



**GOOD NIGHT, SLEEP TIGHT, DON'T  
LET THE BED BUGS BITE!**






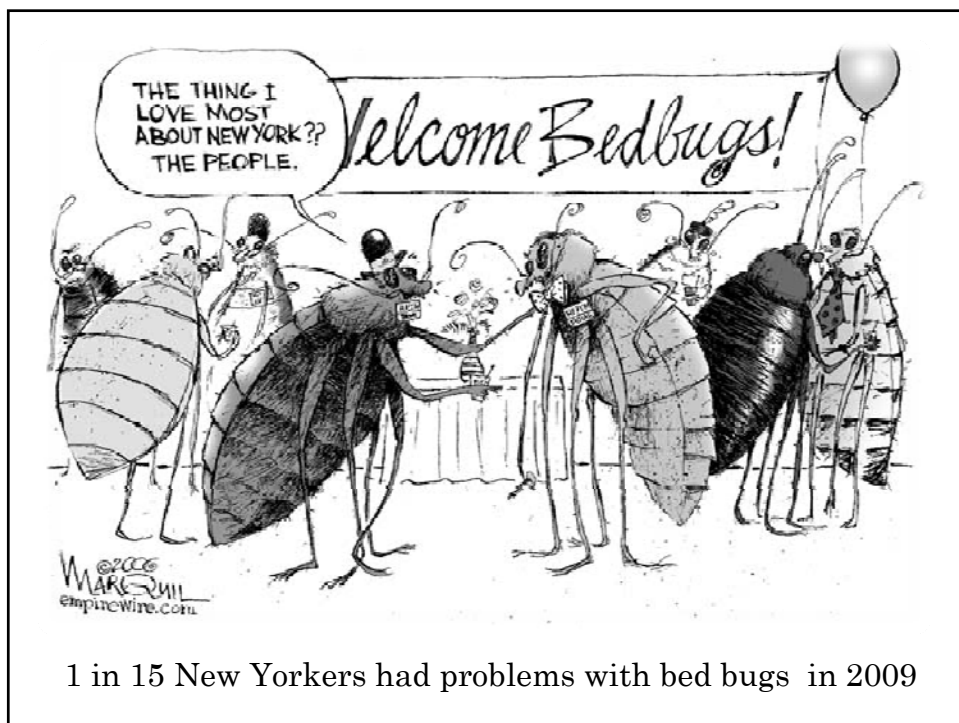
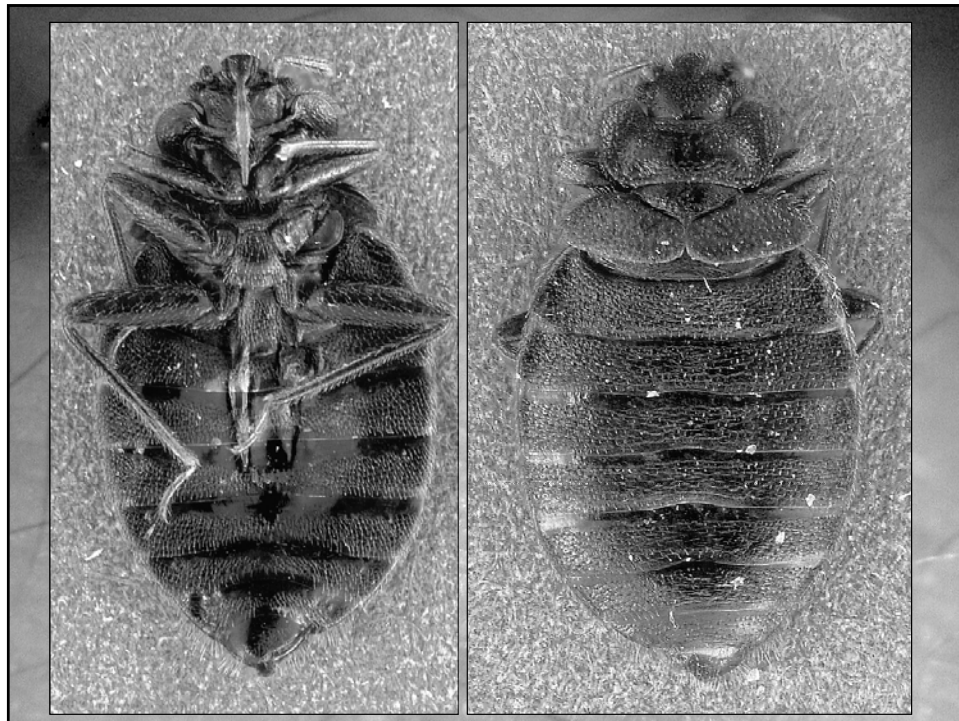
*Cimex lectularius*

**DAWN H. GOUGE  
UNIVERSITY OF ARIZONA**

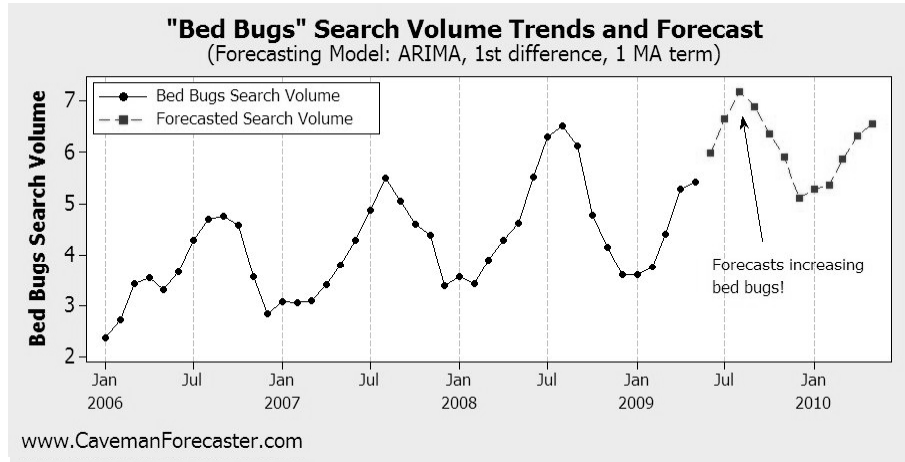
**BED BUGS 101**

- History
- Resurgence
- Biology
- Detection
- ID





## GOOGLE SEARCH VOLUME FOR "BED BUGS"



**THE OHIO STATE UNIVERSITY EXTENSION** & **CENTRAL OHIO BED BUG TASK FORCE**

**DAILY NEWS | NY Local**

### New York bedbug complaints increase 34% in a year

BY Adam Lisberg  
DAILY NEWS CITY HALL BUREAU CHIEF  
Tuesday, February 17th 2009, 4:00 AM  
AP

