

CURRICULUM VITAE: **Jon Fewell Harrison**

EDUCATION:

1973-1975 University of Virginia: Biology
1976-1978 University of Toronto: Biology; B.Sc. May, 1978
1978 University of Pittsburgh, School of Medicine: Medicine
1982-1987 University of Colorado, Boulder: Environmental, Population
and Organismic Biology; Ph.D. December, 1987
Thesis Advisor: Dr. Todd T. Gleeson

PROFESSIONAL EXPERIENCE:

1988-1990 Postdoctoral fellow, Dept. of Zoology, University of British Columbia
Postdoctoral supervisor: Dr. John E. Phillips
Jan 1991-Aug 97 Assistant Professor, Dept. of Zoology, Arizona State University
Aug 1997-2002 Associate Professor, Dept. of Biology, Arizona State University
Aug 2002-present Professor, School of Life Sciences, Arizona State University
July 2005- Associate Director (Facilities), School of Life Sciences

MAJOR RESEARCH INTERESTS:

Ecological and evolutionary physiology, insect physiology, respiratory and nutritional physiology

MEMBERSHIPS IN SCIENTIFIC SOCIETIES:

American Association for Advancement of Science, American Physiological Society,
Entomological Society of America, International Union for the Study of Social Insects,
Organization for Tropical Studies, Society for Integrative and Comparative Biology

HONORS:

2005 Elected Fellow of the American Association for the Advancement of Science
2005 Nominated for "Last Lecture Series" for outstanding teaching by ASU students
(Co-Curricular Programs)
2002 Nominated for Dean's Distinguished Teaching Award, College of Liberal Arts
and Sciences, Arizona State University
1998 Nominated for Outstanding Advising Award, College of Liberal Arts and
Sciences, Arizona State University
1997 Nominated for Outstanding Teaching Award, College of Liberal Arts and
Sciences, Arizona State University
1997 Nominated for Outstanding Advising Award, College of Liberal Arts and
Sciences, Arizona State University
1990 The Scholander Award (Best paper by a young investigator)
American Physiological Society, Orlando, FL
1989-90 Izaak Walton Killam Postdoctoral Fellowship
University of British Columbia (2 years)
1988-89 National Science Foundation (NATO) Postdoctoral Fellowship
University of British Columbia (1 year)
1986 Best Student Paper Award, Division of Comparative
Physiology and Biochemistry, American Society of Zoologists, Nashville, TN
1984-1987 University of Colorado Doctoral Fellowship

NATIONAL/INTERNATIONAL SCIENTIFIC OFFICES AND SERVICES:

- Chair, Scholander Award Selection Committee, American Physiological Society, 2006
- Program Officer, Comparative and Evolutionary Physiology Section, American Physiological Society, 2006-2009
- Organizing Committee, International Congress in Comparative Physiology (American Physiological Society), 2004-5
- Co-Organizer (with Stefan Hetz and Timothy Bradley): International Congress in Entomology Symposium on: "O₂ uptake, H₂O loss, and oxygen radical production: finding the balance, Brisbane, Australia, 2004.
- Co-Organizer (with Robert Sterner): Society for Integrative and Comparative Biology Cross-Society Symposium on: "Integrated Research Challenges: Biological Stoichiometry from Genes to Ecosystems:" for Toronto, 2003 meeting.
- Panel Member, Integrative Animal Biology, National Science Foundation, 2005
- Panel Member, Environmental and Evolutionary Physiology, National Science Foundation, 2000, 2005
- Program Officer, Division of Comparative Physiology and Biochemistry, Society for Integrative and Comparative Biology (2000-2003)
- Editorial Board, Physiological and Biochemical Zoology (1999-present)
- Best Student Paper Judge, Division of Comparative Physiology and Biochemistry, Society for Integrative and Comparative Biology, Chicago 2000 meeting
- Scholander Award Competition Judge, Division of Comparative Physiology, American Physiological Society, San Diego meeting, 2000
- Organizer: 21st International Entomological Congress Symposium on "Spiracular mechanisms: ultrastructure and physiology" (Brazil, 2000)
- Co-Organizer (with John E. Phillips): Society for Integrative and Comparative Biology Symposium on "Responses of terrestrial invertebrates to variation in temperature and water availability: molecular, organismal, and evolutionary approaches" (Albuquerque, 1996)
- "Guest-editor", Physiological Zoology volume 67 (1994) for symposium "Respiratory and ionic aspects of insect acid-base regulation"
- Co-Organizer (with John E. Phillips): American Society of Zoologist Symposium on "Insect Acid-Base Regulation", (Vancouver, 1992)
- Nominating Committee, Division of Comparative Physiology and Biochemistry, American Society of Zoologists, 1990-91

Reviewer for:

National Science Foundation, National Institute of Health, American Zoologist, Arthropod Structure and Development, Canadian Entomologist, Comparative Biochemistry and Physiology, Ecology, Evolution, Experientia, Functional Ecology, Insectes Sociaux, Journal of Applied Physiology, Journal of Comparative Physiology, Journal of Experimental Biology, Journal of Experimental Zoology, Journal of Insect Behavior, Journal of Insect Physiology, Journal of Heredity, Insectes Sociaux, International Journal of Insect Morphology, Nature, Naturwissenschaften, Physiological and Biochemical Zoology, Proceedings of the National Academy of Sciences, Proceedings of the Royal Society of London, Respiration Physiology, Science

GRANTS AND AWARDS:

- 2006-2007 DARPA: Synthetic vertebral implant for cyborg insects (subcontract from Univ. of Michigan). \$167,393
- 2004-2008 National Science Foundation award: Atmospheric oxygen effects on insect body size and tracheal function. IBN 0419704. \$633,725.
- 2003-2004 NSF REU (Research Experience for Undergraduates) supplement to IBN 9985857, \$14,000
- 2002 Deutscher Akademischer Austausch Dienst, \$5,000 (Study visit to Humboldt Universität)
- 2002-2004 NSF Doctoral Dissertation Improvement grant to Kendra Greenlee and JFH, IBN-0206678, Effects of body size and development on gas exchange, \$9,951.
- 2001-2003 Beckman Scholars Program, \$106,500, Beckman Foundation (this award funds undergraduate research in Biology and Chemistry & Biochemistry at ASU)
- 2001-2003 NSF Doctoral Dissertation Improvement Grant to Scott Kirkton and JFH, IBN-0104959 Mechanisms and significance of ontogenetic changes in respiratory function during insect locomotion, \$10,000
- 2001-2005 National Science Foundation award: Genotypic and Phenotypic Variation in Foraging Behavior of African and European Honey Bees, IBN 0093410, \$435,000, Co-PI: J.H. Fewell
- 2001 NSF REU (Research Experience for Undergraduates) Supplement to IBN 9985857, \$10,000
- 2000-2004 National Science Foundation award: Body Size and Tracheal Function, IBN-9985857, \$405,000
- 1999-2003 National Science Foundation IRCEB award: Biological Stoichiometry from Genes to Ecosystems, DEB-9977047, \$2,842,162.
ASU Co-PIs: J.J. Elser, W.F. Fagan.
- 1998-2000 National Science Foundation Award, Integrative Animal Biology panel: "Body size and tracheal function in insects", IBN 9728444, \$150,000
- 1999 Arizona State University CLAS Travel Award. \$900.
Travel to International Union of Social Insects meeting, Adelaide, Australia
- 1998-1999 NSF REU (Research Experience for Undergraduates) Supplements to IBN 9728444, \$20,000

GRANTS AND AWARDS (CONTINUED):

