

# Casey P. terHorst

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## EDUCATION AND PROFESSIONAL EXPERIENCE:

|                                                                                  |              |
|----------------------------------------------------------------------------------|--------------|
| Assistant Professor                                                              | 2013-present |
| California State University, Northridge                                          |              |
| Post-doctoral Research Associate                                                 | 2010-2013    |
| Kellogg Biological Station, Michigan State University<br>(Advisor: Jennifer Lau) |              |
| Ph.D., Biological Science                                                        | 2004-2010    |
| Florida State University<br>(Co-Advisors: Thomas Miller and Don Levitan)         |              |
| M.S., Biological Sciences                                                        | 2001-2004    |
| California State University, Northridge<br>(Advisor: Steve Dudgeon)              |              |
| B.A., History                                                                    | 1994-1998    |
| University of Southern California                                                |              |

## FUNDING/AWARDS:

|                                                                                                                                                                                                     |           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|
| National Science Foundation, Div. Environmental Biology (\$565,000)<br>RUI: Limits to the effects of contemporary evolution<br>on communities                                                       | 2018-2021 |
| National Science Foundation, Div. Ocean Sciences (\$873,062)<br>RUI: Collaborative Research: Genetic variation as a driver of host<br>and symbiont response to increased temperature on coral reefs | 2016-2020 |
| National Science Foundation, Div. Mathematical Sciences (\$594,760)<br>Collaborative Research: Trait Evolution and the Stability<br>of Ecological Communities                                       | 2013-2017 |

## PEER-REVIEWED PUBLICATIONS: 15 as first author, \*indicates supervised student paper (8)

### *Manuscripts in review*

- (34) \*Fleischer, S., **terHorst C. P.**, and J. Li (in review). Stabilizing selection through ecological pleiotropy can increase stable coexistence of predator and prey. *Journal of Theoretical Biology*.
- (33) **terHorst, C. P.** \*C. Wirth, J. A. Lau (in review). Genetic variation in mutualism and competitive ability in an invasive legume. *Oecologia*
- (32) Zee, P. C., **C. P. terHorst**, and S. J. Schreiber (in review). Rapid evolution stabilizes food web communities by rescuing declining populations. *American Naturalist*.
- (31) \*Bayliss, S. L. J., \*Scott, Z. R., Coffroth, M. A., and **C. P. terHorst** (in review). Symbiont genotypes vary in response to temperature and nutrients. Part of a special issues on: The Host-Associated Microbiome in *Molecular Ecology*.
- (30) \*Scott, Z. R. and **C. P. terHorst**. (in review). Spatial variation in the influence of an invasive bryozoan on community diversity and structure. *Biofouling*.
- (29) LaFleur, M. Reuter, K., and **C. P. terHorst**. (in review). Illegal trade of wild ring-tailed lemurs, an Endangered Species, within Madagascar. *PLoS One*.
- (28) \*Getman-Pickering, Z., **C. P. terHorst**, S. Magnoli, and J. A. Lau (in review). Evolution of increased size during invasion does not result in increased competitive ability. *Oecologia*

