


Bed bugs and cities: Prevention & control of bed bugs



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Photos by J. Kim Photography

Worst Bed Bug Cities 2014: Chicago Tops Orkin's Bed Bug Cities List For Second Year In A Row



The Huffington Post, Jan 2014

Posted: 01/06/2014 8:20 pm EST

Updated: 01/06/2014 4:01 pm EST

1. Chicago

2. Los Angeles (+1)

3. Columbus, Ohio (+3)

4. Detroit (-2)

5. Cincinnati

6. Cleveland/Akron/Canton (+2)

7. Dayton (+4)

8. Washington D.C. (-1)

9. Denver (-5)

10. Indianapolis (+6)

11. Richmond/Petersburg, Va. (+1)

12. Raleigh/Durham/Fayetteville, N.C. (+3)

Orkin, Jan 2014





Bed bugs and relatives

- Bed bug - *Cimex lectularius*
- Tropical bed bug – *Cimex hemipterus*
- Bat bug - *Cimex adjunctus*
- Poultry bug - *Haematosiphon inodorus*
- Swallow Bug - *Oeciacus vicarius*
- Chimney Swift Bug - *Cimexopsis nyctalis*



These are insects in the order Hemiptera making them “true bugs”. Specimens must be identified in order to determine the appropriate treatment.

Identification

Pictorial key of bed bugs

- Bed bug
- Tropical bed bug
- Bat bug*
- Poultry bug
- (Barn) Swallow Bug
- Chimney Swift Bug







Sticky tape to capture BB

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Commom Cimicids



Bed bug Bat bug

Images from online sources

Bed bugs (O) vs bedbugs (X)

- Insecta
- Hemiptera
- Heteroptera (true bugs)
- Cimicomorpha
- Cimicoidea
- Cimicidae

Biology of bed bugs

- Adults
 - feed on blood
 - reddish-brown in color
 - flattened oval bodies
- Pierce-sucking mouthparts*
- The tiny wings are represented only by pads*

Biology of bed bugs

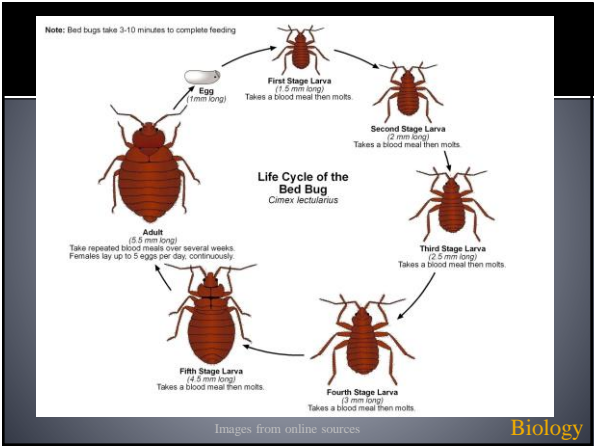
- Blood meals every **3-4 days*****
- 1-2 hours for foraging*** and hide in harborage
- **10 minutes** to complete a blood meal

Biology of bed bugs

- Live **8 - 10 months**
- Eggs hatch in **4-12 days***
 - The eggs are cemented on the surface.* (Vacuum??)
- Nymphs
 - Tiny and colorless at first, nymphs resemble small adults. They require a blood meal between each of five molts.

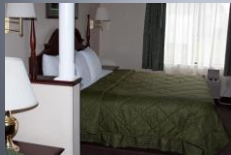
Biology of bed bugs

- Survive **6-7 months without food***
- **3 months ...**



Biology of bed bugs

- Nocturnal
- Humans and other hosts
- Travel 5 – 20 ft (1.5 – 6 m)



Blood meal

- Blood meal to molt
- Blood meal to reproduce
- Other hosts
- Heat and CO₂



Blue-, Orange-colored bed bugs and Milk, Water bed bugs

How many blood meals?

If one bed bug live with you...

Nymph - 2 blood meals for each stage

2 X 5 (>1 month) = 10 blood meals

Adult - 2 blood meals/ week

2 X 40 (10 months) = 80 blood meals

Total 10 + 80 = 90 bites/year

Trial tapping (tasting you)!

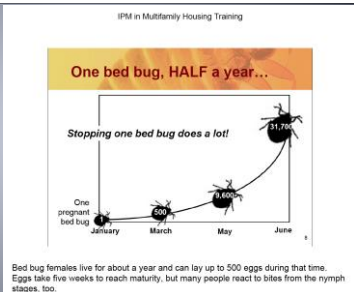
Disturbed by you!

More than one bite!

How many if you had one female?

If one bed bug live with you...

One female – lays about 500 eggs in her life span (10 months)



www.StopPests.org

New York – NY Daily News Poll



New York

By MELANIE GRAYCE WEST

Warning: Bedbugs are not just in bed anymore.

Epic Hollister, a popular clothing store in SoHo, closed this week amid a bedbug outbreak. Exterminators say infestations in commercial spaces are becoming increasingly common, including banks, hotels, offices and hospitals. Even "libraries are dangerous now," said Jeff Eisenberg of PestAway exterminating company in Manhattan. The commercial market is growing three times faster than the residential market.

The city's non-emergency hotline, 311, reported a record number of bedbug-related calls for the fiscal year just ended—31,719 calls in 2010, a 100% increase compared to 2009. That number includes bedbugs in residences, hotels, public schools, day care facilities, domestic-violence shelters and public housing, but does not include calls about bedbugs in business establishments such as stores and restaurants.

Bedbugs' Bite
Violations issued against residential landlords by the New York City Department of Housing Preservation and Development

Hollister was closed Thursday for the second day in a row. Abercrombie & Fitch, which owns the retailer, declined to comment. In a statement Wednesday, the company had said it was dealing with the outbreak.

