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Current Position

July 2016 – Present Research Sabbatical. Santa Barbara, California.

Education

Ph.D. Department of Geophysical Sciences, 2006 University of Chicago, Chicago, IL, USA
Advisor: Michael Foote. Dissertation committee: David Jablonski, Peter J. Wagner, Leigh Van Valen & Kevin Boyce.

B.A. College of Creative Studies (Biology), June 2000 University of California, Santa Barbara, CA, USA

Professional Experience

2015 - 2016 Springer Fellow, Department of Paleobiology, National Museum of Natural History, Smithsonian Institution, Washington, D.C.

2012-2015 Abbott Fellow, Smithsonian Institution, National Museum of Natural History.

2012 Visiting Scholar, Cooperation and Evolution of Multicellularity program. Kavli Institute for Theoretical Physics.

2011 Visiting Scholar Fellowship, National Evolutionary Synthesis Center.

2008-2012 Postdoctoral Researcher, Museum für Naturkunde, Leibniz Institute for Evolution and Biodiversity at the Humbolt University, Berlin.

2006-2008 Research Associate, Department of Biology, Duke University.

2001 Santa Fe Institute Complex Systems Summer School; Budapest, Hungary.

2001 Comparative Invertebrate Embryology. Friday Harbor Marine Laboratories.

Fellowships & Grants

- Springer Fellowship, "Quantifying the stochastic and deterministic aspects of macroevolution" Smithsonian Institution, National Museum of Natural History 2015-2016.
- NSF ELT Collaborative Research: "Investigating the Biotic and Paleoclimatic Consequences of Dust in the Late Paleozoic." 2013-2017. with Gerilyn Soreghan, Linda Hinnov, Sarah Aciego, and Nicholas Heavens.
- Abbott Postdoctoral Fellowship, "The Macroevolution of Bryozoan Polymorphism" Smithsonian Institution, National Museum of Natural History. 2012-2015.

- Co-P.I. with W. Kiessling."Evolutionary rates of zooxanthellate and azooxanthellate corals and their controlling factors." Deutsche Forschungsgemeinschaft, 2011-2013.
- Müller, Johannes. "Patterns of diversification in caenophidian snakes - an integrated paleontological and molecular approach." Deutsche Forschungsgemeinschaft, 2011-2013.
- Aberhan, Martin. "Intrinsic and environmental controls of evolutionary rates in fossil and extant bivalves." Deutsche Forschungsgemeinschaft, 2011-2013.
- NESCent Short-term Visiting Scholar. "Understanding the role of photosymbiosis in coral macroevolution." Summer 2011.
- Santa Fe Institute Complex Systems Summer School Fellowship, 2001

Publications

28. **Simpson, C.** 2016. The case for species selection. *bioRχiv*. http://dx.doi.org/10.1101/084046
27. Hopkins, M. J., D. W. Bapst, **C. Simpson**, R. C. M. Warnock, In Revision. Shifting vantage points and the unification of molecular phylogenetics with the fossil record. *Evolution*.
26. **Simpson, C.** In Press. Understanding macroevolution through the origin of higher taxa. *Ecology*
25. **Simpson, C.**, J.B.C Jackson, and A Herrera-Cubilla. 2016. Evolutionary determinants of morphological polymorphism in colonial animals. *bioRχiv*. http://dx.doi.org/10.1101/046409 and accepted pending minor revisions at the *American Naturalist*.
24. Soreghan, G.S., N.G. Heavens, L.A. Hinnov, S.M. Aciego, and **C. Simpson**. 2015. Reconstructing the dust cycle in deep time: The case of the late Paleozoic icehouse. In, *Earth-Life Transitions: Paleobiology in the context of Earth System Evolution* P. David Polly, Jason J. Head, and David L. Fox, editors. The Paleontological Society Papers volume 21. pp. 83 - 120.
23. Orzechowski, E.A, Lockwood, R., Byrnes, J.E., Anderson, S.C., Finnegan, S., Harnik, P.G., Finkel, Z.V., Lindberg, D.R., Liow, L.H., Lockwood, R., Lotze, H.K., McClain, C.M., McGuire, J.L., O'Dea, A., Pandolfi, J.M. **Simpson, C.**, Tittensor, D.P. 2015. Determinants of extinction risk over the last 500 million years: A meta-analysis of marine bivalves and gastropods. *Global Change Ecology*. 21(10): 3595-3607.
22. Finnegan, S., S.C. Anderson, P.G. Harnik, **C. Simpson**, D.P. Tittensor, J.E. Byrnes, Z.V. Finkel, D.R. Lindberg, L.H. Liow, R. Lockwood, H.K. Lotze, C.M McClain, J.L McGuire, A. O'Dea, and J. M. Pandolfi, 2015. Paleontological baselines for evaluating extinction risk in the modern oceans. *Science*. 348(6234):567-570. DOI: 10.1126/science.aaa6635
21. **Simpson, C.** and D.H. Erwin, 2014. Enriching macroevolution. *Science*. 344(6189):1234-1235.
20. Hopkins, M., **C. Simpson**, and W. Kiessling, 2014. Differential niche dynamics among major marine invertebrate clades. *Ecology Letters*. 17(3):314-323. doi: 10.1111/ele.12232
19. **Simpson, C.**, 2013. Species selection and the macroevolution of coral photosymbiosis and coloniality. *Evolution* 67(6): 1607-1621. For a special issue on multilevel selection.

