

Branch Beating for Caterpillar and other Insects Collection

Many arthropods, such as spiders live on the branches of trees in our yards. You can assess the relative abundance of mobile tree-dwelling arthropods in a study site in your yard compare it to at least one other yard. You can see how the abundance of arthropods might be related to the abundance of birds in gardens.

What are Arthropods?

Arthropods are joint-legged animals with segmented bodies and an exoskeleton. This diverse group is comprised of the insects, arachnids (spiders, mites, and scorpions), crustaceans (shrimp, lobster, crab, etc), millipedes, and centipedes. There are far more species of arthropods than all the other higher order animals put together. Arthropods currently make up 62% of the total known species of all organisms with new species of arthropods continually being discovered.

Measuring Arthropods

Whether measured by species numbers, numbers of individuals, or mass of living tissue, arthropods make up the largest, most diverse, and least understood component of most terrestrial ecosystems. Their extreme variety and small size have enabled them to fill virtually every niche available in these ecosystems. Although arthropods live and feed on virtually every part of the plants in terrestrial ecosystems, these same plants also depend on arthropods for their own survival.

Aside from serving as agents of pollination and seed dispersal for a large percentage of plants, arthropods are the major force that decomposes dead materials into nutrient rich topsoil needed for plants to grow. Arthropods also serve as the largest prey base for small predators, sustaining other arthropods, and feeding birds, and small mammals, which, in turn, sustain the larger predators. Without arthropods, most terrestrial ecosystems would surely collapse.

Materials

- Assembled beating sheet (sheet and frame)
- pooter(s)
- extra vials
- water bottle
- marking pen
- plastic drinking straws
- forceps
- hand lens or dissecting scope
- identification aids
- beating sticks

I. Preparation

- Create a map of the study sites using either GIS or aerial photos.
- Discuss your sampling scheme apply to map. Check each team's branch beating style to ensure uniformity of technique.
- Teams are assigned to or choose specific areas and trees for sampling.

II. Setting up the field study

1. Conduct branch beating and collection. Place beating sheet under branch(es), beat each branch three times in the same manner.
2. Estimate branch percentage coverage by examining how much of the branch covers the beating sheet.
3. Use pooter to aspirate all insects and spiders. Add 10 drops of water to vial before aspirating (water prevents spiders from spinning lots of silk and making the specimens hard to disentangle later on).
4. Label vial with the sample number and species of tree.
5. Important! Repeat the above steps 2-5 for each species of woody plants you are sampling at least 3-5 separate branches.

III. Sorting and Identification

1. Transfer the specimens from the collection vials to the Petri dishes.
2. Sort and identify all arboreal arthropods. It is not necessary to ID a specimen, instead, sort it into its "morpho species", such as "large green caterpillar" and assign it a number.
3. Record all different types of caterpillars in data sheets with appropriate names and numbers.
4. To determine actual species names, use insect ID keys. The best one is from the USFS:
 - https://www.fs.fed.us/foresthealth/technology/pdfs/FHTET_03_11.pdf
 - <http://www.discoverlife.org/mp/20q?guide=Caterpillars>
 - <http://www.projectnoah.org/missions/30733144>

Example of a beating sheet

