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# Colin Richard Morrison

## Education

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- 2017 – Present **The University of Texas at Austin** Austin, Texas  
Program in Ecology, Evolution and Behavior  
*PhD Candidate, 6<sup>th</sup> year* – Department of Integrative Biology  
*Major Advisor:* Dr. Lawrence Gilbert  
*Committee Members:* Dr. Amelia Wolf, Dr. Brian Sedio, Dr. John Smiley
- 2008 – 2012 **University of Nevada, Reno** Reno, Nevada  
*Bachelor of Science* – Biology, *Minor* – Political Science

## Research Experience

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### Graduate Research Assistant, Integrative Biology Department, The University of Texas at Austin

- Invasive Species Laboratory. Supervisors: Dr. Rob Plowes & Dr. Lawrence Gilbert
- Host quality and chemistry of TX native prickly pear cactus (*Opuntia* spp.)
  - Chemical ecology of feeding performance *Cactoblastis cactorum* and TX native cactus moth species.
  - Integrated pest management of invasive cactus moth (*Cactoblastis cactorum*).
  - Invasion ecology of Guinea grass (*Megathyrsus maximus*) in South Texas. Importance of allelopathic inhibition versus shading competition in Guinea grass competitive exclusion of natives.
  - August 2019 – present

### Predoctoral Fellow, Smithsonian Tropical Research Institute, Panama City

- Gamboa, Panama. Advisor: Dr. William Owen McMillan
- Chemical ecology of mate choice in *Heliconius* butterflies.
  - *Heliconius* phenotypic evolution following CRISPR/Cas9 genome editing procedures.
  - Preference, performance, chemistry, and trophic natural enemy interactions of specialist herbivores.
  - December 2015 – November 2016.

### Short-Term Fellow, Smithsonian Tropical Research Institute, Panama City

- Gamboa, Panama. Advisor: Dr. Donald Windsor
- Herbivore diet breadth, host plant defensive chemistry and natural enemy interactions.
  - Preference and performance of the specialist herbivore: *Chelymorpha alternans*
  - Sexual selective patterns amongst disparate phenotypes and genotypes of *Chelymorpha alternans*.
  - June 2015 – December 2015

### Curatorial Assistant, Department of Biology, University of Nevada, Reno

- UNR, Museum of Natural History. Supervisors: Dr. Elizabeth Leger & Dr. Chris Feldman
- Curation of museum insect collection, collections database management.
  - Exhibit setup and publish outreach.
  - November 2013 – December 2015

### Guest Student, Department of Geology and Geophysics, Woods Hole Oceanographic Institution

- Bernhard Laboratory and Edgcomb Laboratory. Advisors: Dr. Joan Bernhard & Dr. Virginia Edgcomb
- N.S.F. funded research on biodiversity of deep hypersaline anoxic brines (DHABs).
  - Science Party, R/V *Atlantis* Research Cruise AT 18-14, 11/25/11 – 12/8/2012, Piraeus, Greece.
  - May 2012 – August 2012 (DHAB data analysis at Woods Hole Oceanographic Institution).

**Forestry Technician, Department of Biology, University of Nevada, Reno**

Whittel Forest and Wildlife Area – Little Valley Field Station (UNR). Supervisor: Dr. Stephen Vander Wall

- Conservation, maintenance of Whittel Forest and Wildlife Area (Carson Range, NV).
- June 2011 – June 2015.

**Laboratory Technician, Department of Biology, University of Nevada, Reno**

Marine Ecosystems Analysis Laboratory. Supervisor: Dr. Jeffrey Baguley

- B.P./N.O.A.A. funded research on effects of Deepwater Horizon Oil Spill on benthic community of the Gulf of Mexico.
- E.P.A. funded research on ecotoxicology of anthropogenic chemical flow into marine ecosystems.
- US Fish and Wildlife Service funded research on benthic community ecology of Gulf of Alaska.
- January 2011 – June 2015.

