Matthew Pennell

Izaak Killam and NSERC Postdoctoral Fellow

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Education

University of Idaho, Moscow, ID | Aug 2010—May 2015
Ph.D. in Bioinformatics and Computational Biology
Dissertation title: Modeling the dynamics of phenotypic diversity across deep time
Major Supervisor: Dr. Luke Harmon
Committee: Drs. Jack Sullivan, Paul Joyce, Arne Mooers, and Scott Nuismer

Simon Fraser University, Burnaby, BC Canada | Sept 2005—May 2010
B.Sc. Honours in Biological Sciences
Cumulative GPA: 3.96; President's List (All Semesters)
Dissertation title: Measuring the two-fold cost in natural populations of *Timema*
Major Supervisor: Dr. Bernie Crespi

Publications

Tank, D.C., J.M. Eastman, M.W. Pennell, P.S. Soltis, D.E. Soltis, C.E. Hinchliff, J.W. Brown, E.B. Sessa, and L.J. Harmon. 2015. Nested radiations and the pulse of angiosperm diversification. New Phytologist 207:454-467.

Pennell, M.W., R.G. FitzJohn, W.K. Cornwell, and L.J. Harmon. 2015. Model adequacy and the macroevolution of angiosperm functional traits. The American Naturalist 186: E33-E50.

Pennell, M.W., M. Kirkpatrick, S.P. Otto, J.C. Vamosi, C.L. Piechel, N. Valenzuela, and J. Kitano. 2015. Y fuse? Sex chromosome fusions in fishes and reptiles. PLoS Genetics 11:e1005237

Uyeda, J.C., D.S. Caetano, and M.W. Pennell. 2015. Comparative analysis of principal components can be misleading. Systematic Biology 64:677-689.

Pennell, M.W. 2015. Modern Phylogenetic Comparative Methods and Their Application in Evolutionary Biology: Concepts and Practice.—Edited by László Zsolt Garamszegi (Book Review). Systematic Biology 64:161-163.

FitzJohn, R.G., M.W. Pennell, A.E. Zanne, P.F. Stevens, D.C. Tank, and W.K. Cornwell. 2014. How much of the world is woody? Journal of Ecology 102:1266-1272.

Lanfear, R. and M.W. Pennell. 2014. Open access is worth considering. Trends in Plant Sciences 19:340-341.

The Tree of Sex Consortium; T. Ashman, D. Bachtrog, H. Blackmon, E.E. Goldberg, M.W. Hahn, M. Kirkpatrick, J. Kitano, J.E. Mank, I. Mayrose, R. Ming, S.P. Otto, C.L. Peichel, M.W. Pennell, N. Perrin, L. Ross, N. Valenzuela, and J.C. Vamosi. 2014. Tree of Sex: a database of sexual systems. Scientific Data 1:140015.

Stansbury, C.R., D.E. Ausband, P. Zager, C.M. Mack, C.R. Miller, M.W. Pennell, and L.P. Waits. 2014. A long term population monitoring approach to a wide-ranging carnivore: noninvasive genetic sampling of gray wolf rendezvous sites in Idaho, U.S.A. Journal of Wildlife Management 78:1040-1049.

Pennell, M.W., J.M. Eastman, G.J. Slater, J.W. Brown, J.C. Uyeda, R.G. FitzJohn, M.E. Alfaro, and L.J. Harmon. 2014. geiger v2.0: an expanded suite of methods for fitting macroevolutionary models to phylogenetic trees. Bioinformatics 15:2216-2218.

Slater, G.J. and M.W. Pennell. 2014. Robust regression and posterior predictive simulation increase power to detect early bursts of trait evolution. Systematic Biology 63:293-308.

