

**California Pest Rating Proposal for
Colletotrichum jiangxiense F. Liu & L. Cai 2015**

Anthracnose

Current Pest Rating: Q

Proposed Pest Rating: B

Kingdom: Fungi, Division: Ascomycota

Class: Sordariomycetes, Order: Glomerellales

Family: Glomerellaceae

Comment Period: 7/29/2020 through 9/12/2020

Initiating Event:

On May 28, 2020, Contra Costa County Agricultural Inspectors submitted a sample of umbrella tree, *Schefflera actinophylla*, recently imported from Florida as nursery stock with leaf spots. On July 2, 2020, CDFA plant pathologist Albre Brown identified the cause of the leaf spots as *Colletotrichum jiangxiense* via morphological comparison and a multi-locus genetic analysis. This species is a known leaf spot pathogen of tea and sweet orange in China but has not previously been reported in the United States. It was assigned a temporary Q-rating. We are identifying this pathogen for the first time in the United States and for the first time on *S. actinophylla*. The extent of its distribution in Florida and its full host range remains undetermined. The risk to California from *C. jiangxiense* is described herein and a permanent rating is proposed.

History & Status:

Background: Anthracnose diseases caused by *Colletotrichum* spp. can cause devastating losses in many economically important crops, including fruits, vegetables, cassava, sorghum, as well as ornamental plants (Agrios, 2005). *Colletotrichum* is the sole genus in family Glomerellaceae. There are approximately 200 accepted *Colletotrichum* species in eleven species complexes and 23 singleton species (Jayawardena et al., 2016 a, b). Many pathogenic *Colletotrichum* species can also be present as

symptomless endophytes in living plant tissues, although many non-pathogenic species also occur purely as endophytes (Cannon et al., 2012).

The gloeosporioides species complex includes *C. gloeosporioides* and 37 closely related species. Most of these species are plant pathogens (Weir et al., 2012), but some species were isolated as endophytes (Liu et al., 2015). Conidia of this species complex are cylindrical with rounded ends tapering slightly towards the base (Weir et al., 2012). Based on the multigene phylogeny, Weir et al., (2012) recognized two subclades within the species complex, namely *kahawae* and *musae*.

Colletotrichum jiangxiense is a pathogen as well as an endophyte on *Camellia sinensis* in China. It belongs to the gloeosporioides species complex and is in the subclade *kahawae*. *Colletotrichum jiangxiense* can be distinguished from *C. kahawae* by glutamine synthetase gene sequences (Liu et al., 2015).

Hosts: *Camellia sinensis* (camellia), *Citrus sinensis* (sweet orange) (Farr and Rossman, 2020; DeSilva et al., 2017).

Symptoms: *Colletotrichum*-infected host plants exhibit symptoms of anthracnose, which include dark brown leaf, stem and fruit spots, and wilting of leaves often resulting in dieback and reduction in plant quality (Weir et al., 2012).

Transmission: It is likely that *C. jiangxiense* has a life cycle similar to that of other *Colletotrichum* species, which are capable of overwintering as mycelium on plant residue in soil, infected plants, and seeds. During active growth, the pathogen produces masses of hyphae (stromata) that bear conidiophores on the plant surface. Conidia (spores) are produced at the tips of the conidiophores and disseminated by wind, rain, cultivation tools, equipment, and field workers to potential host plants. Humid, wet, rainy weather is necessary for infection to occur. Upon germination, conidia penetrate host tissue by means of specialized hyphae (appressoria) and invade host tissue. These requirements may limit the occurrence of the pathogen in California fields and therefore the pathogen may be more of a problem under controlled environments of greenhouses.

Damage Potential: Fungal diseases can significantly limit commercial production of tropical foliage plants (Chase, 1997). Some *Colletotrichum* pathogens are considered as actionable quarantine organisms by the USDA. Anthracnose diseases can result in reduced plant quality and growth. Estimates of yield/crop loss due to this pathogen have not been reported but nursery production of potted host plants or in greenhouses is particularly at risk as nursery conditions are often conducive to infection by *Colletotrichum* species. In cultivated fields, disease development may be sporadic as it is affected by levels of pathogen inoculum and environmental conditions.

Worldwide Distribution: China, United States (California, Florida).

Official Control: This pathogen has a temporary Q rating.

California Distribution: None

California Interceptions: There has been one interception on nursery stock from Florida (see initiating events)

The risk *Colletotrichum jiangxiense* would pose to California is evaluated below.

Consequences of Introduction:

- 1) Climate/Host Interaction:** Similar to other species of *Colletotrichum*, *C. jiangxiense* requires humid, wet, rainy weather for conidia to infect host plants. This environmental requirement may limit the ability of the pathogen to fully establish and spread under dry field conditions in California. Limited regions with conducive climates within California could enable the pathogen to establish. In particular, *C. jiangxiense* can effectively infect and spread to host plants grown under conducive climate conditions in nurseries.

Evaluate if the pest would have suitable hosts and climate to establish in California.

Score: 2

- Low (1) Not likely to establish in California; or likely to establish in very limited areas.
- **Medium (2) may be able to establish in a larger but limited part of California.**
- High (3) likely to establish a widespread distribution in California.