**Research Assistant, Department of Biology, University of Nevada, Reno**

Chemical Ecology, Tropical Entomology & Biodiversity Laboratory. Supervisor: Dr. Lee Dyer

- N.S.F./Earthwatch/D.O.D. funded research on ecology and evolution of plant insect chemical ecology, biodiversity, and tropical entomology.
- Curation of the laboratory research Lepidoptera and parasitoid collections.
- March 2011 – June 2015.

## Teaching Experience

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**Teaching Assistant** – The University of Texas at Austin

- Ecology (BIO 373), Spring 2022
  - Professor: Dr. Laura Gonzales
- Freshman Research Initiative - Biodiversity (BIO 206L/NSC 109), Spring 2018
  - Professor: Dr. Susan Cameron Devitt
- Introduction to Cell & Molecular Biology (BIO 311C), Fall 2017
  - Professor: Dr. Jennifer Fritztz

**Course Facilitator** – The University of Texas at Austin

- Fundamentals of Ecology (BIO 390E), Fall 2018
  - <https://eco-fundamentals.weebly.com/>
  - Designed the course
  - Facilitated course with N. Ivers and W. Behr under supervision of Dr. Tim Keitt

**Guest Lecturer** – Smithsonian Tropical Research Institute

- Yale Tropical Biology Course, Entomology Section, Spring 2016
  - Professor: Dr. Eliza Comita
- Introductory Tropical Field Biology (aka Gigante Course), Fall 2015
  - Professors: Dr. Sabrina Amador & Dr. James Coronado Riviera

**Teaching Assistant** – University of Nevada, Reno

- Entomology (Biology 437), Spring 2013 & 2014
  - Professors: Dr. Lee Dyer

**Teaching Assistant** – University of Nevada, Las Vegas

- Aikido (PEX 115), Fall 2016 & Spring 2017
  - Professor: Sensei Don Bannai

## Talks and Presentations

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**Ecological Society of America** – Contributed talk (August 2022)

**Texas Master Naturalists, Balcones Canyonlands** – Natural history of Texas passion vines (August 2021)

**Native Plant Society of Texas** – Natural history of Texas passion vine communities (December 2021)

**Ecological Society of America** – Late Breaking Poster (August 2020)

**Entomological Society of America** – Poster (November 2020)

**Society for Integrative and Comparative Biology** – Rising Star in Organismal Botany (January 2020)  
**Entomological Society of America** – Ten Minute Paper Competition (November 2017, 2018, 2020, and 2022)  
**UT Science Under the Stars Public Lecture Series** – Science education (March 2019, October 2020)  
**UT Ecology Seminar** – Ecolunch Research Presentation (Spring 2018, Spring 2019, and Spring 2020)  
**UT Integrative Biology** – Graduate Research Symposium (April 2018)  
**Smithsonian Tropical Research Institute** – Fellows Symposium (February 2016)  
**Smithsonian Tropical Research Institute** – Behavioral Discussion Group (October 2015)

## Peer Review and Professional Service

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**Coleopterists Bulletin** (2019 – present)  
**Entomological Extension Consultations** (2018 – present)  
**Environmental Entomology** (2018 – present)  
**UT Austin Ecolunch Seminar Facilitator** (2018 – 2020)  
**Symposium Moderator, 10 TMP Pollinator Health** – Entomology Joint Annual Meeting (November 2018)  
**Symposium Moderator, Annual Fellows Symposium** – Smithsonian Tropical Research Institute (February 2016)  
**National Geographic Society** (2016)  
**Annals of the Entomological Society** (2014)

## Fellowship, Scholarships and Awards Received

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*Over \$150,000 in grants, scholarships and fellowships awarded over career. Over \$117,000 awarded as a graduate student.*

**UT Integrative Biology Research Award**, The University of Texas at Austin, Austin, TX, USA  
- Spring 2021 (\$2,450)  
- Fall 2021 (\$2500)

**Stengl-Wyer College of Natural Science Fellowship**, The University of Texas at Austin, Austin, TX, USA  
- September 2020 – August 2021 (\$34,000)

**Coleopterists Society Graduate Student Research Enhancement Award**, Coleopterists Society, USA  
- May 2020 (\$2,000)

**Jean Andrews Intern Summer Fellowship**, The University of Texas at Austin, Austin, TX, USA  
- Summer 2020 (\$6,600)

**Sigma Xi Grant in Aid of Research**, Sigma Xi: The Scientific Research Honor Society, Research Triangle, NC, USA  
- January 2020 (\$450)

