living in tropical and subtropical conditions tend to have several generations each year and are not known to undergo diapause (Bateman, 1972; Christenson and Foote, 1960). EPPO (No Date) reports that *B. occipitalis* is as damaging as *B. dorsalis*. Members of the *B. dorsalis* species complex, cause significant damages, including sometimes complete loss, in fruit production in Asia (Delomen et al., 2013).

The endangered area for *Bactrocera occipitalis* within the United States

Climatic suitability: *Bactrocera occipitalis* is present in **Asia:** Brunei, Indonesia, Malaysia, and the Philippines (EPPO, 2024; Jalani et al., 2015). These localities correspond with Plant Hardiness Zones 10-14 (SAFARIS, 2024; Takeuchi et al., 2018). In the United States, these zones occur in Hawaii, Puerto Rico, the U.S. Virgin Islands, other tropical or subtropical U.S. territories in the Pacific like Guam and American Samoa, and a small area in the continental United States. In CONUS, they occur in a narrow strip in the southeastern states along the Atlantic Ocean, the southern half of Florida, and west alongside the coast of the Gulf of Mexico into southern Texas. On the west coast, zones 10-14 exist in a narrow strip along the Pacific coast of Northern California, much of Southern California, and southwestern Arizona.

Hosts in PRA area: Scientific literature indicates that *Bactrocera occipitalis* is primarily a pest of *Psidium guajava* (guava) and *Mangifera indica* (mango) (Delomen et al., 2013; Khoo et al., 1991; Leblanc, 1997), both of which are grown in the United States (NRCS, 2025). *Bactrocera occipitalis* has been intercepted inside *Citrus* spp. (Iwaizumi, 2004) and *Citus maxima*

(pummelo) (Iwaizumi et al., 1997); however, without more evidence, we do not consider citrus a primary host.

Economically important hosts[5]: Guava, mango, and citrus are hosts of economic importance that are grown in the United States. The United States produced five million tons of citrus in 2024 (NASS, 2024) and 1.7 million pounds of guava in 2014 (NASS, 2024). These tropical fruit hosts are grown in the subtropical regions of CONUS and grown widely in Hawaii and U.S. territories (NRCS, 2025).

Potential consequences on economically important hosts at risk: This pest is likely to cause unacceptable consequences because Tephritidae fruit flies oviposit eggs into fruit, which leads to loss of marketability and can have international trade impacts (Peña and Moyhuddin, 1997).

***Endangered area*:** The endangered area for *B. occipitalis* in the United States includes Plant Hardiness Zones 10 to 14 where suitable hosts occur. Hosts are likely to exist in gardens, in the wild, or commercially in the endangered area.

[5] 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).

The likelihood of entry of *Bactrocera occipitalis* into the endangered area via fresh mango fruit imported from the Philippines

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Pest prevalence on the harvested commodity	High	Low	The name oriental fruit fly, *B. dorsalis*, had for many years unwittingly been given to a complex of flies attacking a variety of fruits throughout South-East Asia (Peña et al., 2002). The complex was later split into 52 separate species, many of which were described from specimens caught in pheromone traps and have no host records associated with them (Peña et al., 2002). However, *B. occipitalis* is reported to attack mangos in mango production areas in the Philippines (Delomen et al., 2013; Jalani et al., 2014; Leblanc, 1997), indicating it is a primary host. Therefore, we rated this risk element High and have Low uncertainty.
Likelihood of surviving post-harvest processing before shipment	High	Low	Due to the necessity to wash *Mangifera* sap from the fruit, we considered washing and culling as post-harvest mitigations. Infested fruit degrades quickly, and fly oviposition sites may be visible during culling; however, washing will likely have little effect on the larvae inside the fruit. Therefore, we left our risk rating as High.
Likelihood of surviving transport and storage conditions of the consignment	High	Low	We did not consider any transport or storage conditions for this assessment, so we kept the risk rating High.
Overall Likelihood of Entry	High	n/a	n/a

