

# Zachary C. DeVries, PhD

Department of Entomology, University of Kentucky  
S-225 Agricultural Science Center North, Lexington, KY 40546-0091  
Office: 859-562-2856; Cell: 334-559-9384; Fax: 919-515-7746  
Email: [zdevries@uky.edu](mailto:zdevries@uky.edu); Web: <https://devrieslab.weebly.com/>

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## Education

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- 2017 **Doctor of Philosophy**, Entomology. North Carolina State University, Raleigh, NC  
*Dissertation*: Biology, behavior, and management of urban pests
- 2013 **Master of Science**, Entomology. Auburn University, Auburn, AL  
*Thesis*: Respiratory physiology of urban insects
- 2011 **Bachelor of Science**, Zoology (*Summa Cum Laude*; Minor in Statistics). Auburn University, Auburn, AL

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## Professional Appointments/Experience

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- 2019-present **Assistant Professor**. Dept. of Entomology, University of Kentucky, Lexington, KY
- 2019 **Research Assistant Professor**. Department of Entomology and Plant Pathology, North Carolina State University, Raleigh, NC. Mentored by Dr. Coby Schal
- 2018-2019 **Postdoctoral Research Scholar**. Department of Entomology and Plant Pathology, North Carolina State University, Raleigh, NC. Mentored by Dr. Coby Schal
- 2013-2017 **Graduate Research and Teaching Assistant**. Department of Entomology and Plant Pathology, North Carolina State University, Raleigh, NC. Advised by Dr. Coby Schal
- 2011-2013 **Graduate Research Assistant**. Department of Entomology and Plant Pathology, Auburn University, Auburn, AL. Advised by Dr. Arthur Appel

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## Peer-Reviewed Publications (\* indicates student/postdoc under my direction)

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1. Principato\*, S., A. Romero, C.Y. Lee, K. Campbell, D.H. Choe, C. Schal, **Z.C. DeVries**. (in press). Histamine excretion in common indoor and hematophagous arthropods. *Journal of Medical Entomology*.
2. Gordon\*, J.M., R. Santangelo, M.A. González-Morales, M. Menechella\*, C. Schal, **Z.C. DeVries**. 2023. Spatial distribution of histamine in bed bug-infested homes. *Science of the Total Environment* 880:163180. <https://doi.org/10.1016/j.scitotenv.2023.163180>
3. Gaire\*, S., S. Principato\*, C. Schal, and **Z.C. DeVries**. 2022. Histamine excretion by the common bed bug (Hemiptera: Cimicidae). *Journal of Medical Entomology* 59(6):1898-1904. <https://doi.org/10.1093/jme/tjac131>
4. González-Morales, M.A., **Z.C. DeVries**, M. Kakumanu, C. Schal. 2022. Patterns and mechanisms of fipronil resistance in populations of the German cockroach, *Blattella germanica*. *Journal of Economic Entomology* 59(5):1721-1731. <https://doi.org/10.1093/jme/tjac100>
5. Gaire\*<sup>§</sup>, S., **Z.C. DeVries**<sup>§</sup>, R. Mick, R.G. Santangelo, G. Bottillo, E. Camera, and C. Schal. 2021. Human skin triglycerides prevent bed bug (*Cimex lectularius* L.) arrestment. *Scientific Reports* 11:22906. <https://doi.org/10.1038/s41598-021-01981-1> (<sup>§</sup>both authors contributed equally to this work)

6. González-Morales, M.A., **Z.C. DeVries**, A. Sierras, R.G. Santangelo, M.L. Kakumanu and C. Schal. 2021. Resistance to Fipronil in the Common Bed Bug, *Cimex lectularius* (Hemiptera: Cimicidae). *Journal of Medical Entomology* 58(4):1798-1807. <https://doi.org/10.1093/jme/tjab040>
7. Saveer, A.M., **Z.C. DeVries**, and C. Schal. 2021. Mating and starvation modulate feeding and host-seeking responses in female bed bugs, *Cimex lectularius*. *Scientific Reports* 11:1915. <https://doi.org/10.1038/s41598-021-81271-y>
8. Gaire\*, S., C. Schal, R. Mick, and **Z.C. DeVries**. 2020. The role of antennae in heat detection and feeding behavior in the bed bug (*Cimex lectularius* L.). *Journal of Economic Entomology* 113(6):2858-2863. <https://doi.org/10.1093/je/toaa250>
9. **DeVries Z.C.**, R. Santangelo, W. Booth, O. Balvín, T. Bartonička, and C. Schal. 2020. Reproductive compatibility among populations and host-associated lineages of the common bed bug (*Cimex lectularius* L.). *Ecology and Evolution* 10:11090-11099. <https://doi.org/10.1002/ece3.6738>
10. Kakumanu, M.L., **Z.C. DeVries**, A. Barbarin, R.G. Santangelo, C. Schal. 2020. Bed bugs shape the indoor microbial community composition of infested homes. *Science of the Total Environment*. 743: 140704. <https://doi.org/10.1016/j.scitotenv.2020.140704>
11. **DeVries, Z.C.**, R. Santangelo, J. Crissman, A. Suazo, M.L. Kakumanu, and C. Schal. 2019. Pervasive pyrethroid resistance among German cockroaches (*Dictyoptera: Blattellidae*) collected from homes where total release foggers (TRFs) failed. *Journal of Economic Entomology* 112(5):2295-2301. <https://doi.org/10.1093/je/toz120>
12. **DeVries, Z.C.**, R. Santangelo, J. Crissman, R. Mick\*, and C. Schal. 2019. Exposure risks and ineffectiveness of total release foggers (TRFs) used for cockroach control in residential settings. *BMC Public Health* 19:96. <https://doi.org/10.1186/s12889-018-6371-z>
13. **DeVries, Z.C.**, A.M. Saveer, R. Mick\*, and C. Schal. 2019. Bed bug (Hemiptera: Cimicidae) attraction to human odors: Validation of a two-choice olfactometer. *Journal of Medical Entomology* 56(2): 362-367. <https://doi.org/10.1093/jme/tiy202>
14. **DeVries, Z.C.**, R.G. Santangelo, A.M. Barbarin, C. Schal. 2018. Histamine as an emergent indoor contaminant: Accumulation and persistence in bed bug infested homes. *PLoS One* 13(2): e0192462. <https://doi.org/10.1371/journal.pone.0192462>
15. Campbell, B.E., D.M. Miller, **Z.C. DeVries**, and A.G. Appel. 2017. Water loss and metabolic activity in bed bug eggs (*Cimex lectularius*). *Physiological Entomology* 42(4): 355-361. <https://doi.org/10.1111/phen.12204>
16. **DeVries Z.C.**, R.A. Mick\*, O. Balvín, and C. Schal. 2017. Aggregation behavior and reproductive compatibility in the family Cimicidae. *Scientific Reports* 7:13163. <https://doi.org/10.1038/s41598-017-12735-3>
17. Balvín, O., T. Bartonička, K. Pilařová, **Z.C. DeVries**, and C. Schal. 2017. Discrimination between lineage-specific shelters by bat- and human-associated bed bugs does not constitute a stable reproductive barrier. *Parasitology Research* 116(1): 237-242. <https://doi.org/10.1007/s00436-016-5284-y>
18. **DeVries, Z.C.**, R.A. Mick\*, and C. Schal. 2016. Feel the heat: Activation, orientation, and feeding responses of bed bugs to targets at different temperatures. *Journal of Experimental Biology* 219(23): 3773-3780. <https://doi.org/10.1242/jeb.143487>
19. **DeVries, Z.C.**, S.A. Kells, and A.G. Appel. 2016. Estimating the critical thermal maximum ( $CT_{max}$ ) in bed bugs, *Cimex lectularius*: Comparing thermolimit respirometry with traditional visual methods. *Comparative Biochemistry and Physiology Part A: Molecular & Integrative Physiology* 197: 52-57. <https://doi.org/10.1016/j.cbpa.2016.03.003>