*Published Manuscripts*

- (27) **terHorst, C. P.**, P. C. Zee, K. D. Heath, T. E. Miller, A. I. Pastore, S. Patel, S. J. Schreiber, M. J. Wade, and M. R. Walsh (in press). Evolution in a community context. *American Naturalist*
- (26) Schreiber, S. J., S. Patel, **C. P. terHorst**. (in press). Evolution as a coexistence mechanism: does genetic architecture matter? *American Naturalist*
- (25) **terHorst, C.P.**, Lau, J.A., Conner, J.K. (2017). Quantifying non-additive selection caused by indirect ecological effects: Reply to Comment. *Ecology* 98: 1171-1175
- (24) \*Holdridge, E. M., Flores, G. E. **terHorst, C. P.** (2017). Predator trait evolution alters prey community composition. *Ecosphere* 8: e01803
- (23) \*Bayliss, S. L. J., **C. P. terHorst**, and J. A. Lau (2017). Testing genotypic variation of an invasive plant species in response to soil disturbance and herbivory. *Oecologia* 183: 1135-1141
- (22) **terHorst, C. P.** and P. Zee. 2016. Eco-evolutionary dynamics in plant-soil feedbacks. *Functional Ecology* 30: 1062-1072.
- (21) \*Holdridge, E. M., Cuellar-Gempeler, C., and **C. P. terHorst**. 2016. A shift from exploitation to interference competition with increasing density affects population and community dynamics. *Ecology and Evolution* 6: 5333-5341.
- (20) **terHorst, C. P.**, J. A. Lau, I. A. Cooper, K. R. Keller, R. J. LaRosa, A. M. Royer, E. H. Schultheis, T. Suwa, and J. K. Conner. 2015. Quantifying non-additive selection caused by indirect ecological effects. *Ecology* 96: 2360-2369.
- (19) Lau, J.A. and **C.P. terHorst**. 2015. Causes and consequences of failed adaptation to biological invasions: the role of ecological constraints. *Molecular Ecology* 24: 1987-1998.
- (18) **terHorst, C.P.** and J.A. Lau. 2014. Genetic variation in invasive species response to direct and indirect species interactions. *Biological Invasions* 17: 651-659.
- (17) **terHorst, C.P.**, J.A. Lau, and J.T. Lennon. 2014. The relative importance of rapid evolution for plant-microbe interactions depends on ecological context. *Proceedings of the Royal Society B* 281: 20140028.
- (16) Miller, T.E., E.R. Moran, and **C.P. terHorst**. 2014. Rethinking niche evolution: experiments with natural populations of protozoa. *American Naturalist* 184: 277-283.
- (15) **terHorst, C. P.** and J. A. Lau. 2012. Direct and indirect transgenerational effects alter plant-herbivore interactions. *Evolutionary Ecology* 26: 1469-1480.
- (14) Miller, T. E. and **C. P. terHorst**. 2012. Testing successional hypotheses of stability, heterogeneity, and diversity in pitcher-plant inquiline communities. *Oecologia* 170: 243-251.
- (13) **terHorst, C. P.** 2012. Context-dependent orientation cues in an intertidal amphipod. *Marine and Freshwater Behaviour and Physiology* 45: 45-50.
- (12) Miller, T.E. and **C.P. terHorst**. 2012. Indirect effects in communities and ecosystems. *Oxford Bibliographies in Ecology*. Ed. David Gibson. New York: Oxford University Press.  
<http://www.oxfordbibliographies.com/obo/page/ecology>
- (11) **terHorst, C. P.** 2011. Experimental evolution of protozoan traits in response to interspecific competition. *Journal of Evolutionary Biology* 24: 36-46.
- (10) **terHorst, C.P.**, T.E. Miller, and E. Powell. 2010. When can competition for resources lead to ecological equivalence? *Evolutionary Ecology Research* 12: 843-854.
- (9) **terHorst, C. P.** 2010. Evolution in response to direct and indirect effects in pitcher plant inquiline communities. *The American Naturalist* 176: 675-685.
- (8) **terHorst, C.P.**, T.E. Miller and D.R. Levitan. 2010. Discrepancies in evolutionary rates change ecological effect size of predators on prey. *Ecology* 91: 629-636.
- (7) Miller, T. E., **C.P. terHorst**, and J. H. Burns. 2009. The ghost of competition present. *The American Naturalist* 173: 347-353.
- (6) **terHorst, C.P.** and S.R. Dudgeon. 2009. Beyond the patch: disturbance affects species abundances in the surrounding matrix community. *Journal of Experimental Marine Biology and Ecology* 370: 120-126.

