

Ask an Entomologist

Got questions about bugs? We have the answers!

Ladybugs as invasive species...what does the science say?

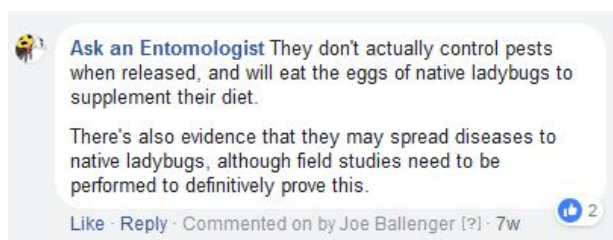
Posted on June 3, 2018 by *Polistes fuscatus*

Written by Joe Ballenger

So...this is a correction of a previous post I wrote on Facebook, back in March.



In the comments under the article, I *may* have gotten myself into a bit of trouble because I made some comments which implied some things which weren't *quite* correct:



The Multicolored Asian Ladybeetle has been useful in controlling pests in a number of crops, namely pecans, pines, and soybeans. They're a very hardy ladybug, and can often withstand pesticides better than their prey can. They're good at avoiding predators, but there are things which eat them. They'll also eat a lot of different bugs, from aphids to ladybirds.

However, at the same time, these insects themselves *are* pests as well. They're well recognized household pests, and we get dozens of emails about them every fall and spring because that's when they're around people. However, on farms, they're also problematic because they can mix in with fruit and ruin the taste of fruit juices with their defensive chemicals. They also eat the fruit before winter, which opens up the fruit to contamination from other stuff.

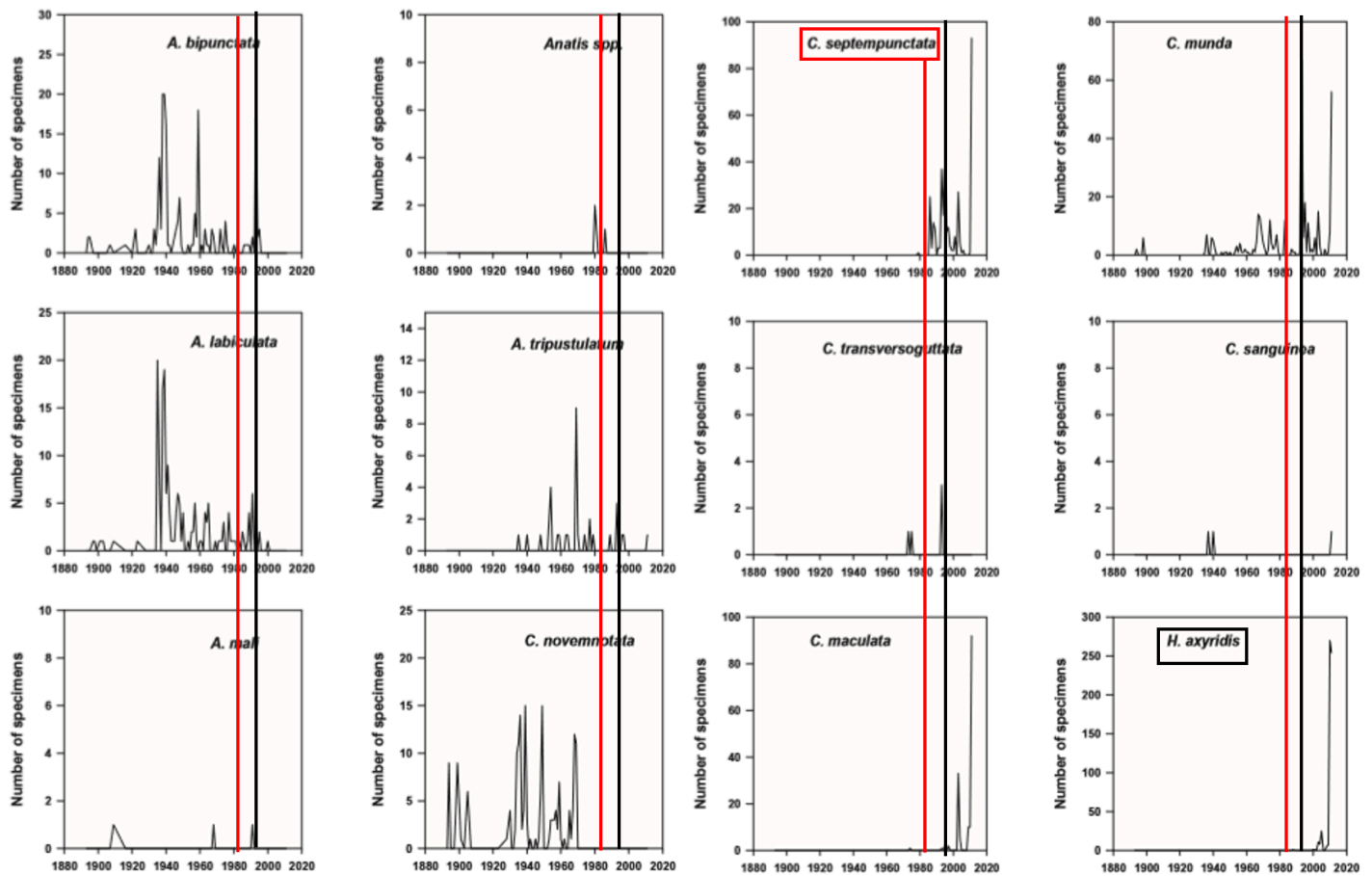
They're particularly damaging in the wine industry, where their characteristic flavor has been given the name 'ladybug taint'.

