

# CURRICULUM VITAE

## KEN R. HELMS

DEPARTMENT OF BIOLOGY, UNIVERSITY OF VERMONT, BURLINGTON, VT 05405

Phone: (802) 656-9012, Fax: (802) 656-2914, email: khelms@uvm.edu

### EDUCATION

PH.D. ZOOLOGY. 1994. *Arizona State University, Tempe, Arizona*

M.S. ZOOLOGY. 1987. *University of Nevada, Reno, Nevada*

B.S. ZOOLOGY. 1983. *Oregon State University, Corvallis, Oregon*

### AREA OF SPECIALIZATION

Social Evolution, Behavior and Ecology of Social Insects, Ecology of Invasive Species, Sex Ratio Evolution and Parental Investment Theory

### PROFESSIONAL EMPLOYMENT

RESEARCH ASSISTANT PROFESSOR. Department of Biology, University of Vermont Burlington, Vermont. SEPTEMBER 2004 – PRESENT

ASSISTANT RESEARCH SCIENTIST. Department of Entomology, Texas A&M University. SEPTEMBER 2002 – SEPTEMBER 2004

PREMIER ASSISTANT (POSTDOCTORAL FELLOW). Department of Ecology and Evolution, University of Lausanne, Lausanne, Switzerland. SEPTEMBER 2000 – SEPTEMBER 2002

POSTDOCTORAL RESEARCHER. Department of Entomology, Texas A&M University College Station, Texas. AUGUST 1998 – SEPTEMBER 2000

ENTOMOLOGIST. Arizona Department of Agriculture. Phoenix, Arizona. 1996 – 1998

FACULTY CONSULTANT. Columbia University (at Biosphere 2), Oracle, Arizona. 1996

TEMPORARY FACULTY. Department of Biology, Northern Arizona University, Flagstaff, Arizona. 1996

POSTDOCTORAL RESEARCHER. *Department of Biology, Arizona State University, Tempe, Arizona.* 1995

FACULTY ASSOCIATE. *Department of Biology, Arizona State University, Tempe, Arizona.* 1994

## **COURSES TAUGHT AS FACULTY, MENTORING**

UNIVERSITY OF VERMONT, BURLINGTON, VERMONT. Mentor for undergraduate research (BIO 191, 193). 2005, 2006, 2007, 2008.

UNIVERSITY OF VERMONT, BURLINGTON, VERMONT. Mentor for undergraduate research. Interdisciplinary Training in Mathematics and Biology Program. 2005, 2006, 2007.

UNIVERSITY OF LAUSANNE, LAUSANNE, SWITZERLAND. Mentor for undergraduate research projects in Zoology and Evolution Modules. 2001, 2002.

TEXAS A&M UNIVERSITY, COLLEGE STATION, TEXAS: Graduate Seminar: Social Insects (Co-Instructor): ENTO 681. 2000

NORTHERN ARIZONA UNIVERSITY, FLAGSTAFF, ARIZONA: Behavior of Animals, BIO 366. 1996

ARIZONA STATE UNIVERSITY, TEMPE, ARIZONA: Animal Behavior, ZOO 280. 1995

## **HONORS, AWARDS, GRANTS**

NATIONAL SCIENCE FOUNDATION. Principle Investigator on a three-year grant (\$506,000 awarded). March 2008 – February 2011

NATIONAL SCIENCE FOUNDATION. Solicited by the Animal Behavior Program Director (Jerry O. Wolff) to serve as a Rotating Program Director (invitation declined). May 2006

U. S. DEPARTMENT OF AGRICULTURE, NATIONAL RESEARCH INITIATIVE. Principle Investigator on a four-year grant (\$346,000 awarded). September 2004 – August 2008

STATE OF TEXAS, TEXAS IMPORTED FIRE ANT RESEARCH AND MANAGEMENT PROGRAM. Co-Principle Investigator on a one-year grant (\$100,000 awarded). September 2003-August 2004

AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE, *SCIENCE UPDATE* RADIO PROGRAM, 5 November 2002. Interview and news story on my research.

NATIONAL PUBLIC RADIO'S *MORNING EDITION* SHOW, 18 September 2002. Interview and news story on my research.

