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# Tabloid Sensationalism Aside, Lady Bugs Are Still Fascinating

ENTOMOLOGY TODAY NOVEMBER 5, 2018 1 COMMENT



*Harmonia axyridis*, known as the harlequin ladybird in the United Kingdom and the multicolored Asian lady beetle in the United States, first arrived in the U.K. in 2004 and now constitutes about 80-90 percent of the ladybirds seen in urban areas of England. Headlines in British media in the fall of 2018

claimed the insects were carrying “STDs,” an over-sensationalized interpretation of research showing the harlequin ladybirds can be infected by a fungus that its transmitted among the species during mating. (Photo credit: Daren Mueller, Iowa State University, Bugwood.org)

**By Leslie Mertz, Ph.D.**

Despite [headlines](#)

([https://news.google.com/stories/CAAqSQgKikNDQkITTERvSmMzUnZjbmt0TXpZd1NoOGFIV1JYUVdsSINsSnIva0U1TTBwdIRUSnpUSFpDUUpGT2RscHViR3ROS0FBUAE?](https://news.google.com/stories/CAAqSQgKikNDQkITTERvSmMzUnZjbmt0TXpZd1NoOGFIV1JYUVdsSINsSnIva0U1TTBwdIRUSnpUSFpDUUpGT2RscHViR3ROS0FBUAE?q=ladybird+beetles+std&lr=English&sa=X&ved=0ahUKEwjL6JbB0LbeAhVwmuAKHUXUDesQqgIILDAA&hl=en-US&gl=US&ceid=US:en)

[q=ladybird+beetles+std&lr=English&sa=X&ved=0ahUKEwjL6JbB0LbeAhVwmuAKHUXUDesQqgIILDAA&hl=en-US&gl=US&ceid=US:en](https://news.google.com/stories/CAAqSQgKikNDQkITTERvSmMzUnZjbmt0TXpZd1NoOGFIV1JYUVdsSINsSnIva0U1TTBwdIRUSnpUSFpDUUpGT2RscHViR3ROS0FBUAE?q=ladybird+beetles+std&lr=English&sa=X&ved=0ahUKEwjL6JbB0LbeAhVwmuAKHUXUDesQqgIILDAA&hl=en-US&gl=US&ceid=US:en)) to the contrary in British tabloids this fall, harlequin

ladybird beetles are not killing off native species by giving them a sexually transmitted fungal infection. “There have been stories mixing up various research findings into quite sensational headlines, which is a shame because these fungi and the ladybirds are fascinating in their own right,” says ecological entomologist Helen Roy, Ph.D., of the Centre for Ecology & Hydrology in Wallingford, England.

Roy wants to set the record straight in part because she is one of the researchers [whose](https://doi.org/10.1007/s10526-011-9387-1) (<https://doi.org/10.1007/s10526-011-9387-1>) [findings](https://doi.org/10.1007/s10530-016-1077-6) (<https://doi.org/10.1007/s10530-016-1077-6>) have been jumbled in the tabloid tales, and also because she wants to share her own excitement about the ladybirds—or lady bugs, as they are known in the United States. (*Editor’s note: In the United Kingdom, the species *Harmonia axyridis* is commonly known as the harlequin ladybird beetle; in the Entomological Society of America’s [Common Names Database](https://www.entsoc.org/common-names?title=lady&field_scientific_name_value=Harmonia+axyridis) ([https://www.entsoc.org/common-names?title=lady&field\\_scientific\\_name\\_value=Harmonia+axyridis](https://www.entsoc.org/common-names?title=lady&field_scientific_name_value=Harmonia+axyridis)), however, the recognized name is*

*multicolored Asian lady beetle. As the focus of this post is on research in the U.K., we’ll use harlequin ladybird below.*)

“All the way back when I was 6 years old in 1976, I can remember there being many, many ladybirds in my back garden on the Isle of Wight. That was a year when ladybirds were in extremely large numbers, and they captured my imagination and sparked my interest,” Roy recalls. That interest carried her all the way through her doctoral research, when she had “the incredible privilege of working with ladybirds.” That included their ecology and especially their interactions with the parasites that infest them.



Leslie Mertz, Ph.D.