20. DeVries, Z.C., S.A. Kells, and A.G. Appel. 2015. Effects of starvation and molting on the metabolic rate of the bed bug (*Cimex lectularius* L.). *Physiological and Biochemical Zoology* 88(1): 53-65. <https://doi.org/10.1086/679499>
21. DeVries, Z.C., W.R. Reid, S.A. Kells, A.G. Appel. 2015. Effects of starvation on deltamethrin tolerance in bed bugs, *Cimex lectularius* L. (Hemiptera: Cimicidae). *Insects* 6: 102-111. <https://doi.org/10.3390/insects6010102>
22. DeVries, Z.C., and A.G. Appel. 2014. Effects of temperature on nutrient self-selection in the common silverfish, *Lepisma saccharina* L. *Physiological Entomology* 39(3): 217-221. <https://doi.org/10.1111/phen.12064>
23. DeVries, Z.C., S.A. Kells, and A.G. Appel. 2013. Standard metabolic rate of the bed bug, *Cimex lectularius*: Effects of temperature, mass, and life stage. *Journal of Insect Physiology* 59(11): 1133-1139. <https://doi.org/10.1016/j.jinsphys.2013.08.012>
24. DeVries, Z.C., and A.G. Appel. 2013. Standard metabolic rates of *Lepisma saccharina* and *Thermobia domestica*: effects of temperature and mass. *Journal of Insect Physiology* 59(6): 638-645. <https://doi.org/10.1016/j.jinsphys.2013.04.002>
25. DeVries, Z.C., and R.P. Henry. 2012. Effects of hypoxia on oxygen uptake and surfacing behavior in the giant aquatic salamander *Siren lacertina*. *Marine and Freshwater Behavior and Physiology* 45(2): 135-143. <https://doi.org/10.1080/10236244.2012.691244>

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### Manuscripts in Review or in Preparation for Publication (\* indicates student/postdoc under my direction)

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1. Gaire\*, S., H. Morgan\*, A. Sierras, Z.C. DeVries. (in review). Behavioral responses of German cockroaches to pyrethroids and pyrethroid-formulated insecticides. To be submitted to *Pest Management Science*.
2. DeVries, Z.C., R. Santangelo, and C. Schal. (in preparation). Effects of differential baiting strategies on German cockroach population and allergen levels. To be submitted to the *Journal of Medical Entomology*.
3. DeVries, Z.C., R. Santangelo, E. Vernon\*, K.J. Ramirez-Borrero\*, and C. Schal. (in preparation). Initial population size influences efficacy of differential baiting strategies – A follow up study. To be submitted to the *Journal of Medical Entomology*.

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### Book Chapters

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1. Schal, C., and Z.C. DeVries. 2021. Public health and veterinary importance of the German cockroach. IN Wang C, Rust M, and Lee CY (eds), *Biology and Management of the German Cockroach*.

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### Grants Funded

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|-----------|--|
| 2023      | <b>DeVries, Z.C.</b> Extension innovation funding. University of Kentucky. \$10,000. DeVries portion: \$10,000. (PI, 1% effort, University Competitive).   |
| 2023      | <b>DeVries, Z.C.</b> Behavioral responses of bed bug ( <i>Cimex lectularius</i> ) to <i>Beauveria bassiana</i> (Apprehend). Washington State Commission on Pesticide Registration. \$25,000. DeVries portion: \$25,000. (PI, 1% effort, Nationally Competitive). |
| 2022-2023 | <b>DeVries, Z.C.</b> Evaluation of <i>Beauveria bassiana</i> (Aprehend) as an alternative to the organophosphate dichlorvos (Nuvan ProStrips) for bed bug ( <i>Cimex lectularius</i> )   |

- control. Washington State Commission on Pesticide Registration. \$47,000. DeVries portion: \$47,000. (PI, 1% effort, Nationally Competitive).
- 2021-2024 **DeVries, Z.C.**, A.G. Appel, and J. Penn. Cockroach Eradication through Community Engagement: Empowering Residents to Improve their Health. U.S. Department of Housing and Urban Development (HUD) Lead and Healthy Homes Technical Studies (LHHTS) Grant Program. \$400,000. DeVries Portion: \$267,693. (PI, 3% effort, Nationally Competitive).
- 2020-2022 **DeVries, Z.C.**, and S. Gaire. The Perfect Meal: Determining How Age and Humidity Effect Cockroach Gel Bait Performance. The Pest Management Foundation. \$21,153.00. DeVries Portion: \$21,153. (PI, 1% effort, Nationally Competitive).
- 2019-2024 **DeVries Z.C.** Histamine in Homes: Exposure Risks and Health Effects. National Institutes of Health (NIH) Office of the Director Early Independence Award. \$1,737,332. DeVries portion: \$1,737,332. (PI, 50% effort, Nationally Competitive).
- 2019-2020 Schal, C., and **Z.C. DeVries**. Histamine in homes: Spatial distribution and exposure. The Center for Human Health and the Environment (NIEHS P30 Center) Pilot Award, North Carolina State University. \$37,881 (co-PI [covered a portion of my postdoc salary], Regionally Competitive).
- 2018 **DeVries, Z.C.**, and C. Schal. Relationship of temperature and humidity with German cockroach (*Blattella germanica*) distribution and microbial communities within homes. The W.M. Keck Center for Behavioral Biology Small Grant Program, North Carolina State University. \$2,000 (PI, Internally Competitive).
- 2015 Schal, C., and **Z.C. DeVries**. An artificial human: Optimized bait for bed bug control. The Pest Management Foundation. \$19,977 (co-PI/graduate student, Nationally Competitive).
- 2014 **DeVries, Z.C.** Physiological and behavioral differences among three host-associated lineages of *Cimex lectularius*. Monsanto Research Grant Award, Entomological Society of America. \$7,320 (PI, Nationally Competitive).

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## Industry Funding

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### Summary of industry funding (2020-present)

| <b>Year</b>          | <b># Projects</b> | <b>Total Funding</b> |
|----------------------|-------------------|----------------------|
| 2023                 | 11                | \$102,541            |
| 2022                 | 13                | \$144,120            |
| 2021                 | 10                | \$98,400             |
| 2020                 | 13                | \$169,100            |
| <b>TOTAL FUNDING</b> | <b>36</b>         | <b>\$514,161</b>     |

Industry partners: Bayer CropScience; Control Solutions, Inc.; Syngenta; FMC Corporation; BASF; Bedoukian Research, Inc.; Bed Bug Central

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## Honors, Awards, Scholarships, and Fellowships

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- 2023 Early Career Innovation Award; Entomological Society of America
- 2021 CAFE Bobby Pass Excellence in Grantsmanship Award; College of Agriculture, Food and Environment, University of Kentucky

2018 John Henry Comstock Award (Southeastern Branch); Entomological Society of America

2017 Friends of IPM Graduate Student Award (PhD); Southern Region IPM Center

2017 International IPM Award of Excellence for Doctoral Students; The 9<sup>th</sup> International IPM Symposium

2017 Vandenberg Travel Fellowship; The W.M. Keck Center for Behavioral Biology, North Carolina State University (\$450)

2016 Outstanding Ph.D. Student Award; North Carolina Entomological Society

2016 First Place Student Paper Competition (Oral Presentation); International Congress of Entomology

2016 Lillian and Alex Feir Graduate Student Travel Award in Insect Physiology, Biochemistry, or Molecular Biology; Entomological Society of America (\$1,850)

2016 First Place Ph.D. Oral Presentation; Southeastern Branch of the Entomological Society of America Annual Meeting

2016 The National Conference on Urban Entomology Ph.D. Scholarship; National Conference on Urban Entomology (\$1,500)

2015 Foundation for Toxicology and AgroMedicine Supplementary Scholarship; The Foundation for Toxicology and AgroMedicine (\$2,000)

2014 John V. Osmun Memorial Scholarship; Pi Chi Omega (\$3,000)

2014 Second Place President's Prize for Oral Presentation; Entomological Society of America National Meeting

2014 Larry Larson Graduate Student Award for Leadership in Applied Entomology; Entomological Society of America (sponsored by Dow AgroSciences)

2014 Kirby L. Hays Memorial Award; Southeastern Branch of the Entomological Society of America

2014 Third Place Oral Presentation; North Carolina State University Entomology Graduate Student Symposium

2014 Medical, Urban, and Veterinary Entomology Section Student Scholarship; Entomological Society of America (MUVE Section; \$500)

2013 Master's Thesis Award; Auburn University

2013 Outstanding Graduate Student (Master's) Award; Auburn University

2013 Outstanding M.S. Graduate Student Award in Entomology; Department of Entomology and Plant Pathology, Auburn University

2013 First Place M.S. Oral Presentation; Southeastern Branch of the Entomological Society of America Annual Meeting

2013 Monsanto Student Travel Award; Entomological Society of America (\$1,830)

2013 University Graduate Fellowship; North Carolina State University (\$4,000)

2013 David R. Nimocks, Jr. Fellowship (for research in urban entomology); North Carolina State University (\$42,000)

2012 Smalley Award (Best Overall Master's Student GPA); Department of Entomology and Plant Pathology, Auburn University

2011 Dean's Medal; Department of Biological Sciences, Auburn University

2010 Outstanding Junior Award; Department of Biological Sciences, Auburn University

2010 Goldwater Scholarship Honorable Mention

2010 Second Place Oral Presentation for the Competitive Undergraduate Research Fellowship Competition; The Auburn University 7<sup>th</sup> Annual Undergraduate Research Forum

