DIANE R. CAMPBELL
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Irvine, CA 92697

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EDUCATION AND EMPLOYMENT

2022-present	Distinguished Professor, University of California, Irvine
1997-2022	Full Professor, University of California, Irvine
1993-1997	Associate Professor, UC Irvine
1989-1993	Assistant Professor, Department of Ecology and Evolutionary Biology, UC Irvine
1984-1989	Assistant Professor, Department of Biology, University of Virginia
1983-1984	Postdoctoral Scholar, Department of Biology, University of California, Riverside
1977-1983	Duke University, Ph.D. in Zoology with minor in Mathematical Statistics
1973-1977	Stanford University, B.S. in Biology with Distinction

RESEARCH INTERESTS

Google scholar citations

Understanding the mechanisms of evolution in natural populations
Current goals:

1. Predict demography and evolution in response to climate change and test whether evolutionary adaptation can rescue plant populations from extinction;
2. Determine how floral volatile emissions affect interactions with mutualists and antagonists;
3. Elucidate the impacts of invasive species and global change on plant-pollinator interactions.

ACADEMIC AWARDS AND HONORS

Faculty Fellow, Newkirk Center for Science and Society, UCI (2023-2024)
Distinguished Professor, UC Irvine (2022)
Top 2% of world scientists (report from Stanford University, 2021)
Elected to Board of Trustees, Rocky Mountain Biological Laboratory (1998 – 2002, 2015-2020)
Fulbright Senior Specialist in Environmental Sciences (2011-2015)
Keynote speaker at Scandinavian Association for Pollination Ecologists Annual Meeting (2014)
Elected Fellow of the American Association for the Advancement of Science (AAAS) 2010
Election to membership in Sigma Xi (2002)
Elected Council Member, Society for the Study of Evolution (1999-2001)

George Lamb Lecturer, University of Nebraska (1998)
Election to Phi Beta Kappa, Stanford University (1977)

RESEARCH GRANTS AND FELLOWSHIPS (PI unless otherwise noted)

2022-2027	NSF-DEB-2135270 "LTREB Renewal: Evolutionary and demographic responses to climate in natural populations. $599,741 (sole PI)
2020	"Covid-19 Summer Award" for enhancing online teaching. UC School of Biological Sciences. $2000
2017-2022	NSF-DEB-1654655 "LTREB: Evolutionary and demographic responses to climate in natural populations." $502,830 including supplementary Research Opportunity Award and additional supplement (sole PI)
2017-2023	NSF-NRT-1735040 "NRT: A training incubator for addressing urban environmental change from ridge to reef (R2R). $2,999,970 (co-PI; Steven Allison is the PI)
2016-2021	NSF-DBI-1624073 "Transforming Chemical Ecology by Enabling Measurement of Volatile Compounds in the Field." $306,599 with amendments (co-PI; Ian Billick is the PI)
2018-2019	NSF-DEB-1753664 "Collaborative research: Unlocking the evolutionary history of *Schiedea* (carnation family: Caryophyllaceae): rapid radiation of an endemic plant genus in the Hawaiian Islands. $224,882 (Substitute PI for Ann Sakai and Stephen Weller)
2016-2017	NSF DEB-1601191 Doctoral Dissertation Improvement Grant (for Kate Gallagher) "Effects of experimental shifts in soil moisture and flowering phenology on plant-pollinator interactions." $16,349 (PI)
2016	Rocky Mountain Biological Laboratory Research Fellowship $1250
2015	CORCL Multi-investigator Award, UC Irvine. "Analysis of volatiles from biological samples: from molecules to ecology" $20,000
2015	UC Mexus Research Award for postdoc Paula Sosenski $1500
2015-2016	UC Mexus Postdoctoral Fellowship on behalf of Paula Sosenski $49,408

2015	Rocky Mountain Biological Laboratory Research Fellowship $1500
2014-2015	National Geographic Society "Biotic pollination in *Schiedea*: the missing link."$12,959 (co-PI; Stephen Weller is the PI)
2014	UC Irvine Faculty Research and Travel "Testing mechanisms of ecological speciation in the field." $4291
2014	Fulbright Senior Specialist in Environmental Sciences at University of KwaZulu-Natal, South Africa. $7223
2013	Rocky Mountain Biological Laboratory Research Fellowship. $1500
2012	UC Irvine Faculty Research and Travel "Partial support of field research on ecological speciation and correlational selection" $5640
2011-2016	Center for Environmental Biology, UC Irvine "Impacts of invasive black mustard on pollination of natives" $11,200
2011	UC Irvine Faculty Research and Travel "Exploratory research: Testing pollinator responses and natural selection on floral volatiles" $2000
2011	Rocky Mountain Biological Laboratory Research Fellowship. $2500
2011	Fulbright Senior Specialist in Environmental Sciences at University of Otago, New Zealand. $7866
2010-2013	NSF Academic Research Infrastructure OIA-0963441 "Renovation of the greenhouse research facility at the University of California, Irvine." $1,257,826 (co-PI; Brandon Gaut is the PI)
2009-2010	National Geographic Society "Explaining flower color and form in alpine New Zealand: the promise and reality of pollinator responses." $10,000
2006-2008	NSF DEB-0608284 Doctoral Dissertation Improvement Grant (for Sarah Kimball) "Mechanisms defining ecological range limits in a plant hybrid zone." $11,994
2006-2012	NSF DEB-0542876 Population and Evolutionary Processes "Ecological speciation and the physiological performance of plant hybrids in

Ipomopsis." $400,000

2005-2006 UC Irvine School of Biological Sciences Faculty Research Grant
"Hybrid fitness and reproductive isolation in a plant hybrid zone." $7,500

2003-2005 NSF DEB-0308772 Doctoral Dissertation Improvement Grant (for Carrie Wu)
"Genetic and ecophysiological causes of differential fitness in a natural plant hybrid zone." $12,000

