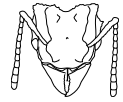


# Cody Raul Cardenas

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## Education

- Université de Genève (Feb. 2022 - Dec. 2025)  
Ph. D., Ecology and Evolution  
Advisor: Dr. Emmanuel Toussaint & Dr. Evgeny Zdobnov
- The Ohio State University (Aug. 2017 - Dec. 2020)  
M. Sc. Evolution, Ecology and Organismal Biology  
Advisor: Dr. Rachele M. M. Adams  
Thesis: The taxonomy and population genetics of the Panamanian fungus-growing ant *Mycetomoellerius* sp. n. (Formicidae: Attini)
- The Ohio State University (Jan 2015. - Aug. 2017)  
B. Ag. Sc. Entomology with research distinction. Minor in Evolution, Ecology and Organismal Biology  
Advisor: Dr. Rachele M. M. Adams  
Thesis: Using an Integrative Taxonomic Approach to Delimit a Sibling Species, *Trachymyrmex fovouros* sp. n. (Formicidae: Attini).
- Columbus State Community College (Jan. 2013 - Dec. 2014)  
A. Sc., Associate of Sciences

## Publications (mentee \*)

- Cardenas, C. R.**, Luo, R. A. \*, Luo, T. H., Schultz T. H., Adams., R. M. M. 2021. Using an integrative taxonomic approach to delimit a sibling species, *Mycetomoellerius mikromelanos* sp. n. (Formicidae: Attini). *PeerJ* 9:e11622. <https://doi.org/10.7717/peerj.11622>
- Cardenas, C. R.**, Mularo, A. J. \*, Chavez A. S., R. M. M. Adams (*in prep.* for *Biotropica*). Population genetics of a new Panamanian fungus-growing ant (Formicidae: Attini).

## Presentations (mentee \*)

- Cardenas, C. R.**, Mularo, A. \*, Chavez, A., Adams, R. M. M. The population genetics of a Panamanian of a new Panamanian fungus-growing ant. 2020 Entomological Society of America Virtual Annual Meeting. Graduate 10-Minute Paper Presentation; Systematics, Evolution, & Biodiversity: Social Insects Genetics (Awarded 1<sup>st</sup> place). Oral Presentation
- Cardenas, C. R.**, Mularo, A. \*, Chavez, A., Adams, R. M. M. Corridors of dispersal: population genetics of a Panamanian fungus-growing ant. 34<sup>th</sup> Edward F. Hayes Graduate Research Forum. The Ohio State University, Ohio Union, Columbus, Ohio. February 28<sup>th</sup>, 2020. Poster Presentation
- Cardenas, C. R.**, Mularo, A. \*, Adams, R. M. M. Corridors of dispersal: population genetics of a Panamanian fungus-growing ant. Evolution, Ecology and Organismal Biology Darwin Series-2020. The Ohio State University, The Chemical and Biomolecular Engineering and Chemistry Building, Columbus Ohio. February 6<sup>th</sup>, 2020. Invited Speaker
- Cardenas, C. R.**, Mularo, A. \*, Adams, R. M. M. Corridors of dispersal: examining how landscape influences the population genetics of a *Trachymyrmex* fungus-growing ant species. Simpósio de Mirmecologia XXIV. Universidade Federal de Minas Gerais, ICB Auditório Caatinga, Belo Horizonte, Minas Gerais, Brazil, October 4<sup>th</sup>, 2019. Oral Presentation

**Cardenas, C. R.**, Adams, R. M. M. Unearthing the overlooked fungus-growing ant parasitoid wasp relationship. The Society for Advancing Chicanos/Hispanics Native Americans in Science 2018 National Diversity in STEM Conference. The Henry B. González Convention Center, San Antonio, Texas. October 12<sup>th</sup>, 2018. Oral Presentation

