Anyi Mazo-Vargas

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EDUCATION

Cornell University, Ithaca, NY, **PhD Candidate** in the Entomology Dept — May 2020

Dissertation title: Cis-regulation evolution of a wing patterning gene in Nymphalid butterflies.
Advisor: Robert Reed. GPA: 4.0

University of Puerto Rico – Mayagüez, Puerto Rico. **M.Sc. Biology** — May 2011

Dissertation title: Untangling the effects of biogeography and host plant associations: phylogenetic and phylogeographic studies in the *Exophthalmus* genus complex.
Advisor: Nico M. Franz. GPA: 4.0

Universidad del Valle, Cali – Colombia. **B.Sc. Biology** — Dec 2005

Dissertation title: Effect of Bollgard (Bt) cotton on the diversity and abundance of soil arthropods during its second year in Valle del Cauca, Colombia.
Advisor: James Montoya Lerma and Jairo Chalarca. GPA: 4.2 (up to 5)

PUBLICATIONS

Peng, C.L., **Mazo-Vargas, A.**, Brack, B.J., Reed, R.D. *In revision*. Multiple roles for laccase2 in butterfly wing pigmentation, scale development, and cuticle tanning. Evolution & Development.

Lewis, J. J., Geltman, R.C., Pollak, P.C., Rondem, K.E., Belleghem, S.MV., Hubisz, M.J, Munn, P.R., Zhang, L., Benson, C., **Mazo-Vargas, A.**, Danko, C.G, Counterman, B.A., Papa, R., Reed, R.D. **2019**. Parallel evolution of ancient, pleiotropic enhancers underlies butterfly wing pattern mimicry. Proc. Natl. Acad. Sci. U.S.A. 116(48): 24174-24183

Mazo-Vargas, A., Concha, C., Livraghi, L., Massardo, D., Wallbank, R.W.R., Zhang, L., Papador, J.D., Martinez-Najera, D., Jiggins, C.D., Kronforst, M.R., Breuker, C.J., Reed, R.D., Patel, N.H., McMillan, W.O., Martin, A. **2017**. Macroevolutionary shifts of WntA function potentiate butterfly wing-pattern diversity. Proc. Natl. Acad. Sci. U.S.A. (114), 10701–10706. ******

Zhang, L., **Mazo-Vargas, A**., Reed, R.D. **2017**. Single master regulatory gene coordinates the evolution and development of butterfly color and iridescence. Proc. Natl. Acad. Sci. U.S.A. (114) 10707–10712*******

Lewis, J. J., van der Burg, K. R. L., **Mazo-Vargas, A**., Reed, R.D. **2016**. ChIP-seq-Annotated Heliconius erato genome highlights patterns of cis-regulatory evolution in Lepidoptera. Cell Reports (16), 2855-2863.

Mazo-Vargas, A., Park, H., Aydin, M., Buchler, N.E. **2014**. Measuring fast gene dynamics in single cells with timelapse luminescence microscopy. Mol. Biol. Cell 25(22), 3699-3708.

Oleksyk, T.K., Pombert, J.F., Siu, D., **Mazo-Vargas, A.**, Ramos, B., Guiblet, W., Afanador, Y., Ruiz-Rodriguez, C.T, Nickerson, M.L., Dean, M., Logue, D., Valentin, R., Figueroa, L., Martinez-Cruzado, J.C. **2012**.A locally funded Puerto Rican parrot (*Amazona vittata*) genome sequencing project increases avian data and advances young researcher education. Giga Science, 1(1), 14214.

****** **LaMont C. Cole Award** from the Department of Ecology and Evolutionary biology at Cornell University. Outstanding paper published by a graduate student in 2017-2018. $100.

*** Cozzarelli Prize from the National Academy of Science. Best paper published in the biological sciences field in the proceedings of the national academy of sciences (PNAS) in 2017. Attendance to the National Academy of Science awards ceremony on Washington, DC April 29, 2018.

POSTER and TALKS

Mazo-Vargas, A. Reed, R.D. 2019. Cis-regulatory architecture of butterfly wing pattern evolution. Poster. 3rd Biennial meeting of the Pan-American Society for Evolutionary Developmental Biology. Jul 30- Aug 2. Miami, Florida.**

** Won first place at the Graduate Student Poster Competition.

Mazo-Vargas, A. Reed, R.D. 2019. Cis-regulatory architecture of butterfly wing pattern evolution. Talk. Evolution. Jun 21-25. Providence, Rhode Island.

Mazo-Vargas, A. Cis-regulation evolution of the WntA locus in Nymphalids. Oral presentation. Pan American *Heliconius* meeting: Developmental architecture of butterflies wing color pattern variation. February 1-2, 2019. San Juan, Puerto Rico.

