



# PAUL ANTHONY DE LUCA

## EDUCATION & PROFESSIONAL TRAINING

- 2009 – 2011 Post Doctoral Scholar**  
**Integrative Behaviour and Neuroscience Group**  
**University of Toronto Scarborough**  
 Conducted research on the physiological ecology of arthropod communication and the evolutionary ecology of buzz pollination  
 (*Advisor: Dr. Andrew C. Mason*)
- 2002 - 2007 Doctor of Philosophy in Biology**  
**Division of Biological Sciences, University of Missouri**  
 Dissertation: *Age effects on reproductive behavior in the treehopper Umbonia crassicornis (Hemiptera: Membracidae)*  
 (*Advisor: Dr. Reginald B. Cocroft*)
- 1995 - 1997 Master of Science in Zoology**  
**Biological Sciences, University of Toronto Mississauga**  
 Thesis: *Vibratory signalling during courtship in the meadow katydid Conocephalus nigropleurum* (*Advisor: Dr. Glenn K. Morris*)
- 1990 - 1995 Honours Bachelor of Science**  
**University of Toronto Mississauga**  
 Specialist in Biology, Minor in Physical Anthropology

## RESEARCH PUBLICATIONS

### JOURNAL ARTICLES

- 2019 De Luca, PA, Buchmann, SL, Galen, C, Mason, AC & Vallejo-Marín, M.** Does body size predict the buzz-pollination frequencies used by bees? *Ecology and Evolution*, Accepted
- 2019 Weissman, DB, De Luca, PA, Judge, KA & Gray, DA.** The identity of the Bahama endemic field cricket *Gryllus bryanti* Morse (Orthoptera: Gryllidae; Gryllinae; Gryllini). *Zootaxa* 4550: 135–140
- 2018 De Luca, PA, Giebnik, N, Papaj, D, Mason, AC & Buchmann, SL.** How well do acoustic recordings characterize properties of bee (Anthophila) floral sonication vibrations? *Bioacoustics*. <https://doi.org/10.1080/09524622.2018.1511474>
- 2016 De Luca, PA. & Morris, GK.** *Erechthis* katydids (Conocephalinae, Tettigoniidae) in the Caribbean: new species from The Bahamas and Hispaniola. *Journal of Orthoptera Research* 25: 49-59
- 2015 De Luca, PA.** Mass correlates with increased mating success in older but not younger males in thornbug treehoppers. *Annals of the Entomological Society of America* 108: 222-228
- 2015 De Luca, PA, Stoltz, JA, Andrade, MCB & Mason, AC.** Metabolic efficiency in courtship favors males with intermediate mass in the Australian redback spider, *Latrodectus hasselti*. *Journal of Insect Physiology* 72: 35-42
- 2014 De Luca, PA, Cox, DA & Vallejo-Marín, M.** Comparison of pollination and defensive buzzes in bumblebees indicates species-specific and context-dependent vibrations. *Naturwissenschaften* 101: 331-338
- 2013 De Luca, PA & Vallejo-Marín, M.** What's the buzz about? The ecology and evolutionary significance of buzz-pollination. *Current Opinion in Plant Biology* 16: 429-435

**CITIZENSHIP: CANADIAN**  
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### WORK ADDRESS

School of Chemistry,  
 Environmental & Life  
 Sciences  
 The University of The  
 Bahamas  
 P.O. Box N-4912  
 Nassau, Bahamas  
 (242) 302-4436/38

### RESEARCH AREAS

- Buzz Pollination in Bees & Plants
- Arthropod Behaviour & Communication
- Arthropod Biodiversity

### RESEARCH SKILLS

- Insect identification
- Insect collection management & curation
- Field based studies
- Laser vibrometry
- Statistics
- MatLab programming