**Cardenas, C.R.** Co-evolution: The fungus-growing ants as a case study. EEOB3310: Evolution. The Ohio State University, Columbus, Ohio. June 13<sup>th</sup>, 2018. Guest Lecture

**Cardenas, C. R.**, A. DeMillo, T. R. Schultz, R. M. M. Adams. 2016. Back from the dead? A re-evaluation of *Trachymyrmex balboai* (Formicidae: Attini). North Central Branch Meeting Entomology Society of America, B.S./M.S. Poster Session. June 6<sup>th</sup>, 2016; Cleveland, OH. (awarded 3<sup>rd</sup> Place). Poster Presentation

## Relevant Experience

Nationwide Childrens Hospital, Institute of Genomic Medicine (Jan. 2021 - Dec. 2021)

*Genetic Technologist I*

Supervisor: Aimee McKinney

Prepare clinically validated high-throughput libraries for broad exome sequencing and inherited disease, library preparation of human genomes, and sanger-sequencing with ABI-3730 & 3730xl. Performed environment of care safety rounds and lead the effort to validate alternative plates for automated library preparation.

Adams Lab (Aug. 2020 - Dec. 2020)

*Graduate Research Assistant*

Advisor: Dr. Rachelle Adams

Built an automontage system for imaging of preserved specimens, drafted lab protocol and trained other lab members on operation and use of the imaging system.

Ant Course 2018 – French Guiana (Aug. 22<sup>nd</sup> - Sep. 2<sup>nd</sup>, 2018)

Course Coordinators: Dr. Brian Fisher, Dr. Jérôme Orivel

Course Instructors: Dr. Flavia Esteves, Dr. Jack Longino, Dr.

Christian Peeters, Dr. Phil Ward, and Dr. Zuzana Burivalova

The Ant Course is a selective and comprehensive workshop providing training and networking for early career myrmecologists. The course was held over 10 days in a remote field station in French Guiana and included regular field trips, lectures, and lab work with an explicit focus on the biology, behavior, genetics, and systematics of ant species.

Adams Lab (Aug. 2016 – Aug. 2017)

*Undergraduate Research Assistant*

Advisor: Dr. Rachelle MM Adams

In the Adams Lab I built a foundational skillset that allowed me to be a competitive applicant for graduate programs. I learned skills necessary for my master's degree, including DNA extraction, PCR, sample preparation for sanger sequencing, and basic phylogenetic tools. My primary role as a work-study student was to maintain fungus-growing ant colonies in the lab while developing my research project focusing on Fungus-growing ants.

EEOB5798 - Tropical Behavioral Ecology and Evolution Field Course (Jan. 2017 - May 2017)

Department of Evolution, Ecology and Organismal Biology

Course Instructors: Dr. Rachelle MM Adams & Dr. Jon Shik

**Project:** Examining nest entrance function, colony distribution, and the natural history of *Mycetomoellerius zeteki* and *M. cf. zeteki* in the Colón Province of the Republic of Panama.

Triplehorn Insect Collection, Museum of Biological Diversity (Aug. 2015 – Aug. 2016)

*Undergraduate Student Research Assistant*

*Undergraduate Intern*

Advisor: Dr. Luciana Musetti & Dr. Norman Johnson

Assisted in digitizing Hymenoptera (Ants, Bees, and Wasps) and Tenebrionidae (Beetles).

Curatorial tasks included databasing and georeferencing.

**Internship Project:** Curatorial work where Hymenoptera and Dynastinae (Beetles) specimen preservation was maintained, barcoded, databased, and georeferenced.

**Internship Project:** Finding and completing citations in Carpenters Vespidae Checklist.

## **Awards & Grants**

### Council of Graduate Students

Global Gateway Grant (June 2018)

Award: \$1,000

The Global Gateway Grant promotes professional and academic development of graduate student researchers at The Ohio State university.

