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

Importation of mango (*Mangifera indica*) for consumption from India into the Continental United States

A Qualitative, Pathway Initiated Pest Risk Assessment

Version 3

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Executive Summary

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

Based on the market access request submitted by India, we considered the pathway to include the following processes and conditions: fresh mango fruit that will be washed to remove sap and hand culled. The pest risk ratings depend on the application of all conditions of the pathway as described in this document. Mango 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 India to develop a list of pests with quarantine significance for the continental United States. These are pests that occur in India 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.

Pest type	Taxonomy	Scientific name	Likelihood of Introduction
Arthropoda	Coleoptera: Curculionidae	*Sternochetus mangiferae* (F.)	Low
Arthropoda	Coleoptera: Curculionidae	*Sternochetus frigidus* (F.)	Low
Arthropoda	Diptera: Tephritidae	*Bactrocera caryeae* (Kapoor)	Medium
Arthropoda	Diptera: Tephritidae	*Bactrocera correcta* (Bezzi)	High
Arthropoda	Diptera: Tephritidae	*Bactrocera frauenfeldi* (Schin.)	Medium
Arthropoda	Diptera: Tephritidae	*Dacus ciliatus* Loew	High
Arthropoda	Diptera: Tephritidae	*Zeugodacus tau* Walker	Medium
Fungi	Botryosphaeriales: Botryosphaeriaceae	*Lasiodiplodia hormozganensis* Abdollahzadeh, Zare & A.J.L. Phillips	Low
Fungi	Botryosphaeriales: Botryosphaeriaceae	*Lasiodiplodia pseudotheobromae* A.J.L. Phillips, A. Alves & Crous	Low
Fungi	Diaporthales: Diaporthaceae	*Nattrassia mangiferae* (Syd. & P. Syd.) B. Sutton & Dyko	Low
Fungi	Diaporthales: Diaporthaceae	*Phomopsis mangiferae* S. Ahmad	Low

The following organisms were found 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 already in place for these pests:

Pest type	**Taxonomy**	**Scientific name**	**Code of Federal Regulation**
Arthropoda	Diptera: Tephritidae	*Bactrocera dorsalis* Hendel	7CFR § 301.32, 2021
Arthropoda	Diptera: Tephritidae	*Bactrocera zonata* (Saunders)	7CFR § 301.32, 2021
Arthropoda	Diptera: Tephritidae	*Zeugodacus cucurbitae* (Coquillett)	7CFR § 301.32, 2021

Detailed examination and choice of appropriate phytosanitary measures to mitigate pest risk are addressed separately from this document.

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1. Introduction

1.1. Background

The purpose of this report is to assess the pest risk associated with the importation of commercially produced fresh fruit of mango (*Mangifera indica* L.) for consumption from India (referred to as the export area) into the continental United States (referred to as the pest risk analysis or PRA area).

This is a qualitative risk assessment. The likelihood of pest introduction is expressed as a qualitative rating rather than in 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, 2017). The use of biological and phytosanitary terms is consistent with ISPM No. 5, "Glossary of Phytosanitary Terms" (IPPC, 2018).

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 importation of fruits and vegetables for consumption into the United States is regulated under Title 7 of the Code of Federal Regulations, Part 319.56-3 (7 CFR §319.56-3, 2019) (PPQ, 2018). Under this regulation, the entry of mango fruit from India into the PRA area is authorized under a pre-clearance program after an irradiation treatment of 400 Gy (treatment: T105-a-2). India is requesting a revision to their current import requirements for this commodity. The pest risk assessment needed to be revisited before any changes can be made.

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 (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 fruit does not need to be analyzed because it is already enterable from other countries and is naturalized in Florida (USDA-NRCS, 2022).

1.4. Description of the pathway

A pathway is "any means that allows the entry or spread of a pest" (IPPC, 2018). In the context of this document, the pathway is the commodity to be imported, together with all the processes the commodity undergoes from production through importation and distribution. The following description of this pathway focuses on the conditions and processes that may have an impact on pest risk. Our assessment is, therefore, contingent on the application of all components of the pathway as described in this section.

1.4.1. Description of the commodity
The specific pathway of concern is the importation of fresh mango fruits, without leaves or stems, for consumption.

1.4.2. Summary of the production, harvest, post-harvest, shipping, and storage conditions considered
India can export mangoes year-round. We will consider standard packinghouse mitigations for mangoes; these include washing to remove sap and hand culling any visibly rotten, infested, or infected fruit. We will not consider other production, harvesting, and post-harvesting procedures in the exporting area, nor did we consider shipping and storage conditions as part of the assessment.

2. Pest List and Pest Categorization

The pest list is a compilation of plant pests of quarantine significance to the continental United States. This list includes pests that are present in India on any host and known to be associated with *Mangifera indica* anywhere in the world. Pests are considered to be of quarantine significance 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 the scientific literature, port-of-entry pest interception data, and information provided by the government of India. We listed the pests that are of quarantine significance to the PRA area in Table 1. For each pest, we provided evidence of the pest's presence in the continental United States and its association with *Mangifera indica* fruit. We also indicated the plant parts with which the pest is generally associated and provided information about the pest's distribution in the United States, if any. Pests that are likely to remain associated with the harvested commodity in a viable form are indicated by shaded rows and are listed separately in Table 2.

We did not include woodboring or root-feeding pests. Nor did we include eusocial pests (e.g., ants, termites, wasps, etc.), or highly mobile polyphagous pests (e.g., grasshoppers, crickets, etc.)

Table 1. List of quarantine pests associated with *Mangifera indica* (in any country) and present in India (on any host).

Pest name	Presence in India	Host association	Plant part(s)[1]	Considered further?[2]
MITE: Trombidiformes: Eriophyidae *Cisaberoptus kenyae* Keifer	Dhooria and Bhullar, 2003; Dhooria et al., 2004; Gupta, 1985; Knihinicki and Boczek, 2002	Dhooria and Bhullar, 2003; Dhooria et al., 2004; Gupta, 1985; Knihinicki and Boczek, 2002	Leaves (Gupta, 1985; Knihinicki and Boczek, 2002)	No.
MITE: Trombidiformes: Eriophyidae *Metaculus mangiferae* (Attiah)	Jeppson et al., 1975	Jeppson et al., 1975	Leaves, inflorescence (Jeppson et al., 1975)	No.
MITE: Trombidiformes: Eriophyidae *Neocalacarus mangiferae* Channabasavanna	Jeppson et al., 1975; Knihinicki and Boczek, 2002	Gupta, 1985; Knihinicki and Boczek, 2002	Leaves, stems, buds (Knihinicki and Boczek, 2002)	No.
MITE: Trombidiformes: Eriophyidae *Tegonotus mangiferae* (Keifer)	Knihinicki and Boczek, 2002	Knihinicki and Boczek, 2002	Young leaves, stems (Knihinicki and Boczek, 2002)	No.
MITE: Trombidiformes: Tetranychidae *Eutetranychus orientalis* (Klein)	Gupta, 1985; Iqbal and Ali, 2008; Jeppson et al., 1975	Iqbal and Ali, 2008	Leaves, fruit, tender shoots (Gupta, 1985; Jeppson et al., 1975)	No. Although mites may externally feed on fruit, the standard packinghouse mitigation of washing mangoes would eliminate them from the pathway.

[1] The plant part(s) listed are those for the plant species under analysis. If the information has been extrapolated, such as from plant part association on other plant species, we note that.
[2] "Yes" indicates simply that the pest has a reasonable likelihood of being associated with the harvested commodity; the level of pest prevalence on the harvested commodity (low, medium, or high) is qualitatively assessed as part of the Likelihood of Introduction assessment (section 3).

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
MITE: Trombidiformes: Tetranychidae *Oligonychus biharensis* (Hirst)	Gupta, 1985	Gupta, 1985	Leaves (Gupta, 1985)	No.
MITE: Trombidiformes: Tetranychidae *Oligonychus mangiferus* (Rahman & Sapra)	Gupta, 1985; Zaman, 1994	Gupta, 1985; Reddy et al., 2020; Zaman, 1994	Leaves (Gupta, 1985; Zaman, 1994)	No.
MITE: Trombidiformes: Tetranychidae *Tetranychus neocaledonicus* André	Gupta, 1985	Gupta, 1985	Leaves (Gupta, 1985)	No.
INSECT: Coleoptera: Attelabidae *Apoderus tranquebaricus* (F.)	Butani, 1993; Mamlayya, 2011	Butani, 1993; Mamlayya, 2011	Leaves (Butani, 1993; Mamlayya, 2011)	No.
INSECT: Coleoptera: Chrysomelidae *Altica coerulea* Olivier; syn. *Haltica caerulea* Olivier	Dhuri and Singh, 1983	Kasturi Bai and Sugandhi, 1968	Flowers (Kasturi Bai and Sugandhi, 1968)	No.
INSECT: Coleoptera: Chrysomelidae *Aspidolopha melanophthalma* Lacord	Zaman, 1994	Zaman, 1994	Leaves (Zaman, 1994)	No.
INSECT: Coleoptera: Chrysomelidae *Aulacophora foveicollis* (Lucas); syn. *Raphidopalpa foveicollis* Lucas	Ramamurthy et al., 1982; Tandon and Lal, 1977	Butani, 1993; Ramamurthy et al., 1982; Tandon and Lal, 1977	Leaves, inflorescence (Ramamurthy et al., 1982; Tandon and Lal, 1977)	No.
INSECT: Coleoptera: Chrysomelidae *Cryptocephalus insubidus* Suffrain	Ramamurthy et al., 1982	Ramamurthy et al., 1982	Leaves (Ramamurthy et al., 1982)	No.
INSECT: Coleoptera: Chrysomelidae *Cryptocephalus suillus* Suffrain	Ramamurthy et al., 1982	Ramamurthy et al., 1982	Leaves (Ramamurthy et al., 1982)	No.
INSECT: Coleoptera: Chrysomelidae *Diapromorpha melanopus* Lacordaire	Batra, 1976; KKHSOU, 2019	Wester, 1911	Tender stems, leaves (KKHSOU, 2019; Wester, 1911)	No.
INSECT: Coleoptera: Chrysomelidae *Diapromorpha pallens* (F.)	Zaman, 1994	Zaman, 1994	Leaves (Zaman, 1994)	No.

Pest name	**Presence in India**	**Host association**	**Plant part(s)**	**Considered further?**
INSECT: Coleoptera: Chrysomelidae *Luperomorpha weisi* Jacoby	Stebbing, 1914	Stebbing, 1914	Flowers, leaves ([based on congener] Kozlowski and Legutowska, 2014)	No.
INSECT: Coleoptera: Chrysomelidae *Monolepta signata* Olivier	Ramamurthy et al., 1982	Ramamurthy et al., 1982	Leaves (Ramamurthy et al., 1982; Zaman, 1994 [*Monolepta* sp.])	No.
INSECT: Coleoptera: Chrysomelidae *Rhytidodera bowringi* Gahan	Ramamurthy et al., 1982	Ramamurthy et al., 1982	Leaves (Ramamurthy et al., 1982)	No.
INSECT: Coleoptera: Chrysomelidae *Scelodonta strigicollis* Matschulsky	Pruthi and Batra, 1960; Ramamurthy et al., 1982	Pruthi and Batra, 1960; Ramamurthy et al., 1982	Leaves (Ramamurthy et al., 1982)	No.
INSECT: Coleoptera: Curculionidae *Alcidodes frenatus* (Faust)	Butani, 1993	Butani, 1993	Leaves (Butani, 1993)	No.
INSECT: Coleoptera: Curculionidae *Amblyrrhinus poricollis* Schönherr	Butani, 1993; Pajni, 1990; Pruthi and Batra, 1960	Butani, 1993; Pajni, 1990; Pruthi and Batra, 1960	Leaves (Pajni, 1990; Pruthi and Batra, 1960)	No.
INSECT: Coleoptera: Curculionidae *Astychus lateralis* (F.); syn. *Lepropus lateralis* (F.)	Zaman, 1994	Zaman, 1994	Leaves (Zaman, 1994)	No.
INSECT: Coleoptera: Curculionidae *Atmetonychus perigrinus* Oliver	Butani, 1993	Butani, 1993	Leaves (Butani, 1993)	No.
INSECT: Coleoptera: Curculionidae *Camptorrhinus mangiferae* Marshall	Marshall, 1925; Pruthi and Batra, 1960	Marshall, 1925; Pruthi and Batra, 1960	Leaves (Butani, 1993)	No.
INSECT: Coleoptera: Curculionidae *Crinorrhinus crassirostris* Faust	Jahhav and Sharma, 2012; Patel et al., 1997	Patel et al., 1997	Leaves (Patel et al., 1997)	No.

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
INSECT: Coleoptera: Curculionidae *Deporaus marginatus* (Pascoe)	Pruthi and Batra, 1960; Srivastava, 1997	Pruthi and Batra, 1960; Reddy et al., 2018; Srivastava, 1997	Leaves (Reddy et al., 2018; Srivastava, 1997)	No.
INSECT: Coleoptera: Curculionidae *Desmidophorus hebes* (F.)	Butani, 1993; Hong et al., 2011	Butani, 1993	Leaves (Butani, 1993; Hong et al., 2011)	No.
INSECT: Coleoptera: Curculionidae *Hypomeces squamosus* F.	CABI, 2022b; Mazumder et al., 2015	Mazumder et al., 2015	Leaves (CABI, 2022b; Mazumder et al., 2015)	No.
INSECT: Coleoptera: Curculionidae *Myllocerus discolor* Boheman	Butani, 1993; Pruthi and Batra, 1960; Ramamurthy, 1988; Srivastava, 1997; Zaman, 1994	Butani, 1993; Pruthi and Batra, 1960; Srivastava, 1997; Zaman, 1994	Leaves, shoots, inflorescence (Srivastava, 1997; Ramamurthy, 1988; Zaman, 1994)	No.
INSECT: Coleoptera: Curculionidae *Myllocerus laetivirens* Boheman	Butani, 1993; Ramamurthy, 1988	Butani, 1993; Ramamurthy, 1988; Srivastava, 1997	Leaves (Ramamurthy, 1988; Srivastava, 1997)	No.
INSECT: Coleoptera: Curculionidae *Myllocerus sabulosus* Marshall	Butani, 1993; Ramamurthy, 1988	Butani, 1993; Pruthi and Batra, 1960; Ramamurthy, 1988	Leaves (Butani, 1993; Ramamurthy, 1988)	No.
INSECT: Coleoptera: Curculionidae *Myllocerus undecimpustulatus* Faust	Butani, 1993; Ramamurthy, 1988	Butani, 1993; Ramamurthy, 1988; Srivastava, 1997	Leaves (Srivastava, 1997)	No.
INSECT: Coleoptera: Curculionidae *Peltotrachelus cognatus* Marshall	Butani, 1993; Pajni, 1990; Siddappaji and Lingappa, 1977	Butani, 1993; Pajni, 1990; Siddappaji and Lingappa, 1977	Leaves (Butani, 1993; Pajni, 1990; Siddappaji and Lingappa, 1977)	No.
INSECT: Coleoptera: Curculionidae *Peltotrachelus pubes* (Faust)	Butani, 1993; Pajni, 1990; Siddappaji and Lingappa, 1977	Butani, 1993; Pajni, 1990; Siddappaji and Lingappa, 1977	Leaves (Butani, 1993; Pajni, 1990)	No.

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
INSECT: Coleoptera: Curculionidae *Platymycterus sjostedti* Marshall	Pajni, 1990; Pruthi and Batra, 1960	Pajni, 1990; Pruthi and Batra, 1960	Leaves (Butani, 1993; Pajni, 1990)	No.
INSECT: Coleoptera: Curculionidae *Rectosternum poriolle* (Faust)	Butani, 1993	Butani, 1993	Leaves (Butani, 1993)	No.
INSECT: Coleoptera: Curculionidae *Rhynchaenus mangiferae* Marshall	Srivastava, 1997	Reddy et al., 2018; Srivastava, 1997	Leaves (Reddy et al., 2018)	No.
INSECT: Coleoptera: Curculionidae *Sternochetus frigidus* (F.); syn. *S. gravis* (F.)	**Reddy et al., 2018; Srivastava, 1997**	**Reddy et al., 2018; Srivastava, 1997**	**Fruit borer (Reddy et al., 2018; Srivastava, 1997)**	**Yes. See section 3.2.1 for assessment.**
INSECT: Coleoptera: Curculionidae *Sternochetus mangiferae* (F.); syn. *Cryptorhynchus mangiferae* (F.)	**Reddy et al., 2018; Srivastava, 1997**	**Reddy et al., 2018; Srivastava, 1997**	**Fruit, stone (Reddy et al., 2018; Srivastava, 1997)**	**Yes. See section 3.2.1 for assessment.**
INSECT: Coleoptera: Scarabaeidae *Adoretus bicaudatus* Arrow	Butani, 1993; Sarkar et al., 2016	Butani, 1993	Leaves (Butani, 1993)	No.
INSECT: Coleoptera: Scarabaeidae *Adoretus lasiophygus* Burmeister	Butani, 1993; Pruthi and Batra, 1960; Sarkar et al., 2016	Butani, 1993; Pruthi and Batra, 1960	Leaves (Butani, 1993)	No.
INSECT: Coleoptera: Scarabaeidae *Anomala dussumieri* (Blanchard)	Butani, 1993; Ghosh et al., 2021	Butani, 1993; Reddy et al., 2018	Leaves (Butani, 1993)	No.
INSECT: Coleoptera: Scarabaeidae *Anomala varicolor* Gyllenhal	Butani, 1993; Ghosh et al., 2021	Pruthi and Batra, 1960; Reddy et al., 2018	Leaves (Butani, 1993)	No.
INSECT: Coleoptera: Scarabaeidae *Holotrichia reynaudi* Blanchard; syn. *Holtrichia insularis* Brenske	Butani, 1993; Dadmal et al., 2013	Butani, 1993	Leaves (Butani, 1993)	No.

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
INSECT: Coleoptera: Scarabaeidae *Holotrichia serrata* (F.)	CABI, 2022b; Raodeo et al., 1976	Husain et al., 1987	Leaves (CABI, 2022b; Husain et al., 1987)	No.
INSECT: Diptera: Cecidomyiidae *Contarinia moringae* (Mani)	Butani, 1993; Gagné, 2010	Butani, 1993	Leaves (Butani, 1993)	No.
INSECT: Diptera: Cecidomyiidae *Dasineura amaramanjarae* Grover	Butani, 1993; Gagné, 2010; Rehman, 2014	Butani, 1993; Gagné, 2010; Reddy et al., 2020; Rehman, 2014; Srivastava, 1997	Flowers, inflorescence (Butani, 1993; Reddy et al., 2020; Rehman, 2014; Srivastava, 1997)	No.
INSECT: Diptera: Cecidomyiidae *Dasineura citri* Rao & Grover	Gagné, 2010;	Butani, 1993	Flowers (Butani, 1993)	No.
INSECT: Diptera: Cecidomyiidae *Gephyraulus indica* Grover & Prasad; syn. *Procystiphora indica* Grover & Prasad	Gagné, 2006; Gagné, 2010; Srivastava, 1997	Gagné, 2010; Srivastava, 1997	Flower buds (Srivastava, 1997)	No.
INSECT: Diptera: Cecidomyiidae *Gephyraulus mangiferae* (Felt); syn. *Procystiphora mangiferae* (Felt), *Dasineura mangiferae* Felt, *Rhabdophaga mangiferae* Mani	Gagné, 2006; Srivastava, 1997; Tripathi, 2020	Gagné, 2006; Srivastava, 1997; Tripathi, 2020	Flowers, inflorescence (Gagné, 2006; Srivastava, 1997; Tripathi, 2020)	No.
INSECT: Diptera: Cecidomyiidae *Lasioptera mangiflorae* (Grover)	Gagné, 2010	Butani, 1993; Gagné, 2010	Leaves (Butani, 1993)	No.
INSECT: Diptera: Cecidomyiidae *Procontarinia allahabadensis* Grover; syn. *Amradiplosis allahabadensis* Grover	Butani, 1993; Gagné, 2010; Srivastava, 1997	Butani, 1993; Gagné, 2010; Srivastava, 1997	Leaves (Butani, 1993; Srivastava, 1997)	No.

