

BIOSURVEILLANCE: USING NATIVE WASPS TO FIND EMERALD ASH BORERS

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ABSTRACT

Successful management and mitigation of any invasive pest species depends on early detection tools. The emerald ash borer (EAB) (*Argilus planipennis* Fairmaire) (Coleoptera: Buprestidae) has already gained a substantial foothold in eastern North America and is having a profound effect on the region's ash-dominated forests. A native ground-nesting wasp, *Cerceris fumipennis* Say (Hymenoptera: Crabronidae), could prove to be a practical solution for this EAB detection problem. The wasp preys on the adult EAB, as well as related native beetle species. The wasp carries the paralyzed beetle back to its ground nest to feed to its larva.

Monitoring for the EAB involves watching the wasps as they return to their nests with prey. It has been shown that by simply observing the ground-nesting wasps provision their nests it is possible to quickly identify the presence of an EAB infestation.

Since 2006 we have worked to assess the biosurveillance potential of *C. fumipennis* as an EAB monitoring tool. Our field work has led us to the conclusion that this native wasp can be successfully used as such a tool.

Cerceris fumipennis effectively locates often cryptic buprestid beetles, including the EAB. The wasps not only discover beetles in often inconspicuous locations but they also proceed to carry the paralyzed prey back to a conspicuous wasp nest. Often found in large aggregations of independent burrows (a colony), the active wasps are capable of presenting the human observer with many buprestid beetles in a single day. Wasp colonies are frequently found in areas disturbed by human activity and are easily accessed for surveys. The wasp's foraging behavior is neither negatively influenced by close human scrutiny nor by the disruptive

process of 'prey inspection.' *Cerceris fumipennis* show no inclination to sting humans (even when roughly handled). The foraging of this wasp overlaps with EAB's flight season and may extend for a 2-month period, weather permitting. Taking advantage of the wasp's foraging activity for biosurveillance is a simple matter: at a naturally established wasp colony, plastic cups and a stopwatch are all the equipment needed to monitor for EAB. If naturally established *C. fumipennis* colonies cannot be found where needed the species also lends itself well to nest extraction and relocation.

Our primary research objective in 2009 is to assess the practicality of using mobile *C. fumipennis* nests to monitor for EAB. The conventional monitoring tools (trap trees and prism traps) will be used concurrently with mobile wasp nests thereby comparing the wasp's efficacy to the existing monitoring tools.

In addition to the comparison trial work, we will begin utilizing eastern North America's naturally established wasp colonies. These wasps have proven themselves unique in their ability to find EAB infestations but most colonies remain undiscovered or underutilized. They represent a pre-existing, currently operating, survey tool that simply needed to be found and observed. Mimicking a successful program from the state of Maine, we will foster and support a 'Cerceris Outreach Program'. The outreach program will educate and train public employees and volunteers as wasp watchers.

Individuals interested in learning more about *C. fumipennis*, searching for their own colonies or participating as a wasp watcher are encouraged to visit www.cerceris.info and email Philip Careless at pcarles@uoguelph.ca.