

**David Charles Collar**  
*Curriculum Vitae*

Department of Organismal & Environmental Biology  
Christopher Newport University  
1 Avenue of the Arts  
Newport News, VA 23606

phone: (757) 594 7064  
fax: (757) 594 7209  
email: david.collar@cnu.edu  
website: <http://davidcollar.info>

---

**CURRENT POSITION**

Assistant Professor, Department of Organismal and Environmental Biology (OENB)  
Christopher Newport University, August 2015 – present

**PROFESSIONAL POSITIONS**

Adjunct Professor & Postdoctoral Researcher, University of Massachusetts Boston, 2014 – 2015  
Assistant Project Scientist, University of California, Davis, 2013 – 2014  
Postdoctoral Scholar, University of California, Santa Cruz, 2010 – 2013  
Postdoctoral Research Fellow, Harvard University, 2007 – 2010

**EDUCATION**

**University of California, Davis**

**Ph.D. in Population Biology**, September 2007

Dissertation title: *Evolution of morphological and functional diversity in centrarchid fishes*

Advisor: Dr. Peter Wainwright

**University of Chicago**

**B.A. in Biological Science**, with honors, June 2000

**PUBLICATIONS**

- Vaitla, B.\*, **D.C. Collar\***, M.R. Smith, S.S. Myers, B.L. Rice, and C.D. Golden. 2018. Predicting nutrient content of ray-finned fishes using phylogenetic information. *Nature Communications* 9: 3742.  
(\*equal contribution)
- Reynolds, R.G., **D.C. Collar**, S.A. Pasatchnik, M.L. Niemiller, A.R. Puente-Rolon, L.J. Revell. 2016. Ecological specialization and morphological diversification in Greater Antillean boas. *Evolution* 70: 1882-1895.
- Collar, D.C.**, M. Quintero, B. Buttler, A.B. Ward, R.S. Mehta. 2016. Body shape transformation along a shared axis of anatomical evolution in labyrinth fishes (Anabantoidei). *Evolution* 70: 555-567.
- Collar, D.C.**, P.C. Wainwright, M.E. Alfaro, L.J. Revell, R.S. Mehta. 2014. Biting disrupts integration to spur skull evolution in eels. *Nature Communications* 5: 5505.
- Collar, D.C.**, J.S. Reece, M.E. Alfaro, P.C. Wainwright, R.S. Mehta. 2014. Imperfect morphological convergence: variable changes in cranial structures underlie transitions to durophagy in moray eels. *American Naturalist* 183: E168-E184.
- Ord, T.J., **D.C. Collar**, T.J. Sanger. 2013. The biomechanical basis of evolutionary change in a territorial display. *Functional Ecology* 27: 1186-1200.
- Collar, D.C.**, C.M. Reynaga, A.M. Ward, R.S. Mehta. 2013. A revised metric for quantifying body shape in vertebrates. *Zoology* 116: 246-257.
- Holzman, R., **D.C. Collar**, S.A. Price, C.D. Hulsey, R.C. Thomson, P.C. Wainwright. 2012. Biomechanical trade-offs bias rates of evolution in the feeding apparatus of fishes. *Proceedings of the Royal Society B* 279: 1287-1292.

