Dichotomous Key to Hexapod Orders

Activity Goals

- Practice using a dichotomous key
- Look at insect specimens up close
- Familiarize yourself with characteristics of various insect orders

Example # 1

Whitney Cranshaw, Colorado State University, Bugwood.org

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Whitney Cranshaw, Colorado State University, Bugwood.org

1. a) Insect has wings? Go to 2.

   b) Insect wingless or with poorly developed (vestigial) wings. Go to 29.

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   b) Insect wingless or with poorly developed (vestigial) wings. Go to 29.

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Whitney Cranshaw, Colorado State University, Bugwood.org

2. a) One pair of wings. Go to 3.

   b) Two pairs of wings. Go to 7.

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Whitney Cranshaw, Colorado State University, Bugwood.org

7. a) Fore wings are hard or leathery. Go to 8.

   b) All wings are membranous. Go to 13.

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Whitney Cranshaw, Colorado State University, Bugwood.org

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   b) All wings are membranous. Go to 13.

Example # 1

Whitney Cranshaw, Colorado State University, Bugwood.org

8. a) Fore wings tough apart from membranous tip
= Hemiptra

b) Fore wings are of uniform texture throughout.
Go to 9.

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b) Fore wings are of uniform texture throughout.
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Example # 1

Gerald Holmes, Strawberry Center, Cal Poly San Luis Obispo, Bugwood.org

9. a) Fore wings (elytra) hard and veinless, meeting in center line. Go to 10.

   b) Fore wings with many veins, overlapping at least a little and often held roofwise over body. Go to 11.

Example # 1

Gerald Holmes, Strawberry Center, Cal Poly San Luis Obispo, Bugwood.org

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b) Fore wings with many veins, overlapping at least a little and often held roofwise over body. Go to 11.

Example # 1

Keren Levy, Bugwood.org

11. a) Insects with piercing and sucking beaks
= **Hemiptera**

b) Insects with chewing mouthparts: cerci (‘tails’) usually present. Go to 12.

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Example # 1

Whitney Cranshaw, Colorado State University, Bugwood.org

12. a) Hind legs are modified for jumping
= **Orthoptera**

b) Hind legs not modified for jumping. Go to 49.

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= **Orthoptera**

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Example # 1

Whitney Cranshaw, Colorado State University, Bugwood.org

49. a) First pair of legs raptorial (used to grasp prey) and held close to the body at rest **= Mantodea**

b) Front legs not like this and body flattened **= Blattodea**

Example # 1

Whitney Cranshaw, Colorado State University, Bugwood.org

49. **a) First pair of legs raptorial (used to grasp prey) and held close to the body at rest = Mantodea**

