

Department of Biology  
University of Missouri - St. Louis  
St. Louis, MO, 63121  
(314) 516-6672  
muchhala@umsl.edu  
www.umsl.edu/~muchhala

# Nathan Muchhala

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## EDUCATION

**Ph.D., Biology** (5/07), University of Miami, Coral Gables, FL (with Dr. Theodore Fleming)

**B.A., Biology** (5/98), Earlham College, Richmond, IN (college and departmental honors)

## PROFESSIONAL EXPERIENCE

Associate Professor (2019-Present), Department of Biology, University of Missouri – St. Louis, St. Louis, MO

Assistant Professor (2013-2019), Department of Biology, University of Missouri – St. Louis, St. Louis, MO

Postdoctoral Research Fellow (2011-2013), School of Biological Sciences, University of Nebraska, Lincoln, NE (with Dr. Stacey Smith)

Postdoctoral Research Fellow (2007-2010), Dept. of Ecology and Evolutionary Biology, University of Toronto, Toronto, ON (with Dr. James Thomson)

## GRANTS & FELLOWSHIPS

- National Council for Scientific and Technological Development, Brazil (PI), Visiting Professor Fellowship (Call No. 08/2019); **\$11,283** (2020; postponed)
- Living Earth Collaborative Grant (Co-PI), “Testing the role that biotic interactions play in shaping elevational-diversity gradients: An ecological metabolomics approach”; J. Myers, J.S. Tello, N. Muchhala, B.E. Sedio; **\$29,010** (2020-21)
- Living Earth Collaborative Grant (Co-PI), “Floral scent differentiation as a method for pollinator partitioning in *Anthurium* (Araceae)”; M. Carlsen, N. Muchhala, G. Camilo, E. Spevak; **\$28,885** (2019-20)
- NSF Full Proposal (PI), “Quantifying the roles of pollination and post-pollination barriers in angiosperm speciation: a case study of the diverse Neotropical genus *Burmeistera* (Campanulaceae)”; N. Muchhala; DEB–Phylogenetic Systematics Panel; **\$731,385** (2018-21)
- UMSL ORA Research Award (PI), “Interspecific pollen transfer and gene flow during the rapid diversification of bat-pollinated *Burmeistera* (Campanulaceae)”; **\$10,900** (2018-19)
- UMSL ORA Research Award (PI), “Is speciation faster in the tropics? Effects of seasonality and mutualists on plant genetic structure”; **\$9,174** (2016-17)

- St. Louis Zoo Field Research for Conservation Grant (Co-PI), “From bat to bird: Investigating a potential case of sympatric speciation via pollinator shift in the Andes”; **\$10,000** (2016)
- UM Research Board Grant (PI), “Speciation in *Burmeistera*”; **\$50,000** (2015)
- University of Nebraska Program of Excellence Postdoctoral Fellowship (2012-13)
- Prometeo Fellowship for Visiting Scholars to Ecuador; **\$36,000** (2012; Declined)
- Encyclopedia of Life Rubenstein Fellowship; **\$24,000** (2012)
- Fulbright Scholar Grant; **\$12,000** (2010)
- National Geographic Society Grant (PI), “Coevolution in an extremely specialized bat-flower mutualism: exploring the geographic mosaic”; **\$22,577** (2010)
- University of Toronto Departmental Postdoctoral Fellowship (2007-09)
- Bat Conservation International Postdoctoral Grant; **\$1,000** (2007)
- National Science Foundation Graduate Research Fellowship (2002-05)
- Curtis Scholarship, University of Miami; **\$500** (2004)
- Bat Conservation International Student Grant; **\$2,524** (2003)
- Curtis Scholarship, University of Miami; **\$500** (2002)
- Organization for Tropical Studies Post-Course Award; **\$500** (2002)
- Maytag Fellowship (2005-07; 2001)
- Fulbright Fellowship (1999-2000)

