

Karin T. Burghardt, Ph.D.

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EDUCATION

- 2016 Yale University, New Haven, **Ph.D.** (Ecology and Evolutionary Biology)
Advisor: Dr. Oswald J. Schmitz
Dissertation: "Linking phenotypic plasticity in plant anti-herbivore defense to spatial variation in insect populations and soil nutrient pools"
- 2010-2012 Yale University, New Haven, **M.Sc.** (Ecology and Evolutionary Biology)
- 2003-2007 University of Delaware, Newark, Honors **B.Sc.** with Distinction, Magna cum laude
Major: Wildlife Conservation (Dean's Scholar Interdisciplinary Program)
Thesis: "Trophic Dynamics and Native Plants in a Suburban Landscape"

PROFESSIONAL EXPERIENCE

2018-present	Assistant Professor	University of Maryland- College Park
2018-present	Research Associate	Smithsonian Environmental Research Center
2016- 2018	Postdoctoral Research Fellow	Smithsonian Environmental Research Center
2010-2015	NSF Graduate Research Fellow	Yale University
2007-2010	Senior Research Technician- Wildlife Ecology	University of Delaware
2007	Biological Intern	Southwestern Research Station, Portal, AZ
2006	Undergraduate Research Fellow	Ecology Lab, University of Delaware
2005	Science Scholar	Ecology Lab, University of Delaware

GRANTS/AWARDS

- 2018 Maryland Native Plant Society Grant (\$600)
- 2018 ESA Plant Population Ecology: Highlighted Member
- 2017 University of Michigan Early Career Scientists Symposium
- 2017 British Ecological Society Early Career Researcher Award
- 2016-2018 Smithson Fellowship Program- Sandra Day O'Conner Fellow (\$104,000)
- 2014-2016 NSF Doctoral Dissertation Improvement Grant (\$21,645)
- 2010-2015 NSF Graduate Research Fellowship (\$126,000)
- 2014 American Society of Naturalists Student Research Award (\$2,000)
- 2014 EEB Best Poster Award
- 2014 Graduate Women in Science fellowship: Honorable Mention
- 2013 Graduate Conference Travel Award
- 2012 Lee S. Pierce summer fellowship (\$4,000)
- 2012 YIBS Center for Field Ecology Grant (3,000)

2012	NASA-MSU professional enhancement award (\$700)
2004-2007	Alfred F. Dupont Undergraduate Scholar (merit scholarship- \$120,000)
2007	Dale F. Bray Award (departmental award: conservation and intellectual merit)
2006	Undergraduate Research Fellow (research grant and support-\$3500)
2004-2007	Dean's Scholar
2005	Science Scholar (summer undergraduate research grant-\$3500)
2003, 2005	UD Woman of Promise selection (honored by the female faculty)
2005	Alpha Zeta Award (highest GPA in UD College)

ACTIVE EXTERNAL FUNDING

2019-2024 Safeguarding soybeans against climate change: Identifying the role of rhizobial diversity in moderating drought and herbivore stress. USDA-NIFA. Total award \$ 500,000- To UMD: \$213,947; To Burghardt: \$213,947; PD: LaPierre; Co-PD: Burghardt & Parker

2020-2025 Understanding forest bee response to deer management and forest restoration. National Park Service. Total Award: \$19,973; To Burghardt: \$19,973

ACTIVE INTERNAL FUNDING

2019 University of Maryland Graduate School Research and Scholarship Summer Award

2019 Maryland Agriculture Experiment Station Seed Grant, PI- Burghardt \$29,849

2019-2020 Active McIntire-Stennis Project

SUBMITTED FUNDING

2019-2023 Selection in the city: understanding how domestic selection shapes function and resilience of the urban forest. USDA NIFA. Total award requested \$ 500,000- To UMD: \$222,822; PD: Avolio; Co-PD: Burghardt

DECLINED FUNDING

2019 Microbiome mediation of multi-trophic diversity and interactions in a tree diversity experiment. *NSF DEB- PCE Panel*. Total award requested: \$433,223 PI- Burghardt, Collaborative Co-PI's: Parker, LaPierre, McCormick & Griffin

2018 The role of the microbiome in mediating tree metabolomics, natural enemies, and tree plantation productivity. NSF Plant-Biotic Interactions Panel. Total award requested: \$931,470. PI- Burghardt, Co-PI's: Parker, LaPierre, McCormick & Griffin

