15.0 PROTOCOL FOR SAMPLING ZOOPLANKTON

Overview

Zooplankton are small invertebrates that float freely in the water column of lakes and oceans. Zooplankton are important as both prey and consumers in the aquatic food web. Zooplankton also act as bio-monitors because they are also highly sensitive to environmental change or disturbance in lakes. Zooplankton are sampled to provide quantitative estimates of community composition, densities and/or biomass within lakes. Zooplankton are sampled with a net (Figure 23) that has a specific mesh size (ranging from as small as 64 µm to as large as 256 µm). Zooplankton densities and species composition show spatial variability both horizontally and vertically in lakes.

Sources

Alberta Environment (2006 a), B. C. WLAP (2003), Environment Canada (1999)

Special safety concerns

Formalin is used as a preservative and is identified as a suspected carcinogen. Formalin should be used with extreme care and the MSDS should be read.

At a glance

1 Soak the body of the zooplankton net in lake water prior to use (2 minutes).

2 Rinse the net with lake water to dislodge any attached material prior to sampling.

3 Attach the zooplankton bucket: make sure the plug is in place.

4 Fill the Nalgene squirt bottle with lake water that has been filtered through the net mesh.

5 Lower the net to the euphotic zone depth making sure it stays in a vertical position. Raise the net vertically at a continuous rate of 0.5 m/s to minimize avoidance of the net by fast-swimming zooplankton.

6 Avoid sampling near sediments and macrophytes because non-planktonic species of Rotifera and Crustacea inhabit these substrates and would contaminate the sample.

avoid sediments and macrophytes

7 At the surface, rinse down the outer sides of the net, repeat two or three times with lake water. Do not splash rinse water into the net opening, or let the net drop below the surface.

8 Separate the bucket from the net, place the lower end of the bucket into an open sample jar, then remove the plug and drain the zooplankton and water into the jar. Rinse the bucket contents into the sample jar with the squeeze bottle previously filled with filtered net water.

9 Preserve zooplankton samples in either 95% ethanol or 5% formaldehyde. Formaldehyde is preferred because counting samples preserved in ethanol is difficult because of the convection currents caused by rapid evaporative losses. The

formaldehyde preservation

following approaches can be used to reduce distortion due to formalin preservation: (a) add 40 g/L of sucrose to formaldehyde solutions; (b) maintain samples at low temperature (6ºC); and (c) narcotisize with carbonated water or methanol prior to preserving in a formaldehyde-sugar solution.

10 Rinse the net and bucket with lake water between sites.

11 Record sampling location (GPS coordinates), site, date, time, samplers ID, number of hauls, and depth of haul on the jar and field sheets/book. Note the mesh size and dimensions, the fixative used, and the prevailing weather conditions in the field sheets/book. Note and record ice depth in the winter.

12 Put a few drops of glycerin into sample when back at the laboratory, before storage of sample to help to prevent the animals from sticking together.

Other Sources

EMAN Undated (d)

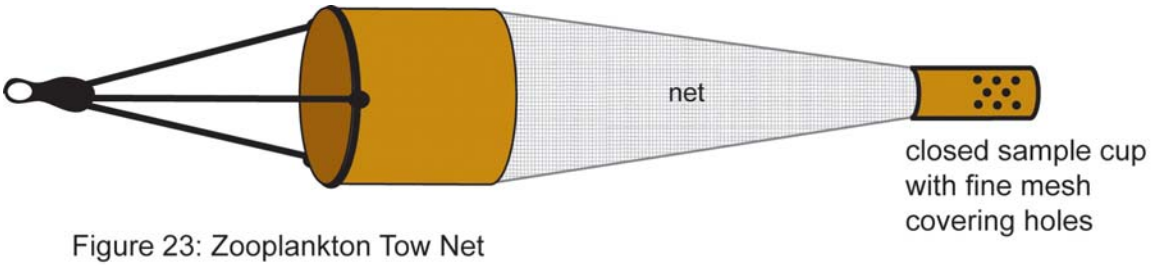
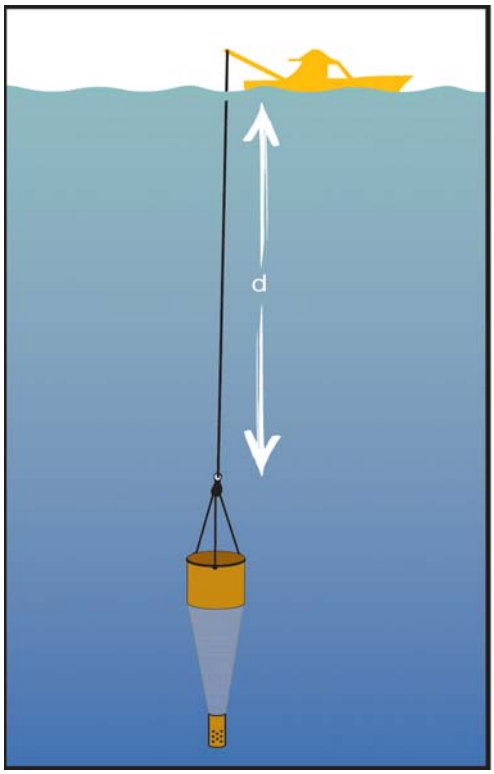


Figure 23: Zooplankton Tow Net



Volume of Water through a Zooplankton Tow = $\prod * r^2 * d$

Where: r = radius of net mouth

D = depth

$\prod$ = 3.1.416

Figure 24. Tow volume calculation