

RESIDENTIAL, STRUCTURAL,
AND COMMUNITY PESTS

INSECT NOTES

DEPARTMENT OF ENTOMOLOGY • NORTH CAROLINA COOPERATIVE EXTENSION

Insect Note ENT/rsc-2

MITES THAT “BUG” PEOPLE

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On a world-wide basis, mites are important nuisance pests and some are capable of transmitting disease agents. Fortunately, the mites that we commonly encounter in North Carolina do not transmit disease agents that affect people. The majority of mites are free-living, but thousands of species are parasites of animals and plants. Most of these are external parasites, but some species inhabit the ear canals, lungs, intestine and bladder of vertebrates, particularly domestic animals. Their biting and bloodsucking behavior causes considerable discomfort to and a few species also cause serious allergic reactions, such as asthma, in people. Because of their relatively small size, mites are often the "suspects" of a whole range of biting/itching problems. Understanding their biology and the symptoms associated with mite can help determine if they are the cause of a particular problem.

Biology and Life History. Mites are not insects; they are more closely related to ticks and spiders. Most mites are visible to the unaided eye and usually measure $\frac{1}{8}$ " or less in length. Their life cycle has four basic stages: egg, larva, nymph and adult. The egg hatches into a larval stage, which molts to the nymphal stage. After 1-2 more molts, the nymph matures to an adult. Mites, like ticks, have three pairs of legs as larvae and four pairs of legs as nymphs and adults. The life histories of some common mites associated with people are described in the rest of this document.

Scabies Mites

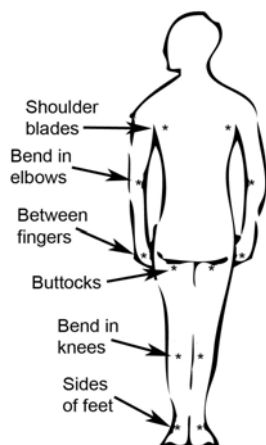
Sarcoptes scabiei, commonly known as the scabies, mange or itch mite, is a parasite of humans and other animals. Scabies mites are host-specific. The varieties of scabies that infest domestic animals can penetrate the skin of humans and cause the typical itching and rash, but they cannot complete their life cycles there. The adult female burrows into the outer layer of the skin (epidermis) where she feeds on tissue fluids and lays eggs that she cements to the floor of the burrow. Females lay eggs at a rate of up to 3 per day for a period of 8 weeks, producing about 200 eggs over her lifetime. These eggs hatch in 3-4 days and the newly-hatched larvae emerge from the burrows onto the surface of the skin and molt to form the first nymphal stage. The rash and intense itching associated with scabies occurs when the nymphs burrow into the skin and begin feeding. These symptoms usually appear several weeks to a month after the initial infestation. The majority of mites is found in lesions in folds of skin between the fingers, on the sides of the feet, on the wrists and genitals, and in the bends of the knees and elbows (see

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picture on next page).

After feeding on tissue fluids, the nymphs molt to become adults. The life cycle, from egg to adult, can be completed in about two weeks. Scabies mites are readily transmitted within families and within institutions such as nursing homes. **Personal contact, particularly holding or shaking the hands of an infested**

person, is a principal method by which the mites are spread. Intimate contact and sleeping with an infested person can also spread the mites.



Proper treatment and control of a scabies problem requires:

- Positive diagnosis of the problem by a physician. Scabies mites are extremely small; females measure about $\frac{1}{60}$ inch. In the case of both scabies and straw itch mites, the rash or bites associated with these mites is the primary diagnostic characteristic.
- Application of an insecticide-containing prescription lotion to the body. Because there is time lag between the initial mite infestation and the appearance of symptoms, family members or people coming in close contact with infested persons may require treatment.
- Sanitation is extremely critical to successful control. An infested person's undergarments and bed linen should be washed regularly in hot, soapy water.

Note: Human scabies mites cannot survive off a host for more than about 24 hours. Therefore, insecticide foggers ("bug bombs") and sprays do not help to eliminate the problem and are unnecessary.

