CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Pest Rating Proposal for

Exosporium petersii (Berk. & M.A. Curtis) U. Braun 2014

Current Pest Rating: Q

Proposed Pest Rating: B

Fungi - Ascomycota - Pleosporales

Comment Period: 2/4/2020 through 3/20/2020

Initiating Event:

On August 15, 2019, a shipment of lanceleaf greenbrier (*Smilax* sp.) cut foliage from Texas, ordered by a commercial florist in Danville, California, was intercepted by Contra Costa County officials. Diseased foliage exhibiting leaf spot symptoms was collected and sent the CDFA Plant Pathology Laboratory for disease diagnosis. The fungal pathogen, *Exosporium petersii*, was identified as the cause for the leaf spots by Albre Brown, CDFA plant pathologist. This pathogen was also detected multiple times from late August to December 2019 on *Smilax* sp. foliage shipments that originated from two wholesale shippers in east Texas and were destined for florists and private residents in San Diego County. The pathogen was given a temporary Q rating. The risk of infestation of *Exosporium petersii* in California is evaluated and a permanent rating is herein proposed.

History & Status:

Background: *Exosporium petersii* is a fungal plant pathogen that belongs to a larger group of *Cercospora*-like fungi, most of which cause leaf spot symptoms in host plants. The pathogen has previously been referred to as *Helminthosporium petersii*, *Ceracospora petersii*, and *C*. (or *Pseudocercospora*) *mississippiensis*, all of which are synonyms of *Exosporium petersii*, which is morphologically distinguished from another important leaf spot pathogen, *Pseudocercospora smilacicola* (Chupp, 1954). However, Braun et al. (2014) reported that *Pseudocercospora mississippiensis* on *Smilax riparia* from Korea is morphologically indistinguishable from the Cuban and North American collections of *P. smilacicola*. *Pseudocercospora smilacicola* is a B rated pathogen in California.

Hosts: *Smilax glauca*, *S. lanceolata*, *S. laurifolia*, *S. pseudochina* [*tamnifolia*], *S. riparia* var. *ussuriensis, S. rotundifolia*, and *S. tamnoides* [*hispida*] (Braun et al., 2014; Farr and Rossman, 2010).

Symptoms: Infected host plants exhibit leaf spots on both leaf surfaces that are sub-circular to angular or irregular, 1-10 mm in diameter, and initially pale, later becoming dark brown and then developing a paler center, brownish to greyish brown, occasionally somewhat zonate with darker brown to black margin. Lesions or spots may be slightly raised and occasionally surrounded by a diffuse lighter halo (Braun et al., 2014).

Transmission: Infected plants produce conidiophores (specialized hyphae) that arise from the plant surface in clusters through stomata and form conidia (asexual spores) successively. Conidia are easily detached and blown by wind often over long distances. On landing on surfaces of a plant host, conidia require water or heavy dew to germinate and penetrate the host. Substomatal stroma (compact mycelial structure) may form from which conidiophores develop. Development of the pathogen is favored by high temperatures and the disease is most destructive during summer months and warmer climates. High relative humidity is necessary for conidial germination and plant infection. The pathogen can overwinter in or on seed and as mycelium (stromata) in old infected leaves (Agrios, 2005). Long distance transmission is primarily with infected plants or foliage.

Damage Potential: Specific losses due to *Exosporium petersii* have not been reported. Photosynthetic area can be reduced due to leaf spotting. In severe infections, leaf wilt and drop may be expected. However, the damage potential of this pathogen is likely similar to that of other *Cercospora* diseases, which is usually low (Agrios, 2005). In California, *Smilax californica* and *S. jamesii* grow indigenously in the northern mountain and valley regions (Calflora, 2020). *Smilax* spp. vines and foliage are used in floral decorations and therefore, diseased plants could be of concern to greenbrier floral/ornamental production nurseries.

Worldwide Distribution: Asia: *Korea, India*; North America: *Cuba, Mexico, United States* (Alabama, Arkansas, Delaware, Florida, Georgia, Illinois, Maryland, Montana, New York, North Carolina, Pennsylvania, South Carolina, Tennessee, Texas, Virginia, Washington D.C., West Virginia, and Wisconsin) (Braun et al., 2014; Farr and Rossman, 2020).

Official Control: None reported.

California Distribution: *Exosporium petersii* has not been reported from California and is not known to be established.

California Interceptions: *Exosporium petersii* was detected in six shipments of *Smilax* sp. from Texas received between August and December 2019.

The risk *Exosporium petersii* 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. In California, host plants (*Smilax* spp.) grow indigenously in warm and humid conditions in northern mountain and valley regions. If introduced, the pathogen could establish in those limited areas.

   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:** Host range is limited to *Smilax* spp.

   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.

3) **Pest Dispersal Potential:** *Exosporium petersii* has high reproductive potential resulting in the successive production of conidia that are dependent on air currents and infected plants and seed for dispersal and spread.

   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.

4) **Economic Impact:** Infected host plants with leaf spot symptoms could lower value of nursery-produced *Smilax* plants used in floral/ornamental decorations.

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

   Economic Impact: 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: **1**
- 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:** Two plant species, namely, *Smilax californica* and *S. jamesii*, are native to California and grow under warm, humid conditions in northern mountain and valley regions of the State. The plants grow as understory plants in pine and mixed evergreen forest communities and provide food for wild animals and birds. Climate conditions may be conducive for the development of the pathogen if introduced. In severe infections, available food could be reduced for wildlife. *Smilax jamesii* is included in the California Native Plant Society Inventory of Rare and Endangered Plants on List 1B.3 7th/8th edition. Also, the pathogen could significantly impact nursery production of ornamental greenbrier foliage and vines.

Environmental Impact: B, 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: 3
- 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 *Exosporium petersii* is Medium:

Add up the total score and include it here.
-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'.

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: 10

Final Score: *Score of Consequences of Introduction – Score of Post Entry Distribution and Survey Information* **= 10**

Uncertainty:

None

Conclusion and Rating Justification:

Based on the evidence provided above **the proposed rating for *Exosporium petersii* is B.**

References:

Agrios, G. N. 2005. Plant Pathology (Fifth Edition). Elsevier Academic Press, USA. 922 p.

Braun, U., Crous, P.W., and Nakashima, C. 2014. Cercosporoid fungi (Mycosphaerellaceae) 2. Species on monocots (Acoraceae to Xyridaceae, excluding Poaceae). IMA Fungus 5: 203-390.

Chupp, C. 1954. A Monograph of the fungus genus *Cercospora*. Ithaca, USA.

Calflora. 2020. Information on California plants for education, research and conservation. [Web application]. Berkeley, California: The Calflora Database [a non-profit organization]. http://www.calflora.org/

Farr, D.F., and Rossman, A. Y. 2020. Fungal Databases, Systematic Mycology and Microbiology Laboratory, ARS, USDA. Retrieved January 2, 2020 from http://nt.ars-grin.gov/fungaldatabases/.

Kim, J.-D., and Shin, H.D. 1999. Taxonomic studies on *Cercospora* and allied genera in Korea (XII). Korean J. Mycol. 27(5): 363-371.

Responsible Party:

Heather J. Scheck, Primary Plant Pathologist/Nematologist, California Department of Food and Agriculture, 204 West Oak Ave, Lompoc, CA. Phone: 805-736-8050, permits[@]cdfa.ca.gov.

---

*Comment Period: 2/4/2020 through 3/20/2020

*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.

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