## PUBLICATIONS

50. Moreira-Hernández, J., C. Calderón-Acevedo, and N. Muchhala. (2020). Fur, wings, and flowers: development and progress on nectarivorous bat research in the last 50 years. Chp 9 in B. Lim (ed), *50 Years of Bat Research*. Springer, Switzerland. (In press)
49. Calderón-Acevedo, C., and N. Muchhala. (2020). First record of the Broad-toothed Tailless Bat, *Anoura latidens* Handley 1984 (Chiroptera, Phyllostomidae) in Bolivia. *Checklist* (In press)
48. Gamba, D., and N. Muchhala. (2020). Flowering asynchrony contributes to genetic divergence in tropical plants. *New Phytologist* (In review)
47. Muchhala, N., and B. Mashburn. (2020). Three new species of *Burmeistera* (Campanulaceae) endemic to Ecuador. *Phytotaxa* (In review).
46. Mashburn, B., C. Ulloa Ulloa, and N. Muchhala. (2020). Seven new species of *Burmeistera* (Campanulaceae) endemic to Ecuador. *Novon* (In press).
45. Gamba, D., A. G. Linan and N. Muchhala. (2020). Global patterns of population genetic differentiation in seed plants. *Molecular Ecology* **29**:3413-3428.
44. Mashburn, B., A. J. Pérez, C. Persson, C. Zapata, D. Cevallos, and N. Muchhala. (2020). *Burmeistera quimiensis* (Lobelioideae, Campanulaceae): A new species from the Cordillera del Cóndor range in southeast Ecuador. *Phytotaxa* **433**(1), 67-74.

43. Armbruster, S., and N. Muchhala. 2020. Floral reorientation: the restoration of pollination accuracy after accidents. *New Phytologist* **227**: 232–243
42. Muchhala, N. and M. Tschapka. 2020. The ecology and evolution of nectar-feeding phyllostomids. Chp. 16 in T. H. Fleming, L. Davalos, and M. Mello (eds.) *Phyllostomid Bats, a Unique Mammalian Radiation*. University of Chicago Press.
41. Calderón-Acevedo, C., M. E. Rodríguez-Posada and N. Muchhala. 2020. Large *Anoura* (Chiroptera:Glossophaginae) taxonomy, taxonomic status of *Anoura carishina*, and implications for the distribution of *Anoura latidens* in Colombia. *Mammalia* (In review)
40. Bagley, J.C., S. Uribe-Convers, M. M. Carlsen, and N. Muchhala. 2020. Utility of targeted sequence capture for phylogenomics in rapid, recent angiosperm radiations: Neotropical *Burmeistera* bellflowers as a case study. *Molecular Phylogenetics and Evolution*, 106769.
39. Moreira-Hernández, J. and N. Muchhala. 2019. Importance of pollinator-mediated interspecific pollen transfer for angiosperm evolution. *Annual Review of Ecology, Evolution, and Systematics* **50**:191-217
38. N. Muchhala. 2019. Quantum dots shed light on angiosperm speciation. *New Phytologist* **224** (3), 1005-1008
37. Moreira- Hernández, J., N. Terzich, R. Zambrano-Cevallos, N. H. Oleas, and N. Muchhala. 2019. Differential tolerance to heterospecific pollen deposition in two sympatric species of *Burmeistera* (Campanulaceae: Lobelioideae). *International Journal of Plant Systematics* **180** (9), 987-995
36. Lagomarsino, L. and N. Muchhala. 2019. A gradient of pollination specialization in three species of Bolivian *Centropogon*. *American Journal of Botany* **106**(5):1-10
35. Vallejo, A. F., A. J. Pérez, D. Cevallos, and N. Muchhala. 2018. New species of *Burmeistera* (Campanulaceae: Lobelioideae) from Ecuador. *Phytotaxa* **362**(3):263-270
34. Calderón-Acevedo, C., and N. Muchhala. 2018. Identification and diagnosis of *Anoura fistulata* with remarks on its presumed presence in Bolivia. *Journal of Mammalogy* **99**(1):131-137
33. Lagomarsino, L., B. Forrestel, N. Muchhala, and C. C. Davis. 2017. Repeated evolution of vertebrate pollination syndromes in a recently diverged Andean plant clade. *Evolution* **71**(8):1970-1985
32. Maguiña, R., and N. Muchhala. 2017. Do artificial nectar feeders affect bat-plant interactions in an Ecuadorian cloud forest? *Biotropica* **49**(5):586–592
31. Gamba, D., R. Maguiña, C. Calderón-Acevedo, K. Torres, and N. Muchhala. 2017. Seed dispersal for the unusual inflated berries of *Burmeistera* (Campanulaceae). *Neotropical Biodiversity* **3**(1):10-17.
30. Uribe-Convers, S., M. M. Carlsen, L. P. Lagomarsino, and N. Muchhala. 2017. Phylogenetic relationships of *Burmeistera* (Campanulaceae: Lobelioideae): Combining whole plastome with targeted loci data in a recent radiation. *Molecular Phylogenetics and Evolution* **107**(2017):551-563
29. Lagomarsino, L. P., D. Santamaría Aguilar, and N. Muchhala. 2015. Two new species of *Burmeistera* (Campanulaceae: Lobelioideae) from the Cordillera de Talamanca of Costa Rica and Panama, with a key to the Central American species. *Systematic Botany* **40**(3):914-921.

