Ikkei Shikano
College of Tropical Agriculture and Human Resources
Plant and Environmental Protection Sciences
FTE Distribution: 60% I; 40% R; 0% E

Education

Degree	University	Major
Bachelors	University of British Columbia	General Biology
Masters	University of British Columbia	Plant Science
PhD	Simon Fraser University	Biological Sciences

Lifetime and Fellow Achievement Awards (peer nominated and endorsed national and International-important for those without accreditation that is peer nominated and endorsed, recognized)

Professional Appointments

Title	Employer	Dates Employed
Assistant Professor	University of Hawai'i at Mānoa	2019 – present
Postdoctoral Researcher	Pennsylvania State University	2014 – 2019

Courses Taught

Course Number and Title (credits)
PEPS 250 World of Insects (3 credits)
PEPS 363 General Entomology (3 credits)
PEPS 363L General Entomology Laboratory (1 credit)
PEPS 421 Foundations in Pest Management (1 credit)
PEPS 486 Insect-Plant Interactions (3 credit)
PEPS 499 Directed Research (1 credit)
PEPS 690 Seminar in Entomology (1 credit)
PEPS 699 Directed Research (1 credit)
PEPS 799 Proposal/Defense Seminar (1 credit)

Publications (reverse chronological order)

Books

Book Chapters

Conference Proceedings

Refereed Journal Publications

Mason, C. & **Shikano, I.** (2023) Hotter days, stronger immunity? Exploring the impact of rising temperatures on insect gut health and microbial relationships. *Current Opinion in Insect Science* 101096.

Pan, Q., **Shikano, I.**, Liu, T.X. & Felton, G.W. (2023) *Helicoverpa zea*–associated gut bacteria as drivers in shaping plant anti-herbivore defense in tomato. *Microbial Ecology* 86:2173-2182.

Budhathoki, S., Sipes, B.S., **Shikano, I.**, Myers, R.Y., Manandhar, R. & Wang, K-H. (2023) Integrating trap

cropping and entomopathogenic nematode foliar sprays to manage Diamondback moth and imported cabbage worm. *Horticulturae* 8:1073.

Kihata, N. & **Shikano, I.** (2022) Enemy-risk effects in parasitoid-exposed diamondback moth larvae: potential mediation of the interaction by host plants. *Insects* 13:818.

Pugh, M., Kihata, N., Uyeda, J., Wang, K-H., & **Shikano, I.** (2022) The effects of a naturalized weed, *Lepidium virginicum*, on the development and behaviors of the diamondback moth and its natural enemies in Hawaii. *Biological Control* 173:104994.

Shikano, I., Gutierrez-Coarite, R., Streit, C., Perez, E., Fujitani, E., & Mau, R.F.L. (2022) Field tests of three alternative insecticides with protein bait for the development of an insecticide rotation program to control melon flies, *Zeugodacus cucurbitae* (Coquillett) (Diptera: Tephritidae). *Insects* 13:629

Honsberger, D., Matsunaga, J.N., Wang, K.H. & **Shikano, I.** (2022) *Oomyzus sokolowskii* (Hymenoptera: Eulophidae) joins the small complex of parasitoids known to attack the diamondback moth on Kauai. *Proceedings of the Hawaiian Entomological Society* 54:21-25.

Hsu, J-C., Chou, M.Y., Mau, R.F.L., Maeda, C., **Shikano, I.**, Manoukis, N.C. & Vargas, R.I. (2021) Spinosad resistance in field populations of melon fly, *Zeugodacus cucurbitae* (Coquillett), in Hawaii. *Pest Management Science* 77:5439-5444.

Mogren, C.L. & **Shikano, I.** (2021) Microbiota, pathogens, and parasites as mediators of tritrophic interactions between insect herbivores, plants, and pollinators. *Journal of Invertebrate Pathology* 186:107589.

Shikano, I., Bellicanta, G.S., Principato, S. & Jenkins, N.E. (2021) Effects of chemical insecticide residues and household surface type on a *Beauveria bassiana*-based biopesticide (Aprehend®) for bed bug management. *Insects* 12:214.

