Rishi De-Kayne

Personal information:

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Academic education and employment:

08/2021-01/2023	**SNSF Early Postdoc Mobility Fellow – Independent Postdoctoral Researcher** Martin Lab – University of Edinburgh, UK Project: The evolution and maintenance of wing-pattern supergenes in *Danaus* butterflies
02/2021-07/2021	**Postdoctoral Research Associate** Martin Lab – University of Edinburgh, UK
10/2016-12/2020	**PhD** – Pass *insigni cum laude* University of Bern, Switzerland Title: The genetic basis of adaptation and speciation in the Swiss Alpine whitefish radiation Supervisors: Prof. Ole Seehausen and Dr. Philine G. D. Feulner
10/2015-10/2016	**MRes Tropical Forest Ecology** – Pass with Distinction Imperial College London, UK Thesis: Endophytic fungal, not bacterial, communities differ between sympatric palm species Project supervisor: Prof. Vincent Savolainen
08/2015-09/2015	**Field Technician** Savolainen Lab – Imperial College London/Lord Howe Island
07/2014-09/2014	**Undergraduate Research Opportunity Placement Student** Bidartondo Lab – Kew Gardens
10/2012-10/2015	**BSc Biology** – 1st Class Honours Imperial College London, UK Thesis: Resolving the phylogeny of the sharks using 20 transcriptomes Project supervisor: Prof. Vincent Savolainen

Publications in peer reviewed journals:

I have **5 publications (4/5 as first author)** in internationally recognised peer reviewed journals with a total of **75 citations and an h-index of 4** (Google scholar).

5. **R De-Kayne***, D Frei*, R Greenway, SL Mendes, C Retel, PGD Feulner (2020)
The future of next generation sequencing datasets: technological shifts provide opportunities but pose challenges for reproducibility and reusability. Molecular Ecology Resources 21: 653–660

4. **R De-Kayne**, S Zoller, PGD Feulner (2020)

A de novo chromosome-level genome assembly of *Coregonus sp.* "Balchen": one representative of the Swiss Alpine whitefish radiation. Molecular Ecology Resources 20:1093–1109

3. **R De-Kayne**, PGD Feulner (2018)
A European whitefish linkage map and its implications for understanding genome-wide synteny between salmonids following whole genome duplication. G3: Genes, Genomes, Genetics 8: 3745-3755

2. OG Osborne*, **R De-Kayne***, MI Bidartondo, I Hutton, WJ Baker, CGN Turnbull, V Savolainen (2017) Arbuscular Mycorrhizal fungi promote coexistence and niche divergence of sympatric palm species on a remote oceanic island. New Phytologist 217:1254-1266

1. PGD Feulner, **R De-Kayne** (2017)
Genome evolution, structural rearrangements and speciation. Journal of Evolutionary Biology 30:1488-1490

*authors contributed equally

Manuscripts in preparation:

3. KS Singh, **R De-Kayne**, KS Omufwoko, R ffrench-Constant, D Martins & SH Martin
Chromosome-scale genome assembly of Danaus chrysippus and analysis of genome size change in milkweed butterflies. – *in prep for G3*

2. D Frei, **R De-Kayne**, OM Selz, O Seehausen, PGD Feulner
Speciation reversal impacts genomes of all species in an adaptive radiation. – *in review at Nature Ecology and Evolution*

1. **R De-Kayne**, OM Selz, D Frei, O Seehausen, PGD Feulner
Hybridization and mixed genetic architectures facilitate adaptive radiation. – *in review at Nature Communications*

Student mentorship:

Co-supervision of Michelé Leemann – University of Bern MSc Bioinformatics student 07-09/2021
During this research project, part of Michelé's MSc, I guided her through the assembly and annotation of the mitochondrial genome of Alpine whitefish.

Co-supervision of Romano Josi – University of Bern BSc Summer Research Student 06-07/2017
This research project used diagnostic microsatellites to determine the pedigree of lab-reared whitefish larvae and the abundance of gynogenetic haploid individuals. My supervision involved training Romano in molecular lab techniques including DNA extraction, PCR, and microsatellite sequencing and analysis.