The likelihood of establishment of *Bactrocera occipitalis* into the endangered area via fresh mango fruit imported from the Philippines

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	Medium	Low	While little is known about the biology of *B. occipitalis* (EPPO, 2024), tephritid fruit flies are among the world's worst fruit pests. However, not every species is as polyphagous or can survive in as wide a temperature margin as others. *Bactrocera occipitalis* has a narrow host range of tropical fruit species that grow in the United States, and none grow widely (see "Hosts in PRA area" and "Economically important hosts"). This greatly reduces the likelihood that fruit fly adults emerging from imported mangos will be able to find hosts for reproduction. Therefore, we rated this risk element Medium.
Overall Likelihood of Establishment	Medium	n/a	n/a

The likelihood of introduction (combined likelihoods of entry and establishment) of *Bactrocera occipitalis* into the endangered area via fresh mango fruit imported from the Philippines is Medium

3.2.3. *Sternochetus frigidus* (Coleoptera: Curculionidae)

The mango fruit weevil*, Sternochetus frigidus* is a serious pest of mango (De and Pande, 1988). It was introduced into the Philippines in 1987, probably via trade (APASD, 2007). *Sternochetus frigidus* incidence rates in mango cultivars of 50 to 80 percent have been observed (De and Pande, 1990). The larvae burrow into the pulp of mango fruits, which causes them to rot and become unusable (De and Pande, 1990). The larvae also damage mango seeds in the fruit and can cause around 20 percent to not germinate (De and Pande, 1990). *Sternochetus frigidus* is univoltine (De and Pande, 1988). The adults are poor fliers and were observed to fly 50 to 90 cm horizontally (De and Pande, 1988). However, larvae, pupae, and adults can be transported long distances in infested fruit (Agriculture Western Australia, No Date).

The endangered area for *Sternochetus frigidus* within the United States

Climatic suitability:

Sternochetus frigidus is present in **Asia**: Bangladesh, India (Assam, West Bengal), Indonesia (Irian Jaya, Java, Kalimantan, Nusa Tenggara, Sumatra), Malaysia, Myanmar, Pakistan, Philippines, Singapore, Thailand; **Oceania:** Papua New Guinea (EPPO, 2024). This distribution indicates that suitable climate for *S. frigidus* likely occurs in Plant Hardiness Zones 10 to 14 in the United States (SAFARIS, 2024; Takeuchi et al., 2018). This area includes parts of southern

and central Florida, southern Texas, southwestern Arizona, southern, coastal, and central California, Hawaii, and the U.S. territories.

Hosts in PRA area:
Sternochetus frigidus hosts include **Anacardiaceae**: *Mangifera indica* (Muniappan et al., 2012), *Mangifera odorata* (Syahputra et al., 2020), *Mangifera sylvatica* (De and Pande, 1990). Suitable climatic areas in the United States where hosts occur include parts of California, Florida, Hawaii, Texas, Puerto Rico (NASS, 2024) and the U.S. Virgin Islands (NRCS, 2024).

Economically important hosts[6]*:*
Mangos are economically important hosts that occur in the climatically suitable areas for *S. frigidus* establishment (NASS, 2024).

Potential consequences on economically important hosts at risk:
Sternochetus frigidus is likely to cause unacceptable consequences because it causes severe economic damage to the mango crop in northern India, where incidence rates in mango cultivars of 50 to 80 percent were observed (De and Pande, 1990). The larvae burrow into the pulp of mango fruits, which causes them to rot and become unusable (De and Pande, 1990). The larvae also damage mango seeds in the fruit and cause around 20 percent to not germinate (De and Pande, 1990). There are one to six larvae per fruit, with pupae and adults occurring at the same time in the fruit (De and Pande, 1990).

Endangered area:
The endangered area for *S. frigidus* in the United States includes Plant Hardiness Zones 10 to 14 where suitable hosts occur.