- 1994-1998 NSF REU (Research Experience for Undergraduates) Supplements to IBN 9317784, \$35,325
- 1997 - 99 United States Dept of Agriculture Competitive Research Award
 "Mechanisms of Colony Growth and Reproduction in African and European Honey Bees" (97-35302-4395) Co-PI: Jennifer H. Fewell. \$95,000
- 1996 to the Society for Integrative and Comparative Biology
 National Science Foundation Symposium funding: "Responses of terrestrial invertebrates to variation in temperature and water availability: molecular, organismal, and evolutionary approaches", Albuquerque, New Mexico, \$5,985
- 1994-98 National Science Foundation Award, Integrative Animal Biology panel:
 Insect acid-base regulation (IBN 9317784) \$304,000
- 1995-97 National Science Foundation Award,
 Dissertation Improvement Grant to Stephen P. Roberts and JFH,
 (IBN-9521543), \$9,960
- 1991-94 National Science Foundation Award, Physiological Processes panel:
 Insect acid-base regulation (DCB-9020284) \$180,519
- 1994 Arizona State University CLAS Travel Award. \$500.
 Travel to International Union of Social Insects meeting, Paris, France
- 1992-1993 NSF REU (Research Experience for Undergraduates) Supplements to
 DCB-9020284, \$8,000
- 1992 Arizona State University Faculty Grant-in-Aid
 Genetic variation in the metabolic capacity of African, European, and hybrid honey bees. (\$5,350)
- 1992 to American Society of Zoologists (IBN 9204954)
 National Science Foundation Symposium Support
 Symposium: "Respiratory and Ionic Aspects of Acid-base Regulation in Insects, Vancouver, British Columbia" \$6,000
- 1992 with N.B. Grimm, J.J. Elser, J.H. Fewell, S.G. Fisher, T.M. Markow, M.C. Moore, G. Walsberg: Analytical Laboratory for Research in Environmental Biology. National Science Foundation \$170,000

INVITED LECTURES AND SYMPOSIA PRESENTATIONS:

- 2006 Invited speaker for the symposium entitled “Ecophysiology and conservation: the contribution of energetics”, Society for Integrative and Comparative Biology, Orlando, FL
- 2005 Invited speaker for symposium entitled “Phanerozoic O₂: Animals, Plants and Fires”, Earth Systems Processes 2, Calgary, Alberta
Dept. of Entomology, University of Arizona
- 2004 Invited speaker for workshop entitled “Emerging Scientific Opportunities Using X-Ray Imaging”, The Abbey, Fontana, WI (Organized by Argonne National Laboratories)
Invited speaker for workshop on “Sociocomplexity and Genomics in Social Insects”, Wuerzburg, Germany
Invited speaker for symposium entitled “Oxygen, Water and Oxygen Radicals in Insects: Understanding the Balance”, International Congress of Entomology, Brisbane, Australia
Invited speaker for symposium entitled: “Ontogeny of Physiological Regulatory Mechanisms”, Society for Integrative and Comparative Biology, New Orleans, LA
Dept. of Biology, Univ. of Nevada, Las Vegas
- 2003 Dept. of Biology, Univ. of Nebraska
Dept. of Biology, Univ. of North Texas
Dept. of Entomology, Univ. of Arizona
Invited speaker for symposium entitled “Physiological gas exchange: strategies for tracheal systems”, Sixth International Congress of Comparative Physiology and Biochemistry, Mt. Buller, Australia.
- 2002 Invited speaker for symposium entitled “Biological stoichiometry from genes to Ecosystems”, Society for Integrative and Comparative Biology, Toronto, Canada.
Comparative Developmental Physiology Workshop, Glen Rose, TX. Greenlee, K. and J.F. Harrison. Ontogeny of the hyoxia response in insects.
Dept. of Animal Physiology, Universitat Humboldt, Berlin
- 2001 Dept. Zoologie, Univ. of Würzburg
Plenary Presentation for Center for Insect Science Hexapodium

INVITED LECTURES AND SYMPOSIA PRESENTATIONS (CONTINUED):

2001

Invited speaker for symposium entitled "Locomotion and energetics of animals",
Society for Experimental Biology, Canturbury, U.K.

Dept. of Entomology, Univ. of California, Riverside

Invited speaker for symposium entitled "Teaching Physiology in the 21st Century,
American Physiological Society, San Diego

2000

Invited speaker for symposium entitled "Epithelial transport in insects", Society for
Integrative and Comparative Biology

Invited speaker for symposium entitled "Insect Flight", International Congress of
Entomology, Iguazu Falls, Brazil

Invited speaker for symposium entitled "Spiracular Mechanisms: Ultrastructure and
Physiology", International Congress of Entomology, Iguazu Falls, Brazil

1999

Dept. of Life Sciences, Arizona State University, West

1998

Dept. of Entomology, University of Kansas

Dept. of Ecology and Evolutionary Biology, University of Arizona

1997

Dept. of Entomology, Univ. of Arizona

Dept. of Biology, Penn State University

Dept. of Biology, Ohio University

1996

Arizona State University, Tempe, AZ

Dept. of Biology, University of New Mexico, Albuquerque

Dept. of Ecology and Evolutionary Biology, Univ. of California, Irvine

Invited symposium speaker for symposium entitled "Responses of terrestrial
invertebrates to variation in temperature and water availability: molecular, organismal
and evolutionary approaches", Society for Integrative and Comparative Biology,
Albuquerque, N.M.

1995

The "Scholander Lecture". Comparative Section, American Physiological Society,
Experimental Biology, Atlanta, GA.

INVITED LECTURES AND SYMPOSIA PRESENTATIONS (CONTINUED):

- 1995 Invited speaker for symposium entitled "Comparative aspects of Control of Arterial Blood Gases: Ventilatory and Cardiovascular Perspectives". American Society of Zoologists, Washington, D.C
- 1994 USDA W-180 African Honeybee Conference, Tucson, AZ
- 1993 University of Montana, Missoula, MT.
- 1992 University of Arizona School of Medicine, Dept. of Physiology
- 1992 Dartmouth College. Hanover, N.H.
- Invited speaker for symposium entitled "Insect Acid-Base Regulation", American Society of Zoologists, Vancouver, B.C.
- 1991 Center for Insect Science. Tucson, AZ
- 1990 Arizona State University. Tempe, AZ
- San Diego State University. San Diego, CA
- Cleveland State University. Cleveland, OH
- 1989 University of Utah. Salt Lake City, UT
- University of North Carolina. Charlotte, N.C.
- 1988 University of British Columbia. Vancouver, B.C.
- 1987 Colorado State University. Fort Collins, CO.
- 1987 University of California, Irvine. Irvine, CA
- University of British Columbia. Vancouver, B.C.
- Wright State University School of Medicine. Dayton, OH.

MEETING PRESENTATIONS:

- 1984 Entomological Society of America. San Antonio, TX.
Harrison, J.M. Physiological parameters related to flight capacity in worker honeybees as a function of age.
- American Society of Zoologists. Denver, CO.
Harrison, J.M. Physiological changes which increase flight capacity in the foraging caste of honeybees.
- 1985 Guild of Rocky Mountain Population Biologists. Ogden, UT.
Harrison, J.M. and M.D. Breed. Time dependent responses of *Paraponera clavata* workers to nectar sources.
- Guild of Rocky Mountain Population Biologists. Ogden, UT.
Breed, M.D. and J.M. Harrison. Individual odor trails in the giant tropical ant.
- American Society of Zoologists. Baltimore, MD.
Harrison, J.M. Temperature effects on hemolymph pH in locusts.
- 1986 Entomological Society of America. Reno, NV.
Harrison, J.M. Temperature effects on acid-base changes in *Melanoplus bivittatus*.
- American Society of Zoologists. Nashville, TN.
Harrison, J.M. Hemolymph acid-base changes with temperature in *Melanoplus bivittatus*.
- 1987 American Society of Zoologists. Denver, CO.
Harrison, J.M. Respiratory and acid-base responses to hypercapnia in the American locust, *Schistocerca nitens*.
- 1988 Second International Congress of Comparative Physiology and Biochemistry. Baton Rouge, LA. Harrison, J.F. Lactate production and hemolymph acid-base status during hopping in grasshoppers.
- 1989 American Society of Zoologists. Boston, MA.
Harrison, J.F., T.T. Gleeson, and J.E. Phillips. Gas exchange in jumping grasshoppers.
- 1989 American Society of Zoologists. Boston, MA.
Wong, C.J.H., J.F. Harrison, and J.E. Phillips. Buffering and recovery from hemolymph acidosis in locusts.
- American Society of Zoologists. Boston, MA.
Fewell, J.H., J.F. Harrison, T.M. Stiller, and M.D. Breed. Variable recruitment strategies in the giant tropical ant, *Paraponera clavata*.

