

Sudip Gaire

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EDUCATION

- 2016-2020** **PhD, Entomology**, Purdue University, West Lafayette, IN
- Dissertation: Toxicology of plant essential oils in bed bugs (*Advisor: Dr. Ameya Gondhalekar*)
 - GPA: 4.0
- 2014-2016** **MS, Entomology**, New Mexico State University, Las Cruces, NM
- Thesis: Toxicity and repellency of essential oils on the Turkestan cockroach, (Blattodea: Blattidae) (*Advisor: Dr. Alvaro Romero*)
 - GPA: 3.78
- 2009-2013** **BS, Agriculture**, Institute of Agriculture and Animal Science, Tribhuvan University, Chitwan, Nepal
- Grade: Distinction

PROFESSIONAL EXPERIENCE

- 2022-present** **Product Development Specialist/ Entomologist**, Central Life Sciences, Dallas, TX
- Role: I am working as a research entomologist for developing EPA registered pesticide products against the pests impacting the urban environment and public health.
 - Insects worked with: Cockroaches, bed bugs, ants, fleas, brown marmorated stink bugs, mosquitoes, Jadera bugs and ticks.
 - Insecticides: Aerosols, natural products, pyrethroids based residual insecticides, IGR, granular baits, gel baits, dust.
- 2020-2022** **Postdoctoral Research Scholar**, Department of Entomology, University of Kentucky, Lexington, KY (*Advisor: Dr. Zachary DeVries*)
- 2016-2020** **Graduate Research/Teaching Assistant**, Department of Entomology, Purdue University, West Lafayette, IN
- 2014-2016** **Graduate Research/Teaching Assistant**, Department of Entomology, Plant Pathology and Weed Science, New Mexico State University, NM
- 2013-2014** **IPM Facilitator**, Organic Offseason Vegetable Producer Training, Kathmandu, Nepal (sponsored by Ministry of Education and the World Bank)

2011-2013 **Coordinator and Instructor-B.Sc.Ag. and B.V.Sc./A.H. Entrance preparation class**
for high school graduate students, Everest Touch Institute, Chitwan, Nepal

AWARDS AND HONORS

- 2021** **First place, Research Talk Competition**, Postdoctoral Research and Career Symposium, University of Kentucky, Lexington, KY (\$300)
- 2021** **Early Career Award in Medical, Urban and Veterinary Entomology**, Entomological Society of America (\$500)
- 2020** **Outstanding Leadership Award**, Society of Overseas Nepalese Entomologists Annual Meeting, ESA Virtual Meeting
- 2019** **Outstanding Doctoral Student Award**, Department of Entomology, Purdue University, West Lafayette, IN (\$1,000)
- 2019** **Pest Management Foundation Scholarship**, National Pest Management Association (\$2,000)
- 2019** **Elanco Animal Health Graduate Travel Award**, Department of Entomology, Purdue University, West Lafayette, IN (\$1,000)
- 2019** **Norm Ehmann/Univar Scholarship**, Department of Entomology, Purdue University, West Lafayette, IN (\$2,000)
- 2019** **Travel Award**, Graduate School, Purdue University, West Lafayette, IN (\$500)
- 2018** **Outstanding Service by a Student Award**, Department of Entomology, Purdue University, West Lafayette, IN (\$500)
- 2018** **First Place, MUVE-Graduate level poster competition**, Entomological Society of America Annual Meeting, Vancouver, Canada
- 2018** **MUVE Shripat Kamble Urban Entomology Graduate Student Award for Innovative Research**, Entomological Society of America Annual Meeting, Vancouver, Canada (\$500)
- 2018** **Megha Parajulee SONE Student Award for Academic Excellence**, Society of Overseas Nepalese Entomologists Annual Meeting, ESA, Vancouver, Canada (\$200)
- 2018** **PhD Scholarship Award**, National Conference on Urban Entomology, Cary, NC (\$1,500)
- 2018** **Travel Award**, Purdue Graduate Student Government, West Lafayette, IN (\$250)
- 2018** **BASF Professional Pest Control Scholarship**, Department of Entomology, Purdue University, West Lafayette, IN (\$1,000)
- 2017** **Second Place, Graduate level poster competition**, Entomological Society of America Annual Meeting, Denver, CO (ESA registration waiver)
- 2017** **MUVE Student Travel Award**, Entomological Society of America Annual Meeting, Denver, CO (\$500)
- 2017** **Pi Chi Omega Founder's Scholarship**, Pi Chi Omega-The Professional Pest Management Fraternity (\$2,000)
- 2017** **Oser Family Scholarship**, Department of Entomology, Purdue University, West Lafayette, IN (\$1,000)

- 2016** **MS Scholarship Award**, National Conference on Urban Entomology, Albuquerque, NM (\$1,500)
- 2016** **Travel Award for Prospective Ph.D. Student**, Department of Entomology, Purdue University, West Lafayette, IN (\$1,000)
- 2016** **Dean's Awards of Excellence-Graduate**, College of Agriculture, Consumer and Environmental Sciences, NMSU, Las Cruces, NM
- 2015** **Salopek Foundation Endowed Scholarship**, Entomology, Plant Pathology and Weed Sciences Department, New Mexico State University, Las Cruces, NM (\$2,000)
- 2013** **University Merit Scholarship**, Tribhuvan University, Institute of Agriculture and Animal Sciences (IAAS), Rampur, Chitwan, Nepal (tuition waiver)
- 2012** **University Merit Scholarship**, Tribhuvan University, Institute of Agriculture and Animal Sciences (IAAS), Rampur, Chitwan, Nepal (tuition waiver)

