

Claire Duménil, PhD

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Pronouns: she/her

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Languages: French (native), English (C2, fluent), Italian (B2, intermediate proficiency)

Current position as research assistant: Functional brain imaging in a novel transgenic model of *Drosophila suzukii*: Towards olfactory-guided pest management.

Dr. Albrecht Haase, Center for Mind/Brain Sciences CIMeC, Rovereto, Italy

Education

2015-2019 Doctor of Philosophy (PhD) in Biological Sciences. Cardiff University, UK

Dissertation: Detection of host odours by the peripheral olfactory system in *Drosophila suzukii* and provide novel semiochemical control tools.

Supervision: Dr W. van der Goes van Naters, Prof. W. Symondson, Prof. J. Pickett, Cardiff University; Dr M. Birkett, Dr J. Vuts and Dr J-J. Zhou, Rothamsted Research.

Examination: Dr J. Hodge, Bristol University and Dr C. Müller, Cardiff University

2011-2013 Master of Sciences in Ecology and Evolution. University of Amsterdam, The Netherlands

Research project 2: The efficacy of essential oil compounds on bed nets to repel and/or kill *A. gambiae*.
Supervision: Dr F. Chandre, IRD and Dr T. Martin, CIRAD, Montpellier, France

Research project 1: Effects of food on the composition of sex pheromones in *Heliothis virescens*.
Supervision: Prof. A.T. Groot, IBED, University of Amsterdam

Literature review: The role of chemoreception in herbivorous insects.
Supervision: Prof. P. Roessingh, IBED, University of Amsterdam

2008-2011 Bachelor of Sciences in Ecology and Physiology, University of Caen Normandy, France

Research project: Cephalopod Recruitment from English Channel Spawning Habitats (CRESH).

Supervision: Prof. J-P. Robin, UMR-100 IFREMER, University of Caen Normandy

Laboratory and office skills

Office and data analysis

- x Microsoft office and Apache Open Office (advanced proficiency)
- x Referencing managers, Agilent and Syntech suites, IgorPro, Image J, SPSS and GraphPad Prism (intermediate proficiency)
- x R (intermediate proficiency), Matlab, Python, HTML and JavaScript (beginner proficiency)

Laboratory (advanced proficiency)

- x Electrophysiology: Single Sensillum Recording (SSR), ElectroAntennoGraphy (EAG) on *Drosophila*
- x Chemistry: Identification of chemicals with Gas Chromatography (GC)- Mass Spectrometry (MS)
Collection of chemicals from plants and insects in laboratory and field
- x Entomology: Behavioural experimentation in laboratory with moths, flies and mosquitoes
Moth and fly rearing (including transgenic *Drosophila* lines)
Handling of live insects for fine mounting and behaviour

Laboratory (beginner proficiency)

- x Molecular biology: PCR, design of primers, crosses of transgenic flies
- x Imaging techniques: Fluorescent microscopy, Lightsheet microscopy (Zeiss Lightsheet Z.1) and Scanning Electron microscopy (SEM) introduction workshops
- x Ecology: Insect collection and field experiments

Transferable and interpersonal skills

- x **Health and safety at work** Laboratory and office protection
First aid intervention, emergency reactions

- Mental health awareness and stress management
- x Transferable skills**
 - Ethics, inclusion, equality and unconscious bias
 - Communication (team work, conflict management)
 - Problem solving
 - Data analysis

x European car driving licence

Fundings awarded

- 2021 Funding for a 2-years postdoc project by the Caritro foundation, Trento-Rovereto, Italy**
Project: Functional brain imaging in a novel transgenic model of *Drosophila suzukii*: Towards olfactory-guided pest management.
- 2015-2019 PhD studentship at Cardiff University and Rothamsted Research, UK**
Scholarship and studentship awarded by the South West Biosciences Doctoral Training Partnership (SWBio DTP), funded by the Biotechnology and Biological Sciences Research Council (BBSRC)
- 2017 Student Travel bursary from the International Society of Chemical Ecology (ISCE)**
To attend and present my work at the joined ISCE/APACE meeting in Kyoto, Japan

