Field Zoology Laboratory (BIOL 209)
Fall 2009

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Hours: TBA

Laboratory: Tuesday, 11:30 AM - 2:15 PM or 2:30 PM to 5:15 PM, 202 Torrey Hall

This laboratory is designed to enable students to become familiar with the insects of the northeastern United States, develop a comprehensive understanding of insect taxonomy and morphology, and to assemble and maintain a diverse insect collection. Through a series of field trips each week, students will become familiar with insects in different habitats including, woodland, riparian, open field, agricultural, and urban environments. During each field trip, students will be responsible for collecting a wide range of insects in each habitat, as well as maintaining a detailed collection notebook. Each week you are responsible for pinning or mounting, identifying, and properly labeling the insects you collect.

Reference texts available in the laboratory:

Borror, Triplehorn, and Johnson. *An Introduction to the Study of Insects*, 6th Edition,

Marshall. *Insects, Their Natural History and Diversity,* 1st Edition

Snodgrass. Principles of Insect Morphology, 1993 Edition

Additional materials.

In additional to the class text, students are required to buy a black and white composition notebook.

Collections

Natural history collections are an essential part of understanding the great diversity of plants and animals on earth. Insect collections, like the one you will construct, are invaluable for keeping permanent records of taxa, serving as the name-bearing specimens for species names, serving as a link to the past as many taxa go extinct, aiding in future taxonomic revisions and ecological studies over time, and providing an excellent educational resource.

Your collection, when completed should be an adequate representation of the insect diversity in Vermont. Each specimen should be neatly and properly pined and labeled, and identified to the

family level. All specimens should be organized by Order, then by Family within Order, and kept neatly in Schmitt boxes (provided in lab).

In the Lab

Each student will be assigned a microscope, and issued a pinning block, forceps, and an identification mount. Pins, unit trays, and Schmitt boxes will be available throughout the semester. Lab time will either be for collecting trips or insect preparation (mostly identifying). Pinning and labeling can also be done in lab, but these are easily done outside of lab and so students may not want to use their scope time to engage in activities that do not require a scope.

In addition to your curation duties, there will be one laboratory practical held in lab.

In the Field

During the first week of lab, each student will be issued a collecting net, vials, and a killing jar. The goal of each field trip is to extensively sample the habitat, and develop an understanding of the diversity and types of taxa in each ecosystem. Given the weather conditions in Vermont during autumn, it is likely that we will receive our first frost as early as October. After the first frost occurs many of the insects will disappear until spring. Keep in mind you must have a diverse insect collection by the end of the semester regardless of weather conditions. Therefore, it is strongly recommended that you spend additional time outside of lab collecting, especially during the early weeks of the semester.

Grading

Your collection is worth 150 points (see lecture syllabus). In order to get full credit for your collection, you must have 12 correctly identified orders, and 90 correctly identified families, as below:

Order	Number Collected
Diptera	15 unique families
Coleoptera	15 unique families
Hemiptera	15 unique families
Hymenoptera	15 unique families
Lepidoptera	8 unique families
Orthoptera	3 unique families
Odonata	4 unique families
Other Orders	15 unique families (from at least five unique orders not above)
Total	90 Families

You will be awarded two points per correctly identified order, and one point per correctly identified family. You will not incur point deductions for incorrectly identified specimens, but they will not be included in your final tally. Therefore, including more specimens than the minimum is strongly advised. Extra orders will not count toward your grade, but they will serve as a cushion in the event of misidentifications.

Diversity Credit

If you have multiple species in a single Family, those additional species will add 0.5 points to your score, with no denominator increase (that is, this is your extra credit). You can only get extra points for a single extra species per Family, and only for up to 20 extra species in 20 different Families (for up to 10 extra credit points).

