Population Model for the Decline of *Homalodisca vitripennis* (Hemiptera: Cicadellidae) over a ten-year period

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The glassy-winged sharpshooter, *Homalodisca vitripennis*, is an invasive pest which presents a major economic threat to the grape industries in California by spreading a disease-causing bacteria, *Xylella fastidiosa*. We create a time and temperature dependent mathematical model to analyze aggregate data from a 10-year study consisting of biweekly monitoring of *H. vitripennis* population on unsprayed citrus, during which *H. vitripennis* decreased significantly. The model was fitted to the data using iterative reweighted weighted least squares (IRWLS) with assumed probability distributions for certain parameter values. Results indicate that the *H. vitripennis* model fits the phenological and temperature data reasonably well, but the observed population decrease may possibly be attributed to factors other than the abiotic effect of temperature such as parasitism of *H. vitripennis* eggs by the mymarid parasitoid *Cosmocomoidea ashmeadi*.

References

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