Cornwell, W.K., M. Westoby, D.S. Falster, R.G. FitzJohn, B.C. O'Meara, M.W. Pennell, D.J. McGlinn, J.M. Eastman, A.T. Moles, P.B. Reich, D.C. Tank, I.J. Wright, L.Aarssen, J.M. Beaulieu, R.M. Kooyman, M.R. Leishman, E.T. Miller, U. Niinemets, J. Oleksyn, A. Ordonez, D.L. Royer, S.A. Smith, P.F. Stevens, L. Warman, P. Wilf, and A.E. Zanne. 2014. Functional distinctiveness of major plant lineages. Journal of Ecology 102:345-356.

Pennell, M.W., L.J. Harmon, and J.C. Uyeda. 2014. Speciation is unlikely to drive divergence rates. Trends in Ecology & Evolution 29:72-73.

Pennell, M.W., L.J. Harmon, and J.C. Uyeda. 2014. Is there room for punctuated equilibrium in macroevolution? Trends in Ecology & Evolution 29:23-32.

Maliska, M.E., M.W. Pennell, and B.J. Swalla. 2013. Developmental mode influences diversification in ascidians. Biology Letters 9:20130068.

Pennell, M.W. and L.J. Harmon. 2013. An integrative view of phylogenetic comparative methods: connections to population genetics, community ecology, and paleobiology. Annals of the New York Academy of Sciences 1289:90-105. (Recommended by Faculty of 1000)

Stoltzfus, A., H. Lapp, N. Matasci, H. Deus, B. Sidlauskas, C.M. Zmasek, G. Vaidya, E. Pontelli, K. Cranston, R. Vos, C.O. Webb, L.J. Harmon, M. Pirrung, B. O'Meara, M.W. Pennell, S. Mirarab, M.S. Rosenberg, J.P. Balhoff, H.M. Bik, T.A. Heath, P.E. Midford, J.W. Brown, E.J. McTavish, J. Sukumaran, M. Westneat, M.E. Alfaro, A. Steele, and G. Jordan. 2013. Phylotastic! Making tree-of-life knowledge accessbile, reusable and convenient. BMC Bioinformatics 14:158.

Pennell, M.W. 2012. Biology in the light of phylogeny. Trends in Ecology & Evolution 27:657-658.

Pennell, M.W., C.R. Stansbury, L.P. Waits, and C.R. Miller. 2012. Capwire: a R package for estimating population census size from non-invasive genetic sampling. Molecular Ecology Resources 13:154-157.

Pennell, M.W., B.A.J. Sarver, and L.J. Harmon. 2012. Trees of unusual size: biased inference of early bursts from large molecular phylogenies. PLOS ONE 7:e43348.

Rosenblum, E.B., B.A.J. Sarver, J.W. Brown, S. Des Roches, K.M. Hardwick, T.D. Hether, J.M. Eastman, M.W. Pennell, and L.J. Harmon. 2012. Goldilocks meets Santa Rosalia: an emphemeral speciation model explains patterns of diversification across time scales. Evolutionary Biology 39:255-261.

Green, D.J., K.B. Loukes, M.W. Pennell, J. Jarvis, and W.E. Easton. 2011. Reservoir water levels do not influence daily mass gain of warblers at a riparian stopover site. Journal of Field Ornithology 82:11-24.

In Review/Revision

Pennell, M.W., R.G. FitzJohn, and W.K. Cornwell. A simple approach for maximizing the overlap of phylogenetic and comparative data. (In review at Methods in Ecology & Evolution)

Sarver, B.A.J., M.W. Pennell, J.W. Brown, K.M. Hardwick, J. Sullivan, and L.J. Harmon. The choice of tree prior and molecular clock does not substantially affect phylogenetic inferences of diversification rates. (In revision at Systematic Biology)

Additional Writings

S.P. Otto, J. Losos, and M.W., Pennell. Essay inducting Joseph Felsenstein as a Honorary Lifetime Member of the American Society of Naturalists.

FitzJohn, R.G., M.W. Pennell, A.E. Zanne, and W.K. Cornwell. Reproducible research is still a challenge. ROpenSci blog.