Ladybug Declines

So, needless to say, our relationship with these insects is a little bit complicated. They were introduced because we thought they'd make a good replacement for ladybirds which were doing a poor job of controlling pests in agricultural fields, and then subsequently became pests in other contexts.

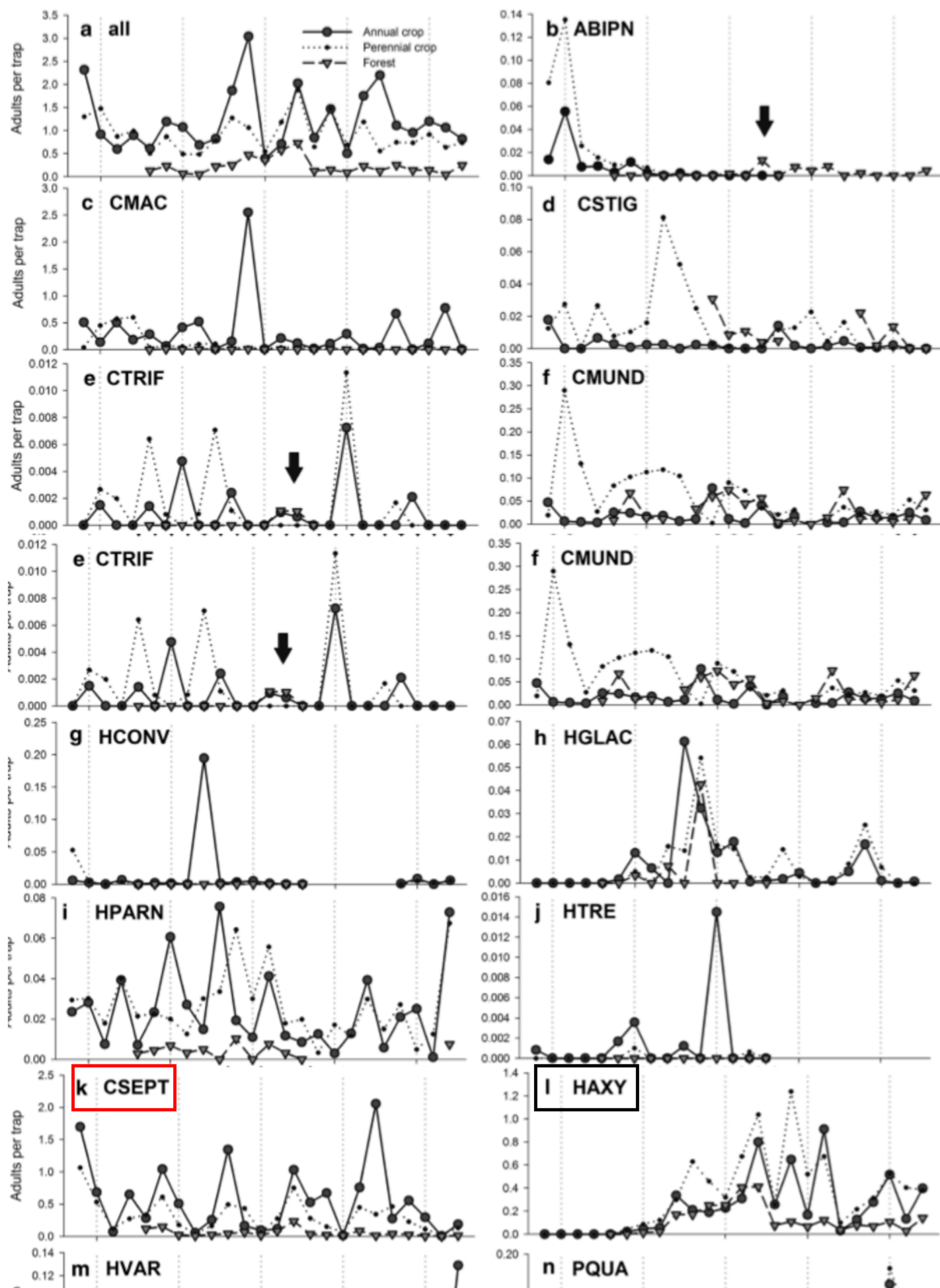
...but what about their relationships to other ladybug species? How can we get to the bottom of that?

