

Pierre-André Eyer

POSTDOCTORAL RESEARCH ASSOCIATE IN EVOLUTIONARY BIOLOGY

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PROFESSIONAL APPOINTMENTS & EDUCATION

Feb. 2017-Now. Postdoctoral Research Associate (*Department of Entomology, Texas A&M University, College Station, Texas, U.S.A.*)

Comparative population genetics of invasive ant species

Advisor: Edward Vargo; Publications: *P9, P10, P11, P12, P14*

Oct. 2016-Feb. 2017. Post doctorate fellow, ATER (*École Pratique des Hautes Études -EPHE-, Biologie Integrative des Populations, Paris, France*)

Mating system and population structure of the desert ant *Cataglyphis cursor*

Advisor: Claudie Doums; Publication: *P13*

2014-2016. Post doctorate fellow (*Department of Zoology, The Georges S. Wise Faculty of Life Sciences, Tel Aviv University, Israel*)

Social structure and phylogeography of *Cataglyphis* desert ants

Advisor: Abraham Hefetz; Publications: *P5, P6, P7, P8*

2010-2014. Ph.D. thesis (*Evolutionary Biology and Ecology, Université Libre de Bruxelles, Belgium*)

Reproductive strategies and genetic diversity in *Cataglyphis* desert ants

Advisor: Serge Aron; Publications: *P2, P3, P4*

2010. Master thesis (*Evolutionary Biology and Ecology, Université Libre de Bruxelles, Belgium*)

Reproductive strategies of the ant *Cataglyphis velox*

Advisors: Serge Aron & Laurianne Leniaud; Publication: *P1*

2009. Master internship (*Evolutionary Biology and Ecology, Université Libre de Bruxelles, Belgium*)

Genetic diversity and relatedness in the common bat species *Pipistrellus pipistrellus*

Advisor: Serge Aron

2008-2010. Master degree in Ecology & Populations Biology (*University of Angers, France*)

2005-2008. Bachelor degree in Animal Biology (*University of Angers, France*)

PUBLICATIONS & PRESENTATIONS

Publications Accepted in Refereed Journals

P14. Aguero CM, **Eyer P-A**, Vargo EL (2020) Increased genetic diversity from colony merging in termites does not improve survival against a fungal pathogen. *Accepted in Scientific Reports*.

P13. Khimoun A, Doums C, Molet M, Kaufmann B, Peronnet R, **Eyer P-A**, Mona S (2020) Urbanization without isolation: the absence of genetic structure among cities and forests in the tiny acorn ant *Temnothorax nylanderii*. *Biology Letters*, 16.

P12. **Eyer P-A**, Espinoza EM, Blumenfeld AJ, Vargo EL (2019) The underdog invader: breeding system and colony genetic structure of the dark rover ant (*Brachymyrmex patagonicus* Mayr). *Ecology & Evolution*, 00: 1-13.

P11. **Eyer P-A**, Blumenfeld AJ, Vargo EL (2019) Sexually antagonistic selection promotes genetic divergence between males and females in an ant. *Proceedings of the National Academy of Sciences USA*, 201906568.

P10. **Eyer P-A**, McDowell B, Johnson LNL, Calcaterra LA, Fernandez, MB, Shoemaker DD, Puckett RT, Vargo EL (2018) Supercolonial structure of invasive populations of the tawny crazy ant *Nylanderia fulva* in the US. *BMC Evolutionary Biology*, 18, 209.

P9. **Eyer P-A**, Matsuura K, Vargo EL, Kobayashi K, Yashiro Y, Suehiro W, Himuro C, Yokoi T, Guénard B, Dunn RR, Tsuji K (2018) Inbreeding tolerance as a pre-adapted trait for invasion success in the invasive Needle ant *Brachyponera chinensis*. *Molecular Ecology*, 27, 4711-4724.

P8. **Eyer P-A**, Hefetz A (2018) Cytonuclear incongruences hamper species delimitation in the socially polymorphic desert ants of the *Cataglyphis albicans* group in Israel. *Journal of Evolutionary Biology*, 31, 1828-1842.

