# Cell counts in newly settled polyps of Antillogorgia bipinnata inoculated with one of six genotypes of Breviolum antillogorgium and reared at 26 and 30 degrees Celsius

**Website**: https://www.bco-dmo.org/dataset/809388
**Data Type**: experimental
**Version**: 1
**Version Date**: 2021-11-16

**Project**
» RUI: Collaborative Research: Genetic variation as a driver of host and symbiont response to increased temperature on coral reefs (Host Symbiont Temp Response)



| Contributors | Affiliation | Role |
|---|---|---|
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**Abstract**
Cell counts in newly settled polyps of Antillogorgia bipinnata inoculated with one of six genotypes of Breviolum antillogorgium and reared at 26 and 30 degrees Celsius.

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## Coverage

**Spatial Extent**: **Lat**:24.7525 **Lon**:-81.754583
**Temporal Extent**: 2018 - 2018

## Dataset Description

Cell counts in newly settled polyps of Antillogorgia bipinnata inoculated with one of six genotypes of Breviolum antillogorgium and reared at 26 and 30 degrees C.

### Methods & Sampling

Larvae were collected from *Antillogorgia bipinnata* colonies that were maintained in seawater tables at the Keys Marine Lab on Long Key, FL. *Antillogorgia bipinnata* colonies were initially collected from Tennessee Reef (N 24° 45.150' W 81° 45.275')

*Breviolum antillogorgium* cultures, representing five genotypes, were used to infect polyps reared from larvae collected from *A. bipinnata*. Three cultures had been grown at 26-degree C since isolation in 2016 (G1 [16-0590F], G2 [16-0875] and G3 [16-1631]) and two had been grown at 30-degree C since isolation in 2016 (G4 [16-0587] and G5 [16-0763]). Polyps from all treatments were reared at both 26 and 30 degree C in the lab under 12:12 light dark cycles. When the experiment was terminated (69 days after initial inoculations), polyps were sampled to determine cell density.

### Data Processing Description

Polyps (aged 92-115 days) were removed from incubation containers and homogenized in 0.1 ml filtered seawater. Two replicate cell counts of each polyp was made using light microscopy and a hemocytometer. Mean symbiont density per ml was calculated.

Mean x 10,000 were calculated from the counts to give cells/ml and then divided by 10 to give cells/polyp

**BCO-DMO Processing notes:**
- added conventional header with dataset name, PI name, version date
- modified parameter names to conform with BCO-DMO naming conventions

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## Data Files

| File |
|---|
| **polyp_cell_count.csv** (Comma Separated Values (.csv), 10.36 KB) MD5:ccefae1e38186b5f6c2fccda1bfea3ef<br>Primary data file for dataset ID 809388 |

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## Related Publications

Pelosi, J., Eaton, K. M., Mychajliw, S., terHorst, C. P., & Coffroth, M. A. (2021). Thermally tolerant symbionts may explain Caribbean octocoral resilience to heat stress. Coral Reefs, 40(4), 1113–1125. doi:10.1007/s00338-021-02116-8
*Results*

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## Related Datasets

### IsRelatedTo

Coffroth, M. A., terHorst, C. (2021) **Proportion of infected polyps at Days 31, 52 and 69 in newly settled polyps of Antillogorgia bipinnata inoculated with one of five genotypes of Breviolum antillogorgium and reared at 26 and 30 degrees Celsius.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2021-11-16 doi:10.26008/1912/bco-dmo.855162.1 [view at BCO-DMO]
*Relationship Description: Part of same experiment.*

Coffroth, M. A., terHorst, C. (2021) **Survivorship of newly settled polyps of Antillogorgia bipinnata inoculated with one of five genotypes of Breviolum antillogorgium and reared at 26 and 30**

**degrees Celsius.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2021-11-16 doi:10.26008/1912/bco-dmo.855116.1 [view at BCO-DMO]
*Relationship Description: Part of same experiment.*

