78-550 Fieldmaster Berlese Apparatus

Warranty and Parts:

We replace all defective or missing parts free of charge. Additional replacement parts may be ordered toll-free. We accept MasterCard, Visa, checks and School P.O.s. All products warranted to be free from defect for 90 days. Does not apply to accident, misuse or normal wear and tear. Intended for children 13 years of age and up. This item is not a toy. It may contain small parts that can be choking hazards. Adult supervision is required.

Introduction:

The Berlese Apparatus is used to extract soil-dwelling insects and other arthropods (spiders, millipedes, etc.) from samples of soil or leaf litter. This is an excellent method for studying micro-ecosystems.

Collection:

In the field, gently collect soil, compost, mulch or leaf litter samples using a trowel or shovel. Mark off a circle or square for sampling if you want to attempt quantitative studies. Moist samples to a depth of 10cm will yield the best results. Collect approximately 3 cm of soil below leaf litter, then place the samples in a plastic bag or covered pails for transport to the lab. If you take more than one sample, label the bags with information from the collection sites. They can be kept in a cool place overnight, but some organisms may die and will not be collected in the jar.

Extraction:

Set up the Berlese Apparatus in a place where it won't get jostled (this may cause soil to fall into the collecting jar). Put the soil or leaf litter sample into the funnel.

Place the jar under the funnel. Fill it with 2-3 cm of 95% ethyl alcohol if you wish to preserve the organisms immediately. If you want to keep them dry or keep them alive, place the funnel directly onto the mouth of the bottle so the organisms can't get out. You can remove the funnel from the stand by unscrewing the nut (screw it back in so you don't lose it in the field).

Attach the lamp to the top of the wooden stand so the bottom of the hood is about 15 cm away from the top of the funnel. You can adjust the distance depending on the ambient temperature, but be careful not to get too close. so you don't kill the organisms and possibly start a fire. Make sure you use a 40-watt incandescent light bulb. Fluorescent bulbs do not give off enough heat. Bulbs above 40 watts will more likely kill the insects than cause them to move away.

Once the light is turned on, a gradient of temperature and humidity will be established in the sample. This will cause the organisms to move downward through the soil sample towards the bottom of the funnel. (You can gently remove the top layers as they dry. This may speed up the extraction process, but you may also knock soil into the sample bottle.) Extraction of organisms may take 24 to 48 hours. For quantitative studies, it is best to wait 48 or more hours.

Please note that all organisms may not be collected in the jar because the heat or dryness produced by the light bulb may kill a few organisms before they reach the bottom of the funnel.

The collecting jar may be replaced with an "insect killing jar". It has a cartridge attached to the cap for holding a chemical agent such as carbon tetrachloride or ethyl acetate (nail polish remover). This can be used to kill the insects in the dry state so they can be mounted. After the organisms are collected, drop a small amount of the killing agent onto the cartridge and place the lid on the jar.

After extraction:

You will normally find a large variety of organisms in the sample jar. Mites, worms, centipedes, millipedes, beetles, and springtails are common. Identify the organisms using dichotomous keys and field guides. Microscopically examine the organisms with bug boxes, magnifying glasses or dissecting microscopes. Place white or black paper under a Petri dish to enhance observations of dark or light organisms.

This activity is an excellent prelude to studies of soil ecology, biodiversity, types of soil invertebrates, the effects of invertebrates on the soil, micro-ecosystems and communities, taxonomy, classification, comparisons of habitats, agricultural studies, and scientific method. Berlese extraction usually yields a number of different species, demonstrating the large range of biodiversity found in even a very small ecosystem.

Suggested activities:

- Compare the organisms and classify them according to similar characteristics.
- Learn how to use dichotomous keys and field guides.
- Compare results from various ecosystems such as a farm, a forest and a backyard.
- Make a sketch of an organism, labeling its major parts.
- Learn how to mount the organisms, labeling them properly.
- Search the internet for information on the organisms.

Note: The Berlese apparatus is often used to detect and identify small organisms in field crops and grains. alibrate the organisms by infusing a measured sample with known quantities of adult and larval forms of insect species.

Additional materials needed in the field:

Small shovels or trowels; small garbage bags or pails for leaf litter; ethyl alcohol; collapsible sampling square (quadrat)

Additional materials needed in the lab:

Dissecting Microscope; Petri dish; white tray or white paper; clear ruler dichotomous key to insects; insect identification field guide; magnifying lens; bug boxes; insect killing jar

Visit us online at:
www.sciencefirst.com
or our research division
www.wildco.com

P/N 24-78550