28. Muchhala, N., and D. Serrano. 2015. The complexity of background clutter affects nectar bat use of flower odor and shape cues. *PlosONE* **10**(10):e0136657.
27. Muchhala, N., and A. Pérez. 2015. *Burmeistera zamorensis* (Campanulaceae: Lobelioideae), a new species from southern Ecuador. *Novon* **24**(1), 36-38.
26. Clark J. L., L. Clavijo, and Muchhala, N. 2015. Convergence of anti-bee pollination mechanisms in the Neotropical plant genus *Drymonia* (Gesneriaceae). *Evolutionary Ecology* **29**(3), 355-377.
25. Lagomarsino, L. P., A. Antonelli, N. Muchhala, S. Mathews, and C. C. Davis. 2014. Phylogeny, classification, and fruit evolution of the species-rich Neotropical bellflowers (Campanulaceae: Lobelioideae). *American Journal of Botany* **101**(12): 2097-2112.
24. Muchhala, N., S. Johnsen, and S. D. Smith. 2014. Competition for hummingbird pollination shapes flower color variation in Andean Solanaceae. *Evolution* **68**(8): 2275–2286.
23. Muchhala, N., and J. D. Thomson. 2012. Interspecific competition in pollination systems: costs to male fitness via pollen misplacement. *Functional Ecology* **26**(2):476-482.
22. Jorgensen, P.M., N. Muchhala, and J.M. MacDougal. 2012. *Passiflora unipetala*, a new bat-pollinated species of *Passiflora* supersection *Tacsonia*. *Novon* **22**(2):174-179.
21. Moreno, M.P. and N. Muchhala. 2011. Campanulaceae. In: R. Valencia, N. Pitman, S. León-Yáñez, and P.M. Jørgensen (eds.). *Libro rojo de las plantas endémicas del Ecuador, segunda edición*. Herbario QCA, Pontificia U. Católica del Ecuador, Quito.
20. Garibaldi, L.A., N. Muchhala, I. Motzke, L. Bravo-Monroy, R. Olschewski, and A.M. Klein. 2011. Services from plant-pollinator interactions in the Neotropics. Pp. 119-139 in B. Rapidel, F. DeClerck, J.F. Le Coq, J. Beer (eds.), *Ecosystem Services from Agriculture and Agroforestry: Measurement and Payment*. Earthscan, London, UK.
19. Muchhala, N., Z. Brown, W.S. Armbruster, and M.D. Potts. 2010. Competition drives specialization in pollination systems through costs to male fitness. *American Naturalist* **176**(6):732-743.
18. Muchhala, N., and J.D. Thomson. 2010. Fur versus feathers: Pollen delivery by bats and hummingbirds, and consequences for pollen production. *American Naturalist* **175**:717-726  
\* Featured in Science Podcast and ScienceNOW
17. Muchhala, N., and J.D. Thomson. 2009. Going to great lengths: selection for long corolla tubes in an extremely specialized bat-flower mutualism. *Proceedings of the Royal Society B* **276**:2147-2152  
\* Featured in Nature's Research Highlights, *Nature* **458**:388
16. Muchhala, N., A. Caiza, J.C. Vizuete, and J.D. Thomson. 2009. A generalized pollination system in the tropics: Bats, birds, and *Aphelandra acanthus*. *Annals of Botany* **103**(9):1481-1487
15. Armbruster, W.S. and N. Muchhala. 2009. Associations between floral specialization and species diversity: Cause, effect, or correlation? *Evolutionary Ecology* **23**:159-179
14. Knox, E.B., A.M. Muasya, and N. Muchhala. 2008. The predominantly South American clade of Lobeliaceae. *Systematic Botany* **33**(2):462-468.
13. Muchhala, N. 2008. Functional significance of interspecific variation in *Burmeistera* flower morphology: Evidence from nectar bat captures. *Biotropica* **40**(3): 332–337

