

Daniele Silvestro

Computational Biologist – Assistant Professor

Contact

Department of Biological and Environmental Sciences, University of Gothenburg,
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Languages

English fluent, Italian mother tongue, Basic French and Portuguese

Programming

Extensive experience in Python, R, \LaTeX
GitHub: dsilvestro

Education

- Feb 2012 **PhD in Natural Sciences** Frankfurt, Germany
at Senckenberg Research Institute and Goethe University. Graded with **summa cum laude**, defended on Feb 27, 2012. Thesis title: *Diversification in time and space – methodological advancement and case studies from the Neotropical plant family Bromeliaceae.*
- Jul 2008 **MSc in Evolutionary Biology** Turin, Italy
at the University of Turin, graded with with summa cum laude, honorific mention, and press dignity.
- Jul 2006 **BSc in Natural Sciences** Turin, Italy
at the University of Turin, graded with with summa cum laude.

Professional experience

Positions

- 2016–now **University of Gothenburg** Gothenburg, Sweden
Assistant Professor at the Department of Biological and Environmental Sciences.
Other affiliations: *University of Lausanne, Swiss Institute of Bioinformatics.*
- 2015 **University of Lausanne** Lausanne, Switzerland
Researcher at the Department of Ecology and Evolution, Salamin Lab – Computational Phylogenetics
- 2013–2015 **University of Gothenburg** Gothenburg, Sweden
Postdoc at the Department of Biological and Environmental Sciences (Antonelli Lab).
- 2013 **Senckenberg Research Institute** Frankfurt, Germany
Postdoc position
- 2012 **University of Lausanne** Lausanne, Switzerland
Postdoc position at the Department of Ecology and Evolution and Swiss Institute of Bioinformatics
- 2009 **University of Turin** Turin, Italy
Scientific collaborator at the Department of Life Sciences

Guest scientist

Jan 2017	Smithsonian Tropical Research Institute	Panama City, Panama
Apr 2016	University of California, Los Angeles	Los Angeles, USA
Oct 2015	University of California, Los Angeles	Los Angeles, USA
Apr 2014	University of São Paulo	São Paulo, Brazil
May 2012	James Cook University	Cairns, Australia
Jan 2011	James Cook University	Cairns, Australia
Mar 2009	Federal University of Pernambuco	Recife, Brazil
Sep 2008	Museum La Specola	Florence, Italy
Sep 2007	Zoological Museum, Academy of Sciences	St. Petersburg, Russia

Awards and grants

2016	Ebbe Nielsen Challenge	Global Biodiversity Information Facility (GBIF) Competition to develop applications of open-access biodiversity data. Won second prize: 4,000 €.
2015	Research Grant	Swedish Research Council 4-year grant for Junior Researcher (VR 2015-04748) at the Gothenburg University, Sweden. Applicant: D. Silvestro, project title: <i>Evolutionary dynamics of extinct and extant species</i> . Total amount: 3,750,000 SEK (400,000 €).
2012	Postdoctoral fellowship	Wenner-Gren Foundation, Sweden 1-year grant. Project title: <i>Integrating Molecular and Fossil data to investigate patterns and dynamics of species diversification</i> . Applicants: A. Antonelli, D. Silvestro. Total amount: 320,000 SEK (34,000 €).
	Wolfgang Strutz Award	Senckenberg Nature Research Society, Germany Prize for outstanding PhD thesis. Awarded amount: 10,000 €.
	Postdoctoral fellowship	Carl Tryggers Foundation, Sweden 2-year grant. Project title: <i>A New Bayesian Approach to Understand the Evolution of Biodiversity Hotspots</i> . Applicants: A. Antonelli, D. Silvestro. Total amount: 580,000 SEK (62,000 €).
	Travel grant	Freunde und Förderer of the Goethe University, Germany Funds for 2-week research stay at the James Cook University in Cairns (Australia). Total amount: 1,300 €.
2011	Research Fellowship	Leibniz-German Academic Exchange Service (DAAD) 1-year postdoctoral grant. Applicant: D. Silvestro, project title: <i>A neglected wealth in phylogenies: the analysis of speciation and extinction rates</i> . Total amount: 22,080 €.
	Travel grants	Willkomm-Stiftung and Deutsche Bromeliengesellschaft, Germany Funds to attend the XVIII International Botanical Congress in Melbourne (Australia). Total amount: 1,400 €.
	BiK-F Outgoing grant	Biodiversity and Climate Research Centre, Germany Funds for a 4-week research stay at the Australian Tropical Herbarium in Cairns (Australia). Total amount: 2,000 €.