b) Front legs not like this and body flattened **= Blattodea**

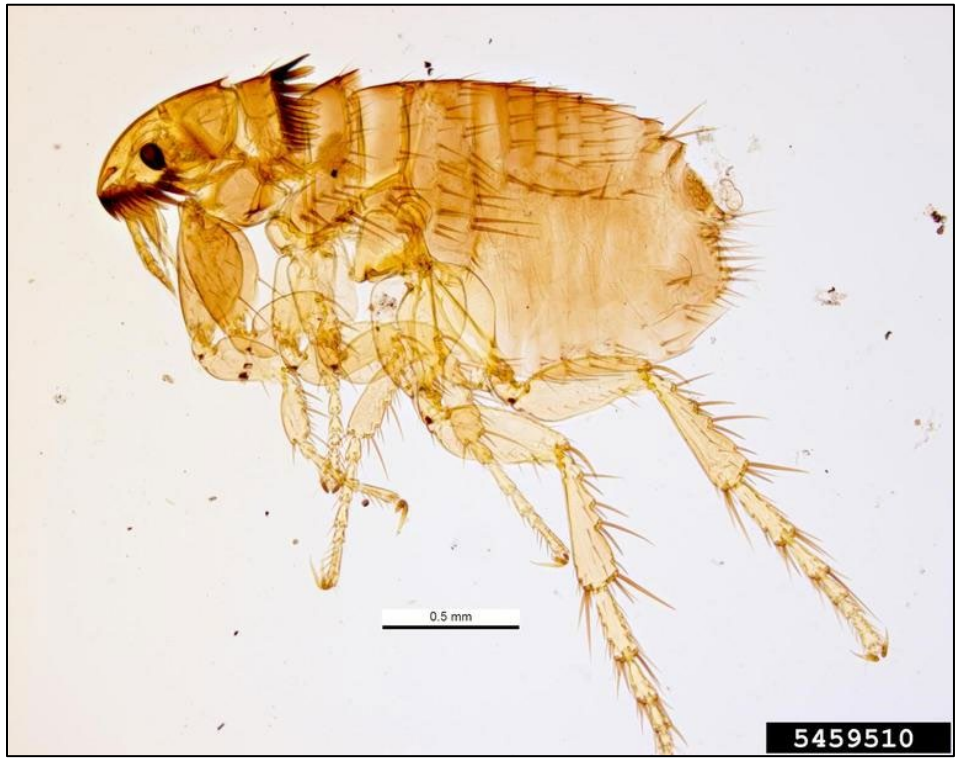
Example # 1

Order: Mantodea
Chinese Mantis

Whitney Cranshaw, Colorado State University, Bugwood.org

Example # 2

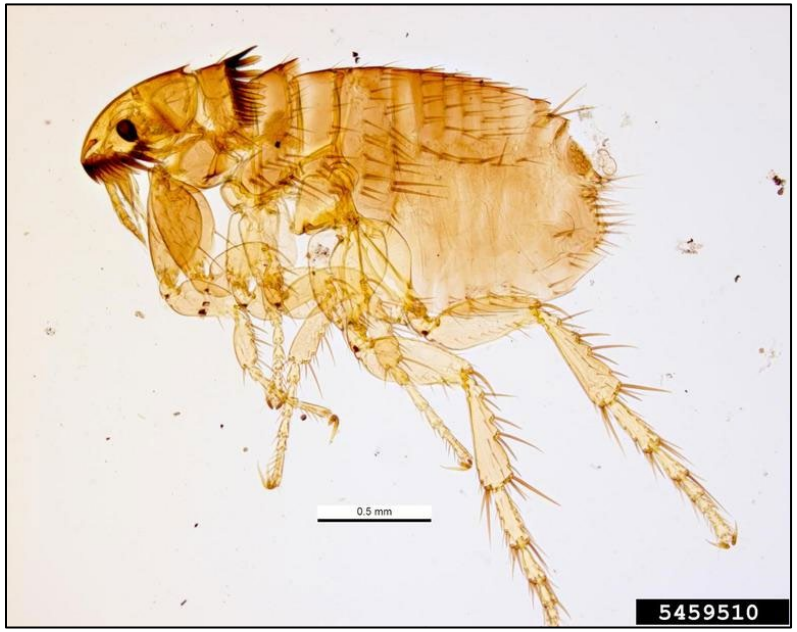
Joseph Berger, Bugwood.org



Pest and Diseases Image Library , Bugwood.org

Example # 2

Joseph Berger, Bugwood.org



Pest and Diseases Image Library , Bugwood.org

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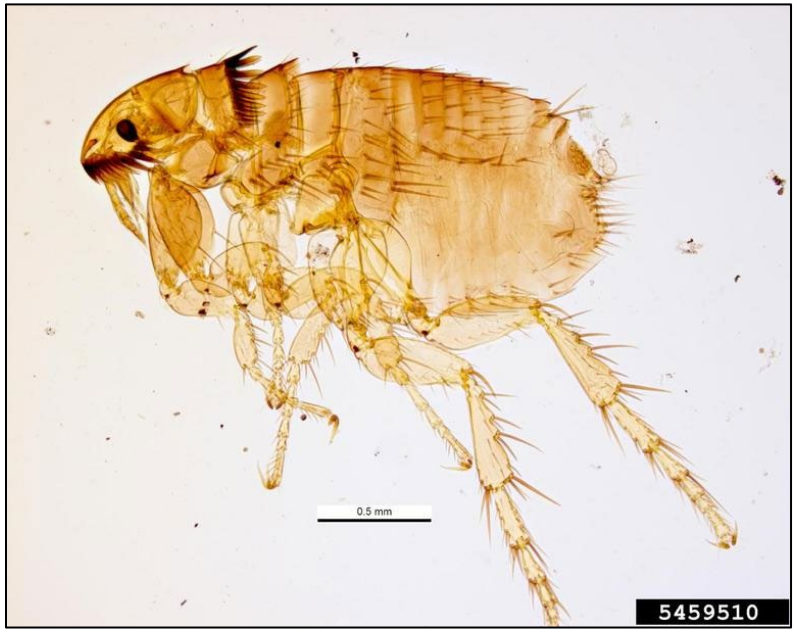
Joseph Berger, Bugwood.org



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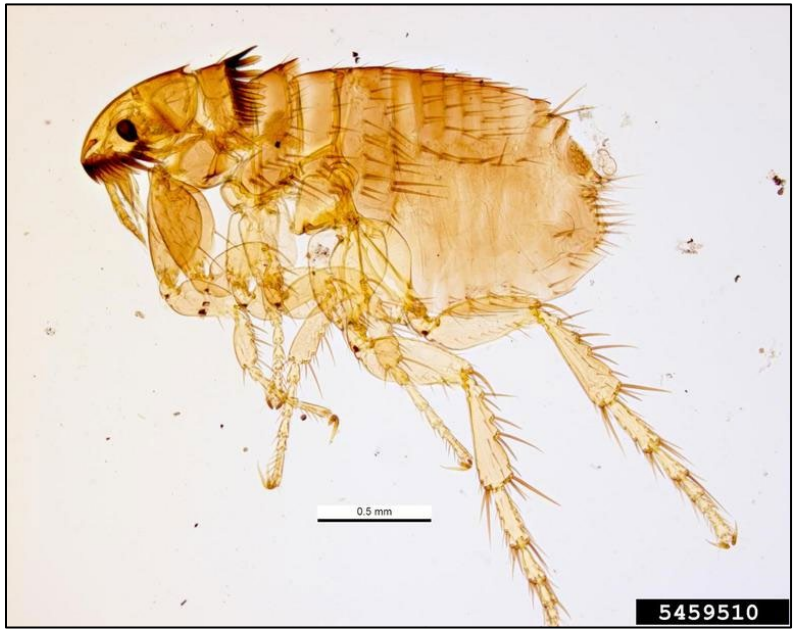

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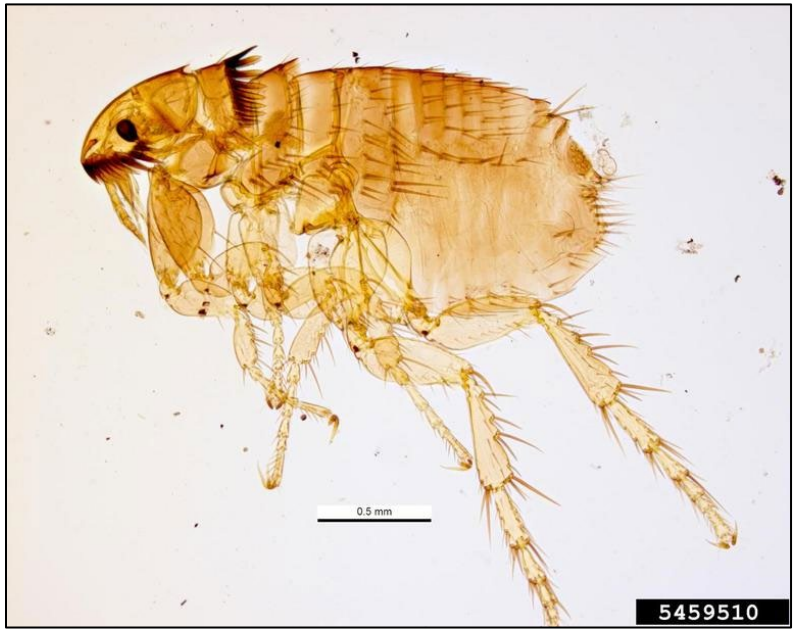
29. a) Insect with slender, twig like body
= **Phasmatodea**

b) Insect not like this. Go to 30.

