Cell volume measurements for phytoplankton collected from the Kellogg Biological Station, MSU, Michigan in 2014 (Phytoplankton Traits project)

Website: https://www.bco-dmo.org/dataset/636302
Data Type: experimental
Version: 2016-01-21

Project
» Phytoplankton Traits, Functional Groups and Community Organization: A Synthesis (Phytoplankton Traits)

Contributors	Affiliation	Role
Litchman, Elena	Michigan State University (MSU)	Principal Investigator
Edwards, Kyle F.	University of Hawai'i at Mānoa (SOEST)	Co-Principal Investigator
Klausmeier, Christopher	Michigan State University (MSU)	Co-Principal Investigator
Copley, Nancy	Woods Hole Oceanographic Institution (WHOI BCO-DMO)	BCO-DMO Data Manager

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Dataset Description

This dataset includes Table 3 from Edwards et al (2015) Ecology. Cell volume measurements for nearly all species in the nutrient trait data set. These measurements supplement those in Table 1, which only includes measurements reported in the nutrient trait publications. The volume measurements in Table 1 are presented again, along with measurements from the literature for species not measured in the nutrient trait publications.

Full metadata details

Related Reference:

Kyle F. Edwards, Christopher A. Klausmeier, and Elena Litchman. 2015. Nutrient utilization traits of phytoplankton. Ecology 96:2311. http://dx.doi.org/10.1890/14-2252.1

Methods & Sampling

Data acquisition, methodology, and criteria for inclusion: We comprehensively searched the literature for studies that used unialgal cultures to measure how phytoplankton growth, nutrient content, and nutrient uptake rate respond to nutrient supply. We focused on experiments using nitrate, ammonium, or phosphate as the limiting nutrient. We only compiled studies where light was not strongly limiting, and where only a single nutrient was limiting. For one diazotroph (*Trichodesmium*), the experiments compiled here did not include nitrogen in the medium.

Data Processing Description

BCO-DMO Processing:

These data/metadata were obtained from http://www.esapubs.org/archive on 2016-01-21.

- added conventional header with dataset name, PI name, version date, reference information
- renamed parameters to BCO-DMO standard
- replaced blank cells with nd
- replaced spaces with underscores

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Data Files

File
nut_traits_T3.csv (Comma Separated Values (.csv), 28.94 KB) MD5:4ca2e1665d30cb95afa4fb5a50af265f Primary data file for dataset ID 636302

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Parameters

Parameter	Description	Units
species	Species name	text
isolate	Isolate ID	text
volume	Cell volume	um^3
volume_citation	Citation for volume measurement	text

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Deployments

Litchman_2014

Website	https://www.bco-dmo.org/deployment/636298
Platform	Unknown Platform
Start Date	2014-01-01
End Date	2014-12-31
Description	Phytoplankton trait studies

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Project Information

Phytoplankton Traits, Functional Groups and Community Organization: A Synthesis (Phytoplankton Traits)

Description from NSF award abstract:
Phytoplankton account for half of global primary productivity and their biomass and community composition significantly impact global carbon and other biogeochemical cycles and ecosystem functioning. Explaining

patterns of global distributions of phytoplankton groups and predicting how phytoplankton communities will re-organize under anthropogenic environmental change requires knowledge of diverse eco-physiological traits defining ecological niches of phytoplankton species. In this project, the investigators will assemble a query-based database of diverse phytoplankton traits such as cell/colony size, growth rates, resource acquisition and predator avoidance traits, among others. Data for all available species and strains will be included. They will use the database to answer fundamental questions in phytoplankton ecology such as:
1) what traits exhibit trade-offs (pairwise and beyond) and what shapes are they?
2) What traits scale allometrically with cell/body size? Can scaling exponents from first principles be predicted? What are potential limits to allometric scaling as a way of simplifying the complex trait space that characterizes real organisms?
3) What are trait differences among major functional/taxonomic groups of phytoplankton and how much does taxonomy/phylogeny constrain particular functional traits?
4) Are there differences in trait distributions between marine and freshwater groups?

The investigators will also use the database to parameterize novel models of phytoplankton community organization and evolution based on adaptive dynamics approaches. They will use the models to explore how community structure emerges under different environmental scenarios, given physiological constraints and ecological interactions. Changes in elemental stoichiometry, size structure and functional group distributions at different spatial and temporal scales will also be examined.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0928819

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