K-STATE Research and Extension

Oak Leaf Itch Mite

The oak leaf itch mite, *Pyemotes herfsi*, bites humans causing itching that can lead to secondary bacterial infections. The oak leaf itch mite is a close relative of the straw itch mite, *Pyemotes tritici*, which also bites humans and may have originated in Europe. The oak leaf itch mite was first detected in the Midwest in 2004 and responsible for widespread occurences of itching bites from 2014 through 2017.

Biology

The oak leaf itch mite is 0.2 mm ($\frac{1}{125}$ inch) long (Figure 1) and difficult to see with the naked eye. The mite is associated with the oak marginal leaf fold gall produced by the midge gall-former *Macrodiplosis erubescens* (Diptera: Cecidomyiidae) on the edges of pin oak (*Quercus palustris*) leaves. In spring, adult midges emerge from hibernation. Mated females fly to pin oak trees and lay eggs on the newly emerging leaves. Larvae hatch from eggs and inject a hormone-containing saliva into the leaf margins, which causes them to curl upward (Figure 2). Midge larvae develop in the leaf folds and drop to the ground in late fall seeking protected sites to spend the winter. Pin oaks are highly susceptible to the midges, but red and black oaks also may serve as hosts. The gall-forming midge has one generation per year.

A mated female oak leaf itch mite enters the leaf fold through a small opening and injects a midge larvae with a neurotoxin and saliva mixture that paralyzes the larva so she can feed (Figure 3). A single female can produce between 200 and 300 eggs, which are deposited into a pouch or ovisac that forms at the end of the abdomen (Figure 3). Larvae hatch from eggs and complete development in less than one week. Eventually, the larvae become adults. Males mate with females and then die. The entire life cycle from egg to adult takes approximately seven days. Oak leaf itch mite populations can build-up to extensive levels due to the seven-day life cycle and the number of offspring produced. Cooler temperatures and moist conditions can increase population growth.

Oak leaf itch mites emerge from the gall folds in late July and continue through late fall on pin oak trees infested with the oak marginal leaf gall folder. The mites eventually

Figure 2. Folds caused by the oak marginal leaf fold gall-former.

Figure 1. Close-up of oak leaf itch mite.

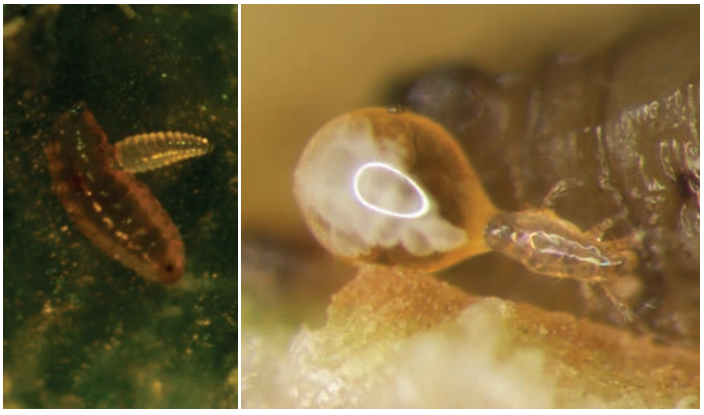

Figure 3a. Left: Oak leaf itch mite feeding on a gall midge larva; Figure 3b. Right: Female oak leaf itch mite with ovisac protruding from the abdomen.

fall from pin oak trees. It is estimated that nearly 400,000 oak leaf itch mites per day can fall from a large pin oak tree. Mites can be carried by the wind for many miles before landing on humans and pets that are later bitten. Oak leaf itch mites overwinter in protected areas or within leaves/leaf litter in the ground.

Bites and Symptoms

Oak leaf itch mite bites usually occur on the upper body around the neck, shoulders, and chest where mites land after dropping from gall-infested pin oak trees. The location on the body distinguishes oak leaf itch mite bites from chigger bites, which occur underneath belts, underwear, socks, and in other places where clothing is pressed against the body. After landing on a human, oak leaf itch mites start biting, and symptoms appear in 10 to 16 hours. Bites may be visible on the skin as raised, red areas with a small, centralized blister. The itchy bites can be painful when scratched, and scratching can lead to secondary bacterial infections.

Oak leaf itch mite problems are more prevalent in the fall when bites appear as a result of exposure to mite-infested oak leaves. Oak leaf itch mites bites are likely to occur after engaging in the following activities:

- Sitting under gall-infested pin oak trees.
- Raking pin oak leaves.
- Handling dogs and cats that have been exposed to gall-infested pin oak trees.

Prevention

There are very few strategies to prevent oak leaf itch mite bites. Repellents used to prevent bites from mosquitoes, chiggers, and ticks are not effective against the oak leaf itch mite. Miticide (acaricide) spray applications do not reach mites protected within the leaf folds of pin oak trees. One prevention strategy is to apply a sticky substance known as Tree Tanglefoot (Figure 4) in a 2-inch band about 5 feet from the base of affected trees. This product acts as a barrier, capturing the mites as they move up pin oak trees to reach the folds.

Figure 4. Tree Tanglefoot.

The best way to prevent oak leaf itch mite bites is to minimize exposure to trees infested with the oak marginal leaf fold gall-former. Bathe thoroughly after spending time near gall-infested pin oak trees and wash clothing daily to reduce the chance of being bitten. Wear rubber gloves and a long-sleeved shirt when raking up oak leaves in the fall to prevent contact with dried oak leaves that may harbor oak leaf itch mites. Using a blower to collect oak leaves may inadvertently spread or distribute the mites and should be avoided.

The following products may provide relief from itching and other symptoms, although some require a prescription:

- Cortisone cream
- Calamine lotion
- Claritin (10 mg daily)
- Other antihistamines

Raymond A. Cloyd
Horticultural Entomology and Plant Protection Specialist

Originated by Alberto B. Broce, Kansas State University, and James Kalisch, University of Nebraska;
revised by Robert J. Bauernfeind, (retired), Kansas State University.

Photo credits
Figure 1: Eric Erbe, USDA Agricultural Research Service, courtesy of Bugwood.org; Figures 2 and 4: Raymond Cloyd, Kansas State University; Figure 3a: Matthew McKernan, Kansas State University; Figure 3b: Rick Grantham, Oklahoma State University.

Kansas State University Agricultural Experiment Station and Cooperative Extension Service
K-State Research and Extension is an equal opportunity provider and employer. Issued in furtherance of Cooperative Extension Work, Acts of May 8 and June 30, 1914, as amended. Kansas State University, County Extension Councils, Extension Districts, and United States Department of Agriculture Cooperating, J. Ernest Minton, Director.

MF2806 September 2019