Example # 2

Joseph Berger, Bugwood.org



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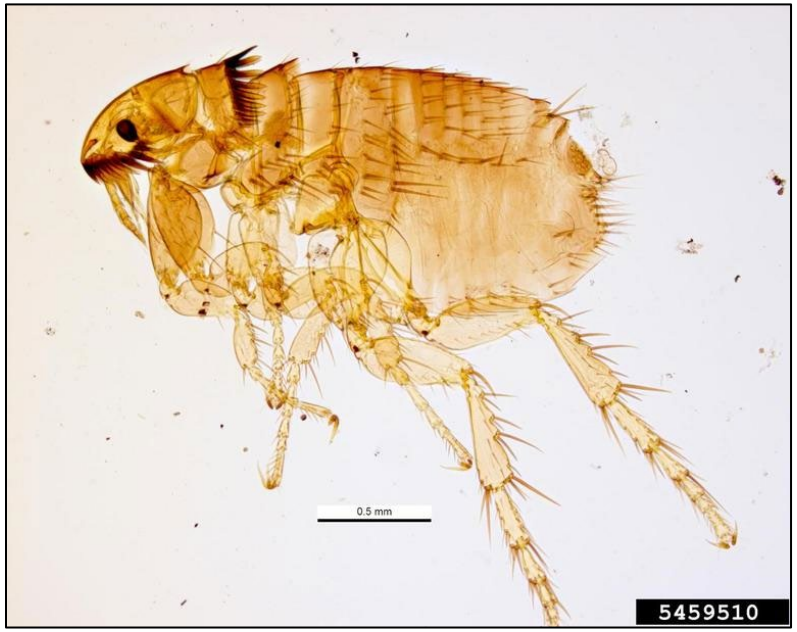

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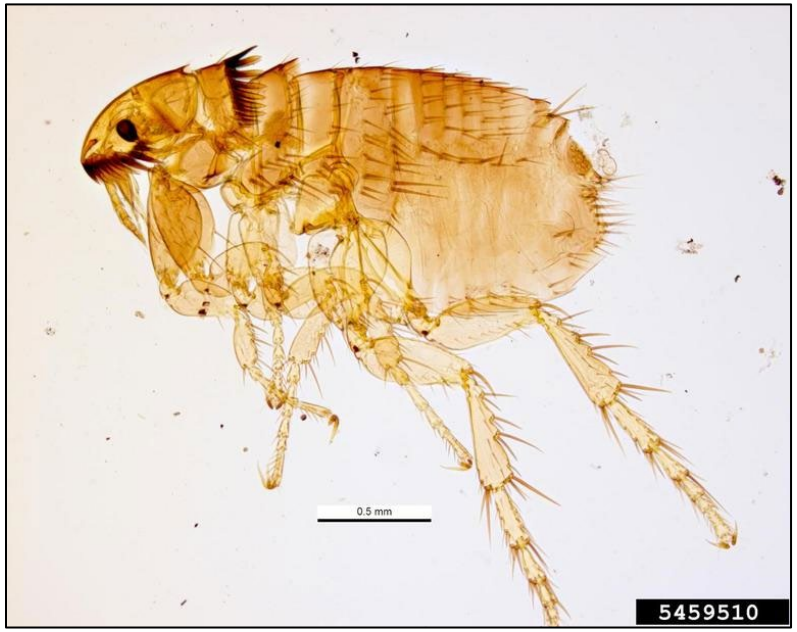
30. a) Insect with grasshopper-like body and long back legs **= Orthoptera**

b) Insect not like this. Go to 31.

Example # 2

Joseph Berger, Bugwood.org



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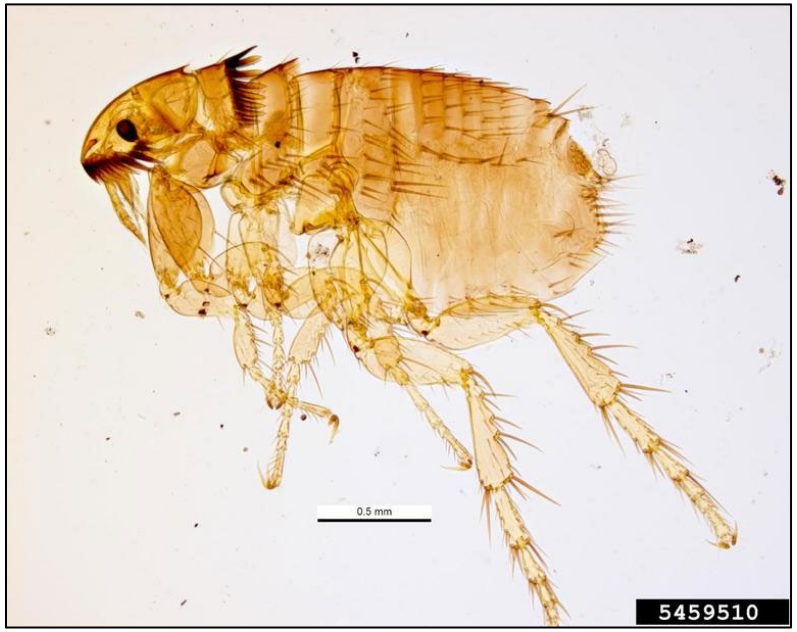


