

# CURRICULUM VITAE

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**Joseph R. Pawlik** - Professor, Department of Biology and Marine Biology

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## EDUCATION:

- 1988 Ph.D. in Marine Biology, Scripps Institution of Oceanography, University of California, San Diego.
- 1982 Bachelor of Science, *summa cum laude*, in Biology, College of Biological Sciences, University of Minnesota, Minneapolis/St. Paul.

## POSITIONS HELD:

- 2017- Frank Hawkins Kenan Distinguished Professor of Marine Biology, UNCW
- 2016- Academic Editor, PeerJ
- 2014-15 Visiting Professor, Dipartimento di Chimica delle Sostanze Naturali, Universita Degli Studi di Napoli Federico II, Naples, Italy.
- 2010-13 Chief Scientist, four NSF UNOLS expeditions to the Bahamas and Mexico, *R/V Walton Smith*
- 2009-10 Chair, 39<sup>th</sup> Annual Benthic Ecology Meeting, 10-13 March, Wilmington, NC
- 2003-05 NSF Ex Officio Member, US Coral Reef Task Force
- 2003-05 NSF Ex Officio Member, Marine Protected Area Federal Advisory Committee
- 2003-05 Associate Program Director, National Science Foundation, Biological Oceanography Program
- 2002 Visiting Scholar, Hong Kong University of Science and Technology, Hong Kong, China
- 1999-08 Chief Scientist, eight NSF UNOLS expeditions to the Bahamas, *R/V Seward Johnson*
- 1999-02 Visiting Professor, Dipartimento di Chimica delle Sostanze Naturali, Universita Degli Studi di Napoli Federico II, Naples, Italy.
- 1998 Chief Scientist, NSF UNOLS expedition to Bahamas, *R/V Edwin Link*
- 1998- Professor, Department of Biological Sciences and Center for Marine Science, UNCW
- 1997- Senior Editorial Advisor, *Marine Ecology Progress Series*
- 1996-97 Government-University-Industry Roundtable, Federal Demonstration Project, UNCW Representative, National Academy of Sciences, Washington, D.C.
- 1995- Adjunct Associate Professor, Curriculum in Marine Science, UNC-Chapel Hill
- 1995- Adjunct Assistant Professor, Marine, Earth and Atmospheric Sciences, NCSU
- 1994-98 Associate Professor, Biological Sciences and CMSR, UNCW
- 1992-93 Guest Investigator, Woods Hole Oceanographic Institution
- 1992-96 Editorial Advisor, *Marine Ecology Progress Series*
- 1991-94 Assistant Professor, Biological Sciences and CMSR, UNCW
- 1990 Sessional Lecturer, University of Alberta, Edmonton. Marine Biology.
- 1990-91 Postdoctoral Fellowship in Ocean Science and Engineering, Woods Hole Oceanographic Institution, Woods Hole, Massachusetts.
- 1988-90 Killam Memorial Postdoctoral Scholarship, University of Alberta, Edmonton, Canada. In residence at the Friday Harbor Laboratories, University of Washington.
- 1987-88 Lecturer, University of California, San Diego. Introductory Oceanography.
- 1982-88 Research Assistant, Scripps Institution of Oceanography, UC-San Diego.
- 1981-82 Teaching Assistant, Bermuda Biological Station for Research. Marine Invertebrate Zoology.
- 1979-82 Research Assistant, Department of Ecology and Behavioral Biology, University of Minnesota, Minneapolis/St. Paul.

**GRANTS, AWARDS, HONORS:**

- 2017 Frank Hawkins Kenan Distinguished Professor of Marine Biology, UNCW
- 2016 NSF Biological Oceanography grant, "Testing the sponge-loop for Caribbean coral reefs" \$818,016/3yrs – Co-PI with C. Finelli, P. Erwin.
- 2016 Honored by the naming of *Elysia pawliki* Krug, Vendetti & Valdés, a new species of sacoglossan mollusc. *Zootaxa* **4148**: DOI: 10.11646/zootaxa.4148.1
- 2013 Inducted into UNCW Office of Research Administration's Five Million Dollar Club
- 2011 NOAA/Aquarius Reef Base grant, "Sponges on Florida coral reefs: Anthropogenic threats and demographic changes." \$75,000/2yrs – Co-PI with C. Finelli.
- 2010 NSF Biological Oceanography renewal, "Chemical ecology of sponges on Caribbean coral reefs." \$580,000/4yrs
- 2009 NOAA/NURP grant, "Sponges on Florida coral reefs: Demographics and impact on water quality" \$69,953/1yr
- 2006 NOAA/NURP grant, "Ecology of sponges on Florida reefs: Demography and bleaching" \$64,502/2yrs
- 2006 NSF Biological Oceanography renewal, "Chemical ecology of sponges on Caribbean reefs." \$542,000/4yrs
- 2004 NOAA/NURP grant, "Barrel sponges on Florida reefs: Reproduction, mortality and bleaching" \$59,774/2yrs
- 2002 NOAA/NURP grant, "Ecology of Caribbean sponges" \$46,476/2yrs
- 2001 NSF Biological Oceanography renewal, "Assessing the chemical defenses of Caribbean Invertebrates." \$440,000/4yrs
- 2001 US-Israel Binational Science Foundation grant "Photosymbiotic relationships in marine sponges" with M. Ilan and S. Beer. \$229,967/3yrs
- 2000 UNCW Faculty Reassignment Award
- 2000 NOAA/NURP grant, "Ecology of deep-water sponges" \$33,490/2yrs
- 1999 UNCW Award for Faculty Scholarship; Faculty Marshall, December Graduation, UNCW
- 1999 Subcontract on USDA-SBIR, Non-fouling netting for aquaculture; \$10,189/1yr
- 1999 Contract with Eli Lilly, Inc. for cooperative research; \$30,000/1yr
- 1999 NOAA/NURP grant, "Chemical ecology of Florida Sponges" \$16,624/2yrs
- 1998 Nominee: 1998 UNCW Award for Faculty Scholarship
- 1998 Inducted into UNCW Office of Research Administration's One Million Dollar Club
- 1998 NSF award for student travel to 5<sup>th</sup> *International Sponge Symposium*. \$25,000/1yr
- 1998 Contract with Eli Lilly, Inc. for cooperative research; \$30,000/1yr
- 1998 Contract with Novartis, Inc. for cooperative research; \$44,000/1yr
- 1997 NSF Biological Oceanography renewal, "Assessing the chemical defenses of Caribbean sponges." \$412,091/4yrs
- 1997 Subcontract on USDA-SBIR, Non-fouling netting for aquaculture; \$5,000/1yr
- 1997 NOAA/NURP grant, "Chemical ecology of Caribbean demosponges." \$6,195/1yr
- 1996 Contract with Monsanto, Inc. for cooperative research; \$20,000/1yr
- 1996 Contract with Eli Lilly, Inc. for cooperative research; \$31,588/1yr
- 1996 UNC - Wilmington Cahill Award for Faculty Research and Development; \$2,000/1yr
- 1995 NOAA/NURP grant, "Investigations of the chemical and physical defenses of reef and mangrove demosponges." \$6,785/1yr.
- 1995 NSF matching funds for cooperative research. \$21,000/1yr.
- 1994 Contract with Eli Lilly Pharmaceuticals for "Cooperative research program with Sphinx/Lilly." \$21,000/1yr
- 1993 NOAA/NURP grant, "Chemical ecology of Caribbean sponges." \$7,000/1yr.
- 1993-96 NSF Biological Oceanography grant, "RUI: Assessing the chemical defenses of Caribbean sponges." \$177,000/3yrs
- 1992 UNC - Wilmington Cahill Award for Faculty Research and Development; \$800/1yr