- (5) Burns, J.H., P. Munguia, B. Nomann, S. Braun, **C.P. terHorst**, and T.E. Miller. 2008. Vegetative morphology and trait correlations in 54 species of Commelinaceae. *Botanical Journal of the Linnean Society* 158: 257-268.
- (4) **terHorst, C.P.** and P. Munguia. 2008. Measuring ecosystem function: consequences arising from variation in the biomass-productivity relationship. *Community Ecology* 9: 36-41.
- (3) Levitan, D.R., **C.P. terHorst** and N.D. Fogarty. 2007. The risk of polyspermy in three congeneric sea urchins and its implications for gametic incompatibility and reproductive isolation. *Evolution* 61: 2009-2016.
- (2) Hoekman, D., **C.P. terHorst**, A. Bauer, S. Braun, P. Gignac, R. Hopkins, S. Joshi, K. Laskis, N. Sanscrainte, J. Travis, and T. E. Miller. 2007. Oviposition decreased in response to enriched water: a field study of the pitcher-plant mosquito, *Wyeomyia smithii*. *Ecological Entomology* 32: 92-96.
- (1) Fierst, J.L., **C.P. terHorst**, J.E. Kubler, and S. R. Dudgeon. 2005. Fertilization success can drive patterns of phase dominance in complex life histories. *Journal of Phycology* 41:238-249.

## **PRESENTATIONS:**

### ***Invited Speaker***

- Regis University: What can ecology teach us about environmental issues? November 2017.
- University of California, Irvine: The ecological players in the evolutionary theater: contemporary evolution in communities. November 2016.
- University of Pennsylvania: Ecology is more than just a theater: effects of contemporary evolution on ecological interactions. October 2015.
- University of California, Davis: Context-dependency of eco-evo feedbacks. April 2015.
- University of California, Los Angeles: Evolution on contemporary time scales alters species interactions. October 2014.
- University of California, Riverside: Ecology and evolution interact to shape species interactions. March 2014.
- Rice University: Ecology and evolution interact to shape species interactions. March 2014.
- Mathematical Biosciences Institute: Rapid evolution of multiple species increases coexistence: insights from models and model systems. October 2013.
- Case Western Reserve University: Ecology and evolution interact to shape species interactions. January 2013.
- California State University, Northridge: Ecology and evolution interact to shape species interactions. December 2012.
- University of Memphis: Ecology and evolution interact to shape species interactions. November 2012.
- University of Kansas: Microbial species interactions in an eco-evolutionary framework. February 2012.
- University of California, Davis: Dynamics species interactions in an eco-evolutionary framework. February 2012.
- Bowling Green State University: Dynamic species interactions in an eco-evolutionary framework. February, 2012.
- University of Louisville: The evolution of species interactions in a community context. January, 2012.
- Kellogg Biological Station, Michigan State University: Evolution in a community context. October 2010.
- Florida State University: Not dead yet: indirect effects make community ecology relevant for ecological and evolutionary processes. October, 2009.
- Smithsonian Environmental Research Center: Rapid evolution in aquatic communities: the missing link between community ecology and evolution. March 2008.
- Florida State University: Evolutionary rates on ecological time scales. April 2007.