2018 Microbiome mediation of multi-trophic diversity and interactions in a tree diversity experiment. *NSF Dimensions of Biodiversity Panel*. Total award requested \$ 1,663,887. PI- Burghardt, Co-PI's: Parker, LaPierre, McCormick & Griffin

PUBLICATIONS

[Google scholar](#)

Citations: 508, h-index: 7, i10: 7

Avolio, M. L., Forrestel, E. J., Chang, C. C., La Pierre, K. J., **Burghardt, K. T.** and Smith, M. D. (2019), Tansley Review: Demystifying dominant species. *New Phytologist*. Accepted Author Manuscript. doi:[10.1111/nph.15789](https://doi.org/10.1111/nph.15789)

Burghardt, K.T., Bradford, M.A., & O.J. Schmitz, (2018) “Acceleration or deceleration of litter decomposition by herbivory depends on nutrient availability through intraspecific differences in induced plant resistance traits” *Journal of Ecology*, 106: 2380– 2394

Burghardt, K. T., (2016) Nutrient supply alters goldenrod's induced response to herbivory. *Functional Ecology*, 30: 1769–1778. *♦

**Spotlight article: Kessler, A. (2016), Inducible plant defences and the environmental context. Functional Ecology, 30: 1738–1739(2016)*

♦ *Functional Ecology: Highly commended early career paper*

Burghardt, K. T., Linking phenotypic plasticity in plant anti-herbivore defense to spatial variation in insect populations and soil nutrient pools. (2016) Yale University Dissertation

Burghardt, K.T. & D. W. Tallamy, (2015) Not all non-natives are equally unequal: Reductions in herbivore β -diversity depend on plant phylogenetic similarity to native community. *Ecology Letters* 18:1087-1098 (2015)

Schmitz, O.J, R. W. Buchkowski, **K.T. Burghardt**, & C. M. Donihue, Functional traits and trait-mediated interactions: connecting community level interactions with ecosystem functioning. *Advances in Ecological Research* 52:319-343 (2015)

Burghardt, K.T. & O.J. Schmitz, Influence of plant defenses and nutrients on trophic control of ecosystems. Chapter 8 in *Trophic Ecology: Bottom-Up and Top-Down Interactions across Aquatic and Terrestrial Systems*. (ed. by T. Hanley and K.J. La Pierre). Cambridge University Press, Cambridge, MA. (2015).

Burghardt, K. T. & D. W. Tallamy. “Plant origin asymmetrically impacts feeding guilds and drives community structure of herbivorous arthropods.” *Diversity and Distributions*, 19:1553-1565 (2013).

Burghardt, K. T., D. W. Tallamy, C. Philips, & K. J. Shropshire, “Non-native plants reduce abundance, richness, and host specialization in lepidopteran communities.” *Ecosphere* 1(5):art11. doi:10.1890/ES10-00032.1 (2010).

Burghardt, K. T., D. W. Tallamy, and W. G. Shriver. “Impact of native plants on bird and butterfly biodiversity in suburban landscapes.” *Conservation Biology* 23:219–224 (2009).

In review/revision (PDF available upon request):

John L. Devaney, J. Pullen, S. C. Cook-Patton, **K. T. Burghardt**, J. D. Parker, “Tree diversity exacerbates deer damage but facilitates establishment of late successional species in a forest experiment.”
In revision: *Ecology*

Eric A. Griffin *, Joshua G. Harrison, Melissa M. McCormick, **Karin T. Burghardt**, John D. Parker, Tree diversity reduces fungal endophyte richness and diversity in a large-scale forest experiment. In revision: *Diversity*

*Urban-Mead, K.R., **K.T. Burghardt**, O.J. Schmitz, "Influence of forest gradient on wild bee trait groups in old-field flower visitor networks." *Undergraduate mentee

Data Sets:

Burghardt K.T., Bradford MA, Schmitz OJ (2018) Data from: Acceleration or deceleration of litter decomposition by herbivory depends on nutrient availability through intraspecific differences in induced plant resistance traits. Dryad Digital Repository. <https://doi.org/10.5061/dryad.st104qv>