New York's bedbug infestation is getting worse, with almost 10,000 complaints to the city last year -- one-third higher than the year before. ...

The screenshot shows the website 'The Bedbug Registry' with a search bar and navigation links. The main content area features a map of Arizona with several black dots indicating reported bedbug locations. To the left of the map is a list of hotels and apartments with their addresses. To the right are several advertisements for services like 'Auto Title Loans', 'Holiday Inn Express', 'Sunrooms for Arizona', 'Voted Best Pest Control', 'Bed Bug Interceptors', and 'Plumber in tempe'.

**Arizona has 48 bug reports**

filter by: [ [hotels](#) | [apartments](#) | [all](#) ]

**Hotels**

- BEST WESTERN CORONADO MOTOR HOTEL, Yuma
- RED ROOF PHOENIX CAMELBACK, Phoenix
- INN SUITES, Flagstaff
- SUPER 8 SEDONA, Sedona
- EXTENDED STAY DELUXE HOTEL SCOTTSDALE, Scottsdale
- MOTEL 6, Yuma
- FLAMINGO SUITES, Tucson
- SUPER 8 QUARTZSITE AZ, Quartzsite
- MOTEL 6, Lake Havasu City
- SUMMERFIELD SUITES SCOTTSDALE, Scottsdale
- RAMADA LIMITED, Phoenix
- WESTIN KIERLAND RESORT, Scottsdale
- TRAVELodge FLAGSTAFF, Flagstaff
- HAWTHORNE SUITES, Chandler
- LO LO MAI SPRING, Cornville
- ARCOSANTI, Mayer

**Apartments**

- 242 S Beck Ave, Tempe
- 1010 N 48th St, Phoenix
- 3715 N 12th St, Phoenix
- 960 S Terrace Rd, Tempe
- 111 N Gilbert Rd, Mesa
- 8902 N 22nd Ave, Phoenix
- 2800 W Shularo Dr, Phoenix
- 1235 W Baseline Rd, Tempe
- 2730 N 19th Ave, Phoenix
- 804 E Jones Ave, Phoenix
- 4201 E Monte Vista Dr, Tucson
- 1502 W Glendale Ave, Phoenix
- 15154 N 140th Dr, Surprise
- 5099 W Bell Rd, Phoenix
- 17030 N 49th St, Scottsdale

Shelters, hotels, public housing,  
medical facilities, student dorms.  
Apartments, homes.  
Work places, schools, child care  
facilities,  
Public  
transport,  
Entertainment  
places,  
Everywhere  
people go.





# Something Lingering in the Lingerie? Bed Bugs Hit Victoria's Secret



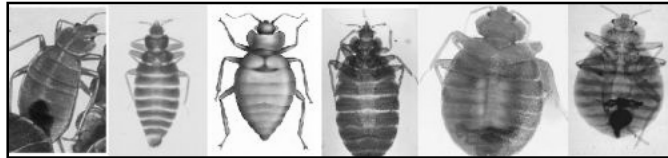
Bed bugs force  
yet another store  
to shutter its  
doors, this time  
it's Abercrombie  
& Fitch

# Significant financial injury - Bed bugs in Empire State Building



### FROM CAVES TO COUCHES

- Bed bugs have been with us through the ages dating back to prehistoric times
- Evolved as parasites on bats, and switched hosts to feed on our cave-dwelling ancestors.
- When humans developed an agrarian society, bed bugs moved with us from cave to hut, to the house, to the hotel, to medical facility.



- Bed bug origins can be traced back to the Eastern Mediterranean countries and ancient Egypt.
- Preserved bed bugs in Egyptian tombs dating back 3500 years.
- Coriander seeds are also frequently found in tombs. Coriander is native to Egypt and the Sudan.



• ***Coriandrum sativum*** - derived from the Greek word “Koris” which means ‘bed bug’. Probably because the plant smells strongly like the insects.



• Mentioned in medieval European texts (400–476 AD), and classical Greek writings back to the time of Aristotle (384 BCE – 322 BCE).

• May have been first introduced into the Americas by early European colonists. Colonial writings document severe bed bug problems in the English colonies and in Canada, but not in Indian villages.

• Old sailing ships were notoriously infested with bed bugs, ships often forbade passengers from bringing bedding on board.



- During the early 20th century, bed bugs - top three pests in structures.
- Bed bugs all but disappeared in 1940s and 1950s
- Widespread use of DDT