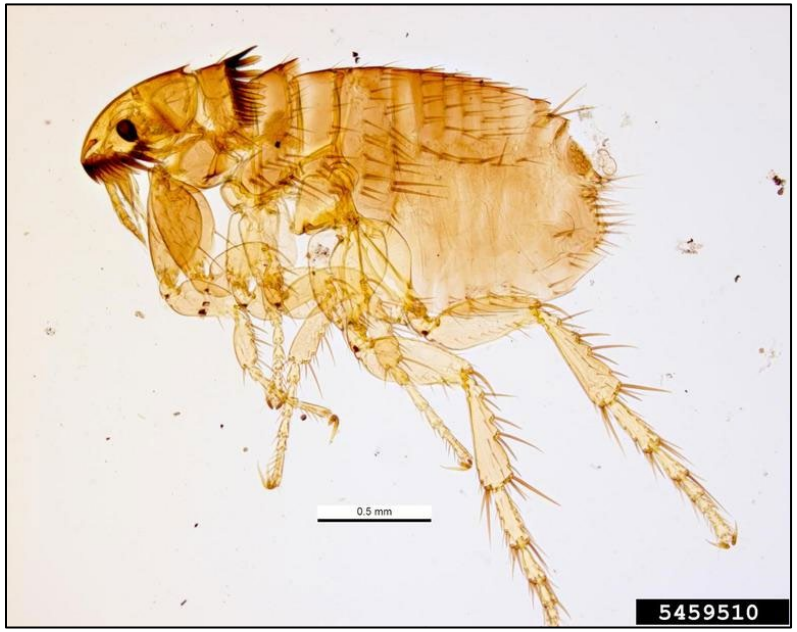
Pest and Diseases Image Library , Bugwood.org

31. a) Small, soft bodies insects living on plants, often under protective shield or scale
= Hemiptera

b) Insect not like this. Go to 32.

Example # 2

Joseph Berger, Bugwood.org



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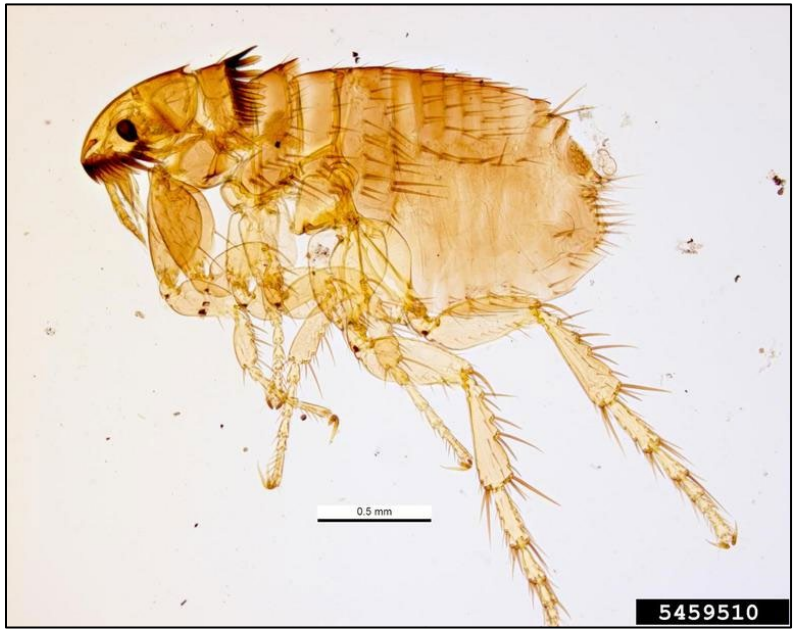

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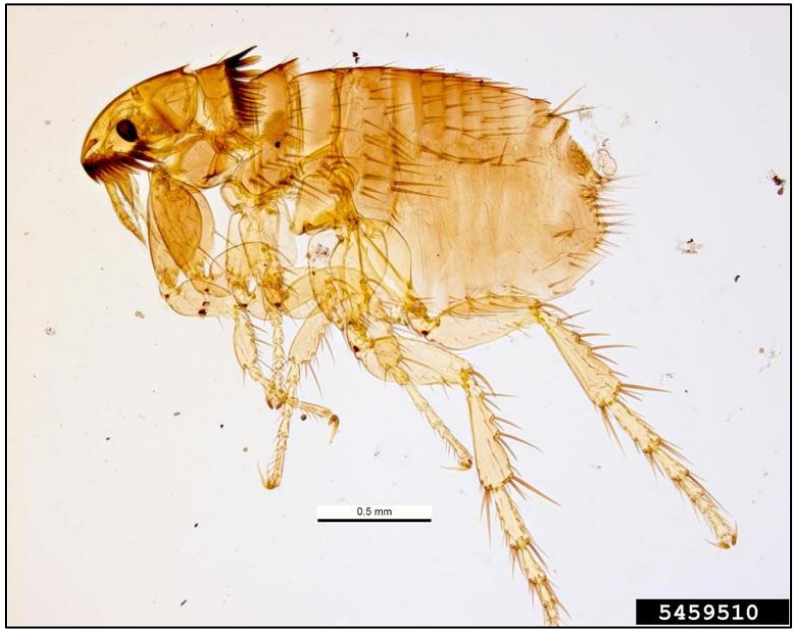
32. a) Minute soil-living insects, < 2mm long without antennae **= Protura**

b) Insect not like this. Go to 33.

