

## CURRICULUM VITAE

### **Ann M. Ray**

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### **Personal History and Professional Experience**

#### Educational Background

- B. A. (2003) Biology Department, Bellarmine University, Louisville, KY  
Minor concentration in chemistry, *Magna cum laude*
- M. S. (2005) Department of Entomology, UIUC, Dr. Lawrence M. Hanks, advisor.  
Thesis title: Predicted taxonomic patterns in pheromone production by cerambycid beetles.
- Ph. D. (expected 5/2009) Department of Entomology, UIUC, Dr. Lawrence M. Hanks, advisor.

#### Intensive Training

- Agilent Technologies, Interpretation of Mass Spectra H4063A, Schaumburg, IL, 10–12 August 2004
- ESEM Training, Philips XL30 ESEM-FEG, Beckman Institute for Advanced Science and Technology, Urbana, IL, August 2004

### **Honors, Recognitions and Outstanding Achievements**

- Monsignor Horrigan Scholarship, Bellarmine University; 1999–2003
- Dean's List, Bellarmine University; six semesters, Fall 2000–Spring 2003
- Research Assistantship – Kentucky Biomedical Research Infrastructure Network, Bellarmine University; 2002
- Faculty Merit Award, Natural Sciences, Bellarmine University; April 2003
- List of Teachers Ranked Excellent by their Students, UIUC, for course Organismal and Evolutionary Biology (Spring 2004); course Introduction to Entomology (Fall 2004)
- Elected to associate membership of Sigma Xi; 2006
- Student and Young Professional Award, Entomological Society of America; January 2008
- North Central Branch Graduate Student Scholarship, Entomological Society of America; 2008
- Educational Project Award, Board Certified Entomologists of Mid-America, for Bugscope Project; 2008
- William H. Luckmann Award for Student Research in Applied Entomology, UIUC Department of Entomology and the Illinois Natural History Survey; July 2008
- Entomological Society of America, Student Competition for the President's Prize, First Place Ten-Minute Talk, Plant-Insect Ecosystems: Behavior, Reno, NV; November 2008

### **Featured Research**

- Image of the Week: May 3, 2005 “Pheromone Gland”, Imaging Technology Group, Beckman Institute for Advanced Science and Technology, UIUC  
<http://www.itg.uiuc.edu/exhibits/iotw/2005-05-03/>

## Grants Received

Graduate College Conference Travel Grant, UIUC; November 2003  
Francis M. and Harlie M. Clark Research Support Grant, UIUC; May 2004  
Animal Behavior Society Student Research Grant; April 2005  
Graduate College Conference Travel Grant, UIUC; April 2005  
Francis M. and Harlie M. Clark Research Support Grant, UIUC; May 2006  
Herbert Holdsworth Ross Memorial Fund Grant, UIUC; May 2006  
Graduate College Conference Travel Grant, UIUC; November 2006  
Francis M. and Harlie M. Clark Research Support Grant, UIUC; May 2007  
Graduate College Conference Travel Grant, UIUC; November 2007  
Francis M. and Harlie M. Clark Research Support Grant, UIUC; May 2008  
Herbert Holdsworth Ross Memorial Fund Grant, UIUC; May 2008

## Invited Presentations

Millar, J. G., L. M. Hanks, J. Moreira, E. S. Lacey, A. M. Ray, and J. Barbour. "Developing pheromone-based detection methods for exotic cerambycid beetles." Exotic/Invasive pests and diseases research program workshop, University of California, Davis, CA, October 2005

Ray, A. M. "Evolution of chemical communication in the longhorned beetles: integrating imaging technology, chemical ecology, and natural history." Imaging Technology Group Forum, Beckman Institute for Advanced Science and Technology, Urbana, IL January 2006

Hanks, L. M., J. G. Millar, J. D. Barbour, E. S. Lacey, and A. M. Ray. "Volatile pheromones of cerambycid beetles." Section C symposium: Semiochemicals mediating behavior of cerambycid beetles, National meeting of the Entomological Society of America. Indianapolis, IN, December 2006

Lacey, E. S., A. M. Ray, J. A. Moreira, J. G. Millar, and L. M. Hanks. "Aggregation pheromones of cerambycine beetles endemic to North America." Section C symposium: Semiochemicals mediating behavior of cerambycid beetles, National meeting of the Entomological Society of America. Indianapolis, IN, December 2006