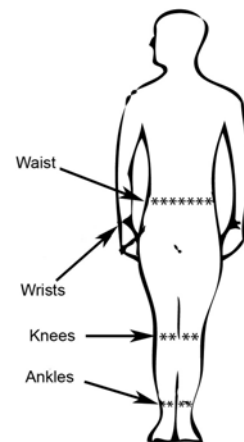
Chiggers (Red Bugs)

Eutombicula alfreddugesi are very small, reddish mites that feed, only in the larval stage, on humans and other animals, particularly rodents. The red color of the larvae is not blood but a natural red pigment. On animals, chigger larvae remain attached to the skin for several days but on humans, they are usually dislodged within several hours of

attachment. Unlike scabies mites, chiggers do not burrow into the skin. They feed at the base of a hair follicle or in a pore.

Chiggers generally attach to those areas of the body where clothing fits tightly, such as at the sock line and waistline. Larvae ingest lymph and partially digested cells after the chigger attaches. The bites

commonly cause itching in about 3 to 6 hours and dermatitis develops in about 10 to 16 hours. Some people experience allergic reactions to the bites and develop blister-like lesions. Chiggers do not transmit any disease agents



Chigger bites on ankle (Texas A&M University)

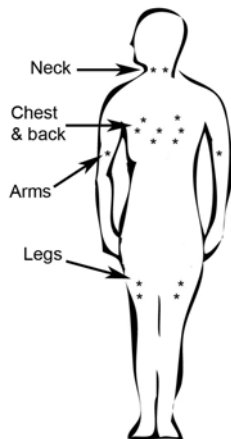
to people. The adults and nymphs are free-living predators of insects. In the South, chiggers are active virtually year round. They are commonly encountered at the woodland borders, along the periphery of swamps, and in shrub thickets and unmowed, overgrown areas of lawn. Areas that contain thick layers of pine straw, leaf litter or thatch are suitable habitats for chiggers and their prey. Treating chigger-infested areas with a pesticide spray will provide some control. Ground cover in these areas should be wetted down to the soil surface.

Avoid excessive treatments that can lead to pesticide runoff into creeks, streams or storm drains. For personal protection, use insect repellents. DEET[®] or Permanone[®] (permethrin) can be applied to clothing (do not apply Permanone to your skin). DEET is appropriate to use on exposed skin. **Repellents should be used in moderation by children and pregnant women.** For more information about repellents, see Insect Note -

ENT/rsc-5.

Straw Itch Mites

Pyemotes tritici commonly breed in stored grain, dried beans and peas, wheat straw, hay and other dried grasses. They are actually beneficial because they parasitize insects that feed on stored grain and similar materials. People who handle mite-infested materials can be attacked. Bites of straw itch mites are characteristically found on the trunk of the body. The best control strategy is to eliminate the mite's host insects. Clean the storage area before restocking with new hay/straw. Surface sprays of may be used in some storage areas. Check the NC Agricultural Chemicals Manual for appropriately-labeled products. If necessary, stored commodities can be fumigated to disinfest them. Fumigation should be performed by persons holding the appropriate North Carolina pesticide applicator's license or certification.



(**Note:** the selection of a chemical will depend on the intended use of the straw. For example, straw that is used for livestock bedding or feed should only be treated with a pesticide labeled for such use. Consult your county office of the NC Cooperative Extension or the *NC Agricultural Chemicals Manual*.)

Bird Mites

Ornithonyssus sylviarum, the northern fowl mite (NFM), is a common pest of domestic fowl, pigeons, starlings, house sparrows and other wild birds commonly associated with people. Mite populations build up rapidly and a generation can be completed in 5 to 12 days. Several generations occur each year. Northern fowl mite spends virtually its entire life on the host bird. **It can survive off a host for about a week or so.** Mites that fall off host birds may be found wandering indoors. In poultry houses, they are sometimes found in the litter or on eggs, crates and cages.

Dermanyssus gallinae, the chicken mite (or red mite of poultry), is similar to the fowl mite in its host preferences. Unlike NFM, the chicken mite spends much of its time off the host bird, hiding in cracks and crevices during the day and feeding at

night. **They can survive for extended periods (as much as 8 months) off a host.** It can be a serious problem to workers who handle birds. Around residences and other structures, mite problems tend to be more sporadic. Bird nests are often located in chimneys and tucked under eaves or window-mounted air conditioners. In the spring, nestling birds may be parasitized by thousands of mites. When the nestlings mature and leave their nest, large numbers of mites may invade buildings in search of alternate hosts.