ARIZONA DEPARTMENT OF AGRICULTURE, Employee of the Month, June 1997

ARIZONA STATE UNIVERSITY, Regents Scholarship and Research Assistantship, The Graduate College, 1993-1994

NATIONAL SCIENCE FOUNDATION, Dissertation Improvement Grant, 1990-1992

AMERICAN MUSEUM OF NATURAL HISTORY, Theodore Roosevelt Memorial Grants, 1989, 1992

AMERICAN MUSEUM OF NATURAL HISTORY, Southwestern Research Station Grant, 1990

ARIZONA STATE UNIVERSITY, Research Development Program Grant, The Graduate Student Association, 1990

### **CURRENT SOCIETY MEMBERSHIPS**

Ecological Society of America, International Union for the Study of Social Insects, Society for the Study of Evolution

### **RECENT PRESENTATIONS AT MEETINGS**

HELMS, K. R., J. M. & S. B. VINSON. Does an invasive mealybug, *Antonina graminis*, facilitate the abundance of the red imported fire ant, *Solenopsis invicta*? Meeting of Principal Investigators, National Research Initiative of the U.S. Department of Agriculture, and the Annual Meeting of the Entomological Society of America, San Diego, California, December 2007.

HELMS, K. R. & C. P. HAYDEN. Split sex ratio evolution with simple family relatedness structure and facultative worker biasing (Poster). Annual Meeting of The Society of Mathematical Biology. San Jose, California, July 2007.

HELMS, K. R. & C. P. HAYDEN. Split sex ratio evolution with simple family relatedness structure and facultative worker biasing (Poster). International Congress of the International Union for the Study of Social Insects, XV. Washington, D.C., August 2006.

O'CONNOR, K. P., S. HELMS CAHAN & K. R. HELMS. Primary polygyny in the desert seed-harvester ant, *Messor pergandei* (Poster). International Congress of the International Union for the Study of Social Insects, XV. Washington, D.C., August 2006.

CHANTOS, JILLIAN M., KEN R. HELMS AND S. B. VINSON. Ovipositional behavior of *Neodusmetia sangwani* (Hymenoptera: Encyrtidae) in an invasive host *Antonina graminis* (Hemiptera: Pseudococcidae), and potential impacts on the red imported fire ant, *Solenopsis invicta* (Hymenoptera: Formicidae). XIV International Entomophagous Insects Workshop. Newark, Delaware, June 2006.

HELMS, K. R. & S. B. VINSON. Experimental test of the importance of an invasive mealybug, *Antonina graminis*, as an intermediary in the transfer of plant carbohydrates to the imported fire ant, *Solenopsis invicta*. Entomological Society of America and the International Union for the Study of Social Insects, Annual Meeting, Fort Lauderdale, Florida, December 2005.

CHANTOS, J., K. R. HELMS & S. B. VINSON. Parasitoids targeting the invasive mealybug *Antonina graminis* (Hemiptera: Pseudococcidae) as a host, and potential impact on *Solenopsis invicta* (Hymenoptera: Formicidae) (Poster). Entomological Society of

America and the International Union for the Study of Social Insects, Annual Meeting,  
Fort Lauderdale, Florida, December 2005.

### **RECENT INVITED SEMINARS**

MEETING OF PRINCIPAL INVESTIGATORS, NATIONAL RESEARCH INITIATIVE OF THE U.S.  
DEPARTMENT OF AGRICULTURE, Ventura, California. Effects of the invasive mealybug, *Antonina*  
*graminis*, on the red imported fire ant, *Solenopsis invicta*. February 2007.

UNIVERSITY OF MAINE, Orono, Maine. Is association with an invasive mealybug and its  
introduced host plants important in explaining the success of an invasive ant? October 2006.

### **REFEREE FOR SCIENTIFIC JOURNALS:**

AMERICAN NATURALIST, ANIMAL BEHAVIOUR, ANNALS OF THE ENTOMOLOGICAL SOCIETY OF  
AMERICA, BEHAVIORAL ECOLOGY AND SOCIOBIOLOGY, BEHAVIOUR, CHEMICAL SENSES, CURRENT  
BIOLOGY, ECOLOGICAL APPLICATIONS, ECOLOGICAL ENTOMOLOGY, ECOLOGY, ECOLOGY LETTERS,  
ENVIRONMENTAL ENTOMOLOGY, EVOLUTION, EVOLUTIONARY ECOLOGY, FUNCTIONAL ECOLOGY,  
JOURNAL OF ETHOLOGY, JOURNAL OF INSECT SCIENCE, PAN PACIFIC ENTOMOLOGIST, PROCEEDINGS  
OF THE ROYAL SOCIETY OF LONDON, SERIES B.

