

Nicholas J. Kooyers

Nicholas.Kooyers@louisiana.edu
(616)-610-1202

University of Louisiana, Lafayette
Department of Biology
411 E. St. Mary Blvd., Wharton Hall 506A
Lafayette, LA 70503-2039

Education

Ph.D. Biology and Biomedical Sciences, Washington University, St. Louis, MO. 2007-2013

Advisor: Kenneth M. Olsen

Program: Evolution, Ecology and Population Biology

Thesis: Mechanisms of recurrent cyanogenesis cline evolution in *Trifolium repens* (white clover)

B.S - Biology, B.S- Chemistry, Magna Cum Laude, Valparaiso University, Valparaiso, IN 2003-2007

Advisors: Laurie S. Eberhardt and Robert J. Swanson

Professional Experience

Assistant Professor, **University of Louisiana, Lafayette** 2018-

Postdoctoral Research Associate, **University of South Florida** 2016-2018

Adviser: Independent PI status, Supervisor: Valerie Haywood (dept. chair)

Visiting Scholar, **University of California, Berkeley** 2016-2018

Postdoctoral Research Associate, **University of California, Berkeley** 2016

Adviser: Benjamin Blackman

Postdoctoral Research Associate, **University of Virginia.** 2013-2016

Adviser: Benjamin Blackman

Research Technician, **University of Chicago** 2006

Adviser: Daphne Preuss, Robert J. Swanson

Peer-Reviewed Publications

- Kooyers, N.J.** 2019. Are drought resistance strategies associated with life history strategy? *Annals of Botany* 124(1):vi-viii.
- Lowry, D.B., J.M. Sobel, A.L. Angert, T.L. Ashman, R.L. Baker, B.K. Blackman, Y. Brandvain, K.J.R.P. Byers, A.M. Cooley, J.M. Coughlan, M.R. Dudash, C.B. Fenster, K.G. Ferris, L. Fishman, J. Friedman, D.L. Grossenbacher, L.M. Holeski, C.T. Ivey, K.M. Kay, V.A. Koelling, **N.J. Kooyers**, M. Vallejo-Marín, C.J. Murren, M.L. Peterson, J.R. Puzey, M.C. Rotter, J.R. Seemann, J.P. Sexton, S.N. Sheth, M.A. Streisfeld, A.L. Sweigart, A.D. Twyford, J.H. Willis, C.A. Wu, Y.W. Yuan. 2019. The case for the continued use of the genus name *Mimulus* for all monkeyflowers. *Taxon*. DOI: <https://doi.org/10.1002/tax.12122>
- Kooyers, N.J.**, J.M. Colicchio, A.B. Greenlee, E. Patterson, N.T. Handloser, B.K. Blackman. 2019. Lagging adaptation to climate change supersedes local adaptation to herbivory in an annual monkeyflower. *American Naturalist*. 194(4): 541-557
- Kooyers, N.J.**, B.H. Bakken, M.C. Ungerer, K.M. Olsen. 2018. Freeze-induced cyanide toxicity does not maintain the cyanogenesis polymorphism in white clover (*Trifolium repens*).

