Curriculum Vitae (November 2011)
Jesse E. Taylor

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Education

2003	Ph.D. (Ecology and Evolutionary Biology), University of Arizona. Advisor: Bruce Walsh
1998	M.S. (Applied Mathematics), University of Arizona.
1992	B.A. (Mathematics; Chemistry), Western Maryland College.

Professional Positions

- 2010-present: Key faculty member, Center for Evolutionary Medicine and Informatics, BioDesign Institute, Arizona State University.
- 2009-present: Assistant Professor, School of Mathematical and Statistical Sciences, Arizona State University.
- 2005-2009: Postdoctoral Research Fellow, Department of Statistics, Oxford University.
- 2003-2005: Postdoctoral Research Fellow, Institute of Cell, Animal and Population Biology, Edinburgh University.
- 2000-2002: Graduate Research Assistant, Theoretical Biology and Biophysics Group, Los Alamos National Laboratory.
- 1995-1996: Research Assistant, Frederick Cancer Research and Development Center (NCI).
- 1995: Lecturer, Department of Mathematics, University of Sarajevo, Sarajevo, Bosnia and Hercegovina.
- 1994: Field Assistant, World Health Organization (WHO) Food Security Monitoring Team, Sarajevo, Bosnia and Hercegovina.
- 1994-1995: Volunteer, Project Bosnia and Bosnian Institute for Public Health (Zavod za zdravstvenu zaštitu), Sarajevo, Bosnia and Hercegovina.

Research Interests: Theoretical Population Genetics; Coalescent Theory; Antigenic Variation; Evolution in Fluctuating Environments.

Professional Societies: American Mathematical Society (AMS), American Society of Parasitologists (ASP), Genetics Society of America (GSA), Society for Mathematical Biology (SMB), Society for the Study of Evolution (SSE).

Funding

National Institutes of Health (NIH 020844-001): "A Global Comparative Study of the Evolution of Antimalarial Drug Resistance", 2011, Co-investigator with Ananias Escalante (PI).

National Institutes of Health (NIH 021748-001): "Evolution of Plasmodium vivax and Asian macaque malarias", 2011, Co-investigator with Ananias Escalante (PI).

Engineering and Physical Sciences Research Council (EPSRC EP/E010989/1): "Modeling Adaptation and Evolution in Persistent Parasites", 2007-2009, PDRA with Alison Etheridge (PI).

