

EDUCATION

Ph.D. in Marine Biology, University of Maine, Orono, ME 09/10 - 08/14

Dissertation title: Role of ammonium in *Alexandrium fundyense* blooms in the Gulf of Maine and on Georges Bank

M.Sc. in Marine Ecology and Toxicogenomics, Madurai Kamaraj University, TN, India 07/08 - 05/10

Honors: Gold medalist (Top of Class 2010)

Thesis title: Biosynthesis of silver, gold, and bimetallic nanoparticles and investigating their antimicrobial potential

B.Sc. (Honors) in Botany, University of Delhi, Delhi, India 07/05 - 05/08

SKILLS & KNOWLEDGE

- Phytoplankton (HAB) ecology
- HAB toxin analyses
- HABs and shellfish resources
- Proposal and manuscript writing
- R and SigmaPlot
- Statistical analyses

PROFESSIONAL EXPERIENCE

Assistant Research Scientist/Research Assistant, Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute, Harmful Algal Bloom Group, St. Petersburg, FL

06/15 – Present

Grant Funded Projects:

- Linking *Pyrodinium* physiology and behavior to population growth and loss in nature and implications for management (Role: Co-Principal Investigator) - \$ 97,037
Objective: High resolution sampling in Old Tampa Bay to quantify population growth rates, spatial/temporal variability, and vertical migration during *Pyrodinium bahamense* blooms. Empirical and conceptual growth and loss models augmented by leveraged findings from lab experiments will inform bloom management and mitigation strategies.
- Effects of the toxic dinoflagellate *Pyrodinium bahamense* on feeding efficiency and saxitoxin accumulation/depuration in bivalve grazers (Role: Co-Principal Investigator) - \$49,958
Objective: Use laboratory experiments to examine the effects of *P. bahamense* on growth and grazing of different filter feeders, with a focus on bivalve mollusks of ecological relevance in Tampa Bay: *Crassostrea virginica* and *Mercenaria* spp.

Bloom Monitoring and Other Duties:

- Evaluate new methods and technologies for regulatory shellfish testing and provide technical support for the state's shellfish biotoxin testing program including serving as primary analyst for paralytic shellfish toxins (PSTs) and domoic acid (DA) analyses.
- Conduct bloom dynamic studies on Florida HAB species: *Karenia brevis* and *Pyrodinium bahamense*. Current experiments focus on physiology of *P. bahamense*. Previous experiments focused on estimating compensation irradiance and maximum growth rate of three different *Karenia brevis* strains isolated from Gulf of Mexico.
- Lead the physiology experiments' team for an Ocean and Human Health project focused on *Pseudo-nitzschia australis* bloom dynamics in Gulf of Maine.

Sugandha Shankar

Graduate Research Assistant, University of Maine, Orono, ME

09/10 - 08/14

- Conducted ammonium uptake and growth rate experiments on *Alexandrium fundyense* to understand the role played by regenerated ammonium in sustaining *A. fundyense* blooms in nitrate depleted waters in the Gulf of Maine region. Experimental data analyses was performed on MATLAB.
- Analyzed lugol's samples collected during nine different cruises (2007 - 2010) to assess the phytoplankton community structure found during *A. fundyense* bloom season. Performed multivariate statistics to interpret nutrient and community structure data using statistical tools like 'R' and 'SigmaPlot'.

Graduate Teaching Assistant, the University of Maine, Orono, ME

09/10 - 05/14

- Held weekly office hours to help students understand various concepts for courses: Biology of Marine Organisms (SMS 201) and Introduction to Ocean Science (SMS 100). Graded papers, prepared exam questions, and maintained a record of students' performances for these courses.
- Trained and supervised two undergraduate interns and one high school intern in the laboratory.

DEPARTMENTAL SERVICE

- Helped in setting up an HPLC toxin analyses laboratory at Fish and Wildlife Research Institute ensuring that it is compliant with Food and Drug Administration (FDA) regulations.
- Helped organize weekly seminars of School of Marine Sciences at the University of Maine.
- Served on committee responsible for organizing annual departmental symposium and graduate students' retreat at the University of Maine.