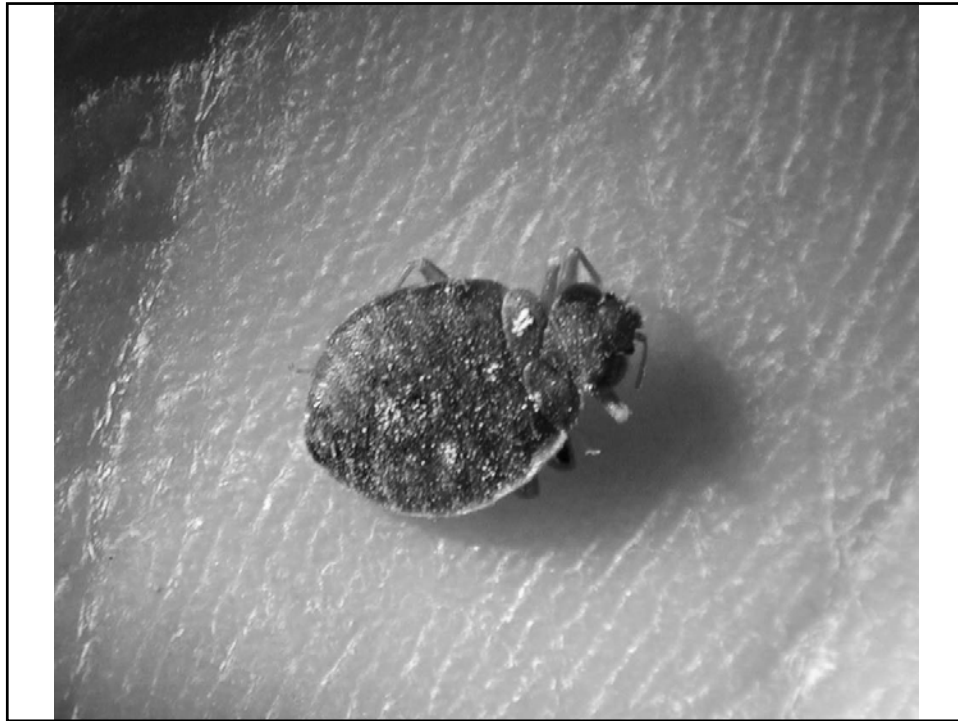


## WHY ARE BED BUGS BACK?

**World-wide resurgence: Norway, Sweden, Germany, Australia, Japan, Canada, and many other locations you might not expect reporting 100-500% increase in bed bug infestations.**



**Bed bugs were never actually gone, but restricted.**



MARCH 18, 2008

### Fox Newsroom in Midtown Besieged by Bed Bugs



Guests at Fox News now have more to worry about than Bill O'Reilly's barking; there are also bed bugs biting. A senior vice president for operations and engineering at Fox News had nothing better to do yesterday than speak to the biased, freedom-hating New York Times about the situation, [confirming that the Manhattan newsroom](#) discovered the problem a few weeks ago, when an employee "caught a bug and showed it to us."

Bedbugs are adept at hitchhiking to new locales in the pockets and clothing creases of their human hosts, so it's not surprising that they've managed to infiltrate Fox, where patriotic Alpha-male hot blood surges in abundance. An exterminator called in to Fox said that one unnamed employee's

apartment has "the worst infestation he had seen in 25 years in the business."

It's still unclear whose apartment the exterminator referred to, but bed bugs have been known to savor the blood (and furry protection) [of male bears](#). Fox swears the bed bugs have been "totally eradicated," but the annoying thing about bed bugs is their tenacious ability to survive for months between feedings, and in some cases they can live up to a year [before sucking blood again](#). The bed bugs have clearly [refused to let New Yorkers rest](#), but their sudden infiltration of Dick Cheney's favorite news source can mean only one thing: Al Qaeda training.

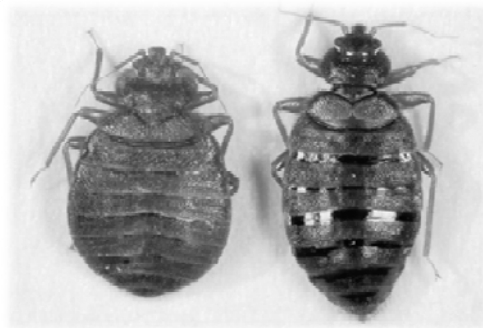
Bed bugs have only recently been subjected to study for the first time since the middle of the last century, and the observed health implications are mild to moderate. Not Known to Vector Pathogens

- Potential allergen and respiratory effects (similar to cockroaches)
- Sleep disturbance results in fatigue and mental health complications
- Bites cause mild to serious skin reactions
- Delusional parasitosis may be incited
- Pesticide poisoning
- Economic hardship - a business concern for health care and long-term care facilities

### Bed Bugs Suck!!!!

- Adult bed bugs  $\frac{1}{4}$  inch in length
- Engorge in less than 15 minutes
- Three times their original size

Bed bug saliva includes an anesthetic and an anti-coagulant



- Bed bugs feed on the blood of humans, birds and mice.
- Feed at night - mainly
- Salivary secretions can cause a person's skin to itch and become swollen
- Scratching can lead to infected sores



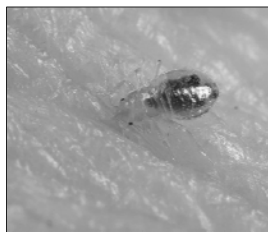
Most bite reactions occur immediately, but may take 14 days.



Secondary infection

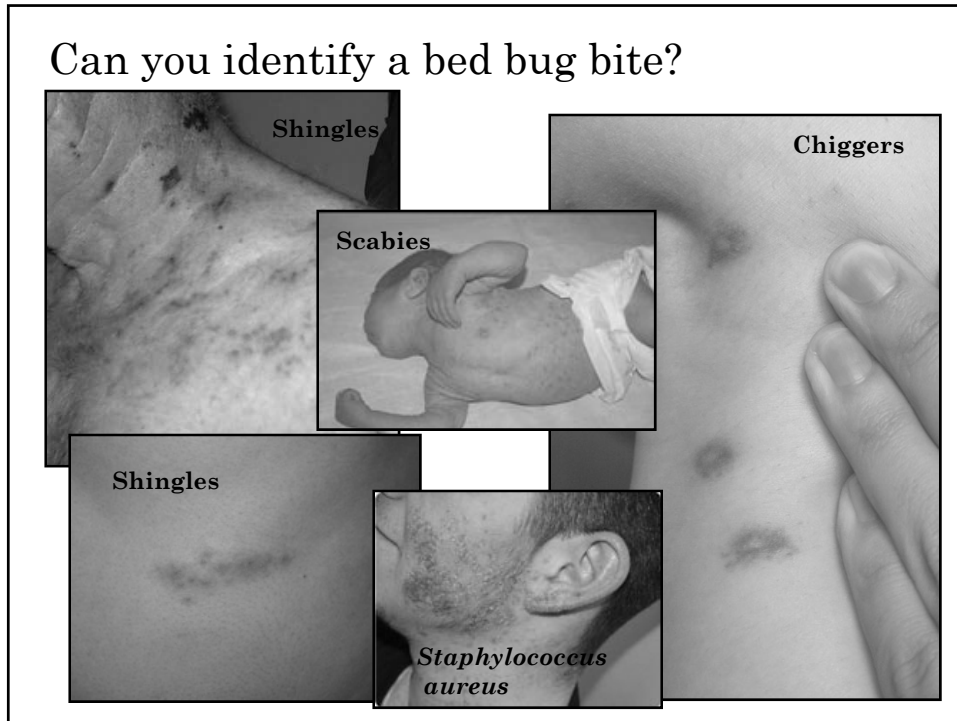
- Attracted by warmth and CO<sub>2</sub>