Then came 2004, which marked the first record of the harlequin ladybird in the U.K. Roy, who was an ecologist on sabbatical at Cambridge University by then, realized that its arrival would likely upset existing ecological networks. She was right. Today, harlequin ladybirds constitute about 80-90 percent of the ladybirds seen in urban areas of England, Roy says, and part of the reason for the population explosion is because they have few natural enemies in the UK. Recently, however, Roy's group found that some harlequins are infected with a small fungus, one that is a sexually transmitted.

## A Fungus Among Us

In her studies, Roy had already seen a small fungus called *Hesperomyces virescens* on the native two-spotted ladybird (*Adalia bipunctata*, or the twospotted lady beetle), but then she and doctoral student Katie Murray began to see it on harlequins too. "We were really quite excited because harlequins are quite resistant to many of the native parasites and pathogens," Roy says. The fungus causes and forms fruiting bodies on the surface of the ladybirds. The fruiting bodies are tiny, delicate, yellow, spike-like structures that can be quite numerous on heavily infected ladybirds.

The harlequins are likely passing it among themselves during their marathon mating sessions, which typically last at least an hour, she says. "The evidence for it being sexually transmitted is that the fruiting bodies occur on the top of the female ladybirds and on the underside of the male ladybirds (the contact points during mating)," Roy explains, adding that transmission may also occur during overwintering when large groups of harlequins will aggregate for months at a time. As for infecting other species, she asserts, "We don't have any evidence of transmission from harlequin ladybirds to other ladybird species in the field at all."

The fungus itself has not been well studied in the past, but Murray and another researcher at Harvard University, Danny Haelewaters, are changing that. Murray is investigating whether the fungus causes any health or other ill effects to harlequins, and Haelewaters just published [a paper in \*Scientific Reports\*](https://doi.org/10.1038/s41598-018-34319-5) (<https://doi.org/10.1038/s41598-018-34319-5>) suggesting that *Hesperomyces virescens* may actually be three separate lineages and that the lineage on harlequins is different from that on native ladybirds.



## The Ladybird Survey

Besides her own work on ladybird ecology, Roy helped spearhead a citizen-science, online mapping project called the [U.K. Ladybird Survey](http://www.ladybird-survey.org/) (<http://www.ladybird-survey.org/>), with colleague Peter Brown, Ph.D., of Anglia Ruskin University. For more than a decade, citizens have been reporting sightings of the harlequin ladybird (and other ladybirds) as a way to track its spread but also provide information on the way in which the distribution of other ladybirds is changing. “It’s really exciting to report that we had more than 48,000 verified records of the harlequin ladybird submitted from thousands of people across the U.K.,” she says.

At the end of October, the information from that survey was [published in the new \*Nature\* journal \*Scientific Data\*](https://doi.org/10.1038/sdata.2018.239) (<https://doi.org/10.1038/sdata.2018.239>). The data show

patterns of harlequin spread, including correlations with declines of some native species. So far, although citizens haven't reported many occurrences of *Hesperomyces virescens* infestation, Roy believes it is on the rise: "I have seen it myself more often within the last couple of years than I have before that, so, anecdotally at least, the number does seem to be increasing."

The U.K. Ladybird Survey will continue, and it will also now track the native seven-spot ladybird (*Coccinella septempunctata*, or seven-spotted lady beetle) and its infestation by the small parasitic wasp *Dinocampus coccinellae*. This wasp lays eggs inside the ladybird's body, and its larvae hatch out and spin a noticeable cocoon between the ladybird's legs. "At the moment, *D. coccinellae* is in very low prevalence within the harlequin populations within the U.K., but, given this super-abundant resource of harlequin ladybirds, I imagine it's only a matter of time before the wasps begin attacking them as well," Roy says.

With the surveys, as well as the ongoing research ladybird interactions, Roy adds, "It seems we have a really exciting opportunity to see evolution in action by watching the way in which these parasites and pathogens start to play out within these invaded systems. It's really quite fascinating."

**Leslie Mertz, Ph.D.**, teaches summer field-biology courses, writes about science, and runs an educational insect-identification website, [www.knowyourinsects.org](http://www.knowyourinsects.org) (<http://www.knowyourinsects.org>). She resides in northern Michigan.

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