

Curriculum Vitae
Vanessa A. Koelling

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EDUCATION

Ph.D. University of Georgia (2008), Genetics
B.A. Reed College (2000), Biology

PROFESSIONAL EXPERIENCE

1. 2024 – present: **Associate Professor of Biology**, Auburn University at Montgomery (AUM), Montgomery, AL
2. 2018 – 2024: **Assistant Professor of Biology**, Auburn University at Montgomery (AUM), Montgomery, AL
3. 2013 – 2018: **Visiting Assistant Professor of Biology**, University of Puget Sound (UPS), Tacoma, WA
4. 2010 – 2013: **Institutional Research and Academic Career Development Award (IRACDA) Post-doctoral Fellow**, University of Kansas (KU), Lawrence, KS, *Advisor*: Dr. John Kelly
5. 2011 – 2012: **Adjunct Instructor**, Haskell Indian Nations University, Lawrence, KS
6. 2008 – 2010: **Postdoctoral Researcher**, KU, *Advisor*: Dr. John Kelly
7. 2002 – 2008: **Graduate Student**, University of Georgia, Athens, GA, *Advisor*: Dr. Rodney Mauricio
8. 2000 – 2002: **Laboratory Technician**, Reed College, Portland, OR, *Employer*: Dr. Keith Karoly

GRANTS AND FELLOWSHIPS

1. 2023-2024, **Botanical Society of America Undergraduate Research Award**. Title: Identification of kudzu-associated soil microbes - a first step towards developing more successful restoration techniques. **Award total: \$500**; this grant was made to my undergraduate mentee, Samuel Monger, for a research project he is conducting with myself and Dr. Claudia Stein as mentors.
2. 2023-2024, **Undergraduate Research and Creative Activity Award**. Title: Identification of kudzu-associated soil microbes. **Award total: \$3,000**. These funds were jointly awarded to me and Dr. Claudia Stein.

3. 2023-2025, **Alabama Audubon Walter F. Coxe Research Grant**. Title: Identification of kudzu-associated soil microbes - a first step towards developing more successful restoration techniques. **Award total: \$1,000**; this grant was made to my undergraduate mentee, Samuel Monger, for a research project he is conducting with myself and Dr. Claudia Stein as mentors.
4. 2022, **Undergraduate Research and Creative Activity Award**. Title: Student Participation at Invasion Genomics Conference. **Award total: \$1,548.00**. These funds were jointly awarded to me and Dr. Claudia Stein.
5. 2021—2023, **Undergraduate Research and Creative Activity Award**. Title: Digitizing the AUM Herbarium: A Valuable Resource for Biodiversity Information. **Award total: \$3,000**
6. 2020-2021: **Alabama Invasive Plant Council Education and Outreach Grant**: Removal and Control of Invasive Plants in an Open Hardwood Forest on the Auburn University at Montgomery (AUM) Campus. **Award total: \$1,500**
7. 2019 – 2022: **AUM Grants-in-Aid of Research**. Title of Grant: An investigation of physiological and genetic differences between two closely related Southern Azalea species. **Award total: \$7,500**
8. 2019 – present: **Azalea Society of America**. Title of Grant: What's in a species? Investigating morphological, physiological, and genetic differences between closely related Southern Azalea species. **Award total: \$5,000**
9. 2019 – present: **American Rhododendron Society**. Title of Grant: What's in a species? Investigating morphological, physiological, and genetic differences between closely related Southern Azalea species. **Award total: \$5,000**
10. 2014 – 2017: **Murdock College Research Program for Life Sciences**. Title of Grant: Identifying the Contributions of Purging and Biparental Inbreeding to the Evolution of Mating System in the Common Yellow Monkeyflower, *Mimulus guttatus*. **Award total: \$48,900**
11. 2010 – 2013: **National Institutes of Health IRACDA Postdoctoral Fellow**, KU & Haskell Indian Nations University (HINU). **Award total: \$132,000**
12. 2002 – 2008: **National Institutes of Health Ruth L. Kirschstein National Research Service Award (pre-doctoral fellowship)**. **Award total: \$230,490**

AWARDS

- 2023 AUM College of Sciences Pre-Tenure Service Award winner

PEER-REVIEWED PUBLICATIONS

1. Conner, J. K., Issaka, O. S., Zhao, Z-G., Knapcyk, F., Sahli, H., **Koelling, V. A.**, and K. Karoly. 2023. Rapid evolution of a family-diagnostic trait: artificial selection and correlated

