Copepod husbandry – *Temora longicornis*

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Calanoid copeods (*Temora longicornis*) were provided by the Danish Institute of Aquatic Resources and maintained in laboratory cultures. *Temora longicornis* is a native species to British waters with adult females growing to approximately 1.5 mm.

Tanks: Copepods are kept in 20 L buckets (tanks) at 15 ° C in the dark in the Grazing Lab (3.28). If experiments requiring light are being carried out in the Grazing Lab, black bin bags should be placed over the buckets to reduce light levels. Copepods are kept in artificial seawater (salinity of 34 on the practical salinity scale) by mixing reef salts (lab 2.12) with RO water in a 20 L carboy, ideally water should be left in the dark at 15 ° C for at least several days prior to use. A Hobo logger is kept in the lab to monitor temperature and light levels, the software is installed on my computer in 3.18 and the technician's computer in 3.07, either Tania or I will have the docking station.

Salinity should be checked weekly using a salinity refractometer (in 3.07) and maintained at 34, slight evaporative losses may necessitate the addition of small quantities of RO water. Gentle aeration (~ 1 bubble s^{-1}) should be provided to the tank through the wide opening of a glass pipette – if you change the airflow for one tank it may affect the others!

Feeding: In cultures copepods should be fed 3 times a week (Monday, Wednesday, Friday) and food levels should be maintained at approximately 200 µg C L^{-1}. Copepods are fed a mixture of *Rhodomonas* sp. (~ 55 pg C $cell^{-1}$) and *Thalassiosira weissflogii* (~ 64 pg C $cell^{-1}$) at a 2:1 ratio. Tania grows and provides the algae for the copepods. Visual inspections of food levels should be made routinely using high magnification and a dissecting scope. Occasionally, food quality may be enhanced by the addition of microzooplankton such as *Oxyrrhis marina*.

Copepod condition: It is important to regularly check the condition of the copepods in culture. Take a water sample with a beaker and gently pour some water into a Petri dish. Use the microscope to check for nauplii and copepodites. Use a wide mouthed pipette and visually inspect the condition of the adults. If the copepods are too overcrowded they may become aggressive and may 'bite-off' the antenna, infection also becomes more of a problem. In a good culture food will be visible in the gut, and the antenna, mouth, urosome and swimming appendages should be intact to indicate that the copepods are not overcrowded. If fungal infection is observed the culture may not be used and copepods should not be transferred to other cultures!

Water changes: At least every 6 weeks it is necessary to carry out water changes. There are several specifically made copepod sieves with different pore sizes to collect copepods at different life history stages. The copepod sieve should be placed in a plastic tub over a waste bucket. The contents of the tank should be gently poured through the sieve but ensure that the tub is place so that copepods trapped by the mesh are still immersed. The size of the mesh used depends on the density of the culture. If the culture is dense it may be necessary to use a large mesh size (400 µm), which will only collect later stage copepodites and adults. Copepods trapped by the mesh may then be transferred into a clean tank. The water change may cause mechanical damage to the copepods so it is essential to do it gently and is not advised immediately prior to an experiment.

Selecting ♀ copepods for experiments: Experiments should be conducted with adult female copepods. Several features may be used to distinguish between male and female copepods:

Males have 5 segments on the urosome whereas females have only 3. The first urosome segment on the female is ventrally swollen and the genital opening may be seen as a dark spot. Additionally, adult males have a thickened section on the right antennule used for holding females during mating.

A good photographic guide to the life history stages of *Temora longicornis* can be found on the website of the Royal Netherlands Institute for Sea Research:
http://www.nioz.nl/nioz_nl/2e6fd618ff5a8371635b04bb5aa622ee.php

Copepods should be gently captured using a sieve and individually caught (using a wide bore pipette) and placed under a microscope for visual inspection. Selected females can then be placed in a large beaker to allow for acclimation prior to experiments.