MEETING PRESENTATIONS, continued:

- 1990 Canadian Society of Zoologists. Burnaby, B.C.
Harrison, J.F., C.J.H. Wong, and J.E. Phillips. Buffering and recovery from hemolymph acid loads in locusts.
- Canadian Society of Zoologists. Burnaby, B.C.
Stagg, A.P., J.F. Harrison, and J.E. Phillips. Role of the Malpighian tubules in recovery from acidosis in locusts.
- American Physiological Society. Orlando, FL.
Harrison, J.F., A.P. Stagg, and J.E. Phillips. Ammonium, total urate, and titratable acid excretion in acid-loaded locusts.
- 1991 Physiological Ecology Conclave, Bishop, CA.
Harrison, J.F. Acid-base regulation in insects.
- Entomological Society of America, Reno, NV.
Harrison, J.F. and J.E. Phillips. Acid and nitrogen excretion in locusts.
- 1992 Physiological Ecology Conclave, Bishop, CA.
Harrison, J.F. and H.G. Hall. Activity metabolism of African, European, and hybrid honey bees.
- American Society of Zoologists. Vancouver, B.C.
Harrison, J.F. and H.G. Hall. Temperature, size, and metabolic influences on the metabolic capacity of African, European, and hybrid honeybees.
- 1993 American Society of Zoologists. Los Angeles, CA.
Krolikowski, K.A., S.L. Gulinson, and J.F. Harrison. Hemolymph acid-base status and the control of ventilation in grasshoppers.
- American Society of Zoologists. Los Angeles, CA.
Harrison, J.F. and J.H. Fewell. High Q₁₀'s for feeding and gut passage in a stenothermic grasshopper.
- 1994 XXII International Meeting of International Union for the Study of Social Insects. Paris, France. Harrison, J.F., D. Nielsen, and R.E. Page.
- American Physiological Society Intersociety Meeting. San Diego, CA.
Harrison, J.F., P. Waclawski, S. Gulinson, and K. Krolikowski. Control of ventilation in locusts.

MEETING PRESENTATIONS, continued:

- 1994 American Physiological Society Intersociety Meeting. San Diego, CA.
Weinsten, R., J.F. Harrison, and R.J. Full. Intracellular pH recovers rapidly in ghost crabs following exhaustion.
- American Society of Zoologists, St. Louis, MO.
Roberts, S.P., N.F. Hadley and J.F. Harrison. Water loss and metabolic rate during flight in the bees *Centris pallida* and *Apis mellifera*.
(*Best student poster award, Division of Comparative Physiology and Biochemistry)
- American Society of Zoologists, St. Louis, MO.
Harrison, J.F., D.I. Nielson, and R.E. Page. Thermal and MDH phenotype effects on the flight metabolism of honey bees.
- American Society of Zoologists, St. Louis, MO.
Gulinson, S.L. and J.F. Harrison. Control of resting ventilation in grasshoppers.
- American Society of Zoologists, St. Louis, MO.
Krolikowski, K.A. and J.F. Harrison. Feedback-independent elevation of post-exercise ventilation rate in grasshoppers.
- 1995 Entomological Society of America, Las Vegas, NV.
Harrison, J.F. Tracheal gas levels, hemolymph pH, and the control of ventilation in grasshoppers.
- 1996 Physiological Ecology Conclave, Bishop, CA.
Harrison, J.F. Oxygen-sensitive flight metabolism in a dragonfly: implications for the evolution of maximal insect body size.
- Society for Integrative and Comparative Biology, Albuquerque, N.M.
Harrison, J.F, K. Greenlee and K. Krolikowski. Mechanisms for variation in gas exchange of grasshoppers.
- Society for Integrative and Comparative Biology, Albuquerque, N.M.
Liao, U.I.S., X. Lui, and J.F. Harrison. Renal regulation of acid-base status in the American locust, *Schistocerca americana*.
- Society for Integrative and Comparative Biology, Albuquerque, N.M.
Feuerbacher, E.N., J.H. Fewell and J.F. Harrison. Metabolic costs of pollen and nectar load carriage. American Zoologist.

MEETING PRESENTATIONS, continued:

- 1997 Experimental Biology, New Orleans, LA
Roberts, S.P., J.F. Harrison and R. Dudley. Mass scaling of kinematics and power during normal and maximal hovering flight performance in the bee *Xylocopa varipuncta*.
- Experimental Biology, New Orleans, LA
Feuerbacher, E., J.H. Fewell and J.F. Harrison. Flight metabolism and kinematics of pollen and nectar load carriage in honey bees.
- Experimental Biology, New Orleans, LA
Greenlee, K. and J.F. Harrison. How do grasshoppers maintain metabolic rates with reduced oxygen availability?
- Experimental Biology, New Orleans, LA
Harrison, J.F., U.I.S. Liao, X. Lui and S.P. Roberts. Localization and quantification of sites of acid-base regulation in the grasshopper.
- 1998 Experimental Biology, San Francisco
Harrison, J.F., K. Greenlee and J.R.B. Lighton. Safety margins and the hypoxia sensitivity of insects.
- Entomological Society of America, Las Vegas, NV.
Harrison, J.F. and U.I. S. Liao-Troth. Measuring fluid and solid flows in locusts: implications for digestive function and pH regulation.
- Entomological Society of America, Las Vegas, NV.
Frazier, M.R. and J.F. Harrison. Dietary acid-base loading in grasshoppers.
- Entomological Society of America, Las Vegas, NV.
McCoy, L.M., J.H. Fewell and J.F. Harrison. Behavioral and physiological differences between African and European honey bee workers.
- 13th International Congress of the International Union for the Study of Social Insects, Adelaide, Australia.
Harrison, J.F., S. Roberts, E. Feuerbacher, J. Fewell, and K. Greenlee. Environmental and genetic effects on the cost of foraging in honey bees: implications for foraging models.

MEETING PRESENTATIONS, continued:

- 1999 Society for Integrative and Comparative Biology, Denver, CO
Greenlee, K.J., J.F. Harrison, and J.H. Fewell. Ontogeny of resting and flight metabolic rates in African and European honey bees.
- Experimental Biology, Washington, D.C.
Espinosa, KA. and J.F. Harrison. Renal modulation of acid-base excretion in response to diet in the American locust.
- Experimental Biology, Washington, D.C.
Lafreniere, J.J., J.F. Harrison and K.J. Greenlee. Ontogenetic development of gas exchange capacities of the primary trachea of the American locust.
- Experimental Biology, Washington, D.C.
Kirkton, S.D. and J.F. Harrison. Oxygen sensitivity of jumping performance in the grasshopper *Schistocerca Americana*
- Animal Behavior Society, Bucknell University, PA.
Fewell, J.H. and J.F. Harrison. Behavioral and Physiological variation between African and European honey bees.
- 2000 Society for Integrative and Comparative Biology, Atlanta, GA
Woods, H.A. and J.F. Harrison. Comparison of acclimatory and evolutionary changes in water balance physiology of larval *Manduca sexta*.
- Society for Integrative and Comparative Biology, Atlanta, GA
Harrison, J.F., J.J. Lafrenie, K.J. Greenlee. Body size effects on gas exchange capacities of primary trachea of the American locust.
- Center for Insect Science Poster Hexapodium, Tucson, AZ
Woods, A.H. and Harrison, J.F. Gene flow, acclimation, and the evolution of water balance physiology in North American *Manduca sexta*.
- Experimental Biology, San Diego, CA
Kirkton, S. D., Petrie, N. and Harrison, J. F. Effects of body size on the oxygen sensitivity of grasshopper jumping.
- Experimental Biology, San Diego, CA
Greenlee, K. J. and Harrison, J. F. Developmental effects on gas exchange in the American locust, *Schistocerca americana*.
- XXI International Congress of Entomology, Foz do Iguassu, Brazil
Frazier, M. R., Harrison, J. F. and Woods, H. A. Interaction of oxygen tension and temperature on insect development.

