

BSPM 423/523

Advanced Evolution and Classification of Insects

Fall 2013

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Lecture: 8:00-8:50 am MW (E008 PLSCI)

Lab: 3:00-4:40 pm MW (E008 PLSCI)

Objectives

Principles of systematic entomology, speciation, phylogeny, and evolution; modern techniques in insect taxonomy; description, illustration of insects and preparation of identification keys; phylogeny, classification and biology of the orders of North American insects; non-insect arthropods; use of identification keys for adults; major sources of literature. A collection of adult insects is required.

Texts and Special Teaching Aids

Required Text:

Triplehorn, C. A. and N.E Johnson. 2005. Borror and Delong's An introduction to the Study of Insects. 7th Edition. Thomson Brooks/Cole. Belmont, CA.

Reference Texts:

- Arnett, R.H., Jr. American Insects. 2nd Edition. CRC Press, Boca Raton, Florida. 2000.
- Grimaldi, D. and M. S. Engel. Evolution of Insects. Cambridge University Press. 2005.
- Mayr, E. and P.D. Ashlock. Principles of Systematic Zoology. 2nd Ed. New York, NY. McGraw-Hill. 1991. 475pp.
- Merritt, R.W. et al. 2008. An Introduction to the Aquatic Insects of North America. 4th Ed. Dubuque, IA. Kendal Hunt Publishing Co., Dubuque, Iowa
- Resh, V. H. and R. T. Carde. Encyclopedia of Insects. 2nd Edition. Academic Press. Elsevier Science, Amsterdam. 2009.

SYLLABUS - LECTURE

1. Introduction; history of systematic entomology.
2. Taxonomic categories; criteria of species; old and new species concepts.
3. Intraspecific categories; classification of higher taxonomic categories.
4. Types of insect collections; identification procedures.
5. Taxonomic characters and procedures.
6. Morphological description of an insect.
7. Preparation of keys and illustrations.
8. International Code of Zoological Nomenclature (ICZN) Part I.
9. ICZN Part II. Code of Ethics.
10. Role of natural selection in evolution. Factors influencing the effectiveness of selection.
11. Geological time table and arthropods. Geological history of insects. Fossil records.
12. Different concepts on the phylogeny of arthropods and insects.
13. Others. Major faunal regions of the world.
14. Phylum Arthropoda
15. Review of the orders

Revision of a Selected Group of Insects

Pick a group of insects (a genus, a tribe or subfamily) which includes at least 10 named species. This group should be well represented in the C. P. Gillette Museum of Arthropod Diversity. The Curator will assist you (make individual appointments). Pick a group you like!

Brief summary of procedures (review past revisions of similar groups):

- 1) Literature review (become familiar with the taxonomic history of your group, previous work, etc.)
- 2) Examination and sorting of available material
- 3) Delimitation of species
- 4) Descriptions*, illustrations, preparation of keys

* Redescribe one taxon completely as per you group (style).

Insect Collection

10% of this course is an insect collection. Each person will turn in a collection. The collection must include the following taxa:

Collembola	2 families
Thysanura	order
Ephemeroptera	1 families
Odonata	2 families
Orthoptera	5 families
Dermaptera	1 family
Isoptera	1 family
Plecoptera	2 families

Psocoptera	1 family
Mallophaga/Anoplura	order
Thysanoptera	1 family
Hemiptera	5 families
Homoptera	5 families
Neuroptera	2 families
Coleoptera	12 families
Hymenoptera	10 families
Trichoptera	3 families
Lepidoptera	8 families
Diptera	12 families
*Siphonaptera	order

Organization, diversity, effort, and proper techniques will be important.

* Special Credit