**1.1 Personal details**

Ellyn Valery BITUME

Born October 9th, 1983 in New Jersey USA

American nationality

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**1.2 Current position**

**Post-doctoral fellow**

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Team webpage: <http://www.hufbauerlab.org/>

**1.3 Academic degrees**

**2012: PhD** in Ecology and Evolutionary Biology, Ecology and Evolutionary Genetics group, Earth and Life Institute, Universite catholique de Louvain-la-Neuve, Belgium. Public thesis defense December 6th, 2012.

**2008: Master Degree** in Ecology and Evolutionary Biology, Leiden University, the Netherlands, with honors.

**2006: Bachelor Degree** in Ecology, Population, and Organismic Biology, University of Colorado-Boulder, USA

**2001: High-school diploma**, Livingston High School, New Jersey, USA

**1.4 Research grants and contracts**

**2015 – Present: NIFA USDA Fellowship,** 2 years

Host Institution: Colorado State University

Funding agency: National Institute of Food and Agriculture (NIFA-USDA)

**2012-2013 : Research contract**, 1 year

Host Institution: Universite catholique de Louvain-la-Neuve

Funding agency: ARC Project

**2008-2012: Research contract**, 4 years.

Host institution: Universite Montpellier II; Univeriste catholique de Louvain-la-Neuve

Funding agency: FRIA-FNRS, 5 rue Egmont, Brussels, Belgium

Involved in project writing and handled two interviews

**2009: Short visit grant**

Host institution: University of Helsinki, Dr. Illka Hanski

Funding agency: ESF

**2005: Traveling grant** for field work in Oregon.

Host institution: Portland University

Funding agency: Leiden University

**1.5 Research experience**

**2015 – Present: Post-doctoral research**in evolutionary ecology

Host institution: Colorado State University, Fort Collins, CO USA

Supervisor: Professor Ruth Hufbauer

Project: Investigating rapid evolution and genetic diversity in an introduced biological control agent (*Diorhabda spp)*

Summary: By collecting beetles along a north-south latitudinal gradient and comparing their genetic composition to those in the native range, we hope to answer questions about local adaptation and the effects of genetic variation on establishment and success in a biological control agent. We are also looking at the rate of hybridization between species of introduced beetles and examining the effect of hybridization on fitness, efficacy, and host-shifting. We plan to use genotype-by-sequencing to look for genes in the introduced populations that have undergone selection.

**2012-2013: Post-doctoral research** in evolutionary biology

Host institution: Universite Montpellier II, Montpellier, France; Universite catholique de Louvain-la-Neuve, Louvain-la-Neuve, Belgium

Supervisor: Dr. Caroline Nieberding (Universite catholique de Louvain-la-Neuve)

Project:Artificial selection on plasticity in dispersal distance in response to density in the two-spotted spider mite

Summary: My main project is to perform artificial selection on plasticity in dispersal distances in response to density, also using the two-spotted spider mite. By performing selection, we can get an idea of the adaptive significance of plastic traits in different environmental conditions, and also understand the relative contribution of phenotypic plasticity and genetic variability in the production of adaptive phenotypes.

**2008-2012: PhD Thesis** in Ecology and Evolutionary Biology

Host institution: Universite Montpellier II, Montpellier, France; Universite catholique de Louvain-la-Neuve, Louvain-la-Neuve, Belgium

Supervisor: Dr. Caroline Nieberding (Universite catholique de Louvain-la-Neuve)

Co-supervisor: Dr. Isabelle Olivieri (Universite Montpellier II)

Project: Genetic and environmental contributions to dispersal distance in the two-spotted spider mite *Tetranychus urticae*.

Summary: Dispersal, the movement of individuals leading to gene flow, is a life-history trait found in virtually all organisms. This thesis attempts to distinguish genetic mechanisms of dispersal distance and to quantify plastic responses to different environmental and individual conditions. First, two different methods of artificial selection were performed: one experiment on emigration and another on dispersal distance. While unable to produce differently dispersing lines in either of these experiments, the results revealed the importance of phenotypic plasticity in the expression of this trait. Further experiments revealed that increases in density and genetic relatedness also increased dispersal distance in spider-mites. We also found that maternal density can influence the dispersal distance of her offspring and grand-offspring.