Teaching Experience:

OH-KNOW workshop
09/21
I co-organised this four-day online workshop aimed at teaching and discussing the latest k-mer based tools for bioinformatics. During the workshop I wrote and taught a 'bash refresher' course which introduced participants to bash scripting for bioinformatics and the programming basics required for working on a computer cluster. I also assisted with teaching for the remainder of the course coverings topics including *** and ***. I am currently drafting a manuscript with the

other co-organizers about the power of k-mers for addressing genome evolution questions that directly resulted from the workshop.

University of Bern – Practical in Aquatic Ecology and Evolution
03-05/2018, 03-05/2019, and 04/2021
In this course, students designed their own practical investigation to study the ecology and evolution of fish in Swiss lakes. In both 2018 and 2019 these projects revolved around scale and fossil bones excavated from sediment cores collected from various Swiss lakes. The students collected the sediment cores, extracted fossils, carried out the necessary molecular lab, analysed their data, and wrote the investigation up in manuscript format. I assisted during all stages of the practical and wrote and presented an 'introduction to scientific writing' guide to help the students through the writing process. I then graded student reports at the end of the practical. In 2021 I was invited to give a guest lecture on scientific writing.

University of Bern – Introduction to R for Beginners
09/2019
In this five-day course, second- and third-year BSc students received an introduction to R covering basic syntax, an outline of different data types, linear modelling, writing functions, and carrying out descriptive statistics in R. I assisted students to work through R exercises throughout the course and provided them with feedback on their code. I also graded the final homework exercises from the course.

Academic Service:

- Scientific manuscript reviewing for: G3 (Genes, Genomes and Genetics) and Molecular Ecology Resources, Journal of Evolutionary Biology, Genome Biology and Evolution, and Molecular Biology and Evolution.
- Scientific grant reviewing for: Great Lakes Fisheries Commission
- PhD and Postdoc representative (Unteren Mittelbau) on the hiring committee for a new Professor for Theoretical Ecology and Evolution at the University of Bern 2019.

Active memberships to scientific societies:

European Society of Evolutionary Biology (ESEB) member – since 2017

Grants, prizes, and awards:

- SNSF Early Postdoc Mobility fellowship (18 months) **– CHF 73,150/£57,600**
- Best student talk at PopGroup53 01/2020 – **1st Place (CHF 316/£250)**
- Best student poster at PopGroup51 01/2018 **– 2nd Place (CHF 190/£150)**
- Best conference poster at Biology20 02/2020 – **2nd Place (CHF 150/£120)**

Contributions to conferences/seminars:

19. **R. De-Kayne**, O. M. Selz, D Frei, O. Seehausen and P.G.D. Feulner. A mixed genetic architecture and gene flow facilitate adaptive radiation. *Understanding 'reproductive isolation'? ESEB symposium*, Online - **Oral presentation**

18. **R. De-Kayne**, O. M. Selz, O. Seehausen and P.G.D. Feulner. The genomic basis of adaptation and speciation in the Alpine whitefish radiation. *COMgen Seminar Series*, University of Nottingham - **Invited Seminar**

17. **R. De-Kayne**, O. M. Selz, O. Seehausen and P.G.D. Feulner. Genomic insights into the evolution of the Alpine whitefish radiation. *CIGENE Seminar Series*, Norwegian University of Life Sciences - **Invited Seminar**

16. **R. De-Kayne**, O. M. Selz, O. Seehausen and P.G.D. Feulner. Dissecting the evolutionary mechanisms driving Alpine whitefish diversification, *54nd Population Genetics Group Meeting (PopGroup54)*, Liverpool, UK - **Oral presentation**

15. **R. De-Kayne**, S. Zoller, O. Seehausen and P.G.D. Feulner. From palms to whitefish – understanding the genetic basis of adaptation and speciation. *Eawag Aquatic Ecology & Macroevolution Seminar Series 2020*, Kastanienbaum, Switzerland - **Seminar**

14. **R. De-Kayne**, S. Zoller, O. Seehausen and P.G.D. Feulner. Towards understanding adaptation and speciation in the Swiss Alpine whitefish radiation. *Biology20 Conference,* Freiburg, Switzerland – **Poster presentation**

13. **R. De-Kayne**, S. Zoller, O. Seehausen and P.G.D. Feulner. Towards understanding adaptation and speciation in the Swiss Alpine whitefish radiation. *53rd Population Genetics Group Meeting (PopGroup53)*. Leicester, UK - **Oral presentation**

