

Curriculum Vitae

Yann Bourgeois

PhD in Ecology, Evolution and Genomics

Research topics and interests

My research focuses on how **selection and demography** act on **phenotypic** and **genomic variability** in wild populations. My PhD project dealt with the study of **melanic color polymorphism** at a fine scale in an island bird. I have also worked on **hybridization and speciation** in various lineages. During my first post-doc, I focused on the coevolutionary dynamics between an obligatory endoparasite, *Pasteuria ramosa*, and a crustacean, *Daphnia magna*. I generally use molecular methods to study **proximate causes** underlying differentiation, but I am also interested in the study of **ultimate causes**, linking environment to phenotypic variation.

Personal information

Nationality: French
Birth date: June 12 1987

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Academic cursus

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| 2016-to date | Post-doctoral researcher in Stéphane Boissinot's group in Abu Dhabi.
Genomic study of hybridization in toads and transposable elements dynamics in Vertebrates. |
| 2013-2016 | Post-doctoral researcher in Dieter Ebert's group in Basel, Switzerland. Study of the evolutionary dynamics of host-parasite interaction in <i>Daphnia magna</i> . |
| 2009-2013 | PhD student at University of Toulouse, France. Investigating the proximate causes of a color polymorphism in Réunion island, <i>Zosterops borbonicus</i> . |
| 2007-2009 | Master in Biosciences (M1, M2), Ecole Normale Supérieure de Lyon. I took courses in biophysics, evolution, development, virology, genomics, paleontology and physiology. |
| 2006-2007 | Admission by competitive examination to Ecole Normale Supérieure de Lyon, France. " Licence " in Molecular Biology (equivalent to Bsc). |

Grants

- April 2010 ATUPS program travel grant from Toulouse University (**1,500 CHF**). One month in **Hopi Hoekstra's laboratory**, Harvard, United States.
- 2010-2013 PhD supported by a grant from the **French Ministry of Higher Education and Research (50,000 CHF)**.
- 2006-2010 Master supported by a grant from the **French Ministry of Higher Education and Research (67,000 CHF)**.

Popular science

- 2010-2013 Writer for the journal Plume! (<http://www.plume.info>). Involvement in **various cultural events in Toulouse** (Novela, Fête de la Science, Nuit des chercheurs, Scientilivre).

Teaching and Supervision

- 2015-2019 Officially eligible to french « **Maître de conférences** » positions (equivalent to associate professor) in section 67 (**Population Biology & Ecology**) and in section 68 (**Organismal Biology**), as defined by the French National Board of the Universities (C.N.U.).
- 2014-2015 Basics in Population Genetics for bachelor students. 20 hours. Participation to BlockKurse at the **University of Basel**. Co-supervision of **four bachelor students** for a short research project.
- 2010-2012 Supervision of bachelor and master students. Co-supervision of an ornithology **module** (organized by Christophe Thébaud).
- 2009-2010 **Animal anatomy** and **Plant organization** practical classes for bachelor students. 18 hours.

Academic services

Reviewer for **Molecular Ecology**, **Molecular Ecology Resources**, **Global Change Biology**, **Biology Letters**, **Genetics and Molecular Biology**, the **Czech Science Foundation** and the **US-Israel Binational Science Foundation**.

Skills

Field experience

Fieldwork in **various climatic conditions**. Design and realization of a **census study** on *Zosterops borbonicus* populations in highlands from Réunion. **Capture, morphometric studies and tissue sampling** on protected animals (endemic birds from Mascarenes and Ethiopia, endangered sea turtles). Overall a total of **eight months** of research in the field. Diving: **CMAS level 1, PADI level 2**.

Animal manipulation certifications:

The CITI Basic Course in Laboratory Animal Welfare for Investigators, Staff and Students, Reducing Pain and Distress in Laboratory Mice and Rats, Working with Amphibians in Research Settings.

Laboratory skills

Methods in **molecular biology**: DNA and RNA extraction, PCR, cloning, restriction, primer design, work with precious samples. **Preparation of Next Generation Sequencing (NGS) libraries**. Awareness of techniques for target enrichment and resequencing.