- 1992 NC Biotechnology Center grant, Visiting Industrial Scientist Program; \$2,500
- 1992-94 ONR Grant "Biofouling by gregarious macrofauna: a multidisciplinary approach." \$157,000/2yrs
- 1991 UNC - Wilmington Faculty Research and Development Fund Award; \$1,500/1yr
- 1991-96 National Science Foundation Presidential Young Investigator Award; \$125,000/5yrs
- 1990 Woods Hole Oceanographic Inst. Postdoctoral Fellowship in Ocean Science and Engineering.
- 1988 ONR Grant (with M.G. Hadfield) for a symposium held at the Annual Conference of the American Society of Zoologists, San Francisco.
- 1988 Killam Memorial Postdoctoral Scholarship, University of Alberta, Edmonton, Canada.
- 1987-88 Dissertation Fellowship, Scripps Institution of Oceanography, UC-San Diego.
- 1986 Outstanding Paper Award, Annual Conference of the Western Society of Naturalists, Hilo, HI.
- 1983 -86 National Science Foundation Predoctoral Graduate Fellowship.
- 1980 Exxon Scholarship, Bermuda Biological Station for Research.

### GRADUATE STUDENTS:

MS students, acting as major advisor (29): Robert Toonen, David Mense, Brian Chanas, Alicia Henrikson, David Swearingen, Matt Dunlap, Ian Zelo, Brett Waddell, Robyn Palmer, Chloe Deodato, Sebastian Engel, Tim Henkel, Sarah Kelly, Kyle Walters, Shobu Odate, Adam Jones, Steven McMurray, Tse-Lynn Loh, David Hines, Wai Leong, Michael Echevarria, Andrew Miller, John Hanmer, Lindsey Deignan, Inga Conti-Jerpe (with Dr. Chris Finelli), Micah Marty, Clark Marino, Alec Scott, Emily Fox.

PhD students, acting as major advisor (5): Jonathan Cowart, Tim Henkel, Tse-Lynn Loh, Steven McMurray (with Dr. Chris Finelli), Lindsey Deignan.

Postdoctoral students, acting as major advisor (3): Julia Kubanek, Susanna López-Legentil, Steven McMurray (with Drs. Chris Finelli, Patrick Erwin).

### PUBLICATIONS:

**ISI-Web of Science Core Collection h-index = 43; Google Scholar h-index = 55, i10-index = 116**

149. McMurray, S.E., Pawlik, J.R., Finelli, C.M. 2017. Demography alters carbon flux for a dominant benthic suspension feeder. *Functional Ecology*, DOI 10.1111/1365-2435.12908
148. Hanmer, J., White, J.W., Pawlik, J.R. 2017. Application of diet theory reveals context-dependent foraging preferences in an herbivorous coral reef fish. *Oecologia*, in press doi 10.1007/s00442-017-3855-y
147. Marino, C., Pawlik, J.R., López-Legentil, S., Erwin, P. 2017. Latitudinal variation in the microbiome of the sponge *Ircinia campana* correlates with host haplotype but not anti-predatory chemical defense. *Marine Ecology Progress Series*, **565**: 53-66.
146. Deignan, L.K. Pawlik, J.R. 2016. Demographics of the Caribbean brown tube sponge *Agelas tubulata* on Conch Reef, Florida Keys, and a description of *Agelas* Wasting Syndrome (AWS). Proceedings of the 13th International Coral Reef Symposium, Honolulu: pp. 72-84
145. Wooster, M.K., Marty, M.J., Pawlik, J.R. 2016. Defense by association: Sponge-eating fishes alter the small scale distribution of Caribbean reef sponges. *Marine Ecology*, doi: 10.1111/maec.12410.
144. Pawlik, J.R., Loh, T.L. 2016. Biogeographical homogeneity of Caribbean coral reef benthos. *Journal of Biogeography*, doi: 10.1111/jbi.12858.
143. Marty, M.J., Blum, J.E., Pawlik, J.R. 2016. No accounting for taste: Palatability of variably defended Caribbean sponge species is unrelated to predator abundance. *Journal of Experimental Marine Biology and Ecology*, **485**: 57-64.
142. Pawlik, J.R., Burkepille, D.E., Vega Thurber, R. 2016. A vicious circle? Altered carbon and nutrient cycling may explain the low resilience of Caribbean coral reefs. *BioScience*, **66**: 470-476 DOI: 10.1093/biosci/biw047.
141. Esposito, G., Della Sala, G., Teta, R., Caso, A., Bourguet-Kondraki, M-L., Pawlik, J.R., Mangoni, A., Costantino, V. 2016. Chlorinated thiazole-containing polyketide-peptides from the Caribbean sponge *Smenospongia conulosa*: Structure elucidation on microgram scale. *European Journal of Organic Chemistry*, **2016**: 2871-2875, DOI: 10.1002/ejoc.201600370.

