

The Pit Trap as a Device for Determining Surface Inhabiting Arthropod Populations

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The pit trap consists of any wide-mouth jar, preferably a one-half pint glass Mason fruit canning jar, set in the soil of the area to be sampled so that the top of the jar is flush with the surrounding soil surface which has been leveled and firmed around the trap opening. Before being placed in position each jar should be filled to a depth of approximately one inch with water which contains a teaspoonful of 40 percent formalin and a pinch of some detergent. It is best not to remove the covers of the jars until after they are in place so as to avoid contamination with soil or other debris.

The number of jars per location is optional but I prefer four set in a quadrangle about three feet apart. The duration of exposure can be varied. Some evaporation will take place in hot weather, however, I find that a 48-hour period is very satisfactory. The interval between exposures can be varied but a weekly record gives a good picture of the soil surface arthropod population. For determining night activity versus that taking place during the daylight hours, the jar covers can be removed and screwed back on according to the time when a record is to be made. Unless the jars are in a depression which floods, ordinary summer showers do not cause overflowing.

These pit traps have proved excellent for measuring populations of Collembola and mites. They are superior to soil surface trash processing by Berlese funnels in that the period of sampling is longer. On the other hand if one can make only one trip to a station then the Berlese funnel method is the answer. The trap appears to be a better method for taking certain extremely small species of Collembola and delicate mites which would rarely be recovered by the Berlese funnel. In comparative studies with sweeping with a net it was found that a greater number of species of Carabidae were taken along with their larvae. Also taken in the trap and never collected in the net were beetles in the family pselaphidae, a species of cicindelid beetle, *Tetracha virginica*, and certain dipterous larvae. Very small Diptera such as the Phoridae are taken more frequently in the traps and are in much better condition for examining and mounting than when taken in a sweep net. This also applied to the minute parasitic Hymenoptera which could be found in such locations. Many other species of insects in different orders are trapped in about the same proportions as they would be taken in the sweep net. Spiders are represented in the collections and are the same species as would be taken in a sweep net except that the *Lycosa* spiders are much better represented.