

CURRICULUM VITAE
NICHOLAS C. MANOUKIS

CONTACT INFORMATION

United States Department of Agriculture - Agricultural Research Service
Daniel K. Inouye US Pacific Basin Agricultural Research Center
64 Nowelo Street, Hilo, Hawaii 96720 USA

Tel. (808) 932-2118
Email nicholas.manoukis@usda.gov
Homepage <http://unitsci.org/manoukis.php>
ORCID 0000-0001-5062-7256

EDUCATION

PhD University of California, Los Angeles (Los Angeles, CA). Ecology and Evolutionary Biology, Dec 2006.
BA Reed College (Portland, OR). Biology, Jan 1997.

POSITIONS HELD

Agricultural Research Service (USDA)

2016 – pres.	Supervisory Res. Biologist/ Research Leader (GS-14, -15)	Provide research and administrative leadership to the Tropical Crop and Commodity Protection Research Unit, comprised of ten scientists plus staff. Manage unit budget and act as a research liaison to state, federal, university and other stakeholders. Conduct personal research on Tephritid fruit fly and other invasive pest biology and control.
2010 – 2016	Research Biologist (GS-12, -13)	Designed and implemented a research program on Tephritid fruit fly biology and control. Planned and executed research, supervised up to six employees and published impactful research results.

National Institutes of Health (NIH)

2007 – 2010	Post-doctoral Fellow	Researched <i>An. gambiae</i> ecology and evolution in the laboratory of Dr. José M.C. Ribeiro. Focused on mosquito sexual behavior and dry season ecology.
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University of California, Los Angeles (UCLA)

2001 – 2006	Graduate Student Researcher	Conducted research under the supervision of Dr. Charles E. Taylor in mosquito ecology, evolution and malaria epidemiology.
2003 – 2004	Systems and Integrative Biology Fellow	Awarded NIH-funded fellowship to pursue courses in mathematical modeling and theory.

Long Beach Unified School District

1998 – 2000 **Teacher** Provided instruction on all subject areas to Fifth graders who were English language learners (Garfield Elementary, Long Beach Unified School District).

University of Southern California

1997 – 1998 **Laboratory Assistant** Prepared laboratories for introductory Life Science course.

Reed College

1995 – 1997 **Head Lab Assistant** Maintained an amphibian colony, aided with experiments and assisted with training in the laboratory of Dr. Robert H. Kaplan.

GRANTS, AWARDS, AND MEMBERSHIPS

2022-2024 Awarded \$124,500 by USDA-APHIS for project “Advancing Male Annihilation Technique for Invasive Culex-Responding Fruit Flies.”

2021-2022 Awarded \$25,000 ARS “Innovation Fund” (Round 14).

2019-2021 Awarded \$75,000 by California Dept of Food and Agriculture (CDFA) to support research on Male Annihilation Technique.

2016-2018 Awarded \$140,000 ARS Administrator’s Research Associate to support modeling (class of 2016).

2016-2017 Received \$110,000 to support postdoctoral researcher to implement Coffee Berry Borer Area-Wide Research.

2016-2018 Cooperator on \$170,000 Farm Bill section 10007 project to model Medfly risk in continental US.

2014-2015 Awarded \$80,000 USDA grant to create GIS-based spatial model of Coffee Berry Borer on Hawaii Island.

2013-2015 Co-PI on \$230,000 USDA-APHIS grant to support continuing work with Agent Based Simulation.

2013-2014 Awarded \$13,000 contract to model increased efficiency trapping networks and parametrize model with field work by IAEA/FAO.

2022 – present Sigma Xi, The Scientific Research Honor Society, member.

2012–present Hawaiian Entomological Society, member.

2011–present Entomological Society of America, member.

2001–2021 American Association for the Advancement of Science, member.

2003–2004 Recipient of Systems and Integrative Biology Training Grant (NIH).

2000–2001 Recipient of California Genetic Resources Conservation Program Grant.

1995 Recipient of Reed College Independent Fieldwork Grant.

INVITATIONS, APPOINTMENTS, AND PROFESSIONAL SERVICE

Chief scientific investigator (agreement holder) on International Atomic Energy Agency Research Coordination Meeting (RCM) on improving Sterile Insect Technique (2021 - 2026).

President of the Hawaiian Entomological Society (2021 - 2022).