- Single or clusters (disturbed feeding) of bites



- Bites can be found anywhere, especially exposed skin.





EPA and CDC joint statement describes bed bugs as: “a pest of significant public health importance”



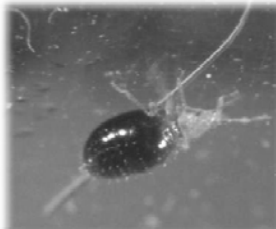
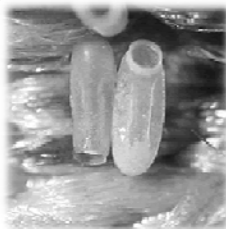
- Found naturally infected with  $\geq 28$  human pathogens
- Never proven to transmit any human disease
- Salivary proteins cause “sensitivity” to repeated bites
  - 5 stages: no reaction; delayed reaction; both immediate & delayed; immediate reaction only; & finally, no reaction.
- True hypersensitivity can develop (anaphylaxis)
- Anemia
- Asthma
- Bullous eruptions (multiple bites)
- Serious social stigma to “having” an infestation

40 bed bugs are  
in a 70°F room  
on May 2. By  
Nov 2 there are  
5,905!

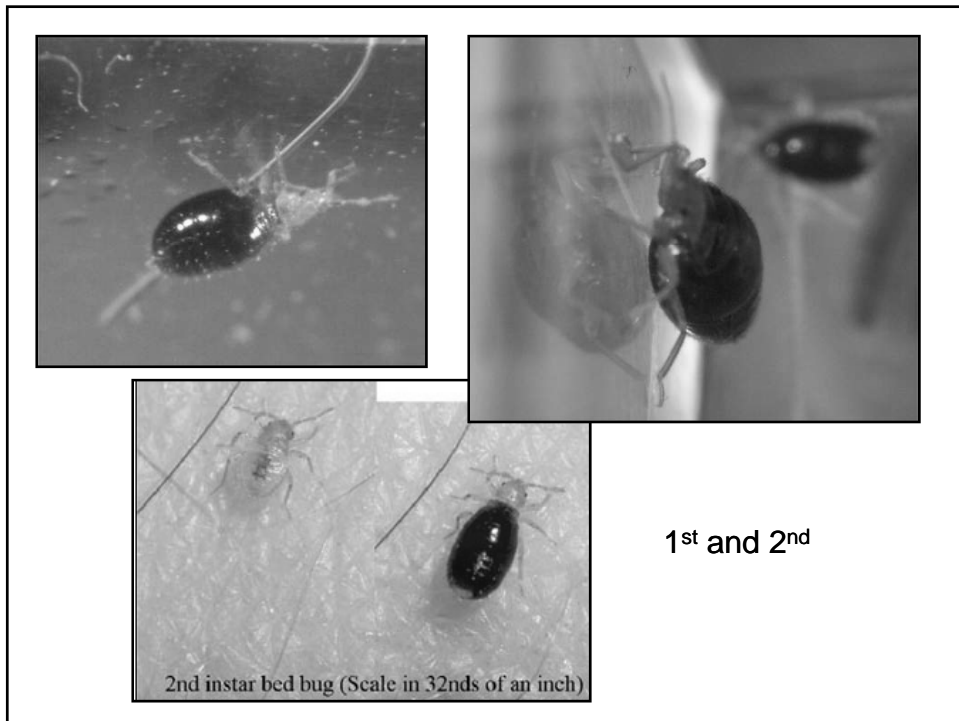


Female bed  
bugs > 500  
eggs

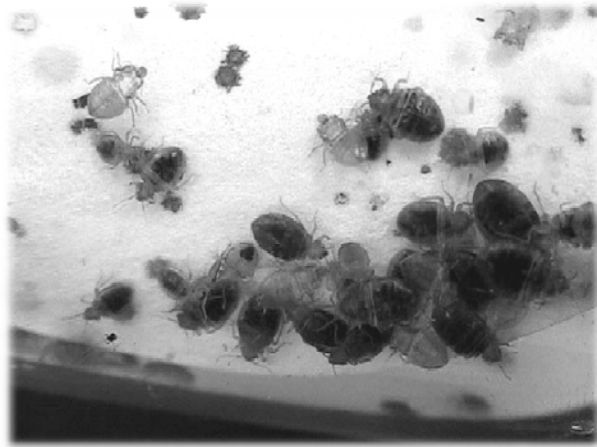
Molt 5 times,  
feed each time.