[6] 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).

The likelihood of entry of *Sternochetus frigidus* into the endangered area via fresh mango fruit imported from the Philippines

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Pest prevalence on the harvested commodity	High	Moderate	In northern India, the incidence rate of *S. frigidus* in mango fruit cultivars ranged from 50 to 80 percent (De and Pande, 1990). Larvae, pupae, and adults can occur in mango fruit at the same time (De and Pande, 1990) and could follow the pathway. *Sternochetus frigidus* infestation was not related to premature fruit drop in northern India (De and Pande, 1990), which increases the likelihood of it remaining in harvested mangos. Based on this evidence, we rated this risk element High. A source of uncertainty is its prevalence in mango fruits in the Philippines vs. northern India.
Likelihood of surviving post-harvest processing before shipment	High	Low	*Sternochetus frigidus* larvae burrow into the fruit with no signs of entry on the fruit exterior (Muniappan et al., 2012), and there are no outward signs of fruit infestation prior to adult emergence (CABI, 2024), indicating washing and culling are unlikely to prevent its movement on the commodity. Based on this evidence, we kept the risk rating High.
Likelihood of surviving transport and storage conditions of the consignment	High	Low	Transport and storage conditions were not considered, so we kept the risk rating High.
Overall Likelihood of Entry	High	n/a	n/a

The likelihood of establishment of *Sternochetus frigidus* into the endangered area via fresh mango fruit imported from the Philippines

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	Low	Low	*Sternochetus frigidus* has a limited host range (see "Hosts in PRA area"), and available hosts in the climatically suitable area will be limited to mangos (NASS, 2024), which reduces the likelihood of it finding suitable hosts. *Sternochetus frigidus* adults are poor fliers (De and Pande, 1988), which reduces the likelihood of adults successfully escaping from mangos for consumption into the environment in sufficient numbers to successfully mate, locate suitable hosts, and establish a population. Based on this evidence, we rated its likelihood of establishment Low.
Overall Likelihood of Establishment	Low	n/a	n/a

The likelihood of introduction (combined likelihoods of entry and establishment) of *Sternochetus frigidus* into the endangered area via fresh mango fruit imported from the Philippines is Medium.

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[a]	Notes
Arthropod	*Bactrocera dorsalis* (Hendel)	N/A	7CFR § 301.32, 2024
Arthropod	*Bactrocera frauenfeldi* (Schiner)	High	
Arthropod	*Bactrocera occipitalis* (Bezzi)	Medium	
Arthropod	*Sternochetus frigidus* (Fabricius)	Medium	
Arthropod	*Zeugodacus cucurbitae* (Coquillett)	N/A	7CFR § 301.32, 2024

[a] N/A: The likelihood of introduction was not assessed for Select Agents and Program Pests - federal regulations are in place for these pests because they were previously determined to pose an unacceptable risk to U.S. agriculture or natural resources.

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.

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6. Appendix: Pests with non-quarantine status

We found evidence that the organisms listed below are associated with mango and are present in the Philippines; however, none are of quarantine significance for the United States (ARM, 2024), or as defined by ISPM No. 5 (IPPC, 2024). Although we did not intensively evaluate the evidence, we provide references supporting each pest's potential presence in the Philippines, presence in the United States (if applicable), and association with mango. If any of the organisms are **not** present in the United States, we also provided justification for their non-quarantine status. Unless otherwise noted, these organisms are non-actionable at U.S. ports of entry (ARM, 2024).

