

Spotted Lanternfly: An Asian Exotic is Moving Westward from the East Coast

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Fig 1: SLF adult with a 2 inch wingspan by Lawrence Barringer PDA

The spotted lanternfly (SLF), *Lycorma delicatula* (White) (Hemiptera: Fulgoridae), is native to China and Vietnam. An early report that SLF occurs in India was described by the author as “doubtful” (Distant 1906); nevertheless, some papers have reported India within this insect’s native range. SLF has also spread to Japan and Korea in recent decades, with the DNA in those populations matching very closely to populations in China (Kim et al. 2013). SLF was first reported in the USA in 2014, in Berks County, Pennsylvania, northwest of Philadelphia (Barringer et al. 2015, Dara et al. 2015). As of early 2019, additional established populations of SLF have been found in small areas of Delaware, New Jersey, and Virginia. In addition, SLF individuals have been collected at various locations in Connecticut, Maryland, Massachusetts, and New York, but no established populations have yet been detected.

There are over 700 species of fulgorid planthoppers (or lanternflies) worldwide (Bourgoin 2019), but only 17 are

native to the continental US, with most found in the Southwest (Bartlett et al. 2014). Most native fulgorids feed on woody plants, by sucking phloem juices through the bark, but a few are grass feeders (Bartlett et al. 2014). SLF is the first exotic fulgorid to become established in the US, and it feeds on a wide range of woody plants, including vines, shrubs, and trees.



Fig 2: SLF adult by Lawrence Barringer PDA

SLF completes one generation per year, overwintering in the egg stage (Zhou 1992, Dara et al. 2015). There are four nymphal instars. First instars appear in May and June, with fourth instars present during July to August. The first three instars are mostly black with white spots, whereas the fourth instar is largely red with white spots. Adults can be found from July into December, but mating (often taking place along the lower trunk) and oviposition usually do not begin until October. Adults are about 1 inch long with a 2-inch wingspan. Their forewings are gray with black spots, while the hindwings have bold red, black and white markings. Eggs are often laid on flat surfaces in groups of 30-50 eggs, and covered with a mud-like substance that is grayish brown in color.

More than 70 species of woody plants have been recorded as hosts for SLF (Dara et al. 2015), including several important commercial crop species (e.g., grapes, hops, apples, apricots, peaches, plums, and nectarines) as well as ornamental and timber tree species (e.g., cherry, maple, mulberry, oak, poplar, sycamore, walnut, and willow). In China, the favorite host is tree of heaven, *Ailanthus altissima*. Extensive feeding by SLF nymphs and adults, usually occurring on newer growth, can weaken plants and slow their growth. However, much of the economic impact to agricultural crops results from sooty mold development on the fruit after being coated with the insect’s excreted “honeydew.” SLF populations can be very high with 100s to 1000s of individuals occurring on a single infested plant.



Fig 3: SLF adults at base of tree to mate by Lawrence Barringer PDA

Adults can disperse on their own by active flight, but long distance spread will likely occur by humans moving objects contaminated with any SLF life stage, but especially eggs. The egg masses appear as dried mud, so are easily overlooked and can be easily moved on firewood, nursery stock, lawn and garden equipment, as well as autos, trucks, recreational vehicles, and trailers.



Fig 4: SLF egg masses on tree branches by Emelie Swackhamer PSU



Fig 5: SLF 4th instar nymphs and one adult by Stephen Ausmus-USDA ARS

Infested US states have imposed internal quarantines on their infested counties, and some states are starting to impose external quarantines on the infested states. There is no federal quarantine at this time.

Management options are still being developed, but many recommendations can be made based on current knowledge. For example, individuals can scrape egg masses off woody plants and other infested items during fall, winter, and spring. They can also apply sticky band traps around the lower trunks of trees to capture SLF nymphs and adults as they ascend. People should avoid parking vehicles under infested trees, given that SLF nymphs and adults often drop from trees when disturbed. They should also inspect their vehicles and outdoor items before moving them outside of infested zones. Similarly, businesses within infested areas should manage nearby woody vegetation and inspect their products, pallets, and vehicles regularly. In areas outside of quarantine zones, people should be made aware of SLF and encouraged to quickly report any sightings. In some communities, the preferred host tree of SLF (the exotic, tree of heaven) is being removed, while in other areas these trees are being used as trap trees. Several contact and systemic insecticides have proven effective against SLF, but there are concerns about non-target impacts and reinfestation can occur from untreated areas.

