

Curriculum vitae

SUNSHINE A. VAN BAEL

Tulane University
Department of Ecology and Evolutionary Biology
Boggs 400
6823 St. Charles Avenue
New Orleans, LA 70118

EDUCATION:

- 2003 Ph. D. University of Illinois at Urbana-Champaign
Department of Animal Biology and Program in Ecology and Evolutionary Biology
Advisors: Dr. Jeffrey Brawn and Dr. Scott Robinson
- 1996 B. A. with honors in Biology, University of Chicago
Advisor: Dr. Stephen Pruett-Jones

RESEARCH INTERESTS:

Community ecology, microbial ecology, plant-animal-fungal interactions, multi-trophic interactions, tropical agriculture and biodiversity.

APPOINTMENTS:

- 2016 The Burk-Kleinpeter Inc. Professor in Science and Engineering, Tulane University
2015 Research Associate, Smithsonian Tropical Research Institute
2012 Assistant Professor, Tulane University
2010 Adjunct Faculty, School of Life Sciences, Arizona State University
2009 Associate Scientist, Smithsonian Tropical Research Institute

GRANTS, FELLOWSHIPS AND AWARDS:

- 2017 Graduate Student Society Association – GSSA SSE Faculty Award for teaching excellence
2017 Lavin-Bernick Fellowship, Tulane University – “The microbial symbionts of baldcypress and flooding stress” (\$3071).
- 2016 Grant to support undergraduate research – CELT, Tulane University, “Flooding and baldcypress symbionts” (\$2000).
- 2016 Grant to support undergraduate research – Louisiana Board of Regents SURE program, “Flooding and baldcypress symbionts” (\$4500).
- 2016 National Science Foundation, “Collaborative Research: Extending leaf functional trait ecology to leaf symbionts” S. Van Bael, A. E. Arnold, S.J. Wright (\$186,972).
- 2016 GoMRI, “Chemical evolution and plant-microbe degradation of petroleum in saline marsh plants and soils” S. Van Bael, K. Papadopolous, C. Gunch and J. Pardue (\$1,580,319).
- 2015 Grant to support undergraduate research – LA Sea Grant UROP Program “The symbionts of baldcypress along a salt gradient” (\$2500).
- 2015 Grant to support undergraduate research – Louisiana Board of Regents SURE program, “The symbionts of baldcypress along a salt gradient” (\$4500).
- 2014 Grant to support undergraduate research – CELT, Tulane University, “The symbionts of baldcypress trees and environmental stress” (\$2000).
- 2014 Grant to support undergraduate research – Newcomb Institute, Tulane University, “Leaf traits and foliar endophytes in tropical forest plant communities” (\$1800).
- 2014 Grant to support undergraduate research – Louisiana Board of Regents SURE program, “The endophytes of bald cypress trees in Southeastern Louisiana” (\$4500).
- 2013 Grant to support undergraduate research – Newcomb Institute, Tulane University, “Microbiological diversity and defense in ant agriculture.” (\$2500).