**2006-2008: Master degree** in Ecology and Evolutionary Biology

Host institution: Leiden University

Supervisor (1): Suzanne Lommen

Project: Mating behavior in wingless lady-bird beetles, *Adalia bipunctata*

Summary: A population of naturally genetically wingless lady-bird beetles was reared in the laboratory at Leiden University. The wingless form of *A. bipunctata* has potential as a biological control agent because of its increased efficacy. However, it is important to know how about the mating potential of these beetles to better predict any negative consequences of releasing them in to the field. We found that that structure of the wings, the elytra, is an essential cue for mating. Thus, it is highly unlikely that numerous matings with wingless beetles would occur, and concluded that releasing wingless beetles into the field would have negligible consequences.

Supervisor (2): Klaas Vrieling

Project: Potential host-shifting in the cinnabar moth, *Tyria jacobaeae*, a biological control agent

Summary: In the 1960’s *T. jacobaeae* was released in the northwestern United States as a biological control agent expected to target the invasive ragwort plant, *Jacobaea vulgaris*. However, between 1999 and 2005, there were reported observations that *T. jacobaeae* had shifted to a non-target host plant *Senecio triangularis*. After performing choice experiments, we found that all populations, regardless of the host-plant they were reared on, preferred ragwort to *S. triangularis*. Thus, we found no evidence for a genetically based host-shift. However, populations feeding on ragwort were highly parasitized, while those feeding on *S. triangularis* were not. More sampling is needed, but we concluded that we found preliminary evidence for enemy-free space driving the shift of host plant from ragwort to *S. triangularis*.

**1.6 Further scientific training**

**2010: R Statistical Modeling Course.** Focus on generalized linear modeling in R. Taught by Prof. M.J. Crawley, Silwood Park, UK. 3 weeks, February 2010

**2013: North American Invasive Plant Short Course (NAISPC)**: Week-long field and web course on the problems facing Rangeland Ecologists and Land Managers.

**1.7 Scientific skills**

**Behavioral Biology, Ecology, and Evolution**

Mate choice experiments in laboratory (lady-bird beetles)

Host-choice experiments (cinnabar moths, spider-mites)

Long-term artificial selection experiments (spider-mites)

Quantification of dispersal distances (spider-mites)

Lab behavioral data observation, collection, and analysis

Lab breeding stock management (lady-bird beetles, aphids, cinnabar moths, spider-mites)

**Physiology and Genetics**

Analysis of various life-history traits (cinnabar moths, spider-mites)

Heritability calculations

GC analysis (lady-bird beetles)

PCA, microsatellite analysis (spider-mites)

**Statistics**

Factorial analyses, ANOVA, Generalized linear modeling (with fixed and/or random effects), time-series analysis, parametric and non-parametric tests

**Regular and/or extensive software practice**

Statistics: R

Genetics: Genetix

Office automation: Word, Excel, Powerpoint

**1.8 Principal scientific collaborators** (past\* and present, in alphabetical order)

**1.8.1 Collaboration on rapid evolution in a biological control agent**

**Dr. Dan Bean**

Colorado Department of Agriculture, Palisade, Colorado

**Dr. James Tracy**

Texas A&M University, College Station, Texas

**Dr. Zeynep Ozsoy**

Colorado Mesa University, Grand Junction, Colorado

**1.8.2 Collaboration on dispersal and maternal effects**

**Dr. Dries Bonte**

Terrestrial Ecology Unit, Gent University, Gent, Belgium

**Dr. Sara Magalhães\***

Centre for Environmental Biology, Lisbon, Portugal

**Dr. Ophelie Ronce**

University of Montpellier II, Montpellier, France

**Dr. Gilles San-Martin**

University Louvain-la-neuve, Belgium

**1.8.3 Collaboration on host-shifting in a biological control agent**

**Eric Coombs**

Oregon Department of Agriculture, Oregon, USA

**Dr. Peter McEvoy**

Department of Botany and Plant Pathology, Oregon State University, Oregon, USA

**Dr. Urs Shaffner\***

CABI Europe-Switzerland

**1.9 Scientific (co-) supervision**

**2011: Meritan Zeqiri MSC1 (Masters project)**

6-month project: Dispersal personalities in *Tetranychus urticae*

**1.10 Further information**

**Languages**

**English:** Native

**French:** Intermediate working level

**Spanish:** Beginner

**Dutch:** Beginner

**Miscellaneous**

Driving License

Regular sports: Yoga, biking, hiking, swimming, long distance walking, community gardening

