DETECTIVE DENDRO

THE DIAGNOSTIC SLEUTH

By Marnie Demand

The Case of the Lamentable Maples

After being away for a week at the ISA Annual Conference in Orlando, Florida, U.S., Codit and I were backlogged with calls for the rest of August. It always seems that when Codit and I were away, there was a surplus of calls. As the seasons changed, and after finally having caught up on all the calls, we had a bit of free time.

It was just as I was starting to relax that Codit came running to me, "Oh no!" he said, "I completely forgot that my family is having a reunion next week! I've missed it for the last three years!"

With Codit's panic and the slowing of the season, I tried not to sound too disappointed when I pushed him to go. I really was a bit disappointed—after all, I would have to make my own coffee for a whole week!

Later, when Codit returned, I heard all about his adventure. The family reunion had been grand and the weather was fantastic. Not only was the reunion great, but he also managed to impress his entire family with his arboricultural problem-solving skills. There was, however, one case that had stumped him a bit, and he wanted my opinion on the matter. Codit then informed me he had signed me up for a diagnostic trip, and we would be staying with his relatives for a few days.

The sun was setting when we arrived and I couldn't help but notice the forests near Codit's family home where he'd grown up. No wonder he loved being around trees so much, the forests by his house were composed of some truly spectacular trees. Their autumn color proved particularly stunning . We put off checking out the trees Codit's family was concerned about until morning, when the light would be better.

It was nearly 11:00 am when we awoke, so we rushed to get ready and head out for look at the trees.

Codit grabbed his climbing equipment from the truck and we set out. A bit to my surprise, the trees we were going to look at were not in the front yard. Nor were they in the backyard. As we started our short hike, I began to wonder where exactly we were going, but the view was nice, despite the drizzling rain, so I elected to keep quiet.

We finally reached a stand of sugar maples (*Acer saccharum*) with a few eastern white pines (*Pinus strobus*) interspersed. The overmature sugar maples had already lost most of their leaves, so I was a little bit disappointed with the view after what I had seen in the last day and a half.

But upon our approach, I heard word of their concerns: the neighbors had been tapping the maples to make syrup for years, and the trees were in decline as a result. Codit had loved this forest as a child, climbing trees and making tree forts. I could see why he dragged me out here to look at trees that were a little less urban than I was used to—these trees had sentimental value.

KENNETH R. LAW, USDA APHIS PPQ, BUGWOOD.ORG

The forests near Codit's family home are in decline. What's with all the holes?

As I looked around, something was a little bit odd. At first I thought it was that we could hear cars nearby (That's weird, I thought. Why had we walked in?), but then I examined one of the sugar maples again. The thing that struck me was not the noises, but the lack of leaves on the trees compared to the ones we had driven by yesterday. I also observed the relatively terrible job the neighbors had done tapping the trees for syrup. The 3/8-inch (10 mm) holes were all over the place. They were about the right size, but high and low, and certainly not properly spaced. There was even still coarse sawdust left behind. In fact, some of these holes looked quite recent, perhaps too recent? Taking in my surroundings, I noticed the pines were in fine condition, but they hadn't been tapped for decades like the maples.

As I looked to Codit, who was just about to set his line, I remembered feeling that something was not right.

"Wait!" I said. "Did you do a tree and site inspection, or are you just eager to get back into these trees?"

Codit immediately realized his mistake and took a step back. Upon looking at the tree again, I realized that the maple syrup spile holes continued up far too high. Nobody climbs trees to tap for syrup, I thought to myself. I reached for my binoculars only to learn I had left them in my other coat. Codit saw me reaching and remarked that he didn't need binoculars anymore. His new phone had an excellent zoom on the camera.

With Codit's phone, we were able to take close-up photos, higher on the trunk, as well as of the branch tips, and then we zoomed in on them for further investigation. In addition to the 3/8-inch holes, there were also half-inch (13 mm) pits in the bark. The trees also had significant dieback, which we had missed between the height of the canopies, and perhaps not inspecting them as closely as we should have—assuming the change of season was playing a role in their less-than-leafy appearance.

Much to Codit's delight, his phone, magically, had network coverage in the forest. It enabled us to pull up an electronic-version of one of my favorite books. We looked at it in miniature on the phone's tiny screen, but a bit to my surprise, my trusty (or so I had thought) book yielded no answers, and I was briefly stumped.

How did those holes get there?
Turn to page 74 to find out.

DENNIS HAUGEN, USDA FOREST SERVICE, BUGWOOD.ORG

Divots in a boxelder? What's going on?

WHAT'S THE SOLUTION?

May I stress, *briefly*?

This was something I had read about recently, but never seen before in-person. I looked at the ground, watching the soil drinking up the drizzly rain, not looking for clues, but looking for a way to break the news to Codit and his family. As Codit had suspected, the problem had nothing to do with the maple syrup tapping that had been going on for years, if not decades, but something much more recent.

