

**California Pest Rating Profile for**  
***Tropilaelaps mercedesae* Anderson and Morgan: Asian bee mite**  
**Acari: Mesostigmata**  
**Pest Rating: A**

---

**Comment Period: 02/05/2025 – 03/22/2025**

---

**Initiating Event:**

Mites in the genus *Tropilaelaps* are pests of honeybees in Asia and are considered to pose a threat to beekeeping worldwide. These mites are not known to be present in the United States and none have been assessed with the California pest rating proposal system. One species, *T. mercedesae*, will be considered in this pest rating proposal.

**History & Status:**

**Background:**

Mites in the genus *Tropilaelaps* are parasites of bees in the genus *Apis*. They feed on the hemolymph of larvae and pupae (Dainat et al., 2009). The adult female lays one to four eggs on a bee larva before the brood cell is capped. The mites feed on bee larvae and pupae and cause death of bees and colony decline, or absconding. Up to 50% of the bee larvae can be killed. *Tropilaelaps* mites are dispersed on bees, although survival on adult bees with the absence of brood is reported to be limited to 60 hours and the numbers present on bees may be relatively low (e.g., an average of 1.4 *T. clareae* per 100 honeybees) (Infestation of honey bees with *Tropilaelaps* spp., 2024; Woyke, 1984). *Tropilaelaps* species are apparently not able to feed on adult bees. These mites are presumed to have originally been associated with Asian bee species, including *Apis dorsata*.

Infestation of developing honey bees by *T. mercedesae* resulted in lower weight, increased wing deformities, reduced longevity, and increased deformed wing virus (DWV) infection levels (Khongphinitbunjong et al., 2016). Some of these impacts may have resulted simply from injury and loss of hemolymph through feeding by the mites. However, *Tropilaelaps* mites are known to carry and may vector honeybee viruses. The following viruses were isolated from *T. mercedesae*, in Thailand: DWV (found in all of the mites sampled), acute bee paralysis virus, chronic bee paralysis virus, and varroa destructor virus-1 (Minoo et al., 2018). *Tropilaelaps mercedesae* in China tested positive (+ RNA and – RNA) for DWV, meaning this virus can infect and replicate in this mite (Dainat et al., 2009). There appears to be some uncertainty regarding the ability of these mites to vector these viruses to honeybees and the relative significance of viruses versus the direct impacts of feeding. It is possible that some symptoms of DWV seen in honeybees with the virus may be caused by the feeding of the mite itself, rather than the virus itself (Phokasem et al., 2019).

*Tropilaelaps* mites appear to be limited to *Apis* species and are not known to be associated with *Bombus* species (EFSA Panel on Animal Health and Welfare, 2013).

*Tropilaelaps* mites are dealt with by beekeepers by manipulating the hives to remove all brood and thus starve the mites (Kaundil and Thakur, 2020).

In terms of risk of introduction, long-distance commercial movement of isolated (without hives/brood) bees is likely low-risk, as these mites cannot survive long periods without brood as a food source. *Tropilaelaps mercedesae* lived for six days on honeycomb and three days on pollen without bees. The longer survival on honeycomb may be due to temperature and/or humidity differences (Khongphinitbunjong et al., 2019). Movement of hives with brood is higher risk as is natural dispersal via swarming (EFSA Panel on Animal Health and Welfare, 2013).

**Worldwide Distribution:** *Tropilaelaps mercedesae* is reported to occur in: **Asia:** China, South Korea, Thailand; **Europe:** Georgia (Dainat et al., 2009; Janashia et al., 2024; Minoo et al., 2018; Truong et al., 2022).

**Official Control:** *Tropilaelaps mercedesae* is considered a priority pest in Australia (The National Priority List of Exotic Environmental Pests, Weeds and Diseases).

**California Distribution:** *Tropilaelaps* mites are not known to be present in California.

**California Interceptions:** *Tropilaelaps* mites have not been intercepted in California (California Department of Food and Agriculture, 2024).

The risk *Tropilaelaps mercedesae* poses to California is evaluated below.

### **Consequences of Introduction:**

- 1) **Climate/Host Interaction:** The known distribution of *Tropilaelaps mercedesae* appears to include temperate as well as warmer or tropical climates. Honeybees are widespread in California. Therefore, *T. mercedesae* 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:** *Tropilaelaps mercedesae* is associated with *Apis* species. 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:** *Tropilaelaps* mites are thought to be capable of dispersing with bees for short periods (depending on the medium they are infesting, they cannot

survive for more than six days without brood to feed on). It could also be dispersed via movement of infested hives. Therefore, *T. mercedesae* 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.** *Tropilaelaps mercedesae* is a pest of honeybees. Mites in this genus cause death and absconding of bees and may vector serious honeybee viruses. Honeybees are critical for pollination of California crops, include almonds. Special practices may be necessary to eliminate this mite from hives. Therefore, it receives a **High (3)** in this category.