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
INSECT: Diptera: Cecidomyiidae *Procontarinia amraeomyia* Rao; syn. *Amradiplosis amaemyia* Rao	Butani, 1993; Gagné, 2010	Butani, 1993; Gagné, 2010	Leaves (Butani, 1993)	No.
INSECT: Diptera: Cecidomyiidae *Procontarinia brunneigallicola* Rao; syn. *Amradiplosis brunneigallicola* Rao	Butani, 1993; Gagné, 2010; Karnawat, 1990; Singh, 1993	Butani, 1993; Gagné, 2010; Karnawat, 1990; Singh, 1993	Leaves (Butani, 1993; Karnawat, 1990; Singh, 1993)	No.
INSECT: Diptera: Cecidomyiidae *Procontarinia mangifoliae* (Grover); syn. *Indodiplosis mangifoliae* Grover	Gagné, 2010; Srivastava, 1997	Gagné, 2010; Srivastava, 1997	Leaves, shoots (Singh, 1993; Srivastava, 1997)	No.
INSECT: Diptera: Cecidomyiidae *Procontarinia matteiana* Kieffer & Cecconi	Gagné, 2010; Pruthi and Batra, 1960; Reddy et al., 2018; Srivastava, 1997	Gagné, 2010; Pruthi and Batra, 1960; Reddy et al., 2018; Srivastava, 1997	Leaf miner (Reddy et al., 2018; Reddy et al., 2020; Srivastava, 1997)	No.
INSECT: Diptera: Cecidomyiidae *Procontarinia tenuispatha* (Kieffer); syn. *Allassomyia tenuispatha* (Kieffer), *Amradiplosis tenuispatha* (Kieffer)	Butani, 1993; Gagné, 2010	Butani, 1993; Gagné, 2010; Singh, 1993	Leaves (Butani, 1993; Singh, 1993)	No.
INSECT: Diptera: Cecidomyiidae *Procontarinia viridigallicola* Rao; syn. *Amradiplosis viridigallicola* (Rao)	Butani, 1993; Gagné, 2010	Butani, 1993; Gagné, 2010; Singh, 1993	Leaves (Butani, 1993; Singh, 1993)	No.
INSECT: Diptera: Tephritidae *Bactrocera caryeae* (Kapoor)	**Drew and Raghu, 2002; Reddy et al., 2018**	**Drew and Raghu, 2002; Reddy et al., 2018**	**Fruit (Drew and Raghu, 2002; Reddy et al., 2018)**	**Yes. See section 3.2.3 for assessment.**

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
INSECT: Diptera: Tephritidae *Bactrocera correcta* (Bezzi); syn. *Dacus correctus* (Bezzi), *Chaetodacus correctus* Bezzi	**Allwood, 1999; Drew and Raghu, 2002; Reddy et al., 2018**	**Allwood, 1999; Reddy et al., 2018**	**Fruit (Allwood, 1999; Reddy et al., 2018)**	**Yes. See section 3.2.4 for assessment.**
INSECT: Diptera: Tephritidae *Bactrocera diversa* (Coquillett); syn. *Dacus diversus* (Coquillett), *Zeugodacus diversus* (Coquillett)	Batra, 1954; Chaturvedi, 2012; Drew and Raghu, 2002; Srivastava, 1997	Batra, 1954; Srivastava, 1997	Flowers (Allwood, 1999; Batra, 1954; Srivastava, 1997)	No. See section 2.2 for more information on this species.
INSECT: Diptera: Tephritidae *Bactrocera dorsalis* Hendel; syn. *B. papayae* Drew & Hancock, *Dacus dorsalis* Hendel, *Strumeta dorsalis* (Hendel)	**Allwood, 1999; Drew and Raghu, 2002; Reddy et al., 2018**	**Allwood, 1999; Reddy et al., 2018**	**Fruit (Allwood, 1999; Reddy et al., 2018)**	**Yes. This is a domestic quarantine species and is regulated by the U.S. Code of Federal Regulations (7CFR § 301.32, 2021).**
INSECT: Diptera: Tephritidae *Bactrocera frauenfeldi* (Schin.); syn. *Bactrocera albistrigata* (de Meijere)	**Allwood, 1999; Drew and Romig, 2013**	**Allwood, 1999; Leblanc, et al., 2013; Drew and Romig, 2013**	**Fruit (Allwood, 1999; Drew and Romig, 2013)**	**Yes. *Bactrocera albistrigata* was recently synonymized with *B. frauenfeldi* (Doorenweerd, et al. 2022). See section 3.2.2 for assessment.**
INSECT: Diptera: Tephritidae *Bactrocera zonata* (Saunders); syn. *Dacus zonatus* (Saunders), *Chaetodacus zonatus* (Saunders)	**Drew and Raghu, 2002; Reddy et al., 2018**	**Reddy et al., 2018**	**Reddy et al., 2018**	**Yes. This is a domestic quarantine species and is regulated by the U.S. Code of Federal Regulations (7CFR § 301.32, 2021).**
INSECT: Diptera: Tephritidae *Dacus ciliatus* Loew	**Chaturvedi, 2012**	**Kambura et al., 2018**	**Fruit (Kambura et al., 2018)**	**Yes See section 3.2.5 for assessment.**

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
INSECT: Diptera: Tephritidae *Zeugodacus cucurbitae* (Coquillett); syn. *Bactrocera cucurbitae* (Coquillett), *Dacus cucurbitae* Coquillett	**Drew and Raghu, 2002; Srivastava, 1997**	**Srivastava, 1997**	**Fruit (Srivastava, 1997)**	**Yes. This is a domestic quarantine species and is regulated by the U.S. Code of Federal Regulations (7CFR § 301.32, 2021).**
INSECT: Diptera: Tephritidae *Zeugodacus tau* Walker; syn. *Bactrocera tau* Walker, *Dacus tau* (Walker)	**Drew and Raghu, 2002; Srivastava, 1997**	**Srivastava, 1997**	**Fruit (Srivastava, 1997)**	**Yes. See section 3.2.6 for assessment.**
INSECT: Hemiptera: Aleyrodidae *Aleurocanthus mangiferae* Quaintance & Baker	Butani, 1993	Butani, 1993; Reddy et al., 2018	Leaves (Butani, 1993; Reddy et al., 2018)	No.
INSECT: Hemiptera: Aleyrodidae *Aleurocanthus woglumi* Ashby	Butani, 1993	Butani, 1993	Leaves (Butani, 1993)	No.
INSECT: Hemiptera: Aleyrodidae *Aleurolobus marlatti* (Quaintance)	David and Ragupathy, 2004	Evans, 2008	Leaves (Hill, 1983)	No.
INSECT: Hempitera: Aphididae *Toxoptera odinae* (van der Goot)	CABI, 2022b; Srivastava, 1997	CABI, 2022b; Srivastava, 1997	Leaves, shoots, fruit (CABI, 2022b; Srivastava, 1997)	No. Mango aphids are external feeders and would not follow the pathway after standard packinghouse mitigations.
INSECT: Hemiptera: Calophyidae *Calophya brevicornis* (Crawford); syn. *Microeropsylla brevicornis* Crawford, *Pauropsylla brevicornis* Crawford	Ouvrard, 2022; Srivastava, 1997	Ouvrard, 2022; Srivastava, 1997	Leaves, stems (Srivastava, 1997)	No.

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
INSECT: Hemiptera: Calophyidae *Calophya maculata* (Mathur); syns. *Microceropsylla maculata* Mathur, *Pauropsylla maculata* Mathur	Hodkinson, 1986; Ouvrard, 2022	Butani, 1993; Ouvrard, 2022	Leaves (Butani, 1993)	No.
INSECT: Hemiptera: Calophyidae *Calophya mangferae* Burckhardt & Basset; syn. *Microceropsylla nigra* (Crawford), *Pauropsylla nigra* Crawford	Hodkinson, 1986; Ouvrard, 2022	Butani, 1993; Ouvrard, 2022	Leaves (Butani, 1993)	No.
INSECT: Hemiptera: Cicadellidae *Amrasca splendens* Ghauri	Sohi and Sohi, 1990	Sohi and Sohi, 1990	Inflorescence, leaves (Sohi and Sohi, 1990)	No.
INSECT: Hemiptera: Cicadellidae *Amritodus atkinsoni* (Lethierry); syn. *Idiocerus atkinsoni* Lethierry	Dalvi et al., 1992; Sohi and Sohi, 1990; Reddy et al., 2020; Srivastava, 1997	Dalvi et al., 1992; Reddy et al., 2020; Sohi and Sohi, 1990; Srivastava, 1997	Leaves, tender shoots, inflorescence (Dalvi et al., 1992; Sohi and Sohi, 1990; Srivastava, 1997)	No.
A INSECT: Hemiptera: Cicadellidae *mritodus brevistilus* Viraktamath	Sohi and Sohi, 1990	Sohi and Sohi, 1990	Leaves, tender shoots, inflorescence (Sohi and Sohi, 1990)	No.
INSECT: Hemiptera: Cicadellidae *Busoniomimus manjunathi* Viraktamath &Viraktamath	Dalvi et al., 1992; Reddy et al., 2018; Sohi and Sohi, 1990;	Dalvi et al., 1992; Reddy et al., 2018; Sohi and Sohi, 1990	Leaves, tender shoots, inflorescence (Dalvi et al., 1992; Reddy et al., 2018; Sohi and Sohi, 1990)	No.
INSECT: Hemiptera: Cicadellidae *Idiscopus anasuyae* Viraktamath & Viraktamath	Dalvi et al., 1992; Reddy et al., 2018; Sohi and Sohi, 1990	Dalvi et al., 1992; Reddy et al., 2018; Sohi and Sohi, 1990	Leaves, tender shoots, inflorescence (Dalvi et al., 1992; Reddy et al., 2018; Sohi and Sohi, 1990)	No.

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
INSECT: Hemiptera: Cicadellidae *Idioscopus clypealis* (Lethierry)	Dalvi et al., 1992; Reddy et al., 2018; Reddy et al., 2020; Srivastava, 1997	Dalvi et al., 1992; Reddy et al., 2018; Reddy et al., 2020; Srivastava, 1997	Leaves, tender shoots, inflorescence (Dalvi et al., 1992; Srivastava, 1997)	No.
INSECT: Hemiptera: Cicadellidae *Idioscopus decoratus* Virktamath	Sohi and Sohi, 1990	Sohi and Sohi, 1990	Leaves, tender shoots, inflorescence (Sohi and Sohi, 1990)	No.
INSECT: Hemiptera: Cicadellidae *Idioscopus jayshriae* Virktamath	Dalvi et al., 1992; Reddy et al., 2018	Dalvi et al., 1992; Reddy et al., 2018	Leaves, inflorescence (Dalvi et al., 1992; Reddy et al., 2018)	No.
INSECT: Hemiptera: Cicadellidae *Idioscopus nagpurensis* Pruthi	Reddy et al., 2018; Reddy et al., 2020	Reddy et al., 2018; Reddy et al., 2020	Leaves, inflorescence (Reddy et al., 2018)	No.
INSECT: Hemiptera: Cicadellidae *Idioscopus niveosparsus* (Lethierry)	Dalvi et al., 1992; Sohi and Sohi, 1990; Srivastava, 1997	Dalvi et al., 1992; Sohi and Sohi, 1990; Srivastava, 1997	Leaves, tender shoots, inflorescence (Dalvi et al., 1992; Sohi and Sohi, 1990; Srivastava, 1997)	No.
INSECT: Hemiptera: Cicadellidae *Idioscopus spectabilis* Virktamath	Sohi and Sohi, 1990	Sohi and Sohi, 1990	Leaves, tender shoots, inflorescence (Sohi and Sohi, 1990)	No.
INSECT: Hemiptera: Coccidae *Ceroplastes actiniformis* Green	Garcia Morales et al., 2016	Garcia Morales et al., 2016; Srivastava, 1997	Leaves (Srivastava, 1997)	No.
INSECT: Hemiptera: Coccidae *Ceroplastes pseudoceriferus* Green	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Leaves, shoots, inflorescence (Ali, 1978)	No.
INSECT: Hemiptera: Coccidae *Ceroplastes rubens* Maskell	Srivastava, 1997	Srivastava, 1997	Leaves, leaf stalks, tender shoots (Srivastava, 1997)	No.

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
INSECT: Hemiptera: Coccidae *Coccus formicarii* (Green)	Garcia Morales et al., 2016	Garcia Morales et al., 2016; Takagi, 1975	Leaves, stems [based on congener], found within aerial *Crematogaster* ant nests (Takagi, 1975)	No.
INSECT: Hemiptera: Coccidae *Maacoccus adersi* (Newstead); syn. *Neoplatylecanium adersi* (Newstead), *Lecanium adersi* Newstead	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Leaves, fruit (Mansfield-Aders, 1920)	No. Scale insects are near- immobile, external fruit feeders; therefore, standard packinghouse mitigations would likely remove them from the pathway.
INSECT: Hemiptera: Coccidae *Maacoccus bicruciatus* (Green); syn. *Coccus bicruciatus* (Green)	Butani, 1993; Garcia Morales et al., 2016	Butani, 1993; Garcia Morales et al., 2016	Leaves (Martin, 2011)	No.
INSECT: Hemiptera: Coccidae *Maacoccus piperis* (Green); syn. *Coccus piperis* (Green)	Suresh and Mohanasundaram, 1996	Suresh and Mohanasundaram, 1996	Leaves (Suresh and Mohanasundaram, 1996; Varshney, 2020)	No.
INSECT: Hemiptera: Coccidae *Pulvinaria avasthii* Yousuf & Shafee	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Leaves, tender shoots ([based on a congener] Suresh and Mohanasundaram, 1996)	No.
INSECT: Hemiptera: Coccidae *Pulvinaria iceryi* (Signoret)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Leaves (Williams, 1982)	No.
INSECT: Hemiptera: Coccidae *Pulvinaria ixorae* Green	Garcia Morales et al., 2016	Tandon and Lal, 1977	Leaves, petioles, flower panicles, tender shoots (Tandon and Lal, 1977)	No.

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
INSECT: Hemiptera: Coccidae *Pulvinaria polygonata* (Cockerell); syn. *Chloropulvinaria polygonata* (Cockerell); *Pulvinaria cellulosa* Green	Garcia Morales et al., 2016; Srivastava, 1997; Pruthi and Batra, 1960	Garcia Morales et al., 2016; Srivastava, 1997; Pruthi and Batra, 1960	Branches (Ali, 1978), leaves, twigs (Srivastava, 1997)	No.
INSECT: Hemiptera: Coccidae *Saissetia privigna* De Lotto	Garcia Morales et al., 2016; Varsheny, 1992	Garcia Morales et al., 2016; Srivastava, 1997	Flowers, stems, twigs, bark (Srivastava, 1997)	No.
INSECT: Hemiptera: Coreidae *Acanthocoris scabrator* F.	Butani, 1993; Koshy et al., 1978	Butani, 1993; Koshy et al., 1978	Fruit, tender leaves (Butani, 1993; Koshy et al., 1978)	No. Leaf-footed bugs are conspicuous external feeders on fruits; however, the standard practice of washing mangoes would remove them from the pathway.
INSECT: Hemiptera: Coreidae *Leptocorisa acuta* (Thunberg)	Atwall, 1976; CABI, 2022b; Reji and Chander, 2008	Atwall, 1976; Reji and Chander, 2008	Leaves (Atwall, 1976; CABI, 2022b)	No.
INSECT: Hemiptera: Flatidae *Salurnis marginellus* (Guerin)	Dalvi et al., 1992	Dalvi et al., 1992	Leaves, branches, trunk (Dalvi et al., 1992)	No.
INSECT: Hemiptera: Fulgoridae *Ricania marginalis* Westwood	Dalvi et al., 1992	Dalvi et al., 1992	Leaves, branches, trunk (Dalvi et al., 1992)	No.
INSECT: Hemiptera: Kerridae *Kerria lacca* Kerr	Garcia Morales et al., 2016; Kher and Lakra, 1989	Garcia Morales et al., 2016; Hwang and Hsieh, 1981	The underside of branches (Hwang and Hsieh, 1981)	No.
INSECT: Hemiptera: Kerridae *Paratachardina mahdihassani* Kondo & Gullan	Garcia Morales et al., 2016; Kondo, 2007	Kondo, 2007	Leaves, stems ([based on a congener] Kondo, 2007)	No.

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
INSECT: Hemiptera: Kerridae *Paratachardina theae* (Green)	Garcia Morales et al., 2016; Kondo, 2007; Varshney, 2020	Garcia Morales et al., 2016; Varshney, 2020	Leaves, stems ([based on a congener] Kondo, 2007)	No.
INSECT: Hemiptera: Lophopidae *Pyrilla perpusilla* Walker	Dubey et al., 1981	Dubey et al., 1981	Leaves, trunk (Dubey et al., 1981)	No.
INSECT: Hemiptera: Lygaeidae *Spilostethus pandurus* Scopoli; syn. *Lygaeus pandurus* (Scopoli)	Butani, 1993; Pruthi and Batra, 1960	Butani, 1993; Pruthi and Batra, 1960	Sap sucking from stems, leaves, fruit (Butani, 1993)	No. Seed bugs feed externally on fruit; the standard packinghouse practice of washing mangoes would remove this conspicuous pest from the pathway.
INSECT: Hemiptera: Membracidae *Leptocentrus obliquus* Walker	Butani, 1993	Butani, 1993	Leaves, branches (Butani, 1993)	No.
INSECT: Hemiptera: Membracidae *Otinotus oneratus* Walker	Butani, 1993; CABI, 2022b	Butani, 1993	Leaves, branches (Butani, 1993)	No.
INSECT: Hemiptera: Membracidae *Oxyrachis tarandus* Fab.	Butani, 1993; CABI, 2022b; Sharma and Pati, 2011	Butani, 1993	Buds, leaves, twigs (Butani, 1993; Sharma and Pati, 2011)	No.
INSECT: Hemiptera: Membracidae *Tricentrus bicolor* Distant	Butani, 1993	Butani, 1993	Buds, leaves, twigs (Butani, 1993)	No.
INSECT: Hemiptera: Monophlebidae *Drosicha contrahens* (Walker)	Butani, 1993; Garcia Morales et al., 2016	Garcia Morales et al., 2016	Young shoots (Butani, 1993)	No.
INSECT: Hemiptera: Monophlebidae *Drosicha dalbergiae* (Green)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Young shoots (Butani, 1993)	No.

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
INSECT: Hemiptera: Monophlebidae *Drosicha mangiferae* (Stebbing)	Garcia Morales et al., 2016; Reddy et al., 2018; Reddy et al., 2020; Srivastava, 1997	Garcia Morales et al., 2016; Reddy et al., 2018; Reddy et al., 2020; Srivastava, 1997	Leaves, stems, young shoots (Butani, 1993; Srivastava, 1997)	No.
INSECT: Hemiptera: Monophlebidae *Drosicha stebbingii* (Green)	CABI, 2022b; Garcia Morales et al., 2016; Reddy et al., 2018; Reddy et al., 2020	CABI, 2022b; Garcia Morales et al., 2016; Reddy et al., 2018; Reddy et al., 2020	Leaves, stems (Butani, 1993; CABI, 2022b)	No.
INSECT: Hemiptera: Monophlebidae *Icerya aegyptiaca* (Douglas)	CABI, 2022b; Garcia Morales et al., 2016	Garcia Morales et al., 2016; Uesato et al., 2011	Leaves, stems, twigs (CABI, 2022b; Uesato et al., 2011)	No.
INSECT: Hemiptera: Monophlebidae *Icerya minor* Green	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Leaves, stems ([based on a congener] Srivastava, 1997)	No.
INSECT: Hemiptera: Monophlebidae *Icerya pulchra* (Leonardi); syn. *Icerya pulcher* (Leonardi)	Garcia Morales et al., 2016	Garcia Morales et al., 2016; Watson, 2014	Leaves, stems ([based on a congener] Srivastava, 1997)	No.
INSECT: Hemiptera: Monophlebidae *Icerya seychellarum* (Westwood)	Garcia Morales et al., 2016; Varsheny, 1992	Garcia Morales et al., 2016; Mani, 2016	Leaves, stems (Williams, 1982)	No.
INSECT: Hemiptera: Monophlebidae *Labioproctus poleii* (Green)	Garcia Morales et al., 2016; Varsheny, 1992	Garcia Morales et al., 2016; Varsheny, 1992	Stems, twigs (Garcia Morales et al., 2016)	No.

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
INSECT: Hemiptera: Monophlebidae *Perissopneumon ferox* Newstead	Butani, 1993; Garcia Morales et al., 2016; Mani, 2016	Butani, 1993; Mani, 2016; Srivastava, 1997	Fruit, stem, flower (Butani, 1993; Srivastava, 1997)	No. Fluted scales are immobile and feed externally on fruit; the standard packinghouse practice of washing mangoes would remove this pest from the pathway.
INSECT: Hemiptera: Oxycarenidae *Oxycarenus hyalinipennis* (Costa)	Belamkar and Jadesh, 2014; Sengupta, 1955	Sengupta, 1955	Overwinter in mango trees (Sengupta, 1955)	No.
INSECT: Hemiptera: Pentatomidae *Antestiopsis cruciata* (F.); syn. *Antestictsis cruciata* F.	McPherson, 2018; Pruthi and Batra, 1960	Pruthi and Batra, 1960	Fruit (Pruthi and Batra, 1960)	No. Stink bugs are mobile and feed externally on fruit; the standard packinghouse practice of washing mangoes would remove this pest from the pathway.
INSECT: Hemiptera: Pentatomidae *Bagrada hilaris* (Burmeister); syn. *Bagrada cruciferarum* Kirkaldy	Butani, 1993; CABI, 2022b; Tandon and Lal, 1977	Butani, 1993; Tandon and Lal, 1977	Leaves, inflorescence, shoots (Butani, 1993; CABI, 2022b; Tandon and Lal, 1977)	No. The painted bug is a FRSMP pest for FL.
INSECT: Hemiptera: Pentatomidae *Coptosoma nazirae* Atkinson	Nair et al., 1975	Reddy et al., 2018	Leaves, flowers (Reddy et al., 2018), shoots (Butani, 1993)	No.
INSECT: Hemiptera: Pentatomidae *Halys dentata* (F.)	Butani, 1993	Butani, 1993	Stem, trunk (Butani, 1993)	No.

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
INSECT: Hemiptera: Pseudococcidae *Formicococcus robustus* (Ezzat & McConnell); syn. *Planococcoides robustus* Ezzat & McConnell	CABI, 2022b; Garcia Morales et al., 2016; Mani, 2016	Garcia Morales et al., 2016; Mani, 2016	Roots, fruit (Mani, 2016)	No. Primarily a root feeding mealybug; however, if mangoes touch the soil, they may become infested (Mani, 2016). Since this mealybug is an external feeder, standard packinghouse practices of washing mangoes would remove it from the pathway.
INSECT: Hemiptera: Pseudococcidae *Maconellicoccus hirsutus* (Green)	CABI, 2022b; Garcia Morales et al., 2016	Garcia Morales et al., 2016	Leaves, twigs, fruit (CABI, 2022b; Hoy et al., 2008)	No. Pink hibiscus mealybugs feed externally on fruit; standard packinghouse practice of washing mangoes would remove this pest from the pathway. Present in the continental United States (CABI, 2022b).
INSECT: Hemiptera: Pseudococcidae *Planococcus lilacinus* (Cockerell)	CABI, 2022b; Garcia Morales et al., 2016; Mani, 2016	Garcia Morales et al., 2016; Mani, 2016	Leaves, twigs, fruit (CABI, 2022b; Mani, 2016)	No. Cacao mealybugs may feed externally on fruit, but they exude conspicuous wax flakes and are immobile; therefore, the standard packinghouse practice of washing mangoes would remove this pest from the pathway.

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
INSECT: Hemiptera: Pseudococcidae *Rastrococcus iceryoides* (Green); syn. *Pseudococcus obtusus* Newstead	Garcia Morales et al., 2016; Reddy et al., 2018; Reddy et al., 2020; Zaman, 1994	Garcia Morales et al., 2016; Mansfield-Aders, 1920; Reddy et al., 2020; Srivastava, 1997	Leaves, twigs, fruit (Mansfield-Aders, 1920; Srivastava, 1997; Zaman, 1994)	No. Mango mealybugs feed externally on fruit; however, the standard packinghouse practice of washing mangoes would remove this pest from the pathway.
INSECT: Hemiptera: Pseudococcidae *Rastrococcus invadens* Williams	Garcia Morales et al., 2016	Agounke et al., 1988; Garcia Morales et al., 2016	Leaves (Garcia Morales et al., 2016), but in high densities they will move to petioles, flowers, and fruits (Agounke et al., 1988)	No. Mealybugs are immobile external feeders; the standard packinghouse practice of washing mangoes would remove this pest from the pathway.
INSECT: Hemiptera: Pseudococcidae *Rastrococcus mangiferae* (Green)	Garcia Morales et al., 2016; Mani, 2016	Garcia Morales et al., 2016; Mani, 2016	Leaves, twigs (Garcia Morales et al., 2016)	No.
INSECT: Hemiptera: Pseudococcidae *Rastrococcus spinosus* (Robinson)	Garcia Morales et al., 2016; Mani, 2016	Garcia Morales et al., 2016; Williams, 2004	Leaves, fruit (Williams, 2004)	No. Mealybugs are immobile external feeders; the standard packinghouse practice of washing mangoes would remove this pest from the pathway.
INSECT: Hemiptera: Psyllidae *Apsylla cistellata* Buckton	Pruthi and Batra, 1960; Reddy et al., 2018; Reddy et al., 2020	Pruthi and Batra, 1960; Reddy et al., 2018; Reddy et al., 2020	Shoots, leaves (Pruthi and Batra, 1960; Reddy et al., 2018)	No.
INSECT: Hemiptera: Psyllidae *Arytania obscura* Crawford	Butani, 1993; Veeresh, 1988	Butani, 1993	Leaves (Butani, 1993)	No.
INSECT: Hemiptera: Psyllidae *Leuronota minuta* (Crawford)	Hodkinson, 1986	Butani, 1993; Hodkinson, 1986	Leaves (Butani, 1993)	No.