Example # 2

Joseph Berger, Bugwood.org



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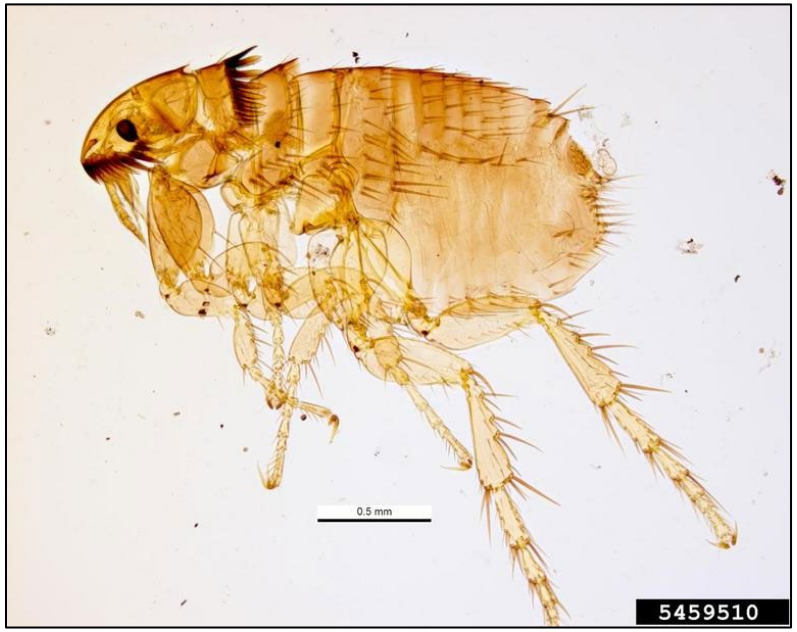

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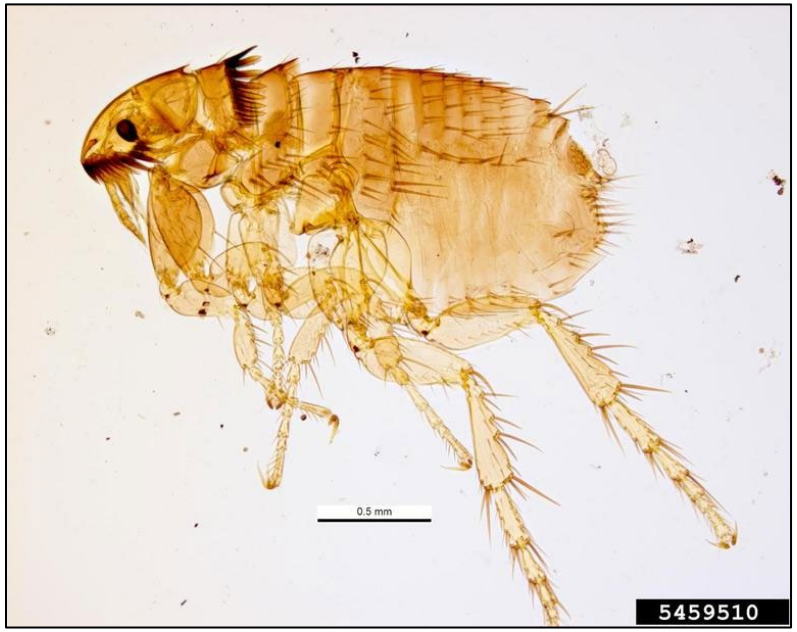
33. a) Insects with cerci or other abdominal appendages. Go to 34.

b) Insects without appendages. Go to 41.

Example # 2

Joseph Berger, Bugwood.org



Pest and Diseases Image Library , Bugwood.org

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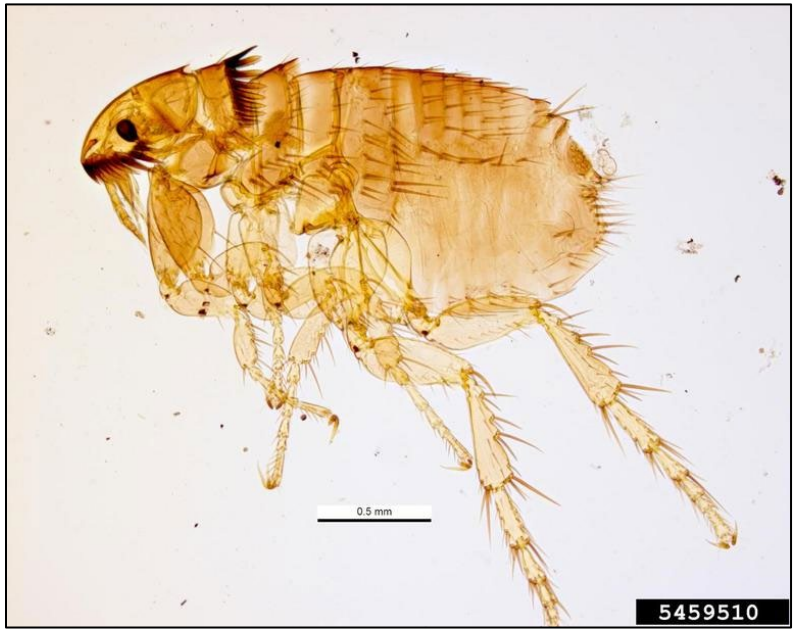


