

Susan N. Gershman

230 Faircrest Rd.
Ottawa, ON K1H 5E1
(613) 867-6315
sgershma@uottawa.ca

Department of Biology
University of Ottawa
Ottawa, ON K1N 6N5
(613) 562-5800 x6837

CITIZENSHIP: USA

ACADEMIC HISTORY

- ◇ Postdoctoral Fellow, University of Ottawa, ON, Canada 2010-present
Research topic: The genetics of sexual selection in *Drosophila*;
plasticity in female choice for male cuticular hydrocarbons (CHCs) in *D. serrata*; the effect of circadian rhythms on *D. serrata* CHCs and mating behavior.
Advisor: Howard Rundle
- ◇ POE-NB Postdoctoral Fellow, Illinois State University, 2007-2010
Research topic: Female preference for partner novelty in the decorated cricket, *Grylloides sigillatus*; trade-offs between male reproduction and immunity; sexual conflict over spermatophylax composition in *G. sigillatus*.
Advisor: Scott Sakaluk
- ◇ Ph.D., Biology, University of California, Riverside, 2007
Dissertation title: The reproductive consequences of multiple mating and partner novelty in female *Gryllus vocalis* field crickets.
Co-advisors: Marlene Zuk and Daphne Fairbairn
- ◇ M.S., Zoology, Washington State University, 1999
Thesis title: Variance in mating success in the salamander *Desmognathus ocoee*.
Advisor: Paul Verrell
- ◇ B.A., Anthropology, Johns Hopkins University, 1992

AWARDS AND HONORS

- Outstanding Teaching Assistant, UC Riverside (2004-2005)
- Dean's List, Johns Hopkins University (1990-1992)
- General Honors, Johns Hopkins University (upon graduation)
- Phi Beta Kappa (inducted 1992)

Susan N. Gershman

FUNDING AWARDS

- ❖ The Orthopterists' Society Research Grant (2002, 2003, 2010)
- ❖ GAANN Fellowship, University of California, Riverside (2000-2001, 2005-2006)
- ❖ Animal Behavior Society Student Research Grant (2005)
- ❖ Boyce Fellowship, University of California, Riverside (2004-2005)
- ❖ Dissertation Research Grant, University of California, Riverside (2004)
- ❖ Sigma Xi Grants in Aid of Research (2004)
- ❖ Newell Fund Research Grant, University of California, Riverside (2002-2003)
- ❖ Chancellor's Fellowship, University of California, Riverside (1999-2000)

RESEARCH EXPERIENCE

Post-Doctoral Research, University of Ottawa

I am currently studying sexual selection in *Drosophila* flies using a quantitative genetic approach. Previous research indicates that female *Drosophila* prefer males that bear specific chemical signatures (cuticular hydrocarbons). I am examining the effects of female *Drosophila serrata* mating status and age on preference for different combinations of male cuticular hydrocarbons. I am studying male plasticity in CHC production, and female plasticity in preference for male CHCs. I am currently investigating how male CHCs change with male age, mating experience and over 24-hour circadian cycles as well as the effect of these conditions on male CHC attractiveness to females. Thus far it appears that male CHCs fluctuate over a 24-hour cycle and males display the most attractive profiles when they are most likely to attract a female.

Post-Doctoral Research, Illinois State University

My postdoctoral work consists of three interrelated research directions: female preference for novel partners, trade-offs between male reproduction and immunity and sexual conflict between males and females over the composition of male courtship gifts. I found that female *G. sigillatus* decorated crickets use post-copulatory choice to exert preference for novel partners over previous mates. Moreover, female preference for male quality has a greater influence on female choice than female preference for novel mates. However, male *G. sigillatus* do not demonstrate a preference for novel females. In both *G. sigillatus* and *Cyphoderris strepitans*, two cricket species in which males provide courtship feeding for females, males suffer an immune cost with increased reproductive effort. Further, in *G. sigillatus*, females were found to have a greater ability to mount an immune response than males, and inbred individuals had a greater ability to mount an immune response than outbred individuals. Work on sexual conflict over courtship feeding is ongoing, but I am currently attempting to use inbred lines of *G. sigillatus* to determine whether differences in the amino acid

Susan N. Gershman

composition of the male spermatophylaxes (courtship gifts) are associated with female resistance to consume spermatophylaxes.

Ph.D. Dissertation Research, University of California, Riverside

My Ph. D. project focuses on the consequences of multiple mating and mating rate on the vocal field cricket *Gryllus vocalis*. I conducted a mating experiment examining the effects of large numbers of matings on female fecundity, fertility and survival, and found that females mated more times than was beneficial for lifetime reproductive success. Further, females that mated more times suffered an immunological cost of mating that was not shared by males. Females that mated large numbers of times to different males gained slight benefits over females mated repeatedly to the same male, suggesting only small genetic benefits to polyandry. However, females that mated multiply with different males laid more eggs than females that mated repeatedly with the same male. In additional experiments to investigate this effect, I found that females paired repeatedly with the same partner were faster to remove spermatophores, thus reducing the dose of male oviposition-stimulating chemical contributions. Paternity analysis indicated that females bias fertilization in favor of novel males versus the null expectation.