Shikano, I., Woolcott, J., Cloonan, K., Andreadis, S. & Jenkins, N.E. (2021) Biology of mushroom phorid flies, *Megaselia halterata* (Diptera: Phoridae): effects of temperature, humidity, crowding and compost stage. *Environmental Entomology* 50:149-153.

Pan, Q., **Shikano, I.,** Felton, G.W., Liu, T-X. & Hoover, K. (2021) Host permissiveness to baculovirus influences time-dependent immune responses and fitness costs. *Insect Science* 28:103-114.

Shikano, I. (2020) Efficacy of a fungal biopesticide for bed bug management is influenced by the toxicity and associated behavioral avoidance of harborages on insecticide-impregnated box spring covers. *Journal of Economic Entomology* 113:2850-2857.

Mason, C.J., Ray, S., **Shikano, I.,** Peiffer, M., Jones, A., Luthe, D.S., Hoover, K. & Felton, G.W. (2019) Plant defenses interact with insect enteric bacteria by initiating a leaky gut syndrome. *Proceedings of the National Academy of Sciences* 116:15991–15996.

Scholefield, J.A., **Shikano, I.,** Lowenberger, C.A. & Cory, J.S. (2019) The impact of baculovirus challenge on immunity: the effect of dose and time after infection. *Journal of Invertebrate Pathology* 167:107232.

Shikano, I., Gomez, L., Bellicanta, G. & Jenkins, N. (2019) Persistence and lethality of a fungal biopesticide (Aprehend®) applied to insecticide-impregnated and encasement-type box spring covers for bed bug management. *Journal of Economic Entomology* 112:2489–2492.

Pan, Q., **Shikano, I.,** Hoover, K., Liu, T-X. & Felton, G.W. (2019) Pathogen-mediated tritrophic interactions: baculovirus-challenged caterpillars induce higher plant defenses than healthy caterpillars. *Journal of Chemical Ecology* 45:515–524.

Pan, Q., **Shikano, I.**, Hoover, K., Liu, T-X. & Felton, G.W. (2019) *Enterobacter ludwigii*, isolated from the gut

microbiota of *Helicoverpa zea*, promotes tomato plant growth and yield without compromising anti-herbivore defenses. *Arthropod-Plant Interactions* 13:271–278.

Shikano, I., Pan, Q., Hoover, K. & Felton, G.W. (2018) Herbivore-induced defenses in tomato plants enhance the lethality of the entomopathogenic bacterium, *Bacillus thuringiensis* var. *kurstaki*. *Journal of Chemical Ecology* 44:947–956.

Shikano, I., McCarthy, E.M., Hayes-Plazolles, N., Slavicek, J.M. & Hoover, K. (2018) Jasmonic acid-induced plant defenses delay caterpillar developmental resistance to a baculovirus: Slow-growth, high-mortality hypothesis in plant–insect–pathogen interactions. *Journal of Invertebrate Pathology* 158:16–23.

Extension Publications

Wang, K.-H., Budhathoki, S., Pugh, M., **Shikano, I.**, Silva, J., Uyeda, J. and Manandhar, R. 2021. Insecticide resistance management for diamondback moth in organic farms: Integration of trap cropping, intermittent sprinkler irrigation and biological control. *Hānai'Ai Newsletter* Jan-Mar 2021.

Creative Works (i.e., Extension Videos, Websites, Blogs, Creative Designs and Exhibitions, etc.)

Leadership Roles (Committees, Boards, Advisory, etc.)