- 2013 Grant to support undergraduate research – CELT, Tulane University, “Using endophytic fungi of *Spartina alterniflora* to improve coastal restoration efforts” (\$2000).
- 2013 Faculty Enhancement Grant, Center for Bioenvironmental Research, Tulane University, “The fungal endophytes of *Spartina alterniflora* in degraded, natural and restored sites of Southeastern Louisiana” S. Van Bael and D. Kandalepas (\$12,600).
- 2012 National Science Foundation, “Research Experience for Undergraduates Supplement” S. Van Bael (\$5,950).
- 2011 Arizona State University – Smithsonian Tropical Research Institute (STRI) Collaborative Research “Drivers of Microbial Community Structure and Function in Tropical Soils” F. Garcia-Pichel, E. Herre, B. Turner, S. Van Bael (\$141,787).
- 2011 Smithsonian Restricted Endowment Program, “Mechanisms of fungal-mediated protection in tropical plants” S. Van Bael, C. Estrada, W. Wcislo (\$49,500).
- 2010 National Science Foundation (NSF), “Conflicts among members of interacting symbioses: How do symbiotic fungi influence plant defense against leaf-cutting ants?” S. Van Bael, W. Wcislo, S. Rehner (\$314,524).
- 2010 Panama’s Secretary of Science and Technology, “National Investigator,” S. Van Bael (\$21,600).
- 2010 Panama’s Secretary of Science and Technology, “How do endophytic fungi influence leaf removal by leaf-cutting ants?” S. Van Bael, W. Wcislo, H. Fernandez-Marin, A. Bethancourt (\$48,766).
- 2009 Arizona State University – Smithsonian Tropical Research Institute (STRI) Collaborative Research Grants “Sustainability of ecosystem services: From local to global” with J. Hall, A. Kinzig and C. Perrings (\$15,000 to Van Bael).
- 2009 Smithsonian Scholarly Studies Program, “Symbionts collide: Do plants use symbiotic fungi to defend themselves from fungi-farming ants?” W. Wcislo and S. Van Bael (\$57,000).
- 2007 STRI, Earl S. Tupper Fellowship (\$128,000).
- 2005 American Association of University Women, Post-doctoral Fellowship (\$30,000.)
- 2004 NSF International Research Fellowship Program (\$93,374).
- 2003 Smithsonian Institute Post-doctoral fellowship, National Zoo (\$41,600).
- 2001 The Andrew W. Mellon Foundation Comparative Tropical Ecology Course
- 2000 Frank M. Chapman Memorial Fund, American Natural History Museum
- 2000 American Ornithologist Union Graduate Awards
- 2000 U. S. Environmental Protection Agency STAR Fellowship (\$83,540).
- 2000 Smithsonian Pre-doctoral Fellowship (awarded but not accepted)
- 1999 University of Illinois Research Board Grant, with J. Brawn (\$19,094.)
- 1999 Smithsonian Short-term Fellowship, STRI (\$2300).
- 1998 University Fellowship, University of Illinois at Urbana-Champaign

PUBLICATIONS:

*Indicates publications that were not peer-reviewed

39. Washburn, G. and **Van Bael S. A.** 2017. Fungal diversity in galls of baldcypress trees. *Fungal Ecology* 29: 85-89.
- 38.* **Van Bael, S. A.**, Estrada C., Arnold, A.E. 2016. Foliar endophyte communities and leaf traits in tropical trees. Book Chapter in “The Fungal Community,” Editors Dighton, J. and White, J.
37. Mighell, K., and **Van Bael S. A.** 2016. Selective elimination of microfungi in leaf-cutting ant gardens. *Fungal Ecology* 24:15-20.
- 36.* Hall, J. et al., Moss, D., Stallard R. ..., **Van Bael S. A.** et al. 2016. *Managing Watersheds for Ecosystem Services in the Steepland Neotropics*. Inter-American Development Bank <https://publications.iadb.org/handle/11319/7233>.
35. Tellez, P. H., **Van Bael, S. A.** 2016. Red coloration in young tropical leaves associated with reduced fungal pathogen damage. *Biotropica*, 48(2)150-153.
34. Maas, B., D. S. Karp, S. Bumrungsri, K. Darras, D. Gonthier, J. C. C. Huang, C. A. Lindell, J. J. Maine, L. Mestre, and N. L.

Michel...**S. A. Van Bael**...K. Williams-Guillen. 2015. Bird and bat predation services in tropical forests and agroforestry landscapes. *Biological Reviews*. DOI: 10.1111/brv.12211

33. Kandalepas, D., Blum, M. J., **Van Bael, S. A.** 2015. Shifts in symbiotic endophyte communities in a foundational salt marsh grass following oil exposure from the Deepwater Horizon oil spill. *PLoSone*, 10(4): e0122378. doi:10.1371/journal.pone.0122378.

32. Hammer, T. J., **Van Bael, S. A.** 2015. An endophyte-rich diet increases ant predation on a specialist herbivorous insect. *Ecological Entomology*, 40: 316-321.

31. Estrada, C., Degner, E.C., Rojas, E.I., Wcislo, W.T., **Van Bael, S. A.** 2015. The role of endophyte diversity in protecting plants from defoliation by leaf-cutting ants. *Current Science*, 109: 55-61.

30. Mejía L.C., Herre E.A., Sparks J.P., Winter K., García M.N., **Van Bael S.A.**, Stitt J., Shi Z., Zhang Y., Guiltinan M.J. and Maximova S.N. 2014. Pervasive effects of a dominant foliar endophytic fungus on host genotypic and phenotypic expression in a tropical tree. *Frontiers in Microbiology*, 5:479. doi: 10.3389/fmicb.2014.00479.

