

PREFACE AND INTRODUCTION TO TAXONOMY

The activities in this manual are designed to complement and reinforce the material you will learn in the lecture portion of this course. The first half of the labs provides an overview of living organisms and their taxonomy, and the remaining exercises focus on the comparative physiology of many of the animal groups studied in the first half.

In the 1700s, Linnaeus devised the hierarchical system of classification we still use today. In the simplest version of this system, the taxonomic categories are, from the broadest to the most specific:

- Domain
- Kingdom
- Phylum
- Class
- Order
- Family
- Genus
- Species

Other categories such as "subphylum" or "superorder" are sometimes used as well. The genus and species of an organism comprise its scientific name; for example, *Homo sapiens* is the scientific name for a human and *Carcharodon carcharias* is the scientific name for the great white shark. The genus name comes first and is capitalized, and both names are in Latin and are italicized. To note here is the difference between the terms taxonomic category and taxon (pl. = taxa). Taxonomic categories are the list above (domain through species). A taxon is a specific category name. For example, sharks are in the class Chondrichthyes; "class" is the taxonomic category, and "Chondrichthyes" is the taxon.

As will be mentioned throughout the semester, taxonomy is dynamic. The classification of some groups, such as the protists, has been a source of debate among taxonomists for years. As scientists began using molecular techniques to investigate the relatedness of organisms, new possible evolutionary relationships began to emerge: for example, organisms previously thought of as being somewhat unrelated (or distantly related) were shown to have very similar DNA sequences for the genes studied. As a result, phylogenetic trees were rearranged and they continue to be reconstructed as more data are collected. The taxonomy of organisms is an ongoing project, and it is possible to see different classifications of the same organism in different sources. For lab this semester, you should refer to the classification discussed in lecture and in your textbook.

Because of the dynamic nature of taxonomy, especially in certain groups, this manual presents taxon names only for those organisms/groups whose classification remains somewhat consistent from one source to another. For other organisms, the common names are provided and you should consult your textbook and lecture notes for the formal taxa to learn.