

California Pest Rating Proposal

Psyllaephagus euphyllurae (Masi): a parasitoid wasp

Hymenoptera: Encyrtidae

Current Rating: Z

Proposed Rating: D

Comment Period: **05/20/2022 – 07/04/2022**

Initiating Event:

There is interest in releasing *Psyllaephagus euphyllurae* to control the olive psyllid, *Euphyllurae olivina*. *Psyllaephagus euphyllurae* has not been rated. A pest rating proposal is needed.

History & Status:

Background: The olive psyllid (*Euphyllura olivina*) is native to southern Europe and has been in the United States since at least 2007 (note: This pest is considered to be within the family Liviidae, but it is referred to as a “psyllid” for historical reasons). It is present in southern California but has not yet invaded the main olive-producing areas of California. It feeds on flower blossoms and in the Old World it is reported to reduce yield, in some cases severely (USDA, 2021). It is therefore considered a significant threat to the California olive industry.

The wasp *Psyllaephagus euphyllurae* parasitizes late-instar (3rd and 4th) *E. olivina* nymphs and it is considered a promising candidate for biological control of the pest. It is parthenogenic and is reported to have two generations per year (Pickett et al., 2019). It aestivates from late summer to the following spring in the exoskeleton of its host (USDA, 2021). It has been reported to parasitize one additional species, *Euphyllura phillyreae* (Triapitsyn et al., 2014).

Host specificity testing by Pickett et al. (2019) involved seven non-target psyllid species. One of these was the California native *Neophyllura arctostaphyli*, which was considered the most closely-related (to *E. olivina*) native species because it is in the same tribe as *E. olivina*. None of the tests found any parasitism (or even any attacks) of any of the non-target species. The lack of attacks suggests that the potential for mortality of non-target psyllids (even if it does not result in successful parasitism) is minimal.

Worldwide Distribution: *Psyllaephagus euphyllurae* is native to the Mediterranean regions and has been reported from France, Spain, Tunisia, and Turkey and likely other locations as well (Gonçalves et al., 2012; Pickett et al., 2019; Yayla, 1983). It is not known to have been introduced outside of this area (USDA, 2021).

Official Control: *Psyllaephagus euphyllurae* is not known to be under official control anywhere.

California Distribution: *Psyllaephagus euphyllurae* is not known to be established in California (California Department of Food and Agriculture).

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

The risk *Psyllaephagus euphyllurae* poses to California is evaluated below.

Consequences of Introduction:

- 1) **Climate/Host Interaction:** This wasp lives in the Mediterranean region. Its main host, *E. olivina*, is already established in California and could spread to a much greater portion of the state. It appears likely that this wasp could establish over much of California. Therefore, it receives a **High (3)** 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:** *Psyllaephagus euphyllurae* is only known to utilize two species of *Euphyllura* as hosts. Therefore, it receives a **Low (1)** 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:** *Psyllaephagus euphyllurae* is parthenogenic and it can fly. In addition, it remains within the exoskeleton of its host on olive trees for a certain amount of time, so it could be moved with plant material. Therefore, it receives a **High (3)** 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:** *Psyllaephagus euphyllurae* does not feed on plants. It is not known to parasitize any beneficial insects. It could potentially provide biological control of *E. olivina*, which poses a threat to the California olive industry, which is worth tens of millions of dollars annually. Therefore, it receives a **Low (1)** in this category.

Economic Impact:

- 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:** The only known host genus is *Euphyllura*, and host specificity testing, which did not reveal any of the tested non-target species to be used as hosts or even attacked, further supports this specificity. The genus *Euphyllura* is Old World in origin, so there are no native California psyllids in this genus. There are no endangered psyllids in California. If *E. olivina* becomes a serious pest of olives in California, pesticide use may increase. Therefore, if *P. euphyllurae* provides effective biological control of *E. olivina*, it could reduce pesticide use. Therefore, *P. euphyllurae* receives a **Low (1)** in this category.

Environmental Impact:

- 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: Low (1)

- **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 *Psyllaephagus euphyllurae*: Medium (9)

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:** *Psyllaephagus euphyllurae* 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 (9)

Uncertainty:

It is not known if *E. olivina* will become a serious pest of California olive. It is not known if *P. euphyllurae* will provide significant control of *E. olivina*.

Conclusion and Rating Justification:

Psyllaephagus euphyllurae is a parasitic wasp that appears to be limited to the Old World psyllid genus *Euphyllura*. It could provide biological control of the olive psyllid, *Euphyllura olivina*, which has not yet invaded the olive-growing areas of California but is established in California and is considered a serious threat. *Psyllaephagus euphyllurae* does not appear to pose a threat to the agriculture or environment of California and it may be a useful biological control agent. For these reasons, a “D” rating is justified.

References:

California Department of Food and Agriculture. Pest and damage record database. Accessed May 4, 2022:

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

Gonçalves, M. F., Santos, S. A. P., and Torres, L. M. 2012. Efficacy of Spinosad bait sprays to control *Bactrocera oleae* and impact on non-target arthropods. *Phytoparasitica* 40:17-28.

Pickett, C. H., Jones, J. M., Triapitsyn, S., and Hougardy, E. 2019. Host specificity testing for *Psyllaephagus euphyllurae* (Hymenoptera: Encyrtidae) collected in eastern Spain for the biological control of olive psyllid, *Euphyllura olivina* (Hemiptera: Liviidae, formerly Psyllidae) in California. An environmental assessment report for the USDA APHIS.

Triapitsyn, S. V., Jones, J. M. L., Pickett, C. H., Buffington, M. L., Rugman-Jones, P. F., and Daane, K. M. 2014. Description of the male of *Psyllaephagus euphyllurae* (Masi) (Hymenoptera, Encyrtidae), a parasitoid of the olive psylla, *Euphyllura olivina* (Costa) (Hemiptera, Liviidae), with notes on its reproductive traits and hyperparasitoids. *Journal of Entomological and Acarological Research* 46:112-118.

USDA. 2021. Field release of *Psyllaephagus euphyllurae* (Hymenoptera: Encyrtidae) for biological control of olive psyllid, *Euphyllura olivina* (Hemiptera: Liviidae), in the contiguous United States. Environmental assessment.

Yayla A. 1983. Investigation on the olive pests and its natural enemies on the Antalya. Plant Protection Bulletin 23:188-206.

Responsible Party:

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***Comment Period: 05/20/2022 – 07/04/2022**

***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: D