140. McMurray, S.E., Johnson, Z.I., Hunt, D.E., Pawlik, J.R., Finelli, C.M. 2016. Selective feeding by the giant barrel sponge enhances foraging efficiency. *Limnology and Oceanography*, **61**: 1271-1286. doi: 10.1002/lno.10287.
139. Pawlik, J.R., 2015. Overfishing aids sponges, hurts corals on Caribbean reefs. *Alert Diver*, **31(4)**: 22-23.
138. Puyana, M., Pawlik, J.R., Blum, J., Fenical, W. 2015. Metabolite variability in Caribbean sponges of the genus *Aplysina*. *Brazilian Journal of Pharmacognosy*, **25**: 592-599.
137. McMurray, S.E., Finelli, C.M., Pawlik, J.R. 2015. Population dynamics of giant barrel sponges on Florida coral reefs. *Journal of Experimental Marine Biology and Ecology*, **473**: 73-80 DOI: 10.1016/j.jembe.2015.08.007
136. Loh, T.-L., McMurray, S.E., Henkel, T.P., Vicente, J., Pawlik, J.R. 2015. Indirect effects of overfishing on Caribbean reefs: sponges overgrow reef-building corals. *PeerJ*, **3**: e901 DOI: 10.7717/peerj.901
135. Pawlik, J.R., McMurray, S.E., Erwin, P., Zea, S. 2015. No evidence for food limitation of Caribbean reef sponges: Reply to Slattery & Lesser (2015). *Marine Ecology Progress Series*, **527**: 281-284.
134. Zea, S., Henkel, T.P., Pawlik, J.R. 2015. The sponge guide: Interactive photographic online guide to the identification of Caribbean sponges. *Reef Encounter*, **30**: 25-28.
133. Pawlik, J.R., Deignan, L.K. 2015. Cowries graze verongid sponges on Caribbean reefs. *Coral Reefs*, **34**: 663.
132. Marty, M.J., Pawlik, J.R. 2015. A fish-feeding laboratory bioassay to assess the antipredatory activity of secondary metabolites from the tissues of marine organisms. *Journal of Visualized Experiments*, **95**: e52429; DOI: 10.3791/52429
131. Pawlik, J.R., McMurray, S.E., Erwin, P., Zea, S. 2015. A review of evidence for food-limitation of sponges on Caribbean reefs. *Marine Ecology Progress Series*, **519**: 265-283.
130. Deignan, L.K., Pawlik, J.R. 2015. Perilous proximity: Does the Janzen-Connell hypothesis explain the distribution of giant barrel sponges on a Florida coral reef? *Coral Reefs*, **34**: 561-567.
129. McMurray, S.E., Pawlik, J.R., Finelli, C.M. 2014. Trait-mediated ecosystem impacts: How morphology and size affect pumping rates of the Caribbean giant barrel sponge. *Aquatic Biology*, **23**: 1-13
128. Vicente, J., Zea, S., Powell, R., Pawlik, J.R., Hill, R.T. 2014. New epizooic symbioses between sponges of the genera *Plakortis* and *Xestospongia* in cryptic habitats of the Caribbean. *Marine Biology*, **161**: 2803-2818
127. Gloeckner, V., Wehrl, M., Moitinho-Silva, L., Gernert, C., Schupp, P., Pawlik, J.R. Lindquist, N.L., Erpenbeck, D., Wörheide, G., Hentschel, U. 2014. The HMA-LMA dichotomy revisited: an electron microscopical survey of 56 sponge species. *Biological Bulletin*, **227**: 78-88.
126. Henkel, T.H., Pawlik, J.R. 2014. Cleaning mutualist or parasite? Classifying the association between the brittlestar *Ophiothrix lineata* and the Caribbean reef sponge *Callyspongia vaginalis*. *Journal of Experimental Marine Biology and Ecology*, **454**: 42-58.
125. Loh, T.-L., Pawlik, J.R. 2014. Chemical defenses and resource trade-offs structure sponge communities on Caribbean coral reefs. *Proceedings of the National Academy of Science*, **111**: 4151-4156. **Cover article!**
124. Pawlik, J.R., Amsler, C.D., Ritson-Williams, R., McClintock, J.B., Baker, B.J., Paul, V.J. 2013. Pages 53-69 in: *Research and Discoveries: The Revolution of Science through Scuba*. Edited by: Lang, M.A., Marinelli, R.L., Roberts, S.J., and Taylor, P.R. Smithsonian Contributions to the Marine Sciences, Vol. 39. Washington, DC: Smithsonian Institution Scholarly Press. 258 pp.
123. Pawlik, J.R., Loh, T.-L., McMurray, S.E., Finelli, C.M. 2013. Sponge communities on Caribbean coral reefs are structured by factors that are top-down, not bottom-up. *PLoS One* 8(5): e62573.
122. Miller, A.M., Pawlik, J.R. 2013. Do coral reef fish learn to avoid unpalatable prey using visual cues? *Animal Behaviour*, **85**: 339-347.
121. Loh, T.-L., Pawlik, J.R. 2012. Specificity of larval settlement of the Caribbean Orange Icing Sponge *Mycale laevis*: A mutualistic response? *Invertebrate Biology*, **131**: 155-164.
120. Loh, T.-L., Pawlik, J.R. 2012. Friend or foe? No evidence that association with the sponge *Mycale laevis* provides a benefit to corals of the genus *Montastraea*. *Marine Ecology Progress Series*, **465**: 111-117.
119. A new sponge ecology. 2012. *International Innovation*, June issue, p.37.
118. Redwoods of the reef. 2012. *International Innovation*, June issue, pp.38-39.