- 2013** **De Luca, PA**, Bussière, LF, Souto-Villaros, D, Goulson, D, Mason, AC & Vallejo-Marín, M. Variability in bumblebee pollination buzzes affects the quantity of pollen ejected from flowers. *Oecologia* 172: 805-816
- 2011** Judge, KA, **De Luca, PA** & Morris, GK. Food limitation causes female hagdids to mate more often. *Canadian Journal of Zoology* 89: 992-998
- 2011** **De Luca, PA** & Cocroft, RB. The influence of age on male mate acquisition behaviour in thornbug treehoppers. *Ethology* 117: 440-450
- 2009** **De Luca, PA** & Cocroft, RB. Age-related changes in an insect mating signal have no effect on female choice. *Behavioral Ecology and Sociobiology* 63: 1787-1798
- 2008** **De Luca, PA** & Cocroft, RB. The effects of age and relatedness of mating patterns in thornbug treehoppers: inbreeding avoidance or inbreeding tolerance? *Behavioral Ecology and Sociobiology* 62: 1869-1875
- 2002** Morris, GK, **De Luca, PA**, Norton, M & Mason, AC. Calling song function in male hagdids (Orthoptera: Haglidae, *Cyphoderris*). *Canadian Journal of Zoology* 80: 271-285
- 1998** **De Luca, PA** & Morris, GK. Courtship communication in meadow katydids: Female preference for large male vibrations. *Behaviour* 135: 777-794

#### **BOOK CHAPTERS**

- 2006** Cocroft, RB & **De Luca, PA**. Size-frequency relationships in insect vibrational signals. In, *Insect Sounds and Communication: Physiology, Behaviour, Ecology and Evolution* (eds. Claridge, M. F. & Drosopoulos, S.). CRC Press, 99-110

#### **BOOK REVIEWS**

- 2008** *Vibrational communication in animals* by Peggy SM Hill. *Journal of Orthoptera Research* 17: 373-374

#### **POPULAR PRESS COVERAGE OF MY RESEARCH**

- 1) 'New insect species discovered at the Leon Levy Native Plant Preserve on Eleuthera' ([http://www.thebahamasweekly.com/publish/local/New\\_insect\\_species\\_discovered\\_at\\_Leon\\_Levy\\_Native\\_Plant\\_Preserve\\_on\\_Eleuthera51991.shtml](http://www.thebahamasweekly.com/publish/local/New_insect_species_discovered_at_Leon_Levy_Native_Plant_Preserve_on_Eleuthera51991.shtml)). Published online January 9, 2017.
- 2) 'Dr. Paul De Luca reveals new insect species discovery in Eleuthera' (<http://eleutheranews.com/?p=7661>). Published online December 5, 2016.
- 3) 'Bees are great at pollinating flowers – but so are vibrators' (<http://www.wired.com/2015/05/bees-great-pollinating-flowers-vibrators/>). Published online May 4, 2015
- 4) 'Bees do it (for now): biologist's research may lead to building a better vibrator' ([http://www.ithaca.edu/news/releases/bees-do-it-for-now:-biologists-research-may-lead-to-building-a-better-vibrator-39593/#.VTAq6\\_BBm8A](http://www.ithaca.edu/news/releases/bees-do-it-for-now:-biologists-research-may-lead-to-building-a-better-vibrator-39593/#.VTAq6_BBm8A)). Published online April 16, 2015
- 5) 'Arthropod survey continues to document new specimens for The Levy Preserve' (<http://levypreserve.org/news/Arthropod-survey-continues-to-document-new-specimens-for-The-Levy-Preserve>). Published online August 8, 2014
- 6) 'Professor studies bees and their buzzing' (<http://theithacan.org/news/professor-studies-bees-and-their-buzzing>). Published online March 18, 2014
- 7) 'There is music in the humming of bees' (<http://www.economist.com/news/science-and-technology/21597879-there-music-humming-bees-buzz-feed>). Published online March 1, 2014
- 8) 'Unraveling the pollinating secrets of a bee's buzz' (<http://www.nytimes.com/2013/07/11/science/unraveling-the-pollinating-secrets-of-a-bees-buzz.html>). Published online July 11, 2013
- 9) 'Development of the insect collection' (<http://www.levypreserve.org/news/Development-of-the-Insect-Collection-2013>). Published online July 1, 2013
- 10) 'Cannibal insect sex caught on video' (<http://www.newscientist.com/blogs/nstv/2013/01/cannibal-grig-sex.html>). Published online January 3, 2013
- 11) 'Female crickets eat virgin males' (<http://www.bbc.co.uk/nature/18796829>). Published online July 12, 2012

