

# Matthew E. Wolak

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## PROFESSIONAL EXPERIENCE

- 2013- **Postdoctoral Research Fellow in Evolutionary Quantitative Genetics:** University of Aberdeen  
Advisor: Prof. Jane Reid  
Project: Quantitative genetics of polyandry, inbreeding, and fitness in wild song sparrows

## EDUCATION

- 2013 **University of California, Riverside:** PhD Evolution, Ecology, and Organismal Biology  
Advisor: Prof. Daphne Fairbairn  
Dissertation: The Quantitative Genetics of Sexual Differences: New Methodologies and an Empirical Investigation of Sex-Linked, Sex-Specific, Non-Additive, and Epigenetic Effects
- 2007 **College of William and Mary:** BSc Environmental Science (with honors) and Biology (double major)  
Advisor: Prof. Randy Chambers  
Thesis: Ecology and Status of the Northern Diamondback Terrapin (*Malaclemys terrapin terrapin*) of the Lower Chesapeake Bay

## ACADEMIC HONORS AND FELLOWSHIPS

- 2012 University of California Riverside, Graduate Dean's Dissertation Year Program Fellowship  
2010 University of California Riverside, Outstanding Evolution, Ecology, and Organismal Biology Program Service Award  
2008 National Science Foundation Graduate Research Fellowship  
2007 University of California Riverside Chancellor's Distinguished Fellowship

## RESEARCH GRANTS AND AWARDS

- 2012 Genetics Society of America, DeLill Nasser Career Development Travel Award (\$1,000)  
2011 University of California Riverside, Department of Biology Newell Award (\$800)  
2011 American Society of Naturalists Travel Award (\$500)  
2011 National Science Foundation Doctoral Dissertation Improvement Grant (\$14,545)  
2010 University of California Riverside Graduate Dean's Dissertation Research Grant (\$800)  
2010 University of California Riverside, Department of Biology Newell Award (\$250)  
2006 National Science Foundation University Biomath Initiative Research Grant (\$3500)  
2005 National Science Foundation University Biomath Initiative Research Grant (\$3000)

## PUBLICATIONS

17. **Wolak, ME & Reid, JM** (*accepted*) Accounting for genetic differences among unknown parents in microevolutionary studies: How to include genetic groups in quantitative genetic animal models. *Journal of Animal Ecology*.