2009 Undergraduate Research Fellowship; Auburn University (\$5,800)

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## Scientific Presentations (\* indicates invited presentation)

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1. **\*DeVries, Z.C.** 2023. Indoor Pests, Pesticides, and Emerging Contaminants. Division of Basic Biomedical Sciences, University of South Dakota (Departmental Seminar). Vermillion, SD.
2. **\*DeVries, Z.C.** 2022. Indoor Pests, Pesticides, and Emerging Contaminants. Office of Pesticide Program, United States Environmental Protection Agency. Online.
3. **\*DeVries, Z.C.** 2022. Cockroaches, Bed Bugs, and Public Health. Norton Healthcare Pulmonary Summit. Louisville, KY.
4. **\*DeVries, Z.C.** 2022. Do-it-yourself Pest Control in Affordable Housing. National Conference on Urban Entomology. Salt Lake City, UT.
5. **\*DeVries, Z.C.** 2022. Cockroaches, Bed Bugs, and Public Health. Kentucky Asthma Symposium. Louisville, KY.
6. **\*DeVries, Z.C.** 2022. Urban Pests, Pesticides, and Emerging Contaminants. Department of Entomology, Virginia Polytechnic Institute and State University (Departmental Seminar). Blacksburg, VA.
7. **\*DeVries, Z.C.** 2022. Cockroaches, Bed Bugs, and Public Health. The Kentucky Environmental Health Association Annual Educational Conference. Lexington, KY.
8. **\*DeVries, Z.C.** 2021. Bed bugs and histamine: Emerging health concerns from a resurged indoor pest. Entomological Society of America Annual Meeting. Denver, CO.
  - Part of an ESA Program symposium (one of only 6 for the entire conference)
9. **\*DeVries, Z.C.** 2021. Indoor Insects: Pesticides, Allergens, and Emerging Contaminants. Children's Environmental Health Summit. Online.
10. **DeVries, Z.C.,** J. Gordon, S. Gaire, S. Principato, A. Sierras, R. Santangelo, M.A. González-Morales M, Menechella M, Schal C. 2021. Bed bugs: An emerging threat to public health? The National Institutes of Health Common Fund High-Risk, High-Reward Research Symposium. Online (Poster).
11. **\*DeVries, Z.C.** 2021. Indoor Insects: Pesticides, Allergens, and Emerging Contaminants. Department of Entomology, University of Georgia (Departmental Seminar). Online.
12. **DeVries, Z.C.,** R.G. Santangelo, C. Schal. 2019. Bed bugs, histamine, and human health. Entomological Society of America Annual Meeting. St. Louis, MO.
  - Part of an ESA Medical, Urban and Veterinary Entomology (MUVE) Section Symposium ("Indoor Pests and Human Health: Advocating for Interdisciplinary Interactions") organized by **DeVries, Z.C.** and Schal C.
13. **\*DeVries, Z.C.** 2019. An Integrative Approach to Urban Entomology. University of Kentucky, Department of Entomology Seminar. Lexington, KY.
14. **\*DeVries, Z.C.** 2018. Larry Larson's impact on an urban entomologist. Entomological Society of America Annual Meeting. Vancouver, BC, Canada.
15. **\*DeVries, Z.C.** 2018. The intersection of urban entomology and public health: Allergens, pesticides, and emerging indoor contaminants. University of Kentucky, Department of Entomology Seminar. Lexington, KY.
16. **\*DeVries, Z.C.** 2018. The intersection of urban entomology and public health: Pesticides, allergens, and emerging contaminants. University of Hawaii at Mānoa, Department of Plant and Environmental Protection Seminar. Honolulu, HI.
17. **DeVries, Z.C.,** R. Santangelo, A. Barbarin, C. Schal. 2018. Bed bugs and Histamine: a public health risk? National Conference on Urban Entomology. Cary, NC.

18. \***DeVries, Z.C.**, A. Sierras, C. Schal. 2018. A liquid bait for bed bugs? National Conference on Urban Entomology. Cary, NC.
19. **DeVries, Z.C.**, R. Santangelo, J. Crissman, R. Mick, A. Suazo, C. Schal. 2018. Cost-benefit analysis of total release foggers (TRFs). 9<sup>th</sup> International IPM Symposium. Baltimore, MD (Poster).
20. **DeVries, Z.C.**, R. Santangelo, E. Vernon, C. Schal. 2017. Baiting for German cockroaches: effects of bait placement on population and allergen levels. Entomological Society of America Annual Meeting. Denver, CO.
21. **DeVries, Z.C.**, R. Santangelo, J. Crissman, R. Mick, A. Suazo, and C. Schal. 2017. Efficacy and exposure risks of total release foggers. The International Society for Exposure Science Meeting. Durham, NC.
22. \***DeVries, Z.C.**, R. Mick, and C. Schal. 2016. Baiting for bed bugs: Is it possible? North Carolina Entomological Society. Raleigh, NC (Ph.D. student award).
23. **DeVries, Z.C.**, R. Mick, O. Balvín, C. Schal. 2016. Reproductive compatibility and aggregation fidelity among populations and host-associated lineages of bed bugs, *Cimex lectularius*. International Congress of Entomology. Orlando, FL.
24. \***DeVries, Z.C.**, R. Mick, and C. Schal. 2016. Orientation of bed bugs to thermal cues. National Conference on Urban Entomology. Albuquerque, NM (Ph.D. student scholarship).
25. **DeVries, Z.C.**, R. Mick, and C. Schal. 2016. Thermosensory behavior of bed bugs in host location. W.M. Keck Center for Behavioral Biology 17<sup>th</sup> Annual Student and Postdoc Symposium. Raleigh, NC.
26. **DeVries, Z.C.**, R. Mick, and C. Schal. 2016. Feel the heat: Activation, orientation, and feeding responses of bed bugs (*Cimex lectularius*) to different temperatures. Entomological Society of America-Southeastern Branch Meeting. Raleigh, NC.
27. \***DeVries, Z.C.** 2015. Bugs and baits: Changing the way we think about urban pest management. Dow AgroSciences. Indianapolis, IN.
28. **DeVries, Z.C.** and C. Schal. 2014. Reproductive compatibility among populations and host-associated lineages of bed bugs, *Cimex lectularius*. Entomological Society of America Annual Meeting. Portland, OR.
29. **DeVries, Z.C.**, S.A. Kells, and A.G. Appel. 2014. Effects of starvation and molting on the metabolic rate of the bed bug, *Cimex lectularius*. North Carolina State University Entomology Graduate Student Association Symposium. Raleigh, NC.
30. **DeVries, Z.C.**, S.A. Kells, and A.G. Appel. 2013. Standard metabolic rate of the common bed bug, *Cimex lectularius*: Effects of temperature, mass, and life stage. Entomological Society of America Annual Meeting. Austin, TX.
31. **DeVries, Z.C.** 2013. Urban insect respiratory physiology. Auburn University Department of Entomology and Plant Pathology-Seminar. Auburn, AL.
32. **DeVries, Z.C.**, S.A. Kells, and A.G. Appel. 2013. Effects of starvation on the metabolic rate of the common bed bug, *Cimex lectularius*. Entomological Society of America-Southeastern Branch Meeting. Baton Rouge, LA.
33. **DeVries, Z.C.** and A.G. Appel. 2012. Standard metabolic rates of *Lepisma saccharina* and *Thermobia domestica*: effects of temperature and mass. Entomological Society of America Annual Meeting. Knoxville, TN.
34. **DeVries, Z.C.** and A.G. Appel. 2012. Respiratory physiology of the bed bug, *Cimex lectularius* (Cimicidae). Auburn University, Department of Entomology and Plant Pathology-Seminar. Auburn, AL.

35. **DeVries, Z.C.** and R.P. Henry. 2010. The effects of hypoxia on behavior and oxygen uptake in two species of giant aquatic salamander: *Siren lacertina* and *Amphiuma means*. The Auburn University 7<sup>th</sup> Annual Undergraduate Research Forum, Auburn, AL.