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
INSECT: Hemiptera: Pyrrhocoridae *Dysdercus cingulatus* (F.)	CABI, 2022b; Tandon and Lal, 1977	Tandon and Lal, 1977	Flowers, inflorescence (CABI, 2022b; Tandon and Lal, 1977)	No.
INSECT: Hemiptera: Pyrrhocoridae *Dysdercus koenigii* F.	Butani, 1993; Jaleel et al., 2013	Butani, 1993	Leaves, stems, inflorescence, fruit (Butani, 1993; [hosts in general] Jaleel et al., 2013)	No. The red cotton bug is a conspicuous external feeder on some fruits; however, the mitigation of washing mangoes would remove any hitchhikers.
INSECT: Hemiptera: Scutelleridae *Chrysocoris patricius* (F.)	Sajan, 2018; Tandon and Lal, 1977	Tandon and Lal, 1977	Leaves, shoots (Tandon and Lal, 1977)	No.
INSECT: Hemiptera: Triozidae *Trioza jambolanae* Crawford	Hodkinson, 1986; Ouvrard, 2022	Butani, 1993	Leaves (Butani, 1993)	No.
INSECT: Lepidoptera: Cosmopterigidae *Anatrachyntis simplex* Walsingham; syn. *Pyroderces simplex* Walsingham	CABI, 2022b; Zhang, 1994	Butani, 1993	Flowers, rotten fruit (Butani, 1993), cotton bolls and injured seeds (Fletcher, 1920)	No.
INSECT: Lepidoptera: Crambidae *Conogethes punctiferalis* (Guenée); syn. *Dichocrocis punctiferalis* Guenée	Pruthi and Batra, 1960; Reddy et al., 2018	Pruthi and Batra, 1960; Reddy et al., 2018; Singh et al., 2002	Fruit borer (Reddy et al., 2018; Singh et al., 2002)	No. See section 2.2 for additional notes on this species.
INSECT: Lepidoptera: Crambidae *Maruca vitrata* F.; syn. *Maruca testulalis* (Geyer)	CABI, 2022b; Mahalle and Srivastava, 2020; Nair et al., 1975	Butani, 1993; Robinson, 2010	Flowers, leaves (Butani, 1993), legume pods and seeds (Mahalle and Srivastava, 2020)	No. Primarily a pest of legumes where pod boring behavior is documented (Mahalle and Srivastava, 2020); we found no evidence that this species attacks mango fruit.

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
INSECT: Lepidoptera Erebidae *Achaea janata* L.	CABI, 2022b; Robinson, 2010; Zhang, 1994	Butani, 1993;	Leaves (Butani, 1993; Chung, 2012), fruit (CABI, 2022b)	No. Fruit piercing moths may drink juice from mangoes but would disperse during harvest. Larvae eat foliage, when populations are dense, they may externally feed on fruit. However, larvae are conspicuous and pupate in the soil or rolled leaves (Chung, 2012); so, are unlikely to follow the pathway.
INSECT: Lepidoptera Erebidae *Aloa lactinea* (Cramer); syn. *Amsacta lactinea* (Cramer)	CABI, 2022b; Mehra and Sah, 1977	Srivastava, 1997	Leaves (Srivastava, 1997; [hosts in general] Mehra and Sah, 1977)	No.
INSECT: Lepidoptera Erebidae *Asura ruptifascia* Hampson	Butani, 1993; Reddy et al., 2018	Butani, 1993; Reddy et al., 2018	Flowers, inflorescence (Butani, 1993; Reddy et al., 2018)	No.
INSECT: Lepidoptera Erebidae *Euproctis flava* Bremer	Pruthi and Batra, 1960; Robinson, 2010	Butani, 1993; Pruthi and Batra, 1960	Leaves (Butani, 1993)	No.
INSECT: Lepidoptera Erebidae *Euproctis fraterna* Moore	Robinson, 2010; Srivastava, 1997	Robinson, 2010; Srivastava, 1997	Leaves (Srivastava, 1997)	No.
INSECT: Lepidoptera Erebidae *Euproctis lunata* Walker	Pruthi and Batra, 1960; Robinson, 2010	Butani, 1993; Pruthi and Batra, 1960; Robinson, 2010	Leaves (Butani, 1993)	No.
INSECT: Lepidoptera Erebidae *Euproctis scintillans* (Walker); syn. *Porthesia scintillans* Walker	CABI, 2022b; Srivastava, 1997	Srivastava, 1997	Leaves (Srivastava, 1997)	No.

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
INSECT: Lepidoptera Erebidae *Lymantria ampla* (Walker)	Robinson, 2010; Srivastava, 1997	Robinson, 2010; Srivastava, 1997	Leaves (Srivastava, 1997)	No.
INSECT: Lepidoptera Erebidae *Lymantria beatrix* Stoll	Robinson, 2010; Singh, 1982	Robinson, 2010; Singh, 1982	Leaves (Singh, 1982; Srivastava, 1997)	No.
INSECT: Lepidoptera Erebidae *Lymantria marginata* Walker	Robinson, 2010; Srivastava, 1997	Robinson, 2010; Srivastava, 1997	Leaves (Srivastava, 1997)	No.
INSECT: Lepidoptera Erebidae *Lymantria mathura* Moore	CABI, 2022b; Robinson, 2010; Srivastava, 1997	CABI, 2022b; Robinson, 2010; Srivastava, 1997	Leaves, flowers (CABI, 2022b; Srivastava, 1997)	No.
INSECT: Lepidoptera Erebidae *Olene mendosa* Hübner; syn. *Dasychira mendosa* (Hübner)	Pruthi and Batra, 1960; Zaman, 1994	Pruthi and Batra, 1960; Zaman, 1994	Leaves (Butani, 1993; Zaman, 1994)	No.
INSECT: Lepidoptera Erebidae *Olepa ricini* (F.); syn. *Pericallia ricini* F.	Witt, 2005; Zhang, 1994	Zhang, 1994	Leaves (Zhang, 1994)	No.
INSECT: Lepidoptera Erebidae *Orgyia postica* Walker	CABI, 2022b; Robinson, 2010; Srivastava, 1997	Robinson, 2010; Srivastava, 1997	Leaves (CABI, 2022b; Srivastava, 1997), fruit (Fasih, et al., 1989)	No. Typically, a leaf pest, in severe outbreaks larvae may scrape the surface of mangoes (Fasih, et al., 1989), but this renders the fruit unmarketable and would lead to culling in the field.
INSECT: Lepidoptera Erebidae *Perina nuda* F.	Cheanban, 2017; Robinson, 2010; Srivastava, 1997	Cheanban, 2017; Robinson, 2010; Srivastava, 1997	Leaves (Cheanban, 2017; Srivastava, 1997)	No.

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
INSECT: Lepidoptera Erebidae *Spilarctia obliqua* Walker; syn. *Spilosoma obliqua* Walker	Butani, 1993; CABI, 2022b	Butani, 1993	Leaves (Butani, 1993)	No.
INSECT: Lepidoptera: Gelechiidae *Anarsia melanoplecta* Meyrick	Reddy et al., 2018	Reddy et al., 2018	Shoots, leaves (Butani, 1993; Reddy et al., 2018)	No.
INSECT: Lepidoptera: Gelechiidae *Hypatima haligramma* Meyrick; syn. *Chelaria haligramma* Meyrick	CABI, 2022b; Raju, 1983	Sattler and Stride, 1989	Flowers (Sattler and Stride, 1989), fresh shoots ([hosts in general] Raju, 1983)	No.
INSECT: Lepidoptera: Gelechiidae *Hypatima spathota* Meyrick; syn. *Chelaria spathota* Meyrick	Reddy et al., 2018	Reddy et al., 2018	Leaves (Srivastava, 1997)	No.
INSECT: Lepidoptera: Geometridae *Biston suppressaria* Guenée; syn. *Buzura suppressaria* (Guenée)	CABI, 2022b; Srivastava, 1997	CABI, 2022c; Srivastava, 1997	Leaves (CABI, 2022c; Srivastava, 1997)	No.
INSECT: Lepidoptera: Geometridae *Comostola laesaria* (Walker)	Reddy et al., 2018; Robinson, 2010	Reddy et al., 2018; Robinson, 2010	Flowers, inflorescence (Reddy et al., 2018)	No.
INSECT: Lepidoptera: Geometridae *Gymnoscelis imparatalis* Walker	Reddy et al., 2018; Robinson, 2010	Reddy et al., 2018; Robinson, 2010	Flowers, inflorescence (Reddy et al., 2018)	No.
INSECT: Lepidoptera: Geometridae *Hyposidra talaca* Walker; syn. *Hyposidra successaria* Walker	Roy et al., 2017	Butani, 1993; Roy et al., 2017	Flowers, leaves (Butani, 1993; Roy et al., 2017)	No.
INSECT: Lepidoptera: Geometridae *Thalassodes dissita* (Walker)	Zhang, 1994	Srivastava, 1997	Leaves (Srivastava, 1997)	No.
INSECT: Lepidoptera: Geometridae *Thalassodes quadraria* Guenée	Zaman, 1994; Zhang, 1994	Butani, 1993; Zaman, 1994	Leaves (Butani, 1993; Zaman, 1994)	No.

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
INSECT: Lepidoptera: Geometridae *Thalassodes veraria* Guenée	Singh et al., 2017; Zaman, 1994	Butani, 1993; Zaman, 1994	Leaves, flowers, shoots (Butani, 1993; Srivastava, 1997; Zaman, 1994)	No.
INSECT: Lepidoptera: Gracillariidae *Acrocercops cathedraea* Meyrick	Butani, 1993	Butani, 1993	Leaf miner (Butani, 1993)	No.
INSECT: Lepidoptera: Gracillariidae *Acrocercops isonoma* Meyrick	Butani, 1993	Butani, 1993	Leaf miner (Butani, 1993)	No.
INSECT: Lepidoptera: Gracillariidae *Acrocercops pentalocha* Meyrick	Butani, 1993; Srivastava, 1997	Butani, 1993; Srivastava, 1997	Leaf miner (Butani, 1993; Srivastava, 1997)	No.
INSECT: Lepidoptera: Gracillariidae *Acrocercops syngramma* Meyrick	Butani, 1993; Pruthi and Batra, 1960; Srivastava, 1997	Butani, 1993; Pruthi and Batra, 1960; Reddy et al., 2018; Srivastava, 1997	Leaf miner (Butani, 1993; Reddy et al., 2018; Srivastava, 1997)	No.
INSECT: Lepidoptera: Gracillariidae *Acrocercops zygonoma* Meyrick	Srivastava, 1997	Srivastava, 1997	Leaf miner (Srivastava, 1997)	No.
INSECT: Lepidoptera: Limacodidae *Chalcoscelides castaneipars* Moore	Robinson, 2010; Zhang, 1994	Robinson, 2010; Zhang, 1994	Leaves ([based on congeners] Cock et al., 1987)	No.
INSECT: Lepidoptera: Limacodidae *Cheromettia laleana* Moore; syn. *Belippa laleana* Moore	Zhang, 1994	Butani, 1993	Leaves (Butani, 1993)	No.
INSECT: Lepidoptera: Limacodidae *Parasa lepida* Cramer; syn. *Latoia lepida* (Cramer)	Pruthi and Batra, 1960; Srivastava, 1997	Pruthi and Batra, 1960; Reddy et al., 2018; Srivastava, 1997	Leaves (Reddy et al., 2018; Srivastava, 1997)	No.

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
INSECT: Lepidoptera: Limacodidae *Phocoderma velutina* Kollar	Robinson, 2010; Zhang, 1994	Butani, 1993; Robinson, 2010	Leaves (Butani, 1993)	No.
INSECT: Lepidoptera: Lycaenidae *Deudorix isocrates* (F.); syn. *Virachola isocrates* (F.)	CABI, 2022b; Pruthi and Batra, 1960; Robinson, 2010; Srivastava, 1997	Srivastava, 1997	Fruit (Pruthi and Batra, 1960; Srivastava, 1997)	No. See section 2.2 for additional notes on this species.
INSECT: Lepidoptera: Lycaenidae *Rapala manea* Hewitson	Johnson et al., 1980; Robinson, 2010	Johnson et al., 1980; Robinson, 2010	Inflorescence (Johnson et al., 1980)	No.
INSECT: Lepidoptera: Lycaenidae *Rapala melampus* (Stoll)	Srivastava, 1997	Butani, 1993; Srivastava, 1997	Leaves (Butani, 1993; Srivastava, 1997)	No.
INSECT: Lepidoptera: Lycaenidae *Rathinda amor* F.	Rayalu, 2012; Robinson, 2010; Zhang, 1994	Robinson, 2010; Zhang, 1994	Leaves (Rayalu, 2012)	No.
INSECT: Lepidoptera: Metarbelidae *Indarbela dea* Swinhoe; syn. *Arbela dea* Swinhoe	CABI, 2022b; Robinson, 2010; Zhang, 1994	Robinson, 2010; Srivastava, 1997; Zhang, 1994	Bark (Srivastava, 1997)	No.
INSECT: Lepidoptera: Metarbelidae *Indarbela quadrinotata* Walker	Pruthi and Batra, 1960; Reddy et al., 2018; Robinson, 2010; Srivastava, 1997	Pruthi and Batra, 1960; Robinson, 2010	Tree tissue under bark (Pruthi and Batra, 1960; Reddy et al., 2018; Srivastava, 1997)	No.
INSECT: Lepidoptera: Metarbelidae *Indarbela tetraonis* (Moore)	Pruthi and Batra, 1960; Robinson, 2010	Pruthi and Batra, 1960; Reddy et al., 2018; Robinson, 2010	Tree tissue under bark, stem (Pruthi and Batra, 1960; Reddy et al., 2018)	No.
INSECT: Lepidoptera: Metarbelidae *Indarbela theivora* (Hampson)	Robinson, 2010; Zhang, 1994	Robinson, 2010; Srivastava, 1997	Bark (Srivastava, 1997)	No.

Pest name	**Presence in India**	**Host association**	**Plant part(s)**	**Considered further?**
INSECT: Lepidoptera: Noctuidae *Autoba anguilifera* Moore; syn. *Eublemma anguilifera* Moore	Butani, 1993; Robinson, 2010	Butani, 1993; Reddy et al., 2018; Robinson, 2010	Inflorescence (Butani, 1993; Reddy et al., 2018), mealybug predator (Mani, 2016)	No.
INSECT: Lepidoptera: Noctuidae *Autoba silicula* Swinhoe; syn. *Eublemma silicula* Swinhoe	CABI, 2022b; Robinson, 2010	Butani, 1993; Reddy et al., 2018; Robinson, 2010	Inflorescence (Butani, 1993; Reddy et al., 2018), mealybug predator (Mani, 2016)	No.
INSECT: Lepidoptera: Noctuidae *Chlumetia alternans* Moore	Robinson, 2010	Reddy et al., 2018	Leaves, inflorescence, shoots (Pruthi and Batra, 1960; Reddy et al., 2018)	No.
INSECT: Lepidoptera: Noctuidae *Chlumetia transversa* Walker; syn. *Sholumetia transversa* Walker	Pruthi and Batra, 1960; Robinson, 2010;	Pruthi and Batra, 1960; Reddy et al., 2018	Leaves, inflorescence, shoots (Pruthi and Batra, 1960; Reddy et al., 2018)	No.
INSECT: Lepidoptera: Noctuidae *Eudocima phalonia* (L.); syn. *Eudocima fullonia* (Clerck)	Robinson, 2010; Srivastava, 1997	Reddy et al., 2018; Robinson, 2010; Srivastava, 1997	Leaves as larva, fruit juice (Reddy et al., 2018)	No. Fruit piercing moths suck juice from mangoes, but they are highly mobile and would disperse during harvest.
INSECT: Lepidoptera: Noctuidae *Eudocima homaena* Hübner; syn. *Ophideres ancilla* Cramer	Atwall, 1976; CABI, 2022b; Zhang, 1994	Atwall, 1976	Leaves as larva, fruit juice (Zhang, 1994)	No. Fruit piercing moths suck juice from mangoes, but they are highly mobile and would disperse during harvest.
INSECT: Lepidoptera: Noctuidae *Eudocima materna* (L.); syn. *Ophideres materna* L.	Robinson, 2010; Srivastava, 1997	Reddy et al., 2018; Robinson, 2010; Srivastava, 1997	Leaves as larva, fruit juice (Reddy et al., 2018)	No. Fruit-piercing moths suck juice from mangoes, but they are highly mobile and would disperse during harvest.

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
INSECT: Lepidoptera: Noctuidae *Helicoverpa armigera* (Hübner); syn. *Heliothis armigera* Hübner	Butani, 1993; Nair et al., 1975; Robinson, 2010	Robinson, 2010	Leaves, fruit (Butani, 1993)	No. Larvae may attack young fruits (Bharati et al., 2007; Grové and De Beer, 2015), but only mature fruits are harvested. Additionally, feeding on young fruit would cause visible damage such as superficial scars or deep holes (Grové and De Beer, 2015), which would be noticed at harvest or result in culling.
INSECT: Lepidoptera: Noctuidae *Oraesia emarginata* F.; syn. *Calpe emarginata* (F.)	CABI, 2022b; Nair et al., 1975; Robinson, 2010	Butani, 1993	Fruit juice (Butani, 1993; CABI, 2022b; Nair et al., 1975)	No. Fruit piercing moths suck juice from mangoes, but they are highly mobile and would disperse during harvest.
INSECT: Lepidoptera: Noctuidae *Penicillaria jocosatrix* Guenée; syn. *Bombotelia jocosatrix* (Guenée)	CABI, 2022b; Robinson, 2010; Srivastava, 1997	Butani, 1993; Robinson, 2010; Srivastava, 1997	Leaves, shoots (Butani, 1993; Srivastava, 1997)	No.
INSECT: Lepidoptera: Noctuidae *Selepa celtis* Moore	Butani, 1993; CABI, 2022b; Robinson, 2010	Butani, 1993; CABI, 2022b; Robinson, 2010	Leaves (Butani, 1993)	No.
INSECT: Lepidoptera: Noctuidae *Stauropus alternus* (Walker); syn. *Neostauropus alternans* Walker	CABI, 2022b; Robinson, 2010	CABI, 2022b; Robinson, 2010	Leaves (Nair et al., 1975; Srivastava, 1997)	No.
INSECT: Lepidoptera: Nolidae *Nola analis* Wileman & West; syn. *Celama analis* Wileman & West	Robinson, 2010	Butani, 1993; Robinson, 2010	Flowers, inflorescence (Butani, 1993)	No.

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
INSECT: Lepidoptera: Nymphalidae *Euthalia aconthea* Cramer; syn. *Euthalia garuda* (Moore)	CABI, 2022b; Robinson, 2010; Srivastava, 1997	CABI, 2022b; Robinson, 2010; Srivastava, 1997	Leaves (Srivastava, 1997)	No.
INSECT: Lepidoptera: Pyralidae *Citripestis eutraphera* (Meyrick)	CABI, 2022b; Reddy et al., 2018)	Reddy et al., 2018	Fruit borer (Reddy et al., 2018)	No. See section 2.2 for additional notes on this species.
INSECT: Lepidoptera: Pyralidae *Cryptoblabes gnidiella* Millière	CABI, 2022b; Robinson, 2010;	Abdel Kareim et al., 2018; Robinson, 2010; Zhang, 1994	Leaves (Boyer et al., 2017), inflorescence (Abdel Kareim et al., 2018), fruit ([on other hosts] Silva and Mexia, 1999)	No. Butani (1993) states that Christmas berry webworms are predators. Larvae may attack some fruit, particularly citrus, causing premature fruit drop (Silva and Mexia, 1999); however, we found little information on mango infestation.
INSECT: Lepidoptera: Pyralidae *Ctenomeristis ebriola* Meyrick	Butani, 1993; Sengupta, 1955; Sengupta and Behura, 1957	Butani, 1993; Sengupta, 1955; Sengupta and Behura, 1957	Fruit borer (Butani, 1993; Sengupta, 1955; Srivastava, 1997)	No. See section 2.2 for additional notes on this species.
INSECT: Lepidoptera: Pyralidae *Deanolis albizonalis* (Hampson); syn. *Noorda albizonalis* Hampson, *Autocharis albizonalis* Hampson	Bhattacharya, 2014; Reddy et al., 2018; Sengupta, 1955; Sengupta and Behura, 1957	Bhattacharya, 2014; Reddy et al., 2018; Sengupta, 1955; Sengupta and Behura, 1957	Fruit borer (Bhattacharya, 2014; Reddy et al., 2018; Sengupta, 1955)	No. See section 2.2 for additional notes on this species.
INSECT: Lepidoptera: Pyralidae *Hyalopsila leuconeurella* Ragonot	Reddy et al., 2018	Reddy et al., 2018; Srivastava, 1997	Fruit borer (Reddy et al., 2018; Srivastava, 1997)	No. See section 2.2 for additional notes on this species.
INSECT: Lepidoptera: Pyralidae *Lamida moncusalis* (Walker)	Robinson, 2010; Srivastava, 1997	Robinson, 2010; Srivastava, 1997	Leaves (Srivastava, 1997)	No.

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
INSECT: Lepidoptera: Pyralidae *Lamida sordidalis* Hampson	Srivastava, 1997	Srivastava, 1997	Leaves (Srivastava, 1997)	No.
INSECT: Lepidoptera: Pyralidae *Macalla carbonifera* Meyrick; syn. *Lamida carbonifera* Meyrick	Srivastava, 1997	Srivastava, 1997	Leaves (Srivastava, 1997)	No.
INSECT: Lepidoptera: Pyralidae *Orthaga euadrusalis* Walker	CABI, 2022b; Reddy et al., 2018; Srivastava, 1997	Reddy et al., 2018; Srivastava, 1997	Leaves, inflorescence (CABI, 2022b; Srivastava, 1997)	No.
INSECT: Lepidoptera: Pyralidae *Orthaga exvinaceae* Hampson	Reddy et al., 2018; Srivastava, 1997	Reddy et al., 2018; Srivastava, 1997	Leaves (Reddy et al., 2018; Srivastava, 1997)	No.
INSECT: Lepidoptera: Pyralidae *Orthaga mangiferae* Misra	Rani and Chatterjee, 2007; Srivastava, 1997	Rani and Chatterjee, 2007; Srivastava, 1997)	Leaves (Butani, 1993; Rani and Chatterjee, 2007)	No.
INSECT: Lepidoptera: Pyralidae *Thylacoptila paurosema* Meyrick; syn. *Nephopteryx paurosema* Meyrick	Butani, 1993; CABI, 2022b; Maruthadurai et al., 2012; Robinson, 2010	Butani, 1993; Maruthadurai et al., 2012; Srivastava, 1997	Fruit (Butani, 1993; Srivastava, 1997)	No. See section 2.2 for additional notes on this species.
INSECT: Lepidoptera: Pyralidae *Tirathaba mundella* Walker	Bhumannavar and Jacob, 1990; CABI, 2022b; Robinson, 2010; Srivastava, 1997	Robinson, 2010; Srivastava, 1997	Fruit borer (Bhumannavar and Jacob, 1990; CABI, 2022b; Srivastava, 1997)	No. See section 2.2 for additional notes on this species.
INSECT: Lepidoptera: Saturniidae *Attacus atlas* L.	Hill, 1983; Zhang, 1994	Hill, 1983; Zhang, 1994	Leaves (Hill, 1983; Zhang, 1994)	No.
INSECT: Lepidoptera: Saturniidae *Cricula trifenestrata* Helfer	CABI, 2022b; Robinson, 2010; Srivastava, 1997	Robinson, 2010; Srivastava, 1997	Leaves (Srivastava, 1997)	No.

