

Bed Bugs



Common Name: Bed Bug

Scientific Name: *Cimex lectularius* L.
(Insecta: Hemiptera: Cimicidae)

INTRODUCTION

Bed bugs, *Cimex lectularius* Linnaeus, (*Cimex* is pronounced sym ex) are blood feeding parasites of humans, poultry, bats, sparrows and occasionally domesticated animals. They are in the order Hemiptera and are considered "true bugs". Bed bugs have never been implicated in the spread of disease to humans. After the development and use of modern insecticides, such as DDT, bed bug infestations virtually disappeared; however, since 1995, pest management professionals have noticed an increase in bed bug related complaints

(Disclaimer: The information provided in this pest profile sheet is a partial compilation of research material, general pest management strategies and general information on this pest. Pest Management Professionals must follow label directions for insecticides used in bed bug control. BASF assumes no liability or responsibility for specific control situations in the control of bed bugs.)

WHERE ARE THEY FOUND?

Both adults and immatures live together. In the United States, they can be found wherever man lives, but favor temperate areas. Human dwellings, birds nests, and bat caves make the most suitable habitats for bed bugs since they offer warmth, areas to hide, and most importantly hosts on which to feed. Within human dwellings, harborage include cracks and crevices in walls, furniture, behind wallpaper and wood paneling, and under carpeting. Bed bugs are usually only active during night but can feed during the day when hungry. Bed bugs can be transported on clothing, in traveler's luggage, or in bedding and furniture. They lack claws to enable them to cling to hair, fur, or feathers, so are rarely found on hosts.

WHAT DO THEY LOOK LIKE?

Adults have no wings, but do possess small wing pads. They are broadly flattened, top to bottom, are reddish brown in color, have piercing-sucking mouthparts (commonly called a beak), are oval in shape, and are about five millimeters long (see illustration). The immature insects look like the adults except they are much smaller in size. Newly hatched nymphs are no bigger than a pinhead. Eggs are yellowish white and glued by secretions in crevices. They are only about 1/32 inch long. The adult bed bug is a broadly flattened, ovoid, insect with greatly reduced wings. The reduced fore wings, or hemelytra, are broader than they are long, with a somewhat rectangular appearance. Before feeding, bed bugs are usually brown in color. Adults range in size from 3/16 to 1/5 inch. After feeding, the body is often swollen and red in color.

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Adult



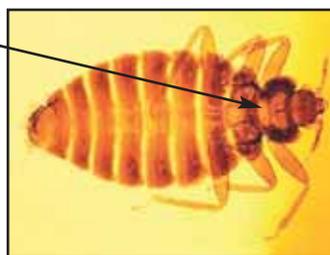
Nymph

The two bed bugs most important to man are the common bed bug, *Cimex lectularius*, and the tropical bed bug, *Cimex hemipterus* F. These two species of bed bugs can easily be distinguished by looking at the prothorax, the first segment of the thorax. The **prothorax** of the common bed bug is more expanded laterally and the extreme margins are more flattened than that of the tropical bed bug.



Common Bed Bug

prothorax



Tropical Bed Bug

(Common bed bug picture courtesy of Dr. Mike Potter University of Kentucky. Tropical bed bug picture courtesy of Ohio State University College of Biological Sciences.)

WHAT IS THE BED BUG LIFE CYCLE?

Females may lay four to five eggs per day. A single female can lay 200 to 500 eggs in her lifetime. Eggs can hatch in six to ten days, but in cool areas it may take as long as 30 days. Nymphs hatch from eggs and go through a series of five stages taking one to five months before the adult is formed. The entire life cycle from egg to egg usually takes seven to ten weeks.

WHERE DO BED BUGS LAY EGGS?

Adult female bed bugs deposit their eggs in many different places. Most commonly the eggs are placed on the mattress, inside the hollow areas of a bed, in the coils of a bed, inside a box spring, behind peeling wallpaper, behind walls and baseboards, near the edge of rugs and in closets.

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WHAT DO THEY EAT?

Both nymphs and adults feed only on blood. Bed bugs feed on humans, poultry, rabbits, dogs, cats, mice, pigeons and sparrows. Humans are the preferred host. Freshly deposited blood on sheets could provide nourishment for young nymphs. It has been suggested that dried blood on sheets can provide proper nourishment for immature bed bugs

HOW LONG CAN BED BUGS GO WITHOUT EATING?

Below 60° Fahrenheit, activity is reduced. Adults can live several months without feeding. Nymphs can live up to 3 months without feeding. During the winter bed bugs can survive long periods without feeding. In the laboratory at 10% humidity and 44° Fahrenheit, bed bugs have survived as long as 560 days without a blood meal.

HOW OFTEN DO THEY FEED?