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## Co-Authored Scientific Presentations

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1. Sierras, A., and **Z.C. DeVries**. 2023. Urban Pests and Public Health. The Kentucky Environmental Health Association Annual Educational Conference. Lexington, KY.
2. Gordon, J., and **Z.C. DeVries**. 2022. Investigation of a novel allergen from the common bed bug (Hemiptera: Cimicidae) Entomological Society of America Annual Meeting. Vancouver, BC, Canada.
  - First place student competition for the president's prize
3. Lucero, I., S. Gaire, and **Z.C. DeVries**. 2022. The perfect meal: Determining how aging affects cockroach gel bait performance. Entomological Society of America Annual Meeting. Vancouver, BC, Canada.
  - Second place student competition for the president's prize
4. Principato, S., A. Romero, and **Z.C. DeVries**. 2022. Histamine production in common urban arthropods. Entomological Society of America Annual Meeting. Vancouver, BC, Canada.
5. Gaire, S., and **Z.C. DeVries**. 2022. Pyrethroids fail to repel German cockroaches in free-moving assays. Entomological Society of America Annual Meeting. Vancouver, BC, Canada.
6. Gordon, J., R. Santangelo, M.A. González-Morales, M. Menechella, C. Schal, and **Z.C. DeVries**. 2021. More than the bite: Introduction of environmental contaminants into the home by bed bugs (Hemiptera: Cimicidae). Entomological Society of America Annual Meeting. Denver, CO.
7. Principato, S., and **Z.C. DeVries**. 2021. Evaluation of the ability of arthropods to contaminate the indoor environment with histamine. Entomological Society of America Annual Meeting. Denver, CO (Poster).
8. Gaire, S., J. Gordon, and **Z.C. DeVries**. 2021. Common bed bugs possess a robust ability to produce histamine. Entomological Society of America Annual Meeting. Denver, CO.
9. González-Morales, M.A., **Z.C. DeVries**, A. Sierras, R. Santangelo, M.L. Kakumanu, and C. Schal. 2021. Resistance to Fipronil in the Common Bed Bug (Hemiptera: Cimicidae). Entomological Society of America Annual Meeting. Denver, CO.
10. Kakumanu, M.L., **Z.C. DeVries**, and C. Schal. 2021. Detection of cockroach allergens, monitoring their levels and mitigation strategies to reduce allergen levels in infested areas. Entomological Society of America Annual Meeting. Denver, CO.
11. Gaire, S., J. Gordon, and **Z.C. DeVries**. 2021. Common bed bugs possess a robust ability to produce histamine. University of Kentucky Society of Postdoctoral Scholars Symposium. Lexington, KY.
12. Gordon, J., R. Santangelo, M.A. González-Morales, M. Menechella, C. Schal, and **Z.C. DeVries**. 2021. Histamine distribution in bed bug (Hemiptera: Cimicidae) infested homes. Entomological Society of America North Central Branch Meeting. Online.
13. Gaire, S., J. Gordon, and **Z.C. DeVries**. 2021. Histamine production by the common bed bug (*Cimex lectularius* L.). Entomological Society of America North Central Branch Meeting. Online.
14. Gordon, J., R. Santangelo, M.A. González-Morales, M. Menechella, C. Schal, and **Z.C. DeVries**. 2021. Characterization of the spatial distribution of histamine in bed bug infested homes. National Conference on Urban Entomology. Online.



15. González-Morales, M.A., **Z.C. DeVries**, A. Sierras, R. Santangelo, M.L. Kakumanu, and C. Schal. 2021. Resistance to Fipronil in the Common Bed Bug, *Cimex lectularius* L. (Hemiptera: Cimicidae). National Conference on Urban Entomology. Online.
16. González-Morales, M.A., **Z.C. DeVries**, M.L. Kakumanu, A. Sierras, and C. Schal. 2019. Fipronil resistance in the German cockroach: Some things never change. Entomological Society of America Annual Meeting. St. Louis, MO.
17. Schal, C., **Z.C. DeVries**, R.G. Santangelo. 2019. Effective interventions eradicate cockroaches and reduce allergens in the home environment. Entomological Society of America Annual Meeting. St. Louis, MO.
18. Saveer, A., **Z.C. DeVries**, and C. Schal. 2019. Mating and starvation modulate host-seeking and feeding propensity in bed bug females. Entomological Society of America Annual Meeting. St. Louis, MO.
19. Kakumanu, M.L., **Z.C. DeVries**, R.G. Santangelo, and C. Schal. 2019. Microbial diversity of urban pests: German cockroach vs. bed bug. Ecological Society of America Annual Meeting. Louisville, KY.
20. González-Morales, M.A., **Z.C. DeVries**, M.L. Kakumanu, A. Sierras, and C. Schal. 2019. Fipronil and pyrethroid resistance in the German cockroach: Some things never change. Southeastern Branch of the Entomological Society of America Annual Meeting. Mobile, AL.
21. Booth, W., C. Lawrence, G. Holleman, O. Balvin, G. Robison, **Z.C. DeVries**, E. Vargo, and C. Schal. 2018. Unravelling the Invasion dynamics of the bed bug using molecular tools. National Conference of Urban Entomology. Research Triangle Park, NC.
22. Kakumanu M.L., **Z.C. DeVries**, A. Barbarin, R.G. Santangelo, and C. Schal. 2018. Impact of bed bugs on the microbial diversity of infested homes. National Conference of Urban Entomology. Research Triangle Park, NC.
23. Robison, G., **Z.C. DeVries**, O. Balvin, E. Vargo, C. Schal, and W. Booth. 2015. Rapid and pervasive mitochondrial heteroplasmy with recombination in the bed bug, *Cimex lectularius*. Entomological Society of America Annual Meeting. Minneapolis, MN.
24. Sirman, A.E., **Z.C. DeVries**, Z.S. Donoviel, W.R. Hood. 2014. The effects of early nutrition on metabolic rate and fitness in the house mouse (*Mus musculus*). Society for Integrative and Comparative Biology Meeting. Austin, TX (Poster).
25. DeLong, B.M., **Z.C. DeVries**, A.G. Appel, and D.M. Miller. 2013. The effects of temperature and strain on bed bug egg standard metabolic rates. Entomological Society of America-Southeastern Branch Meeting. Baton Rouge, LA.
26. DeLong, B.M., **Z.C. DeVries**, A.G. Appel, and D.M. Miller. 2012. Bed bug (*Cimex lectularius* L.) egg surface morphology and water loss metrics. Entomological Society of America Annual Meeting. Knoxville, TN.

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### Extension Publications and Fact Sheets (\* indicates student/postdoc under my direction)

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1. Larson, J., **Z.C. DeVries**, and R. Bessin. Imported Fire Ants in Kentucky. 2023. University of Kentucky Cooperative Extension Services, 4 pgs
2. **DeVries, Z.C.** Mixing it up: A technician's guide to cockroach baits. 2023. PCT Magazine. 2 pgs
3. **DeVries, Z.C.**, J. Gordon, and S. Gaire. 2022. So you found a bug – what's next? University of Kentucky Cooperative Extension Service, 2 pg.
4. Coyle, D., T. Brosius, **Z.C. DeVries**, R. Schmidt-Jeffris, R.C. Gott, C. Loudon, J. Saguez, T. Simonsen, J. Van Den Berg, R. McDonnell, I. Ronai, L. Zhu, M. Siebert, F. Wessels, R. Hamm, L.

- Higgins, S. Thompson, R. Serikawa, N. Spomer, J.L. Spencer. 2020. COVID-19: Reflections from entomologist who rose to the occasion. *American Entomologist* 66(3):34-41.
5. **DeVries, Z.C.** 2020. Pest Control and COVID-19 (Entfact 652). University of Kentucky Cooperative Extension Service, 1 pg.
  6. **DeVries, Z.C.** 2020. A PMP's Guide to COVID-19 (Entfact 651). University of Kentucky Cooperative Extension Service, 2 pgs.
  7. **DeVries, Z.C.** 2019. University Housing-Pest Management (brochure). University Housing, DASA Facilities, Department of Entomology and Plant Pathology; North Carolina State University.
  8. **DeVries, Z.C.**, X.P. Hu, and A.G. Appel. 2013. Battling bed bugs-knowing the enemy. Alabama Cooperative Extension System, 8 pgs.

