

# MICAH G. FREEDMAN

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## EDUCATION AND TRAINING

**NSF Postdoctoral Fellow**, University of Chicago 2020-present

- **Advisors:** Dr. Marcus Kronforst (University of Chicago), Dr. Riccardo Papa (University of Puerto Rico, Río Piedras)

**Ph.D.**, Population Biology, University of California, Davis 2014-2020

- **Dissertation Title:** *Contemporary Evolution During Global Range Expansion in the Monarch Butterfly.*
- **Advisors:** Dr. Sharon Strauss, Dr. Santiago Ramírez

**B.S.**, Entomology & Plant Sciences, Cornell University 2009-2013

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## PEER-REVIEWED PUBLICATIONS

\*Authors contributed equally; †Undergraduate coauthor

### **Submitted and in preparation**

Hemstrom, W.B.\*, Freedman, M.G.\*, Zalucki, M.P., Ramírez, S.R. & M.R. Miller. Population genetics of a recent range expansion in monarch butterflies. In prep.

Freedman, M.G., Choquette, S.†, Ramírez, S.R. & R.L. Vannette. Do geographically distinct monarch butterfly populations show evidence for local adaptation in cardenolide sequestration from milkweed host plants? In prep.

Freedman, M.G., Ramírez, S.R. & S.Y. Strauss. Plants from the California Channel Islands have reduced physical and chemical defenses against herbivores. In prep.

Pocius, V.M., Majewska, A.A. & M.G. Freedman. The role of experiments in monarch butterfly conservation: a review of recent studies and approaches. Invited review for *Annals of the Entomological Society of America*, submitted.

### **Published**

**Freedman, M.G.**, Dingle, H., Strauss, S.Y. & Ramírez, S.R. Two centuries of monarch butterfly collections reveal contrasting effects of range expansion and migration loss on wing traits. In press, *Proceedings of the National Academy of Sciences, USA*. DOI: 10.1073/pnas.2001283117.

- Featured by [UC Davis](#), [San Jose Mercury News](#), [Santa Cruz Sentinel](#), [East Bay Times](#), [Davis Enterprise](#)

**Freedman, M.G.**, De Roode, J.C., Forsiter, M.L., Kronforst, M.R., Pierce, A.A., Schultz, C.B., Taylor, O.R. & E.E. Crone (2020). Are eastern and western monarch butterflies distinct populations? A review of evidence for ecological, phenotypic, and genetic differentiation and implications for conservation. *Preprints* 2020090353. doi: 10.20944/preprints202009.0353.v1. Currently in review at *Conservation Science and Practice*.

**Freedman, M.G.**, Jason, C.<sup>†</sup>, Ramirez, S.R. & S.Y. Strauss (2020). Host plant adaptation during contemporary range expansion in the monarch butterfly. *Evolution* 74, 377-391. doi.org/10.1111/evo.13914.

**Freedman, M.G.** & H. Dingle. (2018). Wing morphology in migratory North American monarchs: characterizing sources of variation and understanding changes through time. *Animal Migration* 5, 61-73. doi.org/10.1515/ami-2018-0003

- Featured by [National Geographic](#) and as part of a television production by the Japanese National Broadcasting Corporation (NHK)

**Freedman, M.G.**, Miller, R.H. & H.S. Rogers. (2018). Landscape-level bird loss increases the prevalence of honeydew-producing insects and invasive ants. *Oecologia* 188, 1263-1272. doi.org/10.1007/s00442-018-4273-5.

**Freedman, M.G.**, Dingle, H., Chiu, J.C., Tabuloc, C. Yang, L.H. & M.P. Zalucki. (2018). Non-migratory monarch butterflies retain developmental and transcriptional mechanisms associated with migration. *Biological Journal of the Linnean Society* 123, 265-278. doi.org/10.1093/biolinnean/blx148.

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### **FELLOWSHIPS AND AWARDS**

NSF Postdoctoral Research Fellowship in Biology - <b>\$138,000</b>	<b>2020-2022</b>
Center for Population Biology Summer Research Award - <b>\$1,693</b>	<b>2019-2020</b>
Center for Population Biology Summer Research Award - <b>\$1,700</b>	<b>2018-2019</b>
Center for Population Biology Summer Research Award - <b>\$1,800</b>	<b>2017-2018</b>
National Geographic Society Exploration Grant - <b>\$4,750</b>	<b>2017-2018</b>