Mazo-Vargas, A.; Reed, R.D. Building eyespots, novelty over novelty. Oral presentation. 7th Jugatae Entomology symposium. Jan 19, 2018. Geneva, New York.

Mazo-Vargas, A.; Reed, R.D. Mapping the regulatory architecture of a butterfly wing patterning gene. Oral presentation. Entomology department. Aug 26, 2016. Ithaca, New York.

Mazo-Vargas, A.; Reed, R.D. Mapping the regulatory architecture of a butterfly wing patterning gene. Talk. Evolution meeting. June 17-21, 2016. Austin, Texas.

Mazo-Vargas, A.; Verosloff, M. S.; Wasik, B.R.; Reed, R.D. The Developmental Basis of Wing Color Pattern in Monarch Butterflies. Poster. First Meeting of the Pan- American Society for Evolutionary Developmental Biology. August 5-9, 2015. University of California, Berkley.

Mazo-Vargas, A.; Cafaro, M.; Franz, N. 2015. Diversification of West Indian entimine weevils (Coleoptera: Curculionidae): untangling the effects of host plants and biogeography. Talk. 39th Annual Ecology & Evolutionary Biology Graduate Student Symposium. December 8-9. Ithaca, New York.

Mazo-Vargas, A.; Park, H., Aydin, M.; Buchler, N. 2014. Measuring fast dynamics in single yeast cell with timelapse luminescence microscopy. Poster. 8th Annual Duke Systems Biology Symposium, "Network Signals & Responses". October 17, Durham, North Carolina.

Mazo-Vargas, A.; Park, H., Buchler, N. 2012. Single-cell timelapse luminescence microscopy with multicolor beetle luciferases. Poster. 7th Annual Duke Systems Biology Symposium, "Oscillatory Systems in Biology". October 4, Durham, North Carolina.

Ferrer, D. Mazo-Vargas, A.; Ruiz-Rodriguez, C. T.; Martínez-Cruzado, J.Cr.; Stephens, R. M.; Winkler, C. A.; Volfovsky, N.; Oleksyk, T. K. 2011. Experimental validation and search for polymorphism of insertions and deletions from comparisons of primate genomes. Poster. American Society of Human Genetics/ICHG, October 11-15, Montreal, Canada.

Mazo-Vargas, A.; Franz, N. 2009. Phylogeography of the citrus root weevil, Diaprepes abbreviatus (Coleoptera: Curculionidae: Entiminae), in Puerto Rico and surrounding islands. Poster. The 57th Annual Meeting of the Entomological Society of America, December 13-16, 2009, Indianapolis, Indiana.

Mazo-Vargas, A.; Franz, N. 2009. Molecular insights into the phylogeny of Caribbean weevils (Coleoptera: Curculionidae: Entiminae). Oral presentation. The 57th Annual Meeting of the Entomological Society of America, December 13-16, 2009, Indianapolis, Indiana.

Mazo-Vargas, A.; Franz, N. 2009. Filogenia del complejo de género Exophthalmus Schoenherr (Coleoptera: Curculionidae: Entiminae) para el caribe. Poster. XXXVI Congreso de la Sociedad Colombiana de Entomología SOCOLEN, Julio 29-31, 2009, Medellin, Colombia.

Mazo-Vargas, A.; Cafaro, M.; Franz, N. 2009. Phylogeny of the Exophthalmus genus complex (Coleoptera: Curculionidae: Entiminae) from the Caribbean. Poster. XXVIII Simposio de la flora y fauna del Caribe, April 24, 2009, Humacao, PR.

Rodriguez, J, Ospina, C.M.; Mazo-Vargas, A.; Peck, D.C. 2006. Field evaluation of the impact of Bt cotton on non-target soil arthropods in Colombia. 4th Congress of Biological Control. Poster. May 31, June 1-2, CIAT, Colombia.

Rodriguez, J.; Peck, D.C.; Ospina, C.M.; Mazo-Vargas, A. 2006. Efecto del algodón Bt (Tecnología Bollgard ®) sobre los artrópodos no-blanco del suelo en el Valle delCauca durante el 2003 y 2004. Poster. XXXIII Congreso de la Sociedad Colombiana de Entomología SOCOLEN

OUTREACH AND PROFESSIONAL ACTIVITIES

Coordinator of the butterfly room for the Annual Department of Entomology Open Day: Insectapalooza. The butterfly room is one of the biggest attractions of the day, where thousands of visitors have an interactive experience with butterflies and moths. 2016-2019

Volunteer for the Diversity Preview Weekend (DPW) at Cornell. This event brings in students from underrepresented backgrounds to learn about the application process to graduate school, meet faculty and attend workshops. 2017-2019

