

## **Insect Collection Requirements**

Each of you is responsible for assembling your own insect collection. Your insect collection will be evaluated based on a number of factors, generally including: 1) the number of families and orders, 2) the accuracy of identification, 3) the number of representatives and diversity of representatives in each family, 4) representation of certain ecological categories, 5) the quality of pinning and labelling, and 6) overall presentation. Specifically, you should use the following guidelines.

### **Number of families and orders**

Your collection should include insects belonging to 60 families, coming from at least 15 orders (see list of orders and families you are likely to encounter). Each order in your collection should be designated by a separate label, and each family within an order should also be designated by a separate label. Credit will only be given for accurately-identified insects. Partial credit will be given for fewer families or orders than the minimum. If you feel like including greater diversity than this, feel free. I'll consider such extra work when assigning course grades.

### **Representation and diversity within families**

For adequate representation of the diversity within families you include in your collection, a minimum of ten families should be represented by at least 5 specimens and at least 5 species. Again, partial credit will be given.

### **Ecological representation**

Insects belonging to each of the following 12 ecological categories should be represented and clearly designated with a separate label (select one representative for each category). For situations in which the ecological category of an insect cannot be determined from the family to which the insect belongs, you must categorize the insect based on your observations of that insect.

Herbivores:

- Leaf chewer
- Sap tapper
- Galler
- Leaf miner
- Wood borer

Predator

Parasite of Animals (external feeder)

Parasitoid

Terrestrial Scavenger/Detritivore

Fungivore

Aquatic predator

Aquatic detritivore

## **Pinning and alcohol preservation**

Insects in your collection should be either pinned or preserved in alcohol, as appropriate for the particular type of insect. If they are pinned, they should be pinned properly, following standards regarding the height of the insect on the pin, the angle of the pin through the insect, and the location of pin insertion. Furthermore, the wings of butterflies and moths should be spread as shown in your lab text. Pins should be inserted firmly in the pinning surface of the box. Avoid including insects that are broken and/or are missing body parts.

## **Labelling**

All specimens in the collection should be labelled neatly, using labels printed either with type (word processing programs work well for this) or with a fine-point permanent ink pen. Labels should include the locality and date, as well as the collector. The height of the label(s) on the pin should follow standard procedure (use the pinning block). For pinned specimens, labels should be printed on card-stock paper, and they should be small (ideally < 15mm x 10mm), and uniform in size. Labels for alcohol-preserved specimens should be larger, and may be printed on standard white paper, but care should be taken to ensure that the ink used for the label does not run in alcohol.

## **Overall Presentation**

The collection should be arranged with the heads of all specimens pointing toward the hinge of the box, and with the labels oriented to be read by a person holding the box with the hinge away from their body. Arrange the collection using four to six columns per box, beginning in the upper left hand corner of the box, and proceeding to the lower right hand corner. Specimens should be arranged phylogenetically, with the more evolutionarily basal orders (e.g. Odonata, Ephemeroptera) coming first, followed by the more recent orders (e.g. Coleoptera, Diptera).

## **Orders and families you are likely to encounter, with luck & persistence!**

<b>Archaeognatha (=Microcoryphia)</b> (jumping bristletails)	Stenopelmatidae
Machilidae	Raphidiphoridae
Meinertellidae	Gryllidae
	Prophalangopsidae (= Haglidae)
<b>Zygentoma (=Thysanura)</b> (silverfish)	<b>Blattaria</b> (roaches)
Lepismatidae	Blattidae
	Blattellidae
<b>Ephemeroptera</b> (mayflies)	<b>Mantodea</b> (mantids)
Ephemeridae	Mantidae
Baetidae	
Heptageniidae	<b>Isoptera</b> (termites)
Ephemerellidae	Rhinotermitidae
Leptophlebiidae	Termopsidae (= Hodotermitidae)
Siphonuridae	<b>Dermaptera</b> (earwigs)
<b>Odonata</b> (dragonflies and damselflies)	Forficulidae
Coenagrionidae	Anisolabididae
Aeshnidae	<b>Grylloblattodea</b> (rock crawlers)
Libellulidae	Grylloblattidae
<b>Orthoptera</b> (grasshoppers, katydids, and crickets)	<b>Plecoptera</b> (stoneflies)
Tetrigidae	Nemouridae
Acrididae	Taeniopterygidae
Tettigoniidae	<b>Plecoptera</b> (stoneflies) (cont'd)
	Leuctridae

