

## California Pest Rating Proposal

### *Toumeyella parvicornis* (Cockerell): pine tortoise scale

Hemiptera: Coccidae

Current Rating: Q

Proposed Rating: A

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Comment Period: **10/11/2021 – 11/25/2021**

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#### Initiating Event:

*Toumeyella parvicornis* was found on a pine tree at a residence in San Diego in September 2021. It has not been rated. A pest rating proposal is needed.

#### History & Status:

**Background:** *Toumeyella parvicornis* is a soft scale that feeds on pine trees (*Pinus* spp.). The shape of the adult female is variable and dependent on the part of the tree it has settled on. Those on shoots or twigs are more hemispherical, and those on needles are more elongate (Clarke, 2013). Development time is dependent on climate. In cooler areas, there may be one generation per year and immature female scales overwinter. In warmer climates, there can be up to four overlapping generations per year (Clarke, 2013; Garonna et al., 2018; Hamon and Williams, 1984; McKinley, 2019).

*Toumeyella parvicornis* is reported to feed on *Pinus banksiana*, *P. sylvestris*, *P. strobus*, *P. nigra*, *P. resinosa*, *P. contorta*, *P. mugo*, *P. virginiana*, *P. ellioti*, *P. echinata*, *P. caribaea*, *P. pinaster*, and *P. pinea* (Clarke, 2013; Garonna et al., 2018). *Pinus halapensis* (Aleppo pine) appears to be resistant (Garonna et al., 2018).

*Toumeyella parvicornis* is reported to cause reduced growth, dieback, tree mortality and reduced cone production (Garonna et al., 2018; Malumphy et al., 2012). Sooty mold that grows on

honeydew impacts photosynthesis. Significant impacts in some situations appear to be limited to young trees (Wilkinson and Chellman, 1979).

This scale is a common pest of pine trees in the eastern United States and Canada (Cheung, 2011). It is a significant pest of Christmas trees in Louisiana and North Carolina, for example (McKinley, 2019; Oliver and Chapin, 1988). Oliver and Chapin (1988) describe foliage blackened by sooty mold and deformed by damage and indicate that damaged trees are unfit for sale as Christmas trees. In a slash pine plantation in Florida, Wilkinson and Chellman (1979) reported that growth (height) of trees infested by *T. parvicornis* was reduced by 40%; these scales were apparently being tended by red imported fire ant (*Solenopsis invicta*). In the Turks and Caicos Islands, this scale caused mortality of the endemic pine tree species *P. caribaea* var. *bahamensis* and caused the complete loss of these trees from some areas (Malumphy et al., 2012).

In some cases, predators and parasitoids appear to limit this scale to acceptable levels, at least in larger trees (Hamon and Williams, 1984). Chemical control is difficult and treatments must target the crawler stage (McKinley, 2019). Cooper and Cranshaw found that imidacloprid soil treatments controlled this scale on lodge-pole pine. Clarke et al. (1992) suggested bifenthrin may provide effective control. Aphelinid wasps that are known to attack this scale include species in the genera *Coccophagus* and *Metaphycus* (Clarke, 2013; Garonna et al., 2018).

**Worldwide Distribution:** *Toumeyella parvicornis* is native to the eastern United States and Canada. It is reported from Canada, Mexico, United States (most states east of the Mississippi River and also west to North Dakota, Colorado, and Texas) (Cheung, 2011; Clarke, 2013). It has been introduced to Italy and the Caribbean (Garonna et al., 2018).

**Official Control:** *Toumeyella parvicornis* is not known to be under official control anywhere.

**California Distribution:** *Toumeyella parvicornis* was found on a stone pine (*Pinus pinea*) tree at a residence in San Diego in September 2021 (CDFA).

**California Interceptions:** *Toumeyella parvicornis* has not been intercepted in California (CDFA).

The risk *Toumeyella parvicornis* poses to California is evaluated below.

### Consequences of Introduction:

- 1) **Climate/Host Interaction:** *Toumeyella parvicornis* is found in areas representing cool temperate, Mediterranean, and tropical climate. It feeds on a wide variety of *Pinus* species. It could likely establish widely in California. Therefore, *T. parvicornis* 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:** *Toumeyella parvicornis* is only known to feed on pines. 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:** *Toumeyella parvicornis* has multiple, overlapping generations in warm climates. It can likely spread through movement of infested 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.** *Toumeyella parvicornis* is reported to be a significant pest of pines, including those grown for Christmas trees. Ornamental pines grown in California (e.g., *P. pinea*, *P. mugo*, and *P. sylvestris*) are known hosts and nursery production of these trees could be impacted (R. Price, pers. comm.). Yield of salable trees could be decreased and treatment costs could increase. Therefore, it receives a **Medium (2)** in this category.

**Economic Impact: A, 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: Medium**

- 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.** *Toumeyella parvicornis* is known to impact a wide variety of pine trees. It is likely that some pines native to California would be attacked if this scale became established here. The loss of native pines over large areas in the Turks and Caicos Islands is evidence of ecosystem-level impacts. This scale is known to cause significant damage to, and sometimes kill, pines that are grown in California as ornamentals. Therefore, *T. parvicornis* 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 *Toumeyella parvicornis*: 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:** *Toumeyella parvicornis* 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 are no ongoing surveys for *T. parvicornis*, so it is possible that this scale is already established in California, although the dense infestations that appear typical of this scale suggest this species would be noticed in the state if it was here. Native California pines may not be suitable hosts, although the diversity of pines known to be hosts suggests that at least some species of pines here are potential hosts.

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

*Toumeyella parvicornis* is a severe pest of pines that has been shown to have economic and environmental impacts in its native and introduced range. It is not known to be established in California. For these reasons, an “A” rating is justified.

### **References:**

California Department of Food and Agriculture. Pest and damage record database. Accessed September 29, 2021:

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Garonna, A. P., Foscari, A., Russo, E., Jesu, G., Somma, S., Cascone, P., and Guerrieri, E. 2018. The spread of the non-native pine tortoise scale *Toumeyella parvicornis* (Hemiptera: Coccidae) in Europe: a major threat to *Pinus pinea* in Southern Italy. *iForest* 11:628-634.

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Malumphy, C., Hamilton, M. A., Manco, B. N., Green, P. W. C., Sanchez, M. D., Corcoran, M., and Salamanca, E. 2012. *Toumeyella parvicornis* (Hemiptera: Coccidae), causing severe decline of *Pinus caribaea* var. *bahamensis* in the Turks and Caicos Islands. *The Florida Entomologist* 95:113-119.

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Wilkinson, R. C. and Chellman, C. W. 1979. *Toumeyella* scale, red imported fire ant, reduce slash pine growth. *The Florida Entomologist* 62:71-72.

## Responsible Party:

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**\*Comment Period: 10/11/2021 – 11/25/2021**

### **\*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.

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**Proposed Pest Rating: A**