Commercial buildings, such as offices or retail stores, are not currently required to report bedbug infestations. Lawmakers want to change that.

11 through Dec. 31, 2009
Rate: 31.7 per 1,000 residents
Source: NYC Dept. of Housing Preservation and Development

July 1, 2010

Bed bugs in history

- One theory is that bed bugs originated from bugs that fed on bats living in caves. When man moved into the caves the bugs adapted to feed on them; when man left, the bugs went with them.
- Mentioned from earliest recorded history.
- Commonly referred to as chinchies by grand folks. Mahogany flats and red coats were also used.
- Sometimes legs of bed were placed into cans of oil or kerosene to prevent bugs from climbing into the bed.
- An assortment of treatments used for control.

Old bed bug recommendations

- Iron or brass bedsteads* are better for controlling bed bugs than wood.
- Kerosene oil, gasoline, or benzine will kill bedbugs if forced into cracks and crevices with a feather or with a hand syringe.
- A mixture of corrosive sublimate (mercury chloride) one ounce, alcohol one pint and spirits of turpentine one-fourth pint painted into the cracks of a bedstead with a feather
- Boiling water poured over the parts of a bedstead that have been carried where they may be liberally treated.
- Sulfur candles for fumigating are now made and are very convenient
- Hydrocyanic acid (cyanide) gas – this is the killing agent par excellence for bedbugs and household insects. Formed by chemical reaction between potassium cyanide, water, and sulfuric acid and is a deadly poison to human beings and other animals. However it can be generated and used in the fumigation of houses, without the least danger if care and precaution are used in the work.

insects injurious to the household, G. Herrick, 1914

World distribution of the human bed bugs

Fig. 11-2.—World distribution of the human bed bugs, *C. lectularius* and *C. hemipterus*, and the pigon bug, *Cimex columbarius*.


October 2008

bedbugregistry.com

DDT and bed bugs

1939 - 1959- 1972


DDT and bed bugs




"Bed bugs hide in cracks and crevices during the day and come out at night to suck blood. Hence, DDT spray must be directed toward their daytime hiding places*. Apply the DDT spray to the bedsteads, paying particular attention to cracks in the wood and joints. Spray the springs and mattresses. Strip the mattress and spray all sides and the edges, especially any crevices in which bed bugs might hide and behind any loose paper where they might congregate**".

Comeback

- Underground economy
- Secondhand merchandise
- Changes in bed bug habits
- Cannot recognize bed bugs or the signs of their infestation
- No effective insecticides
- Bait-oriented pest control
- Increased worldwide travel

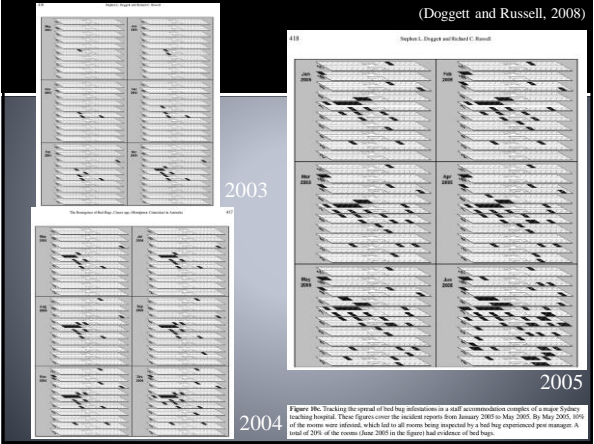
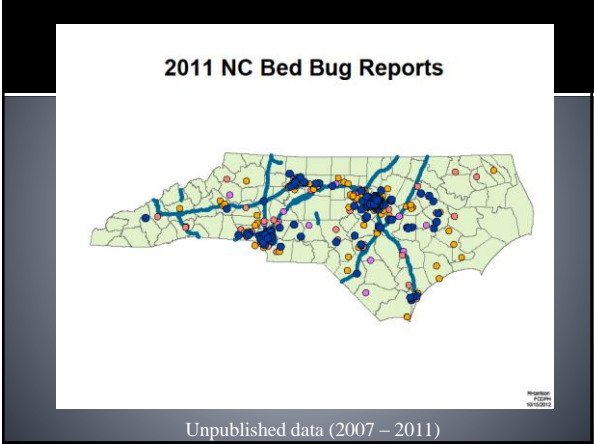


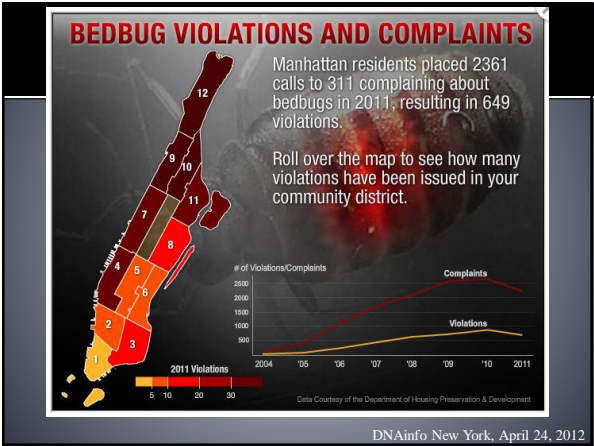
Recognition, detection, and control of bed bugs



Current status

- North Carolina
- United States
- Spread of bed bugs





A holistic approach

- Knowledge
 - Prevention
 - Recognition
 - Early detection
 - Inspection
 - Professional pest control
 - Treatment
 - Monitoring and surveillance
 - Personal protection equipment (PPE)
 - Pesticide safety

IPM

Who should be educated?

- A) pest control technician
- B) cleaning staff
- C) management staff
- D) students/ residents/ tenants
- E) supervisors
- F) administrators
- G) all of the above

Roles

How to prevent bed bugs

Prevention (= Education ***)

- Recognition of bed bugs
- Biology of bed bugs
- Source of introduction
- Inspection
- Early detection
- Effective reporting system
- How to hire a reliable pest control co.

www.NCBedBugs.com



Bed bugs look like...