#### **RESEARCH FUNDING & ACADEMIC AWARDS**

- 2018** **University of The Bahamas**: Annual Fund recipient to develop University Insect Collection
- 2017** **National Geographic Society**: Research and Exploration Grant to study Buzz Pollination
- 2011** **The Leon Levy Foundation**: Research Grant to study Arthropod Diversity in The Bahamas
- 2010** **Royal Society of Edinburgh**: International Travel Grant to study Floral Sonication
- 2004** **Sigma-Xi Research Society**: Grant-in-Aid-of-Research to study Treehopper Communication
- 2003** **Entomological Society of America**: President's Prize for Best Poster at annual meeting
- 2002 - 2004** **National Science & Engineering Research Council of Canada**: Post-Graduate Scholarship
- 1996** **University of Toronto**: Graduate Fellowship

## RESEARCH PRESENTATIONS

- **Invited talk:** A comparison of insect diversity between Grand Bahama, Eleuthera and San Salvador Islands. *Rand Nature Centre Public Lecture Series*, Freeport, Grand Bahama, Bahamas. October 23, 2018.
- Oral presentation: The “hidden” value of habitat preservation: New katydid species for the Bahamas and Hispaniola. *Bahamas Natural History Conference 2018*, Nassau, Bahamas. March 19, 2018.
- **Invited talk:** The “hidden” value of habitat preservation: A new endemic katydid for The Bahamas. *Rand Nature Centre Public Lecture Series*, Freeport, Grand Bahama, Bahamas. February 12, 2018
- **Invited talk:** The “hidden” value of habitat preservation: A new endemic katydid for The Bahamas. *The Levy Preserve Public Lecture Series*, Governor’s Harbour, Eleuthera, Bahamas. November 6, 2016.
- Oral presentation: The “hidden” value of habitat preservation: A new endemic katydid for The Bahamas. *University of The Bahamas Research Edge Forum*, Nassau, Bahamas. October 28, 2016.
- **Invited talk:** Bees that talk to plants: the behavioural ecology of buzz-pollination. *University of Wisconsin-Milwaukee Behavior and Molecular Ecology Seminar Series*, Milwaukee, WI. March 9, 2015
- **Invited talk:** Arthropod diversity at the Leon Levy Native Plant Preserve. *The Levy Preserve Public Lecture Series*, Governor’s Harbour, Eleuthera, Bahamas. November 26, 2014
- **Invited talk:** Preliminary assessment of arthropod diversity at the Leon Levy Native Plant Preserve. *The Levy Preserve Public Lecture Series*, Governor’s Harbour, Eleuthera, Bahamas. April 6, 2013
- Oral presentation: The behavioural ecology of thornbugs, *Umbonia crassicornis*. *The College of The Bahamas Research Seminar Series*, Nassau, Bahamas. November 13, 2012
- Oral presentation: Buzz-pollination behaviour in bumblebees: Implications for agriculture? *The College of The Bahamas Faculty Research Forum*, Nassau, Bahamas. October 31, 2012
- Oral presentation: Buzz-pollination by bumblebees and its influence on pollen ejection in *Solanum rostratum* flowers. *13<sup>th</sup> Invertebrate Sound and Vibration Meeting*, Columbia, MO, USA. June 2011
- **Invited talk:** Age and energetics as sources of variation in arthropod mating behaviour. *University of Nebraska-Lincoln Biology Seminar Series*, Lincoln, NE. November 4, 2010
- **Invited talk:** Age effects on male mating behaviour in the thornbug, *Umbonia crassicornis*. *Scottish Ecological Ageing Research Group*, Stirling, UK. July 20, 2010
- **Invited talk:** Age effects on reproductive behavior in the treehopper *Umbonia crassicornis*. *SUNY Potsdam Biology Seminar Series*, Potsdam, NY. October 7, 2009
- Oral presentation: Mate searching tactics vary with age in treehoppers (Hemiptera: Membracidae, *Umbonia crassicornis*). *12<sup>th</sup> International Congress for Behavioral Ecology*. Ithaca, NY. August 2008
- **Invited talk:** Age effects on reproductive behavior in the treehopper *Umbonia crassicornis*. *University of Toronto at Mississauga Biology Seminar Series*, Mississauga, ON, Canada. February 7<sup>th</sup>, 2008
- Oral presentation: Age-based variation in the vibrational mating signals of *Umbonia crassicornis* treehoppers. *11<sup>th</sup> Invertebrate Sound and Vibration Meeting*, Toronto, ON, Canada. August 2006
- Poster presentation: Does mating with older males reduce inbreeding risk in the treehopper *Umbonia crassicornis*? *11<sup>th</sup> International Congress for Behavioral Ecology*, Tours, France, July 2006
- Poster presentation: Correlates of male mating success in the treehopper *Umbonia crassicornis* (Hemiptera: Membracidae). *12<sup>th</sup> International Auchenorrhyncha Congress*, Berkeley, CA. August 2005
- Oral presentation: Females prefer older males in treehoppers. *University of Missouri Ecolunch Series*, Columbia, MO. March 2005
- Poster presentation: Is inbreeding avoidance mediated by male vibrational signals in the sub-social treehopper, *Umbonia crassicornis* (Hemiptera: Membracidae)? *Entomological Society of America Annual Meeting*, Cincinnati, OH. October 2003 (**President’s Prize recipient in poster competition**)
- Oral presentation: Acoustic communication in the katydid *Neoconocephalus retusus*. *University of Missouri Ecolunch Series*, Columbia, MO. February 2003
- Oral presentation: Vibratory communication in meadow katydids. *Animal Behaviour Society Annual Meeting*, College Park, MD. June 1997