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## **Extension Presentations** (\* indicates invited presentation)

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1. **\*DeVries, Z.C.** 2023. Bed bug biology and control. Kentucky Pest Management Association Annual Summer Meeting. Louisville, KY (Oral, 60 min, ~160 attendees).
2. **\*DeVries, Z.C.** 2023. Everything you never thought you wanted to know about bed bugs! Lexington Senior Center "Now you Know" Program, Lexington, KY (Oral Presentation, 60 min, ~15 attendees).
3. **\*DeVries, Z.C.** 2023. No Trespassing! Identification, Management, and Prevention of Common Indoor Pests. Boone County Extension Program, Burlington, KY (Oral Presentation, 90 min, ~25 attendees).
4. **\*DeVries, Z.C.** 2023. Everything you never wanted to know about bed bugs. UK FCS Agent Training. Owensboro, KY (Oral Presentation, 180 min, ~20 attendees).
5. **\*DeVries, Z.C.** 2023. Everything you never wanted to know about bed bugs. UK FCS Agent Training. London, KY (Oral Presentation, 180 min, ~25 attendees).
6. **\*DeVries, Z.C.** 2023. Everything you never wanted to know about bed bugs. UK FCS Agent Training. Georgetown, KY (Oral Presentation, 180 min, ~50 attendees).
7. **\*DeVries, Z.C.** 2023. Dangers of DIY Pest Control. The Ohio State University Pesticide Safety Education Program, Ohio Pesticide Commercial Applicator Recertification Conference. Columbus, OH (Oral Presentation, 60 min, ~200 attendees).
8. **\*DeVries, Z.C.** 2023. Bed Bug Management. The Ohio State University Pesticide Safety Education Program, Ohio Pesticide Commercial Applicator Recertification Conference. Columbus, OH (Oral Presentation, 30 min, ~200 attendees).
9. **\*DeVries, Z.C.** 2023. Dangers of DIY Pest Control. The Ohio State University Pesticide Safety Education Program, Ohio Pesticide Commercial Applicator Recertification Conference. Cincinnati, OH (Oral Presentation, 60 min, ~150 attendees).
10. **\*DeVries, Z.C.** 2023. Bed Bug Management. The Ohio State University Pesticide Safety Education Program, Ohio Pesticide Commercial Applicator Recertification Conference. Cincinnati, OH (Oral Presentation, 30 min, ~150 attendees).
11. **\*DeVries, Z.C.** 2022. Bed Bugs, Histamines, and the Health Impact of Bed Bug Infestations. National Pest Management Association Pests and Public Health Summit. San Antonio, TX. (Oral Presentation, 60 min, ~150 attendees).
12. **\*DeVries, Z.C.** 2022. Cockroach Update. New England Pest Management Association Fall Training. Online (Webinar, 60 min, ~300 attendees).

13. **DeVries, Z.C.** 2022. Welcome to the 21st Century, Where DIY Treatments Run Wild. University of Kentucky Pest Control Short Course. Lexington, KY. (Oral Presentation, 60 min, ~400 attendees).
14. **DeVries, Z.C.** 2022. Urban Pests. University of Kentucky East Agricultural and Natural Resources Agents Annual Update. Winchester, KY. (Oral Presentation, 40 min, ~85 attendees).
15. **\*DeVries, Z.C.** 2022. Bed Bug Basics. Rose Pest Solutions 17<sup>th</sup> Annual Technical Conference. Mount Pleasant, MI. (Oral Presentation, 60 min, ~400 attendees).
16. **\*DeVries, Z.C.** 2022. Cockroach Management. The Indiana Vector Control Association Annual Metering. Louisville, KY. (Oral Presentation, 60 min, ~150 attendees).
17. **\*DeVries, Z.C.** 2022. Bed Bug Management. The Ohio State University Pesticide Safety Education Program, Ohio Pesticide Commercial Applicator Recertification Conference. Columbus, OH (Oral Presentation, 30 min, ~300 attendees).
18. **\*DeVries, Z.C.** 2022. Bed Bug Management. The Ohio State University Pesticide Safety Education Program, Live Commercial Pesticide Recertification Webinars-Structural and Vertebrate Pests. Online (Webinar, 30 min, ~300 attendees).
19. **\*DeVries, Z.C.** 2021. Bed Bugs and Cockroaches-What's New? University of Kentucky Pest Control Short Course. Lexington, KY (Oral, 60 min, ~430 attendees).
20. **\*DeVries, Z.C.** 2021. Think like a cockroach! Kentucky Pest Management Association Annual Summer Meeting. Louisville, KY (Oral, 60 min, ~230 attendees).
21. **\*DeVries, Z.C.** 2021. Bed Bug Biology and Control. The Kentucky Pest Management Association Virtual Training Meeting (March). Online (Webinar, 60 min, ~70 attendees).
22. **\*DeVries, Z.C.** 2021. Bed Bug Biology and Control. The Kentucky Pest Management Association Virtual Training Meeting (February). Online (Webinar, 60 min, ~70 attendees).
23. **\*DeVries, Z.C.** 2021. Bed Bug Management. The Ohio State University Pesticide Safety Education Program, Live Commercial Pesticide Recertification Webinars-Structural and Vertebrate Pests. Online (Webinar, 30 min, ~300 attendees).
24. **\*DeVries, Z.C.** 2021. Cockroaches. The 85<sup>th</sup> Annual Purdue Pest Management Conference. Online (Webinar, 120 min, ~350 attendees).
25. **\*DeVries, Z.C.** 2020. Roaches. The Ohio Pest Management Association 2020 Winter Meeting. Online (Webinar, 60 min, ~70 attendees).
26. **\*DeVries, Z.C.** 2020. Bed Bugs. The Ohio Pest Management Association 2020 Winter Meeting. Online (Webinar, 60 min, ~70 attendees).
27. **\*DeVries, Z.C.** 2020. Understanding the Full Potential of Bed Bugs as an Important Public Health Pest. The Global Bed Bug Summit. Online (Webinar, 50 min, ~200 attendees).
28. **\*DeVries, Z.C.** 2020. Cockroach 101: Back to the Basics. The University of Kentucky Online Pest Control Training Series. Online (Webinar, 50 min, ~430 attendees).
29. **\*DeVries, Z.C.** 2020. Bed Bug Biology and Control. Kansas State University Commercial Pesticide Applicator Training Program. Online (Webinar, 60 min, ~64 attendees).
30. **\*DeVries, Z.C.** 2020. Fall Invaders and Pest Proofing. University of Kentucky Entomology Extension Series. Online (Webinar, 60 min, ~60 attendees).
31. **\*DeVries, Z.C.** 2020. The Allergenic Threats of Insects. University of Florida #Beyond the Label Webinar Series. Online (Webinar, 60 min, ~38 attendees).
32. **\*DeVries, Z.C.** 2020. Everything You Never Thought You Wanted to Know About Bed Bugs. USDA Forest Service (safety meeting). Online (Webinar, 60 min, ~35 attendees).
33. **\*DeVries, Z.C.** 2020. Cockroaches! Back to the Basics. National Pest Management Association "Back to the Basics" Webinar Series. Online (Webinar, 60 min, ~100 attendees).

34. **\*DeVries, Z.C.** 2020. Do-it-Yourself Pest Control: Bug Bombs and Cockroaches. Kentucky Pest Management Association Recertification Training. Burlington, KY (Oral Presentation, 50 min, ~100 attendees).
35. **\*DeVries, Z.C.** 2020. Do-it-Yourself Pest Control: Bug Bombs and Cockroaches. Kentucky Pest Management Association Recertification Training. Elizabethtown, KY (Oral Presentation, 50 min, ~100 attendees).
36. **DeVries, Z.C.** 2019. Allergenic Threat of Insects. The University of Kentucky Pest Control Short Course. Lexington, KY (Oral Presentation, 50 min, ~400 attendees).
37. **\*DeVries, Z.C.** 2019. Do-It-Yourself Pest Control: Why are “Bug Bombs” Still Here? Greater Chicago Pest Management Alliance Meeting of the Minds. Chicago, IL (Oral Presentation, 50 min, ~400 attendees).
38. **\*DeVries, Z.C.** 2019. The War Against German Roaches: Bombing Roaches with Total Release Foggers. PestWorld 2019. San Diego, CA (Oral Presentation, 50 min, ~100 attendees).
39. **\*DeVries, Z.C.** 2019. Cockroaches, allergens, and their remediation. 5<sup>th</sup> Annual Tennessee Bed Bug and Cockroach Management Meeting. Knoxville, TN (Oral Presentation, 50 min, ~150 attendees).
40. **\*DeVries, Z.C.** 2019. New data on old technology: Why total release foggers don't measure up against cockroaches in homes. National Pest Management Association (NPMA) Carolinas/Mid-Atlantic Summer Conference. Myrtle Beach, SC (Oral Presentation, 50 min, ~150 attendees).
41. **\*DeVries, Z.C.** 2018. Bed Bug Feces and Allergies: Why Bed Bugs Continue to be an Important Public Health Pest. The Global Bed Bug Summit. Denver, CO (Oral Presentation, 50 min, ~500 attendees).
42. **\*DeVries, Z.C.** 2018. Everything you never thought you wanted to know about bed bugs. North Carolina Department of Labor Annual Training Meeting. Raleigh, NC (Oral Presentation, 2 hrs, ~30 attendees).
43. **\*DeVries, Z.C.** 2018. Bed bug research update and the future of innovations in bed bug management. National Pest Management Association (NPMA) Carolinas/Mid-Atlantic Summer Conference. Wrightsville Beach, NC (Oral Presentation, 50 min, ~50 attendees).
44. **\*DeVries, Z.C.** 2018. Medical importance of cockroaches and bed bugs. North Carolina Pest Management Association PCT School. Durham, NC (Oral Presentation – P-phase, 50 min, ~400 attendees).
45. **\*DeVries, Z.C.** 2017. Challenges and opportunities surrounding bed bug baits. North Carolina Pest Management Association PCT School. Durham, NC (Oral Presentation – P-phase, 50 min, ~400 attendees).
46. **\*DeVries, Z.C.** 2016. The promise and pitfalls surrounding bed bug baits. The Global Bed Bug Summit. Indianapolis, IN (Oral Presentation, 50 min, ~200 attendees).
47. **\*DeVries, Z.C.** 2016. Cockroaches and bed bugs: Similarities, differences, and what it means for management. North Carolina Pest Management Association PCT School. Durham, NC (Oral Presentation – P-phase, 50 min, ~400 attendees).
48. **\*DeVries, Z.C.** 2015. Effects of baiting strategies on German cockroach populations and allergen levels. North Carolina Pest Management Association PCT School. Durham, NC (Oral Presentation, 15 min, ~400 attendees).
49. **\*DeVries, Z.C.** 2013. Urban insect physiology and management implications. Alabama Pest Control Association Meeting. Auburn, AL. (Oral Presentation, 15 min, ~100 attendees).
50. **\*DeVries, Z.C.** 2013. Bed Bug Biology and Management. Extension Agents, Huntsville, AL (oral presentation, performed remotely via conference call, 50 min, ~25 attendees).