MEETING PRESENTATIONS, continued:

- 2000 XXI International Congress of Entomology, Foz do Iguassu, Brazil
Kirkton, S. D. and Harrison, J. F. Effects of ontogeny of the oxygen sensitivity of jumping performance in the American locust, *Schistocerca americana*.
- XXI International Congress of Entomology, Foz do Iguassu, Brazil
Greenlee, K.J. and Harrison J.F. Respiratory changes throughout ontogeny in the American locust, *Schistocerca americana*.
- XXI International Congress of Entomology, Foz do Iguassu, Brazil
McCoy, L. M., Fewell, J. H. and Harrison, J. F. Genetic mechanisms contributing to differences in colony growth rates between African and European honey bees.
- Physiological Ecology Meeting, Bishop, CA.
Perkins, M. C., H. A. Woods and J. F. Harrison. Effects of phosphorus on growth in larval *Manduca sexta*.
- Entomological Society of America, Montreal, Canada.
Perkins, M. C., H. A. Woods and J. F. Harrison. Effects of dietary phosphorus on growth of larval *Manduca sexta* on both an artificial and natural diet.
- Pacific Branch of the Entomological Society of America, Costa Mesa, CA.
Perkins, M. C., H. A. Woods and J. F. Harrison. Effects of dietary phosphorus on growth of larval *Manduca sexta*.
- 2001 Society for Integrative and Comparative Biology, Chicago, IL
Kirkton, S. D. and Harrison, J. F. Effects of allometric growth on oxygen sensitivity and jumping performance in the American locust.
- Society for Integrative and Comparative Biology, Chicago, IL
Greenlee, K. J., Harrison, J. F., and Egbert, K. How does the respiratory response to hypoxia change throughout ontogeny in a grasshopper and a caterpillar?
- Center for Insect Science Poster Hexapodium, Tucson, AZ
Hartung, D., Kirkton, S.D. and Harrison, J.F. Developmental variation in the ultrastructure of the jumping muscle from the American locust.

Meeting Presentations, continued

- 2002 Society for Integrative and Comparative Biology, Anaheim, CA.
Woods, H.A., Hobbie, S.E., Makino, W., Cotner, J., Harrison, J.F. and Elser, J.J.
Temperature shifts cause systematic changes in biochemical composition of poikilothermic organisms.
- Society for Integrative and Comparative Biology, Anaheim, CA.
Roberts, S.P., Frazier, M.R., Kirkton, S.D. and Harrison, J.F. Temperature sensitivity of *Drosophila* flight and flight performance.
- Society for Integrative and Comparative Biology, Anaheim, CA.
Harrison, J.F., LaFreniere, J., Hartung, D.A., Greenlee, K. and Kirkton, S.D.
Ontogeny effects on the diffusive and convective conductance of abdominal and leg trachea in *Schistocerca americana* grasshoppers.
- Society for Integrative and Comparative Biology, Anaheim, CA.
Kirkton, S.D. and J.F. Harrison. Effects of body size changes on jumping performance in the American locust.
- Experimental Biology, New Orleans, LA.
Greenlee, K. and J.F. Harrison. Ontogeny of the hypoxia response in insects.
- Experimental Biology, New Orleans, LA
Kirkton, S.D. and J.F. Harrison. Effects of body size change on jumping performance in the American locust.
- Experimental Biology, New Orleans, LA
Hartung, D.K. and J.F. Harrison. Developmental variation in the jumping leg of the American locust.
- The Power of Comparative Physiology: Evolution, Integration and Applied, San Diego, CA
Harrison, J.F., Okoroh, E., Feurbacher, E., Fewell, J.H. and Roberts, S.P. Effects of load type and air temperature on the energetics of load carriage in the honeybee, *Apis mellifera*
- The Power of Comparative Physiology: Evolution, Integration and Applied, San Diego, CA. Greenlee, K. and J.F. Harrison. Variation in oxygen sensitivity in insects of different size and age.
- The Power of Comparative Physiology: Evolution, Integration and Applied, San Diego, CA. Kirkton, S.D., Harrison, J.F., Timmins, G. and Nsika, J. Oxygen delivery problems may reduce jumping performance in larger locusts.
- Society for Integrative and Comparative Biology, Toronto, Ontario.
Kirkton, S.D. and J.F. Harrison. Developmental and interspecific body size effects on grasshopper jumping performance.

Meeting Presentations, continued

- 2003 Sixth International Congress of Comparative Physiology and Biochemistry, Mt. Buller, Australia. Greenlee, K., J.F. Harrison and K. Egbert. Developmental changes in safety margins for gas exchange in caterpillars and grasshoppers.
- Sixth International Congress of Comparative Physiology and Biochemistry, Mt. Buller, Australia. Kirkton, S.D. and J.F. Harrison. Do larger grasshoppers have more problems with oxygen delivery during jumping?
- German International Union for the Study of Social Insects. Weidenmuller, A., J. Fewell and J.Harrison. Energetic costs of thermoregulatory behavior in bumblebees: linking individual differences in metabolic rates to division of labor?
- Physiological Ecology Meeting, Bishop, CA.
Greenlee, K. and J. Harrison. Ontogeny of gas exchange in insects.
- Physiological Ecology Meeting, Bishop, CA.
Kirkton, S.D. and J. Harrison. Jumping to conclusions: body size and oxygen delivery in grasshoppers.
- Physiological Ecology Meeting, Bishop, CA.
Fay, M. and J. Harrison. Effects of dietary phosphorous on grasshopper growth and behavior.
- Physiological Ecology Meeting, Bishop, CA.
La Moure, D., J. Henry and J. Harrison. Do higher atmospheric oxygen levels allow for evolution of larger flies?
- Physiological Ecology Meeting, Bishop, CA.
Rascón, B. and J. Harrison. The effect of oxygen on the metabolic capacity of *Schistocerca americana* during flight.
- 2004 Society for Integrative and Comparative Biology, New Orleans, LA. Henry, J.R. and Harrison, J.F. Plastic and evolved responses of tracheal dimensions to varying atmospheric oxygen content in *Drosophila melanogaster*.
- Society for Integrative and Comparative Biology, New Orleans, LA. Lee, W.K., Harrison, J.F., Greenlee, K., Betz, O. and Westneat, M. Biomechanics of insect respiration and feeding using synchrotron x-ray imaging.
- 2005 Society for Integrative and Comparative Biology, San Diego, CA. Kirkton, S.D and J.F. Harrison. Within instar development reduces locomotory performance but not oxygen delivery to the jumping muscle in the American locust
- Society for Integrative and Comparative Biology, San Diego, CA. Lease, H.M.; Wolf, B.O. and Harrison, J. F.; Ontogeny of Tracheal Volume in *Schistocerca Americana*

Meeting Presentations, continued

2005 Society for Integrative and Comparative Biology, San Diego, CA. Rascón, B, and Harrison, J.F. Atmospheric oxygen effects on metabolic rate and behavior of tethered flying locusts

Society for Integrative and Comparative Biology, San Diego, CA. Greenlee, K.J., Harrison, J.F., Henry, J.R., Westneat, M., Kirkton, S.D. and Lee, W.-K. An analysis of grasshopper tracheal morphology across instars using synchrotron x-ray imaging.

2006 Society for Integrative and Comparative Biology, Orlando, FL. Grayson, D.L., J.F. Harrison and J.H. Fewell. 2005. Foraging effort and metabolism in European and African honey bees. Integrative and Comparative Biology

Society for Integrative and Comparative Biology, Orlando, FL. Rascón, B. J.R. Henry, J.F. Harrison, K. Fezzaa, W-K Lee, J.J. Socha. Peering inside the insect thorax: an examination of thoracic autoventilation in live insects using synchrotron x-rays.