29. Estrada, C., Rojas, E., Wcislo, W., and **S. A. Van Bael.** 2014. Fungal endophyte effects on leaf chemistry alter the *in vitro* growth rates of leaf-cutting ants' fungal mutualist, *Leucocoprinus gongylophorus*. *Fungal Ecology* 8, 37-45.

28. Van Bael, S. A., R. Zambrano and J. E. Hall. 2013. Bird communities in forested and human modified landscapes of Central Panama: a baseline survey for a native species reforestation treatment. *International Journal of Biodiversity Science, Ecosystem Services & Management* DOI: 10.1080/21513732.2013.842187.

27. Coblentz, K. E., and **S. A. Van Bael.** 2013. Field colonies of leaf-cutting ants select plant materials containing low abundances of endophytic fungi. *Ecosphere* 4(5).

26. Estrada, C., Wcislo, W., **S. A. Van Bael.** 2013. Symbiotic fungi alter plant chemistry that discourages leaf-cutting ants. *New Phytologist* doi: 10.1111/nph.12140.

25. Van Bael, S. A., C. Estrada, S. Rehner, J. F. Santos, W. Wcislo. 2012. Leaf endophyte load influences fungal garden development in leaf-cutting ants. *BioMedCentral Ecology* 12:23.

24. Van Bael, S. A., M. Seid, W. Wcislo. 2012. Endophytic fungi increase the processing rate of leaves by leaf-cutting ants (*Atta*). *Ecological Entomology* 37:318-321.

23. Van Bael, S. A., C. Estrada, W. Wcislo. 2011. Fungal-fungal interactions in leaf-cutting ant agriculture. *Psyche* doi:10.1155/2011/617478.

22. Schroth, G., D. Faria, M. Araujo, L. Bede, **S. A. Van Bael**, C. R. Cassano, L. C. Oliveira, J. H.C. Delabie. 2011. Conservation in tropical landscape mosaics: the case of the cacao landscape of southern Bahia, Brazil. *Biodiversity and Conservation* 20(8): 1635-1654.

21. Urriola, J., A. Bethancourt, **S. A. Van Bael.** 2011. Limited persistence of endophytic fungi in leaf-cutting ant gardens. *Neotropical Biology & Conservation* 6(1): 1-4.

20. Onoda, Y., M. Westoby ...**S. A. Van Bael**...et al. Global patterns of leaf mechanical properties. 2011. *Ecology Letters* 14: 301-312.

19. Connahs, H., A. Aiello, **S. A. Van Bael**, G. Rodríguez-Casteñada. 2011. Caterpillar abundance and parasitism in a seasonally dry versus wet tropical forest of Panama. *Journal of Tropical Ecology* 27:51-58.

18. Bittleston, L. S., F. Brockmann, W., Wcislo, **S. A. Van Bael.** 2011. Endophytic fungi reduce leaf-cutting ant damage to seedlings. *Biology Letters* 7: 30-32.