Every specimen must have two labels: a locality label and a determination (= identification) label. Any submitted specimen that lacks either will not be counted (that is, all specimens must have both labels). The label must be printed in a font that lacks serifs, in 4 or 3 pt, using a lazer printer (not bubble- or deskjet). The format is as follows:

Locality label:

COUNTRY: <STATE>, <County>, <City>,
<area>, Elev. <elevation>, <coordinates>
IX-21-2009
Coll. <initials and last names of collectors>

Determination Label:

Order: <ordinal name>
Family: <familial name>
IX-29-2009
Det. <initials and last name of determiner>

Specimens must be organized by Order (and Family, if you have multiple species of the same family). Orders must be arranged from left to right, top to bottom, alphabetically. This component is worth 10 points. Specimens must also be pinned correctly for size and Order. This component is worth 20 points.

Merely turning in a box with even a single, correctly identified specimen is worth the remaining six points.

You *are permitted to trade* specimens with classmates, but you must correctly indicate the collector and determiner on the appropriate labels. Selling or stealing specimens will be treated as a violation of the Code of Academic Integrity.

Notebook

Each student is required to maintain a detailed collection notebook. This notebook must be a standard black and white composition notebook, available at the bookstore. For each week of collecting, the field site and date must be recorded, and specific details entered for every specimen you collect. Examples of specific details include, time of day, weather conditions, location of insect (on a leaf, in the soil), etc. Although you are not expected to immediately know the Family for each specimen you collect, once the specimen is identified, you must to go back to your notebook and update it with the Family name. Remember, the more details you record, the easier it will be to identify the specimen. Every specimen in your collection must have a corresponding entry in your field notebook. Each entry is worth one-half point, for up to 45 points. Turning in the notebook with any specimen data at all is worth five points. You will still be awarded the half-point, even if the relevant specimen is misidentified, but the specimen must appear in the submitted collection, and the notebook points will not exceed 45 points.

Collection	150 points
Notebook	50 points
Practical	100 points
Total	300 points (possible 310 with Diversity Credit)

Eating, drinking and chewing gum are not permitted in the lab.

Laboratory Schedule

For every outdoor laboratory session, you should come prepared with essential collecting equipment (net, vials, killing jar, zip lock bags, whirl packs pen, and notebook). In addition you should be prepared for weather conditions on that day. Wear proper field clothing such as long pants. long-sleeved shirts and closed-toed shoes. Many biting insects are attracted to dark colors, so wear pale-colored shirts.

Week	Laboratory
Sept 8	**Introduction to Insect Collecting, Preparation, and Identification**
Sept 15	**Field Trip 1 - Open Field Habitat (Centennial Woods)**

Collecting in the field habitat located in Centennial Woods on UVM campus. This field site is diverse and provides a great opportunity to develop collecting skills. Given the proximity to campus, it is strongly recommended that you spend extra time outside of lab collecting here.

Sept 22 **Field Trip 2 - Agricultural Habitat**

Corn field on Spear Street

Sept. 29 **Insect Identification and Preparation Lab I**

Oct 6 **Field Trip 3 - Lakeshore Habitat**

For this lab, we will sample the rocky and sandy shore of Lake Champlain around the beach.

Oct 13 **Field Trip 4 - Woodland Habitat**

For this lab, we will travel a few miles from campus, and explore the diversity of a woodland habitat in East Woods. Located here is a small stream, which will serve as an additional riparian zone.

Oct 20 **Field Trip 5 - Riparian Habitat**

For this lab, we will travel to the Winooski River, where you will collect in an upstream riparian habitat.

Oct 27 **Field Trip 6 – Bog Habitat**

If there is time, our last field trip will be to a bog outside of Burlington. Wear water-proof boot and appropriate clothes for this trip.

Nov 3 **Review for Practical, Insect Identification and Preparation Lab II**

Nov 10 **Review for Practical, Insect Identification and Preparation Lab IV**

Nov 17 **Review for Practical, Insect Identification and Preparation Lab V**

Nov 24 **Review for Practical, Insect Identification and Preparation Lab V**

Dec 1 **Practical**

Dec 8 **Collections Due**

Note: This schedule is subject to change.