Dataset name: **Viral infection of bacteria**

|  |  |
| --- | --- |
| Parameters: | * **Virus–like particle counts**
* **Virus production**
 |

PROJECT TITLE: **MOBYDICK**

Oceanographic cruise: **MOBYDICK**

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

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

Project manager: **Bernard Quéguiner** bernard.queguiner@mio.osupytheas.fr

Address: **Mediterranean Institute of Oceanolography**

 **Institut Pytheas - Observatoire des Sciences de l'Univers**

 **Bâtiment OCEANOMED, Campus de Luminy, case 901**

 **F-13288 Marseille Cedex 09, France**

Chief scientist: **Ingrid Obernosterer** ingrid.obernosterer@obs-banyuls.fr

Address: **Laboratoire d’Océanographie Microbienne**

 **Observatoire Océanologique de Banyuls sur mer**

 **66650 Banyuls sur mer, France**

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

 Latitude: **49.5°S – 52.5°S**

 Longitude: **67,0°E – 74.5°E**

Parameter supervisor: **Urania Christaki**

LOG

32 avenue Foch,

62930 Wimereux, France

+33 (0)3 21 99 64 01

Urania.christaki@univ-littoral.fr

Dataset contact: **Urania Christaki**

LOG

32 avenue Foch,

62930 Wimereux, France

+33 (0)3 21 99 64 01

Urania.christaki@univ-littoral.fr

# OPERATIONS

## Sampling device(s)

Seawater samples were collected from rosette bottles (CTD–Omics T casts for viral infection and viral counts and CTD–stock casts for viral counts).

## List of stations sampled

**Table 1 : Sampling details**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Station** | **Date** | **Operation** | **Code** | **Bottle #** | **Depth** |
| M2-1 | 26/02/18 | CTD-Stock | CTD\_007 | 21 | 10 m |
| M2-1 | 26/02/18 | CTD-Stock | CTD\_007 | 19 | 30 m |
| M2-1 | 26/02/18 | CTD-Stock | CTD\_007 | 17 | 50 m |
| M2-1 | 26/02/18 | CTD-Stock | CTD\_007 | 15 | 70 m |
| M2-1 | 26/02/18 | CTD-Stock | CTD\_007 | 13 | 100 m |
| M2-1 | 26/02/18 | CTD-Stock | CTD\_007 | 11 | 125 m |
| M2-1 | 26/02/18 | CTD-Stock | CTD\_007 | 9 | 150 m |
| M2-1 | 26/02/18 | CTD-Stock | CTD\_007 | 5 | 200 m |
| M2-1 | 26/02/18 | CTD-OMICS\_T | CTD\_009 | 17 | 10 m |
| M2-1 | 26/02/18 | CTD-OMICS\_T | CTD\_009 | 12 | 60 m |
| M2-1 | 26/02/18 | CTD-OMICS\_T | CTD\_009 | 7 | 125 m |
| M2-1 | 26/02/18 | CTD-OMICS\_T | CTD\_009 | 2 | 300 m |
| M4-1 | 01/03/18 | CTD-Stock | CTD\_013 | 21 | 10 m |
| M4-1 | 01/03/18 | CTD-Stock | CTD\_013 | 19 | 30 m |
| M4-1 | 01/03/18 | CTD-Stock | CTD\_013 | 17 | 50 m |
| M4-1 | 01/03/18 | CTD-Stock | CTD\_013 | 15 | 70 m |
| M4-1 | 01/03/18 | CTD-Stock | CTD\_013 | 13 | 100 m |
| M4-1 | 01/03/18 | CTD-Stock | CTD\_013 | 11 | 125 m |
| M4-1 | 01/03/18 | CTD-Stock | CTD\_013 | 7 | 175 m |
| M4-1 | 01/03/18 | CTD-Stock | CTD\_013 | 5 | 200 m |
| M4-1 | 01/03/18 | CTD-Stock | CTD\_013 | 3 | 250 |
| M4-1 | 01/03/18 | CTD-OMICS\_T | CTD\_011 | 17 | 10 m |
| M4-1 | 01/03/18 | CTD-OMICS\_T | CTD\_011 | 12 | 60 m |
| M4-1 | 01/03/18 | CTD-OMICS\_T | CTD\_011 | 7 | 125 m |
| M4-1 | 01/03/18 | CTD-OMICS\_T | CTD\_011 | 2 | 300 m |
| M3-1 | 04/03/18 | CTD-Stock | CTD\_023 | 21 | 25 m |
| M3-1 | 04/03/18 | CTD-Stock | CTD\_023 | 19 | 50 m |
| M3-1 | 04/03/18 | CTD-Stock | CTD\_023 | 17 | 75 m |
| M3-1 | 04/03/18 | CTD-Stock | CTD\_023 | 15 | 100 m |
| M3-1 | 04/03/18 | CTD-Stock | CTD\_023 | 13 | 125 m |

