

Trematode host risk data from Carpinteria Salt Marsh in California (Parasite Populations project)

Website: <https://www.bco-dmo.org/dataset/718108>

Data Type: experimental

Version: Final

Version Date: 2017-10-26

Project

» [OCE-PRF Track 1 \(Broadening Participation\): Determinants of parasite populations in an estuarine system](#)
(Parasite_Populations)

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Coverage

Spatial Extent: Lat:34.401402 Lon:-119.538479

Dataset Description

Host density increases parasite recruitment but decreases host risk in a snail-trematode system.

Methods & Sampling

At eight sites at Carpinteria salt marsh, I deployed uninfected snails in 83 5-gallon bucket-size cages. Each cage contained 1, 5, 25, or 100 uninfected snails. Cages were permeable to trematode eggs and miracidia, but not permeable to snails. After 4 months, I measured the influence of snail density on the number of infected snails in each cage (exp_recruitment dataset) and per capita infection risk (exp_risk dataset). I statistically controlled for snail size, the input of trematode infective stages, and snail biomass surrounding the cage. Detailed methods are available in the associated publications.

Data Processing Description

All statistical analyses were run in R (version 3.2.2; R Development Core Team 2015) using the lme4 package.

BCO-DMO Data Processing Notes:

- changed "long" column name to "lon"

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Data Files

File
risk.csv (Comma Separated Values (.csv), 5.51 KB) MD5:24feba8b65f9f92caa46abaeb1a5a454 Primary data file for dataset ID 718108

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Related Publications

Bates, D., Maechler, M., & Bolker, B. (2013). lme4: Linear mixed-effects models using Eigen and Eigenpack. R package version 0.999999-2.

Software

Buck, J. C., Hechinger, R. F., Wood, A. C., Stewart, T. E., Kuris, A. M., & Lafferty, K. D. (2017). Host density increases parasite recruitment but decreases host risk in a snail-trematode system. *Ecology*, 98(8), 2029–2038. doi:[10.1002/ecy.1905](https://doi.org/10.1002/ecy.1905)

Methods

Buck, J. C., Wood, A. C., Cook, I.M., and Lafferty, K. D. (2017). Parasite Recruitment and Host Risk in a Snail-Trematode System at Carpinteria Salt Marsh, 2012-2015 Field Experiment [Data set]. U.S. Geological Survey. <https://doi.org/10.5066/f7gx48p2> <https://doi.org/10.5066/F7GX48P2>

Methods

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Parameters

Parameter	Description	Units
site	Site Identifier	unitless
lat	Latitude	decimal degrees
lon	Longitude	decimal degrees
cage	Cage number	unitless
egginf	Snail infected with egg-transmitted trematode; 1=yes; 0=no	unitless
mirainf	Snail infected with mira-transmitted trematode; 1=yes; 0=no	unitless
cagebmdens	Snail biomass density in cage	grams per meter squared
eggfhi	Influence of final hosts for egg trematodes	grams ^{3/4}
mirafhi	Influence of final hosts for mira trematodes	grams ^{3/4}

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Instruments

Dataset-specific Instrument Name	Cage
Generic Instrument Name	Fish Cage
Dataset-specific Description	Used in trematode experiments
Generic Instrument Description	Used to catch fish.

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Deployments

Carpinteria_Salt_Marsh

Website	https://www.bco-dmo.org/deployment/718116
Platform	shoreside Calif_shore

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Project Information

OCE-PRF Track 1 (Broadening Participation): Determinants of parasite populations in an estuarine system (Parasite_Populations)

Website: https://www.nsf.gov/awardsearch/showAward?AWD_ID=1420273

Coverage: Carpinteria Salt Marsh -- Carpinteria, CA

Parasites are now recognized as integral members of ecological communities, yet thorough investigation of the relative influences of the complex factors controlling their populations has not been undertaken. In this two year postdoctoral research fellowship, the fellow will pursue empirical and theoretical investigations into the relative influences of bottom-up and top-down regulation and recruitment limitation on parasite populations in an estuarine system. The research will take place at the University of California, Santa Barbara (UCSB) under the direction of the lead sponsoring scientist Kevin Lafferty. The fellow will also work with a second sponsoring scientist, Jan Medlock at Oregon State University. The fellow will broaden participation of under-represented groups in ocean sciences by designing a teachable unit on host-parasite interactions and presenting this activity to groups of K-12 students.

In this research effort, the fellow will investigate the relative influences of host density and eutrophication (bottom-up influences), concomitant predation, predation on free-swimming parasite stages, and intraguild predation (top-down influences), and recruitment limitation in a guild of trematode parasites with complex life cycles. Results of experimental and survey work will be supplemented with data from ongoing and completed projects in the UCSB Ecological Parasitology Laboratory to parameterize mathematical models describing the system. Under the direction of the second sponsoring scientist, modified 'macroparasite' equations will be used to model the dynamics of parasite populations, and test the relative influences of bottom-up effects, top-down influences, and recruitment limitation. Research findings will contribute to the growing body of knowledge on the relative influence of bottom-up vs. top-down effects on population dynamics and the role of recruitment in limiting populations.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1420273

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