- Round
- Brown or yellow
- Flat
- Somewhat tick-like (unfed ticks)
- Hiding...



Photo by Gale Ridge
Connecticut Agricultural Experiment Station

Prevent the spread of bed bugs by following these steps and talking about it. Ask for help!

Correct identification! Bed bugs may be confused with other household insects such as cockroaches, carpet beetles, or spider beetles. If you find an insect that may be a bed bug, **SAVE IT** in a container for identification! **These are not bed bugs:**



German cockroaches
Young roaches look like bed bugs. Look for rectangular egg cases and fecal pellets. The color is more brown than red.

Carpet and warehouse beetle adults and larvae may appear in beds feeding on hair and feathers. Larvae may shed tiny hairs that cause itching but these do not bite.



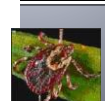
Shiny spider beetles are often confused with bed bugs and ticks. They feed on dried plant material, seeds, or dried meat and do not bite humans.

Bed bug guidelines NYC

Bed Bugs



Not Bed Bugs



Made by C. Pindrabata

The bed bug



Color

Images from online sources

The bed bug



Size and shape

Images from online sources

IPM in Multifamily Housing Training

Bed bug life cycle

Unfed

Fed



Bed bugs at various stages of growth.

Bed bugs can be two different shapes, depending on when they last fed. They expand when full of blood and quickly (within a few hours) digest the blood and poop out the excess so that they are flat again. A recently fed bed bug will be plump, but after it digests it is back to being flat.

www.StopPests.org

3

2

1



A bed bug nymph and an egg

Bed bugs in your house and in your bed

■Hiding...in beds

Bed bug signs of infestation





Inspection

Bed bug signs of infestation



Images from online sources

Inspection

Bed bug telltale signs

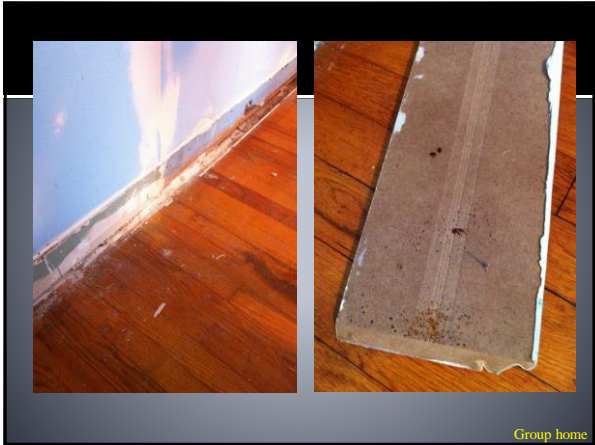


Eggs on TV screen!

Dark black spots! Inspection

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Bed bugs in work places

- Chairs
- Desks
- Bookshelves
- Files on the floor

Inspection kit

- LED flashlight
- Plastic bags (Zip-lock bags) or bottles for sample collection
- Magnifying lens
- Forceps

Preserve the collected sample for identification



Bites of bed bugs

Bed bug bites

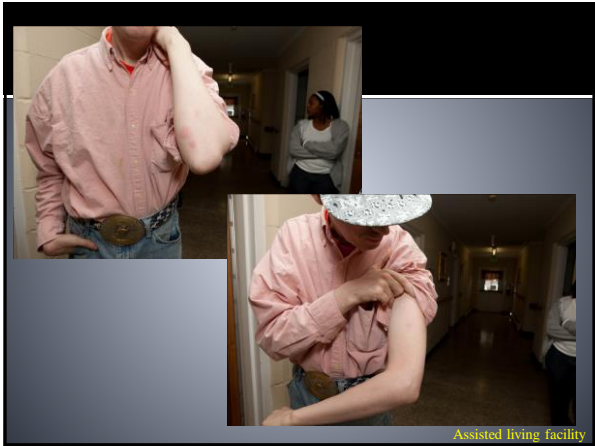
No reactions, 46% 7-11 days delay, 54% no reactions

Bites (4)