### Office of International Affairs

Academic Enrichment Grant (April 2018)

Award: \$4,000

Project Title: Unearthing the Overlooked Fungus-growing Ant Parasitoid Relationship

The Academic Enrichment Grant supports research that promotes international collaboration, address global issues, and fosters inter-disciplinary research.

### OSU College of Arts and Sciences

EEOB Departmental SACNAS Travel Award (March 2018)

Award: \$1,500

Nominated for, and received, travel scholarship for the 2018 SACNAS conference.

Fred E. Obey Endowed Scholarship Fund (March 2018)

Award: \$2,000

Nominated for and received general research funds.

### OSU Undergraduate Research Office

Summer Research Fellowship (May 2016 – Aug. 2016)

Advisors: Dr. Rachelle MM Adams

Grant: \$3,500

Project: Cryptic speciation of a Panamanian fungus grower: A new *Trachymyrmex* species (Formicidae: Attini) finally described.

## **Workshops**

Graham Elementary and Middle School Ant workshop

*Volunteer with the Adams Lab*

(Mar 17<sup>th</sup>, Apr 8<sup>th</sup>, 9<sup>th</sup>, & 16<sup>th</sup>,  
May 23<sup>rd</sup>, 2019)

Instructor: Dr. Rachelle MM Adams; OSU

Leah Ecaruan; Graham Elementary and Middle  
School

Collaborated with a science teacher of two middle school 5<sup>th</sup> grade classes (nearly 50 students). Their focus was using ants as a study organism to explore STEM topics. Students were introduced to sampling methods, comparative taxonomy, analyzing available resources for its credibility, and learn tools to gather data and information. Students integrated these practices to collect ants, interpret that data, and presented results to their family.

Ohio Ants Workshop at The Edge of Appalachia Nature Preserve, The Cincinnati Museum

*Instructor Assistant* (Aug. 4<sup>th</sup> – 6<sup>th</sup>, 2017)

Instructors: Dr. Rachele MM Adams; The Ohio State University  
Gary Coovert; Crane Hollow Preserve Field Biologist  
Randy Morgan; Curator Emeritus at the Cincinnati Zoo

Assisted instructors and 12 students who were naturalists from across Ohio and neighboring states over the course of a weekend. The purpose of this course was to introduce the natural history, evolution, and identification of ants in Ohio. My main role was workshop organization, identification materials, reference specimens, and field work introduction.

Engaging with Insects - Summer Day Camp, The Triplehorn Insect Collection and 4H

*Group Leader* (Jun 26<sup>th</sup> – 30<sup>th</sup>, 2017)

*Camp Mentor* (Jun. 27<sup>th</sup> -Jul. 1<sup>st</sup>, 2016)

Coordinators Dr. Luciana Musetti and Dr. Norman Johnson

Engaged with 4H students on the many aspects of building an insect collection and preserving insects for a personal collection. We spent every day collecting insects, practicing identification skills, visiting insect collections (i.e., Insect Collection and the Adams *Mega*. Ant Lab, both located in The Ohio State Universities Museum of Biological Diversity). The week culminated in an event with the student's parents, where the students showed them the skills they learned over the course of a week.

## Outreach events

Museum of Biological Diversity Open House Volunteer

*Habitat for Biodiversity* (Mar. 2019)

*Magnified* (Mar. 2018)

*Web of Life* (Apr. 2017)

*Living Color: an exploration of the role of color in Nature* (Apr. 2016)

*TOXIC: Venoms, poisons, and the organisms that make them* (Feb. 2015)

Advisor: George Keeney (2015-2017), Dr. Rachele M.M. Adams (2018-2019)

The open house event is an opportunity for scientific outreach with the broader Columbus community. I have discussed topics ranging from venomous arthropods to the fungus-growing ant symbiotic network. This event brings in thousands of people every year and recently, the museum started hosting a soft opening for neurodivergent folks who can better experience the event in a calmer less stimulating environment.