Presentations

The adequacy of phylogenetic models
CEES, Oslo, NO | Sept 2014 (invited talk)
Evolution, Raleigh, NC | June 2014 (Invited symposium)
Evo-WIBO, Port Townsend, WA | April 2014 (poster)
PEES, Pullman, WA | April 2014 (invited talk)
Evolution, Snowbird, UT | June 2013 (talk)

Nested radiations and the pulse of angiosperm diversification
Evo-WIBO, Port Townsend, WA | April 2012 (poster) **Best poster**
University of Virginia, Charlottesville, VA | Sept 2012 (invited talk)
University of Texas, Austin, TX | Jan 2012 (invited talk)

Service + Outreach

Coordinator Reproducible Research Curriculum | Aug 2014—Present
Organized a series of workshops to develop course material for teaching reproducible research practices to biologists

Graduate Student Representative American Society of Naturalists | Sept 2012—Sept 2014
Voting position on Executive Council of the Society
Organized student events and reviewed research grant proposals

Developer ROpenSci | Nov 2014—Present
Wrote R package to access API of large database of chromosomal information

Expert Reviewer Multiple scientific journals | Sept 2011—Present
Reviewed manuscripts for *Nature, Proceedings of the National Academy of Sciences*, *Proceedings of the Royal Society: B, Ecology Letters, Systematic Biology, Evolution, Ecology, New Phytologist, Journal of Evolutionary Biology, Methods in Ecology & Evolution, PLoS ONE, Functional Ecology, The ISME Journal, Molecular Ecology Resources, Bioinformatics, and Axios Reviews*

Ad-Hoc Grant Reviewer National Science Foundation, U.S.A. | Sept 2015—Present

Lecturer International | Jan 2011—Present
Led workshops in R programming and statistics in Santa Barbara, CA, Durham, NC, Quito, Ecuador, and Česky Krumlov, Czech Republic
Co-Taught graduate-level course in *Applied Bioinformatics* at the University of Idaho

Teaching Assistant Simon Fraser University | Jan 2011—Present
BISC 300 Evolution (x2)
BISC 302 Genetic Analysis
BISC 102 Introduction to Ecology and Evolution

Public Outreach National Evolutionary Synthesis Center | March 2015
Participated in the Darwin Day Roadshow; talked about my research at local high schools

Working Groups

Tempo and Mode of Plant Trait Evolution Model the macroevolution of functional traits
Tree of Sex Consortium Characterize the diversity of sex determination systems
Phylotastic! Computational infrastructure for re-using phylogenetic data
SimBank Repository of simulations to aid population genetic software development

Software

Arbutus Evaluate statistical adequacy of evolutionary models GitHub
Geiger Fit evolutionary models to large phylogenetic trees GitHub
Capwire Estimate population size from genetic data GitHub
Chromer Access API of Chromosome Counts Database GitHub
Phyndr Improve overlap of phylogenetic and comparative data GitHub
Taxonlookup Taxonomic resources for land plants GitHub

Selected Awards

2015 Izaak Killam Memorial Fellowship, University of British Columbia ($100,000)
2015 Marie Skłodowska Curie Research Fellowship, European Research Council ($294,600)
2015 Postdoctoral fellowship, NSERC ($90,000)
2015 Diane Haynes Memorial Award (Outstanding graduate student U. Idaho; $300)

2013 Postgraduate fellowship, NSERC ($42,000)
2013 Bioinformatics and Computational Biology Fellowship, University of Idaho ($21,000)
2012 Bioinformatics and Computational Biology Fellowship, University of Idaho ($21,000)
2012 Graduate Research Fellowship, National Evolutionary Synthesis Center ($19,000)
2010 Postgraduate fellowship, NSERC ($19,000)
2010 Vice Pres. of Research, Undergraduate Research Award, Simon Fraser University ($6,000)
2009 Undergraduate Student Research Award, Simon Fraser University ($6,000)
2005 Gordon Shrum Entrance Scholarship, Simon Fraser University ($24,000)