17. Rojas, E. I., S. A. Rehner, G. J. Samuels, **S. A. Van Bael**... et al. 2010. *Colletotrichum gloeosporioides* s.l. associated with *Theobroma cacao* and other plants in Panama: multilocus phylogenies distinguish host-associated pathogens from asymptomatic endophytes. *Mycologia* 102: 1318-1338.
16. Mooney, K., D. Gruner, N. Barber, **S. A. Van Bael**, S. Philpott, R. Greenberg. 2010. Interactions among predators and the cascading effects of vertebrate insectivores on plants. *Proceedings of the National Academy of Sciences* 107(16): 7335-7340.
15. **Van Bael, S. A.**, H. Fernández-Marín, M. Valencia, E. Rojas, W. Wcislo, E.A. Herre. 2009. Two fungal symbioses collide: Endophytic fungi are not welcome in leaf-cutting ant gardens. *Proceedings Royal Society of London – Series B* 276: 2419-2426.
14. **Van Bael, S. A.**, M. Valencia, E. Rojas, N. Gómez, D.M. Windsor, & E. A. Herre. 2009. Effects of foliar endophytic fungi on the preference and performance of a leaf beetle, *Chelymorpha alternans* Boheman (Chrysomelidae: Cassidinae). *Biotropica* 41:221-225.
13. L. C. Mejía, E. I. Rojas Z. Maynard, A. E. Arnold, **S. A. Van Bael**, G. J. Samuels, N. Robbins, E. A. Herre. 2008. Endophytic fungi as biocontrol agents of *Theobroma cacao* pathogens, *Biological Control* 46: 4-14.
12. **Van Bael, S. A.**, S. Philpott, R. Greenberg, P. Bichier, N. Barber, K. Mooney and D. Gruner. 2008. Birds as predators in tropical agroforestry systems: a meta-analysis. *Ecology* 89: 928-934.
11. **Van Bael, S. A.**, P. Bichier and R. Greenberg. 2007. Bird predation on insects reduces damage to the foliage of cocoa trees (*Theobroma cacao*) in western Panama. *Journal of Tropical Ecology* 23:715-719.
10. **Van Bael, S. A.**, I. Ochoa, P. Bichier and R. Greenberg. 2007. Bird diversity in cacao farms and forest fragments of western Panama. *Biodiversity and Conservation* 16:2245-2256.
9. E. A. Herre, L. C. Mejía, D. Kylo, E. I. Rojas, Z. Maynard, A. Butler, **S. A. Van Bael**. 2007. Antipathogenic effects of endophytic fungi in roots and leaves of *Theobroma cacao*: implications for tropical host plants. *Ecology* 88: 550-557.
- 8.* Herre, E.A., **S. A. Van Bael**, Z. Maynard, N. Robbins, J. Bischoff, A. E. Arnold, E. Rojas, L. C. Mejia, R. A. Cordero, C. Woodward, and D. A. Kylo. 2005. Tropical plants as chimera: some implications of foliar endophytic fungi for the study of host plant defense, physiology, and genetics. Book chapter in "Biotic Interactions in the Tropics." Eds. D. Burslem, M. Pinard & S. Hartley. Cambridge University Press. Cambridge, UK.
7. ***Van Bael, S. A.**, Z. Maynard, N. Robbins, J. Bischoff, A. E. Arnold, E. Rojas, L. C. Mejia, D. A. Kylo, and E. A. Herre. 2005. Emerging perspectives on the ecological roles of endophytic fungi in tropical plants. Book chapter in "The Fungal Community: Its organization and role in the ecosystem." Eds. J. Dighton, P. Oudemans & J. White. Taylor & Francis Publishing Group, Boca Raton, FL, USA.
6. **Van Bael, S. A.**, Aiello, A., Valderrama, A., Medianero, E., Samaniego, M. and S. J. Wright. 2004. General herbivore outbreak of following an El Niño related drought in a lowland Panamanian forest. *Journal of Tropical Ecology* 20: 625-633.
5. Pauw, A., **S. A. Van Bael**, H. Peters et al. 2004. Physical damage in relation to carbon allocation strategies in tropical forest tree saplings. *Biotropica* 36: 410-413.
4. **Van Bael, S. A.** and J. Brawn. 2005. The direct and indirect effects of insectivory by birds in two contrasting Neotropical forests. *Oecologia* 143: 106-116.
3. **Van Bael, S. A.**, J. Brawn, and S. Robinson. 2003. Birds defend trees from insect herbivores in a Neotropical forest canopy. *Proceedings of the National Academy of Sciences*, 100:8304-8307.
2. **Van Bael S.** and S. Pruett-Jones. 1998. Breeding biology and social behaviour of the Eastern race of the Splendid Fairy-wren, *Malurus splendens melanotus*. *Emu* 100: 95-108.

1. **Van Bael S.** and S. Pruett-Jones. 1996. Exponential population growth of Monk Parakeets in the United States. *Wilson Bulletin* 108:584-588.

PUBLICATIONS IN REVIEW:

Janowsky J., Kimbrough, L., Kandalepas, D., Schaffer, G., **Van Bael, S.A.** in review: Bacterial and fungal endophyte communities differ in trees of natural versus wastewater-treated wetlands. *Ecological Engineering*.

Zheng, M., Weiyao, W., Hayes, M., Nydell, A., Tarr, M.A., **Van Bael, S.A.**, Papadopoulos, K. in review: Degradation of Macondo 252 oil by endophytic bacteria *Pseudomonas putida*. *Environmental Microbiology*.

