PS02

Plasticity in cold tolerance of overwintering emerald ash borer

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The extent and rate of ash mortality at northern latitudes will depend on the population growth rates of emerald ash borer, *Agrilus planipennis Fairmaire*. Previous research from Canada and Minnesota has suggested that extensive mortality of larvae, the overwintering stage for this insect, may occur due to cold exposure. However, the potential for emerald ash borer to adapt to winter temperatures remains unknown. Might different populations of this insect have differing abilities to acclimatize to winter temperatures? A reciprocal transplant study was used to examine this question. Naturally infested green ash, *Fraxinus pennsylvanica* Marshall, were harvested in late autumn 2016 from Virginia, Ohio, and Minnesota and cut into bolts. Infested bolts from each source were held in confined but unheated conditions in Ohio and Minnesota. In December 2016 (pre-acclimatization) and January 2017 (post-acclimatization), bark was peeled from the bolts to collect J-stage larvae. Cold tolerance was assessed by measuring the supercooling point of individuals. Larvae that overwintered in Minnesota had lower supercooling points than larvae that overwintered in Ohio. The source of infested bolts appeared to have little effect. The results suggest that the cold tolerance response of emerald ash borer larvae may be more physiologically plastic than previous studies had suggested. Conditions prior to extreme cold exposure likely play a critical role in determining the degree of overwintering mortality in this invading insect.

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