Society for Integrative and Comparative Biology, Orlando, FL. Kaiser, A., C.M. Klok, J. Socha, W.-K Lee, K. Fezzaa, M.C. Quinlan and J.F. Harrison. Structure, function, and allometry of the tracheal system of darkling beetles (Tenebrionidae).

Society for Integrative and Comparative Biology, Orlando, FL. Socha, J.J., J.F. Harrison, W.-K. Lee and M.W. Westneat. Tubes squeeze and air flows out: correlated patterns of CO₂ emission and tracheal compression in the beetle *Patynus decentis*.

Society for Integrative and Comparative Biology, Orlando, FL. Klok, C.J., A. Kaiser, B. McKinley, B. Rascón, J. Henry, W.K. Lee, J. Socha and J.F. Harrison. Plastic and evolutionary responses of body size and tracheal dimensions to atmospheric oxygen concentration in fruitflies.

Experimental Biology Meeting, San Francisco, CA. Blatch, S. and J.F. Harrison. Physiological consequences of a methylation diet in the fruitfly, *Drosophila melanogaster*.

Experimental Biology Meeting, San Francisco, CA. Harrison, J.F., K. Greenlee, J. Henry, S. Kirkton, M. Westneat, J. Socha and W.K. Lee. Hyper-development of the tracheal system in larger insects.

Experimental Biology Meeting, Moscone Convention Center, San Francisco, CA. Rascón B., Henry J.R., Harrison J.F., Fezzaa K., Lee W-K., Socha J.J. Peering inside the insect thorax: an examination of thoracic autoventilation in live insects using synchrotron x-rays.

Meeting presentations, continued

NSF Division of Human Resource Development Joint Annual Meeting, Washington D.C. Rascón B., Henry J.R., Harrison J.F., Fezzaa K., Lee W-K., Socha J.J. Peering inside the insect thorax: an examination of thoracic autoventilation in live insects using synchrotron x-rays.

FASEB Folic Acid and Vitamin B-12 Conference, Palm Springs, CA, Blatch, S. and J.F. Harrison. Physiological consequences of a methylation diet in the fruitfly, *Drosophila melanogaster*.

International Union for the Study of Social Insects, Washington, D.C. Grayson, D., J.F. Harrison and J.H. Fewell. Size alone does not account for differences in metabolic rates between Africanized and European honey bees.

Comparative Physiology 2006: Integrating Diversity (American Physiological Society Intersocietal Meeting, Virginia Beach, VA. Kaiser, A., Klok, C.J., Socha, J.J., Lee, W.K., Quinlan, M.C., Harrison, J.F. No giants today: tracheal oxygen supply to the leg limits beetle size.

Comparative Physiology 2006: Integrating Diversity (American Physiological Society Intersocietal Meeting, Virginia Beach, VA. Klok, C.J., A. Kaiser, W.K. Lee, J. Socha and J.F. Harrison. Physiological constraints of atmospheric oxygen levels on insect size.

Comparative Physiology 2006: Integrating Diversity (American Physiological Society Intersocietal Meeting, Virginia Beach, VA. Blatch, S. and J.F. Harrison. Physiological consequences of methylation diets and folic acid in the fruitfly, *Drosophila melanogaster*.

Comparative Physiology 2006: Integrating Diversity (American Physiological Society Intersocietal Meeting, Virginia Beach, VA. Harrison, J.F., C.J. Klok and B. McKinley. Both larval and pupal hypoxia affect adult size in the fruitfly.

1st International Congress for Respiratory Biology, Bonn, Germany. Klok, C.J. A. Kaiser, W.K. Lee, J. Socha and J.F. Harrison. Physiological constraints of atmospheric oxygen levels on insect body size, tracheal structure and function.

2007

Society for Integrative and Comparative Biology (SICB) Annual Meeting, Phoenix Convention Center, Phoenix, AZ. Rascón B. and Harrison J.F. Death by oxygen.

Society for Integrative and Comparative Biology, Phoenix, AZ. Blatch, S.A. and J. Harrison. 2007. Oral Presentation Folic Acid Physiology in *Drosophila melanogaster*.

Meeting presentations, continued

2007

Society for Integrative and Comparative Biology, Phoenix, AZ. Farzin, M., S.A. Blatch and J.F. Harrison. Effects of atmospheric hypoxia on cell size in adult *Drosophila melanogaster*.

Society for Integrative and Comparative Biology, Phoenix, AZ. Albert, T.W., N. Pierce, C.J. Klok and J.F. Harrison. Normoxic *Drosophila* larvae like it deeper.

Society for Integrative and Comparative Biology, Phoenix, AZ. Klok, C.J., A. Kaiser, W.K. Lee, J.J. Socha and J.F. Harrison. Single- and multi-generational effects of atmospheric oxygen level on body size and tracheal dimensions in *Drosophila melanogaster*.

Society for Integrative and Comparative Biology, Phoenix, AZ. Henry, J. R. and J.F. Harrison. Does body size affect the safety margin for oxygen delivery in flying dragonflies?

Society for Integrative and Comparative Biology, Phoenix, AZ. Grayson, D.L., J.H. Fewell and J.F. Harrison. Why do Africanized honey bees have higher metabolic capacities than Europeans?

TEACHING:

Dept. of Biology, Arizona State University:

1991, Spring and Summer	Zoology 202, Human Anatomy and Physiology
1992, Spring and Summer	Zoology 202, Human Anatomy and Physiology
1992, Fall	Zoology 560, Comparative Physiology Zoology 494, Advanced Human Anatomy and Physiology
1993, Spring	Zoology 202, Human Anatomy and Physiology Zoology 494, Advanced Human Anatomy and Physiology
1993, Fall	Zoology 202, Human Anatomy and Physiology Zoology 494, Advanced Human Anatomy and Physiology Seminar: Zoology 591, Elements in Individuals and Ecosystems
1994, Spring	Zoology 202, Human Anatomy and Physiology Zoology 494, Advanced Human Anatomy and Physiology
1994, Fall	Zoology 560, Comparative Physiology
1995, Fall	Zoology 360, General Physiology Seminar: Zoology 591, General Principles and Current Topics in Insect Physiology
1996, Fall	Zoology 202, Human Anatomy and Physiology Zoology 494, Advanced Human Anatomy and Physiology
1997, Spring	Zoology 560, Comparative Physiology approximate enrollment: 12
1997, Fall	Zoology 202, Human Anatomy and Physiology approximate enrollment: 150, supervised 3 TAs Zoology 494, Advanced Human Anatomy and Physiology Zoology 591, Seminar in Organismal Biology (with J. Fewell)
1998, Spring	Zoology 598, Comparative and Environmental Physiology (co-taught with G. Walsberg); approximate enrollment: 10 Zoology 591, Seminar in Animal Design and Function
1998, Fall	Biology 360, Basic Physiology approximate enrollment: 120, supervised 4 TAs Zoology 591, Seminar in Animal Design and Function

TEACHING (CONTINUED):

1999, Spring	Biology 182, General Biology (co-taught with J. Fewell) approximate enrollment: 250, supervised 6 TAs Zoology 591, Seminar in Animal Design and Function
1999, Fall	Bio 360, Animal Physiology approximate enrollment: 120, supervised 4 TAs Bio 591: Seminar in Biochemical Adaptation (co-taught with J. Hazel) Bio 591: Seminar in Animal Design and Function
2000, Spring	Bio 182, General Biology (co-taught with Dr. Fewell) approximate enrollment: 250, supervised 5 TAs Bio 598, Cellular and Organismal Responses to Stress (with Drs. Orchinik and Deviche) approximate enrollment: 12
2000, Fall	Bio 201, Human Anatomy & Physiology (with R. Satterlie) approximate enrollment: 150, supervised 3 TAs
2001, Spring	Bio 181, General Biology (with J. Wilson-Rawls) approximate enrollment: 380, supervised 8 TAs
2001, Fall	Bio 360, Animal Physiology (with M. Moore) approximate enrollment: 70, supervised 4 TAs Bio 591: Seminar in Comparative Animal Physiology enrollment: 6
2002, Spring	Bio 360, Animal Physiology approximate enrollment: 112 Bio 494: Writing Seminar for Beckman Fellows (enrollment = 6)
2003, Spring	Bio 188, General Biology (with J. Wilson-Rawls) approximate enrollment: 350 (supervised 8 TAs)
2003, Fall	Bio 560 Comparative Physiology, enrollment: 13
2004, Spring	Bio 360, Animal Physiology: approximate enrollment: 160 Bio 361, Animal Physiology lab enrollment 32 (supervised 2 TA's)
2004, Fall	Bio 591, Oxygen Radicals and Oxidative Stress: enrollment: 7
2005, Spring	Bio 360, Animal Physiology: approximate enrollment: 100 Bio 361, Animal Physiology Lab: enrollment: 64 (4 TA's) Bio 591, Seminar in Insect Physiology: approximate enrollment: 9