2002-2004 NSF DEB-0206279 Doctoral Dissertation Improvement Grant (for George Aldridge) "Comparing prezygotic isolating mechanisms in unimodal and bimodal plant hybrid zones." $9,901

2002-2003 UC Irvine School of Biological Sciences Faculty Research Grant
"The molecular genetic structure of a natural plant hybrid zone"

2000 UC Irvine Multi-Investigator Faculty Grant (co-PI; PI is Ann Sakai)
"Changes in photosynthetic traits with evolution of separate sexes"

1999-2008 NSF DEB-9815878 Population Biology (co-PI; PI is Ann Sakai)
"Evolution of dioecy from gynodioecy: artificial selection for sex allocation patterns." $675,202

1998-2003 NSF DEB-9805034 Population Biology (co-PI; PI is Mary Price)
"Pollination, plant fitness, and population dynamics: how strong are the links?" $199,990

1998-2004 NSF DEB-9806547 (supplements DEB-0117003 and DEB-0333001) Population Biology "Lifetime fitness of hybrids in natural plant populations: testing models for hybrid zones." $219,415 including supplements

1997 UC Irvine Multi-Investigator Faculty Research Grant (co-PI; PI is Ann Sakai)
"Evolution of dioecy from gynodioecy: artificial selection for sex allocation patterns."

1994-1998 NSF DEB-9407144 Systematic and Population Biology
"Evolutionary dynamics of a plant hybrid zone." $325,350

1992-1993 UC Irvine Faculty Fellowship
"Evolutionary dynamics of a plant hybrid zone."

1992-1993	UC Irvine Faculty Career Development Award "Using paternity analysis to study evolution in natural plant populations."
1992	UC Natural Reserve System Elizabeth Hall Blakey Travel Grant
1990	UC Irvine Committee for Instructional Development Curricular Improvement Grant: "Instruction in Field Methods in Ecology."
1989-1994	NSF BSR-8996306 Population Biology and Physiological Ecology "Mechanisms and evolutionary consequences of male and female fitness effects in a natural plant population." $284,010
1986-1989	NSF BSR-8516498 Population Biology and Physiological Ecology "Sexual selection in a montane wildflower: quantifying selection from measurements of male and female reproduction." $157,131
1984-1985	American Philosophical Society Research Grant "Sexual selection and flower traits in a hermaphroditic plant."
1982	Sigma Xi Grant-in-Aid of Research "Pollination-limitation on seed set of alpine and subalpine plant populations."
1978-1980	James B. Duke Fellowship, Duke University
1977-1978	Angier B. Duke Fellowship, Duke University

TEACHING EXPERIENCE (Instructor of Record: TA Positions Not Listed)

2018, 2022	Instructor, GCMS Workshop on Volatiles at the Rocky Mountain Biological Laboratory, CO.
2021	Instructor, Ridge-to-Reef Summer Institute on Environmental Data Analysis, UC Irvine
2020	Visiting Instructor, Drivers of Biodiversity Change, University of Puerto Rico, Rio Piedras, Puerto Rico.
2014	Fulbright Senior Specialist in Environmental Sciences, "Statistics for Ecologists" Workshops, University of KwaZulu-Natal,

SOUTH AFRICA

2011 Visiting Professor, Fulbright Senior Specialist in Environmental Sciences, Otago University, NEW ZEALAND

1989-2022 Assistant, Associate, and Full Professor, Department of Ecology and Evolutionary Biology, UC Irvine

Undergraduate Level:

BioSci 2B Freshman Seminar: Invasive Species
BioSci 2B Freshman Seminar: Introduction to Field Biology
BioSci 2C Solutions in Science
BioSci 4B Intro to Field Biology
BioSci 96 Ecology
BioSci 140L Evolution and the Environment (in person and online versions)
BioSci 166W Field Methods in Ecology
BioSci 185 Plant-Animal Interactions
BioSci 197 Special Study
BioSci 194 and 199 Independent Research

Graduate Level:

EE 200 Independent Research
EE 201 Seminar in Ecology & Evolutionary Biology
EE 202 Ecology & Evolutionary Biology Research Reviews
EE 203 Special Study
EE 205 Special Topics in Ecology
EE 207 Quantitative Methods in Ecology & Evolutionary Biology (in person and online versions)
EE 221 Advanced Topics in Ecology
EE 223 Advanced Applied Statistics
EE 245 Plant-Animal Interactions

1984-1989 Assistant Professor, Department of Biology, U. Virginia

Implications of Biology
Introduction to Biology
Plant Population Biology (upper division course)
Evolutionary Biology (graduate course)
Colloquium on Plant-Pollinator Interactions (graduate)
Member of committees for 5 PhD students and 1 masters student

(Departments of Biology, Chemistry, and Environmental Sciences)

Graduate Students at UC Irvine:

Janelle Bohey, 3rd year student
Dissertation topic: Impacts of climate change on floral volatiles

Xinyu Li, 6th year student
Dissertation topic: Influences of fire on plant-pollinator interactions

Amanda Barth, MS 2019
Characterizing floral volatiles for a subalpine dry meadow community
Present position: Rare Insect Conservation Coordinator, Utah Department of Natural Resources

Wilnelia Recart Gonzalez, PhD 2019
Dissertation title: Invasive plants and water availability mediate outcomes of plant-pollinator interactions
Present position: Assistant Professor of Biology, University of San Diego

Kate Gallagher, PhD 2017
Dissertation title: Plant-pollinator interactions and environmental change: Effects of experimental changes in phenology and water availability on a montane wildflower.
Present position: Environment and Natural Resource Management Specialist, US Agency for International Development

Daniela Bruckman, PhD 2015
Dissertation title: Mechanisms for pollinator-mediated interactions between invasive and native plants
Present position: Professor of Biology, San Diego Mesa College