NSF EAPSI Australia Fellowship - <b>\$5,400</b>	<b>2016</b>
SSE Rosemary Grant Award - <b>\$2,250</b>	<b>2016-2017</b>
Mildred E. Mathias Research Award - <b>\$2,752</b>	<b>2016-2017</b>
Center for Population Biology Summer Research Award - <b>\$1,800</b>	<b>2015-2016</b>
National Science Foundation Graduate Research Fellowship	<b>2015-2019</b>
Davis Botanical Society Award - <b>\$1,690</b>	<b>2015-2016</b>
Hunter Rawlings Cornell Presidential Research Scholarship - <b>\$32,000</b>	<b>2009-2013</b>
Garden Club of America Summer Environmental Scholarship - <b>\$2,000</b>	<b>2011</b>

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### **INVITED TALKS**

“Contemporary evolution during global range expansion in the monarch butterfly.” Eco-Evo Lunch Seminar, Stanford University, March 3, 2020.

“Contemporary evolution of monarch butterflies in North America and abroad.” Departmental Seminar, Iowa State University Department of Ecology, Evolution, and Biodiversity, December 12, 2019.

“The ecology and evolution of monarch butterflies on Pacific islands.” POETS seminar series, University of Guam, June 1, 2018.

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### **CONFERENCE PRESENTATIONS**

**Freedman, M.G.**, Hemstrom, W.B., Miller, M.R., Zalucki, M.P., Ramírez, S.R. & S.Y. Strauss. Standing genetic variation in monarch butterflies and its conservation implications. Invited oral presentation at the 2019 Entomological Society of America Meeting, Saint Louis, MO.

**Freedman, M.G.**, Jason, C., Ramirez, S.R. & S.Y. Strauss. Host plant adaptation during global range expansion in the monarch butterfly. Oral presentation at the 2019 Evolution Meeting, Providence, RI.

**Freedman, M.G.**, Jason, C., Ramirez, S.R. & S.Y. Strauss. Host plant adaptation during global range expansion in the monarch butterfly. Poster presented at the 2019 Gordon Conference on Plant-Herbivore Interactions, Ventura, CA.

**Freedman, M.G.** Parallel loss of defenses against ungulate herbivores in chaparral shrubs from the Channel Islands, California, USA. Oral presentation at the 2017 Ecological Society of America Meeting, Portland, OR.

**Freedman, M.G.** Contemporary evolution of monarch butterflies in their introduced range. Oral presentation at the 2017 Evolution Meeting, Portland, OR.

**Freedman, M.G.**, Miller, R.H. & H.S. Rogers. Assessing the importance of “unwanted” mutualisms between invasive ants and honeydew-producing insects in native forests of the Northern Mariana Islands. Poster presented at the 2014 Ecological Society of America Conference, Sacramento, CA.

**Freedman, M.G.**, Campbell, S.A., Halitschke, R. & A. Kessler. Evolution of reduced floral scent emission under multiple independent transitions from outcrossing to selfing in the wild nightshades (Solanaceae). Poster presented at the 2014 Gordon Conference on Plant Volatiles, Ventura, CA.

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### **NON-PEER-REVIEWED PUBLICATIONS**

Freedman, M.G. (2018). Restoration of the Colorado River Delta: Assessing the impacts of the Minute 319 environmental pulse flow. Available at:  
<https://watershed.ucdavis.edu/education/classes/files/content/page/Micah%20Freedman%20research%20paper.pdf>

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### **TEACHING EXPERIENCE**

Teaching Assistant: EVE 100 – Introduction to Evolution	Fall 2019
Reader: EVE 181 – Plant-Animal Interactions	Fall 2016
Reader: EVE 101 – Introduction to Ecology	Spring 2016
Teaching assistant: EVE 100 - Introduction to Evolution	Fall 2015

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### **SERVICE ACTIVITIES**

**Manuscript reviews:** *Ecology and Evolution*, *Scientific Reports*, *Journal of Tropical Biology and Conservation*

**Graduate Student Mentor:** UC Davis EEGAP (Evolution and Ecology Graduate Admissions Pathways) partnership with Howard University

**Graduate Student Mentor:** UC Davis SEEDS (Strategies for Ecology Education, Diversity, and Sustainability) undergraduate club

**Assistant instructor:** R Bootcamp – 2017

**Outreach activities:** Volunteer at UC Davis Picnic Day (2015, 2018, 2019), UC Davis Biodiversity Museum Day (2019), UC Davis BioBlitz (2016), Science Exploration Day at the Chabot Space and Science Center in Oakland, CA (2017)

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### **PROFESSIONAL MEMBERSHIPS**

Society for the Study of Evolution  
Ecological Society of America

March 2015 - Present  
August 2014 – Present