***National and Regional Meetings*** (40 presentations since 2001; last five years shown)

- terHorst, C.P. Evolution to overcome biotic resistance to invasion is limited by multiple species interactions. Presented at the American Society of Naturalists, Pacific Grove, CA. January 2018.
- terHorst, C.P., Brisson, C., and M.A. Coffroth. Is evolutionary rescue a viable option for conservationists? Presented at the Western Society of Naturalists meeting. Pasadena, CA. November 2017.
- terHorst, C.P., Bayliss, S.L.J., Scott, Z.R., and M.A. Coffroth. Ecological and evolutionary consequences of symbiont genetic variation. Presented at the 102<sup>nd</sup> meeting of the Ecological Society of America. Portland, OR, August 2017.
- terHorst, C.P., Getman-Pickering, Z.L., Bayliss, S. L. J., Magnoli, S.M., Cammisa, N., and J.A. Lau. Contemporary evolution in invasive species in a community context. Presented at the Joint Meeting of The American Society of Naturalists and Society for the Study of Evolution, Portland, OR, June 2017.
- terHorst, C.P., S. Bayliss, M.D. Fowler, S. VonVreckin, Z. Scott, and M.A. Coffroth. Evolution to the rescue: symbiont evolution offers hope for corals. Presented at the Western Society of Naturalists meeting, Monterey, CA. November 2016.
- terHorst, C.P., S. Bayliss, M.D. Fowler, S. VonVreckin, Z. Scott, and M.A. Coffroth. Potential for evolutionary rescue via symbiont adaptation. 101<sup>st</sup> annual meeting of the Ecological Society of America. Fort Lauderdale, FL. August 2016.
- terHorst, C.P., S. Bayliss, M.D. Fowler, S. VonVreckin, Z. Scott, and M.A. Coffroth. Genetic variation in *Symbiodinium* traits: potential for evolutionary rescue via symbiont adaptation. International Coral Reef Symposium, Honolulu, HI. June 2016.
- terHorst, C.P., S. Bayliss, Z. Scott, and M.A. Coffroth. Evolutionary salvation: functional trait variation in *Symbiodinium*. Benthic Ecology Meetings, Portland, ME. March 2016
- terHorst, C.P. and M.A. Coffroth. Genetic variation in symbionts may allow coral reef species to adapt to global change. American Society of Naturalists, Pacific Grove, California. January 2016.
- terHorst, C.P., J.A. Lau, and J.T. Lennon. Plant evolution in response to drought alters the structure and function of soil microbial communities. 100<sup>th</sup> annual meeting of the Ecological Society of America, Baltimore, MD, August 2015.
- terHorst, C.P., J.A. Lau, and J.K. Conner. Indirect ecological effects drive non-additive selection on traits. Benthic Ecology Meetings, Quebec City, Quebec, March 2015.
- terHorst, C.P., J.A. Lau, and J.K. Conner. Indirect ecological effects drive non-additive selection on traits. Presented at the Western Society of Naturalists, Tacoma, Washington, November 2014.
- terHorst, C.P. et al. Indirect effects drive non-additive selection. Presented at the 99<sup>th</sup> annual meeting of the Ecological Society of America, Sacramento, California. August 2014.
- terHorst, C.P., J.T. Lennon, and J.A. Lau. The relative importance of rapid evolution depends on ecological context. Presented at American Society of Naturalists, Pacific Grove, California. January 2014.
- terHorst, C.P. and J.A. Lau. Genetic variation in invader response to direct and indirect species interactions. Presented at the Western Society of Naturalists, Oxnard, California. November 2013.
- terHorst, C.P., J.T. Lennon, and J.A. Lau. The relative importance of rapid evolution depends on ecological context. Presented at Ecological Society of America, Minneapolis, Minnesota. August 2013.
- terHorst, C.P., E. Miller, J.A. Lau. Dynamic ecological trade-offs can alter ecological experiments and evolutionary responses to selection. Presented at the Benthic Ecology Meeting, Savannah, Georgia. March, 2013.

**CURRENT COLLABORATORS:**

- Mary Alice Coffroth, University at Buffalo
- Catalina Cuellar-Gempeler, Florida State University
- Jen Lau, Michigan State University

- Jing Li, California State University, Northridge
- Tom Miller, Florida State University
- Sebastian Schreiber, UC Davis
- Peter Zee, University of Mississippi

#### **TEACHING:**

Principles of Ecology (Biol427, 427L, 492H: lecture, lab, and field course): Fall 2013, 2014, 2015, 2017  
 Principles of Biology I (Biol 106): Spring 2014, 2015, 2016, 2017  
 Seminar in Evolution (Biol 615F): Spring 2015  
 Biometry (Biol 502, 502L): Fall 2016  
 Co-facilitator of Transforming STEM Learning (Faculty Learning Community organized through UC Berkeley)