RESEARCH

Funded Grants and Fellowship: (total amount = \$ 87,607)

1. The perfect meal: Determining how aging and humidity effect cockroach gel bait performance
 - Role: PI: Zachary DeVries, **co-PI: Sudip Gaire**
 - Funding source: Pest Management Foundation Research Grant, National Pest Management Association (NPMA)
 - Amount and period: \$21,309 (Nov 2020-March 2022)

2. Defining target sites for plant essential oil constituents used in agricultural, veterinary and structural insect pest management
 - Role: PI: Ameya Gondhalekar, **co-PI's: Sudip Gaire** and Wei Zheng
 - Funding source: Purdue University AgSEED Grant Program
 - Amount and period: \$50,000 (March 2019-Feb 2020)
(*Note: this proposal was crafted based upon #4 ESA-MUVE grant award*)

3. Bilsland Dissertation Fellowship
 - Role: **PhD Candidate: Sudip Gaire**
 - Funding source: The Graduate School, Purdue University
 - Amount and period: \$9,911 (stipend), \$891 (insurance), \$ 4,996 (tuition) (Spring 2020)

4. Identifying target sites for plant essential oil constituents in bed bugs, *Cimex lectularius* L. (Cimicidae: Hemiptera)
 - Role: **PI: Sudip Gaire**
 - Funding source: Medical, Urban, & Veterinary Entomology (MUVE) Section, Entomological Society of America
 - Amount and period: \$500 (2018)

Grant proposal not funded:

1. Insecticide resistance development under complex selection pressure (**with intention to re-submit**)
 - **Role:** PI: Zachary DeVries, **co-PI: Sudip Gaire**
 - **Funding source:** Center for Arthropod Management Technologies: A National Science Foundation I/UCRC: Phase II
 - **Amount requested:** \$160,000 (Jan 2022- Dec 2023)
 - **Status:** Invited to submit a full proposal, but not funded during this cycle
2. Effects of nutritional status on foraging and aggregation in cockroaches
 - **Role:** **Co-mentored** Isabelle Lucero (MS student) on fellowship proposal preparation with Zachary DeVries
 - **Funding source:** NSF Graduate Research Fellowships Program (GRFP)
 - **Amount and period:** \$138,000 (2022-2025)
 - **Status:** **Not funded**

Peer-reviewed Publications (*indicates joint senior authors, #served corresponding author):

1. **Gaire, S.#**, S. Principato, C. Schal, and Z. C. DeVries. 2022. Histamine Excretion by the Common Bed Bug (Hemiptera: Cimicidae). *Journal of Medical Entomology*. <https://doi.org/10.1093/jme/tjac131> (Press release: [University of Kentucky release #2](#); Media coverage: [ESA](#), [PCT](#), [Bourboncountycitizen](#), [Medicaldaily](#), [Newsbreak](#), [Phys](#),...)
2. **Gaire, S.*#**, Z. DeVries*, R. Mick, E. Camera, and C. Schal. 2021. Human skin triglycerides prevent bed bug arrestment. *Scientific Reports*. 11, 22906. <https://doi.org/10.1038/s41598-021-01981-1> (Press release: [University of Kentucky release #1](#); Media coverage: [PCT](#), [PMP](#), [Phys](#), [ABC-WTVQ](#), [ZME Science](#), [Heromaq](#), [Kentucky Today](#), [Sci News](#), [Exterminator News](#), [Pest Control Daily News](#), [Exclusive Global News](#), [SciTech Daily](#), [Ohio Aq Connection](#), [Kentucky Aq Connection](#), [Elizabethtown News Enterprise](#), [Verve Times](#), [News Break](#), [Mirage News Australia](#), [24hTech](#), [FocusTechnica](#)...)
3. **Gaire, S.#**, W. Zheng, M. E. Scharf and A. D. Gondhalekar. 2021. Plant essential oil constituents enhance deltamethrin toxicity in a resistant population of bed bugs (*Cimex lectularius* L.) by inhibiting cytochrome P450 enzymes. *Pesticide Biochemistry and Physiology*. 104829. <https://doi.org/10.1016/j.pestbp.2021.104829> (Press release: [Purdue University release #2](#), Media coverage: [Phys](#), [PCT](#), [Pest Control Daily](#), [OLT News](#), [N Opera News](#), [PMP](#), [Mirage News](#) and many more..)
4. **Gaire, S.#**, C. Schal, R. Mick and Z. C. DeVries. 2020. The role of antenna 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/jee/toaa250>
5. **Gaire, S.#**, C. D. Lewis, W. Booth, M. E. Scharf, W. Zheng, M. D. Ginzal, and A. D. Gondhalekar. 2020. Bed bugs, *Cimex lectularius* L., exhibiting metabolic and target site