Well, one of the things we can do is to look at when various invasive species arrived in an area, and compare them to data gathered from insect museums. The idea here is to see if there's a correlation between changes in the ladybug population, and when the invasive species arrived.

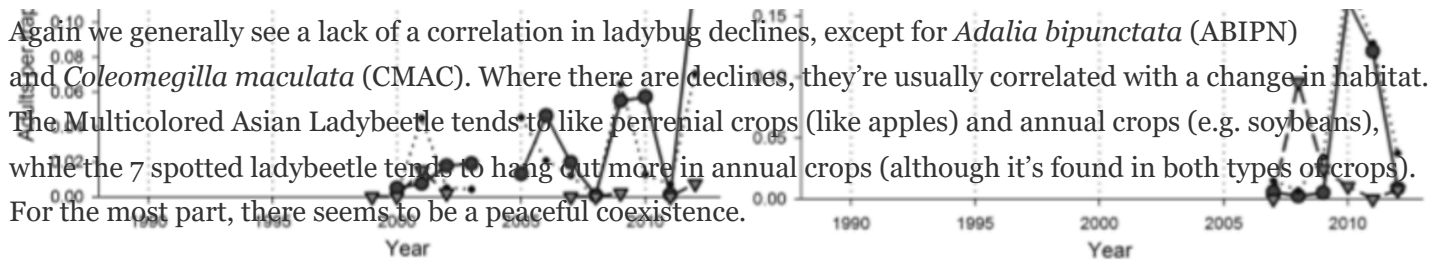


To make it easier to interpret the data from these graphs, I've highlighted the years that two invasive ladybug species arrived. The 7 spotted ladybird, *Coccinella septempunctata*, native to Europe, is highlighted in red. The Multicolored Asian Ladybeetle, *Harmonia axyridis*, has been highlighted in **Black**. In both cases, the big changes for many of these species happened well before the arrival of these species in Missouri.

Another thing we can do is to look at these sorts of correlations in the habitats where these insects hang out. This not only cues us into these sorts of correlations, but tells us if the ladybirds appear in the same time and place. This was done by trapping native and exotic ladybirds at a research site in Michigan, which was surrounded by two different types of agricultural systems and forests.



Again we generally see a lack of a correlation in ladybug declines, except for *Adalia bipunctata* (ABIPN) and *Coleomegilla maculata* (CMAC). Where there are declines, they're usually correlated with a change in habitat. The Multicolored Asian Ladybeetle tends to like perennial crops (like apples) and annual crops (e.g. soybeans), while the 7 spotted ladybeetle tends to hang out more in annual crops (although it's found in both types of crops). For the most part, there seems to be a peaceful coexistence.



The Bottom Line

Figuring out why-and if-ladybugs is declining is a complicated affair. In some cases, they aren't actually declining. In other cases, they are declining...but it's a part of a natural boom and bust cycle that's a part of nature.

In the cases where there are real declines that can't be explained by competition or natural cycles, it's usually because of changes in habitat use. Ladybugs are frequently found in agricultural settings, but they need natural spaces (or refuges) in order to lay eggs. It used to be that there would be borders around farm fields, hedgerows which would provide these refuges. However, as agriculture has become increasingly automated, farmers now have the precision needed to farm the areas which used to house these refuges.

Conservation is a complicated affair, and it only becomes more complex when ecological factors are put in the mix. Pest control provided by these sorts of natural predators is an important part of agriculture, and new farming techniques can be used to enhance other pest control measures. There needs to be a way for these sort of natural areas to become more widely viewed as profitable, even though many farmers *do* already understand the benefits of natural pest control. That's a more complicated conversation which deserves it's own blog post, though.

For now...it appears that invasive ladybirds aren't as large of a factor in the decline of native ladybug species.

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