Trait data captured from literature sources, field observations and measurements of sessile marine invertebrates from coastal sites across a geographic gradient spanning the sub-arctic to the tropics from 2015 to 2017.

Website: https://www.bco-dmo.org/dataset/850202
Data Type: Other Field Results
Version: 1
Version Date: 2021-04-23

Project
» Community Effects of Competition and Predation across Latitude and Implications for Species Invasions (Competition and Predation across Latitude)

Contributors	Affiliation	Role
Freestone, Amy L.	Temple University (Temple)	Principal Investigator
López, Diana Paola	Temple University (Temple)	Student, Contact
York, Amber D.	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

Abstract
Trait data captured from literature sources, field observations (2015 to 2017) and measurements of sessile marine invertebrates from coastal sites across a geographic gradient spanning the sub-arctic to the tropics.

Table of Contents

Coverage

Spatial Extent: **N**:55.47257 **E**:-79.52183 **S**:8.91758 **W**:-131.79698
Temporal Extent: 2015-12 - 2017-06

Dataset Description

These data were used for the publication Lopez and Freestone (2020).

Methods & Sampling

Location: Ketchikan, AK, San Francisco, CA, La Paz, Mexico, and Panama City, Panama

Methodology: Traits were collected from field measurements, observations, or literature sources. For field measurements, an average of five individuals per taxa were photographed for color, structural defense, and growth form determination. All other traits except water content and organic content were collected from the literature. A brief description of the sampling procedure for determining water content and organic content is

in the following section below.

For more information about the field data see dataset "Community composition separated by native and cryptogenic, and introduced species of each community" https://www.bco-dmo.org/dataset/850190.

Sampling and analytical procedures: For field measurements of organic and water content, an average of five individuals per taxa were collected and used dry weights (DW) and ash free dry weights (AFDW) to calculate water content as [(1−(DW/WW)) x 100] and organic content as [(1−(AFDW/DW)) x 100]. We then calculated a single mean trait value per taxa to be included in the trait table.

Data Processing Description

BCO-DMO Data Manager Processing Notes:
* Imported file Trait_data.csv into the BCO-DMO data system
* removed underscores in taxonomic names in column MorphName.
* Taxonomic names matched to accepted taxonomic names using the World Register of Marine Species taxa match tool on 2021-04-26. Names were not changed in this dataset. Misspelled and unaccepted synonyms are present in the data. A species list including the matches accepted names, aphiaIDs, and LSIDs attached to this dataset as a supplemental file. For more information see https://www.marinespecies.org/aphia.php?p=match

[table of contents | back to top]

Data Files

File
trait_data.csv (Comma Separated Values (.csv), 8.25 KB) MD5:689abc88dccf5d34b4a6d1efbf27e3c9 Primary data file for dataset ID 850202

[table of contents | back to top]

Supplemental Files

File

Species list

filename: species_list.csv

(Comma Separated Values (.csv), 6.24 KB)
MD5:d1fa4f271c48a5e6eeb588f965a72230

Species list for BCO-DMO datasets:

Community composition separated by native and cryptogenic, and introduced species of each community

https://www.bco-dmo.org/dataset/850190

Trait data: native, cryptogenic, introduced species

https://www.bco-dmo.org/dataset/850202

This file contains the exact taxonomic names used in these datasets along with the results of the Taxa Match tool at the World Register of marine species (match performed 2021-04-26). For more information about match, results see http://www.marinespecies.org/tutorial_taxonmatch.php.

Parameter (Column names and descriptions):

ScientificName_in_Dataset, The taxonomic name exactly as it appears is in the datasets.

AphiaID, The AphiaID matched with the ScientificName_in_Dataset.

Match type, The ScientificName_in_Dataset's match type to the AphiaID (exact or phonetic).

Taxon status, Whether ScientificName_in_Dataset is the accepted taxonomic name or an unaccepted synonym.

LSID, Life Science Identifier for the ScientificName_in_Dataset.

AphiaID_accepted, The AphiaID for the accepted taxonomic name matched to the ScientificName_in_Dataset.

ScientificName_accepted, The accepted taxonomic name matched to the ScientificName_in_Dataset.

[table of contents | back to top]

Related Publications

López, D. P., & Freestone, A. L. (2020). History of co-occurrence shapes predation effects on functional diversity and structure at low latitudes. Functional Ecology, 35(2), 535–545. doi:10.1111/1365-2435.13725
Results

[table of contents | back to top]

Related Datasets

IsRelatedTo

Freestone, A., Torchin, M., Lopez, D. P., Bonfim, M., Jurgens, L., Repetto, M. F., Schloder, C., Ruiz, G. (2021) **Community composition (relative abundance) separated by native and cryptogenic, and introduced species of each community from coastal sites across a geographic gradient spanning the sub-arctic to the tropics from 2015-2017.** Biological and Chemical Oceanography Data Management Office (BCO-DMO). (Version 1) Version Date 2021-04-23 doi:10.26008/1912/bco-dmo.850190.1 [view at BCO-DMO]
Relationship Description: Field data referenced in this trait dataset.