18. Nowak, M. D., R. J. Carter, A. B. Smith, **C. Simpson**, and D.J. Zwickl, 2013. A Simple Method for Estimating Informative Node Age Priors for the Fossil Calibration of Molecular Divergence Time Analyses. *PLOS One* 8 (6) (June 5): e66245. doi:10.1371/journal.pone.0066245.
17. Kiessling, W., **C. Simpson**, B. Beck, H. Mewis, and J. Pandolfi, 2012. Equatorial decline of reef corals during the last Pleistocene interglacial. *Proceedings of the National Academy of Sciences*. doi: 10.1073/pnas.1214037110
16. Harnik, P. G., **C. Simpson**, and J. L. Payne, 2012. Long-term differences in extinction risk among the seven forms of rarity. *Proceedings of the Royal Society B: Biological Sciences*. doi:10.1098/rspb.2012.1902
15. Harnik, P. G., H. K. Lotze, S. C. Anderson, Z. V. Finkel, S. Finnegan, D. R. Lindberg, L.H. Liow, R. Lockwood, C.M. McClain, J.L. McGuire, A. O'Dea, J.M. Pandolfi, **C. Simpson**, and D. P. Tittensor, 2012. Extinctions in ancient and modern seas. *Trends in Ecology and Evolution*. 27(11): 608-617. doi: 10.1016/j.tree.2012.07.010
14. **Simpson, C.** and J. Müller, 2012. Species selection in the molecular age, in From Clone to Bone: The Synergy of Morphological and Molecular Tools in Paleobiology, Johannes Müller and Rob Asher, eds. Cambridge University Press. Pp 116-134.
13. **Simpson, C.**, 2012. The evolutionary history of division of labour. *Proceedings of the Royal Society B: Biological Sciences* 279(1726): 116-121. doi: 10.1098/rspb.2011.0766
12. **Simpson, Carl**, W. Kiessling, H. Mewis, R. C. Baron-Szabo, and J. Müller, 2011. Evolutionary diversification of reef corals: a comparison of the molecular and fossil records. *Evolution* 65(11), 3274-3284. doi: 10.1111/j.1558-5646.2011.01365.x
11. Liow, L. H., **C. Simpson**, et al. 2011. Pioneering Paradigms and Magnificent Manifestos – Leigh Van Valen's priceless contributions to evolutionary biology. *Evolution* 65(4), 917-922. doi: 10.1111/j.1558-5646.2011.01242.x
10. Kiessling, W. and **C. Simpson**, 2011. On the potential for ocean acidification to be a general cause of ancient reef crises. *Global Change Biology*, 17(1), 56-67. doi: 10.1111/j.1365-2486.2010.02204.x.
9. **Simpson, C.**, 2011. *How many levels are there? How insights from evolutionary transitions in individuality help measure the hierarchical complexity of life*, in The Major Transitions in Evolution Revisited. Edited by Brett Calcott and Kim Sterelny. The Vienna Series in Theoretical Biology, MIT Press. Pp 199-226.
8. McShea, D. W. and **C. Simpson**, 2011. *The miscellaneous transitions in evolution*, in The Major Transitions in Evolution Revisited. Edited by Brett Calcott and Kim Sterelny. The Vienna Series in Theoretical Biology, MIT Press. Pp 19-34.
7. **Simpson, C.**, 2010. Species selection and driven mechanisms jointly generate a large-scale morphological trend in monobathrid crinoids, *Paleobiology* 36(3), 481-496. doi: 10.1666/08018.1
6. **Simpson, C.** and W. Kiessling, 2010. Diversity of Life Through Time. Encyclopedia of Life Sciences. John Wiely & Sons. doi: 10.1002/9780470015902.a0001636.pub2
5. **Simpson, C.** and W. Kiessling, 2010. The role of extinction in large-scale diversity-stability relationships, *Proceedings of the Royal Society B: Biological Sciences*, 277, 1451-1456. doi: 10.1098/rspb.2009.2062

