Dataset name: **Archaeal diversity**

|  |  |
| --- | --- |
| Parameters: | * **16S rRNA gene sequences** * **concentrations of individual amino acid species** * **microbial growth of incubations** |

PROJECT TITLE: **MOBYDICK**

Oceanographic cruise: **MOBYDICK**

Start date: **18/02/2018**

End date: **27/03/2018**

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Geographic information: **Indian sector of the Southern Ocean**

Latitude: **49.5°S – 52.5°S**

Longitude: **67,0°E – 74.5°E**

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# OPERATIONS

## Sampling device(s)

Water samples were collected from the rosette bottles at stations M2 and M4

## List of stations sampled

**Table 1 : Sampling details (for abreviations see text § 3 below)**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Station** | **Depth** | **AA** | **AA+E** | **FA** | **FA+E** | **P** | **P+E** | **sample ID** | **Duration of incubation** | **CTD #** | **bottle #** |
| **M4\_1** | 25 m | x | x | x | x |  |  | MJB1-8 | 10 h | 017 | 21-22 |
| 350 m | x | x | x | x |  |  | MJB9-16 | 10 h | 017 | 12-13 |
| 1900 m | x | x | x | x |  |  | MJB17-24 | 14 h | 017 | 1-2 |
| **M2\_2** | 25 m | x | x |  |  | x | x | MJB25-33 | 10 h | 029 | 20-21 |
| 350 m | x | x |  |  | x | x | MJB34-40 | 10 h | 029 | 9-11 |
| **M4\_2** | 350 m |  |  |  |  | x | x | MJB41-44 | 10 h | 041 | 1-12 |
| 4000 m | x | x | x | x | x | x | MJB45-56 | 10 h | 044 | 3-5 |
| **M2\_3** | 25 m |  |  | x | x |  |  | MJB57-60 | 7 h | 052 | 20-22 |
| 350 m |  |  | x | x |  |  | MJB65-68 | 7 h | 052 | 7-10 |

# INSTRUMENTS

Instrument Type: **High Performance Liquid Chromatography**

Manufacturer: **Agilent**

Model: **1260 Infinity II Bio-Inert LC System**

Instrument Features / Calibration: **see below, § 3.4**

# DESCRIPTION of PARAMETERS

## Measurement details

Seawater samples were filtered through a 60 µm mesh before being filled into 2 L polycarbonate incubation bottles. Within 24 h after water collection the experimental procedure was started.

To investigate the potential archaeal response to the addition of carbon and energy sources, incubation experiments were carried out. Amino acids (AA), fatty acids (FA) or proteins (P) were added as a carbon source to seawater from different depths. The incubation was carried out at 4°C in the dark for at least 7 days. For each treatment two replicates without and two replicates with erythromycin (+E) were used to possibly investigate a clearer archaeal response. Throughout the incubation samples were taken for cell abundance, CARD-FISH and amino acids (only from the treatments with amino acids addition). At the final time point each incubation bottle was filtered onto a 0.22 µm filter (47 mm diameter, GVWP, Millipore) and stored at –80°C until DNA extraction.

## Analytical procedure

Prokaryotic abundance samples will be analyzed within a month in the home lab by flow cytometry and available thereafter. Amino acids will be available after 6 months and analyzed by high-pressure liquid chromatography (HPLC) (Clifford *et al.,* 2017). CARD-FISH filters will initially be archived in the home lab and analyzed within a year or upon request or depending on the data analysis according to Teira *et al.* (2006). DNA samples for 16S rRNA analyses of incubations will be analyzed on request or in the framework of a MSc thesis. Finally, relative and absolute abundance measurements of heterotrophic archaea will be available.

## Units

* Prokaryotic abundance cells mL–1
* Specific archaeal abundance cells mL–1
* Genomics (Amplicon sequencing) N/A
* Amino acid concentrations nM

## Sensor precision

N/A

## Post-cruise data analysis/treatment required

N/A

## Estimated Date of Delivery

Amplicon sequencing data and amino acids approximately 1 to 1.5 years after the end of the cruise. Cell abundances and CARD-FISH will be available after 0.5 to 1 year later.

# BIBLIOGRAPHY

Clifford E.L., Sintes E., Hansell D.A., Varela M.M., Nieto-cid M., Herndl G.J., 2017. Crustacean zooplankton release copious amounts of dissolved organic matter as taurine in the ocean. *Limnology & Oceanography*, **62**, 2745–2758

Teira E., Lebaron P., van Aken H.M., Herndl G.J., 2006. Distribution and activity of Bacteria and Archaea in the deep water masses of the North Atlantic. *Limnology & Oceanography*, **51**, 2131–2144