

BIO 353: Entomology

Insect Collection Requirements: Fall 2002

Two Primary Goals of the Insect Collection are:

1. Teach you about the diversity of Insects, their habitats and biology.
2. Teach you the proper way to collect, mount, preserve, label, identify and classify arthropods.

You will learn how to make a proper collection at the professional level that can be incorporated into museum collections used by other entomologists. The collection is worth 50% of your lab grade, 25% of your entire grade for the class. It will require a considerable amount of time outside of class to complete this project. You must begin collecting early and collect in a diversity of habitats. It will get too cold to collect at the end of the semester when you will discover many of your insects belong to the same family! Ask me questions throughout the semester and bring your collections to me to insure you are collecting enough diversity to fulfill the collection requirements. Steadily working on your collection throughout the semester will better prepare you for lab exams and will allow you to easily finish your collection on time.

Different authors follow different taxonomy, and we must have at a point of reference, therefore, all taxonomy must follow your BTJ text - always defer to this text and double check it for family names. A few taxa on the "Required Taxonomy" handout are listed only to the superfamily level. In those cases, superfamily will be accepted as family.

Minimum Requirements equal a total of 250 points. This represents 100% on the collection score. Extra credit is possible, see below.

Breakdown of requirements:

5 different non-Hexapod Arthropods required, each worth 3 points: **total 15 points**

18 Hexapod orders required, each worth 5 pts: **total 90 points**

65 Hexapod families required, each worth 2 pts: **total 130 points**

3 Hexapod larval types required, each worth 3 pts: **total 6 points**

2 Hexapod pupal types required, each worth 3 pts: **total 9 points**

You can earn points for properly identified families and orders in ways other than what is shown above. For example: 16 orders plus 70 families = 220 pts OR 20 Orders plus 60 families = 220 pts. **You can also earn up to 25 extra credit points for going above and beyond the minimal requirements.**

Non-Hexapod Arthropods

Identify your specimens to the level on the "Required Taxonomy" handout. You may identify them further to receive more credit. Example: you collect 2 spiders that you identified to order (Araneae), but you will only receive credit for 1 representative. However, if you correctly identify these two spiders to family, then you will receive credit for 2 different representatives of the order, as long as the specimens are correctly and properly labeled at both the order and family level. Your collection can have a maximum of 3 spider families.

Hexapoda

*****You must identify all Hexapoda to the order level, this includes larvae and pupae.** Specimens are not restricted to adult forms. You may use larvae, pupae, or subimagos but they must be properly identified. You do NOT have to identify all Hexapoda in your collection to family level, only those hexapods identified to family will receive family credit, but they can also receive order credit. Ex: you collect a honey bee and a sweat bee, both belonging to the order Hymenoptera, but to different families. If you include both specimens under a "Hymenoptera" label, you will receive 5 pts. for order credit. If you correctly identify and label them to family (Apidae and Halictidae) under the Hymenoptera label, you will receive 9 pts (1 order, 2 families).

You may also identify specimens further to obtain credit at the family level. That is, you may identify specimens of a family to subfamily and/or genus and receive more family credit. For example, you have 3 ants representing the order Hymenoptera, family Formicidae, genera *Pogonomyrmex*, *Solenopsis*, and *Crematogaster* all properly identified and labeled, you will receive credit for 3 families instead of one! However, there are some additional rules to ensure you learn about insect diversity:

1. You must have a different specimen for each taxonomic subunit, and family determinations must be correct.
2. When identifying specimens below family level, all specimens in that family must be identified below family level. Extra credit will not be given for one family level specimen and one subfamily (or genus) level specimen because this does not demonstrate your study of insect diversity. You can only get credit for two (or three) specimens if they are from different subfamilies/genera or are determined to subfamily and genus respectively. This means you only get credit for additional specimens if they represent within family diversity.
3. You can only submit two specimens of the same "morpho-species" (those that look like they are from the same species) identified to subfamily and genus respectively. Rules 2 and 3 together mean you cannot get credit for three identical specimens, one identified only to family, the second to subfamily and third to genus. However, you can get credit for two identical specimens, one identified to subfamily and the other to genus.
4. For each family, I will only award credit for 3 correctly determined specimens below the family level (three specimens from different subfamilies/genera or a combination of different subfamilies and genera). Also note that the maximum extra credit is 25 pts.