Nelida Pohl, PhD 2008 (co-advised by Adriana Briscoe)
Dissertation title: Insights in ecology and evolution of butterflies
Present position: Professor and Director of Communications at Instituto de Ecologia y Biodiversidad, CHILE

Sarah Kimball, PhD 2007
Dissertation title: Mechanisms defining ecological range limits in a plant hybrid zone
Present position: Director, Center for Environmental Biology, and Associate Adjunct Professor, UC Irvine

Carrie Wu, PhD 2005
Dissertation title: Effects of genetic interactions and physiology on differential hybrid fitness in an *Ipomopsis* (Polemoniaceae) hybrid zone
Present position: Associate Professor of Biology, University of Richmond

George Aldridge, PhD 2005
Dissertation title: Comparing prezygotic isolating mechanisms in unimodal and bimodal plant hybrid zones
Present position: Biologist, Helix Environmental Planning

Jennifer Reithel, PhD 2003
Dissertation title: The ecology and evolution of host plant use by the generalist membracid, *Publilia modesta*
Present position: Science Director, Rocky Mountain Biological Laboratory

Elvia Meléndez-Ackerman, PhD 1995
Dissertation title: Selection on flower color in an *Ipomopsis* hybrid zone
Present position: Professor, Department of Biology, University of Puerto Rico

Member of committees for 57 other graduate students, including 46 at UC Irvine, one at Rancho Santa Ana Botanic Garden, two at UCSD, one at Northwestern University / Chicago Botanic Garden, two at University of Puerto Rico, two at University of Wollongong, AUSTRALIA, one at University of KwaZulu-Natal, SOUTH AFRICA, one at University of Zurich, SWITZERLAND, one at Indian Institute of Science Education and Research, INDIA

Postdoctoral scholars:

John Powers, PhD. University of California, Irvine. Postdoc 2020-2024

Heather Briggs, PhD. University of California, Santa Cruz. Postdoc 2018-2019
Present position: Associate Director of Science Research Initiative, University of Utah

Paula Sosenski, PhD. Universidad Nacional Autónoma de México. Postdoc 2015-2016
Present position: CONACYT Researcher at Universidad Autónoma de Yucatán, MEXICO

Mascha Bischoff, PhD. University of Heidelberg, Germany. Postdoc 2009-2011
Present position: Faculty at University of the Highlands and Islands, UK.

Steven E. Travers, PhD. University of California, Santa Barbara. Postdoc 2007

Present position: Associate Professor at North Dakota State University

L. Alan Prather, PhD. Univerity of Texas, Austin. Postdoc 1995-1997
Present position: Associate Professor and Herbarium Director at Michigan State University

Paul G. Wolf, PhD. Washington State University. Postdoc 1990-1991
Present position: Professor at University of Alabama

PROFESSIONAL AND SERVICE ACTIVITIES

UNIVERSITY OF CALIFORNIA, IRVINE:

Department of Ecology and Evolutionary Biology:

Chair, Ecology and Evolutionary Biology Major 2015-2022, 2023-2024
Advisor, Ecology and Evolutionary Biology Major 2021-2024
EEB Leadership 2021-2022
Strategic Plan Committee 2018
GAANN Steering Committee 2010-2011
Space Advisory Committee 2005-2008
Strategic Planning and Mentoring Committee 2002-2003
Molecular Analytical Facility Committee 2002-2004
Graduate Core Review Committee 2001-2002
Faculty Search Committees 1993-1997, 2000-2002, 2011-2012, 2015-2016
Electrophoresis Facilities Committee 1992-1999
Graduate Prescription Committee 1990-1991, 1997-1998
Curriculum Committee 1989-1995

School of Biological Sciences:

Faculty Honors Committee 2009-2010
Faculty Research and Travel Committee 2008-2011, 2011-2012
Executive Committee 1992-1995, 2014-2016
Undergraduate Honors Committee 1992-1993, 2011-2013
Undergraduate Cabinet 1991-1993, 1997-2003, 2021-2024

Irvine Campus:

Committee on Scholarly Honors & Awards 2020-2023
Ridge-to-Reef Graduate Training Grant Executive Committee 2018-2022
Ridge-to-Reef Graduate Training Admissions Committee 2019-2022
Scientist Consultant on NSF Career Award to Hosung Kang in School of Education 2019
Representative to Academic Senate 1992-1995, 2015-2016
Sustainability Committee 2012-2013

Environment Institute Steering Committee 2011-2013
Phi Beta Kappa Selection 2000-2003, 2008
Honors Program Advisory Panel 1998-2003
Undergraduate Scholarships and Financial Aid 1993-1996
Community Education Committee 1993-1994

University -wide:

UC Multicampus Research Programs and Initiatives Review Panel 2020
Presidential Advisory Committee to White Mountain Research Station 1993-2002

ROCKY MOUNTAIN BIOLOGICAL LABORATORY:
Director of GC-MS facility 2017-2023,
Elected Trustee 1998 – 2002, 2015-2020, Board Leadership 2017-2020, Governance Committee 2015-2023, Chair, Board Communication Committee 2019-2022, Research Center Committee 2011-2013, Facilities Committee 2010 and 2015-2016, Education Committee 2006-2009, Board Function and Structure committee 2002, Chair, Safety committee 1998 – 2002, Nominating committee 1996, 1998-1999, Director's Evaluation committee 1994-1995, Research committee 1991-1993, 2010-2019, Lee Snyder Award Committee 1990-1992, 1997-1998, Membership committee 1987

UNIVERSITY OF VIRGINIA: Library Committee 1988-1989, Undergraduate Curriculum Committee 1986-1987

Member of AAAS, Botanical Society of America, British Ecological Society, California Native Plant Society, Colorado Native Plant Society, Ecological Society of America, Sigma Xi, Society of American Naturalists, Society for the Study of Evolution, and Rocky Mountain Biological Laboratory.