- Holzman, R., **D.C. Collar**, R.S. Mehta, P.C. Wainwright. 2012. An integrative modeling approach to elucidate suction feeding performance. *Journal of Experimental Biology* 215: 1-13.
- Collar, D.C.**, J.A. Schulte II, J.B. Losos. 2011. Evolution of extreme body size disparity in monitor lizards (*Varanus*). *Evolution* 65: 2664-2680.
- Holzman, R.\*, **D.C. Collar\***, R.S. Mehta, P.C. Wainwright. 2011. Functional complexity can mitigate performance trade-offs. *American Naturalist* 177: E69-E83. (\*equal contribution)
- Collar, D.C.**, J.A. Schulte II, B.C. O'Meara, J.B. Losos. 2010. Habitat use affects morphological diversification in dragon lizards. *Journal of Evolutionary Biology* 23: 1033-1049.
- Price, S.A., P.C. Wainwright, D.R. Bellwood, E. Kazancioglu, **D.C. Collar**, T.J. Near. 2010. Functional innovations and morphological diversification in parrotfishes. *Evolution* 64: 3057-3068.
- Collar, D.C.**, B.C. O'Meara, P.C. Wainwright, T.J. Near. 2009. Piscivory limits diversification of feeding morphology in centrarchid fishes. *Evolution* 63: 1557-1573.
- Revell, L.J.\* and **D.C. Collar\***. 2009. Phylogenetic analysis of the evolutionary correlation using likelihood. *Evolution* 63: 1090-1100. (\* equal contribution)
- Collar, D.C.** and P.C. Wainwright. 2009. Ecomorphology of centrarchid fishes. Pp. 70-89. In: Centrarchid fishes: diversity, biology and conservation. S. J. Cook and D. P. Philipp, eds. Blackwell Scientific Press, Cambridge, UK.
- Revell, L.J., L.J. Harmon, **D.C. Collar**. 2008. Phylogenetic signal, evolutionary process, and rate. *Systematic Biology* 57: 591-601.
- Holzman, R., **D.C. Collar**, S.W. Day, K.L. Bishop, P.C. Wainwright. 2008. Scaling of suction-induced flows in bluegill: morphological and kinematic predictors for the ontogeny of feeding performance. *Journal of Experimental Biology* 211: 2658-2668.
- Collar, D.C.**, P.C. Wainwright, M.E. Alfaro. 2008. Integrated diversification of locomotion and feeding in labrid fishes. *Biology Letters* 4: 84-86.
- Wainwright, P.C., A.M. Carroll, **D.C. Collar**, S.W. Day, T.E. Higham, R. Holzman. 2007. Suction feeding mechanics, performance and diversity in fishes. *Integrative and Comparative Biology* 47: 96-106.
- Collar, D.C.** and P.C. Wainwright. 2006. Discordance between morphological and mechanical diversity in the feeding mechanism of centrarchid fishes. *Evolution* 60: 2575-2584.
- Collar, D.C.**, T.J. Near, P.C. Wainwright. 2005. Comparative analysis of morphological diversity: does disparity accumulate at the same rate in two lineages of centrarchid fishes? *Evolution* 59: 1783-1794.
- Carroll, A.M., P.C. Wainwright, S.H. Huskey, **D.C. Collar**, R.G. Turingan. 2004. Morphology predicts suction feeding performance in centrarchid fishes. *Journal of Experimental Biology* 207: 3873-3881.
- Praitis, V., E. Casey, **D. Collar**, J. Austin. 2001. Creation of low-copy integrated transgenic lines in *Caenorhabditis elegans*. *Genetics* 157: 1217-1226.

### **SUBMITTED MANUSCRIPTS**

- Wainwright, D.K., E. Karan, and **D.C. Collar**. *In review*. Ecomorphological evolution of fish scales: habitat imposed selection generates scale diversity in damselfishes. (submitted to *Integrative Organismal Biology*)
- Ord, T.J., J. Garcia-Porta, M. Querejeta, and **D.C. Collar**. *In review*. Gliding dragons and flying squirrels: diversifying versus stabilizing selection following evolution of a major innovation. (submitted to *American Naturalist*)

**TEACHING EXPERIENCE****Introductory-Level Courses for Biology Majors**

*Principles of Biology III: Form and Function in Animals*, CNU 2015-18

*Principles of Biology III Lab*, CNU 2017, 2018

*Principles of Biology II: Evolution, Ecology, & Biodiversity*, CNU 2015, 2016

**Upper-Division Courses**

*Macroevolution*, CNU 2017, 2018

*Comparative Anatomy of Vertebrates*, CNU 2016, 2017

*Comparative Anatomy of Vertebrates Lab*, CNU 2016, 2017

*Animal Behavior Lab*, UMass Boston, 2014

**Team Taught Workshops**

*Workshop in Applied Phylogenetics*, UC Davis, 2007

**STUDENT MENTORING****Graduate Students**

Trevor Hobbs, CNU, MS in Environmental Science, Life history effects on mummichog fast-start performance across environmental gradients, 2018-present