Ray, A. M. and L. M. Hanks. "Taxonomic patterns in volatile pheromone production by longhorned beetles." Section C symposium: Semiochemicals mediating behavior of cerambycid beetles, National meeting of the Entomological Society of America. Indianapolis, IN, December 2006

Rutledge, C. E., E. S. Lacey, A. M. Ray, J. A. Moreira, J. G. Millar, and L. M. Hanks. "Potential pheromones of an invasive longhorned beetle, *Callidiellum rufipenne* (Coleoptera: Cerambycidae)." Section C symposium: Semiochemicals mediating behavior of cerambycid beetles, National meeting of the Entomological Society of America. Indianapolis, IN, December 2006

Ray, A. M., C. Conway, B. Grosser, and S. J. Robinson. "What does that hair do? Remote-access scanning electron microscopy and the evolution of the Bugscope project." Member symposium: From Field to Screen: Digital Imaging Technology in Entomology, National meeting of the Entomological Society of America. San Diego, CA, December 2007

Hanks, L. M., J. G. Millar, J. D. Barbour, E. S. Lacey, and A. M. Ray. "Semiochemicals of cerambycids that signal across species and trophic boundaries." Member symposium: Semiochemicals that mediate behavior of cerambycid beetles. National meeting of the Entomological Society of America, Reno, NV, November 2008

Ray, A. M., J. G. Millar, and L. M. Hanks. "Volatile pheromones of longhorned beetles." Section symposium: For the love of Longicornia: Cerambycid workers symposium. National meeting of the Entomological Society of America, Reno, NV, November 2008

### **Meetings Organized**

Symposium with Student Affairs Committee; Walking the Entomological Line: Making the Transition from Student to Professional. North Central Branch meeting of the Entomological Society of America, Columbus, OH, March 2008

Section symposium with Amy Berkov; For the Love of Longicornia: Cerambycid Workers Symposium. National meeting of the Entomological Society of America, Reno, NV, November 2008

### **Contributed Talks**

Ray, A. M., M. D. Ginzel, J. G. Millar and L. M. Hanks. "Chemical basis for mate location and recognition in the longhorned beetle *Megacyllene caryae* (Gahan) (Coleoptera: Cerambycidae)." National meeting of the Entomological Society of America. Cincinnati, OH, October 2003

Ray, A. M., M. D. Ginzel, E. S. Lacey, J. G. Millar, and L. M. Hanks. "Taxonomic patterns in the composition of cuticular hydrocarbons of longhorned beetles (Coleoptera: Cerambycidae)." National meeting of the Entomological Society of America. Salt Lake City, UT, November 2004

Ray, A. M., J. B. Nardi, J. G. Millar, S. J. Robinson, H. M. Robertson, and L. M. Hanks. "Antennal sensilla associated with long-range and contact pheromones in longhorned beetles (Coleoptera: Cerambycidae)." North Central Branch meeting of the Entomological Society of America. West Lafayette, IN, March 2005

Rutledge, C. E., E. S. Lacey, A. M. Ray, J. A. Moreira, J. G. Millar, and L. M. Hanks. "Chemical ecology of the small Japanese cedar borer, *Callidiellum rufipenne* (Motschulsky) (Coleoptera: Cerambycidae)." National meeting of the Entomological Society of America. Ft. Lauderdale, FL, December 2005

Lacey, E. S., A. M. Ray, J. G. Millar, and L. M. Hanks. "Behavior associated with pheromone release in the cerambycid beetle *Neoclytus acuminatus acuminatus*." National meeting of the Entomological Society of America, Ft. Lauderdale, FL, December 2005

Ray, A. M., E. S. Lacey, and L. M. Hanks. "Predicted taxonomic patterns in pheromone production by cerambycid beetles." North Central Branch meeting of the Entomological Society of America. Bloomington, IL, March 2006

E. S. Lacey, A.M. Ray, and L. M. Hanks. "Employing pheromone lures to trap cerambycid beetles." National meeting of the Entomological Society of America, San Diego, CA, December 2007

Ray, A. M., and L. M. Hanks. "Phylogenetic relationships and patterns of pheromone use in the Cerambycinae" National meeting of the Entomological Society of America, San Diego, CA, December 2007

Ray, A. M., I. P. Swift, J. S. McElfresh, J. Barbour, J. G. Millar, and L. M. Hanks. "Male-produced volatile aggregation pheromone of the longhorned beetle *Rosalia funebris*" National meeting of the Entomological Society of America, Reno, NV, November 2008