- 2) Known Pest Host Range:** The published host range of *C. jiangxiense* is *Camellia sinensis* and *Citrus sinensis*, but the host range is expanding as we are reporting the first occurrences on *Schefflera actinophylla*.

Evaluate the host range of the pest.

Score: 2

- Low (1) has a very limited host range.
- **Medium (2) has a moderate host range.**
- High (3) has a wide host range.

- 3) Pest Reproductive Potential:** The pathogen has high reproductive potential and conidia are produced successively. They are transmitted by wind, wind-driven rain, cultivation tools, and human contact however conidial germination and plant infection require long, wet periods.

Evaluate the natural and artificial dispersal potential of the pest.

Score: 3

- Low (1) does not have high reproductive or dispersal potential.
 - Medium (2) has either high reproductive or dispersal potential.
 - **High (3) has both high reproduction and dispersal potential.**
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4) Economic Impact: Under suitable climates, the pathogen could lower plant growth and value.

Evaluate the economic impact of the pest to California using the criteria below.

Economic Impact: A, B

- A. The pest could lower crop yield.**
- B. The pest could lower crop value (includes increasing crop production costs).**
- C. The pest could trigger the loss of markets (includes quarantines).
- D. The pest could negatively change normal cultural practices.
- E. The pest can vector, or is vectored, by another pestiferous organism.
- F. The organism is injurious or poisonous to agriculturally important animals.
- G. The organism can interfere with the delivery or supply of water for agricultural uses.

Economic Impact Score: 2

- Low (1) causes 0 or 1 of these impacts.
- **Medium (2) causes 2 of these impacts.**
- High (3) causes 3 or more of these impacts.

5) Environmental Impact: The pathogen could significantly impact cultural practices, home gardening, or ornamental plantings.

Environmental Impact: E

- A. The pest could have a significant environmental impact such as lowering biodiversity, disrupting natural communities, or changing ecosystem processes.
- B. The pest could directly affect threatened or endangered species.
- C. The pest could impact threatened or endangered species by disrupting critical habitats.
- D. The pest could trigger additional official or private treatment programs.
- E. The pest significantly impacts cultural practices, home/urban gardening or ornamental plantings.**

Environmental Impact Score:

- Low (1) causes none of the above to occur.
- **Medium (2) causes one of the above to occur.**
- High (3) causes two or more of the above to occur.

Consequences of Introduction to California for *Colletotrichum jiangxiense*: Medium

Add up the total score and include it here. **11**

-Low = 5-8 points

-Medium = 9-12 points

-High = 13-15 points

- 6) Post Entry Distribution and Survey Information:** Evaluate the known distribution in California. Only official records identified by a taxonomic expert and supported by voucher specimens deposited in natural history collections should be considered. Pest incursions that have been eradicated, are under eradication, or have been delimited with no further detections should not be included.

Evaluation is 'Not established'. There has been one interception of *C. jiangxiense* on incoming nursery stock from Florida.

Score: -0

-Not established (0) Pest never detected in California or known only from incursions.

-Low (-1) Pest has a localized distribution in California or is established in one suitable climate/host area (region).

-Medium (-2) Pest is widespread in California but not fully established in the endangered area, or pest established in two contiguous suitable climate/host areas.

-High (-3) Pest has fully established in the endangered area, or pest is reported in more than two contiguous or non-contiguous suitable climate/host areas.

- 7) The final score is** the consequences of introduction score minus the post entry distribution and survey information score: (Score)

Final Score: *Score of Consequences of Introduction – Score of Post Entry Distribution and Survey Information = 11*

Uncertainty:

This recent detections on incoming nursery stock has identified a new host (*Schefflera*) from a state without a record of this pathogen (Florida,). It is likely that the host range and geographical range is increasing through the international and interstate trade of nursery stock.

Conclusion and Rating Justification:

Based on the evidence provided above the proposed rating for *Colletotrichum jiangxiense* is B.

References:

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Responsible Party:

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***Comment Period: 7/29/2020 through 9/12/2020**

***NOTE:**

You must be registered and logged in to post a comment. If you have registered and have not received the registration confirmation, please contact us at [permits\[@\]cdfa.ca.gov](mailto:permits[@]cdfa.ca.gov).

Comment Format:

- ❖ Comments should refer to the appropriate California Pest Rating Proposal Form subsection(s) being commented on, as shown below.
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Example Comment:

Consequences of Introduction: 1. Climate/Host Interaction: [Your comment that relates to “Climate/Host Interaction” here.]

- ❖ Posted comments will not be able to be viewed immediately.
- ❖ Comments may not be posted if they:

Contain inappropriate language which is not germane to the pest rating proposal;

Contains defamatory, false, inaccurate, abusive, obscene, pornographic, sexually oriented, threatening, racially offensive, discriminatory or illegal material;

Violates agency regulations prohibiting sexual harassment or other forms of discrimination;

Violates agency regulations prohibiting workplace violence, including threats.

- ❖ Comments may be edited prior to posting to ensure they are entirely germane.
- ❖ Posted comments shall be those which have been approved in content and posted to the website to be viewed, not just submitted.

Proposed Pest Rating: B
