

Lesley G. Campbell

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Post-doctoral positions

Post-doctoral fellow, January 2007

University of Maryland, Department of Plant Science and Landscape Architecture
Research supervisor: Dr. Maile Neel.

Education

2006. Ph.D. Evolution, Ecology, and Organismal Biology. The Ohio State University
Advisor: Professor Allison A. Snow
Dissertation: 'Rapid evolution in a crop-weed complex (*Raphanus* spp.)'.

2001. M.Sc. Botany. University of Guelph
Advisor: Professor Brian C. Husband
Thesis: 'Pollen limitation in small populations of the self-incompatible plant, *Hymenoxys herbacea*.'

1998. B.Sc. Plant Biology. University of Guelph
Thesis Advisor: Professor Robert Sheath
Thesis: 'Biogeography and systematics of the Lemnaceae (Batrachospermales, Rhodophyta) in North America based on ITS sequences.'

Academic Awards Received

2007. Young Scientists' Symposium – Invited speaker, University of Michigan

2006. The Mary S. Muellhaupt Presidential fellowship, The Ohio State University
(\$17,300)

Darwin Award for Best Graduate Associate Poster, EEOB, The Ohio State University (\$500)

2005. Doctoral Dissertation Improvement Grant, National Science Foundation (\$10,370)

Henry Gleason Fellowship, University of Michigan Biological Station (\$6,615)

Darwin Award for Best Graduate Associate Presentation, EEOB, The Ohio State University (\$500)

Graduate Associate Teaching Award, EEOB, The Ohio State University (\$500)

2004. Janice Carson Beatley Herbarium Award, The Ohio State University (\$1000)

Graduate Researcher Fellowship, The Nature Conservancy – University of Michigan Biological Station (\$3008)

Best Student Poster, American Institute of Biological Sciences, Washington, D.C.

Summer Statistical Institute Travel Award, North Carolina State University (\$750)

Travel Award, The Nature Conservancy – University of Michigan Biological Station (\$1000)

2003. Graduate Researcher Fellowship, The Nature Conservancy – University of Michigan Biological Station (\$4600)

2002. Graduate Research Fund, University of Michigan Biological Station (\$2000)

Janice Carson Beatley Herbarium Award, The Ohio State University (\$1449)

Graduate Research Award, Sigma Xi (\$500)

2000. Graduate Student Advancement Fund, College of Biological Sciences, University of Guelph (\$500)

1999. Intradepartmental Scholarship, Department of Botany, University of Guelph (\$1,000)

University Graduate Scholarship, University of Guelph (\$1,500)

1998. Access Registrar's Entrance Award, University of Guelph (\$1,500)

Peer-Reviewed Publications

Conservation biology

1. Campbell, L.G., and B. C. Husband. 2005. Impact of clonal growth on effective population size in *Hymenoxys herbacea* (Asteraceae). *Heredity* 94: 526-532.
2. Husband, B.C., and L.G. Campbell. 2004. Population genetic and demographic responses to novel environments: implications for ex situ plant conservation. In *Ex Situ Plant Conservation Symposium: Strategies for Survival*. Eds E. Guerrant Jr., K. Havens, M. Maunder. Island Press. pp. 231 - 266.
3. Campbell, L.G., B.C. Husband, M.J. Oldham. 2001. Status report on the Lakeside Daisy, *Hymenoxys herbacea*, in Canada. Committee on the Status of Endangered Wildlife in Canada Status Report.

4. Waite, T.A., L.G. Campbell, A.K. Chhangani, and P. Robbins. (*Submitted*) La Niña's signature: parallel die-off of mammals in a protected area in India. Submitted to: *Diversity and Distributions*, August 12, 2006.
5. Campbell, L.G, and B.C. Husband. (*Submitted*) Small populations are mate-poor but pollinator-rich in a rare, self-incompatible plant, *Hymenoxys herbacea* (Asteraceae). Submitted to: *New Phytologist*, December 10, 2006.

Invasion biology

6. Snow, A.A., and L.G. Campbell. 2005. Can feral radishes become weeds? In *Crop Fertility and Volunteerism*. Ed. J. Gressel. CRC Press. Pp. 193-208.
7. Campbell, L.G., A.A. Snow, and C.E. Ridley. 2006. Weed evolution after crop gene introgression: greater survival and fecundity of hybrids in a new environment. *Ecology Letters* 11 (9): 1198-1209.
8. Campbell, L.G., and A.A. Snow. 2006. Competition alters life-history traits and increases the relative fecundity of crop-wild hybrids (*Raphanus* spp.). *New Phytologist* (in press, doi: 10.1111/j.1469-8137.2006.01941.x).

