

# Andrea C Westerband, PhD

+61448941204 | a.westerband@westernsydney.edu.au | orcid.org/0000-0003-4065-9689 | [www.andreawesterband.com](http://www.andreawesterband.com)

I investigate how plants cope with resource scarcity by studying variation in morphological and physiological properties to characterize ecological strategies. By combining large-scale field campaigns and greenhouse studies, my research examines how the environment influences trait-performance outcomes, intraspecific phenotypic variation, invasion success, and population dynamics.

I have a proven track record of publishing my work in high quality scientific journals, of successfully competing for research funding, and in being an effective teacher and mentor. I have an exceptional amount of teaching experience and play an active role in service, science education and outreach.

**Keywords:** functional traits, intraspecific trait variation, invasive species, limiting resources, plant ecology, plant ecophysiology, plasticity, population dynamics, stress tolerance

## EMPLOYMENT HISTORY

Assistant Professor in Ecology and Evolution August 2024 – Present  
Department of Biology  
University of Louisiana at Lafayette, USA

Postdoctoral Research Associate January 2023 – July 2024  
Mentored by Ian J Wright  
Hawkesbury Institute for the Environment, Western Sydney University, Australia

Postdoctoral Research Associate August 2018 – December 2022  
Mentored by Ian J Wright  
School of Natural Sciences, Macquarie University, Australia

Postdoctoral Research Associate August 2016 – August 2018  
Mentored by Kasey Barton and Tiffany Knight  
Botany Department, University of Hawai'i at Mānoa, USA

## ACADEMIC QUALIFICATIONS

PhD, Advised by Carol C Horvitz May 2016  
Department of Biology, University of Miami, USA

BS, Summa Cum Laude May 2010  
Environmental Biology, State University of New York, College of Environmental Science and Forestry, USA

## SCIENTIFIC JOURNAL PUBLICATIONS (\*denotes shared first authorship)

Li, J., **Westerband, A.**, Wright, I.J., Li, X., Du, J., Zhong, Q.L., Hu, D., and Cheng, D. 2024. Temperature and plant-available soil phosphorus drive intraspecific variation in plant economic traits across an elevation gradient (*accepted*)

Zhang, H., Wang, H., Wright, I.J., Prentice, I.C., Harrison, S.P., Smith, N.G., **Westerband, A.**, Rowland, L., Plavcova, L., Morris, H., Reich, P.B., Jansen, S., Keenan, T. 2024. Thermal acclimation of stem respiration reduces terrestrial carbon emissions (*Submitted for review, pre-print can be found on bioRxiv: doi:10.1101/2024.02.23.581610*)

**Westerband, A.C.**, Knight, T.M., Barton, K.E. 2024. Scale-dependent variation in leaf functional traits clarifies mechanisms of invasion (*Submitted*)

**Westerband, A.C.**, Knight, T.M., Barton, K.E. 2024. A test of island plant syndromes using resource use traits. *Journal of Systematics and Evolution*. <https://doi.org/10.1111/jse.13032>

Fan, B., **Westerband, A.C.\***, Wright, I.J., Gao, P., Ding, N., Ai, D., Tian, T. Zhao, X. Sun, K. 2024. Shifts in plant resource use strategies across climate and soil gradients in dryland steppe communities. *Plant and Soil*: 1-20. <https://doi.org/10.1007/s11104-023-06401-z>

**Westerband, A.C.**, Wright, I.J., Maire, V., Paillassa, J., Prentice, I.C., Atkin, O.K., Bloomfield, K.J., Cernusak, L.A., Dong, N., Gleason, S.M., Guilherme Pereira, C., Lambers, H., Leishman, M.R., Malhi, Y., Nolan, R.H. 2023. Coordination of photosynthetic traits across soil and climate gradients. *Global Change Biology*, 29: 856-873. <https://doi.org/10.1111/gcb.16501>

