

Earthworm Collecting Procedures

Author: B. A. Snyder; July 2010

Earthworms live in soil and leaf litter. They require moisture to survive and can be found in most terrestrial and semi-aquatic habitats (including edges of rivers and ponds). To collect earthworms, they must be extracted from their habitat in some way. Although other extraction methods exist, I recommend the following for middle and high school classrooms.

Collection Data - THIS IS VERY IMPORTANT

All earthworms collected and preserved **must have a collection label** with them - this contains information about where, when, and by whom the earthworm was collected. These data make the specimen useful for scientific purposes indefinitely. *Earthworms Across Kansas* kits contain specially prepared fill-in-the-blank labels on museum-quality (archival) paper and also contain pencils. **Fill-in labels only in pencil. Pen, inkjet, and other printing methods will wash away.** At minimum, labels need a state, county and date, but the more information a label has, the more useful it is in the future. Include on your label the following information, in this format:

State: County: City (if applicable) Location (as specific as possible) Date (write out month) Method of collecting (optional) Name(s) of collector(s)

Here are some examples:

KS: Riley Co.: Manhattan Outside Ackert Hall, KSU campus 4 May 2010 Hand coll. Coll: B.A.Snyder

KS: Riley Co. Konza Prairie Biological Station, 100 m north of manager's residence 39° 6'2.71"N, 96°36'25.92"W 22 Oct 1981 Coll: SW James

Digging method

This is the most reliable way of finding earthworms: if there is an earthworm in the volume of soil you examine, you will find it. Dig a small hole (a standard size is 12" x 12" x 6-12" deep; 30cm x 30cm x 15-30cm deep; or slightly larger than the size of a basketball) and place the soil onto a tarp, plastic sheet, or into a container. Go through the soil by hand, gently breaking clumps of soil into small pieces, removing earthworms as they are found. Do not crush pieces of soil: they may contain living things!

If you are keeping earthworms alive for students to observe for more than a few minutes, you can put them into a container with wet paper towels or a shallow dish or tray of water. This will prevent the earthworms from drying out. Watch to make sure they don't escape! Return all soil and organisms (except earthworms) to the hole when you are finished. Earthworms should promptly be put into collection containers with preservation fluid and a label describing the collection location (see above). Earthworms that are not preserved properly will decompose rapidly and produce significant odor.

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Mustard extraction method

It is possible to use chemicals to extract earthworms from soil. These all function by irritating the earthworm and a common response is to come to the surface. This does not work equally for all species of earthworms or work equally well for all chemicals. A solution of hot (spicy) mustard in water works well and is easy to prepare. There are many brands of mustard and recipes for the mustard extraction solution. These are coarse guidelines and you can experiment on your own to determine the best recipe for your area.

- Mix a small quantity of mustard powder (2 tbsp - 1/3 cup) or prepared mustard (1-2 tbsp or more) into a container of water (1/2-2 gallons).
- Mix thoroughly.
- Choose a location to collect earthworms. If possible, construct a shallow metal frame (a few inches high, one foot square) and push this into the ground. It will help the solution to drain into the soil you are sampling.
- Slowly pour one-third of the solution into the ground.
- Wait a few minutes and collect all earthworms that come to the surface.
- Repeat this two more times.

If you are keeping earthworms alive for students to observe for more than a few minutes, you can put them into a shallow dish or tray of water. This will prevent the earthworms from drying out and allow the mustard to wash away. Watch to make sure they don't escape! Earthworms should promptly be put into collection containers with preservation fluid and a label describing the collection location (see above). Earthworms that are not preserved properly will decompose rapidly and produce significant odor.