Bed bug bites



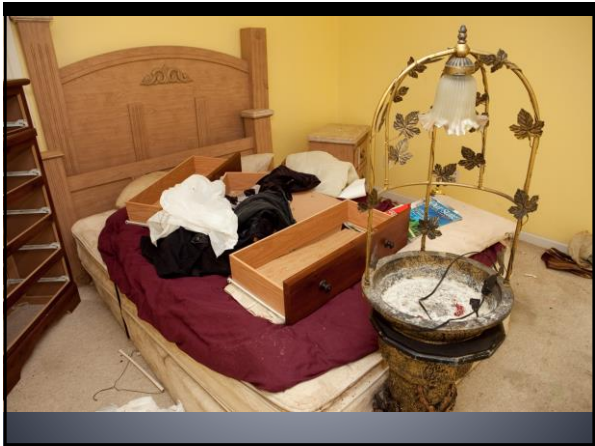


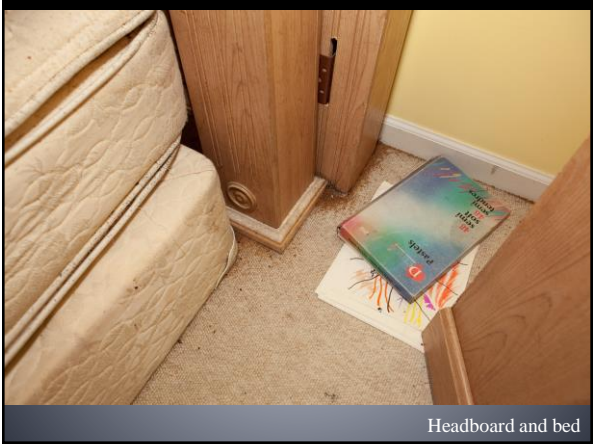


Recognition of bed bug infestation and case studies

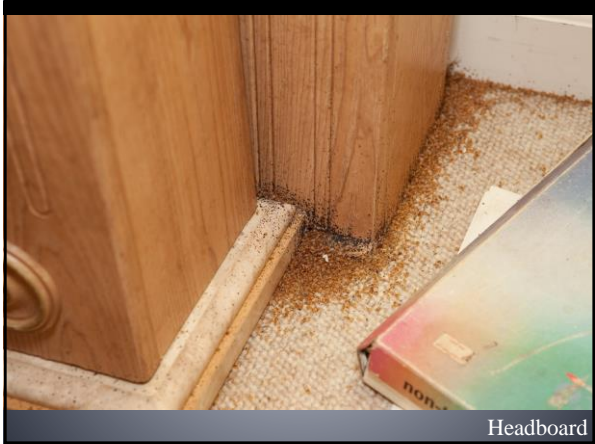


Extreme infestation
Single family home

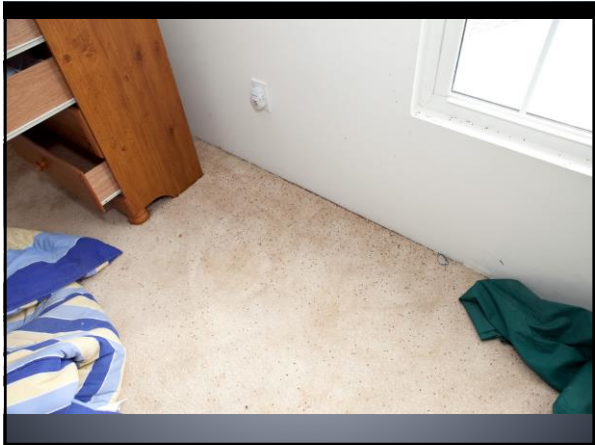




Headboard and bed



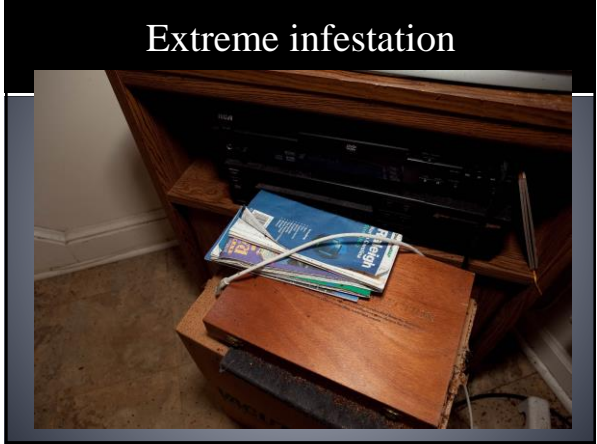
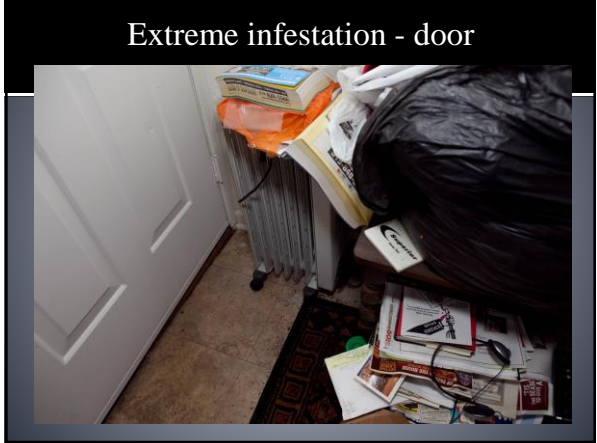
Headboard





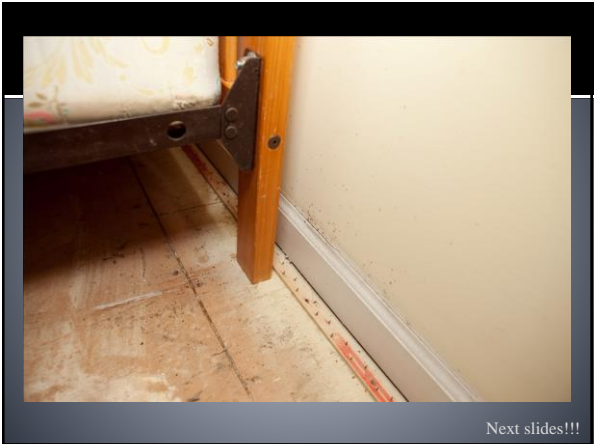
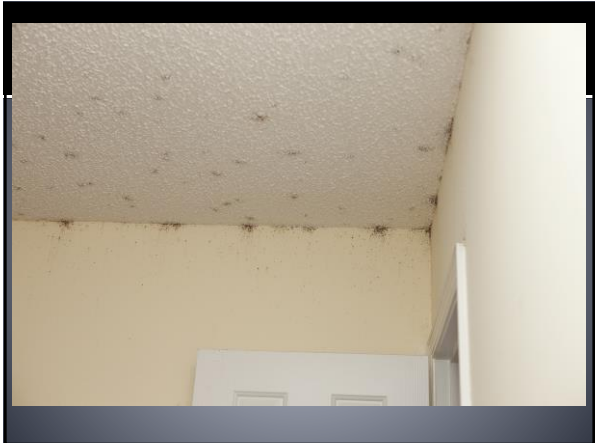
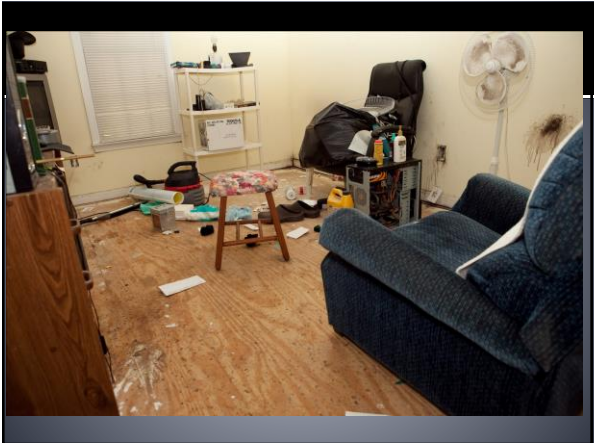
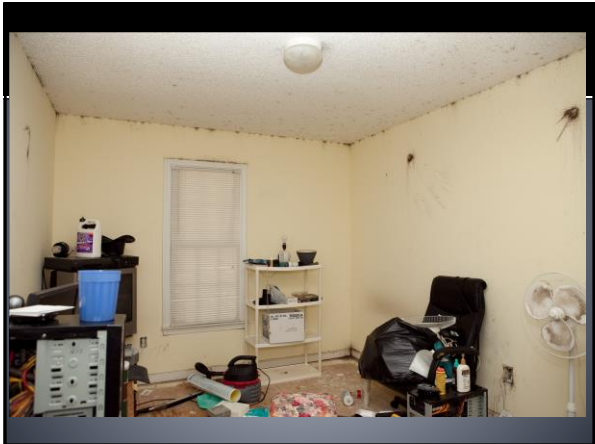
Extreme infestation