- deltamethrin resistance are susceptible to plant essential oils. *Pesticide Biochemistry and Physiology* 169, 104667. <https://doi.org/10.1016/j.pestbp.2020.104667>
6. **Gaire, S.** and A. Romero. 2020. Comparative efficacy of residual insecticides against the Turkestan cockroach, *Blatta lateralis* (Blattodea: Blattidae) on different substrates. *Insects* 11, 477. <https://doi.org/10.3390/insects11080477>
 7. **Gaire, S.**, M. E. Scharf, and A. D. Gondhalekar. 2020. Synergistic toxicity interactions between plant essential oil components against the common bed bug (*Cimex lectularius* L.). *Insects* 11, 133. <https://doi.org/10.3390/insects11020133>
 8. Feston, J.*, **S. Gaire***, M. Fardisi, L. Mason and A. D. Gondhalekar. 2020. Determining baseline toxicity of ozone against an insecticide-susceptible strain of the common bed bug, *Cimex lectularius* L. under laboratory conditions. *Pest Management Science* 76: 3108-3116. <https://doi.org/10.1002/ps.5864>
 9. **Gaire, S.**, M. E. Scharf, and A. D. Gondhalekar. 2019. Toxicity and neurophysiological impacts of plant essential oil components on bed bugs (Cimicidae: Hemiptera). *Scientific Reports* 9 (1), 3961. <https://doi.org/10.1038/s41598-019-40275-5> (**Press release: [Purdue University release #1](#); Media coverage: [PCT](#), [Morning Aq Clips](#), [Phys.org](#) many others**).
 10. **Gaire, S.**, M. O'Connell, F. O. Holguin, A. Amatya, S. Bundy and A. Romero. 2017. Insecticidal properties of essential oils and some of their constituents on the Turkestan cockroach (Blattodea: Blattidae). *Journal of Economic Entomology* 110 (2): 584-592. <https://doi.org/10.1093/jee/tox035>

Manuscript in preparation:

1. Gaire, S., H. Morgan, Z. C. DeVries. **In draft.** Pyrethroids fail to spatially repel German cockroaches in free-moving arena assays. *Pest Management Science*.
2. Ashbrook, A., **S. Gaire**, and A. Gondhalekar. **In preparation.** Population dynamics of bed bugs in caged free poultry house. *Journal of Economic Entomology*.
3. Erasmus, M, Y. Dong, K. VanDeWater, A. Ashbrook, **S. Gaire** and A. Gondhalekar. **In preparation.** Bed bugs effects on hen welfare and productivity in cage free housing systems. *Poultry Science*. (Collaborative work with Animal Science Department)

Postdoctoral research projects:

1. Stability of fipronil resistance through ingestion in the German cockroach.
2. Aging and humidity effects on cockroach gel bait performance (co-mentored MS student Isabelle Lucero on this project).
3. Determining repellency of pyrethroids insecticides using advanced video tracking in the German cockroach (Undergraduate student Henry Morgan was involved and trained in this project).
4. Histamine production in common bed bug (PhD student Simona involved in this project and is co-authored in published paper).

5. Efficacy of common consumer insecticides products against the German cockroach (in collaboration with Dr. Art Appel, Auburn University)
6. Effects of various treatment on histamine stability and its correlation with bed bugs arrestment behavior (co-mentored PhD student Simona Principato and undergraduate student Henry Morgan in this project)
7. Behavioral response of German cockroach towards insecticide contaminated gel baits (Co-mentored MS student Ben Grady).

Industry sponsored insecticides/methods efficacy projects:

University of Kentucky:

1. Calibration of bed bug detection device.
2. Preliminary insect growth regulator dust formulation testing on bed bugs.
3. Evaluate performance of Suspend PolyZone against other general insect control products.

Purdue University:

1. Evaluation of field efficacy of Advion and Advion Evolution cockroach gel bait against German cockroaches in public housing in South Bend IN (more than 10 visits).
2. Effects of temperature, humidity and photoperiod conditions on efficacy of chlorfenapyr against bed bugs
3. Effects of bed bug feeding regimes (daily, biweekly, weekly etc.) on the efficacy of chlorfenapyr against bed bugs
4. Determining the potential Phantom PT II (aerosol) to cause secondary mortality through horizontal insecticide transfer
5. Efficacy of a liquid insecticide with novel mode of action against American cockroaches
6. Syngenta: Understanding the impacts of outdoor aging (on a non-porous substrate) on efficacy of Demand CS against German cockroaches
7. Comparing water fastness of insecticides applied to a non-porous substrate by conducting efficacy test against German cockroaches
8. Field efficacy of Alpine WDG, Alpine Rotation 1 gel bait, Alpine Rotation 2 gel bait and Avert Dry Flowable Bait against German cockroaches
9. Comparative field efficacy of Maxforce FC Select and Maxforce FC Magnum against German cockroaches
10. Effects of chitin synthesis inhibitors of molting success of bed bugs.
11. Evaluating repellency of liquid residual insecticides against German cockroaches in a novel gutter bioassay
12. Field evaluations of bed bugs traps.

Books:

1. **Gaire, S. et al. 2011.** A Reference Guide for Entrance of BScAg and BVSc & AH, Revised Edition. Chitwan, Nepal.

Scientific Presentations:

Invited first authored presentation: 2 scholarship winner plenary talks

1. **Gaire, S.** 2022. Unraveling the mysteries of plant essential oils in insects using neurophysiological, enzymatic, and *in vivo* assays. Corteva Agriscience, Indianapolis, IN.
2. **Gaire, S.** 2021. Sustainable and environmentally-friendly urban pest management. Florida A&M University, Tallahassee, FL.
3. **Gaire, S.** and A. D. Gondhalekar. 2020. Overcoming deltamethrin resistance in common bed bugs (*Cimex lectularius* L) by using plant essential oils. Entomological Society of America Annual Virtual Meeting. (**Part of member symposium, Advancement in Natural and Biological-based Insecticide Research**)
4. **Gaire, S.** 2020. Utility of plant essential oils for urban pest management. Society of Overseas Nepalese Entomologists Fall Semester Webinar.
5. **Gaire, S.,** M. E. Scharf and A. D. Gondhalekar. 2018. Toxicity and neurophysiological impacts of essential oil components on bed bug (*Cimex lectularius* L.). National Conference on Urban Entomology. Cary, NC. (**Doctoral Scholarship Winner Paper**).
6. **Gaire, S.,** M. O'Connell, F. Omar Holguin and A. Romero. 2016. Identification of botanically-derived repellents for Turkestan cockroaches using a video tracking system. National Conference on Urban Entomology, Albuquerque, NM. (**Master of Science Scholarship Winner Paper**).