117. Angermeier, H., Glöckner, V., Pawlik, J.R., Lindquist, N.L., Hentschel, U. 2012. Sponge white patch disease affecting the Caribbean sponge *Amphimedon compressa*. *Diseases of Aquatic Organisms*, **99**:95-102.
116. Pawlik, J.R. 2012. Antipredatory defensive roles of natural products from marine invertebrates. Chapter 12, pages 677-710 in *Handbook of Marine Natural Products*. Edited by: Fattorusso, E., Gerwick, W.H., Tagliatalata-Scafati, O. Springer Science, NY.
115. Loh, T.-L., López-Legentil, S., Song, B., Pawlik, J.R. 2012. Phenotypic variability in the Caribbean Orange Icing sponge *Mycale laevis* (Demospongiae: Poecilosclerida). *Hydrobiologia*, **687**: 205-217.
114. Hines, D.E., Pawlik, J.R. 2012. Assessing the antipredatory defensive strategies of Caribbean non-scleractinian zoantharians (Cnidaria): Is the sting the only thing? *Marine Biology*, **159**:389-398.
113. Echevarria, M., Naar, J.P., Tomas, C., Pawlik, J.R. 2011. Effects of *Karenia brevis* on clearance rates and bioaccumulation of brevetoxins in benthic suspension feeding invertebrates. *Aquatic Toxicology*, **106-107**: 85-94.
112. Pawlik, J.R. 2011. The chemical ecology of sponges on Caribbean reefs: Natural products shape natural systems. *BioScience*, **61**: 888-898. **Cover article!**
111. McMurray, S.E., Blum, J.E., Leichter, J.J., Pawlik, J.R. 2011. Bleaching of the giant barrel sponge *Xestospongia muta* in the Florida Keys. *Limnology and Oceanography*, **56**: 2243-2250.
110. López-Legentil, S., Song, B., Bosch, M., Pawlik, J.R., Turon X. 2011. Cyanobacterial diversity and a new Acaryochloris-like symbiont from Bahamian sea squirts. *PLoS ONE*, **6(8)**: e23938.
109. Henkel, T.P., Pawlik, J.R. 2011. Host specialization of an obligate sponge-dwelling brittlestar. *Aquatic Biology*, **12**: 37-46.
108. Leong, W., Pawlik, J.R. 2011. Comparison of reproductive patterns among 7 Caribbean sponge species does not reveal a resource trade-off with chemical defenses. *Journal of Experimental Marine Biology and Ecology*, **401**: 80-84.
107. Angermeier, H., Kamke, J., Abdelmohsen, U., Krohne, G., Pawlik, J., Lindquist, N., Hentschel, U. 2011. The pathology of Sponge Orange Band disease affecting the Caribbean barrel sponge *Xestospongia muta*. *FEMS Microbiology Ecology*, **75**: 218-230.
106. López-Legentil, S., Erwin, P.M., Pawlik, J.R., Song, B.K. 2010. Effects of sponge bleaching on ammonia oxidizing Archaea: Distribution and relative expression of ammonia monooxygenase genes associated with the barrel sponge *Xestospongia muta*. *Microbial Ecology*, **60**: 561-571.
105. Morinaka, B., Pawlik, J.R., Molinski, T.F. 2010. Amaranzoles B-F, imidazole-2-carboxy steroids from the marine sponge *Phorbas amaranthus*. C24-N- and C24-O-analogues from a divergent oxidative biosynthesis. *Journal of Organic Chemistry*, **75**: 2453-2460. **Cover article!**
104. Leong, W., Pawlik, J.R. 2010. Evidence of a resource trade-off between growth and chemical defenses among Caribbean coral reef sponges. *Marine Ecology Progress Series*, **406**: 71-78.
103. Leong, W., Pawlik, J.R. 2010. Fragments or propagules? Reproductive trade-offs among *Callyspongia* spp. from Florida coral reefs. *Oikos*, **119**: 1417-1422.
102. López-Legentil, S., Henkel, T.P., Erwin, P.M., Pawlik, J.R. 2010. Phenotypic plasticity in the sponge *Callyspongia vaginalis*: morphological and molecular data. *Scientia Marina*, **74**:445-453.
101. Bickmeyer, U., Grube, A., Klings, K-W., Pawlik, J.R., Köck, M. 2010. Siphonodictyal B1 from a marine sponge increases intracellular calcium levels comparable to the Ca<sup>2+</sup>-ATPase (SERCA) inhibitor thapsigargin. *Marine Biotechnology*, **12**: 267-272.
100. McMurray, S.E., Henkel, T.P., Pawlik, J.R. 2010. Demographics of increasing populations of the giant barrel sponge *Xestospongia muta* in the Florida Keys. *Ecology*, **91**:560-570
99. Lee, O.O., Chui, P.Y., Wong, Y.H., Pawlik, J.R., Qian, P.Y. 2010. Evidence for vertical transmission of bacterial symbionts from adult to embryo in the Caribbean sponge *Svenzea zeai*. *Applied Environmental Microbiology*, **75**: 6147-6156
98. Zea, S., Henkel, T.P., Pawlik, J.R. 2009. The Sponge Guide: a picture guide to Caribbean sponges. Available online at <http://www.spongeguide.org>
97. Loh, T.-L., Pawlik, J.R. 2009. Bitten down to size: Fish predation determines growth form of the Caribbean coral reef sponge *Mycale laevis*. *Journal of Experimental Marine Biology and Ecology*, **374**: 45-50.