Single family home



Extreme infestation

Single family home
+ roommate



Next slides!!!

A nightmare!!!



A submitted photo



Submitted photos

Personal protection

- Remember that bed bugs are nocturnal, hiding during daytime. They live in the cracks and crevices. They do not live on people.
- If you simply inspect (unless it is a heavy infestation), you may not need to worry too much about getting bed bugs on you.

Be careful when you control (or treat) bed bugs or when move infested furniture.

PPE suggestions

- If you want something for PPE
 - Disposable gloves*, boot covers*, and overalls
 - Dust masks
 - Insect repellent*
 - Garbage bags* or a plastic container with a lid

* Highly recommended

Control and management of bed bugs

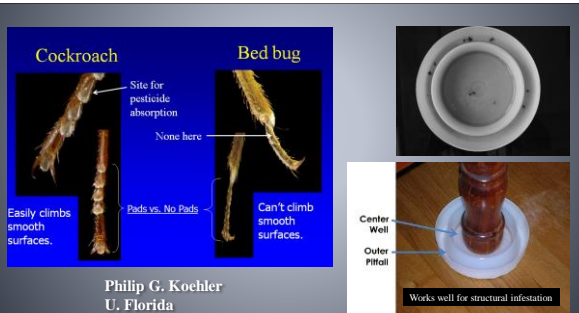


Control of bed bugs

- Education
- Prevention and Early detection
- Inspection
- Chemical
- Non-chemical

Control

Bed bug trap/ a monitoring device



Control



Do-It-Yourself Bed Bug Trap

Barb Clegg, Extension Educator

In the last decade, we've seen a resurgence of bed bugs in the United States. Bed bugs aren't just an "old-timey" problem — people all over the world are dealing with these bed bug problems.

Before treatments are done, it's important to make sure bed bugs are present. Inspectors require removing bed frames, turning over mattresses and box springs, looking for bed bug droppings, and bed bug detectors.

An easier method of finding bed bugs has been developed by Dr. Chang-Ming Wang, a research entomologist from Rutgers University. This homemade trap is simple to make. It is also inexpensive. The research lab has compared it with some high-priced traps, and they found it worked very well. This trap will catch more bed bugs if already infested than the bed, but more bugs will catch even if someone is sleeping in the bed or on the sofa. If there is a very small infestation, it may take several weeks to catch bed bugs. The larger the infestation, the more bed bugs will be caught. This trap is useful in determining if bed bugs are present, but probably won't catch all the bed bugs present. It should not be used as a method of control. Only one trap per room should be used.

What You Need for This Trap

- To make this trap, you'll need:
 - 4 plastic pint disks (and two a divided pet disk with flat bottom bowl bowls) (I paid \$2.78)
 - 1/2 cup of white powder (I used talcum powder that is unscented and has a spatula on the top) (18-49)
 - Talcum powder (baby powder). Scented or unscented, it doesn't matter. Before you buy, check the label to make sure it is talcum baby powder and contains baby powder (11-23)
 - A small paper bowl, make-up brush or cotton ball. I used an old make-up brush.
 - Some fabric. I used one of my husband's old shirts, which would work.
 - Glue. I used Elmer's, because I don't had it. You can also use masking tape.
 - Try for the tubes. Look in the Yellow Pages for suppliers.
 - This is the last step. Don't use to prepare the trap before you get dry kit.

Know how. Know more.

Extension is a Division of the Institute of Agriculture and Natural Resources at the University of Nebraska-Lincoln. In cooperation with the Canadian and the United States Department of Agriculture. Extension's educational programs align with the nondiscriminatory policies of the University of Nebraska-Lincoln and the United States Department of Agriculture.