Elected council member, Society for the Study of Evolution, 1999-2001

Reviewer of manuscripts for 37 journals: Acta Oecologica, American Journal of Botany, American Naturalist, Annals of Botany, Annals of the Missouri Botanical Garden, Biological Invasions, Biological Journal of the Linnaean Society, Biology Letters, BioScience, Biotropica, Conservation Biology, Conservation Genetics, Ecography, Ecological Research, Ecology, Ecology Letters, Ecoscience, Evolution, Global Change Biology, Heredity, International Journal of Plant Sciences, Journal of Applied Ecology, Journal of Ecology, Journal of Evolutionary Biology, Journal of Heredity, Molecular Ecology, Nature, New Phytologist, Oecologia, Oikos, Perspectives in Plant Ecology, Evolution and Systematics, Plant Biology, Plant Science, Proceedings of the National Academy of Sciences, Proceedings of the Royal Society B, Science, Southwestern Naturalist, Trends in Ecology and Evolution.

Associate editor for Functional Ecology 2010-2021. Reviewing editor for Journal of Evolutionary Biology 2003-2007. Adhoc editor for Ecology 1996. Associate editor for Evolution 1992-1994.

Reviewer of proposals for National Science Foundation (Biological Oceanography, Ecology, International Programs, Population Biology, Population and Community Ecology, Ocean Sciences, Research Opportunities for Women, Population and Evolutionary Processes, Environment and Structural Systems, Ecological Biology), USDA (Biology of Weedy and Invasive Plants, Biotechnology Risk Assessment), NSERC (Evolution and Ecology), Binational Science Foundation (US and ISRAEL, Minerva Stiftung (GERMANY), UK Biotechnology and Biological Sciences Research Council, UK Natural Environment Research Council, Vidi Programme, NWO (NETHERLANDS).

Panel member for National Science Foundation: Total of 5 panels
DEB Population Biology
Biotic Systems and Resources Doctoral Dissertation Improvement
Division of Graduate Education

Diversity and Inclusion

Multiple presentations at UC Irvine to underrepresented minority undergraduate groups about applying to NSF-REU programs.

Led multiple discussions of diversity in science for groups of undergraduate students at the RMBL and participated in diversity committee events.

Organized discussions of diversity/equity/inclusion between RMBL board members and RMBL scientists and worked to expand diversity of RMBL board.

Mentored undergraduate students from all over the US, often spending about 3 days per week in the field with them to provide intensive mentoring. Served as a research mentor for 60 female and 28 underrepresented minority undergraduate students (out of 85 total). At least 22 undergrads in the lab went on to graduate school.

Supervised 11 female and 4 underrepresented minority graduate students (out of 12 students total).

PUBLICATIONS (Google Scholar: H index = 51; Web of Science (A-1653-2012): Average citations per paper = 70)

112. Wu, C. A.., Powers, J. M., Hopp, D., and D. R.**Campbell**. Effects of experimental warming on floral scent and other traits in a subalpine plant. Annals of Botany, accepted.

111. **Campbell, D.R.**, Powers, J. M., Crowell, M. 2023. Pollinator and habitat-mediated selection as potential contributors to ecological speciation in two closely related species. Evolution Letters, in press.

110. Opedal, O. H., Armbruster, W. S., Hansen, T. F., Holstad, A., Pélabon, C., Andersson, S.., **Campbell, D. R**., Caruso, C. M., Delph, L. F., Eckert, C. G., Lankinen, A., Walter, G., Agren, J., Bolstad, G. H. 2023. Trait function and evolvability predict phenotypic divergence of plant populations. Proceedings of the National Academy of Sciences (USA) 120 (1) e2203228120.

109. Eisen, K., J. M. Powers, R. A. Raguso, and **D. R. Campbell**. 2022. An analytical pipeline to support robust research on the ecology, evolution, and function of floral volatiles. Frontiers in Ecology and Evolution 10:1006416.

108. **Campbell, D. R.**, Sakai, A.K., Weller, S.G., Culley, T., Dunbar-Wallis, A.K., Andres, A. M., Wong, T. G., Dang, T., Au, B., Ku, M., Marcantonio, A., Ngo, P. J., Nguyen, A., Tran, M., and Q. Tran. 2022. Genetic potential for changes in breeding systems: predicted and observed trait changes during artificial selection for male and female allocation in a gynodioecious species. American Journal of Botany 109: 1918-1938.

107. **Campbell, D. R**., Raguso, R. A., Midzik, M., Bischoff, M. and G. T. Broadhead. 2022. Genetic and spatial variation in vegetative and floral traits across a hybrid zone. American Journal of Botany 109: 1780-1793.

106. **Campbell, D. R**., M. V. Price, N. M. Waser, R. E. Irwin, A. K. Brody. 2022. Comparative impacts of annual variation in snowmelt and species interactions on population dynamics of a subalpine plant. Journal of Ecology 110: 1102-1112.

105. Navarro, J., Powers J. M., Paul, A. and **D. R. Campbell**. 2022. Phenotypic plasticity and selection on leaf traits in response to snowmelt timing and summer precipitation. New Phytologist 234: 1477-1490.

104. Powers, J. M., Sakai, A. K., Weller, S. G., and **D. R. Campbell.** 2022. Variation in floral volatiles across time, sexes, and populations of wind-pollinated *Schiedea globosa.* American Journal of Botany 109: 345-360.

103. Recart, W. and **D. R. Campbell.** 2021. Water availability influences the relationship between pollen intensity and seed production. AOB Plants 13: plab074.

102. Powers, J., Briggs, H. M., Dickson, R., Li, X., and **Campbell, D.R**. 2022. Earlier snowmelt and reduced summer precipitation alter floral traits important to pollination. Global Change Biology 28: 323-339.

101. **Campbell, D.R**., Bischoff, R. A. Raguso, M., Briggs, H., and P. Sosenski. 2022. Selection of floral traits by pollinators and seed predators during sequential life history stages. American Naturalist 199: 808-823.