12. Fleming, T.H. and N. Muchhala. 2008. Nectar-feeding bird and bat niches in two worlds: pantropical comparisons of vertebrate pollination systems. *Journal of Biogeography* **35**(5): 764–780
11. Muchhala, N. and M.D. Potts. 2007. Character displacement among bat-pollinated flowers of the genus *Burmeistera*: analysis of mechanism, process, and pattern. *Proceedings of the Royal Society B* **274**:2731-2737.  
\* Featured in Science Daily News
10. Muchhala, N. 2007. Adaptive tradeoff in floral morphology mediates specialization for flowers pollinated by bats and hummingbirds. *American Naturalist* **169**:494-504.  
\* Featured in Science Daily News and LiveScience
9. Muchhala, N. 2006. Nectar bat stows huge tongue in its rib cage. *Nature* **444**:701-702.  
\* Featured in The New York Times, Quirks & Quarks, New Scientist, Scientific American, and various other news outlets
8. Muchhala, N. 2006. The pollination biology of *Burmeistera* (Campanulaceae): Specialization and syndromes. *American Journal of Botany* **93**(8):1081-1089.
7. Muchhala, N., P. Mena V., and L. Albuja V. 2005. A new species of *Anoura* (Chiroptera: Phyllostomidae) from the Ecuadorian Andes. *Journal of Mammalogy* **86**:457-461.
6. Fleming, T.H., N. Muchhala, and P. Ornelas. 2005. New world nectar-feeding vertebrates: Community patterns and processes. Pp. 161-182 in V. Sanchez-Cordero and R. A. Medellín (eds.) *Contribuciones Mastozoológicas en Homenaje a Bernardo Villa-R. Instituto de Biología e Instituto de Ecología*, UNAM, Mexico City.
5. Muchhala, N. and T. G. Lammers. 2005. A new species of *Burmeistera* (Campanulaceae) from Ecuador. *Novon* **15**(1):176-179.
4. Muchhala, N. and T.A. Munroe. 2004. A new species of *Soleichthys* (Soleidae: Pleuronectiformes) from tropical seas off northern Australia. *Ichthyological Research* **51**:57-62.
3. Muchhala, N. 2003. Exploring the boundary between pollination syndromes: Bats and hummingbirds as pollinators of *Burmeistera cyclostigmata* and *B. tenuiflora*. *Oecologia* **134**:373-380.
2. Cramer, J. M., M. L. Cloud, N. Muchhala, A. E. Ware, B. H. Smith, and G. B. Williamson. 2003. A test of the bicolored fruit display hypothesis: Berry removal with artificial fruit flags. *Journal of the Torrey Botanical Society* **130**(1):30–33.
1. Muchhala, N. and P.J. Jarrin-V. 2002. Flower visitation by bats in cloud forests of western Ecuador. *Biotropica* **34**:387-395.

## TEACHING EXPERIENCE

- Instructor, *Theory of Systematics*, University of Missouri – St. Louis, St. Louis, MO (2020)
- Instructor, *Introgression (Graduate Seminar)*, U. Missouri – St. Louis, St. Louis, MO (2020)
- Instructor, *Introduction to Graduate Research*, U. Missouri – St. Louis, St. Louis, MO (2019)
- Instructor, *Senior Seminar on Genetics and Archaeology*, U. of Missouri – St. Louis, St. Louis, MO (2019)
- Instructor, *Advanced Evolution*, University of Missouri – St. Louis, St. Louis, MO (2015-19)

Instructor, *General Ecology*, University of Missouri – St. Louis, St. Louis, MO (2013-20)

Instructor, *Speciation (Graduate Seminar)*, U. Missouri – St. Louis, St. Louis, MO (2018)

Instructor, *Ethical Issues in Biology*, U. Missouri – St. Louis, St. Louis, MO (2018)

Faculty Resource Person, *Tropical Biology*, Organization for Tropical Studies, Las Cruces, Costa Rica (June 22-29, 2017)

Faculty Resource Person, *Tropical Biology*, Organization for Tropical Studies, Cabo Blanco, Costa Rica (June 16-22, 2015)

Instructor, *Senior Seminar on Plant-Animal Interactions*, University of Missouri – St. Louis, St. Louis, MO (2015)

Guest Lecturer, *Introductory Biology* (BIOL1821), University of Missouri – St. Louis (2015)

Guest Lecturer, *Phylogenetic Biology*, University of Nebraska, Lincoln, NE (2013)

Instructor, *Scientific Writing*, University of Nebraska, Lincoln, NE (2012)

Guest Lecturer, *Phylogenetics*, University of Nebraska, Lincoln, NE (2012)

Instructor, *Speciation*, University of Nebraska, Lincoln, NE (2011)