Nominated and selected to be a member of International Atomic Energy Agency/Food and Agriculture (IAEA/FAO) International Fruit Fly Steering Committee (2018-present).

Affiliate Faculty, Tropical Conservation Biology and Environmental Studies Program at the University of Hawaii, Hilo (2016-present).

Editorial board member, *Journal of Insect Behavior* (2018-present).

Editorial board member (Ecology and Evolution) *Scientific Reports* (2015-2017).

Member of Technical Advisory Group on tephritid trapping (New Zealand Fruit Fly Council; 2017-2018).

Member of the Entomological Society of America Diversity and Inclusion Committee (2015-2017).

Invited to National Taiwan University as featured speaker on trapping tephritids, Taipei, November 2016 (funding provided by host).

Participant in International Atomic Energy Agency Research Coordination Meeting (RCM) on Male mosquito biology and behavior in Petrolina, Brazil, March 2013 (funding provided by host).

Invited to participate in Degree-day modeling workshop at USDA-APHIS, Raleigh, NC, March 2011 (funding provided by host).

Invited to present “Adaption and diversification in *Anopheles gambiae*, and their implications for malaria transmission”, special seminar at the Smithsonian National Zoo, Washington, DC, 2009.

Presented “Population size and migratory patterns of *Anopheles gambiae* in the Bancoumana region of Mali and their significance for efficient vector control.” at the Fundação Luso-Americana (FLAD) Workshop on Malaria, Lisbon, Portugal, July 2009 (funding provided by host).

California State Science Fair Judge (1998–2002).

Reviewer for *Science*, *Theoretical Population Biology*, *J. of Economic Entomology*, *Acta Tropica*, *J. of Vector Ecology* *PLoS Neglected Tropical Diseases*, *Entomologia Experimentalis et Applicata*, *Insects*, *Physiological Entomology*, *Bioinformatics*, *PLoS ONE*, *Conservation Genetics Resources* and others, updated list see: <https://www.webofscience.com/wos/author/rid/V-9063-2019>

TEACHING EXPERIENCE

- Spring 2013 Taught a graduate-level class titled “Computer Modeling and Simulation” in the Tropical Conservation, Biology and Environmental Science Department of the University of Hawaii, Hilo.
- Fall 2012 Co-instructor of a one week bioinformatics workshop at University of Hawaii, Hilo.
- Fall 2009 Taught a course titled “Introduction to Dynamic Biological System Modeling” in the Mathematics department of the Foundation for Advanced Education in the Sciences, National Institutes of Health, Bethesda Maryland.
- 2000-2005 Teaching assistant for various courses, including Introductory Biology, Evolutionary Biology and Biological Computation in the Organismic Biology, Ecology and Evolution Department at University of California, Los Angeles.
- 1998–2000 Fifth grade teacher at Garfield Elementary, Long Beach Unified School District, Long Beach, California.
- 1995 – 1997 Student teacher and first coordinator of Reed College Biology Outreach Program, Portland Oregon.
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FIELD AND LABORATORY WORK

- Conducting annual three-month sabbaticals at the ARS European Biocontrol Laboratory (EBCL) in Montpellier, France, to study parasitoids of *Bactrocera oleae* in quarantine and in field (2019-2023).
 - Managed ecological surveys on the invasive Coffee Berry Borer (*Hypothenemus hampei*) on Hawaii Island (2016 – 2017).
 - Led Mark-Release-Recapture experiments with fruit flies in Hawaii Island in tropical coastal areas and arid lava flats (2011 – 2016).
 - Conducted field work in Bamako and Niono, Mali (2002 – 2010).
 - Proficient in population genetic molecular lab technique.
 - Completed a demographic survey of threespine sticklebacks (*Gasterosteus aculeatus*) in Reed Canyon (1995).
 - Conducted survey of the nectivorous bat *Glossophaga soricina* in Rio de Janeiro, Brazil (1992).
 - Fluent in Portuguese; Proficient in French and Spanish.
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COMPUTATION EXPERIENCE

- UNIX and GNU/Linux operating systems. Proficient programmer in Java, Python and R.
- Agent-based and matrix modeling.
- Computer Vision (CV).
- High Performance Computing (HPC) system design and administration. Was system administrator for HPC cluster moana.