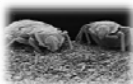
Slow their  
metabolism  
until blood is  
available

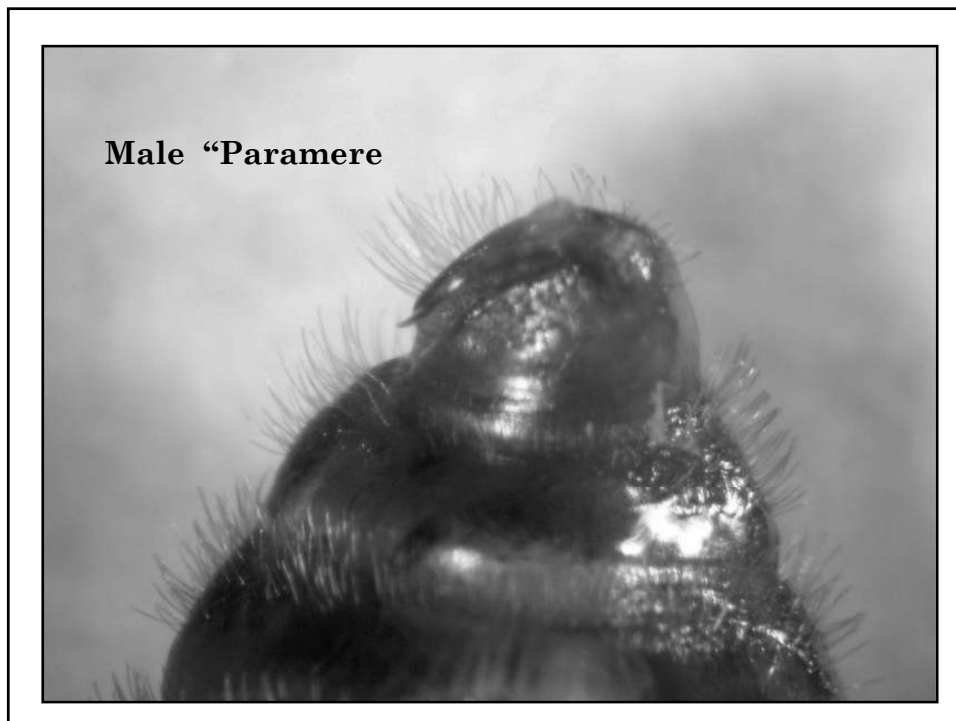
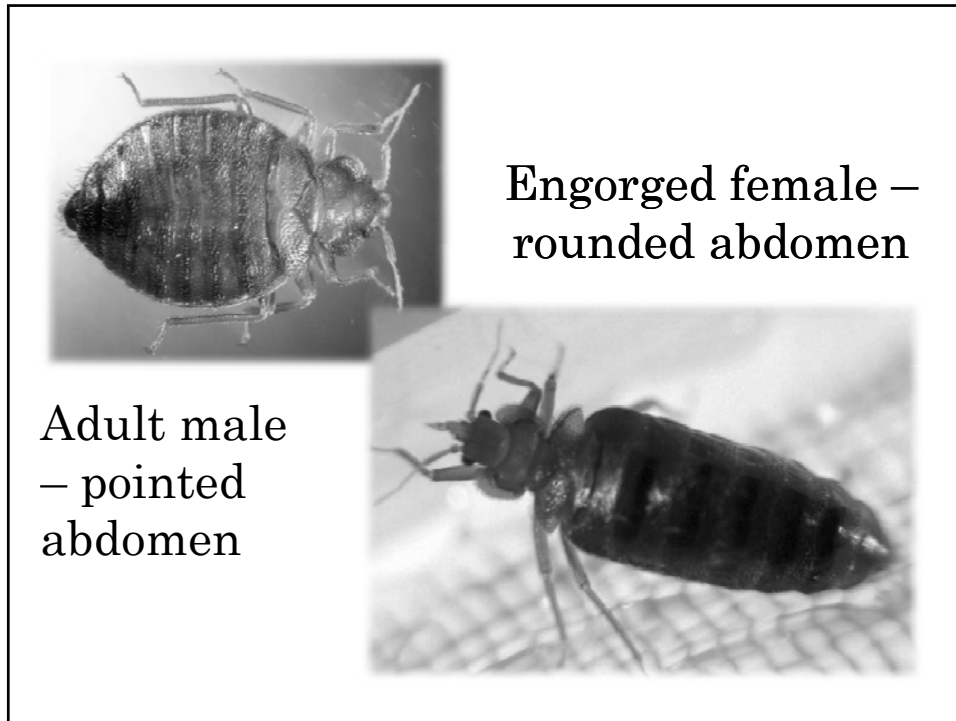


- From egg to adult: 5 wk to four months
- Can >18 months without blood
- Adults live about 10 months
- Remain active at <math><45^{\circ}</math> F



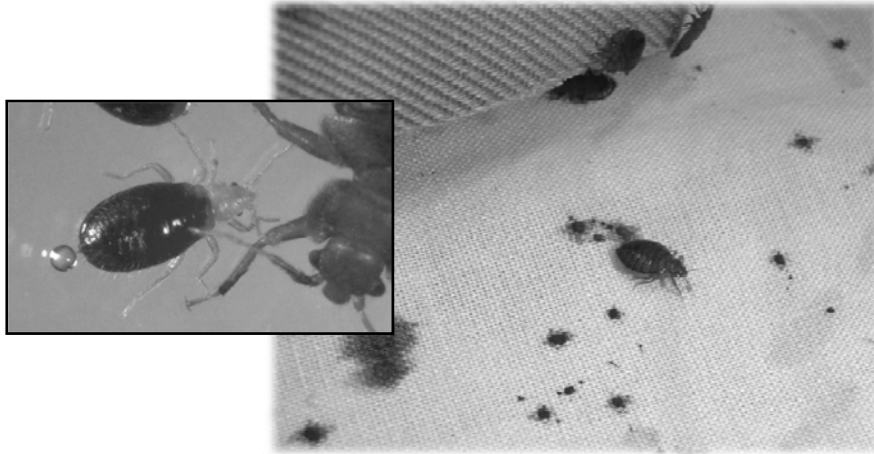
- Lay between one and five eggs per day
- Incubation period of 10 days in warm weather
- Bugs try to feed every 3-7 days
- Double their weight with every blood meal
- $\frac{1}{2}$  of blood meal is lost through the anus in the first 5 hours after feeding
- Fecal matter, egg shells, and cast exoskeletons accumulate in brood centers