Guest Lecturer, *Ecology and Evolution*, University of Nebraska, Lincoln, NE (2011)

Guest Lecturer, *Tropical Field Research*, Truman State University, Kirksville, MO (2010)

Guest Lecturer, *Animal Behavior*, Pontificia Univ. Catolica del Ecuador, Quito (2010)

Guest Lecturer, *Introductory Biology*, University of Miami, Miami, FL (2005)

Teaching Assistant, *Biodiversity*, University of Miami, Miami, FL (2000-01)

Teaching Assistant, *Evolution*, Earlham College, Richmond, IN (1997-98)

Teaching Assistant, *Ecological Biology*, Earlham College, Richmond, IN (1996-97)

## MENTORING EXPERIENCE

### Advisor:

- Giulia De Gennaro (U. Missouri – St. Louis), PhD (2020-Present)
- Shawn Kelley (U. Missouri – St. Louis), MS (2019-Present)
- Belén Alvestegui (U. Missouri – St. Louis), MS (2019-Present)
- Justin Bagley (U. Missouri – St. Louis), Postdoctoral Researcher (2018-Present)
- Rieka Yu (U. Missouri – St. Louis), PhD (2018-Present)
- Alexander Lascher-Posner (U. Missouri – St. Louis), PhD (2018-Present)
- Brock Mashburn (U. Missouri – St. Louis), MS (2017-2019): “A taxonomic revision of the genus *Burmeistera* in Ecuador”
- Juan Moreira (U. Missouri – St. Louis), PhD (2016-Present)
- Diana Gamba (U. Missouri – St. Louis), PhD (2014-2020): “Investigating drivers of genetic structure in plants: Global, regional and local scales”
- Serena Achá (U. Missouri – St. Louis), PhD (2014-2019): “Vines in the Neotropics: Phylogenomics, biogeography and systematics in passion flowers (*Passiflora* subgenus *Decaloba* section *Decaloba*)”

- Camilo Andrés Calderón-Acevedo (U. Missouri – St. Louis), PhD (2013-2019): “Taxonomy, species limits, and phylogenetic relationships of *Anoura* Gray 1838 (Chiroptera: Phyllostomidae)”
- Simon Uribe-Convers (U. Missouri – St. Louis), Postdoctoral Researcher (2015-2017)
- Laura Lagomarsino (U. Missouri – St. Louis), Postdoctoral Researcher (2015-2017)
- Mayra Ninazunta (U. Missouri – St. Louis), non-thesis MS (2017)
- Rossana Maguiña (U. Missouri – St. Louis), MS 2016: “Nectar bats and their flowers across cloud forests of Ecuador and the effect of artificial nectar feeders”
- Mónica Carlsen (U. Missouri – St. Louis), Postdoctoral Researcher (2014-2015)
- Juan Carlos Vizuete (U. Central, Ecuador), MS 2011: “Influence of aspects of bat ecology on the richness and abundance of ectoparasites (*Diptera*) in Wisui, Ecuador”
- Guillermo Javier Gilbert (U. de Guayaquil, Ecuador), Licenciatura 2011: “Learning, identification, and discrimination by nectar bats”
- Diana Serrano (Pontificia U. de Ecuador), Licenciatura 2011: “Use of vision and scent in flower foraging by nectar bats”
- Juan Carlos Vizuete (U. Central, Ecuador), Licenciatura 2008: “Seed dispersal by fruits bats of the genus *Sturnira*”
- Angelica Caiza (U. Central, Ecuador), Licenciatura 2007: “Feeding ecology of *Anoura* and their role as pollinators in cloud forests in eastern and western Ecuador”

#### **Committee Member:**

- Eva Colberg (Marquis Lab, U. Missouri – St. Louis ), PhD (2019-Present)
- Shawn Kelley (Miller Lab, MOBOT), MS (2019-Present)
- Yingtong (Amanda) Wu (Ricklefs Lab, U. Missouri – St. Louis ), PhD (2019-Present)
- Estefania Fernandez (Marquis Lab, U. Missouri – St. Louis ), PhD (2019-Present)
- Andreia Figueiredo (Dunlap Lab, U. Missouri – St. Louis), PhD (2017-Present)
- Matthew Austin (Dunlap Lab, U. Missouri – St. Louis), PhD (2017-Present)
- Isabel Loza (Ricklefs Lab, U. Missouri – St. Louis), PhD (2014-2019): “Regional and historical influences on the spatial distribution of Neotropical trees”
- Meghann Humphries (Ricklefs Lab, U. Missouri – St. Louis), PhD (2014-2019): “Phylogeographic relationships of *Coereba flaveola* and their malaria parasites”
- Emma Young (Ricklefs Lab, U. Missouri – St. Louis), PhD (2014-Present)
- Rani Asmarayani (Stevens Lab, U. Missouri – St. Louis), PhD 2018: “Systematics of Malesian-Pacific *Piper* (Piperaceae)”
- Samoa Asigua (Parker Lab, U. Missouri – St. Louis), PhD 2018: “The ecology and feeding behavior of mosquitoes in the Galapagos Islands”

