

Curriculum Vitae

**RACHEL V. WILKINS**

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EDUCATION

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- Jan. 2018 – Dec. 2019 (anticipated)                      Master of Science in Entomology  
Advisors: Dr. Kun Yan Zhu, Dr. Rob Morrison  
*Kansas State University, Manhattan, KS*
- Aug. 2014 – Dec. 2017                                      Bachelor of Science in Biology  
Minor in Entomology  
*Kansas State University, Manhattan, KS*

PROFESSIONAL EXPERIENCE

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**Jan. 2018 – Present                      Graduate Research Assistant**

USDA-ARS Stored Product Insects and Engineering Unit

Supervisor: Dr. Rob Morrison

- Research focus: Developing attract-and-kill tools and using long-lasting insecticide netting to prevent the infestation of stored product insects. Involved using Ethovision, video tracking techniques, release-recapture experiments, semiochemical attractant assays, wind tunnel assays. Gained experience in experimental design, writing up data, common statistical procedures (ANOVA, chi square, generalized linear models), and presenting results.

**May 2017 – Jan. 2018                      Biological Sciences Aide**

USDA-ARS Stored Product Insects and Engineering Unit

Supervisor: Dr. Erin Scully

- Research focus: Investigated the behavioral effects of volatile treatments on the movement and dispersal of *Tribolium castaneum* and *Rhyzopertha dominica*. Extracted dsDNA/RNA from various stored product insects as contributions to genomic libraries. Operated Kingfisher Flex Purification System. Involved in antennal ablation to isolate important chemosensory neurons. Conducted wind tunnel assays, maintained insect colonies and lab equipment.

**Aug. 2016 – Nov. 2016                      Undergraduate Independent Study**

Department of Entomology, Kansas State University

Supervisor: Dr. Kristopher Silver and Dr. Kun-Yan Zhu

- Research focus: Injected dsRNA into German cockroaches to study RNAi of several target genes (tubulin, VATPase subunit 1, Snf7, Vha). Cared for and observed roaches over multiple weeks, developed poster presentation to present findings at undergraduate research symposium.

PEER-REVIEWED PUBLICATIONS

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- 2019 Morrison III, W.R., A. Bruce, **R.V. Wilkins**, C. Albin, F.H. Arthur. Sanitation improves stored product insect pest management. *Insects* 10: 77.
- 2018 Morrison III, W.R., **R. Wilkins**, A. Gerken, D.S. Scheff, K.-Y. Zhu, F.H. Arthur, and J.F. Campbell. The behavioral compatibility of long-lasting insecticide netting with adult *Tribolium castaneum* (Coleoptera: Tenebrionidae) and *Rhyzopertha dominica* (Coleoptera: Bostrichidae). *Journal of Economic Entomology* 111: 2443-2453.
- Review **Wilkins, R.**, and W.R. Morrison III. Life-stage dependent differences in the effect of long-lasting insecticide netting on the mobility and dispersal of immature *Trogoderma variabile* (Coleoptera: Dermestidae) and *Tribolium castaneum* (Coleoptera: Tenebrionidae). *Journal of Economic Entomology*.
- Prep **Wilkins, R.**, T. McKay, K.Y. Zhu, J.F. Campbell, and W.R. Morrison III. Using long-lasting insecticide netting and attractants to intercept immigrating insects at pilot scale and commercial food facilities.

OTHER PUBLICATIONS

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- Oct. 2018 Morrison III, W.R., and **R. Wilkins**. The use of long-lasting insecticide netting to prevent dispersal of stored product insects. Proceedings of the 12<sup>th</sup> International Working Conference on Stored Product Protection, Berlin, Germany.