**UT Integrative Biology Start Up Grant**, The University of Texas at Austin, Austin, TX, USA  
- April 2019 (\$1,960)

**NSF LSAMP – REU Mentor Program**, National Science Foundation USA & Organization for Tropical Studies, CR  
- Summer 2019 (\$3,600)

**UT Departmental Recruitment Fellowship**, The University of Texas at Austin, Austin, TX, USA  
- Fall 2018 – Summer 2019 (\$27,000)

**UT Summer Research Fellowship**, The University of Texas at Austin, Austin, TX, USA  
- Summer 2018 (\$6,600)

**NSF Graduate Research Fellowship Program**, National Science Foundation USA  
- Spring 2018 (Honorable Mention)

**Texas Ecolab Research Grant**, Braun & Gresham Associates, Dripping Springs, TX, USA  
- Spring 2018 – Fall 2018 (\$11,000)  
- Spring 2019 – Fall 2019 (\$8,975)  
- Spring 2020 – Fall 2020 (\$8,900)

**Linda Escobar Award**, UT Austin, Austin, TX, USA  
- February 2017 (\$1,500)

**STRI Pre-doctoral Fellowship**, Smithsonian Tropical Research Institute, Panama City, Panama  
- December 2015 – November 2017 (\$22,000)

**STRI Short-Term Fellowship**, Smithsonian Tropical Research Institute, Panama City, Panama  
- June 2015 – November 2015 (\$4,800)

**Pack Pride Scholarship**, University of Nevada, Reno, NV, USA

- 2008 to 2010 (\$3,000)

**Millennium Scholar**, University of Nevada, Reno, NV USA

- 2008 to 2012 (\$7,680)

**Eagle Scout Award**, Boy Scouts of America, Las Vegas, NV USA

- 2008

## Public Service and Outreach

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**UT Austin Development** – Fundraising, scientific communication, and research presentations with potential donors

**Texas Master Naturalists** – Project development consultant. I work with volunteers in designing ecological studies

**UT Science Under the Stars** – Public outreach series established to expose local Austinites to ongoing graduate research. Natural History Section Coordinator.

**Gamboa Discovery School** – Why are insects ubiquitous and important?

**CHISPA - Smithsonian Tropical Research Institute** sponsored experiential learning for at-risk children from Panama.

**Make a Wish Foundation –Smithsonian Tropical Research Institute** sponsored experiential learning for those children with debilitating ailments that intend to embark upon careers as entomologists.

**UNR, Museum of Natural History** – community science/natural history outreach events.

**Earthwatch Institute** – “Climate Change and Caterpillars”: Arizona USA, California USA, Florida, USA, Costa Rica, Ecuador: supervising citizen scientist involvement in research projects, data and collection in field and laboratory settings.

**STEM Night**, Veterans Elementary School – K-12 science outreach events.

**Boys and Girls Club** - College of Science outreach events.

**Boy Scouts of America** – Eagle Scouts: numerous public service projects and community progress events.

## Languages

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1st Language – **English** (native)

2nd language – **Spanish** (fluent)

## Professional Memberships

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Ecological Society of America (current)

Entomological Society of America (current)

Coleopterists Society (current)

American Society of Naturalists

Society for Integrative and Comparative Biology

## Mentoring

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### **Undergraduate Mentoring at Home Institutions**

#### The University of Texas at Austin, Austin, TX, USA

- Chloe Nguyen (Senior Thesis) – Variable *Heliconius* sequestration on different host plants.
- Amelia Nelson (Senior Capstone) – *Heliconius* trade-offs between immune response and sequestration.
- Richard Freeman (Senior Capstone) – Performance of *Heliconius* caterpillars on different host plants.
- Wyatt Armstrong (Research Assistant) – *Passiflora* flea beetle performance, behavior and sequestration.
- Marshall Cahill (Research Assistant) – Performance and immune response of *Heliconius* caterpillars.