**Undergraduate Students**

Emma DiPaolo, CNU, Anatomical basis of body shape transformation in blenniiform fishes, 2016 - present

Sienna Mai, CNU, Body shape diversity in combtooth blennies, 2018 – present

Tyler Ralston, CNU, Temperature and salinity effects on mummichog fast-start escape performance, 2017 - present

Rachel Ramirez, CNU, Intraspecific variation in body shape and its anatomical determinants in scombrid fishes, 2017 - present

Dylan Thomson, CNU, Recovery of fish community diversity following oyster reef restoration in Chesapeake Bay, 2016 – 2017

Samantha Tremaine, CNU, Evolution of extreme body elongation in *Pelagia*, 2016 – 2017

Crystal Reynaga, UC Santa Cruz, A revised metric for quantifying body shape in vertebrates, 2011 – 2013

**PROFESSIONAL SERVICE**

Associate Editor for *American Naturalist*, 2015-present

Liberal Learning Council, CNU, 2018-present

Faculty Advisor to the Biology Club, CNU, 2017-present

Reviewer for *American Naturalist*, *Biological Journal of the Linnean Society*, *Canadian Journal of Fisheries and Aquatic Sciences*, *Copeia*, *Ecology Letters*, *Evolution*, *Evolutionary Biology*, *Evolutionary Ecology*, *Functional Ecology*, *Hydrobiologia*, *Integrative and Comparative Biology*, *Journal of Evolutionary Biology*, *Journal of Experimental Biology*, *Journal of Fish Biology*, *Methods in Ecology and Evolution*, *Molecular Phylogenetics and Evolution*, *Nature Communications*, *PLoS One*, *Proceedings of the Royal Society B*, *Science*, *Scientific Reports*, *Systematic Biology*, *Zoology*

External reviewer for National Science Foundation proposals in Population and Evolutionary Processes, Physiological and Structural Systems, and Systematic Biology and Biodiversity Inventories

**GRANT PROPOSALS**

*Assessment of shoreline and breakwater reef design and forage fish utilization.* Submitted to Atlantic Coast Fish Habitat Partnership, 2018, with Dr. Russel Burke (CNU), *unfunded*

*RUI: Genetic covariation as a constraint on floral adaptation in populations and across species.*

Submitted to National Science Foundation, Division of Environmental Biology, Program in Evolutionary Genetics, 2017, with Dr. Janet Steven (CNU), *unfunded*

*Assessment of shoreline and breakwater reef design and forage fish utilization.* Submitted to Virginia Ecological Solutions Foundation, 2017, with Dr. Russel Burke (CNU), *unfunded*

*Evolutionary causes and consequences of elongation in blennioid fishes.* Submitted to National Science Foundation, Division of Integrative Organismal Systems, Program in Physiological and Structural Systems 2010, with Dr. Rita Mehta (UC Santa Cruz), *unfunded*

**AWARDS**

Faculty Development Grant, CNU 2018

Merton Love Award for best dissertation in Ecology and Evolution, UC Davis, 2007

Amos Alonzo Stagg Medal, University of Chicago, Order of the "C", awarded to senior male athlete with the best all-around record for athletics, scholarship and character, 2000

**NEWS COVERAGE**

Coverage of Collar et al. 2009. Piscivory limits diversification of feeding morphology in centrarchid fishes. *Evolution* 63: 1557-1573.

- Editors' Choice. 2009. *Evolution*: Unable to diversify. *Science* 325:12.

Coverage of Vaitla & Collar et al. 2018. Predicting nutrient content of ray-finned fishes using phylogenetic information. *Nature Communications* 9: 3742.