Organism	In the Philippines	In U.S.	Host Association	Notes
MITE: Trombidiformes: Tarsonemidae *Polyphagotarsonemus latus* Banks syn. *Hemitarsonemus latus* Banks	(Lin and Zhang, 2002)	(CABI, 2024)	(Lin and Zhang, 2002)	None.
MITE: Trombidiformes: Tenuipalpidae *Brevipalpus obovatus* Donnadieu	(Corpuz-Raros, 2001)	(CABI, 2024)	(Mohamed and Nabil, 2014)	None.
MITE: Trombidiformes: Tenuipalpidae *Brevipalpus phoenicis* (Geijskes)	(Corpuz-Raros, 2001)	(CABI, 2024)	(Sadana et al., 1982)	None.
INSECT: Coleoptera: Curculionidae *Xyleborus ferrugineus* (Fabricius)	(Chang et al., 2014)	(CABI, 2024)	(Schedl, 1960)	None.
INSECT: Coleoptera: Scolytidae *Xyleborus volvulus* (Fabricius)	(CABI, 2024)	(CABI, 2024)	(CABI, 2024)	None.
INSECT: Coleoptera: Curculionidae *Xylosandrus compactus* Wood & Bright	(Dole and Cognato, 2010)	(CABI, 2024)	(Wood and Bright, 1992b)	None.
INSECT: Coleoptera: Scolytidae *Xylosandrus crassiusculus* (Motschulsky)	(CABI, 2024)	(CABI, 2024)	(CABI, 2024)	None.
INSECT: Diptera: Drosophilidae *Drosophila melanogaster* Meugen	(CABI, 2024)	(CABI, 2024; Wolcott, 1951)	(CABI, 2024)	None.
INSECT: Diptera: Muscidae *Atherigona orientalis* Schiner	(CABI, 2024)	(CABI, 2024)	(CABI, 2024)	None.
INSECT: Hemiptera: Aleyrodidae *Aleurodicus dispersus* Russell	(Waterhouse , 1993)	(CABI, 2024)	(Peña and Moyhuddin, 1997)	None.

Organism	In the Philippines	In U.S.	Host Association	Notes
INSECT: Hemiptera: Aleyrodidae *Aleurothrixus floccosus* (Maskell)	(CABI, 2024)	(CABI, 2024)	(CABI, 2024)	None.
INSECT: Hemiptera: Aphididae *Aphis aurantii* Fonscolombe	(CABI, 2024)	(CABI, 2024)	(Blackman and Eastop, 2000; CABI, 2024)	None.
INSECT: Hemiptera: Aphididae *Aphis craccivora* Koch	(CABI, 2024)	(CABI, 2024; Heu, 2007)	(Blackman and Eastop, 2000; Peña and Moyhuddin, 1997)	None.
INSECT: Hemiptera: Aphididae *Aphis gossypii* Glover	(CABI, 2024; Woodworth, 1922)	(CABI, 2024)	(Blackman and Eastop, 2000; Ferreira and Barbosa, 2002)	None.
INSECT: Hemiptera: Asterolecaniidae *Russellaspis pustulans* (Cockerell)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Coccidae *Ceroplastes ceriferus* (Fabricius)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Coccidae *Ceroplastes cirripediformis* Comstock	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Coccidae *Ceroplastes stellifer* (Westwood) syn. *Vinsonia stellifera* (Westwood)	(Ben-Dov, 1993; García Morales et al., 2016)	(Ben-Dov, 1993; García Morales et al., 2016; Hodges et al., 2005; Wolcott, 1948)	(García Morales et al., 2016; Peña and Moyhuddin, 1997)	None.
INSECT: Hemiptera: Coccidae *Coccus hesperidum* (Linnaeus)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.

Organism	In the Philippines	In U.S.	Host Association	Notes
INSECT: Hemiptera: Coccidae *Coccus longulus* (Douglas)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Coccidae *Coccus viridis* (Green)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Coccidae *Milviscutulus mangiferae* (Green) syn. *Coccus mangiferae* (Green)	(García Morales et al., 2016; Otanes, 1936)	(García Morales et al., 2016)	(García Morales et al., 2016; Otanes, 1936)	None.
INSECT: Hemiptera: Coccidae *Parasaissetia nigra* (Nietner)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Coccidae *Pulvinaria psidii* Maskell	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Coccidae *Saissetia coffeae* (Walker)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Coccidae *Saissetia oleae oleae* (Olivier)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae[7]: *Andaspis hawaiiensis* (Maskell)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Aonidiella aurantii* (Maskell)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Aonidiella citrina* (Coquillett)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Aonidiella inornata* Mckenzie	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.