In some areas of the state, bird mite problems may continue year round because hosts, such as pigeons, are constantly present. Mites that find their way indoors are easily removed by vacuuming or can be killed with an aerosol insecticide. The key to reducing bird mite problems is to prevent the birds from nesting on/in structures and to remove abandoned nests quickly. Although pigeons, starlings and sparrows can be removed readily, birds such as chimney swifts are protected under the 1918 Federal Migratory Bird Treaty Act and **cannot** be disturbed. The best approach is to install screened chimney caps in the early spring or fall when the birds are not nesting.

House Dust Mites

Dermatophagoides pteronyssinus and *D. farinae* are the most common species of house dust mites in North Carolina. These tiny mites are most abundant in warm, humid areas. **Contrary to popular belief, house dust mites do not bite or sting.** They feed on shed human skin scales that collect in the dust on furniture, particularly mattresses, and on carpeting below beds. House dust mites are important medically because they produce allergens in their secretions and excrement. Inhaling airborne house dust containing mite feces and cast skins is a common cause of asthma in young children.

Products containing benzoyl benzoate and other ingredients are often used for severe infestations of house dust mites. However, the long-term solution to reducing a house dust mite problem is sanitation and environmental modifications:

- Vacuum (possibly with a HEPA-filtered vacuum cleaner) frequently and thoroughly to remove mites and the organic debris on which they feed.

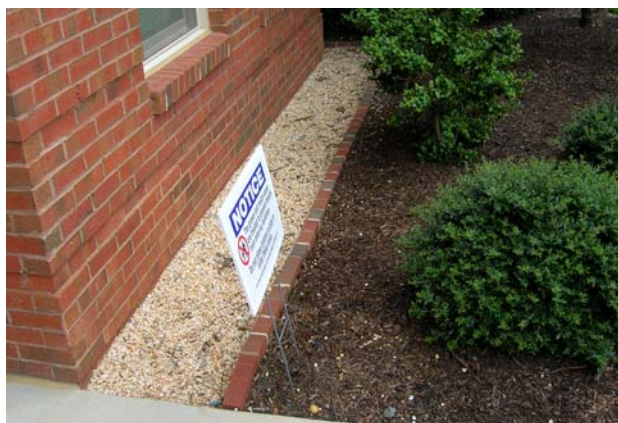
Target critical areas, such as: mattresses and bed frames rugs and carpets (especially under beds) overstuffed furniture (and the area underneath)

- Change air conditioner filters frequently and lower humidity indoors (less than 50%) to reduce conditions favorable to dust mites.
- Encase mattresses and pillows change bed linen frequently to help prevent mite populations from building up.

Clover Mites

Bryobia praetiosa is a small ($\frac{1}{32}$ ") mite easily recognized because of its reddish-brown color and long pair of front legs. Clover mites do not bite. They are a nuisance because large numbers of them often invade homes. Hot dry weather in the summer will cause clover mites to migrate indoors. Similarly In the fall, the mites may also migrate indoors seeking shelter from low winter temperatures. In attempting to remove the mites, homeowners often crush them, leaving red stains on furniture and drapes. Mite invasions are most common from vigorously-growing lawns and other vegetation surrounding homes, especially if shrubs are close to or touching the walls.

A simple, non-chemical control method involves leaving a strip (12-18 ") of bare soil or gravel around foundation walls. This plant-free zone discourages mites from migrating onto the walls and provides an area that is easily treated if needed.



Gravel barrier to deter clover mites.