Contributor, SPLAT-MAT-CL Methods Development Meeting, USDA APHIS, Response to two fruit fly quarantine programs in California (2023)
Technical Working Group, USDA APHIS, Response to an outbreak of *Zeugodacus tau* (pumpkin fruit fly; Family: Tephritidae) in Stevenson Ranch, Los Angeles County, California (2023)
President, Hawaiian Entomological Society (2022-2023)
President-Elect, Hawaiian Entomological Society (2021-2022)
Tropical Agriculture and Environment (TAE) Curriculum Committee (2022 – present)
Co-organizer, Hawaiian Entomological Society Student and Early Career Researcher Symposium (2022)
Faculty Advisor, Ka Mea Kolo Entomology Club (2020-2021)
CTAHR Strategic Planning Working Group (2021-2022)
Editorial Board – Review Editor for Insect Physiology (specialty section of Frontiers in Insect Science) (2020 – present)
Plant and Environmental Protection Sciences Greenhouse Manager (2019 – present)
Tropical Agriculture and Environment (TAE) Curriculum Committee (2019 – 2021)

Graduate Students

Category	Current Number of Students	Number Graduated (Career)
Chair of Masters Committees	3 (Sarah Pennington, April Grummer, Maya Montoya-Pimolwatana)	3 (Morgan Pugh, Christian Streit, Kevin Armstrong)
Chair of PhD Committees	0	0
Member of Masters Committees	0	2 (Sabina Budhathoki, Daniel Hausler)
Member of PhD Committees	2 (Michelle Au, Jordie Ocenar)	1 (Sayaka Aoki)

Grant Support

Title of Grant:	**Utilizing phytochemical diversity and microbes for effective nematode control**
Source of Grant:	USDA NIFA Postdoctoral Fellowship
Total Dollar Value:	$224,280
Dates of Grant:	2024 – 2025 (PENDING)

Role (PI, CoPI):	Primary Mentor / PI
Title of Grant:	**Field testing of bait stations containing a fungal pathogen to control invasive fruit flies – Year 3**
Source of Grant:	USDA PPA7721
Total Dollar Value:	$269,758
Dates of Grant:	2024 – 2025 (PENDING)
Role (PI, CoPI):	PI
Title of Grant:	**Developing an insecticide rotation to combat spinosad-resistance in three species of invasive Tephritidae fruit flies – Year 3**
Source of Grant:	USDA PPA7721
Total Dollar Value:	$170,660
Dates of Grant:	2024 – 2025 (PENDING)
Role (PI, CoPI):	PI
Title of Grant:	**Establishment of microbial probiotics in SIT-reared Medfly**
Source of Grant:	USDA PPA7721
Total Dollar Value:	$216,695
Dates of Grant:	2024 – 2025 (PENDING)
Role (PI, CoPI):	Co-PI
Title of Grant:	**Field testing of bait stations containing a fungal pathogen to control invasive fruit flies**
Source of Grant:	USDA PPA7721
Total Dollar Value:	$206,425
Dates of Grant:	2023 – 2024 (FUNDED)
Role (PI, CoPI):	PI
Title of Grant:	**Developing an insecticide rotation to combat spinosad-resistance in three species of invasive Tephritidae fruit flies**
Source of Grant:	USDA PPA7721
Total Dollar Value:	$129,851
Dates of Grant:	2023 – 2024 (FUNDED)
Role (PI, CoPI):	PI
Title of Grant:	**Optimizing bacterial probiotic establishment for medfly sterile insect technique**
Source of Grant:	USDA PPA7721
Total Dollar Value:	$162,176
Dates of Grant:	2023 – 2024 (FUNDED)
Role (PI, CoPI):	Co-PI
Title of Grant:	**Conservation of green lacewings in avocado groves to suppress avocado lace bug populations**
Source of Grant:	Specialty Crop Block Grant Program, Hawaii Department of Agriculture
Total Dollar Value:	$40,000
Dates of Grant:	1/1/2022 – 12/31/2023 (FUNDED)
Role (PI, CoPI):	PI
Title of Grant:	**Transdisciplinary education for a contemporary land grant college: The case of Hawaii 2022-2025**

Source of Grant: NIFA, Higher Education - Institution Challenge Grants Program
Total Dollar Value: $150,000
Dates of Grant: 2022 – 2025 (NOT FUNDED)
Role (PI, CoPI): PI