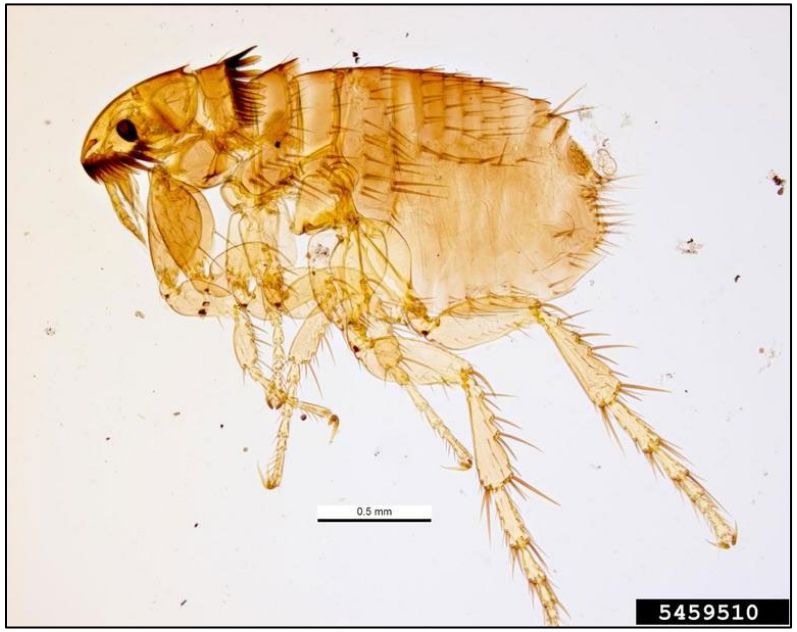
Pest and Diseases Image Library , Bugwood.org

41. a) Parasites in fur or feathers: insects generally flattened side-to-side or dorso-ventrally. Go to 42.

b) Insect not parasitic and not usually flattened. Go to 46.

Example # 2

Joseph Berger, Bugwood.org



Pest and Diseases Image Library , Bugwood.org

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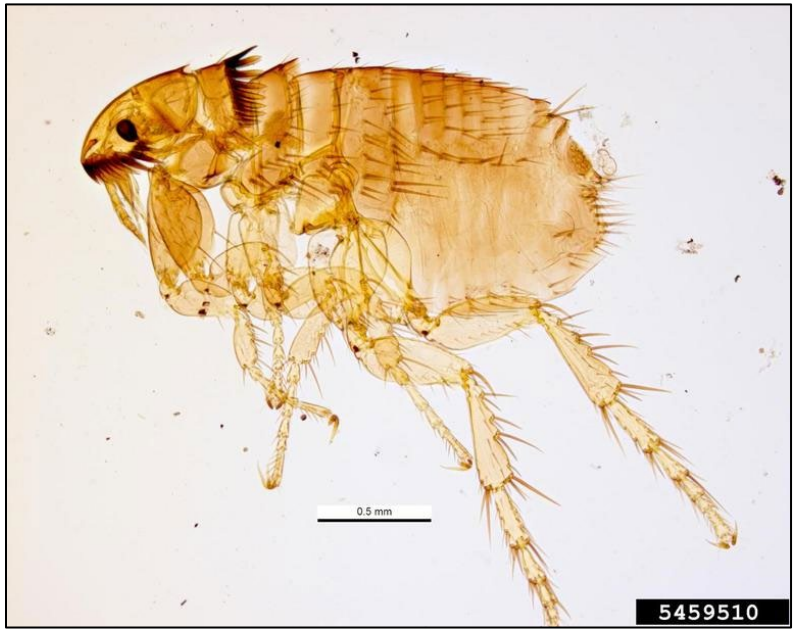

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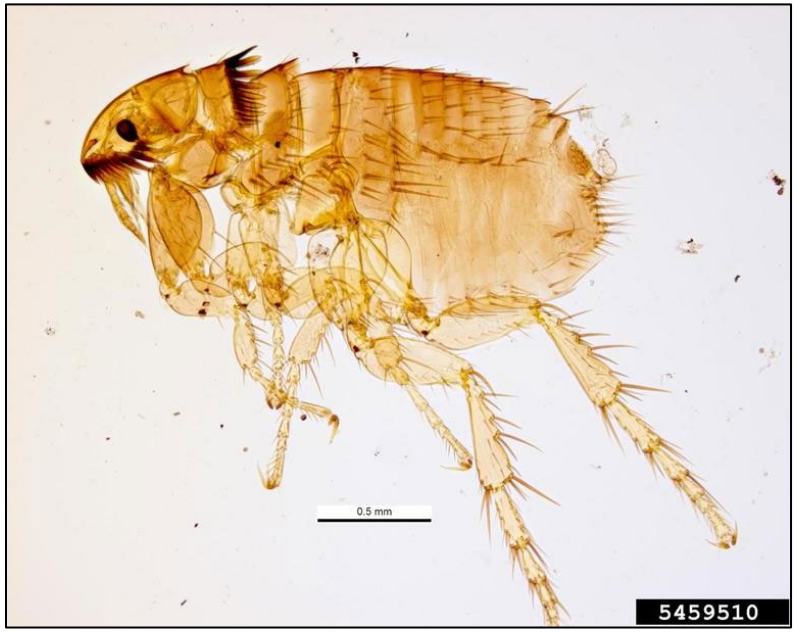
42. a) Jumping insects flattened from side-to-side
= Siphonaptera

b) Insect not flattened side-to-side. Go to 43.