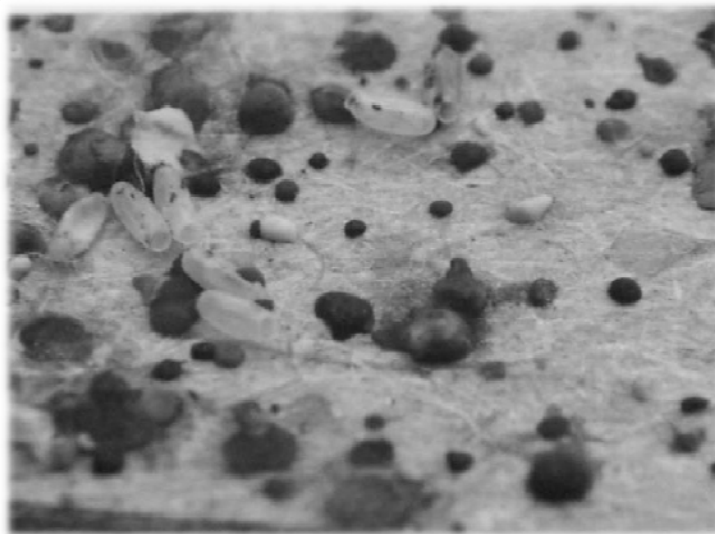




- Feed at night
- Harbor during the day in clusters
- Travel 5-20 ft. (each way) to feed



Form aggregations by cueing into fecal matter, and blood.

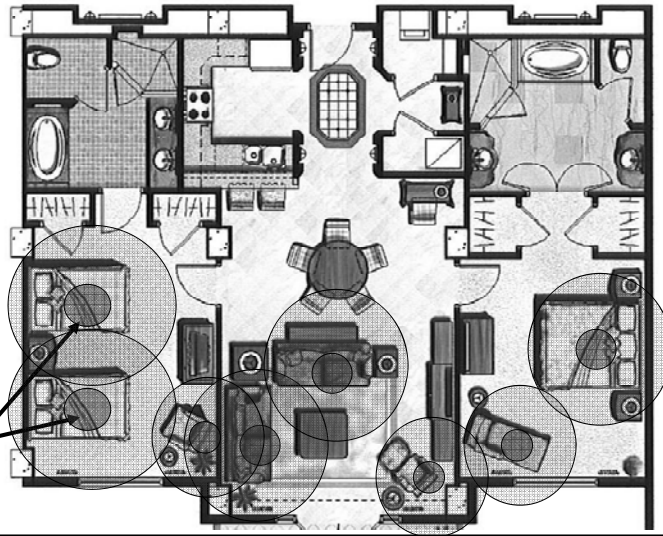




## WHERE BED BUGS LIVE

Beds,  
sofas,  
bedside  
tables,  
recliners,  
picture  
frames...

● = Hot Spot



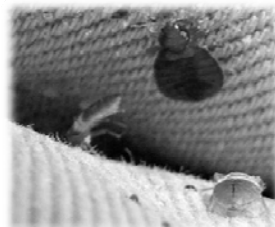
**Inspect for:**  
Bed bugs, molts,  
blood, fecal stains,  
sweet smell.

•Use a brush,  
flash-light,  
canister vacuum  
with a crevice  
attachment





Inspect sleeping areas, of humans and pets, and where bats or birds have entered structures.



Beds, bedding, headboards;  
Luggage racks;  
Wallpaper;  
Window and door casings;  
Pictures and artwork on walls;  
Edges of carpets, baseboards,  
carpet stays;  
Where ceilings and walls meet;  
Behind light switch covers/outlets;  
Clothes;  
Appliances and furniture.