Refereed Papers

1. Stanne, T. M., Kushwaha, M., Wand, M., Taylor, J. E., and Rudenko, G. (2011) TbISWI regulates multiple Pol I transcribed loci and is present at Pol II transcription boundaries in *Trypanosoma brucei*. *Eukaryotic Cell* **10**: 964-976.
2. Tang, W., Taylor, J. E., and Mahalov, A. (2010) Lagrangian dynamics in stochastic inertia-gravity waves. *Physics of Fluids* **22**: 126601.
3. Hutzenthaler, M. and Taylor, J. E. (2010) Time Reversal of Some Stationary Jump Diffusion Processes from Population Genetics. *Adv. Appl. Prob.* **42**: 1-25.
4. Etheridge, A. M., Griffiths, R. C. and Taylor, J. E. (2010) A coalescent dual process in a Moran model with genic selection, and the lambda coalescent limit. *Theor. Pop. Biol.* **78**: 77-92.
5. Taylor, J. E. (2009) The Genealogical Consequences of Fecundity Variance Polymorphism. *Genetics* **182**: 813-837.
6. Taylor, J. E. and Véber, A. (2009) Coalescent Processes in Subdivided Populations Subject to Recurrent Mass Extinctions. *Elec. J. Prob.* **14**: 242-288.
7. Hertz-Fowler, C. *et al.* (2008) Telomeric Expression Sites Are Highly Conserved in *Trypanosoma brucei*. *PLOS One* **3**:e3527.
8. Didelot, X., Taylor, J. E. and Watkins, J. C. (2008) A duality identity between a model of bacterial recombination and the Wright-Fisher diffusion. *Markov Proc. Rel. Topics: A Festschrift for Thomas G. Kurtz* **4**: 315-324.
9. Taylor, J. E. (2008) Environmental variation, fluctuating selection and genetic drift in subdivided populations. *Theor. Pop. Biol.* **74**: 233-250.
10. Young, R., Taylor, J. E., Kurioka, A., Becker, M., Louis, E. J., and Rudenko, G. (2008) Isolation and analysis of the genetic diversity of repertoires of VSG expression site containing telomeres from *Trypanosoma brucei gambiense*, *T. b. brucei* and *T. equiperdum*. *BMC Genomics* **9**: 385.
11. Salazar, C., Jiggins, C. D., Taylor, J. E., Kronforst, M. J., and Linares, M. (2008) Hybrid speciation and the genealogical history of *Heliconius heurippa*. *BMC Evol. Biol.* **8**: 132.
12. Rong, R. *et al.* (2007) Unique mutational patterns in the envelope alpha 2 amphipathic helix and acquisition of length in gp120 hypervariable domains are associated with resistance to autologous neutralization of subtype C human immunodeficiency virus type 1. *J. Virolology* **81**: 5658-5668.
13. Taylor, J. E. (2007) The Common Ancestor Process for a Wright-Fisher Diffusion. *Elec. J. Prob.* **12**:808-847.
14. Taylor, J. E. and Rudenko, G. (2006) Switching trypanosome coats: What's in the wardrobe? *Trends Genetics* **22**: 614-620.
15. Ramanathan, M. P., Chambers, J. A., Taylor, J. E., Korber, B. T., Lee, M. D., Nalca, A., Dang, K. S., Pankhong, P., Attatippaholkum, W., and Weiner, D. B. (2005) Expression and evolutionary analysis of West Nile virus (Merion Strain). *J. Neurovirology* **11**: 544-556.
16. Taylor, J. E. and Korber, B. (2005) HIV-1 intra-subtype superinfection rates: estimates using a structured coalescent with recombination. *Infection, Genetics and Evolution* **5**:85-95.
17. Gao, F., Bhattacharya, T., Gaschen, B., Taylor, J., Moore, J. P., Novitsky, V., Yusim, K., Lang, D., Foley, B., Beddows, S., Alam, M., Haynes, B., Hahn, B., and Korber, B. (2004) Consensus and ancestral state HIV vaccines - Response. *Science* **299**: 1517-1518.
18. Taylor, J. E. and Jaenike, J. (2003) Sperm competition and the dynamics of X chromosome drive in finite and structured populations. *Ann. Zool. Fenn.* **40**: 195-206.
19. Gaschen, B., Taylor, J., Yusim, K., Gao, F., Lang, D., Novitsky, B., Haynes, B., Hahn,

B. H., Bhattacharya, T., and Korber, B. (2002) AIDS-Diversity considerations in HIV-1 vaccine selection. *Science* **296**:2354-2360.

20. Taylor, J. E. and Jaenike, J. (2002) Sperm competition and the dynamics of X chromosome drive: Stability and Extinction. *Genetics* **160**: 1721-1731.
21. Smith, R. H., Wladkowski, B. D., Taylor, J. E., Thompson, E. J., Pruski, B., Klose, J. R., Andrews, A. W., and Michedja, C. J. (1993) Acid-Catalyzed Decomposition of Alkyltriazolines - A Mechanistic Study. *J. Org. Chem.* **58**: 2097-2103.
22. Smith, R. H., Wladkowski, B. D., Herling, J. A., Pfaltzgraff, T. D., Taylor, J. E., Thompson, E. J., Pruski, B., Klose, J. R., and Michedja, C. J. (1992) Novel Triazenes and Triazolenes from the Base-Catalyzed Hydrolysis of 1,3-Dialkyl-3-Acyltriazenes. *J. Org. Chem.* **57**: 6448-6454.