- Data and metadata archiving and curation.
 - GIS and spatial modeling.
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SELECTED PRESENTATIONS

- [1] N. C. Manoukis. New technologies and approaches for controlling invasive *Bactrocera*: How we might build on our successes and address important gaps. Keynote presentation at 10th Tephritid Workers of the Western Hemisphere Conference, Bogota, Colombia, 2020.
- [2] N. C. Manoukis. New App for CBB Monitoring and Control: Best Beans. Coffee Berry Borer Area-Wide Program “Virtual Talk Story” (University of Hawaii) 16 April 2020.
- [3] N. C. Manoukis. Climate and Mediterranean Fruit Fly Invasion Persistence: Insights from Agent-Based Simulations. Oral Presentation at Third FAO-IAEA International Conference on Area-wide Management of Insect Pests: Integrating the Sterile Insect and Related Nuclear and Other Techniques, Vienna, Austria, 2017.
- [4] N. C. Manoukis, B. Hall and S. M. Geib. A Computer Model of Attractant-Based Fruit Fly Traps and its Utility for Optimizing Trapping Networks. Poster Presentation at 9th International Symposium on Fruit Flies of Economic Importance, Bangkok, Thailand 2014.
- [5] N. C. Manoukis. Effect of host *Bactrocera dorsalis* fruit fly sex on the parasitoid *Fopius arisanus*. Poster Presentation given at the Entomology 2013, Annual meeting of the Entomological Society of America, Austin TX.
- [6] N. C. Manoukis. An Agent-Based Simulation of Tephritid Fruit Flies: Time to Extirpation of *Ceratitidis capitata*. Oral Presentation given at the 8th Meeting of the Tephritid Workers of the Western Hemisphere, Panama City, Panama 2012.
- [7] N. C. Manoukis, S. Butail, D. A. Paley, A. S. Yaro, M. Diallo, S. F. Traoré, A. Dao, T. Lehmann and J. M. C. Ribeiro. Quantifying and analyzing the mosquito dance in mating swarms. Oral presentation given at the 2011 Entomological Society of America Pacific Branch Meeting, Waikaloa HI 2011.
- [8] N. C. Manoukis, Y. Lee and C. E. Taylor. Detecting recurrent extinction in a metapopulation of *Anopheles gambiae*. Oral presentation given at the California Population and Evolutionary Genetics Group (CalPEG), San Diego CA, 2004.
- [9] N. C. Manoukis, M. A. Diuk-Wasser, M. B. Touré, G. Dolo, S. F. Traoré and C. E. Taylor. Malaria transmission and intraspecific competition in *Anopheles gambiae* at an irrigation project in Mali. Oral presentation given at 53th Annual Meeting of the American Society of Tropical Medicine and Hygiene, Miami FL, 2004.
- [10] N. C. Manoukis and C. E. Taylor. Effective Population Size of *Anopheles gambiae* s.s. in Mali: Some Implications for Malaria Control Through Genetically Modified Vectors. Oral presentation given at the Molecular and Population Biology of Mosquitoes Workshop (EMBO), Kolymbari, Greece, 2003.

TECHNICAL PAPERS AND OTHER PUBLICATIONS

A.N. Auclair, A. Perez de Leon, P.D. Teel, **N. C Manoukis**, M.T. Messenger and D.L. Bonilla. Prediction of Cattle Fever Tick Outbreaks in United States Quarantine Zone. Ag Data Commons <https://doi.org/10.15482/USDA.ADC> December 2021.

N. C Manoukis and M.P. Hill. Probability of Insect Capture in a Trap Network: Low Prevalence and Detection Trapping with TrapGrid. arXiv:2110.11432 [q-bio.QM], October 2021.

N. C. Manoukis. Drivers of Mosquito Mating. *Science*, 371:340 - 341, 2021.

B. P. Caton, H. Fang, **N. C. Manoukis** and G. R. Pallipparambil. How Effective is the 5-Mile-by-5-Mile Grid for Insect Trapping? A Simulation-based Investigation Plant Protection and Quarantine (PPQ) report, Animal and Plant Health Inspection Service, U.S. Department of Agriculture. Fall 2019.

J. D. Stark, L. Leblanc, R. F. L. Mau and **N. C. Manoukis**. In Memoriam: Roger Irvin Vargas (1947-2018). Proceedings of the Hawaiian Entomological Society v 50, 2018; Also published in American Entomologist, Spring 2019.

N. C. Manoukis. Description of a method for localizing swarming mosquitoes and other insects in 3d space with visualizations. Available from Nature Precedings, December 2008.