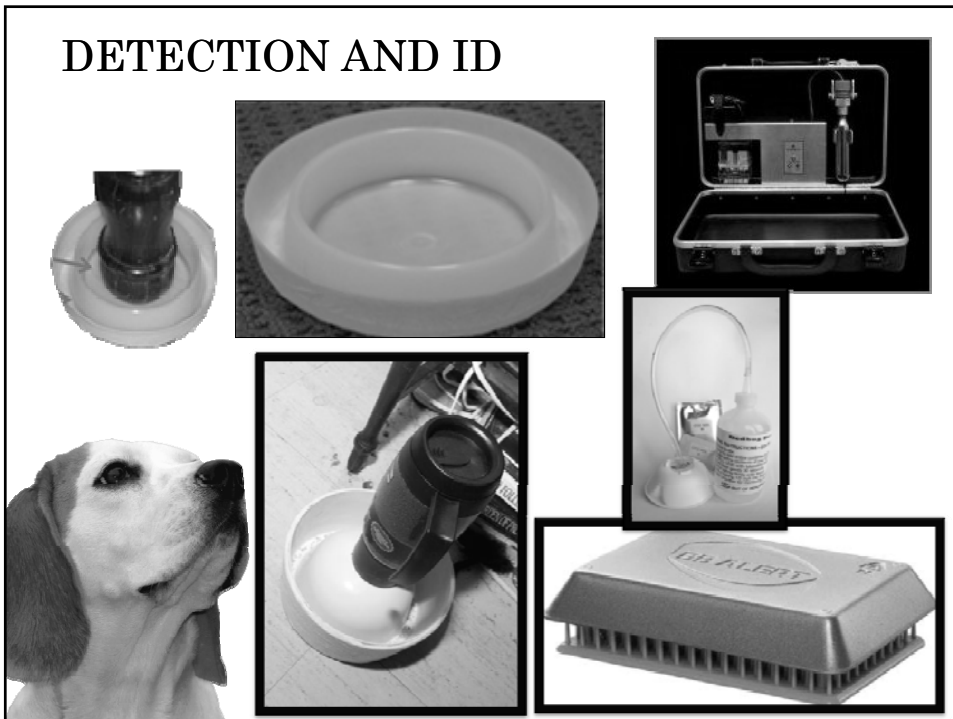
## BED BUGS ARE NOT ROMANTICS

Traumatic  
insemination



Females move to avoid males

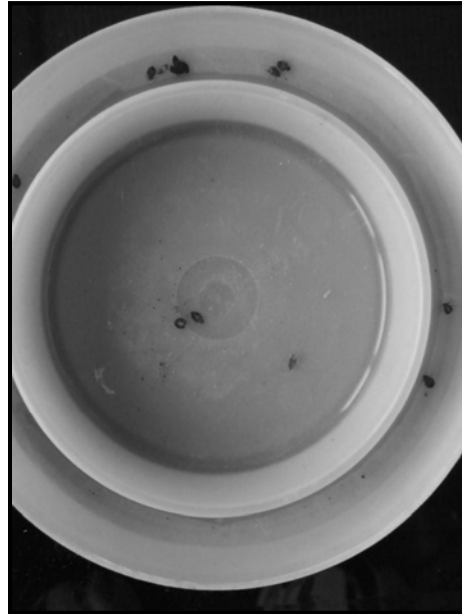
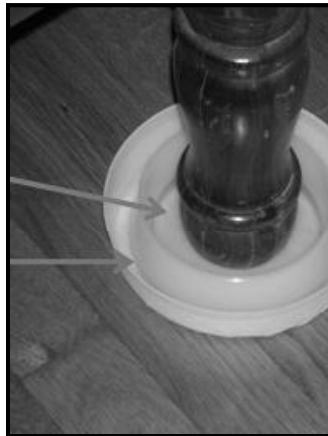
## DETECTION AND ID



### Simple Monitor

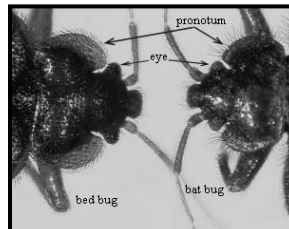


**CLIMBUP**  
INSECT INTERCEPTOR



### Bed Bug Species

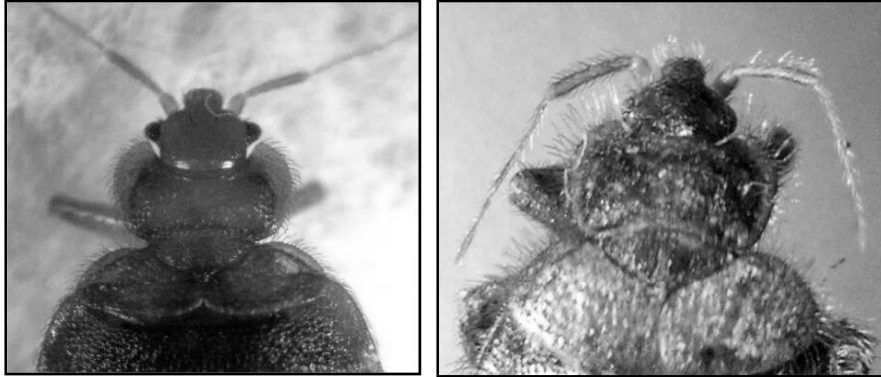
Common bed bug,  
Tropical bed bug,  
Bat bug,  
Poultry bug,  
Chimney swift bug and the swallow bug.



Most commonly encountered after bed bugs, is the bat bug, *Cimex adjunctus*. *Maybe*

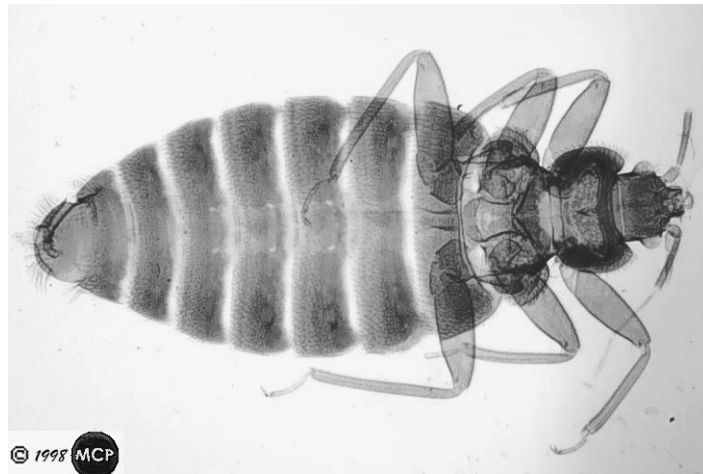
Bat bugs live in attics (and eaves) associated with bats and birds, so inspection and control measures must be expanded to include areas where these animals may be found.

Bed bug (**common**) vs. Bat bug (**eastern**)  
*C. lectularius* L. Vs. *C. adjunctus* barber