16. Charmantier A, **ME Wolak**, A Grégoire, A Fargevieille, & C Doutrelant (2016) Colour ornamentation in the blue tit: quantitative genetic (co)variances across sexes. *Heredity*. DOI: 10.1038/hdy.2016.70.
15. Germain RR, **ME Wolak**, P Arcese, S Losdat, & JM Reid (2016) Direct and indirect genetic and fine-scale location effects on breeding date in song sparrows. *Journal of Animal Ecology*. DOI: 10.1111/1365-2656.12575.
14. Reid JM, G Bocedi, P Nietlisbach, AB Duthie, **ME Wolak**, EA Gow, & P Arcese (2016) Variation in parent-offspring kinship in socially monogamous systems with extra-pair reproduction and inbreeding. *Evolution* 70:1512-1529. DOI: 10.1111/evo.12953.
13. **Wolak ME** & JM Reid (2016) Is pairing with a relative heritable? Estimating female and male genetic contributions to the degree of biparental inbreeding in song sparrows (*Melospiza melodia*). *American Naturalist* 187:736-752. DOI: 10.1086/686198.  
     [Press release: The 'nature vs. nurture' of incest] (<http://www.amnat.org/an/newpapers/JuneWolak.html>)
12. Reid JM, P Arcese, G Bocedi, AB Duthie, **ME Wolak**, & LF Keller (2015) Resolving the conundrum of inbreeding depression but no inbreeding avoidance: estimating sex-specific selection on inbreeding by song sparrows (*Melospiza melodia*). *Evolution* 69:2846-2861. DOI: 10.1111/evo.12780.
11. Careau V, **ME Wolak**, PA Carter, & T Garland Jr (2015) Evolution of the additive genetic variance-covariance matrix under continuous directional selection on a complex behavioural phenotype. *Proceedings of the Royal Society of London B* 282:20151119. DOI: 10.1098/rspb.2015.1119.
10. Reid JM, AB Duthie, **ME Wolak**, & P Arcese (2015) Demographic mechanisms of inbreeding adjustment through extra-pair reproduction. *Journal of Animal Ecology* 84:1029-1040. DOI: 10.1111/1365-2656.12340.
9. Hoeck PEA, **ME Wolak**, RA Switzer, CM Kuehler, & AA Lieberman (2015) Effects of inbreeding and parental incubation on captive breeding success in Hawaiian crows. *Biological Conservation* 184:357-364. DOI: 10.1016/j.biocon.2015.02.011.
8. **Wolak ME**, DA Roff, & DJ Fairbairn (2015) Are we underestimating the genetic variances of dimorphic traits? *Ecology and Evolution* 5:590-597. DOI: 10.1002/ece3.1361.
7. Reid JM, P Arcese, LF Keller, RR Germain, AB Duthie, S Losdat, **ME Wolak**, & P Nietlisbach (2015) Quantifying inbreeding avoidance through extra-pair reproduction. *Evolution* 69:59-74. DOI: 10.1111/evo.12557.
6. **Wolak ME** & LF Keller (2014) Dominance genetic variance and inbreeding in natural populations. In *Quantitative Genetics in the Wild*, A Charmantier, LEB Kruuk, & D Garant eds. Oxford University Press, pp.104-127.
5. Careau V, **ME Wolak**, PA Carter, & T Garland Jr (2013) Limits to behavioral evolution: the quantitative genetics of a complex trait under directional selection. *Evolution* 67:3102-3119. DOI: 10.1111/evo.12200.
4. **Wolak ME** (2012) nadiv: an R package to create relatedness matrices for estimating non-additive genetic variances in animal models. *Methods in Ecology and Evolution* 3:792-796. DOI: 10.1111/j.2041-210X.2012.00213.x
3. **Wolak ME**, DJ Fairbairn, & YP Paulsen (2012) Guidelines for Estimating Repeatability. *Methods in Ecology and Evolution* 3:129-137. DOI: 10.1111/j.2041-210X.2011.00125.x
2. **Wolak ME**, GW Gilchrist, VA Ruzicka, DM Nally & RM Chambers (2010) A contemporary, sex- limited change in body size of an estuarine turtle in response to commercial fishing. *Conservation Biology* 24:1268-1277. DOI: 10.1111/j.1523-1739.2010.01469.x  
     Cover Photo selected for our article
1. **Wolak ME** (2008) Rensch's rule applies to clinal variation of body size in the Argentine grasshopper *Dichroplus pratensis*: correction of Bidau & Martí. *Annals of the Entomological Society of America* 101:801. DOI: 10.1093/aesa/101.5.801

## SOFTWARE

2. nadiv: (Non)Additive Genetic Relatedness Matrices. R package.  
CRAN - <https://CRAN.R-project.org/package=nadiv>  
GitHub - <https://github.com/matthewwolak/nadiv>
1. ICC: Facilitating Estimation of the Intraclass Correlation Coefficient. R package.  
CRAN - <https://CRAN.R-project.org/package=ICC>  
GitHub - <https://github.com/matthewwolak/ICC>

## SUBMITTED MANUSCRIPTS OR TO BE RE-SUBMITTED

1. **Wolak ME**, DA Roff, & DJ Fairbairn (*in revision*) The contribution of sex chromosomal additive genetic (co)variation to the phenotypic resemblance between relatives under alternative models of dosage compensation.
2. **Wolak ME**, AJ Wilson, LEB Kruuk, DA Roff, & DJ Fairbairn (*in revision*) Sex chromosome linked genetic variation affects estimates of additive genetic (co)variation.
3. **Wolak ME** & DJ Fairbairn (*in revision*) Intersexual differences in epistasis covary with sexual dimorphism: genetic architecture of population crosses in *Aquarius remigis*.
4. Roff DA, **ME Wolak**, LA Correa, & M Soto-Gamboa (*in review*) The phenotypic correlates and quantitative genetics of masculinization in the rodent, *Octodon degus*. *Heredity*.