Submitted first authored presentations (ESA and other meetings): 16 talks and 7 posters

1. Gaire, S., H. Morgan, Z. C. DeVries. 2022. Pyrethroids fail to spatially repel German cockroaches in free-moving arena assays. Entomological Society of America Annual Meeting (Oral presentation)
2. Gaire, S., H. Morgan, Z. C. DeVries. 2022. Pyrethroids fail to spatially repel German cockroaches in free-moving arena assays. Department of Entomology, University of Kentucky Research Session (Poster presentation)
3. **Gaire, S.,** J. Gordon, Z. DeVries. 2021. Common bed bugs possess a robust ability to produce histamine. Entomological Society of America Annual Meeting (Oral presentation)
4. **Gaire, S.,** J. Gordon, Z. DeVries. 2021. Common bed bugs possess a robust ability to produce histamine. Postdoctoral Research and Career Symposium. University of Kentucky (Oral presentation)

5. **Gaire, S.,** J. Gordon, Z. DeVries. 2021. Histamine production by the common bed bug (*Cimex lectularius* L.). North Central Branch Entomological Society of America Annual Meeting. (Oral presentation)
6. **Gaire, S.,** W. Zheng, M. E. Scharf and A. D. Gondhalekar. 2020. Plant essential oil constituents synergize deltamethrin toxicity in resistant bed bugs (*Cimex lectularius* L.) by inhibiting cytochrome P450 enzymes. Joint North Central & Southwestern Branch Entomological Society of America Virtual Student Competition (Oral presentation)
7. **Gaire, S.,** and A. D. Gondhalekar. 2019. Efficacy of plant essential oils, deltamethrin and their mixtures against field-collected bed bugs (Cimicidae: Hemiptera). Entomological Society of America Annual Meeting, St. Louis, MO. (Oral presentation)
8. **Gaire, S.,** and A. D. Gondhalekar. 2019. Susceptibility of deltamethrin-resistant bed bugs to various plant essential oils. Ohio Valley Entomological Association Annual Forum, Lexington, KY. (Oral presentation)
9. **Gaire, S.,** M. E. Scharf and A. D. Gondhalekar. 2018. Synergistic interactions between plant essential oil components and their impacts on bed bug (Cimicidae: Hemiptera) nervous system. Purdue Pest Management Conference, West Lafayette, IN. (Poster presentation)
10. **Gaire, S.,** M. E. Scharf and A. D. Gondhalekar. 2018. Synergistic interactions between plant essential oil components and their impacts on bed bug (Cimicidae: Hemiptera) nervous system. Entomological Society of America Annual Meeting, Vancouver, BC, Canada. (Poster presentation)
11. **Gaire, S.,** M. E. Scharf and A. D. Gondhalekar. 2018. Synergistic interactions between plant essential oil components and their impacts on bed bug (Cimicidae: Hemiptera) nervous system. Ohio Valley Entomological Association Annual Forum, Indianapolis, IN. (Oral presentation)
12. **Gaire, S.,** M. E. Scharf and A. D. Gondhalekar. 2018. Toxicity and neurophysiological impacts of essential oil components on bed bug (*Cimex lectularius* L.). Health and Disease: Science, Technology, Culture and Policy Research Poster Session, Purdue University Chapter. (Poster presentation)
13. **Gaire, S.,** M. E. Scharf and A. D. Gondhalekar. 2018. Toxicity and neurophysiological impacts of essential oil components on bed bug (*Cimex lectularius* L.). The Society of Sigma Xi, Purdue University Chapter. (Poster presentation)
14. **Gaire, S.,** M. E. Scharf and A. D. Gondhalekar. 2017. Toxicity and neurophysiological impacts of essential oil components on bed bug (*Cimex lectularius* L.). Entomological Society of America Annual Meeting, Denver, CO. (Poster presentation)
15. **Gaire, S.,** M. E. Scharf and A. D. Gondhalekar. 2017. Toxicity and neurophysiological impacts of essential oil components on bed bug (*Cimex lectularius* L.). Ohio Valley Entomological Association Annual Forum, Columbus, MO. (Oral presentation)

