

CURRICULUM VITAE

Jeffrey D. Lozier

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EDUCATION

- December 2007 PhD
University of California, Berkeley
Environmental Science, Policy, and Management
Division of Organisms and Environment
Advisor: Nicholas J. Mills
GPA = 3.9
- 1996-2000 BA, Biology
Wesleyan University
Middletown, CT 06459
GPA = 3.8

PHD DISSERTATION

Evolutionary, population genetic, and ecological approaches to studying the invasive aphid genus *Hyalopterus* and the parasitoid *Aphidius transcaspicus*

PUBLICATIONS

- Lozier J. D., Miller, G. Foottit, R., Mills, N. J., Roderick G. K. (2008) Molecular and morphological evaluation of the aphid genus *Hyalopterus* Koch (Insecta: Hemiptera: Aphididae), with a description of a new species. *Zootaxa* 1688: 1-19 (23 Jan. 2008)
- Milton Katharine, Lozier Jeffrey, Lacey Eileen A. (2008) Genetic structure of an isolated population of mantled howler monkeys (*Alouatta palliata*) on Barro Colorado Island, Panama. *Conservation Genetics*, on line early. DOI 10.1007/s10592-008-9584-3
- Lozier, J. D., Roderick G. K., Mills N. J. (in press) Tracing the invasion history of mealy plum aphid, *Hyalopterus pruni* (Hemiptera: Aphididae), in North America: a population genetics approach. *Biological Invasions*, in press.
- Lozier, J. D., Roderick G. K., Mills N. J. (in press) Evolutionarily significant units in Natural enemies: Identifying regional populations of *Aphidius transcaspicus* Hymenoptera: Braconidae) for use in biological control of mealy plum aphid. *Biological Control*, in press.

Lozier, J. D., Roderick G. K., Mills N. J. (in press) Molecular markers reveal strong geographic, but not host associated, genetic differentiation in *Aphidius transcaspicus*, a parasitoid of the aphid genus *Hyalopterus*. Bulletin of Entomological Research, in press.

Lozier, J. D. (in press). Population genetics, island models in. *Encyclopedia of Islands*. (R. Gillespie, D. Clague, Editors). University of California Press, Berkeley.

Lozier, J. D., Mills N. J., Roderick G. K. (2007) Genetic evidence from mitochondrial, nuclear, and endosymbiont markers for the evolution of host plant associated species in the aphid genus *Hyalopterus* (Hemiptera: Aphididae). *Evolution* 61: 1353-1367.

Lozier J. D., Mills N. J., Roderick G. K. (2006) Di- and tri-nucleotide repeat microsatellites for the parasitoid wasp, *Aphidius transcaspicus*. *Molecular Ecology Notes* 6: 27-29.

Rew Mary Beth, Peery Zacharia M., Beissinger Steven R., Bérubé Martine, Lozier Jeffrey D., Rubidge Emily M., Palsbøll Per J. (2006) Cloning and characterization of 29 tetranucleotide and two dinucleotide polymorphic microsatellite loci from the endangered marbled murrelet (*Brachyramphus marmoratus*). *Molecular Ecology Notes* 6: 241-244.

Lozier J. D., Mills N. J., Palsbøll P. J., Roderick G. K. (2005) Di- and tri- nucleotide repeat microsatellites isolated for the mealy plum aphid, *Hyalopterus pruni*. *Molecular Ecology Notes* 5: 499-501.

PAPERS IN PREPARATION

Lozier J. D., Mills N. J. Relative virulence and mating compatibility among different geographic populations of *Aphidius transcaspicus* (Hymenoptera: Braconidae), a potential biological control agent for mealy plum aphid.

Lozier J. D., Mills N. J. Combining ecological niche models with coalescent analysis of gene flow to understand extreme genetic divergence of *Aphidius transcaspicus* (Hymenoptera: Braconidae) populations in the Mediterranean.