Co-organizer of the BugZoo Activity for Expanding Your Horizons, which is an annual conference aimed at providing hands-on experience with STEM fields to 7th - 9th grade girls. 2017

Invited talk: Mazo-Vargas, A. Butterfly GenePaint v 1.0. Rockefeller evening "Reimagining Biology". 10th Annual Imagine Science Film Festival. Achievements: get broader audiences, mainly artist, to get a snap of our understanding of wing color pattern formation, why is important to study it and inspiring new ideas for films. Oct 18 2017

Chair and co-organizer of the symposium of the Entomology department at Cornell University. Jugatae, Entomology Grad Student Society, Cornell University, NY. 2015 -2017

Co-organizer of the EvoDay symposium. As part of the EvoGroup, a graduate-led organization in the Ecology and Evolutionary biology, Cornell University, NY. 2015

AWARDS

NSF Graduate Research Fellowship (GRFP) $138,000	2015-2017
Cornell Diversity Fellowship $74,230	2014, 2018
Rawlins Award, Department of Entomology, Cornell University, NY. $1,000	2015
José Trías Monge Fellowship, University of Puerto Rico, PR. $1,110	2009
OSU-Willi Hennig Society fellowship. Ohio State University. $600	2009

PROFESSIONAL DEVELOPMENT

NextGen Professors program. Cornell Univeristy, NY	2018-2019
ComSciCon Cornell, Science Communication Conference, Cornell University, NY.	July 14 and 22, 2017
4th Annual BEST (Broadening Experiences in Scientific Training) Symposium.	May 3-4, 2017
Summer Success Symposium (S3).	August 16, 2017

EMPLOYMENT

Duke University — Jul 2011 – Jul 2014

Laboratory Research Assistant

- Optimized time-lapsed luminescence microscopy for single cells of yeast.
- Tracked gene expression via single-molecule RNA FISH (smFISH) in single cells.
- Engineered yeast genome and monitored effects in microscopy, flow cytometry, and/or bioreactor.
- Trained high-school, undergraduates and graduate students on methods and lab procedures.
- Prepared manuscript for publication.

CIAT - International Center for Tropical Agriculture — May 2006 – Nov 2007

Laboratory Research Assistant

- Monitored the effects on non-target organisms and the susceptibility of target pest insects to Bt crops.
- Collected and processed arthropods from soil samples.
- Prepared annual reports of the project activities and presented results in national conference.

TEACHING EXPERIENCE

University of Puerto Rico – Mayagüez

Phylogenetics and Comparative Genomics (Online course). Fall 2010

Laboratory of Cellular Physiology. Department of Biology, University of Puerto Rico, Mayagüez. Spring – Fall 2010

Laboratory of Genetics. *Department of Biology, University of Puerto Rico, Mayagüez*. Fall 2009

Universidad de l Valle – Cali, Colombia

Arthropod zoology laboratory. Department of Biology, Universidad del Valle, Cali, Colombia. Fall 2002

Microbiology laboratory. Department of Biology, Universidad del Valle, Cali, Colombia. Spring 2002

Mentoring

I have done formal training in genetic and molecular techniques to students from different academic background. In addition, I have done informal mentoring by sharing my career path with other students, giving support, and open channel of communication and advocating for undergraduate students' best interest.

High School students

Param Sidhu – Chief of Staff at Pendo.io

Morgan Howell – Software Engineer at Facebook

Undergraduate students

Alan Liang Junior – undergrad student at Cornell University. Currently performing experiments.

Brian Liang Junior – undergrad student at Cornell University. Currently performing experiments.

Benjamin J. Brack – Previous undergrad student at Cornell University. Currently manuscript preparation.

Ceili Peng – Previous undergrad student at Cornell University. Currently manuscript preparation.

Christina T. Ruiz-Rodriguez – M.Sc, University of Illinois at Urbana-Champaign.

Daysha Ferrer-Torres – Postdoctoral Fellow at University of Michigan Medical School

Master students

Yashira Afanador – Research Assistant at the Cincinnati Children's Hospital Medical center.

ONLINE RESOURCES

Mazo-Vargas, A. 2010. Pest weevils species images. University of Puerto Rico.
http://www.forestryimages.org/browse/autthumb.cfm?aut=65051

Press releases about my research.

Scientists Can Now Repaint Butterfly Wings. The Atlantic.
https://www.theatlantic.com/science/archive/2017/09/the-genes-that-paint-butterflies/540159/

Genes Color a Butterfly's Wings. Now Scientists Want to Do It Themselves. The New York Times.
https://www.nytimes.com/2017/09/18/science/butterfly-wing-color-patterns-gene-editing.html