#### **GRADUATE STUDENTS ADVISED (7):**

Erica Holdridge, 2013-2015. Now in PhD program at Yale University.  
 Shannon Bayliss, 2013-2016. Now in PhD program at University of Tennessee  
 Nickie Cammisa, 2014-2017. Now in D. Env. Program at University of California, Los Angeles  
 Zoë Scott, 2014-2017. Starting PhD program at Univ. Alabama, Birmingham  
 James Canepa, 2015-2017. M.F.A. student at University of British Columbia  
 Melissa Kurman, 2015-2017.  
 Chelsea Brisson, 2017-present

#### **UNDERGRADUATE STUDENTS ADVISED (18):**

Angela Vela (current biology undergraduate, CSUN)  
 Leslie Rivas Quijano (current biology undergraduate, CSUN)  
 Aleena Hussain (current biology undergraduate, CSUN)  
 Alejandro Flores (current biology undergraduate, CSUN)  
 Emma Collosi (current biology undergraduate, CSUN)  
 Leah Bandak (current biology undergraduate, CSUN)  
 Cameron Winbush (current biology undergraduate, CSUN)  
 Katie Wong (current biology undergraduate, CSUN)  
 Sam Fleischer (CSUN, now in PhD program at UC Davis)  
 Michael Perez (REU, Michigan State, graduated with M.A. from UC Santa Barbara)  
 Zoe Getman-Pickering (REU, Michigan State, now in PhD program at Cornell)  
 Julia Miller (REU, Michigan State, now in PhD program at Cornell)  
 Maddy Screnock (Florida State, graduated from P.A. school)  
 Elisabeth Hibner (Florida State)  
 Nicole Hancock (Florida State)  
 Jennifer Heinlein (Florida State, Ph.D. student at Univ. Central Florida)  
 Lindsay Goldenberg (Florida State)  
 Lindsay Meyerowitz (Florida State)

#### **SERVICE:**

-National Science Foundation Review Panel, January 2014, April 2015  
 -Reviewer for Foreign Governments: Agence Nationale de la Recherche (France), Research Grant Council of Hong Kong  
 -Reviewer for: American Journal of Botany, American Naturalist, BMC Evolutionary Biology, Ecology, Ecology Letters, Ecosphere, Evolution, Journal of Experimental Marine Biology and Ecology, Limnology & Oceanography, Marine Ecology Progress Series, Microbial Ecology, Nature, Oecologia, Oikos, PLOS One, PNAS, Proceedings of the Royal Society B

CSUN University Committees:

- Graduate Studies Committee (2015-present), Chair (2017-present)
- National Council of Research Administrators Peer Review, Office of Research and Sponsored Projects (2015)
- New Faculty Orientation Mentor, Office of Faculty Development (2014-2015)

CSUN Biology Departmental Committees:

- Marine Biology Faculty Search Committee
- Plant Evolutionary Biology Faculty Search Committee
- Computer Committee (chair), Vehicle, Webpage, and Graduate (interim) Committees
- Core Curriculum Action Group for Introductory Biology
- Advisor for Behavioral, Ecology, and Evolution Reading Group
- Thesis Committee Member (16): Shannon Bayliss, Chelsea Brisson, Nicole Cammisa, James Canepa, Emma Collosi, Matthew Dickson, Andrea Haberkern, Erica Holdridge, Jacob Holmes, George Jarvis, Carson Keller, Melissa Kurman, Gillian Larson, Charlotte Messineo, Lansing Perng, Zoë Scott
- External Thesis Reviewer (10): Jesse Bergmann, Brian Clark, Nick Evensen, Parker House, Diana Jacinto, Edwin Leung, Lorna McFarlane, Corrine Paterson, Michael Schram, Jennifer Smolenski

**MEMBERSHIPS:**

American Association of Underwater Scientists  
American Society of Naturalists  
Benthic Ecology Society  
Ecological Society of America  
Western Society of Naturalists

**REFERENCES:**

Thomas E. Miller  
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