**Tobin J. Hammer**

303 Steinhaus Hall hammert@uci.edu

Irvine, CA 92697 (949) 824-6006

**Research Interests**

Evolution of symbiosis, microbial ecology, plant-insect interactions, bees, tropical biology

**Professional Employment**

Assistant Professor 1/2022 – Present

Department of Ecology & Evolutionary Biology

University of California, Irvine

Postdoctoral Researcher 9/2018 – 12/2021

University of Texas at Austin

*Advisor: Nancy A. Moran*

**Education**

Ph.D. in Ecology and Evolutionary Biology 8/2012 – 5/2018

University of Colorado Boulder

*Advisors: Noah Fierer and M. Deane Bowers*

B.S. in General Biology 9/2005 – 6/2009

University of California, San Diego

Magna Cum Laude, with Distinction

*Honors Thesis Advisor: Eric E. Allen*

UC Education Abroad Program 10/2007 – 12/2007

Tropical Biology and Conservation

Monteverde Institute, Costa Rica

**Peer-Reviewed Publications (\* indicates student mentee)**

**[22] Hammer, T.J.**, Kueneman, J., Argueta-Guzmán, M., McFrederick, Q.S., Grant, L., Wcislo, W., Buchmann, S., Danforth, B.N. 2023. Bee breweries: the unusually fermentative, lactobacilli-dominated brood cell microbiomes of cellophane bees. *Frontiers in Microbiology* 14, 1114849.

**[21] Hammer, T.J.**, Easton-Calabria, A., Moran, N.A. 2022. Microbiome assembly and maintenance across the lifespan of bumble bees. *Molecular Ecology* 32, 724-740.

**[20] Hammer, T.J.**, Le, E.\*, Martin, A.N.\*, Moran, N.A. 2021. The gut microbiota of bumblebees. *Insectes Sociaux* 68, 287-301.

**[19]** Silva Cerqueira, A.E., **Hammer, T.J.**, Moran, N.A., Cristiano Santana, W., Megumi Kasuya, M.C., Canêdo da Silva, C. 2021. Extinction of anciently associated gut bacterial symbionts in a clade of stingless bees. *The ISME Journal* 15, 2813-2816.

**[18] Hammer, T.J.**, De Clerck-Floate, R., Tooker, J.F., Price, P.W., Miller, D.G., Connor, E.F. 2021. Are bacterial symbionts associated with gall induction in insects? *Arthropod-Plant Interactions* 15, 1-12.

**[17] Hammer, T.J.**, Le, E.\*, Moran, N.A. 2021. Thermal niches of specialized gut symbionts: the case of social bees. *Proceedings of the Royal Society B* 288, 20201480.

**[16] Hammer, T.J.**, Dickerson, J.C.\*, McMillan, W.O., Fierer, N. 2020. *Heliconius* butterflies host characteristic and phylogenetically structured adult-stage microbiomes. *Applied and Environmental Microbiology* 86, e02007-20.

**[15]** Danielsson, R., Lucas, J., Dahlberg, J., Ramin, M., Agenäs, S., Bayat, A., Tapio, I., **Hammer, T.J.**, Roslin, T.2019.Compound- and context-dependent effects of antibiotics on greenhouse gas emissions from livestock. *Royal Society Open Science* 6, 182049.

**[14] Hammer, T.J.**, Moran, N.A. 2019. Links between metamorphosis and symbiosis in holometabolous insects. *Philosophical Transactions of the Royal Society B* 374, 20190068.

**[13]** Moran, N.A., Ochman, H., **Hammer, T.J.** 2019. Evolutionary and ecological consequences of gut microbial communities. *Annual Review of Ecology, Evolution, and Systematics* 50, 451-475.

**[12]** Keiser, C.N., **Hammer, T.J.**, Pruitt, J.N. 2019. Social spider webs harbour largely consistent bacterial communities across broad spatial scales. *Biology Letters* 15, 20190436.

**[11] Hammer, T.J.**, Sanders, J.N., Fierer, N. 2019. Not all animals need a microbiome. *FEMS Microbiology Letters* 366, fnz117.

**[10]** Ravenscraft, A., Berry, M., **Hammer, T.J.**, Peay, K., Boggs, C. 2018. Structure and function of the bacterial and fungal gut microbiota of Neotropical butterflies. *Ecological Monographs* 89, e01346.

**[9] Hammer, T.J.**, Janzen, D.H., Hallwachs, W., Jaffe, S., Fierer, N. 2017. Caterpillars lack a resident gut microbiome. *Proceedings of the National Academy of Sciences* 114, 9641-9646.

**[8] Hammer, T.J.**, Fierer, N., Hardwick, B., Simojoki, A., Slade, E., Taponen, J., Viljanen, H., Roslin, T. 2016. Treating cattle with antibiotics affects greenhouse gas emissions, and microbiota in dung and dung beetles. *Proceedings of the Royal Society B* 283, 20160150.

