Background fish community at the start of each experimental run for an experiment in Moorea, French Polynesia from May to June 2008 (CDD_in_Reef_Fish project)

Website: https://www.bco-dmo.org/dataset/727058
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
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Abstract
Background fish community at the start of each experimental run for an experiment in Moorea, French Polynesia from May to June 2008. This dataset is from a manipulative experiment the relative competitive abilities of juveniles of three closely related species of reef fish (bird wrasse, Gomphosus varius; fivestripe wrasse, T. quinquevittatum; and the sixbar wrasse, Thalassoma hardwicke.

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Coverage

Spatial Extent: **Lat**:-17.5 **Lon**:-149.8333333
Temporal Extent: 2008-05-20 - 2008-06-06

Dataset Description

This dataset is from a manipulative experiment the relative competitive abilities of juveniles of three closely related species of reef fish (bird wrasse, Gomphosus varius; fivestripe wrasse, Thalassoma. quinquevittatum; and the sixbar wrasse, Thalassoma hardwicke). This research was conducted in 2008 at the Gump Biological Research Station, Moorea, French Polynesia.

Data within this file contain information on the background fish community at the start of each experimental run. For additional experimental data, please see the Related Datasets section.

Related Datasets:

- Geange_et_al_2013 Competitive Hierarchies: https://www.bco-dmo.org/dataset/727026

- Geange_et_al_2013 Competitive Hierarchies Background Community: https://www.bco-dmo.org/dataset/727058 (current page)
- Geange_et_al_2013 Competitive Hierarchies Lengths: https://www.bco-dmo.org/dataset/727043
- Geange_et_al_2013 Competitive Hierarchies Spatial Covariance: https://www.bco-dmo.org/dataset/727076

Methods & Sampling

This datasets records the background fish community at the start of each experimental run.

We constructed an array of 30 live-coral patch reefs and used these to conduct a field experiment that examined competitive asymmetry between bird wrasse, fivestripe wrasse and sixbar wrasse. On our constructed reefs, we aimed to minimize habitat variation by standardizing the reefs' size, rugosity and water depth. To achieve this, we selected natural reefs (based upon a set of morphological attributes that included a base of live *Porites lobata* coral with a surface area [mean ± SD] of 2.23 ± 0.56 m2, and a height of 0.59 ± 0.10 m) from a nearby location and transplanted them to our study site (17°29.010' S, 149° 50.346'W), an open sand flat 2 to 4 m deep. Each reef was separated from its nearest neighbor and other non-experimental reefs by a minimum of 10 m. To each reef we attached 3 similar-sized colonies (colony surface area = 0.2 ± 0.07 m2) of the branching coral *Pocillopora verrucosa* using Z-Spar Splash Zone Compound (Kopcoat).

Prior to starting the experiment, we removed all bird wrasse, fivestripe wrasse and sixbar wrasse from the reefs and manipulated the relative abundances of other resident fish species via selective removals and additions so that the relative abundance of all species was similar among the 30 reefs. To each reef, we randomly assigned 1 of 6 treatments: (1) 6 bird wrasses; (2) 6 fivestripe wrasses; (3) 6 sixbar wrasses; (4) 3 bird wrasses and 3 fivestripe wrasses; (5) 3 bird wrasses and 3 sixbar wrasses; or (6) 3 fivestripe wrasses and 3 sixbar wrasses.

We ran the experiment in 2 temporal blocks (21 to 25 May 2008 and 2 to 6 June 2008), yielding 10 replicates for each of the 6 treatments, with treatments randomly assigned in each temporal block. We surveyed reefs twice daily (approximately 08:00 and 16:00 h) for 5 d after the introduction of fishes. During surveys, we searched neighboring non-experimental reefs for tagged immigrants. We found no immigrants or emigrants.

Surveys were conducted the day immediately before deployment of fishes in each temporal block, with 30 reefs surveyed on 20 May 2008 and 24 reefs surveyed on 1 June 2008.

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
- replaced all spaces with underscores

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Data Files

File	
Geangeetal_2013_CompetitiveHierarchies_Backgroundcommunity.csv	(Comma Separated Values (.csv), 63.83 KB) MD5:9e532417f586c79f330744cd6a9e7938
Primary data file for dataset ID 727058	

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Related Publications

Geange, S., Stier, A., & Shima, J. (2013). Competitive hierarchies among three species of juvenile coral reef fishes. Marine Ecology Progress Series, 472, 239–248. doi:10.3354/meps10015
General

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Parameters

Parameter	Description	Units
Reef	unique identifier for each reef	unitless
Species	Genus and species	unitless
Count	The number of individuals	unitless

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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

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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).

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Funding

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

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