**Table 1 : Sampling details (cont'd)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| M3-1 | 04/03/18 | CTD-Stock | CTD\_023 | 11 | 150 m |
| M3-1 | 04/03/18 | CTD-Stock | CTD\_023 | 9 | 175 m |
| M3-1 | 04/03/18 | CTD-Stock | CTD\_023 | 7 | 200 m |
| M3-1 | 04/03/18 | CTD-OMICS\_T | CTD\_021 | 16 | 10 m |
| M3-1 | 04/03/18 | CTD-OMICS\_T | CTD\_021 | 11 | 60 m |
| M3-1 | 04/03/18 | CTD-OMICS\_T | CTD\_021 | 6 | 125 m |
| M3-1 | 04/03/18 | CTD-OMICS\_T | CTD\_021 | 5 | 300 m |
| M2-2 | 06/03/18 | CTD-Stock | CTD\_030 | 21 | 10 m |
| M2-2 | 06/03/18 | CTD-Stock | CTD\_030 | 19 | 30 m |
| M2-2 | 06/03/18 | CTD-Stock | CTD\_030 | 17 | 50 m |
| M2-2 | 06/03/18 | CTD-Stock | CTD\_030 | 15 | 70 m |
| M2-2 | 06/03/18 | CTD-Stock | CTD\_030 | 13 | 100 m |
| M2-2 | 06/03/18 | CTD-Stock | CTD\_030 | 11 | 125 m |
| M2-2 | 06/03/18 | CTD-Stock | CTD\_030 | 9 | 150 m |
| M2-2 | 06/03/18 | CTD-Stock | CTD\_030 | 5 | 200 m |
| M2-2 | 06/03/18 | CTD-OMICS\_T | CTD\_027 | 21 | 10 m |
| M2-2 | 06/03/18 | CTD-OMICS\_T | CTD\_027 | 19 | 60 m |
| M2-2 | 06/03/18 | CTD-OMICS\_T | CTD\_027 | 17 | 125 m |
| M2-2 | 06/03/18 | CTD-OMICS\_T | CTD\_027 | 15 | 300 m |
| M1 | 09/03/18 | CTD-Stock | CTD\_038 | 21 | 25 m |
| M1 | 09/03/18 | CTD-Stock | CTD\_038 | 19 | 50 m |
| M1 | 09/03/18 | CTD-Stock | CTD\_038 | 17 | 75 m |
| M1 | 09/03/18 | CTD-Stock | CTD\_038 | 15 | 100 m |
| M1 | 09/03/18 | CTD-Stock | CTD\_038 | 13 | 125 m |
| M1 | 09/03/18 | CTD-Stock | CTD\_038 | 11 | 150 m |
| M1 | 09/03/18 | CTD-Stock | CTD\_038 | 9 | 175 m |
| M1 | 09/03/18 | CTD-Stock | CTD\_038 | 7 | 200 m |
| M1 | 09/03/18 | CTD-OMICS\_T | CTD\_036 | 17 | 10 m |
| M1 | 09/03/18 | CTD-OMICS\_T | CTD\_036 | 12 | 60 m |
| M1 | 09/03/18 | CTD-OMICS\_T | CTD\_036 | 6 | 125 m |
| M1 | 09/03/18 | CTD-OMICS\_T | CTD\_036 | 2 | 300 m |
| M4-2 | 12/03/18 | CTD-Stock | CTD\_042 | 21 | 25 m |
| M4-2 | 12/03/18 | CTD-Stock | CTD\_042 | 19 | 50 m |
| M4-2 | 12/03/18 | CTD-Stock | CTD\_042 | 17 | 75 m |
| M4-2 | 12/03/18 | CTD-Stock | CTD\_042 | 15 | 100 m |
| M4-2 | 12/03/18 | CTD-Stock | CTD\_042 | 13 | 125 m |
| M4-2 | 12/03/18 | CTD-Stock | CTD\_042 | 11 | 150 m |
| M4-2 | 12/03/18 | CTD-Stock | CTD\_042 | 9 | 175 m |
| M4-2 | 12/03/18 | CTD-Stock | CTD\_042 | 7 | 200 m |

