

RYAN ANDREW MARTIN

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EDUCATION

PhD 2010 Biology, The University of North Carolina at Chapel Hill
BS 2002 Ecology and Evolution, University of California Santa Cruz (honors in the major)

PROFESSIONAL EXPERIENCE

2014-present Assistant Professor, Department of Biology, Case Western Reserve University
2012-2014 Postdoctoral Fellow, National Institute for Mathematical and Biological Synthesis
2010-2012 Postdoctoral Researcher, Department of Biology, W.M. Keck Center for Behavioral Biology, North Carolina State University

PUBLICATIONS

*equal author contribution, † graduate, ‡ undergraduate, and &high-school coauthors since January 2014
current and former Martin Lab members in **bold**

Peer-Reviewed Manuscripts Published or In Press

- 36.** Siepielski, A., M.B. Morrissey, M. Buoro, S. Carlson, C.M. Caruso, S.M. Clegg, T. Coulson, J. Di Battista, K.M. Gotanda, C.D. Francis, J. Hereford, J.G. Kingsolver, K.E. Augustine, L.E.B. Kruuk, **R.A. Martin**, B.C. Sheldon, N. Sletvold, E.I. Svensson, M.J. Wade, A.D.C. MacColl. 2018. Response to Comment on "Precipitation drives global variation in natural selection". *Science*. 359: eaan5760.
- contributed to study design and data collection
- 35.** Moore[†], **M.P.**, **C. Lis**[&], **R.A. Martin**. 2018. Larval body condition mediates predator-induced life-history variation in a dragonfly. *Ecology*. 91: 224-230.
- contributed to study design, data analysis, and writing
- 34.** Levis[†], N.A., **R.A. Martin**, K.A. O'Donnell[‡], and D.W. Pfennig. 2017. Intraspecific adaptive radiation: competition, ecological opportunity, and the evolution of cryptic ecomorphological diversity within species. *Evolution*. 71: 2496–2509.
- contributed to data collection, data analysis, and writing
- 33.** Caruso^{*}, C.M., **R.A. Martin**^{*}, N. Sletvold, M.B. Morrissey, M.J. Wade, K.E. Augustine, S.C. Carlson, A.D.C. MacColl, A.M. Siepielski, J.G. Kingsolver. 2017. What are the environmental determinants of phenotypic selection? A meta-analysis of experimental studies. *The American Naturalist*. 190: 363-376.
- co-first author: analyzed data, contributed to study conception and design, data collection, and writing
- 32.** Siepielski, A., M.B. Morrissey, M. Buoro, S. Carlson, C.M. Caruso, S.M. Clegg, T. Coulson, J. Di Battista, K.M. Gotanda, C.D. Francis, J. Hereford, J.G. Kingsolver, K.E. Augustine, L.E.B. Kruuk, **R.A. Martin**, B.C. Sheldon, N. Sletvold, E.I. Svensson, M.J. Wade,