TEACHING (CONTINUED):

2006, Spring

Bio 591, Seminar in Ecological and Evolutionary Physiology of
Insects: enrollment: 8

2006, Fall

Bio 560, Comparative Animal Physiology: enrollment 8

DEPARTMENTAL and UNIVERSITY SERVICES

1991	Co-Chair, Seminar Committee
1992-93	Advisory Committee (elected) Graduate Committee Organizer: Physiology Discussion Group, Spring 1992
1993-1994	Advisory Committee (elected) Graduate Committee
1994-1995	Advisory Committee (elected) Graduate Committee Search Committee, Integrative Biologist (affirmative action officer)
1995-1996	Advisory Committee (elected) Graduate Committee Search Committee, Theoretical Ecologist (affirmative action officer)
1996-1997	Advisory Committee (elected) Graduate Committee
1997-1998	Chair, Search Committee, Environmental or Evolutionary Physiologist Advisory Committee (elected)
1998-99	Personnel Committee (elected) Exercise Science Executive Committee wrote Beckman Foundation grant for undergraduate research (grant declined)
1999-2000	Advisory Committee (elected) Exercise Science Executive Committee Insect Science Center Executive Committee Chair, Biology Department Seminar Committee wrote Beckman Foundation grant for undergraduate research
2000-2001	Advisory Committee (elected) Graduate Committee Exercise Science Executive Committee Insect Science Center Executive Committee Wrote Beckman Foundation grant for undergraduate research Chair, Beckman Scholar Steering Committee

DEPARTMENTAL and UNIVERSITY SERVICES, continued

- 2001-2002 Chair, Search Committee for Director of Interdisciplinary Ph.D.
 Program in Exercise Science
 Exercise Science Executive Committee
 Insect Science Center Executive Committee
 Chair, Beckman Scholar Steering Committee
 Life Sciences Reorganization Committee
- 2002-2003 sabbatical
 Exercise Science Executive Committee
 Insect Science Center Executive Committee
 Chair, Search Committee for Anatomy and Physiology Lab Coordinator
- 2003-2004 Insect Science Center Executive Committee
 Initiative Programs Committee Member, elected
 Evolutionary and Systems Biology committee member
 SOLS Director Search Committee member, elected, affirmative action officer
 Physiology lecturer search committee member, affirmative action officer
- 2004-2005 Insect Science Center Executive Committee
 Initiative Programs Committee Member, elected
 Chair, Honey Bee Reproductive Physiology Search Committee
 ISTB-1 Ad Hoc Building Committee
 OISB Hiring Proposal Proposal Ad-Hoc Committee
- 2005-2006 Associate Director for Facilities, School of Life Sciences
 Safety Committee (ex-officio)
 AP Personnel committee
 Physiology Curriculum Committee
 Insect Science Center Executive Committee
- 2006-2007 Associate Director for Facilities, School of Life Sciences
 Safety Committee (chair during fall, 2006, member in spring 07)
 Chair, Graduate Programs Associate Director Search Committee
 Insect Science Center Executive Committee

MENTORING

Current Postdoctoral Fellows: C.J. Klok (Ph.D., 1999, University of Pretoria), John Vandenberg (Ph.D. 2006, Yale University)

Past Postdoctoral Fellows: 1998-2001, H. Arther Woods (Ph.D, 1998, Univ. of Washington, currently Assistant Professor at Univ. of Montana, Missoula); summer 1997, Patricia Ashby, Ph.D. 1987, Univ. of New Mexico, currently Assistant Professor, Scottsdale Community College

Matriculated Graduate Students: Kendra Greenlee (Ph.D. May 2004, NSF Doctoral Dissertation Improvement Grant, EPA Star Award, currently NIH PDF at Baylor College of Medicine); Melanie Frazier (M.Sc. 2000, currently Ph.D. student, Univ. of Washington), Scott Kirkton (Ph.D. May 2004, NSF Doctoral Dissertation Improvement Grant, Best Student Paper, Society for Experimental Biology 2002, Best Student Paper, SICB 2003; NIH PDF at Scripps Research Institute, San Diego, currently Assistant Professor, Union College); Marc Perkins (M.Sc. 2001, currently Assistant Professor, Orange County Community College); Steven Roberts (Ph.D. May, 1998, Outstanding Graduate of the College of Liberal Arts and Sciences, currently Associate Professor, Univ. of Nevada, Las Vegas)

Current Graduate Students: Sydella Blatch, Joanna Henry, Brenda Rascon, James Waters

Graduate Committee Service: student in the Dept. of Biology, Arizona State University unless otherwise indicated):

Past:

Kirk Anderson, Patricia Ashby (Univ. of New Mexico), Susan Bertram, Chris Breitmeyer, Michael Bizeau, Michael Black, Michael Crowley (Exercise Science), Dean R. Dobberfuhr, Jennifer Edmonds, G. Ian Gallicano, Martin Gerrits, Ty Hoffman, Richard Howlett (Exercise Science), Matt Jackman (Exercise Science), Glennis Julian, Michael Kennedy, Rosemary Knapp, Eva Lacy, Neil Mackay, Devin Martin, Susan McKinley, Este Miranda, Lee McCoy, Dale Pasino, Randi Papke, John Robertson, Michael Quinlan, Darleen Sandoval (Exercise Science), Randy Tracy, Tina Traustidottir (Exercise Science), Todd Weaver, Todd McWhorter (Univ. of Arizona), Adrienne Williams (Univ. of California, Irvine), Blair Wolf, Mark Wooden, Mathew Wright, Kasey Yturalde, John Zehmer

Current:

Rebecca Clark, Dina Grayson, Tamar Helmy, Kate Ihle, Justin Merry, Nathan Morehouse, John Olson (Utah State Univ.), James Watts

MENTORING, continued

Undergraduate Researchers Supervised (current status):

Past:

Aaron Bruce (M.D., Midwestern University)
TimaSue Cantu (Gates Scholar, conducting currently in nursing school)
Patricia Coulter (unknown)
Margaret Creswell (Ph.D., Univ. Texas, Austin, Biology),
Seth Dobrin (Ph.D., A.S.U., Microbiology),
Kristina Egbert (unknown)
Kyra Espinosa (B.Sc., Bioengineering, A.S.U.)
Erica Feuerbacher (currently in Ph.D. program, Univ. North Texas),
Melanie Frazier (currently in Ph.D. program, University of Washington)
James Gerace (M.D., DePaul Univ. Medical School),
Nicholas Gonzalez (M.D., Univ. Wisconsin Medical School),
John Gransee (B.A. in Psychology from ASU, currently a counselor)
Kendra Greenlee (currently postdoctoral fellow, Baylor Medical School)
Joy Gur-Lavi (M.D., Emory Univ. Medical School),
Olivera Grubisha (unknown)
Scotti Gulinson (DVM, Univ. Calif. Veterinary School, Davis),
Steve Hammet (M.D., Univ. of Arizona)
DeeAnn Hartung (currently in Ph.D. program, Univ. of California, Santa Barbara)
Joanna Henry (currently in M.Sc. program at ASU)
Alexander Keyel (currently applying to Biology Ph.D. programs)
Sakina Kino (B.Sc., Biochemistry degree at ASU, unknown)
Katie Krolikowski (Ph.D., Harvard Univ., Biology, currently postdoc at U.C. Davis),
Jesse LaFrenier (architect)
Dillon LaMoure (B.Sc., ASU, unknown)
Uio Sara Liao (currently software consultant),
Xu Lui (Ph.D. program, Purdue Univ., Biochemistry),
Ekwutosi Ohuro (currently in medical school, Tufts University)
Rekha Nair (currently completing B.Sc. at ASU)
Christina Nebeker (currently completing B.Sc. at ASU)
Jared Nsika (currently in M.D./Ph.D. program at U.C., San Diego)
Andrew Rael (unknown)
Nicole Petrie (unknown)
Brenda Rascon (currently in M.Sc. program at ASU)
Jennifer Stewart (Ph.D., Colorado State Univ., Microbiology, currently a postdoctoral fellow at the Univ. of Hawaii),
Eric Wilkinson (M.D., Stanford Medical School)

