

Lab Exercise 7 - True bugs, thrips, and other orders

**Introduction**

In this laboratory, you will learn about representatives of the Hemiptera, Thysanoptera, Anoplura and Mallophaga. As a part of the laboratory, you will key two representatives of the hemipteran suborder Heteroptera and two representatives of the suborder Homoptera to family. As was the case last week, you will also be able to use laboratory time for identification of specimens in your insect collection.

**Subclass Pterygota:** consists of most insects; possess wings (some forms have subsequently lost wings); thorax enlarged and strengthened for wing support; undergo metamorphosis

*Aquatic pterygote orders*

- Order Ephemeroptera- Nymphs live multiple years in water and molt many times. Pre-adult stage called subimago emerges from water and flies. Adults live 2-3 days, do not feed, and form mating swarms. Hind wings smaller than forewings
- Order Odonata- Aquatic naiads predate on aquatic invertebrates and vertebrates, and have a modified labium that serves as a grasping organ that pulls food into mouth. Naiads live up to six years. Adults have conspicuous compound eyes, complex veined wings, and a long slender abdomen. Suborder Anisoptera, or dragonflies have wings folded straight out, while the Zygoptera (damselflies) have wings folded back over the abdomen.
- Order Plecoptera (Stoneflies)- Adults and nymphs have two long cerci and long and slender antennae. Adults have flattened body and four membranous wings held flat over abdomen at rest. Adults are dull colored and medium sized.

**Order Hemiptera:** true bugs. These have piercing sucking mouthparts; hemimetabolous; diverse and inhabit a wide variety of ecological niches.

- Suborder Heteroptera- basal portion of front wings usually thickened and colored, distal portion usually membranous like hind wings. Three or four-segmented beak, used to feed on plant sap, seeds, fungi, arthropod haemolymph, or vertebrate blood. Includes aquatic insects we looked at earlier (Corixidae, Belostomatidae, Notonectidae, Gerridae), stink bugs (Pentatomidae), seed bugs (Lygaeidae), plant bugs (Miridae), and assassin bugs (Reduviidae).
- Suborder Homoptera- front wings uniformly clear and membranous or colored and slightly thickened. Wings held at a rooflike angle over the body when the insect is resting. Beak arises from posterior part of head. Feed on plant sap. Includes the treehoppers (Membracidae), cicadas (Cicadidae), aphids (Apididae), and soft scale insects (Coccidae).

**Order Thysanoptera:** These are very small, elongated insects with or without wings (wings often have a fringed appearance often found in minute insects). They have short antennae and sucking mouthparts. Often found on flowers or fungi. They can be major garden pests.

**Order Anoplura:** sucking lice. These small, wingless blood feeding insects are external parasites of mammals. They are hemimetabolous and have piercing, sucking mouthparts. Lice are often species specific. For example, one species of louse, *Pediculus humanus* feeds only on humans. They have a one-segmented tarsus with a single claw.

**Order Mallophaga:** chewing lice. These small (0.5-11 mm) wingless insects are external parasites of birds, and sometimes mammals. Some feed on feathers, hair, skin, or secretions, others feed on mites that also live on vertebrates. These are hemimetabolous insects, whose nymphs feed on the same hosts as adults.

**Activity 1- Examination of collection specimens**

Representatives from these orders will be on display for you to examine. You should recognize important diagnostic features of each group. One way to do this would be to take a representative specimen and follow the key to the correct order.

**Activity 2- Family level identification of two heteropterans and two homopterans**

Keying four specimens- Complete an identification to family level for two members of the Heteroptera and two members of the Homoptera. You can use insects from your collection, or insects on display from the SSU insect collection. Try to find insects that differ from each other in overall form. For each specimen, write down the list of key numbers that you used in the identification, the name of the family to which the specimen belongs. When you are finished, show your results to your instructor and verify your identification. Then write a brief description of members of that family, based on the description in Bland and Jacques (or another source if necessary).

**Specimen 1- Heteroptera**

Family \_\_\_\_\_ Source \_\_\_\_ my collection OR \_\_\_\_ SSU collection

Key couplets- \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_,  
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Brief description

**Specimen 2- Heteroptera**

Family \_\_\_\_\_ Source \_\_\_\_ my collection OR \_\_\_\_ SSU collection

Key couplets- \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_,  
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Brief description

**Specimen 3- Homoptera**

Family \_\_\_\_\_ Source \_\_\_\_ my collection OR \_\_\_\_ SSU collection

Key couplets- \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_,  
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Brief description

**Specimen 4- Homoptera**

Family \_\_\_\_\_ Source \_\_\_\_ my collection OR \_\_\_\_ SSU collection

Key couplets- \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_,  
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Brief description