

Daniel S. Caetano

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Research interests

I am interested in macroevolutionary patterns of trait evolution across the tree of life. I use and develop statistical models applied to phylogenetic trees to ask questions such as the ecological and historical drivers of macroevolution, the association between morphological differentiation and lineage diversification and patterns of evolutionary correlation among several traits.

Education

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| 2012 - present | University of Idaho, Moscow, ID
Ph. D. in Bioinformatics and Computational Biology
Advisor: Dr. Luke J. Harmon |
| 2009 - 2011 | University of São Paulo, São Paulo, Brazil
M. S. in Ecology
Advisor: Dr. Glauco Machado |
| 2004 - 2009 | University of São Paulo, São Paulo, Brazil
B. S. in Biological Sciences (major/minor system does not apply) |

Peer reviewed publications

- Genevcius B.C., **Caetano D.S.** & C.F. Schwertner, 2017. Rapid differentiation and asynchronous coevolution of male and female genitalia in stink bugs. *Journal of Evolutionary Biology*, doi:10.1111/jeb.13026
- Uyeda J.C., **Caetano D.S.** & M.W. Pennell, 2015. Comparative analysis of Principal Components can be misleading. *Systematic Biology*, 64(4):677–689.
- Caetano D.S.** & A. Aisenberg, 2014. Forgotten treasures: the fate of data in animal behaviour studies. *Animal Behaviour*, 98:1–5.
- Caetano D.S.** & G. Machado, 2013. The ecological tale of Gonyleptidae (Arachnida, Opiliones) evolution: phylogeny of a Neotropical lineage of armoured harvestmen using ecological, behavioural and chemical characters. *Cladistics*, 29(6):589–609.
- Caetano D.S.**, Bená D.D.C. & S.A. Vanin, 2013. *Copelatus cessaima* sp. nov. (Coleoptera: Dytiscidae: Copelatinae): first record of a troglomorphic diving beetle from Brazil *Zootaxa*, 3710(3):226–232.
- Werneck R.M., **Caetano D.S.** & G. Machado, 2012. Maternal care in the Neotropical harvestman *Liogonyleptoides tetracanthus* (Opiliones: Gonyleptidae). *Journal of Arachnology*, 40(1):135–137.
- Caetano D.S.** & S.A. Vanin, 2008. A new species of the genus *Pimelerodius* Vanin, 1986 from the Amazon Region, with notes on the geographic distribution of *Pimelerodius motacilla* (Boheman, 1843) (Coleoptera, Curculionidae, Otidocephalini). *Revista Brasileira de Entomologia*. 52(3):431–433.

Manuscripts in pre-print and under review

- Caetano D.S.** & L.J. Harmon, 2017. Estimating correlated rates of trait evolution with uncertainty. *bioRxiv*, doi: <https://doi.org/10.1101/102939>
Under review in Systematic Biology.
- Caetano D.S.**, Alencar L.R.V., Passos P., Grazziotin F.G., Zaher H. & M. Martins, 2016. Have coral snake mimics diversified more than non-mimics? *bioRxiv*, doi: <http://dx.doi.org/10.1101/042440>
To be submitted to Journal of Evolutionary Biology.

Caetano D.S. & L.J. Harmon. 2017. ratematrix: a R package for studying evolutionary integration among several traits on phylogenetic trees.

Under review in Methods in Ecology and Evolution.

Software

'ratematrix' (Open source) – <https://github.com/Caetanods/ratematrix>

R package for the study of evolutionary integration using phylogenies in a Bayesian framework.

'Posterior_Phylo_sampler' (Open source) - https://github.com/Caetanods/Posterior_Phylo_sampler

A memory efficient bash script to randomly sample phylogenies from large nexus files.

Awards and fellowships

2016 - 2017 Bioinformatics and Computational Biology Program fellowship - \$48,050
 University of Idaho (Full tuition and fellowship)

2012 - 2016 Science Without Borders Fellowship - \$157,560
 CAPES, Brazil (Full tuition and fellowship)

2015 College of Sciences Travel Award - \$1,300
 University of Idaho

2012 - 2013 GPSA Travel Award - \$1,400
 University of Idaho

2009 - 2011 FAPESP Master level Scholarship - \$14,400
 São Paulo state, Brazil

2008 – 2009 FAPESP Undergrad level Scholarship - \$2,316
 São Paulo state, Brazil

Invited talks

2016 External IBEST Evaluation – Research Updates
 University of Idaho, Moscow, ID
 Title: “Comparative methods to study the evolution of correlated traits using phylogenetic trees”

2014 and 2015 Biology 489 (Herpetology)
 University of Idaho, Moscow, ID
 Title: "Evolution of warning signals and mimicry in Neotropical snakes"

2011 Neotropical Harvestmen symposium
 III Latin-American Congress of Arachnology, Montenegro, Colombia
 Title: “The ecological tale of Gonyleptidae evolution: phylogeny using behavioral, ecological, and chemical characters”

2011 Seminários da Ecologia (Graduate seminar series)
 University of São Paulo, São Paulo, Brazil
 Title: “Binary animal behavior: phylogeny of a harvestmen family and evolutionary patterns of behavioral characters”

2011 Biological systematics class
 Federal University of São Paulo, São Paulo, Brazil
 Title: “Use of behavioral characters in phylogenetic inference”

Conference presentations

- 2017 Society of Systematic Biologists – Standalone Meeting
Title: “ratematrix: a R package for studying evolutionary integration among several traits on phylogenetic trees” (lightning talk)
- 2016 Evolution Meeting
Title: “Estimating correlated rates of trait evolution from phylogenies with uncertainty”
- 2015 Ernst Mayr symposium (Evolution Meeting - SSB Student Award competition)
Title: “The colors of deception: Evolution of warning signals in Neotropical snakes (Colubroidea: Dipsadidae)”

Teaching experience

- 2016 Workshop teacher, University of São Paulo
“MCMC step by step: Applications of Monte Carlo methods in phylogenetic comparative methods”
- 2015 Workshop helper, Washington State University, Pullman, WA
“Software carpentry”
- 2014 Teaching assistant, University of Idaho
“Computer Skills for Biologists”
- 2011 Teaching assistant, University of São Paulo
“Use of the R Language to analyze ecological data”
- 2010 Teaching assistant, University of São Paulo
“Introduction to Ecology” (undergraduate level)

Professional service

- 2015 - *present* Committee member of the Bioinformatics and Computational Biology seminar series
University of Idaho, Moscow, ID
- 2015 - 2016 Graduate student representative
Bioinformatics and Computational Biology program (University of Idaho)
- 2011 R study group – Introduction to the R language (Graduate level)
University of São Paulo, São Paulo, Brazil
- 2009 - 2010 R study group – Phylogenies and the R language (Graduate level)
University of São Paulo, São Paulo, Brazil
- 2010 - 2011 Committee member of the Department of Ecology seminars
University of São Paulo

Consultant experience

- 2011-2012 Project manager – Collection and identification of insects (Coleoptera)
Location: Cerrado/Savanna region (Belo Horizonte, Brazil)
- 2011-2012 Field assistant – Collection of insects (Lepidoptera)
Location: Amazon region (Rondônia, Brazil)

References

Dr. Luke J. Harmon
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