Unrefereed Articles

1. Taylor, J. E. (2012) The Effect of Fluctuating Selection on the Genealogy at a Linked Site. *Invited submission for a special issue of Theor. Pop. Biol. (pending review).*
2. Maruki, T., Taylor, J. E., and Greenwood, P. E. (2011) The Stochastic Dynamics of a Hitchhiking Allele. *Unpublished manuscript.*

Book Reviews

1. Taylor, J. E. and Walsh, B. (2001). Book review of *The Mathematical Theory of Selection, Recombination, and Mutation* by R. Burger. SIAM Review 43: 740-743.

Talks/Presentations/Workshops

1. Invited speaker for "Probability, Population Genetics and Evolution" meeting at CIRM (Marseilles), June 2012.
2. "Genetics and Natural Selection", presentation to MAT 191 class, ASU, November 2011.
3. "Environmental Variation and Genetic Drift in Subdivided Populations", talk for MTBI summer program, ASU, June 2011.
4. "Diffusions, Genealogies, and Substitution Processes at Selected Loci", invited colloquium at the Department of Mathematics and Statistics, Georgetown University, October 2010.
5. "Genealogical Consequences of Fecundity Variance Polymorphism", invited talk at the Banff International Research Station Workshop: New Mathematical Challenges from Molecular Biology and Genetics, Banff, Canada, September 2009.
6. "Diffusions and Structured Coalescents", two day workshop presented at the Evolutionsbiologiskt Centrum, Uppsala University, Sweden, March 2009 (with J. Wakeley).
7. "The Genealogical Consequences of Fecundity Variance Polymorphism and Fluctuating Selection", invited talk at the University of Arizona, Tucson, AZ, March 2009.
8. "Common Ancestor Processes", plenary talk at the meeting of the Bilateral Research Group "Random Spatial Models in Physics and Biology", Bielefeld University, Bielefeld, Germany, April 2007.
9. "Common Ancestor Processes For Diffusions and Jump-Diffusion", invited talk at the Gemeinsame Jahrestagung der Deutschen Mathematiker-Vereinigung, Humboldt University, Berlin, Germany, March 2007.

TEACHING/EDUCATIONAL SERVICE

Courses Taught

Arizona State University:

- STP 421/598: Probability Theory
- MAT 394: Forensic DNA Analysis (new course developed for Spring 2012)
- MAT 499: Theoretical Population Genetics (reading course)
- APM 504: Applied Probability and Stochastic Processes
- APM 530: Mathematical Cell Physiology
- APM 541: Stochastic Modeling in Biology

Oxford University:

- MS2b: Stochastic Models in Mathematical Genetics

University of Arizona:

- ECOL 484/584: Ornithology (Lab/Field)

University of Sarajevo:

- Point-Set Topology

Student Advising

Advising: Ph.D. students

1. Romarie Morales, Ph.D. candidate, Applied Mathematics in the Life and Social Sciences, ASU, 2013 (expected). Co-advised by C. Castillo-Chávez (ASU).
2. Takahiro Maruki, Ph.D. Biology, ASU, 2011. "The Effects of Natural Selection and Random Genetic Drift in Structured Populations." Co-advised by Y. Kim (Ewha Womans University).
3. Alisha Rossi, Ph.D. candidate, Computational Biosciences, ASU, 2010.

Advising: M.S. students

1. Lin Zhou, M.S. Computational Biosciences, ASU, 2011. "Effect of Recurrent Mutations on the Estimated Age of the Most Recent Common Ancestor."
2. Tacker Fink, M.S. Mathematics (No-Thesis Option), ASU, 2011.
3. Mingze Li, M.S. Statistics, ASU, 2010. "An Extended Ancestral Mixture Model for Phylogenetic Inference under the HKY DNA Substitution Model." Co-advised by G. Chen (ASU).
4. Amandine Véber, M.S. Statistics, Oxford University, 2007. "Structured Population Models as Measure-Valued Random Evolutions."