### **REFEREE FOR GRANT PROPOSALS:**

UNITED STATES DEPARTMENT OF AGRICULTURE, NATIONAL SCIENCE FOUNDATION

### **PEER REVIEWED PUBLICATIONS**

CHANTOS, J.M., VINSON, S.B. AND K.R. HELMS. 2009. Distribution and abundance of parasites  
of the rhodesgrass mealybug, *Antonina graminis*: reassessment of a classic example of  
biological control in the southeastern United States. *Journal of Insect Science* (In Press).

HELMS, K. R. & S. B. VINSON. 2008. Plant resources and colony growth in an invasive ant: the  
importance of honeydew-producing Hemiptera in carbohydrate transfer across trophic  
levels. *Environmental Entomology* 379: 487-493.

HELMS, K. R., M. REUTER & L. KELLER. 2005. Sex-ratio conflict between queens and workers  
in eusocial Hymenoptera: mechanisms, costs, and the evolution of split colony sex ratios.  
*Evolution* 59: 2626-2638.

KÜMMERLI, R., K. R. HELMS & L. KELLER. 2005. Experimental manipulation of queen number  
affects colony sex ratio investment in the highly polygynous ant *Formica exsecta*.  
*Proceedings of the Royal Society of London, Series B* 272: 1789-1794.

HELMS, K. R. & S. B. VINSON. 2005. Surface activity of native ants co-occurring with an  
invasive species, *Solenopsis invicta*. *Southwestern Entomologist* 30: 223-237.

- REUTER, M, K. R. HELMS, L. LEHMANN & L. KELLER. 2004. Effects of brood manipulation costs on optimal sex allocation in social Hymenoptera. *American Naturalist* 164: E73-E82.
- HELMS, K. R., D. FOURNIER, L. KELLER, L. PASSERA & S. ARON. 2004. Colony sex ratios in the facultatively polygynous ant *Pheidole pallidula*: A reanalysis with new data. *Evolution* 1141-1142.
- HELMS, K. R. & S. B. VINSON. 2003. Apparent facilitation of an invasive mealybug by an invasive ant. *Insectes Sociaux* 50: 403-404.
- LIAUTARD, C., W. D. BROWN, K. R. HELMS & L. KELLER. 2003. Temporal and spatial variations of Gyne production in the ant *Formica exsecta*. *Oecologia* 136:558-564.
- HELMS, K. R. & S. B. VINSON. 2002. Widespread association of the invasive ant, *Solenopsis invicta*, with an invasive mealybug. *Ecology* 83: 2425-2438.
- HELMS, K. R. & S. B. VINSON. 2001. Coexistence of native ants with the red imported fire ant, *Solenopsis invicta*. *Southwestern Naturalist* 46: 396-400.
- HELMS, K. R. & S. B. VINSON. 2000. New host records for the "legless" mealybugs of Texas (Homoptera: Pseudococcidae: *Antonina*, *Antoninoides*). *Southwestern Entomologist* 25:229-231.
- HELMS, K. R., J. H. FEWELL & S. W. RISSING. 2000. Sex ratio determination by queens and workers in the ant *Pheidole desertorum*. *Animal Behaviour* 59:523-527.
- HELMS, K.R. 1999. Colony sex ratios, conflict between queens and workers, and apparent queen control in the ant *Pheidole desertorum*. *Evolution* 53:1470-1478.
- WETTERER, J. K., S. E. MILLER, D. E. WHEELER, C. A. OLSON, D. A. POLHEMUS, M. PITTS, I. W. ASHTON, A. G. HIMLER, M. M. YOSPIN, K. R. HELMS, E. L. HARKEN, J. GALLAHER, C. E. DUNNING, M. NELSON, J. LITSINGER, A. SOUTHERN & T. L. BURGESS. 1999. Ecological dominance by *Paratrechina longicornis* (Hymenoptera: Formicidae), an invasive tramp ant, in Biosphere 2. *Florida Entomologist* 82:381-388.
- CAHAN, S., K. R. HELMS & S. W. RISSING. 1998. An abrupt transition in colony founding behaviour in the ant *Messor pergandei*. *Animal Behaviour* 55:1583-1594.
- HELMS, K. R. 1995. Natural history of the ant *Pheidole desertorum* Wheeler in a desert grassland habitat. *Psyche* 102:35-47.
- HELMS, K. R. 1994. Sexual size dimorphism and sex ratios in bees and wasps. *American Naturalist* 143:418-434.
- HELMS, K. R. AND S. W. RISSING. 1990. Single sex alate production by colonies of *Pheidole desertorum* and *Pheidole xerophila tucsonica* (Hymenoptera: Formicidae). *Psyche* 97:213-