Ecological statistics

9. Waite, T.A., and L.G. Campbell. 2006. Controlling the false discovery rate in molecular ecology: an alternative to Bonferroni. *Ecoscience* 13(4): 439-442.

Grant applications in review

2007 – 2009 Post-doctoral Fellow NSERC
(Decision expected March 2006)
Potential Research Advisor: Dr. John Stinchcombe

Two significant research accomplishments and explanations of their impact:

1. Campbell, L.G., A.A. Snow, and C.E. Ridley. 2006. Weed evolution after crop gene introgression: greater survival and fecundity of hybrids in a new environment. *Ecology Letters* 9: 1198-1209.

This experimental study tested a long-standing question in evolutionary biology: what is the role of hybridization in adaptive evolution? When grown in Michigan, a location where they originated and evolved for three generations, hybrids had slightly lower lifetime fecundity than their wild, weedy ancestors. However, when translocated to California, a location within the geographic range of the weedy ancestors, hybrids exhibited ~270% *greater* lifetime fecundity and ~22% *greater* survival than their wild and weedy ancestors. Our experiment revealed unexpected consequences of hybridization that were consistent with the hypothesis that the **evolution of weeds can be stimulated by hybridization** among disparate source populations. Although this manuscript benefited greatly from editorial comments and suggestions from my co-authors (A. Snow, C. Ridley) and peer-review by OSU and UC-Riverside colleagues, this manuscript is a chapter of my dissertation and I was the primary author and contributor. I conducted the majority of the research (80%), coordinated a long-term field experiment combined with a cross-continental common garden experiment, and wrote the manuscript (80%).

2. Campbell, L.G., and B. C. Husband. 2005. Impact of clonal growth on effective population size in *Hymenoxys herbacea* (Asteraceae). *Heredity* 94: 526-532.

Here, we presented the first empirical study of the impact of clonal reproduction (production of genetically identical individuals) on the effective population size (the number of genetically unique individuals in a population), using several novel techniques and theoretical models. We found, in natural populations of this rare plant, that **clonal reproduction had a greater impact on effective population size than sexual reproduction**. From a theoretical point of view, these results suggest that overlooking clonal reproduction, as had previously been acceptable, may bias results more than overlooking sexual reproduction, the typical focus of these sort of studies. The practical significance of our study suggested that monitoring and augmenting the survival of non-sexual and sexual adults and clonal expansion may provide the most effective strategy to maintain and even increase population effective size in this species of conservation interest. Although, again, this study benefited greatly from the editorial suggestions of my co-author (B. Husband), this manuscript was a chapter in my MSc thesis and I was the primary author, having conducted both the field and laboratory research (100%), and having written the manuscript (70%).

Invited Lectures

University of Michigan, Biological Station, July 2002
University of Michigan, Biological Station, July 2003
The Ohio State University, Introduction to Ecology, April 2003
The Ohio State University, Honour's Introduction to Ecology, March 2003
University of Michigan, Biological Station, August 2004
The Ohio State University, Honour's Introduction to Evolution, February 2005
The Ohio State University, Plant Population Ecology, April 2005
University of Michigan, Biological Station, August 2005
The Ohio State University, Department of Evolution, Ecology and Organismal Biology, October 2005
Otterbein College, Life and Earth Sciences Department, November 2005
Notre Dame University, Department of Biology, December 2006.
University of Maryland, Departments of Plant Sciences and Landscape Architecture & Biology, December 2006.
University of Michigan, Young Scientists Symposium, March 2007.

Talks and Presentations at Scientific Meetings

- Campbell LG**, Snow AA. 2006. Selective pressures on and fitness consequences of divergent life-histories: complementary insights from natural and artificial selection studies after hybridization. Society for the Study of Evolution Annual Meeting, Stony Brook, NY.
- Snow AA**, Culley TM, Campbell LG, Ellstrand NC, Uthus KL, Hegde S. 2006. A decade of introgression: crop alleles persist in experimental populations of wild radish (*Raphanus raphanistrum*). American Botanical Society Annual Meeting.
- Snow AA**, Culley TM, Campbell LG, Ellstrand NC, Uthus KL, Hegde S. 2005. A decade of introgression: crop alleles in experimental populations of wild radish (*Raphanus raphanistrum*). Crop gene flow & the occurrence and consequences of gene introgression between crops and their sexually compatible relatives. North Central Weed Science Society. Kansas City, MO.
- Campbell LG**, Snow AA. 2005. The life of a social radish. Competition and its fitness consequences for advanced generation, crop-wild hybrids. Crop gene flow & the occurrence and consequences of gene introgression between crops and their sexually compatible relatives. North Central Weed Science Society. Kansas City, MO.
- Campbell LG**, Snow AA. Do neighbors affect individual weediness? Presented to underrepresented students participating in Strategies for Ecology Education, Development and Sustainability (SEEDS) conference at UMBS, Pellston, MI.
- Campbell LG**, Snow AA, Ketner JM, Sweeney, PM. 2005. Can hybridization alter evolutionary potential? Society for the Study of Evolution Annual Meeting, Fairbanks, AK.