96. Morinaka, B. I., Pawlik, J.R., Molinski, T.F. 2009. Amaro-xocanes A and B: Sulfated dimeric sterols defend the Caribbean coral reef sponge *Phorbos amaranthus* from fish predators. *Journal of Natural Products*, **72**: 259-264.
95. Ein-Gil, N., Ilan, M., Carmeli, S., Smith, G.W., Pawlik, J.R., Yarden, O. 2009. Presence of *Aspergillus sydowii*, a pathogen of gorgonian sea fan in the marine sponge *Spongia obscura*. *ISME Journal*, **3**: 752-755
94. López-Legentil, S., Pawlik, J.R. 2009. Genetic structure of the Caribbean giant barrel sponge *Xestospongia muta* using the I3-M11 partition of COI. *Coral Reefs*, **28**: 157-165.
93. Pawlik, J.R., Henkel, T.P., McMurray, S.E., López-Legentil, S., Loh, T.-L., Rohde, S. 2008. Patterns of sponge growth and recruitment on a shipwreck corroborate chemical defense resource trade-off. *Marine Ecology Progress Series*, **368**: 137-143.
92. McMurray, S.E., and Pawlik, J.R. 2009. A novel technique for the reattachment of large coral reef sponges. *Restoration Ecology*, **17**: 192-195. **Cover article!**
91. McMurray, S.E., Blum, J.E., Pawlik, J.R. 2008. Redwood of the reef: growth and age of the giant barrel sponge, *Xestospongia muta* in the Florida Keys. *Marine Biology*, 155: 159-171.  
Redwoods of the Reef . (Random Sample) 2008. *Science*, **321**: 19.
90. Nagelkerken, I., Blaber, S.J.M., Bouillon, S., Green, P., Haywood, M., Kirton, L.G., Meynecke, J.-O., Pawlik, J.R., Penrose, H.M., Sasekumar, A., Somerfield, P.J. 2008. The habitat function of mangroves for terrestrial and marine fauna: a review. *Aquatic Botany*, **89**: 155-185.
89. López-Legentil, S., Song, B.K., McMurray, S.E., Pawlik, J.R. 2008. Bleaching and stress in coral reef ecosystems: *hsp70* expression by the giant barrel sponge *Xestospongia muta*. *Molecular Ecology*, **17**: 1840-1849.
88. Meredith, T.L., Cowart, J.D., Henkel, T.P., Pawlik, J.R. 2007. The polychaete *Cirri-formia punctata* is chemically defended against generalist coral reef predators. *Journal of Experimental Marine Biology and Ecology*, **353**: 198-202.
87. Pawlik, J.R., McMurray, S.E., Henkel, T.P. 2007. Abiotic factors control sponge ecology in Florida mangroves. *Marine Ecology Progress Series* **339**: 93-98.
86. Grube, A., Assmann, M., Lichte, E., Sasse, F., Pawlik, J.R., Köck, M. 2007. New bioactive metabolites from the Caribbean sponge *Aka coralliphagum*. *Journal of Natural Products* **70**: 504-509.
85. Lee, O.O., Yang, L.H., Li, X., Pawlik, J.R., Qian, P.Y. 2007. Surface bacterial community, fatty acid profile, and antifouling activity of two congeneric sponges from Hong Kong and the Bahamas. *Marine Ecology Progress Series*, **339**: 25-40.
84. Pawlik, J.R. 2007. Cast-iron beauty: an antique J.W. Fiske aquarium. 2007. *Tropical Fish Hobbyist* **55**: 110-114.
83. Epifanio, R., Maia, L.F., Pawlik, J.R., Fenical, W. 2007. Antipredatory secosterols from the octocoral *Pseudopterogorgia americana*. *Marine Ecology Progress Series*, **329**: 307-310.
82. Pawlik, J.R., Steindler, L., Henkel, T.P., Beer, S., Ilan, M. 2007. Chemical warfare on coral reefs: Sponge metabolites differentially affect coral symbiosis *in situ*. *Limnology and Oceanography* **52**: 907-911.
81. Odate, S., Pawlik, J.R. 2007. The role of vanadium in the chemical defense of the solitary tunicate, *Phallusia nigra*. *Journal of Chemical Ecology* **33**: 643-654.
80. Qian, P.Y., Dobretsov, S., Dahms, H.U., Pawlik, J.R. 2006. Comparison of the antifouling activities and microbial diversity of two congeneric sponges (*Callyspongia* spp.) from Hong Kong and the Bahamas. *Marine Ecology Progress Series* **324**: 151-165.
79. Cowart, J.D., Henkel, T.P., McMurray, S.E., Pawlik, J.R. 2006. Sponge orange band (SOB): a pathogenic-like condition of the giant barrel sponge, *Xestospongia muta*. *Coral Reefs* **25**: 513.
78. Lau, S.C.K., Tsoi, M.M.Y., Li, X.C., Plakhotnikova, I., Dobretsov, S.V., Wu, M., Wong, P.K., Pawlik, J.R., Qian, P.Y. 2006. Description of *Fabibacter halotolerans* gen. nov., sp. nov. and *Roseivirga spongocola* sp. nov. and reclassification of [*Marinicola*] *seohaensis* as *Roseivirga seohaensis* comb. nov.. *International Journal of Systematic and Evolutionary Microbiology* **56**: 1059-1065.

77. Lau, S.C.K., Tsoi, M.M.Y., Li, X.C., Plakhotnikova, I., Dobretsov, S.V., Wong, P.K., Pawlik, J.R., Qian, P.Y. 2006. *Stenothermobacter spongiae* gen. nov., sp. nov., a novel member of the family Flavobacteriaceae isolated from a marine sponge in the Bahamas, and emended description of *Nonlabens tegetincola*. *International Journal of Systematic and Evolutionary Microbiology* **56**: 181-185.
76. Kelly, S.R., Garo, E., Jensen, P.R., Fenical, W., Pawlik, J.R. 2005. Effects of sponge secondary metabolites on bacterial surface colonization. *Aquatic Microbial Ecology*, **40**: 191-203.
75. Engel, S., Pawlik, J.R. 2005. Interactions among Florida sponges. II. Mangrove habitats. *Marine Ecology Progress Series*, **303**: 145-152.
74. Engel, S., Pawlik, J.R. 2005. Interactions among Florida sponges. I. Reef habitats. *Marine Ecology Progress Series*, **303**: 133-144.
73. Lau, S.C.K., Tsoi, M.M.Y., Li, X.C., Plakhotnikova, I., Dobretsov, S.V., Wong, P.K., Pawlik, J.R., Qian, P.Y. 2005. *Nonlabentium tegetincola* gen. nov, sp. nov., a new member of the family *Flavobacteriaceae* isolated from a microbial mat in a subtropical estuary. *International Journal of Systematic and Evolutionary Microbiology*, **55**: 2279-2283.
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## OUTREACH AND BROADER IMPACTS:

### Web resources

Zea, S., Henkel, T.P., Pawlik, J.R. 2009. The Sponge Guide: a picture guide to Caribbean sponges. Available online at <http://www.spongeguide.org> Updated 2014.

### Narrated educational videos

Pawlik, J.R., "Roatan Deep" <https://youtu.be/4F3XQeWs4V8>

Koch, J., Pawlik, J.R. Video entry: "The maid did it! The surprising case of the sponge-cleaning brittle star " Beneath the Waves Film Festival, Quebec City, Canada. (March 2015)

Koch, J., Pawlik, J.R. Video entry: "The maid did it! The surprising case of the sponge-cleaning brittle star " Ocean 180 Video Challenge. <http://ocean180.org/2015-challenge/2015-finalists.html> **Finalist in international competition** (December 2014)

Pawlik, J.R., Video entry: "Sponges of the Caribbean: What ecological factors most affect them?" Beneath the Waves Film Festival, Jacksonville, FL. (March 2014)

Pawlik, J.R., Video entry: "Sponges of the Caribbean: What ecological factors most affect them?" Ocean 180 Video Challenge. <http://ocean180.org/previous-winners.html> **4<sup>th</sup> Place in international competition** (December 2013).

