

# Kaitlyn Mathis, PhD

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## Education

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- Ph.D.** Environmental Science, Policy and Management, 2015: University of California-Berkeley  
*Advisor:* Dr. Neil Tsutsui  
*Thesis Title:* Behavioral and chemical ecology of ants (Hymenoptera, Formicidae) and their natural enemies in dynamic coffee agroecosystems.
- B.A.** Insect Ecology and Biochemistry, 2008: Hampshire College

## Professional Experience

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### Research:

- 2015-2018 NIH Postdoctoral Excellence in Research and Teaching (PERT) Fellow, Department of Ecology and Evolutionary Biology, University of Arizona. Collaboration with Judith Bronstein
- 2009-2015 Ph.D. Candidate: Under Dr. Neil Tsutsui, Dept. of ESPM, UC Berkeley, Berkeley, CA
- 2008-2009 Synthetic Chemist: Under Dr. Thomas Horn, Kalinex Inc., User of Lawrence Berkeley National Lab, Berkeley, CA
- 2007-2008 Undergraduate Researcher: Under Dr. Stacy Philpott, Environmental Studies Department, UC Santa Cruz, Santa Cruz, CA
- 2007 Undergraduate Researcher: Under Dr. Brian Schultz, Department of Natural Science, Hampshire College, Amherst, MA
- 2006 Mosquito Control Biological Aide: Delaware Department of Natural Resources and Environmental Control, Milford, DE

### Teaching Experience:

#### *Instructor of Record*

- 2018 **Intro to Biostatistics** (Bio 106). Clark University.
- 2017 **Insect Ecology** (EIS 544). University of Arizona.
- 2016 **Environmental Biology** (Bio 105). Pima Community College.

#### *Graduate Student Instructor*

- 2014 **Natural History of Insects** (ESPM 42). University of California Berkeley.

2010 **Introduction to Culture and Natural Resource Management** (ESPM 50). University of California, Berkeley.

*Guest Lecturer*

2017 **Natural Resource Ecology** (RNR 316). University of Arizona, Tucson.  
2015 **Environmental Biology** (Bio 105). Pima Community College, Tucson.  
2013, 2014 **Insect Ecology** (ENVS 131). University of California, Santa Cruz  
2008 **Basic Animal Behavior Theory** (CS 216). Hampshire College.  
2008 **General Introduction to Ecology** (NS 207). Hampshire College.

*Other*

2015 Instructor. **Gas Chromatography/Mass Spectrometry Workshop**.  
University of California, Berkeley.  
2011 Syllabus Designer. **Insect Behavior Lab Section** (ESPM 142).  
University of California, Berkeley.

## **Publications**

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- Mathis, K. A.,** N. Tsutsui (2016) "Dead Ant Walking: A beetle predator benefits ants by preferentially consuming parasitized individuals." *Proceedings of the Royal Society: B*. 238: 20161281.
- Mathis, K. A.,** S. Ramirez, S. M. Philpott (2016) "Variation in spatial scale of competing polydomous twig-nesting ants in coffee agroecosystems." *Insectes Sociaux* 63: 447-456.
- Mathis, K.A.,** N. Tsutsui. (2016) "Cuticular hydrocarbon cues are used for host acceptance by *Pseudacteon* spp. phorid flies that attack *Azteca sericeasur* ants." *Journal of Chemical Ecology* 42: 286-293.
- Mathis, K. A.,** K. T. Eldredge (2014) "Descriptions of two new species of *Myrmedonota* Cameron (Staphylinidae: Aleocharinae) from Mexico with comments on the genus taxonomy and behavior." *Zootaxa* 3768(1): 095-100.
- Mathis, K. A.,** S. M. Philpott (2012) "Current Understanding and Future Prospects of Host Selection, Acceptance, Discrimination and Regulation of Phorid Fly Parasitoids that attack Ants" *Psyche*. 2012: 1-9.
- Smith, C., E. Abouheif, R. Benton, E. Cash, V. Croset, C. Currie, E. Elhaik, C. Elsik, M. J. Favé, V. Fernandes, J. Gadau, J. Gibson, D. Graur, K. Grubbs, D Hagen, M. Helmkampf, J. A. Holley, C. Holt, H. Hu, A. S. I. Viniegra, B. Johnson, R. Johnson, A. Khila, J. Kim, J. Laird, **K. Mathis,** J. Moeller, M. Munoz-Torres, M. Murphy, R. Nakamura, S. Nigam, R. Overson, J. Placek, R. Rajakumar, J. Reese, H. Robertson, C. Smith, A. Suarez, G. Suen, E. Suhr, S. Tao, C. Torres, E. van Wilgenburg, L. Viljakainen, K. Walden, A. Wild, M. Yandell, J. Yorke, A. Zimin, N. Tsutsui. (2011) "The Draft Genome of the Globally Widespread and Invasive Argentine ant (*Linepithema humile*)" *Proceedings of the National Academy of Sciences of the United States of America*. 108: 5673-5678.
- Smith, C., C. Smith, H. Robertson, M. Helmkampf, A. Zimin, M. Yandell, C. Holt, H. Hu, E. Abouheif, R. Benton, E. Cash, V. Croset, C. Currie, E. Elhaik, C. Elsik, M. J. Favé, V. Fernandes, J. Gibson, D. Graur, W. Gronenberg, K. Grubbs, D. Hagen, A. S. I. Viniegra,