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
INSECT: Lepidoptera: Sphingidae *Acherontia styx* (Westwood)	Butani, 1993; CABI, 2022b; Robinson, 2010	Butani, 1993	Leaves (CABI, 2022b; Srivastava, 1997)	No.
INSECT: Lepidoptera: Sphingidae *Agrius convolvuli* (L.)	Butani, 1993; CABI, 2022b; Robinson, 2010	Butani, 1993	Leaves (CABI, 2022b), fruit (Butani, 1993)	No. Larvae feed on foliage, moths are fruit piercers and suck mango juice; however, they are highly mobile and would not follow the pathway.
INSECT: Lepidoptera: Stathmopodidae *Stathmopoda auriferella* Walker	Park et al., 1994; Robinson, 2010	Park et al., 1994; Robinson, 2010	Dried fruits, injured plant parts, dead leaves (Park et al., 1994; Pruthi and Batra, 1960 [based on a congener] Fletcher, 1920)	No.
INSECT: Lepidoptera: Tineidae *Hypophrictis plana* Meyrick	Zhang, 1994	Zhang, 1994	Case bearing larvae on trunk (Zhang, 1994), some congeners prey on ants (Pierce, 1995)	No.
INSECT: Lepidoptera: Tortricidae *Dudua aprobola* (Meyrick); syn. *Argyroploce aprobola* Meyrick	Fletcher, 1920; Zhang, 1994	Fletcher, 1920; Reddy et al., 2018	Shoots, leaves (Fletcher, 1920; Reddy et al., 2018; Srivastava, 1997)	No.
INSECT: Lepidoptera: Tortricidae *Gatesclarkeana erotias* (Meyrick)	Reddy et al., 2018; Srivastava, 1997	Reddy et al., 2018; Srivastava, 1997	Shoots, leaves (Reddy et al., 2018; Srivastava, 1997)	No.
INSECT: Lepidoptera: Tortricidae *Homona coffearia* Nietner	Hill, 1983; Robinson, 2010; Zhang, 1994	Robinson, 2010	Leaves (CABI, 2022b; Hill, 1983)	No.
INSECT: Lepidoptera: Tortricidae *Homona permutata* Meyrick	Robinson, 2010; Srivastava, 1997	Robinson, 2010; Srivastava, 1997	Leaves (Srivastava, 1997)	No.

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
INSECT: Lepidoptera: Tortricidae *Strepsicrates rhothia* Meyrick; syn. *Spilonata rhotia* Meyrick	Fletcher, 1920; Robinson, 2010; Zhang, 1994	Butani, 1993; Fletcher, 1920; Robinson, 2010	Tender leaves (Butani, 1993; Fletcher, 1920; Srivastava, 1997)	No.
INSECT: Thysanoptera: Phlaeotrhipidae *Haplothrips ganglbaueri* (Schmutz)	Reddy et al., 2018	Reddy et al., 2018	Inflorescence (Reddy et al., 2018)	No.
INSECT: Thysanoptera: Phlaeotrhipidae *Haplothrips tenuipennis* Bagnall	Kirshnamoorthy and Ganga Visalakshi, 2012	Kirshnamoorthy and Ganga Visalakshi, 2012	Inflorescence (Kirshnamoorthy and Ganga Visalakshi, 2012)	No.
INSECT: Thysanoptera: Phlaeotrhipidae *Neoheegeria mangiferae* (Priesner)	Reddy et al., 2018	Reddy et al., 2018	Inflorescence (Reddy et al., 2018)	No.
INSECT: Thysanoptera: Thripidae *Caliothrips impurus* Priesner	Kirshnamoorthy and Ganga Visalakshi, 2012	Kirshnamoorthy and Ganga Visalakshi, 2012	Inflorescence (Kirshnamoorthy and Ganga Visalakshi, 2012)	No.
INSECT: Thysanoptera: Thripidae *Caliothrips indicus* (Bagnall)	Reddy et al., 2018; Reddy et al., 2020	Pruthi and Batra, 1960; Reddy et al., 2018; Reddy et al., 2020	Leaves (Reddy et al., 2018; Reddy et al., 2020)	No.
INSECT: Thysanoptera: Thripidae *Megalurothrips distalis* (Karny); syn: *Taeniothrips distalis* Karny	CABI, 2022b; Kirshnamoorthy and Ganga Visalakshi, 2012	Hill, 1983; Kirshnamoorthy and Ganga Visalakshi, 2012	Fruit (CABI, 2022b), leaves, inflorescence, flowers (Hill, 1983; Kirshnamoorthy and Ganga Visalakshi, 2012)	No. Although thrips may feed on the surface of fruits, the standard packinghouse practice of washing mangoes to remove the sap would eliminate this pest from the pathway. Present in Florida (CABI, 2022b).
INSECT: Thysanoptera: Thripidae *Rhipiphorothrips cruentatus* (Hood)	Pruthi and Batra, 1960; Reddy et al., 2018; Reddy et al., 2020	Pruthi and Batra, 1960; Reddy et al., 2018; Reddy et al., 2020	Leaves (Reddy et al., 2018; Reddy et al., 2020)	No.

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
INSECT: Thysanoptera: Thripidae *Scirtothrips mangiferae* Priesner	CABI, 2022b; Kirshnamoorthy and Ganga Visalakshi, 2012	Kirshnamoorthy and Ganga Visalakshi, 2012	Inflorescence (Kirshnamoorthy and Ganga Visalakshi, 2012)	No.
INSECT: Thysanoptera: Thripidae *Thrips palmi* Karny	Reddy et al., 2018; Reddy et al., 2020	Reddy et al., 2018; Reddy et al., 2020	Inflorescence, leaves, buds, fruit (Reddy et al., 2018; Reddy et al., 2020)	No. Melon thrips may externally suck juices from fruits but washing the sap off smooth-skinned mangoes would remove this pest. Present in Florida (CABI, 2022b).
INSECT: Thysanoptera: Thripidae *Thrips subnudula* (Karny); syn. *Ramaswamiahiella subnudula* (Karny)	Reddy et al., 2018	Reddy et al., 2018	Flowers (Reddy et al., 2018)	No.
FUNGUS *Actinodochium jenkinsii* Uppal, Patel & Kamat	Rao, 1966; Uppal et al., 1952	Reddy, 1975; Uppal et al., 1952	Fruit (Reddy, 1975; Uppal et al., 1952)	No. See notes in section 2.2.
FUNGUS *Bipolaris australiensis* (Bugnic. ex M.B. Ellis) Tsuda & Ueyama., syn.: *Curvularia australiensis (*Bugnic. ex M.B. Ellis) Manamgoda, L. Cai & K.D. Hyde	Saroj et al., 2011	Chinnusamy et al., 2010	Leaves (Chinnusamy et al., 2010)	No.
FUNGUS *Cercospora mangiferae-indicae* Munjal, Lall & Chona	Braun et al., 2016; Munja, 1962	Braun et al., 2016	Leaves (Braun et al., 2016)	No.
FUNGUS *Colletotrichum tropicale* Rojas, Rehner & Samuels	Sharma et al., 2013a	Sharma et al., 2013a; Tovar-Pedraza et al., 2020	Fruit, leaves (Tovar-Pedraza et al., 2020)	No. It has been reported in Florida (Doyle et al. 2013). See notes in section 2.2.

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
FUNGUS *Cytosphaera mangiferae* Died., syn.: *Aplosporella mangiferae* (Died.) Petr. & Syd.	Mathur, 1979; Pande and Rao, 1995	Johnson and Hyde, 1992; Pande and Rao, 1995	Fruit, leaves, stem (Johnson and Hyde, 1992; Pande and Rao, 1995)	No. See notes in section 2.2.
FUNGUS *Diaporthe arecae* (H.C. Srivast., Zakia & Govindar.) R.R. Gomes, C. Glienke & Crous., syn.: *Subramanella arecae* H.C. Srivast., Zakia & Govindar.	Gomes et al., 2013	Lim et al., 2019	Stem and fruit (Lim et al., 2019)	No. See notes in section 2.2.
FUNGUS *Fusarium sterilihyphosum* Britz, Marasas & M.J. Wingf.	Herron et al., 2015	Haggag and El-Wahab, 2009	Inflorescence, leaves, shoot (Lima et al., 2009)	No.
FUNGUS ***Lasiodiplodia hormozganensis*** **Abdollahzadeh, Zare & A.J.L. Phillips**	**Prasher and Danda, 2017**	**Marques et al., 2013**	**Fruit, stems (Marques et al., 2013); twigs (Abdollahzadeh et al., 2010)**	**Yes.** **See Section 3.2.7 for assessment.**
FUNGUS ***Lasiodiplodia pseudotheobromae*** **A.J.L. Phillips, A. Alves & Crous**	**Dharanendra Swamy et al., 2020**	**Ismail et al., 2012**	**Fruit, leaves, twig (Ismail et al., 2012; Rodríguez-Gálvez et al., 2017; Sakalidis et al., 2011)**	**Yes.** **See section 3.2.8 for assessment.** **Present in Florida (Paez, 2017).**
FUNGUS *Macrophoma mangiferae* Hing. & O.P. Sharma	Mathur, 1979	Okigbo, 2001; Okigbo and Osuinde, 2003	Branches, leaves, stems (Okigbo, 2001; Okigbo and Osuinde, 2003; fruit (Hingorani et al., 1960)	No. See notes in section 2.2.
FUNGUS ***Nattrassia mangiferae*** **(Syd. & P. Syd.) B. Sutton & Dyko, syn.:** ***Hendersonula toruloidea*** **Nattrass);** ***Neofusicoccum mangiferae*** **(Syd. & P. Syd.) Crous, Slippers & A.J.L. Phillips.**	**Mathur, 1979**	**Reckhaus and Adamou, 1987**	**Branch, leaves, shoots, twigs (Reckhaus and Adamou, 1987), fruit (Saaiman, 1996).**	**Yes.** **See section 3.2.9 for assessment.**

Pest name	Presence in India	Host association	Plant part(s)	Considered further?
FUNGUS **_Phomopsis mangiferae_** **S. Ahmad**	**Mathur, 1979**	**Johnson et al., 1991b; Ko et al., 2009**	**Fruit, leaves, stems (Johnson et al., 1991b; Ko et al., 2009; Luo et al., 2004)**	**Yes.** **See section 3.2.10 for assessment.**
FUNGUS *Phyllosticta citricarpa* (McAlpine) Aa, syn.: *Guignardia citricarpa* Kiely	Das et al., 2018	McMillan, 1986	Leaves (McMillan, 1986)	No.
FUNGUS *Pseudofusicoccum adansoniae* Pavlic, T.I. Burgess & M.J. Wingf.	Sharma et al., 2013b	Sharma et al., 2013b	Stems (Sharma et al., 2013b)	No.
FUNGUS *Scolecostigmina mangiferae* (Koord.) U. Braun & Mouch., syn.: *Cercospora mangiferae* Koord; *Stigmina mangiferae* (Koord.) M.B. Ellis	Kamal, 2010	Braun and Freire, 2002	Leaves (Vecchietti and Zapata, 1999)	No.
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 and Pruvost, 2001; Pruvost et al., 2005	Haggag, 2010	Fruit, leaves (Haggag, 2010)	No. See notes in section 2.2.

2.2. Notes on pests identified in the pest list

Actinodochium jenkinsii

This fungus is reportedly associated with mango fruits (Rao, 1966; Reddy, 1975; Uppal et al., 1952). However, Reddy (1975) and Rao (1966) did not provide scientific evidence of pathogenicity or a description of the pathogen in their reports. The only evidence that provides pathogenicity information is Uppal et al. (1952), but there was no confirmation (e.g., satisfying Koch postulates) that the symptoms of black spots on fruits were caused by *A. jenkinsii*. Furthermore, there is a lack of evidence in recent reports of association with mango. To date, there is uncertainty as to whether this fungus is a pathogen on mango. In the case where it would still be associated with mango fruits, the likelihood of establishment through spore dispersal is influenced by the quantity of produced spores, the number of spores that become airborne, the wind or rain direction and speed, the ability of spores to survive adverse environmental conditions, and the availability of susceptible hosts (Palm and Rossman, 2003). Fruits for consumption that reach the endangered area are likely to be consumed or, if disposed, would go to a commercial landfill. As such, fruit for consumption poses a negligible risk for the introduction of pests into new areas (Gordh and McKirdy, 2014).

Bactrocera diversa (Diptera: Tephritidae)
Although tephritid fruit flies are typically serious fruit pests, the three striped fruit fly appears to be a flower specialist (Allwood, 1999; Batra, 1954; Srivastava, 1997). Of the plant species it does attack, those in the family Cucurbitaceae are preferred hosts (Allwood, 1999). Other than listing of host associations, we found no field research or other evidence to substantiate that this species attacks mangoes.

Citripestis eutraphera (Lepidoptera: Pyralidae)
Larvae of the mango fruit borer moth create visible holes from burrowing into fruit. They also exude frass from within. The fruit is often blackened around the holes and may exhibit splitting (Jayanthi et al., 2014; Reddy et al., 2018). The young larvae scrape the fruit skin, resulting in scabbing; the damage is easily detected in the field where it would likely be discarded (Jayanthi et al., 2014). When young fruit is infested, premature fruit drop has been reported (Jayanthi et al., 2014). Because harvesters would likely cull any fruits that are attacked due to the obvious damage, we determined this pest as unlikely to be associated with commercially produced fruit.

Colletotrichum tropicale
This fungus has been reported as an endophyte on mango, not causing any symptoms or damage (Sharma et al., 2013; Vieira et al., 2014), or as a pathogen, having a weak ability to cause necrosis on fruit (Wu et al., 2020). Other reports describe sunken necrotic lesions on mango fruit (Lima et al., 2013; Tovar-Pedraza et al., 2020). This fungus is only known from tropical areas, indicating that it can likely only establish in plant hardiness zones 10-13 (only zone 10 would apply to the continental United States) (Lima et al., 2013; Takeuchi et al., 2018; Vieira et al., 2014). Because this fungus is associated with mango fruit, we consider the likelihood of entry to be medium. *Colletotrichum* spp. are dispersed by rain-splash (Nicholson and Moraes, 1980; Yang et al., 1990) and rain splash is known to take place on very small scale (McCartney, 1994; Ooka and Kommedahl, 1977). Although simulated rain experiments have not been conducted specifically with *C. tropicale*, other species in this genus show that most new infections occur within a 25 cm radius of the inoculum source and are greatly influenced by rainfall intensity and ground cover (Madden et al., 1993; Ntahimpera et al., 1997; Smith, 2008; Yang et al., 1990). Conditions required for dispersal are unlikely to be met once fruit enters the United States. Further, fruit whose intended use is consumption is unlikely to be introduced into commercial production areas because fruit will be consumed or, if disposed, would go to a commercial landfill and are not likely to come in contact with host material in the limited-endangered area. 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. Then fruit rot and finally, fruit drop or 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 Reddy et al. (2018) and Srivastava (1997) stated that mangoes are not a preferred host. Due to the extent of such damage and that we consider the packinghouse mitigation of washing mangoes to remove sap, we have determined this pest as unlikely to be associated with commercially produced fruit.

Ctenomeristis ebriola (Lepidoptera: Pyralidae)
This species of snout moth lays eggs on young mango fruit, immediately after their formation (Sengupta and Behura, 1957; Srivastava, 1997). 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 and completely degrade the marketability. Pupation typically occurs in the fruit and the moths emerge from the now thoroughly rotted original entrance hole (Sengupta and Behura, 1957). Due to the extent of the damage and that we are considering the packinghouse mitigation of washing mangoes to remove sap, we have determined this pest as unlikely to be associated with commercially produced fruit.

Cytosphaera mangiferae
This pathogen has been reported as associated with mango stems (Mathur, 1979; Pande and Rao, 1995), and fruit (Johnson and Hyde, 1992). However, all these reports taken together they do not provide strong scientific evidence of damage, symptoms, pathogenicity tests, or comply with Koch postulates. Therefore, due to the lack of evidence of association with mango fruit, we did not analyze this fungus any further.

Deanolis albizonalis (Lepidoptera: Pyralidae)
Moths of the mango seed borer lay eggs on young mango fruit, immediately after their formation (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 completely and degrade the marketability. Secondary infection by fungi and bacteria is common and causes the fruit to collapse and become unfit for consumption (Bhattacharya, 2014). Pupation typically occurs in the fruit and the moths emerge from the now thoroughly rotted, original entrance hole (Sengupta and Behura, 1957). Due to the extent of the damage and that we are considering the packinghouse mitigation of washing mangoes to remove sap, we have determined this pest as unlikely to be associated with commercially produced fruit.

Deudorix isocrates (Lepidoptera: Lycaenidae)
Larvae of the Anar butterfly are fruit borers; typically, they eat the flesh and seeds inside pomegranates, their primary host (Butani, 1993; Pruthi and Batra, 1960). The species is polyphagous; researchers have recorded the larvae attacking guava, *Prunus*, *Citrus*, and mangoes (Butani, 1993). However, we found very little direct evidence of mango damage, many authors do not include it as a host (Haldhar et al., 2013; Pruthi and Batra, 1960). Butterflies lay a single

egg on the calyx of an immature host fruit, but many individuals can exist in one fruit (Haldhar et al., 2013). Larvae create obvious boreholes which they expel frass from. The entry hole allows for the invasion of secondary rotting bacteria and fungi which leads to premature fruit drop. Numerous publications mentioned the total loss of marketability on attacked fruit because of premature fruit drop, the rancid smell, obvious borehole, and bruising of the fruit (Butani, 1993; Pruthi and Batra, 1960; Srivastava, 1997). Since mangoes are not a common host and harvesters would likely cull any fruits that are attacked due to the obvious damage, we have determined this pest as unlikely to be associated with commercially produced fruit.

Diaporthe arecae

This fungi has only one report that indicates stem-end rot on mangoes (Lim et al., 2019). However, several reports show that this species behaves either as an endophyte, secondary invader or saprobe (Huang et al., 2015; Udayanga et al., 2014). *Diaporthe* species might spread its spores via water or wind, however, the likelihood of establishment through spore dispersal is influenced by the these factors: quantity of produced spores, the number of spores that become airborne, the wind or rain direction and speed, the ability of spores to survive adverse environmental conditions, and the availability of susceptible hosts (Palm and Rossman, 2003). Fruits for consumption that reach the endangered area are likely to be consumed; however, since *Diaporthe* species tend to behave as secondary invaders or saprobes, by the time an infection is starting, the fruit for consumption has been disposed and would go to a commercial landfill. Therefore, fruit for consumption poses a negligible risk for the introduction of pests into new areas (Gordh and McKirdy, 2014).

Hyalopsila leuconeurella (Lepidoptera: Pyralidae)

Larvae bore into young fruit causing obvious damage due to the accumulation of frass near the entrance hole (Srivastava, 1997). Infestation results in premature fruit drop (Srivastava, 1997). Additionally, Reddy et al. (2018) states that mangoes are not a preferred host. Due to these factors, we determined this pest as unlikely to be associated with commercially produced fruit.

Macrophoma mangiferae

This fungus causes dark spots on leaves, stems, and twigs on its only host; *Mangifera indica* (Hingorani et al., 1960; Okigbo, 2001; Okigbo and Osuinde, 2003). Infected fruit show water soaked, circular lesions and stem-end rot under storage conditions, although this is rarely observed (Bing et al., 2012; Hingorani et al., 1960; Mei-Jiao et al., 2012). However, there is one report suggesting a possibility of latency (Mei-Jiao et al., 2012), meaning that the pathogen may enter new areas through the movement of latently infected fruit. Therefore, we consider the likelihood of entry to be low. *Macrophoma mangiferae* inoculum levels are shown to decrease over time on mango fruit (Verma and Singh, 1996). However, there is uncertainty on the period of time that stem-end rot symptoms start developing because of its rare occurrence on mango fruit and poor competitiveness with other organisms (Hingorani et al., 1960). Pycnidiospores have only been reported being dispersed by rain (Okigbo, 2001; Verma and Singh, 1996) and survival during adverse conditions have only been reported on leaves, bark, and stems (Okigbo, 2001; Okigbo and Osuinde, 2003). Spores do not germinate on the plant parts mentioned above unless suitable environmental conditions are met, such as heavy rain and high humidity (Hingorani et al., 1960; Okigbo, 2001; Okigbo and Osuinde, 2003). While we do not have evidence that *M. mangiferae* can sporulate on fruit, if it does these specific conditions are unlikely to be met once fruit enters the United States. Further, fruit whose intended use is consumption is unlikely to be introduced into commercial production areas because fruit will be consumed or, if disposed, would go to a commercial landfill and are not likely to come in contact with host material in the limited-endangered area. 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.

Thylacoptila paurosema (Lepidoptera: Pyralidae)
Larvae bore into mango fruit and plug the bore hole with frass and webbing (Butani, 1993). Infested fruits are usually hollowed and drop prematurely (Butani, 1993; Maruthadurai et al., 2012). Larvae pupate in the soil after fruit drop; therefore, we determined this pest is unlikely to be associated with commercially produced fruit.

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 mango has been observed as an alternative host (Bhumannavar and Jacob, 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 and Jacob, 1990; Srivastava, 1997). Additionally, pupation occurs in the soil. Due to these factors, we determined this pest is unlikely to be associated with commercially produced fruit.

Xanthomonas citri pv. *mangiferaeindicae*
This bacterium infects mangoes and causes fruit drop, especially when infections start on young fruits or when fruit stalks become infected (Gagnevin and Pruvost, 2001; Ploetz et al., 1994). Bacterial canker disease causes fruit drop (10-70%), yield losses ranging from 10 to 85 percent and stem-end rot of harvested fruit (Haggag, 2010; Johnson et al., 1991a). Early fruit drop would limit the prevalence of the pathogen on harvested fruit. Furthermore, this pathogen also causes storage rot (5-100%), which would be detected during visual inspection 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); multiple reports indicate that levels of epiphytic bacteria on fruit surfaces decrease rapidly to levels insufficient to cause disease to develop (Roberts et al., 1998; Stefani and Giovanardi, 2011). Studies suggest that xanthomonads can vary in their ability to survive on plant surfaces, with humid conditions generally favorable to epiphytic survival of this group of bacteria whereas populations quickly decrease to undetectable levels during dry conditions (Swings and Civerolo, 1993; Timmer et al., 1987). The bacterium has no significant long-term ability to survive on the ground in dead leaves or in soil (Gagnevin and Pruvost, 2001; Pruvost et al., 1995). Because of the specific conditions that this disease requires for survival and spread, its restricted host range (mango and macadamia), and the limited commercial production of its hosts in the endangered area (Gagnevin and Pruvost, 2001; McLaughlin et al., 2017; Mossler and Nesheim, 2002; Viana et al., 2007; NASS, 2021), 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). Long-distance dissemination of this pest likely occurs on contaminated plant material used for propagation (Gagnevin and Pruvost, 2001).

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 mangoes and are present in the export area but are not of quarantine significance for the PRA area. These organisms are listed in the 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, 2008). 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 incisa (Walker) (Diptera: Tephritidae)

Both Butani (1993) and Srivastava (1997) list *B. incisa* as a mango pest in India. However, White and Elson-Harris (1994) stated that "the true *B. incisa* (Walker) is a Burmese species", that the records of *B. incisa* on mango and other plants in India were probably based on misidentifications of *B. caryeae*, and that mango is a doubtful host for *B. incisa*. Other than listing of host associations, we found no field research or other evidence to substantiate that this species attacks mangoes.

Colletotrichum nymphaeae (Pass.) Aa

This pest has been reported under experimental settings on mango (Xavier et al., 2019). However, Xavier et al. (2019) does not provide evidence of association in the field or from which plant part that was isolated. In addition, this paper does not comply with Koch postulates. Therefore, due to the lack of evidence on environmental conditions and description or isolation of symptoms, we did not analyze this fungus.