PRESENTATIONS

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- Nov. 2019 **Wilkins, R.V.** and W.R. Morrison III. The promise of long-lasting insecticide-incorporated netting for diversifying post-harvest IPM programs for food facilities. 67<sup>th</sup> Annual Meeting of the Entomological Society of America, St. Louis, MO. (*Invited*)
- Nov. 2019 **Wilkins, R.V.** and W.R. Morrison III. Evaluation of optimal deployment of long-lasting insecticide-incorporated netting and semiochemicals against stored product insects around food facilities. Poster Presentation. 67<sup>th</sup> Annual Meeting of the Entomological Society of America, St. Louis, MO.
- Nov. 2019 Morrison, III W.R, **R.V. Wilkins**, H. Quellhorst, R. Grosdidier, and C. Albin. Can we afford to stop IPM after harvest? Farm to fork IPM programs to improve the sustainability of pest management for the entire agricultural supply chain. 67<sup>th</sup> Annual Meeting of the Entomological Society of America, St. Louis, MO. (*Invited*)
- Nov. 2019 Bruce, A., H. Quellhorst, **R.V. Wilkins**, T. Van Winkle, M. Ponce, W.R. Morrison III. The behavioral responses of *Rhyzopertha dominica* (Coleoptera: Bostrichidae) and *Tribolium castaneum* (Coleoptera: Tenebrionidae) to individual fungal volatiles in a wind tunnel and release-recapture experiment. 67<sup>th</sup> Annual Meeting of the Entomological Society of America, St. Louis, MO.
- Sep. 2019 Morrison, III W.R., and **R.V. Wilkins**. Long-lasting insecticide netting is effective against multiple stored product insect species and life stages. Integrated Protection of

Stored Products, International Organization for the Study of Biological Control, West Palearctic Regional Section, Pisa, Italy.

- Apr. 2019 **Wilkins, R.V.**, and W.R. Morrison III. Long-lasting insecticide netting causes reduced movement and dispersal capacity of immature *Trogoderma variabile* (Coleoptera: Dermestidae). 2<sup>nd</sup> Annual Virtual Symposium of the International Branch of ESA.
- Apr. 2019 **Wilkins, R.V.** and W.R. Morrison III. Prevention of immigrating insects into food facilities. 3-minute Thesis Competition, Department of Entomology, Kansas State University, Manhattan, KS.
- Mar. 2019 **Wilkins, R.V.**, and W.R. Morrison III. Life-stage specific differences in the mobility of *Trogoderma variabile* (Coleoptera: Dermestidae) after exposure to long-lasting insecticide netting. 95<sup>th</sup> Annual Meeting of the Central States Kansas Entomological Society, Overland Park, KS.
- Mar. 2019 **Wilkins, R.V.**, and W.R. Morrison III. Life-stage differences in the mobility of *Trogoderma variabile* (Coleoptera: Dermestidae) after exposure to long-lasting insecticide netting. Graduate School Council K-State Graduate Research, Arts and Discovery (GRAD) Research Forum, Manhattan, KS.
- Mar. 2019 Morrison, III W.R., **R.V. Wilkins**, R. Grosdidier, F.H. Arthur, C. Athanassiou, S.W. Myers, and M. Domingue. From lab studies to the field: how the behavioral ecology of post-harvest insects can inform management. 74<sup>th</sup> Annual Meeting of the North Central Branch of the Entomological Society of America, Cincinnati, OH. (*Invited*)
- Mar. 2019 **Wilkins, R.V.**, and W.R. Morrison III. Life-stage specific differences in the mobility of *Trogoderma variabile* (Coleoptera: Dermestidae) after exposure to long-lasting insecticide netting. 74<sup>th</sup> Annual Meeting of the North Central Branch of the Entomological Society of America, Cincinnati, OH.
- Feb. 2019 Morrison, III W.R., and **R.V. Wilkins**. Effect of long-lasting insecticide netting on the dispersal of immature stored product insects. NC-213 Annual Meeting, U.S. Grain Consortium, "Marketing and Delivery of Quality Grains and BioProcess Coproducts", Ames, IA. (*Invited*)
- Feb. 2019 Morrison, III W.R., **R.V. Wilkins**, F.H. Arthur, D. Brabec, M. Casada. Up-and-coming technologies in fumigation and stored product integrated pest management. Nebraska Urban Pest Management Conference, Nebraska State Pest Control Association, Lincoln, NE. (*Invited*)
- Dec. 2018 Alonso, A.A., **R.V. Wilkins**, and W.R. Morrison III. Assessing the long-distance repellency of long-lasting insecticide netting to a suite of post-harvest insect. 3<sup>rd</sup> Annual Undergraduate Research Symposium, Kansas State University, Manhattan, KS.
- Nov. 2018 **Wilkins, R.V.** and W.R. Morrison III. Reduction in the movement and dispersal capacity of immature stages of *Trogoderma variabile* (Coleoptera: Dermestidae) after exposure to long-lasting insecticide netting. 66<sup>th</sup> Joint Annual Meeting of the Entomological Society

of America, Entomological Society of Canada, and Entomological Society of British Columbia, Vancouver, Canada.