16. **Gaire, S.,** M. O'Connell, F. Omar Holguin and A. Romero. 2016. Toxicity and repellency of essential oils on the Turkestan cockroach (Blattodea: Blattidae). International Congress of Entomology, Orlando, FL. (Oral presentation)
17. **Gaire, S.,** M. O'Connell, F. Omar Holguin and A. Romero. 2016. Toxicity of essential oils on the Turkestan cockroach, *Blatta lateralis* (Blattodea: Blattidae). National Conference on Urban Entomology. Albuquerque, NM. (Oral presentation)
18. **Gaire, S.,** M. O'Connell, F. Omar Holguin and A. Romero. 2016. Botanically derived oils can kill the Turkestan cockroach, *Blatta lateralis* (Blattodea: Blattidae). Graduate Research and Arts Symposium. New Mexico State University, Las Cruces, NM. (Poster)
19. **Gaire, S.,** M. O'Connell, F. Omar Holguin and A. Romero. 2016. Toxicity and repellency of essential oils on the Turkestan cockroach, *Blatta lateralis* (Blattodea: Blattidae), Eighth International Conference, Nepalese Students Association, New Mexico State University, Las Cruces, NM. (Oral presentation)
20. **Gaire, S.,** M. O'Connell, F. Omar Holguin and A. Romero. 2016. Repellency of essential oils on the Turkestan cockroach, *Blatta lateralis* (Blattodea: Blattidae). Southwestern Entomological Society of America Annual Meeting, Tyler, TX. (Oral presentation)
21. **Gaire, S.,** and A. Romero. 2015. Toxicity and repellency of essential oil components on the Turkestan cockroach, *Blatta lateralis* (Blattodea: Blattidae). Entomological Society of America Annual Meeting, Minneapolis, MN. (Oral presentation)
22. **Gaire, S.** and A. Romero. 2015. Toxicity of essential oil components on the Turkestan cockroach, *Blatta lateralis* (Blattodea: Blattidae). Southwestern Entomological Society of America Annual Meeting, Tulsa, OK (Oral presentation)
23. **Gaire, S.** and A. Romero. 2015. Toxicity of essential oil components on the Turkestan cockroach, *Blatta lateralis* (Blattodea: Blattidae). Graduate Research and Arts Symposium, New Mexico State University, Las Cruces, NM. (Poster)
24. **Gaire, S.** and A. Romero. 2015. Quantifying the toxicity of essential oil components on the Turkestan cockroach, *Blatta lateralis* (Blattodea: Blattidae). Seventh International Conference, Nepalese Students Association, New Mexico State University, Las Cruces, NM. (Oral presentation)

Co-authored presentations: (3 orals and 1 poster)

1. Lucero, Isabelle, S. Gaire, and Z. DeVries. 2022. The perfect meal: Determining how aging affects cockroach gel bait performance. Entomological Society of America Annual Meeting, St. Louis, MO. (Oral presentation). **(Second place)**
2. Morgan, H, S. Principato, S. Gaire, and Z. DeVries. 2022. Evaluation of common cleaning methods for the mitigation of bed bug produced histamine. Department of Entomology Annual Poster Competition. **(First place in undergraduate category)**

3. Morgan, H, S. Principato, S. Gaire, and Z. DeVries. 2022. Evaluation of common cleaning methods for the mitigation of bed bug produced histamine. University of Kentucky SURES Program.
4. Meyers, J., A. Gondhalekar, **S. Gaire**, and A. R. Ashbrook. 2019. How bed bug metabolism and environmental conditions significantly effect laboratory outcomes using Phantom, a pro-insecticide. Entomological Society of America Annual Meeting, St. Louis, MO. (Oral presentation)
5. Erasmus, M., Y. Dong, K. VandeWater, A. Ashbrook, **S. Gaire**, and A. Gondhalekar. 2019. External parasites (bed bugs, *Cimex lectularius*) in cage free housing systems: hen welfare and productivity. Poultry Science Association Annual Meeting. Montreal, Canada. (Poster presentation)
6. Gondhalekar, A. D., G. M. Bennett, A. R. Ashbrook, J. Feston and **S. Gaire**. 2018. Alternative methods for bed bug control: do they play a role in insecticide resistance management? National Conference on Urban Entomology. Cary, NC. (Oral presentation)

Student mentoring:

1. Henry Morgan (University of Kentucky undergrad under my supervision, cockroach sorting, rearing, cockroach ingestion bioassays and various projects assistance)
Notable achievements (mentoring on both applications):
 - First place, Undergraduate Poster Competition, Department of Entomology, University of Kentucky (2022)
 - Research Fellowship, College of Agriculture, Food and Environment Science, University of Kentucky (2022)
 - Summer Fellowship- Undergraduate Research Experience in Environmental Health Sciences, College of Medicine, University of Kentucky (2022)
2. Isabelle Lucero (University of Kentucky MS student, started co-mentoring on NPMA funded cockroach baits grant for her thesis from Spring 2021, co-mentored on NSF-GRFP fellowship preparation)
Notable achievements:
 - College of Agriculture, Food and Environment Diversity Research & Teaching Fellowship (2021-2023)
 - Second place, oral presentation, ESA
3. Simona Principato (University of Kentucky PhD student, histamine extraction and GC-MS analysis, EthoVision video tracking)
4. Ben Grady (University of Kentucky MS student, EthoVision video tracking)
5. Cecilia Foley (Purdue undergrad: bed bug handling, sorting, feeding, and topical applications)
6. William Andre Le Van (Purdue undergrad: bed bug handling, feeding, and sorting)
7. Michael Aaron Woodruff (Purdue undergrad: final project presentation preparation)
8. Gretchen Thomas (Purdue undergrad: bed bug handling, sorting and feeding)

9. Yingxuan Cheng (Purdue undergrad-ENTM Lab Practicum program: neurophysiology demonstration, insecticides bioassays)
10. Tianze Xue (Purdue undergrad-ENTM Lab Practicum program: enzymes assay, insecticides bioassays)
11. Wenbo Li (Purdue undergrad-ENTM Lab Practicum program: enzymes assay, insecticides bioassays)
12. Nicole Mortensen (NMSU undergrad: Turkestan cockroach rearing)