Cytospora mangiferae-indicae V.G. Rao & Narendra and *Discosia hiptages* Tilak

Both pests have been reported in association with leaves of *Mangifera indica* (Mathur, 1979). However, this reference lacks scientific evidence of damage, symptoms, pathogenicity, virulence, and Koch postulates with mango. Therefore, we did not analyze these fungi.

Hendersonia creberrima Syd., P. Syd. & Butler

This pest has been reported to cause soft brown rot on mangoes (Boag et al., 1990; Brodrick and van der Westhuizen, 1976; Mathur, 1979). However, Sutton and Dyko (1989) identified these isolates as *Fusicoccum dimidiatum* (Penz.) D.F. Farr, (syn. *Neoscytalidium dimidiatum* (enz.) Crous & Slippers), causing a misidentification from previous authors (Farr and Rossman, 2021). Due to insufficient evidence for association and damage or symptoms with mango, we did not analyze this pathogen.

Raoiella macfarlanei Pritchard & Baker ([Acari] Trombidiformes: Tarsonemidae)
Although Gupta, (1985) cited this flat mite as a pest of mangoes, Beard et al. (2012) stated, "Reports of *R. macfarlanei* on mango in India are considered erroneous." In addition, Beard et al. (2018) could not confirm that this mite attacks mangoes.

Other organisms associated with mango but without evidence that they are a pest
We found reports of the following organisms (fungi) being associated with mango (leaves, stems, flowers) without any disease symptoms /damage reports and in India. Since we found no other corroborating strong evidence about the host association and trade pathway, we did not include them on the pest list:

Aaosphaeria arxii (Aa) Aptroot (Aptroot, 1995), *Acarocybellina arengae* (Matsush.) Subram (Minter et al., 2001; Dubey and Moonnambeth, 2013), *Asterolibertia mangiferae* Hansf. & Thirum (Rangaswami et al., 1970; Reddy, 1975); *Beltrania mangiferae* Munjal & J.N. Kapoor (Pirozynski and Patil, 1970), *Chaetospermum setosum* Rajeshkumar, S.K. Singh & P.N. Singh (Rajeshkumar et al., 2010), *Coccomyces vilis* Syd., P. Syd. & E. J. Butler (Sherwood, 1980), *Colletotrichum cliviicola* Damm & Crous. Syn.: *Colletotrichum cliviae* Y.L. Yang, Zuo Y. Liu, K.D. Hyde & L. Cai (Chowdappa et al., 2014; Jayawardena et al., 2016), *Colletotrichum mangiferae* Kelkar (Mathur, 1979); *Colletotrichum plurivorum* Damm, Alizadeh & Toy. Sato (Damm et al., 2019; Sakthivel et al., 2018); *Coniella citri* G.P. Agarwal & N.D Sharma (Mathur, 1979); *Coniothyriopsis mangiferae* Shreem. & Bilgrami (Mathur, 1979); *Cylindrocarpon mangiferarum* Chowdhry & A. Varma (Chowdhry and Varma, 1986; Pradeep et al., 2011); *Fomes senex* sensu Lloyd (Simmonds, 1966; Spaulding, 1961); *Fusarium sacchari* (E.J. Butler & Hafiz Khan) W. Gams. Syn.: *Gibberella sacchari* Summerell & J.F. Leslie (CABI, 2022b; O'Donnell et al., 1998); *Pestalotiopsis anacardii* Kamil, T.P. Devi, N. Mathur, O.P. Singh, P. Pandey, Prabhak. & V. Patil (Kamil et al., 2012); *Scolecostigmina mangiferae* (Koord.) U. Braun & Mouch. Syn.: *Cercospora mangiferae* Koord; *Stigmina mangiferae* (Koord.) M.B. Ellis (Braun and Freire, 2002; Kamal, 2010); *Trametes leonina* (Klotzsch) Pat. Syn.: *Polystictus leoninus* Sacc. (Reddy, 1975); *Vitalia mangiferae* Bat. Syn.: *Chaetothyrium mangiferae* Bat. & I.H. Lima (Mendes et al., 1998; Panwar and Jagtap, 1990).

2.4. Pests selected for further analysis or already regulated

We identified 11 quarantine pests for further analysis (Table 2).

Table 2. Pests selected for further analysis

Pest type	Taxonomy	Scientific name
Arthropoda	Coleoptera: Curculionidae	*Sternochetus mangiferae* (F.)
Arthropoda	Coleoptera: Curculionidae	*Sternochetus frigidus* (F.)
Arthropoda	Diptera: Tephritidae	*Bactrocera caryeae* (Kapoor)
Arthropoda	Diptera: Tephritidae	*Bactrocera correcta* (Bezzi)
Arthropoda	Diptera: Tephritidae	*Bactrocera frauenfeldi* (Schin.)
Arthropoda	Diptera: Tephritidae	*Dacus ciliatus* Loew
Arthropoda	Diptera: Tephritidae	*Zeugodacus tau* Walker
Fungi	Botryosphaeriales: Botryosphaeriaceae	*Lasiodiplodia hormozganensis* Abdollahzadeh, Zare & A.J.L. Phillips

Pest type	Taxonomy	Scientific name
Fungi	Botryosphaeriales: Botryosphaeriaceae	*Lasiodiplodia pseudotheobromae* A.J.L. Phillips, A. Alves & Crous
Fungi	Diaporthales: Diaporthaceae	*Nattrassia mangiferae* (Syd. & P. Syd.) B. Sutton & Dyko
Fungi	Diaporthales: Diaporthaceae	*Phomopsis mangiferae* S. Ahmad

The following pests can follow the commodity pathway. However, they were not assessed because they have already been determined to pose an unacceptable risk to the PRA area and are already regulated domestically.

Pest type	Taxonomy	Scientific name	Code of Federal Regulation
Arthropoda	Diptera: Tephritidae	*Bactrocera dorsalis* Hendel	7CFR § 301.32, 2021
Arthropoda	Diptera: Tephritidae	*Bactrocera zonata* (Saunders)	7CFR § 301.32, 2021
Arthropoda	Diptera: Tephritidae	*Zeugodacus cucurbitae* (Coquillett)	7CFR § 301.32, 2021

3. Assessing Pest Risk Potential

3.1. Introduction

We estimated the risk potential for each pest selected for further analysis. Risk is described by the likelihood of an adverse event, the potential consequences, and the uncertainty associated with these parameters. For each pest, we determined if an endangered area exists within the continental 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 (i.e., is a threshold pest), that means it could adversely affect agricultural production by causing a yield loss of 10 percent or greater, by increasing U.S. production costs, or by impacting an environmentally important host or international trade. After the endangered area is defined, we assessed the pest's likelihood of introduction into that area on the imported commodity.

The likelihood of introduction is based on the potential entry and establishment of a pest. We qualitatively assessed this risk using the ratings: Low, Medium, and High. The risk elements comprising the likelihood of introduction are interdependent; therefore, the model is multiplicative rather than additive. We defined the risk ratings as follows:

> **High**: This outcome is highly likely to occur.
> **Medium**: This outcome is possible; but for that to happen, the exact combination of required events needs to occur.
> **Low**: This outcome is unlikely to occur because one or more of the required events are unlikely to happen, or because the full combination of required events is unlikely to align properly in time and space.

We addressed uncertainty associated with each risk 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. *Sternochetus frigidus* and *Sternochetus mangiferae* (Coleoptera: Curculionidae)
The mango pulp weevil (*Sternochetus frigidus*) feeds and develops in several species of *Mangifera* (Litz, 2009), and is found in Southern Asia and Papua New Guinea (CABI, 2022b). Larvae bore into the fruit, feeding on the pulp and sometimes, the seed resulting in decay and rendering the fruit unsuitable for consumption (De and Pande, 1990).

The mango seed weevil (*Sternochetus mangiferae*) is a monophagous pest of mango that is widely distributed in most mango-producing areas in the world (Verghese et al., 2005). It is likely native to India and has been introduced to other mango-growing regions (Follett, 2002). There is one generation per year and multiple larvae may infest a single mango seed (Follett, 2002). Infestations of *S. mangiferae* rarely affects the pulp of the fruit and does not reduce seed germination (Follett, 2002), but can cause premature fruit drop (Follett, 2002; Verghese et al., 2005).

The endangered area for *Sternochetus frigidus* and *S. mangiferae* within the continental United States

Endangered area component	Evidence and notes
Climatic suitability	*Sternochetus frigidus* has been reported form **Asia:** Bangladesh, Brunei, India, Indonesia, Malaysia, Myanmar, the Philippines, Singapore, Thailand; **Oceania:** Papua New Guinea (CABI, 2022b). Based on a comparison of Global Plant Hardiness Zones (PHZ) we estimate that *S. frigidus* could establish in plant hardiness zones 9-13 (Takeuchi et al., 2018). *Sternochetus mangiferae* has been reported from **Africa:** Central African Republic, Gabon, Ghana, Guinea, Kenya, Liberia, Madagascar, Malawi, Mauritius, Mozambique, Réunion, Rwanda, Seychelles, South Africa, Tanzania, Uganda, Zambia; **Asia:** Bangladesh, India, Indonesia, Myanmar, Nepal, Oman, Sri Lanka, Yemen; **Europe:** Sweden; **North America:** Barbados, British Virgin Islands, Dominica, Grenada, Guadeloupe, Martinique, Saint Barthélemy, Saint Lucia, Saint Vincent and the Grenadines, Trinidad and Tobago, U.S. Virgin Islands, Hawaii; **Oceana:** Australia, French Polynesia, Guam, New Caledonia, Northern Mariana Islands, Tonga, Wallis Futuna; **South America:** Brazil, Chile, French Guiana (CABI, 2022b). Based on a comparison of Global Plant Hardiness Zones (PHZ) we estimate that *S. mangiferae* could establish in plant hardiness zones 10-13 (Takeuchi et al., 2018).

Endangered area component	Evidence and notes
Hosts in PRA area	*Sternochetus frigidus* is a pest of **Anacardiaceae:** *Mangifera* spp. (De and Pande, 1990). *Sternochetus mangiferae* is a pest of **Anacardiaceae:** *Mangifera indica* (mango) (Verghese et al., 2005). *Mangifera* spp. are found in the continental United States in Florida (USDA-NRCS, 2022) and California (WIFSS, 2016)
Economically important hosts at risk[a]	Mango is an economically important host that is grown in the continental United States in Florida and California (WIFSS, 2016).
Potential consequences on economically important hosts at risk	These pests are likely to cause unacceptable consequences because losses from *S. frigidus* have occasionally reached 100 percent (De and Pande, 1990) and losses from *S. mangiferae* can reduce yield up to 80 percent depending on mango variety (Verghese et al., 2005).
Endangered Area	The endangered area consists of areas in California and Florida in PHZs 9-13 where mangoes are grown.

a As defined by ISPM No. 11, supplement 2, "economically" important hosts refers to both commercial and non-market (environmental) plants (IPPC, 2017).

The likelihood of entry of *Sternochetus frigidus* and *S. mangiferae* into the endangered area via mango imported from India

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Pest prevalence on the harvested commodity	Medium	Moderate	*Sternochetus frigidus* eggs are laid on fruit larvae burrow into the tender flesh, feeding on the pulp and sometimes, the seed which results in decay and renders the fruit unfit for consumption (De and Pande, 1990; Litz, 2009). Similarly, *S. mangiferae* eggs are laid in young fruit where the larvae burrow into the seed and as the fruit develops the oviposition scar disappear (Verghese et al., 2005). However, *S. mangiferae* has been implicated in causing premature fruit drop (Follett, 2002; Verghese et al., 2005), which would decrease the number of infested mature fruit.

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of surviving post-harvest processing before shipment	Medium	Low	Because *Sternochetus* larvae feed internally on the seed and pulp, and may not show visible damage, the post-harvest processes considered are unlikely to reduce or remove the pests from the commodity. The risk rating remains Medium.
Likelihood of surviving transport and storage conditions of the consignment	Medium	Low	We did not consider transportation and storage conditions as part of this assessment. The risk rating remains Medium.
Overall Likelihood of Entry	Medium	N/A	N/A

The likelihood of establishment of *Sternochetus frigidus* and *S. mangiferae* in the endangered area via mango imported from India

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	Low	Moderate	*Sternochetus frigidus* and *S. mangiferae* feed and develop only on mango (Follett, 2002; Verghese et al., 2005; De and Pande, 1990). Mangoes are grown in California and Florida (WIFSS, 2016). For either species of weevil to establish in the continental United States, infested mangoes would have to arrive in areas where mangoes are grown, larvae must develop to adult, mate, and find suitable host material. We consider the likelihood of these events to be Low.

The likelihood of introduction (combined likelihoods of entry and establishment) of *Sternochetus frigidus* and *S. mangiferae* into the endangered area via mango imported from India is Low.

3.2.2. *Bactrocera caryeae* (Diptera: Tephritidae)

Taxonomists consider the Indian fruit fly (*B. caryeae*) as part of the oriental fruit fly (*B. dorsalis*) species group (CABI, 2022b; Jiji et al., 2016). *Bactrocera dorsalis* is known to cause > 40% loss in fruit crops, the fruit fly *B. caryeae* has the same habits and is equally harmful but is restricted to the west coast of India (Jiji et al., 2016).

The endangered area for *Bactrocera caryeae* within the continental United States

Endangered area component	**Evidence and notes**
Climatic suitability	*Bactrocera caryeae* has a narrow distribution, in **Asia:** India (Goa, Karnataka, Kerala, Tamil Nadu) (CABI, 2022b; Drew and Raghu, 2002; Jiji et al., 2016). These localities correspond with Plant Hardiness Zones 11-13 (Takeuchi et al., 2018).
Hosts in PRA area	Unlike other Tephritid fruit flies, *B. caryeae* has a relatively restricted host range, known hosts include: **Anacardiaceae:** *Mangifera indica* (Drew and Raghu, 2002; Reddy et al., 2018), **Moraceae:** *Artocarpus* spp. (breadfruit) (Drew and Raghu, 2002), **Myrtaceae:** *Psidium guajava* (guava) (Drew and Raghu, 2002), **Piperaceae:** *Piper nigrum* (black pepper) (only males attack the inflorescence, Jiji et al., 2016), **Rutaceae:** *Citrus* spp. (Drew and Raghu, 2002).
Economically important hosts at risk[a]	Of the few hosts, citrus, mango, and guava are the only economically important fruits present in CONUS. We used USDA-NRCS (2022) to validate host presence, citrus is grown throughout the south east and western United States, guava grows in Florida and Louisiana, and mangoes are grown in Florida and California (WIFSS, 2016).
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.
Endangered Area	Since *B. caryeae* has a narrow temperature threshold, PHZs 11-13, we only expect suitable habitats to exist in southern Florida, southern Texas, and southern California along their respective coasts, where hosts grow (Takeuchi et al., 2018).

a As defined by ISPM No. 11, supplement 2, "economically" important hosts refers to both commercial and non-market (environmental) plants (IPPC, 2017).

The likelihood of entry of *Bactrocera caryeae* into the endangered area via mangoes imported from India

Risk Element	**Risk Rating**	**Uncertainty Rating**	**Evidence for rating (and other notes as necessary)**
Pest prevalence on the harvested commodity	High	Low	Although there is not a lot of published information on *B. caryeae*, the species has been found to natural infest mangoes in the field (Drew and Raghu, 2002; Reddy et al., 2018).

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of surviving post-harvest processing before shipment	High	Negligible	The only post-harvest processing we considered as a mitigation is washing due to the necessity to wash *Mangifera* sap from the fruit. However, washing will likely have little effect on the larvae inside the fruit; therefore, we maintained a "High" risk rating.
Likelihood of surviving transport and storage conditions of the consignment	High	Negligible	We did not consider any transport or storage conditions for this assessment.
Overall Likelihood of Entry	High	N/A	N/A

The likelihood of establishment of *Bactrocera caryeae* in the endangered area via mangoes imported from India

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	Medium	Low	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 caryeae* has a narrow host range, and of those hosts very few species grow in CONUS, none grow widely. This greatly reduces the risk of reservoir hosts. In addition, the tropical habitat that this species requires for survival only exists in a small, fragmented portion of the United States. Therefore, the risk of numerous fruit flies arriving in mangoes, emerging as adults, finding a mate and a host is reduced.

The likelihood of introduction (combined likelihoods of entry and establishment) of *Bactrocera caryeae* into the endangered area via mango imported from India is Medium.

<u>3.2.3. *Bactrocera correcta* (Diptera: Tephritidae)</u>

The guava fruit fly is a serious pest species with a broad host range. Researchers have recorded the species, causing major infestations in commercial fruit crops in Vietnam and Thailand (Drew and Raghu, 2002). If an infestation were to go unchecked and *B. correcta* were to become established in the US in areas such as California or Florida, it has the potential to become a major pest of citrus, peach, and several kinds of tropical and subtropical fruit hosts (Weems Jr and Fasulo, 2004).

The endangered area for *Bactrocera correcta* within the continental United States

Endangered area component	Evidence and notes
Climatic suitability	*Bactrocera correcta* is primarily distributed in tropical and subtropical areas in Asia. It occurs in Bhutan, southern China, India, Japan, Myanmar, Nepal, Pakistan, Sri Lanka, Thailand, and Vietnam (CABI, 2022b; Liu and Ye, 2009). These areas encompass the global Plant Hardiness Zones 8-11 as defined by Takeuchi et al., 2018.
Hosts in PRA area	*Bactrocera correcta* feeds on numerous hosts in several different plant families, including **Anacardiaceae**: *Mangifera indica* (mango), *Anacardium occidentale* (cashew), *Spondias purpurea* (purple mombin); **Elaeocarpaceae**: *Muntingia calabura* (strawberry-tree); **Myrtaceae:** *Psidium guajava* (guava), *Syzygium* spp.; **Rosaceae**: *Prunus* spp., *Prunus persica* (peach); (CABI, 2022b). Additional reported hosts are *Citrus* spp., *Eugenia uniflora* (Surinam cherry), *Ricinus communis* (castor bean), *Santalum album* (sandalwood), and *Ziziphus* spp., including *Z. jujuba* (jujube) (Weems Jr and Fasulo, 2004; USDA-NRCS, 2022).
Economically important hosts at risk[a]	Economically important hosts of *B. correcta* present in the areas of concern are peaches and citrus (USDA-NRCS, 2022).
Potential consequences on economically important hosts at risk	*Bactrocera correcta* is a serious pest of commercial fruit production in southern Vietnam and Thailand (Drew and Raghu, 2002). It is one of the most destructive pests in the genus *Bactrocera* because it feeds on many economically valuable fruits and vegetables such as mango and citrus (Liu and Ye, 2009). In China's Yunnan Province, *B. correcta* has become a "dominant pest causing great loss to the local fruit productions" (Liu and Ye, 2009, p. 467).
Endangered Area	The area endangered by *B. correcta* comprises peaches and citrus grown in Plant Hardiness Zones 8-11.

a As defined by ISPM No. 11, supplement 2, "economically" important hosts refers to both commercial and non-market (environmental) plants (IPPC, 2017).

The likelihood of entry of *Bactrocera correcta* into the endangered area via mangoes imported from India

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Pest prevalence on the harvested commodity	High	Negligible	*Bactrocera correcta* is polyphagous and attacks a wide array of commercial fruit crops (Allwood, 1999; CABI, 2022b; Drew and Raghu, 2002); including mangoes in India (Reddy et al., 2018).

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of surviving post-harvest processing before shipment	High	Negligible	The only post-harvest processing we considered as a mitigation is washing due to the necessity to wash *Mangifera* sap from the fruit. However, washing will likely have little effect on the larvae inside the fruit; therefore, we maintained a “High” risk rating.
Likelihood of surviving transport and storage conditions of the consignment	High	Negligible	We did not consider any transport or storage conditions for this assessment.
Overall Likelihood of Entry	High	N/A	N/A

The likelihood of establishment of *Bactrocera correcta* in the endangered area via mangoes imported from India

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	High	Negligible	*Bactrocera correcta* can disperse to and infest a wide range of host plants, including cultivated and naturalized species (CABI, 2022b). Also, multiple fruit fly larvae can infest a single fruit, increasing the likelihood of individuals finding mates. Domestic fruit growers do not currently control any *Bactrocera* species and would likely have to change production practices should *B. correcta* become established. Adults of some species of *Bactrocera* can live for several months (Christenson and Foote, 1960; White and Elson-Harris, 1994). In addition, *Bactrocera* species can fly long distances (Koyama et al., 2004) and due to *B. correcta*’s wide temperature threshold (8-11) and host suitability, it is reasonable that individuals could find a mate and host in the United States. Therefore, the introduction of *B. correcta* into the continental United States is likely to result in significant yield losses and increases in costs of production beyond normal fluctuations.

The likelihood of introduction (combined likelihoods of entry and establishment) of *Bactrocera correcta* into the endangered area via mangoes imported from India is High.

3.2.4 *Bactrocera frauenfeldi* (Diptera: Tephritidae)

Bactrocera albistrigata, was recently synonymized with, *B. frauenfeldi*, as part of a group of fruit flies known as the mango fruit fly complex (Doorenweerd et al., 2022). This species oviposits eggs into host fruits, including mango. Each fruit could harbor numerous maggots, which completely degrade the marketability of the commodity. 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 (Antczak, 2009; NAPPO, 2010).

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

Endangered area component	**Evidence and notes**
Climatic suitability	*Bactrocera frauenfeldi* (syn. *B. albistrigata*) 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, Thailand (Drew and Romig, 2013), and Timor-Leste (Oliviera et al., 2016). **Oceania:** Australia, Federated States of Micronesia, Papua New Guinea (CABI, 2022b). These localities correspond with Plant Hardiness Zones 10-13 (Takeuchi et al., 2018).
Hosts in PRA area	The few natural hosts of *B. frauenfeldi* that are present in the continental United States include **Anacardiaceae:** *Mangifera indica* (mango) (Allwood et al., 1999; Leblanc et al., 2013), **Combretaceae:** *Terminalia catappa* (tropical almond) (Allwood et al., 1999), **Myrtaceae:** *Psidium guajava* (guava) (Allwood et al., 1999), and *Syzygium jambos* (Malabar plum) (Allwood et al., 1999).
Economically important hosts at risk[a]	Of the few hosts, mango and guava are the only economically important fruits present in CONUS. We used USDA-NRCS, 2022) to validate host presence, guava grows in Florida and Louisiana and Mangoes are grown in Florida and California (WIFSS, 2016).
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.

Endangered Area	Within CONUS Plant Hardiness Zones 10-13 exist 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 10-13 exist in a narrow strip along the Pacific coast from Northern California, all Southern California, and western Arizona.

a As defined by ISPM No. 11, supplement 2, "economically" important hosts refers to both commercial and non-market (environmental) plants (IPPC, 2017).

The likelihood of entry of *Bactrocera frauenfeldi* into the endangered area via mangoes imported from India

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 mangoes in the field (Allwood et al., 1999; Chinajariyawong et al., 2000; Leblanc et al., 2013).
Likelihood of surviving post-harvest processing before shipment	High	Negligible	The only post-harvest processing we considered as a mitigation is washing due to the necessity to wash *Mangifera* sap from the fruit. However, washing will likely have little effect on the larvae inside the fruit; therefore, we maintained a "High" risk rating.
Likelihood of surviving transport and storage conditions of the consignment	High	Negligible	We did not consider any transport or storage conditions for this assessment.
Overall Likelihood of Entry	High	N/A	N/A

The likelihood of establishment of *Bactrocera frauenfeldi* in the endangered area via mangoes imported from India

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)

Likelihood of Establishment	Medium	Low	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 frauenfeldi* has a narrow host range, and of those hosts very few species grow in CONUS, none grow widely. This greatly reduces the risk of reservoir hosts. In addition, the tropical habitat that this species requires for survival only exists in a small, fragmented portion of the United States. Therefore, the risk of numerous fruit flies arriving in mangoes, emerging as adults, finding a mate and a host is reduced.