MANUSCRIPTS IN PREPARATION:

Bernik, B.M., Mighell, K.L., Formel, S.K., Kandalepas, D., Blum, M.J., **Van Bael, S.A.** in preparation: Plant functional trait variation shapes soil microbial communities in a coastal marsh.

Mighell, K.L., Saltonstall, K., Espinosa-Tason, J., **Van Bael, S.A.** in preparation: Plasticity in the endosymbiont community of *Jatropha curcas*.

Mighell, K.L., **Van Bael, S.A.** in preparation: Arbuscular mycorrhizal fungi do not confer pathogen defense benefits to *Jatropha*.

Lumibao, C., **Van Bael, S.A.** in preparation: Oil history drives unique responses in the aboveground and belowground fungal communities of *Spartina alterniflora*.

Lumibao, C., **Van Bael, S.A.** in preparation: Baldcypress fungal microbiome patterns along salinity gradient in coastal wetland.

Kimbrough, E. **Van Bael, S.A.** in preparation: Culturable endophytes of baldcypress trees (*Taxodium distichum*) along a degradation gradient in southeastern Louisiana.

Kimbrough, E. Krauss, K., Conner, W.H., Lumibao, C., **Van Bael, S.A.** in preparation: Baldcypress associated endophyte and rhizosphere bacterial communities along salinity gradients across the southeastern US.

Formel S.K., Mighell, K.L., Bernik, B.M., Kandalepas, D., Jarrell, E., Blum M.J., Pardue, J., **Van Bael, S.A.** in preparation: Soil microbial communities in recovery following an oil spill.

POSTDOCTORAL ADVISORS:

Russell Greenberg, Smithsonian National Zoo

Donald Windsor, STRI

William Wcislo, STRI

STUDENTS SUPERVISED AT STRI (NATIONALITY):

1. Ellis Rodriguez (Panama), 2. Kimberly Mighell (USA), 3. Anna Kudla (USA), 4. Kyle Coblenz (USA), 5. Ethan Degner (USA), 6. Ruby Zambrano (Panama), 7. Kim Shaffer (USA), 8. Carol Gantes (Panama), 9. Fabiola Santos (Colombia), 10. Michelle Caballero (Panama), 11. Leo Mena (USA), 12. Katherine Arauz (Panama), 13. Gloribel Vergara (Panama), 14. Rosemary Castellero (Panama), 15. Marcos Ramos (Panama), 16. Marija Zvonovik (Serbia), 17. Tobin Hammer (USA), 18. Leonora Bittleston (USA), 19. Franz Brockmann (Nicaragua and Panama), 20. Teresa de Flores (Panama), 21. Mariana Franco (Colombia), 22. Cian Gill (Ireland), 23. Robert Welter (USA), 24. Andrea Concepcion (Panama), 25. Jonathon Hruksa (USA and Nicaragua), 26. Nelva James (Panama), 27. Mariana Valencia (Panama), 28. Luciano Araúz (Panama), 29. Clara Pérez (Panama), 30. Margareta Kalka (USA and Germany), 31. Jill Urriola (Panama), 32. Heidi Connahs (UK), 33. Andre Butler (UK), 34. Luis Ramirez (Panama), 35. Enith Rojas (Panama), 36. Gabriel Patterson (USA), 37. Nathaniel Howard (USA), 38. Carlos Bracho (Panama), 39. Noel Khenafou-Juvigny (France), 40. Emma Tower (USA), 41. Peter Tellez (USA).

STUDENTS SUPERVISED AT TULANE:*

*High school students from Lusher Charter School

1. Stephen Suchy, 2. Jordan Hoffman, 3. Kim Mighell, 4. Peter Tellez, 5. Emma Tower, 6. Taryn Farber, 7. Ryan Wolfe, 8. Matthew Moore, 9. Jennifer Janowsky, 10. Elizabeth Kimbrough, 11. George Washburn, 12. Casy Gu, 13. Joshua Lerner, 14. Kathalina Tran, 15. James Sebes, 16. Elaine Broussard, 17. Emma Darr, 18. Ivana Levy, 19. Keiana Cave*, 20. Stephen Formel, 21. Stephen Cortese, 22. Mallory Kiefer, 23. Courtney Pellegrini, 24. Rebecca Wang, 25. Rebecca Flournoy, 26. Amelia Lourmand, 27. Aurora Duncan, 28. Alison Harrington, 29. Kaylee Arnold, 30. Miranda Hendrix, 31. Max Berdik, 32. Carolyn Babendreier, 33. Clare Lister, 34. Ian Sestak, 35. Caroline Faircloth, 36. Steven Medina, 37. Emma Weisner, 38. Trey Hendrix, 39. Callie Oliver, 40. Sara Schleisenger, 41. Brittany Maldonado, 42. Matthew Moreida, 43. Courtney Pellegrini, 44. Meg Maurer, 45. Julia Simon*

