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## CURRICULUM VITAE

# CAROLINE M. TUCKER

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### CONTACT:

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University of North Carolina at Chapel Hill.  
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**CITIZENSHIP:** Canadian

### PROFESSIONAL POSITIONS:

Assistant Professor  
Biology Department, University of North Carolina at Chapel Hill (2017-Current).  
Adjunct, Curriculum for the Environment and Ecology (CEE)

EU Marie Skłodowska-Curie International Incoming Fellows,  
Centre d'Ecologie Fonctionnelle et Evolutive-CNRS (2016-2017)  
Mentor: Dr. Cyrille Violle

NSERC Postdoctoral Research Fellow,  
University of Colorado, Boulder (2014 - 2016)  
Mentor: Dr. Brett Melbourne

### POST-SECONDARY EDUCATION:

- 2013** **PhD.** Ecology and Evolutionary Biology, University of Toronto; Canada  
Supervisor: Dr. Marc Cadotte
- 2008** **B.Sc.** Honours Biology, Mount Saint Vincent University; Canada

### PUBLICATIONS:

#### In review/revision

- **Caroline M. Tucker**, T. Jonathan Davies, Marc W. Cadotte, and William D. Pearse. On the relationship between phylogenetic diversity and trait diversity. *Ecology*. *In revision*.
- **Caroline M. Tucker**, François Vasseur, Etienne Baron, Marianne Gerard, Elena Kazakou, Kevin Sartori, Denis Vile, Cyrille Violle. The scaling of plant variation: comparing evolutionary constraints on trait relationships across taxonomic scales. *In revision*.

- Cadotte, M.W. and **Tucker, C.M.** Difficult decisions: addressing non-congruence in taxonomic, phylogenetic and functional measures for site priority. *Biological Conservation*. *In revision*.
- \*Matthias Grenié, David Mouillot, Sébastien Villéger, Pierre Denelle, Valeriano Parravicini, **Caroline M. Tucker**, François Munoz, Cyrille Violle. Worldwide functional rarity of coral reef fishes: a new currency for conservation strategies. *In revision*.
- Florent Mazel, Matthew W. Pennell, Marc Cadotte, Sandra Diaz, Giulio Valentino Dalla Riva, Richard Grenyer, Fabien Leprieur, Arne O. Mooers, David Mouillot, **Caroline M. Tucker**, and William Pearse. Is phylogenetic diversity a surrogate for functional richness across clades and space? *In review*.

### Peer-reviewed articles

15. François Munoz, Adrien Taudière, Fabien Laroche, Matthias Grenié, Pierre Denelle, **Caroline M. Tucker** and Cyrille Violle. 2017. Lottery: Coalescent-based simulation of ecological communities. *Methods in Ecology and Evolution*. *In press*.
14. \*Matthias Grenié, Pierre Denelle, **C.M. Tucker**, François Munoz, and Cyrille Violle 2017. funrar: an R package to characterize functional rarity. *Diversity and Distributions*. 00:1–7. <https://doi.org/10.1111/ddi.12629>.
13. Cadotte, M.W., **Tucker, C.M.** 2017. Should environmental filtering be abandoned? *Trends in Ecology and Evolution*, 32(6).
12. Freschet, G. T., O. J. Valverde–Barrantes, **C. M. Tucker**, J. M. Craine, L. M. McCormack, C. Violle, F. Fort, C. B. Blackwood, K. R. Urban–Mead, and C. M. Iversen. 2017. Climate, soil and plant functional types as drivers of global fine–root trait variation. *Journal of Ecology*.
11. **Tucker, C.M.**, Marc W. Cadotte, Silvia B. Carvalho, Jonathan Davies, Simon Ferrier, Susanne A. Fritz, Rich Grenyer, Matthew R. Helmus, Lanna S. Jin, Arne O. Mooers, Sandrine Pavoine, Oliver Purschke, David W. Redding, Dan. F. Rosauer, Marten Winter, Florent Mazel. 2017. A guide to phylogenetic metrics for conservation, community ecology and macroecology. *Biological Reviews*. DOI: 10.1111/brv.12252
10. **Tucker, C.M.**, Shoemaker, L., Nemergut, D., Davies, K., Melbourne, B.A. 2015. Differentiating between niche and neutral assembly in metacommunities using null models of beta-diversity. *Oikos*. DOI: 10.1111/oik.02803
9. Pearse, W.D, Cadotte, M.W., Cavender-Bares, J., Ives, A.R., **Tucker, C.M.**, Walker, S.C., Helmus, M.R. 2015. pez: Phylogenetics for the Environmental Sciences. *Bioinformatics*. DOI: 10.1093/bioinformatics/btv277
8. **Tucker, C.M.** and Fukami, T. 2014. Environmental variability counteracts priority effects to facilitate species coexistence: evidence from nectar microbes. *Proc. R. Soc. B*. 281:1778. DOI: 10.1098/rspb.2013.2637