N. C Manoukis and E. C. Anderson. Guiliner: A configurable and extensible graphical user interface for scientific analysis and simulation software. arXiv:0806.0314v1 [cs.HC], June 2008.

N. C. Manoukis and D. K. Jacobs. Conservation of the California tree frog, *Hyla cadaverina*, from desert oasis areas in Joshua Tree National Park. Technical report, Genetic Resources Conservation Program, U.C. Davis, 2001.

BOOKS AND BOOK CHAPTERS

N. C. Manoukis. Quantifying Insect Trap Network Captures Using TrapGrid *In: Advances in Monitoring of Native and Invasive Insect Pests of Crops*. M. Fountain and T. Pope (eds.), Burleigh Dodds Science Publishing, Cambridge UK, 2023.

N. C. Manoukis, A. Malavasi and R. Pereira. Técnica de Aniquilção de Machos *In: Moscas-das-frutas no Brasil - Conhecimentos Básicos e Métodos de Controle (Vol I)*. R.A. Zucchi (ed.), Fundação de Estudos Agrários Luis de Queiroz, São Paulo, 2022.

N. C. Manoukis and T.C. Collier. Agent-based Simulations to Determine Mediterranean Fruit Fly Declaration of Eradication Following Outbreaks: Concepts and Practical Examples. *In: Area-wide Integrated Pest Management: Development and Field Application*. J. Hendrichs, R. Pereira, and M. J. B. Vreysen (eds.), CRC Press, Boca Raton Florida, USA, 2021.

Y. Itô, K. Yamamura and **N. C. Manoukis**. Role of Population and Behavioral Ecology in the Sterile Insect Technique. *In: Sterile Insect Technique: Principles and Practice in Area-Wide Integrated Pest Management*. 2nd Edition, V. A. Dyck, J. Hendrichs and A. S. Robinson (eds.). CRC Press, Boca Raton

Florida, USA, 2021.

R. I. Vargas and J. C. Pinero and L. Leblanc and **N. C. Manoukis** and R. F. L. Mau. Area-Wide Management of Fruit Flies in Hawaii *In: Fruit Fly Research and Development in Africa - Towards a Sustainable Management Strategy to Improve Horticulture*, S. Ekesi, S. Mohamed, and M. Meyer (eds.), Springer International, Switzerland, 2016.

H. J. Barclay, W. Enkerlin, J. Reyes-Flores and **N. C. Manoukis**. Guidelines for the Use of Mathematics in Operational Area-Wide Integrated Pest Management Programmes Using the Sterile Insect Technique with a Special Focus on Tephritid Fruit Flies IAEA, Vienna, Austria, 2013.

C. E. Taylor and **N. C. Manoukis**. Effective Population Size in Relation to Genetic Modification of *Anopheles gambiae* s.s. *In: Ecological Aspects for Application of Genetically Modified Mosquitoes*, W. Takken and TW Scott (eds.), Kluwer Dordrecht, The Netherlands, 2003.

PEER-REVIEWED PUBLICATIONS

- [1] M. Johnson and **N. C. Manoukis**. Coffee berry borer (coleoptera: Scolytidae) population dynamics across Hawaii Island's diverse coffee-growing landscape: Optimizing location-specific pesticide applications. *Journal of Economic Entomology*, In Press:–, 2024.
- [2] T. Fezza, T. E. Shelly, A. Fox, K. Beucke, C. Aldebron, and **N. C. Manoukis**. Less is more: Fewer attract-and-kill sites improve the male annihilation technique against *Bactrocera dorsalis* (Diptera: Tephritidae). *PLoS ONE*, 19:e0300866, 2024.
- [3] J. Kean, **N. C. Manoukis**, and B. Dominiak. Review of surveillance systems for tephritid fruit fly threats in Australia, New Zealand, and the United States. *Journal of Economic Entomology*, 117:8 – 23, 2024.
- [4] D. G. Stockton, C. Aldebron, R. Gutierrez-Coarite, and **N. C. Manoukis**. Previously introduced braconid parasitoids target recent olive fruit fly (*Bactrocera oleae*) invaders in Hawaii. *Scientific Reports*, 13:22559, 2023.
- [5] R. van Kinken, D. W. Gladdish, **N. C. Manoukis**, P. Caley, and M. P. Hill. Simulation to investigate site-based monitoring of pest insect species for trade. *Journal of Economic Entomology*, 116:1296 – 1306, 2023.
- [6] A. L. Roda, G. Steck, T. Fezza, T. Shelly, R. Duncan, **N. C. Manoukis**, L. A. Carvalho, P. Kendra, and D. Carillo. Sieving fruit pulp to detect immature tephritid fruit flies in the field. *Journal of Visualized Experiments*, -e65501, 2023.
- [7] B. P. Caton, H. Fang, G. R. Palipparambil, and **N. C. Manoukis**. Transect-based trapping for area-wide delimitation of insects. *Journal of Economic Entomology*, 116:1002–1016, 2023.
- [8] P. Liang, N. C. Ladizinsky, G. Asmus, L. J. Hamilton, A. L. Acebes-Doria, **N. C. Manoukis**, and P. A. Follett. Artificial fruits and nuts for studying predation of cryptic prey: A case of 3d-printed coffee berries for studying predation of coffee berry borer by flat bark beetles. *Entomologia Experimentalis et Applicata*, 171:716 – 720, 2023.

