



Bed Bugs

Cimex lectularius; Family: Cimicidae

In most parts of the United States the only bed bug of importance to humans is *Cimex lectularius*. Bed bugs of this species feed on blood, mostly from people, but are also known to feed on bats or other animals including rabbits, rats, guinea pigs, and domestic fowl, especially when the animals are housed in laboratories. The bed bug has a sharp beak that it uses to pierce the skin of the host. It then begins feeding, injecting a fluid that helps in obtaining food. This fluid causes the skin to become swollen and itchy. Bed bugs are nocturnal, feeding at night, often biting people who are asleep. Where infestations are severe one may detect an offensive odor that comes from an oily liquid the bugs emit. Bed bugs can be enticed to bite during the day if light is subdued and they are hungry.



Fig. 1. The red-brown bedbug in the center is an adult, a lighter colored nymph is visible in the upper left corner, and the round dark spots are blood spots. (Gary Alpert, Harvard University, www.Bugwood.org)

Description: A mature bed bug is an oval-bodied insect, brown to red-brown in color, wingless, and flattened top to bottom (**Fig. 1**). Unfed bugs are 1/4 to 3/8 inch long, and the upper surface of the body has a crinkled appearance. A bug that has recently fed is engorged with blood, dull red in color, and the body is elongated and swollen. Eggs are white, and are about 1/32 inch long. Newly hatched bugs are nearly colorless.

Life Cycle: Bed bugs undergo a gradual metamorphosis (change in form) and the young resemble the adult. The young are called nymphs. Under ideal conditions bugs feed regularly when temperatures are above 70° F. Eggs are deposited in batches of from 10 to 50 in crevices of bed frames, floors, walls and similar household sites. When fresh, the eggs are coated with a sticky substance that causes them to adhere to any object on which they are deposited. Eggs are not deposited at temperatures lower than 50° F. Eggs hatch in 6 to 17 days but may take as long as 28 days in cooler temperatures. The nymphs begin to feed as soon as they can locate a host. They molt 5 times before reaching maturity and the nymph period lasts about 6 weeks. There may be up to three generations per year in our climate.

Bed bugs feed for a period of 3 to 5 minutes, after which they are engorged and drop off the host. They crawl into a hiding place and remain there for several days digesting the meal. When hungry again, they emerge from the hiding place and search for a host. If no food is available, the new nymphs may live for several weeks in warm weather, or several months in cool weather. Older bugs may go for 2 months or longer without food.

Management: Management consists primarily of finding places where the bed bugs hide in the daytime and cleaning these sites as thoroughly as possible. Where are bed bugs found? Hiding places can often be discovered by keeping an eye out for black or brown spots of dried insect excrement on surfaces on which the bed bugs rest. Eggs, eggshells and cast skins may also be found in resting places. Early in an infestation bed bugs are likely to be found only about the seams, tufts, or folds of mattresses or daybed covers, but later they spread to crevices in the bedsteads. In severe infestation they may be found behind baseboards, window and door casings, pictures and picture frames, in furniture, loosened wallpaper, cracks in plaster and the like.

Management should focus on mechanical methods such as vacuuming, removing or sealing loose wall surfaces (wallpaper, paint, etc.), caulking cracks and crevices, and other hiding places. A thorough cleaning may need to be done

more than once as eggs may be missed, or bugs may be well hidden during the cleaning process. Vacuum the mattress, especially paying attention to tucks and along seams where bedbugs like to hide. Be sure to remove and seal the vacuum cleaner bag immediately after cleaning. Place the vacuum cleaner bag into a plastic garbage bag, tightly seal, and discard. (The effectiveness of steam cleaning has been questioned, because the mattress quickly absorbs the heat and the bedbugs are not harmed.) In addition, one may put a zippered mattress cover, such as is used for dust mites, on the mattress. This traps any bugs inside. However, effectiveness of this method depends on the thoroughness with which the slats, springs and frame are cleaned. If bedbugs are still in the frame, they may crawl over the mattress cover to reach a host. If they are trapped in the cover, and none are left on the frame or other places in the room, the biting should cease. Bed bugs can live a long time without a meal, so it is best to leave the cover on the mattress for at least a year.

After thorough cleaning be sure the bed is moved away from walls so it does not touch them. You may want to coat the bed legs for 3 or 4 inches with something to prevent bugs from crawling up into the bed. Petroleum jelly is sometimes used for this purpose, but put something under the legs in case it drips. Remove dust covers, and keep bed covers and blankets up off the floor.

If the infestation is severe, or you are unable to get control with other methods the services of a pest management professional is a good idea and may be needed.

If you decide to treat yourself, apply a household insecticide that is labeled for bed bug control. Insecticides registered for homeowner use for bed bug control in the home include cyfluthrin, deltamethrin, diatomaceous earth, or permethrin. Apply to hiding places around baseboards, moldings and floorboards. Caution: *DO NOT USE ANY INSECTICIDE ON A MATTRESS - unless the label specifically discusses application to a mattress.* Most household sprays are not suitable for application to mattresses. Some people would rather discard the mattress, which is fine, but you may also consider putting a dust mite cover on it as described in mechanical control above.

If an approved spray (for mattresses) is applied to treat a bed:

- a) Spray the slats, springs and frame. Apply enough spray to wet thoroughly. Do not miss any crevices where bed bugs may hide.
- b) If a mattress must be treated, spray a light mist to the entire mattress. Open seams, tufts and folds.
REMEMBER: Only use a spray labeled for application to mattresses. Material should be thoroughly dry before using bed.

References: Frishman, A. 2000. "Bed Bug basics and control measures". Pest Control 68: p. 24.

Harlan, Harold 2001. Personal Correspondence. NPMA

Krueger, L. 2000. "Don't get bitten by the resurgence of bed bugs". Pest control 68: pp. 58-64

USDA leaflet number L-453 entitled *How to Control Bed Bugs*.

Reprinted from *Bed Bugs Cimex lectularius; Family: Cimicidae*, Carolyn Klass, Sr. Extension Associate, Department of Entomology, Cornell University, 1/82.

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The Pesticide Management Education Program (PMEP), in cooperation with the New York State Department of Environmental Conservation (NYSDEC), maintains a web site with a searchable database for pesticide products currently registered in New York State. Individuals who have Internet access can locate currently registered products containing the active ingredients suggested above at <http://pims.psur.cornell.edu/> (NYS PIMS).

This publication contains pesticide recommendations. Changes in pesticide regulations occur constantly and human errors are still possible. Some materials mentioned may no longer be available, and some uses may no longer be legal. All pesticides distributed, sold or applied in New York State must be registered with the New York State Department of Environmental Conservation (NYSDEC). Questions concerning the legality and/or registration status for pesticide use in New York State should be directed to the appropriate Cornell Cooperative Extension Specialist or your regional NYSDEC office. Read the label before applying any pesticide.

For additional information see:

http://www.nysipm.cornell.edu/publications/bb_guidelines/

(Includes details on finding and cleaning bed bug hiding places, and other information. Written for group residences, but much of the information applies as well to houses and apartments.)

http://www.nysipm.cornell.edu/publications/bed_bugs/files/bb_travelers_online.pdf

(A printable info card for travelers and college students)

<http://www.nyc.gov/html/doh/bedbugs/html/home/home.shtml>

(Information on how to identify, prevent, and get rid of bed bugs, including choosing a pest management professional, from the Health Department of New York City)

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