Editorial Duties

Associate Editor for **BMC Evolutionary Biology** since 2016 and **Methods in Ecology and Evolution** since April 2017; **Review Editor** for **Frontiers in Ecology and Evolution (Paleoecology)** since 2017.

Reviewer for Nature Ecology and Evolution, Nature Communications, Biology Letters, Proceedings of the National Academy of Sciences USA, PLOS Biology, Systematic Biology, New Phytologist, Evolution, Methods in Ecology and Evolution, Functional Ecology, Global Ecology and Biogeography, Ecology Letters, Bioinformatics, J. of Biogeography, Biological Reviews, Philosophical Transactions of the Royal Society B, Taxon, Zoological J. of Linnean Society, Evolutionary Ecology Research. **18 papers reviewed in 2016.**

Software

PYRATE

Python (and R) program to estimate speciation, extinction, and preservation rates from fossils using a Bayesian framework. *Cited in 39 articles as of Jan 2017.*

Available at: <https://github.com/dsilvestro/PyRate>

BAYESRATE

Bayesian estimation of diversification rates from dated phylogenies (Python and R). *Over 1,900 downloads worldwide, cited in 50 articles as of Jan 2017.*

Available at: <http://sourceforge.net/projects/bayesrate/>

RAXMLGUI

A graphical front-end for RAxML. Official partner of the the CIPRES platform (www.phylo.org). *Over 35,000 downloads worldwide, cited in 996 articles as of Jan 2017.*

Available at <http://sourceforge.net/projects/raxmlgui/>

SAMPBIAS

R package to evaluate geographic sampling biases in species distribution datasets. *Winner of the second prize of the Ebbe Nielsen Challenge 2016* (main developer: A. Zizka).

Available at: <https://github.com/azizka/sampbias>

SPECIESGEOCODER

Python package for easy and fast coding of species into operational units (main developer: M. Töpel). Available at <https://github.com/mtop/speciesgeocoder>

CoEv

Computer program to estimate molecular coevolution (main developer: L. Dib).

Available at: <http://www2.unil.ch/phylo/bioinformatics/coev.html>

JIVE

R package to analyze inter- and intra-specific trait evolution with a hierarchical Bayesian model (main developer: A. Kostikova). Available at <https://github.com/trollius/jive>

SUPERSMART

Self-Updating Platform for Estimating Rates of Speciation and Migration, Ages and Relationships of Taxa (main developers: R. Vos, H. Hettling).

Available at <http://www.supersmart-project.org>

Scientific communications as invited speaker

2017	XIX International Botanical Congress	Shenzhen, China
	Conference of the International Biogeography Society	Tucson, USA
2016	Seminar at ETH Zurich	Basel Switzerland
	Seminar at the University of Montpellier	Montpellier, France
2015	Seminar at the University of California, Los Angeles	Los Angeles, USA
	Evolution Meeting	Guarujá, Sao Paulo, Brazil
	'Regulators of Biodiversity in deep time II'	University of São Paulo, Brazil
2014	Seminar at the University of Uppsala	Uppsala, Sweden
	Evolutionary Radiation meeting	University of Zurich, Switzerland
	iDiv meeting - sFOSSIL	University of Leipzig, Germany
	Seminar at University of São Paulo	São Paulo, Brazil
	Seminar at University of Lyon	Lyon, France
2013	Talk at University of California, Berkeley	Berkeley, USA
	'Mathematics for an Evolving Biodiversity'	University of Montreal, Canada
	Seminar at University of Stockholm	Stockholm, Sweden
	Seminar at Centre for Ecological and Evolutionary Synthesis	Oslo, Norway
2012	Talk at Collège de France	Paris, France
	Seminar at Federal University of Pernambuco	Recife, Brazil
	Seminar at University of Leipzig	Leipzig, Germany
	Seminar at Biodiversity and Climate Research Centre	Frankfurt, Germany
2011	Seminar at University of Zurich	Zurich, Switzerland
	Seminar at University of Gothenburg	Gothenburg, Sweden

Publication list

Google scholar's list

Underline indicates papers for which I am listed as corresponding author). All publications listed here were peer-reviewed prior to acceptance and publication.

