

California Pest Rating Proposal

Carausius morosus (Sinéty): Indian walking stick

Phasmatodea: Phasmatidae

Current Rating: Q

Proposed Rating: C

Comment Period: **9/1/2020 – 10/16/2020**

Initiating Event:

Carausius morosus has been present in California since 1991 and has spread to at least 10 counties. It has not been rated. Therefore, a pest rating proposal is needed.

History & Status:

Background: The Indian walking stick, *Carausius morosus*, is very popular as a pet and model for physiological research. Originally from southern India, it has become introduced to South Africa, Madagascar, the Azores, Madeira, Europe, Mexico, and the United States, probably as a result of the pet trade. It is also found over much of Southeast Asia, but it is not clear if this species is native there or introduced. The females, which are much more common than males, reach approximately 90 mm in length and are distinguished by the red markings on the bases of their front femora. Their bodies are green to brown (Arakelian, 2008). They reproduce parthenogenetically and there are multiple generations per year. They overwinter as eggs in California (Headrick and Wilen, 2011). They are reported to be polyphagous, and host plants include the families Araliaceae (including ivy), Geraniaceae (including geranium), Malvaceae (including hibiscus), Oleaceae (including privet), Quercaceae (including oak), Rhododenraceae (including azalea), Rosaceae (including bramble, hawthorn, rose, and pyracantha), and Theaceae (including camellia) (Arakelian, 2008).

Carausius morosus is reported to sometimes occur in large numbers and cause defoliation in San Diego County (J. Schwartz, pers. comm.).

Worldwide Distribution: *Carausius morosus* is native to India and has been introduced to many locations worldwide, including South Africa, Madagascar, the Azores, Madeira, Europe, Mexico, and the United States (Aguar et al., 2004; Arakelian, 2008; Brock, 1999; iNaturalist).

Official Control: *Carausius morosus* is considered reportable by the United States Department of Agriculture (U.S. regulated plant pest table).

California Distribution: *Carausius morosus* has been reported from 10 counties in California: Alameda, Contra Costa, Los Angeles, Orange, San Diego, San Francisco, San Luis Obispo, Santa Barbara, Santa Cruz, and Ventura (California Department of Food and Agriculture).

California Interceptions: *Carausius morosus* has not been intercepted in California (California Department of Food and Agriculture).

The risk *Carausius morosus* poses to California is evaluated below.

Consequences of Introduction:

1) **Climate/Host Interaction:** *Carausius morosus* is polyphagous and is already reported from 10 counties in California, from San Diego County in the south to Contra Costa County in the north. It may be limited to the coast and southern part of the state. 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:** This walking stick 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:** This walking stick reproduces parthenogenetically. 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.** This walking stick attacks a wide variety of plants, including ornamentals. It may increase production costs of such plants. 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.** This walking stick is a known pest of ornamental plants. It could trigger treatments and affect home gardens. Therefore, *C. morosus* receives a **High (3)** in this category.

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

Environmental Impact: 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 *Carausius morosus*: Medium (11)

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:** *Carausius morosus* is reported from 10 counties in California. It receives a **Medium (-2)** 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 (9)

Uncertainty:

This walking stick could become significantly more widespread in California. It could become a more significant pest of crops and/or ornamental plants. It could be impacting native California plants.

Conclusion and Rating Justification:

Carausius morosus is a walking stick that has been present in California since 1991 and has become widespread in the state. Although it is reported to cause defoliation of ornamental plants, it does not appear to have become a widely significant pest. For these reasons, a “C” rating is justified.

References:

Aguiar, A. M. F., Pombo, D. A., and Y. M. Gonçalves. 2014. Identification, rearing, and distribution of stick insects of Madeira Island: An example of raising biodiversity awareness. *Journal of Insect Science* 14:1-13.

Arakelian, G. 2008. Indian stick insect (*Carausius morosus*). Accessed August 11, 2020: http://file.lacounty.gov/SDSInter/acwm/215658_IndianStickInsect.pdf

Brock, P. D. 1999. New records of alien stick-insects. *Phasmid Studies* 7:39-40.

California Department of Food and Agriculture. Pest and damage record database. Accessed August 11, 2020:

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

Headrick, D. H. and C. A. Wilen. 2011. Indian walking stick. Accessed August 11, 2020:
<http://ipm.ucanr.edu/PMG/PESTNOTES/pn74157.html>

iNaturalist. Accessed August 11, 2020:
www.inaturalist.org

U.S. regulated plant pest table. Accessed August 5, 2020:
<https://www.aphis.usda.gov/aphis/ourfocus/planthealth/import-information/rppl/rppl-table>

Responsible Party:

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***Comment Period: 9/1/2020 – 10/16/2020**

***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\[\[@\]\(mailto:permits@cdfa.ca.gov\)\]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: C