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BEHAVIORAL RESPONSE OF THE SPOTTED LANTERNFLY EGG PARASITOID *ANASTATUS ORIENTALIS* TO CHEMICAL TRACES LEFT BY TARGET AND NON-TARGET ADULTS

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ABSTRACT

The spotted lanternfly, *Lycorma delicatula* (Hemiptera: Fulgoridae) was first recorded in the United States in Pennsylvania in 2014 (Barringer et al. 2015), and it has since spread to several other mid-Atlantic states and is causing significant damage to grape production and poses risks to several other crops (Lee et al. 2019). Research to develop a classical biological control program targeting spotted lanternfly is underway. The egg parasitoid *Anastatus orientalis* (Hymenoptera: Eupelmidae) is one promising natural enemy being studied in biosecurity containment facilities to evaluate the ecological risks and benefits of potential release in North America. In initial no-choice host range testing, a native fulgorid, *Poblicia fuliginosa*, has shown intermediate levels of parasitism by *A. orientalis* compared to attack on spotted lanternfly. Previous research indicates that *A. orientalis* responds to kairomones left on surfaces by adult spotted lanternfly, initiating motivated searching behavior which likely increases host finding ability by the parasitoid (Malek et al. 2019). Here, we compare the response of *A. orientalis* to cues left on glass slides by spotted lanternfly to those left by the non-target *P. fuliginosa*.

Foraging behavior by *A. orientalis* differed from controls for all movement parameters evaluated: faster turning, greater distance moved, longer time spent on the slide, and a slower walking speed. Spotted lanternfly residues resulted in these same trends for three of the parameters tested when compared to *P. fuliginosa*, except there was no difference in angular velocity between the two species. *Poblicia fuliginosa* did not differ from controls in any comparison. Concentrations of kairomones on hexane-rinsed slides that had been exposed to adult planthoppers were too low to detect chemical components of the putative kairomone.

While initial no-choice host range tests show that *A. orientalis* can develop in the native *P. fuliginosa*, this study indicates that the non-target planthopper would not be detected as readily as the invasive spotted lanternfly. We will attempt to increase the concentration of spotted lanternfly chemical traces so that components altering parasitoid searching behavior can be identified. Further non-target testing is ongoing, and more research needs to be completed before a risk assessment can be developed for *A. orientalis* release.

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