Welcome to NEMESIS! National Estuarine and Marine Exotic Species Information System (NEMESIS). Marine Invasions Research, Smithsonian Environmental Research Center. (n.d.). https://invasions.si.edu/nemesis/.

[table of contents | back to top]

Parameters

Parameter	Description	Units
Region	Region where each taxon was collected (Alaska, Panama, Mexico, California)	unitless
MorphName	Lower taxonomic information (~genus/species, if available) based on best available information in the field	unitless
Status	Invasion status: native, cryptogenic, introduced	unitless
Org_cont	Organic content: mean of at least five individuals, calculated as [(1 − (AFDW/DW)) × 100] (AFDW: Ashfree dry weight, DW: Dry weight)	unitless
Wat_cont	Water Content: mean of at least five individuals, calculated as [(1 − (DW/WW)) × 100] (DW: Dry weight, WW: Wet weight)	unitless
Sex_rep	Sexual reproduction categorized as hermaphroditic (herm), gonochoristic (gono), simultaneous (simul)	unitless
Fert_type	Fertilization type categorized as oviparous (ovi), ovoviviparous (ovo), viviparous (vivi)	unitless
Asex_rep	Asexual reproduction defined as capable of asexual reproduction yes (1) or no (0)	unitless
Lar_life	Larval life duration: maximum hours of pelagic life before settling (Number of hours)	unitless
Eggs	Number of eggs produced by an individual (Total number)	unitless
Egg_size	Egg size - diameter of egg size	micrometers (um)
Lar_dev	Larval development type categorized as simultaneous (both), lecithotrophic (leci), or planktotrophic (plank)	unitless
Feed_struc	Feeding structure: whether the morphospecies has (1) or doesn't have (0) feeding appendages such as ciri, tentacles, or other appendages	unitless
Struc_defe	Structural defense: whether the morphospecies has a calcified structure (CalcStr), an uncalcified structure used for protection (NCalcStr), or no structure (NStr) at all	unitless
Sociability	Sociability structure categorized as colonial or solitary	unitless
Growth_form	Growth form categorized as encrusting, erect, arborescent, massive, runner, stolonate (values: encrus, erect, arbo, massi, run, stol)	unitless
Color	Color categorized as bright, dull, dark, transparent, white	unitless

[table of contents | back to top]

Project Information

Community Effects of Competition and Predation across Latitude and Implications for Species Invasions (Competition and Predation across Latitude)

Coverage: Eastern Pacific in four coastal regions: Ketchikan, Alaska; San Francisco, California; La Paz, Mexico; and Panama City, Panama

Description from NSF award abstract:
Global patterns of biodiversity demonstrate that most of the species on earth occur in the tropics, with strikingly fewer species occurring in higher-latitude regions. Biologists predict that this global pattern of species diversity is likely shaped by thee ecological interactions between species. Yet few detailed experimental data exist that demonstrate how species interactions influence natural communities from the tropics to the arctic. Therefore, a significant opportunity exists to transform our understanding of how these fundamental species

interactions shape patterns of biodiversity across the globe. Furthermore, these species interactions have the strong potential to limit potentially harmful biological invasions by non-native species, which are often transported by human activities that can breach historical dispersal barriers, such as ocean basins and continents. Biological invasions can cause undesired ecological and economic effects and are considered one of the primary drivers of global change. Through extensive field research on marine ecosystems along the Pacific Coast of North and Central America, from the tropics to the subarctic, this project will study ecological factors that shape global patterns of diversity and limit biological invasions.

Biologists have long theorized that the latitudinal diversity gradient may be shaped by stronger species interactions, such as competition and predation, occurring in the tropics than at higher latitudes. Prior research suggests that predation pressure is indeed stronger at lower latitudes, but it is unclear how interactive effects of predation and competition structure communities to maintain these diversity patterns in ecological time. This project represents an international research program to expand ecological understanding of species interactions across latitude. The objectives are to determine the relative influences of two primary species interactions, competition and predation, on patterns of species diversity, community assembly and sensitivity to species invasion. Field research will employ a large-scale experimental approach that focuses on sessile marine invertebrate communities across 47 degrees of latitude (over 7000 km). Experiments will manipulate levels of predation and competition for one year and will be conducted in four regions, ranging from the subarctic to the tropics: Alaska, California, Mexico, and Panama. Communities of sessile marine invertebrates, composed of both native and non-native species, will be examined iteratively under different predation and competition regimes to evaluate community dynamics. The relative importance of a suite of factors, including environmental conditions and recruitment rates, to interaction outcomes will be evaluated.

[table of contents | back to top]

Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-1434528

[table of contents | back to top]