Diagnostic accessory pigment data analyzed by HPLC from samples collected on R/V Challenger cruise LIS0507 in the Long Island Sound in 2007

Website: https://www.bco-dmo.org/dataset/3646
Version: 09 May 2012
Version Date: 2012-05-09

Project
» Testing hypotheses about diversity, gene flow, and effective population size in marine planktonic ciliates (CiliateDivGenePop)

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Dataset Description

Accessory pigment analysis data for samples taken from 6 stations in Long Island Sound, including fucox, allox, lutein, gyrox, carotene, pheophorbide a, pheophytin a, chlorophyll, and others.

Related files and references:
Doherty, M, M Tamura, BA Costas, ME Ritchie, GB McManus, and LA Katz. 2010. Ciliate Diversity and Distribution Across an Environmental and Depth Gradient in Long Island Sound, USA. Environmental Microbiology 12:886-898. doi:10.1111/j.1462-2920.2009.02133.x (PDF)

Methods & Sampling

Samples were collected on research cruise LIS0507 in the estuary of Long Island Sound on 01 June 2007. Sampling occurred at stations designed to capture the area where water exiting the Connecticut River forms a shallow plume of low-salinity water. For the HPLC analyses,100 ml samples were collected on glass fiber filters and extracted in acetone.

Data Processing Description

Samples were processed at Horn Point Lab (HPL). Samples were collected in a vacuum. Extraction in the lab took place on 06 November 2011. GF/F type filters of 25-mm diameter were used. Filters were stored at -70 degrees C prior to shipping to HPL. Pigment data were processed using CHEMTAX software.

BCO-DMO made the following modifications to the dataset: format of parameter names was changed to

conform to BCO-DMO conventions; blanks were replaced with 'nd'.

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Data Files

File
HPLC_pigments.csv (Comma Separated Values (.csv), 36.02 KB) MD5:0d6aff018cf93b278b006e9d3195aed9 Primary data file for dataset ID 3646

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Parameters

Parameter	Description	Units
cruiseid	Identifier that represents the research cruise.	dimensionless
year	Year the sample was collected, in YYYY format.	dimensionless
month_gmt	Month the sample was collected. Converted from text to GMT format (MM).	dimensionless
day_gmt	Day the sample was collected, in DD format.	dimensionless
yrday_gmt	Sequential day of the year on which the sample was collected.	dimensionless
station	Numeric identifier of the sample station.	dimensionless
sample	Unique identifier of the sample. Column originally named 'Original PI Sample Code'.	dimensionless
sample_lab	Sample code assigned by the lab. Column originally named 'Horn Point Lab sample code'.	dimensionless
sample_seq	Sequential sample number.	dimensionless
site_descrip	Indicates if the sample site is located in ('in_plume') or out ('out_plume') of the plume. Column originally named 'In plume or out'.	dimensionless
lat	Latitude in decimal degrees.	decimal degrees
lon	Longitude in decimal degrees. Negative indicates West.	decimal degrees

pigment	Name of the pigment measured: chlide_a = chlorophyllide a p_phorbide = pheophorbide a (or pheide) fucox_but = 19-prime-butanoyloxyfucoxanthin fucox = fucoxanthin fucox_hex = 19-prime-hexanoyloxyfucoxanthin p_phytin = pheophytin a (or phaeophytin)	dimensionless
conc	Concentration of the pigment in micrograms/Liter.	ug/L
time_gmt	GMT time in HHMM format.	dimensionless
depth	Sample depth in meters.	meters
vol_filt	Volume of water filtered, in milliliters.	mL
comments	Comments.	dimensionless
vol_extr	Volume extracted, measured in milliliters.	mL

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Instruments

Dataset-specific Instrument Name	High Performance Liquid Chromatograph
Generic Instrument Name	High-Performance Liquid Chromatograph
Dataset-specific Description	HPLC pigment data was processed using CHEMTAX software.
Generic Instrument Description	A High-performance liquid chromatograph (HPLC) is a type of liquid chromatography used to separate compounds that are dissolved in solution. HPLC instruments consist of a reservoir of the mobile phase, a pump, an injector, a separation column, and a detector. Compounds are separated by high pressure pumping of the sample mixture onto a column packed with microspheres coated with the stationary phase. The different components in the mixture pass through the column at different rates due to differences in their partitioning behavior between the mobile liquid phase and the stationary phase.

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Deployments

LIS0507

Website	https://www.bco-dmo.org/deployment/58821
Platform	R/V Challenger
Start Date	2007-06-01
End Date	2007-06-01
Description	Samples were collected at 6 stations in the estuary of Long Island Sound where water exiting the Connecticut River forms a shallow plume of low-salinity water. The cruise occurred on a small boat operated by UConn (known as R/V Challenger).

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Project Information

Testing hypotheses about diversity, gene flow, and effective population size in marine planktonic ciliates (CiliateDivGenePop)

Website: http://microzooplankton.uconn.edu

Coverage: Coastal Northwest Atlantic, from Long Island Sound to Maine

The microbial ecologist Tom Fenchel recently said, “The decoupling of molecular and classical (including experimental) approaches to environmental microbiology has not been fruitful and it represents one of the most important challenges for the field in the coming years.” (Fenchel 2005). Classical approaches center on the centuries-old tradition of describing individual species via meticulous observation and analysis to generate monographs, such as is done for plants and animals. Unfortunately, the rush to new molecular techniques has sometimes ignored this tradition, with claims about new lineages never seen before and reports of staggering diversity of microbial eukaryotes based on environmental DNA samples not backed up by even the most elementary microscopic observations.

In the face of this disconnect between the traditional and the molecular, we propose a marriage of the two approaches in the study of marine ciliate diversity and gene flow. Our own data show that in some clades of planktonic ciliates (Strombidiidae) there is indeed a high level of molecular diversity underlying a relatively small number of morphospecies. In other clades (some choreotrichs), the opposite appears to be true, with morphological heterogeneity underlain by apparently clonal lines, based on molecular data. Currently, we do not understand what sustains diversity in some clades; nor do we know why other clades show low diversity. But this problem is amenable to both experimental and observational approaches.

This proposal uses a two-pronged approach, combining molecular (clone libraries, DGGE,FISH) and traditional (light microscopy) techniques to address three broad questions:
i. What are the most important physical and biological factors that affect distribution and diversity of planktonic marine ciliates?
ii. What is the effective population size for marine ciliate populations, and how does this compare to census population sizes?
iii. How well do traditional morphological descriptions of ciliate species fare when compared with molecular characterizations?

Using a combination of molecular and microscopy methods, we will address these questions in coastal planktonic ciliates. Analyses of the resulting data will yield insights into the nature of ciliate species and patterns of gene flow within the North Atlantic.

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0648711

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