Control

Heat treatment

> \$900 and up or > \$1,500

Control

Chemical treatment (\$250/room)

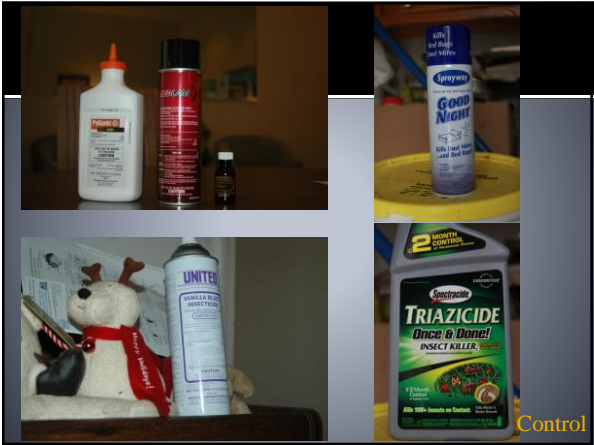


Mattress covers***

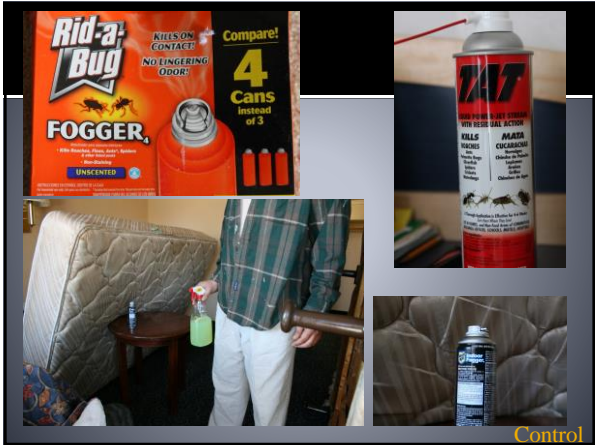
- Major retail stores
- \$20-30, \$50, \$100-150



Control



Control



Control



Conclusions

- Be prepared
- Be preventive
- Be proactive
- Work with your residents, pest control company, and IPM specialists
- You save your time, money, and emotion



Health concerns of bed bugs

the 2013 Bugs Without Borders Survey (comparing to 2011 results)

- Hotels/motels – 75 percent (80 percent in 2011)
- College dorms – 47 percent (54 percent in 2011)
- Nursing homes – 46 percent (46 percent in 2011)
- Office buildings – 36 percent (38 percent in 2011)
- Schools and day care centers – 41 percent (36 percent in 2011)
- Hospitals – 33 percent (31 percent in 2011)
- Transportation (train/bus/taxi) – 21 percent (18 percent in 2011)
- Movie theaters – 10 percent (17 percent in 2011)
- Retail stores – 15 percent (21 percent in 2011)
- Libraries – 12 percent (8 percent in 2011)
- Restaurants – 7 percent (6 percent in 2011)
- Airplanes – 2 percent (6 percent in 2011)
- Laundromats – 9 percent (6 percent in 2011)

The survey was conducted by the National Pest Management Association and the University of Kentucky

Save your money and time Protect your family

- Several \$1,000 dollars
 - Moving expense
 - Hiring professionals
 - Replacing furniture
 - Medical bills (Emergency rooms)
- Your family
- Pesticide exposures (misuse/ overuse)

Health concerns

- Severe itching/irritation - pruritus
- Secondary infection
- Systemic effects from numerous bites
- Lose of sleep – insomnia
- Anemia in young children
- Emotional distress ***
- Pathogens have been isolated, but bed bugs are not known to transmit diseases

Not a vector Not a sanitary issue

Annu. Rev. Entomol. 2007. 52: 351-374

Biology of the Bed Bugs (Cimicidae)

Klaus Reinhardt and Michael T. Siva-Jothy
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Key Words

ecophysiology, hemophagy, passive dispersal, reproductive behavior, sexual conflict, traumatic insemination

Abstract

The cimicids, or bed bugs, belong to a highly specialized hematophagous taxon that parasitizes primarily humans, birds, and bats. Their most famous member is the bed bug, *Cimex lectularius*. This group demonstrates some bizarre but evolutionarily important biology. All members of the family Cimicidae show traumatic insemination and a suite of female adaptations to this mode of reproduction. This group demonstrates some bizarre but evolutionarily important biology. All members of the family Cimicidae show traumatic insemination and a suite of female adaptations to this mode of reproduction. This group demonstrates some bizarre but evolutionarily important biology. All members of the family Cimicidae show traumatic insemination and a suite of female adaptations to this mode of reproduction. Our final goal is to examine the extensive literature on this group in its entirety, from its biology to its control, with a particular emphasis on the recent global spread, and to understand the selective forces that have shaped the unique aspects of this insect's biology.

Delaunay, P. et al. 2011. Clinical Infectious Diseases. 52(2): 200-210.

Bedbugs and Infectious Diseases

Pascal Delaunay,¹ Veronique Blanc,² Pascal Del Giudice,³ Anna Levy-Bencheton,⁴ Olivier Chosidow,⁵ Pierre Marty,¹ and Philippe Brouqui⁶

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Bedbugs are brown and flat hematophagous insects. The 2 cosmopolitan species, *Cimex lectularius* and *Cimex hemipterus*, feed on humans and/or domestic animals, and recent outbreaks have been reported in occidental countries. Site assessment for bedbug eradication is complex but can be assured, despite emerging insecticide resistance, by hiring a pest-control manager. The common dermatological presentation of bites is an itchy maculopapular wheal. Urticarial reactions and anaphylaxis can also occur. Bedbugs are suspected of transmitting infectious agents, but no report has yet demonstrated that they are infectious disease vectors. We describe 65 candidate pathogens potentially transmitted by bedbugs, according to their vectorial capacity, in the wild, and vectorial competence, in the laboratory. Because of increasing demands for information about effective control tactics and public health risks of bedbugs, continued research is needed to identify new pathogens in wild *Cimex* species (spp) and insecticide resistance.

- *Coxiella burnetii* – Q fever
- *Wolbachia* spp.
- *Aspergillus* spp.
- *Trypanosoma cruzi* – Chagas disease
- Hepatitis B virus
- Human immunodeficiency virus

Delaunay, P. et al. 2011. Clinical Infectious Diseases. 52(2): 200-210.



