



A Home Owner's Guide to the Human Bed bugs *Cimex lectularius* L., *C. hemipterus* Fabr.

(Cimicidae: Heteroptera)

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The Common bed bug, *Cimex lectularius* L.

Introduction

There are two species of human bed bug, the Common bed bug, *Cimex lectularius* L. and the tropical bed bug *C. hemipterus* Fabr. These human bed bugs are in a blood feeding family of approximately 100 species (worldwide) preying on bats, birds, and small animals. The tropical bed bug, adapted to high temperatures, seems not to live outside the tropics. The Common bed bug is more tolerant of cooler temperatures and has a worldwide distribution. The cave-dwelling habits of these bed bug's ancestors,

brought them into contact with man, possibly during the last Ice Age, about 35,000 years ago. This is when their association with man is thought to have started. In recent history, they have become a worldwide human pest, described in the literature back to Aristotle, 2000 years ago.

The commonly used word “bug”, applied by many to all insects, comes from the human-bed bug association. Bug or buggie is an old English word for ghost or sprite describing wraiths visiting in the night. Since bed bugs creep to and feed on sleeping people at night, their common name was applied to them.

Medical importance

Bed bugs need to feed on blood to grow and reproduce. In severe infestations, people exposed to bed bug feeding can suffer mild anemia. Feeding can cause allergic skin reactions by injecting anesthetic/anticoagulant compounds. Sometimes a secondary bacterial infection occurs from scratching, and medical treatment may be necessary. Direct bacterial infection from the bug has not been reported.

Disease causing pathogens are not known to be transmitted by bed bugs, though some have been detected in the bugs. Hepatitis B (HBV) DNA has been found in bed bugs up to 2 weeks after feeding and Human Immunodeficiency Virus (HIV) was shown to survive for up to four hours in the bug. Hepatitis C (HCV) has never been detected. These major human health viruses do not appear to be transmitted from human to human by the bug.

Biology

Unfed adult bed bugs are about the size of a lentil or apple seed (6–8mm; ¼ inch) and the young (nymphs) look like the adults. They are chestnut brown, oval and flat. After mating, a female may lay an average of 150 to 250 eggs in her lifetime. Eggs are small, white, barrel shaped, and sticky.



Photo by Rose Hiskes

Bed bug eggs recently hatched

Eggs hatch from seven to ten days. Under normal conditions, it takes 5 to 8 weeks for nymphs (five instars/molts) to develop into adults. Bed bugs can live as long as 316 days.

Bed bugs are temperature sensitive. At 86°F/30°C, egg to adult development can occur in 21 days; at 65°/18°C, 120 days are needed. Between 55°F/13°C and 59 °F/15 °C, adults often become inactive, but they can adapt and have been reported to be active at 45°F/7°C. They are killed at temperatures between 111 °F/44°C and 113°F/45°C.

Bed bugs hide in cracks and crevices during the day close to areas where people sleep or congregate. They feed at night, especially before dawn. Feeding is quick; nymphs 3 – 5 minutes and adults up to 10 minutes. About 20% of adults and large nymphs may defecate after a feeding, leaving a brown spot on bedding sheets or other surfaces.



Bed bug fecal spots



Photos by Dr. Ridge
Bed bug on arm (size, ¼ inch)

Feeding occurs before each molt and before reproduction. Reproduction is unique, to the point of being bizarre. Traumatic insemination occurs when a male reproductive clasper is stabbed into the female's underside and a sperm mass is deposited into her body. Activated by the seminal fluid, the sperm migrate to the ovarioles (egg producing organs) where they are briefly stored.

Signs of bed bug infestation

Bed bug infestations can be recognized by:

- Fecal brown spots of excrement on sheets, mattress or adjacent objects
- A sweet musty odor is often noticed when populations are high
- Unexplained “bite” skin lesions may indicate bed bug feeding (can be inclusive)
- Dead bugs or their shed skins present in or near hiding places

Control

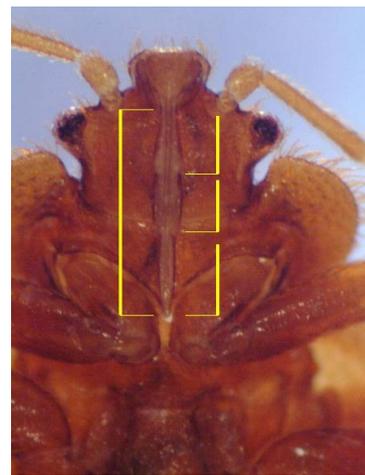
Starting with the use of synthetic insecticides after WWII through the 1970's, the Common bed bug was all but eradicated in the western world. Then in the late 1990's, bed bug complaints increased in Western industrialized nations. The reemergence of bed

bugs as a problem was in large part due to increased international travel and the decline of residual pesticides used in buildings for other pest insects, such as cockroaches. It has nothing to do with personal hygiene. Bed bugs are indiscriminate regarding people's socio-economic status or degree of cleanliness.