B. Johnson, R. Johnson, A. Khila, J. Kim, **K. Mathis**, M. Muñoz-Torres, M. Murphy, J. Mustard, R. Nakamura, O. Niehuis, S. Nigam, R. Overson, J. Placek, R. Rajakumar, J. Reese, G. Suen, S. Tao, C. Torres, N. Tsutsui, L. Viljakainen, F. Wolschin, J. Gadau. (2011) "A draft genome of the red harvester ant *Pogonomyrmex barbatus*" *Proceedings of the National Academy of Sciences of the United States of America*. 108: 5667-5672.

**Mathis, K. A.**, S. M Philpott, R. F. Moreira. (2011) "Parasite lost: Chemical and visual cues used by *Pseudacteon* in search of *Azteca instabilis*" *Journal of Insect Behavior*. 24: 186-199.

**Mathis, K.A.**, J. Bronstein. *Solicited by Annual Review of Ecology, Evolution, and Systematics in prep.* The ecology and evolution of commensalism.

**Mathis, K.A.**, A. Nogueira, J. Bronstein. *In Preparation for Journal of Ecology.* Pollinator effectiveness and importance are determined by foraging tactic and community assembly in pointleaf manzanita.

**Mathis, K.A.**, H. Ellison, J. Bronstein. *In Preparation for Oecologia.* Dominant ground foraging ants impact ant-plant protection mutualisms in peach orchards.

**Mathis, K.A.**, J. Bronstein. *In Preparation for Environmental Entomology.* The effects of management strategies on ant diversity and ant-plant protection mutualism strength in peach orchards

\*Undergraduate student authors

## **Presentations**

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**Mathis, K. A.** Dominant ground foraging ants impact ant-plant protection mutualisms in peach orchards. Entomological Society of America, Denver, CO, 2017.

**Mathis, K. A.**, S. Ramirez, S. M. Philpott. Variation in spatial scale of competing polydomous twig-nesting ants in coffee agroecosystems. International Congress of Entomology, Orlando, FL, 2016.

**Mathis, K.A.**, N.D. Tsutsui. Dead ant walking: A beetle predator uses parasitoid host location cues to selectively prey on parasitized ants. American Society of Naturalists Meeting, Asilomar, CA. 2016.

**Mathis, K.A.** *Azteca* ants and natural enemies in coffee agroecosystems. Entomology Department Seminar, University of Arizona, Tucson, AZ. 2015

**Mathis, K. A.**, N.D. Tsutsui "Defensive Strategies of *Azteca* Ants against Phorid Fly Parasitism" International Union for the Study of Social Insects Conference, Cairns, QLD, Australia. 2014.