100. Gallagher, M. K. and D. R. **Campbell**. 2021. Experimental test of the combined effects of water availability and flowering time on pollinator visitation and seed set. Frontiers in Ecology and Evolution 9: 641693.

99. Recart, W. and **D.R. Campbell**. 2021. Unraveling the ecological and evolutionary impacts of a plant invader on the pollination of a native plant. Biological Invasions 23: 1533-1547.

98. Powers, J.M., R. Seco, C.L. Faiola, A.K. Sakai, S.G. Weller, **D.R. Campbell**, and A. Guenther. 2020. Floral scent composition and fine-scale timing in two moth-pollinated Hawaiian *Schiedea* (Caryophyllaceae). Frontiers in Plant Science 11: 1116.

97. Mullins, M., J.D. Uyl, E. Cruz, S. Trail, B. Davidson, **D. Campbell**, and E. Mooney. 2020. Advanced phenology of higher trophic levels shifts aphid host plant preferences and performance. Ecological Entomology 45: 1004-1014.

96. Kuppler, J., Albert, C., Ames, G., Armbruster, S., Bönisch, G., Boucher, F., **Campbell, D.**, Carneiro, L., Chacón-Madrigal, E., Enquist, B., Fonseca, C. R., Gómez, J. M., Guisan, A., Higuchi, P., Karger, D., Kattge, J., Kleyer, M., Kraft, N., Larue-Kontić, A., Lázaro, A., Lechleitner, M., Loughnan, D., Minden, V., Niinemets, Ü., Overbeck, G., Parachnowitsch, A., Perfectti, F., Schellenberger C.D., Sletvold, N., Stang, M., Alves dos Santos, I., Streit, H., Wright, J., Zych, M., and R. Junker. 2020. Global gradients in intraspecific variation in vegetative and floral plant traits are partially associated with climate and species richness. Global Ecology and Biogeography 29: 992-1007.

95. Gallagher, M.K. and **D.R. Campbell**. 2020. Pollinator visitation rate and effectiveness vary with flowering phenology. American Journal of Botany 107: 445-455.

94. Eisen, K.E., **D.R. Campbell**, E. Richards and M.A. Geber. 2019. Differences in flowering phenology are likely not the product of competition for pollination in *Clarkia* communities. International Journal of Plant Sciences 180: 974-986.

93. **Campbell, D.R**. 2019. Early snowmelt projected to cause population decline in a subalpine plant. Proceedings of the National Academy of Sciences (USA) 116(26): 12901-12906.

92. Recart W., B. Ottoson, and **D.R. Campbell**. 2019. Water influences how seed production responds to conspecific and heterospecific pollen. American Journal of Botany 106(5):1-9.

91. **Campbell, D.R**., P. Sosenski, and R.A. Raguso. 2019. Plasticity of floral volatiles in response to increasing drought stress. Annals of Botany 123: 601-610.

90. **Campbell, D.R**., A. Faidiga, and G. Trujillo. 2018. Clines in traits compared over two decades in a plant hybrid zone. Annals of Botany 122: 315-324.

89. **Campbell, D.R**., A.K. Brody, M.V. Price, N.M. Waser, and G. Aldridge. 2017. Is plant fitness proportional to seed set? An experiment and a spatial model. American Naturalist 190: 818-827.

88. Gallagher, M.K. and **D.R. Campbell**. 2017. Shifts in water availability mediate plant-pollinator interactions. New Phytologist 215: 792-802.

87. Weller, S.G., Sakai, A.K**., Campbell, D.R**., Powers, J.M., Pena, S.R., Keir, M., Loomis, A., Heintzman, S., and Weisenberger, L. 2017. An enigmatic Hawaiian moth is a missing link in the adaptive radiation of *Schiedea.* New Phytologist 213: 1533-1547

86. Bruckman, D. and **D.R. Campbell**. 2016. Pollination of a native plant changes with distance and density of invasive plants in a simulated biological invasion. American Journal of Botany 103:1458-1465.

85. Bruckman, D. and **D.R. Campbell**. 2016. Timing of invasive pollen deposition influences pollen tube growth and seed set in a native plant. Biological Invasions 18: 1701-1711.

84. **Campbell, D.R**., A. Jürgens, and S.D. Johnson. 2016. Ethological isolation between hybridizing *Zaluzianskya* species: the influence of volatiles and flower orientation on hawkmoth foraging choices. New Phytologist 210: 333-342.

83. Raguso, R.A., Thompson, J.N., and **D.R. Campbell**. 2015. Improving our chemistry: Challenges and opportunities in the interdisciplinary study of floral volatiles. Natural Products Reports 32: 893-903.

82. **Campbell, D.R**. and J.M. Powers. 2015. Natural selection on floral morphology can be influenced by climate. Proceedings of the Royal Society B 282: 21050178.

81. Bischoff, M., R.A. Raguso, A. Jürgens and **D.R. Campbell**. 2015. Context-dependent reproductive isolation mediated by floral scent and color. Evolution 69:1-13.

80. Bruckman, D and **D.R. Campbell**. 2014. Floral neighborhood influences pollinator assemblages and effective pollination in a native plant. Oecologia 176: 465-476.

79. Abdala-Roberts, L., V. Parra-Tabla, **D.R. Campbell**, and K.A. Mooney. 2014. Soil fertility and parasitoids shape herbivore selection on plants. Journal of Ecology 102: 1120-1128.

78. **Campbell, D.R**., M. Forster, and M. Bischoff. 2014. Selection of trait combinations through bee and fly visitation to flowers of *Polemonium foliosissimum.* Journal of Evolutionary Biology 27: 325-336.

77. Bischoff, M., A. Jürgens, and **D.R. Campbell**. 2014. Floral scent in natural hybrids of *Ipomopsis* (Polemoniaceae) and their two parental species. Annals of Botany 113: 533-544.

