Biology 337   **College of Charleston**
Biology of Invertebrates   **Dr. Bob Podolsky**

1. CLASSIFICATION and PHYLOGENY: thinking in hierarchies and trees

"Crude classifications and false generalizations are the curse of organized life."

--George Bernard Shaw

MAJOR THEMES	Habitats and functional traits
Distinct animal body plans	Taxonomy vs. phylogeny
Levels of species diversity	Human biases in classification
Diverse goals of classification	Course components and expectations

TOP 'TEN' areas to explore and appreciate about classification:

9. Evolution has resulted in a number of radically different ways to build an animal
8. Body plans represent different integrated solutions to similar biological problems
7. The "invertebrates" are named for feature they lack that is present in a minority of animals
6. The "invertebrates" are not an evolutionary clade
5. The value of a given classification scheme depends on its purpose
4. Organisms can be classified by habitat, function, phenotype, rarity, evolutionary history, etc.
3. Classification schemes are naturally hierarchical
2. An evolutionary classification is useful because it is predictive and "unique"
1. Cladistics provide a systematic way to deduce evolutionary relationships (phylogenies)

GOALS

By the end of this lecture and associated reading, you should be able to:

- state the approximate number of animal phyla and describe generally how species are distributed among phyla, naming some of the most species-rich phyla
- explain what is meant by a "body plan" and how differences in body plan generally relate to differences in taxonomic level
- identify different kinds of characteristics that could be used to group and classify animals
- explain why classifications based on evolutionary relationships are different from those based on other types of information
- deduce the best supported hypothesis (= phylogeny) for evolutionary relationships among a set of taxa using shared, derived characters
- explain why taxonomic categories that correspond to nested degrees of relatedness are most useful to biologists
- describe the suite of developmental features involving cells and tissues that indicate an early evolutionary divergence of protostomes from deuterostomes
- explain why "invertebrate" is not an evolutionarily acceptable classification for the animals considered in this course
- understand expectations about course material, graded assignments, and exam policies