## **UNIVERSITY TEACHING EXPERIENCE**

2016 – Present **ASSISTANT PROFESSOR OF BIOLOGY**  
**University of The Bahamas, Nassau, BAHAMAS**

- **Lecture** courses: 1) General Entomology, 2) Principles of Biology, 3) Independent Study for the Life Sciences, 4) Biology Seminar, 5) Vertebrate Zoology, 6) Animal Biology, 7) Invertebrate Zoology, 8) Animal Behaviour
- **Lab** courses: 1) General Entomology, 2) Vertebrate Zoology, 3) Animal Biology, 4) Principles of Biology, 5) Invertebrate Zoology, 6) Animal Behaviour
- Research mentor for undergraduate seniors conducting independent research projects
- Created new upper division biology courses in *Biostatistics* and *Evolutionary Biology*

2014 – 2016 **LECTURER**  
**Department of Biology, Ithaca College, Ithaca, NY, USA**

- **Lecture** courses: 1) Insects & People, 2) Principles of Biology II
- **Lab** courses: 1) Principles of Biology II, 2) Fundamentals of Biology I, 3) Fundamentals of Biology II
- Created a new general education course (*Insects and People*) for the college's Integrated Core Curriculum

2011 – 2013 **ASSISTANT PROFESSOR OF BIOLOGY**  
**College of The Bahamas, Nassau, BAHAMAS**

- **Lecture** courses: 1) Vertebrate Zoology, 2) Animal Behaviour, 3) General Biology for Non-Majors, 4) Animal Biology, 5) Principles of Biology
- **Lab** courses: 1) Vertebrate Zoology, 2) Invertebrate Zoology, 3) Animal Behaviour, 4) Animal Biology, 5) Principles of Biology
- Research mentor for undergraduate seniors conducting independent research projects

Fall 2008 **LECTURER**  
**Department of Biology, University of Toronto Scarborough, Toronto ON, CANADA**

- Instructed a large enrollment (492 students) 200-level undergraduate class in Evolutionary Biology
- Utilized a range of instructional technology including a web-based course management system which provided students with online access to videotaped lectures, PowerPoint notes, assignments and grades
- Supervised and coordinated duties for 2 teaching assistants

2002 – 2008 **TEACHING ASSISTANT**  
**Division of Biological Sciences, University of Missouri, Columbia MO, USA**

- Instructed a laboratory course for non-science majors (General Biology for Non-Majors)
- Teaching included weekly lectures on topics covered during labs and formulating questions for exams

2000 – 2002 **LECTURER IN BIOLOGY**  
**The College of The Bahamas, Nassau, Bahamas**

- **Lecture** courses: 1) Vertebrate Zoology, 2) Animal Biology, 3) General Biology for Non-Majors
- **Lab** courses: 1) Vertebrate Zoology, 2) Animal Biology, 3) Introductory Biology for Majors
- Created new 300-level lecture and laboratory courses in Animal Behaviour

1995 – 1997 **TEACHING ASSISTANT**  
**Department of Biology, University of Toronto at Mississauga, Mississauga ON, Canada**

- Instructed laboratory courses in: 1) Animal Behaviour, 2) Invertebrate Zoology, and 3) Animal Morphology
- Teaching included weekly lectures given during laboratory sessions
- Provided tutoring to undergraduates