4. Kiessling, W., **C. Simpson**, and M. Foote, 2010. Reefs as cradles of evolution and sources of biodiversity in the Phanerozoic, *Science*, 327, 196. doi: 10.1126/science.1182241
3. **Simpson, C.** and P. G. Harnik, 2009. Assessing the role of abundance in marine bivalve extinction over the post-Paleozoic, *Paleobiology*, 35(4), 631–647. doi: 10.1666/0094-8373-35.4.631
2. Alroy, J., et al. 2008. Phanerozoic trends in the global diversity of marine invertebrates, *Science*, 321(5885), 97–100. doi: 10.1126/science.1156963
1. Sánchez, J. A., W. Zeng, V. R. Coluci, **C. Simpson** and H. R. Lasker, 2003, How similar are branching networks in nature? A view from the ocean: Caribbean gorgonian corals, *Journal of Theoretical Biology*, 222(1), 135-138. doi: 10.1016/S0022-5193(03)00017-1

Publications in preparation

Simpson, C., in prep, The evolution of polymorphic colonies by the life-history ratchet. For *Evolution*

Simpson, C. and J.B.C. Jackson, in prep, The evolutionary potential of colony- and zooid-level traits in the bryozoan *Stylopoma*. For *Science*

Simpson, C., in prep. The measurement of species selection on evolving characters. For *Paleobiology*

Simpson, C., Harnik, P. G., in prep. The role of heritability in the macroevolution of geographic range size. For *Paleobiology*

Invited Presentations and workshops

Science Pub, Santa Barbara Museum of Natural History, August 2016; American Museum of Natural History, February 2016; University of Maryland, November 2015; Washington Society of Paleontology, October 2015; University of Oklahoma, September 2015; University of Akron, December 2014; Santa Fe Institute, October 2014; Harvard, February 2014; Stanford, March 2014; Virginia Tech, February 2013; Origin of Multicellulary, NESCent May 2013. National Museum of Natural History; The origin and evolution of multicellularity. Kavli Institute of Theoretical Physics. February and March 2013; Extinction in ancient and modern seas, NESCent working group. 2011 - 2012; Phylogenetic Approaches to Paleobiology: Diversity, Rates, and Trends, Geological Society of America, 2011; Symposium in Honor of Leigh Van Valen, University of Chicago, January 2011; Stanford University; University of California, Berkeley; Santa Fe Institute; Conference on the Red Queen's Hypothesis, Centre for Ecological and Evolutionary Synthesis. Oslo, Norway; The major transitions in evolution revisited, Konrad Lorenz Institute, Altenberg, Austria.

Student Mentoring and Teaching

- *T. rex* Tuesdays, "Speed trap" on measuring running speed of dinosaurs and kids from trackways. "Sue's Stories" on observation and imagining the stories that Sue's bones tell in comics form.
- Graduate student mentor. 2008-2012, Museum für Naturkunde and Humboldt University, Berlin. I have mentored 4 undergraduates and 3 Ph.D. students.
- Guest lecturer, Analytical Paleobiology. 2008-2009, Museum für Naturkunde and Humboldt University, Berlin.
- Undergraduate mentor. 2006-2007, Duke University.
- Evolution for non-majors, 2000-2005, University of Chicago
- Introductory Paleontology, 2001-2005, University of Chicago
- Quantitive Paleobiology, 2004, 2005, University of Chicago
- Global Warming, 2005, University of Chicago

Reviews for

PNAS, *TREE*, *Proceedings B*, *Phil Trans B*, *Methods in Ecology & Evolution*, *BioScience*, *Biological Reviews*, *Evolution*, *Paleobiology*, *Acta Biotheoretica*, *Behavioral Ecology*, *Foundations of Science*, *Biology & Philosophy*, Wiley-Blackwell, NSF, *PLOS One*, *Evolutionary Biology*, MIT Press, Cambridge University Press.

Professional Affilliations

Paleontological Society, Society for the Study of Evolution, Geological Society of America, American Society of Naturalists

References

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