### Non-narrated educational videos (all recorded and produced by Pawlik, J.R.)

2017. "Great White Wall, Fiji" <https://youtu.be/WgyaZV5NK0w>

2017. "Cabbage Patch, Rainbow Reef, Fiji" <https://youtu.be/9C6i1BhHpWg>

2017. "Rainbow Reef, Fiji" <https://youtu.be/x17oyxXB9Rc>

2017. "Bloody Bay Diving, Little Cayman Island" <https://youtu.be/AEIXSYY3Ia8>

2017. "Red Sea Coral Reefs" <https://youtu.be/RoApX7xGfTc>

2017. "Giant Carpet Anemone – Red Sea" <https://youtu.be/LxLrcRYLJCE>

2017. "Killer squid!" [https://youtu.be/yj9\\_6f5aJTA](https://youtu.be/yj9_6f5aJTA)

2017. "Atlantis" <https://youtu.be/8LMig8-7OIA>

2017. "Wreck diving Cayman Brac" [https://youtu.be/t\\_LpWwOqvAA](https://youtu.be/t_LpWwOqvAA)

2016. "Sponge pumping: Seein' with fluorescein" [https://youtu.be/x8xCX\\_cVwoI](https://youtu.be/x8xCX_cVwoI)
2016. "Roatan wreck diving" <https://youtu.be/BMdGZrbKL3A>
2016. "The last Caribbean coral garden?" <https://youtu.be/FHcUmUry8Vk>
2015. "Diving Tobago" <https://youtu.be/Z2jazdDeZk4>
2015. "Reefs of Roatan" <https://youtu.be/1JzdYwO2YGo>
2014. "Close-up on Conch Reef" <https://youtu.be/qdjhm7ojGJk>
2014. "Sponge gardens of Saba" <https://youtu.be/pISij0Zqj90>
2014. "The reefs of Carrie Bow" <https://youtu.be/Uy79ajDDIGg>
2013. "Redwoods of the Reef" <http://youtu.be/8WaWVuGE-LM>
2013. "A visit to Danger Reef" <http://youtu.be/MzrWACzMFZ8>
2013. "Angels on the Pinnacle" <http://youtu.be/IgPuNMJdgrk>

**ABSTRACTS AND PRESENTATIONS:** Most recent of about 305; <sup>1</sup>=undergrad, <sup>2</sup>=MS, <sup>3</sup>=PhD, <sup>4</sup>=postdoc  
Pawlik, J.R. 13th International Coral Reef Symposium, Honolulu, HI, "What is the best scientific justification for MPAs on Caribbean reefs?" (June 2016).

Deignan, L. K.<sup>3</sup>, Pawlik, J.R. 13th International Coral Reef Symposium, Honolulu, HI, "Caribbean sponge pathology: The diagnosis is not always simple" (June 2016).

McMurray, S. E.<sup>3</sup>, Pawlik, J.R., Finelli, C.M. 13th International Coral Reef Symposium, Honolulu, HI, "Carbon-cycling on Caribbean coral reefs: The increasing role of giant barrel sponges" (June 2016).

Deignan, L. K.<sup>3</sup>, Pawlik, J.R., White, J. W.; Lopez-Legendil, S. 100th Annual Meeting of the Ecological Society of America, Baltimore, Maryland, USA, "Testing the Janzen-Connell hypothesis with fine-scale spatial and genetic analyses of the distribution of Caribbean giant barrel sponges" (August 2015).

Pawlik, J.R. Invited speaker, Old Dominion University, Department of Biology "Natural products shape natural systems: Chemical ecology of sponges of the Caribbean." (November 2015)

Pawlik, J.R. 45th Annual Benthic Ecology Meeting, Portland, Maine, "You can observe a lot just by watching: 20 years of fine-scale monitoring at Conch Reef, Florida Keys" (March 2016).

Deignan, L.<sup>3</sup>, López-Legendil, S., Pawlik, J.R. 45th Annual Benthic Ecology Meeting, Portland, Maine, "Fine-scale spatial and size-structured genetic relatedness of the Caribbean giant barrel sponge *Xestospongia muta*" (March 2016).

Pawlik, J.R. Natural products shape natural systems: Chemical ecology of sponges of the Caribbean. Invited speaker, Roatan Institute for Marine Sciences, Roatan, Honduras (January 2015).

Pawlik, J.R. Invited speaker, Latin American Association of Chemical Ecology, University of the Andes, Bogota, Colombia. "Natural products shape natural systems: Chemical ecology of sponges of the Caribbean." (November 2014).

Pawlik, J.R., Loh, T.-L.<sup>3</sup> 44th Annual Benthic Ecology Meeting, Canada "Sponge overgrowth of corals justifies MPAs on Caribbean reefs; seaweed cover does not" (March 2015).

Deignan, L.<sup>3</sup>, Pawlik, J.R. 44th Annual Benthic Ecology Meeting, Quebec City, Canada, "Population Demographics of the Caribbean brown tube sponge, *Agelas tubulata*" (March 2015).

McMurray, S. E.<sup>3</sup>, Johnson, Z.I., Hunt, D.E., Pawlik, J.R., Finelli, C.M.. 44th Annual Benthic Ecology Meeting, Quebec City, Canada, "Picky eaters at the plankton buffet: selective suspension feeding by giant barrel sponges increases foraging efficiency" (March 2015).

Marino, C.<sup>2</sup>, Erwin, P.M., Pawlik, J.R. 44th Annual Benthic Ecology Meeting, Quebec City, Canada, "Do microbial symbionts and chemical defenses change across latitudes for the sponge *Ircinia campana*?" (March 2015).

Wooster, M.K.<sup>1</sup>, Marty, M.J.<sup>2</sup>, Pawlik, J.R. 44th Annual Benthic Ecology Meeting, Quebec City, Canada, "Defense by association: sponge-eating fishes alter the small-scale distribution of Caribbean reef sponges" (March 2015).

Koch, J.C.<sup>1</sup>, Pawlik, J.R. 44th Annual Benthic Ecology Meeting, Quebec City, Canada, "Together is better: The importance of heterotrophy and symbiosis for growth of the sea anemone *Aiptasia pallida*" (March 2015).