GRANTS AND ACADEMIC HONORS

2008: Recipient, Philip W. Smith Memorial Award, IL Natural History Survey

2007: Recipient, Robert van den Bosch Memorial Scholarship for Graduate Research

2007: Recipient, Robert van den Bosch Memorial Travel Award

2007: Recipient, 2nd Prize in PhD Poster Competition: Pacific Branch ESA Meeting

2006: Recipient, Entomological Society of America President's Prize

2006: Recipient, Robert van den Bosch Memorial Travel Award

2006: Recipient, Margaret C. Walker Fund for Systematic Entomology

2005: Recipient, Johannes Joos Memorial Award, UC Berkeley

2005: Recipient, Margaret C. Walker Fund for Systematic Entomology
2004: Recipient, Powers S. Messenger Memorial Award, UC Berkeley
2004: Recipient, Environmental Protection Agency STAR Fellowship (FP916380)
2003: Co-Investigator, UC IPM Exotic Pests Research Grant (03XA011)
2000: Recipient, Phi Beta Kappa, Wesleyan University

ACADEMIC POSITIONS

2006: Delegate, ESPM Graduate Programs Committee, UC Berkeley
2005: Elected, Graduate Assembly Representative, UC Berkeley
2005: Delegate, ESPM Graduate Admissions Committee, UC Berkeley

PROFESSIONAL TALKS

“Testing for cascading host associated differentiation in the aphid genus *Hyalopterus* and the parasitoid *Aphidius transcaspicus*” 2007 Ecological Society of America Conference *Upcoming August 2007*

“Tracing historical patterns of invasion for an aphid pest” UC Berkeley ESPM Graduate Student Research Symposium, April 2007.

“Does host plant associated population structure in *Hyalopterus* aphids cascade to affect the specialist parasitoid *Aphidius transcaspicus*?” Entomological Society of America Annual Meeting, December 2006 (*1st Place, Student Competition for the President’s Prize: Section A, Systematics, Morphology, and Evolution*).

“Multi-genome evidence for host associated species in the aphid genus *Hyalopterus*.” Entomological Society of America, Pacific Branch Annual Meeting, March 2006.

“Biological control of mealy plum aphid (*Hyalopterus pruni*), an invasive pest in California: Molecular tools for identifying populations, strains and species.” Entomological Society of America Annual Meeting, November 2004.

INVITED TALKS

“Genetic structure of the howler monkey population on Barro Colorado Island, Panama,” with Katherine Milton. Primate Biology Group, UC Berkeley, November 7, 2006.

PRESENTED POSTERS

Jeff Lozier. “Tracing historical patterns of invasion for an aphid pest” UC Berkeley ESPM Graduate Student Research Symposium, April 2007.

Jeff Lozier. “Tracing Historical Patterns of Invasion for the Aphid *Hyalopterus pruni* in North America.” Entomological Society of America, Pacific Branch Annual Meeting, March 2007.

Jeff Lozier. “Genetics of the invasive aphid *Hyalopterus pruni* and the parasitoid *Aphidius transcaspicus*.” EPA STAR Conference, September 2006.

Gary L. Miller, Jeffrey Lozier, Robert G. Foottit, Carol D. von Dohlen, & Nicholas J. Mills. "Biology, population structure, and systematics of *Hyalopterus* (Hemiptera: Aphididae): Insights from molecular and morphometric data." Entomological Society of America Annual Meeting, December 2005.

Jeff Lozier. "The genetics and biological control of the invasive aphid, *Hyalopterus pruni*." EPA STAR Conference, October 2004.

Nicholas J. Mills, Jeffrey D. Lozier, & George K. Roderick. "Using population structure to identify effective parasitoid biotypes for biological control of mealy plum aphid, *Hyalopterus pruni*, in California. UC IPM Exotic/Invasive Pests and Diseases Research Program Conference, October 2004.

