CURRICULUM VITAE

Sonya M. Bierbower
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RESEARCH EXPERIENCE

Ph.D Thesis: (In Progress)
Comparative Studies of Environmental Effects on Behavior, Learning, Physiology and Synaptic Transmission in Crayfish. Mentor: RL Cooper, University of Kentucky, Lexington, KY.

M.S. Thesis:
Parasite-mediated sexual selection in the intermediate host, *Caecidotea intermedius* (Isopoda): effects of male mating response and sperm supplies. Mentor: TC Sparkes, DePaul University, Chicago, IL.

EDUCATION

Ph.D 2006-Present Biological Sciences, University of Kentucky, Lexington, KY
(Post qualifying exam; expected graduation August 2009)
MS 2006 Biological Sciences, DePaul University, Chicago, IL
BS 2001 Biological Sciences, University of Georgia, Athens, GA

TEACHING EXPERIENCE

Animal Physiology, University of Kentucky

Summer 2006, Fall 2006, Spring 2007, Summer 2007, Fall 2007, Spring 2008, Summer 2008. The course is a required Biology course approximately 150 students. Teaching assistant is responsible for planning and conducting discussion sections 3 times a week on processes in Animal Physiology.

Aquatic Biology, DePaul University

Spring 2006. The course was a high level elective that consisted of field-based research projects in the areas of behavioral and environmental processes in an aquatic ecosystem. The teaching assistant was required to organize each project and monitor student's progress weekly, as well as evaluate individuals and group dynamics.

General Biology, DePaul University

Winter 2004, Winter 2005. This course is a required Biology course approximately 300 students concentrating in the area of Ecology and Evolution. Teaching assistants are required to develop individual teaching plans of the main concepts to presented in each lab, as well as organize, set-up and clean-up each lab 3 times a week.

Ecology, DePaul University

Fall 2005. This course is a required Biology course approximately 300 students. Teaching assistants are required to develop individual teaching plans of the main concepts to presented in each lab, as well as organize, set-up and clean-up each lab 3 times a week. In addition, teaching assistants are required to organize many outdoor research projects throughout the semester.

Genetics, DePaul University

Spring 2005. This course is a required Biology course approximately 300 students. Teaching assistants are required to develop individual teaching plans of the main concepts to presented in each lab, as well as organize, set-up and clean-up each lab 3 times a week. In addition, since there are only 2 teaching assistants, we are required to organize and prepare for all future labs due to many crucially time dependent projects.

GUEST LECTURE / INVITED PRESENTATIONS

2006 Center for Ecology and Evolution, "Parasite-mediated sexual selection in an intermediate host, *Caecidotea intermedius* (Isopoda): effects of male mating response and sperm supplies", University of Kentucky

2006 Animal Physiology (core biology course): Ionic and Osmotic Balance, University of Kentucky

2006 General Biology (core biology course): Evolutionary Adaptations of Vampire Bats, DePaul University

2006 Non-majors General Biology course: Origins of Life, DePaul University

AWARDS/ FELLOWSHIPS

2007 Tuition Fellowship, Friday Harbor Laboratory Summer Courses: Neuroethology
Highly competitive, extremely intensive 5 week course focused on neural control of behavior in both isolated central nervous systems and unrestrained, freely behaving animals. The course consisted of 1 week of lectures and (2) two-week projects biased upon a specific research area.

2007 Friday Harbor Travel aid, Biology Department, University of Kentucky
Competitive approval of travel money awarded to further cover the costs of the Neuroethology course at Friday Harbor Laboratories.

2007 Best Poster by a 1st/2nd year graduate student, University of Kentucky, Biology Department.
Competition among first and second year graduate students in the Biology department in which I was awarded in my first year. The competition consisted of 18 graduate students in this category.

2006 Travel Award – Society for Integrative and Comparative Biology (SICB)
Approval for travel funds in a highly competitive process since funds are limited and open to all graduate students.

2006 Travel Award – Biology Department, DePaul University (Annual Animal Behavior Society Conference)
Approval for travel funds in a highly competitive process since funds are limited and open to all graduate students.

SCIENTIFIC PUBLICATIONS

Bierbower S.M., Sparkes TC. Parasite-related success in an intermediate host, *Caecidotea intermedius* (Isopoda): effects of male behavior and reproductive physiology. J. Parasitol. 93 (3): 445-449.

MENTORING

Undergraduates

Shelly Xu
Spring, 2008, Summer 2008

Martha Robinson
Spring 2008

Courtney Allen
Spring 2008

Easter Bocook
Spring 2008

MaryCatherine Wright
Fall 2007, Spring 2008

Keith Nicholas Holmes
Fall 2007, Spring 2008

Tori Lynn Spence
Spring 2007, Summer 2007, Fall 2007, Spring 2008

Doyle Stephens
Spring 2007, Summer 2007, Fall 2007, Spring 2008

Tyler McLaurine
Spring 2007, Summer 2007, Fall 2007

Thomas Cunningham
Spring 2007, Summer 2007, Fall 2007

Geoffry Hughes
Spring 2007

COMMUNITY SERVICE

1. Helping at local Science fairs *(Glendover elementary, Morton Middle, FCPS County fair, UK Regional and KY State fair).*