Title of Grant: **Leveraging a naturalized weed to enhance conservation biological control of Diamondback moths in Hawaii**
Source of Grant: Western SARE
Total Dollar Value: $349,936
Dates of Grant: 2022 – 2025 (NOT FUNDED)
Role (PI, CoPI): PI

Title of Grant: **Integrating insect growth regulators (IGRs) into the framework of invasive fruit fly IPM**
Source of Grant: EPA Pesticide Environmental Stewardship Program
Total Dollar Value: $99,911
Dates of Grant: 2022 – 2024 (NOT FUNDED)
Role (PI, CoPI): PI

Title of Grant: **Auto-dissemination of a microbial insecticide to control invasive fruit flies**
Source of Grant: USDA PPA7721
Total Dollar Value: $175,694
Dates of Grant: 2022 – 2023 (FUNDED)
Role (PI, CoPI): PI

Title of Grant: **Determine the prevalence of spinosad resistance in invasive fruit flies in Hawaii and test alternative bait-insecticides**
Source of Grant: USDA PPA7721
Total Dollar Value: $165,041
Dates of Grant: 2022 – 2024 (FUNDED)
Role (PI, CoPI): PI

Title of Grant: **Outreach education on insecticide resistance management for the control of melon fly in Hawaii and Nationwide**
Source of Grant: USDA PPA7721
Total Dollar Value: $86,189
Dates of Grant: 2022 – 2023 (NOT FUNDED)
Role (PI, CoPI): Co-PI

Title of Grant: **Assessing the distribution of introduced parasitoid species of the diamondback moth, *Plutella xylostella*, in *Hawaii***
Source of Grant: USDA-APHIS CAPS Biological Control
Total Dollar Value: $72,526
Dates of Grant: 2022 – 2024 (NOT FUNDED)
Role (PI, CoPI): PI

Title of Grant: **Entomovectoring as a novel integrated pest management approach for controlling Macadamia felted coccid in Hawaiian Macadamia nut orchards**
Source of Grant: USDA-NIFA Crop Protection and Pest Management Program
Total Dollar Value: $324,654
Dates of Grant: 2021 – 2024 (NOT FUNDED)
Role (PI, CoPI): Co-PI

Title of Grant: **Demonstration of chayote as a sustainable, melon fly resistant cucurbit crop for Hawai'i**
Source of Grant: Specialty Crop Block Grant Program, Hawaii Department of Agriculture
Total Dollar Value: $40,000
Dates of Grant: 2022 – 2023 (NOT FUNDED)
Role (PI, CoPI): PI

Title of Grant: **Determining the prevalence of spinosad resistance in Hawai'i Tephritidae fruit fly populations**
Source of Grant: Plant Protection Act Section 7721 Funding, Plant Pest and Disease Management and Disaster Prevention Program (PPDMDPP) and the National Clean Plant Network (NCPN) Programs of the U.S. Department of Agriculture (USDA) Animal and Plant Health Inspection Service (APHIS)
Total Dollar Value: $139,801
Dates of Grant: 12/1/2020 – 11/30/2021 (NOT FUNDED)
Role (PI, CoPI): PI

Title of Grant: **Dogs to sniff out invasive fruit flies and educate urban communities**
Source of Grant: Hawaii Invasive Species Council
Total Dollar Value: $7,315
Dates of Grant: 10/1/2020 – 09/30/2021 (NOT FUNDED)
Role (PI, CoPI): PI

Title of Grant: **Assessing dead-end trap crops for the management of diamondback moths in Hawaii**
Source of Grant: Specialty Crop Block Grant Program, Hawaii Department of Agriculture
Total Dollar Value: $35,000
Dates of Grant: 1/1/2021 – 12/31/2022 (FUNDED)
Role (PI, CoPI): PI

Title of Grant: **Fatal attraction: Diverting herbivorous pest insects onto plants that kill them**
Source of Grant: 2020 Faculty Mentoring Grants for Summer Undergraduate Research and Creative Works, Undergraduate Research Opportunities Program (UROP), University of Hawaii at Manoa
Total Dollar Value: $3,655
Dates of Grant: 5/15/2020 – 8/31/2020 (FUNDED)
Role (PI, CoPI): PI

