

California Pest Rating Proposal for
***Colletotrichum chamaedoreae* F. Liu, W.P. Wu & L. Cai 2022**

Anthracnose

Current Pest Rating: Q

Proposed Pest Rating: B

Kingdom: Fungi, Phylum: Ascomycota,
Subphylum: Pezizomycotina, Class: Sordariomycetes,
Subclass: Hypocreomycetidae, Order: Glomerellales,
Family: Glomerellaceae

Comment Period: 01/24/2023 through 03/10/2023

Initiating Event:

In November 2022, the fungal pathogen *Colletotrichum chamaedoreae* was detected in infected 5-gallon *Chamaedorea seifrizii* (bamboo or parlor palm) plants in a nursery in San Diego County, California. The plants were part of an incoming nursery shipment which originated from a nursery in Hilo, Hawaii. The pathogen was cultured from leaf spots, and the identification was made via morphological comparisons and a multi-locus genetic analysis by Suzanne Rooney-Latham, CDFA Plant Pathologist. This detection was considered a new North American record and reportable to the USDA. It was assigned a temporary Q-rating. A permanent rating for *Colletotrichum chamaedoreae* is proposed herein.

History & Status:

Background:

The genus *Chamaedorea* (Family: Arecaceae, Subfamily: Arecoideae) contains over 100 species and is native to subtropical and tropical parts of the Americas. They are generally small palms with slender, cane-like stems that grow in the understory of rainforests. Because of their small size and tolerance to lower light levels, they are popular indoor house plants, with the common names of “parlor palm” or “bamboo palm” (Dransfield et al., 2008).

The genus *Colletotrichum* includes important plant pathogens, endophytes, saprophytes, and even human pathogens. Accurate species identification is important for understanding biodiversity, host-parasite interaction, and evolutionary history. It is also critically important for monitoring and controlling plant pathogens and developing quarantine measures. In the past, a host- and morphology-oriented systematics of *Colletotrichum* was in place; however, this did not reflect the phylogenetic relationships between species. Some hosts may be parasitized by multiple species of *Colletotrichum*, and some species of *Colletotrichum* are known to have dozens of hosts. They most commonly act as hemi-biotrophs, which cause disease under select conditions (Cannon et al., 2012).

Many historical species of *Colletotrichum* with large host ranges i.e., *C. gloeosporoides* and *C. acutatum*, have subsequently been determined to be species complexes. A species complex (also called an 'aggregate') is defined as a group of species that form a monophyletic clade and exhibit shared characteristics (e.g., similar conidial morphology) (Cannon et al., 2012). In a recent comprehensive investigation of *Colletotrichum* diversity by Liu et al. (2022), molecular data in combination with morphological, geographical, and ecological data, has been used to increase the understanding of the diversity and phylogenetic relationships in this genus. Their study details *C. boninense* as a species complex containing 13 species. They describe *C. chamaedoreae* as a new, novel species formerly classified as *C. boninense* and closely related to *C. karsti*, *C. camelliae-japonicae*, *C. diversum*, and *C. bromeliacearum*.

Hosts: The range of host plants for *Colletotrichum chamaedoreae* sp. nov. is not well understood from reports published prior to 2022 as many of those reports refer to the broader *C. boninense* complex (*sensu lato*). The type-strain of *C. chamaedoreae* was identified on leaves of *Chamaedorea erumpens* (syn. *C. seifrizii*) (Liu et al., 2022), which is the same host identified in San Diego County (originating in Hawaii).

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 (Sutton, 1992).

Transmission: It is likely that *C. chamaedoreae* has a similar life cycle to that of other *Colletotrichum* species and survives between crops during winter as mycelium on plant residue in soil, on infected plants, and on seeds. During active growth, the pathogen produces masses of hyphae (stromata) which 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. Conidia are transmitted to host plants. Humid, wet, rainy weather is necessary for infection to occur. These requirements may limit the occurrence of the pathogen in California fields and subsequently, the pathogen may be more of a problem under controlled environments of greenhouses. Conidia germinate, penetrate host tissue by means of specialized hyphae (appressoria) and invade host tissue (Sutton, 1992).

Damage Potential: Anthracnose disease caused by *C. boninense*, a species complex that *C. chamaedoreae* has recently been separated out from, can result in reduced plant quality and growth. Estimates of yield/crop loss due to this pathogen have not been reported. Nursery production of

potted host plants or in greenhouses are 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 (Chitambar, 2015).