Masters Thesis Research, Washington State University

My Master's project examined the effects of variance in mating success among male and female *Desmognathus ocoee* (plethodontid salamanders) on the likelihood of success in mating encounters. I used analysis of videotaped encounters to look for behavioral correlates of male mating success. I also manipulated mating encounter conditions to determine whether or not there was a correlation between standardized mating success as scored in the lab, and mating success in nature.

PUBLICATIONS

Gershman, S. N., M. Delcourt and H. D. Rundle (in prep) Female preferences for male cuticular hydrocarbons in *Drosophila serrata* are not affected by female age or mating status

Steiger, S, S. N. Gershman, A. M. Pettinger, A.-K. Eggert and S. K. Sakaluk. (provisionally accepted) Dominance status and sex influence nutritional state and immunity in burying beetles *Nicrophorus orbicollis*. *Behavioral Ecology*

Gordon, D. G., S. N. Gershman and S. K. Sakaluk. (in press) Glycine in nuptial food gifts of decorated crickets decreases female sexual receptivity when ingested, but not injected. *Animal Behaviour*.

Susan N. Gershman

Steiger, S., S. N. Gershman, A. M. Pettinger, A.-K. Eggert and S. K. Sakaluk. (in press) Sex differences in immunity and rapid upregulation of immune defense during parental care in the burying beetle, *Nicrophorus orbicollis*. *Functional Ecology*.

Gershman, S. N., C. Mitchell, S. K. Sakaluk and J. Hunt. (in press) Biting off more than you can chew: sexual selection on the free amino acid composition of the male spermatophylax in decorated crickets. *Proceedings of the Royal Society B*.

Gershman, S. N., J. Hunt and S. K. Sakaluk. (submitted). Food fight: Sexual conflict over free amino acids in the nuptial gifts of male decorated crickets. *Evolution*.

Gershman, S. N. and S. K. Sakaluk. 2010. Mate quality and novelty influence post-copulatory female choice in decorated crickets, *Grylloides sigillatus*. *Ethology* 116:1113-1117.

Kerr, A. M., S. N. Gershman, and S. K. Sakaluk. 2010. Experimentally-induced spermatophore production and immune responses reveal a trade-off in crickets. *Behavioral Ecology* 21:647-654.

Gershman, S. N., C. A. Barnett, A. M. Pettinger, C. B. Weddle, J. Hunt, and S. K. Sakaluk. 2010. Give 'til it hurts: trade-offs between immunity and male reproductive effort in the decorated cricket, *Grylloides sigillatus*. *Journal of Evolutionary Biology* 23:829-839.

Gershman, S. N., C. A. Barnett, A. M. Pettinger, C. B. Weddle, J. Hunt, and S. K. Sakaluk. 2010. Inbred decorated crickets exhibit higher immunity than outbred individuals. *Heredity* 105:282-289.

Gershman, S. N. 2009. Large numbers of matings do not give female *Gryllus vocalis* vocal field crickets a genetic benefit. *Journal of Insect Behavior* 23:59-68.

Gershman, S. N. and S. K. Sakaluk. 2009. No Coolidge effect in decorated crickets. *Ethology* 115: 774-780.

Leman, J. C., C. B. Weddle, S. N. Gershman, A. M. Kerr, G. D. Ower, J. M. St. John, L. A. Vogel, and S. K. Sakaluk. 2009. Lovesick: immunological costs of mating to male sagebrush crickets. *Journal of Evolutionary Biology* 22:163-171.

Gershman, S. N. 2008. Post-copulatory female choice increases the fertilization success of novel males in the field cricket, *Gryllus vocalis*. *Evolution* 63:67-72.

Susan N. Gershman

Gershman, S. N. 2008. Sex-specific differences in immunological costs of multiple mating in *Gryllus vocalis* field crickets. *Behavioral Ecology* 19:810-815.

Gershman, S. N. 2008. Diet quality mediates the effect of multiple mating on female *Gryllus vocalis* vocal field cricket lifetime reproductive success. *Evolutionary Ecology Research* 10:269-280.

Gershman, S. N. 2007. Female *Gryllus vocalis* field crickets gain diminishing returns from increasing numbers of matings. *Ethology* 113:1099-1106.

Gershman, S. N. and P. A. Verrell. 2002. To persuade or be persuaded: which sex controls mating in a plethodontid salamander? *Behaviour* 139:447-462.