Capniidae  
 Perlidae  
 Perlodidae  
 Peltoperlidae  
 Chloroperlidae  
 Pteronarcyidae  
**Psocoptera** (booklice)  
 Liposcelidae  
 Psocidae  
**Hemiptera** (incl. Heteroptera and Homoptera)  
 (bugs, cicadas, leafhoppers, aphids, etc.)  
 Nepidae  
 Belostomatidae  
 Corixidae  
 Gelastocoridae  
 Notonectidae  
 Gerridae  
 Saldidae  
 Tingidae  
 Miridae  
 Nabidae  
 Anthocoridae  
 Reduviidae (incl. Phymatidae)  
 Aradidae  
 Berytidae  
 Rhyparochromidae  
 Lygaeidae  
 Coreidae  
 Alydidae  
 Rhopalidae  
 Scutelleridae  
 Pentatomidae  
 Acanthostomatidae  
 Cicadidae  
 Membracidae  
 Cercopidae  
 Cicadellidae  
 Aleyrodidae  
 Aphididae (incl. Eriosomatidae)  
 Adelgidae  
 Diaspididae  
 Pseudococcidae  
 Ortheziidae  
 Coccidae  
**Thysanoptera** (thrips)  
 Aeolothripidae  
 Heterothripidae  
 Thripidae  
 Phlaeothripidae  
**Neuroptera** (lacewings, antlions)  
 Hemerobiidae  
 Chrysopidae  
 Myrmeleontidae  
 Coniopterygidae  
**Megaloptera** (alderflies, dobsonflies)  
 Sialidae  
 Corydalidae  
**Raphidioptera** (snakeflies)

Raphidiidae  
 Inocellidae  
**Coleoptera** (beetles)  
 Carabidae (incl. Cicindelidae)  
 Haliplidae  
 Dytiscidae  
 Gyrinidae  
 Agryrtidae  
 Silphidae  
 Staphylinidae  
 Hydrophilidae  
 Lucanidae  
 Scarabaeidae  
 Pleocomidae (formerly Scarabaeidae)  
 Geotrupidae (formerly Scarabaeidae)  
 Hybosoridae (formerly Scarabaeidae)  
 Buprestidae  
 Elmidae  
 Elateridae  
 Lycidae  
 Lampyridae  
 Cantharidae  
 Dermestidae  
 Melyridae  
 Cleridae  
 Nitidulidae  
 Cucujidae  
 Coccinellidae  
 Mordellidae  
 Tenebrionidae  
 Meloidae  
 Oedemeridae  
 Cerambycidae  
 Chrysomelidae  
 Curculionidae (incl. Scolytidae)  
 Atteblabidae (= Rhynchitidae)  
**Diptera** (flies)  
 Tipulidae  
 Blepharoceridae  
 Bibionidae  
 Cecidomyiidae  
 Mycetophilidae  
 Psychodidae  
 Dixidae  
 Chaoboridae  
 Culicidae  
 Dixidae  
 Simuliidae  
 Ceratopogonidae  
 Chironomidae  
 Tabanidae  
 Rhagionidae  
**Diptera** (flies) (cont'd)  
 Asilidae  
 Bombyliidae  
 Empididae  
 Dolichopodidae  
 Syrphidae

Tephritidae  
Sciomyzidae  
Drosophilidae  
Chloropidae  
Anthomyiidae  
Faniidae  
Muscidae  
Calliphoridae  
Sarcophagidae  
Tachinidae  
**Siphonaptera** (fleas)  
Pulicidae  
**Trichoptera** (caddisflies)  
Hydropsychidae  
Philopotamidae  
Polycentropodidae  
Glossosomatidae  
Hydroptilidae  
Rhyacophilidae  
Phryganeidae  
Glossosomatidae  
Hydropsychidae  
Limnephilidae  
**Lepidoptera** (moths, butterflies)  
Tortricidae  
Pterophoridae  
Pyralidae  
Crambidae  
Hesperiidae  
Papilionidae  
Pieridae  
Lycaenidae  
Nymphalidae (incl. Satyridae,  
Danaidae)  
Drepanidae  
Geometridae  
Lasiocampidae  
Saturniidae  
Sphingidae  
Notodontidae  
Lymantriidae  
Arctiidae  
Noctuidae  
**Hymenoptera** (sawflies, wasps, ants, bees)  
Cimbicidae  
Tenthredinidae  
Cepidae  
Siricidae  
Braconidae  
Ichneumonidae  
Cynipidae  
Chrysididae  
Sphecidae  
Colletidae  
Halictidae  
Andrenidae  
Megachilidae  
Apidae (incl. 'Anthophoridae')

Mutillidae  
Pompilidae  
Vespidae  
Formicidae