

Mindy Lou Richlen

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Education

B.S. Biology, Virginia Polytechnic Institute and State University, 1993
M.S. Environmental Science, American University, 2001
Ph.D. Biology, Boston University, 2008

Professional Experience

2015-present Research Specialist, Woods Hole Oceanographic Institution (WHOI)
2010-2015 Research Associate III, WHOI
2007-2010 Postdoctoral Investigator, WHOI. Advisor: Dr. Donald Anderson
2005-2006 Research Assistant, Marine Biological Laboratory
2002-2005 Graduate Research Assistant, Boston University Marine Program
1998-2002 Policy Analyst, ADI Technology Corp., Arlington, VA

Awards

2006 Palmer-McLeod Fellowship, Boston University
2006 American Institute of Biological Sciences Emerging Public Policy Leader Award,
Honorable Mention
2005 Arthur G. Humes Alumni Award, Boston University

Research Interests

Ecology and molecular biology of phytoplankton taxa responsible for harmful algal blooms, particularly questions regarding the determinants of bloom structure, the biogeography of species and strains, and impacts of climate change on the range and risks of HABs.

Professional Activities

- Associate Director, Cooperative Institute for the North Atlantic Region (CINAR)
- Assistant Director, U.S. National Office for Harmful Algal Blooms
- U.S. National HAB Committee, Ex Officio member
- Session Chair, Sixth Symposium on Harmful Algae in the U.S., Austin, TX, 2011
- Steering Committee, Eighth Symposium on Harmful Algae in the U.S., Long Beach, CA 2015
- Editorial Advisory Board, Harmful Algae
- Reviewer for NOAA ECOHAB program; manuscript reviews for Aquatic Microbial Ecology, Desalination and Water Treatment, Harmful Algae, Hydrobiologia, Journal of Applied Phycology, Journal of Biogeography, Journal of Biological Research, Journal of Phycology, Journal of Proteomics, Limnology and Oceanography, Marine Ecology Progress Series, Marine Ecology Resources, Marine Genomics, Molecular Ecology, Molecular and Cellular Proteomics, Nature Scientific Reports, Oceanologia, PLOS One, Polar Biology, Toxicon, Toxins

Participation in Education

- Thesis committee member: Lacey Rains (FGCU, M.S. awarded 2015)
- Thesis committee member: Chris Loeffler (UVI, M.S. awarded 2011)
- Co-mentor: Yixiao Xu (guest student, Nanjing University, P.R. China, Ph.D. awarded 2013)
- Guest lecturer, Sea Education Association (2008-2010)
- Guest lecturer, Boston University (2010)
- Guest lecturer, University of the Virgin Islands (2009)
- Graduate Teaching Fellow, Boston University Marine Program: Tropical Biology field course, Wee Wee Caye, Belize (2004, 2006); Tropical Biology field course, St. John, USVI (2005); Ichthyology course, laboratory and lecture; 2004

Supervision at WHOI

2018-present Evangeline Fachon, Research Assistant
2015-present Ann Stone, Administrative Associate
2008-present Northeastern University undergraduate co-op interns (14)
2017-2018 Finnick Correia, Research Assistant
2013-2016 Taylor Sehein, Research Assistant
2008-2009 NOAA Hollings Scholars (2)

Cruise Participation/Field Experience

2012 Oceanographic cruise, ARCHEMHAB expedition: Greenland to Iceland (Jul 23-Aug 9) aboard RV Maria S. Merian
2011 Marakei, Kiribati: Field sampling for benthic dinoflagellates
2007, 2010 St. Thomas, USVI: Field sampling for benthic dinoflagellates
2003 Johnston Atoll, Pacific Ocean: SCUBA-based sampling for benthic dinoflagellates

Peer-reviewed Publications

- Richlen, M.L.**, Barber, P.H. (2005) A technique for the rapid extraction of microalgal DNA from single live and preserved cells. *Molecular ecology notes* 5: 688-691.
- Richlen, M.L.**, Morton, S.L., Barber, P.H., Lobel, P.S. (2008) Phylogeography, morphological variation and taxonomy of the toxic dinoflagellate *Gambierdiscus toxicus* (Dinophyceae). *Harmful Algae* 7 (5): 614-629.
- McCauley, L.A.R., Erdner, D.L., Nagai, S., **Richlen, M.L.**, Anderson, D.M. (2009) Biogeographic analysis of the globally distributed harmful algal bloom species *Alexandrium minutum* (Dinophyceae) based on rRNA gene sequences and microsatellite markers. *Journal of Phycology* 45 (2): 454-463.
- Richlen, M.L.**, Morton, S.L., Jamali, E.A., Rajan, A., Anderson, D.M. (2010) The catastrophic 2008 - 2009 red tide in the Arabian Gulf region, with observations on the identification and phylogeny of the fish-killing dinoflagellate *Cochlodinium polykrikoides*. *Harmful Algae* 9: 163-172.
- Erdner, D.L., **Richlen, M.L.**, McCauley, L.A.R., Anderson, D.M. (2011) Intrapopulation Diversity and Dynamics of a Widespread Bloom of the Toxic Dinoflagellate *Alexandrium fundyense*. *PLoS ONE* 6(7): e22965. doi:10.1371/journal.pone.0022965.
- Richlen, M.L.**, Lobel, P.S. (2011) Effects of depth, habitat, and water motion on the abundance and distribution of ciguatera dinoflagellates at Johnston Atoll, Pacific Ocean. *Marine Ecology Progress Series*. 421: 51-66.