OSU Biological Sciences Greenhouse, Insectary

*Volunteer* (Spring 2013 - Spring 2015)

Advisor: George Keeney

Maintained ant colonies, insect cultures, and other arthropods.

## Undergraduate Researcher Collaborators (mentees \*)

Andrew Mularo (Spring 2018– Summer 2019)

Undergraduate Research Assistant (Adams Lab)

B.S. in Evolution, Ecology and Organismal Biology with Research distinction at OSU:

“Antimicrobial properties of a venom alkaloid in a new Panamanian ant species”. Thesis. The Ohio State University, Columbus, OH

Current Affiliations: Ph.D. program with Ximena Bernal at Purdue University

Collaborative Publications:

**Cardenas, C. R.**, Mularo, A. J. \*, Chavez A. S., R. M. M. Adams (in prep. for *Biotropica*). Population genetics of a new Panamanian fungus-growing ant (Formicidae: Attini).

Presentations:

Mularo A. \*, **Cardenas C. R.**, Adams R. M. M. Testing the isolation by distance model with a new species of Panamanian ant. Second Annual Three Rivers Evolution Event conference. University of Pittsburgh David Lawrence Hall and Alumni Hall, Pittsburgh, Pennsylvania, September 22<sup>nd</sup>, 2018.

Mularo A. \*, **Cardenas C. R.**, Adams R. M. M. Can ants cross a river? Gene flow within a new species of Panamanian ant. OSU NSF Research Experience for Undergraduates Forum (NSF DBI 1560116 Awarded to Dr. Meg Daly and Dr. Bryan Carstens), The Ohio State University, Columbus, Ohio, July 20<sup>th</sup>, 2018.

Amy Luo

(Summer 2017– Summer 2019)

Undergraduate Research Assistant (Adams Lab)

B.S. with Honors in Evolution, Ecology and Organismal Biology with research distinction: “Tyramides found in male fungus-growing ants in an evolutionary context”. B.S. Thesis with Honors. The Ohio State University, Columbus, OH.

Current Affiliations: Ph.D program with Liz Derryberry at the University of Tennessee

Collaborative Publications:

**Cardenas, C. R.**, Luo, R. A. \*, Luo, T. H., Schultz T. H., Adams., R. M. M. 2021. Using an integrative taxonomic approach to delimit a sibling species, *Mycetomoellerius mikromelanos* sp. n. (Formicidae: Attini). *PeerJ* 9:e11622. <https://doi.org/10.7717/peerj.11622>

Presentations:

Luo, A. \*, **C. R., Cardenas**, R. M. M. Adams. Distinguishing species with DNA and behavior: A comparison of two sibling *Trachymyrmex* ant species in novel environments. The 23<sup>rd</sup> Annual Richard J. and Martha D. Denman Undergraduate Research Forum. The Ohio State University. Ohio Union; Columbus OH. April 3<sup>rd</sup>, 2018. Poster Presentation

## Leadership Roles

SACNAS – The Society for Advancing Chicanos/Hispanics Native Americans in Science, The Ohio State University Chapter  
Executive Board Member: Web Master (Spring 2018 - Autumn 2019)

GEES – Graduate Evolution and Ecology Students (Spring 2018 - Autumn 2019)  
GEES Officer: Awards Committee

## Conference Awards

Entomology Society of America 2020 Annual Meeting

Systematics, Evolution, & Biodiversity” Biology. Grad 10-Min. Papers (Nov. 2020)  
1<sup>st</sup> place – “The population genetics of a new Panamanian fungus-growing ant.”

North Central Branch Meeting of the Entomology Society of America

B.S./M.S. Poster: Session (Jun. 2016)  
3<sup>rd</sup> place—“Back from the dead? A re-evaluation of *Trachymyrmex balboai* (Formicidae: Attini)” Cody R. Cardenas, Alexandria DeMillo, Ted R. Schultz, Rachelle M. M. Adams

Triplehorn Challenge

1<sup>st</sup> place for the reference collection portion of the challenge