Residences and temporary shelters with transient and changing human populations appear to be particularly at risk for acquiring bed bugs. These may include homeless shelters, hotels, motels, apartments, other multi-type dwellings, college and university dorms, hostels, summer camps, churches, airports transit lounges, residential or conference centers, and restaurants.



Adult bed bug is 5 mm (1/4 inch) long



Photos by Rose Hiskes
Bed bug mouthpart (the beak)

Proper identification is the first step in managing bed bugs. Bed bugs may be confused with other insects such as carpet beetles. It is nearly impossible for a homeowner to control bed bugs without professional assistance. There are pesticides available for use by licensed applicators. People can follow some procedures before calling a pest control operator for control. These include:

- Check for bats or birds living in or on a building, because bed bugs associated with these animals can bother people
- Pick up personal clutter, books, magazines, ornaments, clothing, and miscellaneous objects, checking each for hiding bed bugs. If an item is suspected of having a bed bug, place it into a ziplock bag and freeze it for >72 continuous hours to kill the bug
- Using a crevice tool, vacuum all cracks and crevices (include baseboard, electrical outlets, light fixtures, chests, dressers, night stands, wall hangings, lamps, chairs, bed frame, mattress and box spring seams, TV, and alarm clock, *etc.*) in the

bedroom area and adjacent rooms. Repeat every three days for two weeks. Be sure to remove the vacuum bag, seal it inside a larger plastic bag and put that in your normal trash

- Seal mattress and box springs in plastic protective encasement sheets. Mattresses and box springs do not always need to be thrown out in controlling bed bugs
- Wash sheets and clothing in hot water and dry in a hot dryer cycle for 30 or more minutes. Dry clean delicate clothing
- Pull bed at least 6" away from the wall and wrap legs with clear 2" wide sticky tape, sticky side facing out to catch any climbing bugs
- Keep bedrooms cool (if possible) at night to slow down bug activity
- Steam clean carpets and area rugs
- At this time, it is advisable not to use over the counter pesticides
- Call in a professional pest management professionals for assistance

Preventing bed bug entry into a home or apartment

Bed bugs can easily enter into homes or apartments. Be aware that the following can be a source for bed bugs:

- Purchased used furniture, TV's, linens, clothes, boxes, etc.
- Furniture including mattresses, clothes etc. picked up off the street
- Gifted furniture, luggage, clothing etc. from a personal acquaintance
- Self infesting by the bed bugs themselves. Bed bugs can walk from room to room; apartment to apartment easily
- House guests who have traveled or relatives/friends visiting from long-term care facilities, hostels, universities, colleges, etc.
- Items from self storage facilities
- Items carried in rental, delivery, or moving trucks
- Rented furniture from rental furniture centers
- Cruise ships vacationers

Travel tips to reduce chances of bring home bed bugs

The following tips may reduce your chances of bringing bed bugs home:

- Select clothes which can be laundered in hot water and withstand 20 minutes of hot drying
- Select hard smooth luggage over fabric luggage. Hard smooth cases have fewer places for bugs to hide

- Pack plastic bags to seal up purchased items or to isolate items which may become infested
- On arriving at your vacation destination, keep luggage off the floor and beds. If possible, place on luggage racks. Do not unpack clothes. Keep luggage closed when not in use. Hang business suites and dresses on a shower rail if it can take the weight
- Inspect bed area for brown fecal spotting and bugs on mattress seams, headboards, furniture, and objects adjacent to the bed. (Before leaving home, learn about what bed bugs look like. They can be mistaken for carpet beetles, and other insects)



Photo by Dr. Ridge

Bed bug compared with a carpet beetle larva (left)

- Before checking out, pack clothing and souvenirs in sealable plastic bags, check luggage, including shoes, for bugs
- On arriving home, unpack luggage outside the residence; take clothing in plastic bags directly to washing machine and wash immediately; dispose of empty plastic bags in trash; dry clean delicate clothing; lightly spray empty luggage with a pyrethrum-based insecticide [Note: Freezing must be for longer than 72 hours to kill bed bugs]

Bed bugs are not everywhere! Only a small number of travelers will encounter bed bugs. Vacationers should keep the problem in perspective. By following a few simple precautions, the possibility of getting bed bugs can be greatly reduced.

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Acknowledgements

I thank Dr. Harold Harlan of the Armed Forces Pest Management Board, Maryland and Dr. John F. Anderson, Dr. Kirby C. Stafford, and Dr. Louis A. Magnarelli of The Connecticut Agricultural Experiment Station, Marty Gilloren and Jim Miller of Yale Pest Elimination, Connecticut for their assistance in writing this fact sheet. I also thank the photographer Rose Hiskes for providing images of bed bugs.



Photo by Dr. Ridge

A common skin reaction to bed bug bites. Note how the bites are in a row