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Nathan Muchhala

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)

RESEARCH EXPERIENCE

Postdoctoral Research Fellow (Jan. 2011-Present), 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 (with Dr. James Thomson)

TEACHING EXPERIENCE

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)

GRANTS & FELLOWSHIPS

- National Science Foundation (PI; with CO-PI Stacey Smith), “Pollinators vs. pollen tubes as drivers of angiosperm speciation: a case study of the diverse Neotropical genus *Burmeistera* (Campanulaceae)”;
\$505,994 (In review)
- 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 (2007-2009)
- Bat Conservation International Postdoctoral Grant; **\$1,000** (2007)
- National Science Foundation Graduate Research Fellowship (2002-2005)

- Curtis Scholarship, University of Miami; **\$500** each (2002 and 2004)
- Bat Conservation International Student Grant; **\$2,524** (2003)
- Organization for Tropical Studies Post-Course Award; **\$500** (2002)
- Maytag Fellowship (2005-2007; 2001)
- Fulbright Fellowship (1999-2000)

HONORS & AWARDS

- 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)

PUBLICATIONS

Refereed Articles:

23. Muchhala, N., and J. D. Thomson. 2012. Interspecific competition in pollination systems: costs to male fitness via pollen misplacement. *Functional Ecology* (In press).
22. Jorgensen, P.M., N. Muchhala, and J.M. MacDougal. 2012. *Passiflora unipetala*, a new bat-pollinated species of *Passiflora* supersection *Tacsonia*. *Novon* (In review).
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*. Publicaciones del Herbario QCA, Pontificia U. Católica del Ecuador, Quito. (In press).
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**(6):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.

Non-Refereed Articles:

Muchhala, N. 2009. Bats & flowers stage an evolutionary race. *BATS* **27**(3):1-3

Muchhala, N. 2005. The bond between bats and plants. *BATS* **23**(2):5-8.

Muchhala, N. and P.J. Jarrín-V. 2000. El reino vegetal y los amos de la noche. *Nuestra Ciencia* **2**:40-43

PRESENTATIONS

Scientific Meetings

- Society for the Study of Evolution, Annual Meetings (2011, 2008 & 2006)
- Ecological Society of America, Annual Meetings (2009, 2008, & 2006)
- Association for Tropical Biology & Conservation, Annual Meetings (2007, 2004, & 2002)
- North American Symposium on Bat Research, Annual Meetings (2008, 2006, & 2000)
- 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 and Symposium Presentations

- Harvard University, Cambridge, MA (10/11)
- University of Nebraska, Lincoln, NE (2/11)
- Humboldt State University, Arcata, CA (2/11)
- Pontificia Universidad Católica 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)
- “Pollination in Natural and Fragmented Communities” Symposium, Association for Tropical Biology & Conservation Meeting (7/07)
- “Diversity and Evolution of Pollination and Mating Systems of Tropical Plants” Symposium, Association for Tropical Biology & Conservation Meeting (7/07)
- 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: Quirks and Quarks (Canadian Broadcasting Corporation), Good Dirt Radio (Grassroots Educational News), Nature Podcast (Nature), pollinators.info

Featured in Books: Plant and Animal Systems (by Sally Ride Science); Mammalogy: Adaptation, Diversity, and Ecology (3rd edition; G. Feldhamer *et al.*); Mammalogy (5th edition; T. Vaughn, N. Czaplewski, and J. Ryan); Biology of Small Mammals (J. F. Merritt), Dry Storeroom No. 1 (R. Fortey); Why the Lion Grew its Mane (L. Smith)

SERVICE & OTHER EXPERIENCE

- Reviewer for *American Naturalist*, *American J. of Botany*, *Annals of Botany*, *Biotropica*, *Biological J. of the Linnean Society*, *Brittonia*, *Check List*, *Ecology*, *Ecography*, *Evolution*, *Functional Ecology*, *J. of Evolutionary Biology*, *J. of Ornithology*, *J. of Pollination Ecology*, *Mammalian Species*, *Naturwissenschaften*, *Oecologia*, *Oikos*, *Plant Systematics and Evolution*, *PNAS*, *PLoS One*, *Science*, and a National Geographic Society grant application.
- 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)
- 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)
- Experience with scientific illustration
- Fluent in Spanish (written and spoken)

REFERENCES

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