- A.D.C. MacColl. 2017. Precipitation drives global variation in natural selection. Science 355 (6328): 959-962.
- contributed to study design, data collection, and writing
Altmetric score of 288 (top 5% of all research output). Recommended by Faculty of 1000.
- 31. Krynak, K.L., D.J. Burke, R.A. Martin, P.M. Dennis.** 2017. Gut microbiome composition is associated with cardiac disease in captive western lowland gorillas (*Gorilla gorilla gorilla*). FEM Microbiology Letters 364: fnx149.
- contributed to writing
- 30. Diamond, S.E., L. Chick, A. Perez[†], S.A. Strickler, R.A. Martin.** 2017. Rapid evolution of ant thermal tolerance across an urban-rural temperature cline. Biological Journal of the Linnean Society 121: 248-257. doi: 10.1093/biolinnean/blw047
- conceived and designed study with S.E. Diamond, contributed to writing
Altmetric score of 93 (top 5% of all research output). Featured in The New York Times, Undark Magazine, Anthropocene Magazine, SICB Science News, Case Western Reserve's The Daily and recommended by Faculty of 1000.
- 29. Diamond^{*}, S.E., R.A. Martin^{*}.** 2016. The interplay between plasticity and evolution in response to human-induced environmental change. F1000 Research 5(F1000 Faculty Rev):2835.
- co-first author: conceived, designed study, and wrote paper with S.E. Diamond
- 28. Moore[†], M.P., R.A. Martin.** 2016. Intrasexual selection favors greater expression of an immune-correlated color ornament in a dragonfly. Journal of Evolutionary Biology 29: 2256-2265.
- contributed to study design, data analysis, and writing
- 27. Dugas, M.B., M.P. Moore[†], R.A. Martin, C.L. Richards-Zawacki, C.G. Sprehn.** 2016. Maternal care, offspring development, and the scope of parent-offspring conflict in an egg-feeding frog. Journal of Evolutionary Biology 29:1977-1985.
- contributed to experimental design, data analysis and writing
- 26. Dugas, M.B., L. McCormack[‡], A. Gadau[‡], R.A. Martin.** 2016. Cannibalistic tadpoles preferentially consume kin with low fitness prospects. The American Naturalist 188:124-131.
- conceived and designed study with M.B. Dugas, contributed to data collection, analysis, and writing
- 25. Moore[†], M.P., R. Riesch, R.A. Martin.** 2016. The predictability and magnitude of life-history divergence to ecological agents of selection: a meta-analysis in livebearing fishes. Ecology Letters 19:435-442.
- conceived and designed study, contributed to data analysis, and writing
- 24. Dugas, M.B., N.R. Franssen, R.A. Martin.** 2016. Morphological correlates of river velocity and reproductive development in an ornamented stream fish. Evolutionary Ecology 30:21-33.
- analyzed data and contributed to writing
- 23. Diamond, S.E., R.R. Dunn, S.F. Frank, N.M. Haddad, R.A. Martin.** 2015. Shared and unique responses of insects to the interaction of urbanization and background environment. Current Opinion in Insect Science 11:71-77.
- conceived of paper with S.E. Diamond, and contributed to writing
- 22. Dugas, M.B., M.P. Moore[†], C.N. Wamelink[‡], C.L. Richards-Zawacki, R.A. Martin.** 2015. Reproductive performance is associated with age and experience in a frog that cares for its young. The Science of Nature (Naturwissenschaften) 102:9-10.

- contributed to data analysis and writing

21. Pfennig, K.S., D.W. Pfennig, C. Porter†, R.A. Martin. 2015. Sexual selection's impacts on ecological specialisation: an experimental test. Proceedings of the Royal Society of London, Series B 282:20150217.

- analyzed data and contributed to study design and writing

20. Martin, R.A., M.D. McGee†, R.B. Langerhans. 2015. Predicting ecological and phenotypic differentiation in the wild: a case of piscivorous fish in a fishless environment. Biological Journal of the Linnean Society 114:588-607.

- wrote paper and analyzed data, contributed to study conception and design, and data collection

Altmetric score of 73 (top 5% of all research output). Highlighted in Case Western Reserve's The Daily, nsf.gov, phys.org, and Fishsens magazine.

19. Martin, R.A., R. Reisch, J. L. Heinen, R.B. Langerhans. 2014. Evolution of male coloration during a post-Pleistocene radiation of Bahamas mosquitofish. Evolution 68:397-411.

- wrote paper and analyzed data, contributed to study conception, design, and data collection

Highlighted in NC State News, phys.org.

18. Martin, R.A., S.C. Garnett. 2013. Relatedness and resource availability interact to affect the intensity of competition. Biological Journal of the Linnean Society 110:689-695.

- conceived and designed study, collected and analyzed data, and wrote paper

17. Riesch R., R.A. Martin, H. Lerp, M. Plath, T. Wronski. 2013. Size and sex matter: reproductive biology and intrinsic determinants of offspring survival in *Gazella marica*. Biological Journal of the Linnean Society 110:116-127.

- analyzed data, contributed to study conception and design, and writing

16. Heinen, J.L., M.W. Coco, A.S. Johnson, M.S. Marcuard, D.N White, M.N. Peterson, R.A. Martin, R.B. Langerhans. 2013. Environmental drivers of variation in demographics, habitat use, and behavior during a post-Pleistocene radiation of Bahamas mosquitofish. Evolutionary Ecology 27:971-991.

- contributed to study conception and design, data collection, analysis and writing

15. Riesch, R., R.A. Martin, R.B. Langerhans. 2013. Predation's role in life-history evolution of a livebearing fish and a test of the Trexler-DeAngelis model of maternal provisioning. The American Naturalist 181:78-93.

- contributed to study conception and design, data collection, analysis and writing

14. Paull, J., R.A. Martin, D.W. Pfennig. 2012. Increased competition as a cost of specialization during the evolution of resource polymorphism. Biological Journal of the Linnean Society 107:845-853.

- analyzed data and contributed to writing

13. Martin, R.A., D.W. Pfennig. 2012. Widespread disruptive selection in the wild is associated with intense resource competition. BMC Evolutionary Biology 12:136.