- Pawlik, J.R. Invited speaker for Faculty of Science Graduate Studies Day, University of Prince Edward Island, Charlottetown, PE, Canada. "Natural products shape natural systems: Chemical ecology of sponges of the Caribbean." (May 2015).
- Pawlik, J.R. Natural products shape natural systems: Chemical ecology of sponges of the Caribbean. Invited speaker, Sea & Learn Saba, Saba Island, Lesser Antilles. (October 2014).
- Pawlik, J.R. Natural products shape natural systems: Chemical ecology of sponges of the Caribbean. Invited keynote speaker, Latin American Association of Chemical Ecology, University of the Andes, Bogota, Colombia. (November 2014).
- Pawlik, J.R. Natural products shape natural systems: Chemical ecology of sponges of the Caribbean. Invited speaker, Roatan Institute for Marine Sciences, Roatan, Honduras (January 2015).
- Pawlik, J.R., Loh, T.-L.<sup>3</sup> 43rd Annual Benthic Ecology Meeting, Jacksonville, FL, "Where angels bring sponge dread: Further evidence for top-down control of sponge community structure on Caribbean reefs " (March 2014).
- Deignan, L.<sup>3</sup>, Pawlik, J.R., Gleason, A. 43rd Annual Benthic Ecology Meeting, Jacksonville, FL, "Understanding Distribution: mapping the spatial relationships of giant barrel sponges " (March 2014).
- Conti-Jerpe, I.<sup>2</sup>, Finelli, C., Pawlik, J.R. 43rd Annual Benthic Ecology Meeting, Jacksonville, FL, "Whipping up dinner: measuring heterotrophic feeding by temperate Atlantic gorgonian octocorals using feeding experiments and stable isotope analysis " (March 2014).
- McMurray, S. E.<sup>3</sup>, Pawlik, J.R., Finelli, C. 43rd Annual Benthic Ecology Meeting, Jacksonville, FL, "The effects of size and morphology on pumping rates of Caribbean giant barrel sponges" (March 2014).
- Marty, M.<sup>2</sup>, Blum, J., Pawlik, J.R. 43rd Annual Benthic Ecology Meeting, Jacksonville, FL, "Accounting for taste: Does fish predation select for greater sponge chemical defenses?" (March 2014).
- Hammer, J.<sup>2</sup>, White, J.W., Pawlik, J.R. 43rd Annual Benthic Ecology Meeting, Jacksonville, FL, "Grazing patterns of redband parrotfish: interaction of value and availability of food resources " (March 2014).
- Marino, C.<sup>2</sup>, Pawlik, J.R., Erwin, P.M. 43rd Annual Benthic Ecology Meeting, Jacksonville, FL, "Effects of climate change on symbiosis: microbial assemblages in sponges " (March 2014).
- Wooster, M.K.<sup>1</sup>, Marty, M.J.<sup>2</sup>, Chaves, L.C.T., Ormond, C.G.A., Pawlik, J.R. 43rd Annual Benthic Ecology Meeting, Jacksonville, FL, "Quantifying sponge associational refugia in the absence of spongivores " (March 2014).
- Zea, S., Henkel, T.H., Pawlik, J.R. 43rd Annual Benthic Ecology Meeting, Jacksonville, FL, "Taxonomical monographs on the web: Upgrading THE SPONGE GUIDE, an interactive guide to identify Caribbean sponges" (March 2014).
- Pawlik, J.R. Chemical ecology of sponges of the Caribbean. Invited guest speaker, Fort Johnson Marine Science Seminar Series (NIST, NOAA, College of Charleston), Charleston, SC (August 2013).
- Pawlik, J.R. Natural products shape natural systems: Chemical ecology of sponges of the Caribbean. Invited guest speaker, Dept. of Ecology, Evolution and Organismal Biology, Iowa State University, Ames, IA (May 2014).
- Pawlik, J.R. 42nd Annual Benthic Ecology Meeting, Savannah, GA, "Do marine animals exhibit warning coloration? Not so much." (March 2013).
- McMurray, S. E.<sup>3</sup>, Johnson, Z.I., Hunt, D.E., Pawlik, J.R., Finelli, C. 42nd Annual Benthic Ecology Meeting, Savannah, GA, "Estimates of pelagic-benthic planktonic carbon flux for populations of giant barrel sponges on coral reefs " (March 2013).
- Marty, M.<sup>2</sup>, Pawlik, J.R. 42nd Annual Benthic Ecology Meeting, Savannah, GA, "Promoting bad taste: Does predation by fishes select for greater sponge chemical defenses? " (March 2013).
- Deignan, L.<sup>3</sup>, Pawlik, J.R. 42nd Annual Benthic Ecology Meeting, Savannah, GA, "Connecting the dots: examining spatial relationships among giant barrel sponges ." (March 2013).
- Hammer, J.<sup>2</sup>, White, J.W., Pawlik, J.R. 42nd Annual Benthic Ecology Meeting, Savannah, GA, "Shifting diets: Quantifying the effects of resource availability on redband parrotfish feeding on Caribbean coral reefs." (March 2013).