Worldwide Distribution: China (Farr and Rossman, 2022).

Official Control: This detection of *C. chamaedoreae* is considered a new United States record and reportable to the USDA. With a Q rating from CDFA, it is subject to the following authorized official control actions: plants and plant products that are found to be infested or infected with, or exposed to, a “Q”-rated pest may be refused entry, held for inspection, returned to the owner, quarantined, treated, or destroyed as specified by the Department or by an authorized representative of the Department prior to the Department determining the appropriate permanent pest rating (3 CCR § 3162. Pest Ratings and Official Control Actions).

California Distribution: None

California Interceptions: There has been one interception on nursery stock from Hawaii (see ‘initiating event’).

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

Consequences of Introduction:

1) Climate/Host Interaction:

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.

Risk is Medium (2) – Similar to other species of *Colletotrichum*, *C. chamaedoreae* 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. chamaedoreae* can effectively infect and spread to host plants grown under conducive climate conditions in nurseries.

2) Known Pest Host Range:

Evaluate the host range of the pest.

Score: 1

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

Risk is low (1) – The known host range of *Colletotrichum chamaedoreae* is currently limited to *Chamaedorea* spp.

3) Pest Reproductive Potential:

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.**

Risk is High (3) – 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.

4) Economic Impact:

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

Economic Impact: A, B, C, D

- 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: 3

- 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.**

Risk is High (3) – Under suitable climates, the pathogen could lower plant growth and value and trigger the loss of markets.

5) Environmental Impact:

Evaluate the environmental impact of the pest to California using the criteria below

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: 2

- 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.

Risk is Medium (2) – The pathogen could significantly impact cultural practices, home gardening or ornamental plantings.

Consequences of Introduction to California for *Colletotrichum chamaedoreae*: 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.

There have been 13 detections of B- rated *C. boninense* (*sensu lato*) in California since January 2015. Twelve were from incoming nursery shipments, from Costa Rica, Florida, and Hawaii, but none were on *Chamaedorea* spp. One detection of *C. boninense* was on orchid nursery stock in Santa Barbara County. They were all subject to quarantine or nursery holds pending eradication or returned to the shipper. It is not known if any of these would be called *C. chamaedoreae* following the work of Liu et al. (2022).

***Evaluation is 'not established'*.**

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:

Changes in taxonomy increases the uncertainty of historical records of *Colletotrichum* spp. in California.

Conclusion and Rating Justification:

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

References:

Cannon, P. F., Damm, U., Johnston, P. R., and Weir, B. S. 2012. *Colletotrichum* – current status and future directions. *Stud. Mycol.* 73:181-213.

Chitambar, J. C. 2015. California Pest Rating for *Colletotrichum boninense* Moriwaki, Toy. Sato & Tsukib. 2003 <https://blogs.cdfa.ca.gov/Section3162/?p=1046>

Dransfield, J., Uhl, N.W., Asmussen, C.B., Baker, W.J., Harley, M.M. and Lewis, C.E., 2008. *Genera Palmarum- The Evolution and Classification of the Palms.*

Farr, D.F., and Rossman, A.Y. 2022. *Fungal Databases, U.S. National Fungus Collections, ARS, USDA.* Retrieved December 13, 2022, from <https://nt.ars-grin.gov/fungaldatabases/>

Liu, F., Ma, Z.Y., Hou, L.W., Diao, Y.Z., Wu, W.P., Damm, U., Song, S. and Cai, L., 2022. Updating species diversity of *Colletotrichum*, with a phylogenomic overview. *Studies in Mycology*, (101), pp.1-86.

Sutton, B. C. 1992. The genus *Glomerella* and its anamorph *Colletotrichum*. In: Bailey, J. A. and Jeger, M. J. eds. *Colletotrichum Biology, Pathology and Control.* CAB International. Wallingford: 1-26

Responsible Party:

Heather J. Scheck, Primary Plant Pathologist/Nematologist, CDFA/PHPPS ECOPERS, 1220 N St Rm 221, Sacramento, CA 95814 Phone: (916) 654-1017, [permits\[@\]cdfa.ca.gov](mailto:permits[@]cdfa.ca.gov).

***Comment Period: 01/24/2023 through 03/10/2023**

***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.

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
