

**Entomology 156: Biology Of Parasites**  
**The Arthropod Parasites Lecture 4. RB**  
**Kimsey**  
**The Insecta: Lice and Bugs**



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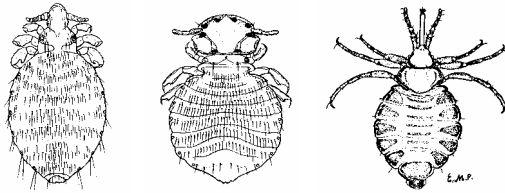
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**I. Order Phthiraptera: The lice**

**A. Introduction**

1. Classification- three major groups sometimes separated
  - a. Chewing lice- Mallophaga
  - b. Sucking lice- Anoplura
  - c. Elephant and Wart hog lice- Rhynchophthira



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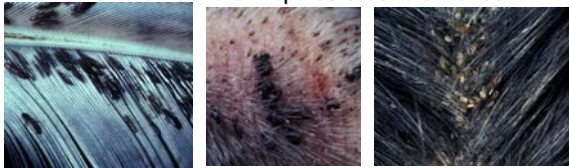
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**I. Order Phthiraptera: The lice**

2. Distribution world wide on mammals and birds
  - a. Inhabit the vestment of the host, including hair, feathers, and clothing
  - b. Highly host specific- parallel evolution with hosts
  - c. Not found on reptiles other than birds



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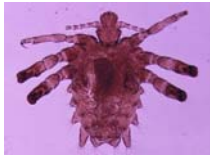
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I. Order Phthiraptera: The lice

- 3. Human species, all sucking lice
  - a. Head lice in head hair
  - b. Body lice in clothing
  - c. Crab lice in axial hair



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I. Order Phthiraptera: The lice

- 4. Morphology
  - a. Dorso-ventrally flattened
  - b. Claws and appendages with various adaptations for clinging to hair and feathers



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B. Biology and Life History

- 1. Complete life history on the host
- 2. Ametabolous or incomplete or gradual metamorphosis
  - a. Egg attached to hair or feathers- nits
  - b. Hatches to asexual nymph resembles adult
  - c. Several nymphal molts to sexual adult
  - d. All stages feed similarly

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**B. Biology and Life History**

3. Feeding specializations

a. Chewing lice, chewing mouth parts

- 1) Laterally opposed mandibles
- 2) Feed on surface skin debris, oils etc

The image contains four illustrations. On the left, three line drawings labeled 'a', 'b', and 'c' show the dorsal view of chewing lice, highlighting their segmented bodies and legs. On the right, a micrograph shows a close-up of a lice's head and mouthparts, with fine hairs and structures visible.

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**B. Biology and Life History**

b. Sucking lice- Anoplura

- 1) Long thin piercing stylet like mouth parts
- 2) Feed by sucking blood from capillaries in the epidermis of the skin

The image contains two illustrations. On the left, a photograph shows a sucking louse (Anoplura) from a dorsal view, showing its segmented body and legs. On the right, a diagram labeled 'A' shows a sucking louse with its long, thin stylet inserted into the skin. Below it, a diagram labeled 'B' shows a cross-section of the skin with the stylet piercing through the epidermis to reach a blood vessel.

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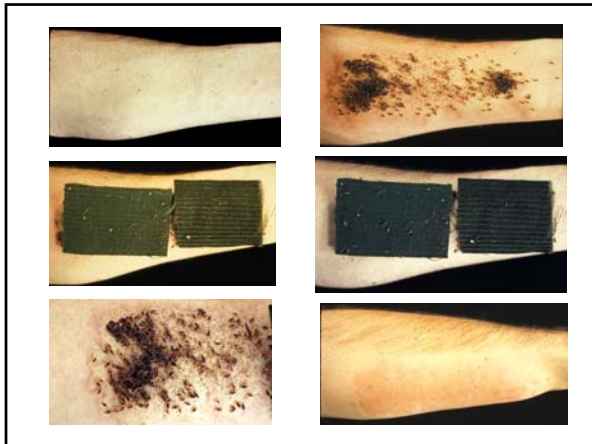
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B. Biology and Life History

3. Feeding specializations

c. Elephant and Wart hog lice-  
Rhynchophthira

- 1) Chewing sucking mouth parts at tip of long rostrum
- 2) Feed presumably on blood
- 3) Semi-permanent tick-like attachment to host

d. Transmission from host to host through direct host contact

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II. Order Hemiptera: True bugs incl. bed and kissing bugs