**Economic Impact: A, B, C, D, E, F**

- 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: High**

- 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.** Honeybees are important pollinators and this mite could therefore impact California gardens if it became established here. Treatments could be triggered. Therefore, *T. mercedesae* receives a **High (3)** in this category.

**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 *Tropilaelaps mercedesae*: Medium (12)**

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:** *Tropilaelaps mercedesae* 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 (12)

### **Uncertainty:**

There is uncertainty regarding the climatic suitability of California to this mite. There is also uncertainty regarding how significant this mite would be if it became established in California. For example, are there beekeeping practices in California that might mitigate the presence and/or impacts of this mite here?

### **Conclusion and Rating Justification:**

*Tropilaelaps mercedesae* is a honeybee pest that poses a risk to California agriculture and it is not known to be present in the state. For these reasons, a “A” rating is justified.

### **References:**

California Department of Food and Agriculture. Pest and damage record database. Accessed December 10, 2024:

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

Dainat, B., Ken, T., Berthoud, H., and Neumann, P. 2009. The ectoparasitic mite *Tropilaelaps mercedesae* (Acari, Laelapidae) as a vector of honeybee viruses. *Insectes Sociaux* 56:40-43.

EFSA Panel on Animal Health and Welfare. 2013. Scientific opinion on the risk of entry of *Aethina tumida* and *Tropilaelaps* spp. in the EU. EFSA Journal 11:1-127.

Infestation of honey bees with *Tropilaelaps* spp. Accessed December 13, 2024:

[https://www.woah.org/fileadmin/Home/eng/Health\\_standards/tahm/3.02.05\\_TROPILAEALAPS.pdf](https://www.woah.org/fileadmin/Home/eng/Health_standards/tahm/3.02.05_TROPILAEALAPS.pdf)

Janashia, I., Uzunov, A., Chen, C., Costa, C., and Cilia, G. 2024. First report of *Tropilaelaps mercedesae* presence in Georgia: The mite is heading westward! Journal of Apicultural Science 68:1-6.

Kaundil, P., and Thakur, R. K. 2020. Chapter 2. Pests of honeybees and their management pp. 13-28 in (K. Ghoneim, ed.) Advances in Agricultural Entomology. AkiNik Publications, New Delhi, India.

Khongphinitbunjong, K., Chantawannakul, P., Yañez, O., and Neumann, P. 2019. Survival of ectoparasitic mites *Tropilaelaps mercedesae* in association with honeybee hive products. Insects <http://dx.doi.org/10.3390/insects10020036>

Khongphinitbunjong, K., Neumann, P., Chantawannakul, P., and Williams, G. R. 2016. The ectoparasitic mite *Tropilaelaps mercedesae* reduces western honey bee, *Apis mellifera*, longevity and emergence weight, and promotes Deformed wing virus infections. Journal of Invertebrate Pathology 137:38-42.

Minoo, H., Kanjanaprachaoat, P., Suppasat, T., and Wongsiri, S. 2018. Honey bee virus detection on *Tropilaelaps* and *Varroa* mites in Chiang Mai Thailand. Journal of Apiculture 33:77-81.

Phokasem, P., de Guzman, L. I., Khongphinitbunjong, K., Frake, A. M., and Chantawannakul, P. 2019. Feeding by *Tropilaelaps mercedesae* on pre- and post-capped brood increases damage to *Apis mellifera* colonies. Scientific Reports <https://doi.org/10.1038/s41598-019-49662-4>

The National Priority List of Exotic Environmental Pests, Weeds and Diseases. Accessed December 20, 2024: <https://www.agriculture.gov.au/biosecurity-trade/policy/environmental/priority-list#terrestrial-invertebrates>

Truong, A. -T., Yoo, M. -S., Yun, B. -R., Kang, J. E., Noh, J., Hwang, T. J., Seo, S. K., Yoon, S. -S., and Cho, Y. S. 2022. Prevalence and pathogen detection of *Varroa* and *Tropilaelaps* mites in *Apis mellifera* (Hymenoptera, Apidae) apiaries in South Korea. Journal of Apicultural Research DOI: 10.1080/00218839.2021.2013425

Woyke, J. 1984. Survival and prophylactic control of *Tropilaelaps clareae* infesting *Apis mellifera* colonies in Afghanistan. Apidologie 15:421-434.

## Responsible Party:

Kyle Beucke (see comment regarding authorship above, in Background), 1220 N Street, Sacramento, CA 95814, 916-698-3034, [permits\[@\]cdfa.ca.gov](mailto:permits[@]cdfa.ca.gov)

**\*Comment Period: 02/05/2025 – 03/22/2025**

### **\*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.

---

## Pest Rating: A