

Making preserved macroinvertebrate specimens using hand sanitizer

Macroinvertebrates are a great teaching tool. Unfortunately sometime we don't have time, or it's the wrong season to collect macros from a stream. For this reason you may wish to start a preserved macroinvertebrate collection for educational use. You can simply keep the macros in alcohol, however they become dehydrated. This makes them brittle and some such as craneflies become deflated and do not resemble the unpreserved organism.

You can purchase specimens in resin cubes. These are well preserved and generally are preserved in a way that they very closely represent the unpreserved organism. They are hard to find, and often times they are species native to another area. They also are relatively expensive.

One of the cheapest and best alternatives is to make your own preserved specimens using hand sanitizer as a medium. This method is relatively inexpensive, and the hand sanitizer not only rehydrates the macros, but also suspends them so they can be observed easily. It takes a bit of work to make the final product look good and last, but once you put in that work the final product can last a year or more with no maintenance.

What you need:

Macroinvertebrate collection nets or other way to collect macroinvertebrates.

Alcohol resistant bottle with tight fitting lid for preservation.

Preservation Alcohol- 80% or higher ethanol or 90% isopropyl alcohol (Rubbing Alcohol). Do not use 70% rubbing alcohol this will not adequately preserve the macroinvertebrates and they will rot.

Glass or Alcohol resistant plastic vials- Some plastics will cloud when exposed to alcohol. Be sure to select vials that can be exposed to alcohol. Be sure they have tight fitting lids or a way to secure them so no air reaches the hand sanitizer. (I use 1 oz bullet bottles and with lids found here: <http://www.usplastic.com/catalog/item.aspx?itemid=91442&catid=991>)

Hand sanitizer- Must be clear. Cheaper brands tend to be thinner which is useful in removing bubbles, but if you are trying to suspend large or heavy macros use the thicker name brands.

Tweezers

Eye droppers

Instructions:

Step 1) **Collect your macroinvertebrates.** The best time to collect these is spring or late fall (This is when they are the largest and easiest to identify.) Be sure to check with your states regulations on collecting macroinvertebrates, and follow all laws.

Step 2) **Preserve the macroinvertebrates.** Hand sanitizer does not contain enough alcohol to kill and preserve the macroinvertebrates. Place the collected macroinvertebrates in alcohol in the preservation jar. It is best to place only the macroinvertebrates (no plant material, rocks or excess water) into the jar. Pour enough alcohol into the jar to cover the macros with about an inch extra.

Step 3) **Allow the macroinvertebrates to fully preserve.** It is best to allow your macroinvertebrates to stay in the alcohol for at least a week. After the first few days you should place the macroinvertebrates in fresh alcohol. If you are preserving large organisms such as crayfish it is recommended that you allow up to three weeks for them to preserve.

Step 4) **Rehydrating the macroinvertebrates.** Pour some hand sanitizer into a small bottle (you do not need to use your final vials). Place the macros in this sanitizer for 24 hours. The next day they will be rehydrated and flexible.

Step 5) **Make your final product.** Pour new hand sanitizer into your final bottles. DO NOT use the pump to dispense the hand sanitizer in as it adds bubbles to the sanitizer. Place your macroinvertebrate into the vial. Try not to introduce bubbles in the sanitizer as you do this step. Some bubbles are inevitable and will be removed later. Using tweezers position the macroinvertebrates how you want them to appear in the final product. If there are large air bubbles use the eye dropper to remove them. If there are many small bubbles you will need to heat the hand sanitizer slightly. Place the vials in nearly boiling water for a few minutes. You will see that the small bubbles will become large bubbles that can be removed with an eye dropper. Once this is done make sure that the vials are over filled with hand sanitizer and place the lid on the vial. There should be as little air as possible in the final product as air causes the hand sanitizer to become cloudy.

Step 6) **Maintaining your samples.** Most samples will last years if properly preserved and maintained. In time the hand sanitizer will start to break down and become thin. The macroinvertebrates will still be preserved and can be reused. Remove the macroinvertebrates and replace the hand sanitizer. Keeping the vial away from intense heat and sunlight helps slow this process. If the sanitizer becomes cloudy it is generally because it has been exposed to air. The cloudy sanitizer can be removed and replaced. If it seems the cloudiness is coming from macroinvertebrates it most likely means that they have begun to rot. This sample should be discarded.

This activity was written by Trout Unlimited's Eastern Abandoned Mine Program. If you have questions about this method, or would like lessons for your preserved macros please contact Rebecca Holler at rholler@tu.org or by phone at 570-748-4901.