Computer skills

Statistics (R), **chromatograms interpretation** (Sequencher, Geneious), **microsatellites preliminary analyses** (GeneMapper, Microchecker), **population genomics** (see www.methodspopgen.com), **phylogeny and datations** (MrBayes, BEAST, RAxML), **ABC estimation** (ms, fastsimcoal, package abc in R), **bioinformatics** (UNIX, regular expressions, shell scripts, classical tools in NGS such as bwa, LastZ, velvet, SAMTools). Analysis of **whole genome resequencing data**. **Niche modeling** (Maxent, RandomForest package in R, extraction of environmental data, ENMTools). **Densities estimation** (Distance), Office, Adobe C5.

Peer-reviewed publications

Accepted publications

- [19] **Bourgeois Y.X.C.***, Ruggiero R.P.*, Boissinot S. (2017). LINE insertion polymorphisms are abundant but at low frequencies across populations of *Anolis carolinensis*. **Frontiers in Genetics**.
- [18] Bento G., Routtu J., Fields P., **Bourgeois Y.X.C.**, Du Pasquier L., Ebert D. (2017). A complex genetic polymorphism underlies resistance to a pathogen in a planktonic crustacean. **PloS Genetics**.
- [17] **Bourgeois Y.X.C.***, Roulin A.*, Müller K., Ebert D. Association mapping and genome scan for selection suggest a major role of parasites in local adaptation of a planktonic crustacean (2017). **Evolution**.
- [16] **Bourgeois Y.X.C.**, Delahaie B., Gautier M., Lhuillier E., Malé P-J.G., Bertrand J.A.M., Cornuault J., Wakamatsu K., Bouchez O., Mould C., Bruaux J., Holota H., Milá B., Thébaud C. (2017). Previously undescribed locus on chromosome 1 underlies a melanic plumage polymorphism in a wild passerine bird. **Royal Society Open Science**.
- [15] Roulin A.C., **Bourgeois Y.X.C.**, Stiefel U., Walser J-C., Ebert D. (2016). A photoreceptor underlies natural variation in *Daphnia magna* diapause induction. **Molecular Biology and Evolution**.
- [14] **Bourgeois Y.X.C.**, Bertrand J.A.M., Delahaie B., Cornuault J., Duval T., Milá B., Thébaud C. (2016). Candidate gene analysis suggests untapped genetic complexity in melanin-based pigmentation in birds. **Journal of Heredity**.
- [13] Bertrand J.A.M.*, Delahaie B.*, **Bourgeois Y.X.C.**, Duval T., García-Jiménez R., Cornuault J., Pujol B., Thébaud C., Milá B. (2016). The role of natural selection and historical factors in driving population differentiation along an elevational gradient in an island passerine bird. **Journal of Evolutionary Biology**.
- [12] **Bourgeois Y.X.C.***, Bertrand J.A.M.*, Thébaud C. (2016). Point-count estimation of Réunion Grey White-eye population density for investigating a case of small spatial scale variation in a bird. **The Ostrich**.
- [11] Besnard G., Bertand J.A.M., Delahaie B., **Bourgeois Y.X.C.**, Lhuillier E., Thébaud C. (2016). Valuing museum specimens: high-throughput DNA sequencing on historical collections of New Guinea crowned pigeons (*Goura*). **Biological Journal of the Linnean Society**.
- [10] van de Crommenacker J., **Bourgeois Y.X.C.**, Warren B., Jackson H., Fleischer-Dogley F., Groombridge J., Bunbury N. (2015). Using molecular tools to guide management of invasive alien species: assessing recent hybridization in an introduced bird population. **Diversity and Distributions**.
- [9] Cornuault J., Delahaie B., Bertrand J.A.M., **Bourgeois Y.X.C.**, Milá B., Heeb P. & Thébaud C. (2015). Morphological and plumage colour variation in the Réunion Grey White-eye (*Aves: Zosterops borbonicus*): assessing the role of selection. **Biological Journal of the Linnean Society**.
- [8] Casquet J., **Bourgeois Y.X.C.**, Cruaud C., Gavory F., Gillespie R.G., Thébaud C. (2015). Community assembly on remote islands: a comparison of Hawaiian and Mascarene spiders. **Journal of Biogeography**.

[7] Bertrand J.A.M., **Bourgeois Y.X.C.**, Delahaie B., Duval T., García-Jiménez R., Cornuault J., Heeb P., Milá B., Pujol B., Thébaud C. (2014). Extremely reduced dispersal and gene flow in an island bird. **Heredity**.