Research experience

- 2019-2020 Postdoctoral research assistant: Reduce insecticide use against the pest *D. suzukii* via the development of a yeast-based trapping lure.**
Dr S. Angeli, university of Bolzano, Italy
I identified antennally active volatiles from yeasts and plants using EAG and GC-MS thereby completing behavioural and chemical studies. I discussed and wrote results in three publications (two in preparation) with partners. I secured two international conference talks. Collaborative project with Dr S. Schmidt and Dr D. Eisenstecken, Laimburg Research center (Italy) and Dr P. Becher, SLU Lund (Sweden). Project DROMYTAL, funded by the European Grant EFRE/FESR 2014-2020.
- 2015-2019 PhD researcher: Detection of host odours by the peripheral olfactory system in the invasive agricultural pest *D. suzukii* and provide novel semiochemical management tools.**
Dr W. van der Goes van Naters, Prof. W. Symondon, Prof. J. Pickett, Cardiff University, UK
Dr M. Birkett, Dr J. Vuts and Dr J-J. Zhou, Rothamsted Research, UK
I led this collaborative project between Cardiff University and Rothamsted Research (manuscript in preparation). I planned, did and troubleshooted all experiments. I designed statistical analysis, wrote and presented the results. I demonstrated how the peripheral olfactory system encode complex odours from fruits in the flies *D. suzukii* and *D. melanogaster*. I identified the subsets of olfactory neurons activated by fruit volatiles in *D. suzukii* and subsequently identified bioactive chemicals that are potential tools for field management. I presented my work at several meetings and was awarded for presentation skills. I was part of the PhD training program SWBio DTP.
- 2014-2015 Research assistant: The role of chemical signaling on oviposition site selection in *Drosophila melanogaster*.**
Dr J-C. Billeter, University of Groningen, The Netherlands
I led this voluntary project and mentored three student to help me with data collection. I designed behavioural experiments with odourless and anosmic flies obtained from transgenic crosses. Designed the statistical analysis of data. We published and I presented the results.
- 2013-2014 Research assistant: The effects of mating disruption techniques on female sex pheromone of *Cydia pomonella* in European apple orchards.**
Dr A. T. Groot, University of Amsterdam, The Netherlands
I led this voluntary project, including field collection, coordination with collaborators and troubleshooting. I collected and analysed the data. We published the results.
- 2013 (6M) Msc researcher: The efficacy of essential oil compounds on bed nets to repel and/or kill *Anopheles gambiae*.**

Dr F. Chandre, IRD and Dr T. Martin, CIRAD, Montpellier, France

I performed behavioural work using WHO-certified methods on an ongoing research. I identified four compounds as the most bioactive and additionally with an experiment of my initiative, I identified a difference in efficacy in the DEET-resistant strain. We published and I presented the results.

2012 (9M) Msc researcher: Effects of food on the composition of sex pheromones in *Heliothis virescens*.**Prof. A.T. Groot, IBED, University of Amsterdam**

I led this project, coordinated the logistics, troubleshooting and performed experiments using transgenic plants, and analysed the data. I found a difference in ratios of components likely associated with deprivation and stress. I presented the results.

2011 (2M) Research internship: Cephalopod Recruitment from English Channel Spawning Habitats.**Prof. J-P. Robin, UMR-100 IFREMER, University of Caen, France**

As a field assistant I prepared the selection of sampling sites (using ArcGIS 10), guided divers for egg laying site observations and helped the pelagic sampling of juveniles in the English channel.

Teaching experience**2016-2017 Teacher assistant for year 1-3 Bsc candidates practical courses and marking**

Squid and fish dissections, aseptic laboratory techniques, Introduction to *Drosophila* genetics
Prof. W. Symondson, Dr S. Griffith, and Prof. H. White-Cooper, Cardiff University, UK

2012-2017 Assistant supervision of Bsc and Msc projects

Mentored students through carrying a research project, reasoning, analysis of data and writing a report. The work of the students was highly graded. I have successfully transmitted enthusiasm.
Dr W. van der Goes van Naters, Cardiff University, UK
Dr J-C. Billeter, University of Groningen, The Netherlands
Dr A. T. Groot and Dr M. Kant, University of Amsterdam, The Netherlands

Other work experience**Consultant****2018 (3M) Internship: Consultancy in organic agriculture and viticulture with E. Mescalchin and A. Grassi, Fondazione Edmund Mach, Italy**

I shared valuable insights with researchers and growers regarding the pest *Drosophila suzukii*. I assisted measuring the impact of pest insects and fungi and the impact of the current pest and disease management techniques in field. I shared how academic research is helping them.