Larvae and pupae requirements

You are required to turn in at least 3 different types of larvae (eruciform, elataeriform, campodaeiform, etc.) and 2 pupal types (obtect, coarctate, or exarate) properly classified and identified to order. Larvae and pupae identified beyond these requirements to family will be properly credited. You can rear adults from larvae and pupae and receive credit for the pupal type and the adult as long as both are in your collection, properly classified.

Diversity, Mounting and Arrangement Requirements

These requirements have no point value, but must be included within the previously mentioned taxonomic requirements. You will indicate them by your locality labels AND in your field notebook. Deductions equivalent to “order” will be given if they are not included (up to 45 pts).

-5 aquatic specimens (fresh or marine)

-5 subterranean specimens (in soil, under rocks, in caves)

-5 vegetative specimens (found on/in a plant is what I want- herbivore, leaf miner, stem borers, galls, etc.)

-3 primarily aerial specimens-you catch in flight (examples: butterfly, dragonfly adult)

-3 parasites (please indicate host on label and in notebook, can also include host in collection)

-10 point mounted specimens

-2 slide mounted specimens

-5 spread specimens

-Specimens from 5 distinct places. For example: Pedernales Falls, B.F.L., Camp Swift, Stengl Lost Pines Station; NOT BFL Pond F, BFL Pond E, Boat house at BFL - I want you going to a diversity of places!)

Other Credit Deductions:

- No Notebook=15 pts deducted
- Dishonest labels= F grade- all points deducted to a failing grade. Never print wrong information on a label. Correct information is priceless data. Your specimens will be used by entomologists in the future. Incorrect information on any label is grounds for failing an entire collection.
- Improper labels= no credit for specimen, no other deduction
- Improper Preservation= no credit, but no deduction (Ex. If you pin a spider, you will not receive credit even if you identified it properly- I won't even look at it.)
- Misidentifications: All specimens in a taxon no credit for taxon. One or more, but not all in a taxon 2.5 pts/specimen at the order level 0.5 pt/specimen at the family level (note: A common error in collections has been to properly identify a specimen to family, but then place it under the wrong order heading. Some hemipterans look like ants, some look like beetles, some dipterans look like hymenopterans. Mimicry is rampant in the insect world! Don't be fooled.)
- Specimen Arrangement: Specimens must be displayed under identification labels in columns (vertically), with all specimens of the same order under one “order” label and all specimens of the same family under one “Family” label. Order and family labels are pinned to the bottom of the box. Do not place family or order identification labels on the specimens' pins. Only “determination “ labels with identification to genus are allowed on the specimens' pin other than the locality label. An example of the arrangement is available for you to look at. Examples of the WRONG things to do will also be provided. Labels on pinned and alcohol specimens must be of proper size and shape following the labeling handout. Alcohol specimens can be arranged in unit trays provided or turned in contained in ziplock bags or small boxes. Again, examples will be provided, and please bring your collection to me throughout the semester to have it checked.

Pest Control & Collection Safety

Bugs eat bugs and dead bugs are sitting ducks for pests such as ants and dermestid beetles. Do not leave your collection outside and be aware that ants will get into specimen boxes left on the laboratory benches. Also be careful leaving your specimens unguarded in your apartments/houses as ants commonly get into collection boxes. Work in or at least check your collection often. Protect your collection by using chemicals available in lab. Prevent specimen damaged by fixing fumigants in small containers to the foam in your collection boxes. Try to minimize transport of specimens and never put alcohol specimens in your insect box with pinned specimens.

Final Arrangements & Returning Equipment

If you want to keep your collection at the end of the semester, you must indicate that desire to me when you turn it in. You will have an opportunity to retrieve your collection after the class final. Collections left after the final will be broken down and assimilated into the teaching collections. Before you pick up your collection purchase insect boxes from: bioquip.com

You must return ALL equipment at the end of the semester with your collections. Your collection will not be accepted until all equipment is returned and if you do not return your equipment, you will be given an incomplete in the class until you return or replace it.