

# Justin P. Lawrence

Lyman Briggs College  
W-24 Holmes Hall  
Michigan State University  
East Lansing, Michigan 48825

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## Education

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- 2018 University of Mississippi  
Ph.D. in Biology  
Advisor: Brice Noonan  
*Impacts and Implications of Polytypism on the Evolution of Aposematic Coloration*
- 2011 Michigan State University  
M.S. in Fisheries and Wildlife  
Co-Advisors: Gerald Urquhart and Kelly Millenbah  
*The Diversity, Distribution, and Conservation of a Polymorphic Frog (Oophaga pumilio) in Western Panama*
- 2006 Michigan State University  
B.S. in Zoology – Magna cum laude

## Professional Experience

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- 2020 Assistant Professor – Fixed Term  
Lyman Briggs College  
Michigan State University
- 2018 - 2019 Postdoctoral Scholar  
University of California, Irvine  
Advisor: Adriana Briscoe
- 2016 Visiting Research Fellow  
Western Sydney University  
Advisor: Kate Umbers
- 2015 Visiting Research Fellow  
University of Newcastle  
Advisor: Michael Mahony

## Peer-Reviewed Publications

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- Lawrence, J.P.\***, B. Rojas\*, A. Fouquet, J. Mappes, A. Blanchette, R.A. Saporito, R.J. Bosque, E.A. Courtois, and B. Noonan. 2019. Weak warning signals can persist in the absence of gene flow. *Proceedings of the National Academy of Science*. 116 (38): 19037-19045. \*Equal contributions
- Umbers, K.D.L., J.L. Riley, M.B.J. Kelly, G. Taylor-Dalton, **J.P. Lawrence**, and P.G. Byrne. Educating the enemy: Harnessing learned avoidance behaviour in wild predators to increase survival of reintroduced Southern Corroboree Frogs. *Conservation Science and Practice*. In press.

- Lawrence, J.P.** 2018. Population estimates and spatial distributions of *Oophaga pumilio* in a forest edge landscape and implications for conservation. *Phyllomedusa* 17: 247-253.
- Bosque, R.J., **J.P. Lawrence**, R. Buchholz, G.R. Colli, J. Heppard, and B.P. Noonan. 2018. Diversity of warning signal and social interaction influences the evolution of imperfect mimicry. *Ecology and Evolution* 8:7490–7499.
- Lawrence, J.P.**, M. Mahony, and B.P. Noonan. 2018. Differential responses of avian and mammalian predators to phenotypic variation in Australian Brood Frogs. *PLoS ONE* 13 (4) e0195446.
- Lawrence, J.P.** and B.P. Noonan. 2018. Avian learning favors colorful, not luminous, signals. *PLoS ONE* 13 (3): e0194279.
- Lawrence, J.P.** 2017. *Hypsiboas cinerascens* predation. *Herpetological Review* 48 (2): 409.
- Lawrence, J.P.** 2017. Ineffectiveness of call surveys for estimating population size in a widespread Neotropical frog, *Oophaga pumilio*. *Journal of Herpetology* 51:52-57.
- Lawrence, J.P.** 2011. *Oophaga pumilio* (Strawberry Dart Frog) habitat use. *Herpetological Review* 42: 90.

## **In Review and In Prep**

\*Undergraduate Author

- Lawrence, J.P.** 2019. Variable conservation of morphological features in a polytypic frog (*Oophaga pumilio*). *PeerJ*. In review.
- Lawrence, J.P.** and G.R. Urquhart. 2019. Demographic responses in a population of the Strawberry Poison Frog (*Oophaga pumilio*) after resource manipulations. *Herpetologica*. In review.
- Lawrence, J.P.**, A.G. Rangel Olguín, and A.D. Briscoe. Unveiling eye molecular evolution by gene-duplication analysis in Lepidoptera. In prep.
- Lawrence, J.P.** and A.D. Briscoe. A guide to *Heliconius* for everybody: A review of The Ecology & Evolution of *Heliconius* Butterflies by Chris Jiggins. In prep.