[7] All armored scales (Diaspididae) are non-actionable at U.S. ports of entry on fruits and vegetables for consumption (NIS, 2024). Therefore, we did not need to determine whether they occur in the United States.

Organism	In the Philippines	In U.S.	Host Association	Notes
INSECT: Hemiptera: Diaspididae *Aonidiella orientalis* (Newstead)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Aspidiotus destructor* Signoret	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Aspidiotus nerii* Bouche	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Aulacaspis rosae* (Bouché)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Aulacaspis sumatrensis* Green	(García Morales et al., 2016)	N/A (see footnote)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Aulacaspis tubercularis* Newstead	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Chrysomphalus aonidum* (Linnaeus)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Chrysomphalus dictyospermi* (Morgan)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Clavaspis herculeana* (Cockerell & Hadden)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Diaspis boisduvalii* Signoret	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Fiorinia fioriniae* (Targioni Tozzetti)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.

Organism	In the Philippines	In U.S.	Host Association	Notes
INSECT: Hemiptera: Diaspididae *Fiorinia phantasma* Cockerell & Robinson	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Genaparlatoria pseudaspidiotus* (Lindinger)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Hemiberlesia cyanophylli* (Signoret)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Hemiberlesia lataniae* (Signoret)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Hemiberlesia palmae* (Cockerell)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Hemiberlesia rapax* (Comstock)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Howardia biclavis* (Comstock)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Ischnaspis longirostris* (Signoret)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Lepidosaphes beckii* (Newman)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Lepidosaphes gloverii* (Packard)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Lepidosaphes laterochitinosa* Green	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.

Organism	In the Philippines	In U.S.	Host Association	Notes
INSECT: Hemiptera: Diaspididae *Lepidosaphes punicae* Laing	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Lindingaspis floridana* Ferris	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Lindingaspis rossi* (Maskell)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Morganella longispina* (Morgan)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Mycetaspis personata* (Comstock)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Octaspidiotus stauntoniae* (Takahashi)	(García Morales et al., 2016)	N/A (see footnote)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Parlatoria cinerea* Hadden	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Parlatoria pergandii* Comstock	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Parlatoria proteus* (Curtis)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Pinnaspis strachani* (Cooley)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Pseudaonidia trilobitiformis* (Green)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Pseudaulacaspis cockerelli* (Cooley)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.

Organism	In the Philippines	In U.S.	Host Association	Notes
INSECT: Hemiptera: Diaspididae *Pseudaulacaspis pentagona* (Targioni Tozzetti)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Selenaspidus articulatus* (Morgan)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Semelaspidus mangiferae* Takahashi	(García Morales et al., 2016)	N/A (see footnote)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Unaspis acuminata* (Green)	(García Morales et al., 2016)	N/A (see footnote)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Diaspididae *Unaspis citri* (Comstock)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Margarodidae *Icerya purchasi* Maskell	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Pentatomidae *Nezara viridula* (Linnaeus)	(CABI, 2024)	(CABI, 2024)	(Butani, 1993)	None.
INSECT: Hemiptera: Pseudococcidae *Dysmicoccus brevipes* (Cockerell)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Pseudococcidae *Dysmicoccus neobrevipes* Beardsley	(Williams, 2004)	(Miller and Miller, 2002)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Pseudococcidae *Ferrisia virgata* (Cockerell)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Pseudococcidae *Nipaecoccus nipae* (Maskell)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.

