

Vanessa K. Michelou
Hopkins Marine Station
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Research

Understanding the forces that shape bacterial communities and the roles of microbial species in biogeochemical fluxes of nutrients. Use of multi-disciplinary approaches for assessing the link between bacterial community structure and ecosystem function. Examples of some of my research foci are: the study of the seasonal variation of microbial assemblages (density and community composition) associated with important kelp forests around Monterey Bay, CA. Microbial ecology of photoheterotrophic bacteria. Comparing the uptake of dissolved organic matter and phosphorus by photoautotrophic organisms and heterotrophic bacteria.

Employment:

Stanford University - Hopkins Marine Station (Jan 2010- present)

Postdoctoral Scholar - *Advisor: Steven Palumbi*

Establishing protocols for genomic assays of microbial diversity in the near shore kelp forest of Monterey Bay as part of the ongoing investigations of the Marine Life Observatory. Work includes detailed testing of genome-based DNA extraction and sequencing, as well as establishing a survey and sampling scheme for microbial diversity patterns over space and time.
<http://mlo.stanford.edu/microbial.htm>

Education

Ph.D. University of Delaware 2009, Marine Bioscience

“Uptake of organic matter compounds by heterotrophic and autotrophic bacteria: exploring photoheterotrophy by marine cyanobacteria”.

Dissertation advisor: David Kirchman.

B.S. University of South Carolina 2004, Marine Sciences

3.6 GPA

Awards

NSF-EAPSI Summer Research Fellowship (2006)

James A. Hicks Scholarship (2003-2004)

Hispanic Scholarship Fund, College Scholarship Program (2001-2004)

NSF-SPGRE Summer Research Fellow (2003)

Minority Fellowship for Research (2001-2004)

David Odom Scholarship (2000-2004)

Research and Work Experience

University of Delaware

Ph.D. Student

Aug 2004-Dec 2009

College of Marine and Earth Studies

Flow cytometry and flow sorting of radiolabeled cells to measure dissolved organic matter uptake by marine cyanobacteria and heterotrophic bacteria. Other analyses included bacterial abundance, bacterial production, bacterial community structure (FISH), community activity (Micro-FISH), chlorophyll a, bacterial chlorophyll a, abundance of aerobic anoxygenic phototrophic bacteria and molecular techniques including 16S rRNA gene community analysis, DGGE and culturing of bacteria.

Research Assistant

June 2005-Dec 2009

Microbial Observatory for photoheterotrophic exploration

Quantified uptake of specific organic compounds, and examined light effects on growth and respiration of microbes. <http://www.ocean.udel.edu/cms/dkirchman/MOPE/index.htm>

Griffith University-Brisbane, Australia

May 2006-Aug 2006

EAPSI Research Fellow

Australian Rivers Institute - Peter Pollard

Applied Pulse Gel Electrophoresis to determine the ecological role of viruses in the control of blooms of toxic cyanobacteria (blue-green algae) in drinking waters.

University of South Carolina

Aug 2003-May 2004

Independent Research Project

Molecular Biology Lab - Renae Brodie

Studied the ecophysiology, development and evolutionary transitions of fiddle crabs in the North Inlet Estuary, SC. Used PCR techniques and DNA extractions. Managed larval and rotifer cultures.

Undergraduate Research-based learning project

March 2003 – May 2003

Chemical Oceanography Lab - Miguel Goni and George Voulgaris

Applied sediment and hydrographic data to study the physical and chemical processes of the Winyah Bay Estuary

Undergraduate Research Assistant

Aug 2001-July 2003

Physical Oceanography Lab - Bjorn Kjerfve

Worked on the development of a grid mesh for an estuarine numerical circulation model and helped with the initial simulations

University of North Carolina-Chapel Hill

May 2003-Aug 2003

Marine Microbial Ecology Lab

Summer Research Intern - Rachel Noble

Studied the impacts of lysogeny in a highly eutrophic lagoonal estuary, the Neuse River Estuary. Experience with managing microbial cultures, plating bacterial DNA extractions and extensive experience with protocol for SYBR Green viral counts.

Publications

Michelou, V.K., Carporaso, G.J., Palumbi, S.R. 2011. The ecology of microbial communities

associated with Giant kelp, *Macrocystis pyrifera*. In prep.

Michelou, V.K., Lomas, M.W., Kircman, D.K. 2011. Amino Acid and Glucose Uptake by Autotrophic and Heterotrophic Bacteria in the Sargasso Sea. Aquatic Microbial Ecology Submitted.

Michelou, V.K., Lomas, M.W., Kircman, D.K. 2011. Phosphate and Adenosine-5'-triphosphate uptake by cyanobacteria and heterotrophic bacteria in the Sargasso Sea. Limnol. Oceanogr., 56(1), 2011, 323-332

Casey JR, Lomas MW, **Michelou VK**, Dyhrman ST, Orchard ED, Ammerman JW, Sylvan JB (2009) Phytoplankton taxon-specific orthophosphate (Pi) and ATP utilization in the western subtropical North Atlantic. Aquat Microb Ecol 58:31-44

Cottrell, M.T., **Michelou, V.K.**, Nemeck, N., DiTullio, G., Kirchman, D.L. 2008. Carbon Cycling by Microbes influenced by Light in the Northeast Atlantic Ocean. Aquatic Microbial Ecology. 50(3): 239-250.