- [9] **N. C. Manoukis**, J. Leathers, K. Beucke, and L. A. Carvalho. Jackson trap efficiency capturing *Bactrocera dorsalis* and *Zeugodacus cucurbitae* with male lures with and without insecticides. *Journal of Applied Entomology*, 147:231 – 238, 2023.
- [10] N. D. Miller, T. J. Yoder, **N. C. Manoukis**, L. A. Carvalho, and M. S. Siderhurst. Harmonic radar tracking of individual melon flies, *Zeugodacus cucurbitae*, in Hawaii: Determining movement parameters in cage and field settings. *PLoS ONE*, 17:e0276987, 2022.
- [11] D. G. Stockton and **N. C. Manoukis**. The comparative efficacy of a spider knottin insecticide, gs-omega/kappa-hxtx-hv1a, against four species of invasive tephritid fruit flies. *Journal of Applied Entomology*, 146(10):1311 – 1319, 2022.
- [12] H. Fang, B. P. Caton, **N. C. Manoukis**, and G. R. Palipparambil. Simulation-based evaluation of two insect trapping grids for delimitation surveys. *Scientific Reports*, 12:11089, 2022.
- [13] G. Desurmont, M. Tannières, M. Roche, A. Blanchet, and **N. C. Manoukis**. Identifying an optimal screen mesh to enable augmentorium-based enhanced biological control of the olive fruit fly *Bactrocera oleae* (diptera: Tephritidae) and the mediterranean fruit fly *Ceratitis capitata* (diptera: Tephritidae). *Journal of Insect Science*, 22(11):1 – 7, 2022.
- [14] T. Shelly and **N. C. Manoukis**. Mating competitiveness of *Bactrocera dorsalis* (diptera: Tephritidae) males from a genetic sexing strain: Effects of overflooding ratio and released females. *Journal of Economic Entomology*, 115:799 – 807, 2022.
- [15] S. B. Sim, K. M. Cubelo, **N. C. Manoukis**, and D. H. Cha. Evaluating *Bactrocera dorsalis* (hendel)(diptera: Tephritidae) response to methyl eugenol: Comparison of three common bioassay methods. *Journal of Economic Entomology*, 115:556 – 564, 2022.
- [16] M. Johnson and **N. C. Manoukis**. Influence of seasonal and climatic variables on coffee berry borer (*Hypothenemus hampei ferrari*) flight activity in hawaii. *PLoS ONE*, 16:e0257861, 2021.
- [17] B. P. Caton, H. Fang, **N. C. Manoukis**, and G. R. Palipparambil. Quantifying insect dispersal distances from trapping detections data to predict delimiting survey radii. *Journal of Applied Entomology*, 146:203 – 216, 2021.
- [18] B. P. Caton, H. Fang, **N. C. Manoukis**, and G. R. Palipparambil. Simulation-based investigation of the performance of delimiting trapping surveys for insect pests. *Journal of Economic Entomology*, 114:2581–25, 2021.
- [19] J. Hsu, M. Chou, R. Mau, C. Maeda, I. Shikano, **N. C. Manoukis**, and R. Vargas. Spinosad resistance in field populations of melon fly, *Zeugodacus cucurbitae* (Coquillett), in Hawaii. *Pest Management Science*, 77:5439 – 5444, 2021.
- [20] L. Feugère, G. Gibson, **N. C. Manoukis**, and O. Roux. Mosquito sound communication: are male swarms loud enough to attract females? *Journal of the Royal Society Interface*, 18:20210121, 2021.
- [21] B. Paranhos, S. Poncio, R. Morelli, D. Nava, L. Nogueira de Sá, and **N. C. Manoukis**. Non-target effects of the exotic generalist parasitoid wasp *Fopius arisanus* (Sonan) estimated via competition assays against *Doryctobracon areolatus* (Szepligeti) on both native and exotic fruit fly hosts. *Bio-Control*, 66:83–96, 2021.