- Oct. 2018 Morrison, III W.R. and **R.V. Wilkins**. The use of long-lasting insecticide netting to prevent the dispersal of stored product insects. 12<sup>th</sup> International Working Conference on Stored Product Protection, Berlin, Germany.
- Apr. 2018 **Wilkins, R.V.** and W.R. Morrison III. Exposure to long-lasting insecticide netting reduces the dispersal capacity and movement of stored product beetles in the laboratory. Annual Meeting of the Kansas Entomological Society and 150<sup>th</sup> Annual Meeting of the Kansas Academy of Science, Washburn University, Topeka, KS.
- Apr. 2018 **Wilkins, R.V.**, and W.R. Morrison III. Reduction in movement and dispersal capacity of immature stages of *Trogoderma variabile* (Coleoptera: Dermestidae) and *Tribolium castaneum* (Coleoptera: Tenebrionidae) after exposure to long-lasting insecticide netting. 1<sup>st</sup> Annual Virtual Symposium of the International Branch of ESA.
- Mar. 2018 **Wilkins, R.V.** and W.R. Morrison III. Exposure to long-lasting insecticide netting reduces the dispersal capacity and movement of stored product beetles in the laboratory. Graduate School Council K-State Graduate Research, Arts and Discovery (GRAD) Research Forum, Kansas State University, Manhattan, KS.
- Mar. 2018 **Wilkins, R.V.** and W.R. Morrison III. Exposure to long-lasting insecticide netting reduces the dispersal capacity and movement of stored product beetles in the laboratory. 73<sup>rd</sup> Annual Meeting of the North-Central Branch of the Entomological Society of America, Madison, WI.
- Mar. 2018 Morrison III, W.R. and **R.V. Wilkins**. Using long-lasting netting to prevent the dispersal of stored product insects. NC-213 Annual Meeting, U.S. Grain Consortium, "Marketing and Delivery of Quality Grains and BioProcess Coproducts," Kansas City, MO.
- Feb. 2018 **Wilkins, R.V.**. 3<sup>rd</sup> Annual Three-Minute Thesis (3MT) Final Competition. Alumni Center Ballroom. Kansas State University, Manhattan, KS.
- Feb. 2018 **Wilkins, R.V.**. 3<sup>rd</sup> Annual Three-Minute Thesis (3MT) Preliminary Competition. Kansas State University, Manhattan, KS.
- Dec. 2017 **Wilkins, R.V.** and W.R. Morrison III. The behavioral compatibility of long-lasting insecticide netting for prevention of infestation by *T. castaneum* in the laboratory. Poster presentation. 2<sup>nd</sup> Annual Undergraduate Research Symposium, Kansas State University, Manhattan, KS.
- Nov. 2017 **Wilkins, R.V.** and W.R. Morrison III. The behavioral compatibility of long-lasting insecticide netting for prevention of infestation by *T. castaneum* in the laboratory. Virtual Poster presentation. 65<sup>th</sup> Annual Meeting of the Entomological Society of America, Denver, CO.
- Nov. 2016 **Wilkins, R.V.**, K. Silver, K.Y. Zhu, and H. Banister. Evaluation of several genes as targets for RNAi in German Cockroach. Poster presentation. 1<sup>st</sup> Annual Undergraduate Research Symposium, Kansas State University, Manhattan, KS.

## MEDIA COVERAGE

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- Mar. 2019     **Arthro-Pod Show**. 3 April. “Stored product pests with Rob Morrison” by Jody Green and Jonathan Larson.
- Jul. 2018     **EntomologyToday**. 6 July. “Insecticide netting could keep beetles out of your breakfast cereal” by Meredith Swett Walker.