- Richlen, M.L.**, Erdner, D.L., McCauley, L.A.R., Libera, K., Anderson, D.M. (2012) Extensive genetic diversity and rapid population differentiation during blooms of *Alexandrium fundyense* (Dinophyceae) in the Nauset Marsh System, Cape Cod, MA, USA. *Ecology and Evolution*, 2(10), 2588-2599. DOI - 10.1002/ece3.373.
- Xu, Y., **Richlen, M. L.**, Morton, S. L., Mak, Y. L., Chan, L. L., Tekiau, A., Anderson, D. M. (2014) Distribution, abundance, and diversity of *Gambierdiscus* spp. from a ciguatera-endemic area in Marakei, Republic of Kiribati. *Harmful Algae*, 34: 56-68.
- Fernandes, L.F., Hubbard, K.A., **Richlen, M.L.**, Smith, J., Bates, S.S., Ehrman, J., Léger, C., Mafra Jr, L.L., Kulis, D., Quilliam, M., Libera, K., McCauley, L., Anderson, D.M. (2014) Diversity and toxicity of the diatom *Pseudo-nitzschia* Peragallo in the Gulf of Maine, Northwestern Atlantic Ocean. *Deep Sea Research Part II: Topical Studies in Oceanography*, 103: 139-162.
- Anderson, D.M., Couture, D.A., Kleindinst, J.L., Keafer, B.A., McGillicuddy, D.J., Martin, J.L., **Richlen, M.L.**, Hickey, J.M., Solow, A.R. (2014) Understanding interannual, decadal level variability in paralytic shellfish poisoning toxicity in the Gulf of Maine: the HAB Index. *Deep Sea Research Part II: Topical Studies in Oceanography*, 103: 264-276.
- Tong, M., Smith, J., **Richlen, M.L.**, Steidinger, K., Kulis, D., Fux, E., Anderson, D.M. (2015) Characterization and comparison of toxin-producing isolates of *Dinophysis acuminata* from New England and Canada. *Journal of Phycology*, 51:66-81.
- Loeffler, C.R., **Richlen, M.L.**, Brandt, M.E., Smith, T.S. (2015) In situ effects of grazing, nutrients, and depth on the ciguatera-causing dinoflagellate *Gambierdiscus* in the U.S. Virgin Islands. *Marine Ecology Progress Series*, 531:91-104. doi: 10.3354/meps11310.
- Sehein, T.R., **Richlen, M.L.**, Nagai, S., Yasuike, M., Nakamura, Y. Characterization of 17 new microsatellite markers for the dinoflagellate *Alexandrium fundyense* (Dinophyceae), a harmful algal bloom species. (2015) *Journal of Applied Phycology*, 1-5.
- Parsons, M.L., **Richlen, M.L.** (2016) An overview of ciguatera fish poisoning in the Bahamas. In: Erdman, R. and R. Morrison (Editors). *The 15th Symposium on the Natural History of the Bahamas*. Gerace Research Centre, San Salvador, Bahamas, p. 1-10.
- Richlen, M.L.**, Zielinski, O., Holinde, L., Lyu, Y., Tillman, U., Cembella, A., Anderson, D.M. (2016) Prevalence of *Alexandrium fundyense* (Dinophyceae) cysts in Greenland and Iceland, with an emphasis on environmental factors affecting viability and growth in the Arctic. *Marine Ecology Progress Series*. doi: 10.3354/meps11660.
- Xu, Y., **Richlen, M.L.**, Liefer, J., Robertson, A., Kulis, D., Smith, T.B., Parsons, M.L., Anderson, D.M. (2016) Influence of environmental variables on *Gambierdiscus* spp. (Dinophyceae) growth and distribution. *PLoS ONE*, 11(4): e0153197.
- Zhou, J., Lyu, Y., **Richlen, M.**, Anderson, D.M. and Cai, Z. (2016) Quorum Sensing Is a Language of Chemical Signals and Plays an Ecological Role in Algal-Bacterial Interactions. *Critical Reviews in Plant Sciences*, pp. 1-25.
- Gómez, F., **Richlen, M.L.** and Anderson, D.M. (2017) Molecular characterization and morphology of *Cochlodinium strangulatum*, the type species of *Cochlodinium*, and *Margalefidinium* gen. nov. for *C. polykrikoides* and allied species (Gymnodiniales, Dinophyceae). *Harmful Algae*, 63, pp.32-44.
- Lyu, Y., **Richlen, M.L.***, Sehein, T.R., Chinain, M., Adachi, M., Nishimura, T., Xu, Y., Parsons, M.L., Smith, T.B., Zheng, T. and Anderson, D.M. (2017) LSU rDNA based RFLP assays for the routine identification of *Gambierdiscus* species. *Harmful Algae*, 66, pp.20-28.
- Catania, D., **Richlen, M.L.**, Mak, Y.L., Morton, S.L., Laban, E.H., Xu, Y., Anderson, D.M., Chan, L.L. and Berumen, M.L. (2017) The prevalence of benthic dinoflagellates associated with ciguatera fish poisoning in the central Red Sea. *Harmful Algae*, 68, pp.206-216.
- Lozano-Duque, Y., **Richlen, M.L.**, Smith, T.B., Anderson, D.M. and Erdner, D.L. (2018) Development and validation of PCR-RFLP assay for identification of *Gambierdiscus* species