- conceived and designed study, collected and analyzed data, and wrote paper

12. Pfennig, K.S., S. Allenby, R.A. Martin, A. Monroy, C.D. Jones. 2012. A suite of molecular markers for identifying species, detecting introgression, and describing population structure in spadefoot toads (*Spea* spp.). Molecular Ecology Resources 12:909-917.

- contributed to study design, data collection, analysis, and writing

11. Riesch, R., R.A. Martin, D. Bierbach, M. Plath, R.B. Langerhans, L. Arias-Rodriguez. 2012. Natural history, diet, and life history of *Priapella chamulae* Scharf, Meyer and Wilde 2006 (Teleostei: Poeciliidae). Aqua, International Journal of Ichthyology 18:95-102.

- contributed to data collection, analysis, and writing

10. Martin, R.A., D.W. Pfennig. 2011. Evaluating the targets of selection during character displacement. Evolution 65:2946-2958.

- conceived and designed study, collected and analyzed data, and wrote paper

9. Martin, R.A. 2011. Evaluating a novel technique for individual identification of anuran tadpoles using coded wire tags. Herpetological Conservation and Biology 6:168-173.

- conceived and designed study, collected and analyzed data, and wrote paper

8. Diamond, S.E., A.M. Frame, R.A. Martin, L.B. Buckley. 2011. Species' traits predict phenological responses to climate change in butterflies. Ecology 92:1005-1012.

- wrote first draft with S.E. Diamond, contributed to study design, data collection, and analysis
Recommended by Faculty of 1000 and featured in Nature as a Research Highlight

7. Pfennig D.W., R.A. Martin. 2010. Proximate basis of character displacement in spadefoot toads: Different mechanisms in different species. Evolution 64:2331-2341.

- analyzed data, contributed to study conception, design, data collection and writing

6. Martin, R.A., D.W. Pfennig. 2010. Maternal investment influences expression of resource polymorphism in amphibians: Implications for the evolution of novel resource-use phenotypes. PLoS ONE 5(2)e9117.

- conceived and designed study, collected and analyzed data, and wrote paper
Highlighted on The New Scientists' Zoologger

5. Martin, R.A., D.W. Pfennig. 2010. Field and experimental evidence that competition and ecological opportunity promote resource polymorphism. Biological Journal of the Linnean Society 100:73-88.

- conceived and designed study, collected and analyzed data, and wrote paper

4. Martin, R.A., D.W. Pfennig. 2009. Disruptive selection in natural populations: The roles of ecological specialization and resource competition. The American Naturalist 174:268-281.

- conceived and designed study, collected and analyzed data, and wrote paper

3. Pfennig D.W., R.A. Martin. 2009. A maternal effect mediates rapid population divergence and character displacement in spadefoot toads. Evolution 63:898-909.

- analyzed data, contributed to study conception, design, data collection and writing

2. Pfennig D.W., A.M. Rice, R.A. Martin. 2007. Field and experimental evidence for competition's role in phenotypic divergence. Evolution 61:257-271.

- contributed to study design, data collection, analysis, and writing

1. Pfennig D.W., A.M. Rice, R.A. Martin. 2006. Ecological opportunity and phenotypic plasticity interact to promote character displacement and species coexistence. Ecology 87:769-779.

- contributed to study design, data collection, analysis, and writing

Manuscripts in Review or Revision

Riesch, R., **R.A. Martin**, S.E. Diamond, J. Jourdan[†], M. Plath, R.B. Langerhans. Thermal regime drives a latitudinal gradient in morphology and life history in a livebearing fish. In revision.

- contributed to study design, data collection, data analysis, and writing

Riesch, R., **R.A. Martin**, R.B. Langerhans. Multivariate character suites across multifarious environments: integrated responses of morphology and life history in Bahamas mosquitofish. In revision

- contributed to study design, data analysis, and writing

Martin, R.A., R. Riesch, M. Plath, T. Wronski. Maternal provisioning and paternal genetic quality: predictors of short- and long-term offspring survival in *Gazella arabica*. In revision

-analyzed data, contributed to study conception, design and writing

Moore[†], M.P., R.A. Martin. The potential for ontogenetic conflict on adult ornamentation depends on larval predation risk in a dragonfly. In revision.