- Lei, Z., **Westerband, A.**, Wright, I.J., He, Y., Zhang, W., Cai, X., Zhou, Z., Liu, F., Zhang, Y. 2022. Leaf trait covariation and controls on leaf mass per area (LMA) following cotton domestication. *Annals of Botany*, 130(2):231-243. <https://doi.org/10.1093/aob/mcac086>
- Westerband, A.**, Wright I.J., Eller, A.S.D., Cernusak, L.A., Reich, P.B., Perez-Priego, O., Chhajed, S.S., Hutley, L.B., Lehmann, C.E.R. 2022. Nitrogen concentration and physical properties are key drivers of woody tissue respiration. *Annals of Botany*, 129 (6): 633-646. <https://doi.org/10.1093/aob/mcac028>
- Liu, Z., Dong, N., Zhang, H., Zhao M., Ren, T., Liu C., **Westerband, A.**, He, N. 2021. Divergent long- and short-term responses to environmental gradients in specific leaf area of grassland species. *Ecological Indicators*, 130: 108058. <https://doi.org/10.1016/j.ecolind.2021.108058>.
- Barton, K., **Westerband, A.**, Ostertag, R., Stacy, E., Drake, D., Litton, C., Winter, K., Cordell, S., Fortini, L., Bennett, G., Krushelnycky, P., Kawelo, K., Feliciano, K., and Knight, T. 2021. Hawai'i forest review: Synthesizing the ecology, evolution, and conservation of a model system. *Perspectives in Plant Ecology, Evolution and Systematics*, 52: 125631. <https://doi.org/10.1016/j.ppees.2021.125631>
- Westerband, A.**, J. Funk, and K. Barton. 2021. Intraspecific trait variation in plants: a renewed focus on its role in ecological processes. *Annals of Botany*, 127(4): 397-410. <https://doi.org/10.1093/aob/mcab011>
- Westerband, A.**, T. Knight, and K. Barton. 2021. Intraspecific trait variation and reversals of trait strategies across key climate gradients in native Hawaiian plants and non-native invaders. *Annals of Botany*, 127 (4): 553-564. <https://doi.org/10.1093/aob/mcaa050>
- Paillassa, J., Wright, I.J., Prentice, I.C., Pepin, S., Smith, N.G., Ethier, G., **Westerband, A.C.**, Lamarque, L.J., Han, W., Cornwell, W.K. and Maire, V. 2020. When and where soil is important to modify the carbon and water economy of leaves. *New Phytologist*, 228: 121-135. <https://doi.org/10.1111/nph.16702>
- Westerband, A.**, T. Knight, and K. Barton. 2020. Intraspecific variation in seedling drought tolerance and associated traits in a critically endangered, endemic Hawaiian shrub. *Plant Ecology and Diversity*, 13(2): 159-174. <https://doi.org/10.1080/17550874.2020.1730459>
- Westerband, A.**, A. Kagawa-Viviani, K. Bogner, K. D. Beilman, T. Knight, and K. Barton. 2019. Seedling drought tolerance and functional traits vary in response to the timing of water availability in a keystone Hawaiian tree species. *Plant Ecology*, 220(3): 321-344. <https://doi.org/10.1007/s11258-019-00917-0>
- Westerband, A.**, and C. Horvitz. 2017. Photosynthetic rates influence the population dynamics of herbs in stochastic light environments. *Ecology*, 98: 370-381. <https://doi.org/10.1002/ecy.1664>
- Westerband, A.**, and C. Horvitz. 2017. Early life conditions and precipitation influence the performance of widespread understory herbs in variable light environments. *Journal of Ecology*, 105: 1298-1308. <https://doi.org/10.1111/1365-2745.12757>
- Westerband, A.**, and C. Horvitz. 2015. Interactions between plant size and canopy openness influence vital rates and life-history tradeoffs in two Neotropical understory herbs. *American Journal of Botany*, 102: 1290-1299. <https://doi.org/10.3732/ajb.1500041>
- Westerband, A.**, M. Dovčiak, G. LaQuay-Velazquez, J.S. Medeiros. 2015. Aspect influences soil moisture and species coexistence in semi-arid pinyon-juniper woodlands of the southwestern United States. *The Southwestern Naturalist*, 60: 21-29. <https://doi.org/10.1894/FMO-18.1>

## BOOK CHAPTERS

- Westerband, A.C.**, and Barton. K.E. 2024. Investigating the origins and effects of intraspecific trait variation. In M. Kumar, R.W. Bussmann, & N.G. Swenson (Eds.) *Plant Functional Traits: Linking Climate and Ecosystem Functioning*. Elsevier. eBook ISBN: 9780443133688.