## STUDENT MENTORING

- 2016 – current *University of The Bahamas*: Primary advisor for the following undergraduate seniors conducting independent research projects: Khirishka Albury, Traven Cargill, Rose Charles, Kendra Darling, Sapphire Davis, Barbrianna Dawkins, Shanelle Gayle, Tamarind Johnson, O'neil Leadon, Rickell Lightborne, Le'Deswanique Nixon, Shekeira Outten, Sanchia Pratt, Janice Seymour, Marcelite Smith, Makiah Swaby, Chantia Sweeting, Cyrilia Thompson, Ashlee Wells
- 2010 – 2011 *University of Toronto Scarborough*: Jennifer Van Eindhoven, *Master's thesis*: Competitive signaling during aggressive encounters in the primitive acoustic insect *Cyphoderris monstrosa*
- 2009 – 2010 *University of Toronto Scarborough*: Dean Koucoulis, *Undergraduate research thesis*: Directional hearing in the parasitoid fly *Ormia ochracea*

## TEACHING WORKSHOPS

- *Faculty rights and responsibilities when addressing disruptive classroom behavior. Workshop* – Center for Faculty Excellence, Ithaca College (March 24, 2014)
- *How to engage students in the classroom and beyond. Workshop* - Centre for Teaching Excellence, University of Toronto Scarborough (March 11, 2009)
- *Beginning Teaching: An orientation for new instructors. Workshop* - Office of Teaching Advancement, University of Toronto (September 4, 2008)
- *College Science Teaching. Graduate course* - University of Missouri, Instructor: Dr. Sandra Abell (Winter semester 2003)

## EDUCATION OUTREACH & SERVICE

- Night Walk at the Levy Preserve, Leon Levy Native Plant Preserve, Eleuthera, Bahamas (October 6, 2018)
- Night Walk at the Rand Nature Centre, Rand Nature Centre, Grand Bahama, Bahamas (February 12, 2018)
- "Evolution, Society & Religion", Café Scientifique Lecture Series, Nassau, Bahamas (December 1, 2017)
- Night Walk at the Levy Preserve, Leon Levy Native Plant Preserve, Eleuthera, Bahamas (October 14, 2017)
- Live arthropod presentation, Expanding Your Horizons, Cornell University, Ithaca, NY, USA (April 30, 2016)
- Live arthropod presentation, Ithaca Science Center, Ithaca, NY, USA (July 11, 2015)
- Live arthropod presentation, New York State Fair, Syracuse, NY, USA (August 30, 2014)
- Live arthropod presentation, Camp Safari, Leon Levy Native Plant Preserve, Eleuthera, Bahamas (July 22, 2014)
- Live arthropod presentation, Ithaca Science Center, Ithaca, NY, USA (March 29, 2014)
- Live arthropod presentation, New York State Fair, Syracuse, NY, USA (August 31, 2013)
- Co-Organizer, The College of The Bahamas Science Week, Nassau, Bahamas (October 29 – November 1, 2012)
- Science Fair Judge, Toronto Science & Technology Fair, University of Toronto Scarborough (April 9, 2011)
- "Insect vibrational communication", Public Lecture – Earth Day 2007, University of Missouri, Columbia, MO, USA
- Presentation to the Hickman High School Science Club (Columbia, MO), about pursuing careers in science (February 1, 2006)
- BioBlitz 2005 & 2006, University of Missouri, Columbia, MO, USA: Assisted with insect collection
- "Insects of the jungle", Public Lecture – 1998 Science Exposition, University of Toronto at Mississauga
- Appeared on a Toronto television show ("Breakfast Television"), February 6, 1998, to promote the 1998 Science Exposition at the University of Toronto at Mississauga

## PROFESSIONAL ACTIVITIES

- Manuscript Reviewer: 1) *Acta Amazonica*, 2) *Animal Behaviour*, 3) *Apidologie*, 4) *Behaviour*, 5) *Behavioral Ecology and Sociobiology*, 6) *Bioacoustics*, 7) *Biological Journal of the Linnean Society* 8) *Ethology*, 9) *Evolution*, 10) *International Journal of Bahamian Studies*, 11) *Journal of Evolutionary Biology*, 12) *Journal of Insect Behavior*, 13) *Journal of Insect Science*, 14) *Journal of Orthoptera Research*, 15) *Journal of Tropical Ecology*, 16) *PLoS One*, 17) *Physiological Entomology*
- Society Affiliations: 1) *Bahamas National Trust*, 2) *Entomological Society of America*, 3) *Orthopterists' Society*