Burghardt, K.T. (2016) Data from: Nutrient supply alters goldenrod's induced response to herbivory. Dryad Digital Repository. <https://doi.org/10.5061/dryad.q1j71>

Non-refereed publications:

Burghardt, K.T. (2018) Different "ghosts of herbivory past" for soil microbes; Journal of Ecology Blog; available at: <https://jecologyblog.com/2018/07/05/different-ghosts-of-herbivory-past-for-soil-microbes/>

Media appearances:

2018 Interviewed by *Popular Science* "These plants bring all the birds to your yard" [article](#)

2018 Interviewed by *Audubon Magazine* "Yards with Non-native Plants Create Food Deserts for Bugs and Birds" [article](#)

RESEARCH PRESENTATIONS

2019 Inv**Karin T. Burghardt**; Michigan State University Ecology, Evolutionary Biology and Behavior Program Seminar Series: Causes and consequences of variation in phytochemical landscapes, East Lansing, MI (50 attendees)

2019 Inv**Karin T. Burghardt** and Douglas W. Tallamy; Entomological Society of America-Eastern Branch: Phylogenetic isolation of non-native tree species shapes the pattern of novel plant-insect associations., Blacksburg, VA Symposium: Novel Plant-Insect Associations: Interactions between Exotic and Native Species (40 attendees)

2018 Inv**Karin T. Burghardt** and Oswald J Schmitz; ESA, ESC, and ESBC Joint Annual Meeting: Different "ghosts of insect herbivores past" for soil microbes if goldenrod grows in fertile vs. infertile soil. Vancouver, Canada, Member Symposium: The Dirt on Plant-Insect Interactions (110 attendees)

2018 Inv**Karin T. Burghardt**; George Washington University Biology Seminar Series: Diversity and ecosystem impact of insects in managed landscapes. (65 attendees)

- 2018 **Karin T. Burghardt** and John D Parker; Ecological Society of America: “Does diversity of tree neighbors influence moth and butterfly host use and compositional patterns: A test in a large-scale tree diversity experiment”, New Orleans, LA (55 attendees)
- 2018 **Karin T. Burghardt**; Smithsonian Environmental Research Center Seminar Series: “Insect herbivores in human-dominated landscapes”, Edgewater, MD (35 attendees)
- 2018 Inv**Karin T. Burghardt**; University of Maryland Entomology Seminar Series: “Diversity and ecosystem impact of insects in managed landscapes”. College Park, MD (25 attendees)
- 2017 Inv**Karin T. Burghardt**; University of Michigan Early Career Scientists Symposium, “The role of plastic plant defense strategies in determining landscape level variability in ecosystem processes” (75 attendees)
- 2017 Inv**Karin T. Burghardt**; James Smithson Fellowship Lecture, “The role of mixed species vs. monoculture tree planting in determining caterpillar host use.” Washington DC (50 attendees)
- 2017 **Karin T. Burghardt** and John D. Parker; International Congress of Conservation Biology; “Using a tree diversity experiment to explore caterpillar host use and diversity patterns”, Cartagena, Columbia (65 attendees)
- 2017 **Karin T. Burghardt**; Gordon Research Conference: Plant-herbivore interactions: “Plastic plant defense strategies alter ecosystem processes,” Ventura, CA, Poster
- 2015 **Karin T. Burghardt**; Ecological Society of America: “Not all non-natives are equally unequal: the β -diversity of herbivores in experimental tree communities” Baltimore, MD
- 2014 Inv**Karin T. Burghardt**; Yale University Quiet Corner Initiative Seminar Series: “Plant defense and herbivore offense in old field ecosystems”.
- 2014 Inv**Karin T. Burghardt**; Northeast Natural History Conference: If you’ve seen one tree: The alpha and beta diversity of herbivores in experimental native and non-native tree communities. In: Urban Ecology: Spineless Wonders: Invertebrate Research in Urban Systems I and II.
- 2014 **Karin T. Burghardt**; Ecological Society of America: “Induced plant defensive traits in ecosystems: The consequences of genes and nutrients in *Solidago altissima*.” Sacramento, CA
- 2014 **Karin T. Burghardt**; 20th Century Naturalists Conference of the American Society of Naturalists: “Plant induced defensive traits in ecosystems.”
- 2013 **Karin T. Burghardt**; Yale Ecology and Evolutionary Biology graduate research symposium. “To tolerate or resist: plant responses to herbivory in different nutrient contexts” New Haven, CT(50 attendees)
- 2013 **Karin T. Burghardt**; Gordon Research Conference: Plant-herbivore interactions, “Plasticity in plant defensive traits to nutrient context.”, Ventura, CA. Poster
- 2012 **Karin T. Burghardt**; US-IALE Landscape Ecology Meeting, “The evolutionary origin of landscaping plants and herbivore populations: implications for the functioning of managed landscapes.” Newport, RI (70 attendees)
- 2011 Inv**Karin T. Burghardt**; University of Delaware Wildlife Ecology seminar, “Evolutionary origin of landscaping plants: Impacts on insect abundance, diversity, and community structure.” Newark, DE (45 attendees)