## INVITED TALKS

- 2014 The quantitative genetics of morphological adaptations and sexual dimorphism in California water striders. Ecology Seminar Series. University of Aberdeen, Scotland, UK
- 2012 X-linked Additive Genetic Variation. Wild Evolution Group Seminar. University of Edinburgh, Scotland, UK

## CONFERENCE PRESENTATIONS

- 2016 Fitness variation in a wild song sparrow (*Melospiza melodia*) population: Quantitative genetic analyses of fitness components. Oral Presentation, Annual Evolution Meeting. Austin, TX, USA.
- 2015 Inherited Inbreeding: Evidence of sex-specific, additive genetic variances in the degree of inbreeding. Oral Presentation, Congress of the European Society for Evolutionary Biology. Lausanne, Switzerland.
- 2014 Is the relatedness between social mates heritable in song sparrows? Oral Presentation, Wild Animal Model Biennial Meeting. Pitlochry, Scotland, UK.
- 2014 Quantitative genetic analyses of inbreeding decisions in the wild. Oral Presentation, Evolution of Mating Systems Workshop. Konnevesi, Finland.
- 2012 X-linked Additive Variance Reduces the Between-Sex Genetic Correlation. Oral Presentation, 1<sup>st</sup> Joint Congress on Evolutionary Biology. Ottawa, Canada.
- 2012 X-linked additive variance reduces the between sex genetic correlation. Poster Presentation, 4<sup>th</sup> International Conference on Quantitative Genetics. Edinburgh, Scotland, UK.
- 2011 Computing the dominance relatedness matrix to estimate dominance variance. Oral Presentation, Wild Animal Model Biennial Meeting. Galleria, Corsica, France.
- 2011 Quantifying the genetic architecture of sexually dimorphic traits from population line crosses of the water strider, *Aquarius remigis*. Oral Presentation, Annual Evolution Meeting. Norman, OK, USA.
- 2010 Rules of thumb for estimating repeatability. Oral Presentation, 4<sup>th</sup> Annual Western Evolutionary Biology Meeting. Irvine, CA, USA.
- 2010 Is there a rule of thumb for estimating repeatability? The effect of variance structure, number of measurements per individual, and number of individuals measured. Poster Presentation, Annual Evolution Meeting. Portland, OR, USA.

- 2010 Evolutionary genetics in metapopulations: elucidating the importance of non-additive genetic effects in population hybrids. Oral Presentation, UC Riverside Evolution, Ecology, and Organismal Biology Gradfest. Riverside, CA, USA.
- 2008 Selection shifts female body size and growth rate in the diamondback terrapin (*Malaclemys terrapin*). Oral Presentation, UC Riverside Evolution, Ecology, and Organismal Biology Gradfest. Riverside, CA, USA.
- 2006 Crab Pot Mortality Exerts a Selection Pressure On a Diamondback Terrapin Population. Oral Presentation, Atlantic Estuarine Research Society Meeting. Baltimore, MD, USA.

## **TEACHING**

### **Guest Lecturer**

#### University of Aberdeen, School of Biological Sciences:

- Life History Evolution (BI3809): Create and deliver the lecture “Introduction to Quantitative Genetics: part 2” (2016)
- Life History Evolution (BI3809): Co-deliver and co-deliver the directed learning exercise in R “Introduction to Quantitative Genetics” (2016)

### **Teaching Assistant**

#### University of California Riverside, Department of Biology:

- Evolution (BIOL105), 2 quarters
- Evolutionary Ecology of Terrestrial Vertebrates (BIOL163), 1 quarter assistant
- Introductory Organismal Biology (BIOL5B), 1 quarter

### **Science Mentor**

Journal of Emerging Investigators: Since 2015 I have provided constructive feedback and served as a reviewer for 4 scientific papers written by 16 middle and high school students.

#### University of California Riverside:

- Mentor to 27 undergraduate students conducting work in the water strider laboratory (22 students from underrepresented minority populations in STEM and an equal gender balance), where 4 of these students worked directly with me for course credit.
- Mentor to one student conducting a science fair project through the NASA–UCR–Riverside Unified School District Climate Science Mentor program (2011–2012)

## **PROFESSIONAL SERVICE**

Manuscript review: Proceedings of the Royal Society B (1x), Evolution (3x), Molecular Ecology (2x), Heredity (2x), Biological Journal of the Linnean Society (2x), PloS One (1x), Evolutionary Biology (1x), Australian and New Zealand Journal of Statistics (1x), Psyche (1x).

University of Aberdeen: Co-organizer of 2014 Wild Animal Model Biennial Meeting in Pitlochry, Scotland.

University of California Riverside: EEOB Graduate Student Association Teaching and Program Committee Representative (2012–2013), Moderator of Biology Graduate Student E-mail Listserver (2011–2013). EEOB Graduate Student Association President (2010–2011), Co-organizer of EEOB seminar series (2008).