- Lauren Hart (Research Assistant) – Nutrient availability and resource allocation by *Passiflora*.  
Smithsonian Tropical Research Institute, Gamboa Panama
- Clement Aubert (Research Assistant) – Host plant driven variation in tortoise beetle performance.  
University of Nevada Reno, Reno, NV
- Morgan Ricci (Senior Thesis) – Invasive clam removal operation effects on Lake Tahoe meiofauna.
- Kira Espinoza (Senior Thesis) – Effect of industrial Triclosan on estuarine meiofaunal communities.

#### **National Science Foundation REU Program**

Summer 2022 (InSTInCT), The University of Texas at Austin, Austin TX, USA

- Allison Morales Palomino – biodiversity collections

Summer 2019 (LSAMP), Organization for Tropical Studies, La Selva BS, Costa Rica

- Ashlyn Nest – nitrogen fertilization effect on *Passiflora* leaf cyanide production.
- Alana Gipson – *Passiflora* flea beetle and *Heliconius* larvae parasitoid immune response.

Summer 2016 (Site Grant), Smithsonian Tropical Research Institute, Gamboa Panama

- David Tian & Sylvia Durkin – CRISPR/Cas9 mutagenesis of *Heliconius* wing traits

## Publications

- Morrison, C. R.**, Armstrong, W.A., and L. E. Gilbert. *in prep.* Egg cannibalism by passion vine specialist *Disonycha* Chevrolat flea beetles (Coleoptera: Chrysomelidae). <https://www.biorxiv.org/content/10.1101/2020.04.15.005611v1>
- Morrison, C. R.**, MacNeill, F., Salazar, G., Smiley, J., Sedio, B. A., and L. E. Gilbert. *in prep.* The structure of a passion vine specialist insect community: Phylogenetic and metabolomic similarity drive parallel structured herbivore assemblages.
- Morrison, C. R.**, Bowman, E. A., Plowes, R. M., and L. E. Gilbert. *in prep.* Prickly pear cactus (*Opuntia engelmanni*) chemical profiles are induced by specialist insect and microbial natural enemies with functionally distinct feeding habits.
- Nguyen, C., Gilbert, L. A., and **C. R. Morrison**. *in review*. The role of host plant usage and the incorporation of toxic cyanogenic compounds across the life cycle of *Heliconius charithonia*.
- Morrison C. R.**, Rhodes, A. R., Bowman, E. A., Sedio, B. E., Plowes, R. M., and L. E. Gilbert. *in review*. Adding insult to injury: Light competition and novel weapons interact to facilitate Guinea grass invasion.
- Moskowitz, N. A., Alvarez-Buylla, A., **Morrison, C. R.**, Chamba, A., Rentería, J., Tapia, E. A., Coloma, L. A., Donoso, D. A., and L. A. O’Connell. *in review*. Poison frog diet and chemical defense are influenced by availability and selectivity for ants
- Morrison, C. R.**, Plowes, R. M., Jones, N. T., and L. E. Gilbert. 2020. Host quality does not matter to native or invasive cactus moth larvae: grave implications for North American prickly pears. *Ecological Entomology* 46:319–333. <https://doi.org/10.1111/een.12964>
- *Press Coverage by* [KUT](#) (Austin NPR affiliate), [UT Austin News](#), and [KXAN](#) (Austin NBC affiliate),
- Darragh, K., Montejo-Kovacevich, G., Kozak, K. M., **Morrison, C. R.**, Figueiredo, C., Ready, J., Salazar, C., Linares, M., Byers, K. J. R., Merrill, R. M., McMillan, W. O., Schulz, S., and C. D. Jiggins. 2020. Species specificity and intraspecific variation in the chemical profiles of *Heliconius* butterflies across a large geographic range. *Ecology and Evolution* 10:3895–3918. <https://doi.org/10.1101/573469>.
- Smiley, J. and **C. R. Morrison**. 2020. Using a portable hydrogen cyanide gas meter to uncover a dynamic phytochemical landscape. *Applications in Plant Sciences* 8:e11336. <https://doi.org/10.1002/aps3.11336>
- Concha, C., Wallbank, R. W. R., Hanly, J. J., Fenner, J., Livraghi, L., Rivera, E. S., Paulo, D. F., Arias, C., Vargas, M., Sanjeev, M., **Morrison, C. R.**, Tian, D., Aguirre, P., Ferrara, S., Foley, J., Pardo-Diaz, C., Salazar, C., Linares, M., Massardo, D., Counterman, B. A., Scott, M. J., Jiggins, C. D., Papa, R., Martin, A., and W. O. McMillan. 2019. Interplay between developmental flexibility and determinism in the evolution of mimetic *Heliconius* wing patterns. *Current Biology* 29:3996–4009. <https://doi.org/10.1016/j.cub.2019.10.010>
- Morrison, C. R.**, Aubert, C., and D. M. Windsor. 2019. Variation in Host Plant Usage and Diet Breadth Predict Sibling Preference and Performance in the Neotropical Tortoise Beetle *Chelymorpha alternans* (Coleoptera: Chrysomelidae: Cassidinae). *Environmental Entomology* 48:382–394. <https://doi.org/10.1093/ee/nvy194>.
- Morrison, C. R.** 2018. Predation of top predators: cane toad consumption of bullet ants in a Panamanian lowland wet forest. *The Journal of Tropical Ecology* 0:1–5, <https://doi.org/10.1017/S0266467418000342>.