- contributed to study design, data analysis, and writing

Moore[†], M.P., C. Lis[&], R.A. Martin. The costs of larval immune deployment manifest within and across life stages in a dragonfly. In review

- contributed to study design, data analysis, and writing

Dugas, M.B., R.A. Martin. Cannibalism in a crowd: carnivorous tadpoles consume siblings at similar rates alone and in the presence of competitors. In revision

- contributed to study design, data analysis, and writing

Diamond, S.E., L. Chick, A. Perez[†], S.A. Strickler, **R.A. Martin**. Evolution of thermal tolerance and its fitness consequences: parallel and non-parallel responses across three cities. In revision

- conceived and designed study with S.E. Diamond, contributed to writing and analysis

Manuscripts in Draft

manuscript available upon request

Moore[†], M.P., H.H. Whiteman, R.A. Martin. A mother's legacy: the strength of maternal effects in animal populations

Moore[†], M.P., R.A. Martin. The evolution of carryover effects.

Krynak, K.L., S. del la Serna Buzon[†], M.B. Dugas, D.J. Burke, P.M. Dennis, R.A. Martin. Eco-morphology predicts microbiome composition in a resource polyphenism.

de la Serna Buzon[†], S., **R.A. Martin**, D.W. Pfennig, and K.S. Pfennig. Physiological differences underlying alternative resource specialists in spadefoot tadpoles.

Caruso, C.M., K. Eisen[†], **R.A. Martin**, N. Sletvold. A meta-analysis of the causes of phenotypic selection on floral traits.

Johnson, M. et al (18 authors). A Roadmap for Urban Evolutionary Ecology. [Invited submission to New Phytologist](#)

Non-Refereed Publications

Martin, R.A., 2012. The ecology of mate choice: dicey climates and sexual selection. [The Signal](#) 13(7):7.

Martin, R.A., 2010. Coping with an arid habitat. [The Signal](#) 12(1):2-3.

FUNDING AND AWARDS

2012 National Institute for Mathematical and Biological Synthesis Postdoctoral Fellowship

2012 National Evolutionary Synthesis Center Postdoctoral Fellowship (awarded but declined)

2012 W.M. Keck Center for Behavioral Biology (\$600)

2010 W.M. Keck Center for Behavioral Biology (\$2650)

- 2010 Southwestern Research Station Graduate Support Fund (\$800)
- 2008 Elected Graduate Student Speaker, Department of Biology, UNC Chapel Hill (\$50)
- 2007 Smith Graduate Research Grant, UNC, Chapel Hill (\$1000)
- 2005 Honorable Mention: NSF Graduate Research Fellowship
- 2004 Southwestern Research Station Graduate Support Fund (\$800)

INVITED SYMPOSIA AND SEMINARS

- 2017 Evolution in Urban Ecosystems: International Evolution Meeting Symposium
- 2016 Brigham Young University, Department of Biology (*graduate student invited talk*)
- 2016 Southwestern Research Station Summer Seminar Series
- 2016 Pymatuning Laboratory of Ecology, University of Pittsburgh
- 2014 Bucknell University, Department of Biology
- 2014 University of Akron, Integrated Biosciences Program
- 2014 John Carroll University, Department of Biology
- 2013 Case Western Reserve University, Department of Biology
- 2013 National Institute for Mathematical and Biological Synthesis
- 2009 Duke University, Department of Biology, Behavior, Population and Community Ecology Seminar Series
- 2009 Eastern Carolina University, Department of Biology, Research in Progress Seminar Series
- 2008 UNC Chapel Hill, Department of Biology (elected graduate student speaker)
- 2008 Southwestern Research Station Summer Seminar Series

INVITED WORKING GROUPS

- 2017 Synthesis in the City: Urban Evolutionary Ecology. 19th New Phytologist Workshop
- 2014 Computational Landscape Genomics: working group funded by the National Institute for Mathematical and Biological Synthesis (NIMBioS)
- 2012-15 Environmental and Demographic Determinants of Natural Selection: working group funded by the National Evolutionary Synthesis Center (NESCent)

PRESENTATIONS AT INTERNATIONAL MEETINGS SINCE 2014

- 2017 Ecological Society of America (author on 1 poster)
- 2017 International Evolution Conference (author on 1 talk and an invited symposium speaker)
- 2017 Society for Integrative and Comparative Biology (author on 2 talks-one presented)
- 2017 The International Biogeography Society (author on 1 poster)
- 2016 International Evolution Conference (author on 2 talks-one presented, and 1 poster)
- 2015 Ecological Society of America (author on 2 talks-one presented)
- 2014 International Evolution Conference (presented 1 talk)

TEACHING AND MENTORING

Primary Instructor

Case Western Reserve University

Biology 364/464: Research Methods in Evolutionary Biology

Biology 472: Foundations of Evolution (Graduate Course)