- Conti-Jerpe, I.<sup>2</sup>**, Finelli, C., Pawlik, J.R. 42nd Annual Benthic Ecology Meeting, Savannah, GA, "Does size really matter? Relationships between polyp morphology and heterotrophic food sources in gorgonian octocorals." (March 2013).
- Pawlik, J.R. 41st Annual Benthic Ecology Meeting, Norfolk, VA, "Perceptive poriferan perspectives: Chemical defenses and resource allocation explain sponge ecology on Caribbean reefs." (March 2012).
- McMurray, S. E.<sup>3</sup>**, Finelli, C., Pawlik, J.R. 41st Annual Benthic Ecology Meeting, Norfolk, VA, "Demographics of the giant barrel sponge *Xestospongia muta* and carbon flux on coral reefs." (March 2012).
- Loh, T.-L.<sup>3</sup>**, Pawlik, J.R. 41st Annual Benthic Ecology Meeting, Norfolk, VA, "Death by thousand bites: Top-down processes structure communities on Caribbean coral reefs." (March 2012).
- Deignan, L.<sup>2</sup>**, Pawlik, J.R. 41st Annual Benthic Ecology Meeting, Norfolk, VA, "Perilous proximity: Does the Janzen-Connell hypothesis explain dispersion among giant barrel sponges?" (March 2012).
- Hammer, J.<sup>2</sup>**, Pawlik, J.R. 41st Annual Benthic Ecology Meeting, Norfolk, VA, "Polly wanna choose? Testing parrotfish food preferences on Caribbean coral reefs." (March 2012).
- Conti-Jerpe, I.<sup>2</sup>**, Finelli, C., Pawlik, J.R. 41st Annual Benthic Ecology Meeting, Norfolk, VA, "Fruit of the flume: patterns of heterotrophic feeding in gorgonian corals." (March 2012).
- Pawlik, J.R. Invited lecture: Gordon Research Conference in Marine Natural Products, Ventura CA, "The chemical ecology of sponges on Caribbean reefs: Natural products shape natural systems" (March 2012).
- Pawlik, J.R. 40th Annual Benthic Ecology Meeting, Mobile, AL, "Defense for free? Patterns of resource allocation confirm that chemical defenses are costly for Caribbean sponges." (March 2011).
- McMurray, S. E.<sup>3</sup>**, Pawlik, J.R. 40th Annual Benthic Ecology Meeting, Mobile, AL, "Do temperature extremes cause bleaching of the giant barrel sponge *Xestospongia muta* in the Florida Keys?", (March 2011).
- Miller, A.<sup>2</sup>**, Pawlik, J.R. 40th Annual Benthic Ecology Meeting, Mobile, AL, "Effects of prey color and pattern on feeding by a coral reef fish" (March 2011).
- Echevarria, M.<sup>2</sup>**, Tomas, C. R., Naar, J., Pawlik, J.R. 40th Annual Benthic Ecology Meeting, Mobile, AL, "Effects of the harmful alga *Karenia brevis* on clearance rates and bioaccumulation of brevetoxins in benthic suspension feeders" (March 2011).
- Loh, T.-L.<sup>3</sup>**, Pawlik, J. R. 40th Annual Benthic Ecology Meeting, Mobile, AL, "Sponges rising: coral reef community shifts in response to reduced predation pressure" (March 2011).
- Pawlik, J.R. Reefs in a changing environment, European International Society for Reef Studies, Wageningen, Netherlands, "Are sponges taking over Caribbean reefs?" (December 2010).
- Pawlik, J. R. Linking Science to Management: the Florida Keys Marine Ecosystem, NOAA, Duck Key, FL, "Florida's "Redwood of the Reef": Growth, Age, Demographics and Bleaching of the Caribbean giant barrel sponge, *Xestospongia muta*" (October 2010).
- Lopez-Legentil, S., Erwin, P. M., Pawlik, J.R., Song, B. Erwin, P. M., Pawlik, J.R., Song, B. 8th World Sponge Conference, Girona Spain, "Ammonia oxidizing Archaea in bleaching barrel sponges: Diversity, distribution and ammonia monooxygenase expression" (September 2010).
- Loh, T.-L.<sup>3</sup>**, Pawlik, J.R. 8th World Sponge Conference, 20-24 Sep 2010, Girona Spain, "Investigating the specificity of larval settlement in the Caribbean Orange Icing Sponge *Mycale laevis*" (September 2010).
- Pawlik, J.R. 8th World Sponge Conference, Girona Spain, "KEYNOTE: Researching the Redwood of the Reef: Growth, age, demographics and bleaching of the Caribbean giant barrel sponge, *Xestospongia muta*" (September 2010).
- Loh, T.-L.<sup>3</sup>**, Lopez-Legentil, S., Song, B., Pawlik, J.R. Lopez-Legentil, S., Song, B., Pawlik, J. R. 8th World Sponge Conference, Girona Spain, "Phylogenetic analysis of the sponge genus *Mycale* (Demospongiae: Poecilosclerida)" (September 2010).
- Zea, S. E., **Henkel, T. P.<sup>3</sup>**, Pawlik, J. R. Henkel, T. P., Pawlik, J. R. 8th World Sponge Conference, 20-24 Sep 2010, Federation of Sponge Biologist, Girona Spain, "The sponge Guide: A web-based interactive photographic guide to identify Caribbean sponges" (September 2010).
- Pawlik, J.R. Invited seminar: National Research Council and Smithsonian Institution. Revolution of Science through Scuba Symposium. NMNH, Washington, DC. "Researching the "Redwood of the Reef": How Scuba and related undersea technologies revealed one of the oldest animals on earth" (May 2010).

Pawlik, J.R. Invited seminar: University of Pennsylvania, Dept. of Biology, Philadelphia, PA. “The chemical ecology of sponges on Caribbean coral reefs: How natural products shape natural systems” (March 2010).

**Loh, T.L.**<sup>3</sup>, López-Legentil, S., Song, B., and Pawlik, J.R. 2010. Molecular phylogenetic analysis of the sponge genus *Mycale* (Demospongiae; Poecilosclerida). Society of Integrative and Comparative Biology Annual Meeting; 3-7 January, Seattle, WA

**Hines, D.E.**<sup>2</sup> Pawlik, J.R. 39<sup>th</sup> Annual Benthic Ecology Meeting, Wilmington, NC, “Defensive decisions: Trade-offs in physical and chemical defenses of Caribbean non-scleractinian zoantharians” Best student paper award winner. (March 2010)

**Loh, T.L.**<sup>3</sup> Pawlik, J.R. 39<sup>th</sup> Annual Benthic Ecology Meeting, Wilmington, NC, “Fatal attraction? No, the Caribbean Orange Icing Sponge does not prefer to settle on corals.” (March 2010)

**Echevarria, M.L.**<sup>2</sup> Pawlik, J.R. 39<sup>th</sup> Annual Benthic Ecology Meeting, Wilmington, NC, “Effects of metabolites from harmful algal blooms on benthic filter feeders” (March 2010).

**Miller, A.**<sup>2</sup> Pawlik, J.R. 39<sup>th</sup> Annual Benthic Ecology Meeting, Wilmington, NC, “Does aposematism exist on Caribbean coral reefs?” (March 2010).

**Robuck, A.**<sup>1</sup> Pawlik, J.R. 39<sup>th</sup> Annual Benthic Ecology Meeting, Wilmington, NC, “Development of nontoxic commercial marine antifouling paints using natural products from the sponge *Aplysilla longispina* and tunicate *Eudistoma hepaticum*” (March 2010).