- Galen Priest (Marquis Lab, U. Missouri – St. Louis), PhD 2018: “The ecology of nest cavity use by arboreal ants in the Brazilian Cerrado: resource availability, nest modification, and trophic interactions”
- Justen Zweck (Bernhardt Lab, Saint Louis U.), PhD 2017: “The evolutionary ecology of pollination systems in papilionoid vs non-papilionoid legumes (Fabaceae)”
- Ben Abts (Dunlap Lab, U. Missouri – St. Louis), MS 2016: “Forgetting and the value of social information”
- Priya Maharaj (Bourne Lab, U. Missouri – St. Louis), PhD 2016: “Color-mediated foraging by pollinators: A comparative study of two passionflower butterflies at *Lantana camara*”
- Leticia Soares (Ricklefs Lab, U. Missouri – St. Louis), PhD 2016: “Historical biogeography, spatial distribution, and within-host interactions of avian haemosporidian parasites (Apicomplexa, Haemosporida)”
- Haydee Hernandez (Marquis Lab, U. Missouri – St. Louis), MS 2015: “The role of herbivores and soils as limiting factors in *Piper*’s distribution in a tropical rain forest”
- Cassandra Lynn Coleman (Clark Lab, U. of Alabama), MS 2012: “A phylogeny and study of pollinator shifts and floral traits in the Neotropical genus *Gasteranthus* (Gesneriaceae)”

#### **External Reviewer:**

- Ethan Newman (U. of Stellenbosch, South Africa), PhD 2017: “The convergence and divergence of floral traits are driven by the heterogeneity of pollinator and plant communities”
- Marinus de Jager (U. of Stellenbosch, South Africa), PhD 2013: “The role of pollinators in generating and maintaining floral polymorphism: phylogeographic and behavioral aspects”

#### **HONORS & AWARDS**

- Named honorary member of the UMSL Chapter of the Golden Key International Honor Society (2017)
- SSE Student Travel Award, Evolution Meeting (2007)
- Best Graduate Student Paper, University of Miami (2007)
- Best Student Talk (Lubee Prize), North American Symposium on Bat Research (2006)
- SBDN Student Travel Award, North American Symposium on Bat Research (2006)
- Best Student Talk (Gentry Award), Association for Tropical Biology (2004)
- Best Student Talk (Lubee Prize), North American Symposium on Bat Research (2000)
- National Merit Scholar (1994-1998)

#### **PRESENTATIONS**

##### **Scientific Meetings**

- Botany Meeting, Virtual (2020)



- Botany Meeting, Tucson, AZ (2019)
  - Co-organized symposium: "Ecological factors that drive patterns of population genetic structure in plants" D. Gamba and N. Muchhala (2019)
- American Society of Naturalists Conference, Pacific Grove, CA (2018)
- International Botanical Conference, Shenzhen, China (2017)
- North American Symposium on Bat Research, Annual Meetings (2019, 2015, 2014, 2013, 2012, 2008, 2006, 2000)
- Society for the Study of Evolution, Annual Meetings (2015, 2012, 2011, 2008, 2006)
- Congreso Latinoamericano de Murciélagos (2014)
- International Bat Research Conference (2016, 2013)
  - Co-organized symposium: "The ecology and evolution of the mutualism between nectar bats and bat-pollinated flowers" N. Muchhala and M. Holderied (2013)
- Congreso Ecuatoriano de Mastozoología, Puyo, Ecuador (2013)
- Association for Tropical Biology & Conservation, Annual Meetings (2013, 2007, 2004, 2002)
  - Co-organized symposium: "Bats and hummingbirds as pollinators: from ecological differences to evolutionary consequences" L. Lopes, N. Muchhala, S. Buzato (2013)
- Ecological Society of America, Annual Meetings (2009, 2008, 2006)
- American Society of Mammalogists Meeting, Amherst, Mass. (2006)
- Jornadas Ecuatorianas de Biología, Annual Meetings, Ecuador (2004, 2003)
- Congreso Ecuatoriano de Botánica, Loja, Ecuador (2003)