- [22] M. Johnson, C. Ruiz-Diaz, **N. C. Manoukis**, and J. Verle Rodrigues. Coffee berry borer (*Hypothenemus hampei*), a global pest of coffee: Perspectives from historical and recent invasions, and future priorities. *Insects*, 11:882, 2020.
- [23] **N. C. Manoukis** and L. Carvalho. Flight burst duration as an indicator of flight ability and physical fitness in two species of Tephritid fruit flies. *Journal of Insect Science*, 20(5):11, 2020.
- [24] M. Johnson and **N. C. Manoukis**. Abundance of coffee berry borer in feral, abandoned and managed coffee on Hawaii island. *Journal of Applied Entomology*, 144(10):920–928, 2020.
- [25] M. Johnson, S. Fortna, and **N. C. Manoukis**. Evaluation of exclusion netting for coffee berry borer (*Hypothenemus hampei*) management. *Insects*, 11(6):364, 2020.
- [26] A. M. Szyniszewska, N. C. Leppla, **N. C. Manoukis**, T. C. Collier, J. M. Hastings, D. J. Kriticos, and K. M. Bigsby. CLIMEX and MED-FOES models for predicting the variability in growth potential and persistence of Mediterranean fruit fly (Diptera: Tephritidae) populations. *Annals of the Entomological Society of America*, 113(2):114–124, 2020.
- [27] M. Johnson, S. Fortna, R. Hollingsworth, and **N. C. Manoukis**. Post-harvest population reservoirs of coffee berry borer (*Hypothenemus hampei*) on Hawaii Island. *Journal of Economic Entomology*, 112(6):2833 – 2841, 2019.
- [28] L. Hamilton, R. Hollingsworth, M. Sabado-Helpert, **N. C. Manoukis**, P. Follett, and M. Johnson. Coffee berry borer (*Hypothenemus hampei*) (coleoptera: Curculionidae) development across an elevational gradient on Hawaii Island: Applying laboratory degree-day predictions to natural field populations. *PLoS ONE*, 14(7):e0218321, 2019.
- [29] **N. C. Manoukis**, R. Vargas, L. Carvalho, T. Fezza, S. Wilson, T. Collier, and T. Shelly. A field test on the effectiveness of male annihilation technique against *Bactrocera dorsalis* (diptera: Tephritidae) at varying application densities. *PLoS ONE*, 14(3):e0213337, 2019.
- [30] K. Lehman, D. Barahona, **N. C. Manoukis**, L. Carvalho, S. De Faveri, J. Auth, and M. Siderhurst. Raspberry ketone trifluoroacetate trapping of *Zeugodacus cucurbitae* in Hawaii. *Journal of Economic Entomology*, 112(3):1306–1313, 2019.
- [31] **N. C. Manoukis** and T. Collier. Computer vision to enhance behavioral research on insects. *Annals of the Entomological Society of America*, 112(3):227–235, 2019.
- [32] P. Follett, **N. C. Manoukis**, and B. Mackey. Comparative cold tolerance in *Ceratitidis capitata* and *Zeugodacus cucurbitae* (diptera: Tephritidae). *Journal of Economic Entomology*, 111(6):2632–2636, 2018.
- [33] **N. C. Manoukis**, D. Cha, R. Collignon, and T. E. Shelly. *Terminalia* larval host fruit reduces the response of *Bactrocera dorsalis* (diptera: Tephritidae) adults to the male lure methyl eugenol. *Journal of Economic Entomology*, 111(4):1644–1649, 2018.
- [34] M. A. Johnson, R. H. Hollingsworth, S. Fortna, and **N. C. Manoukis**. The Hawaii Protocol for scientific monitoring of coffee berry borer: A model for coffee agroecosystems worldwide. *Journal of Visualized Experiments*, 133:e57204, 2018.
- [35] T. E. Shelly and **N. C. Manoukis**. Capture of melon flies, *Zeugodacus cucurbitae* (Diptera: Tephritidae), in a food-baited multilure trap: Influence of distance, diet, and sex. *Journal of Asia-Pacific Entomology*, 21(1):288–292, 2018.