Under normal conditions, bed bugs feed approximately once every week. Nymphs cannot grow without a blood meal. Bed bugs will molt (shed their skin) five times before reaching maturity. A blood meal is needed between each successive molt.

WHEN DO THEY FEED?

Bed bugs are nocturnal. They are most active at night and therefore, usually feed at night when humans are sleeping. If the lighting in a room is poor or if the bed bugs have not fed for a while, they will bite during the day.

HOW DO PEOPLE GET BED BUGS IN THEIR HOMES?

Bed bugs only stay on humans when they feed. After feeding they crawl off. It is possible to "pick up" bed bugs by sitting next to someone who has bed bug infested clothing or other items. In apartment houses, bed bugs can spread easily from one apartment to the next, especially if people vacate an infested apartment. Bed bugs can also be carried from one house to another in furniture and bedding via moving vans. International travel to and from areas of high infestations has allowed for global bed bug distribution.

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WHERE DO BED BUGS BITE?

Bed bugs will bite people on the legs, arms, face and main body regions. Some people are more sensitive to the bite than others. Most people know when they have been bitten. A bite commonly causes severe itching and a large inflamed red spot.

HOW DO BED BUG BITES DIFFER FROM FLEA BITES?

Flea bites are more prevalent on the leg region, and result in a red spot surrounded by a circular reddish halo fading into the normal skin. Bed bug bites are more widely spread over the body and commonly produce large red spots with a hard white swelling in the center.

CAN THEY REACH A BED IF ALL BED POSTS ARE IN POTS OF OIL OR KEROSENE?

The ability of the bed bug to reach a human in bed should not be underestimated. The bed bug can crawl along a wall and ceiling and drop on top of the bed. Using oil/kerosene pots in this manner is not recommended!

ARE BED BUGS A HEALTH HAZARD?

Bed bugs can be a major nuisance because of the odor which they create, the specks they leave on the beds and walls, and the blood they can take from humans. Bed bugs are not documented vectors of human diseases. When large populations of bed bugs are present, humans may become irritable, lose sleep and in general, have less resistance to combat other diseases. In the laboratory, bed bugs are capable of carrying several different disease organisms including bacteria and viruses; however in the field there has been no documented human disease transmission.

DO THEY FEED ON BATS?

Bed bugs rarely, if ever, feed on bats. Closely related species include the bat bugs (*Cimex pilosellus* (Horvath) and *Cimex adjunctus* Barber).

ARE THERE OTHER INSECTS THAT LOOK LIKE BED BUGS?

Other related species are Swallow bugs (*Oeciacus vicarius* Horvath) which can cause serious problems where swallow nests are attached to dwellings. Poultry bugs (*Haematosiphon inodorus* Duges), associated with poultry houses, also are occasionally encountered.

DO BED BUGS HAVE ENEMIES?

Several predators feed on bed bugs, including pharaoh ants, cone-nosed insects, spiders and American cockroaches. However, no biological control is currently available for structural pest control situations.

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HOW MUCH PERSISTENCE AND THOROUGHNESS ARE REQUIRED TO ELIMINATE BED BUGS?

The room(s) must be inspected through dismantling and stripping of all furniture and fixtures. If in a commercial account such as hotels, nursing homes, etc, PMPs will need un-wavering cooperation from management, housekeeping, maintenance and engineering. All bedding and bed furniture must be dismantled and if mounted on a wall must be taken off. Switch plates, electrical outlets, openings into walls, seams in wallpaper (may need to be removed in heavy infestations), drop or suspended ceilings, furniture and electrical appliances must be thoroughly inspected and ultimately treated for control. Furniture may need to be inverted. Remove the decorative fabric beneath furniture and box springs (it is for decoration only). Every crack and crevice; nook and cranny must be thoroughly inspected; even down to pulling back carpeting to expose the "tackless" carpet strip. The room should look like an "inspection hurricane hit it!" Bed bugs are most active at night; they are extremely shy and wary so their infestations are not easily located. However, when bed bugs are numerous, a foul odor from oily secretions can easily be detected. Other recognizable signs of a bed bug infestation include excrement left around points of entry and exit to their hiding places and reddish brown spots on mattresses and furniture. Good sanitation is the first step to controlling the spread of bed bugs. However, upscale hotels and private homes have recently noted infestations, suggesting that good sanitation is not enough to stop a bed bug infestation.

If bed bugs are located in bedding material or mattresses, then focus on mechanical methods of control. Mattresses can be treated with disinfectants. Some natural pyrethrums, and synthetic pyrethroids have labeled uses for mattresses. Please check product labels for use directions. Mattress covers designed to exclude bed bugs can be used to cover currently infected mattresses or to protect mattresses from future infestations. It is not necessary to throw out newer mattresses; however consideration on discarding heavily infested mattresses must be taken into account. Phantom can be used on the folds and seams of mattresses.