### **Invited Lectures**

- Master Gardener Series, Missouri Botanical Garden, St. Louis, MO (virtual talk; 5/20)
- Southern Illinois University – Edwardsville, IL (2/20)
- Washington University of St. Louis, MO (1/20)
- Universidad del Valle, Cali, Colombia (7/19)
- University of São Paulo, São Paulo, Brazil (3/19)
- Universidad Nacional de Colombia, Bogota, Colombia (1/19)
- Universidad del Valle, Cali, Colombia (1/19)
- Columbia University, New York, NY (11/18)
- Keynote Speaker, Congreso Latinoamericano de Mastozoología (Latin American Mammalogy Conference), La Paz, Bolivia (7/18)
- Rancho Santa Ana Botanic Garden, Claremont, CA (2/18)
- Plenary Speaker, Annual Student Research Symposium, SIU Carbondale, IL (11/17)
- St. Louis Ecology, Evolution, and Conservation (SLEEC) Retreat, St. Louis, MO (9/17)
- University of Miami, Coral Gables, FL (9/17)

- Tyson Biological Station, Washington University of St. Louis, St. Louis, MO (6/17)
- Purdue University, Purdue, IN (11/16)
- Murray State University, Murray, KY (11/16)
- University of KwaZulu-Natal, Pietermaritzburg, South Africa (8/16)
- PGAV Design Firm, St. Louis, MO (5/16)
- Smithsonian Botanical Symposium, “Bat, Birds, Bees, and Bouquets: New Research in Pollination Biology”, Washington, DC (5/16)
- Universidad Mayor de San Andres, La Paz, Bolivia (3/16)
- University of Pittsburgh, Pittsburgh, PA (11/15)
- Missouri University of Science & Technology, Rolla, MO (9/15)
- Sigma Xi Seminar, UMSL Chapter, St. Louis, MO (4/15)
- Simposio de Biodiversidad Neotropical, Quito, Ecuador (2/15)
- Washington University of St. Louis, MO (11/14)
- Saint Louis University, St. Louis, MO (2/14)
- University of Missouri, Columbia, MO (10/13)
- St. Louis Ecology, Evolution, and Conservation (SLEEC) Retreat, St. Louis, MO (9/13)
- Ohio State University, Columbus, OH (1/13)
- University of Missouri – St. Louis, St. Louis, MO (10/12)
- University of California -Davis, Davis, CA (5/12)
- Chicago Plant Science Symposium, Field Museum, Chicago, IL (4/12)
- Universidad de Antioquia, Medellin, Colombia (4/12)
- University of Denver, Denver, CO (2/12)
- Harvard University, Cambridge, MA (10/11)
- Humboldt State University, Arcata, CA (2/11)
- Pontificia Universidad Catolica de Ecuador, Quito, Ecuador (4/10)
- Universidad de San Francisco, Quito, Ecuador (3/10)
- University of Wisconsin-Milwaukee, Milwaukee, WI, USA (1/10)
- University of Guelph, Guelph, ON, Canada (3/09)
- Texas Tech University, TX, USA (1/09)
- Queens University, Kingston, ON, Canada (12/08)
- Trent University, Peterborough, ON, Canada (11/08)
- University of Calgary, Calgary, AB, Canada (11/08)
- Sea & Learn, Saba, Netherlands Antilles (10/08)
- University of Toronto, Toronto, ON, Canada (4/08)
- Fulbright Commission, Quito, Ecuador (8/05)

## MEDIA COVERAGE

**Press Interviews:** The New York Times, ABC, CNN, Reuters, FOX, BBC Wildlife Magazine, The Telegraph, New Scientist, Scientific American, Science News, and various other print and on-line media

**Radio Interviews:** Science Friday, Crash Davis (KFAB Radio, Omaha, NE), Quirks and Quarks (Canadian Broadcasting Corporation), Good Dirt Radio (Grassroots Educational News), Nature Podcast (Nature), pollinators.info

**Interviews for Books:** Bats: Biggest! Littlest! (S. Markle, 2013); Plant and Animal Systems (R. Johnson, 2011); Why the Lion Grew its Mane (L. Smith, 2009); Dry Storeroom No. 1 (R. Fortey, 2008)

## SERVICE & OTHER EXPERIENCE

- Reviewer for:

<i>American Naturalist</i>	<i>Evolution</i>	<i>Neotropical Biodiversity</i>
<i>American J. of Botany</i>	<i>Evolutionary Ecology</i>	<i>New Phytologist</i>
<i>Annals of Botany</i>	<i>Functional Ecology</i>	<i>Oecologia</i>
<i>Biol. J. Linnean Soc.</i>	<i>Int'l J. of Plant Sciences</i>	<i>Oikos</i>
<i>Biology Letters</i>	<i>J. of Evolutionary Biology</i>	<i>Plant Biology</i>
<i>Biotropica</i>	<i>J. of Ornithology</i>	<i>Plant Syst. and Evolution</i>
<i>Brittonia</i>	<i>J. of Plant Ecology</i>	<i>PLoS One</i>
<i>Caldasia</i>	<i>J. of Pollination Ecology</i>	<i>PNAS</i>
<i>Check List</i>	<i>J. of Tropical Ecology</i>	<i>Proc. of the Royal Society B</i>
<i>Ecology</i>	<i>Mammalian Species</i>	<i>Science</i>
<i>Ecography</i>	<i>Nature Communications</i>	<i>Selbyana</i>
<i>Ecology and Evolution</i>	<i>Naturwissenschaften</i>	

- Biology Graduate Program Director (UMSL, 2019-Present)
- Member of the Board of Directors for the Organization for Tropical Studies (San Jose, Costa Rica, 2019-Present)
- Associate Editor for *Neotropical Biodiversity*, an international open-access journal (launched in 2015 in Quito, Ecuador)
- Reviewer for three NSF proposals, two National Geographic Society grant proposals, two South African National Research Foundation researcher evaluations, a U. of Missouri Research Board proposal, and a US-Israel Binational Science Foundation grant proposal
- Judge for the OTS Outstanding Student Paper Award (Apr. 2019)
- Sciences Representative for the 'Saturday Academy Event' of the UMSL Bridge Program, designed to introduce local high school students to UMSL (Sept. 2018)
- Graduate Committee Member (UMSL, 2015-2019)
- Representative for the Organization for Tropical Studies (UMSL, 2014-Present)
- Presenter for the Science in STL Seminar Series, St. Louis County Library (Weber Branch), St. Louis, MO (Oct. 17)

- Presenter at the Missouri Bat Festival (June 2017)
- Presenter at the 10th Annual Indiana Bat Festival (Terra Haute, IN); three lab members also attended and presented their research (Sept. 2016)
- Judge for UMSL Graduate Research Fair (2016)
- Volunteer for bat survey at Queeny Park, MO; part of a restoration project with the Missouri Department of Conservation (2014)
- Advisor for undergraduate research project with Missouri Botanical Garden's summer REU program (2014)
- Scientific advisor for National Geographic Magazine article "Call of the Bloom" (2014)
- Executive Council Member (UMSL, 2016-2017)
- Student Awards Committee Member (UMSL, 2014-2017)
- Harris Scholarship Committee Member (UMSL, 2013 - Present)
- Volunteer presenter for 'Sunday with a Scientist', Nebraska State Museum (2011)
- Judge for elementary school science fair (Sheridan Elementary, 2011),
- Judge for Biology Graduate Student Association poster session (U. Nebraska, 2011 and 2013)
- Judge for SSE Hamilton Award, Evolution Meeting (2008)
- Student Representative, Graduate Admission Committee (2006-07 and 2001-02)
- Student Representative, Faculty Search Committee (2005-06 and 2000-01)
- Biology Representative, Graduate Student Association, (2000-01)

## REFERENCES

**Dr. Theodore H. Fleming**  
 Department of Biology  
 University of Miami  
 Coral Gables, FL 33124  
 (305) 284-6881  
 tedfleming@dakotacom.net

**Dr. W. Scott Armbruster**  
 School of Biological Sciences  
 University of Portsmouth  
 Portsmouth, PO1 2DY, United Kingdom  
 (+44) (0)23 9284 2081  
 scott.armbruster@port.ac.uk

**Dr. Stacey D. Smith**  
 School of Biological Sciences  
 University of Nebraska  
 Lincoln, NE 68588  
 (402) 472-6741  
 sdsmith@unl.edu

**Dr. James D. Thomson**  
 Dept. of Ecology and Evolutionary Biology  
 University of Toronto  
 Toronto, ON M5S 3G5, Canada  
 (416) 978-3527  
 james.thomson@utoronto.ca