- [36] L. Aristizabal, M. A. Johnson, S. Shriner, R. H. Hollingsworth, **N. C. Manoukis**, R. Myers, P. Bayman, and S. Arthurs. Integrated pest management of coffee berry borer in Hawaii and Puerto Rico: Current status and prospects. *Insects*, 8:123, 2017.
- [37] T. Collier and **N. C. Manoukis**. Evaluation of predicted Medfly (*Ceratitis capitata*) quarantine length in the United States utilizing degree-day and agent-based models. *F1000 Research*, 6:1863, 2017.
- [38] E. B. Jang, R. V. Dowell, and **N. C. Manoukis**. Mark-release-recapture experiments on the effectiveness of methyl eugenol-spinosad male annihilation technique against an invading population of *Bactrocera dorsalis*. *Proceedings of the Hawaiian Entomological Society*, 49(1):37–45, 2017.
- [39] M. A. Khan, **N. C. Manoukis**, T. Osborne, I. M. Barchia, G. M. Gurr, and O. L. Reynolds. Semiochemical mediated enhancement of males to complement sterile insect technique in management of the tephritid pest *Bactrocera tryoni* (Froggatt). *Scientific Reports*, 7:13366, 2017.
- [40] J. Gaertner, V. B. Genovese, C. Potter, K. Sewake, and **N. C. Manoukis**. Vegetation classification of coffee on Hawaii island using Worldview-2 satellite imagery. *Journal of Applied Remote Sensing*, 11:046005, 2017.
- [41] R. da Silva Gonçalves, **N. C. Manoukis**, and D. E. Nava. Effect of *Fopius arisanus* sonan oviposition experience on parasitization of *Bactrocera dorsalis* hendel. *BioControl*, 62(5):595 – 602, 2017.
- [42] **N. C. Manoukis**, E. B. Jang, and R. V. Dowell. Survivorship of male and female *Bactrocera dorsalis* in the field and the effect of male annihilation technique. *Entomologia Experimentalis et Applicata*, 162:243–250, 2017.
- [43] **N. C. Manoukis** and T. E. Mangine. Response of the pearly eye melon fly *Bactrocera cucurbitae* (coquillett) (diptera: Tephritidae) mutant to host-associated visual cues. *Proceedings of the Hawaiian Entomological Society*, 48:15–20, 2016.
- [44] **N. C. Manoukis**. To catch a fly: Landing and capture of *Ceratitis capitata* in a Jackson trap with and without an insecticide. *PLoS ONE*, 11:e0149869, 2016.
- [45] M. S. Siderhurst, S. J. Park, C. N. Suttles, I. M. Jaime, **N. C. Manoukis**, E. B. Jang, and P. W. Taylor. Raspberry ketone trifluoroacetate, a new attractant for the Queensland fruit fly (*Bactrocera tryoni* (Froggatt)). *Journal of Chemical Ecology*, 42:156–162, 2016.
- [46] **N. C. Manoukis** and S. M. Gayle. Attraction of wild-like and colony-reared *Bactrocera cucurbitae* (Diptera:Tephritidae) to cuelure in the field. *Journal of Applied Entomology*, 140:241–249, 2016.
- [47] **N. C. Manoukis**, M. Siderhurst, and E. B. Jang. Field estimates of attraction of *Ceratitis capitata* to trimedlure and *Bactrocera dorsalis* to methyl eugenol in varying environments. *Environmental Entomology*, 44:695–703, 2015.
- [48] **N. C. Manoukis**, B. Hall, and S. M. Geib. A computer model of insect traps in a landscape. *Scientific Reports*, 4:7015, 2014.
- [49] S. M. Geib, B. Calla, B. Hall, S. Hou, and **N. C. Manoukis**. Characterizing the developmental transcriptome of the oriental fruit fly *Bactrocera dorsalis* (Diptera: Tephritidae) through comparative genomic analysis with *Drosophila melanogaster* utilizing modENCODE datasets. *BMC Genomics*, 15:942, 2014.

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