76. **Campbell, D.R**. and M. Bischoff. 2013. Selection for a floral trait is not mediated by pollen receipt even though seed set in the population is pollen-limited. Functional Ecology 27: 1117-1125.

75. **Campbell, D.R**. and C. Wendlandt. 2013. Altered precipitation affects plant hybrids differently than their parental species. American Journal of Botany 100: 1322-1331.

74. Sakai, A.K., S.G. Weller, **D.R. Campbell**, T.M. Culley, A.K. Dunbar-Wallis, and A. Andres. 2013. Measure for measure: comparing morphological and biomass traits for sex allocation in two gynodioecious species. American Journal of Botany 100: 1071-1082.

73. Bischoff, M., **D.R. Campbell**, J. M. Lord, and A. W. Robertson. 2013. The relative importance of solitary bees and syrphid flies as pollinators of two outcrossing plant species in the New Zealand alpine. Austral Ecology 38: 169-176.

72. **Campbell, D.R**. and C.A. Wu. 2013. Geographical variation in hybridization of *Ipomopsis* (Polemoniaceae): Testing the role of photosynthetic responses to temperature and water. International Journal of Plant Sciences 174: 57-64.

71. **Campbell, D.R**., M. Bischoff, A.W. Robertson, and J.M. Lord. 2012. Where have all the blue flowers gone: Pollinator responses and selection on flower colour in New Zealand *Wahlenbergia albomarginata* Journal of Evolutionary Biology 25: 352-364.

70. Pohl, N.B., J. Van Wyk and **D.R. Campbell**. 2011. Butterflies show flower colour

preferences but not constancy in foraging at four plant species. Ecological Entomology 36: 290-300.

69. **Campbell, D.R**., Weller, S.G., A.K. Sakai, T. M. Culley, P.N. Dang, and A.K. Dunbar-Wallis. 2011. Genetic variation and covariation in floral allocation of two species of *Schiedea* with contrasting levels of sexual dimorphism. Evolution 65: 757-770.

68. Waser, N.M., **Campbell, D. R**., Price, M.V., and A.K. Brody. 2010. Density-dependent demographic responses of a semelparous plant to natural variation in seed rain. Oikos 119: 1929-1935.

67. **Campbell, D.R**., Wu, C.A. and S.E. Travers. 2010. Photosynthetic and growth responses of reciprocal hybrids to variation in water and nitrogen availability. American Journal of Botany 97: 925-933.

66. **Campbell, D.R**., M. Bischoff, J. Lord, and A.W. Robertson. 2010. Flower color influences insect visitation in alpine New Zealand. Ecology 91: 2638-2649.

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55. Wu, C.A. and **D.R. Campbell**. 2007. Leaf physiology reflects environmental differences and cytoplasmic background in *Ipomopsis* (Polemoniaceae) hybrids. American Journal of Botany 94: 1804-1812.

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39. Waser, N.M. and **D.R. Campbell**. 2004. Adaptive speciation in flowering plants. In Dieckmann, U., Metz, H., Doebeli, M. and Tautz, D. (editors), Adaptive Speciation. Cambridge University Press, Cambridge, UK.

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34. **Campbell, D.R**. 2000. Experimental tests of sex allocation theory in plants. Trends in Ecology and Evolution 15: 227-231.

33. Alarcón, R. and **D. R. Campbell**. 2000. Absence of conspecific pollen advantage in the dynamics of an *Ipomopsis* (Polemoniaceae) hybrid zone. American Journal of Botany 87: 819-824.

32. Sork, V. L., J. Nason, **D. R. Campbell**, and J. F. Fernandez-M. 1999. Landscape approaches to historical and contemporary gene flow in plants. Trends in Ecology and Evolution 14: 219-223.

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30. **Campbell, D.R**., N. M. Waser, and P. G. Wolf. 1998. Pollen transfer by natural hybrids and parental species in an *Ipomopsis* hybrid zone. Evolution 52: 1602-1611.

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27. **Campbell, D.R.** 1998. Multiple paternity in fruits of *Ipomopsis aggregata* (Polemoniaceae). American Journal of Botany 85: 1022-1027.

26. **Campbell, D.R**. 1997. Genetic correlation between biomass allocation to male and female functions in a natural plant population. Heredity 79:606-614.

25. Meléndez-Ackerman, E., **D. R. Campbell**, and N. M. Waser. 1997. Hummingbird behavior and mechanisms of selection on flower color in *Ipomopsis*. Ecology 78: 2532-2541.

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23. **Campbell, D.R**., N.M. Waser, and E.J. Meléndez-Ackerman. 1997. Analyzing pollinator-mediated selection in a plant hybrid zone: hummingbird visitation patterns on three spatial scales. American Naturalist 149: 295-315.

22. **Campbell, D.R**. 1996. Evolution of floral traits in a hermaphroditic plant: Field measurements of heritabilities and genetic correlations. Evolution 50: 1442-1453.

21. **Campbell, D.R**., N. M. Waser, and M.V. Price. 1996. Mechanisms of hummingbird-mediated selection for flower width in *Ipomopsis aggregata*. Ecology 77: 1463-1472.

20. Wolf, P. G. and **D. R. Campbell**. 1995. Hierarchical analysis of allozymic and morphometric variation in a montane herb, *Ipomopsis aggregata* (Polemoniaceae). Journal of Heredity 86: 386-394.

19. **Campbell, D. R**., N. M. Waser, and M. V. Price. 1994. Indirect selection of stigma position in *Ipomopsis aggregata* via a genetically correlated trait. Evolution 48: 55-68.

18. **Campbell, D.R.** and K.J. Halama. 1993. Resource and pollen limitations to lifetime seed production in a natural plant population. Ecology 74: 1043-1051.