- 2017
- 38. Scientific Reports** Accepted
Lehtonen*, Silvestro*, Karger, Scotese, Tuomisto, Kessler, Peña, Wahlberg, Antonelli. *Environmentally driven extinction and opportunistic origination explain fern diversification patterns* (* equal contributions)
- 37. Nature Ecology & Evolution** Accepted
Pimiento, Griffin, Clements, Silvestro, Varela, Uhen, Jaramillo. *The Pliocene marine megafauna extinction and its impact on functional diversity*
- 36. New Phytologist** Accepted
Perez Escobar, Chomicki, Condamine, Karremans, Bogarin, Matzke, Silvestro, Antonelli. *Recent origin of Neotropical orchids in the world's richest plant biodiversity hotspot*
- 35. Science Advances** Accepted
Jaramillo, Cardona, Montes, Silvestro, Antonelli, Bacon. *Conclusions by O'Dea et al. regarding formation of the Isthmus of Panama are not supported*
- 34. Proceedings of the Royal Society B.** 284:20162361
Huang, Eronen, Janis, Saarinen, Silvestro, Fritz. *Mammal body size evolution in North America and Europe over 20 million years: Similar trends generated by different processes*
- 33. Evolutionary Ecology Research** 18:41–59
Silvestro, Pires, Quental, Salamin. *Bayesian estimation of multiple clade competition from fossil data*
- 32. Evolution** Accepted
Pires, Silvestro, Quental. *Interactions Within and Between Clades Shaped the Diversification of Terrestrial Carnivores*
- 31. Molecular Phylogenetics and Evolution** 107:152–165
Cruz, Zizka, Silvestro, Leme, Schulte, and Benko-Iseppon. *Molecular phylogeny, character evolution and historical biogeography of *Cryptanthus Otto* and *A. Dietr.* (Bromeliaceae)*
- 2016
- 30. Systematic Biology** 10.1093/sysbio/syw066
Antonelli, ..., Silvestro et al. *Towards a Self-Updating Platform for Estimating Rates of Speciation and Migration, Ages, and Relationships of Taxa (SUPERSMART)*
- 29. Scientific Reports** 10.1038/srep30965
Raia, ..., Silvestro, Fortelius. *Progress to extinction: increased specialisation causes the demise of animal clades*
- 28. Botanical Journal of the Linnean Society** 10.1111/boj.12489
Pinangé, Krapp, Zizka, Silvestro, Leme, Weising, and Benko-Iseppon. *Molecular phylogenetics and character evolution in the genus *Dyckia* (Bromeliaceae, Pitcairnioideae): implications in the historical biogeography.*

2016

27. Systematic Biology

10.1093/sysbio/syw064

Töpel, Zizka, Calió, Scharn, Silvestro, Antonelli. *SpeciesGeoCoder: Fast categorization of species occurrences for analyzes of biodiversity, biogeography, ecology and evolution*

Book chapter

Accepted

Silvestro and Schnitzler. *Macroevolutionary dynamics in mountain systems in Mountains, Climate, and Biodiversity* Eds. Hoorn, Perrigo, and Antonelli. Scheduled publication by Wiley: Fall 2017

26. Philosophical Transactions of the Roy. Soc. B

10.1098/rstb.2015.0225

Silvestro, Zizka, Bacon, Cascales-Miñana, Salamin, Antonelli. *Fossil Biogeography: A new model to infer dispersal, extinction and sampling from paleontological data.*

25. Palgrave Communications

10.1057/palcomms.2016.19

Gjesfjeld, Chang, Silvestro, Kelty, and Alfaro. *Competition and extinction explain the evolution of diversity in American automobiles* (Press release)

2015

24. Proceedings of the Royal Society B

282:20151952

Pires, Silvestro, Quental. *Continental Faunal Exchange and the Asymmetrical Radiation of Carnivores*

23. Nucleic Acids Research

44, D27–D37

The SIB Members. *The SIB Swiss Institute of Bioinformatics' resources: focus on curated databases*

22. PNAS

112:43, E5767–E5768

Bacon, Silvestro, Jaramillo, Smith, Chakrabarty, Antonelli. *Reply to Lessios and to Marko et al.: An early and progressive biotic interchange across the Isthmus of Panama is robust to missing data and biases*

21. BMC Evolutionary Biology

15:247

Serrano-Serrano, Perret, Guignard, Chautems, Silvestro, and Salamin. *Decoupled evolution of floral traits and climatic preferences in a clade of Neotropical Gesneriaceae*

20. PNAS

doi:10.1073/pnas.1502803112

Silvestro, Antonelli, Salamin, Quental. *The role of clade competition in the diversification of North American canids.* (Press release)

19. New Phytologist

10.1111/nph.13247

Silvestro, Cascales-Miñana, Bacon, Antonelli. *Revisiting the origin and diversification of vascular plants through a comprehensive Bayesian analysis of the fossil record* (Press release)