- responses in wild radish, *Raphanus raphanistrum*. New Phytologist 239: 2382–2388. doi: 10.1111/nph.19125.
2. Waterman, R., Sahli, H., **Koelling, V. A.**, Karoly, K., and J. K. Conner. 2023. Strong evidence for positive and negative correlational selection revealed by recreating ancestral variation. *Evolution* 77(1): 264-275. <https://doi.org/10.1093/evolut/qpac001>
 3. Lowry, D.B., Sobel, J. M., Angert, A. L., Ashman, T-L., Baker, R. L., Blackman, B. K., Brandvain, Y., Byers, K. J. R. P., Cooley, A. M., Coughlan, J. M., Dudash, M. R., Fenster, C. B., Ferris, K. G., Fishman, L., Friedman, J., Grossenbacher, D. L., Holeski, L. M., Ivey, C. T., Kay, K. M., **Koelling, V. A.**, Kooyers, N. J., Murren, C. J., Muir, C. D., Nelson, T. C., Peterson, M. L., Puzey, J. R., Rotter, M. C., Seemann, J. R., Sexton, J. P., Sheth, S. N., Streisfeld, M. A., Sweigart, A. L., Twyford, A. D., Vallejo-Marin, M., Willis, J. H., Wright, K. M., Wu, C. A., and Y-W. Yuan. 2019. The case for the continued use of the genus name *Mimulus* for all monkeyflowers. *Taxon* 68(4): 617-623. doi.org/10.1002/tax.12122
 4. Sapir, Y., K. Karoly, **V. A. Koelling**, H. F. Sahli, F. N. Knapczyk, and J. K. Conner. 2017. Effect of expanded variation in anther position on pollinator visitation to wild radish, *Raphanus raphanistrum*. *Annals of Botany*, mcx041. doi: 10.1093/aob/mcx041
 5. Conner, J. K., C. J. Mills, **V. A. Koelling**, and K. Karoly. 2014. Artificial selection on anther exertion in wild radish, *Raphanus raphanistrum*. *Scientific Data* 1: 140027. doi:10.1038/sdata.2014.27
 6. **Koelling, V. A.**, P. J. Monnahan, and J. K. Kelly. 2012. A Bayesian method for the joint estimation of outcrossing rate and inbreeding depression. *Heredity* 109: 393-400. doi:10.1038/hdy.2012.58
 7. Conner, J. K., K. Karoly, C. Stewart, **V. A. Koelling**, H. Sahli, F. H. Shaw. 2011. Rapid independent trait evolution despite a strong pleiotropic genetic correlation. *The American Naturalist* 178: 429-441. doi: 10.1086/661907
 8. **Koelling, V. A.**, J. L. Hamrick, and R. Mauricio. 2011. Genetic diversity and structure in two species of *Leavenworthia* with self-incompatible and self-compatible populations. *Heredity* 106: 310-318. doi:10.1038/hdy.2010.59
 9. **Koelling, V. A.**, and R. Mauricio. 2010. Genetic factors associated with mating system cause a partial reproductive barrier between two parapatric species of *Leavenworthia* (Brassicaceae). *American Journal of Botany* 97: 412-422. doi:10.3732/ajb.0900184
 10. **Koelling, V. A.**, and K. Karoly. 2007. Self-pollen interference is absent in wild radish (*Raphanus raphanistrum*, Brassicaceae), a species with sporophytic self-incompatibility. *American Journal of Botany* 94: 896-900. doi:10.3732/ajb.94.5.896

NON-PEER-REVIEWED PUBLICATIONS

Koelling, V. A., Medeiros, J., and Thompson, P. 2024. What's in a species? Morphological variation suggests temperature tolerance as a key factor differentiating two closely related

Southern American Azalea species. Journal of the American Rhododendron Society, Fall 2024 issue.