17. **Campbell, D.R.** 1992. Variation in sex allocation and floral morphology in *Ipomopsis aggregata* (Polemoniaceae). American Journal of Botany 79: 516-521.

16. Weis, A.E. and **D.R. Campbell**. 1992. Plant genotype: a variable factor in insect-plant interactions. Pages 75-111 in M. D. Hunter, T. Ogushi and P. W. Price (eds.), Resource Distribution and Animal- Plant Interactions. Academic Press, San Diego.

15. **Campbell, D.R.** and J.D. Dooley. 1992. The spatial scale of genetic differentiation in a hummingbird-pollinated plant: comparison with models of isolation by distance. American Naturalist 139: 735-748.

14. **Campbell, D.R.** 1991. Comparing pollen dispersal and gene flow in a natural plant population. Evolution 45: 1965-1968.

13. **Campbell, D.R.**, N.M. Waser, M.V. Price, E.A. Lynch, and R.J. Mitchell. 1991. Components of phenotypic selection: pollen export and flower corolla width in *Ipomopsis aggregata*. Evolution 45: 1458-1467.

12. **Campbell, D.R.** 1991. Effects of floral traits on sequential components of maternal fitness in *Ipomopsis aggregata*. American Naturalist 137: 713-737.

11. **Campbell, D.R.** and N.M. Waser. 1989. Variation in pollen flow within and among populations of *Ipomopsis aggregata*. Evolution 43: 1444-1455.

10. **Campbell, D.R.** 1989. Inflorescence size: test of the male function hypothesis. American Journal of Botany 76: 730-738.

9. **Campbell, D.R.** 1989. Measurements of selection in a hermaphroditic plant: variation in male and female pollination success. Evolution 43: 318-334.

8. **Campbell, D.R.** and N.M. Waser. 1987. The evolution of plant mating systems: multilocus simulations of pollen dispersal. American Naturalist 129: 593-609.

7. **Campbell, D.R.** 1987. Interpopulational variation in fruit set: the role of pollination-limitation in the Olympic Mountains. American Journal of Botany 74: 269-273.

6. **Campbell, D.R.** 1986. Predicting plant reproductive success from models of competition for pollination. Oikos 47: 257-266.

5. **Campbell, D.R.** and A.F. Motten. 1985. The mechanism of competition for pollination between two forest herbs. Ecology 66: 554-563.

4. **Campbell, D.R.** 1985. Pollinator sharing and seed set of *Stellaria pubera*: competition for pollination. Ecology 66: 544-553.

3. **Campbell, D.R.** 1985. Pollen and gene dispersal: the influences of competition for pollination. Evolution 39: 418-431.

2. **Campbell, D.R.** 1983. Pollinator sharing and reproduction in a forest herb. PhD dissertation, Duke University, Durham NC.

1. Motten, A.F., **D.R. Campbell**, D.E. Alexander, and H.L. Miller. 1981. Pollination effectiveness of specialist and generalist visitors to a North Carolina population of *Claytonia virginica*. Ecology 62: 1278-1287.

INVITED SYMPOSIUM / WORKSHOP PAPERS AT MEETINGS (Contributed Papers Not Listed)

Campbell, D.R. 2020. 12th International Symposium on Pollination, Kirstenbosch Botanic Garden, Capetown, SOUTH AFRICA (Cancelled due to Covid).

Campbell, D.R. Impacts of early snowmelt and level of pollen limitation on population dynamics of a subalpine plant. 2020. **Lead speaker** in Symposium on Predicting Population Persistence and Coexistence in the Anthropocene. American Society of Naturalists, Asilomar, CA.

Campbell, D.R., Briggs, H., Bischoff, M. and R.A. Raguso. Natural selection of trait associations shaped by sequential interactions with pollinators and seed predators. 2019. 43rd New Phytologist Symposium, Interaction networks and trait evolution. Zurich, SWITZERLAND

Campbell, D.R. Adding geography to mating patterns: Do pollinators drive divergence in floral traits across a hybrid zone? 2019. Mate choice in plants. 14th Annual Plant Biology Initiative Symposium, Arnold Arboretum, Harvard University, MA

Campbell, D.R. PACE (Rocky Mountain Biological Lab, Colorado, USA) -
How will a changing climate influence selection and evolution in plant-pollinator systems? Thematic session "Long-term ecological experiments forever!" 2018 British Ecological Society, Birmingham, UK.

Recart, W. and D.R. Campbell. Ecological and evolutionary impacts of water availability on pollination: lessons for translocation of species. 2017 California Native Plant Society Annual Meeting, Los Angeles, CA.

Campbell, D.R. and W. Recart. Ecological and evolutionary impacts of climate on pollinator-mediated interactions between native and invasive plants. Organized Oral Session "Will Climate Change Increase the Impacts of Invasive Species?" 2017 Ecological Society of American Annual Meeting, Portland, OR.

Campbell, D.R. Impacts of invasive species on pollination of natives. 2017. Center for Environmental Biology Workshop, Irvine, CA.

Raguso, R.A., M. Bischoff, H.E. Summers, G.T. Broadhead, and D.R. Campbell. Why do hawkmoths like nitrogenous volatiles? Exploring the behavioral importance of "animalic notes" in white floral blends. 2015. 46th International Symposium on Essential Oils, Rio de Janeiro, BRAZIL.

Campbell, D.R. Natural selection of floral trait associations shaped by interactions with multiple species. 2014. **Keynote speaker** at Scandinavian Association for Pollination Ecologists Annual Meeting, Tovetorp, SWEDEN.

Campbell, D.R. Impacts of invasive Black Mustard (*Brassica nigra*) on pollination of natives. 2013. Center for Environmental Biology Workshop, Irvine, CA.

Campbell, D.R. Evolution of flower color: phenotypic integration with floral morphology and vegetative traits. 2008. Congreso Mexicano de Ecologia, Merida, MEXICO.