All the signs pointed towards an Asian longhorned beetle (*Anoplophora glabripennis*) infestation in the forest, an insect from Asia that is highly invasive in this part of the world.

Codit, you can imagine, wasn't happy.

The 3/8-inch holes we found in the sugar maples were exit holes, and the half-inch pits in the bark were the females beetles' egg-laying sites. The female chews a hole down to the cambium and deposit an individual egg. Unfortunately, she doesn't do this just once—one female may lay 25–90 eggs, each in its own site or niche within in a susceptible host tree. One of the largest concerns, I recalled, was that with this particular insect the list of susceptible species was not a short one. While some trees, such as maples (including boxelder) and willows, are favored, horsechestnut, birch, apple, mulberry, poplar, cherry, pear, elm, and black locust are also vulnerable. In this part of the world, that puts a large percentage of our urban trees and forests alike at risk.

I thought back to the reading I had done on the beetle previously and remembered that the lifecycle took from 12 to 18 months here, and adults are usually present from about July until October or early November in this region. It was time to go hunting, I decided, and somewhat worryingly, it didn't take me all that long to find an adult beetle.

I suppose I shouldn't have expected it to take very long, given the number of exit holes present in the area's trees. But at approximately three-quarters to one and one-quarter inches (2 to 3 cm) long, shiny and black with white spots and banded antenna longer than its body, the Asian longhorned beetle was quite a striking insect.

DENNIS HAUGEN, USDA FOREST SERVICE, BUGWOOD.ORG

Adult Asian longhorned beetle (*Anoplophora glabripennis*).

KENNETH R. LAW, USDA APHIS PPQ, BUGWOOD.ORG

ALB damage, following removal of an infested tree branch.

While it was exciting to see something new, it was also horrifying to realize the implications.

As I explained to Codit, the larvae of the Asian longhorned beetle initially mine in the cambium but bore deeper into the wood as they grow, spending the majority of their lives in the heartwood of the tree. The symptoms of the damage to the cambium include yellowing and wilting of leaves, and limb or even tree death in more severe infestations. To make matters worse, the damage the larvae do in the heartwood compromises the strength of the tree, increasing the risk of storm damage. The adults emerge through the 3/8-inch exit holes they chew, and these holes will commonly ooze sap. Sawdust-like frass can often be found on and around the trees as well. I paused, realizing that my listing off of the facts wasn't helping the situation.

We decided to head back. The rain was picking up anyway.

I informed Codit's family that while the pesticide imidacloprid has been showing promising results recently, and may be used in conjunction with other control methods, the only eradication method found to be assured so far within North America was to completely destroy all infested trees. Since the beetles cannot fly very far, at most a quarter mile (400 m), and often will only fly 55–80 yards (50–75 m) in search of a new host tree, buffers have even been created in some areas. These buffers are created by cutting down all susceptible trees around infected sites to prevent the beetle from spreading further.

And yet, even then, the beetle spreads when people carelessly move around wood, whether it be firewood, shipping pallets, or anything in between. This particular infestation was likely spread by cars along the highway on the other side of the property, possibly transporting firewood to the nearby campgrounds. I reminded Codit's family to never move firewood.

DISEASE PROFILE

Polyporus squamosus

DAN MOLTER

This fruiting body can found on living angiosperm trees, as well as logs and stumps. The most commonly affected genera are *Acer, Populus, Salix*, and *Ulmus*. Other host genera include, but are not limited to *Betula, Pyrus, Tilia, Fagus*, and *Umbellularia*.

Family:	Polyporaceae
Common names:	dryad's saddle, pheasant's back
Range:	Canada, southwestern United States, Eurasia, Southern Hemisphere
Type of decay:	White, spongy heart and trunk rot
Fruiting body:	Annual, but old fruiting bodies may be present year-round. They appear either individually or in layers at the site of injury, during May–June and/or September–October (the mycelium has the potential to produce fruiting bodies more than once a year). These fruiting bodies smell like watermelon rind, can be up to 18 inches (45 cm) across, and are typically fan-shaped with a short lateral stalk. The upper surface is yellowish-tan, with dark brown scales, while the lower surface is cream-colored with large, angular pores.
Consequences:	Cavity formation in the trunk. Wood may become brittle before turning soft. The presence of this fungi can cause brittle or ductile fractures.
Recommendations:	Monitor tree, remove if hazard exists

Codit and I were able to report the sighting for the officials to deal with. The pictures we had taken came in handy, not only in providing documentation of what we had seen, but they were also georeferenced by Codit's phone, marking the exact location of the infestation. Unfortunately, there was little we could do beyond reporting the sighting and handing the matter over to the government department in charge of invasive species.

The only good that came out of the day was the rekindling of a friendship between Codit's family and the neighbors, now realizing that it wasn't the neighbors' fault the trees were in decline.

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