- 2011 **Karin T. Burghardt**; Grasslands in a Global Context, “The impact of fire and grazing on insect community composition: A cross-continental comparison.” Manhattan, KS Poster
- 2009 **Karin T. Burghardt**; Entomological Society meeting, “Impact of Native Plants on Bird and Butterfly Biodiversity in Suburban Landscapes.”
- 2009 Douglas W. Tallamy, **Karin T. Burghardt**, Erin Reed, and W. Gregory Shriver; Urban Wildlife Ecology & Management: An International Symposium on Urban Wildlife & the Environment, The impact of non-native landscape plants on local food webs. Amherst, MA. Presented by: Doug Tallamy
- 2007 **Karin T. Burghardt**; Entomological Society meeting, “Trophic Dynamics and Native Landscaping in a Suburban Landscape.”
- 2006 **Karin T. Burghardt** & Douglas W. Tallamy; Entomological Society meeting, “Linking insect biomass to the success of vertebrate insectivores.”

EXTENSION PRESENTATIONS

- 2019 ^{Inv}**Karin T. Burghardt**, Maryland Natural History Society, Baltimore, MD “Landscaping for Lepidoptera” (35 attendees)
- 2019 ^{Inv}**Karin T. Burghardt**, Southern Maryland Urban Pest Management Conference, Brandywine, MD “Landscaping with Native Plants +” (70 attendees)

EXTENSION OBSERVATION

- 2019 Advanced landscape Plant IPM PHC short course
- 2019 Master Gardener training Baltimore County (Entomology)

EXTENSION EVENTS

- 2019 Audubon after Dark: live and pinned specimens and blacklight demonstration
- 2019 UMD Bug Zoo: live insect presentation to the public at Maryland day

TEACHING

UMD-College Park

- BEES 497-2019:** Insect Pests of Ornamentals and Turf (4 credits: Lecture and Lab)
- BEES 608A-2018:** Guest Instructor-Population & Community Ecology section (new graduate students)
- BSCI 279C/BSCI 279H-** Guest faculty presentation
- TLTC launch participant**
- TLTC teacher training: participant-** Starting off on the right foot: promoting positive classroom climate and student inclusion

Pre-2018

Teaching Fellowships: Terrestrial Arthropods; Terrestrial Arthropods Lab course; Ecosystem/Field Ecology (field-based course); Ecology, Evolution, and Behavior (taught independent writing section of lecture-based course)

Teaching Training: Workshop series: Teaching Writing (Workshop Series); Fundamentals of Teaching Science Labs (Workshop Series); Course Design and Syllabus development (Advanced Teaching Workshop); Gender Bias in the Classroom (Advanced Teaching Workshop); The Flipped Classroom (Advanced Teaching Workshop); Preparing and Delivering a Lecture (Advanced Teaching Workshop); Teacher Observation Training (Advanced Teaching Workshop); Teaching First Generation and Non-Traditional Students (Advanced Teaching Workshop)

Faculty Assistant Mentorship:

Kelsey McGurrin

Graduate Student Mentorship:

Max Ferlauto- MS ENTM 2019-

UMD Undergraduate student mentorship:

Elizabeth Butz

Zoe Read (Smithsonian REU Internship)

Pre-2018 Undergraduate student mentorship: Alison Blansfield (2010, University of Delaware); Brain Wysolmerski (2012, Pomona College); Katherine Urban-Mead (2013-2015, Yale University); Anna Nordseth (2016, James Madison University); Tatiana Eaves (2017, Appalachian State University)

