

California Pest Rating Proposal

Lepidosaphes chinensis Chamberlin: Chinese mussel scale

Hemiptera: Diaspididae

Current Rating: Q

Proposed Rating: A

Comment Period: **5/26/2021 – 7/10/2021**

Initiating Event:

Lepidosaphes chinensis is frequently intercepted in California on *Dracaena* plants from Florida, Ecuador, and Asia (China and Thailand). It was collected twice on orchids in Los Angeles County in 1934 and 1935 but it was since eradicated (Gill, 1997). It was also recently found in a nursery in Monterey County in 2011 (California Department of Food and Agriculture). It has not been rated. Therefore, a pest rating proposal is needed.

History & Status:

Background: The scale *Lepidosaphes chinensis* is reported to feed on plants in eight families: Arecaceae, Asparagaceae, Elaeagnaceae, Euphorbiaceae, Fabaceae, Magnoliaceae, Orchidaceae, and Pandanaceae (García Morales et al., 2016). Reported hosts *Beaucarnea recurvata*, *Dracaena* (including *D. braunii*, or lucky bamboo), *Ficus*, *Sansevieriana trifasciata*, and *Yucca elephantipes* (California Department of Food and Agriculture; Łabanowski, 2017; Suh and Bombay, 2015). Infestations are reported to cause chlorosis, necrosis, wilting, and black streaks, and heavy infestations cause the death of affected leaves (Malumphy et al., 2012; Stocks, 2014). No reports of economic damage were found, but it is apparent that the value of ornamental plants can be lowered, and this scale was deemed to have the potential to become a significant economic and ecological pest in Florida (Stocks, 2014).

Worldwide Distribution: *Lepidosaphes chinensis* is apparently native to eastern Asia, where it is reported from China, Hong Kong, Laos, Philippines, Singapore, Vietnam, Taiwan, and Thailand (Martin and Lau, 2011; García Morales et al., 2016; Suh and Bombay, 2015). It has been reported at nurseries in Florida, but it is not known if this scale is established in the environment. It has been intercepted in shipments originating from Ecuador, but it is not otherwise known to be established in the New World (California Department of Food and Agriculture).

Official Control: *Lepidosaphes chinensis* is considered reportable by the United States Department of Agriculture and it is considered a quarantine pest in Brazil (EPPO global database; U.S. regulated plant pest table).

California Distribution: *Lepidosaphes chinensis* is not known to be established in California.

California Interceptions: *Lepidosaphes chinensis* is frequently intercepted in California on *Dracaena* plants from Florida, Ecuador, and Asia (China and Thailand). It was also found in a nursery in Monterey County in 2011 (California Department of Food and Agriculture).

The risk *Lepidosaphes chinensis* poses to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** *Lepidosaphes chinensis* appears to be limited to areas with tropical and subtropical climates, and climate will likely limit its distribution outdoors in California to southern coastal areas. It could be much more widespread in the state in greenhouses. It is somewhat polyphagous, and *Ficus* species are commonly grown as ornamentals in southern California. Therefore, it receives a **Medium (2)** 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:** *Lepidosaphes chinensis* is somewhat polyphagous and reported to feed on plants in eight families. Therefore, it receives a **Medium (2)** 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:** *Lepidosaphes chinensis* could be moved on infested plant material. 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.** Known hosts include a variety of ornamental plants, including *Dracaena*, *Sansevieriana*, *Ficus*, and orchids. Nurseries (especially in greenhouses) and ornamental *Ficus* species grown outdoors as hedges and street trees could be impacted, including increased production costs. No known California crops are hosts. Therefore, it receives a **Low (1)** in this category.

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: Low

– **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.** *Lepidosaphes chinensis* could become established in southern coastal California, and possibly in a larger area on widely-grown hosts like *Ficus*. Ornamental plants commonly grown in nurseries are hosts of this scale. Affected nurseries and homeowners may treat infested plants and trees. There is one rare orchid species, *Piperia cooperi*, that occurs in coastal southern California and a nearly endemic orchid species, *Cypripedium californicum*, considered vulnerable by the North American Orchid Conservation Center, that this scale could potentially threaten (Calflora). Therefore, *L. chinensis* receives a **High (3)** in this category.

Environmental Impact: A, D, 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: High (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 *Lepidosaphes chinensis*: 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:** *Lepidosaphes chinensis* is not known to be established 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:

There is uncertainty regarding the ability of this scale to establish over more than a limited portion of southern California based on the climate of its origin. However, other *Lepidosaphes* species

originating from the same region have become established over a wide area in the state. It is possible that its host range may be broader than currently known.

Conclusion and Rating Justification:

Lepidosaphes chinensis is a scale that attacks a variety of ornamental plants. It could become a pest of ornamental plants in greenhouses and outdoors in southern California, triggering treatments by businesses and homeowners. It could also impact native orchids. It is not presently known to be in the state. For these reasons, an “A” rating is justified.

References:

Calflora. Accessed May 12, 2021:
<https://www.calflora.org/>

California Department of Food and Agriculture. Pest and damage record database. Accessed May 12, 2021:
<https://pdr.cdfa.ca.gov/PDR/pdrmainmenu.aspx>

EPPO Global Database. Accessed May 12, 2021:
<https://gd.eppo.int/>

García Morales, M., Denno, B.D., Miller, D.R., Miller, G.L., Ben-Dov, Y., and Hardy, N.B. 2016. ScaleNet: A literature-based model of scale insect biology and systematics. Accessed May 12, 2021:
<http://scalenet.info>.

Gill, R. J. 1997. The Scale Insects of California: Part 3. The Armored Scales (Homoptera: Diaspididae). California Department of Food and Agriculture, Sacramento, California.

Łabanowski, G. S. 2017. The threat of greenhouse horticultural crops by pests. *Zeszyty Naukowe Instytutu Ogrodnictwa* 25:39-56.

Malumphy, C., Halstead, A. J., and Salisbury, A. 2012. First incursion of Chinese mussel scale *Lepidosaphes chinensis* (Hemiptera: Diaspididae) in Europe, with a review of *Lepidosaphes* species found in Britain. *British Journal of Entomology and Natural History* 25:65-73.

Martin, J. H. and Lau, C. S. K. 2011. The Hemiptera-Sternorrhyncha (Insecta) of Hong Kong, China – an annotated inventory citing voucher specimens and published records. *Zootaxa* 2847:1-122.

Stocks, I. 2014. Pest alert: *Lepidosaphes chinensis* Chamberlin (Hemiptera: Diaspididae), an armored scale infesting lucky bamboo. Florida Department of Agriculture and Consumer Services, Division of Plant Industry.

Suh, S. -J., and Bombay, K. 2015. Scale insects (Hemiptera: Coccoidea) found on dracaena and ficus plants (Asparagales: Asparagaceae, Rosales: Moraceae) from southeastern Asia. *Insecta Mundi* 448:1-10.

U.S. regulated plant pest table. Accessed May 12, 2021:

<https://www.aphis.usda.gov/aphis/ourfocus/planthealth/import-information/rppl/rppl-table>

Responsible Party:

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***Comment Period: 5/26/2021 – 7/10/2021**

*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