- McDermott, A. 2018. How nutritious is that fish? To find out, ask its relatives. *Oceana Blog*. (<https://oceana.org/blog/how-nutritious-fish-find-out-ask-its-relatives>)

**INVITED SEMINARS**

*The mechanics of morphological evolution in ray-finned fishes.* School of Integrative Biology, University of Illinois

*The mechanics of diversification in eels.* Department of Organismal and Environmental Biology, Christopher Newport University

*The anatomy of ray-finned fish diversity.* Department of Biology, Manhattan College

*Identifying ecological constraints on morphological and functional evolution using phylogenies.*

Department of Ecology and Evolutionary Biology, UC Santa Cruz

*Comparative analysis of functional morphology: insights into the diversification of form in teleost fishes.* Department of Biological Science, Florida International University

*Evolution of morphological and functional disparity in fishes.* Department of Ecology and Evolutionary Biology, University of Michigan

*What factors affect the evolution of morphological and functional disparity in centrarchid fishes?* Merton Love Award Seminar, UC Davis

*Testing for shifts in rates of morphological, functional and ecological evolution in centrarchid fishes.* Museum of Vertebrate Zoology, University of California, Berkeley

**MEETING PRESENTATIONS**

*The adaptive landscape for body shape diversification in Pelagia.* Society for Integrative and Comparative Biology, Tampa, FL, 2019

**MEETING PRESENTATIONS (CONTINUED)**

- Cascading anatomical evolution underlies body elongation in a lineage of clinoid blennies.* Society for Integrative and Comparative Biology, Tampa, FL, 2019 (Emma DiPaolo (CNU), presenting author)
- Body shape transformation along anatomical lines of least resistance in labyrinth fishes.* International Congress of Vertebrate Morphology, Washington, D.C., 2016.
- Anatomical basis of body shape diversification in labyrinth fishes.* Society for Integrative and Comparative Biology, Palm Beach, FL, 2015.
- The morphological and kinematic basis of suction feeding performance evolution.* Society for Integrative and Comparative Biology, San Francisco, CA, 2013.
- Does feeding mode constrain diversification of the skull in elopomorph fishes?* Society for Integrative and Comparative Biology, Charleston, SC, 2012.
- Feeding mode affects evolutionary rates and integration of skull modules in anguilliform fishes.* Evolution, Norman, OK, 2011.
- Rates of morphological evolution vary with habitat use in dragon lizards.* Society for Integrative and Comparative Biology, Seattle, WA, 2010.
- The effects of habitat use on morphological diversification in dragon lizards.* Society for the Study of Evolution, Moscow, ID, 2009.
- Correlated evolution of feeding morphology in piscivorous versus non-piscivorous centrarchid fishes.* Society for Integrative and Comparative Biology, Boston, MA, 2009.
- Complexity in the feeding mechanism mitigates a diet tradeoff in centrarchid fishes.* Society for Integrative and Comparative Biology, San Antonio, TX, 2008.
- Discordance between mechanical and morphological diversity in the suction feeding mechanism of centrarchid fishes.* Society for Integrative and Comparative Biology. Phoenix, AZ, 2007.
- Decoupled morphological and mechanical diversity in the suction feeding mechanism of centrarchid fishes.* Society for the Study of Evolution, Stony Brook, NY, 2006.
- Testing the bass fisherman's hypothesis: Does reaching an adaptive peak limit diversification of the feeding apparatus in *Micropterus* (Teleostei: Centrarchidae)?* Society for Integrative and Comparative Biology. Orlando, FL, 2006.
- Does morphological disparity evolve at the same rate in two lineages of centrarchid fishes?* Symposium on *Evolution and Ecology of the Centrarchidae*, American Society of Ichthyologists and Herpetologists, Tampa, FL, 2005
- Comparative analysis of morphological diversity: trophic evolution in centrarchid fishes.* Society for Integrative and Comparative Biology. San Diego, CA, 2005.

**PROFESSIONAL MEMBERSHIPS**

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