

# Lab experiment to test effects of short-term exposure to live coral from corals, *Porites lobata*, *Pocillopora* sp., *Porites* rus, on *Caerasignum maximum* larvae (Vermetids\_Corals project)

**Website:** <https://www.bco-dmo.org/dataset/722135>

**Data Type:** experimental

**Version:** 2017-10-05

## Project

» [Spatial patterns of coral-vermetid interactions: short-term effects and long-term consequences](#)  
(Vermetids\_Corals)

| Contributors                     | Affiliation   | Role                            |
|----------------------------------|---|---------------------------------|
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| <a href="#">Osenberg, Craig</a>  | University of Georgia (UGA)                         | Co-Principal Investigator       |
| <a href="#">Shima, Jeffrey</a>   | Victoria University of Wellington                   | Co-Principal Investigator       |
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## Dataset Description

These datasets all provide data for the settlement of *Ceraesignum* (previously *Dendropoma*) *maximum* to live coral.

### Related Datasets:

- Experiment 1 day: <https://www.bco-dmo.org/dataset/722097>
- Experiment 2 hours: <https://www.bco-dmo.org/dataset/722118>
- Experiment 3 minutes: <https://www.bco-dmo.org/dataset/722135> (The current page.)
- Settlement to Quadrats: <https://www.bco-dmo.org/dataset/722208>
- Settlement to Rubble: <https://www.bco-dmo.org/dataset/722226>

## Methods & Sampling

*Ceraesignum maximum* larvae were obtained from field- collected adults. Individual adult *C. maximum* were chiseled from the coral matrix intact in their tubes, transported to the laboratory in coolers of seawater, and their brooding status ascertained by gently poking each snail until it retracted deep into its shell. If late-stage capsules were observed attached to the inside of the shell, a mesh-sided cage (mesh = 150  $\mu$ m) was secured around the tube with cable-ties, and the adult (with mesh enclosing the openings to their tubes) was then placed in a large tank with flowing seawater. Swimming larvae were released by females after 1–3 days.

Fragments (approximately 2x3 cm) of live coral were collected from the lagoon on the morning of each experiment and left for 2 h in flowing ambient seawater to recover. Fragments were examined under a

microscope prior to each experiment to ensure that polyps were extended.

For this experiment:

Fragments of each coral species were placed into tubs with 500 ml filtered seawater (n = 4 replicate tubs for each treatment). 20-25 3-day posthatch larvae from a single female (number 4) were added to each tub. Larvae were pipetted out very slowly and released a few cm above the coral, ensuring the velum was extended and that larvae would exit the pipette swimming in a trajectory that would bring them slowly into contact with the coral polyps. A dissecting microscope was used to observe as many larvae as possible as they came into contact with coral polyps. After approximately 5 min, as many larvae as could be found were collected from each dish with a pipette and scored as live or dead. Live larvae were placed in a petri dish with filtered seawater for 2 h and then examined for recovery. Larvae were observed for several min before a determination was made about their recovery status. Larvae were considered 'recovered' if they were swimming, or if the velum was extended or was in the process of being extended, and the velar cilia were visibly beating. Larvae judged to be dead did not recovered after 2 h.

## Data Processing Description

### BCO-DMO Processing:

- added conventional header with dataset name, PI name, version date
- modified parameter names to conform with BCO-DMO naming conventions
- blank values replaced with no data value 'nd'.

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## Data Files

| File  |
|---|
| <b>Phillipsetal_2014_Expt3mins.csv</b> (Comma Separated Values (.csv), 470 bytes)<br>MD5:0defe437a31d64cb300ce422bd91d0e4 |
| Primary data file for dataset ID 722135   |

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## Related Publications

Phillips, N. E., Shima, J. S., & Osenberg, C. W. (2014). Live coral cover may provide resilience to damage from the vermetid gastropod *Dendropoma maximum* by preventing larval settlement. *Coral Reefs*, 33(4), 1137–1144. doi:[10.1007/s00338-014-1198-2](https://doi.org/10.1007/s00338-014-1198-2)  
*General*

