Updated November 2016

Institute for Integrative Biology
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William K. Petry

Research Appointments & Training

Postdoctoral Fellow, Institute of Integrative Biology, Plant Ecology Group: since May 2016, ETH Zürich. Advisor: Jonathan Levine.

Ph.D. Ecology & Evolutionary Biology: March 2016, University of California Irvine. Advisor: Kailen Mooney.

B.Sc. Biology (with honors; minor in Mathematical Biology): May 2010, Truman State University. Co-advisors: Stephanie Foré & Laura Fielden.

Field technician:

2007: Missouri Department of Conservation, Resource Science Division (in collaboration with US Environmental Protection Agency, US Department of Agriculture, & Missouri Department of Natural Resources)

2005: Missouri Department of Conservation, Fisheries Division

Publications (first author n = 5; *unique undergraduate co-authors, n = 9)

7. **Petry, W.K.**, J.D. Soule, A.M. Iler, A. Chicas-Mosier*, D.W. Inouye, T.E.X. Miller, & K.A. Mooney. (2016) Sex-specific responses to climate change in plants alter population sex ratios and performance. Science 353:69-71. DOI: 10.1126/science.aaf2588
Selected for Perspective by Etterson & Mazer *(2016) DOI: 10.1126/science.aag1624.*
Dryad featured data package *for week of 10 October 2016 DOI:10.5061/dryad.1cf8p.*
6. Moreira, X.[†], **W.K. Petry[†]**, J. Hernández-Cumplido, S. Morelon, & B. Benrey. (2016) Plant defence responses to volatile alert signals are population-specific. Oikos 125:950-956. DOI: 10.1111/oik.02891
[†] ***Authors contributed equally***
5. Moreira, X., K.A. Mooney, S. Rasmann, **W.K. Petry**, A. Carrillo-Gavilán, R. Zas, & L. Sampedro. (2014) Trade-offs between constitutive and induced defences drive geographical and climatic clines in pine chemical defences. Ecology Letters 17:537-546. DOI: 10.1111/ele.12253
Cover article
4. **Petry, W.K.**, K.I. Perry*, A. Fremgen*, S.K. Rudeen*, M. Lopez*, J. Dryburgh*, & K.A. Mooney (2013) Mechanisms underlying plant sexual dimorphism in multi-trophic arthropod communities. Ecology 94: 2055-2065. DOI: 10.1890/12-2170.1
3. Mooney, K.A., A. Fremgen*, & **W.K. Petry** (2012) Plant sex and induced responses independently influence herbivore performance, natural enemies and aphid-tending ants. Arthropod-Plant Interactions 6: 553-560. DOI: 10.1007/s11829-012-9204-5
2. **Petry, W.K.**, K.I. Perry*, & K.A. Mooney (2012) Influence of macronutrient imbalance on native ant interactions with aphids, aphid enemies, and host plant flowers in the field. Ecological Entomology 37: 175-183. DOI: 10.1111/j.1365-2311.2012.01349.x
1. **Petry, W.K.**, S.A. Foré, L.J. Fielden, & H-J. Kim (2010) A quantitative comparison of two sample methods for collecting *Amblyomma americanum* and *Dermacentor variabilis* (Acari: Ixodidae) in Missouri. Experimental and Applied Acarology 52: 427-438. DOI: 10.1007/s10493-010-9373-9

In review or revision

2. CaraDonna, P.J., **W.K. Petry**, R.M. Brennan, J.L. Cunningham*, J.L. Bronstein, N.M. Waser, & N.J. Sanders (*In revision*) The seasonal progression of plant-pollinator interactions and the importance of phenology, abundance, and rewiring. Ecology Letters.
1. Roslin, T., B. Hardwick, V. Novotny, N. Andrew, A. Asmus, I.C. Barrio, Y. Basset, A.L. Boesing, T. Bonebrake, E.K. Cameron, W. Dáttilo, D.A. Donoso, P. Drozd, C.L. Gray, D.S. Hik, S. Hill, T. Hopkins, S. Huang, B. Koane, B. Laird-Hopkins, L. Laukkanen, O.T. Lewis, S. Milne, I. Mwesige, A. Nakamura, C.S. Nell, E. Nichols, **W.K. Petry**, A. Prokurat, K. Sam, N.M. Schmidt, A. Slade, V. Slade, T. Teder, S. van Nouhuys, V. Vandvik, A. Weissflog, V. Zhukovich, & E.M. Slade (*In revision*) Higher predation risk for insect prey at low latitudes. Science.