Title of Grant: **Leveraging the wing beating courtship rituals of Tephritidae fruit flies to develop novel attract-and-kill methods**
Source of Grant: Strategic Environmental Research and Development Program (SERDP), Resource Conservation and Resiliency (RC) Program Area, Department of Defense
Total Dollar Value: $249,983
Dates of Grant: 1/1/2021 – 12/31/2022 (NOT FUNDED)
Role (PI, CoPI): PI

Title of Grant: **Insecticide resistance management for diamondback moth**

	in organic farms: integrating push-pull cropping, insect behavior and microbial biocontrol
Source of Grant:	2019 CTAHR Team Science Concept Note, College of Tropical Agriculture and Human Resources, University of Hawaii at Manoa
Total Dollar Value:	$78,154
Dates of Grant:	1/1/2020 – 9/30/2020 (FUNDED)
Role (PI, CoPI):	Co-PI
Title of Grant:	**Leveraging fitness costs associated with insecticide-resistance and host plant heterogeneity for pest management** (HAW09051-H)
Source of Grant:	HATCH, United States Department of Agriculture
Total Dollar Value:	n/a
Dates of Grant:	11/21/2019 – 9/30/2024
Role (PI, CoPI):	PI
Title of Grant:	**Facilitating phorid fly control strategies for Pennsylvania's mushroom farms and nearby urban communities through extension and on-farm research**
Source of Grant:	Mushroom Research Competitive Grants Program, College of Agricultural Sciences, Pennsylvania State University
Total Dollar Value:	$30,000
Dates of Grant:	2019 – 2020 (FUNDED)
Role (PI, CoPI):	Co-PI
Title of Grant:	**Multitrophic manipulation of herbivore perception by plants**
Source of Grant:	National Science Foundation, Division of Integrative Organismal Systems, Plant-Biotic Interactions Program (Grant 1645548)
Total Dollar Value:	$600,000
Dates of Grant:	2017 – 2020 (FUNDED)
Role (PI, CoPI):	Co-PI

Presentations at Conferences

Title:	**Determining the extent of Spinosad resistance in wild fruit fly populations across Hawai'i**
Authors (put an asterisk on the presenter):	*Dombrowski, P., Doucette, L., Stockton, D. and **Shikano, I.**
Name of Conference:	Pacific Entomological and Botanical Meeting
Location:	Honolulu, HI
Date of Presentation:	12/06/2023– 12/08/23
Title:	**An investigation into the bacterial profile of insecticide-resistant populations of *Plutella xylostella* across O`ahu and Maui**
Authors (put an asterisk on the presenter):	*Montoya-Pimolwatana, M.L., Jani, A. and **Shikano, I.**
Name of Conference:	Pacific Entomological and Botanical Meeting
Location:	Honolulu, HI
Date of Presentation:	12/06/2023– 12/08/23
Title:	**Facilitating horizontal transfer of the fungal pathogen, *Beauveria bassiana*, to control fruit flies (Diptera: Tephritidae)**
Authors (put an asterisk on the presenter):	*Shikano, I.

Name of Conference: Pacific Entomological and Botanical Meeting
Location: Honolulu, HI
Date of Presentation: 12/06/2023– 12/08/23

Title: **Assessing silica dust as a non-toxic pest control for Tephritidae fruit flies**
Authors (put an asterisk on the presenter): *Suzuki, C. and Shikano, I. & Streit, C.
Name of Conference: Undergraduate Research Opportunities Program (UROP), Summer Undergraduate Research Experience (SURE) Symposium
Location: UH Manoa
Date of Presentation: 08/04/2023

Title: **Interactive effects of nutrient dilutions and spinosad concentration on melon fly, *Zeugodacus cucurbitae*, consumption and mortality**
Authors (put an asterisk on the presenter): *Grummer, A. and Shikano, I.
Name of Conference: Entomological Society of America Pacific Branch Meeting
Location: Seattle, WA, Canada
Date of Presentation: 04/02/2022 – 04/05/22