**Mathis, K. A.**, N.D. Tsutsui "Phorid fly parasitoid host preference in *Azteca* ants in coffee agroecosystems" Ecological Society of America, Sacramento, CA. 2014.

**Mathis, K. A.**, N.D. Tsutsui "Predators for the Greater Good: The role of an ant associated beetle in *Azteca* ant-phorid fly interactions" Entomological Society of America Conference, Austin, TX. 2013.

**Mathis, K. A.** "The Rules of Attraction: Host Location and Acceptance of the ant, *Azteca instabilis*, by their Phorid Fly Parasitoids" XX Simposio de Mirmecologia, Petropolis,

Brazil. 2011

### **Grants and Fellowships**

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2018-2019 AAUW American Postdoctoral Fellowship, Declined.  
2015-2018 NIH Postdoctoral Excellence in Research and Teaching Fellowship, University of Arizona Center for Insect Science (\$147,000)  
2014 ESPM Continuing Graduate Student Fellowship, UC Berkeley (\$9,162)  
2011-2014 Graduate Research Fellowship, National Science Foundation (\$94,000)  
2014 ESPM Travel Grant, UC Berkeley (\$2,000)  
2014 Travel Grant, International Union for the Study of Social Insects (\$2,500)  
2010-2014 Margaret C. Walker Fund Grant, UC Berkeley (\$1,000 per year)  
2011-2013 UC Mexus Dissertation Research Grant, University of California (\$11,852)  
2013 Julius H. Freitag Memorial Award, UC Berkeley (\$1,000)  
2012 Van den Bosch Research Award, UC Berkeley (\$10,000)  
2012 Robert L. Usinger Memorial Award, UC Berkeley (\$1,000)  
2011 Edna and Yoshinori “Joe” Tanada Fellowship, UC Berkeley (\$1,000)  
2010, 2011 ESPM Summer Grant, UC Berkeley (\$3,000 per year)  
2010 ESPM Travel Grant, UC Berkeley (\$1,000)  
2007 Ray Coppinger Research Grant, Hampshire College (\$2,000)  
2004-2008 Science Scholarship, Hampshire College (\$4,000 per year)

### **Community and University Service**

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#### **Society Service and Memberships:**

Ecological Society of America (ESA)  
International Union for the Study of Social Insects (IUSI)  
Entomological Society of America (ESA)  
American Society of Naturalists (ASN)

#### **Review Services:**

Insectes Sociaux (2018); Bulletin of Entomological Research (2018); Frontiers in Zoology (2017); PeerJ (2017); Biotropica (2016); Apidologie (2016); Ecology and Evolution (2016); Biological Invasions (2014); Ecology (2014); Biological Control (2014); Journal of Insect Science (2013)

#### **Panel Services & Selection Committees:**

Postdoctoral Representative, PERT Advisory Board, 2017-2018  
Heller Agroecology Research Grant Judge, University of California, Santa Cruz, 2014-2018  
Center for Insect Science Travel Grant Judge, University of Arizona, 2015  
ESPM 201C Starter Grant Panel, University of California, Berkeley, 2012

### **Outreach**

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2018 “From Garden Peonies to a Career Studying Ant-Plant Interactions”  
Entomology Today <https://entomologytoday.org/2018/05/31/kate->

[mathis-standout-early-career-professional-garden-peonies-career-studying-ant-plant-interactions/](#)

2015-2017	Volunteer: Arizona Insect Festival
2016	Media Interview. <i>Forschung aktuell</i> : German National Public Radio, August 16, 2016
2016	“Parasitic flies, zombified ants, predator beetles – insect drama on Mexican coffee plantations. The Conversation. <a href="https://theconversation.com/parasitic-flies-zombified-ants-predator-beetles-insect-drama-on-mexican-coffee-plantations-63692">https://theconversation.com/parasitic-flies-zombified-ants-predator-beetles-insect-drama-on-mexican-coffee-plantations-63692</a>
2012-2014	Volunteer: Cal Day, Entomological Student Organization
2013	Guest Presentations on Insects: 2 <sup>nd</sup> Grade Class, Malcolm X Elementary School, Oakland, CA
2011-2013	Artist in Residence: Entomological Student Organization. Designed t-shirts and tote bags for organization merchandise and posters for Essig Brunch seminar speakers