Campbell, D.R. Insect responses to flower color and form in alpine New Zealand: promise and reality. 2008. Pollination Ecology Conference at Ecological Society of America, Milwaukee, WI.

Campbell, D.R. Pollinator shifts, pollinator losses, and floral evolution. 2006. Systematics Symposium at Missouri Botanical Garden, St. Louis, MO.

Weller, S.G., A.K. Sakai, and D.R. Campbell. The quantitative genetic basis of breeding system evolution in *Schiedea* (Caryophyllaceae) in the Hawaiian Islands. 2005. Botanical Society of America Annual Meeting, Austin, TX.

Campbell, D.R. Pollination, plant fitness, and population dynamics: how strong are the links? 2003-2004. Workshop on Pollen Limitation, National Center for Ecological Analysis and Synthesis, Santa Barbara, CA.

Culley, T.M., A.K. Sakai, S.G. Weller, and D.R. Campbell. The quantitative genetics of sex allocation in gynodioecious Schidea salicaria (Caryophyllaceae). 2002. Symposium on Systematics and Evolution of the Caryophyllaceae, American Society of Plant Taxonomists Annual Meeting, Madison, WI

Campbell, D.R. Evolutionary consequences of hybridization with invasive plants: two key questions. 2002. Symposium on Evolutionary Consequences of Biological Invasions, Institute for Mathematics and its Applications, University of Minnesota, MN

Campbell, D.R. Selection in a plant hybrid zone. 1999. Workshop on The Formation of Biodiversity Through Adaptive Speciation, International Institute for Applied Systems Analysis, Laxenburg, AUSTRIA.

Campbell, D.R. Selection on sex allocation in *Ipomopsis aggregata*: test of the theory. 1999. Symposium on The Ecology and Genetics of Plant Reproductive Characters. XVI

International Botanical Congress, St. Louis, Missouri.

Campbell, D.R. Estimating gene flow within and between populations in a plant hybrid zone. 1998. Workshop on Theoretical and Empirical Aproaches to the Study of Gene Flow in Fragmented and Managed Populations, National Center for Ecological Analysis and Synthesis, Santa Barbara, CA.

Campbell, D.R. 1) The ecological basis of selection through male and female functions in hermaphroditic plants. 2) Distances of pollen-mediated gene flow. 1991. Symposium on Plant Reproductive Ecology, Scandinavian Association for Pollination Ecology, Uppsala, SWEDEN.

Campbell, D.R. Measuring selection of floral traits in natural plant populations. 1989. Symposium on Evolution of Plant Mating Systems, Botanical Society of America Annual Meeting, Toronto, CANADA.

Campbell, D.R. Pollinator efficiency: effects of pollen quality and competitors for pollination in natural populations. 1984. Symposium on Pollinator Efficiency, Entomological Society of America Annual Meeting, San Antonio, TX.

INVITED DEPARTMENTAL SEMINARS

2022 Biology Department, University of Vermont
2021 Quantitative and Systems Biology, UC Merced
2020 Department of Biology and Department of Environmental Sciences, University of Puerto Rico
2019 Division of Biological Sciences, University of California, San Diego
2018 Centre for Biodiversity, University of British Columbia, CANADA
2015 Rocky Mountain Biological Laboratory
Department of Ecology and Evolutionary Biology, UC Irvine
School of Medicine Roundtable, UC Irvine
2014 Instituto de Ecologia, UNAM, MEXICO (Fronteras en Ecologia y Evolucion)
Evolutionary Biology Centre, Uppsala University, SWEDEN (Frontiers in Plant Ecology)
School of Life Sciences, University of KwaZulu-Natal, SOUTH AFRICA
2013 Department of Biology, University of Richmond
2011 Botany Department, Otago University, NEW ZEALAND
Department of Ecology, Evolution and Marine Biology, UC Santa Barbara
2010 Department of Integrative Biology, University of California, Berkeley
2008 Department of Plant Sciences, University of Arizona
2007 Section of Integrative Biology, University of Texas, Austin
2005 Department of Genetics, University of Georgia
2001 Division of Biological Sciences, University of Missouri, Columbia
2000 School of Biological Sciences, Washington State University
Rancho Santa Ana Botanic Garden
1999 Botanical Institute, University of Copenhagen, DENMARK
Departments of Plant Systematics and Genetics, Lund University, SWEDEN
Ecology and Evolutionary Biology, Leiden University, NETHERLANDS
Biology Department, California State University, Northridge
1998 School of Biological Sciences, University of Nebraska – Lincoln
1997 Rocky Mountain Biological Laboratory
1996 Rocky Mountain Biological Laboratory
Department of Ecology, Evolution, and Marine Biology, UC Santa Barbara
Department of Biological Science, California State University, Fullerton
1995 Department of Ecology and Evolution, University of Chicago
1994 Department of Biology, Humboldt State University
1991 Department of Biology, University of California, San Diego
Rocky Mountain Biological Laboratory
Rancho Santa Ana Botanic Garden
Department of Biology, University of California, Los Angeles
Department of Biology, University of Puerto Rico
1990 Zoologisches Institut der Universitaet Basel, Basel, SWITZERLAND
1989 Department of Botany, University of Washington

Departments of Botany, Zoology, and Genetics, Washington State
Section of Ecology and Systematics, Cornell University
Department of Biology, Indiana University
Department of Biology, University of California, Riverside
1988 Division of Biology, Kansas State University
Department of Botany, Ohio State University
Department of Ecology and Evolutionary Biology, UC Irvine
Rocky Mountain Biological Laboratory
1987 Department of Biological Sciences, Rutgers University
Department of Botany, University of Kansas
Department of Biology, Virginia Polytechnic Institute
Division of Biological Sciences, University of Missouri, Columbia
Department of Biological Sciences, Bowling Green State Univ.
1985 Department of Biology, Seton Hall University
1984 Department of Biology, University of Virginia