American Journal of Botany 105(7): 1-8

5. **Kooyers, N.J.**, B. James, B.K. Blackman. 2017. Competition drives trait evolution and character displacement between *Mimulus* species along an environmental gradient. *Evolution* 71(5): 1425-1427
Featured: K.E. Eisen. 2017. Digest: Trait variation in *Mimulus* provides new evidence for the joint action of ecological sorting and character displacement. *Evolution* 71(5): 1425-1427
6. **Kooyers, N.J.**, B.K. Blackman, L.M Holeski. 2017. Optimal defense theory explains deviations from latitudinal herbivory defense hypothesis. *Ecology* 98(4): 1036-1048
7. **Kooyers, N.J.** 2015. The evolution of drought escape and avoidance in natural herbaceous populations. *Plant Science* 234: 155-162
8. **Kooyers, N.J.**, A.B. Greenlee, J.M. Colicchio, M. Oh, B.K. Blackman. 2015. Replicate altitudinal clines reveal evolutionary flexibility underlies adaptation to drought stress in annual *Mimulus guttatus*. *New Phytologist*. 206: 152-165
9. **Kooyers, N.J.**, K.M. Olsen. 2014. Adaptive cyanogenesis clines in introduced regions evolve through geographical sorting of previously existing gene deletions. *Journal of Evolutionary Biology* 27: 2554-2558
10. **Kooyers, N.J.**, L.R. Gage, A. Al-Lozi, K.M. Olsen. 2014. Aridity shapes cyanogenesis cline evolution in white clover (*Trifolium repens* L.). *Molecular Ecology* 23:1053-1070
11. Olsen, K.M., **N.J. Kooyers**, L. Small. 2014 Adaptive gains through repeated gene loss: Parallel evolution of cyanogenesis polymorphisms in the genus *Trifolium*. *Philosophical Transactions of the Royal Society B: Biological Sciences* 369: 20130347.
Featured: Futuyma D.J., M. Kirkpatrick. 2017. *Evolution*, Fourth Edition. Sinauer. Oxford
12. **Kooyers, N.J.**, K.M. Olsen. 2013. Searching for the Bull's-eye: Targets of selection on cyanogenesis in white clover (*Trifolium repens* L.) vary between geographically disparate clinal replicates. *Heredity*. 11:495-504
13. Olsen, K.M., **N.J. Kooyers**, L. Small. 2012. Recurrent gene deletions and the evolution of adaptive cyanogenesis polymorphisms in white clover (*Trifolium repens* L.). *Molecular Ecology* 22: 724-738
14. **Kooyers, N.J.**, K.M. Olsen. 2012. Rapid evolution of an adaptive cyanogenesis cline in introduced North American white clover (*Trifolium repens* L.) *Molecular Ecology* 21:2455-2468
Featured: Molecular Ecology Perspective, Olson, M.S., N. Levens (2012) Classic clover cline clues. *Molecular Ecology* 21: 2315-2317
15. Dobritsa, A.A. , A. Geanconteri, J. Shrestha, A. Carlson, **N.J. Kooyers**, D. Coerper, E. Urbanczyk, B.J. Bench, L.W. Sumner, R. Swanson, D. Preuss. 2011. A large-scale genetic screen in *Arabidopsis thaliana* to identify genes involved in pollen exine production. *Plant Physiology* 157: 947-970.

Popular Science and Non Peer-Reviewed Publications

1. **Kooyers, N.J.** 2018. Walking with Wildflowers: Citizen Science along the Pacific Crest Trail. AAAS Public Engagement Reflections Blog. Web address: <https://www.aaas.org/blog/public-engagement-reflections/walking-wildflowers-citizen-science-along-pacific-crest-trail>
2. **Kooyers, N.J., B.K. Blackman.** 2017. Walking with Wildflowers: Citizen science along the PCT. *The Jepson Globe* 27(1): pp. 1, 4.

Grants, Honors and Awards

- 2019 **NSF OIA-1920858**: “RII Track-2 FEC: Consortium for Plant Invasion Genomics (CPING): Combining Big Data and Plant Collections to Understand Invasiveness” (8/1/2019-7/31/2023; Lead PI, **\$3,835,497**)
- 2017 University of South Florida New Researcher Grant: “Investigating the role of pleiotropy in plant adaptation using next generation sequencing” (5/1/2017-4/30/2018; PI; **\$9,937**)
- 2017 American Genetics Association Ecological, Evolutionary, and Conservation Genomics Research Grant: “Investigating the role of pleiotropy in the adaptive divergence of plant defense arsenals” (4/6/2017-10/15/18; PI; **\$9,862**)
- 2016 Southeastern Population Ecology and Evolutionary Genetics Meeting (SEPEEG) Best Postdoctoral Researcher Talk
- 2016 **NSF IOS-1558035**: “Mechanisms of malleability and resilience of flowering responses to current and future variability in seasonal cues in a geographically-widespread species” (5/1/16-4/30/20; Co-PI, PI: Ben Blackman; **\$1,072,974**)
- 2015 Donald Danforth Fall Symposium Best Poster Contest Award
- 2011 **NSF DEB-1110588**: “Dissertation Research: Determining the mechanisms of recurrent cline evolution in white clover (*Trifolium repens*)” (6/1/2011-5/31/2013; Co-PI, PI: Kenneth Olsen; **\$13,539**)
- 2011 Midwest Consortium of Sciences Travel Grant: Lawrence University (**\$580**)
- 2011 Penn State Plant Biology Symposium Travel Grant (**\$350**)
- 2010-12 Washington University: GAANN fellowship
- 2008 Washington University: Conservation Genetics Workshop Aid Grant (**\$3,000**)
- 2008 American Genetics Association Tuition Aid Grant (**\$300**)
- 2007 NSF Research Experience for Undergraduates Fellowship
- 2006 Lumina Award for Outstanding Scholarship (Valparaiso University)
- 2005 Kooyers, N. Valparaiso University: Undergraduate Research Grant (**\$500**)
- 2003-06 College of Arts and Science Achievement Award

