

Dataset: pteropod respiration

Version date: 6 Nov. 2012

[Description](#)

Respiration rates of thecosome pteropod exposed to various O₂ and CO₂ concentrations

Data access is restricted until late 2014.

[Acquisition Description](#)

At sea, animals were captured for physiological experiments using a 1 m diameter, 150 μ m (in 2011) or 335 μ m (in 2012) mesh Reeve net trawl, or a 1 m² MOCNESS tow with 150 μ m mesh nets. Pteropods were placed in filtered seawater at densities of < 30 individuals liter⁻¹ and acclimated for at least 8 hours at 20° C, 15°C or 10°C in temperature controlled waterbaths. After acclimation, individuals that were in good condition were put into glass syringe respiration chambers with a known volume of 0.2 micron filtered seawater for at least four hours.

In 2012 on cruise NH1208, an experiment was conducted to determine whether antibiotics changed the metabolic rate of the pteropods. In this experiment water was treated with 25mg each of Streptomycin and Ampicillin liter⁻¹ or without antibiotics.

Unless otherwise explicitly stated, the water contained 25mg each of Streptomycin and Ampicillin liter⁻¹, to prevent bacterial growth, and was bubbled with certified gas mixes to achieve normal air saturated (21% O₂, 380 ppm CO₂), high CO₂ (21% O₂, 800 ppm CO₂), low O₂ (10% O₂, 380 ppm CO₂) or low O₂ high CO₂ (10% O₂, 800 ppm CO₂) conditions. Bubbling of 10% O₂ achieved a mean initial O₂ concentration of 10-13% in low O₂ treatments.

During all experiments, we simultaneously ran a control syringe (without an animal) to monitor background respiration of microbes. At the conclusion of the experiments, we measured the O₂ level by withdrawing a sample of water from the chamber using a 500 μ L airtight Hamilton syringe and injected past a Clarke-type O₂ electrode (#1302) and meter (#782) in a water-jacketed injection port (#MC100, Strathkelvin Instruments, North Lanarkshire, United Kingdom; Marsh and Manahan, 1999). Our resulting O₂ consumption rates are reported in μ moles g⁻¹ h⁻¹ (wet mass). Notes on carbonate chemistry and net profiles are in the cruise report.

[Processing Description](#)

Individuals in normoxic treatments that consumed more than 70% of the oxygen in the chamber were excluded from further analyses. Oxygen consumption was calculated by subtracting experimental O₂ from control O₂.

[Deployments](#)

Deployment Synonyms	Start Date	Platform	Investigator
NH1208	Thu, 08/09/2012	R/V New Horizon	Dr Gareth Lawson (Chief Scientist) Dr Gareth Lawson (Chief Scientist) Dr Peter Wiebe (Co-Principal Investigator)
OC473	Sun, 08/07/2011	R/V Oceanus	Dr Zhaohui Wang (Co-Principal Investigator) Ms Dicky Allison (BCO-DMO Data Manager)

[Instruments](#)

[MOCNESS](#)

Short Name: MOCNESS

[Community Standard Description](#)

Generic Description

The Multiple Opening/Closing Net and Environmental Sensing System or MOCNESS is a family of net systems based on the Tucker Trawl principle. There are currently 8 different sizes of MOCNESS in existence which are designed for capture of different size ranges of zooplankton and micro-nekton. Each system is designated according to the size of the net mouth opening and in two cases, the number of nets it carries. The original MOCNESS (Wiebe et al, 1976) was a redesigned and improved version of a system described by Frost and McCrone (1974). (from MOCNESS manual) This designation is used when the specific type of MOCNESS (number and size of nets) was not specified by the contributing investigator.

PI supplied instrument name: MOCNESS

Dataset-specific description

MOCNESS-1 m² with 150 micron mesh.

[Oxygen Microelectrode Sensor](#)

Short Name: O2 microsensor

[Community Standard Description](#)

Generic Description

A miniaturized Clark-type dissolved oxygen instrument, including glass micro-sensors with minute tips (diameters ranging from 1 to 800 μ m). A gold or platinum sensing cathode is polarized against an internal reference and, driven by external partial pressure, oxygen from the environment penetrates through the sensor tip membrane and is reduced at the sensing cathode surface. A picoammeter converts the resulting reduction current to a signal. The size of the signal generated by the electrode is proportional to the flux of oxygen molecules to the cathode. The sensor also includes a polarized guard cathode, which scavenges oxygen in the electrolyte, thus minimizing zero-current and pre-polarization time. With the addition of a meter and a sample

chamber, the respiration of a small specimen can be measured. Example: Strathkelvin Inst.
<http://www.strathkelvin.com>

PI supplied instrument name: Oxygen Microelectrode Sensor

Dataset-specific description

Clarke-type O₂ electrode (#1302) and meter (#782) in a water-jacketed injection port (#MC100, Strathkelvin Instruments, North Lanarkshire, United Kingdom; Marsh and Manahan, 1999)

[Reeve Net](#)

Short Name: Reeve Net

[Community Standard Description](#)

Generic Description

A Reeve Net is a conventional ring net with a very large acrylic cylindrical cod-end (30 liters) designed to collect fragile gelatinous animals. The net is lowered to a particular depth and then hauled slowly back to the surface (5-10 m/min). Reeve (1981) also described a double net system with no bridle and flotation at the net mouth that is attached to a roller mechanism that rides on a tow wire.

The roller system is locked in place by a pressure release device. Once below a set pressure, the roller

and nets are released and they float slowly up the wire, gently collecting the zooplankton, without being

influenced by the motion of the vessel and associated vertical wire movements. (from Wiebe and Benfield, 2003)

PI supplied instrument name: Reeve Net

Dataset-specific description

1 m diameter, 150 µm (in 2011) or 335 µm (in 2012) mesh Reeve net trawl