Current:

Todd Albert, Greg Burnett, Manoush Farzin, Erica Heinrich, Nicholas Pierce

ACADEMIC DEVELOPMENT

Summer 1993 Hughes Teaching Strategies Workshop (1 month)
 Spring 1994 "Fast Plants" teaching workshop by Paul Williams (1 day)
 Summer 2002 General Biology Workshop (1 week)

PUBLIC SERVICE, OUTREACH

1993 Interview, NBC radio
 1995 Interview, Channel 12, Phoenix
 1995 Interview, Tribune Newspapers
 1991-1996 Judge, Broadmoor Science Fair
 1995-1996 Monthly science demonstrations, Waggoner Elementary School
 1996 Interview, CNN (Bailey Barash)
 1996 Interview, BBC World News Service (Ruth Linton), phone interview
 broadcast world-wide on "Programme Science", Oct. 4 and 5
 1996 Interview, German News Service (Gisela Ostwald)
 1996 Interview, Washington Post (Kurt Supple)
 1996 Interview, New Scientist Magazine (Ben Crystal)
 1996 Interview, Tribune Newspapers
 1997 Channel 3 Halloween interview re edible insects
 1998 ASU Insight and ASU Research articles re giant insects
<http://researchmag.asu.edu/stories/bugs.html>
<http://researchmag.asu.edu/stories/test.html>
 1999 Featured on KAET (Channel 8): ASU Research
 2000 Interviewed for Raven & Johnson's Biology "Real People Doing
 Real Science" feature
 2001 Interviewed by Annie Bates, BBC
 2002 Interviewed by John Doyle, British channel 6
 2002 Monthly science demonstrations, Waggoner Elementary
 2002 Biology career day: Kyrene Middle School
 2002 Desert Botanical Gardens Presentation: "Hoppin' Hoppers"
 2003 Several science demonstrations, Waggoner Elementary
 2004 New York Times interview: front page article regarding giant insects
 2005 Larry Hanlon, Discovery Magazine
<http://dsc.discovery.com/news/briefs/20050815/megainsect.html>
 Science News Dec. 17, 2005 by Sid Perkins:
http://www.findarticles.com/p/articles/mi_m1200/is_25_168/ai_n16029291
 2006 Dagmar Röhrlich, German Public Radio: Deutschlandfunk
 Multiple science demonstrations at Waggoner Elementary School
 Living on Earth Radio Interview
<http://www.loe.org/shows/segments.htm?programID=06-P13-00042&segmentID=8>
 American Physiological Society News Release
<http://www.the-aps.org/press/conference/vabeach/11.htm>
 Coverage by PHYSORG.COM 16:51, Oct. 2006
<http://www.physorg.com/news79804314.html>

Public Service/Outreach Continued

2006

Coverage by EurekaAlert.com:

http://www.eurekaalert.org/pub_releases/2006-10/aps-gim100706.php

Inside JEB:

<http://jeb.biologists.org/cgi/reprint/207/3/387.pdf>

Coverage by LiveScience.Com, article by Charles Choi, Oct. 2006

http://www.livescience.com/animalworld/061011_giant_insects.html

Coverage by ScienceAgogo: "Bow to Your Insect Overlords"

http://www.scienceagogo.com/news/insects_climate.shtml

Coverage by Softpedia, Article by Stefan Anitei

<http://news.softpedia.com/news/More-Oxygen-Would-Mean-Giant-Insects-37643.shtml>

Coverage by What's Next in Science and Technology

http://www.whatsnextnetwork.com/technology/index.php/2006/10/11/more_oxygen_in_atmosphere_produced_giant

Coverage by UnExplainedMysteries.Com

<http://www.unexplained-mysteries.com/viewnews.php?id=80269>

Coverage by Jennifer Vegas, Discovery News

http://dsc.discovery.com/news/2006/10/11/giantbug_ani.html?category=dinosaurs&guid=20061011140030

Coverage by Mongabay.Com

<http://news.mongabay.com/2006/1010-insects.html>

ABC News: Dye Hard Science

<http://abcnews.go.com/Technology/DyeHard/story?id=2578773&page=1>

Coverage by Tribe.net

<http://tribes.tribe.net/strangephenomena/thread/90bb6cc9-fb5f-4bca-be8e-1c83c3bd1920>

Coverage by CreationontheWeb.com

<http://www.creationontheweb.com/content/view/4686/>

Coverage by NSF

[http://www.nsf.gov/news/mmg/mmg_disp.cfm?med_id=51729&from=googlebot\(at\)googlebot.com](http://www.nsf.gov/news/mmg/mmg_disp.cfm?med_id=51729&from=googlebot(at)googlebot.com)

2007

Coverage by TrueAuthority.com

<http://www.trueauthority.com/dinosaurs/death2.htm>

REVIEWED PUBLICATIONS:

1. Harrison J.M. 1986. Caste-specific changes in the flight capacity of honeybees. *Physiological Zoology* 59(2):175-187.
2. Gleeson T.T., and J.M. Harrison. 1986. Reptilian skeletal muscle: fiber type composition and enzymatic profile in the lizard *Iguana iguana*. *Copeia* 1986:324-332.
3. Harrison J.M. 1987. Roles of individual honeybee workers and drones in colonial thermogenesis. *Journal of Experimental Biology* 129:53-61.
4. Harrison J.M., and M.D. Breed. 1987. Temporal learning in the giant tropical ant, *Paraponera clavata*. *Physiological Entomology* 12:317-320.
5. Breed M.D., and J.M. Harrison. 1988. Individually discriminable recruitment trails a Ponerine ant. *Insectes Sociaux* 34:222-226.
6. Gleeson, T.T. and J.M. Harrison. 1988. Muscle composition and its relation to sprint running in the lizard *Dipsosaurus dorsalis*. *American Journal of Physiology* 255:R470-R477.
7. Breed M.D., and J.M. Harrison. 1988. Worker size, ovary development and division of labor in the giant tropical ant, *Paraponera clavata*. (Hymenoptera: Formicidae). *Journal of the Kansas Entomological Society*. 61:285-291.
8. Harrison, J.M. 1988. Temperature effects on haemolymph acid-base status *in vivo* and *in vitro* in the two-striped grasshopper, *Melanoplus biviattus*. *Journal of Experimental Biology* 140:421-435.
9. Harrison, J.F., J.H. Fewell, T.M. Stiller, and M.D. Breed. 1989. Effects of experience on utilization of orientation cues in the giant tropical ant. *Animal Behaviour* 37:869-871.
10. Harrison, J.M. 1989. Temperature effects on intra- and extracellular acid-base status in the American locust, *Schistocerca nitens*. *Journal of Comparative Physiology B* 15:763-770.
11. Breed, M.D. and J.. Harrison. 1989. Arboreal nesting in the giant tropical ant, *Paraponera clavata* (Hymenoptera: Formicidae). *Journal of the Kansas Entomological Society* 62:133-135.
12. Harrison, J.F. 1989. Ventilatory frequency and haemolymph acid-base status during short-term hypercapnia in the locust, *Schistocerca nitens*. *Journal of Insect Physiology* 35:809-814.
13. Harrison, J.F., C.J.H. Wong and J.E. Phillips. 1990. Haemolymph buffering in the locust *Schistocerca gregaria*. *Journal of Experimental Biology* 154:573-579.