The likelihood of introduction (combined likelihoods of entry and establishment) of *Bactrocera frauenfeldi* into the endangered area via mangoes imported from India is Medium.

3.2.5. *Dacus ciliatus* (Diptera: Tephritidae)

The lesser pumpkin fly (*Dacus ciliatus*) is primarily a pest of cucurbits in Africa, Asia, and the Middle East (CABI, 2022a). The females oviposit into fruit, which leaves puncture marks and eventually, necrosis and collapse of the tissue (CABI, 2022a). Females, on average, may lay approximately 200–300 eggs (CABI, 2022a).

The endangered area for *Dacus ciliatus* within the continental United States

Endangered area component	Evidence and notes
Climatic suitability	*Dacus ciliatus* has been reported from **Africa:** Angola, Botswana, Burkina Faso, Burundi, Cameroon, Comoros, the Democratic Republic of Congo, Côte d'Ivoire, Egypt, Eritrea, Ethiopia, Gabon, Gambia, Gambia, Ghana, Guinea, Kenya, Lesotho, Malawi, Mauritius, Mayotte, Mozambique, Namibia, Niger, Nigeria, Réunion, Rwanda, Saint Helena, Senegal, Somalia, South Africa, Sudan, Tanzania, Togo, Uganda, Zambia, Zimbabwe; **Asia:** India, Iraq, Iran, Israel, Jordan, Nepal, Oman, Pakistan, Saudi Arabia, Turkey, United Arab Emirates, Yemen (CABI, 2022a). Based on a comparison of Global Plant Hardiness Zones (PHZ) we estimated that *Dacus ciliatus* could establish in plant hardiness zones 8-13 (Takeuchi et al., 2018).

Endangered area component	**Evidence and notes**
Hosts in PRA area	The main hosts of *D. ciliatus* are cucurbits and host plants present in the PRA area are **Cucurbitaceae:** *Citrullus lanatus* (watermelon), *Cucumis melo* (melon), *Cucumis sativus* (cucumber), *Cucurbita maxima* (great pumkin), and *Cucurbita pepo* (bitter bottle gourd) (CABI, 2022a). Recently, some non-cucurbit hosts were reported from a study in Kenya and include **Anacardiaceae:** *Mangifera indica* (mango) (Kambura et al., 2018).
Economically important hosts at risk[a]	Economically important hosts include melon, cucumber, pumpkin, squash, and watermelon.
Potential consequences on economically important hosts at risk	This pest is likely to cause unacceptable consequences because it infests the fruit of many important cucurbit crops (White and Elson-Harris, 1994). Oviposition into the fruit causes puncture marks on the surface in which fluid oozes out (El-Nahal et al., 1970). Larvae feed around their oviposition site, causing the fruit tissue to become soft and brown, and eventually, this tissue collapses (El-Nahal et al., 1970).
Endangered Area	The endangered area includes Plant Hardiness Zones 8-13 where host plants occur.

a As defined by ISPM No. 11, supplement 2, "economically" important hosts refers to both commercial and non-market (environmental) plants (IPPC, 2017).

The likelihood of entry of *Dacus ciliatus* into the endangered area via mangoes imported from India

Risk Element	**Risk Rating**	**Uncertainty Rating**	**Evidence for rating (and other notes as necessary)**
Pest prevalence on the harvested commodity	High	High	All stages of mango fruit were infested by *D. ciliatus* larvae in a study from Kenya (Kambura et al., 2018). However, this is the only study that reports mango fruit infestation by *D. ciliatus*; therefore, uncertainty was rated "High".
Likelihood of surviving post-harvest processing before shipment	High	Low	Fruit fly larvae feed inside the fruit. Washing would not affect the prevalence of this fruit fly. Other post-harvest processes were not considered. The risk rating remains High.
Likelihood of surviving transport and storage conditions of the consignment	High	Low	Transport and storage conditions were not considered as part of this assessment. The risk rating remains High.

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Overall Likelihood of Entry	High	N/A	N/A

The likelihood of establishment of *Dacus ciliatus* in the endangered area via mangoes imported from India

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	High	Moderate	We could not find any information on the flight capabilities of the lesser pumpkin fly, but its dispersal capabilities are likely similar to *Bactrocera* spp. (CABI, 2022b; Koyama et al., 2004), which would allow it to reach host plants. *Dacus ciliatus* has a host range, primarily, of cucurbits and would be able to find hosts in the endangered area during their growing seasons; therefore, we rate this risk element High.

The likelihood of introduction (combined likelihoods of entry and establishment) of *Dacus ciliatus* into the endangered area via mangoes imported from India is High.

3.2.6. *Zeugodacus tau* (Diptera: Tephritidae)

Walker first described the pumpkin fly in 1849 and since then, much confusion has surrounded its name; *Z. tau* is occasionally referred to as *Dacus hageni* or *D. nubilus*, since it is a member of the subgenus *Zeugodacus* sometimes it is cited as *Bactrocera* (*Zeugodacus*) *tau* (CABI, 2022b). Regardless of name, the pumpkin fly is a serious pest of fruits, particularly Cucurbitaceae (Allwood, 1999; Lin et al., 2005). Similar to other Tephritid flies, *Z. tau* oviposits as many as 450 eggs into host fruits (Singh et al., 2010). Each fruit could harbor numerous maggots, which completely degrade the marketability of the commodity and increases the risk of establishment from the pathway.

The endangered area for *Zeugodacus tau* within the continental United States

Endangered area component	**Evidence and notes**
Climatic suitability	*Zeugodacus tau* is primarily distributed in tropical and subtropical areas in **Asia:** Bangladesh, Bhutan, Brunei, Cambodia, China (Chongqing, Fujian, Guangdong, Guangxi, Guizhou, Hainan, Hong Kong, Hubei, Shaanxi, Sichuan, Tibet, Yunnan, Zhejiang), India, Andaman Islands, Nicobar Islands, Indonesia, Laos, Malaysia, Myanmar, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Taiwan, Thailand, and Vietnam (CABI, 2022b; Gould and Raga, 2002; Lin et al., 2005; White and Elson-Harris, 1994). The reported distribution primarily encompasses Plant Hardiness Zones 6-11 (Takeuchi et al., 2018).
Hosts in PRA area	*Zeugodacus tau* appears to prefer fruits of Cucurbitaceae (Allwood, 1999; Lin et al., 2005; White and Elson-Harris, 1994), but it also infests fruits of several other plant families, including Fabaceae, Loganiaceae, Moraceae, Myrtaceae, Sapotaceae, Vitaceae (Allwood et al., 1999), Solanaceae (Khan et al., 2011), Passifloraceae (Hasyim et al., 2016) and Rutaceae (Lin et al., 2005; Wu et al., 2011).
Economically important hosts at risk[a]	Economically important hosts at risk in the PRA area include watermelon (*Citrullus lanatus*), muskmelon (*Cucumis melo*), cucumber (*Cucumis sativus*), squash and pumpkin (*Cucurbita maxima, C. moschata, C. pepo*), tomato (*Solanum lycopersicum*) and *Citrus* spp. (Allwood et al., 1999; Khan et al., 2011; Lin et al., 2005; USDA-NRCS, 2022; Wu et al., 2011).
Potential consequences on economically important hosts at risk	This pest is likely to cause unacceptable consequences because *Z. tau* is identified as an economically important pest in many countries (Hasyim et al., 2016; Khan et al., 2011; Yang et al., 1994); in addition, Tephritidae oviposit eggs into fruit, which ruins marketability and can have international trade impacts.
Endangered Area	*Zeugodacus tau* is polyphagous; therefore, many hosts exist as reservoirs in Plant Hardiness Zones 6-11.

a As defined by ISPM No. 11, supplement 2, "economically" important hosts refers to both commercial and non-market (environmental) plants (IPPC, 2017).

The likelihood of entry of *Zeugodacus tau* into the endangered area via mangoes imported from India

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Pest prevalence on the harvested commodity	Low	Moderate	We found little evidence that *Z. tau* uses mango fruit as a natural host. Nakahara et al. (2018) published the first comprehensive fruit fly survey in Myanmar mango orchards. During the survey, 70,000 individual fruit flies representing twenty species were detected in mango orchards using fruit fly lures. Adult *Z. tau* were caught in traps, but none were detected in mango fruit (Nakahara et al., 2019). In the lab, Lin et al. (2005) was able to raise individuals from mangoes, but without field evidence we considered the pest prevalence on the harvest commodity as low, with moderate uncertainty.
Likelihood of surviving post-harvest processing before shipment	Low	Negligible	The only post-harvest processing we considered as a mitigation is washing due to the necessity to wash *Mangifera* sap from the fruit. However, washing will likely have little effect on the larvae inside the fruit; therefore, we maintained the risk rating.
Likelihood of surviving transport and storage conditions of the consignment	Low	Negligible	We did not consider any transport or storage conditions for this assessment.
Overall Likelihood of Entry	Low	N/A	N/A

The likelihood of establishment of *Zeugodacus tau* in the endangered area via mangoes imported from India

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	High	Low	*Zeugodacus tau* can disperse to and infest a wide range of host plants, including cultivated and naturalized species in the continental United States (CABI, 2022b). Also, multiple fruit fly larvae can infest a single fruit, increasing the likelihood of individuals finding mates. Domestic fruit growers do not currently control any *Zeugodacus* (*Bactrocera*) species and would likely have to change production practices should *Z. tau* become established. Adults of some species of *Zeugodacus* (*Bactrocera*) can live for several months (White and Elson-Harris, 1994; Christenson and Foote, 1960). In addition, *Zeugodacus* (*Bactrocera*) species can fly long distances (Koyama et al., 2004) and due to *Z. tau*'s wide temperature threshold (6-11) and host suitability, it is reasonable that individuals could find a mate and host in the United States. Therefore, the introduction of *Z. tau* into the continental United States is likely to result in significant yield losses and increases in costs of production beyond normal fluctuations.

The likelihood of introduction (combined likelihoods of entry and establishment) of *Zeugodacus tau* into the endangered area via mangoes imported from India is Medium.

3.2.7. *Lasiodiplodia hormozganensis* Abdollahzadeh, Zare & A.J.L. Phillips (Botryosphaeriales: Botryosphaeriaceae)

This pathogen causes stem-end rot and dieback of mangoes. Impacts include post-harvest fruit rot and dieback of infected plants which might lead to the application of several fungicides as a way of management and control.

The endangered area for *Lasiodiplodia hormozganensis* within the continental United States.

Endangered area component	Evidence and notes
Climatic suitability	**Asia:** China, Iran, Malaysia, Oman, United Arab Emirates; **Europe:** Italy; **North America:** Haiti, Puerto Rico; **Oceania:** Australia; **South America:** Brazil (Burgess et al., 2019; Farr and Rossman, 2021; Kee et al., 2019; Machado et al., 2019; Serrato-Diaz et al., 2020).

Endangered area component	**Evidence and notes**
Hosts in PRA area	**Agavaceae**: *Sansevieria trifasciata* (vier's bowstring hemp) (Kee et al., 2019); **Anacardiaceae**: *Mangifera indica* (mango) (Marques et al., 2013); **Annonaceae**: *Annona squamosa* (sugar apple) (Machado et al., 2019); **Arecaceae**: *Phoenix dactylifera* (date palm) (Al-Sadi et al., 2013); **Euphorbiaceae**: *Manihot esculenta* (cassava) (Brito et al., 2020), *Ricinus communis* (castorbean); **Caricaceae**: *Carica papaya* (papaya) (Netto et al., 2014); **Rutaceae**: *Citrus* × *aurantiifolia* (key lime) (Al-Sadi et al., 2014); **Sapindaceae**: *Dimocarpus longan* (longan) (Serrato-Diaz et al., 2020); **Solanaceae**: *Solanum melongena* (eggplant) (Fayette et al., 2019); **Vitaceae**: *Vitis vinifera* (grape) (Correia et al., 2016) (Farr and Rossman, 2021).
Economically important hosts at risk[a]	Economically important host is grape. There is a limited production of mango (3329 acres) in the continental United States in Florida, California, Hawaii, and Texas (NASS, 2021).
Potential consequences on economically important hosts at risk	This pest is likely to cause unacceptable consequences because it causes dieback on economically important hosts (Correia et al., 2016).
Endangered Area	The endangered area includes areas corresponding to Plant Hardiness Zones 4 to 12 in the continental United States (Takeuchi et al., 2018; USDA NRCS, 2021).

a As defined by ISPM No. 11, supplement 2, "economically" important hosts refers to both commercial and non-market (environmental) plants (IPPC, 2017).

The likelihood of entry of *Lasiodiplodia hormozganensis* into the endangered area via mango imported from India.

Risk Element	**Risk Rating**	**Uncertainty Rating**	**Evidence for rating (and other notes as necessary)**
Pest prevalence on the harvested commodity	Low	Moderate	There has been only one report of *L. hormozganensis* affecting mango fruits causing circular necrotic lesions (Marques et al., 2013).
Likelihood of surviving post-harvest processing before shipment	Medium	Low	Severely diseased fruit would not be harvested for the export market. Washing would not affect the prevalence of this disease. Other post-harvest procedures were not considered. However, latent infections could be present (Ploetz et al., 1994). We raised the rating because even though visibly infected fruit should not be harvested, latent infections could be present and post-harvest disease may occur.

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of surviving transport and storage conditions of the consignment	Medium	Low	Transport and storing conditions were not considered. Therefore, this rating remains unchanged.
Overall Likelihood of Entry	Medium	N/A	N/A

The likelihood of establishment of *Lasiodiplodia hormozganensis* in the endangered area via mango imported from India.

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	Low	Low	*Lasiodiplodia* spp. colonizes the inflorescence and reaches the stem end of the fruit, several weeks after flowering. Stem end infections then remain quiescent until the fruit ripens. Under natural conditions, stem end rot symptoms appear between 3 and 7 days after harvest, but symptoms can be delayed by cold treatment (Ploetz et al., 1994), which means that the pathogen may enter new areas through the movement of infected fruit. Such conditions may be encountered during storage and transport. The conidia and ascospores of species in the Botryosphaeriaceae can be dispersed with rain or irrigation splash and may also become airborne (Copes and Hendrix Jr, 2004). Establishment is unlikely in the fruit for consumption pathway because infested fruit is unlikely to be in close enough proximity with host material in the endangered area for spread to occur.

The likelihood of introduction (combined likelihoods of entry and establishment) of *Lasiodiplodia hormozganensis* into the endangered area via mango imported from India is Low.

3.2.8. *Lasiodiplodia pseudotheobromae* A.J.L. Phillips, A. Alves & Crous (Botryosphaeriales: Botryosphaeriaceae)

This pathogen causes stem cankers, dieback, and stem end rot of mangoes. Impacts include reductions in yield, post-harvest fruit rot, dieback and decline of infected plants, and increasing need for fungicides to control these pathogens.

Defining the endangered area for *Lasiodiplodia pseudotheobromae* within the continental United States.

Endangered area component	Evidence and notes
Climatic suitability	*Lasiodiplodia pseudotheobromae* is present in **Africa:** Democratic Republic of the Congo, Egypt, Guinea-Bissau, Mozambique, Namibia, South Africa, Tunisia **Asia:** China, India, Iran, Korea, Laos, Malaysia, Pakistan, Thailand, Turkey; **Central America:** Costa Rica; **Europe:** Spain, and the Netherlands; **North America:** Mexico, and Puerto Rico; **Oceania:** Australia; **South America:** Brazil, Ecuador, Peru, Suriname, and Venezuela (CABI, 2022b; Farr and Rossman, 2021; Sakalidis et al., 2011; Serrato-Diaz et al., 2020). Based on a comparison of this distribution with a global map of Plant Hardiness Zones (Takeuchi et al., 2018), we estimated it could establish in Plant Hardiness Zones 4-11 in the continental United States.
Hosts in PRA area	The hosts for *L. pseudotheobromae* include **Anacardiaceae**: *Mangifera indica* (mango); **Annonaceae**: *Annona squamosa* (sugar apple); **Arecaceae**: *Cocos nucifera* (coconut palm); **Combretaceae**: *Terminalia catappa* (tropical almond); **Euphorbiaceae**: *Manihot esculenta* (cassava); **Lauraceae**: *Persea americana* (avocado); **Myrtaceae**: *Eucalyptus grandis* (grand eucalyptus), **Rosaceae**: *Malus pumila* (paradise apple) (Xue et al., 2019), *Prunus persica* var. *nucipersica* (nectarine) (Endes et al., 2016), *Rosa* sp. (rose); **Rutaceae**: *Citrus × limon* (lemon), *Citrus reticulata* (tangerine); **Vitaceae**: *Vitis vinifera* (grape) (Correia et al., 2013) (Farr and Rossman, 2021; Sakalidis et al., 2011).
Economically important hosts at risk[a]	Economically important hosts include apple, avocado, coconut, grape, lemon, peach, and nectarine. There is a limited production of mango (3329 acres) in the continental United States in Florida, California, and Texas (NASS, 2021).
Pest potential on economically important hosts at risk	This pest is likely to cause unacceptable consequences because it causes stem cankers, dieback, and stem end rot on economically important hosts at risk. Impacts include reductions in yield, post-harvest fruit rot, dieback and decline of infected plants (Correia et al., 2013; Endes et al., 2016; Sakalidis et al., 2011; Xue et al., 2019).

Endangered area component	Evidence and notes
Endangered Area	The endangered area includes areas corresponding to Plant Hardness Zones 6 to 12 in the continental United States where hosts occur.

a As defined by ISPM No. 11, supplement 2, "economically" important hosts refers to both commercial and non-market (environmental) plants (IPPC, 2017).

The likelihood of entry of *Lasiodiplodia pseudotheobromae* into the endangered area via mango imported from India.

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Pest prevalence on the harvested commodity	High	Low	Mango is a host for *L. pseudotheobromae,* and the fruit is often affected, causing fruit rot (Ismail et al., 2012).
Likelihood of surviving post-harvest processing before shipment	Medium	Low	Severely diseased fruit would not be harvested for the export market. Washing would not affect the prevalence of this disease. Other post-harvest procedures were not considered. However, latent infections could be present (Ploetz et al., 1994). We reduced the rating because visibly infected fruit would be removed from the pathway.
Likelihood of surviving transport and storage conditions of the consignment	Medium	Low	Transport and storing conditions were not considered. Therefore, this rating remains unchanged.
Overall Likelihood of Entry	Medium	N/A	N/A

The likelihood of establishment of *Lasiodiplodia pseudotheobromae* in the endangered area via mango imported from India.

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	Low	Low	*Lasiodiplodia pseudotheobromae* colonizes the inflorescence and reaches the stem end of the fruit several weeks after flowering. Stem end infections, then, remain quiescent until the fruit ripens. Under natural conditions, stem end rot symptoms appear between 3 and 7 days after harvest, but symptoms can be delayed by cold treatment (Ploetz et al., 1994), which means that the pathogen may enter new areas through the movement of infected fruit. Such conditions may be encountered during storage and transport. The conidia and ascospores of species in the Botryosphaeriaceae can be dispersed with rain or irrigation splash and may also become airborne (Copes and Hendrix Jr, 2004); however, establishment is unlikely in the fruit for consumption pathway because infested fruit is unlikely to be in close enough proximity with host material in the endangered area for spread to occur.

The likelihood of introduction (combined likelihoods of entry and establishment) of *Lasiodiplodia pseudotheobromae* into the endangered area via mango imported from India is Low.

3.2.9. *Nattrassia mangiferae* (Syd. & P. Syd.) B. Sutton & Dyko (Botryosphaeriales: Botryosphaeriaceae)

This pathogen causes postharvest disease, including stem cankers, dieback, and stem end rot of mangoes. Impacts include reductions in yield, post-harvest fruit rot, dieback and decline of infected plants, and an increasing need for fungicides to control these pathogens.

Defining the endangered area for *Nattrassia mangiferae* within the continental United States.

Endangered area component	Evidence and notes
Climatic suitability	*Nattrassia mangiferae* is present in **Africa:** Benin, Democratic Republic of the Congo, Egypt, Ethiopia, Gambia, Ghana, Guinea-Bissau, Mali, Mozambique, Niger, Nigeria, Senegal, Sierra Leone, South Africa, Sudan, Tanzania, Tunisia, Uganda, and Zimbabwe; **Asia:** Bangladesh, Bhutan, Brunei, China, India, Iran, Iraq, Israel, Kuwait, Lebanon, Malaysia, Myanmar, Pakistan, Saudi Arabia, and Sri Lanka; **Caribbean:** Cuba, and Jamaica; **Europe:** Cyprus, Greece, Portugal, Sweden, and the United Kingdom; **North America:** Canada, United States (Arizona, California, Hawaii, Washington, and West Virginia); **Oceania:** Australia, Fiji and Solomon Islands; **South America:** Brazil, and Venezuela (CABI, 2022b; Farr and Rossman, 2021; Heath et al., 2011; HerbIMI, 2021; Lin et al., 2019; Mackinaite, 2010; Phillips et al., 2013). Based on a comparison of this distribution with a global map of Plant Hardiness Zones (Takeuchi et al., 2018), we estimate it could establish in Plant Hardiness Zones 6-12 in the continental United States.
Hosts in PRA area	The hosts for *Nattrassia mangiferae* include **Anacardiaceae**: *Mangifera indica* (mango); **Brassicaceae**: *Armoracia rusticana* (horseradish); **Convolvulaceae**: *Ipomoea batatas* (sweet potato); **Euphorbiaceae**: *Manihot esculenta* (cassava); **Fagaceae**: European chestnut (*Castanea sativa*); **Juglandaceae**: *Juglans regia* (walnut); **Myrtaceae**: *Eucalyptus grandis* (grand eucalyptus), Eucalyptus (*Eucalyptus* spp.), *Psidium guajava* (guava); **Plantaginaceae**: *Plantago* spp. (plantain); **Poaceae**: *Saccharum officinarum* (sugarcane); **Rosaceae**: *Prunus armeniaca* (apricot); **Rutaceae**: *Citrus × limon* (lemon), *Citrus paradisi* (grapefruit), *Citrus* spp. (citrus), *Citrus × paradisi* (grapefruit); **Vitaceae**: *Vitis vinifera* (grape) (CABI, 2022b; Farr and Rossman, 2021; HerbIMI, 2021; Saaiman, 1996).
Economically important hosts at risk[a]	Economically important hosts include citrus and grape. There is a limited production of mango (3329 acres) in the continental United States in Florida, California, Hawaii, and Texas (NASS, 2021).
Pest potential on economically important hosts at risk	This pest is likely to cause unacceptable consequences. *Nattrassia mangiferae* is an important pathogen of mango, causing blossom blight, stem-end dieback and soft brown fruit rot (Ni et al., 2012; Saaiman, 1996). On important hosts at risk, it causes dieback on grapevine (Dissanayake et al., 2015). There is not enough evidence of damage or symptoms for *Citrus* spp., therefore, there is uncertainty on the pest potential on this host.
Endangered Area	The endangered area includes areas corresponding to Plant Hardiness Zones 6 to 12 in the continental United States where hosts occur.

a As defined by ISPM No. 11, supplement 2, "economically" important hosts refers to both commercial and non-market (environmental) plants (IPPC, 2017).