Caretaker

2011 Voluntary caretaker for rescued small primates at Stichting AAP, Almere, The Netherlands
2010-2011 Childcare provider, O2 services, Caen, France
2004-2009 Self-employed: childcare provider and housekeeping, Caen, France

Industry worker experience

2010-2011 Warehouse packer, Decathlon Oxylane logistics, Cagny, France
2006-2008 Interim warehouse packer, Caen, France

Volunteering activities and societies

2021- Member of the Society of Chemical Industry (SCI) Agri-Food Early Career Committee
Equality, diversity and inclusion officer
2021- Member of the reviewing board of MDPI and Wiley (> 5 peer-review activities)

Communication and outreach

2019 Oral presentation at the FlyTech molecular genetic technique symposium, Cardiff, UK
Imaging of neuron activity via genetically encoded voltage indicators GEVIs
2018 Poster presentation at the special Interest group insect behaviour meeting of the Royal Entomological Society, Rothamsted Research, UK
*Induction of host fruit preference in the invasive agricultural pest *D. suzukii**

Description published in the journal *Antennae*

- 2018** SCI Agri-Food Early Career Forum #agrifoodbecause twitter competition 2017
Host fruit selection by the olfactory system in the invasive agricultural pest D. suzukii
Tweet was selected as winner entry
- 2017** Oral presentation at the joined ISCE/APACE meeting, Kyoto, Japan
Host fruit selection by the olfactory system in the invasive agricultural pest D. suzukii
Awarded the ISCE Student Travel bursary and best oral presentation
- 2017** Poster presentation at the 3rd Agriscience Chemical Biology Postgraduate Symposium, London, UK
Host fruit selection by the olfactory system in the invasive agricultural pest D. suzukii
Awarded runner up poster price
- 2016-2018** 3-minute-oral and poster presentations to a multidisciplinary audience at the annual conferences of the SWBioDTP training program, UK
Watch the 3-minute-talk at: <https://youtu.be/okXNXERMclQ>
- 2012, 2014** Poster presentations at the annual meeting of the Netherlands Society for Behavioural Biology (NVG), Soesterberg, The Netherlands
- 2013** Oral presentation at the first national meeting of the french association of young researchers in Chemical Ecology AFJCEC, Montpellier, France
- 2010** Demonstrator on DNA extraction at Annual Science Day, Caen, France

Publications open access via <https://orcid.org/0000-0002-8339-5540>

C. Sims, J. Oddy, L. E. Hibbert, A. S. Newell, L. R. Steel, A.T. Gibbons, N. Caporaso, **C. Duménil**, S. Read, R. C.P. Margerison. Feeding the future: developing the skills landscape in the agri-food sector. **Journal of Chemical Technology & Biotechnology** 2021. DOI: 10.1002/jctb.6844

Bianchi F., Spitaler U., Castellan, I., Cossu C.S., Brigadoi T., **Duménil C.**, Angeli S., Robatscher P., Vogel R.F., Schmidt S., Eisenstecken D. Persistence of a yeast-based attract-and-kill formulation against *Drosophila suzukii* on grape leaves. *Insects* 2020, 11, 810. DOI:10.3390/insects11110810

Deletre E., Martin T., **Duménil C.**, Chandre F. Insecticide resistance modifies mosquito response to DEET and natural repellents. **Parasites & Vectors** 2019, 12:89. DOI:10.1186/s13071-019-3343-9

Duménil C., Woud D., Pinto F., Alkema J.T., Jansen I., Geest A.M., Roessingh S., Billeter J.C. Pheromonal cues deposited by mated females convey social information about egg-laying sites in *Drosophila melanogaster*. **Journal of chemical ecology** 2016, 42 (3), 259-269. DOI: 10.1007/s10886-016-0681-3

Deletre E., Chandre F., Williams L., **Duménil C.**, Menut C., Martin T. Electrophysiological and behavioral characterization of bioactive compounds of the *Thymus vulgaris*, *Cymbopogon winterianus*, *Cuminum cyminum* and *Cinnamomum zeylanicum* essential oils against *Anopheles gambiae* and prospects for their use as bednet treatments. **Parasites & Vectors** 2015, 8:316. DOI: 10.1186/s13071-015-0934-y

Duménil C., Judd G.J.R., Bosch D., Baldessari M., Gemeno C., Groot A.T. Intraspecific variation in female sex pheromone of the codling moth *Cydia pomonella*. **Insects** 2014, 5, 705-721. DOI:10.3390/insects5040705