in the Greater Caribbean Region. *Journal of Applied Phycology*, pp.1-12.
<https://doi.org/10.1007/s10811-018-1491-5>

Zhou, J., **Richlen, M.L.** *, Sehein, T.R., Kulis, D.M., Anderson, D.M. and Cai, Z. (2018) Microbial community structure and associations during a marine dinoflagellate bloom. *Frontiers in microbiology*, 9.

*Co first author

Other Publications

Richlen, M.L., Parsons, M., Anderson, D.M. (2012) Ecology and impacts of ciguatera on coral reef ecosystems. In: *Advances in Environmental Research*, V. 26, pp. 41-76 Nova Publishing.

Cembella A.; Zielinski O.; Anderson D.; Graeve M.; Henkel R.; John U.; Kattner G.; Koch B.; Krock B.; Meier D.; **Richlen M.**; Tillmann U.; Voß D. (2016) ARCHEMHAB: Interactions and feedback mechanisms between hydrography, geochemical signatures and microbial ecology, with a focus on HAB species diversity, biogeography and dynamics - Cruise No. MSM 21/3 – July 25 – August 10, 2012 – Nuuk (Greenland) – Reykjavik (Iceland). MARIA S. MERIAN-Berichte, MSM21/3, 49 pp., DFG-Senatskommission für Ozeanographie, ISSN 2195-8483. doi:10.2312/cr_msm21_3.

Cembella, A. D., Tillmann, U., Gobler, C. J., Morton, S. L., Tomas, C. R., Burkholder, J. M., O’Neil, J. M., Parsons, M. L., Richlen, M. L., Robertson, A., Band-Schmidt, C. J., Brand, L. E., Marshall, H. G., Glibert, P. M., Roelke, D. L., Manning, S. R. and Kudela, R. (2018) Harmful Algal Species Fact Sheets. In *Harmful Algal Blooms* (eds S. E. Shumway, J. M. Burkholder and S. L. Morton). doi:[10.1002/9781118994672.ch16](https://doi.org/10.1002/9781118994672.ch16)

Parsons, M.L., **Richlen, M.L.** and Robertson, A., 2018. Harmful Algal Species Fact Sheet: *Gambierdiscus*. In: *Harmful Algal Blooms: A Compendium Desk Reference*, (eds S. E. Shumway, J. M. Burkholder and S. L. Morton). pp.601-604. doi:
<https://doi.org/10.1002/9781118994672.ch16j>

Parsons, M.L., **Richlen, M.L.** and Robertson, A., 2018. Harmful Algal Species Fact Sheet: *Ostreopsis*. *Harmful Algal Blooms: A Compendium Desk Reference*, pp.617-620. doi:
<https://doi.org/10.1002/9781118994672.ch16jn>

Oral Presentations

Richlen, M.L., Lyu, Y., Smith, J., Cembella, A., Anderson, D.M. “Cyst distribution, viability, and growth characteristics of *Alexandrium tamarens* from Arctic waters”, *Oral Presentation at the International Conference on Harmful Algae, Wellington, New Zealand, October 2014*.

Richlen, M.L., Crespo, B.G., Adams, J., Keafer, B., Erdner, D.L., Anderson, D.M. “Population structure and genetic dynamics of toxic *Alexandrium fundyense* (Dinophyceae) blooms in coastal embayments”, *Oral Presentation at the Seventh Symposium on Harmful Algae in the U.S., Sarasota, FL, October 2013*.