18. PNAS

10.1073/pnas.1423853112

Bacon, Silvestro, Jaramillo, Smith, Chakrabarty, Antonelli. *Biological Evidence Supports an Early and Complex Emergence of the Isthmus of Panama.* Featured as **Highlight in Science 348:770** (Press release)

17. Methods in Ecology and Evolution

10.1111/2041-210X.12337

Silvestro, Kostikova, Litsios, Pearman, Salamin. *Measurement errors should always be incorporated in phylogenetic comparative analysis*

16. Frontiers in Genetics

10.3389/fgene.2015.00130

Antonelli, Zizka, Silvestro, Scharn, Cascales-Miñana, Bacon. *An engine for global plant diversity: highest evolutionary turnover and emigration in the American tropics*

- 2014 **15. Methods in Ecology and Evolution** 5:1126–1131
Silvestro, Salamin, Schnitzler. *PyRate: A new program to estimate speciation and extinction rates from incomplete fossil record*
- 14. Molecular Phylogenetics and Evolution** 77:54–64
Louzada, Schulte, Wanderley, Silvestro, Zizka, Barfuss, Palma-Silva. *Molecular phylogeny of Orthophytum (Bromeliaceae) elucidates infrageneric relationships and demonstrates the taxonomic significance of the inflorescence type*
- 13. Journal of Biogeography** 41:1833–1847
Masters, Génin, Silvestro, Lister, DelPero. *The Red Island and the seven dwarfs: Body size reduction in Cheirogaleidae* [Featured as: 'Special paper']
- 12. Systematic Biology** 63:349–367
Silvestro, Schnitzler, Liow, Antonelli, Salamin. *Bayesian estimation of speciation and extinction from incomplete fossil occurrence data*
- 11. Bioinformatics** 30:1241–1249
Dib, Silvestro, Salamin. *Evolutionary footprint of coevolving positions in genes*
- 10. Evolution** 68:163–175
Silvestro, Zizka, Schulte. *Disentangling the effects of key innovations on the diversification of Bromelioideae (Bromeliaceae)*
- 2013 **9. Folia Primatologica** 84:201–219
Masters, Silvestro, Génin, DelPero. *Seeing the Wood through the Trees: the Current State of Higher Systematics in the Strepsirhini*
- 8. Journal of Biogeography** 40:869–880
Wagner*, Silvestro*, Brie, Ibsch, Zizka, Weising, Schulte. *Spatiotemporal evolution of Fosterella (Bromeliaceae) in the Central Andean biodiversity hotspot* (*Equal contributions)
- 2012 **7. Organisms Diversity and Evolution** 12:335–337
Silvestro, Michalak. *RaxmlGUI: A graphical front-end for RAxML*
- 2011 **6. BMC Evolutionary Biology** 11:311
Silvestro, Schnitzler, Zizka. *A Bayesian framework to estimate diversification rates and their variation through time and space* [Flagged 'highly accessed']
- 5. Journal of Mammalian Evolution** 18:131–146
Picone, Masters, Silvestro, Sineo, DelPero. *A Phylogenetic Analysis of Human Syntenies revealed by Chromosome Painting in Euarchontoglires Orders*
- 2010 **4. Molecular Phylogenetics and Evolution** 57:1105–1119
Schulte, Silvestro, Kiehlmann, Vesely, Novoa, Zizka. *Detection of recent hybridization between sympatric Chilean Puya species (Bromeliaceae) using AFLP markers and reconstruction of complex relationships*
- 3. Zoologischer Anzeiger** 248:299–312
Tirelli, Silvestro, Pessani and Tudge. *Description of the male reproductive system of Paguristes eremita (Anomura, Diogenidae) and its placement in a phylogeny of diogenid species based on spermatozoal and spermatophore ultrastructure*
- 2008 **2. Biogeographia** XXIX:117–132
Meregalli, Silvestro. *Assessing relationships between Mediterranean and Afro-tropical taxa of Cleonini (Coleoptera: Curculionidae: Lixinae): a survey based on Bayesian analysis and lineage geohistory reconstruction*

2008

1. Journal of Crustacean Biology

28:534–542

Tirelli, Campantico, Pessani, Silvestro and Tudge. *Reproductive biology of Mediterranean Hermit crabs: fine structure of spermatophores and spermatozoa of *Diogenes pugilator* (Decapoda: Anomura) and its bearing on a sperm phylogeny of the Diogenidae*