The likelihood of entry of *Nattrassia mangiferae* into the endangered area via mango imported from India.

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Pest prevalence on the harvested commodity	High	Low	Mango is a host for *Nattrassia mangiferae,* and the fruit is often affected, causing blossom blight, stem-end dieback and soft brown fruit rot (Ni et al., 2012; Saaiman, 1996).
Likelihood of surviving post-harvest processing before shipment	Medium	Low	Severely diseased fruit would not be harvested for the export market. Washing would not affect the prevalence of this disease. Other post-harvest procedures were not considered. However, latent infections could be present (Ploetz et al., 1994). We reduced the rating by one because visibly infected fruit should not be harvested.
Likelihood of surviving transport and storage conditions of the consignment	Medium	Low	Transport and storing conditions were not considered. Therefore, this rating remains unchanged.
Overall Likelihood of Entry	Medium	N/A	N/A

The likelihood of establishment of *Nattrassia mangiferae* in the endangered area via mango imported from India.

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	Low	Low	*Nattrassia mangiferae* colonizes the inflorescence and then, remains quiescent until the fruit ripens, at which point causes water-soaked lesions that radiate from the stem end in fingerlike projections (Ploetz et al., 1994). Under natural conditions stem-end rot symptoms appear between 3 and 7 days after harvest, but symptoms can be delayed by cold treatment (Ploetz et al., 1994), which means that the pathogen may enter new areas through the movement of infected fruit, as such conditions may be encountered during storage and transport. The conidia and ascospores of species in the Botryosphaeriaceae can be dispersed with rain or irrigation splash and may also become airborne (Copes and Hendrix Jr, 2004); however, fruit whose intended use is consumption is unlikely to be introduced into commercial production areas, and are not likely to come in contact with host materials in the endangered area.

The likelihood of introduction (combined likelihoods of entry and establishment) of *Nattrassia mangiferae* into the endangered area via mango imported from India is Low.

3.2.10. *Phomopsis mangiferae* S. Ahmad (Diaporthales: Diaporthaceae)

Phomopsis mangiferae causes twigs and leaves spots and postharvest disease such as stem-end rot of mangoes (Johnson et al., 1991b; Ko et al., 2009). Impacts include post-harvest fruit rot and increasing need for fungicides to control this pathogen.

Defining the endangered area for *Phomopsis mangiferae* within the continental United States.

Endangered area component	Evidence and Notes
Climatic suitability	**Asia:** Brunei Darussalam, China, India, Japan, Malaysia, Pakistan, Taiwan; **Caribbean:** Cuba; **Oceania:** Australia; **South America:** Brazil (Farr and Rossman, 2021; Ko et al., 2009; Luo et al., 2004). Based on a comparison of this distribution with a global map of Plant Hardiness Zones (Takeuchi et al., 2018), we estimate it could establish in Plant Hardiness Zones 8-12 in the continental United States.
Hosts in PRA area	The hosts for *Phomopsis mangiferae* include **Anacardiaceae**: *Mangifera indica* (mango); **Myrtaceae**: *Psidium guajava* (guava) (Farr and Rossman, 2021; Ko et al., 2009; Luo et al., 2004).
Economically important hosts at risk[a]	There is a limited production of mango (3329 acres) in the continental United States in Florida, California, and Texas (NASS, 2021).
Pest potential on economically important hosts at risk	This pest is likely to cause unacceptable consequences. *Phomopsis mangiferae* causes stem-end rot on mangoes (Johnson et al., 1991b).
Endangered Area	The endangered area includes areas corresponding to Plant Hardiness Zones 6 to 13 in the continental United States where hosts occur.

a As defined by ISPM No. 11, supplement 2, "economically" important hosts refers to both commercial and non-market (environmental) plants (IPPC, 2017).

The likelihood of entry of *Phomopsis mangiferae* into the endangered area via mango imported from India.

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Pest prevalence on the harvested commodity	Low	Moderate	*Phomopsis mangiferae* has been reported affecting mango fruits and consequently, causing stem end rot which appear as light-to-dark brown lesions surrounding peduncles or dark circular lesions at the stem end (Johnson et al., 1991b; Ko et al., 2009; Luo et al., 2004).
Likelihood of surviving post-harvest processing before shipment	Medium	Low	Severely diseased fruit would not be harvested for the export market (Ko et al., 2009). Washing would not affect the prevalence of this disease. Other post-harvesting processes were not considered. However, latent infections could be present (Luo et al., 2019; Schilder, 2006). We raised the rating because, even though, visibly infected fruit should not be harvested, latent infections could be present and post-harvest disease may occur.

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of surviving transport and storage conditions of the consignment	Medium	Low	Transport and storing conditions were not considered. Therefore, this rating remains unchanged.
Overall Likelihood of Entry	Medium	N/A	N/A

The likelihood of establishment of *Phomopsis mangiferae* in the endangered area via mango imported from India.

Risk Element	Risk Rating	Uncertainty Rating	Evidence for rating (and other notes as necessary)
Likelihood of Establishment	Low	Low	Under natural conditions stem end rot symptoms appear approximately one week after harvest or maybe longer because it is considered a slow spreading fungus in storage (Johnson et al., 1991b), which means that the pathogen may enter new areas through the movement of infected fruit, as such conditions may be encountered during storage and transport. *Phomopsis* spp. pycnidiospores can be dispersed with splashing rain (Javadi and Banihashemi, 2008; Manda et al., 2020; Rosskopf et al., 2000); however, fruit whose intended use is consumption is unlikely to be introduced into commercial production areas, and are not likely to come in contact with host material in the endangered area.

The likelihood of introduction (combined likelihoods of entry and establishment) of *Phomopsis mangiferae* into the endangered area via mango imported from India is Low.

4. Summary

Of the organisms associated with mangoes worldwide and present in the export area, we identified 14 organisms that are quarantine pests for the continental United States. These pests are likely to meet the threshold for unacceptable consequences in the PRA area, and have a reasonable likelihood of following the commodity pathway. Thus, these pests are candidates for risk management. These results represent a baseline estimate of the risks associated with the import commodity pathway as described in section 1.4.

Table 3. Summary of pests that met the threshold for unacceptable consequences of introduction, have a reasonable likelihood of following the commodity pathway, and thus, are candidates for risk management.

Pest type	Scientific name	Likelihood of Introduction	Uncertainty statement (optional)[a]
Arthropoda	*Sternochetus frigidus* (F.)	Low	N/A
Arthropoda	*Sternochetus mangiferae* (F.)	Low	N/A
Arthropoda	*Bactrocera caryeae* (Kapoor)	Medium	N/A
Arthropoda	*Bactrocera correcta* (Bezzi)	High	N/A
Arthropoda	*Bactrocera frauenfeldi* (Schin.)	Medium	N/A
Arthropoda	*Dacus ciliatus* Loew	High	N/A
Arthropoda	*Zeugodacus tau* Walker	Medium	N/A
Fungi	*Lasiodiplodia hormozganensis* Abdollahzadeh, Zare & A.J.L. Phillips	Low	N/A
Fungi	*Lasiodiplodia pseudotheobromae* A.J.L. Phillips, A. Alves & Crous	Low	N/A
Fungi	*Nattrassia mangiferae* (Syd. & P. Syd.) B. Sutton & Dyko	Low	N/A
Fungi	*Phomopsis mangiferae* S. Ahmad	Low	N/A

[a]The uncertainty statement, if included, identifies the most important source(s) of uncertainty.

The following organisms were found 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 and territories and have domestic regulations in place. Therefore, they are candidates for risk mitigation.

Pest type	Scientific name	Code of Federal Regulation
Arthropoda	*Bactrocera dorsalis* Hendel	7CFR § 301.32, 2021
Arthropoda	*Bactrocera zonata* (Saunders)	7CFR § 301.32, 2021
Arthropoda	*Zeugodacus cucurbitae* (Coquillett)	7CFR § 301.32, 2021

Our assessment of risk is contingent on the application of all components of the pathway as described in section 1.4. Appropriate phytosanitary measures to mitigate pest risk are addressed separately from this document.

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6. Appendix: Pests with non-quarantine status

We found evidence that the organisms listed below are associated with mangoes and present in India. Because these organisms are not of quarantine significance for the continental United States (ARM, 2021; as defined by ISPM 5, IPPC, 2018), we did not list them in Table 1 nor did we intensively evaluate their association with mangoes and their presence in India. Therefore, the organisms are considered to have only "potential" association with the commodity and presence in India.

We listed these organisms along with the references supporting their potential presence in India, their presence in the continental United States (if applicable), and their potential association with mangoes. If any of the organisms are **not** present in the continental 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, 2021).

Organism	In India	In U.S.	Host Association	Notes
MITE: Trombidiformes: Cheyletidae *Cheletogenes ornatus* Canestrini & Fanzago	Gupta, 1985	Gupta, 1985	Gupta, 1985	
MITE: Trombidiformes: Eriophyidae *Eriophyes mangiferae* Sayed; syn. *Aceria mangiferae* Sayed	Dhooria and Bhullar, 2003; Gupta, 1985	Reddy et al., 2020	Dhooria and Bhullar, 2003	
MITE: Trombidiformes: Tarsonemidae *Polyphagotarsonemus latus* (Banks)	CABI, 2022b	CABI, 2022b	CABI, 2022b	
MITE: Trombidiformes: Tarsonemidae *Brevipalpus californicus* (Banks)	CABI, 2022b	CABI, 2022b	CABI, 2022b	
MITE: Trombidiformes: Tetranychidae *Oligonychus coffeae* (Nietner)	CABI, 2022b	CABI, 2022b	CABI, 2022b	
INSECT: Coleoptera: Latridiidae *Corticarina gibbosa* Herbst	Tandon and Lal, 1977	Butani, 1993	Tandon and Lal, 1977	Entire genus is non-actionable (ARM, 2021).
INSECT: Coleoptera: Nitidulidae *Carpophilus dimidiatus* (F.)	Butani, 1993; CABI, 2022b	CABI, 2022b	Butani, 1993	

Organism	In India	In U.S.	Host Association	Notes
INSECT: Coleoptera: Silvanidae *Oryzaephilus mercator* (Fauval)	CABI, 2022b	CABI, 2022b	Polyphagous stored product pest (CABI, 2022b)	
INSECT: Hemiptera: Aleyrodidae *Aleurodicus dispersus* Russell	CABI, 2022b	CABI, 2022b	Butani, 1993	
INSECT: Hemiptera: Aleyrodidae *Aleurothrixus floccosus* Maskell	CABI, 2022b	CABI, 2022b	Butani, 1993	
INSECT: Hemiptera: Aphididae *Aphis gossypii* Glover	CABI, 2022b; Srivastava, 1997)	CABI, 2022b	Srivastava, 1997)	
INSECT: Hemiptera: Aphididae *Macrosiphum euphorbiae* (Thomas)	CABI, 2022b	GBIF.org, 2022	Butani, 1993	
INSECT: Hemiptera: Aphididae *Toxoptera aurantii* (Boyer de Fonscolombe)	CABI, 2022b	CABI, 2022b	Butani, 1993	
INSECT: Hemiptera: Coccidae *Ceroplastes ceriferus* (Anderson)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Coccidae *Ceroplastes floridensis* Comstock	Srivastava, 1997	Srivastava, 1997	Srivastava, 1997	
INSECT: Hemiptera: Coccidae *Ceroplastes rusci* (L.)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Coccidae *Coccus hesperidum* L.	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Coccidae *Coccus longulus* (Douglas)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Coccidae *Coccus viridis* (Green)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	

Organism	In India	In U.S.	Host Association	Notes
INSECT: Hemiptera: Coccidae *Eucalymnatus tessellatus* (Signoret)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Coccidae *Kilifia acuminata* (Signoret)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Coccidae *Milviscutulus mangiferae* (Green); syn. *Lecanium mangiferae* Green, *Protopulvianria mangiferae* Green	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Coccidae *Parasaissetia nigra* (Nietner)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Coccidae *Parthenolecanium persicae* (F.)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Coccidae *Protococcus acutissimus* (Green)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Coccidae *Pulvinaria psidii* Maskell	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Coccidae *Saissetia coffeae* (Walker)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Coccidae *Saissetia miranda* (Cockerell & Parrott)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Coccidae *Saissetia oleae* Bernard; syn. *Parlatoria oleae* (Colv.)	Garcia Morales et al., 2016; Pruthi and Batra, 1960	Garcia Morales et al., 2016	Garcia Morales et al., 2016; Pruthi and Batra, 1960	
INSECT: Hemiptera: Coccidae *Vinsonia stellifera* (Westwood)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	

Organism	In India	In U.S.	Host Association	Notes
INSECT: Hemiptera: Diaspididae[3] *Aonidiella aurantii* (Maskell)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Aonidiella citrina* (Coquillett)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Aonidiella inornata* McKenzie	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Aonidiella orientalis* (Newstead)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Aspidiotus destructor* Signoret	Garcia Morales et al., 2016; Pruthi and Batra, 1960; Srivastava, 1997	Garcia Morales et al., 2016; Srivastava, 1997	Garcia Morales et al., 2016; Pruthi and Batra, 1960; Srivastava, 1997	
INSECT: Hemiptera: Diaspididae *Aspidiotus nerii* Bouché	Suresh and Mohanasundaram, 1996	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
Aulacaspis rosae (Bouché)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Aulacaspis tubercularis* Newstead	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Aulacaspis vitis* (Green)	Garcia Morales et al., 2016	N/A see footnote	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Chrysomphalus aonidum* (L.)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Chrysomphalus dictyospermi* (Morgan)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	

[3] All armored scales (Diaspididae) are non-actionable at U.S. ports of entry on fruits and vegetables for consumption (NIS, 2008). Therefore, we did not need to determine whether they occur in the United States.

Organism	In India	In U.S.	Host Association	Notes
INSECT: Hemiptera: Diaspididae *Chrysomphalus pinnulifer* (Maskell)	Garcia Morales et al., 2016	N/A see footnote	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Hemiberlesia lataniae* (Signoret)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Hemiberlesia rapax* (Comstock)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Ischnaspis longirostris* (Signoret)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Lepidosaphes beckii* (Newman)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Lepidosaphes gloverii* (Packard)	Garcia Morales et al., 2016; Pruthi and Batra, 1960	Garcia Morales et al., 2016	Garcia Morales et al., 2016; Pruthi and Batra, 1960	
INSECT: Hemiptera: Diaspididae *Lepidosaphes pallidula* (Williams); syn. *Insulaspis palldula* Williams	Garcia Morales et al., 2016	N/A see footnote	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Lepidosaphes shikohabadensis* Dutta	Garcia Morales et al., 2016	N/A see footnote	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Lepidosaphes tapleyi* Williams	Garcia Morales et al., 2016	N/A see footnote	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Lindingaspis floridana* Ferris	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Lindingaspis greeni* (Brain & Kelly)	Garcia Morales et al., 2016	N/A see footnote	Butani, 1993	

Organism	**In India**	**In U.S.**	**Host Association**	**Notes**
INSECT: Hemiptera: Diaspididae *Lindingaspis rossi* (Maskell)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Parlatoria camelliae* Comstock	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Parlatoria cinerea* Hadden	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Parlatoria crypta* Mckenzie	Garcia Morales et al., 2016	N/A see footnote	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Parlatoria oleae* (Colvée)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Parlatoria pergandii* Comstock	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Pinnaspis aspidistrae* (Signoret)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Pinnaspis strachani* (Cooley)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Pseudaonidia trilobitiformis* (Green)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Pseudaulacaspis barberi* (Green)	Garcia Morales et al., 2016	N/A see footnote	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Pseudaulacaspis cockerelli* (Cooley); syn. *Phenacaspis cockerelli* (Cooley)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	

Organism	In India	In U.S.	Host Association	Notes
INSECT: Hemiptera: Diaspididae *Pseudaulacaspis pentagona* (Targioni-Tozzetti)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Radionaspis indica* (Marlatt)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Diaspididae *Radionaspis indica* (Marlatt); syn. *Leucaspis indica* Marlatt	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Monophlebidae *Icerya purchasi* Maskell	Garcia Morales et al., 2016; Srivastava, 1997	Garcia Morales et al., 2016; Srivastava, 1997	Garcia Morales et al., 2016; Srivastava, 1997	
INSECT: Hemiptera: Pentatomidae *Nezara viridula* (L.)	CABI, 2022b	CABI, 2022b	Butani, 1993	
INSECT: Hemiptera: Pseudococcidae *Dysmicoccus brevipes* (Cockerell)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Pseudococcidae *Ferrisia virgata* (Cockerell)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Pseudococcidae *Nipaecoccus nipae* (Maskell)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Pseudococcidae *Nipaecoccus viridis* (Newstead)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Pseudococcidae *Planococcus citri* (Risso)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Hemiptera: Pseudococcidae *Planococcus ficus* (Signoret)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	

Organism	In India	In U.S.	Host Association	Notes
INSECT: Hemiptera: Pseudococcidae *Pseudococcus longispinus* (Targioni-Tozzetti)	Garcia Morales et al., 2016	Garcia Morales et al., 2016	Garcia Morales et al., 2016	
INSECT: Lepidoptera: Gelechiidae *Anarsia lineatella* Zeller	CABI, 2022b; Reddy et al., 2018	CABI, 2022b	Reddy et al., 2018	
INSECT: Lepidoptera: Pyralidae *Cadra cautella* Walker; syn. *Cadra defecta* Walker	CABI, 2022b	CABI, 2022b	Reddy et al., 2018	
INSECT: Thysanoptera: Aeolothripidae *Aeolothrips collaris* (Priesner)	Reddy et al., 2018	GBIF.org, 2022	Reddy et al., 2018	
INSECT: Thysanoptera: Thripidae *Anaphothrips sudanensis* (Tybom)	Reddy et al., 2018	GBIF.org, 2022	Reddy et al., 2018	
INSECT: Thysanoptera: Thripidae *Frankliniella schultzei* (Trybom)	CABI, 2022b	GBIF.org, 2022	CABI, 2022b	
INSECT: Thysanoptera: Thripidae *Retithrips syriacus* (Mayet)	CABI, 2022b	GBIF.org, 2022	CABI, 2022b	
INSECT: Thysanoptera: Thripidae *Scirtothrips dorsalis* (Hood)	Reddy et al., 2018; Zaman, 1994	GBIF.org, 2022	Reddy et al., 2018; Zaman, 1994	
INSECT: Thysanoptera: Thripidae *Selenothrips rubrocinctus* (Giard)	Reddy et al., 2018	GBIF.org, 2022	Reddy et al., 2018	
INSECT: Thysanoptera: Thripidae *Thrips hawaiiensis* (Morgan)	Srivastava, 1997	Srivastava, 1997	Srivastava, 1997	
BACTERIUM *Pseudomonas syringae* pv. *syringae* van Hall	CABI, 2022b	Trantas et al., 2017	Trantas et al., 2017	

Organism	In India	In U.S.	Host Association	Notes
FUNGUS *Aithaloderma citri* (Briosi & Pass.) Woron., syn.: *Capnodium citri* Berk. & Desm. *Pleosphaeria citri* Amaud	Rao, 1969	French, 1989	Farr and Rossman, 2021	
FUNGUS *Alatospora acuminata* Ingold	Ghate and Sridhar, 2015	Shearer and Lane, 1983	Farr and Rossman, 2021; Minter et al., 2001	
FUNGUS *Albonectria rigidiuscula (*Berk. & Broome) Rossman & Samuels., syn.: *Calonectria rigidiuscula* (Berk. & Broome) Sacc. *Fusarium decemcellulare* C. Brick	Wadia and Manoharachary, 1980	Ploetz et al., 1996	Ploetz et al., 1996	
FUNGUS *Alternaria alternata (*Fr.: Fr.) Keissl., syn.: *Alternaria tenuis* Nees; *Alternaria tenuissima* (Nees & T. Nees: Fr.) Wiltshire	Kant et al., 2020	Alfieri et al., 1984; USDA-ARS, 1960	Haggag, 2010	
FUNGUS *Alternaria infectoria* E. G. Simmons	Sidhu and Behl, 1991	Zhu and Xiao, 2015	Rivera-Vargas et al., 2006	
FUNGUS *Armillaria mellea* (Vahl: Fr.) P. Kumm., syn.: *Armillariella mellea* (Vahl : Fr.) P. Karst.	Spaulding, 1961	French, 1989; USDA-ARS, 1960	Spaulding, 1961	
FUNGUS *Athelia rolfsii (Curzi)* C.C. Tu & Kimbr., syn.: *Corticium rolfsii* Curzi; *Sclerotium rolfsii* Sacc.	Farr and Rossman, 2021	Farr and Rossman, 2021	Farr and Rossman, 2021	
FUNGUS *Aureobasidium pullulans* (de Bary) G. Arnaud	Sarbhoy et al., 1975	Farr and Rossman, 2021	Sarbhoy et al., 1975	

Organism	In India	In U.S.	Host Association	Notes
FUNGUS *Barriopsis fusca* (N.E. Stevens) A.J.L. Phillips, A. Alves & Crous., syn.: *Botryosphaeria disrupta* (Berk. & M.A. Curtis) Arx & E. Müll	Pande, 2008	Alfieri et al., 1984; USDA-ARS, 1960	Alfieri et al., 1984	
FUNGUS *Beltrania rhombica* Penz. Syn.: *Beltrania indica* Subram.	Pirozynski and Patil, 1970	Sutton, 1978	Pirozynski and Patil, 1970	
FUNGUS *Beltraniella portoricensis* (F. Stevens) Piroz. & S.D. Patil., syn.: *Ellisiopsis gallesiae* Bat. & Nascim.	Pirozynski and Patil, 1970	Delgado, 2008	Milagres et al., 2018	
FUNGUS *Botryosphaeria dothidea* (Moug.: Fr.) Ces. & De Not., syn.: *Botryosphaeria berengeriana* De Not. *Fusicoccum aesculi* Corda	Rabari et al., 2016	Alfieri et al., 1984; French, 1989	Rabari et al., 2016	
FUNGUS *Botryosphaeria quercuum* (Schwein.: Fr.) Sacc	Pande, 2008	Alfieri et al., 1984	Alfieri et al., 1984	
FUNGUS *Botrytis cinerea* Pers.: Fr. Syn.: *Botryotinia fuckeliana* (de Bary) Whetzel)	Baiswar et al., 2008	Alfieri et al., 1984.	Alam et al., 2017	
FUNGUS *Capnodium ramosum* Cooke	Rao, 1966; Vala et al., 1988	No evidence found	Rao, 1966; Vala et al., 1988	
FUNGUS *Capnodium mangiferae* Sacc.,	Shukla et al., 2016	No evidence found	Shukla et al., 2016	
FUNGUS *Ceratocystis fimbriata* Ellis & Halst., syn.: *Ceratostomella fimbriata* (Ellis & Halst.) J.A. Elliott; *Endoconidiophora fimbriata* (Ellis & Halst.) R.W. Davidson	Lenné, 1990	Alfieri et al., 1984; French, 1989	Ferreira et al., 2010	