## AWARDS AND GRANTS

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- Apr. 2019     **Roger C. Smith Award** for exceptional overall accomplishments in the Master’s program, Department of Entomology, Kansas State University, Manhattan, KS. Amount: **\$600**.
- Apr. 2019     **2<sup>nd</sup> Place**, Department of Entomology M.S. 3-Minute Thesis Competition, Kansas State University, Manhattan, KS. Amount: **\$75**.
- Apr. 2019     **2<sup>nd</sup> Place**, Phenotype Adornment Contest, Department of Entomology, Kansas State University, Manhattan, KS.
- Mar. 2019     **3<sup>rd</sup> Place**, M.S. Oral Competition, 95<sup>th</sup> Annual Meeting of the Central States Kansas Entomological Society, Overland Park, KS. Amount: **\$50**.
- Mar. 2019     **1<sup>st</sup> Place**, M.S. Oral Competition P-IE Session III, 74<sup>th</sup> Annual Meeting of the North Central Branch of the Entomological Society of America, Cincinnati, OH. Amount: **\$200**.
- Jan. 2019     ESA North Central Branch Student Travel Award for the 2019 NCB Meeting in Cincinnati, Ohio. Amount: **\$200**.
- Jan. 2019     Graduate Student **Mini-Grant Research** Proposal, Department of Entomology, Kansas State University, Manhattan KS. Amount: **\$500**.
- Sep. 2018     Graduate Student Council **Travel Grant**, Kansas State University, Manhattan KS. Amount: **\$675**.
- Apr. 2018     **2<sup>nd</sup> Place**, Student Oral Competition, 94<sup>th</sup> Annual Meeting of the Kansas Entomological Society and 150<sup>th</sup> Annual Meeting of the Kansas Academy of Science, Washburn University, Topeka, KS.
- Mar. 2018     **1<sup>st</sup> Place**, K-State Annual Graduate Research, Arts and Discovery (GRAD) Biological Sciences Oral Session #2, Kansas State University, Manhattan, KS. Prize: **\$500**.
- Mar. 2018     **2<sup>nd</sup> Place**, Department of Entomology M.S. 3-Minute Thesis Competition, Kansas State University, Manhattan, KS. Amount: **\$75**.
- Feb. 2018     **Finalist**, K-State Graduate School’s 3-Minute Thesis Competition, Kansas State University, Manhattan, KS.

Nov. 2017 **1<sup>st</sup> Place**, President's Prize, Virtual Poster Competition in Plant-Insect Ecosystems (P-IE) Section, 65<sup>th</sup> Annual Meeting of the Entomological Society of America, Denver, CO.

## OUTREACH

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- Apr. 2019 Insect Study Merit Badge Counselor for 26<sup>th</sup> Annual Boy Scouts of America Conference, Waters Hall, Kansas State University, Manhattan, KS.  
Attendance: 30 youth and parents
- Led presentation and group activity about entomological-related subjects including taxonomy and dichotomous keys, insect pest management, helpful/harmful insects, and importance of bees and native pollinators.
- Sep. 2018 4-H Entomological Judging: Advanced, 2018 Kansas State Fair, Hutchinson, KS.
- Judged 4-H insect collections at the Advanced level. Evaluated collections based on correctness in labeling and identification, neatness, organization, and overall aesthetic.
- Jun. 2018 4-H Insect Spectacular Advanced Identification: Lepidoptera, Sedgwick County Zoo, Wichita, KS.  
Attendance: 35 youth and parents
- Co-presented lecture on Lepidopteran taxonomy, biology, and morphology including identification based on defining wing venation characteristics
- Apr. 2018 Insect Study Merit Badge Counselor for 25<sup>th</sup> Annual Boy Scouts of America Conference, Waters Hall, Kansas State University, Manhattan, KS.  
Attendance: 40 youth and parents
- Feb. 2018 STEM GROW workshop hosted by KAWSE, Engineering Building, Kansas State University, Manhattan, KS.  
Attendance: 80 middle-school girls
- Led discussion on insect morphology and identification to middle-school girls and aided in mini-greenhouse crafts for the NASA-themed event.
- Nov. 2017 USDA-ARS Open house, Science Communications Week, Manhattan, KS.  
Attendance: 100
- Educated visitors about the stored product insect displays available and the research conducted at the center to prevent or treat infestations of these insects.
- Oct. 2017 STEM Spooktacular Event hosted by KAWSE, Seaton Hall, Kansas State University, Manhattan, KS.  
Attendance: 40 middle-school girls
- Assisted with hands-on forensic entomology activity for middle-school girls and discussed the role of forensic entomology in solving crimes.
- Sep. 2017 4-H "Bug Out!" Workshop: For Beginners, Green Valley Community Center, Manhattan, KS.  
Attendance: 10 kids

- Presented information about insect life stages to elementary-aged kids and how-to demonstration on insect pinning collections.

#### MEMBERSHIPS & PROFESSIONAL SERVICE

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May 2019 – Present	Popenoe Entomology Club; <b>Public Relations Coordinator</b> Kansas State University
Jan. 2018 – Apr. 2019	Popenoe Entomology Club; <b>Outreach Coordinator</b> Kansas State University
Jan. 2018 – Mar. 2019	Linnaean Games Trivia Team Kansas State University
Jun. 2017 – Present	Entomological Society of America North Central Branch
Nov. 2016 – Present	Beta Rho Chapter of Alpha Chi Sigma, Collegiate chemistry fraternity, Kansas State University