

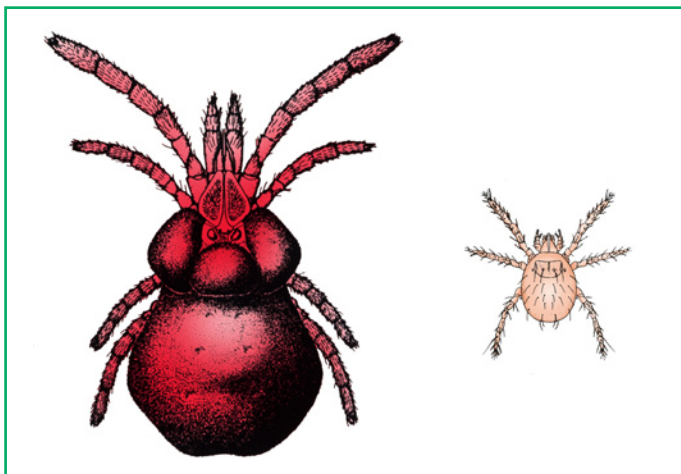
chigger, making it appear that the chigger has burrowed into the host's skin. Itching typically peaks at 24 to 48 hours after chigger bites occur, but redness and itching may persist for a week or more for some people.

Chigger Biology

Chiggers live outdoors in vegetation-shaded soil. They pass through four life stages: egg, larva, nymph and adult. Adults spend the winter in the soil. During the early, warm days of spring, females deposit their eggs in leaf litter and damp soil. The tiny larvae that hatch have six legs, are yellowish to light-red, and measure 0.15 to 0.3 mm ($1/100$ inch) in diameter. Only the chigger larvae are parasitic. Once a larva finds a host, it typically feeds for 3 days before dropping off to digest its meal and molt into its next life stage.

Nymphs and adults have eight legs and are predators, feeding on small insects and insect eggs found in the soil. Adult *Eutrombicula* mites are about 1 mm long, with a velvety texture and brilliant red coloring. They sometimes are seen walking in leaf litter or along the edges of stones or concrete and often are referred to as "red bugs."

Under favorable conditions, chiggers can complete their development in 2 to 12 months. Chiggers are active from late spring to fall in most parts of Texas, but they may remain active year-round in southern areas, where they can produce up to four generations per year.



Adult chigger (left) and chigger larva. The tiny larva (0.25 mm) is the chigger's only biting life stage. The adult is a predator on other soil-dwelling arthropods (images modified from Michener [adult] and the Centers for Disease Control).

Defending Yourself Against Chigger Bites

The best defense against chiggers is to avoid them. Wear protective clothing, such as long pants, long-sleeved shirts and shoes or boots, when venturing into chigger habitats. Loose-fitting, tightly woven fabrics provide the best protection, because such fabrics minimize the movement of chiggers through clothing. To keep chiggers on the outside of your clothing, tuck pants legs inside boots, and button your cuffs and collar. Avoid sitting or lying directly on the ground. Remove your clothes as soon as possible after exposure to chigger habitats, and launder them before the next wearing.

Take a warm, soapy shower or bath within a few hours after exposure to chiggers to reduce the number and severity of bites. Scrub your skin vigorously with a washcloth to dislodge any mites that may have settled there recently. The sooner you take a shower, the more likely it is to provide relief from skin reactions to chigger bites (chigger dermatitis).

Commercially available insect repellents containing DEET (N,N-diethyl-meta-toluamide) offer protection from chiggers and insects. Apply repellents according to label directions. DEET may be applied to exposed skin and around the edge of openings in clothing, such as cuffs and waistbands, and around boot tops. Avoid getting DEET repellents around or in your eyes. Skin-applied repellents' effectiveness decreases after several hours, so reapply them as necessary. Sulfur powder applied to clothing also may provide some protection. Plant-oil-based repellents may not have been tested for effectiveness against chiggers; however, a repellent that specifically states it repels chiggers should provide some degree of protection.

Apply products containing permethrin (such as Permanone[®] Tick Repellent) to clothing for long-lasting chigger protection. Do not apply permethrin sprays directly to skin; allow them to dry on clothing before wearing it. Permethrin treatments are long-lasting and will remain effective through several washings. Combine permethrin-treated clothing and DEET applied to the skin if you will be in areas heavily infested with chiggers.

Chigger infestations are less common in maintained turfgrass and landscaped environ-

ments. But occasionally, especially in sites recently cleared for development, chiggers may infest vegetation around a home. Also, hosts such as wild mammals, birds or reptiles can help sustain chiggers in backyard settings. Keeping grass cut short and vegetation well-trimmed can raise soil temperatures and lower humidity enough to make lawns less hospitable to chiggers.

Residual insecticide sprays, such as those containing bifenthrin, cyfluthrin, esfenvalerate or permethrin, can help suppress chigger numbers. Granular insecticides generally are less effective than sprays; however, among granular products, bifenthrin performed best against chiggers in recent studies.

Use hose-end spray applicators to apply liquid insecticide sprays to large lawn areas. Make sure the insecticide product you purchase is labeled for use on lawns, and carefully follow label directions.

When applying insecticides to your lawn, wear long pants, shoes and any other protective gear recommended on the product. As a general rule, pets should be removed from the yard during treatment but can be returned after spray residues are dry.

Treating Chigger Bites

Chigger dermatitis can be extremely irritating and uncomfortable. A hot shower or bath, with scrubbing as described on page 2, can provide some relief if done early in the itching phase. Once a pustule (bump) has formed, do not scratch it, to avoid opening the bite to possible infection.

Antihistamines such as oral Benadryl®, anti-itch creams (camphor and menthol, calamine or pramoxine), or hydrocortisone ointments give the best relief from the intense itching associated with chigger bites. It's also a good idea to apply an antiseptic ointment to prevent infection, especially on bites that have been abraded by clothing or scratching.

Commercial chigger-bite medications vary in effectiveness but often rely on numbing agents or sealants to prevent air from contacting a bite. Analgesics (pain relievers) also can provide relief from itching discomfort. Chronic scratching only causes further irritation and increases the risk of secondary infection.

Individuals with severe cases of chigger dermatitis or hypersensitivity to chigger bites should consult their physicians.