### **Career Development and Pedagogical Training**

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2017	Participant. Process Oriented Guided Inquiry Learning Pedagogy Workshop. Tucson, Arizona (Oct2-3 <sup>rd</sup> )
2017	Participant. Institutional research and academic career development award (IRACDA) Conference. Birmingham, Alabama. (June 4-6 <sup>th</sup> ).
2016	Organizer. Institutional research and academic career development award (IRACDA) Conference. Tucson, Arizona. (June 12-14 <sup>th</sup> ).
2016	Participant. Active Learning Pedagogy Workshop (February 25-26 <sup>th</sup> )
2015	Participant. Institutional research and academic career development award (IRACDA) Conference. San Diego, California. (June 14-16 <sup>th</sup> ).

### **Mentorship**

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2017-present	Hannah Dineli, Master’s student, Project: Invasive ant-homopteran mutualisms in Biosphere 2, University of Arizona
2015-present	Heather Ellison, Undergraduate Research Apprentice, Project: Environmental stress as a driver in ant protection mutualisms in agroecosystems with extrafloral nectaries, University of Arizona
2017-2018	Nicolette Potts, Senior Thesis Student: Nectar robbing in two Arizona Manzanita species, University of Arizona
2017	Kalen Krause, Undergraduate Research Apprentice, Project: Impacts of ant seed predation on transitional grassland habitats, University of Arizona
2017	Abby Wang, Undergraduate Research Apprentice, Impacts of ant seed predation on transitional grassland habitats, University of Arizona
2017	Kristina Marikos, Volunteer, Project: Environmental stress as a driver in ant protection mutualisms in agroecosystems with extrafloral nectaries, Tucson High School

2016- 2017 Karen Wang, Undergraduate Research Apprentice, Project: Fitness consequences and phenology of pollinators, florivores and nectar

2016 John Bosak, Independent Study Student, Project: Fitness consequences and phenology of pollinators, florivores and nectar robbers on Pointleaf Manzanita, University of Arizona

2016 Sarah Evans, Independent Study Student, Project: Fitness consequences and phenology of pollinators, florivores and nectar robbers on Pointleaf Manzanita, University of Arizona

2016 Niels Schmidt-Crans, Independent Study Student, Project: Fitness consequences and phenology of pollinators, florivores and nectar robbers on Pointleaf Manzanita, University of Arizona

2015 Nicolas Alexandre, Undergraduate Research Apprentice, Project: Environmental stress as a driver in ant protection mutualisms in agroecosystems with extrafloral nectaries, University of Arizona

2014-2015 Leila Ramanculova, Volunteer, Project: Floral volatile cue use in phorid fly-honey bee parasitism, UC Berkeley

2013-2015 Hiromi Murata, Volunteer, Project: Floral volatile cue use in phorid fly-honey bee parasitism, UC Berkeley

2013-2015 Savannah Carnes, Undergraduate Research Apprentice, Project: Floral volatile cue use in phorid fly-honey bee parasitism, UC Berkeley

2013-2014 Blake Caracci, Undergraduate Research Apprentice, Project: Behavior and Chemical Ecology of Ant-Decapitating Phorid Fly Interactions in Coffee Agroecosystems (including a summer 2013 and 2014 internship), UC Berkeley

2013-2014 Shelley Pneh, Undergraduate Research Apprentice, Project: Behavior and Chemical Ecology of Ant-Decapitating Phorid Fly Interactions in Coffee Agroecosystems (including a summer 2013 internship), UC Berkeley

2012 Kimberley Chen, Undergraduate Research Apprentice, Project: Behavior and Chemical Ecology of Ant-Decapitating Phorid Fly Interactions in Coffee Agroecosystems, UC Berkeley

2012 Nicholas Sykora, Environmental Leadership Program, Project: the role of cuticular hydrocarbons in brood care in the Argentine ant, *Linepithema humile*, UC Berkeley