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## Parameters

| Parameter | Description | Units |
|---|---|---|
| Container | Identification of container replicate | unitless |
| Polyp_ID | Identification of polyp that was sampled given as container and mapped polyp number (eg. 2.06 would be container 2; mapped polyp 6) | unitless |
| Culture | Culture used to inoculate the polyps | unitless |
| Polyp_age | Age of the polyp | days |
| Temperature | Temperature at which the polyp was reared | Degrees C |
| Count_1 | First replicate of cells counted | unitless |
| Count_2 | Second replicate of cells counted | unitless |
| Mean | Mean of replicate counts | unitless |
| Cells_ml | Cells in one ml | Cells ml-1 |
| Cells_polyp | Cells in the sampled polyp | Cells_polyp |

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## Instruments

| | |
|---|---|
| **Dataset-specific Instrument Name** | Reichert Brightline hemocytometer |
| **Generic Instrument Name** | Hemocytometer |
| **Dataset-specific Description** | Used to make cell counts. |
| **Generic Instrument Description** | A hemocytometer is a small glass chamber, resembling a thick microscope slide, used for determining the number of cells per unit volume of a suspension. Originally used for performing blood cell counts, a hemocytometer can be used to count a variety of cell types in the laboratory. Also spelled as "haemocytometer". Description from: http://hlsweb.dmu.ac.uk/ahs/elearning/RITA/Haem1/Haem1.html. |

| | |
|---|---|
| **Dataset-specific Instrument Name** | Zeiss |
| **Generic Instrument Name** | Microscope - Optical |
| **Generic Instrument Description** | Instruments that generate enlarged images of samples using the phenomena of reflection and absorption of visible light. Includes conventional and inverted instruments. Also called a "light microscope". |

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## Project Information

**RUI: Collaborative Research: Genetic variation as a driver of host and symbiont response to increased temperature on coral reefs (Host Symbiont Temp Response)**

**Coverage**: Florida Keys, Caribbean

*Description from NSF award abstract:*
On coral reefs, mutualisms with single celled algae (Symbiodinium) and reef species literally and figuratively form the foundation of reef ecosystems. Coral reefs are among the most threatened ecosystems under a changing climate and are rapidly declining due to increasing levels of environmental stress, namely increased temperatures. Climate change is resulting in even warmer ocean temperatures that threaten associations between Symbiodinium and their hosts. In this project the investigators examine the genetic diversity of Symbiodinium and the potential for this important species to evolve in response to temperature. The project will also address whether the ecological and evolutionary dynamics of the Symbiodinium population affect the performance of their host. If so, this suggests that the evolution of microscopic organisms with short generation times could confer adaptation to longer-lived host species on ecologically and economically vital coral reefs. Given that diversity is already being lost on many reefs, considering how evolutionary changes in Symbiodinium will affect reef species is crucial for predicting the responses of reefs to future climate change. This project provides training for two graduate students and several undergraduates at a Hispanic-serving institution. This work includes outreach to the students and the general public through the Aquarium of Niagara, local K-12 schools, and web-based education modules.

The effects of evolution on contemporary ecological processes are at the forefront of research in evolutionary ecology. This project will answer the call for experiments elucidating the effects of genetic variation in Symbiodinium performance and the effect on the response of the holobiont (host and symbiont) to increased temperature. These experiments examine the effects of temperature through both ecological and evolutionary

mechanisms and will determine the relative importance of adaptation and acclimatization in replicated experimental populations. The investigators will examine how genetic variation within a species (Symbiodinium antillogorgium) affects symbiont performance in culture and in the host and how this affects the response of the holobiont to increased temperature. Further, the project examines whether holobiont response to increased temperature associated with climate change depends on particular GxG host-symbiont combinations. Moreover, the investigators will examine the effects of symbiont history on mutualist hosts, which have been largely ignored in eco-evolutionary studies. These experiments provide a first step in predicting whether invertebrate hosts on coral reefs will respond to global change via adaptation of their symbionts.

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## Funding


| Funding Source | Award |
| --- | --- |
| NSF Division of Ocean Sciences (NSF OCE) | OCE-1559286 |


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