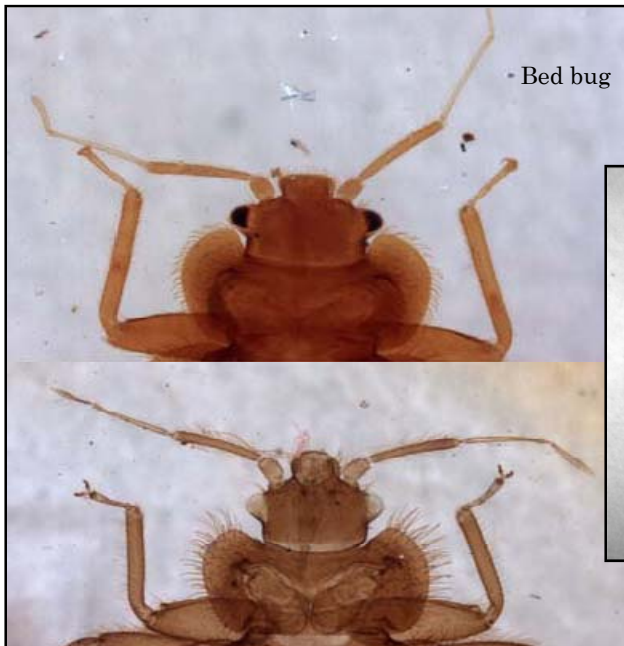


*Common and Tropical Bed Bug*  
*Cimex lectularius* and *C. hemipterus*

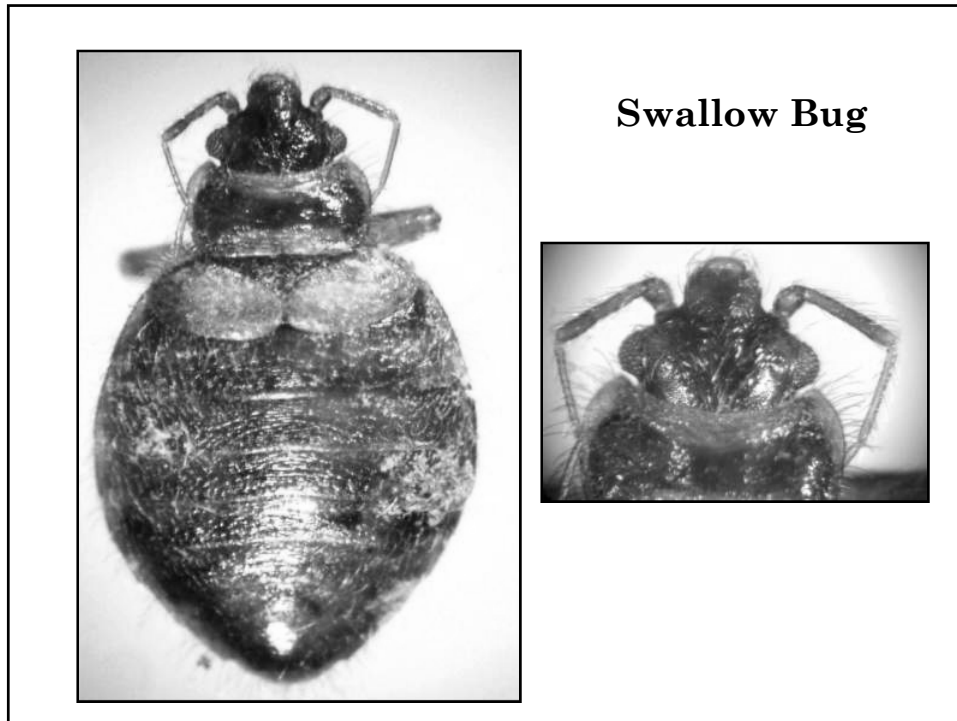
*Cimex hemipterus* the width of pronotum is two times the length at midline. Common in the tropics.



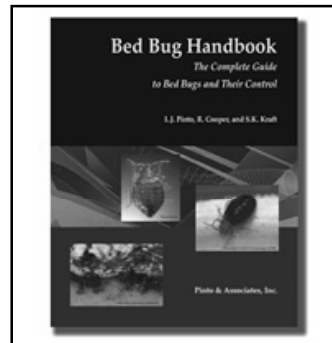
*Cimex lectularius* the width of pronotum is more than 2.6 times the length at midline. This species is more common in temperate areas.



**Bat Bug**



Available for purchase at:  
[www.techletter.com](http://www.techletter.com)  
Currently: \$ 67.00 (U.S.)



The National Pest Management  
Assn.'s web site.  
[www.pestworld.org](http://www.pestworld.org)

**PCT Magazine** web site.  
[www.pctonline.com](http://www.pctonline.com)

**Pest Management Professional**  
web site.  
[www.pestcontrolmag.com](http://www.pestcontrolmag.com)  
formerly = *Pest Control*





## BEWARE Bed Bugs

To Control Them, You Have To Find Them

**IDENTIFY** Got Bugs? - Bed Bugs Are Small With A Big Bite

*Lifecycle Of The Bed Bug*

**LOCATE** Bedding

**LOCATE** Furniture

**The Most Common Areas To Find Bed Bugs**

1. Mattress, fold, seam, rips & buttons
2. Box Springs, seams, rips
3. Headboard, cracks & frame guides
4. Alarm clocks, radios, or any electrical equipment
5. Under carpeting
6. Behind baseboards
7. Wall outlets and switch cover plates
8. Suitcase luggage stand
9. Light fixtures
10. Insiding boards
11. Picking wallpaper
12. Shower head and curtain
13. Behind or in cracks of trim or anything hanging on the wall
14. Blouse curtains and flaps
15. Anywhere on or under furniture

**REPORT**

## ¡ATENCIÓN! Chinchas de Cama

Para controlarlas, tiene que encontrarlas

**IDENTIFIQUE** Las Chinchas de Cama son Pequeñas pero Pican Fuerte.

*Ciclo de vida de una chincha de cama*

**LOCALICE** Ropa de cama

**LOCALICE** Muebles

**Los lugares más comunes donde encontrar chinchas de cama**

1. Edificios, edificios, colinas, repostería y botones
2. Cuchetas de trenes, estantes, repostería
3. Colchones, alfombras y alfombrillas
4. Pelotas de goma, cables o cualquier aparato eléctrico
5. Detrás de la alfombra
6. Detrás de la alfombra, cables o cualquier aparato eléctrico
7. En cualquier lugar sobre o debajo de los muebles y cualquier otro lugar
8. Cualquier electrodoméstico
9. Cualquier lugar que se encuentre en el área de la alfombra
10. Cualquier lugar que se encuentre en el área de la alfombra, cables o cualquier aparato eléctrico
11. En cualquier lugar sobre o debajo de los muebles y cualquier otro lugar
12. Cualquier electrodoméstico
13. Cualquier lugar que se encuentre en el área de la alfombra y botones

**REPORTE**