- Campbell LG, **Snow AA**. 2005. The life of a social radish. Competition and its fitness consequences for advanced generation, crop-wild hybrids. American Botanical Society Annual Meeting, Austin, TX.
- Ketner JM**, Campbell LG, Snow AA. 2005. Heritability of two life-history traits in wild, crop and crop-wild hybrid radishes (*Raphanus* spp). American Botanical Society Annual Meeting, Austin, TX.
- Snow AA**, Campbell LG. 2004 OECD/Rockefeller Foundation Workshop on Fertility and Volunteerism in Crop Plants, "Can Feral Radishes Become Weedy?" Bellagio, ITALY. (May 23, 2004)
- Campbell LG**, Waite TA, Bartsch D. 2004. Impacts of crop-to-wild gene flow: Beyond conventional metrics of genetic diversity. American Botanical Society Annual Meeting, Snowbird, UT.
- Campbell LG**, Waite TA, Bartsch D. 2004. Impacts of crop-to-wild gene flow: Beyond conventional metrics of genetic diversity. American Institute of Biological Sciences Society Annual Meeting, Washington, DC.
- Campbell LG**, Husband BC. 2002. Genetic drift and effective population size of the self-incompatible plant *Hymenoxys herbacea*. Society of the Study of Evolution Society Annual Meeting, University of Illinois at Urbana-Champaign, Urbana Champaign, Illinois.
- Campbell LG**, Husband BC. 2002. Genetic drift and effective population size of the self-incompatible plant *Hymenoxys herbacea*. Ohio Academy of Science Society Annual Meeting. Capitol University, Columbus, Ohio.
- Husband BC**, Campbell LG. 1999. Population genetic and demographic responses to novel environments: implications for ex situ plant conservation. In *Ex Situ Plant Conservation Symposium: Strategies for Survival*. Chicago Botanic Garden, Chicago, Illinois.

Teaching Experience

2005. NSF-REU mentor for one undergraduate student, Univ. Michigan Biol. Station
EEOB H400 – Honor's Evolution – Teaching Assistant and Guest Lecturer
EEOB 671 – Plant Population Ecology – Guest Lecturer
2004. EEOB 693 – Independent Study – Mentored two undergraduate researchers
EEOB 400 - Evolution – Teaching Assistant
2003. EEOB 400 – Evolution – Teaching Assistant
EEOB 693 – Independent Study – Mentored an undergraduate researcher (student won an award for her poster in the College of Biological Sciences Undergraduate Research Symposium and she participated in the OSU Denman Forum for Undergraduate Research).
EEOB H413 – Honor's Introduction to Ecology – Guest Lecturer
EEOB 413 – Introduction to Ecology – Guest Lecturer
2002. EEOB 671 – Plant Population Ecology – Teaching Assistant
2001. EEOB 400 – Evolution – Teaching Assistant
2000. General Biology I, II (University of Guelph) – Senior teaching assistant
1999. Population biology (University of Guelph) – Teaching Assistant
General Biology I, II (University of Guelph) – Teaching Assistant
1998. General Biology I (University of Guelph) – Teaching Assistant

Services to the Scientific Community

Reviewer of Manuscripts for *Evolution*, *American Journal of Botany*, and *Conservation Biology*.

- 2003-2004 Departmental Chair Advisory Committee (EEOB, OSU)
- Departmental Communication Committee (EEOB, OSU)
- 2002-2003 Departmental Graduate Student Committee (EEOB, OSU)
- 1999-2000 Departmental Graduate student representative (Botany, Univ. Guelph)
- Departmental Curriculum Committee (Botany, Univ. Guelph)
- Departmental Scholarship Committee (Botany, Univ. Guelph)
- Departmental Public Relations Committee (Botany, Univ. Guelph)

Training of Undergraduate students

Fieldwork – K. Alofs, A. Babayan, N. Curiel, A. DeCamp, E. Hill, N. Marsh, R. Rajbhandari, N. Smith, J. Waterbury.

Greenhouse, Experimental pollination work – M. Burlison, S. Clark, H. Eisel, S. Gifford, J. Ketner, N. Masuda, K. Mollohan, S. Pflingsten, S. Sekharan, M. Schneider, D. Smith, K. Toth, K. Vedam, D. Yang

Undergraduate research projects – J. Ketner (award-winner for her project), M. Schneider, N. Smith (NSF – REU program)