7. Jeganmohan, S.\*, **Tucker, C.M.**, and Cadotte, MW. 2014. Colonization rates in a metacommunity altered by competition. *PLoS ONE*. 9:2, e88344. DOI: 10.1371/journal.pone.0088344
6. **Tucker, C.M.**, Cadotte, M.W. 2013. Unifying measures of biodiversity: understanding when richness and phylogenetic diversity should be congruent. *Diversity and Distributions*. 19:7. DOI: 10.1111/ddi.12087
5. **Tucker, C.M.**, Cadotte, M.W. 2013. Fire variability, not frequency explains species coexistence in a fire-dominated system. *Journal of Applied Ecology*. 50(3). DOI: 10.1111/1365-2664.12073
4. Abrams, P., **Tucker, C.M.**, Gilbert, B. 2012. Evolution of the storage effect. *Evolution*. 67(2). DOI:10.1111/j.1558-5646.2012.01756.x
3. **Tucker, C.M.**, Rebelo, A.G., Davies, J.D., Cadotte, M.W. 2012. The distribution of biodiversity: linking richness to geographical and evolutionary rarity in a biodiversity hotspot. *Conservation Biology*. 25:2. DOI: 10.1111/j.1523-1739.2012.01845.x. Featured on cover.
2. **Tucker, C.M.**, Rebelo, T.R., Manne, L.L. 2011. How disturbance affects the distribution and abundance of species in a fire-adapted system. *Ecography*. 35:4:p348-355. DOI: 10.1111/j.1600-0587.2011.06948.x
1. **Tucker, C.M.**, Avila-Sakar, G. 2010 Ontogenetic changes in tolerance to herbivory among three ecotypes of *Arabidopsis thaliana*. *Oecologia*. 164:4, p1005-1015. DOI 10.1007/s00442-010-1738-6

\*Asterisks indicate student coauthors

### Preprints

1. Florent Mazel, **Tucker, C.M.** Cadotte, M.W., Silvia B. Carvalho, Jonathan Davies, Simon Ferrier, Susanne A. Fritz, Rich Grenyer, Matthew R. Helmus, Lanna S. Jin, Arne O. Mooers, Sandrine Pavoine, Oliver Purschke, David W. Redding, Dan. F. Rosauer, Marten Winter. 2016. The Forest, the Trees, and the Phylo-diversity Jungle. bioRxiv doi: <http://dx.doi.org/10.1101/063461>

### R Packages

1. Grenié, M., Denelle, P., **Tucker, C.M.** Funrar: functional rarity indices computation. 2016. (<https://cran.r-project.org/web/packages/funrar/index.html>)
2. François Munoz, Adrien Taudière, Fabien Laroche, Matthias Grenié, Pierre Denelle, **Caroline M. Tucker** and Cyrille Violle.. ecolottery: Coalescent-Based Simulation of Ecological Communities. (<https://cran.r-project.org/web/packages/ecolottery/index.html>)
3. Pearse, W.D, Cadotte, M.W., Cavender-Bares, J., Ives, A.R., **Tucker, C.M.**, Walker, S.C., Helmus, M.R. 2015. pez: Phylogenetics for the Environmental Sciences. (<https://cran.r-project.org/web/packages/pez/index.html>)

### Book chapters

1. Hobohm, C. and **Tucker, C.M.** 2014. The Increasing Importance of Endemism: Responsibility, the Media and Education. In Hobohm, C.: Plant Endemism. Springer Netherlands.
2. Hobohm, C. and **Tucker, C.M.** 2014. How to quantify endemism. In Hobohm, C.: Plant Endemism. Springer Netherlands.