Select Presentations

Invited talks

- 2019** – University of South Florida, Botanical Society of America “Life without Water” Symposium, Valparaiso University, Louisiana State University
- 2018** – Auburn University; University of Louisiana, Lafayette; Tulane University; Mississippi State University
- 2017** -- German Institute of Biodiversity Research (iDiv); University of Florida; New College of Florida; North Carolina State University; Georgia Southern University; Purdue University; University of Central Florida
- 2016** – University of South Florida (GeoSciences); Smithsonian Institution (Dept. of Botany);
- 2015** – Fresno State University; Davidson College; San Jose State University
- Prior 2015** -- Mt. Lake Biological Station; University of Virginia; Maryville University; Colorado College; Valparaiso University

Contributed Talks (Meeting/Venue, Date)

Entomological Society of America (2019)

Evolution (2011, 2012*, 2014, 2016, 2017, 2018)

University of South Florida Integrative Biology Seminar Series (2017)

University of Virginia Population Biology Seminar (2014, 2016)

University of Virginia Biology Retreat (2013)

SEPEEG (2013, 2016)

ESA (2012)

St. Louis Behavior, Ecology, Evolution and Systematics Meeting (2012)

Washington University Bioforum (2012)

Washington University Ecology, Evolutionary, and Population Biology Seminar (2008, 2010, 2011)

**Featured*: New Phytologist Meeting Review: New Phytologist 196: 975-977 (2012)

Contributed Posters (primary presenter only)

1. The ecological genetics of critical photoperiod clines in annual monkeyflowers (*Mimulus guttatus*). Donald Danforth Fall Symposium. St Louis, MO. 2015

*received Danforth Fall Symposium Poster Award (e.g. 1 of top 3 posters)

2. Replicate altitudinal clines reveal intricately related patterns of local adaptation in photoperiod response, flowering time, and drought stress tolerance in *Mimulus guttatus*. Gordon Conference: Ecological and Evolutionary Genomics. Biddeford, ME. 2013.
3. Mechanisms of parallel cline evolution in introduced populations of white clover (*Trifolium repens* L.). Penn State Plant Biology Symposium (Plant Evolutionary Genomics). College Station, PA. 2011.
4. Testing predictions of clinal dynamics using a system of recurrent cline in cyanogenesis in white clover (*Trifolium repens*). Ecological Genomics Symposium. Kansas City, MO. 2010.
5. Coarse-grain selection creates clinal variation in introduced populations of white clover (*Trifolium repens*) Ecological Genomics Symposium. Kansas City, MO. 2009.

Teaching Experience

Course Creation and Instruction-

Instructor: Bio 501 – Population Genetics (University of Louisiana, Lafayette)	Fall 2019
Instructor: Bio 230 - Genetics and Evolution (University of Louisiana, Lafayette)	Spring 2019
Instructor: Bio 551 - Foundations of Evolution (University of Louisiana, Lafayette)	Fall 2018
Instructor: Introduction to R workshop (University of Virginia)	2013, 2015
Lab Instructor: NSF Summer Institute for Biology Teachers	2009, 2012

Guest Lecturer-

Organic Evolution (University of South Florida)	2017
Molecular Ecology (University of Richmond)	2015
Graduate Student Survival Skills (University of Virginia)	2014
Evolution, Ecology and Development (University of Virginia)	2013, 2014
Plant-Animal Interactions (Lawrence University)	2011
Evolution (Washington University)	2011
Populations Genetics (Washington University)	2011

History of Genetics in the Twentieth Century (Washington University) 2009, 2010
Population Genetics (Washington University) 2009

