Cell counts of Breviolum antillogorgium cultures isolated from the octocoral Antillogorgia bipinnata by sample and treatment for cultures historically grown at 26C and 30C and reciprocally grown at 26C and 30C, Oct - Dec 2018

Website: https://www.bco-dmo.org/dataset/756510

Data Type: experimental

Version: 1

Version Date: 2019-02-20

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 of Breviolum antillogorgium cultures isolated from the octocoral Antillogorgia bipinnata by sample and treatment for cultures historically grown at 26 and 30 degrees C and reciprocally grown at 26 and 30 degrees C

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Coverage

Spatial Extent: **Lat**:25.1326 **Lon**:-80.2635

Temporal Extent: 2018-10-02 - 2018-12-24

Dataset Description

Cell counts of *Breviolum antillogorgium* cultures isolated from the octocoral *Antillogorgia bipinnata* by sample and treatment for cultures historically grown at 26 and 30 degrees C and reciprocally grown at 26 and 30 degrees C.

Acquisition Description

Breviolum antillogorgium cultures were initially isolated from *Antillogorgia bipinnata* colonies collected at in the upper Florida Reef tract at Elbow Reef (N 25 07.956 W 80 15.810) in September 2016.Â Culture isolations and cell growth experimentation occurred in the Coffroth lab, University at Buffalo.

A total of six *Breviolum antillogorgium* genotypes were used in this experiment. Three cultures had been grown at 26 degrees C since isolation in 2016 (16-0590F, 16-0875 and 16-1631) and three had been grown at 30 degrees C since isolation in 2016 (16-0587, 16-0763 and 16-0764). Three replicates of each of the six *Breviolum antillogorgium* cultures were grown at 26 and 30 C for a total of four treatments (26 degrees at 26 and 30 C and 30 degrees C at 26 and 30 C). A total of four to six replicate counts from each culture was made every three to twelve days using light microscopy and a hemocytometer. Mean symbiont density per ml was calculated.

Data Processing: Mean x 10000 were calculated from the counts.

Processing Description

BCO-DMO Processing notes:- created separate files for each daily cell count
- added columns for Count_5 and Count_6 to data from day 56 to day 83 to match days 1 to 55
- created a toplevel file with date and day from each Excel sheet, which calls the daily files

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Parameters

Parameter	Description	Units
Date	date of count formatted as yyyy-mm-dd	unitless
Day	Number of days since inoculation	days
Culture_ID	Identification of sample given as culture name (16-0587; 16-0590F; 16-1631; etc.); treatment temperature (26 or 30 C) and replicate (1; 2; 3)	unitless
Count_1	First replicate of culture counted	cells x 10^4/milliliter (cells x 10^4 ml-1)
Count_2	Second replicate of culture counted	cells x 10^4/milliliter (cells x 10^4 ml-1)
Count_3	Third replicate of culture counted	cells x 10^4/milliliter (cells x 10^4 ml-1)
Count_4	Fourth replicate of culture counted	cells x 10^4/milliliter (cells x 10^4 ml-1)
Count_5	Fifth replicate of culture counted	cells x 10^4/milliliter (cells x 10^4 ml-1)
Count_6	Sixth replicate of culture counted	cells x 10^4/milliliter (cells x 10^4 ml-1)
Mean	Mean of replicate counts	cells x 10^4/milliliter (cells x 10^4 ml-1)

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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".

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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