12. **R. De-Kayne**, S. Zoller, O. Seehausen and P.G.D. Feulner. A de novo chromosome-level genome assembly of *Coregonus steinmanni* – towards understanding adaptation and speciation in the Swiss Alpine whitefish radiation. *4th International Conference on Integrative Salmonid Biology (ICISB2019).* Edinburgh, UK - **Oral presentation**

11. **R. De-Kayne**, S. Zoller, O. Seehausen and P.G.D. Feulner. Genomics of adaptation in the Alpine whitefish radiation - genomic resources to study adaptation and speciation. *2019 Congress of the European Society for Evolutionary Biology (ESEB2019).* Turku, Finland - **Poster presentation**

10. **R. De-Kayne**, S. Zoller and P.G.D. Feulner. Assembling the genome of *Coregonus steinmanni* – unlocking the secrets of the Swiss Alpine whitefish radiation. *EAWAG Fish Ecology and Evolution Symposium 2019*. Kastanienbaum, Switzerland - **Oral presentation**

9. **R. De-Kayne**, S. Zoller, O. Seehausen and P.G.D. Feulner. Towards the understanding of adaptation and speciation in the Swiss Alpine whitefish radiation. *Biology19 Conference*. Zurich, Switzerland - **Oral presentation**

8. **R. De-Kayne**, S. Zoller, O. Seehausen and P.G.D. Feulner. Towards the understanding of adaptation and speciation in the Swiss Alpine whitefish radiation. *52nd Population Genetics Group Meeting (PopGroup52).* Oxford, UK - **Oral presentation**

7. **R. De-Kayne**, S. Zoller, O. Seehausen and P.G.D. Feulner. The Swiss Alpine whitefish radiation – first steps in understanding the genomic basis of adaptation and speciation. *Programming for Evolutionary Biology (PEB) Conference 2018*. Buttermere, UK - **Oral presentation**

6. **R. De-Kayne**, O. Seehausen and P.G.D. Feulner. The Swiss Alpine whitefish radiation – genomic resources to study adaptation and speciation. *2018 Congress of the European Society for Evolutionary Biology (ESEB2018).* Montpellier, France - **Poster presentation**

5. **R. De-Kayne**, O. Seehausen and P.G.D. Feulner. Producing genomic resources for pre-Alpine whitefish and what they can tell us about genome evolution. *EAWAG Fish Ecology and Evolution Symposium 2018.* Kastanienbaum, Switzerland - **Oral presentation**

4. **R. De-Kayne**, O. Seehausen and P.G.D. Feulner. Constructing a linkage map for Swiss Alpine whitefish. *Biology18 Conference*. Neuchatel, Switzerland - **Poster presentation**

3. **R. De-Kayne**, O. Seehausen and P.G.D. Feulner. Constructing a linkage map for Swiss Alpine whitefish. *51st Population Genetics Group Meeting (PopGroup51).* Bristol, UK - **Poster presentation**

2. **R. De-Kayne**, O. Seehausen and P.G.D. Feulner. Investigating the genomic basis of adaptation and speciation in the Alpine whitefish radiation. *EAWAG Fish Ecology and Evolution symposium 2017.* Kastanienbaum, Switzerland - **Oral presentation**

1. **R. De-Kayne**, O. Seehausen and P.G.D. Feulner. The genomic basis of adaptation and speciation in the Swiss Alpine whitefish radiation. *Biology17 Conference.* Bern, Switzerland. **Poster presentation**

Personal skills:

- Bioinformatics programming: using R, Python and Bash.
- Lab experience: extensive molecular lab experience including RAD library preparation and extracting high molecular weight DNA for genome sequencing. Aquarium experience breeding and rearing salmonid larvae. Herbarium specimen preparation and organization.
- Fieldwork experience: biodiversity studies and species-specific collections in multiple habitats.

Outreach and science communication:

I founded and manage the PhDetails blog: http://phdetails.blogspot.com/ - featuring interviews with biology PhD students from around the world to promote the diversity of students in biology. Over 100 PhD students have been featured to date. I also write broader interest articles on the PhDetails blog and have contributed to The Molecular Ecologist Blog https://www.molecularecologist.com/.