Cyanobaterica production alteration from nudibranchs and sea hares through a trophic cascade in Moorea, French Polynesia from (CDD_in_Reef_Fish project)

Website: https://www.bco-dmo.org/dataset/726851
Data Type: experimental
Version: 1
Version Date: 2017-10-05

Project
» Cryptic density dependence: the effects of spatial, ontogenetic, and individual variation in reef fish (CDD_in_Reef_Fish)

Contributors	Affiliation	Role
Geange, Shane	Victoria University of Wellington	Principal Investigator, Contact
Shima, Jeffrey	Victoria University of Wellington	Co-Principal Investigator
Stier, Adrian	University of Washington (UW)	Co-Principal Investigator
Biddle, Mathew	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

Abstract
This dataset is part of a manipulative experiment to investigate how nudibranchs and sea hares alter cyanobaterica production through a trophic cascade.

Table of Contents

Coverage

Spatial Extent: **Lat**:-17.5 **Lon**:-149.8333333
Temporal Extent: 2008-05-23

Dataset Description

This dataset is from a manipulative experiment to investigate how nudibranchs and sea hares alter cyanobaterica production through a trophic cascade. This research was conducted in 2008 at the Gump Biological Research Station, Moorea, French Polynesia. For additional data, please see files listed in Related Datasets.

Related Dataset

- Geange_and_Stier_2010 Charismatic Microfauna Functional Response: https://www.bco-dmo.org/dataset/726813
- Geange_and_Stier_2010 Charismatic Microfauna Sea Hare Size: https://www.bco-dmo.org/dataset/726832
- Geange_and_Stier_2010 Charismatic Microfauna Trophic Cascade: https://www.bco-dmo.org/dataset/726851 (current page)

Methods & Sampling

All experiments were conducted in plastic containers (190 mm x 190 mm x 90 mm; W x L x H). To allow the exchange of fresh seawater, approx. 80% of the surface area of the lids, and two opposing sides of containers were cut away and covered with 0.5 mm mesh screening. Containers were placed within large (2,670 l) outdoor flow-through seawater tanks (10 containers per tank). In each experiment, sea hares (*Stylocheilus striatus*), nudibranchs (*Gymnodoris ceylonica*), and cyanobacteria (*Lyngbya* spp.) were collected from the field. Prior to experiments, nudibranchs were starved for 3 days, and cyanobacteria were rinsed with filtered seawater, which removed associated flora or fauna.

The presence of a trophic cascade was examined using three treatments: (1) cyanobacteria alone (n = 16); (2) cyanobacteria and sea hares (n = 8); (3) cyanobacteria, sea hares, and nudibranchs (n = 8). Cyanobacteria (mean = 78.0 g, SD = 12.9) were added to each of the 32 containers. Ten sea hares (mean length 57.4 mm ± 5.6 SD) were added to containers assigned to treatments 2 and 3, and one nudibranch (mean length 48.6 mm ± 3.6 SD) was added to containers assigned to treatment 3. Each morning (*0700), the number of surviving sea hares in each container was recorded. Nudibranch densities were maintained at their original density by replacing any missing or dead nudibranchs throughout the duration of the study (two nudibranchs were replaced on day two, and no other replacements were necessary). After 4 days, cyanobacterial biomass (g) and the number of sea hares in each container were recorded.

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
- date converted from dd-Mon-yy (eg, 8-May-08) to yyyymmdd (eg. 20080508)

[table of contents | back to top]

Data Files

File	
GeangeandStier_2010_Charismaticmicrofauna_TrophiCascade.csv	(Comma Separated Values (.csv), 1.94 KB) MD5:8353961bf9694c0bf3e34bbaa208a81e
Primary data file for dataset ID 726851	

[table of contents | back to top]

Related Publications

Geange, S. W., & Stier, A. C. (2010). Charismatic microfauna alter cyanobacterial production through a trophic cascade. Coral Reefs, 29(2), 393–397. doi:10.1007/s00338-010-0606-5
General

[table of contents | back to top]

Parameters

Parameter	Description	Units
Date	Date of Experiment (in yyyymmdd format)	unitless
OBS	Name of observers (SWG (Shane Geange) or ACS (Adrian Stier))	unitless
bin	Unique container ID	unitless
initial_alg	Initial weight of algae (g)	grams (g)
final_alg	final weight of algae (g)	grams (g)
delta_mass	initial_alg - final_alg	grams (g)
pred_ttt	Nudibranch presence or absence	unitless
aplysia	Sea hare presence or absence	unitless
initial_aplysia	Initial number of sea hares at the start of experiment in each container	unitless
final_aplysia	Final number of sea hares at the end of the experiment	unitless
prop_surv	Proportional survival of sea hares at the end of the experiment. Proportion survival was calculated as final_aplysia/initial_aplysia.	unitless

[table of contents | back to top]

Deployments

Osenberg_et_al_Moorea

Website	https://www.bco-dmo.org/deployment/644752
Platform	Osenberg et al Moorea
Start Date	2003-05-19
End Date	2015-07-12

[table of contents | back to top]

Project Information

Cryptic density dependence: the effects of spatial, ontogenetic, and individual variation in reef fish (CDD_in_Reef_Fish)

Coverage: Moorea, French Polynesia (-17.48, -149.82)

Description from NSF award abstract:
Ecologists have long been interested in the factors that drive spatial and temporal variability in population density and structure. In marine reef systems, attention has focused on the role of settlement-the transition of pelagic larvae to a benthic stage-and on density-dependent processes affecting recently settled juveniles. Recent data suggest that co-variance in settlement and subsequent density-dependent survival can obscure the patterns of density dependence at larger scales, a phenomenon called cryptic density dependence. This research will explore the mechanisms that underlie the spatial covariance of settlement and site quality - a process that has received little attention in the standard paradigm. These mechanistic studies of cryptic density dependence will facilitate the development of new frameworks for fish population dynamics that incorporate larval ecology, habitat quality, density dependence, life history, and the patterns and implications of spatial covariance among these factors. More generally, the work provides a specific empirical context, and a general theoretical treatment, of cryptic heterogeneity (hidden individual variation in demographic rates).

Note: Drs. Craig W. Osenberg and Ben Bolker were 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). Dr. Bolker moved to McMaster University in 2010 (current contact information).

[table of contents | back to top]

Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0242312

[table of contents | back to top]