## PRESENTATIONS

### Invited

- |  |                     |
|--|---------------------|
| Ecological Society of America, The Role of Intraspecific Trait Variation (ITV) in the Assembly of Ecological Communities | August 2023         |
| ComBio National Conference, Plant Biology Stream, Melbourne, Australia   | September 2022      |
| ARC, Centre of Excellence for Plant Success in Nature and Agriculture, Virtual Lab                                       | July 2022           |
| Sydney Plant Ecophysiology Group   | Feb 2022, June 2019 |
| Department of Biological Sciences, Macquarie University  | October 2018        |
| Department of Geography, University of Hawai'i at Mānoa  | July 2017           |
| Department of Biology, University of Hawai'i at Mānoa  | July 2017           |
| German Center for Integrative Biodiversity Research  | September 2017      |
| Department of Botany, University of Hawai'i at Mānoa   | Spring 2017         |
| Evolution and Conservation Biology Seminar, University of Hawai'i at Mānoa   | Fall 2016           |

*Attended*

- Westerband A., Soil and climate properties jointly influence leaf traits in Australian plants. Ecol Soc of Australia, November 2020.
- Westerband A., Photosynthetic physiology of the Australian flora over key abiotic gradients: a test of least cost theory. Ecol Soc of Australia, November 2019.
- Westerband A., K. Barton, T. Knight. Leaf traits in native Hawaiian plants and invaders. Ecol Soc of America, 2018
- Westerband, A., K. Barton, T. Knight. Functional traits across a rainfall gradient. Ecol Soc of America, 2017.
- Westerband, A., K. Barton, T. Knight. Functional trait responses of Hawaiian native and invasive plants across spatial scales and a precipitation gradient. Hawaii Ecosystems Meeting. June 2017.
- Westerband, A. Physiological responses to light are important predictors of growth in two understory herbs. Evol Demography Society, October 2015.
- Westerband, A. Size-dependent demographic responses demonstrate that forest-dwelling herbs do not always benefit from increasing light availability. Evol Demography Society, November 2014. *poster*
- Westerband, A. Linking light availability to plant morphological and physiological adaptations using preliminary data. Association for Tropical Biology and Conservation, June 2013. *poster*

**FUNDING (TOTAL: \$101,585.64 USD or \$159,550AUD)**

Amount	Agency (Award Dates)
\$ 60,255.64 [ <i>\$ 83,374.00 AUD</i> ]	Hermon Slade Foundation, AUS (2020-2023)
\$ 15,000.00	Vaughn-Jordan Foundation, USA (2013-2016)
\$ 4,200.00	Organization for Tropical Studies, Graduate Research Fellowship (2013-2015)
\$ 3,750.00	
\$ 3,750.00	
\$ 1,250.00	University of Miami, Department of Biology, Internal Research Funds (2012-2015)
\$ 1,080.00	
\$ 3,600.00	
\$ 1,200.00	
\$ 1,000.00	Heliconia Society International (2015)
\$ 5,000.00	University of Miami, College of Arts and Sciences Summer Award (2014)
\$ 1,500.00	University of Miami, Center for Latin American Studies (2013)

**MENTORSHIP****HIGHER DEGREE RESEARCH SUPERVISION**

- Amy Smart, Macquarie University, MSc 2019  
 Thesis title: Biotic interactions affecting the reproductive success of Antarctic beech (*Nothofagus moorei*)  
 I was invited to serve on Amy's committee as a co-supervisor in her final semester. I mentored Amy in statistics and writing and provided significant feedback on the writing of her thesis. Degree conferred January 2020.