Advising: Undergraduate students

1. Wenyu Zheng, B.S. candidate, Mathematics/Finance, ASU, 2012 (expected). Honors Thesis Project: "Bayesian Biogeographical Analyses with BEAST: Assessment using Simulated Data."
2. Ann Napier, B.S. Statistics, Oxford University, 2009. "Composite Likelihood Estimation of Gene Conversion and Recombination."
3. Emma Whitehouse, B.S. Statistics, Oxford University, 2009. "Selective Sweeps in Variable Environments."

4. Philip Berman, B.S. Statistics, Oxford University, 2008. "A Diffusion Approximation for a Subdivided Population Subject to Fluctuating Selection, Extinction and Recolonization."
5. Jie He, B.S. Statistics, Oxford University, 2008. "Gene Conversion and Diversification of Antigen Repertoires."
6. Ayako Kurioka, B.S. Zoology, Oxford University, 2008. "Cloning and Comparative Analysis of Trypanosome *VSG* Expression Sites." Co-supervised with G. Rudenko (Oxford).

Advising: Graduate Student Rotations

1. Karl Dutson, Ph.D. candidate, BioDesign, ASU, Spring 2011. Project: "Stochastic Simulations of Antigenic Variation in African Trypanosomes."

Graduate Student Committee Memberships: Odalys Colón-Rentas (SoMSS), Tom Holeva (SoMSS), Jon Young (SoMSS), Yuqin Zhou (SoMSS), Sharquetta Tatum (AMLSS), Andreina Castillo-Siri (SoLS).

Undergraduate Research Supervision: Mentor for the 2012 Mathematical Biosciences Institute Undergraduate Summer Research Program. Proposed project: "Evolutionary Genetics of Antigen Repertoires."

PROFESSIONAL SERVICE

Editorial Service

Review editor for Frontiers in Bioinformatics and Computational Biology.

Referee for: American Naturalist; BMC Evolutionary Biology; Electronic Journal of Probability; Epidemics; Evolution; Genetics; Infection, Genetics and Evolution; Journal of Biological Dynamics; Journal of Mathematical Biology; Journal of Raptor Research; Journal of Theoretical Biology; Nature; Oecologia; PLOS Genetics; Proceedings of the Edinburgh Mathematical Society; Theoretical Population Biology.

Professional Activities

Reviewer for National Science Foundation CAREER proposal.

Service at Arizona State University

College of Liberal Arts and Sciences

Coordinated the Population Genetics reading group in SoLS/SHESC (Spring 2011)

School of Mathematical and Statistical Science

Co-chair of the SoMSS Colloquium/DLS Committee (Fall 2010-Spring 2012)
Member, Undergraduate Mathematics Curriculum Committee (Spring 2011)
Member, Tenure-track Faculty Hiring Committee (March 2011: special probability position)
Member, Tenure-track Faculty Hiring Committee (2009/2010: probability and statistics position)
Member, Committee on Learning Mathematics (2009/2010)

Volunteer Work: Bird Conservation and Ecology

Participant in numerous National Audubon Society Christmas Bird Counts in AZ and Sonora, Mexico (1997-2002; 2010-2011).

Conducted breeding bird counts in Oxford (UK) for the British Trust for Ornithology's 2007-2011 Bird Atlas (Spring-Summer 2008).

Conducted Common Swift counts in Edinburgh (UK) for the Royal Society for the Protection of Birds' 2005 UK Common Swift Survey (Summer 2005).

Volunteer assistant in the University of Arizona Bird Collection (2001-2002).

Volunteer field assistant for an Arizona Game & Fish-supported study of the effects of grazing on wintering populations of grassland sparrows in southern AZ (Winter 1998-2000).

Volunteer field assistant at four MAPS bird banding stations in Organ Pipe National Monument (Growler Wash and Alamo Canyon), Tumacacori, and Florida Canyon Work Station (Summer 1997-1999).