2. Two ongoing projects with Woodford High School and Wolf County High School. *These schools have take on a thematic approach to science education. They are using the crayfish as a model organism in studying, behavior, life cycle, environmental impact on crayfish, and economic use in modeling of shrimp farming. I will be working closely with the teachers and their students on their projects over the Fall 2007 and Spring 2008 terms. See www site: http://www.as.uky.edu/Biology/faculty/cooper/TFC/crayfish.htm*

COLLABORATORS

Motor Task Learning

Zhana P. Shuranova, Institute of Higher Nervous Activity and Neurophysiology, Russian Academy of Sciences, Moscow Russia

CONFERENCE PRESENTATIONS

(● indicates mentored undergraduate, * indicates presenting author)

Bierbower, S.M.*, Cooper, R.L. (2008) Comparative study of environmental modulation of intrinsic behavior in blind and sighted crayfish. 15th Annual meeting. Center for the Integrative Study of Animal Behavior Conference. Indiana University, Bloomington, IN.

Bierbower, S.M.*, Cooper, R.L. (2008) The mechanistic effects of CO2 on physiology and behavior in Procambarus clarkii. Annual meeting of the BlueGrass Chapter of the Society for Neuroscience. University of Kentucky.

●McLaurine, T.*, ●Robinson, M., ●Spence, T., **Bierbower, S.M.,** Cooper, R.L. (2008) The role of olfactory: comparison of the autonomic response of multiple sensory modalities in crayfish. Univ. of KY, Showcase of Scholars (3rd annual undergraduate research event).

●Stephens, D.*, **Bierbower, S.M.,** Cooper, R.L. (2008) The effect of CO2 on behavior and physiology in crayfish. Univ. of KY, Showcase of Scholars (3rd annual undergraduate research event).

●Allen, C.*, ●Naik, S., **Bierbower, S.M.,** Cooper, R.L. (2008) Learning and memory in blind crayfish, Orconectes australis packardi. Univ. of KY, Showcase of Scholars (3rd annual undergraduate research event).

●Wright, M.C.*, ●Bocook, E., **Bierbower, S.M.,** Cooper, R.L. (2008) Effects of olfaction and environment on agonistic behavior in the crayfish, *Procambarus clarkii*. Univ. of KY, Showcase of Scholars (3rd annual undergraduate research event).

●Holmes, K.*, **Bierbower, S.M.,** Cooper, R.L. (2008) Effects of exercise duration and environment on the autonomic response in crayfish, *Procambarus clarkii*. Univ. of KY, Showcase of Scholars (3rd annual undergraduate research event).

●Naik, S.*, **Bierbower, S.M.,** Cooper, R.L. (2008) Learning and memory in crayfish. Univ. of KY, Showcase of Scholars (3rd annual undergraduate research event).

●Bocook, E.*, **Bierbower, S.M**., Cooper, R.L. (2008) A quantifiable measure of interaction intensity influenced by environmental factors in blind crayfish. Univ. of KY, Showcase of Scholars (3rd annual undergraduate research event).

●Stephens, D.*, **Bierbower, S.M.,** Kolasa, J., Adami, M., Cooper, R.L. (2008) Heart and ventilatory measures in crayfish during altered environments. Annual meeting of the BlueGrass Chapter of the Society for Neuroscience, University of Kentucky.

Bierbower, S.M.*, Cooper, R.L. (2008) The mechanistic effects of CO2 on physiology and behavior in Procambarus clarkii. Annual meeting of the BlueGrass Chapter of the Society for Neuroscience, University of Kentucky.

●Spence, T.*, ●McLaurine, T., **Bierbower, S.M.,** Cooper, R.L. (2008) Chemosensory induced behavioral and physiological responses in crayfish. NCUR- National Council on Undergraduate Research. Salisbury University, Salisbury, MD.

●Spence, T.*, **Bierbower, S.M**., Cooper, R.L. (2007). Chemosensory: Identification of the Physiological Response during Chemical Introduction. Kentucky Academy of Sciences, University of Louisville, Louisville, KY.

Bierbower, S.M.*, Cooper, R.L. (2007) The mechanistic effects of CO2 on physiology and behavior in Procambarus clarkii. Society for Neuroscience Annual Meeting, San Diego, CA. 359.1

Chaffins, G.*, **Bierbower, S.M**., Lund, J. (2007) Identification of genes affe3cting stress resistance and lifespan in C. elegans. 16th International C. elegans Meeting, University of California, Los Angeles, CA.

Bierbower, S.M.*, Cooper, R.L. (2007) Behavior and Physiology: Now We Have A Complete Picture. University of Kentucky Department of Biology Graduate Student Association Poster Session, Lexington, Kentucky.

●Spence, T.*, ●McLaurine, T., **Bierbower, S.M.,** Cooper, R.L. (2007) Sensory: Do Some Species Do It Differently? Showcase for Undergraduate Scholars, University of Kentucky, Lexington, KY.