**[7]** Barberán, A., **Hammer, T.J.**, Madden, A., Fierer, N. 2016. Microbes should be central to ecological education and outreach. *Journal of Microbiology & Biology Education* 17, 23-28.

**[6]** Planet, P.J., Parker, D., Cohen, T.S., Smith, H., Leon, J.D., Ryan, C., **Hammer, T.J.,** Fierer, N., Chen, Emily I., Prince, A.S. 2016. Lambda interferon restructures the nasal microbiome and increases susceptibility to *Staphylococcus aureus* superinfection. *mBio* 7, e01939-15.

**[5] Hammer, T.J.**, Dickerson, J.C.\*, Fierer, N. 2015. Evidence-based recommendations on storing and handling specimens for analyses of insect microbiota. *PeerJ* 3, e1190.

**[4] Hammer, T.J.**, Bowers, M.D. 2015. Gut microbes may facilitate insect herbivory of chemically defended plants. *Oecologia* 179, 1-14.

**[3] Hammer, T.J.**, Van Bael, S.A. 2015. An endophyte-rich diet increases ant predation on a specialist herbivorous insect. *Ecological Entomology* 40, 316-321.

**[2] Hammer, T.J.**, McMillan, W.O., Fierer, N. 2014. Metamorphosis of a butterfly-associated bacterial community. *PLoS One* 9, e86995.

**[1] Hammer, T.J.**, Hata, C., Nieh, J.C. 2009. Thermal learning in the honey bee, *Apis mellifera*. *Journal of Experimental Biology* 212, 3928-3934.

**Submitted Manuscripts (available upon request)**

**Hammer, T.J.** Why many animals eat plants without help from microbes. *Resubmitted* (book chapter).

**Fellowships, Grants, and Awards**

USDA NIFA Postdoctoral Fellowship ($164,850) 2019 – 2021

Travel Fellowship from the NIH Social Dimensions of Aging Research Network 2020

Texas Ecolab Program Research Grant ($8,691) 2018

National Geographic Society Early Career Grant ($5,415) 2018

CU Boulder / CIRES Graduate Student Research Award ($39,539) 2017 – 2018

NSF Graduate Research Fellowship Program ($132,000) 2014 – 2017

NSF Doctoral Dissertation Improvement Grant ($16,113) 2016

Grants Supporting Undergraduate Research, CU Boulder ($4,789) 2015, 2016

Departmental Research Grants, CU Boulder ($4,613) 2014, 2016

Lewis and Clark Fund for Exploration and Field Research Grant ($2,900) 2015

CU Boulder Chancellor’s Fellowship 2012 – 2014

Smithsonian Tropical Research Institute Short-Term Fellowship 2011

Fulbright Grant, Max Planck Institute for Marine Microbiology 2009 – 2010

American Society for Microbiology Undergraduate Research Fellowship 2008 – 2009

Robins Scholarship for Undergraduate Research in Marine Sciences 2008 – 2009

Phi Beta Kappa Honors 2009

NSF REU Program at Woods Hole Oceanographic Institution 2008

Amgen Scholars Summer Research Program at UC Berkeley 2007

**Seminars and Conference Presentations**

*Invited Seminars*

Department of Entomology, University of Illinois Urbana-Champaign 2022

UC Santa Barbara Natural Reserve System Seminar Series 2022

Department of Biology, Harvey Mudd College 2022

Department of Biology, Indiana University 2022

Department of Entomology and Nematology, UC Davis 2022

Department of Entomology, Purdue University 2019

*Conference Talks (\* denotes invited)*

Yosemite Symbiosis Workshop 2023

\* Entomological Society of America Annual Meeting 2022

International Union for the Study of Social Insects Conference 2022

Yosemite Symbiosis Workshop 2022

\* NIH Animal Models for the Social Dimensions of Health and Aging Network Meeting 2021