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## Co-Authored Extension Presentations (\* indicates invited presentation)

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1. Lucero, I., and **Z.C. DeVries**. 2023. Cockroaches. Kentucky Pest Management Association Recertification Training. Elizabethtown, KY (Oral Presentation, 60 min, ~50 attendees).
2. Grady, B., and **Z.C. DeVries**. 2023. Cockroaches. Kentucky Pest Management Association Recertification Training. Burlington, KY (Oral Presentation, 60 min, ~50 attendees).
3. Lucero, I., S. Gaire, and **Z.C. DeVries**. 2022. German Cockroach Bait Consumption and Efficacy. University of Kentucky Pest Control Short Course. Lexington, KY (Oral, 15 min, ~50 attendees).
4. Principato, S., and **Z.C. DeVries**. 2022. Mitigation of bed bug-produced histamine through common cleaning methods. University of Kentucky Pest Control Short Course. Lexington, KY (Oral, 15 min, ~50 attendees).
5. Gordon, J., and **Z.C. DeVries**. 2022. Tropomyosin: A novel bed bug allergen. University of Kentucky Pest Control Short Course. Lexington, KY (Oral, 15 min, ~50 attendees).
6. Grady, B., and **Z.C. DeVries**. 2022. German cockroach biology. University of Kentucky Pest Control Short Course. Lexington, KY (Oral, 15 min, ~50 attendees).
7. Lucero, I., S. Gaire, and **Z.C. DeVries**. 2022. German Cockroach Bait Consumption and Efficacy. National Pest Management Association PestWorld. Boston, MA (Oral, 10 min, ~50 attendees).
8. Principato, S., and **Z.C. DeVries**. 2022. Mitigation of bed bug-produced histamine through common cleaning methods. National Pest Management Association PestWorld. Boston, MA (Oral, 10 min, ~50 attendees).
9. Gordon, J., and **Z.C. DeVries**. 2022. Tropomyosin: A novel bed bug allergen. National Pest Management Association PestWorld. Boston, MA (Oral, 10 min, ~50 attendees).
10. Grady, B., and **Z.C. DeVries**. 2022. German cockroach biology. National Pest Management Association PestWorld. Boston, MA (Oral, 10 min, ~50 attendees).
11. Gordon, J., and **Z.C. DeVries**. 2022. Understanding and Controlling Cockroaches. Kentucky Pest Management Association. Louisville, KY (Oral, 60 min, ~250 attendees)
12. Sierras, A., and **Z.C. DeVries**. 2022. Bed Bugs: Think Before You Treat! Kentucky Pest Management Association. Louisville, KY (Oral, 60 min, ~250 attendees).
13. Lucero I., S. Gaire, **Z.C. DeVries**. 2021. German cockroach bait consumption and foraging. National Pest Management Association PestWorld. Las Vegas, NV (Oral, 10 min, ~30 attendees).
14. Principato, S., and **Z.C. DeVries**. 2021. Evaluation of histamine production in common indoor arthropods. National Pest Management Association PestWorld. Las Vegas, NV (Oral, 10 min, ~30 attendees).

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## Extension News Briefs

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1. **DeVries, Z.C.** 2023. Managing Mosquitoes in Kentucky (<https://kentuckypestnews.wordpress.com/2023/07/11/managing-mosquitoes-in-kentucky/>)
2. **DeVries, Z.C.** 2022. Fall Invaders (podcast) (<https://ukfcsext.podbean.com/e/fall-invaders/>)
3. **DeVries, Z.C.** 2022. Managing Mosquitoes in Kentucky (<https://kentuckypestnews.wordpress.com/2022/07/12/managing-mosquitoes-in-kentucky/>)
4. **DeVries, Z.C.** 2022. Time for Termites! Kentucky Pest News (<https://kentuckypestnews.wordpress.com/2022/04/26/time-for-termites/>)

5. DeVries, Z.C. 2021. Pest-Proofing Your Home. Kentucky Pest News (<https://kentuckypestnews.wordpress.com/2021/09/28/pest-proofing-your-home/>)
6. DeVries, Z.C. 2021. Managing Mosquitoes in Kentucky. Kentucky Pest News (<https://kentuckypestnews.wordpress.com/2021/07/06/managing-mosquitoes-in-kentucky/>).
7. Larson J and DeVries, Z.C. 2021. Bugs that make you itch! UK CAFE News. (<https://exclusives.ca.uky.edu/2021/anr/bugs-and-other-things-make-you-itch>).
8. DeVries, Z.C. 2020. Pest-Proofing Your Home. Kentucky Pest News (<https://kentuckypestnews.wordpress.com/2020/09/08/pest-proofing-your-home/>).
9. DeVries, Z.C. and Larson J. 2020. New stinging ant species could cause problems for Kentuckians. UK CAFE News (<https://news.ca.uky.edu/article/new-stinging-ant-species-could-cause-problems-kentuckians>).
  - Additional Media Coverage: [Phys](#), [Northern Kentucky Tribune](#), [Western Kentucky Star](#)
10. DeVries, Z.C. 2020. Time for Termites! Kentucky Pest News (<https://kentuckypestnews.wordpress.com/2020/04/21/time-for-termites/>).
11. DeVries, Z.C. 2020. Pest Control and COVID-19. Kentucky Pest News (<https://kentuckypestnews.wordpress.com/2020/04/07/pest-control-and-covid-19/>).

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### **Pest Management Activities (Training, Workshops, Certification, Consultations, etc.)**

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- 2022 **University of Kentucky Pest Control Short Course**  
 Designed and coordinated an in-person training meeting for pest control operators in Kentucky and surrounding states. This meeting involved 15 1-hour talks from speakers around the country and provided training for >400 pest control operators.
- 2022 **University of Kentucky Technical Director's Retreat (Lexington, KY).**  
 Hosted a meeting for pest control company technical director's from around the country to discuss the future and current needs of pest control, and how research can be utilized to address these needs (20 attendees).
- 2022 **Kentucky Department of Agriculture Licensed Pest Control Operator's (LPCO) Exam (Frankfort, KY).**  
 Updated and administered the LPCO exam (July), which consists of 260 multiple choice questions and 40 specimen identification questions (July: 23 examinees).
- 2022 **National Pest Management Association Bed Bug Best Management Practices**  
 Reviewed and assisted in updating the comprehensive list of best practices for bed bug management published by the NPMA.
- 2021 **University of Kentucky Pest Control Short Course**  
 Designed and coordinated an in-person and online training meeting for pest control operators in Kentucky and surrounding states. This meeting involved 15 1-hour talks from speakers around the country and provided training for >430 pest control operators and awarded >6,300 CEUs.
- 2021 **University of Kentucky Technical Director's Retreat (Lexington, KY).**  
 Hosted a meeting for pest control company technical director's from around the country to discuss the future and current needs of pest control, and how research can be utilized to address these needs (20 attendees).
- 2021 **Kentucky Department of Agriculture Pest Control Advisory Board-Pesticide Application Regulation Working Group (Frankfort, KY).**

