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## Pyemotes herfsi (Acari: Pyemotidae) as the cause of mysterious human bites in the Midwestern United States

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- The first media report on an outbreak of mysterious bites on people occurred in early September when football players from a Colorado college went home covered with these bites after playing against Pittsburg Sta. Univ. Crawford Co. Health Dept. was flooded with calls from Pittsburg residents complaining of these “itchy bites”.
- Typical bites were quarter-size reddened welts with a pimple in the center, and were most commonly distributed over the neck and shoulders, and on areas of the torso where clothing fitted loosely. The most striking characteristic of these bites was the fact that no one had felt the bite nor had anyone seen an insect biting.
- In collaboration with the Crawford Co. Health Dept., Pittsburg Sta. Univ., epidemiologists from the Center for Disease Control and Prevention (Atlanta, GA), and the Kansas Department of Health and Environment, we collected insects with light traps, but no suspects were found.



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- By then, bites were reported from other places, such as Lincoln, NE, Joplin, MO, and Manhattan, KS.

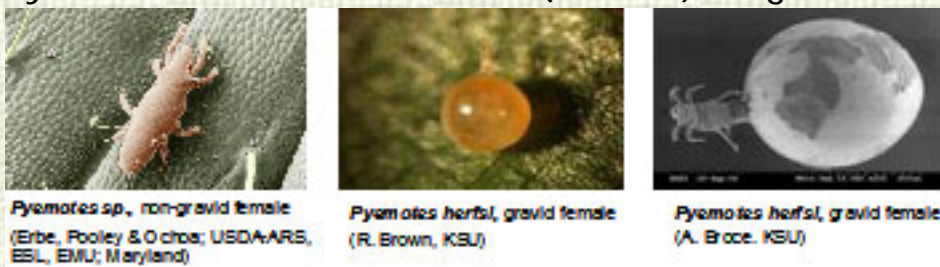
- Extension Newsletters written in 1994 by Dr. Don Mock, retired K-State Extension Professor, describing cases of bites on people in 1992-94 gave us the first clue to a possible association between bites and oak trees.
- Using this information, we found a *Pyemotes* sp. itch mite to be the cause of these bites.
- This particular species of *Pyemotes* mites was found predated on midge larvae which form leaf marginal galls and smooth vein pocket galls on pin, red, and black oaks (most likely two different species of *Cecidomyiid* midges).



- Cal Wellbourn, Florida's Division of Plant Industry, Gainesville; John Moser, U. S. Forest Service, Pineville, LA; and Ronaldo Ochoa, USDA Systematic Entomology Laboratory, Beltsville, MD identified the mite as *Pyemotes herfsi*, an European species that feeds on larvae of various moths and beetles. This is the first record for this mite species in North America.

- Although these mites prefer to feed on insect larvae, there are numerous reports from Europe of this species biting humans.

- *Pyemotes herfsi* are 0.2 mm (1/125") long.



- Newly emerged and mated females inject a venom-containing saliva into their hosts. This paralyzing toxin is so potent that a single mite can paralyze and kill an insect larva 166,000 times its own size (this explains the severity of reaction to the bites experienced by humans).
- The female abdomen enlarges as its progeny develops inside and within a few days, up to 250 adult mites emerge from the gravid female. Newly emerged males position themselves around the genital opening of the mother and mate with emerging females.

- Then, mated females disperse to colonize new sites. They are dispersed by wind and when they land on a vertebrate host, they attempt to feed, resulting in the itchy bites.



Confirmed (C) and suspected (S) cases of *Pyemotes herfsi* bites in the Midwestern USA