Teaching Assistant-

Population Genetics (Washington University) Fall 2009
History of Genetics in the Twentieth Century (Washington University) Spring 2009
Evolution (Washington University) Fall 2008

Graduate Students

Nevada King (PhD; anticipated graduation Spring 2024) 2019-current
Andrea Turcu (Masters; anticipated graduation Spring 2021) 2019-current

Graduate Student Rotation Co-Mentor (with Ben Blackman)

Alyssa Black (UVA; 2015), Catherine Debban (UVA; 2014)

Undergraduate Research Mentor

Laura McDonald (ULL, 2019-), Roark Gaspard (ULL, 2019-), Haley St. Martin (ULL, 2019-current), Josh Fitzpatrick (ULL, 2018-), Bryan 'Luke' Rabalais (ULL, 2018-), Clint Gibson (USF, 2017-18), Kaityln Clark (USF, 17-18), Abigail Donofrio (USF, 2016-2018), Kevin Shinkaveg (USF, 2017) Ashley Ramirez (USF, 2016), Qiara Perez (USF, 2016), Allison Blakely (USF, 2016), Alia Wofford (UVA, 2015), Brooke James (UVA, 2014-15), Katherine Aracena (UVA, 2014-15), Shawnette Toney (UVA, 2014), Dania Zuniga (UVA, 2013), Lily Rose Gage (WUSTL, 2012), Joseph Lampe (WUSTL, 2010-12), Amal Al-Lozi (WUSTL, 2010-11), Graham Caulkins (WUSTL; 2009), Josh Levy (2008)

High School Student Research Mentor

Asha Clark (WUSTL, 2011-12)

Service Activities

University of Louisiana Graduate Committees

Jonas Mendez-Reneau (UL PhD, Sigel Lab), Lauren Kezia Walling (UL PhD, France Lab), Kamal Bagale (UL PhD, Kulkarni Lab), Romina Carnero-Huaman (UL Masters, Rosel lab), Matthew Winter (PhD, France Lab)

Departmental Service Activities

Graduate Talk and Poster Judge (UL GSS Fall Symposium) 2018
Undergraduate and Graduate Talk and Poster Judge (SEPEEG 20016) 2016
NC/VA Minority Alliance Program Research Mentor 2015
Coordinated Software Carpentry Workshop at Washington University 2012
WUSTL EEPB Seminar Coordinator 2009-2010

Public Outreach

UL Science Day Module Instructor ("The Rope of Life"). 2018, 2019
Co-Creator of 'Walking with Wildflowers' (citizen science phenology monitoring on PCT) 2015-current
Speaker at University of Colorado-Boulder Teaching Evolution Workshop 2011
Cyanogenesis Module (Commercialization of cyanogenesis kits for 6-12 classrooms). 2010-2013
Shaw Institute for Field Training program (Student Mentor) 2008
Young Scientist Program (Secondary Ed Outreach; Washington University). 2007-2009

Reviewer

Molecular Ecology*, Molecular Ecology Resources, Journal of Experimental Botany, Plant Science, Journal of Heredity, Functional Ecology, Evolution, PLOS One, Journal of Evolutionary Biology, New Phytologist, American Journal of Botany, Integrative and Comparative Biology, Oecologia, Biological Invasions, Journal of Plant Research, Annals of Botany, Ecology Letters, PLoS Genetics, Evolution Letters, Ecology and Evolution

*Molecular Ecology top reviewer for 2015 (top 8% of reviewers, nominated by subject editors)

Professional Organizations

Society for the Study of Evolution, American Society of Naturalists, Ecological Society of America, American Genetics Association, Botanical Society of America, Entomological Society of America, Phi Lambda Epsilon (Beta Sigma Chapter)- National Chemistry Honor Society

Short Courses/Internships

Transcriptomics Assembly Workshop, Charlottesville, VA	2013
Next Generation Sequencing Workshop, Evolution 2012, Ottawa, Canada	2012
Software Carpentry, Washington University, St. Louis, MO	2012
Early Career Success Workshop, Midwest Consortium for Math and Science, Holland, MI	2011
Conservation Genetics Short Course, Organization for Tropical Studies, Palo Verde, Costa Rica	2008
REU, La Selva Biological Station, Costa Rica (Advisor Johel Chaves-Campos)	2007