

California Pest Rating Proposal

***Ganaspis brasiliensis* (Ihering) (G 1 lineage): parasitoid wasp**

Hymenoptera: Figitidae

Current Rating: None

Proposed Rating: D

Comment Period: 09/01/2021 – 10/16/2021

Initiating Event:

An application was submitted for a federal permit for the release of *Ganaspis brasiliensis* (G 1 lineage) for the purpose of controlling *Drosophila suzukii*. *Ganaspis brasiliensis* is not exempt and it has not been rated. Therefore, a pest rating proposal is needed.

History & Status:

Background: *Ganaspis brasiliensis* is a tiny (1.5-1.75 mm in length) dark brown to black wasp (Buffington and Forshage, 2016). This wasp parasitizes larvae of *Drosophila*. Several “lineages” of *G. brasiliensis* are recognized. The G 1 lineage is identifiable with molecular techniques and it forms a monophyletic clade. In experiments, it was found to be much more host-specific than *G. brasiliensis* as a whole and to prefer parasitizing larvae feeding in fresh fruit (as opposed to artificial diet) (Daane, 2019).

Drosophila suzukii is a significant pest of soft-skinned fruits. It not only causes damage and losses, but, in addition, it impacts trade because its presence in fruit can lead to rejection of shipments. Resistance to Spinosad, which is commonly used to control *D. suzukii*, has been found in some California populations of *D. suzukii* (Gress and Zalom, 2018).

Worldwide Distribution: The geographic origin of *Ganaspis brasiliensis* is probably Asia. It has been reported from Africa (Benin and Uganda), Asia (China, Indonesia, Japan, Malaysia, the Philippines, South Korea, Thailand), Central America (Panama), Oceania (Hawaii), South America (Brazil), and the Caribbean (Guadeloupe), (Buffington and Forshage, 2016; Daane, 2019).

Official Control: *Ganaspis brasiliensis* is not known to be regulated anywhere.

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

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

The risk *Ganaspis brasiliensis* poses to California is evaluated below.

Consequences of Introduction:

- 1) **Climate/Host Interaction:** *Ganaspis brasiliensis* is present in areas with a range of climates, including temperate and tropical. Much of California likely has a suitable climate. This wasp has a narrow host range, but its main host, *Drosophila suzukii*, is widespread in 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:** The host range of *Ganaspis brasiliensis* appears to be limited to the genus *Drosophila*. 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:** *Ganaspis brasiliensis* could be moved with fruit that is infested with parasitized *Drosophila* larvae. These wasps also fly. 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.** *Ganaspis brasiliensis* is not known to have any negative economic impacts. It may be an effective biological control agent against *D. suzukii*. 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.** *Ganaspis brasiliensis* (G 1 lineage) parasitized several species of *Drosophila* in laboratory experiments. California has native *Drosophila* species; the total number is not known, but it could be approximately 50 species. Two lines of evidence from experiments suggest *G. brasiliensis* (G 1 lineage) is unlikely to pose a threat to native California *Drosophila*. First, the species parasitized in experiments, *D. suzukii*, *D. simulans*, and *D. melanogaster*, are all part of the melanogaster species group. Most or all the species in this group are native to the Old World (Bock, 1980; Golic and Hawley, 2011). Second, *G. brasiliensis* (G 1 lineage) showed a strong preference for parasitizing larvae in fresh fruit, not artificial diet. Native California *Drosophila* are not known to feed in fresh fruit (Girod et al., 2018; M. Hauser, pers. comm.). Therefore, *G. brasiliensis* (G 1 lineage) 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 *Ganaspis brasiliensis* (G 1 lineage):

Low (8)

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:** *Ganaspis brasiliensis* 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: Low (8)

Uncertainty:

There is some uncertainty regarding the potential of *G. brasiliensis* (G 1 lineage) to parasitize native California *Drosophila*. This uncertainty is low for the reasons explained above, in Environmental impact.

Conclusion and Rating Justification:

Ganaspis brasiliensis is a potential biological control agent against *D. suzukii*. This wasp appears to pose very little risk to California's agriculture or environment. If it proves effective against *D. suzukii*, it could benefit agriculture and the environment in this state by reducing crop losses, damage, and pesticide use resulting from *D. suzukii*. For these reasons, a "D" rating is justified.

References:

Bock, I. R. 1980. Current status of the *Drosophila melanogaster* species-group (Diptera). Systematic Entomology 5:341-356.

Buffington, M. L. and Forshage, M. 2016. Redescription of *Ganaspis brasiliensis* (Ihering, 1905), new combination, (Hymenoptera: Figitidae) a natural enemy of the invasive *Drosophila suzukii* (Matsumura, 1931) (Diptera: Drosophilidae). Proceedings of the Entomological Society of Washington 118:1-13.

California Department of Food and Agriculture. Pest and damage record database. Accessed August 24, 2021:

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

Daane, K. 2019. Petition to release *Ganaspis brasiliensis* (Ihering) (Hym.: Figitidae), an Asian larval parasitoid for the biological control of *Drosophila suzukii* Matsumura (Dip.: Drosophilidae).

Girod, P., Lierhmann, O., Urvois, T., Turlings, T. C. J., Kenis, M., and Haye, T. 2018. Host specificity of Asian parasitoids for potential classical biological control of *Drosophila suzukii*. Journal of Pest Science 91:1241-1250.

Golic, K. G. and Hawley, R. S. 2011. *Drosophila*: A laboratory handbook. Second edition. Cold Spring Harbor Laboratory press, Cold Spring Harbor, New York.

Gress, B. E. and Zalom, F. G. 2018. Identification and risk assessment of Spinosad resistance in a California population of *Drosophila suzukii*. Pest Management Science DOI 10.1002/ps.5240

Responsible Party:

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***Comment Period: 09/01/2021 – 10/16/2021**

***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: D