RECENT TEACHING EXPERIENCE

1. **BIOL 1010: Cells, Molecules, and Life**; lecture course introducing biology majors to the fundamentals of molecular and cellular biology.
2. **BIOL 1011: Cells, Molecules, and Life Lab**; lab course introducing biology majors to fundamental lab techniques and the scientific method in the form of a course-based undergraduate research experience (CURE).
3. **BIOL 3300: Genetics**; lecture course covering classical and molecular genetics.
4. **BIOL 3301: Genetics Lab**; laboratory course covering classical and molecular genetics.
5. **BIOL 4763: Evolution with Lab**; lecture plus lab course covering population genetics, phylogenetics, molecular evolution, and other contemporary topics in evolution.
6. **BIOL 4801: Perspectives in Ecological Genetics Lab**; lab course introducing wet lab and computational biology techniques in the field of ecological genetics.
7. **BIOL 4803: Perspectives in Applied Bioinformatics**; lecture plus computer laboratory course introducing students to bioinformatics skills and data analysis.
8. **BIOL 4932: Directed Research**; undergraduate biology majors conduct research under the supervision of biology faculty.

UNDERGRADUATE RESEARCH MENTORING AT AUM

1. Nivea Patel (2019-2021)
2. Fadil Abdoullahi (2019)
3. Austin Boehm (2019-2020)
4. Kelvin Pettus (2019)
5. HeavenLee Pagan (2019-2023)
6. Zarria Howard (2019-2021)
7. Lauren Nations (2020)
8. Brianna James (2020-2021)
9. Samantha Mejia (2020-2023)
10. Hailey (Peyton) Poe (2021-2022)
11. Isabella Soto (2022-present)
12. Samuel Monger (2022-2023)
13. Amiya Whitson (2023-2024)

RECENT PRESENTATIONS AT PROFESSIONAL MEETINGS & SYMPOSIA

(*undergraduate coauthor)

1. Whitson, A.* , **V. A. Koelling**, and Claudia Stein. 2024. The value of non-expert herbarium collections for providing biodiversity information. Poster presentation, Ecological Society of America (Long Beach, CA).
2. Whitson, A.* , **V. A. Koelling**, and Claudia Stein. 2024. The value of non-expert herbarium collections for providing biodiversity information. Poster presentation, Botanical Society of America (Grand Rapids, MI).
3. Soto, I.* , McKain, M. R., and **V. A. Koelling**. 2024. Identification of novel genetic markers for the southeastern azalea, *Rhododendron prunifolium* (Ericaceae). Poster presentation, AUM Student Research Symposium (Montgomery, AL).
4. Monger, S. C.* , **Koelling, V. A.**, and C. Stein. 2023. Changes in the soil microbiome due to kudzu invasion inhibit growth of a native legume. Poster presentation, Ecology 2023 (Portland, OR).
5. Soto, I.* , McKain, M. R., and **V. A. Koelling**. 2023. Identification of novel genetic markers for the southeastern azalea, *Rhododendron prunifolium* (Ericaceae). Poster presentation, Botany 2023 (Boise, ID).
6. Pagan, H.* , Thompson, P. G., Medeiro, J. S., and **V. A. Koelling**. 2023. An investigation of morphological and physiological differences between two closely related species of southeastern azalea, *Rhododendron prunifolium* and *R. cumberlandense* (Ericaceae). Poster presentation, Botany 2023 (Boise, ID).
7. Breitman, M. F., Foster, R. A., **Koelling, V. A.**, Stein, C., and D. B. Stoeckel. 2023. Reinforcing common skills to develop mastery and increase student identity, confidence, and agency. AUM Out of the Box Workshop on Teaching and Learning (Montgomery, AL). Note: all co-authors contributed equally to this presentation.
8. Mejia, S.* , Whitson, A.* , Pagan, H.* , Stein, C., and **V.A. Koelling**. Digitization and analysis of the contents of the Auburn University at Montgomery herbarium. Poster presentation, AUM College of Sciences Student Research Symposium (Montgomery, AL).
9. Pagan, H.* , Soto, I.* , Whitson, A.* , and **V. A. Koelling**. Germination rates of southeastern native azaleas (*Rhododendron* spp.) in the soilless substrate, coconut coir. Poster presentation, AUM College of Sciences Student Research Symposium (Montgomery, AL).
10. Soto, I.* , and **V. A. Koelling**. 2023. Comparing the Effectiveness of Modifications to the CTAB Method in Isolating DNA from *Rhododendron prunifolium*. Poster presentation, AUM College of Sciences Student Research Symposium (Montgomery, AL).
11. Monger, S. C.* , Stein, C., and **V. A. Koelling**. 2023. A comparison of the soil microbiome between kudzu-invaded and uninvaded areas. Poster presentation, AUM College of Sciences Student Research Symposium (Montgomery, AL).
12. Soto, I.* , and **V. A. Koelling**. 2023. Comparing the Effectiveness of Modifications to the CTAB Method in Isolating DNA from *Rhododendron prunifolium*. Poster presentation, Auburn Student Research Symposium (Auburn, AL); **won best poster in the AUM category.**
13. Monger, S. C.* , Stein, C., and **V. A. Koelling**. 2023. A comparison of the soil microbiome between kudzu-invaded and uninvaded areas. Poster presentation, Auburn Student Research Symposium (Auburn, AL).
14. Soto, I.* , and **V. A. Koelling**. 2022. Comparing the Effectiveness of Modifications to the CTAB Method in Isolating DNA from *Rhododendron prunifolium*. Poster presentation, Invasion Genomics (Lafayette, LA).