Example # 2

Joseph Berger, Bugwood.org



Pest and Diseases Image Library , Bugwood.org

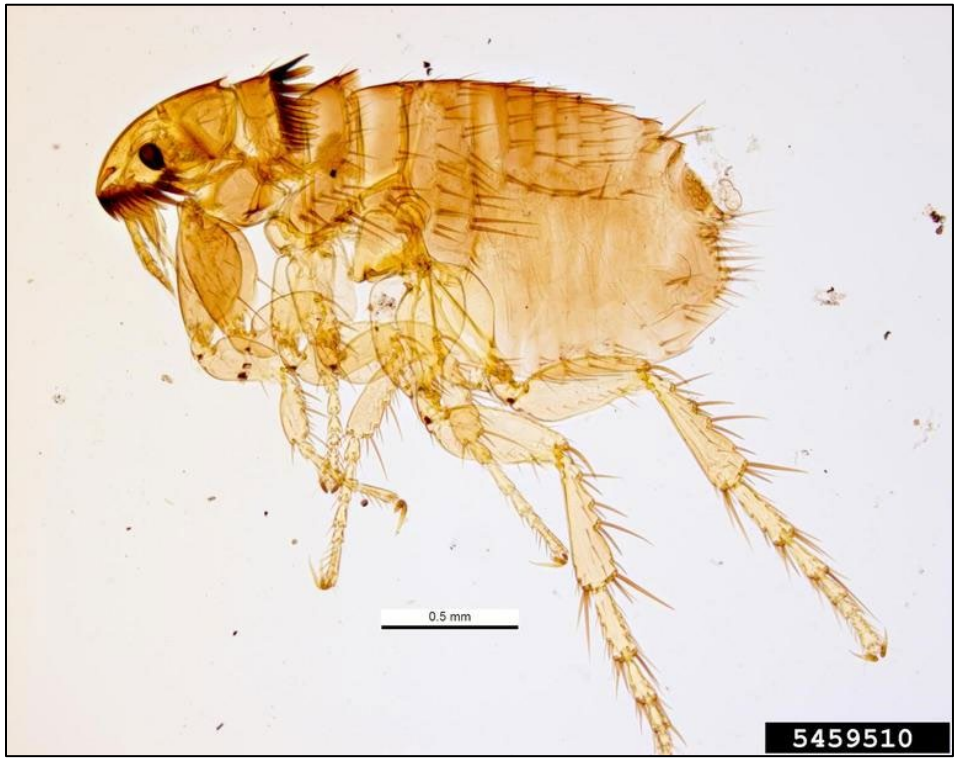
42. **a) Jumping insects flattened from side-to-side = Siphonaptera**

b) Insect not flattened side-to-side. Go to 43.

Example # 2

Order: Siphonaptera
Cat Flea

Joseph Berger, Bugwood.org



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Specimen # A

Lawrence Barringer, Pennsylvania Department of Agriculture, Bugwood.org

Pennsylvania Department of Agriculture , Bugwood.org

Specimen # A

Order: Hemiptera
Spotted Lanternfly (Planthopper)

Lawrence Barringer, Pennsylvania Department of Agriculture, Bugwood.org

Pennsylvania Department of Agriculture , Bugwood.org

Specimen # B

Whitney Cranshaw, Colorado State University, Bugwood.org

Specimen # B

Order: Dermaptera
Earwig

Whitney Cranshaw, Colorado State University, Bugwood.org

Specimen # C

Lisa Ames, University of Georgia, Bugwood.org

Specimen # C

Order: Hemiptera
Planthopper

Lisa Ames, University of Georgia, Bugwood.org

Specimen # D

Whitney Cranshaw, Colorado State University, Bugwood.org

Specimen # D

Order: Odonata
Damselfly

Whitney Cranshaw, Colorado State University, Bugwood.org

Specimen # E

Ansel Oommen, Bugwood.org

Specimen # E

Order: Diptera
Bee Fly

Ansel Oommen, Bugwood.org

Specimen # F

David Cappaert, Bugwood.org

Specimen # F

Order: Hymenoptera
Carpenter Ant

David Cappaert, Bugwood.org

Specimen # G

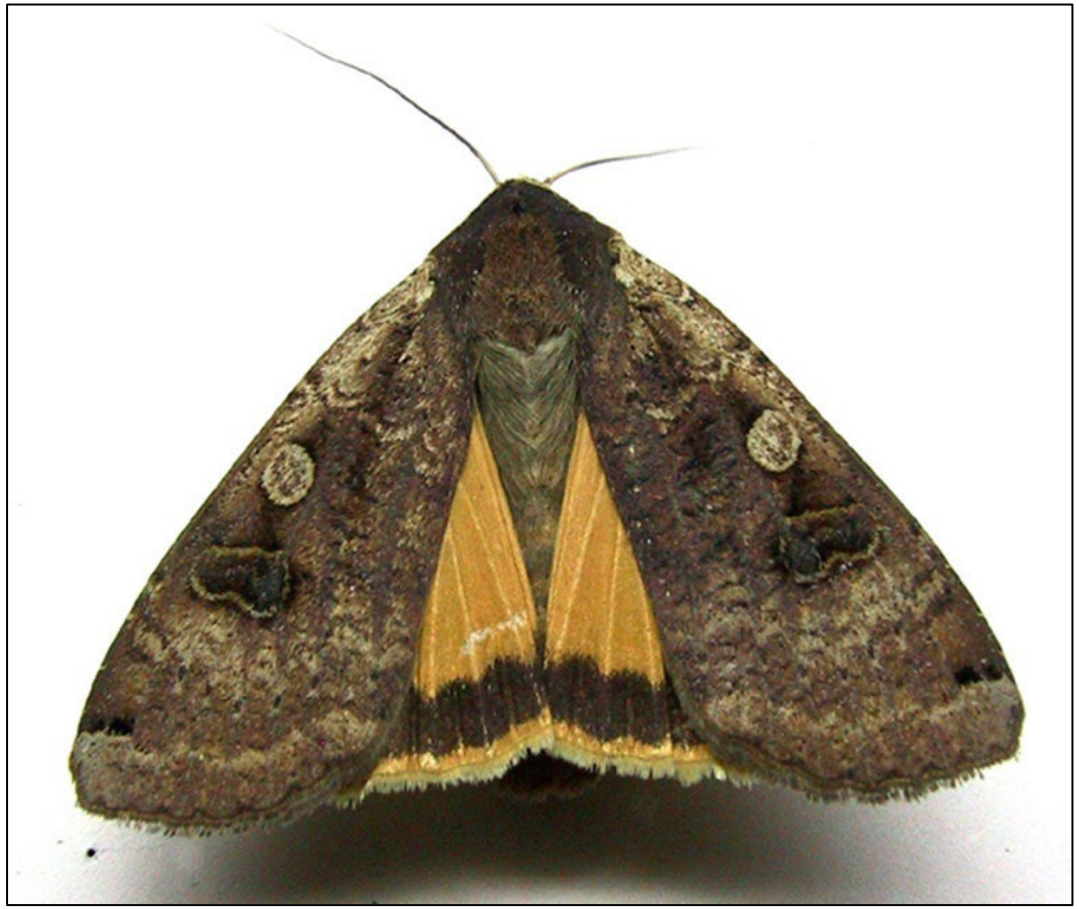
Michael Reding, USDA Agricultural Research Service, Bugwood.org