\* Frontiers in Terrestrial and Marine Microbial Ecology Symposium, STRI 2021

Gutenberg Workshop on Aging in Social Insects 2021

\* Entomological Society of America Annual Meeting 2020

Virtual Symbiosis Seminar Series 2020

\* Ecological Society of America Meeting, Organized Oral Session 2019

BOMBUSS Bumble Bee Monitoring and Conservation Meeting 2019

Population Biology Seminar, Department of Integrative Biology, UT Austin 2018

The Lepidopterists’ Society Annual Meeting 2017

Yosemite Symbiosis Workshop 2017

\* Tropical Microbial Ecology Symposium, STRI 2016

\* International Congress of Entomology 2016

10th International *Heliconius* Meeting 2015

\* European Congress of Entomology 2014

Entomological Society of America Annual Meeting 2013

High Country Lepidopterists’ Meeting 2013

Smithsonian Tropical Research Institute Fellows Symposium 2011

American Society for Microbiology General Meeting 2009

*Posters*

Gordon Research Conference on Animal-Microbe Symbioses 2019

Meeting of the Guild of Rocky Mountain Ecologists & Evolutionary Biologists 2017

Gordon Research Conference on Animal-Microbe Symbioses 2017

International Society for Microbial Ecology 2016

Gordon Research Conference on Plant-Herbivore Interactions 2013

International Society for Microbial Ecology 2010

**Teaching Experience**

*Courses Taught*

Principles of Ecology, CU Boulder (Sole Instructor, Summer Term) 7/2018 – 8/2018

Insect Biology, CU Boulder (Lecture Co-Instructor and Lab TA) 8/2017 – 12/2017

Microbiology, CU Boulder (Lab TA) 1/2015 – 5/2015

Introductory Organismal and Evolutionary Biology, UCSD (TA) 4/2009 – 6/2009

Introductory Molecular and Cell Biology, UCSD (TA) 9/2008 – 12/2008

*Pedagogical Training and Recognition*

Award for Outstanding Contributions to Undergraduate Teaching (CU Boulder) 5/2018

Graduate coursework in Science Education Teaching & Learning 8/2017 – 12/2017

Graduate coursework in Pedagogy for Future Faculty 1/2017 – 5/2017

**Undergraduate Mentees**

Alejandro Rodriguez Vazquez (UC Irvine) 3/2023 – Present

Sophia Aredas (UC Irvine) 9/2022 – Present

Perla Vasquez (UC Irvine) 9/2022 – Present

Thuy-Tien Bui (UC Berkeley) 6/2022 – 8/2022

Nickole Villabona (Universidad de los Andes) 5/2019 – 12/2021

Eli Le (UT Austin) 10/2018 – 5/2021

Alexia Martin (UT Austin) 10/2018 – 5/2021

Hadis Askari (UT Austin) 11/2019 – 5/2020

Lady Grant (Metro State University of Denver) 5/2018 – 6/2018

Jacob Dickerson (CU Boulder) 2/2013 – 6/2016

Kristen Vaccarello (CU Boulder) 4/2015 – 1/2016

Evelyn Beaury (CU Boulder) 10/2015 – 12/2015

**Service**

*Academic Service*

Ph.D. thesis opponent, University of South Bohemia, 2021

Postdoctoral representative for departmental diversity and inclusion committee at UT Austin

Member of departmental diversity and inclusion working group at CU Boulder

Volunteer judge, 2019 UT Symposium for Undergraduate Research Exploration

Volunteer judge, 2019 UT Fall Undergraduate Research Symposium

Session presider, 2019 Ecology Society of America Annual Meeting

Discussion leader, 2019 Gordon Research Seminar on Animal-Microbe Symbioses

Lead organizer for weekly departmental Lunch & Learn seminar series at CU Boulder

*Peer Review*

Ad hoc grant review: National Science Foundation Division of Integrative Organismal Systems, National Science Foundation Division of Environmental Biology, Swiss National Science Foundation, Israeli Science Foundation, German Research Foundation, Graduate Women In Science National Fellowship Program

Manuscript review: *Molecular Ecology* (x 9), *International Society for Microbial Ecology Journal* (x 3), *Proceedings of the Royal Society B* (x 3), *Current Biology* (x 2), *mBio* (x 2), *Oecologia* (x 2), *Animal Microbiome* (x 2), *PLoS One* (x 2), *Ecological Entomology* (x 2), *FEMS Microbiology Ecology* (x 2), *PNAS*, *Evolution*, *Ecology Letters*, *Philosophical Transactions of the Royal Society* *B*, *Functional Ecology*, *Biology Letters*, *Trends in Microbiology*, *BMC Biology*, *BMC Microbiology*, *Frontiers in Microbiology*, *Journal of Animal Ecology*, *Microbial Ecology*, *Journal of Applied Microbiology*, *Royal Society Open Science*, *Environmental Microbiology Reports*, *Scientific Reports*, *Insectes Sociaux*, *NPJ Biofilms and Microbiomes*, *Journal of Crustacean Biology*, *Malacalogia*, *Journal of Insect Science*, *Journal of Tropical Lepidoptera Research*, *Environmental Entomology*, *Current Opinion in Insect Science*, *mSystems*, *mSphere*.

*Public Outreach*

Design of educational activities with UCI Science Project 12/2021 – Present

Lunch & Learn webinar on social insects, Austin Nature & Science Center 5/2021

Talk for the BEEMAS group at Universidad de los Andes, Colombia 11/2020

Explore UT campus exhibition for Texas high school students 3/2019

Talk for the Alamo Area Beekeepers’ Association Meeting 3/2019

Pollination Exhibit at the San Antonio Rodeo Wildlife Expo 2/2019

Teen Science Cafe, CU Boulder Natural History Museum 4/2018

Talk for the CU Boulder STEMinar series 3/2018

Evolution Outreach Family Day, CU Boulder Natural History Museum 2/2018

Public research talks for the Portal, Arizona community 8/2016, 8/2017

Family Science Day, CU South Denver 2/2017, 5/2017

Student BioBlitz, Denver Museum of Nature and Science 10/2016

Moth Mania, CU Boulder Natural History Museum 9/2014, 9/2015, 9/2016

Mysterious Microbes Workshop, CU Boulder / CIRES 5/2016