A. Introduction

1. Hemimetabolous or incomplete life cycle
  - a. Egg hatches to wingless nymph
  - b. Several nymphal molts to winged adult
  - c. All stages feed on same materials

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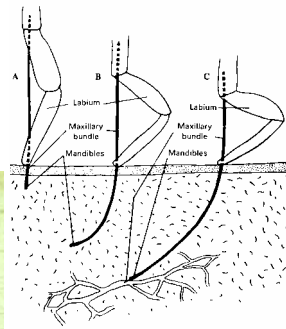
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II. Order Hemiptera: True bugs incl. bed and kissing bugs

A. Introduction

2. Piercing sucking mouth parts within fascicle




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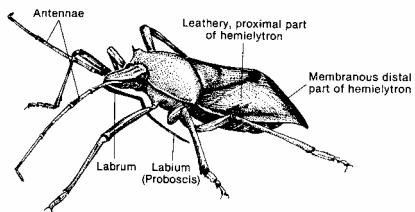
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II. Order Hemiptera: True bugs incl. bed and kissing bugs

A. Introduction

3. Two pair wings, first hemelytra, second membranous




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II. Order Hemiptera: True bugs incl. bed and kissing bugs

A. Introduction

- 4. Symbiotic bacteria in mycetomes provide nutritional components not found in blood



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B. The kissing bugs- family Reduviidae; Triatoma, Rhodnius, etc

1. Morphology

- a. Elongated, narrow, cylindrical head
- b. Piercing sucking mouth parts, folded under head against thoracic sternum
- c. Dark colored



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B. The kissing bugs- family Reduviidae; Triatoma, Rhodnius, etc

1. Morphology

- d. Abdomen with thin margin extending out from under wings
- e. Hemelytra with three major veins in the posterior region



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B. The kissing bugs- family Reduviidae

2. Biology and Life history

- a. Life cycle as for the order
- b. Essentially vagile nest parasites living near nest
- c. Reach and infest new nests by flight

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B. The kissing bugs- family Reduviidae

3. Relationships with hosts

- a. In general very wide host range
- b. Several species peridomestic with humans
- c. Other species associated with forest mammals
- d. Transmit Trypanosoma cruzi agent of Chaga's disease
- e. Woodrat nests in California

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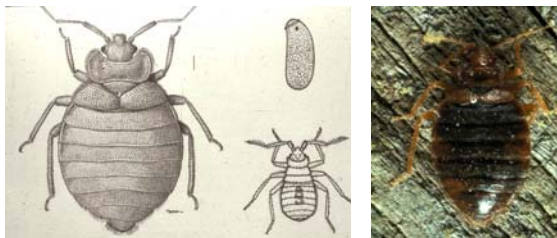
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C. The bed bugs- Cimicidae

1. Morphology

- a. Dorso-ventrally compressed, 1/4-3/8" long
- b. Wingless
- c. Straw colored



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C. The bed bugs- Cimicidae

2. Biology and life cycle

- a. Host specific nest parasites of birds, humans and bats
- b. Tend to parasitize colonial hosts, swallows, bats etc



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C. The bed bugs- Cimicidae

2. Biology and life cycle

- c. Transmission to new hosts within colony nest or by phoresis to new colonies
  - 1) Bat wing membranes
  - 2) Human clothing

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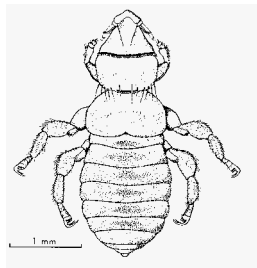
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D. The bat bugs- family Polytinidae

1. Morphology

- a. Louse like
- b. Reduced features, no eyes or hind wings, short fore wings
- c. Adaptations for clinging to host- ctenidia, flattened spines



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D. The bat bugs- family Polytinidae

- 2. Biology and Life history
  - a. Entire life history on host
  - b. All stages feed on blood
  - c. Viviparous, eggs hatch in female, nymphs in advanced developmental state

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E. Relationships with hosts among bug parasites

- 1. Increasing focus on host
- 2. Kissing bug free living, loose association with nest
- 3. Bed bug not free living, close association with nest
- 4. Bat bug, louse like complete dependency on host

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F. Bug bites, medical significance to humans

- 1. Kissing bugs, painless
  - a. Local swelling ache and irritation
  - b. Healing accompanied by itching
  - c. Occasionally anaphylaxis and death



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F. Bug bites, medical significance to humans

- 2. Assassin bugs- and others very painful
  - a. Assassin bugs- free living predators of other insects
  - d. Occasionally anaphylaxis and death



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