TEACHING, EXTENSION AND OUTREACH ACTIVITIES

Teaching:

1. **Purdue Integrated Pest Management Correspondence Courses**, Purdue University:
(Voluntary teaching—part of lab extension programs)
 - Evaluated pest management exams at a weekly basis for training Pest Management Professionals. **I have evaluated more than 8,000 Urban IPM tests.**
 - Updated the course “Food Pest Management” with Dr. Gary Bennett in Spring 2019

2. **Laboratory Teaching Assistant**, Department of Entomology, Purdue University
(Voluntary lab teaching)
 - ENTM 61000: Toxicology of Insecticides (2017, 2019, 2020):
 - Students: 20-30 each year.
 - Projects: Neurological effects of fipronil in cockroaches and bed bugs.
 - ENTM 35300: Insecticides and Environment (2019, 20):
 - Students: 15-20 each year.
 - Projects: Neurological effects of fipronil, bifenthrin and imidacloprid in cockroaches and bed bugs.

3. **Teaching Assistant**, Department of Entomology, Plant Pathology and Weed Science, New Mexico State University: ***(Part of departmental teaching assistantships)***
 - EPWS 330: Economic Entomology (2016):
 - Students: 35
 - Responsibility: Giving lectures (4 lectures), developing and grading quizzes, and grading exams.
 - EPWS 420: Parasitology (2016):
 - Students: 40
 - Responsibility: Developing quizzes, grading quizzes, grading assignments.

4. **Co-ordinator and Instructor:** Everest Touch Institute, Chitwan, Nepal (2011-2013):
(Part time job during undergrad)
 - B.Sc.Ag. and B.V.Sc.&A.H. Entrance preparation class for high school graduate students:
 - Students: 50-60 students (at least 2 section per year)
 - Responsibility: Giving lectures on Agriculture Sciences (>50 lectures), developing entrance exams and grading, some administration.

Extension activities and publications:

1. **Pest Control Technical Directors Meeting, University of Kentucky (2021, 2022):**
 - Two days robust discussion on urban pest issues with 13 pest control technical directors
 - Research update:
Gaire, S., H. Morgan, Z. C. DeVries. 2022. Can pyrethroids insecticides repel German cockroaches? (Oral presentation)
2. **University of Kentucky Pest Control Short Course (2021):**
 - General planning
 - Conference staff
3. **Facts Sheet:**
 - Gordon, J., **S. Gaire** and Z. DeVries. 2022. University of Kentucky Housing Pest Fact Sheet.
4. **University of Kentucky Pest Control Trainings (2020)**
 - Moderator (8 weeks of webinar series)
5. **Purdue Annual Pest Management Conference (2016-2020):**
 - Planning committee executive member
 - Moderating the session (moderated >3 sessions)
 - Student staff
 - Research presenter
6. **Poultry house bed bugs management (2018-2019):**
 - More than 20 visits to poultry houses in the Midwest.
 - Provides regularly scientific information on bed bugs management to poultry house managing group
 - Bed bug effects on hen welfare and productivity assessment
7. **Low-income multifamily housing (2016-2019):**
 - More than 15 visits to low-income housing in Indiana and Illinois
 - Assess bed bug and cockroach populations

- Evaluate efficacy of newly formulated insecticides (baits) against cockroaches and bed bugs
 - Provides regular cultural control information such as sanitation for housing authority and families
8. **Science Communication graduate level course** (2019): Created an extension YouTube video on bed bug management using Purdue Video Express facility.
YouTube Link: <https://youtu.be/HGgc-50IWlo>
9. **Extension report:**
Erasmus, M., Y. Dong, K. VanDeWater, A. Ashbrook, **S. Gaire**, C. Foley and A. Gondhalekar. 2019. Hen behavior as a tool for detecting pest infestations and improving hen welfare. Center for Animal Welfare Science Purdue University.
<https://vet.purdue.edu/CAWS/files/documents/erasmus.pdf>
10. **IPM Facilitator:** Off season vegetable production training, Ministry of Education, Government of Nepal (2013-2014)
- Number of farmers: 20
 - Program duration: 3 months
 - Responsibility: Full responsibility on lectures (vegetable production, pest management, botanicals, soil management etc.), field demonstration
11. **IPM Facilitator:** IPM School, District IPM Farmers Association, Chitwan, Nepal (2013-2014)
- Number of farmers: 30-35
 - Program duration: 1 year
 - Responsibility: Partial responsibility on lectures (pest management, botanicals, soil management etc.) and field demonstration on insects pests and pathogens
12. National newspapers articles on agriculture:
- **Gaire, S. 2014.** Community Participation in Agriculture Development. Chitwan Post National Daily Newspaper, Nepal.
 - **Gaire, S. 2013.** Need of Agriculture and Forestry University (AFU). Chitwan Post National Daily Newspaper, Nepal.