**UNDERGRADUATE RESEARCH SUPERVISION**

PACE Program: Research internship program that provided for 3 credit hours for students at Macquarie University, in exchange for 50 hours of research completed under the supervision of Macquarie University research staff (faculty or postdocs). Students were required to receive training and conduct supervised and unsupervised research under my direction. Students were also required to submit a final report describing their key findings and the utility of their internship experience.

## PACE Students:

- Afnan Abbas and John Jones March 2023 – May 2023  
 Trained and supervised fieldwork and labwork on plant traits
- Jasmyn Garrick and Benjamin Reynolds March 2022 – May 2022  
 Trained and supervised fieldwork and labwork on root traits

Vidhika Kamboj

June 2021

Trained and supervised fieldwork and labwork on plant traits

Science Made Sensible Program: NSF-funded (**Award # 0638135**) science education program. I served as a graduate student fellow and was paired with high school science teachers and two undergraduate students per semester. The aim was to improve the communication skills of the former and the inquiry-based teaching skills of the latter. Fellows and teachers attend summer workshops on student learning, curriculum development, and effective communication. We developed and implement inquiry-based lesson plans built upon the fellows' research areas in order to foster student interest in science.

Science Made Sensible Students:

Andres Fantauzzi, Hannah Long, Vincent Hsu, and Joseph Marvin

Spring 2016 - Fall 2014

**TEACHING, SERVICE AND COMMUNITY OUTREACH****University-level teaching experience**

Co-convenor, Life Processes

Department of Biology, Macquarie University

*Led four lab-based practical classes for second-year students, spanning cell division, plant growth, symbioses, and plant hormones.*

June – December 2021, 2022

Co-convenor, Plant Biology

Department of Biology, Macquarie University

*Developed and implemented lab-based practical classes for third-year students.*

*Delivered lectures via Zoom. Assisted with course development, student inquiries, and marking assignments.*

August – December 2020

Leader of practical classes, Diversity of Life

Department of Biological Sciences, Macquarie University

*Devised lab-based practical classes focusing on floral morphology and plant functional traits.*

March – April 2020

Leader of practical classes and co-convenor, Plant Biology

Department of Biology, Macquarie University

*Developed and implemented lab- and field-based practical classes for third-year students, delivered lectures.*

July – December 2019

Leader of practical classes, Ecology

Department of Biological Sciences, Macquarie University

October 2018, 2019

Graduate Teaching Assistant, General Biology, Biodiversity, Ecology

Department of Biology, University of Miami, USA

August 2010 – May 2016

Undergraduate Teaching Assistant, Zoology

State University of New York College of Environmental Science and Forestry, USA

January 2009 – May 2009

**Service to the scientific community at large**Editorial Board, *Critical Insights in Plant Science*

September 2024-Present

Guest handling editor, Special Issue in *Plants*

*Special Issue Title: Trait-Environment Relationships in Plants: Acclimation and Adaptation*

Target date: 2024

Review Editor, Forest Ecophysiology Section, *Frontiers in Forests and Global Change*

September 2023

Guest handling editor, Special Issue in *Forests*

*Special Issue Title: Drought Tolerance Traits and Growth Responses in Trees*

February 2023

Organiser, Sydney Plant Ecophysiology Research Group

Selection and coordination of research talks, foment discussion, and maintain the listserv

November 2020 – September 2024

Co-organiser, Australian Society of Plant Scientists, NSW chapter meeting

November 2021

## CURRICULUM VITAE, Westerband

I worked with Dr Kristine Crous at Western Sydney University to secure speakers and host the meeting.