SERVICE & MEMBERSHIPS

Society membership:

2012-present	American Society of Naturalists
2011-2012	International Association of Landscape Ecology
2009-present	Ecological Society of America
2006-2009, 2018-present	Entomological Society of America

Reviewer for:

New Phytologist (1) Proceedings of the Royal Society B (2); Journal of Ecology (2); Biological Invasions (10); Ecology (3); Functional Ecology (1); Oikos (2); Ecology and Evolution (2); Environmental Entomology (1); European Journal of Entomology (1); Journal of Insect Conservation (1); Journal of Insect Science (1); Urban Ecosystems; Insect Science(2); Biodiversity and Conservation (1); Environmental Entomology (1); European Journal of Soil Science (1) | [Publons](#)

NSF: ad hoc reviewer (2); GRFP review panelist

Departmental and Extracurricular Service:

2018	Graduate Fellowship Panelist (BISI graduate program- UMD-College Park)
2018	GRFP open workshop time (ENTM graduate program- UMD-College Park)
2017	Post-doc Representative (Smithsonian Environmental Science Center External Review)
2017	Post-doc Panelist for Smithsonian REU student interns
2017	University of Delaware Women in Science Panel Participant

2011-2013 Yale EEB Student Recruitment Chair
 2013 Yale EEB Hutchinson Speaker Host
 2013-2015 Yale Women's Club Ultimate Frisbee Team Coach
 2012-2014 Women in Science at Yale (WISAY) mentor

Advising: Committee Membership

Theodore Striegel, M.S. (ENTM) Committee member. Winter 2019-

EXTENSION AND OUTREACH

- *Outreach to stakeholders:* Developed and presented workshop and seminar on research findings for the Quiet Corner Initiative which promotes sustainable forestry practices around Yale-Myers Forest
- *Consultant for the Wallingford Conservation Commission:* communicated the results of research performed within their town fields and suggested ways to integrate the results of my work into their old-field management strategies.
- *Women in Science mentor:* 2017- UD Women in Science Panel Participant. 2010-2016- mentor to many undergraduate and master student members of doctoral lab. One female undergraduate's thesis research is now currently in review at an ecological journal. Women in Science at Yale (WISAY) mentoring program participant: pairs undergraduate students with graduate student mentors with similar interests. 2007-2010- mentored 4 undergraduates including both women and minorities.
- *Science communication:* Presentations at numerous Agricultural days and fairs on the use of native plants within sustainable backyard landscapes; research featured in popular magazine and news articles (i.e. Audubon magazine and American Forests).
- *Education:* Developed and published educational module illustrating perverse economic effects of designating conservation land. Local science fair judge.
- *Board member and President (2006-2007):* Amigos de Corcovado conservation organization

Research Interests: Plant/insect interactions; Biodiversity conservation within human-managed landscapes; Plant defense induction and strategies; Impact of global change on insect and host populations; Diversity patterns and quantification; Functional trait-based approaches

SKILL SETS

Experimental: Design of systematically randomized, manipulative field and lab experiments; Insect and arthropod sampling techniques (beating, visual search, sticky traps, window traps, malaise traps; Berlese funnel; pitfall traps etc.). Environmental monitoring; Plant trait

measurements and care (particularly defensive and growth traits); Ecosystem process measurement (decomposition; microbial respiration; nitrogen mineralization etc.)

Organismal specialization: Mid-Atlantic forest and old-field plant species and the insect herbivores they host (particular focus on larval lepidopterans, sawflies, cicadellids, and orthopterans). Bird id by site and call.

Statistical tools: Generalized linear models (GLM) including mixed models (GLMM); Traditional ANOVA approaches; Phylogenetic metrics; Multivariate trait and insect community analyses; Diversity profiles and beta diversity metrics; Survival analyses; Principal component/coordinate analysis, Redundancy analysis, Permutation tests; Using AIC for model selection and comparison; Network analysis; R; SAS;

Data types: Community matrices paired with environmental and phylogenetic data; Diverse organismal traits (physiological, life history, metabolic, survival and fecundity); Environmental time series; Plant defensive chemistry; Spatially-explicit datasets

Theoretical Modeling: Individual and population-based modeling; dynamical models;