Title: **Analyses of gut microbiota in insecticide-resistant populations of *Plutella xylostella* across Oahu and Maui**
Authors (put an asterisk on the presenter): *Montoya-Pimolwatana, M.L., Shikano, I., Silva, J., Uyeda, J. and Jani, A.
Name of Conference: Entomological Society of America Pacific Branch Meeting
Location: Seattle, WA, Canada
Date of Presentation: 04/02/2022 – 04/05/22

Title: **Male bait stations containing the fungal pathogen, *Beauveria bassiana*, kills both male and female fruit flies (Diptera: Tephritidae) through horizontal transfer of spores**
Authors (put an asterisk on the presenter): *Shikano, I. & Streit, C.
Name of Conference: Entomology 2022; Annual Meeting of the Entomological Society of America
Location: Vancouver, BC, Canada
Date of Presentation: 11/13/2022 – 11/16/22

Title: **Use of attract-and-kill stations on mushroom farms to kill mushroom flies**
Authors (put an asterisk on the presenter): *Wolfin, M.S., Shikano, I., Baker, T.C.C. & Jenkins, N.E.
Name of Conference: Entomology 2022; Annual Meeting of the Entomological Society of America
Location: Vancouver, BC, Canada
Date of Presentation: 11/13/2022 – 11/16/22

Title: **Impact of the naturalized weed Virginia pepperweed (*Lepidium virginicum*) on the behavior of the diamondback moth (*Plutella xylostella*) and its parasitoid (*Cotesia plutellae*) in Hawaii**
Authors (put an asterisk on the presenter): *Shikano, I. & Pugh, M.
Name of Conference: Entomology 2021; Annual Meeting of the Entomological Society of America
Location: Online
Date of Presentation: 10/31/2021 – 11/03/21

Title: **Parasitoids and weeds for diamondback moth management**
Authors (put an asterisk on the presenter): *Shikano, I.
Name of Conference: Integrated Pest Management Mini Conference. University of Hawaii,

College of Tropical Agriculture and Human Resources, Cooperative Extension.
Location: Online
Date of Presentation: 09/28/2021

Title: **Behavioral ecology in integrated pest management**
Authors (put an asterisk on the presenter): *Shikano, I.
Name of Conference: Hawaiian Entomological Society Meeting
Location: Online
Date of Presentation: 05/28/2021

Title: **Effects of soil application of the biofungicide Serenade ASO (*Bacillus subtillus*) on anti-herbivore defenses in tomato plants**
Authors (put an asterisk on the presenter): *Pennington, S.K. & Shikano, I.
Name of Conference: Entomology 2020; Annual Meeting of the Entomological Society of America
Location: Online
Date of Presentation: 11/11/2020 – 11/25/20

Title: **Efficacy of spot-spray applications of protein bait-insecticide combinations to roosting hosts of melon fly (*Zeugodacus cucurbitae*) in Hawai'i**
Authors (put an asterisk on the presenter): *Streit, C.A., Gutierrez-Coarite, R., Mau, R.F.L. & Shikano, I.
Name of Conference: Entomology 2020; Annual Meeting of the Entomological Society of America
Location: Online
Date of Presentation: 11/11/2020 – 11/25/20

Title: **Assessing dead-end trap crops to control diamondback moths (*Plutella xylostella*) in Hawai'i**
Authors (put an asterisk on the presenter): *Pugh, M.E. & Shikano, I.
Name of Conference: Entomology 2020; Annual Meeting of the Entomological Society of America
Location: Online
Date of Presentation: 11/11/2020 – 11/25/20

Title: **Assessing induced anti-herbivore defenses in tomato plants after soil treatment with *Bacillus subtilis* (Serenade ASO)**
Authors (put an asterisk on the presenter): *Pennington, S. & Shikano, I.
Name of Conference: UHM SURE Symposium
Location: Honolulu, HI, USA (Online Zoom Conference)
Date of Presentation: 07/31/2020