- Served on a working group to revise pesticide application regulations based on guidance from the EPA and new Kentucky Statue passed into law in 2021.
- 2021 **Kentucky Department of Agriculture Licensed Pest Control Operator's (LPCO) Exam (Frankfort, KY).**  
Updated and administered the LPCO exam (July, November), which consists of 260 multiple choice questions and 40 specimen identification questions (July: 16 examinees; November: 35 examinees).
- 2020 **The University of Kentucky Online Pest Control Training Series (Webinar).**  
Designed and coordinated an online webinar series (8 weeks, 16 CEUs) to replace our annual University of Kentucky Pest Control Short Course (canceled due to COVID). Weekly enrollment > 420, and >6,700 CEUs provided.
- 2020 **Pest Control in Bourbon Warehouses (Consultation)**  
Inspected bourbon warehouses for cockroaches, identified the species of interest, and provided management recommendation to the pest control company involved.
- 2020 **University of Kentucky Housing-Pest Management (Consultation)**  
Visited graduate and family housing, assessed current pest problems, and provided recommendations for pest control moving forward.
- 2020 **Kentucky Department of Agriculture Licensed Pest Control Operator's (LPCO) Exam (Frankfort, KY).**  
Updated and administered the LPCO exam (July, November), which consists of 260 multiple choice questions and 40 specimen identification questions (16 examinees).
- 2020 **Kentucky Department of Agriculture Structural Fumigation Exam.**  
Coordinated the complete redesign of this exam, which was >40 years old and contained outdated material (1 examinee).
- 2020 **Pest Control Ride-Alongs**  
Visited with several pest control companies in Lexington, KY and rode along with their technicians. Provided feedback on novel strategies that they could employ to better serve their clients.
- 2019 **University Housing, North Carolina State University (Raleigh, NC).**  
Consultation and demonstration of a community-wide cockroach management plan.
- 2018 **North Carolina Farmworker Institute (Durham, NC).**  
Provided practical information on bed bugs for those working with migrant farmworkers (e.g. identification, safety tips, best management practices)
- 2013 **Childersburg Housing Authority (Childersburg, AL)**  
Trained property management and staff on the best practices for bed bug inspections and management. Met with residents and answered questions regarding bed bugs.
- 2013 **Sylacauga Housing Authority (Sylacauga, AL).**  
Trained property management and staff on the best practices for bed bug inspections and management. Met with residents and answered questions regarding bed bugs.

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## **Outreach and Community Engagement**

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- 2022 **University of Kentucky Curiosity Fair (Lexington, KY)**  
Urban entomology presentation to the public (~500 attendees)
- 2022 **Insect Presentation for Pre-School Children (Lexington, KY)**

- Basic entomology presentation for preschool children (3-5 years old) including hands-on insect demonstrations.
- 2021 **University of Kentucky Curiosity Fair (Lexington, KY)**  
Urban entomology presentation to the public (~500 attendees)
- 2018 **Creating Awareness of Agriculture and Life Sciences Disciplines, Degree Programs and Discoveries (CAALS 3D), North Carolina State University (Raleigh, NC).**  
Provided a hands-on laboratory experience to 6 high school students from underrepresented groups to increase awareness and interest in careers in agricultural and life sciences
- 2016-2018 **Fred Olds School Science Fair Judge (Raleigh, NC)**
- 2016-2019 **Brain and Behavior Night, North Carolina Museum of Natural Sciences (Raleigh, NC)**  
Presentation on urban insect behavior (~300 attendees).
- 2013-2019 **BugFest, North Carolina Museum of Natural Sciences (Raleigh, NC)**  
Urban entomology presentation to the public (>35,000 attendees)
- 2014- **Cockroach and bed bug inspection/intervention for the public (Raleigh, NC)**
- 2014-2018 **North Carolina State 4-H Competition Judge (Raleigh, NC)**
- 2014 **Science of Attraction, Museum of Life and Science (Durham, NC)**  
Presentation on chemical ecology to the public (~200 attendees).
- 2013 **Cockroach presentation for Pre-School children, Lee-Scott Academy (Auburn, AL)**

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## Media Coverage

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- 2023 Interview on the next generation of urban entomologists [[PCT](#)]
- 2023 Interview on the health effects of bed bugs [[PCT](#)]
- 2022 Interviews on our bed bug histamine excretion work: [[UK CAFE News](#)] [[Entomology Today](#)] [[PCT](#)] [[Medical Daily](#)]
- 2022 Interview on stored product pests. [[Washington Post](#)]
- 2022 Interview of cockroach and bed bug management in Kentucky. [[WEKU](#)]
- 2022 Interview on fruit fly management. [[Washington Post](#)]
- 2022 Interview on DIY wasp deterrence device. [[AFP Fact Check](#)]
- 2021 interviews on our bed bug anti-arrestment work: [[UKNow](#)] [[PCT](#)] [[PMP](#)] [[Phys](#)] [[ABC-WTVQ](#)] [[Kentucky Today](#)] [[Sci News](#)] [[ZME Science](#)] [[Heromag](#)] [[Exterminator News](#)] [[Pest Control Daily News](#)] [[Exclusive Global News](#)] [[SciTech Daily](#)] [[Ohio Ag Connection](#)] [[Kentucky Ag Connection](#)] [[Elizabethtown News Enterprise](#)] [[Verve Times](#)] [[News Break](#)] [[Mirage News Australia](#)] [[24hTech](#)] [[FocusTechnica](#)]
- 2021 Media Coverage of our annual University of Kentucky Pest Control Short Course: [[PCT](#)]
- 2021 Interview by "TheHealthy.com" on bed bugs and house dust mites [[TheHealthy](#)]
- 2021 Interview by Vermont Public Radio on the Challenges of Cockroaches in Public Housing. [[VPR](#)]
- 2020 Interviews on the Asian Needle Ant in Kentucky. [[UK Now](#)] [[Lexington Herald-Leader](#)] [[West Kentucky Star](#)] [[Norther Kentucky Tribune](#)]
- 2020 Contributed article to Pest Control Technology with advice for PMPs in relation to COVID-19. [[PCT](#)]
- 2019 Interviewed by weather.com about the dangers and ineffectiveness of 'bug bombs'. [[Pattnr](#)]
- 2019 Interview by Gizmodo about "the life of and urban pest scientist". [[Gizmodo](#)]



- 2019 TV and online interviews for our total release fogger (TRF, 'Bug Bomb') work: [\[NC State News\]](#) [\[Science\]](#) [\[New York Post\]](#) [\[Natural History Magazine\]](#) [\[WRAL\]](#) [\[ABC North Carolina \(WTVD\)\]](#) [\[North Carolina Public Radio\]](#) [\[C&E News\]](#) [\[FairWarning\]](#) [\[Yahoo News\]](#) [\[Fox News\]](#) [\[Gizmodo\]](#) [\[PCT Online\]](#) [\[Eurekalert\]](#) [\[Phys.org\]](#) [\[Science Daily\]](#) [\[Tech Explorist\]](#) [\[UPI\]](#) [\[The Siasat Daily\]](#) [\[Tech Times\]](#) [\[ZME Science\]](#) [\[Foreign Affairs\]](#) [\[Long Room\]](#) [\[Business Standard\]](#) [\[Beyond Pesticides\]](#) [\[Earth.com\]](#) [\[Brinkwire\]](#) [\[The Week\]](#) [\[e Science News\]](#) [\[News-Medical\]](#) [\[Eurasia Review\]](#) [\[Science Codex\]](#) [\[Devdiscourse\]](#) [\[Zee News\]](#) [\[ANI News\]](#) [\[Mental Floss\]](#) [\[the Doctor will see you now\]](#) [\[boingboing\]](#) [\[North Carolina Health News\]](#) [\[Tuscon Sentinel\]](#)
- 2018 TV and online Interviews for bed bug histamine work: [\[NC State News\]](#) [\[Newsweek\]](#) [\[CBS North Carolina-WNCN\]](#) [\[Kentucky Public Radio WFPL 89.3\]](#) [\[EurekAlert\]](#) [\[PCT Online\]](#) [\[Gizmodo\]](#) [\[Quartz\]](#) [\[Science News\]](#) [\[Science Daily\]](#) [\[Phys.org\]](#) [\[Atlanta Journal Constitution\]](#) [\[ARS Technica\]](#) [\[Tech Times\]](#) [\[Medpage Today\]](#) [\[DoctorsLounge\]](#) [\[News-Medical\]](#) [\[WeekFacts\]](#) [\[Mental Floss\]](#) [\[Newsmax\]](#) [\[UPI\]](#) [\[Stuff\]](#) [\[The Sun\]](#) [\[Philly.com\]](#) [\[Outbreak News Radio\]](#) [\[WXPI Pittsburgh\]](#)
- 2017 Pest Control Technology (PCT) Interview: "Baits: An 'Outside-the-Box' Bed Bug Solution". [\[PCT Online\]](#)
- 2016 Web Interview on developing an artificial bait for bed bugs. [\[NC Health News\]](#)
- 2013 TV Interview on bed bug metabolism, prevention, and management tips. [\[WSFA\]](#)
- 2013 Web Interview on bed bug biology, management, and ongoing research. [\[Auburn University\]](#)
- 2013 TV Interview on bed bug problems and management. Trinity Broadcasting Network, WMCF-TV 45, Montgomery, AL.