Outreach for K-12 students and Bug bowl:

1. Cockroaches and bed bugs demonstration, Curiosity Fair, University of Kentucky (Oct 12, 2021)
2. Observation zoo (bed bug life stages) and Petting zoo (caterpillars), Bug Bowl, Spring Fest, Purdue University (April 6-7, 2019)
3. Petting zoo. Bug Bowl, Spring Fest, Purdue University. (April 15, 2018)

4. Bed bug rearing and feeding activities, Experience Purdue Agriculture (September 11, 2017)
5. Cockroach Racing booth and Honey tasting booth, Bug Bowl, Spring Fest, Purdue University (April 8, 9, 2017)
6. Purdue Bug Barn 5th grade student visit (showed tobacco horn worm caterpillar/pupae, millipede and hissing cockroach) (March 1, 2017)
7. Brooks School Elementary Math and Science Night, Fishers, IN (showed tobacco horn worm caterpillar, pupae, adult and hissing cockroach adults) (February 15, 2017)
8. College of Agriculture Fish fry, Indiana State Fair ground, Indianapolis, IN, (showed caterpillar, bugs and petting zoo) (February 4, 2017)
9. Thomas Miller Elementary School, Purdue Bug Barn visit (showed hissing cockroach, and beetle) (Nov 17, 2016)

ADVANCE TRAINING AND WORKSHOPS PARTICIPATION

1. **Science of Storytelling**, (March 2021, Society of Postdoctoral Scholars, University of Kentucky, Lexington)
2. **Virtual Academic Workshop**, (Nov 2020, Armani Research Lab, University of Southern California, Los Angeles)
3. **Teamwork**, (Nov 2020, Office of Intramural Training and Education, National Institute of Health)
4. **Training and Mentoring Plans**, (Nov 2020, Office of Postdoctoral Affairs, University of Kentucky, Lexington)
5. **Science Communication: Increase the Impact of your Work**, (Sept 2020, Society of Postdoctoral Scholars, University of Kentucky, Lexington)
6. **Basic Grantsmanship: A Framework for Success**, (Sept 2020, UK Research, University of Kentucky, Lexington)
7. **Pitch skills development webinar** (July 2020, Office of Technology Commercialization, University of Kentucky, Lexington).
8. **Insect Photography** (April 2018, Entomology Graduate Student Organization, Purdue University, West Lafayette, IN)
9. **Grant and Proposal Writing Workshop** (Sept 2017, Purdue University Graduate School, West Lafayette, IN)
10. **Project concept note and proposal writing** (2013, Dalit Students Society, Tribhuvan University, Chitwan, Nepal)
11. **IPM Facilitator training**: Participated in 16 weeks (once a week) training by District IPM Farmers Association, Chitwan Nepal (2012)
12. **Training of Training (TOT)**: Participated in 5 days training (2011, Technical Students Association, Tribhuvan University, Chitwan, Nepal)
13. **Proposal writing, logical framework and presentation skill development** (2012, Lumbini Students Family, Tribhuvan University, Chitwan, Nepal)

14. **Research methodology, data analysis and report writing** (2012, Gandaki Students Society, Tribhuvan University, Chitwan, Nepal)
15. **Amnesty International and human rights** (2010, Amnesty International Youth Network, Chitwan, Nepal)

SERVICE

University Academic Committee:

2019-2020 **Graduate Student Representative**, Curriculum and Student Relations Committee, College of Agriculture, Purdue University, West Lafayette, IN

Leadership in professional committee's:

2022-present **Executive member**, MUVE Initiative on Diversity, Equity and Inclusion, Entomological Society of America

2021-present **Chair-Award Committee**, Society of Overseas Nepalese Entomologists

2022 **Vice-Chair**, Early Career Professionals Committee, North Central Branch, Entomological Society of America

2021 **Executive member**, Early Career Professionals Committee, North Central Branch, Entomological Society of America

2020-2021 **Executive member**, Society of Postdoctoral Scholars, University of Kentucky, Lexington, KY

2020-2023 **Executive Member**, Diversity and Inclusion Committee, Entomological Society of America

2020 **Webinar series coordinator**, Society of Overseas Nepalese Entomologists

2020 **President**, Society of Overseas Nepalese Entomologists

2019-2020 **Vice President**, Entomology Graduate Student Organization, Department of Entomology, Purdue University, West Lafayette, IN

2018-2019 **President-Elect**, Society of Overseas Nepalese Entomologists

2018-2019 **Treasurer**, Entomology Graduate Student Organization, Department of Entomology, Purdue University, West Lafayette, IN

2017-2019 **Executive Member, Fund Raising Subcommittee**, Ohio Valley Entomological Association

2017-2018 **Secretary**, Society of Overseas Nepalese Entomologists

2017-2018 **Treasurer**, Entomology Graduate Student Organization, Department of Entomology, Purdue University, West Lafayette, IN

2017-2018 **Executive member & Student representative**, Departmental IT Committee, Department of Entomology, Purdue University, West Lafayette, IN

2016-2018 **Member-At-Large**, Ohio Valley Entomological Association

2016-2017 **Treasurer**, Society of Overseas Nepalese Entomologists

2016 **Executive Member & NM state representative**, Students Affairs Committee and Insect Photo Salon Committee, SW Entomological Society of America

2015-2016 **Secretary**, Joined EPPWS and PES Department's Graduate Student Organization, NMSU, Las Cruces, NM