Richlen, M.L. “Ecology and diversity of *Gambierdiscus*: Towards an integrated study of Ciguatera Fish Poisoning”, *Invited talk, SKLMP-MEL Joint Symposium, Shenzhen, China, January 2013*.

Morris, J.G., Smith, T., **Richlen, M.L.**, Robertson, A., Radke, E., Roberts, S., Grattan, L., Anderson, D.M. Ciguatera in St. Thomas, USVI. *Invited talk (speaker panel), University of the Virgin Islands, September 2012*.

- Richlen, M.L.** Population dynamics, diversity, and physiology of ciguatera associated dinoflagellates from St. Thomas, U.S. Virgin Islands. *Invited talk, Dauphin Island Sea Lab, Dauphin Island, AL, February 2012.*
- Richlen, M.L.,** Smith, T., Robertson, A., Xu, Y., Kulis, D., Flores Quintana, H.A., Garcia, A.C., Hooe-Rollman, J.I., Anderson, D.M. Population dynamics, diversity, and physiology of ciguatera associated dinoflagellates from St. Thomas, U.S. Virgin Islands. *Oral Presentation at the Sixth Symposium on Harmful Algae in the U.S., Austin, TX, November 2011.*
- Richlen, M.L.,** Erdner, D., McCauley, L., Libera, K., Anderson, D.M. Extensive genetic diversity and rapid population succession during blooms of *Alexandrium fundyense* (Dinophyceae) in an isolated salt pond on Cape Cod, MA, USA. *Oral Presentation at the American Society of Limnology and Oceanography, San Juan, Puerto Rico, February 2011*
- Richlen, M.L.** Impact of Climate on Dinoflagellates and Ciguatera Fish Poisoning. *Invited talk at the University of the Virgin Islands, St. Thomas, USVI, December 2010.*
- Richlen, M.L.,** Erdner, D., McCauley, L., Libera, K., Anderson, D.M. Extensive genetic diversity and rapid population succession during blooms of *Alexandrium fundyense* (Dinophyceae) in an isolated salt pond on Cape Cod, MA, USA. *Oral Presentation at the International Conference on Harmful Algae, Crete, Greece, November 2010.*
- Fernandes, L.F., **Richlen, M.L.,** Kulis, D., Erdner, D.L., Bates, S.S., Ehrman, J., McCauley, L.A.R., Libera, K., Liang, J., Anderson, D.M. Taxonomy, toxicity and distribution of *Pseudo-nitzschia* diatoms in the Gulf of Maine: Characterizing an emerging threat in the region. *Oral Presentation at the Fifth Symposium on Harmful Algae in the U.S., Ocean Shores, WA, November 2009.*
- Richlen, M.L.** Examining the determinants of ciguatera fish toxicity: Ecology and biodiversity of benthic dinoflagellates, phylogeography of *Gambierdiscus toxicus* and herbivore digestive mechanisms. *Invited talk at WHOI, Woods Hole, MA, June 2009.*
- Richlen, M.L.** Causes and Impacts of Ciguatera Fish Poisoning. *Invited talk for the WHOI Science Made Public lecture series, Woods Hole, MA, August 2008.*
- Richlen, M.L.,** Morton, S.L., Barber, P.H., Lobel, P.S. Phylogeography, morphological variation, and taxonomy of the toxic dinoflagellate *Gambierdiscus toxicus* (Dinophyceae). *Oral Presentation at the Phycological Society of America annual meeting, Providence, RI, August 2007.*
- Richlen, M.L.** The continuing enigma of ciguatera: progress? *Invited talk at the Marine Biological Laboratory (MBL), Woods Hole, MA, 2006.*
- Richlen, M.L. & Barber, P.H.** Genetic variation in *Gambierdiscus toxicus*. *Oral presentation at the 44th annual meeting of the Northeast Algal Society, Rockport, ME, 2005.*
- Richlen, M.L.** Evaluating the determinants of ciguatera fish toxicity: ecological and molecular research. *Invited talk at the MBL, Woods Hole, MA, 2005.*

Professional Affiliations

- International Society for the Study of Harmful Algae (ISSHA)
- American Association for the Advancement of Science (AAAS)
- Sigma Xi, the Scientific Research Society
- American Society of Limnology and Oceanography

Additional Skills and Courses

- *Workshop on Molecular Evolution*, Marine Biological Laboratory, Woods Hole. Jul 24-Aug 2, 2011

- *Strategies and Techniques for Analyzing Microbial Populations*, Marine Biological Laboratory, Woods Hole. Aug 3-10, 2011
- *Proteomics*, Cold Spring Harbor Laboratory, NY, Jul 22-Aug 4, 2010
- PADI advanced SCUBA diver certification