Alexander Piper

Research Scientist

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Alexander Piper is a Research Scientist with Agriculture Victoria Research whose research uses high-throughput sequencing and computational biology to improve detection and control of insect pests.

Education

School of Applied Systems Biology, College of Science, Health, and Engineering, La Trobe University — *Melbourne, Australia*

Doctor of Philosophy — 2021

- Thesis title: Genomic Bio-surveillance for Insect Pests

Queensland University of Technology — *Brisbane, Australia*

Bachelor of Science (Biology) — 2015

- Biotechnology and Genetics Minor
- Chemistry Minor

Research experience

Agriculture Victoria Research — *Melbourne, Australia*

Research Scientist — 2017-2021

- Developing high-throughput sequencing assays and bioinformatic pipelines for diagnostics of insect pests.

Agriculture Victoria Research — *Melbourne, Australia*

Research Scientist — 2016-2017

- Investigating the role of microbial volatile organic compounds in the ecology of Bactrocera fruit flies, and their potential for application in novel insect attractant formulations.

Queensland University of Technology — *Brisbane, Australia*

Laboratory Assistant — 2015-2016

- Isolation and physiological characterisation of environmental microbes from insects and host plants.

Queensland University of Technology — *Brisbane, Australia*

Vacation Research Scholar — 2015

- Exploratory research into fungal symbionts of an agricultural pest insect funded by a university scholarship.

Queensland University of Technology — *Brisbane, Australia*

B.Sc. Capstone Research Project — 2015

- Developing an environmental DNA PCR assay for detection of an invasive freshwater fish species.

Queensland University of Technology — *Brisbane, Australia*

Undergraduate Research — 2013-2014

- Validation of transcriptomics differentially expressed genes using qRT-PCR.

Journal articles

1. Piper, A., Cunningham, J., Cogan, N., & Blacket, M. (2021). DNA metabarcoding enables high-throughput detection of spotted wing drosophila (drosophila suzukii) within unsorted trap catches. In *Fronteirs in Ecology and Evolution (In Review)*.
2. Batovska, J., Piper, A., Valenzuela, I., Cunningham, J., & Blacket, M. (2021). Developing a non-destructive metabarcoding protocol for detection of pest insects in bulk trap catches. *Scientific Reports*.
3. Martoni, F., Nogarotto, E., Piper, A., Mann, R., Valenzuela, I., Eow, L., Rako, L., & …. (2021). Propylene glycol and non-destructive DNA extractions enable preservation and isolation of insect and hosted bacterial DNA. *Agriculture*.

4. Baig, F., Farnier, K., Piper, A., Speight, R., & Cunningham, J. (2020). Yeasts influence host selection and larval fitness in two frugivorous carpophilus beetle species. *Journal of Chemical Ecology*.
5. Piper, A., Batovska, J., Cogan, N., Weiss, J., Cunningham, J., Rodoni, B., & …. (2019). Prospects and challenges of implementing DNA metabarcoding for high-throughput insect surveillance. *GigaScience*.
6. Piper, A., Farnier, K., Linder, T., Speight, R., & Cunningham, J. (2017). Two gut-associated yeasts in a tephritid fruit fly have contrasting effects on adult attraction and larval survival. *Journal of Chemical Ecology*.

Preprint articles

1. Piper, A., Cogan, N., Cunningham, J., & Blacket, M. (2021). Computational evaluation of DNA metabarcoding for universal diagnostics of invasive insect pests. *bioRxiv*.

Selected scientific presentations

Australian Entomological Society Conference — *Online*
A DNA metabarcoding assay for early detection of Spotted Wing Drosophila within unsorted bulk trap catches. — 2021

International Congress of Entomology — *Helsinki, Finland (Cancelled due to COVID19)*
Detecting the Unexpected: Invasive Insect Surveillance using Non-Destructive DNA Metabarcoding. — 2020

Australian Entomological Society Conference — *Brisbane, Queensland*
Towards quantitative and high-throughput insect surveillance using DNA Metabarcoding. — 2019

Agriculture Victoria Regional Science Conference — *Tatura, Victoria*
An updated molecular toolbox for Biosecurity. — 2019

AgriBio Science Conference — *Melboure, Victoria*
Detecting the unexpected, DNA metabarcoding for high-throughput insect surveillance. — 2018

Victorian DNA Barcoding Workshop — *Melbourne, Victoria*
Quality control considerations for metabarcoding. — 2018

Australian Entomological Society Conference — *Alice Springs, Northern Territory*
Detecting the unexpected, DNA metabarcoding for high-throughput insect surveillance. — 2018

iMapPESTS metabarcoding Workshop — *Melbourne, Victoria*
Quality control considerations for metabarcoding. — 2018

SciPlant 17 — *Brisbane, Queensland*
The importance of Yeasts in the ecology and control of the Queensland Fruit Fly. — 2017

Australian Entomological Society Conference — *Terrigal, New South Wales*
Yeast-insect interactions in the Queensland fruit fly (Bactrocera tryoni). — 2017

Biology of Tephritid Fruit Flies Meeting IV — *Melbourne, Victoria*
A microbial hypothesis for Queensland fruit fly host selection. — 2016

Software development

2021 **taxreturn**: Lead developer
An R package for curating public DNA sequence databases for metabarcoding studies.

2021 **piperline**: Lead developer
A nextflow-based metabarcoding pipeline for detection of regulated species.

Society memberships

- Member, Australian Bioinformatics and Computational Biology Society.
- Member, Australian Entomological Society.
- Member, Society for Molecular Biology and Evolution.

- Member, International Society for Computational Biology

Synergistic activities

- Reviewer for VALITEST Work Package 2 - Guidelines for validation and application of non-targeted HTS diagnostic procedures in plant pest diagnostics.
- Reviewer for Molecular Ecology Resources, Evolutionary Ecology, and Journal of Economic Entomology.
- Participant in the Insect Genetic Technologies Research Coordination Network (IGTRCN).

References

- **Assoc Prof. Paul Cunningham**
  Research Leader — Invertebrate and Weed Sciences
  Agriculture Victoria Research
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  Email: `paul.cunningham@agriculture.vic.gov.au`
- **Dr. Noel Cogan**
  Research Leader — Molecular Genetics Agriculture Victoria Research
  Phone: +613 9032 7096
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- **Dr. Mark Blacket**
  Senior Research Scientist — Invertebrate and Weed Sciences
  Agriculture Victoria Research
  Phone: +613 9032 7333 Email: `mark.blacket@agriculture.vic.gov.au`