

## Unit 3

### Insect Orders

#### General Directions:

1. To complete this study guide, please read the assigned readings for Unit 3 and watch the lecture. If you need additional information to complete this study guide, you may visit an external website created by North Carolina University at <http://www.cals.ncsu.edu/course/ent425/library/compendium/index.html>.

Note that this website classifies some of the insects differently than what you will learn from this lecture. Both classification systems are mentioned in the lecture.

2. Make sure you know the names and common names of each order *fairly well* before you come to lab the following week. The TA will assume you will already know these order names.

#### Interactive activities:

1. Read the attached readings including the Insect Order Taxoboxes.
2. Watch the linked (bristletails) and attached videos (proturans).
3. Take two online quizzes during the lecture presentation.
4. Fill out the study guide.
5. Review study guide and create notecards to learn the order names and characteristics.

#### Unit objectives:

*After you have completed this unit you should know for each order:*

1. *its common name*
2. *its type of metamorphosis*
3. *several facts regarding its life history and/or economic importance*
4. *its wing type and leg adaptations*

#### Lesson Outline:

- 1) Review Terms
- 2) Protura
- 3) Collembola
- 4) Diplura
- 5) Class Insecta
  - a) Archaeognatha
  - b) Zygentoma/Thysanura
  - c) Ephemeroptera
  - d) Odonata
  - e) Plecoptera
  - f) Dermaptera
  - g) Embioptera
  - h) Zoraptera
  - i) Orthoptera
  - j) Phasmatodea
  - k) Grylloblattodea

- l) Mantophasmatodea
  - m) Mantodea
  - n) Blattodea
  - o) Psocodea
  - p) Thysanoptera
  - q) Hemiptera
  - r) Neuroptera
  - s) Megaloptera
  - t) Raphidioptera
  - u) Coleoptera
  - v) Strepsiptera
  - w) Diptera
  - x) Mecoptera
  - y) Siphonaptera
  - z) Lepidoptera
  - aa) Hymenoptera
- 6) Wing Development
  - 7) Conclusion

## **Review Terms**

Define each of the following terms.

1. Ametabolous:
2. Hemimetabolous:
3. Holometabolous:
4. Apterygote:
5. Paleopterous:
6. Pterygote:
7. Neoptera:
8. Exopterygote:
9. Endopterygote:

## **Insect Orders**

Take note, the column for **Development** refers to metamorphosis, i.e. whether or not the order is ametabolous, hemimetabolous or holometabolous. The column for **Wing Type** refers to whether or not the order is a) Apterygote, b) Paleopterous or b) Neoptera; **and** whether or not the order is: a) Endopterygote or b) Exopterygote.

# Table 1

| <u>Order or Class</u>   | <u>Common Name</u> | <u>Development</u> | <u>Facts</u> | <u>Economic Importance</u> | <u>Wing Type or Leg Adaptation</u> |
|-------------------------|--------------------|--------------------|--------------|----------------------------|------------------------------------|
| Protura                 |                    |                    |              |                            |                                    |
| Diplura                 |                    |                    |              |                            |                                    |
| Collembola              |                    |                    |              |                            |                                    |
| CLASS INSECTA           |                    |                    |              |                            |                                    |
| Archaeognatha           |                    |                    |              |                            |                                    |
| Zygentoma/<br>Thysanura |                    |                    |              |                            |                                    |
| Ephemeroptera           |                    |                    |              |                            |                                    |
| Odonata                 |                    |                    |              |                            |                                    |
| Plecoptera              |                    |                    |              |                            |                                    |
| Dermaptera              |                    |                    |              |                            |                                    |
| Embioptera              |                    |                    |              |                            |                                    |
| Zoraptera               |                    |                    |              |                            |                                    |
| Orthoptera              |                    |                    |              |                            |                                    |

|                  |  |  |  |  |  |
|------------------|--|--|--|--|--|
| Phasmatodea      |  |  |  |  |  |
| Grylloblattodea  |  |  |  |  |  |
| Mantophasmatodea |  |  |  |  |  |
| Mantodea         |  |  |  |  |  |
| Blattodea        |  |  |  |  |  |
| Psocodea         |  |  |  |  |  |
| Thysanoptera     |  |  |  |  |  |
| Hemiptera        |  |  |  |  |  |
| Neuroptera       |  |  |  |  |  |
| Megaloptera      |  |  |  |  |  |
| Raphidioptera    |  |  |  |  |  |
| Coleoptera       |  |  |  |  |  |
| Strepsiptera     |  |  |  |  |  |
| Diptera          |  |  |  |  |  |
| Mecoptera        |  |  |  |  |  |

|              |  |  |  |  |  |
|--------------|--|--|--|--|--|
| Siphonaptera |  |  |  |  |  |
| Lepidoptera  |  |  |  |  |  |
| Hymenoptera  |  |  |  |  |  |

Table 2

Arthropoda

Class Entognatha: Collembola, Diplura and Protura  
Class Insecta

Ametabola

- Order Archaeognatha (Bristletails)
- Order Zygentoma (Silverfish)

Apterygota

Hemimetabola

- Order Ephemeroptera (Mayflies)
- Order Odonata (Dragonflies, Damselflies)
- Order Plecoptera (Stoneflies)
- Order Dermaptera (Earwigs)
- Order Embioptera (webspinners)
- Order Zoraptera (Angel insects)
- Order Orthoptera (Grasshoppers, Crickets)
- Order Phasmatodea (Walking sticks)
- Order Grylloblattodea (Rock crawlers)
- Order Mantophasmatodea (heelwalkers)
- Order Mantodea (Praying mantids)
- Order Blattodea (Cockroaches, Termites)
- Order Psocodea (lice)
- Order Thysanoptera (Thrips)

Paleoptera

Exopterygote

Neoptera

Holometabola

- Order Neuroptera (Lacewings)
- Order Megaloptera (Alderflies, Dobsonflies)
- Order Raphidioptera (Snakeflies)
- Order Coleoptera (Beetles)
- Order Strepsiptera (Twisted wing parasites)
- Order Diptera (True Flies)
- Order Mecoptera (Scorpionflies)
- Order Siphonaptera (Fleas)
- Order Trichoptera (Caddisflies)
- Order Lepidoptera (Moths, Butterflies)
- Order Hymenoptera (Ants, Wasps, Bees)

Endopterygote