PUBLICATIONS

- Lopez, C.B., **Shankar, S.**, Garcia S., Geiger, S. Hubbard, K.A. and Flewelling, L.J. Effects of the toxic dinoflagellate *Pyrodinium bahamense* on feeding efficiency and saxitoxin accumulation/depuration in bivalve grazers. TBEP technical report #09-19, 23 pp.
- Tilney, C. L., **Shankar, S.**, Hubbard, K. A., & Corcoran, A. (2019). Is *Karenia brevis* really a low light adapted species? *Harmful Algae*, 90, Article 101709
- **Shankar, S.**, Townsend, D. W., & Thomas, M. A. (2014). Ammonium and maintenance of bloom populations of the toxic dinoflagellate, *Alexandrium fundyense*, in the Gulf of Maine and on Georges Bank: Results of laboratory culture experiments, *Marine Ecology Progress Series*, 507, 57-67.
- Ramakritinan, C. M., Kaarunya, E., **Shankar, S.**, & Kumaraguru, A. K. (2013). Antibacterial effects of silver, gold, and bimetallic (Ag-Au) nanoparticles synthesized from red algae. *Solid State Phenomena*, 201, 211-230.
- Ramakritinan, C. M., **Shankar, S.**, Anand, M., & Kumaraguru, A. K. (2010). Biosynthesis of silver, gold and bimetallic alloy (Ag: Au) Nanoparticles from green alga, *Lyngbya* spp. In *Proceedings of 3rd National Conference on Nanomaterials and Nanotechnology*, Amity University, Lucknow, India (Vol. 21, pp. 174-187).

PRESENTATIONS

- **Shankar, S.**, Lopez, C. B., & Flewelling, L.J. *Pyrodinium bahamense* growth and toxicity in two geographically distinct populations of Florida. November 2019. 10th US Symposium on Harmful Algae, Orange Beach, AL (oral).
- **Shankar, S.** & Lopez, C.B. Effects of the toxic dinoflagellate *Pyrodinium bahamense* on feeding efficiency and saxitoxin accumulation/depuration in bivalve grazers. October 2019. TBEP-TAC meeting, invited speakers (oral).
- Vasquez-Cruz, K., **Shankar, S.**, Lopez, C.B., Garcia, S., & Flewelling, L.J. *Pyrodinium bahamense* growth and toxicity. February 2019. 2019 Indian River Lagoon Symposium, Harbor Branch, FL (poster).
- Garcia, S., Lopez, C.B., **Shankar, S.**, Vasquez-Cruz, K., & Flewelling, L.J. Effects of toxic *Pyrodinium bahamense* on the clearance rates of eastern oysters and hard clams. February 2019. 2019 Indian River Lagoon Symposium, Harbor Branch, FL (poster).
- **Shankar, S.**, Lopez, C.B., & Hubbard, K.A. Growth irradiance relationships of *Pyrodinium bahamense*. February 2018. 2018 Indian River Lagoon Symposium, Harbor Branch, FL (oral).

Sugandha Shankar

- **Shankar, S.**, Lopez, C.B., Tilney, C.L., & Hubbard, K.A. Physiological investigations of Florida HABs: a tale of two protagonists. August 2017. 2nd FWRI-Mote HAB Symposium, Sarasota, FL (oral).
- **Tilney, C.L., Shankar, S.**, Hoeglund, A.E., Villac, C., Corcoran, A., Flewelling, L.J., Olesin, E., Chadwick, C., Muhlbach, E., Nieuwkerk, D., Ulrich, R.M., Paul, J.H., & Hubbard, K.A. November 2017. 9th US Symposium on Harmful Algae, Baltimore, MD (oral).
- **Lopez C.**, Karim A, Murasko S, Marot M, Smith C, Karlen D, **Shankar S**, Hubbard K, Corcoran A. Seasonal temperature conditioning mediates dormancy in Tampa Bay populations of *Pyrodinium bahamense*. 9th US Symposium on Harmful Algae, November 11-17, 2017. Baltimore, MD.
- **Shankar, S.**, Townsed, D.W., & Thomas, M.A. Role of ammonium in *Alexandrium fundyense* blooms in the Gulf of Maine and Georges Bank. October 2013. 7th US Symposium on Harmful Algae, Sarasota, FL (oral).

AWARDS & ACHIEVEMENTS

- Mention of work in Environmental News Journal - Bay Soundings (<http://baysoundings.com/researchers/target-pyrodinium-bloomswith-shellfish/>)
- FWRI Crisis Response Award – 2018, 2019
- FWRI Outstanding Team Award – 2017, 2018, 2019
- FWRI Extra-Effort Award – 2015

OUTREACH EFFORTS

- Speaker in Taste of Science Event – April 2019, St. Petersburg, FL
- Marine Quest – 2015, 2016, 2017, 2018, 2019
- Marine Quest – 2015, 2016, 2017, 2018, 2019
- Volunteer in Nor'easter Ocean Science Bowl – 2010, 2011