### **Contributed Posters**

Ray, A. M., M. D. Ginzel, J. A. Moreira, J. G. Millar and L. M. Hanks. "Chemical basis for mate location and recognition in the longhorned beetle *Megacyllene caryae* (Gahan)

- (Coleoptera: Cerambycidae).” Joint meeting of the International Society of Chemical Ecology and the Phytochemical Society of North America. Ottawa, Canada, July 2004
- Lacey, E. S., A. M. Ray, J. G. Millar and L. M. Hanks. “Behavior associated with pheromone release in the cerambycid beetle *Neoclytus acuminatus acuminatus*.” Meeting of the International Society of Chemical Ecology. Washington, D. C., July 2005
- Ray, A. M., E. S. Lacey, and L. M. Hanks. “Taxonomic patterns in use of long-range pheromones within the longhorned beetle subfamily Cerambycinae (Coleoptera: Cerambycidae).” Meeting of the International Society of Chemical Ecology. Washington, D. C., July 2005
- Millar, J. G., L. M. Hanks, J. Moreira, E. S. Lacey, A. Ray, and J. Barbour. CSREES-USDA Awardee Workshop at the Gordon Conference on Plant-Herbivore Interactions, Ventura, CA, February 2006

### **Courses Taught**

<u>Year</u>	<u>Spring</u>	<u>Fall</u>
2003		Teaching Assistant, Laboratory Introduction to Animal Biology (IB 104)
2004	Teaching Assistant, Discussion Organismal and Evolutionary Biology (IB 150)	Teaching Assistant, Laboratory Introduction to Entomology (IB 460)

### Other Contributions to Instructional Programs

- Guest lecture, Introduction to Entomology, IB 460, October 2004; “Circulation and thermoregulation.”
- Guest lecture, Introduction to Entomology, IB 460, July 2005; “Pheromones of cerambycid beetles.”
- Guest lecture, Introduction to Pest Management, IB 482, November 2007; Lab presentation: “Semiochemicals in IPM.”
- Guest lecture, Insect Physiology, IB 427, April 2008; Lab presentation: “Physiology of pheromone production in cerambycid beetles.”
- Co-advisor (with L. M. Hanks), Introductory Research, IB 390:  
 Michael Currier 2006, Cuticular hydrocarbons of the Carolina pine sawyer, *Monochamus carolinensis*  
 Paul Masonick and Mark Knaub 2007, Influence of body size in mate competitions in the locust borer, *Megacyllene robiniae*  
 Brett Forrestier 2008, Effects of contamination sources on cuticular hydrocarbons of the red-headed ash borer, *Neoclytus a. acuminatus*

### **Professional Service**

#### Service to Disciplinary or Professional Societies or Associations

- Audiovisual volunteer, National meeting of the Entomological Society of America, Ft. Lauderdale, FL, November 2002
- Employment center volunteer, National meeting of the Entomological Society of America, Salt Lake City, UT, November 2004
- Local Arrangements Committee volunteer, North Central Branch meeting of the Entomological Society of America, Bloomington, IL, March 2006
- Member, UIUC Linnaean Games team, North Central Branch meeting of the Entomological Society of America, Bloomington, IL, March 2006

Registration volunteer, National meeting of the Entomological Society of America, Indianapolis, IN, December 2006  
Registration volunteer, National meeting of the Entomological Society of America, San Diego, CA, December 2007  
Student Affairs Committee, North Central Branch of the Entomological Society of America, 2007–2009, vice-chair, 2008–2009  
Student Affairs Committee, National Entomological Society of America, ad-hoc member, 2007–2008  
Cerambycid Workers network organizer, Entomological Society of America, 2008  
Captain, UIUC Linnaean Games team, North Central Branch meeting of the Entomological Society of America, Columbus, OH, March 2008  
Registration volunteer, North Central Branch meeting of the Entomological Society of America, Columbus, OH, March 2008  
Honorary Awards Committee, North Central Branch of the Entomological Society of America, student member, 2008–2009  
Student Affairs Committee, National Entomological Society of America, North Central Branch Representative, 2008–2010  
Career center volunteer, National meeting of the Entomological Society of America, Reno, NV, November 2008

#### Reviews

Journal manuscripts (N=7): *The Great Lakes Entomologist*, *The Coleopterists Bulletin*, *Journal of Insect Science*, *Insecta Mundi*, *Journal of Economic Entomology*, *Ecological Entomology*  
Pre-publication reviews: *An Illustrated Key to the Longhorned Woodboring Beetles of the Eastern United States*, by S. J. Lingafelter, for the Coleopterists Society (2006)