Elifantz, H., Waidner, L.A., **Michelou, V.K.** et al. 2008. Diversity and Abundance of glycosyl hydrolase family 5 in the North Atlantic Ocean. FEMS Microbiology 63(3): 316-327.

Michelou, V.K. Cottrell, M.T., Kirchman, D.L., 2007. Light-stimulated Organic Matter Assimilation by Cyanobacteria and Other Microbes in the North Atlantic Ocean. Applied and Environmental Microbiology 73(17): 5539-5546.

Teaching experience:

Stanford University: BIOL 175H:
Problems in Kelp Forest Ecology and Microbial Ecology

Spring 2011

Stanford University, Guest Lecturer
Molecular Ecology

Winter 2010

Invited seminars

University of California at Santa Cruz
Ocean Sciences Department Seminar Series: Linking microbial communities and ecosystem function: what are microbes doing in the Sargasso Sea?

April 28 2010

University of California at Merced
Biodiversity of epiphytic bacterial communities in Kelp forests

Nov 17 2010

Sea Experience and Field Work

RV Atlantic Explorer

Sept 2-5 2008

Sargasso Sea - Ph.D. Work

In charge of radioisotope incubations (33P, 3H), bacterial production measurements, bulk uptake incubations (33P, 3H), samples for flow cytometry and microscopy counts.

RV Atlantic Explorer

May 3-27 2008

Bermuda-Puerto Rico-Mid Atlantic ridge - Ph.D. Work

In charge of radioisotope incubations (33P-3H) for later flow cytometry analysis and microscopy (Micro-FISH), bulk uptake incubations (33P, 3H), samples for microscopic counts.

RV Atlantic Explorer

Oct 11- Nov 1 2007

Bermuda-Puerto Rico-Bermuda - Ph.D. Work

In charge of radioisotope incubations (33P, 3H), bacterial production, bulk uptake incubations (33P, 3H), samples for flow cytometry and microscopy counts.

R/V Hugh Sharp

Delaware Bay Microbial Observatory sampling

2005-2009

Monthly sampling for bacterial production and incubations to measure effects of light on bacterial communities and processes in Delaware Bay.

R/V Seward Johnson

May 22-July 5 2005

Ft. Pierce Florida-Azores Islands-Iceland - Ph.D work

Assessed the effect of light on the growth of heterotrophic bacteria using 3H-leucine incorporation and the uptake of other organic compounds. Measured bacterial abundance, bacterial production, bacterial community structure (FISH), community activity (Micro-FISH).

R/V Cape Henlopen

May 7-9

2005

Delaware Estuary Turbidity maximum - General research

Collected samples for quantification of aerobic anoxygenic photosynthetic bacteria. Also helped collect samples for other ongoing Kirchman lab projects.

R/V Susan Hudson

March 12-15 2003

Winyah Bay, SC - Undergraduate research

Basic sampling for independent research project including sediment and hydrogeographic data collection.

SSV Corwith Cramer

May - Aug 1999

Gulf of Maine Sea Education Association

Learned basic sailing skills as well as basic oceanographic techniques.

Outreach and Community Service

Hopkins Marine Station/Monterey Bay Aquarium

Family Science Program

2010-Present

Partnered with the Monterey Bay Aquarium to work on a program to engage families in the learning process, while opening communication channels and having fun. The work consists in

developing and executing 5-week programs in predominantly Hispanic populated middle schools around the Monterrey Bay area, to teach families how to integrate science into their home.

Elementary Family Science Program

2010-Present

Served as a science resource and teacher for the program, which, through hands-on, ocean-themed activities, helps parents, develop inquiry and positive discipline skills that will help their children explore science and ocean conservation topics.

University of Delaware

Delaware Governor's school program

2007-2008

Led Field trips demonstrating estuarine flora and fauna to local school groups (elementary through high school). Delaware Governor's School (high school), and Delaware Estuary Teacher's Workshop (primary and secondary educators).

Underrepresented undergraduate mentoring

2006-2007

Mentored undergraduate interns from Lincoln University, as part of an initiative to broaden the participation of groups underrepresented in science. Taught basic lab and scientific writing skills as well as the methods used in Kirchman lab.

Coast Day

2004-2008

Volunteer at Coast Day. Education outreach activities to educate the public about microbial ecology and what we do in the laboratory.

University of South Carolina

2003-2004 Certified note taker for the Student Disabilities Department

2001-2003 Volunteer at the National Ocean Sciences Bowl (NOSB). Served as a science judge.

2001-2004 Marine Science Undergraduate Society (MSUS)

-Vice President

-Education Outreach Coordinator

Specialized Skills

Flow Cytometry cell analysis and sorting: FACS Calibur, Cytopeia Influx

Microautoradiography and fluorescence in situ hybridization (Micro-FISH)

Epifluorescence microscopy

Molecular techniques: 16S rRNA gene community analysis, DGGE and culturing of bacteria

Language skills: Spanish (native tongue), English, French

Certifications

Completed safe boating course (ID#71453)

SCUBA-PADI certified 2003