**Table 1 : Sampling details (cont'd)**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| M4-2 | 12/03/18 | CTD-OMICS\_T | CTD\_046 | 17 | 10 m |
| M4-2 | 12/03/18 | CTD-OMICS\_T | CTD\_046 | 12 | 60 m |
| M4-2 | 12/03/18 | CTD-OMICS\_T | CTD\_046 | 7 | 125 m |
| M4-2 | 12/03/18 | CTD-OMICS\_T | CTD\_046 | 2 | 300 m |
| M2-3 | 16/03/18 | CTD-Stock | CTD\_053 | 21 | 15 m |
| M2-3 | 16/03/18 | CTD-Stock | CTD\_053 | 19 | 30 m |
| M2-3 | 16/03/18 | CTD-Stock | CTD\_053 | 17 | 50 m |
| M2-3 | 16/03/18 | CTD-Stock | CTD\_053 | 15 | 70 m |
| M2-3 | 16/03/18 | CTD-Stock | CTD\_053 | 13 | 100 m |
| M2-3 | 16/03/18 | CTD-Stock | CTD\_053 | 11 | 125 m |
| M2-3 | 16/03/18 | CTD-Stock | CTD\_053 | 9 | 150 m |
| M2-3 | 16/03/18 | CTD-Stock | CTD\_053 | 7 | 200 m |
| M2-3 | 16/03/18 | CTD-OMICS\_T | CTD\_049 | 16 | 10 m |
| M2-3 | 16/03/18 | CTD-OMICS\_T | CTD\_049 | 11 | 60 m |
| M2-3 | 16/03/18 | CTD-OMICS\_T | CTD\_049 | 6 | 125 m |
| M2-3 | 16/03/18 | CTD-OMICS\_T | CTD\_049 | 2 | 300 m |
| M3-3 | 19/03/18 | CTD-Stock | CTD\_061 | 21 | 25 m |
| M3-3 | 19/03/18 | CTD-Stock | CTD\_061 | 19 | 50 m |
| M3-3 | 19/03/18 | CTD-Stock | CTD\_061 | 17 | 75 m |
| M3-3 | 19/03/18 | CTD-Stock | CTD\_061 | 15 | 100 m |
| M3-3 | 19/03/18 | CTD-Stock | CTD\_061 | 13 | 125 m |
| M3-3 | 19/03/18 | CTD-Stock | CTD\_061 | 11 | 150 m |
| M3-3 | 19/03/18 | CTD-Stock | CTD\_061 | 9 | 175 m |
| M3-3 | 19/03/18 | CTD-Stock | CTD\_061 | 7 | 200 m |
| M3-3 | 19/03/18 | CTD-OMICS\_T | CTD\_059 | 16 | 10 m |
| M3-3 | 19/03/18 | CTD-OMICS\_T | CTD\_059 | 11 | 60 m |
| M3-3 | 19/03/18 | CTD-OMICS\_T | CTD\_059 | 6 | 125 m |
| M3-3 | 19/03/18 | CTD-OMICS\_T | CTD\_059 | 2 | 300 m |

# INSTRUMENTS

Instrument Type: **CYTOFLEX flow cytometer**

Manufacturer: **Beckman**

Model:

Instrument Features / Calibration: N/A

Instrument Type: **Transmission Electron Microscope**

Manufacturer:

Model:

Instrument Features / Calibration: N/A

# DESCRIPTION of PARAMETERS

## Measurement details

Samples for viral infection of bacteria were taken at all stations from the CTD–Omics T casts from four depths ( the same as for molecular diversity analysis) between the surface and 300 m. At each depth a 9 mL sample was separated in two 4.5 mL cryotubes. Samples for viral counts (VLP: virus–like particles) were collected from the CTD–stock casts at all depths and the CTD–Omics T casts at four depths (from the surface to 300 m). All samples were fixed with glutaraldelhyde (1 % final concentration), flash–frozen in liquid nitrogen and stored at –80 °C until analysis.

## Analytical procedure

Viral infection of bacteria will be established via observations on Transmission Electron Microscope (TEM) as described in Christaki *et al.* (2014). The analyses will be performed in collaboration with J. Colombet and T. Sime-Ngando at *Laboratoire Microorganismes: Génome et Environnement* (Université Clermont Auvergne, 63177 Aubière Cedex, France)

## Units

* Virus–like particle counts: VLP mL–1
* Virus production: % of bacterial production d–1

## Sensor precision

N/A

## Post-cruise data analysis/treatment required

N/A

## Estimated Date of Delivery

Spring 2019.

# BIBLIOGRAPHY

Christaki U., Lefèvre D., Georges C., Colombet J., Catala P., Courties C., Sime-Ngando T., Blain S., Obernosterer I., 2014. Microbial food web dynamics during spring phytoplankton blooms in the naturally iron-fertilized Kerguelen area (Southern Ocean). *Biogeosciences*, **11**, 6739–6753.
<https://doi.org/10.5194/bg-11-6739-2014>