[6] **Bourgeois Y.X.C.**, Lhuillier E., Cézard T., Bertrand J.A.M., Delahaie B., Cornuault J., Duval T., Bouchez O., Milá B., Thébaud C. (2013). Mass production of SNP markers in a non-model passerine bird through RAD sequencing and contig mapping to the zebra finch genome. **Molecular Ecology Resources**.

[5] **Bourgeois Y.X.C.** (2013). Génétique évolutive d'un cas extrême de polymorphisme de la coloration du plumage chez un oiseau insulaire, *Zosterops borbonicus* (Zosteropidae). **PhD thesis** from Paul Sabatier University, Toulouse.

[4] Cornuault J., Khimoun A., Harrigan R.J., **Bourgeois Y.X.C.**, Milá B., Thébaud C., Heeb P. (2013). Role of ecology in the geographical separation of blood parasites infecting an insular bird. **Journal of Biogeography**.

[3] **Bourgeois Y. X. C.**, Bertrand J.A.M., Thébaud C., Milá B. (2012). Investigating the role of the Melanocortin-1 receptor gene in an extreme case of microgeographical variation in the pattern of melanin-based plumage pigmentation. **PloS One**.

[2] Warren B.H., Bermingham E., **Bourgeois Y.**, Estep L.K., Prys-Jones R.P., Strasberg D., Thébaud C. (2012). Hybridization and barriers to gene flow in an islandbird radiation. **Evolution**.

[1] Bertrand J. A. M., García-Jiménez R., **Bourgeois Y.**, Duval T., Heeb P., Thébaud C., Milá B. (2012) Isolation and characterization of twelve polymorphic microsatellites loci for investigating an extreme case of microgeographical variation in an island bird (*Zosterops borbonicus*). **Conservation Genetics Resources**.

Manuscripts submitted or in preparation

Bourgeois Y.X.C. (2016). Going down the rabbit hole: a review on how to link genome-wide data with ecology and evolution in natural populations. preprint on [BioRxiv](https://doi.org/10.1101/058888). In revision for **Methods in Ecology and Evolution**.

Delahaie B., Cornuault J., Masson C., Bertrand J.A.M., **Bourgeois Y.X.C.**, Milá B. & Thébaud C. Narrow hybrid zones in spite of very low population differentiation in neutral markers in an island bird species complex. In revision for **Journal of Evolutionary Biology**.

Bourgeois Y.X.C., Bento G., Fields P., McTaggart S., Little T., Obbard D., Ebert D. Widespread balancing selection at a locus involved in resistance to parasitism. To be submitted to **Nature**.

* shared first authorship.

Popular science articles

Bertrand J., Delahaie B., **Bourgeois Y.**, Thébaud C. (2013). Comment naissent de nouvelles espèces? Le cas du zostérops gris de La Réunion. - How do new species arise? The case of Grey White-Eye on Réunion island. **L'Oiseau Magazine - french journal of ornithology.**

Bourgeois Y. (2012) Les parents lèguent plus que des gènes : l'héritabilité non-génétique. - Parents bequeath more than genes: the non-genetic heritability. **Plume! – popular science journal.**

Oral presentations

Bourgeois Y., Fields P., Bento G., Roulin A., McTaggart S., Little T., Obbard D., Ebert D. (2015). Increased diversity at a locus involved in resistance to parasitism in *Daphnia magna*. ESEB 2015, Lausanne.

Bento G., Routtu J., **Bourgeois Y.**, Ebert D. (2015). Genetics of natural variation of *Daphnia magna* resistance to a bacterial pathogen. ESEB 2015, Lausanne.

Ebert D., Routtu J., Bento G., **Bourgeois Y.** (2014). Mapping of a parasite resistant locus in the *Daphnia magna* genome. EMBO Conference on the Mighty Daphnia: Past, Present and Future. Birmingham.

Bourgeois Y.X.C. SNPs characterization by RAD-sequencing for studying color polymorphism in an island bird (2013). Journée d'échanges et de retours sur les développements technologiques de la plateforme génomique de Toulouse. **Presentation at the Toulouse genomic platform.**

Referees

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