Organism	In India	In U.S.	Host Association	Notes
FUNGUS *Coleophoma cylindrospora* (Desm.) Höhn., syn.: *Macrophoma collabens* Berl. & Voglino	Farr and Rossman, 2021	Farr and Rossman, 2021	Farr and Rossman, 2021	
FUNGUS *Cladosporium herbarum* (Pers.: Fr.) Link., syn.: *Mycosphaerella tassiana* (De Not.) Johans.	Sarbhoy et al., 1975	Alfieri et al., 1984; Shaw, 1973; USDA-ARS, 1960,	Farr and Rossman, 2021	
FUNGUS *Cladosporium oxysporum* Berk. & M.A. Curtis	Farr and Rossman, 2021	Farr and Rossman, 2021	Farr and Rossman, 2021	
FUNGUS *Colletotrichum acutatum* J.H. Simmonds., syn.: *Glomerella acutata* Guerber & J.C. Correll	Farr and Rossman, 2021	Farr and Rossman, 2021	Farr and Rossman, 2021	
FUNGUS *Colletotrichum asianum* Prihastuti, L. Cai & K.D. Hyde	Jayawardena et al., 2016; Sharma et al., 2015a	No evidence found	Diao et al., 2017	
FUNGUS *Colletotrichum coccodes* (Wallr.) S. Hughes. Syn.: *Colletotrichum atramentarium* (Berk. & Broome)	Mathur, 1979	Alfieri et al., 1984; French, 1989; USDA-ARS, 1960	Adikaram and Yakandawala, 2020	
FUNGUS *Colletotrichum fructicola* Prihastuti, L. Cai & K.D. Hyde	Sharma and Shenoy, 2014	Weir et al., 2012	Mo et al., 2018	
FUNGUS *Colletotrichum gloeosporioides* (Penz.) Penz. & Sacc.	Sharma et al., 2013a	Alfieri et al., 1984; French, 1989; USDA-ARS, 1960	Haggag, 2010	
FUNGUS *Colletotrichum karstii* Y.L. Yang, Z.Y. Liu, K.D. Hyde & L. Cai	Saini et al., 2016	Jadrane et al., 2012	Dubey and Moonnambeth, 2013	
FUNGUS *Colletotrichum siamense* Prihastuti, L. Cai & K.D. Hyde., syn.: *Colletotrichum communis* G. Sharma, A.K. Pinnaka & B.D. Shenoy	Sharma et al., 2015b	Xavier et al., 2019	Sharma et al., 2015b	

Organism	**In India**	**In U.S.**	**Host Association**	**Notes**
FUNGUS *Colletotrichum simmondsii* R.G. Shivas & Y.P. Tan	Shivas and Yu, 2009	Xavier et al., 2019	Jayawardena et al., 2016; Xavier et al., 2019	
FUNGUS *Colletotrichum truncatum* (Schwein.) Andrus & W.D. Moore., syn.: *Colletotrichum capsici* (Syd.) E.J. Butler & Bisby	Mathur, 1979	Tarnowski and Ploetz, 2010	Mathur, 1979	
FUNGUS *Colletotrichum theobromicola* Delacr. Syn.: *Colletotrichum fragariae* A.N. Brooks	Sharma et al., 2017; Sharma et al., 2015b	Alfieri et al., 1984; Grand, 1985	Sharma et al., 2017	
FUNGUS *Coniella castaneicola* (Ellis & Everh.) B. Sutton	Farr and Rossman, 2021	Farr and Rossman, 2021	Farr and Rossman, 2021	
FUNGUS *Corticium rolfsii* Curzi, syn: *Sclerotium rolfsii* (Sacc.)	Farr and Rossman, 2021	CABI, 2022b	CABI, 2022b	
FUNGUS *Corynespora cassiicola* (Berk. & M.A. Curtis) C.T. Wei	Murali et al., 2007	Alfieri et al., 1984; Grand, 1985	Peregrine and Bin Ahmad, 1982	
FUNGUS *Curvularia aeria* (Bat., J.A. Lima & C.T. Vasconc.) Tsuda., syn.: *Curvularia lunata* var. *aeria* (Bat., I.H. Lima & Vasconc.) M.B. Ellis	Sarbhoy et al., 1975	Miller and Roy, 1982	Sarbhoy et al., 1975	
FUNGUS *Curvularia clavata* B.L. Jain	Lenné, 1990	Roane, 2009	Bashar et al., 2012	
FUNGUS *Curvularia fallax* Boedijn	Lenné, 1990	Sivanesan, 1987	Minter et al., 2001	
FUNGUS *Curvularia intermedia* Boedijn., syn.: *Cochliobolus intermedius* R.R. Nelson	Sivanesan, 1987	Grand, 1985; Sivanesan, 1987	Farr and Rossman, 2021	

Organism	In India	In U.S.	Host Association	Notes
FUNGUS *Curvularia lunata* (Wakker) Boedijn; syn.: *Acrothecium lunatum* Wakker; *Cochliobolus lunatus* R.R. Nelson & F.A. Haasis	Srivastava et al., 2015	Alfieri et al., 1984; French, 1989; USDA-ARS, 1960	Nattrass, 1961	
FUNGUS *Curvularia pallescens* Boedijn., syn.: *Cochliobolus pallescens* (Tsuda & Ueyama) Sivan.; *Curvularia leonensis* M.B. Ellis; *Pseudocochliobolus pallescens* Tsuda & Ueyama	Lenné, 1990	Sivanesan, 1987	Peregrine and Bin Ahmad, 1982	
FUNGUS *Curvularia penniseti* (Mitra) Boedijn., syn.: *Acrothecium penniseti* Mitra	Lenné, 1990	Conway et al., 1974	CABI, 2022b; Farr and Rossman, 2021	
FUNGUS *Cylindrocladiella camelliae* (Venkataram. & C.S.V. Ram) Boesew.	Farr and Rossman, 2021	Farr and Rossman, 2021	Farr and Rossman, 2021	
FUNGUS *Cytospora rhuina* Fr.: Fr.	Mathur, 1979	Shaw, 1973; USDA-ARS, 1960	Mathur, 1979	
FUNGUS *Daldinia concentrica* (Bolton: Fr.) Ces. & De Not., syn.: *Hypoxylon concentricum* (Bolton: Fr.) Grev	Farr and Rossman, 2021	Farr and Rossman, 2021	Farr and Rossman, 2021	
FUNGUS *Daldinia eschscholtzii* (Ehrenb.: Fr.) Rehm	Farr and Rossman, 2021	Farr and Rossman, 2021	Farr and Rossman, 2021	
FUNGUS *Diaporthe citri* (H.S. Fawc.) F.A. Wolf	Srivastava, 1982	Alfieri et al., 1984; USDA-ARS, 1960	Mendes et al., 1998	
FUNGUS *Dictyochaeta simplex* (S. Hughes & W.B. Kendr.) Hol-Jech., syn.: *Codinaea simplex* S. Hughes & W.B. Kendr.	Farr and Rossman, 2021	Farr and Rossman, 2021	Farr and Rossman, 2021	

Organism	In India	In U.S.	Host Association	Notes
FUNGUS *Didymella musae* (P. Joly) Qian Chen & L. Cai., syn.: *Peyronellaea musae* P. Joly	Aveskamp et al., 2010	No evidence found	Farr and Rossman, 2021	
FUNGUS *Drechslera hawaiiensis* Bugnic. ex M.B. Ellis. Syn.: *Curvularia hawaiiensis* (Bugnic.) Manamgoda, L. Cai & K.D. Hyde; *Bipolaris hawaiiensis* (M.B. Ellis) J.Y. Uchida & Aragaki	Farr and Rossman, 2021	Farr and Rossman, 2021	Farr and Rossman, 2021	
FUNGUS *Earliella scabrosa* (Pers.) Gilb. & Ryvarden., syn.: *Polyporus persoonii* Mont; *Trametes corrugata* (Pers.) Bres.	Pande, 2008; Reddy, 1975	Farr and Rossman, 2021	Pande, 2008; Reddy, 1975	
FUNGUS *Elsinoë mangiferae* Bitanc. & Jenkeins, syn: *Denticularia mangiferae* (Bitanc. & Jenkins) Alcorn, Grice & R.A. Peterson; *Sphaceloma mangiferae* Bitanc. & Jenkins)	Mathur, 1979	Alfieri et al., 1984; USDA-ARS, 1960	Mathur, 1979	
FUNGUS *Erysiphe alphitoides* (Griffon & Maubl.) U. Braun & S. Takam., syn.: *Erysiphe alphitoides* var. *alphitoides* (Griffon & Maubl.) U. Braun & S. Takam	Farr and Rossman, 2021	Farr and Rossman, 2021	Farr and Rossman, 2021	
FUNGUS *Erythricium salmonicolor* (Berk. & Broome) Burds.	Farr and Rossman, 2021	Farr and Rossman, 2021	Farr and Rossman, 2021	
FUNGUS *Erysiphe quercicola* S. Takam. & U. Braun, syn.: *Oidium mangiferae* Berthet); *Oidium anacardii* F. Noack; *Pseudoidium anacardii* (Noack) U. Braun & R.T.A. Cook	Farr and Rossman, 2021	Alfieri et al., 1984	CABI, 2022b	

Organism	In India	In U.S.	Host Association	Notes
FUNGUS *Erysiphe cichoracearum* DC., syn.: *Golovinomyces cichoracearum* (Ehrenb.) Heluta	Farr and Rossman, 2021	Farr and Rossman, 2021	Farr and Rossman, 2021	
FUNGUS *Erysiphe communis* (Wallr.: Fr.) Schltdl., syn.: *Erysiphe pisi* var. *pisi* DC.	Amano (Hirata), 1986	Farr and Rossman, 2021	Amano (Hirata), 1986	
FUNGUS *Erysiphe polygoni* DC.	Alfieri et al., 1984; Shaw, 1973	Farr and Rossman, 2021	Mendes et al., 1998; Spaulding, 1961	
FUNGUS *Erythricium salmonicolor* (Berk. & Broome) Burds. Syn.: *Corticium salmonicolor* Berk. & Broome	Boa and Lenné, 1994	Alfieri et al., 1984; USDA-ARS, 1960	Dahal et al., 1992	
FUNGUS *Exserohilum rostratum* (Drechsler) K.J. Leonard & Suggs., syn.: *Setosphaeria rostrata* K.J. Leonard	Farr and Rossman, 2021	Farr and Rossman, 2021	CABI, 2022b	
FUNGUS *Fusarium fujikuroi* Nirenberg., syn.: *Gibberella fujikuroi* (Sawada) S.	Bashyal et al., 2016	Alfieri et al., 1984; French, 1989; USDA-ARS, 1960	Liew et al., 2016	
FUNGUS *Fusarium incarnatum* (Desm.) Sacc., syn.: *Fusarium pallidoroseum* (Cooke) Sacc.; *Fusarium semitectum* Berk. & Ravenel	Singh et al., 2011	USDA-ARS, 1960	Liew et al., 2016	
FUNGUS *Fusarium lateritium* Nees: Fr. syn. *Gibberella baccata* (Wallr.) Sacc	Sarbhoy et al., 1975	Farr and Rossman, 2021	Farr and Rossman, 2021	
FUNGUS *Fusarium mangiferae* Britz, M.J. Wingf. & Marasas	Lima et al., 2012; Smith et al., 2011	Britz et al., 2002	Gamliel-Atinsky et al., 2009	

Organism	In India	In U.S.	Host Association	Notes
FUNGUS *Fusarium moniliforme* J. Sheld	Sankar et al., 2011	Alfieri et al., 1984; French, 1989; USDA-ARS, 1960	Alfieri et al., 1984; Otero-Colina et al., 2010	
FUNGUS *Fusarium oxysporum Schltdl.:* Fr.	Lenné, 1990	Alfieri et al., 1984; French, 1989; USDA-ARS, 1960	Liew et al., 2016	
FUNGUS *Fusarium proliferatum* (Matsush.) Nirenberg ex Gerlach & Nirenberg	Sankar and Babu, 2012	Farr and Rossman, 2021	Haggag et al 2009	
FUNGUS *Fusarium scirpi* Lambotte & Fautrey	Lenné, 1990	Shaw, 1973; USDA-ARS, 1960	Liew et al., 2016	
FUNGUS *Fusarium solani* (Mart) Sacc., syn: *Nectria haematococca* (Wollenw.) Gerlah; *Haematonectria haematococca* (Berk. & Broome) Samuels & Rossma	Farr and Rossman, 2021	Alfieri et al., 1984; USDA-ARS, 1960	Farr and Rossman, 2021	
FUNGUS *Fusarium subglutinans* (Wollenw. & Reinking) P.E. Nelson, Toussoun & Marasas	Boa and Lenné, 1994	Alfieri et al., 1984; Grand, 1985; USDA-ARS, 1960	Haggag, 2010	
FUNGUS *Fusarium verticillioides* (Sacc.) Nirenberg	Farr and Rossman, 2021	Farr and Rossman, 2021	Farr and Rossman, 2021	
FUNGUS *Fusicoccum dimidiatum* (Penz.) D.F. Farr., syn: *Neoscytalidium dimidiatum* (Penz.) Crous & Slippers; *Hendersonula toruloidea* Nattrass.	Farr and Rossman, 2021	Farr and Rossman, 2021	Farr and Rossman, 2021	
FUNGUS *Ganoderma applanatum* (Pers.) Pat.	Boa and Lenné, 1994	Farr and Rossman, 2021	Farr and Rossman, 2021	
FUNGUS *Ganoderma lucidum* (Curtis : Fr.) P. Karst.	Farr and Rossman, 2021	Farr and Rossman, 2021	Farr and Rossman, 2021	

Organism	**In India**	**In U.S.**	**Host Association**	**Notes**
FUNGUS *Gibberella zeae* (Schwein.) Petch., syn.: *Fusarium graminearum* Schwabe	Boa and Lenné, 1994; Lenné, 1990	Ali et al., 2005, USDA-ARS, 1960	CABI, 2022b	
FUNGUS *Gloeophyllum striatum* (Sw.: Fr.) Murrill., syn.: *Lenzites striata* (Sw.: Fr.) Fr.	Farr and Rossman, 2021	Farr and Rossman, 2021	Farr and Rossman, 2021	
FUNGUS *Gloeophyllum striatum* (Sw.: Fr.) Murrill., syn.: *Lenzites striata* (Sw.: Fr.) Fr.	Farr and Rossman, 2021	Farr and Rossman, 2021	Farr and Rossman, 2021	
FUNGUS *Golovinomyces cichoracearum (*Ehrenb.) Heluta., syn.: *Erysiphe cichoracearum* DC	Amano (Hirata), 1986; Spaulding, 1961	Alfieri et al., 1984; French, 1989; USDA-ARS, 1960	Amano (Hirata), 1986; French, 1989	
FUNGUS *Haplotrichum croceum* (Mont.) Partridge & Morgan-Jones., syn.: *Allescheriella crocea (*Mont.) S. Hughes; *Botryobasidium croceum* Lentz	Sarbhoy et al., 1975	Partridge et al., 2002	Urtiaga, 1986	
FUNGUS *Lasiodiplodia theobromae* (Pat) Griffiths & Maubl., syn.: *Bothryodiplodia theobromae* Pat). syn. *Botryosphaeria rhodina* (Berk. & M.A. Curtis) Arx; *Diplodia cacaoicola* Henn.; *Diplodia natalensis* Pole-Evans; *Physalospora rhodina* Berk. & M.A. Curtis	Murali et al., 2007	CONUS: Lenné, 1990, HI: Raabe et al., 1981, PR: Lenné, 1990, USVI: Lenné, 1990.	Haggag, 2010	
FUNGUS *Lecanicillium lecanii* (Zimm.) Zare & W. Gams. Syn.: *Cephalosporium lecanii* Zimm. *Verticillium lecanii* (Zimm.) Viégas	Gams, 1975	Alfieri et al., 1984; USDA-ARS, 1960	Alfieri et al., 1984	

Organism	In India	In U.S.	Host Association	Notes
FUNGUS *Macrophomina phaseolina* (Tassi) Goid., syn.: *Rhizoctonia lamellifera* W. Small	Farr and Rossman, 2021	USDA-ARS, 1960	CABI, 2022b	
FUNGUS *Microsphaeropsis olivacea* (Bonord.) Höhn., syn.: *Coniothyrium olivaceum* Bonord.	Farr and Rossman, 2021	Farr and Rossman, 2021	Farr and Rossman, 2021	
FUNGUS *Neocosmospora haematococca* (Berk. & Broome) Samuels, Nalim & Geiser, syn.: *Haematonectria haematococca* (Berk. & Broome) Samuels & Rossman	Farr and Rossman, 2021	USDA-ARS, 1960	CABI, 2022b	
FUNGUS *Nigrospora oryzae* (Berk. & Broome) Petch, syn.: *Khuskia oryzae* H.J. Huds.	Farr and Rossman, 2021	Farr and Rossman, 2021	Farr and Rossman, 2021	
FUNGUS *Neofusicoccum parvum* (Pennycook & Samuels) Crous, Slippers & A.J.L. Phillips., syn.: *Botryosphaeria parva* Pennycook & Samuels	Jayakumar et al., 2011	Úrbez-Torres et al., 2006	Úrbez-Torres et al., 2006	
FUNGUS *Neofusicoccum ribis* (Slippers, Crous & M.J. Wingf.) Crous, Slippers & A.J.L. Phillips., syn.: *Botryosphaeria ribis* Grossenb. & Duggar	Pande, 2008	Ramos et al., 1991	Ramos et al., 1991	
FUNGUS *Nitschkia broomeiana* (Berk.) Nannf., syn.: *Fracchiaea heterogenea* Sacc.	Farr and Rossman, 2021	Grand, 1985; USDA-ARS, 1960	Farr and Rossman, 2021	

Organism	**In India**	**In U.S.**	**Host Association**	**Notes**
FUNGUS *Pestalotiopsis clavispora* (Atk.) Steyaert., syn.: *Neopestalotiopsis clavispora* (G.F. Atk.) Maharachch., K.D. Hyde & Crous	Farr and Rossman, 2021	Farr and Rossman, 2021	Farr and Rossman, 2021	
FUNGUS *Pestalotiopsis mangiferae* (Henn.) Steyaert	Farr and Rossman, 2021	Alfieri et al., 1984	CABI, 2022b	
FUNGUS *Pestalotiopsis theae (*Sawada) Maharachch., K.D. Hyde & Crous	Sandoval-Sánchez et al., 2013	No evidence found	Sandoval-Sánchez et al., 2013	
FUNGUS *Pestalotiopsis uvicola* (Speg.) Bissett	Mathur, 1979	Alfieri et al., 1984; USDA-ARS, 1960	CABI, 2022b	
FUNGUS *Pestalotiopsis versicolor (*Speg.) Steyaert	Farr and Rossman, 2021	No evidence found	Farr and Rossman, 2021	
FUNGUS *Phellinidium noxium* (Corner) Bondartseva & S. Herrera	Farr and Rossman, 2021	No evidence found	Farr and Rossman, 2021	
FUNGUS *Phytophthora cinnamomi* Rands	CABI, 2022b	CABI, 2022b	CABI, 2022b	
FUNGUS *Phytophthora citrophthora* (R.E. Sm. & E.H. Sm.) Leonian	Farr and Rossman, 2021	USDA-ARS, 1960	CABI, 2022b	
FUNGUS *Phytophthora palmivora (*E.J. Butler) E.J. Butler, syn.: *Phytophthora arecae* (L.C. Coleman) Pethybr	Farr and Rossman, 2021	Farr and Rossman, 2021	Farr and Rossman, 2021	
FUNGUS *Phytophthora nicotianae* Breda de Haan., syn.: *Phytophthora nicotianae* var. *parasitica* (Dastur) G.M. Waterh.; *Phytophthora parasitica* Dastur; *Phytophthora terrestris* Shreb.	Farr and Rossman, 2021	Farr and Rossman, 2021	Farr and Rossman, 2021	

Organism	In India	In U.S.	Host Association	Notes
FUNGUS *Pithomyces maydicus* (Sacc.) M.B. Ellis., syn.: *Clasterosporium maydicum* Sacc.	Sarbhoy et al., 1975	Fell and Hunter, 1979	Farr and Rossman, 2021	
FUNGUS *Pseudocochliobolus pallescens* Tsuda & Ueyama., syn.: *Curvularia pallescens* Boedijn	Manamgoda et al., 2011	Farr and Rossman, 2021	Peregrine and Bin Ahmad, 1982	
FUNGUS *Pythium middletonii* Sparrow., syn.: *Globisporangium middletonii* (Sparrow) Uzuhashi, Tojo & Kakish.	Farr and Rossman, 2021	Farr and Rossman, 2021	Farr and Rossman, 2021	
FUNGUS *Rhizoctonia noxia* (Donk) Oberw., R. Bauer, Garnica & R. Kirschne. Syn.: Corticium koleroga	Farr and Rossman, 2021	Farr and Rossman, 2021	Farr and Rossman, 2021	
FUNGUS *Rhizoctonia solani* Kühn Kuhn, syn.: *Thanatephorus cucumeris* (A.B. Frank) Donk	Farr and Rossman, 2021	USDA-ARS, 1960	CABI, 2022b	
FUNGUS *Rhizopus arrhizus* A. Fisch.	Farr and Rossman, 2021	Farr and Rossman, 2021	CABI, 2022b	
FUNGUS *Rhizopus stolonifer* (Ehrenb.: Fr.) Vuill., syn.: *Rhizopus nigricans* Ehrenb.	Farr and Rossman, 2021	Farr and Rossman, 2021	Farr and Rossman, 2021	
FUNGUS *Robillarda sessilis* (Sacc.) Sacc.	Prakash and Raoof, 1985	No evidence found	Prakash and Raoof, 1985	
FUNGUS *Rosellinia necatrix* Prill. Syn.: *Dematophora necatrix* R. Hartig	CABI, 2022b	CABI, 2022b	CABI, 2022b	
FUNGUS *Sclerotinia sclerotiorum* (Lib.) de Bary, syn.: *Sclerotium varium* Pers.: Fr; *Sclerotinia libertiana* Fuckel	Farr and Rossman, 2021	Farr and Rossman, 2021	Farr and Rossman, 2021	

Organism	**In India**	**In U.S.**	**Host Association**	**Notes**
FUNGUS *Setosphaeria rostrata* K.J. Leonard, syn.: *Exserohilum rostratum* (Drechsler) K.J. Leonard & Suggs	Farr and Rossman, 2021	Farr and Rossman, 2021	CABI, 2022b	
FUNGUS *Sphaeropsis visci* (Fr.) Sacc. Syn.: *Botryosphaeria visci* (Kalchbr.) Arx & E. Müll.	Pande, 2008	Alfieri et al., 1984; USDA-ARS, 1960	Pande, 2008	
FUNGUS *Stemphylium vesicarium (*Wallr.) E.G. Simmons	CABI, 2022b; Farr and Rossman, 2021	USDA-ARS, 1960	CABI, 2022b	
FUNGUS *Syncephalastrum racemosum* Cohn ex J. Schröt.	Misra et al., 2016	Fell and Hunter, 1979	CABI, 2022b	
FUNGUS *Thielaviopsis paradoxa* (De Seynes) Honn. syn.: *Ceratocystis paradoxa* (Dade) C. Moreau. *Charlara paradoxa* (De Seynes) Sacc.	Spaulding, 1961	USDA-ARS, 1960	Spaulding, 1961	
FUNGUS *Trichothecium roseum* (Pers. : Fr.) Link. Syn.: *Cephalothecium roseum* Corda	Sarbhoy et al., 1975	Alfieri et al., 1984; Grand, 1985; USDA-ARS, 1960	CABI, 2022b	
FUNGUS *Verticillium albo-atrum* Reinke & Berthold	Farr and Rossman, 2021	USDA-ARS, 1960	Haggag, 2010	
FUNGUS *Verticillium dahliae* Kleb.	Farr and Rossman, 2021	Collado-Romero et al., 2010	Haggag, 2010	