#### **AWARDS, FELLOWSHIPS AND HONOURS:**

- iDiv-CIEE joint funding for sCAP: Conservation and Phylogenies working group (€35,000.00) (2017)
  - German Centre for Integrative Biodiversity Research (iDiv)
  - Canadian Institute for Ecology and Evolution (CIEE)
- EU Marie Skłodowska-Curie International Incoming Fellowship (2016)
  - These are highly competitive fellowships for international researchers to work in EU labs. (€185,076.00)
- British Ecological Society Research Grant (2014)
  - This supported the development of zooplankton microcosms for experimentation. (£2,940.70)
- NSERC Postdoctoral Fellowship (2014-2016)
  - This is a competitive Canadian fellowship, with less than 180 awarded across all sciences. (\$40,000 for 2 years)
- NIMBioS Postdoctoral fellowship in Mathematical Biology (2014, declined. \$51,000)
- University of Toronto, EEB: Ramsay Wright Award (2012)
  - This award is given to 3rd and 4th year PhD students with strong contributions to research and to the life of the department. (\$1000)
- Visiting researcher, Fukami Lab, Stanford University (06/2012-10/2012)
- NSERC: Michael Smith Foreign Study Supplement (2012)
  - Awarded to holders of NSERC graduate scholarships to work in a foreign country. (\$6000)
- NSERC: Alexander Graham Bell Canada Graduate Scholarship (2009-2012)
  - Competitive graduate fellowship for Canadian science and engineering students (\$40,000/year)
- Ontario Graduate Scholarship (2011, declined)
- NSERC: Julie Payette Scholarship (2008; \$24,000)
- University of Toronto: Helen Sawyer Hogg Graduate Admissions Award (2008)
- NSERC: Undergraduate Student Research Award (3x, 2005-2008)
- Mount Saint Vincent University: Merit Scholarship (2005-2008)

## TEACHING EXPERIENCE:

- UNC-Chapel Hill Biology Department
  - Biology 891: Special Topics in Ecology and Evolution. (Winter 2018)
- Lecturer
  - University of Colorado, Boulder, 4100 Advanced Ecology (Winter 2016)
  - University of Colorado, Boulder, 6200-001 Graduate Seminar in Population and Community Ecology (Fall 2015)
    - With Kendi Davies and Julian Resasco
- Guest lecturer
  - University of Colorado, Boulder. EBIO 5100, Advanced Ecology (2015), topic – “Changing directions for community phylogenetics”
  - University of Toronto. BIOD60, Spatial ecology (2013), topic – “Species distribution models”
  - University of Toronto. BIOD66, Causes and Consequences of Diversity (2012), topic – “Spatially explicit analysis of diversity”
  - University of Toronto. BIO321H, Community Ecology (2011), topic – “Community Phylogenetics”
- Graduate assistant, University of Toronto, Scarborough (2010-2013)
  - BIOD60, Spatial Ecology, Prof. Marc Cadotte
  - BIOD66, Causes and Consequences of Diversity, Prof. Marc Cadotte
- Undergraduate assistant, MSVU (2005-2008)
  - Biology Department: Plant physiology, Introductory Botany and Introductory Biology
  - Mathematics Department: Introductory Statistics

## MENTORING EXPERIENCE:

- Centre d’Ecologie Fonctionnelle et Evolutive, Montpellier, France
  - Marie Skvorova, Erasmus program
  - Co-supervised with François Vasseur
  - Intraspecific seed mass variation in *A. thaliana*.
- Undergraduates
  - University of Colorado, Boulder
    - Elizabeth Angell (2014-2016)
      - Honours project supervisor;  
<http://www.colorado.edu/ebio/2015/09/09/elizabeth-angell>
      - Funded via Biological Undergraduate Research Skills & Training program.
    - Reese Beeler (2014-2016)
      - funded via Biological Undergraduate Research Skills & Training program.