If mites become a problem, application of a pesticide to nearby foliage and lawns may help. Insecticides applied to foundation walls, door thresholds and window ledges make an excellent

barrier. Indoors, the mites are easily killed with aerosol insecticide sprays, but vacuuming is a preferable alternative. Cyfluthrin, bifenthrin, and permethrin are examples of chemicals labeled for such use. Read the pesticide label carefully and select products appropriate for use indoors or outdoors as needed. For information about clover mites, check:

<http://insects.ncsu.edu/O&T/lawn/note124/note124.html>

“Paper Mites” and Other Unidentified Bites

Complaints about bites and rashes for which a specific cause cannot be found are often attributed to so-called (and non-existent) "paper mites" or to one of the other mites mentioned above, particularly scabies and bird mites. Other biting/stinging pest such as fleas and bed bugs are easily seen and produce very noticeable and characteristic bites and other evidence of their feeding. Although mites are extremely small, they are usually detectable with the unaided eye or by skin scrapings or other samples collected and examined by a physician. In the case of scabies and straw itch mites, the rash or bites that these mites leave can aid in identifying them as the cause of the problem, but you still need **positive confirmation by a health care professional** before beginning treatments that will only prove to be ineffective. Very often we unconsciously and repeatedly scratch irritated areas of the skin (particularly at night) and this will only worsen the condition. So-called "paper mites" or even bird mites are often alleged as a cause of a problem without any real proof of a biting pest problem in order to justify pesticide treatments in homes and offices. Pesticide applications made without first identifying a specific pest problem (and target application site) are usually ineffective and should not be used. More importantly, repeated and widespread pesticide applications are potentially hazardous to you and others around you. This includes constant (and multiple) applications of insect repellents and other insecticides to your skin (which can cause rashes and irritation) and to your clothing and/or bedding. Similarly, other chemicals such as bleach, ammonia, and kerosene are totally inappropriate for application to your skin. You need to identify the cause of a problem before you resort to spraying any pesticides in your home or applying chemicals to your skin.

Tips for Collecting Mites and Other Small Specimens for Identification

1. Never use adhesive ("Scotch") tape to "trap" specimens on your skin. Key features that are important for pest identification can easily be damaged or obscured.
2. Use mouse glueboards, or cockroach sticky traps (available at most hardware stores) as monitors. Keep track of where and when you place each one. Such information may be critical if mites or insects are found.
3. Brush/knock suspected specimens from your clothing or skin onto a light-colored piece of paper or cardboard.
4. Use a fine artist paint brush to pick up the specimens. Place them carefully into a small prescription vial or bottle filled with alcohol (rubbing alcohol should work). Label the vial as to where you collected the specimen.
5. Make sure that the vial/bottle is sealed tightly so that the contents do not leak.
6. Take the specimens to your county Cooperative Extension Center.
7. **Please note:** Specimens containing bodily fluids, skin tissue, etc. should be examined by a medical professional. Such samples will not be opened or handled by Cooperative Extension or NCSU staff. Contact your personal physician for advice. Likewise, do not send vacuum cleaner bags filled with debris and possibly pesticide-laden dust. These items pose a potential hazard to the people handling them.

If no insects or mites can be found, then you need to consider other possible causes for your symptoms, such as allergies or sensitivities to food, chemicals or dusts, or changes in your indoor environment (e.g., changes in humidity), some medications and supplements. Even stressful situations can trigger skin reactions and sensitivities. Consult your family physician or a specialist such as a dermatologist or allergist.

RELIEVING THE ITCH OF MITE BITES

When mites attach to skin, the saliva they secrete causes the intense itch that may be felt for several days after the mite is no longer attached. As soon as possible after walking through chigger-infested areas or being exposed to other mites, you should bathe in hot, soapy water and scrub down with a washcloth. Oral antihistamines and/or application of a hydrocortisone cream to bites may help to relieve itching. If you develop a severe reaction, then consult your physician.

Pest information and control recommendations presented here were developed for North Carolina and may not be appropriate for other states or regions. Any recommendations for the use of chemicals are included solely as a convenience to the reader and do not imply that insecticides are necessarily the sole or most appropriate method of control. Any mention of brand names or listing of commercial products or services in the publication does not imply endorsements by North Carolina Cooperative Extension nor discrimination against similar products or services. All recommendations for pesticide use were legal at the time of publication, but the status of pesticide registrations and use patterns are subject to change by actions of state and federal regulatory agencies. Individuals who use chemicals are responsible for using these products according to the regulations in their state and to the guidelines on the product label. Before applying any chemical, always obtain current information about its use and read the product label carefully. For assistance, contact the Cooperative Extension Center in your county.

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