Organism	In the Philippines	In U.S.	Host Association	Notes
INSECT: Hemiptera: Pseudococcidae *Paracoccus marginatus* Williams & Granara de Willink	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Pseudococcidae *Phenacoccus madeirensis* Green	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Pseudococcidae *Planococcus citri* (Risso)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Pseudococcidae *Planococcus minor* (Maskell)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Pseudococcidae *Pseudococcus jackbeardsleyi* Gimpel & Miller	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Pseudococcidae *Pseudococcus longispinus* (Targioni Tozzetti)	(García Morales et al., 2016)	(García Morales et al., 2016)	(García Morales et al., 2016)	None.
INSECT: Hemiptera: Pseudococcidae *Pseudococcus viburni* (Signoret)	(Watson, 2016)	(Watson, 2016)	(García Morales et al., 2016)	None.
INSECT: Hymenoptera: Formicidae *Solenopsis geminata* (Fabricius)	(Gotzek et al., 2015)	(Martorell, 1976)	(CABI, 2024)	None.
INSECT: Lepidoptera: Pyralidae *Cadra cautella* Walker	(CABI, 2024)	(CABI, 2024)	(CABI, 2024)	None.
INSECT: Thysanoptera: Thripidae *Frankliniella occidentalis* (Pergande)	(CABI, 2024)	(CABI, 2024)	(CABI, 2024)	None.
INSECT: Thysanoptera: Thripidae *Frankliniella schultzei* (Trybom)	(CABI, 2024)	(CABI, 2024)	(CABI, 2024)	None.

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INSECT: Thysanoptera: Thripidae *Heliothrips haemorrhoidalis* Bouché	(CABI, 2024)	(CABI, 2024)	(CABI, 2024)	None.
INSECT: Thysanoptera: Thripidae *Scirtothrips dorsalis* Hood	(CABI, 2024)	(CABI, 2024)	(CABI, 2024)	None.
INSECT: Thysanoptera: Thripidae *Thrips tabaci* Lindeman	(CABI, 2024)	(CABI, 2024)	(CABI, 2024)	None.
BACTERIA *'Candidatus Phytoplasma asteris'*-related strains	CABI, 2024)	(CABI, 2024)	(CABI, 2024)	None.
FUNGUS: *Albonectria rigidiuscula* (Berk. & Broome) Rossman & Samuels syn:. *Calonectria rigidiuscula* (Berk. & Broome) Sacc.; *Fusarium decemcellulare* Brick	(Booth and Waterston, 1998)	(Ploetz et al., 1996) ; (Serrato-Diaz et al., 2015)	(Qi et al., 2013)	None.
FUNGUS: *Aspergillus niger* Tiegh.	(CABI, 2024)	(CABI, 2024)	(CABI, 2024)	None.
FUNGUS: *Athelia rolfsii* (Curzi) C.C. Tu & Kimbr. syn:. *Corticium rolfsii* Curzi	(CABI, 2024)	(CABI, 2024)	(CABI, 2024)	None.
FUNGUS: *Berkeleyomyces basicola* (Berk. & Broome) W.J. Nel, Z.W. de Beer, T.A. Duong & M.J. Wingf. syn:. *Chalara elegans* Nag Raj & Kendr., *Thielaviopsis basicola* (Berk. & Broome) Ferraris	(CABI, 2024)	(CABI, 2024)	(CABI, 2024)	None.
FUNGUS: *Botrytis cinerea* Pers. : Fr.	(Evallo et al., 2023); (Yap and Halos, 1995)	(Alfieri et al., 1984)	(Raabe et al., 1981)	None.
FUNGUS: *Cephaleuros virescens* Kunze	(Kobayashi and de Guzman, 1988)	(Alfieri et al., 1984)	(Vasconcelos et al., 2019)	None.
FUNGUS: *Ceratocystis fimbriata* Ellis & Halst.	(CABI, 2024)	(CABI, 2024)	(CABI, 2024)	None.
Colletotrichum asianum Prihast., L. Cai & K.D. Hyde	(Alvarez et al., 2020)	(Chitambar, 2015)	(Alvarez et al., 2020)	None.