- Austin Hampton (2015-present)
- University of Toronto, Scarborough (2011-2013)  
Monaly Mistry,  
Shajini Jeganmohan,  
Janani Sivarajah,  
Javad Champsi (all for independent research projects)

### **PROFESSIONAL SERVICE:**

- Co-organizer with Arne Mooers, sCAP working group (2017-present).
- Main contributor, *EEB and Flow* blog (evol-eco.blogspot.com) (2010 to Present).
- Organizer, organized oral session (OOS). "Communities writ small: Integrating microbial systems into community ecology". ESA. (2014).
- Graduate representative, EEB Graduate Affairs Committee, U of Toronto. (2012)
- Scarborough Campus representative on the EGSA. (2012)
- University of Toronto Atwood Lecture search committee. (2009-2012 (chair 2012))
- EEB Colloquium organizing committee. (2011)
- Programming and statistical consulting for Ontario Ministry of the Environment, Environmental Monitoring and Reporting Branch (2010-2012)
  - Produced *Report* for Sport Fish and Biomonitoring Unit of the Ontario Ministry of the Environment, Environmental Monitoring and Reporting Branch. 2012.

### **Refereeing**

The American Naturalist, Biological Conservation, Canadian Journal of Fisheries and Aquatic Science, Diversity and Distributions, Ecology, Ecology Letters, Ecography, Environmental Microbiology, Global Ecology and Biogeography, Journal of Applied Ecology, Journal of Chemical Ecology, Journal of Molecular Ecology, Journal of Plant Ecology, Methods in Ecology and Evolution, Oecologia, Oikos, PLoS ONE, Philosophical Transactions of the Royal Society, Proceedings of the Royal Society, B.

### **PRESENTATIONS**

- Tucker, C.M. 2017. "What value does the past have for the future? Assessing the use of evolutionary history to inform conservation." Duke University. (Invited talk).
- Tucker, C.M. 2017. "What value does the past have for the future? Assessing the use of evolutionary history to inform conservation." CEE, University of North Carolina. (Invited talk).
- Tucker, C.M. "The scaling of plant variation: comparing evolutionary constraints on trait relationships across taxonomic scales." ESA (oral presentation).
- Tucker, C.M. 2016. "Biodiversity in a variable world". University of Mississippi, Biology Department (Invited talk).

- Tucker, C.M. 2016. “Local effects on diversity congruence”. EcoSummit (oral presentation).
- Tucker, C.M. 2016. “Biodiversity in a variable world”. University of North Carolina, Chapel Hill (Invited talk).
- Tucker, C.M., Legault, G., Melbourne, B. 2015. “Plasticity alters competitive interactions between zooplankton species.” ESA. (Oral presentation).
- Shoemaker, L.\*, Tucker, C.M.\*, Nemergut, D., Melbourne, B. 2014. “Differentiating between niche and neutral assembly: where null models fall short”. ESA. (Oral presentation). \*Shared first author.
- Tucker, C.M. and Fukami, T. 2013. “Environmental variability counteracts priority effects to facilitate species coexistence: evidence from nectar microbes.” ESA. (Oral presentation).
- Tucker, C.M. Wadgymar, S., Carscadden, K. 2012. "Community-level interactions alter species responses to climate change." ESA. (Oral presentation).
- Tucker, C.M. EEB Colloquium. 2011. Diversity disturbance relationships: rethinking the Intermediate Disturbance Hypothesis. (Oral presentation)
- Tucker, C. M. and M. Cadotte. 2011. Diversity-disturbance relationships in the fynbos. BES. (Invited oral presentation).
- Tucker, C. M. 2010. Understanding patterns of community structure: abiotic and biotic drivers across multiple scales. University of Toronto EEB department seminar.
- Tucker, C. M., Rebelo, T.R., Manne, L.L. 2009. Differential contribution of fire, space and climate to distribution and abundance in a fire-adapted system. Ecological Society of America (Poster presentation)
- Tucker, C. M., Avila-Sakar, G. 2008. Ontogenetic changes in tolerance to herbivory among three ecotypes of *Arabidopsis thaliana*. Mexican Congress of Ecology. (Poster presentation).
- Tucker, C. M. 2008 Does age matter? Developmental changes in plant tolerance. APICS Undergraduate Biology Conference. (Poster presentation). Atlantic Undergraduate Biology Conference
- Avila-Sakar, G., Tucker, C. M. .2007. Tolerance to herbivory in resistant and susceptible ecotypes of *Arabidopsis thaliana*. (Oral presentation).