In advanced preparation (available by request)

1. **Petry, W.K.**, T.E.X. Miller, J.D. Soule, A. Chicas-Mosier*, & K.A. Mooney (*In preparation*) Climate-skewed sex ratios: Partitioning the linear and nonlinear effects of climate change on two-sex populations.

Grants & Fellowships (total = $518,261, *extramural = $427,161)

2015–8	$260,183*	"Demographic consequences of sexually dimorphic responses to ongoing and experimental climate change", National Science Foundation *(PI: K.A. Mooney, Senior personnel: **W.K. Petry**, T.E.X. Miller)* ***Based on Petry's Ph.D. research***
2015	$3,000*	BIO-OCE REU Mentor-Student Travel Scholarship
2015	$2,500*	Langenheim Fellowship, Rocky Mountain Biological Laboratory
2014	$20,083*	Doctoral Dissertation Improvement Grant, National Science Foundation *(PI: K. Mooney, **Co-PI: W.K. Petry**)*
2011–4	$130,000*	Graduate Research Fellowship, National Science Foundation
2014	$2,100	Mildred E. Mathias Graduate Student Research Grant, University of California Natural Reserve System
2014	$3,000	Ecology & Evolutionary Biology Departmental Fellowship, University of California Irvine
2014	$450*	Research Grant, American Alpine Club
2014	$700*	Grant in Aid of Research (GIAR), Sigma Xi
2014	$650*	Graduate Student Grant, Rocky Mountain Biological Laboratory
2013	$275*	Travel Grant, Ecological Society of America Plant Population Ecology section
2013	$1,000	School of Biological Sciences Graduate Fellowship, University of California Irvine
2013	$1,245*	John W. Marr Fund Research Grant, Colorado Native Plant Society
2013	$800*	Graduate Student Grant, Rocky Mountain Biological Laboratory
2012	$275*	Travel Grant, Ecological Society of America Plant Population Ecology section
2012	$400*	Research Grant, American Alpine Club
2012	$500*	Snyder Graduate Student Grant, Rocky Mountain Biological Laboratory
2011	$500*	Kingsdale Graduate Grant, Rocky Mountain Biological Laboratory
2011	£375*	Hendry Bequest, Alpine Garden Society (~$600)

2010	$10,000	Graduate Dean Recruitment Award, University of California Irvine
2010	$75,000*	NSF-IGERT Comparative Genomics Fellowship, University of Arizona *(award declined)*
2009	$5,000*	NSF-REU fellowship, Rocky Mountain Biological Laboratory

Awards

2016 Early Career Award for Exceptional Presentation, 4th Annual Evolutionary Demography Society Meeting, Charlottesville, Virginia, USA.

2016 ETH Zürich Fellowship finalist (pending award decision in March 2017)

Presentations

Invited talks

2016 University of Neuchâtel, Institute of Biology

2017 University of Sheffield, Department of Animal and Plant Sciences

Contributed conference talks

Petry, W.K., T.E.X. Miller, J.D. Soule, & K.A. Mooney (2016) Partitioning the linear and nonlinear effects of climate change on two-sex populations. Evolutionary Demography Society Meeting, October 2-5, Charlottesville, Virginia, USA.

Petry, W.K., T.E.X. Miller, J.D. Soule, & K.A. Mooney (2015) Intraspecific variation in response to climate drives population patterns and dynamics. Ecological Society of America, August 9-14, Baltimore, Maryland, USA. Included in organized session, "*A Century of Structured Population Models in Ecology*."

Petry, W.K., T.E.X. Miller, J.D. Soule, & K.A. Mooney (2014) Sexually dimorphic responses to climate variation: Demographic causes and consequences of climate-skewed sex ratios. Evolutionary Demography Society Meeting, November 10-12, Palo Alto, California, USA.