- P7. Saar M, **Eyer P-A**, Kilon-Kallner T, Hefetz A, Scharf I (2018) Within-colony genetic diversity differentially affects foraging, nest maintenance, and aggression in two species of harvester ants. *Scientific Reports*, 8, 13868.
- P6. **Eyer P-A**, Seltzer R, Reiner-Brodetzki T, Hefetz A (2017) An integrative approach to untangling species delimitation in the *Cataglyphis bicolor* desert ant complex in Israel. *Molecular Phylogenetic and Evolution*, 115, 128-139.
- P5. Iunesco A, **Eyer P-A** (2016) Notes on *Cataglyphis* Foerster, 1850 species belonging to the *bicolor* species-group in Israel; and a description of a new species. *Israeli Journal of Entomology*, 46, 109-131.
- P4. **Eyer P-A**, Leniaud L, Tinaut A, Aron S (2016) Combined hybridization and mitochondrial capture shape complex phylogeographic patterns in hybridogenetic *Cataglyphis* desert ants. *Molecular Phylogenetic and Evolution*, 105, 251-262.
- P3. Aron S, Darras D, **Eyer P-A**, Leniaud L, Percy P (2014) Colony genetic structure and breeding system in the ant *Cataglyphis viatica* (Fabricius, 1787). *Bull. Inst. Sci. Rab.*
- P2. **Eyer P-A**, Freyer J[#], Aron S (2013) Genetic polyethism in the polyandrous desert ant *Cataglyphis cursor*. *Behavioral Ecology* 24, 144-151. ^{#Supervised master student.}
- P1. **Eyer P-A**, Leniaud L, Darras H, Aron S (2013) Hybridogenesis through thelytokous parthenogenesis in two *Cataglyphis* desert ants. *Molecular Ecology* 22, 947-955.

Publications in Preparation

- Eyer P-A**, Boursier T[#], Khimoun A, d'Ettorre P, Fédérici P, Finand B, Leroy C, Chifflet-belle P, Mona S, Monin T, Doums C (*Revised for Heredity*) Micro-allopatric differentiation challenges species delimitation in the *Cataglyphis cursor* thermophilic ant complex. ^{#Supervised master student.}
- Eyer P-A**, Blumenfeld AJ, Vargo EL (*In prep*) Approximate Bayesian Computations and ddRadSeq unravel the global invasion history of the termite species *Reticulitermes flavipes*.
- Eyer P-A**, Aguero CM, Helms A, Vargo EL (*In prep*) Distinct royal pheromones in primary and secondary reproductives of the subterranean termite species *Reticulitermes flavipes*.
- Blumenfeld AJ, **Eyer P-A**, Vargo EL (*In prep*) The global invasion history of the highly destructive termite species *Coptotermes formosanus*.

Presentations Author presenting in bold

- Eyer P-A**, Blumenfeld AJ, Vargo E (2019) Sexually antagonistic selection: Genetic divergence between males and females maintains diversity in an ant. *Southeast Texas Evolutionary Genetics and Genomics Symposium, College Station, TX, USA.*
- Eyer P-A**, Vargo E (2018) Genetic differences between males and females in an ant highlight the reproductive system of the invasive Tawny Crazy ant *Nylanderia fulva*. *Entomological Society of America meeting, Vancouver, BC, Canada.*
- Eyer P-A**, Matsuura K, Vargo EL, Kobayashi K, Yashiro Y, Suehiro W, Himuro C, Yokoi T, Guénard B, Dunn RR, Tsuji K (2018-Poster) Inbreeding tolerance as a pre-adapted trait for invasion success in the invasive Needle ant *Brachyponera chinensis*. *International Meeting of the IUSI, Guarujá, Brazil.*
- Eyer P-A**, Matsuura K, Tsuji K, Vargo E (2017) Population genetics and colony breeding structure of the invasive ant *Brachyponera chinensis*. *Entomological Society of America meeting, Denver, CO, USA.*
- Eyer P-A**, Vargo E (2017) Impoverished genetic diversity and colony breeding structure in introduced populations of the invasive ant *Brachyponera chinensis*. *Ecology and Evolutionary Biology Lectures, College Station, TX, USA.*
- Eyer P-A**, Leniaud L, Aron S (2014) Social hybridogenesis shapes complex phylogeographic patterns in *Cataglyphis* desert ants. *International Meeting of the IUSI, Cairns, Australia.*
- Eyer P-A**, Leniaud L, Darras H, Aron S (2013) Hybridogenesis in *Cataglyphis* clonal ants. *27th Colloque de l'UIEIS, Villetaneuse, France.*
- Eyer P-A**, Aron S (2012) Genetically mediated division of labor in the polyandrous desert ant *Cataglyphis cursor*. *19th Benelux Congress of Zoology, Brussels, Belgium.*

Eyer P-A, Leniaud L, Darras H, Aron S (2012-Poster) Hybridogenesis through thelytokous parthenogenesis in two *Cataglyphis* desert ants. 5th European Meeting of the IUSSI, Montecatini Terme, Italy.

Eyer P-A, Freyer J, Aron S (2012) Genetic polyethism in the polyandrous desert ant *Cataglyphis cursor*. 5th European Meeting of the IUSSI, Montecatini Terme, Italy.

Invited Presentations

Eyer P-A (2020) Social structure and mating strategies of different invasive ant species. *Entomology Department Seminar, College Station, TX, USA*.