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## Parameters

| Parameter                   | Description  | Units    |
|-----------------------------|--|----------|
| Treatment                   | Coral species that larvae were exposed to (P.lobata = Porites lobata; P.rus = Porites rus; Pocillopora = Pocillopora sp.                             | unitless |
| number_dead                 | number of dead larvae  | unitless |
| number_live_but_unrecovered | number of live larvae that did not recover after 2 hours removed from coral  | unitless |
| number_recovered            | number of live larvae that did recover after 2 hours post removal from coral   | unitless |
| total                       | total number of live and dead larvae   | unitless |
| percent_live_recovered      | percent of live larvae that recovered. percent live, recovered = number of live, recovered larvae/total larvae                                       | percent  |
| pcnt_dead_alive_unrec       | percent of dead and live larvae that did not recover. percent dead + live but unrecovered = number of dead + number of live unrecovered/total larvae | percent  |

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## Instruments

|   |  |
|---|--|
| <b>Dataset-specific Instrument Name</b> | dissecting microscope  |
| <b>Generic Instrument Name</b>          | Inverted Microscope  |
| <b>Dataset-specific Description</b>     | Tubs were maintained in a flowthrough seawater table and examined after 24 h under a dissecting microscope.  |
| <b>Generic Instrument Description</b>   | An inverted microscope is a microscope with its light source and condenser on the top, above the stage pointing down, while the objectives and turret are below the stage pointing up. It was invented in 1850 by J. Lawrence Smith, a faculty member of Tulane University (then named the Medical College of Louisiana). Inverted microscopes are useful for observing living cells or organisms at the bottom of a large container (e.g. a tissue culture flask) under more natural conditions than on a glass slide, as is the case with a conventional microscope. Inverted microscopes are also used in micromanipulation applications where space above the specimen is required for manipulator mechanisms and the microtools they hold, and in metallurgical applications where polished samples can be placed on top of the stage and viewed from underneath using reflecting objectives. The stage on an inverted microscope is usually fixed, and focus is adjusted by moving the objective lens along a vertical axis to bring it closer to or further from the specimen. The focus mechanism typically has a dual concentric knob for coarse and fine adjustment. Depending on the size of the microscope, four to six objective lenses of different magnifications may be fitted to a rotating turret known as a nosepiece. These microscopes may also be fitted with accessories for fitting still and video cameras, fluorescence illumination, confocal scanning and many other applications. |

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## Deployments

### Osenberg\_et\_al\_Moorea

|                   |   |
|-------------------|---|
| <b>Website</b>    | <a href="https://www.bco-dmo.org/deployment/644752">https://www.bco-dmo.org/deployment/644752</a> |
| <b>Platform</b>   | Osenberg et al Moorea   |
| <b>Start Date</b> | 2003-05-19  |
| <b>End Date</b>   | 2015-07-12  |

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## Project Information

### Spatial patterns of coral-vermetid interactions: short-term effects and long-term consequences (Vermetids\_Corals)

**Coverage:** Moorea, French Polynesia (-17.48 degrees S, -149.82 degrees W)

*Description from NSF abstract:*

Ecological surprises are most likely to be manifest in diverse communities where many interactions remain uninvestigated. Coral reefs harbor much of the world's biodiversity, and recent studies by the investigators suggest that one overlooked, but potentially important, biological interaction involves vermetid gastropods. Vermetid gastropods are nonmobile, tube-building snails that feed via an extensive mucus net. Vermetids reduce coral growth by up to 80%, and coral survival by as much as 60%. Because effects vary among coral

taxa, vermetids may substantially alter the structure of coral communities as well as the community of fishes and invertebrates that inhabit the coral reef.

The investigators will conduct a suite of experimental and observational studies that: 1) quantify the effects of four species of vermetids across coral species to assess if species effects and responses are concordant or idiosyncratic; 2) use meta-analysis to compare effects of vermetids relative to other coral stressors and determine the factors that influence variation in coral responses; 3) determine the role of coral commensals that inhabit the branching coral, *Pocillopora*, and evaluate how the development of the commensal assemblage modifies the deleterious effects of vermetids; 4) determine how vermetid mucus nets affect the local environment of corals and evaluate several hypotheses about proposed mechanisms; and 5) assess the long-term implications of vermetids on coral communities and the fishes and invertebrates that depend on the coral.

**Note:** The Principal Investigator, Dr. Craig W. Osenberg, was at the University of Florida at the time the NSF award was granted. Dr. Osenberg moved to the University of Georgia during the summer of 2014 ([current contact information](#)).

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## Funding

| Funding Source   | Award                       |
|--|-----------------------------|
| <a href="#">NSF Division of Ocean Sciences (NSF OCE)</a> | <a href="#">OCE-1130359</a> |

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