●Stephens, D.*, **Bierbower, S.M.,** Cooper, R.L. (2007) Crayfish: Let's Get Physical. University of Kentucky, Showcase of Scholars (2nd annual undergraduate research event).

Kolasa, J.*, **Bierbower, S.M.**, Adami, M., Cooper, R.L. (2007) Physiological Acclimization in crayfish among environment alterations and social interactions. Southeastern Nerve Net, Orlando, Florida.

●McLaurine, T.*, **Bierbower, S.M.,** Cooper, R.L. (2007) CO_2: How Bad Could It Be? Showcase for Undergraduate Scholars, University of Kentucky, Lexington, KY.

Bierbower, S.M.*, Cooper, R.L. (2007) Behavior and Physiology: Now We Have A Complete Picture. University of Kentucky, Department of Biology Graduate Student Association Poster Session, Lexington, Kentucky.

Kolasa, J.*, **Bierbower, S.M.**, Adami, M., Cooper, R.L. (2006) Heart and ventilatory measures in crayfish during altered environments and social interactions. Society for Neuroscience Annual Meeting, Atlanta, GA.

Badre, N.*, Hayden, B., Kolasa, J., ●Hughes, G., **Bierbower, S.M.**, Adami, M., Desai, M. (2006) Research in Neurophysiology: Calcium's role in Synaptic Transmission, Facilitation, and Behavioral Regulation. Poster's at the Capital, Frankfort, Kentucky.

●Hughes, G.*, Kolasa, J., **Bierbower, S.M.**, Adami, M., Cooper, R.L. (2006) Heart and ventilatory measures in crayfish during altered environments and social interactions. Kentucky Academy of Sciences, Moorehead, Kentucky.

Bierbower, S.M.*, Cooper, R.L. (2006) Evidence for the autonomic nervous system in decapod crustaceans: a historical perspective. Annual Meeting of Society for Neuroscience, Atlanta, Georgia

Bierbower, S.M.*, Sparkes, T.C. (2006) Parasite-mediated sexual selection in an intermediate host, *Caecidotea intermedius* (Isopoda): effects of male mating response. Annual Meeting of Society for Neuroscience, Atlanta, Georgia

Bierbower, S.M.*, Sparkes, T.C. (2006) Parasite-related changes in the mating behavior of the intermediate host, *Caecidotea intermedius*

(Isopoda): is modification dependent on ecological context? Annual Meeting of the Animal Behaviour Society, Snowbird, Utah

Bierbower, S.M.*, Sparkes, T.C. (2006) Parasite-mediated sexual selection in an intermediate host, *Caecidotea intermedius* (Isopoda): male mating response, sperm viability and energetic state. Midwest Ecology and Evolution Conference, St. Louis University, St. Louis, Missouri

Bierbower, S.M.*, Sparkes, T.C. (2006) Parasite-mediated sexual selection in an intermediate host, *Caecidotea intermedius* (Isopoda): effects of male mating response, sperm production and energetic state. Annual Meeting of the Society of Integrative and Comparative Biology, Orlando, Florida

Bierbower, S.M.*, Sparkes, T.C. (2005) Parasite-related changes in male mating behavior in an intermediate host; effects of sperm supplies. Annual Meeting of the Animal Behaviour Society, Snowbird, Utah

PROFESSIONAL SOCIETIES

The *Sigma Xi* Scientific Research Society
AAAS
Society for Neuroscience
Animal Behavior Society
American Society for Parasitologists
Society for Conservation Biology

UNDERGRADUATE RESEARCH

Research Assistant: University of Georgia – Complex Carbohydrate Research Center (CCRC), Athens, GA. *Harpin Z protein produced by the plant pathogenic bacterium* Pseudomonas syringae pv. Syringae. *Harpin Z elicits the hypersensitive response (HR) in plants. The ultimate target of Harpin Z is unknown; however, past studies have shown that it binds the plant cell wall. We developed an efficient protocol to isolate the protein in large quantities, and performed preliminary analyses to determine the cell wall component that binds Harpin Z. Harpin Z was shown to associate with a plant cell-wall component present in a pectic preparation. In addition, it was found that the cell wall component is EPG sensitive.*

Research Assistant: University of Georgia – Psychology Department, Athens, GA. *The research examined Capuchin monkey motor task skills and the correlation with memory.*

TECHNICAL SKILLS

Statistical Analysis Software
Data Analysis Software (SigmaPlot, Chart, Scope)
Organismal Dissections
DNA and RNA Isolation techniques
Western Blot Analysis
DNA Gel Electrophoresis
SDS-PAGE Protein Gel Electrophoresis
PCR
Gas Chromatography
HPLC
Organism Sectioning Techniques
Ability to design and conduct field-based experiments
Electrophysiology
Physiology: Automonic Response experimentation
Learning paradigm development and experimentation

PROFESSIONAL SCIENCE APPOINTMENTS

2004 TAP Pharmaceuticals, *Research and Development*
2002 Pinnacle Priority Group, *Research and Development*

RESEARCH INTERESTS

Neurophysiology
Neuroethology
Behavioral Ecology
Animal Behavior
Parasite-Host Relationships

REFERENCES

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