#### University/Campus Service (UIUC)

Sales coordinator, 21<sup>st</sup> Annual Insect Fear Film Festival, Graduate Student Association, Department of Entomology, February 2004  
President, Graduate Student Association, Department of Entomology, 2004–2006  
Sales and event coordinator, 22<sup>nd</sup> Annual Insect Fear Film Festival, Graduate Student Association, Department of Entomology, February 2005  
Event coordinator, 23<sup>rd</sup> Annual Insect Fear Film Festival, Graduate Student Association, February 2006  
Volunteer, 24<sup>th</sup> Annual Insect Fear Film Festival, Graduate Student Association, February 2007  
Volunteer, 25<sup>th</sup> Annual Insect Fear Film Festival, Graduate Student Association, February 2008  
Graduate student representative, administrator evaluation committee for Dr. May Berenbaum, March 2008

#### **Public Service**

Assistant/ “Bug Hike” Leader, Area 12 Day Camp, Camp Shantituck, Girl Scouts of Kentuckiana, Metro Service Unit, Louisville, KY, July 2002  
Organizer and Coordinator, Cadette Eco-Action Interest Project Workshop, Girl Scouts of Kentuckiana, Metro Service Unit, Louisville, KY, March 2003  
Cooperator with Claus Tittiger, Dept. of Biochemistry, Univ. of Nevada, Reno, on PCR-based survey of cDNAs of wood-boring beetles for genes involved in detoxification of secondary compounds of pines, May 2004  
Media interview for 2005 Insect Fear Film Festival, WCIA-3 Champaign, IL, February 19, 2005

Co-organizer and presenter, Brownie “Bugs” Try-It Activity, Girl Scouts-Green Meadows Council, Urbana, IL, March 2005  
Volunteer, Microscopy Suite, Beckman Institute Open House, UIUC, March 2005  
Advisor to M. Baer, New Jersey, on identification of insects, March and May, 2005  
Consultant to Dr. Claire Rutledge, USDA-ARS, on protocols for extracting cuticular hydrocarbons of longhorned beetles, April 2005  
Consultant to Dr. Christopher Pierce, Coordinator for the Indiana Cooperative Agricultural Pest Survey, USDA-APHIS-PPQ, on obtaining voucher specimens of invasive wood-boring insects, May 2005  
Media interview for 2005 National Science Olympiad, The News-Gazette, Champaign-Urbana, IL, May 23, 2005  
Coordinator, Insect “Fear” Outreach Event, National Science Olympiad, UIUC, May 2005  
Moderator/ Judge, Middle school division “Don’t Bug Me” Trial Event, National Science Olympiad, UIUC, May 2005  
Advisor to L. Connelly, Chicago, IL, on identification of insects, June 2005  
Advisor to D. Carlsen, Park Ridge, IL, on identification of insects, November 2005  
Consultant to Dr. Jon Sweeney, Natural Resources Canada, on pheromone-producing tissues in longhorned beetles, October 2005  
Media interview for 2006 Insect Fear Film Festival, UIUC News Bureau, February 2, 2006  
Advisor to D. Geiman, Chicago, IL, on identification of insects, August 2006  
Advisor to L. Burge, Johnson City, TN, on identification of insects, December 2006  
Coach, Illinois Science Olympiad, “Don’t Bug Me” event, Campus Middle School for Girls, Urbana, IL, Spring 2007  
Volunteer, Microscopy Suite, Beckman Institute Open House, UIUC, March 2007  
Consultant to Dr. Jakub Michalcewicz, Dept. of Forest Entomology, Hugo Kollataj Agricultural University, Krakow, Poland, on the eggs of longhorned beetles, January 2008  
Media interview for 2008 Insect Fear Film Festival, Environmental Almanac, WILL-AM Radio and The News-Gazette, Champaign, IL, February 21, 2008  
Volunteer, Mountains Recreation and Conservation Authority, native plant garden at East Canyon, Newhall, CA, June 2008  
Volunteer, trail mapping, Coalition for America's Wilderness under the guidance of the Community Hiking Club, Santa Clarita, CA, June 2008  
Guest presenter, insect program, Kids Adventure Camp, Placerita Canyon Nature Center, Newhall, CA, August 15, 2008  
Media interview for Bugscope, Pittsburgh Post-Gazette, November 5, 2008  
Advisor to M. Brezic, Willoughby, OH, on identification of insects, November 2008  
Bugscope (ESEM) volunteer, Beckman Institute for Advanced Science and Technology, 2004–present