Graduate and Postdoctoral Student Mentoring

Case Western Reserve University

Postdoctoral Researchers

Dr. Matthew Dugas: 2014-2017: now Assistant Professor, Illinois State University

Dr. Katherine Krynak: 2015-2016: now Assistant Professor, Ohio Northern University

PhD Students

Michael Moore: 2014-present

Iulian Gherghel: 2015-present

Aaron Yilmaz: 2018-present

Madeline Balman: starting fall 2018

Undergraduate Student Mentoring

Case Western Reserve University

Kayla Harris: Fall 2017-Spring 2018 (Capstone research)

Cheryl Lin: Fall 2017-present

Yannique Stewart: Fall 2017

Andrew Wiecek: Fall 2016-2017

Aramaria Mendez: Fall 2016-Spring 2017 (Capstone research)

Lindsey Robinson: Summer 2016

Jared Larson: Spring 2015-Spring 2017 (Awarded HHMI/SOURCE funding, Capstone research)

High School Student Mentoring

Hathaway Brown School

Cassandra Lis: January 2016-present

Gilmour Academy

Nicholas Majer: Spring 2017

Guest Lectures

2015-present Field Herpetology of the Southwest, Southwestern Research Station

2014 Limnology, Bucknell University

2014 Herpetology, Case Western Reserve University

2012 EEB Graduate Student Seminar, University of Tennessee

2009 Research Methods in Biology, North Carolina School of Science and Mathematics

2008-present Animal Behavior Course, Southwestern Research Station

PROFESSIONAL SERVICE

Editorial Positions

2016-present Area Editor in Evolutionary and Behavioral Ecology for *Oxford Bibliographies*

Graduate Committee Member

Case Western Reserve University

Mimi Guo, Biology MS program (*graduated Spring 2016*)

Hillary Rollins, Biology PhD program

Henrique Rodrigues, Biology PhD program

Valentine Siba, Biology MS program (*graduated Fall 2016*)
David Dimitrie, Biology PhD program
Sheng Chen, Biology MS program (*graduated Spring 2018*)

External Graduate Committees

Sofia de la Serna Buzon, Biology PhD program, University of North Carolina at Chapel Hill

Undergraduate Honors Committee Member

Laura Hill (*Spring 2015*)
Brian Lerch (*Spring 2018*)
Rachel Hill (*Spring 2018*)
Erin Conway (*Spring 2018*)

Departmental Service

2017-present Seminar Committee
2017-present bio[box] Oversight Committee
2014-2017 Committee on Graduate Affairs
2014-2017 Graduate Recruitment Events Co-Organizer

SOCIETY MEMBERSHIP

American Society of Naturalists, Society of Integrative and Comparative Biology, Society for the Study of Evolution

JOURNAL REFEREE

American Naturalist, Aquatic Invasions, Behavioral Ecology and Sociobiology, Biological Journal of the Linnean Society, Biology Letters, BMC Biology, BMC Evolutionary Biology, Current Zoology, Ecology, Ecology and Evolution, Ecosphere, Evolutionary Ecology Research, Ethology, Evolution, Evolutionary Biology, Functional Ecology, Heredity, Herpetologica, Herpetological Conservation and Biology, Journal of Animal Ecology, Journal of Evolutionary Biology, Journal of Herpetology, Journal of Morphology, Molecular Ecology, National Science Foundation, Oecologia, Oikos, Proceedings of the Royal Society B, Philosophical Transactions of the Royal Society, Phyllomedusa, Science

OUTREACH AND PRESS

(2017) Presenter at Cleveland Museum of Natural History's "Think and Drink with the Extinct"

(2017-present) Research mentor for Catalyst Program at Gilmour Academy (Gates Mill, OH)

(2016-present) Research mentor for Science Research & Engineering Program (SREP) at Hathaway Brown School (Shaker Heights, OH)

(2016) Speaker for SOURCE Wednesday Lunch and Learns sessions, CWRU

(2015) Interview with Dr. Marie McNeely for the science outreach orientated podcast “People Behind the Science” <http://www.peoplebehindthescience.com/dr-ryan-martin/>

(2013) Profiled in a NSF supported ScienceLives article “Agents of Selection: Scientist Synthesizes the Myriad Causes” <http://www.livescience.com/41440-natural-selection-ryan-martin-nsf-sl.html>

(2013) Education and outreach activities in mathematics and biology with Gresham Middle School’s National Beta Club (Knoxville, TN)

(2013) Video interview “Selection in the Wild”, posted to the NIMBioS website and YouTube channel, discussing NSF-funded postdoctoral research

(2009) Research mentor for North Carolina School of Science and Mathematics’ Research Methods in Biology class