CALIFORNIA DEPARTMENT OF FOOD & AGRICULTURE

California Pest Rating Profile for

Neocercosporidium smilacis (Thüm.) U. Braun, C. Nakash., Videira & Crous 2017

Pest Rating: B

Comment Period CLOSED: 2/22/2019 – 4/8/2019

Initiating Event:

On October 31, 2018, a shipment of *Smilax* sp. plants, showing leaf spotting and yellowing, was intercepted in San Luis Obispo County by county agricultural inspectors. The shipment had originated in Alabama and was destined to a floral company in San Luis Obispo County. A sample of the diseased foliage was submitted to the CDFA Plant Pathology Lab for diagnosis of the associated pathogen. On November 6, 2018, Cheryl Blomquist, CDFA Plant Pathologist, identified the associated pathogen as *Neocercosporidium smilacis*. Since there were no earlier reports or rating of this pathogen in California, it was assigned a temporary Q rating. This rating resulted in the destruction of the diseased shipment. An assessment of the consequences of introduction of *N. smilacis* to California is presented here and a permanent rating is proposed.

History & Status:

Background: *Neocercosporidium smilacis* is a fungal plant pathogen that belongs to the group of *Cercospora*-like fungi, most of which cause leaf spot symptoms in host plants. Recently, the species underwent several taxonomic revisions, and was previously known as *Cercospora smilacina, C. smilacis,* and *Passalora smilacis* (Braun et al., 2014; Farr & Rossman, 2019; Videira et al., 2017).

Hosts: Hosts of the pathogen are limited to plant species within the genus *Smilax* in the family Smilacaceae. These hosts include *Smilax aspera* (syn. *S. mauritanica*, *S. nigra*; greenbrier), *S. bona-nox* (saw greenbrier), *S. chinensis* (chopchini), *S. excelsa* (sarsaparilla), *S. guianensis* (syn. *S. macrophylla*), *S. havanensis* (everglades greenbrier), *S. herbacea* var. *pulverulenta* (syn. *S. pulverulenta*; downy carrionflower), *S. hispida* (syn. *S. tamnoides*; bristly greenbrier), *S. laurifolia* (laurel greenbrier), *S. pseudo-china* (bamboo vine/false chinaroot), *S. rotundifolia* (roundleaf/common greenbrier), and *Smilax* sp. (Braun et al., 2014; Farr and Rossman, 2019).

Symptoms: Infected host plants exhibit leaf spots on both leaf surfaces. These spots are sub-circular to angular or irregular in shape, 1-12 mm in diameter, and initially pale-colored before turning dark brown or reddish brown with a narrow to moderately wide, darker border. Lesions or spots may be slightly raised and occasionally surrounded by a yellowish halo (Braun et al., 2014).

Disease Cycle: Infected plants produce conidiophores (specialized hypha) 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, even as 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).

Dispersal and Spread: Air-currents, infected nursery plants, infected leaves, and seeds.

Damage Potential: Specific losses due to *Neocercosporidium smilacis* have not been reported. Photosynthetic area can be reduced due to leaf spotting. In severe infections, leaf wilt and drop may be expected. However, damage potential due to this pathogen is likely to be similar to 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, 2019). *Smilax* sp. vines and foliage are used in floral decorations and therefore, diseased plants could be of concern to greenbrier floral/ornamental production nurseries.

Worldwide Distribution: *Africa*: Algeria, Canary Islands, Ethiopia, Kenya, Libya, Morocco; *Asia*: India; *Europe*: Cyprus, France, Greece, Italy, Malta, Montenegro, Portugal, Russia, Sicily, Spain including Balearic Islands; *North America*: United States of America; *South America:* Brazil, Uruguay, Venezuela; *Australia* (Braun et al., 2014; Farr and Rossman, 2019).

In the United States of America, *N. smilacis* has been reported from Connecticut, Delaware, Florida, Georgia, Indiana, Iowa, Kansas, Louisiana, Maryland, Minnesota, Missouri, Mississippi, Nebraska, New Jersey, New York, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, Washington D.C., West Virginia, and Wisconsin (Braun et al., 2014; Farr and Rossman, 2019).

Official Control: *Cercospora smilacis* (syn. of *Neocercosporidium smilacis*) is on the 'Harmful Organisms' list for Japan (USDA-PCIT, 2019).

California Distribution: *Neocercosporidium smilacis* has not been reported from California. The pathogen is not known to be established in California.

California Interceptions: *Neocercosporidium smilacis* was detected in a shipment of *Smilax* sp. plants which was intercepted in San Luis Obispo County in October 2018 (see 'Initiating Event').

The risk *Neocercosporidium smilacis* would pose to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** In California, *Smilex* spp. host plants grow indigenously in warm and humid conditions in northern mountain and valley regions. If introduced, the pathogen could establish in those limited areas.

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 host range for *Neocercosporidium smilacis* 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:** *Neocercosporidium smilacis* has a high reproductive potential which results in the successive production of conidia that are dependent on air-currents, 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:** *N. smilacis*-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, C

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:** 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 under story 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* (English peak greenbriar) is included in the California Native Plant Society Inventory of Rare and Endangered Plants (CNPS, 2019; Calflora, 2019). Also, the pathogen could significantly impact nursery production of ornamental greenbrier foliage and vines.

Environmental Impact: A, B, C, D

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 *Cucurbit chlorotic yellows virus:*

Add up the total score and include it here.
-Low = 5-8 points
-Medium = 9-12 points
-High = 13-15 points

Total points obtained on evaluation of consequences of introduction to California = **11**

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. (Score)

Evaluation is not established (0)*: ***Neocercosporidium smilacis is not established in California and has only been detected in an intercepted plant shipment to the State.

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:

Specific losses caused by *Neocercosporidium smilacis* have not been reported.

Conclusion and Rating Justification:

Based on the evidence provided above **the proposed rating for *Neocercosporidium smilacis* 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.
Calflora. 2019. Information on California plants for education, research and conservation. [Web application]. Berkeley, California: The Calflora Database [a non-profit organization]. http://www.calflora.org/ (Accessed: Feb 19, 2019).
CNPS. 2019. *Smilax jamesii.* California Native Plant Society, Rare Plant Program. 2019. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.38). Website http://www.rareplants.cnps.org [accessed 19 February 2019].
Farr, D.F., & A. Y. Rossman. 2016. Fungal Databases, Systematic Mycology and Microbiology Laboratory, ARS, USDA. Retrieved August 1, 2016, from http://nt.ars-grin.gov/fungaldatabases/.
USDA-PCIT. 2019. USDA Phytosanitary Certificate Issuance & Tracking System. Retrieved Feb 19, 2019, 1:29:53 pm CST. https://pcit.aphis.usda.gov/PExD/faces/ReportHarmOrgs.jsp.
Videira, S. I. R., Groenewald, J. Z., Nakashima, C., Braun, U., Barreto, R. W., de Wit, P. J. G. M., and Crous, P. W. 2017. Mycosphaerellaceae - chaos or clarity? Studies in Mycology, 87:257-421.

Responsible Party:

John J. Chitambar, Primary Plant Pathologist/Nematologist, California Department of Food and Agriculture, 3294 Meadowview Road, Sacramento, CA 95832. Phone: 916-738-6693, plant.health[@]cdfa.ca.gov.

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