Leadership in conferences, symposium, organized meetings

- 2021** **Organized meeting co-organizer**, Society of Overseas Nepalese Entomologists Annual Meeting, Entomological Society of America Virtual Meeting (Lead: Sujan Dawadi, other co-organizers: Babu Panthi, Binita Shrestha)
- 2021** **Symposium co-organizer**, Postdoctoral Research and Career Symposium, University of Kentucky, Lexington, KY (Lead: Joseph Lutz and 12 other co-organizers)
- 2020** **Member symposium organizer**, Advancement in Natural and Biological-based Insecticide Research, Entomological Society of America Virtual Meeting, Livestream session Nov 18th 5:30-7:30pm) (Co-organizers: Babu Panthi, Sandipa Gautam, Jhalendra Rijal) (*~250 live participants*)
- 2020** **Organized meeting organizer**, Society of Overseas Nepalese Entomologists Annual Meeting, Entomological Society of America Virtual Meeting (Co-organizers: Babu Panthi, Sujan Dawadi, Binita Shrestha)
- 2019** **Member symposium co-organizer**, Linking insect movement ecology with applied pest management, Entomological Society of America Virtual Meeting. (lead: Jhalendra Rijal, co-organizer: Govinda Shrestha)
- 2019** **Organized meeting organizer**, Society of Overseas Nepalese Entomologists Annual Meeting, Entomological Society of America Annual Meeting St. Louis (Co-organizers: Babu Panthi, Sujan Dawadi, Binita Shrestha)
- 2018** **Organized meeting organizer**, Society of Overseas Nepalese Entomologists Annual Meeting, Entomological Society of America Annual Meeting, Vancouver, Canada (Co-organizer: Deepak Shrestha, Govinda Shrestha, Babu Panthi)

Leadership in community:

- 2017-2018** **President**, Nepali Society at Purdue, Purdue University, West Lafayette, IN
- 2016-2017** **Treasurer**, Nepali Society at Purdue, Purdue University, West Lafayette, IN
- 2014-2015** **Treasurer**, Nepalese Student's Association, NMSU, Las Cruces, NM
- 2014-2015** **Executive member**, Voice against Cancer, NMSU, Las Cruces, NM
- 2008-2014** **President**, Alumni Students Association, New Vision Academy, Chitwan, Nepal
- 2004-2005** **President**, Junior Red Cross Circle, New Vision Academy, Chitwan, Nepal

Professional society memberships:

- 2018-present** Association of Nepalese Agricultural Professionals of Americas
- 2017-present** Pi Chi Omega, The Professional Pest Management Fraternity
- 2016-present** Ohio Valley Entomological Association
- 2015-present** Entomological Society of America
- 2015-present** Society of Overseas Nepalese Entomologists

Reviewer for the following Journals:

- Journal of Economic Entomology
- Pest Management Science
- Scientific Reports
- Biologia
- Insects
- Physiological Entomology
- Parasitology Research
- Environmental Health Insights

Other volunteering:

Entomological Society of America (ESA) and other professional societies:

1. **Judge**, Grad MUVE: Urban Insects, Invasive Species, and Pests On-Demand Presentations, Entomological Society of America, 2021
2. **Judge**, Undergraduate oral competition, North Central Branch Meeting, Entomological Society of America, 2021
3. **Judge**, Alate Award, Entomological Society of America 2021-2023.
4. **Moderator**, Member symposium, Advancement in Natural and Biological-based Insecticide Research, Entomological Society of America Virtual Meeting, 2020
5. **Moderator**, Society of Overseas Nepalese Entomologists Annual Virtual Meeting, Entomological Society of America Virtual Meeting Platform, 2020.
6. **Moderator**, Society of Overseas Nepalese Entomologists Annual Meeting, St. Louis, MO, Nov 19th, 2019
7. **Judge**, MUVE Undergraduate Poster competition (MUVE 1), Entomological Society of America Annual Meeting, 2019
8. **Judge**, MUVE Undergraduate Poster competition, Entomological Society of America Annual Meeting, 2018
9. **Moderator**, Society of Overseas Nepalese Entomologists Annual Meeting, Vancouver, Canada, Nov 13th, 2018
10. **Judge**, Master Category, Ohio Valley Entomological Association Annual Forum, Oct 19th, 2018.
11. **Moderator**: Student paper competition session, National Conference on Urban Entomology, Cary, NC, 2018
12. **Presentation upload room**, Ohio Valley Entomological Association Annual Forum, Nov 4, 2016
13. **Photo Salon Judging**, Southwestern Branch ESA Meeting, Tyler, TX, Feb 22-25, 2016

Purdue University:

1. **Entomology Department seminar host:** Dr. Joel Coats (Iowa State University), Oct 24th, 2019.
2. **Moderator:** Fumigation session, 2018, 2019 Purdue Pest Management Conference
3. **Student staff:** 2017-2019 Purdue Pest Management Conference
4. **Judge:** Junior Life Sciences Award, Lafayette Regional Science and Engineering Fair- March 2, 2018
5. **Judge:** Undergraduate Research and Poster Symposium, April 11, 2017, Purdue University, West Lafayette, IN (April 11, 2017)
6. **Judge:** Sigma Xi Senior Life Sciences (LS) Special Award, Lafayette Regional Science and Engineering Fair- March 3, 2017

New Mexico State University:

1. **International Cultural Bazaar and Festivals**
 - Showcased Nepalese dresses, dance, musical instruments in 2014 and 2015
2. **Associated New Mexico State University Keep State Great Events**
 - Volunteered in community wide cleaning activities representing Nepalese Students Association in 2014 and 2015
3. **Associated New Mexico State University Big Events**
 - Volunteered in community wide cleaning activities representing PES/EPPWS Graduate Student Organization in 2015 and 2016
4. **Organic Pumpkin Planting and Selling**
 - Involved in group organic pumpkin planting, selling to various stores, and Halloween activities in department (raised >\$2,500 in 2014 and 2015 by GSO)
5. **Voice Against Cancer public booth**
 - Raised awareness against cancer diseases through campus wide multiple public booth in 2014

REFERENCES

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