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## Mentorship (since joining the University of Kentucky in 2020)

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### Summary of mentorship

| Category               | My Role          | Current   | Prior    | Total     |
|------------------------|------------------|-----------|----------|-----------|
| Research Scientists    | Advisor          | 1         | 0        | 1         |
| Postdoctoral Scholars  | Advisor          | 0         | 1        | 1         |
| PhD Students           | Advisor          | 3         | 0        | 3         |
| MS Students            | Advisor          | 3         | 0        | 3         |
|                        | Committee Member | 1         | 1        | 2         |
| Undergraduate Students | Mentor           | 2         | 1        | 3         |
| <i>Total Advisees</i>  | -                | <i>10</i> | <i>3</i> | <i>13</i> |

### Notable positions of my former mentees (including mentees prior to joining UK)

- Sudip Gaire (Postdoctoral Research Scholar, 2020-2022); Product Development Specialist/Entomologist, Central Life Sciences, Dallas, TX.

### Notable accomplishments of my mentees (including mentees prior to joining UK)

- Sudip Gaire (Postdoctoral Research Scholar, 2020-2022)
  - Entomological Society of America (ESA) Medical, Urban and Veterinary Entomology (MUVE) Early Career Award (2021)

- 1<sup>st</sup> place Oral Presentation, 2021 University of Kentucky Society of Postdoctoral Scholars Symposium
- Johnalyn Gordon (PhD Student, 2020-present)
  - ESA MUVE Shripat Kamble Urban Entomology Graduate Student Award for Innovative Research (2023)
  - First place student competition for the president's prize, Entomological Society of America Annual Meeting (2022)
  - Pest Management Foundation Scholarship (2021, 2022)
  - Pi Chi Omega Alain VanRyckeghem Scholarship (2021)
  - College of Agriculture, Food and Environment Karri Casner Environmental Sciences Fellowship (2021)
  - ESA MUVE Student Travel Award (2021)
  - Larry Larson Graduate Student Award for Leadership in Applied Entomology, ESA (2021)
- Simona Principato (PhD Student, 2021-present)
  - ESA MUVE Student Travel Award (2023)
  - Pest Management Foundation Scholarship (2023)
  - Pi Chi Omega Alain VanRyckeghem Scholarship (2023)
- Isabelle Lucero (MS Student, 2021-present)
  - Pi Chi Omega Founders Endowment Scholarship (2023)
  - Second place student competition for the president's prize, Entomological Society of America Annual Meeting (2022)
  - College of Agriculture, Food and Environment Diversity Research & Teaching Fellowship (2021-2023)
- Ben Grady (MS Student, 2022-present)
  - Pi Chi Omega Dr. Austin Frishman Scholarship (2023)
- Henry Morgan (BS Student, 2021-present)
  - First Place Department of Entomology 2022 Poster Session, Department of Entomology, University of Kentucky (2022)
  - College of Agriculture, Food and Environment (CAFE) Undergraduate Research Award (2022).
  - University of Kentucky Summer Undergraduate Research Experience in Environmental Health Sciences (SUREs) Program (2022)
- Emily Vernon (Undergraduate Student, 2017-2018)
  - NC State Undergraduate Research Grant (2018)
  - National Conference on Urban Entomology B.S. Scholarship (2018)

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## Teaching Experience

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|      | <u>Course</u>  | <u>Course Quality</u> | <u>Instructor Quality</u> |
|------|--|-----------------------|---------------------------|
| 2022 | <b>Guest Lecture – Integrated Pest Management</b> (ENT 530), University of Kentucky (enrollment ~ 8)                         | NA                    | NA                        |
| 2022 | <b>Guest Lecture – Scientific Method In Biotechnology</b> (ABT 201), University of Kentucky (enrollment ~ 25)                | NA                    | NA                        |
| 2022 | <b>Guest Lecture – Horticultural Entomology</b> (ENT 320), University of Kentucky (enrollment ~ 25)                          | NA                    | NA                        |
| 2021 | <b>Guest Lecture – Integrated Pest Management</b> (ENT 530), University of Kentucky (enrollment = 12)                        | NA                    | NA                        |
| 2021 | <b>Guest Lecture – Insects Affecting Human and Animal Health</b> (ENT/BIO/CPH 561), University of Kentucky (enrollment = 16) | NA                    | NA                        |
| 2021 | <b>Co-Instructor of Record – Invisible Itches</b> (ENT 770), University of Kentucky (enrollment = 10)                        | 4.8/5                 | 5/5                       |
| 2020 | <b>Guest Lecture – Insects Affecting Human and Animal Health</b> (ENT/BIO/CPH 561), University of Kentucky (enrollment = 16) | NA                    | NA                        |
| 2018 | <b>Co-Instructor of Record – Urban Pest Management</b> (ENT 132), North Carolina State University (enrollment = 20)          | 5/5                   | 5/5                       |
| 2017 | <b>Co-Instructor of Record – Urban Pest Management</b> (ENT 132), North Carolina State University (enrollment = 16)          | 5/5                   | 5/5                       |
| 2016 | <b>Instructor of Record – General Entomology</b> (ENT 110-001), North Carolina State University (enrollment = 34)            | 5/5                   | 4.8/5                     |
| 2015 | <b>Instructor of Record – General Entomology Lab</b> (ENT 110-201,202), North Carolina State University (enrollment = 36)    | 5/5                   | 5/5                       |
| 2011 | <b>Guest Lecturer – General Entomology</b> (ENTM 3040), Auburn University (enrollment = 20)                                  | NA                    | NA                        |
| 2011 | <b>Peer Instructor – Conservation Biology Learning Community</b> , Auburn University (enrollment = 20)                       | NA                    | NA                        |
| 2010 | <b>Peer Instructor – Conservation Biology Learning Community</b> , Auburn University (enrollment = 20)                       | NA                    | NA                        |

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## Memberships, Activities, and Service

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### Department

- Graduate Program Committee, Department of Entomology, University of Kentucky (2022-present)
  - Assist in acquiring/compiling Program Student Learning Outcomes (PSLOs)
  - Assist in graduate student admission decisions
- Self-Study Document Preparation Committee, Department of Entomology, University of Kentucky (2022)
  - Assist in assembling the self-study document used for the 6-year review of the Department of Entomology.
- Planning Committee, Department of Entomology, University of Kentucky (2019-present)

- Provided feedback on the needs and direction for the Department moving forward

### College and University

- Judge, Postdoc Talk Competition, 2022 Society of Postdoctoral Scholars Annual Research & Career Symposium (2022).
  - One of only five judges selected from the entire University of Kentucky
- The University of Kentucky Center for Health Equity Transformation (CHET; Affiliate Member, 2021-Present).
- The University of Kentucky Center for Appalachian Research in Environmental Sciences (UK CARES; Associate Member, 2020-present)
  - This is an NIEHS Core Center (P30) designed to enhance research capacity focused on major environmental health risks.
  - Served on a working group which assisted in reviewing the center and providing feedback for the upcoming center renewal application (2020).

### Professional

- Entomological Society of America (member, 2012-Present)
  - Honors and Awards Committee Member (MUVE Representative; 2022-present)
  - Judge for the Entomological Society of American Student Competition for the President's Prize (2022)
  - Judge for the Henry and Sylvia Richardson Research Grant Award (2020-present)
  - Judge for the North Central Branch Meeting Student Competition (2021)
- Journal of Economic Entomology
  - Associate editor (2020-present)
- National Pest Management Association (member, 2022-present)
  - Technical Committee (member, 2023-present)
- Kentucky Department of Agriculture Pesticide Advisory Board (Member [voting], 2019-present).
  - This boards meets to review and approve individuals requesting to take the pest control licensing exam for the state of Kentucky. In addition, this boards reviews pending legislative changes that impact structural pest control rules and regulations
- Reviewer for the following journals or institutions (# of items reviewed)
  - Journal of Economic Entomology (21)
  - Physiological Entomology (3)
  - Journal of Thermal Biology (2)
  - Journal of Medical Entomology (2)
  - Medical and Veterinary Entomology (1)
  - PLoS One (1)
  - The Canadian Entomologist (1)
  - Journal of Insect Behavior (1)
  - Hormones and Behavior (1)
  - Journal of Urban Ecology (2)
  - Acta Biotheoretica (1)
  - The Florida Entomologist (1)
  - Entomology, Ornithology, and Herpetology (1)
  - USDA Hatch Grant (1)

- Other Review Services
  - Reviewer for University of Kentucky Extension Fact Sheet (1)