

California Pest Rating Proposal

Ferrisia virgata (Cockerell): striped mealybug

Hemiptera: Pseudococcidae

Current Rating: B

Proposed Rating: A

Comment Period: 7/17/2020 – 8/31/2020

Initiating Event:

Until recently, *Ferrisia virgata* was considered to be established in California and it is currently rated B. After the revision of the genus *Ferrisia* by Kaydan and Gullan (2012), specimens in the CDFA collection were examined and all specimens previously identified as *F. virgata* from California were found to represent other species of *Ferrisia* (N. von Ellenrieder, pers. comm.). *Ferrisia virgata* is no longer considered to be present in California. Therefore, a pest rating proposal is needed.

History & Status:

Background: Adult female *F. virgata* are large mealybugs that measure up to 4.5 mm in length. They are covered with white wax and have two dark stripes on their upper surface. They closely resemble other *Ferrisia* species. As is the case with mealybugs in general, species identification requires that specimens (adult females) be cleared, stained, and mounted on slides for microscopic examination of minute structures. *Ferrisia virgata* is highly polyphagous, feeding on plants in over 15 families, including Aponcynaceae (including *Hoya*), Rutaceae (including *Citrus*), Fabaceae, Rubiaceae (including *Coffea* and *Gardenia*), Malvaceae (including *Gossypium* and *Hibiscus*), Myrtaceae, Punicaceae (including *Punica granatum*), and Cactaceae (Bharathi and Muthukrishnan, 2017; Elango and Sridharan, 2017; Kaydan and Gullan, 2012).

Worldwide Distribution: *Ferrisia virgata* is reported to be present in Africa (Ghana, Kenya, South Africa, Uganda, and Zambia), North America (Mexico), South America (Brazil), the Caribbean (Jamaica), Asia (Cambodia, China, India, Indonesia, Iran, Malaysia, Philippines, Singapore, Sri Lanka, Thailand), and Oceania (Australia, Hawaii, Tahiti). The native range is not known, but it was originally described from material from Jamaica (Kaydan and Gullan, 2012; Moghaddam, 2013).

Official Control: *Ferrisia virgata* is listed as an A1 pest by Chile and a quarantine pest by Israel (EPPO).

California Distribution: *Ferrisia virgata* is not known to be present in California.

California Interceptions: *Ferrisia virgata* intercepted in California on fruit from Florida, Hawaii, Costa Rica, Mexico, and Venezuela (California Department of Food and Agriculture).

The risk *Ferrisia virgata* poses to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** *Ferrisia virgata* is highly polyphagous and host availability is not expected to significantly restrict its distribution in California within the area it is likely to survive in based on climate. This mealybug is apparently restricted to tropical and subtropical areas, and it seems unlikely that it could become established over more than a small part of southern California. Therefore, it receives a **Low (1)** in this category.

– **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:** *Ferrisia virgata* is highly polyphagous. Therefore, it receives a **High (3)** in this category.
- 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 and Dispersal Potential:** *Ferrisia virgata* is not reported to be parthenogenetic. Early instars may be dispersed passively via wind and movement of infested plants and fruit is another likely mode of dispersal. Therefore, it receives a **Medium (2)** in this category.
- 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.** *Ferrisia virgata* feeds on many different plants, including crops (e.g., citrus, cotton, and pomegranate) and ornamentals. Besides the direct impact of feeding (loss of plant fluid), the buildup of honeydew and resulting sooty mold impacts photosynthesis. The presence of this mealybug in California could lead to the loss of markets. Therefore, it receives a **Medium (2)** in this category.

Economic Impact: A, 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: Medium

- 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.** *Ferrisia virgata* is known to attack *Acalypha* species. There is one species in this genus native to California (*A. californica* Benth.) and it occurs in southern California, where this mealybug could become established. This mealybug attacks ornamental plants and could trigger treatments. Therefore, *F. virgata* receives a **Medium (2)** in this category.

Evaluate the environmental impact of the pest on California using the criteria below.

Environmental Impact: 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: Medium (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.

Consequences of Introduction to California for *Ferrisia virgata*: Medium (10)

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:** *Ferrisia virgata* is not known to be present in California. It receives a **Not established (0)** in this category.

–**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.

Final Score:

7) The final score is the consequences of introduction score minus the post entry distribution and survey information score: Medium (10)

Uncertainty:

The host range of *F. virgata* could be much wider. Data prior to the 2012 revision by Kaydan and Gullan is suspect.

Conclusion and Rating Justification:

Ferrisia virgata is a highly polyphagous mealybug pest that attacks crops grown in California. It is not known to be present in the state. For these reasons, an “A” rating is justified.

References:

Bharathi, K. and Muthukrishnan, N. 2017. Survey and records of mealy bugs species on cotton and alternate hosts of key mealy bug *Phenacoccus solenopsis* Tinsley and its natural enemies complex in major cotton growing areas of South Tamil Nadu, India. International Journal of Current Microbiology and Applied Sciences 6:1047-1054.

California Department of Food and Agriculture. Pest and damage record database. Accessed June 26, 2020:

<https://pdr.cdfa.ca.gov/PDR/pdrmainmenu.aspx>

Elango, K. and Sridharan, S. 2017. Population dynamics of pomegranate sucking pests under high density planting in Tamil Nadu. *Journal of Entomology and Zoology Studies* 5:377-380.

EPPO global database. Accessed June 26, 2020:
<https://gd.eppo.int/taxon/PSECVI/categorization>

Kaydan, M.B. and Gullan, P.J. 2012. A taxonomic revision of the mealybug genus *Ferrisia* Fullaway (Hemiptera: Pseudococcidae), with descriptions of eight new species and a new genus. *Zootaxa* 3543:1-65.

Moghaddam, M. 2013. A review of the mealybugs (Hemiptera: Coccoidea: Pseudococcidae, Putoidae and Rhizoecidae) of Iran, with descriptions of four new species and three new records for the Iranian fauna. *Zootaxa* 3632:001-107.

Responsible Party:

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***Comment Period: 7/17/2020 through 8/31/2020**

***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.

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: A