Microarthropod Variation and Taxonomy

Introduction

This activity allows students to gain experience in arthropod classification using dichotomous keys. Specimens for this activity should be collected using Berlese funnel methodology outlined in the previous activity, Microarthropod Collection and Examination. Most organism classification keys are dichotomous, they consider only two possibilities at a time. Dichotomous keys are arranged as series of couplets by which the user matches paired sets of individual characteristics to the specimen at hand. You always begin at the first set of characteristics and decide which of the two described characteristics best describes the specimen you are observing. Each characteristic is followed by a number. You then proceed to the couplet with the number of the last determined trait. You continue doing this until you come to a trait that is followed by a name rather than a number. This is the name of the taxonomic group to which you have classified the organism. One advantage of classification keys over simple descriptions is that classification keys tell you not only what the organism is, they tell you what it is not.

Activity Instructions

A. Internet Search Component

Begin by finding an appropriate online classification key. Probably the simplest key to examination of microarthropods is one developed by Dr. John R. Meyer at North Carolina State University. Note that his key, entitled "Kwik-Key to Soil-Dwelling Invertebrates," is not a dichotomous key. You may want to perform an Internet search to find a different arthropod classification key. Try using keywords/phrases such as "microarthropod", "microarthropod classification", "arthropod classification key", etc.

B. Observation of Specimens

Closely examine your collection jar, as well as a number of small light colored specimens at the surface of the ethanol. Pour a small amount of ethanol into a petri dish, filling it to about 2/3 its height. Place the dish on the stage of a binocular microscope for examination. After initial examination you may want to place different colored construction paper between the petri dish and the microscope stage since light colored organisms show up best against a dark background, while darker organisms show up best against a white background. Sketch and try identifying several specimens using the "Kwik-Key to Soil-Dwelling Invertebrates" or an online key of your choice. Label characteristics used in your identification and/or briefly explain how you went about identifying your selected organisms.

C. Web-based In Depth Study of a Selected Arthropod Order

Once you have several specimens and classified them using an online classification key, perform a web search using the scientific or common name of the arthropod specimen you found most interesting. Write a brief description of the order (including scientific and common names), typical habitat, ecological role(s),

morphological (structural) variations within the order, impact on humans (if any) and any other information (e.g. behaviors, method of reproduction) you find interesting. This information may be written up as a single page or a web page with links to your sources, depending upon your school's resources and student access to computers.

Proceed to Teacher's Guide to Microarthropod Variation and Taxonomy

Proceed to Quantitative Study of Arthropod Ecology

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