Specimen # G

Order: Coleoptera
Green June Beetle

Michael Reding, USDA Agricultural Research Service, Bugwood.org

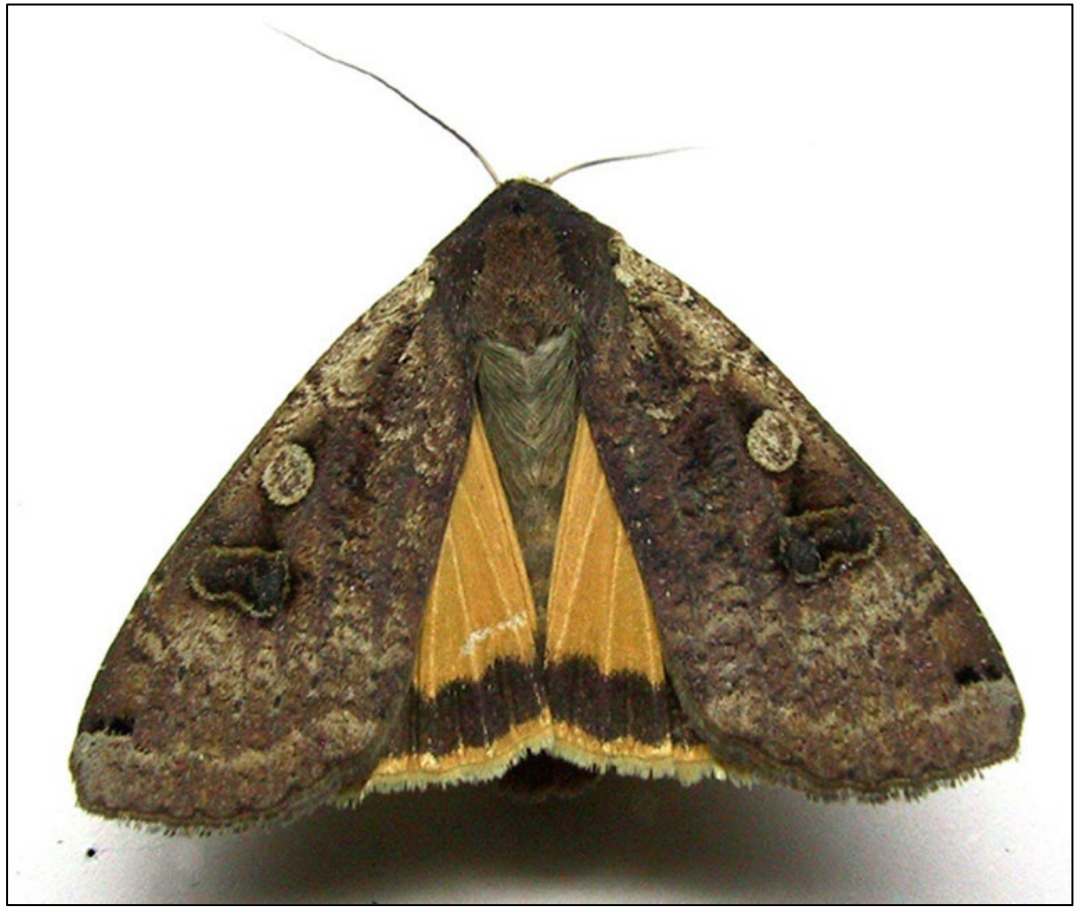
Specimen # H



Larry Line, Mostly Moths of Maryland, Bugwood.org

Specimen # H

Order: Lepidoptera
Underwing Moth



Larry Line, Mostly Moths of Maryland, Bugwood.org

Specimen # I

David Cappaert, Bugwood.org

Specimen # I

Order: Hemiptera
Annual Cicada

David Cappaert, Bugwood.org

Specimen # J

David Cappaert, Bugwood.org

Specimen # J

Order: Orthoptera
Grasshopper

David Cappaert, Bugwood.org

Specimen # K

Pest and Diseases Image Library , Bugwood.org

Specimen # K

Order: Diptera
House Fly

Pest and Diseases Image Library , Bugwood.org

Specimen # L

Johnny N. Dell, Bugwood.org

Specimen # L

Order: Neuroptera
Green Lacewing

Johnny N. Dell, Bugwood.org

Specimen # M

Johnny N. Dell, Bugwood.org

Specimen # M

Order: Hymenoptera
Paper Wasp

Johnny N. Dell, Bugwood.org

Specimen # N

Kristie Graham, USDA ARS, Bugwood.org

Specimen # N

Order: Hemiptera
Brown Marmorated Stink Bug

Kristie Graham, USDA ARS, Bugwood.org

Specimen # O

Gary Alpert, Harvard University, Bugwood.org

Specimen # O

Order: Blattodea
American Cockroach

Gary Alpert, Harvard University, Bugwood.org

Specimen # P

Clemson University - USDA Cooperative Extension Slide Series , Bugwood.org

Specimen # P

Order: Coleoptera
Blister Beetle

Clemson University - USDA Cooperative Extension Slide Series , Bugwood.org