Hydromedusae and zooplankton abundance in Naragansett Bay timeseries from in the coastal northwest Atlantic from 2005-2006 (Hydromedusae trophic ecology project)

Website: https://www.bco-dmo.org/dataset/3606
Version: Jan 24, 2012
Version Date: 2012-11-20

Project
» Trophic ecology of small hydromedusae: a new perspective on their function in coastal ecosystems (Hydromedusae trophic ecology)

Contributors	Affiliation	Role
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Dataset Description

The focus of the research is the trophic role of small (bell diameter < 5 mm) hydromedusae. Medusae are important, often highly selective, planktonic predators that can strongly affect standing stocks of metazoan zooplankton as well as fish eggs and larvae. The feeding rates, prey selection patterns and the underlying feeding mechanisms that have led to the success of large, conspicuous medusae have been well studied. However, most medusae are small. These small medusae are abundant, taxonomically diverse, and often have cosmopolitan distributions. Yet their feeding ecology is virtually unknown despite their status as the largest and most diverse group of gelatinous zooplankton in the sea.

The following hypotheses were tested:
(1) Small hydromedusae feed in ways that enable them to utilize protistan prey, including microzooplankton as well as autotrophic protists typically regarded as phytoplankton. Consequently, these hydromedusae are omnivores utilizing microplankton prey rather than strict predators on metazoans.
(2) The combination of high seasonal abundances of these small medusae in coastal waters and their omnivorous diet allows them to function as significant grazers of phytoplankton during periods of peak seasonal production.

Specific objectives of the research were:
(1) Quantification of the ecological impact of small hydromedusae on their prey community. This objective will be accomplished by measuring the temporal distribution and abundance of hydromedusae and their potential microplankton and metazoan prey, quantifying feeding rates and prey selection, and confirming that the prey ingested are utilized for growth by the medusae.

(2) Quantification of the mechanical basis of prey selection by the target organisms. This objective will be accomplished by evaluating the sequential components of feeding for each of the target species, predicting

prey selection patterns from measured encounter, retention and capture efficiencies of different prey types, and comparing predictions derived from this analysis with empirical results from in situ feeding and prey selection studies.

Methods & Sampling

Field Sampling: Field sampling in Narragansett Bay was done twice weekly in 2005 and once weekly in 2006 during the hydromedusan growth season. Hydrographic data was collected using a HydroLab Datasonde 4 profiling package outfitted with sensors for depth, conductivity,and temperature. The potential prey field of hydromedusae consists of mesozooplankton (>200 µm) and microplankton (autotrophs and heterotrophs <200 µm). Mesozooplankton samples include both the hydromedusae and their potential mesozooplankton prey. Mesozooplankton were collected by vertical hauls of a metered 64 µm-mesh 0.5m diameter ring net. Samples were preserved in 4% buffered formaldehyde. Samples for analysis of autotrophic and heterotrophic microplankton were collected using a Niskin bottle deployed at targeted depths, typically 3 depths perstation (surface, mid-depth and bottom of the well-mixed water column). Samples were preserved with 10% (vol/vol) acid Lugols solution, settled, and then processed by inverted microscopy (Gifford and Caron 2001).

Data Processing Description

Microzooplankton abundance is displayed as number/liter, the other groups are number/cubic meter.

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Data Files

File
zoop_abund.csv (Comma Separated Values (.csv), 151.73 KB) MD5:ae656ba59f5e49e078195a1a7f217442 Primary data file for dataset ID 3606

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Parameters

Parameter	Description	Units
date_local	local date	mm/dd/YYYY
temp_surface	surface temperature	degrees Celsius
temp_bottom	bottom temperature	degrees Celsius
sal_surface	surface salinity	PSU
sal_bottom	bottom salinity	PSU
depth_w	depth of water	meters
taxon	taxonomic group	text
taxon2	sub-taxonomic group	text
abundance	abundance of animals: microzooplankton abundance = #/L; all other groups = #/m^3	number/liter or number/m^3
yrday_local	local day and decimal time, as 326.5 for the 326th day of the year, or November 22 at 1200 hours (noon)	
year	year of sampling	
month_local	month of sampling, local time	1 to 12
day_local	day of month	1 to 31
lat	Latitude - North is positive	decimal degrees
lon	Longitude - West is negative.	decimal degrees

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Instruments

Dataset-specific Instrument Name	HydroLab Datasonde 4 Multiprobe
Generic Instrument Name	HydroLab DataSonde
Dataset-specific Description	This package was outfitted with sensors for depth, conductivity,and temperature.
Generic Instrument Description	Hydrolab DataSonde Multiparameter Probes have sensors for temperature, conductivity, salinity, specific conductance, TDS, pH, ORP, dissolved oxygen, turbidity, chlorophyll a, blue-green algae, Rhodamine WT, ammonium, nitrate, chloride, ambient light (PAR), and total dissolved gas.

Dataset-specific Instrument Name	Niskin bottle
Generic Instrument Name	Niskin bottle
Dataset-specific Description	Deployed at targeted depths, typically 3 depths per station (surface, mid-depth and bottom of the well-mixed water column)
Generic Instrument Description	A Niskin bottle (a next generation water sampler based on the Nansen bottle) is a cylindrical, non-metallic water collection device with stoppers at both ends. The bottles can be attached individually on a hydrowire or deployed in 12, 24, or 36 bottle Rosette systems mounted on a frame and combined with a CTD. Niskin bottles are used to collect discrete water samples for a range of measurements including pigments, nutrients, plankton, etc.

Dataset-specific Instrument Name	Plankton Net
Generic Instrument Name	Plankton Net
Dataset-specific Description	64 µm-mesh 0.5m diameter ring net with flow meter.
Generic Instrument Description	A Plankton Net is a generic term for a sampling net that is used to collect plankton. It is used only when detailed instrument documentation is not available.

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Deployments

Greenwich_Cove

Website	https://www.bco-dmo.org/deployment/58768
Platform	Narragansett_Bay
Start Date	2005-01-05
End Date	2006-05-08
Description	Dock-based station in Greenwich Cove, RI Field sampling was done twice weekly in 2005 and once weekly in 2006 during the hydromedusan growth season. Hydrographic data was collected using a HydroLab Datasonde 4 profiling package outfitted with sensors for depth, conductivity,and temperature. The potential prey field of hydromedusae consists of mesozooplankton (>200 µm) and microplankton (autotrophs and heterotrophs

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Project Information

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Funding

Funding Source	Award
NSF Division of Ocean Sciences (NSF OCE)	OCE-0350970

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