POST-DOCTORAL SCIENTISTS SUPERVISED:

1. Catalina Estrada (Colombia)
2. Luis Mejia (Panama)
3. Franziska Beran (Germany)
4. Grego Toral (Spain)
5. Demetra Kandalepas (Canada)
6. Brittany Bernik (US)
7. Candice Lumibao (US)
8. Lorena Torres Martinez (Colombia)

TEACHING:

2017 “Foundations in Ecology,” Tulane University
2012-present; Assistant professor at Tulane University in “Entomology,” “Tropical Agroecology,”
“Tropical Ecology,” “Insect Biology,” and “Biostatistics and Experimental Design.”
2011 Co-professor “Tropical Behavioral Ecology and Evolution” Univ. of Copenhagen
2011 Co-professor “Tropical Biology and Conservation” McGill University
2011 Coordinated SENACYT-STRI workshop on proposal writing for Panamanian undergraduates
2010 Lecturer by video conference-Yale School of Forestry and Environment
2009 Co-professor, “Tropical Biology and Conservation,” McGill University
2008 Guest online instructor for “Rainforest Researchers,” Smithsonian Institute
2005-7 Michigan State University field course in Gamboa
2003 Guest professor “Field Biology,” McGill University
2000 Graduate Teaching Assistant for “Basic Ecology,” and “Animal Behavior”; U. Illinois
1995 Professional Tutor and Home School Instructor, Chicago Illinois
1996 Education Director and Naturalist, The Fowler Center, Mayville, Michigan

UNIVERSITY COMMITTEES:

2015- Stone Center for Latin American Studies Executive Committee
2015 – Graduate Student Honor Board

EDUCATION AND OUTREACH:

- Conducted service learning programs with students at Homer Plessey Charter School, Benjamin Banneker Charter School, Audubon Charter School, Ursaline Academy.
- NSF – Research Experience for Teachers; hosted 3 biology teachers to learn about our research program in Panama. Worked with the teachers to create curriculum based on their experiences.
- Partners with teachers at Audubon Charter School and Lusher Charter School; in class presentations by lab members, interactions with teachers.
- Creation of “The Kids Master Plan for Coastal Restoration,” a lesson plan and/or workshop for kids to practice making physical models of the coast, with emphasis on climate change. This workshop is now used throughout the New Orleans area, and will soon be piloted in the Dominican Republic, in partnership with Pueblo Science.
- Hosted a high school student as she conducted a project for the New Orleans Science Fair.
- Biannual outreach workshops at Tulane: Girls in STEM at Tulane and Boys at Tulane in STEM

- Developed a K-5 teaching unit on symbioses for online publication and simultaneous presentation to Panamanian and U.S. primary school students via video conference. <http://www.stri.si.edu/english/kids/symbiosis/index.html>
- Annual presentations to teacher workshops in Panama.
- Presenter at Smithsonian Folklife Festival in Washington, D.C.
- “Smithsonian - Meet our Scientists” interview <http://www.youtube.com/user/SmithsonianVideos>
- Smithsonian-Microsoft webcast conference, “Sustain the Land” <http://www.smithsonianconference.org/shout/>

PROFESSIONAL AFFILIATIONS & HONORS:

Member, American Tropical Biology and Conservation Association

Member, Ecological Society of America

Research Affiliate, University of Panama

National Investigator, Secretary of Science and Technology for Panama (SENACYT)

PROFESSIONAL REFERENCES:

Available upon request

WEB PAGES:

<https://vanbaellab.wp.tulane.edu>

<http://oilysoil.tulane.edu>

<http://endotraits.tulane.edu>

On Instagram: vanbael.lab; and #vanbaellab