### **Field Research Experience**

Costa Rica: 2007

Mexico: 2006, 2007, 2008

United States: 2002–present, including Arizona, California (extensive), Illinois, Kentucky

### **Museum Experience**

United States Natural History Museum, Washington, DC, USA: 2006

Illinois Natural History Survey, Champaign, IL, USA: 2007, 2008

Santa Barbara Natural History Museum, Santa Barbara, CA, USA: 2007

San Diego Natural History Museum, San Diego, CA, USA: 2007

Instituto Nacional de Bioversidad (INBio), Heredia, Costa Rica: 2007  
C. A. Triplehorn Collection, The Ohio State University, Columbus, OH, USA: 2008  
California State Collection of Arthropods, California Department of Food and Agriculture,  
Sacramento, CA, USA: 2008  
Essig Museum of Entomology, University of California Berkeley, Berkeley, CA, USA: 2008  
Natural History Museum of Los Angeles County, Los Angeles, CA, USA: 2008

### **Publications**

- Ray, A. M., I. P. Swift, J. A. Moreira, J. G. Millar, and L. M. Hanks. An aggregation pheromone produced by males of the desert cerambycid beetle *Anelaphus inflaticollis* (Coleoptera: Cerambycidae). *Environ. Entomol.* (submitted 22 November 2008)
- Rodstein, J., J. S. McElfresh, J. D. Barbour, A. M. Ray, L. M. Hanks, & J. G. Millar. Identification and synthesis of a female-produced sex pheromone for the cerambycid beetle *Prionus californicus*. *J. Chem. Ecol.* (submitted 12 December 2008)
- Ray, A. M., J. G. Millar, J. S. McElfresh, I. P. Swift, J. D. Barbour, and L. M. Hanks. Male-produced aggregation pheromone of the cerambycid beetle *Rosalia funebris*. *J. Chem. Ecol.* (in press)
- Ray, A. M., M. D. Ginzal, and L. M. Hanks. Male *Megacyllene robiniae* (Coleoptera: Cerambycidae) use multiple tactics when aggressively competing for mates. *Environ. Entomol.* (in press)
- Swift, I. P., and A. M. Ray. 2008. A review of the genus *Tragidion* Audinet-Serville, 1834 (Coleoptera: Cerambycidae: Cerambycinae: Trachyderini). *Zootaxa* 1892: 1–25
- Ray, A. M., C. Conway, U. Thakkar, C. Wallace, and S. J. Robinson. 2008. What does that hair do? Remote-access scanning electron microscopy and the Bugscope project. *Instant Symposium feature: American Entomologist* 54: 232–234
- Lacey, E. S., J. A. Moreira, J. G. Millar, A. M. Ray, and L. M. Hanks. 2007. Male-produced aggregation pheromone of the cerambycid beetle *Neoclytus mucronatus mucronatus*. *Entomol. Exp. Appl.* 122: 171–179
- Lacey, E. S., A. M. Ray, and L. M. Hanks. 2007. Calling behavior of the cerambycid beetle *Neoclytus acuminatus acuminatus*. *J. Insect Behavior* 20: 117–128
- Hanks, L. M., J. G. Millar, J. A. Moreira, J. D. Barbour, E. S. Lacey, J. S. McElfresh, F. R. Reuter, and A. M. Ray. 2007. Using generic pheromone lures to expedite identification of aggregation pheromones for the cerambycid beetles *Xylotrechus nauticus*, *Phymatodes lecontei*, and *Neoclytus modestus modestus*. *J. Chem. Ecol.* 33: 889–1126
- Ginzal, M. D., J. A. Moreira, A. M. Ray, J. G. Millar, and L. M. Hanks. 2006. (Z)-9-Nonacosene, major component of the contact sex pheromone of the beetle *Megacyllene caryae*. *J. Chem. Ecol.* 32: 435–451
- Nearns, E. H. and A. M. Ray. 2006. A new species of *Curius* Newman (Coleoptera: Cerambycidae) from Venezuela with notes on sexual dimorphism within the genus. *Zootaxa* 1256: 49–57
- Ray, A. M., E. S. Lacey, and L. M. Hanks. 2006. Predicted taxonomic patterns in pheromone production by longhorned beetles. *Naturwissenschaften* 93: 543–550

### **Memberships and Affiliations**

Entomological Society of America  
Coleopterists Society  
Society of Systematic Biologists  
Sigma Xi  
American Association for the Advancement of Science