- Morrison, C. R.**, and D. M. Windsor. 2017. The life history of the neotropical Tortoise Beetles *Chelymorpha alternans* from the Republic of Panama. *Annals of the Entomological Society of America* 111:31–41. <https://doi.org/10.1093/aesa/sax075>.
- Darragh, K., Vanjari, S., Mann, F., Gonzalez, M. R., **Morrison, C. R.**, Salazar, C., Pardo-Diaz, C., Merrill, R. M., McMillan, W. O., Schulz, S., and C. D. Jiggins. 2017. Male sex pheromone components in *Heliconius* butterflies released by the androconia affect female choice. *PeerJ* e3953. <https://doi.org/10.7717/peerj.3953>.
- Glassmire, A. E., Jeffrey, C. S., Forister, M. L., Parchman, T., Nice, C. C., Jahner, J. P., Wilson, J., Walla, T., Robinson, L., Smilanich, A. M., **Morrison, C. R.**, Simbaña, W., Salgaje, L. A., Dodson, C., Miller, J., Leonard, M. D., and L. A. Dyer. 2016. Intraspecific phytochemical variation drives population and community structure for specialist caterpillar. *New Phytologist* 212:208–219. <https://doi.org/10.1111/nph.14038>.
- *Special commentary from the editor*: Kessler A. (2016) The geographic mosaic of plant chemistry and its effects on community and population genetic diversity. *New Phytologist* 212:8–10. <https://doi.org/10.1111/nph.14136>.
- Bernhard, J. M., **Morrison, C. R.**, Pape, E., Beaudoin, D. J., Todaro, A., Pachiadaki, M. G., Kormas, K. A., and V. P. Edgcomb. 2015. Metazoans of redoxcline sediments in Mediterranean deep-sea hypersaline anoxic basins. *BMC Biology* 13. <https://doi.org/10.1186/s12915-015-0213-6>.
- Bernhard, J. M., Kormas K., Pachiadaki, M. G., Rocke, E., Beaudoin, D. J., **Morrison, C. R.**, Visscher, P. T., Cobban, A., Starczak, V. R., and V. P. Edgcomb. 2014. Benthic protists and fungi of Mediterranean deep hypersaline anoxic basin redoxcline sediments. *Extreme Microbiology* 5. <https://doi.org/10.3389/fmicb.2014.00605>.
- Baguley, J. G., Montagna, P. A., Cooksey, C., Hyland, J. L., Bang, H. W., Kamikawa, A., Bennetts, P., **Morrison, C. R.**, Saiyo, G., Parsons, E., Herdener, M., and M. Ricci. 2014. Community response of deep-sea soft-sediment metazoan meiofauna to the Deepwater Horizon blow out and oil spill. *Marine Ecological Progress Series* 528:127–140. <https://doi.org/10.3354/meps11290>.