PROFESSIONAL MEMBERSHIPS

American Association for the Advancement of Science
Entomological Society of America
Society for the Study of Evolution
Ecological Society of America
Phi Beta Kappa

PREVIOUS SCIENTIFIC WORK EXPERIENCE

2000-2002: Research Associate II, CuraGen Corporation, Branford, CT 06405.
Supervisors: Dr.'s Peter Mezes, Ravi Ramachandran, Traci A. Mansfield

Summer 2000: Research Assistant, Connecticut Agricultural Experiment Station, New Haven, CT 06504.
Supervisor: Dr. Kirby C. Stafford III

Summer 1999: Research Assistant, Connecticut Agricultural Experiment Station, New Haven, CT 06504.
Supervisors: Dr. Louis A. Magnarelli, Carol R. Lemmon

TEACHING EXPERIENCE

Spring 2007: I have voluntarily developed and am currently instructing a course in basic population genetics and molecular ecology for graduate students (~20 attendees) aimed at filling a gap in the current U. C. Berkeley curriculum

Fall 2006: Course in professional preparation: Teaching in Environmental Science, Policy, and Management, UC Berkeley
Instructors: Dr.'s Vincent Resh, Sally Fairfax

Spring 1999: T.A., Behavioral Neurobiology and lab, Wesleyan University.
Supervisor: Dr. Janice Naegele

Fall 1998-99: T.A., Principles of Biology I and lab. Wesleyan University.
Supervisor: Dr. Anthony Infante

REFERENCES

Nicholas J. Mills
Dissertation advisor
UC Berkeley Environmental Science, Policy, and Management
1 + 510.642.1711
nmills@nature.berkeley.edu

George K. Roderick
Dissertation committee member, collaborator
UC Berkeley Environmental Science, Policy, and Management
1 + 643.3326
Roderick@berkeley.edu
(Currently out of U.S. on sabbatical; email is best)

Per J. Palsbøll
Collaborator
Stockholm University, Department of Genetics, Microbiology, and Toxicology
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DISSERTATION RESEARCH SUMMARY

Invasive insects are a primary threat to agricultural systems in the United States, and with increasing numbers of species introduced each year the development of innovative pest management strategies is critical. Biological control using natural enemies from an invasive pest's region of origin is one possible method of control, though rapid identification of agents remains problematic, and many biocontrol attempts ultimately end in failure. Population genetic and evolutionary studies of invasive species in both invaded and native regions, combined with similar studies of natural enemies, have the potential to aid in the development of such management strategies. The mealy plum aphid (*Hyalopterus pruni*) is an invasive pest on dried plum in California that is under investigation as a target for biological control using the parasitoid *Aphidius transcaspicus*. *H. pruni* is likely native to the Mediterranean, where *Hyalopterus* aphids feed on a number of host plants in the genus *Prunus*. Using a combination of classical and modern molecular genetics approaches and greenhouse parasitism assays, I am addressing the following objectives: **1)** identify the importance of host plant associations in structuring genetic diversity of *Hyalopterus* and *A. transcaspicus* populations and assess the taxonomy of each group; **2)** identify the population structure, genetic diversity,

and geographic region of origin of *H. pruni* in California and compare genetic results to documented agricultural history in the region; **3)** assess the geographic population structure of *A. transcaspicus* in the Mediterranean and examine inter-population variation in parasitism behavior against Californian *H. pruni*. These results will be used to aid the control of *H. pruni* in California by identifying the most effective parasitoid populations for biocontrol introduction and to understand fundamental evolutionary and genetic properties of invasion, resource use in phytophagous insects and natural enemies, and how interactions between invasive pests and natural enemies vary geographically. More generally, however, I am interested in how molecular techniques can be used to address questions of natural history and species origins at multiple timescales. In the future, I hope to expand my research by studying the interplay of demographic population structure and natural selection by examining genes that may contribute to phenotypic variation in addition to analyzing structure at neutral polymorphisms.