There are many active areas of SLF research in Asia and the US (Dara et al. 2015). A few of the recently published papers deal with attractants (Cooperband et al. 2019), natural enemies (Barringer and Smyers 2016, Liu 2019), morphology (Hao et al. 2016, Wang et al. 2018), flight behavior (Domingue and Baker 2019, Myrick and Baker 2019), defense sequestration (Song et al. 2018), low temperature threshold of eggs (Lee et al. 2011), and efficacy of chipping woody material to kill SLF eggs (Cooperband et al. 2018). Foreign exploration for natural enemies of SLF in China is also occurring.

We do not know when SLF will arrive in Michigan or in nearby states. It could take years or it may already be here. Therefore the public should be on the alert for this insect and report it quickly when seen given that early detection may allow for successful control of new introductions.

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Newsletter of the Michigan Entomological Society

Vol. 63, No. 1

April 2019

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Upcoming MES Events

65th Annual Meeting – 21- 22 June 2019 at the Rockwell Lake Lodge.

(<https://rockwelllakelodge.hillsdale.edu/>).

The Rockwell lake Lodge has been a great place for several of our annual meetings, with posh accommodations and lots of habitat to explore! David Houghton has been putting together another grand meeting, and we hope that you will attend. The Annual Meeting has a rich history, and while locations have varied from year to year, The Rockwell lake Lodge has been a favorite spot for many of us. It's not far from Cadillac, MI, which itself is a nice place to visit, The trails meander through a variety of habitats, and there is excellent fishing in Rockwell Lake. Canoeing and kayaking the lake is another treat for those that wish to do so. There are good spots to set up your night lights, and of course, insect nets are allowed everywhere. The Lodge accommodations are top-notch, and the food, excellent. In short, it's a place where you have have a meeting and can also relax and mingle with the MES folk. Inside this newsletter, you'll find the meeting registration and reservation information, and you can also go online at our website to download the pdf. It's at <http://michentsoc.org/MES2019Registration.pdf>



A New Insect Collection Manager at the UMMZ

Hello Michigan Entomological Society! I know I haven't met most of you yet since I'm new to the area, but I wanted to introduce myself. My name Erika Tucker and I am the Insect Collection Manager at the UM Museum of Zoology. I'm really excited to be here in Michigan to take care of the collection!

Now that the insect collection has relocated slightly south of main campus to the Research Museum Center (HUGE undertaking - thank you Mark O'Brien!), we have started a couple big projects. We are currently working on digitizing and databasing all of the estimated 3.5 million specimens in the collection. This is mostly run on student power at the moment, but we will soon be incorporating citizen scientists into the project to help transcribe digitized datasets. Our other big project is a prairie restoration! The school gave us permission to use the plot of lawn next the RMC and restore it to native prairie land. Volunteers from UM and the local community have been a huge part of this project. We are currently in the process of removing the dead grass and weeds from the site and plan on planting a cover crop once it warms up, with the prairie seed to be planted this fall. Stay tuned for updates on both projects and please let me know if you'd like to become involved!

While the Insect Collection at the RMC is not currently open to the public, I am more than happy to provide tours to small groups of those interested in visiting. We also have the capability to host things like lectures or events here at the RMC and I'd love to have some of those activities be entomologically related (hint, hint).

We would also greatly welcome enthusiastic, experienced volunteers. As many of you are well aware, insect collections are living things (albeit composed of dead specimens) and require constant care and attention. If you have extra time or expertise, with collections or a particular group of insects, and are interested in volunteering please contact me! I can always use extra hands for identifying undetermined specimens, updating taxonomic groupings in the collections, digitizing