CONFERENCE TALKS

- ◇ “Battle of the sexes: mating success variance in *Desmognathus ocoee*.” 1998. Northwest Scientific Association Society for Northwestern Vertebrate Biology, Evergreen State College, Seattle, WA
- ◇ “Multiple mating in *Gryllus vocalis*, the vocal field cricket.” 2004. Evolution, Colorado State University, Fort Collins, CO
- ◇ “Conflict or cooperation: multiple mating in *Gryllus vocalis*, the vocal field cricket.” Southern California Animal Behavior, 2004. UCLA, Los Angeles, CA
- ◇ “The immunological consequences of sex and multiple mating in a field cricket.” 2005. Southern California Animal Behavior, UC Riverside, Riverside, CA
- ◇ “The effects of ad libitum multiple mating on the female vocal field cricket (*Gryllus vocalis*).” 2005. Animal Behavior Society, Snowbird, UT
- ◇ “Sick of sex: large numbers of matings bear an immunological cost for females, but not males in *Gryllus vocalis*, the vocal field cricket.” 2006. Southern California Animal Behavior, UCSD, San Diego, CA
- ◇ “Sick of sex: large numbers of matings bear an immunological cost for females, but not males in *Gryllus vocalis*, the vocal field cricket.” Sex Matters Interdisciplinary Graduate Conference, UCR, Riverside, CA (best science paper prize winner)
- ◇ “Material girls: direct and indirect benefits of multiple mating for *Gryllus vocalis* vocal field cricket females.” 2006. International Society for Behavioral Ecology, Tours, France
- ◇ “Material girls: direct and indirect benefits of multiple mating for *Gryllus vocalis* vocal field cricket females.” 2006. Evolution, Stony Brook, NY
- ◇ “The monotony of monogamy: female field crickets invest more reproductive effort in matings with novel males.” 2007. Southern California Animal Behavior, UCSB, Santa Barbara, CA

Susan N. Gershman

- ◇ “Post-copulatory female choice increases the fertilization success of novel males in the field cricket, *Gryllus vocalis*.” 2008. International Society for Behavioral Ecology, Ithaca, NY
- ◇ “Give ‘til it hurts: male crickets trade off immunity for courtship gift size.” 2009. Evolution, Moscow, ID
- ◇ “Quality trumps novelty: Female post-copulatory choice is more influenced by male variability than male novelty.” 2010. Animal Behavior Society, Williamsburg, VA

INVITED TALKS

- Is it easy being easy? The benefits of large numbers of matings in a field cricket. 2006. University of Lincoln, Nebraska, Lincoln, NE
- Females on top: Sex-specific effects of reproduction on cricket immunity. 2010. Purdue University, Lafayette, IN
- Time Flies: Plasticity in female preference and male attractiveness. 2012. Carleton University, Ottawa, ON

TEACHING EXPERIENCE

- ❖ Illinois State University (Instructor): Animal Behavior (2008-2010)
- ❖ University of California, Riverside (Instructor): Human Reproduction and Sexual Behavior (2007)
- ❖ University of California, Riverside (Instructor): Human Heredity and Evolution (2002-2005)
- ❖ University of California, Riverside (Teaching Assistant): Introductory Biology courses for majors and non-majors (2001-2006), Invertebrate Zoology lab (2003-2005), Animal Behavior discussion and lab (2004-2007)
I worked autonomously on the Invertebrate Zoology and Animal Behavior labs, coordinating the lab preparation and modifying the lab syllabi and exercises. I wrote the Animal Behavior lab on statistical analysis.
- ❖ Washington State University (Teaching Assistant): Introductory Biology courses for majors and non-majors, Principles of Conservation Biology, and Animal Behavior (1996-1998). I created the lab for Animal Behavior.

DEPARTMENTAL, UNIVERSITY AND PROFESSIONAL SERVICE

- ◇ Currently supervising Ethan Toumishey in his undergraduate honors project at University of Ottawa.
- ◇ Poster judge for the OCIB 2011 Symposium at Carleton University.
- ◇ Committee member for two Illinois State University Master’s students: Angela Kerr and Darcy Gordon. I had a primary role in advising Angela

Susan N. Gershman

Kerr, who won the ISU James Fisher Outstanding MS Thesis Competition for best Science M.S. thesis in 2010.

- ◆ Supervised several undergraduate research projects at the University of California, Riverside (2004-2007).
- ◆ Primary organizer of the 2005 Southern California Animal Behavioral Society Meeting at UC Riverside
- ◆ President of the UC Riverside Biology Graduate Student Association (2002-2003)
- ◆ Reviewer for Behaviour, Behavioral Ecology, Biology Letters, Biological Journal of the Linnean Society, Ecological Entomology, Ethology, Evolution, Journal of Australian Zoology, Journal of Ethology, Journal of Evolutionary Biology, Journal of Heredity, Journal of Insect Science, Naturwissenschaften, Parasitology and Physiological Entomology, PLoS ONE, Proceedings of the Royal Society B.

COMMUNITY SERVICE

- Discussion panelist for Café Scientifique at the Canadian Museum of Nature, Ottawa, ON (2011)
- Local and district science fair judge for Jurupa Unified School District, Riverside, CA (2000-2006)
- Trained 4th grade teachers for ALIAS (Advancing Literacy Integrating Algebra and Science) in physics and biology (2004-2006)
- Assisted 4th graders planning science fair projects at local elementary schools in the Jurupa Unified School District, Riverside, CA (2000-2001)
- Hosted Sara Blaffer Hrdy as the John and Betty Moore Science as a Way of Knowing seminar speaker (2001)