Figure 5. Presentation of bedbug (*Cimex lectularius* or *Cimex hemipterus*) bites: forms vary from asymptomatic or pauci-symptomatic to purpuric, vesicular, and bullous lesions. The typical skin lesion is a puritic erythematous maculopapule that is 5 mm to 2 cm in diameter with a central hemorrhagic crust or vesicle at the bite site, similar to other arthropod bites (A). A series of bites in a line is characteristic of bedbug bites (B). Lesion numbers range from a few to numerous, depending on habitat-infestation intensity, and are preferentially located in unclothed zones (C). In some cases, the eruption mimics urticaria (D).

Bed Bugs (*Cimex lectularius*) and Clinical Consequences of Their Bites

Jeanne Goddard, PhD
Richard deShazo, MD

CIMEX LECTULARIUS HAS BEEN known as a human parasite for thousands of years, but scientific studies of this insect are scarce and limited.¹⁻³ International travel, immigration, changes in pest control practices, and insecticide resistance may have contributed to a recent resurgence of this blood-sucking insect in developed countries.⁴⁻⁷ Bed bug infestations have been reported increasingly in homes, apartments, hotel rooms, hospitals, and dormitories in the United States since 1980 (Table 1).^{1,10,11} For example, reports of bed bug infestations in San Francisco doubled between 2004 and 2008.¹² The resurgence affects other countries as well. Public health experts in Toronto, Ontario, Canada, reported a 100% increase in telephone complaints about bed bugs during a 6-month period in 2002.¹³ In Germany, bed bug infestations increased from 5 reported cases in 1992 to 78 cases in 2004.¹⁴ In Australia, bed bug samples submitted to a government public agency increased by 400% during the period of 2001-2004 compared with 1997-2000.¹⁵ The insect family Cimicidae contains species commonly called bed bugs.

Context. Bed bug (*Cimex lectularius*) infestations are rapidly increasing worldwide. Health consequences include nuisance biting and cutaneous and systemic reactions. The potential for bed bugs to serve as disease vectors and optimal methods for bed bug pest control and eradication are unclear.

Objectives. To present current knowledge of the health and medical effects of bed bug bites and to explore key issues in pest control and eradication efforts.

Data Sources. A search of MEDLINE and EMBASE databases (1960-October 2008) for articles using the keywords bed bugs, *Cimex lectularius*, humans, parasitology, pathogenesis, and drug effects. For pest control, published and Tinsley searches (1960-October 2008) were performed using the keywords bed bugs, *Cimex*, control, prevention, and eradication. Manual searches of older journals, textbooks, pest control trade journals, and newspapers (1892-October 2008) were also performed.

Study Selection. Original accounts or investigations of bed bugs, clinical responses with sufficient detail of cause and effect between the bed bug bite and clinical response, and convincing evidence of substantiated presence of bed bug exposure. For pest control, documentation that an eradication measure quantitatively decreased bed bugs.

Data Extraction. A trained medical reference librarian assisted with the literature search. Two authors with expertise in the diagnosis, treatment, and eradication of bed bugs reviewed the clinical articles. One author evaluated the pest control articles.

Data Synthesis. Fifty-three articles met inclusion criteria and were summarized. Only 2 clinical trials concerning bed bugs were identified and tested the ability of pest control interventions to eradicate bed bugs. Although transmission of more than 40 human diseases has been attributed to bed bugs, there is little evidence that they are vectors of communicable disease. A variety of clinical reactions to bed bugs have been reported, including cutaneous and rarely systemic reactions. A wide range of empirical treatments, including antibiotics, antihistamines, topical and oral corticosteroids, and diphenhydramine, have been used for bite reactions with varying results. No evidence-based interventions to eradicate bed bugs or prevent bites were identified.

Conclusions. Treatment options for cutaneous and systemic reactions from bed bug bites have not been evaluated in clinical trials and there is no evidence that outcomes differ significantly from those receiving no treatment. Evidence for disease transmission by bed bugs is lacking. Pest control and eradication is challenging due to insecticide resistance, lack of effective products, and health concerns about spraying mattresses with pesticides.

JAMA. 2009;301(13):1358-1366.

See also Patient Pages.

CME available online at www.jamaonline.com and questions on p 1391.

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Studies of Bed Bugs and Disease

Studies of Bed Bugs and Disease in Human Settings			
Mills et al., ⁴² 1977	HEV	161 Bed bugs	23/161 Bed bugs (14.2%) collected from bedding in huts in Senegal, West Africa, were HBeAg-positive
Jupp et al., ⁴³ 1978	HEV	1368 Bed bugs from 6 localities	30.6/1000 Bed bugs collected from huts in HEV endemic areas in Africa were HBeAg-positive
Hu et al., ⁴⁴ 1984	HEV	401 Bed bugs collected from beds	HBeAg positivity of bed bugs (n = 32) from HBeAg-positive carrier's beds in China was 56.2%; for HBeAg-negative (n = 140) bugs, 33.5%; and for HBeAg-unknown status (n = 229) bugs, 24.4%
El-Masry and Kotkot, ⁴⁵ 1990	HEV	276 Soldiers: 1800 bed bugs from army barracks, 300 bed bugs from uninfected colony	10/276 Military recruits (3.6%) were HBeAg-positive; 300/1800 bed bugs (16%) collected from barracks were HBeAg-positive; all controls were negative
Rushberg and Pick, ⁴⁶ 1994	HEV	641 Children divided into treatment (n = 320) and control (n = 321) groups	Treatment group had insecticide sprayed to kill bed bugs in homes over 2 y. At end of intervention, 525 children retested and homes evaluated. No children in sprayed homes had bed bug bites. 68/160 children (93%) in treatment group were HEV-positive and 91/160 (33%) in control group had HEV infection. Bed bug eradication had no effect on HEV infection rates, despite reduction in bed bugs

Abbreviations: HBeAg, hepatitis B surface antigen; HEV, hepatitis B virus; HV, human immunodeficiency virus; PCR, polymerase chain reaction.