Business and pleasure trips to the UK, Germany, Finland, Sweden, Switzerland, Italy, Spain, Brazil, Mexico, Thailand, Laos, Cambodia and 33 states in the US

**2.1 Publications**

**Publications in peer-reviewed international journals with impact factors**

P4. **Bitume, E.V.,** Bonte, D., Ronce, O., Olivieri, I., Nieberding, CM (2014). Dispersal distance is influenced by parental and grand-parental density. **Proceedings of the Royal Society B – Biological Science, 281 (1790)** (IF: 5.683)

P3. Attia, S., Grissa, K., Lognay, G., **Bitume, E.V.,** Hance, T., Mailleux, A.C. (2013). A review of the major biological approaches to control the worldwide pest Tetranychus urticae (Acari: Tetranychidae) with special reference to natural pesticides. **Journal of Pest Science**, 86 (3), 361-386 (IF 1.51)

P2. **Bitume, E.V.**, Bonte, D., Ronce, O., Bach, F., Flaven, E., Olivieri, I., Nieberding, CM (2013). Density and genetic relatedness increase dispersal distance in a subsocial organism. **Ecology Letters***,* 16 (4), 430-437(Impact factor: 17.949)

P1. **Bitume, E.V.**, Bonte D., Magalhaes S., Van Dongen, S., San Martin, G., Olivieri I., Nieberding, CM (2011) Heritability and artificial selection on ambulatory dispersal distance in *Tetranychus urticae*: effects of density and maternal effects. **PLoS One** (Impact factor: 4.092)

**2.2 Research promotion**

**2.2.1 Contribution to international scientific meetings – Talks and posters**

C9 **Bitume, E.V.**, Bonte, D., Ronce, O., Olivieri, I., Nieberding, CM – Density and genetic relatedness increase dispersal distance in a subsocial species. Dispersal meeting, Moulis, France, October 2012. **Talk**

C8 **Bitume, E.V.**, Bonte, D., Ronce, O., Olivieri, I., Nieberding, CM – Maternal effects on dispersal distance. Dispersal meeting, Moulis, France, October 2012. **Talk**

C7 **Bitume, E.V.**, Bonte, D., Ronce, O., Olivieri, I., Nieberding, CM – Density and genetic relatedness increase dispersal distance in a subsocial species. Ecological Society of America, Portland, Oregon, August 2012. **Talk**

C6 **Bitume, E.V.**, Olivieri, I., Hance, T., Bonte, D., Nieberding, C. - Effects of density and genetic relatedness on the dispersal kernel in Tetranychus urticae. XII European Ecological Federation Congress. Avila, Spain, September 2011. **Talk**

C5 **Bitume, E.V.**, Bonte, D., Magalhaes, S., Olivieri, I., & C. Nieberding - Heritability and artificial selection on ambulatory dispersal in Tetranychus urticae. Ecology & Behaviour meeting, Rennes, France, May 2011. **Talk**

C4 **Bitume, E.V.**, Bonte, D., Magalhaes, S., Olivieri, I., & C. Nieberding - Heritability and artificial selection on ambulatory dispersal in Tetranychus urticae. Symposium: Mite Behavior and Biology. XIII International Congress of Acarology. Recife, Brazil, August 2010. **Talk**

C3 **Bitume, E.V.**, Olivieri, I., Nieberding, C. - Environmental effects of dispersal evolution in *Tetranychus urticae*. Symposium: Evolution of dispersal. *Organisms on the move – On the ecology and evolution of dispersal*. Ghent, Belgium, September 2009. **Poster**

C2 **Bitume, E.**, Olivieri, I., Nieberding, C. - Local adaptation via host specialization and dispersal evolution. Symposium: Frontiers in speciation research: proximal and causal mechanisms of behavioural divergence. *European Society of Evolutionary Biology*,Torino, Italy, August 2009. **Poster**

C1 **Bitume, E.**, and Lommen, S. – Mating behavior in wingless lady-bird beetles. Nederlands Entomologen dagen, Wageningen, Netherlands, December 2008. **Talk**

**2.2.2 Service to the international scientific community – Reviewer activities**

3 for **PLoS ONE** (2011 IF: 4.092)

3 for **Oikos** (2011 IF: 3.061)

2 for **Journal of Evolutionary Biology**

1 for **Biological Journal of the Linnean Society** (2011 IF: 2.193)

1 for **Population Ecology** (2011 IF: 2.54)

**Prof. Isabelle Olivieri**

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