Guest handling editor, Special Issue in *Annals of Botany*. Vol 127 (4) April 2021  
*Special Issue Title:* Intraspecific variation in plant functional traits

Symposium moderator, Ecological Society of America Annual Conference August 2018  
Symposium: "Downscaling, Extreme Events and Stochastic Population Models"

*Reviewer for peer-reviewed scientific journals, N>50*

American Journal of Botany, Annals of Botany, Biological Invasions, Ecology, Ecology and Evolution, Forests, Functional Ecology, Journal of Ecology, Nature Communications, New Phytologist, Plant Biology, Plant Ecology, Plant Physiology and Biochemistry, PLOS One, Proceedings of the Royal Society B, Scientific Reports

### Departmental Service

Laboratory Manager, Ecology Labs at Macquarie University 2019 – 2022  
10% of my second postdoctoral appointment was spent as lab manager for the Ecology Lab (wet/dry labs used by Ian Wright/Mark Westoby/Rachael Gallagher research groups). Carried out routine laboratory inspections, maintained facilities and chemical inventory, ordered supplies/equipment, trained personnel, and maintained WHS compliance

Panel member, ECR enabling scheme, Macquarie University 2020  
Reviewed grant (\$2500AUD) applications from postdocs in the Faculty of Science and Engineering.

Panel member, PhD Progress Evaluation, Macquarie University 2019  
Interviewed HDR students, evaluated progress, and provided recommendations towards completion.

Graduate Student Organiser, Friday Seminar Series 2014 – 2015  
Department of Biology, University of Miami, USA

Graduate Student Committee Chair, Distinguished Visiting Professor Program 2014  
Department of Biology, University of Miami, USA

Graduate Student Organiser, Distinguished Visiting Professor Program 2013  
Department of Biology, University of Miami, USA

### Select Community Outreach Activities

Future Science Talks, Sydney: *Plant Resource Use in a Changing World* October 2023

Pint of Science, Sydney: *Plant Resource Use in a Changing World* May 2023

Podcast Interview, Branch Out, Hosted by the Royal Botanic Garden Sydney May 2021  
*The Plant World Economy*

Educator, Science in the City at the Australian Museum of Science August 2019  
*Plant adaptations and symbioses*, primary school

Educator, Expanding Your Horizons April 2017, 2018  
Grades 6-8. Fostering women's engagement in science

Graduate student mentor, Science Made Sensible August 2014 – May 2016  
Education program funded by the National Science Foundation (USA)  
Fostered engagement of underrepresented minority groups in science

Educator, Girl Scouts for America Badge Day February 2014, April 2015

### PROFESSIONAL DEVELOPMENT AND MEMBERSHIPS

HDR Supervisory Training (Course number HDR31) December 2020  
Online training for supervision of higher degree research (HDR) students

Early Career Researcher Workshop June 2019  
Introduction to higher degree research (HDR) Supervision

Scientific Teaching Tools to Promote Active Learning Spring 2018  
Pedagogical techniques for scientific teaching

Organization for Tropical Studies: Tropical Biology, An Ecological Approach Summer 2011

## CURRICULUM VITAE, Westerband

Research Experience for Undergraduates (NSF, Sevilleta LTER) Summer 2009

Ecological Monitoring and Bioassessment Course Summer 2007

### ***Active and previous society memberships***

Ecological Society of Australia, Ecological Society of America, Evolutionary Demography Society, Botanical Society of America, Association for Tropical Biology and Conservation

### **TECHNICAL SKILLS**

Highly Proficient: LiCor 6800, LiCor 6400 (and XT), porometer, R, RStudio, Minitab 17-20, ImageJ

Basic Proficiency: MATLAB, JMP, LaTeX, ArcGIS, FORTRAN90, Campbell Data Logger, Apogee Sensors,

Temperature and Humidity Sensors, Confocal Microscope, fluorometer, stable isotope analysis

Other: Valid US and AUS driver's license

Fully bilingual in Spanish (*Hispanic ethnicity*)

### **HONORS AND AWARDS**

Honorarium, contributed paper, Journal of Systematics and Evolution (AUD\$1500) 2024

Ecological Society of America, Travel Award 2023

Outstanding Teaching Assistant, Department of Biology, University of Miami, USA 2015

Best oral presentation: Graduate Student Research Symposium, Department of Biology, Univ of Miami, USA 2015

Second place, best oral presentation: Graduate Student Research Symposium, Department of Biology, University of Miami, USA 2014

Best poster: Graduate Student Research Symposium, Department of Biology, Univ of Miami, USA 2013

Phyllis Roskins Memorial Award 2010

Recognition of outstanding academic performance for a woman in the biology curriculum