

# Chiggers in Kansas

Chiggers are parasitic mites that feed on or bite humans causing itching, irritation, and discomfort. Chiggers in other regions of the world transmit diseases, whereas chiggers in the United States do not transmit diseases. The common chigger species in Kansas is *Eutrombicula alfreddugesi* (Oudemans) (Acari: Trombiculidae). This publication provides information on the biology, behavior, and management of chiggers.

## Biology and Behavior

The life cycle of a chigger consists of an egg, larva, nymph, and adult (Figure 1). Chigger adults are approximately  $\frac{1}{20}$  of an inch (1.3 millimeters) long, red, with eight legs, and covered with hair (Figure 2). Adults are active in the spring, moving across turfgrass, leaf litter, and hard surfaces, such as walkways and rocks. Females lay eggs in leaf litter and moist soil. In five to seven days, six-legged larvae emerge (eclose) from the eggs. Larvae are about  $\frac{1}{128}$  of an inch (0.19 millimeters) long and orange yellow to red. Larvae are most abundant in areas exposed to sunlight with extensive vegetation containing shrubs, brush, and weeds. Larvae move onto grasses and weeds so they can attach to a host. Natural hosts of chigger larvae include rodents, birds, snakes, and toads. Humans are not a preferred host of chiggers. Once on a host, larvae attach themselves to the skin at the base of hair follicles.

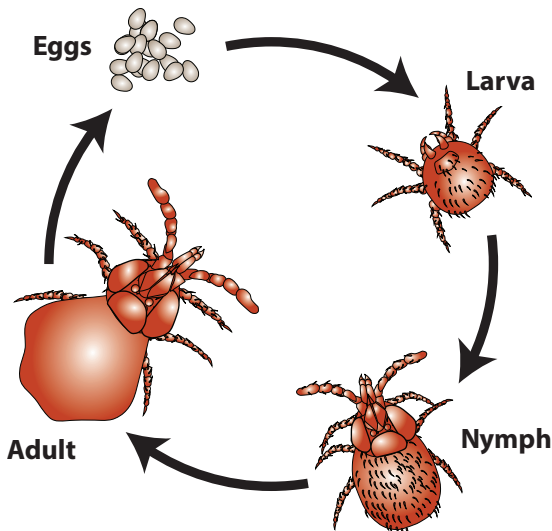


Figure 1. Chigger life cycle (modified from: Bugboy52.4).

Chigger larvae do not burrow into the skin or feed on blood. Instead, they remain on the surface of the skin and inject a fluid called saliva that dissolves tissues in the middle layer of the skin. Chigger larvae feed on the dissolved skin cells. The saliva secreted into the skin forms a hard tube called a stylosome, which attaches chigger larvae to the host where they feed on the liquefied tissue. The saliva induces a reaction at the feeding site that results in the formation of a red swollen lesion (welt) or a raised pimple (bump) (Figure 3), which is irritating and itchy. Itching is caused by the release of histamines from immune response cells and usually starts three to eight hours after chiggers have fed. Itching can last for more than a week. Chigger larvae are typically found on the body where clothing fits tightly against the skin, such as ankles, waist, armpits, and back of knees. The larvae fall off the host after feeding for two to four days or are removed from the skin when people start scratching. Chigger larvae that fall off or are removed outdoors, burrow into the soil. After seven to 10 days, they become eight-legged nymphs.

Nymphs are  $\frac{1}{20}$  of an inch (1.3 millimeters) in length, red, and covered with hair. Nymphs become adults after two weeks to one month. Nymphs and adults do not feed on humans or other animals but instead feed on insects, mites, and their eggs in the soil. The life cycle, from egg to adult, can take from one to 12 months to complete. Chiggers are generally active from early spring through late fall with activity dependent on temperature and food availability. Chiggers commonly reside in moist soil covered with vegetation, such as grass or



Figure 2. Chigger adult (Susan Ellis, Bugwood.org).



Figure 3. Chigger bites on ankle.

weeds. In addition, chiggers may be present in turfgrass at golf courses and parks. Adult chiggers overwinter in cavities located 1 to 1½ inches (2.5 to 3.8 centimeters) below the soil surface. There may be two to three generations per year in Kansas.

## Management

Management strategies that prevent chiggers from feeding (biting) and/or reduce chigger populations include personal protection, repellents, and a miticide.

## Personal Protection

- Avoid walking into areas with tall grass and weeds that can harbor chiggers.
- Do not sit, lie down, or walk barefoot in areas that may harbor chiggers.
- Insert pant legs underneath socks to deter chiggers from getting onto the skin.
- Mow turfgrass regularly and remove extensive vegetation (e.g., brush, shrubs, grass, and weeds) from areas to minimize habitats that may harbor chiggers.
- Take a hot shower as soon as possible after walking or hiking in areas that may harbor chiggers.
- Wash clothes using a hot water wash and rinse to kill any chiggers attached to clothing.
- Consult a physician about products that can be used to relieve discomfort and itching caused by chigger feeding. Continuous scratching may result in secondary bacterial infections.

## Repellents

Repellents deter chiggers from getting onto the body and feeding on humans. The effectiveness in repelling chiggers varies depending on the amount of active

ingredient in the formulation. Products with a high percentage of active ingredient provide longer repellent activity against chiggers. Common repellents include those containing DEET (N,N-diethyl-meta-toluamide), picaridin, and IR3535 (ethyl butyl acetyl aminopropionate). All three repellents (Figure 4) can be applied to the skin. Apply repellents to socks, pant legs, ankles, and around the waist. Sulfur can also be used as a repellent against chiggers. Apply sulfur powder to socks, shoes, and pant legs to repel chiggers and prevent them from feeding. Always follow directions on the product label before using repellents.

## Miticide

Permethrin, the active ingredient in miticide products, should only be applied to clothing (Figure 4). Do not apply permethrin to the skin. Chigger larvae are killed when they attach to clothes treated with permethrin.

Brand names appearing in this publication are for product identification purposes only. No endorsement is intended, nor is criticism implied of similar products not mentioned. Persons using such products assume responsibility for their use accordance with current label directions by the manufacturer.



Figure 4. Repellent products that can be applied to the skin to protect against chigger bites (left) and repellent that contains permethrin as the active ingredient (right) (Raymond Clloyd).

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