The effectiveness of using steam cleaners or hot water to clean mattresses is questionable. Heat is readily absorbed by the mattress and does no harm to the bed bug in fact the moisture may produce favorable conditions for house dust mites. Pillows should be removed and dry-cleaned or replaced. Mattresses can be treated with disinfectants. Some natural pyrethrums, and synthetic pyrethroids have labeled uses for mattresses. Please check product labels for use directions. Mattress covers designed to exclude bed bugs can be used to cover currently infected mattresses or to protect mattresses from future infestations. It is not necessary to throw out newer mattresses; however consideration on discarding heavily infested mattresses must be taken into account.

Pest professionals can use pesticides to control and prevent bed bug infestations. Care should be taken not to overapply pesticides to mattresses and upholstery with pesticides. A thorough application to all cracks, crevices, voids, furniture framing, curtain rods and seams, behind baseboard molding (especially vinyl cove molding) and even down to the tackless carpet may be necessary. Pest professionals are reporting that several follow up treatments are commonly needed to provide control. Please follow the label directions of the products selected.

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I HAVE A SENSITIVE ACCOUNT THAT DOES NOT ALLOW PESTICIDES. WHAT DO I DO?

Control in this situation may take a long time. Compressed air can be used to "flush" bed bugs out of cracks and crevices and follow with a vacuum to pick up bed bugs. Pest professionals may want to wear a respirator with a HEPA filter. Heat has been reported to control bed bugs. If allowed pest professionals can use disinfectants to kill bed bugs. While expensive, CO₂ flushes used to clean electronics may excite and flush out bed bugs. It may be necessary to hire a consultant to help with ultra sensitive accounts and difficult jobs. Some newer pest management products that meet the National Organic Program (NOP) may be allowed according to site use on the label. Check with your state regulatory agency for guidance.

HOW DO I TELL IF THEY ARE GONE?

Follow up inspections are a must. Educate and train employees on how to look for tell tale blood "spots" and odor created by bed bugs. It has been reported that a vinyl balloon filled with CO₂ and placed on a large glue board will catch bed bugs. A warming "heat pad" put on low and put beneath the glue board helps attract bed bugs. Glue boards placed next to pet cages may help detect bed bug infestations.

CAN I USE PHANTOM® TERMITICIDE-INSECTICIDE FOR BED BUG CONTROL?

Yes! Bed bugs are listed as a target pest on the Phantom label. BASF has completed Independent Laboratory and University Cooperator Research on Phantom for bed bug control. Phantom is a pro-active insecticide and contact treatments provide results within 24 hours. Phantom is listed on the Insecticide Resistance Action Committee (IRAC) chart for use with pyrethroid resistant bed bugs. Consult your BASF Technical Representative for current research results on Phantom and bed bugs. Pest professionals are reporting very good success with Phantom. Read and follow label directions.

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Selected References

- University of Florida "Feature Creatures – Bed bugs"
- Dolling WR. 1991. The Hemiptera. Oxford University Press, New York, New York.
- Frishman A. 2000. Bed Bug basics and control measures. Pest Control 68:24.
- Furman DP, Catts E.. 1970. Manual of Medical Entomology, 3rd ed. National Press Books, Palo Alto, California.
- Ghauri MSK. 1973. Hemiptera (bugs), pp. 373-393. In K.G.V. Smith [ed], Insects and other Arthropods of Medical Importance. British Museum, London, England. [USDA] U.S. Department of Agriculture. 1976. How to control bed bugs. USDA. Washington D.C.
- Koehler PG, Short DE, Fasulo TR. (1998). Pests In and Around the Home. UF/IFAS. SW-126. CD-ROM.
- Krueger L. 2000. Don't get bitten by the resurgence of bed bugs. Pest Control 68:58-64.
- Snetsinger R. 1997. Bed bugs & other bugs, pp. 393-425. In A. Mallis and S.A. Hedges [eds.], Handbook of Pest Control, 8th ed. Franzak & Foster Co., Cleveland, Ohio.
- Schuh R, Slater JA 1995. True Bugs of the World (Hemiptera : Heteroptera) Classification and Natural History. Cornell University Press, Ithica, New York.
- Usinger RL. 1966. Monograph of Cimicidae (Hemiptera - Heteroptera). Entomological Society of America, College Park, Maryland.
- Mallis Handbook of Pest Control <http://www.pctonline.com>
- Scientific Guide to Pest Control Operations <http://www.pestcontrolmag.com/pestcontrol/>
- NPMA Scientific Field Guide <http://www.pestworld.org>