Petry, W.K., T.E.X. Miller, J.D. Soule, & K.A. Mooney (2013) Historical demography along a climatic gradient: Generating predictions of population responses to climate change in the montane dioecious herb *Valeriana edulis.* Ecological Society of America, August 4-9, Minneapolis, Minnesota, USA. Included in organized session, "*Informing and Evaluating Climate Change Adaptation Approaches Using Historic Ecological Data Records*."

Petry, W.K., A.M. McKinney, D.W. Inouye, K.A. Mooney, & J.D. Soule (2012) Warming up to changing trait frequencies: Rapid, climate change-induced shifts in population sex ratios along an elevation gradient. Ecological Society of America, August 5-10, Portland, Oregon, USA.

Mooney, K.A., **W.K. Petry**, L. Abdala-Roberts, & X. Moreira (2012) Consequences of monarch damage and plant genotype for ant-aphid interactions on the common milkweed *Asclepias syriaca*. Ecological Society of America, August 5-10, Portland, Oregon, USA. Included in organized session, "*The Chemical Ecology of Plant-Animal Mutualisms*."

Petry, W.K. & K.A. Mooney (2011) Sex-biased and variable herbivory parallel clinal variation in plant sex ratios along an elevational gradient. Ecological Society of America, August 7-12, Austin, Texas, USA.

Petry, W.K., K.I. Perry, & K.A. Mooney (2010) Ant-aphid interactions are mediated by host plant sex and ant colony nutritional status. Ecological Society of America, August 1-6, Pittsburgh, Pennsylvania, USA.

Petry, W.K., L.J. Fielden, S.A. Foré, & H-J. Kim (2009). Modeling the questing behavior of nymphal *Dermacentor variabilis* in response to environmental factors. Truman State University Student Research Conference, April 7, Kirksville, Missouri, USA.

Contributed conference posters

Petry, W.K. & K.A. Mooney (2013) *Valeriana edulis*, a system for studying the mechanisms of plant genetic effects on arthropod communities in the context of climate change. Gordon Research Conference – Plant Herbivore Interaction, February 24-March 1, Ventura, California, USA.

Petry, W.K. & L.J. Fielden (2009) Modeling questing height in response to environmental variables in the tick, *Dermacentor variabilis.* National Conference on Undergraduate Research, Lacrosse, Wisconsin, USA.

Petry, W.K., T.A. Dallas, G. Mueller, S.A. Foré, L.J. Fielden (2008) Modeling questing height in response to environmental variables in the tick *Dermacentor variabilis*. Society for Vector Ecology, Ft. Collins, Colorado, USA.

Presentations by mentored students

Chicas-Mosier, A., **W.K. Petry**, & K.A. Mooney (2015) Consequences of pollination neighborhood composition on mating success. Ecological Society of America, August 9-14, Baltimore, Maryland, USA. Poster.

Teaching (*field/lab course n = 5; ‡graduate-level n = 2)

Independent teaching & curriculum development

‡Climate Action Program Data Science Workshop (UC Irvine)—Co-organized and co-taught 3-day interdisciplinary data science workshop for graduate students and postdocs, Spring 2016

R Statistical Workshop (Rocky Mountain Biological Laboratory)—Organized and taught two 2-hour workshops for undergraduates, graduate students, postdocs, and professors, Summer 2014

*Experimental Design workshop (Rocky Mountain Biological Laboratory)—Organizer and presented field workshop to undergraduates, Summers 2012 & 2014

Invited guest lectures

*Field Methods in Ecology (Summer 2013, Rocky Mountain Biological Laboratory) – designed and taught 2-day field module on population biology

‡Quantitative Methods in Ecology and Evolution (Fall 2014, UC Irvine) – organized and taught two 1.5-hour lessons on analysis of variance, follow-up testing, and planned comparisons of means

Center for Environmental Biology Internship (Spring 2015, UC Irvine) – taught 1-hour workshop on R statistical software

Teaching assistance

The Idiom & Practice of Science (UC Irvine)—Teaching assistant, Fall 2015

*Plant Diversity (UC Irvine)—Teaching assistant, Spring 2015

Global Change Biology (UC Irvine)—Teaching assistant, Spring 2015

‡Quantitative Methods in Ecology and Evolution (UC Irvine)—Teaching assistant, Fall 2014