REVIEWED PUBLICATIONS, CONTINUED:

14. Harrison, J.F., J.E. Phillips and T.T. Gleeson. 1991. Activity physiology of the two-striped grasshopper, *Melanoplus bivittatus*: gas exchange, hemolymph acid-base status, lactate production, and the effect of temperature. *Physiological Zoology*. 64:451-472.
15. Fewell, J.H. and J.F. Harrison. 1991. Flexible seed selection by the western harvester ant, *Pogonomyrmex occidentalis*. *Behavioral Ecology and Sociobiology*. 28:377-384.
16. Stagg, A.P., J.F. Harrison, and J.E. Phillips. 1991. Acid-base parameters in Malpighian tubule secretion and response to acidosis. *Journal of Experimental Biology* 159:433-447.
17. Breed, M.D., T.M. Stiller, J.H. Fewell, and J.F. Harrison. 1991. Intercolonial interactions and nestmate recognition in the giant tropical ant, *Paraponera clavata*. *Biotropica* 23:301-306.
18. Harrison, J.F., C.J.H. Wong, and J.E. Phillips. 1992. Recovery from acute haemolymph acidosis in locusts: I. Acid transfer to the alimentary lumen is the dominant mechanism. *Journal of Experimental Biology* 165:85-96.
19. Harrison, J.F. and J.E. Phillips. 1992. Recovery from acute haemolymph acidosis in locusts: II. Role of ammonium and titratable acid excretion. *Journal of Experimental Biology* 165:97-110.
20. Fewell, J.H., Harrison, J.F., Stiller, T.M., and M.D. Breed. 1992. Distance effects on resource profitability and recruitment in the giant tropical ant, *Paraponera clavata*. *Oecologia*. 92:542-547.
21. Harrison, J.F. and G. Hall. 1993. African-European hybrid honeybees have low nonintermediate metabolic capacities. *Nature* 363:258-260.
22. Harrison, J.F. and M.L. Kennedy. 1994. *In vivo* studies of the acid-base physiology of grasshoppers: the effect of feeding state on acid-base and nitrogen excretion. *Physiological Zoology*. 67:120-141.
23. Harrison, J.F. 1994. Respiratory and ionic aspects of acid-base regulation in insects. An introduction. *Physiological Zoology*. 67:1-6.
24. Harrison, J.F. and J.H. Fewell. 1995. Thermal effects on feeding behavior and net energy intake in a grasshopper experiencing large diurnal fluctuations in body temperature. *Physiological Zoology*. 68:453-473.
25. Harrison, J.F. 1995. Nitrogen metabolism and excretion in locusts. In: *Nitrogen Metabolism and Excretion* (eds: Walsh, P.J. and P.A. Wright). CRC Press.
26. Harrison, J.F., N.F. Hadley, and M.C. Quinlan. 1995. Acid-base status and spiracular control during discontinuous ventilation in grasshoppers. *Journal of Experimental Biology*. 198:1755-1763.

REVIEWED PUBLICATIONS, CONTINUED:

27. Gulinson, S.L. and J.F. Harrison. 1996. Control of resting ventilation in grasshoppers. *Journal of Experimental Biology* 199:379-389.
28. Krolikowski, K.A. and J.F. Harrison. 1996. Haemolymph acid-base status, tracheal gas levels, and the control of post-exercise ventilation rate in grasshoppers. *Journal of Experimental Biology* 199:391-399.
29. Harrison, J.F., D. Neilson, and R.E. Page. 1996. Malate dehydrogenase genotype, temperature and colony effects on flight metabolic rate in the honey bee, *Apis mellifera*. *Functional Ecology* 10:81-88.
30. Fewell, J.H., J.R.B. Lighton, J.F. Harrison, T.M. Stiller, and M.D. Breed. 1996. Energetics of foraging in the giant tropical ant, *Paraponera clavata*. *Oecologia* 105:419-427.
31. Harrison, J.F., J.H. Fewell, S.P. Roberts, and H.G. Hall. 1996. Achievement of thermal stability by varying metabolic heat production in flying honeybees. *Science*. 284:88-90.
32. Suarez, R.K., J.R.B. Lighton, B. Joos, S.P. Robert and J.F. Harrison. 1996. Energy metabolism, enzymatic flux capacities and metabolic flux rates in flying bees. *Proceedings of the National Academy of Science* 93:12616-12620.
33. Joos, B., J.R.B. Lighton, J.F. Harrison, R.K. Suarez and S.P. Roberts. 1997. Effects of ambient oxygen tension on flight performance, metabolism and water loss of the honeybee. *Physiological Zoology* 70:167-174.
32. Harrison, J.F. 1997. Ventilatory mechanism and control in grasshoppers. *American Zoologist* 37:73-81.
33. Harrison, J.F., J.H. Fewell, S.P. Roberts, and H.G. Hall. 1997. Letter: Honeybee thermoregulation. *Science* 276:1016-1017.
34. Harrison, J.F. 1998. An introduction to "Responses of terrestrial arthropods to variation in the thermal and hydric environment: molecular, organismal and evolutionary approaches" *American Zoologist* 38:413-417.
35. Roberts, S.P. and J.F. Harrison. 1998. Mechanisms of thermoregulation in flying bees. *American Zoologist* 38:492-502.
36. Harrison, J.H. and J.R. Lighton. 1998. Oxygen sensitive flight metabolism in the dragonfly, *Erythemis simplicicollis*. *Journal of Experimental Biology* 201:1739-1744.
37. Roberts, S.P., J.F. Harrison and N.F. Hadley. 1998. Mechanisms of thermal balance in flying *Centris pallida* (Hymenoptera:Anthoporidae). *Journal of Experimental Biology* 201:2321-2331.

REVIEWED PUBLICATIONS, CONTINUED:

38. Greenlee, K.J. and J.F. Harrison. 1998. Acid-base and respiratory responses to hypoxia in the grasshopper *Schistocerca americana*. *Journal of Experimental Biology* 201:2843-2855.
39. Roberts, S.P. and J.F. Harrison. 1999. Mechanisms of thermal stability during flight in the honey bee *Apis mellifera*. *Journal of Experimental Biology* 202:1523-1533.
40. Elser, J. J., Sterner, R. W., Gorokhova, E. Fagan, W. F., Markow, T. A., Cotner, J. B., Harrison, J. F., Hobbie, S. E., Odell, G. M. and Weider, L. J. 2000. Biological stoichiometry from genes to ecosystems. *Ecology Letters*, 3: 540-550.
41. Harrison, J.F. and S.P. Roberts. Flight respiration and energetics. 2000. *Annual Review of Physiology* 62:179-205.
42. Frazier, M.R., J.F. Harrison and S. Behmer. 2000. Effects of diet on titratable acid-base excretion in grasshoppers. *Physiological and Biochemical Zoology* 73:66-76.
43. Harrison, J.F. Insect acid-base physiology. 2001. *Annual Review of Entomology* 46:221-250.
44. Woods, H.A. and J.F. Harrison. 2001. The beneficial acclimation hypothesis versus acclimation of specific traits: physiological change in water-stressed *Manduca sexta* caterpillars. *Physiological and Biochemical Zoology* 74:32-44.
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Kendra J. Greenlee, Christina Nebeker and Jon F. Harrison. Body size-independent safety margins for gas exchange across grasshopper species. Submitted to the *Journal of Experimental Biology*.

Kendra J. Greenlee, Joanna R. Henry, Scott D. Kirkton, Mark W. Westneat⁴, Kamel Fezzaa, Wah-Keat Lee and Jon F. Harrison. Tracheal hyper-investment explains oxygen limits on insect size. Submitted to *PLOS Biology*.

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