⁴²Originally described Paratuberculosis, a thermophilic, self-seeding film (Pachypleura) Packing Co., Chicago, Illinois.

1362 JAMA, April 1, 2009—Vol 301, No. 13 (Reprinted) ©2009 American Medical Association. All rights reserved.

Goddard, J. and R. deShazo. 2009. JAMA. 301 (13): 1358-1366.



How to Identify a Bed Bug Infestation


Diri M. Miller, PhD, Department of Entomology, Virginia Tech

Introduction

You cannot just "get" bed bugs. They have to be brought into your home. So what is your first clue that you have brought bed bugs home in your luggage after a trip, or on a piece of used furniture that you bought at a garage sale? Most people become suspicious of a bed bug infestation when they find unexplained bites on their bodies. Most commonly a person will go to bed feeling fine but wake up in the morning with itching bites. While bites might suggest bed bugs, they are not a good method for diagnosing a bed bug infestation. This is because bite reactions are so variable from person to person. For instance, a person who has been bitten while traveling may not react for several days, and only notice the bites after they have returned home. These bites do not mean the home is infested. Alternatively, a person may not react to bed bug bites at all. This can allow an infestation to get started in their home and remain unnoticed until the bed bug population increases so much that bed bugs start to be seen. Because bites are an unreliable indicator of an infestation (they may not be bed bug bites at all), it is very important to be familiar with the other signs that bed bugs leave behind to detect a real infestation (particularly a small one). By looking for specific bed bug evidence, the infestation can be identified early before the population becomes difficult to control.

Dermatographic urticaria

October 2005



- Downtown Bedbug Attack Costs Ramada (SF) \$71,000
- A woman who received more than 400 bedbug bites
- The out-of court settlement is the largest ever paid to victims in similar bedbug-attack cases.
- She developed "steroid acne" after treatment for the bites. Nine months later was diagnosed with dermatographism

<http://sfchron.com/2008/10/24/downtown-bedbug-attack-costs-ramada.php>

Thought Bedbugs Were Bad? Try Bedbugs With MRSA

By Meredith Melnick @meredithm | May 12, 2011 | Add a Comment

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(Updated) The one bright side to having bedbugs – if you wanted to be optimistic about it – has always been that at least the tormenting critters didn't transmit disease. But now researchers in Vancouver report that they've found bedbugs with methicillin-resistant *Staphylococcus aureus*, or MRSA.

The scientists studied five bedbugs, taken from three patients treated at St. Paul's Hospital. All three patients were residents of Vancouver's poor Downtown Eastside, where both bedbugs and MRSA have been on the rise in recent years. The researchers wanted to see if there was a connection.



May, 2011 Time

Acute illness – Insecticides – Bed bugs

Centers for Disease Control and Prevention

MMWR

Morbidity and Mortality Weekly Report

Weekly / Vol. 60 / No. 37

September 23, 2011

Acute Illnesses Associated With Insecticides Used to Control Bed Bugs — Seven States, 2003–2010

The common bed bug, *Cimex lectularius*, is a wingless, reddish-brown insect that requires blood meals from humans, other mammals, or birds to survive (1). Bed bugs are not considered to be disease vectors (2,3), but they can reduce quality of life by causing anxiety, discomfort, and sleeplessness (4). Bed bug populations and infestations are increasing in the United States and internationally (3,5). Bed bug infestations often are treated with insecticides, but insecticide resistance is a states participating in the SENSOR-Pesticides program* and from NYC DOHMH.† Acute illnesses associated with an insecticide used to control bed bugs were defined as two or more acute adverse health effects resulting from exposure to an insecticide used for bed bug control. Cases were categorized as definite, probable, possible, and suspicious based on three criteria: certainty of exposure, reported health effects, and

September 2011

The New York Times

(December 2012)

By CATHERINE SAINT LOUIS

- READING in bed, once considered a relatively safe pastime, is now seen by some as a riskier proposition.
- That's because bedbugs have discovered a new way to hitchhike in and out of beds: library books.

Not true

CLAIMS JOURNAL

View this article online: <http://www.claimsjournal.com/news/bedbug2013/05/13/228796.htm>

Iowa High Court Allows Bedbug Case to Proceed

By DAVID PITT | May 13, 2013

- Article
- Comments

Hundreds of residents from two Des Moines, Iowa apartment buildings may move forward with a class action lawsuit over a bedbug infestation in what may be one of the nation's first class action cases against apartment owners and managers regarding damages from bedbugs.



The Iowa Supreme Court said Friday it was deadlocked, which means Polk County Judge Joel Novak's 2011 ruling certifying class-action status stands because of an Iowa law that says when the Supreme Court is equally divided in opinion, the judgment of a lower court stands affirmed.

Iowa – Class action lawsuit, May 13, 2013
More than 250 tenants (may exceed 300)

Maryland Bedbug Lawsuit: Faika Shaaban Awarded \$800,000 In Suit Against Landlord

The Huffington Post | By Ron Dicker |
Posted: 06/03/2013 1:20 pm EDT | Updated: 06/03/2013 1:30 pm EDT

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FOLLOW: Faika Shaaban, Bedbug Lawsuit, Bedbug Lawsuit Faika Shaaban, Bedbug Lawsuit Landlord, Maryland Bedbug Lawsuit, Business News



An Annapolis, Md., woman was awarded a record \$800,000 in a bedbug lawsuit against her landlord, the Baltimore Sun reported.

Faika Shaaban, 69, will receive \$650,000 of the amount in punitive damages, spotlighting the growing sympathy that juries have with plaintiffs in infestation cases, the Sun said.

June 2013

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Woodbury, NJ (June 12, 2013)