From Organisms to Ecosystems (UC Irvine)—Teaching assistant (Winter 2011) & course coordinator for 11 teaching assistants with ~800 students (Winter 2015)
*Limnology and Freshwater Biology (UC Irvine)—Teaching assistant, Spring 2011
*Field Methods in Ecology and Evolutionary Biology (UC Irvine)— Teaching assistant, Fall 2010
*Introduction to Ecology—Teaching assistant for field lab component, Fall 2009

Student Mentoring & Outreach

Undergraduate mentoring

UC Irvine: 6 undergraduate students
Rocky Mountain Biological Laboratory: 8 undergraduate students (3 NSF-REU fellows; 4 currently in graduate school or recent graduates)

Citizen science

PlantShift – Citizen science program engaging high school & undergraduate students in field data collection, >200 volunteer hours, 2013-2015

K-12 education

Irvine Unified School District, science fair advisor & mentor, 2010-2016

Academic & Scientific Citizenship

Peer referee

Ecology
Journal of Ecology
Journal of Animal Ecology (×2)
Evolutionary Ecology
Oecologia
Écoscience
Alpine Botany (×2)

Committees & service positions

Assistant professor search committee, graduate representative (UC Irvine; 2011-2012). *Resulted in the hire of Sergio Rasmann.*

Rocky Mountain Biological Laboratory

Research Committee Member—reviewed research applications & voted on Lab research policy (2016-present)
Organized weekly graduate student seminar (2011-2014)
Alumni Reunion field excursion organizer (2012-2013)
Consultation on research facility design (2011)
Photograph contributor to newsletter, 5 featured on the cover (2010-present)

Professional society membership

Ecological Society of America (since 2010, Plant Population Ecology Section since 2012, Natural History Section since 2012)
Evolutionary Demography Society (since 2013)
Colorado Native Plant Society (2011-2015)
Orange County Society for Conservation Biology (2011-2013)

Advanced Coursework & Workshops

2016 Individual Stochasticity: An Introduction to Demographic Models and Analysis, 4th Annual EvoDemoS (short workshop); Hal Caswell (University of Amsterdam)
2016 Analyzing Transient Population Dynamics, 4th Annual EvoDemoS (short workshop); Iain Stott (Max Planck Odense Center, University of Southern Denmark)
2016 Predictive modeling with Python, UC Irvine Data Science Initiative (1-day workshop)
2015 Philosophy of Biology (10 week graduate course; Cailin O'Connor, UC Irvine)
Software Carpentry – Shell, Python, & Git (2-day workshop; UC Irvine)
2014 IPMpack – an R package for Integral Projection Models, 2nd Annual EvoDemoS (1-day workshop; Cory Merow, Smithsonian Environmental Research Center & Rob Salguero-Gómez, University of Queensland)
2014 Linux & High Performance Computing, UC Irvine Data Science Initiative (1-day workshop; Harry Mangalam, UC Irvine)
2013 GIS: Geographic Information Systems (10-week graduate course; LuAnna Dobson & Bradford Hawkins, UC Irvine)
2012 Models in Biology (10-week graduate course; Steven Frank, UC Irvine)
2011 Quantitative Methods in Ecology & Evolutionary Biology (10-week graduate course; Diane Campbell, UC Irvine)

Skills

Statistics: generalized linear mixed models, randomization/Monte-Carlo simulation, restricted maximum likelihood, power analysis, optimization, bootstrapping, MANOVA, canonical discriminant analysis, zero-inflated models, multiple imputation
Population modeling: integral projection models (IPM), matrix population models, two-sex models, non-linear analysis, sensitivity/elasticity, life table response experiments (LTRE), transient dynamics, analysis of individual stochasticity
Programming: R [statistics, graphics, custom functions, optimization, profiling, RMarkdown, Shiny], shell, Linux high performance computing cluster, Git, Python
Spatial analysis: interpolation, spatial point pattern analysis, zonal statistics, geocoding, mapping
Natural languages: English (native), Spanish (upper intermediate proficiency)