15. Monger, S. C.*, Stein, C., and **V. A. Koelling**. 2022. A comparison of the soil microbiome between kudzu-invaded and uninvaded areas. Poster presentation, Invasion Genomics (Lafayette, LA).
16. Mejia, S.*, Stein, C., and **V. A. Koelling**. 2022. Digitization and Analysis of the Contents of the Auburn University at Montgomery Herbarium. Poster presentation, Invasion Genomics (Lafayette, LA).
17. **Koelling, V. A.** and M. R. McKain. 2022. A comparative analysis of the chloroplast genomes of two southeastern azaleas, *Rhododendron cumberlandense* and *R. prunifolium* (Ericaceae). Poster presentation, Evolution 2022 (Cleveland, OH).
18. Mejia, S.*, and **V. A. Koelling**. 2022. Digitizing the AUM Herbarium: A Valuable Resource for Biodiversity Information. Oral presentation, AUM Celebration of Research and Creative Activity (Montgomery, AL).
19. Mejia, S.*, and **V. A. Koelling**. 2022. Digitizing the AUM Herbarium: A Valuable Resource for Biodiversity Information. Poster presentation, AU Student Research Symposium (Auburn, AL); **won best poster in the AUM category**.
20. Johnson, P. P.*, and **V. A. Koelling**. 2021. Comparing Methods of Isolating DNA from Two Species of Southern Azaleas, *Rhododendron cumberlandense* and *R. prunifolium*. Poster presentation, Invasion Genomics (Lafayette, LA).
21. **Koelling, V. A.**, Newsum, T.*, and J. K. Kelly. 2019. Oral presentation, Botany (Tucson, AZ).

RECENT SCIENCE OUTREACH PRESENTATIONS

1. Spears, T., **Koelling, V. A.**, and M. R. McKain. 2024. Exploration of Genetic Diversity of *Rhododendron smokianum*. Poster presentation, annual convention of the American Rhododendron Society (Bellingham, WA).
2. Spears, T., **Koelling, V. A.**, and M. R. McKain. 2024. Exploration of Genetic Diversity of *Rhododendron smokianum*. Poster presentation, annual convention of the Azalea Society of America (Auburn, AL).

PROFESSIONAL MEMBERSHIPS

Society for the Study of Evolution, 2002 – present
Botanical Society of America, 2007 – present
Society of Herbarium Curators, 2024 – present

PROFESSIONAL SERVICE & OUTREACH

1. 2025-2027; **Chair of the Education & Outreach Committee** of the Society for the Study of Evolution and member of SSE Council.
2. 2024– present; **Member of the Education Committee of the Botanical Society of America**.
3. 2024– present; **Chair of the Huxley Award subcommittee** of the Education and Outreach Committee of the Society for the Study of Evolution.