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FUNGUS: *Colletotrichum fructicola* Prihastuti, L. Cai & K.D. Hyde	(Dela Cueva et al., 2021)	(Hu et al., 2015); (Serrato-Diaz et al., 2017)	(Dela Cueva et al., 2021); (Joa et al., 2016)	None.
FUNGUS: *Colletotrichum gloeosporioides* (Penz.) Penz. & Sacc. syn:. *Glomerella cingulata* (Stoneman) Spauld. & H. Schrenk, *Gloeosporium cingulatum* G.F. Atk., *Gloeosporium mangiferae* Henn.	(CABI, 2024)	(CABI, 2024)	(CABI, 2024)	None.
FUNGUS: *Colletotrichum siamense*	(Dimayacyac and Balendres, 2024); (Evallo et al., 2023)	(Xavier et al., 2019)	(Qin et al., 2017)	None.
FUNGUS: *Curvularia lunata* (Wakker) Boedijn syn:. *Cochliobolus lunatus* R.R. Nelson & F.A. Haasis	(CABI, 2024)	(CABI, 2024)	(Singh, 1971)	None.
FUNGUS: *Elsinoë mangiferae* Bitanc. & Jenkins	(CABI, 2024)	(CABI, 2024)	(CABI, 2024)	None.
FUNGUS: *Fusarium fujikuroi* Nirenberg syn:. *Gibberella fujikuroi* (Sawada) Wollenw.	(CABI, 2024)	(CABI, 2024)	(CABI, 2024)	None.
FUNGUS: *Fusarium moniliforme* J. Sheld.	(Farr and Rossman, 2024)	(Alfieri et al., 1984)	(Alfieri et al., 1984)	None.
FUNGUS: *Lasiodiplodia theobromae* (Pat.) Griffon & Maubl. syn:. *Diplodia natalensis*	(CABI, 2024)	(CABI, 2024)	(CABI, 2024)	None.
FUNGUS: *Nigrospora oryzae* (Berk. & Broome) Petch syn:. *Khuskia oryzae* H.J. Huds.	(CABI, 2024)	(CABI, 2024); (Raabe et al., 1981); (Serrato-Diaz et al., 2011).	(CABI, 2024)	None.

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FUNGUS: *Pestalotiopsis mangiferae* (Henn.) Steyaert syn. *Pestalotia mangiferae* Henn.	(Guerrero et al., 2018)	(CABI, 2024)	(Rakesh et al., 2020); (Rizwana et al., 2012)	None.
FUNGUS: *Phytophthora cinnamomi* Rands	(CABI, 2024)	(CABI, 2024)	(CABI, 2024)	None.
FUNGUS: *Phytophthora palmivora* (E.J. Butler) E.J. Butler	(CABI, 2024)	(CABI, 2024)	(Tsao et al., 1994)	None.
FUNGUS: *Rhizoctonia solani* J.G. Kühn syn:. *Thanatephorus cucumeris* (A.B. Frank) Donk	(CABI, 2024)	(CABI, 2024)	(Alfieri et al., 1984)	None.
FUNGUS: *Schizophyllum commune* Fr. : Fr.	(Farr and Rossman, 2024)	(Alfieri et al., 1984)	(Farr and Rossman, 2024)	None.
FUNGUS: *Thielaviopsis paradoxa* (De Seynes) Höhn. syn:. *Ceratocystis paradoxa* (De Seynes) C. Moreau, *Ceratostomella paradoxa* Dade	(CABI, 2024)	(CABI, 2024)	(CABI, 2024)	None.
FUNGUS: *Verticillium albo-atrum* Reinke & Berthold	(CABI, 2024)	(CABI, 2024)	(Alfieri et al., 1984)	None.