Eyer P-A, Aron S. (2016) Social hybridogenesis: the unorthodox mating system of the *Cataglyphis* desert ants. 8th International Congress of Zoology, Bucharest, Romania.

Co-authored Presentations

Aguero CM, Eyer P-A, Vargo E (2019) Group diversity alters social immunity in the subterranean termite *Reticulitermes flavipes*. *Entomological Society of America meeting, St Louis, MI, USA*.

Blumenfeld AJ, Eyer P-A, Vargo EL (2019) Colony structure of the odorous house ant *Tapinoma sessile*, a native urban invader. *Entomological Society of America meeting, Southwestern Branch Meeting, Tulsa, OK, USA*

Espinoza E, Eyer P-A, Vargo E (2018) The population and colony genetic structure of the dark rover ant, *Brachymyrmex patagonicus* Mayr. *Entomological Society of America meeting, Vancouver, BC, Canada*.

Eyer P-A, McDowell B, Johnson L, Calcaterra L, Shoemaker D, Puckett R, **Vargo E** (2017) Supercolonial structure in the invasive population of the tawny crazy ant *Nylanderia fulva*. *Entomological Society of America meeting, Denver, CO, USA*.

Eyer P-A, Reiner T, **Hefetz A** (2016) Social polymorphism or cryptic speciation in the desert ant *Cataglyphis*. 6th European Meeting of the IUSSI, Helsinki, Finland.

Darras H, Leniaud L, Eyer P-A, Aron S (2012) Social hybridogenesis in clonal ants of the *Cataglyphis altisquamis* group. 19th Benelux Congress of Zoology, Brussels, Belgium.

GRANTS & AWARDS

2019 – Southeast Texas Evolutionary Genetics and Genomics Collaborative grant - 16,000\$

2015 – David Furth Fellowship for systematic Entomology – 2,000\$

2014 – The Georges S. Wise Science Post-Doctoral Fellowship, Dept. of Zoology

TEACHING

Practical exercises for Population Genetics (*Université Libre de Bruxelles, Belgium*; Bachelor degree).

Introduction to Population Genetics (*EPHE, Paris, France*; Master degree).

Lab instructor for Chemical Ecology (Texas A&M University, TX, USA; Graduate Students)

LABORATORY, ANALYTICAL & STATISTICAL SKILLS

Field sampling & rearing of ant and termite colonies

(Termite Course 2019, Ft Lauderdale, FL, USA).

Genetic analyses: DNA extraction & sequencing: microsatellite, mitochondrial & nuclear markers

Populations genetic structure & phylogeographic analyses (e.g., Parental offspring inferences; *F*-statistics estimation; Structure, isolation-by-distance & AMOVA analyses).

Phylogenetic analyses (Phylogenetic reconstruction & Species delimitation models).

Chemical analyses: Hydrocarbon extraction and peak integration

Statistical analyses with R software

Parasite preparation (i.e., *Metarhizium anisoplae* fungus culture & solution preparation) & ant infection.

SERVICE

Reviewer: Peer-reviewed Journals

Article reviewer for *Biological Journal of the Linnean Society*, *Biological Invasion*, *Frontiers in Ecology & Evolution*, *Heredity*, *Insect Conservation and Diversity*, *Insect Science*, *Insectes Sociaux*, *Journal of*

Economic Entomology, Molecular Ecology, Molecular Phylogenetics and Evolution, Myrmecological News, Zoological Journal of the Linnean Society.

Reviewer: Grant Agencies

Project expertise for grant funding for *ECOS-Nord* comity (French Ministry).

Student Advising

Honored Undergraduate Student (Salin J, 2018-2019) Royal pheromone in *Reticulitermes* termites
Master thesis (Boursier T, 2016-2017) Population genetics and phylogeography of *Cataglyphis cursor*
Bachelor degree (Caulat L, Laymand E, 2016) Imbreeding & thelytokous parthenogenesis in *C. cursor*
Master thesis (Guery P-A, 2013-2014) Genetic diversity and pathogens resistance in *Cataglyphis* ants
Bachelor degree (Avet M, 2013) Paternal origins and pathogens resistance in *Cataglyphis* desert ants
Master thesis (Freyer J, 2011-2012) Genetic polyethism in the polyandrous desert ant *C. cursor*

Institutional Service

Seminar organizer (2012-2014) for the *Evolutionary Ecology & Evolution* group in Brussels University.

Community Service & Outreach

Invited by the French Embassy in Romania for a 2hours class at high school (2016 – Anna de Noailles, School of Bucharest): '*Genetic as a tool to study Ecology and Evolution*'.

MEMBERSHIPS

Member of the International Union for the Study of Social Insects, French Section (UIEIS)
Member of the International Union for the Study of Social Insects, North American Section (IUSSI-NAS)
Member of the Entomological Society of America (ESA)