Taxonomic Classification

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Biology 435: Entomology

Taxonomic Classification Isn't Always Easy: The purpose of this paper is to familiarize you with some of the subjective elements of how animals are classified, particularly at the higher order (i.e. families, orders, subphyla). A survey of entomology and zoology texts reveals substantial variation in the number and inclusiveness of insect orders recognized. One particular area of controversy is the relation of the primitively wingless (apterygote) to each other and other insect orders. Some authors believe they are polyphyletic and different enough from insects for each to be elevated to the rank of class. Your assignment is to analyze the evidence for and against inclusion of the apterygotes (particularly Protura, Collembola, Diplura) in the class Insecta or not, based on their differences from Pterygote (winged) insect orders. Your discussion should include descriptions of the life habits, types of metamorphosis and morphological characteristics of the apterygotes, but the main focus should be on evaluating arguments for or against including the apterygotes in the Class Insecta. Pretend that you are revising a 1970 textbook, and you need to justify to your readers why you treat these orders the way you do. Note that in order to best introduce your audience to the controversy, you may need to explain how a systematic hierarchy is constructed and what constitutes a "class" versus an "order" (for example, differences between insects and chilopods compared to the difference between a grasshopper and a dragonfly). Why taxonomists are sometimes categorized as "splitters" or "lumpers" and how might this affect their classification? Why is there so much emphasis on mouthparts, or patterns of development, in classifying insect groups? Your paper should be between 2-5 pages, typed (double-spaced), and fully edited. Use text (pp.340-347) as your main reference for Apterygote and Pterygote characteristics. Ch. 11 (pp.318-323) contain a useful discussion of systematics and biological classification. Be prepared for the possibility of exchanging your paper with other students in class.