4. 2023: **Participated in AUM's "Flash Talks" as a presenter.** My presentation was entitled "Plickers", in which I discussed how to use paper clickers (i.e., "plickers") as an interactive response tool in the classroom.
5. 2023: **Served on the planning committee for the Life Discovery Conference, a teaching conference for university and high school educators** sponsored by the Ecological Society of America, the Society for the Study of Evolution, and the Botanical Society of America. The conference took place March 23-25 at Florida A&M University in Tallahassee, FL.
6. 2023: **Served as a head judge for the Junior Division Animal, Plant, Computational, and Bioinformatics Sciences category at the Greater East Alabama Regional Science and Engineering Fair (GEARSEF)** held at AUM in February. As head judge for my category, I facilitated the deliberations between the category judges, checked the final scores for each participant, and recorded the 1st through 4th place rankings.
7. 2022-2024: **Member of the Education and Outreach Committee of the Society for the Study of Evolution**
8. 2022: **Served as a reviewer of applications for the American Society of Plant Taxonomy Graduate Student Research Grant program.**
9. 2019 & 2023: **Served on a proposal review panel for the Biological Sciences Directorate/Division of Biological Infrastructure at the National Science Foundation.**
10. 2011 & 2019: **Mentor, Preparing Leaders and Nurturing Tomorrow's Scientists (PLANTS)**, an undergraduate diversity program at the annual Botany meeting put on by the Botanical Society of America
11. 2015 – 2018: **Botanical Society of America Technology Committee member**, focusing on ways in which technology can be used to promote the mission of the BSA
12. 2008 – 2009: **Mentor, Society for the Study of Evolution undergraduate diversity program, Evolution 2008 & 2009 conferences**
13. 2017 – 2019: **Planting Science Mentor.** I advised middle school or high school student groups and their teacher on a class research project involving plants.
<https://plantingscience.org/>
14. 2008 – present: **Ad hoc journal reviews for the following peer-reviewed scientific journals:** African Journal of Biotechnology, American Journal of Botany, Annals of Botany, Evolution, Frontiers in Ecology and the Environment, International Journal of Evolutionary Biology, International Journal of Plant Sciences, Journal of Heredity, Journal of Plant Research, Journal of Urban Ecology, The New Phytologist, Oecologia, Plant Ecology and Diversity, PLoS Genetics, Preslia, Scientific Reports

PROFESSIONAL DEVELOPMENT

1. 2024: **Attended two-day Partnership for Undergraduate Life Science Education (PULSE) training** aimed at catalyzing change in our department to implement the goals and recommendations of the NSF Vision & Change report.
2. 2022: **Attended one-day workshop on “Active Teaching for Active Learning” taught by Dr. Claire Howell Major.** I learned about different kinds of active learning activities that can be employed in the classroom to improve engagement and student success.
3. 2022: **Attended one day of a two-day workshop on “Promoting Student Learning in Mathematics Courses” taught by Dr. Drew Lewis.** I attended Day 1 of this workshop to learn about some practical changes that can be made to my course structure and instruction methods that will increase equity and inclusion for my students.
4. 2022: **Attended two-day in-person workshop on “Improving STEM Education: engaging and empowering agents of change” taught by Dr. Nate Brown.** This was a workshop aimed at teaching faculty why changing classroom instruction methods can benefit student inclusion and retention.
5. 2022: **Co-taught one-day workshop on DNA sequencing library preparation in late July at AUM.** This workshop was sponsored by the Consortium for Plant Invasion Genomics and co-taught by CPING member Dr. Michael McKain of the University of Alabama. The workshop was attended by AUM faculty and undergraduate research students.
6. 2022: **Attended two-day online workshop on inclusive pedagogy taught by Dr. Bryan Dewsbury.** The goal of this workshop was to introduce attendees to inclusive pedagogy in the classroom.
7. 2021: **Attended one week-long Consortium for Plant Invasion Genomics workshop at the University of Alabama.** I received training in contemporary wet lab techniques for plant genomic analysis.
8. 2018: **“Meeting Our Students Where They Are: Establishing Just Standards for Teaching and Assessing Writing”**, a three-day workshop addressing the teaching and assessment of writing from an anti-racist perspective; held at the University of Puget Sound
9. 2015: **Using the Linux Command Line for Analysis of High-Throughput Sequence Data**, a workshop I attended at the UC Davis Genome Center designed to enhance command line skills and introduce participants to the latest workflows for a variety of bioinformatics purposes
10. 2010: **Women Evolving Biological Sciences (WEBS)**, Invited Participant, NSF-supported symposium addressing retention of early-career female scientists and their transition to tenure track positions and leadership roles in academic and research settings
11. 2009 – 2011: **Faculty Institutes for Reforming Science Teaching (FIRST IV)**, Invited Postdoctoral Scholar, NSF-supported program conducting workshops and mentoring in inquiry-based teaching; designed lecture materials using active learning pedagogy

COMPUTER PROGRAMS

Bayesian Outcrossing Rate and Inbreeding Coefficient Estimation (BORICE);

<https://github.com/vkoelling/BORICE>