## **Grants and Fellowships (\$55,181)**

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| 2019 | American Philosophical Society Franklin Grant, \$6000                                   |
|      | Weaving the Future of Animal Behavior Grant, \$2000                                     |
|      | Society for the Study of Evolution Congressional Visit Days Grant, \$1194               |
|      | The Wildlife Society Southern California Chapter Travel Grant, \$962                    |
| 2016 | Endeavour Research Fellowship, \$17910  |
| 2015 | North American Nature Photography Association College Scholarship, \$1000               |
|      | National Science Foundation East Asia and Pacific Summer Institutes Fellowship, \$10965 |
| 2013 | Smithsonian Tropical Research Institute A. Stanley Rand Fellowship, \$3100              |
|      | Society for the Study of Amphibians and Reptiles Grant in Herpetology, \$500            |
|      | University of Mississippi Graduate Student Council Research Grant, \$1000               |

- 2012 American Society of Ichthyologists and Herpetologists Gaige Award, \$500  
University of Mississippi Summer Research Assistantship, \$2600
- 2011 Michigan State University Graduate School Travel Funding Fellowship, \$350  
Michigan State University Fisheries and Wildlife Graduate Student Organization  
Travel Fellowship, \$100
- 2010 Michigan State University Graduate School Research Extension Fellowship,  
\$1000
- 2009 Michigan State University College of Agriculture and Natural Resources Summer  
Research Fellowship, \$6000

## Conference Talks

\*Speaker

- Lawrence, J.P.\***, M. Mahony, and B.P. Noonan. Differential responses of avian and mammalian predators to phenotypic variation in Australian Brood Frogs. Behaviour 2019, Chicago, Illinois.
- Lawrence, J.P.\***, M. Mahony, and B.P. Noonan. Differential responses of avian and mammalian predators to phenotypic variation in Australian Brood Frogs. Evolution 2019, Providence, Rhode Island.
- Lawrence, J.P.\***, B. Rojas, A. Fouquet, J. Mappes, A. Blanchette, R.A. Saporito, R.J. Bosque, and B. Noonan. Evolution and origin of polymorphism in aposematic species. Evolution 2017, Portland, Oregon.
- Lawrence, J.P.\***, B. Rojas, A. Fouquet, R.J. Bosque, E.A. Courtois, J. Mappes, and B. Noonan. 2016. Aposematic signal optimization in a polytypic species. Australian Society of Herpetologists Meeting 2016, Launceston, Tasmania, Australia.
- Lawrence, J.P.\***, B. Rojas, A. Fouquet, E.A. Courtois, J. Mappes, and B. Noonan. 2015. Directional Selection on Color in the Dyeing Poison Frog, *Dendrobates tinctorius*. Behaviour 2015, Cairns, Queensland, Australia.
- Lawrence, J.P.\***, B. Rojas, A. Fouquet, E.A. Courtois, J. Mappes, and B. Noonan. 2014. Directional Selection on Color in the Dyeing Poison Frog, *Dendrobates tinctorius*. Evolution 2014, Raleigh, North Carolina.
- Lawrence, J.P.\*** 2011. The Diversity, Distribution, and Conservation of a Polymorphic Frog (*Oophaga pumilio*) in Western Panama. Michigan Amphibian and Reptile Research Symposium, Central Michigan University.
- Lawrence, J.P.\*** 2010. Conservation of a Polymorphic Frog. Michigan Amphibian and Reptile Research Symposium, University of Michigan – Flint.
- Lawrence, J.P.\*** 2010. Conservation of a Polymorphic Frog in Western Panama. Michigan State University Fisheries and Wildlife GSO Symposium. Michigan State University.
- Lawrence, J.P.\*** 2009. Conservation of a Polymorphic Frog. Michigan Amphibian and Reptile Research Symposium. Michigan State University.

## Poster Presentations

\*Presenter

- Lawrence, J.P.\***, A.G. Rangel Olguín, and A.D. Briscoe. 2019. Unveiling eye molecular evolution by gene-duplication analysis in Lepidoptera. Evolution 2019, Providence, Rhode Island.
- Lawrence, J.P.\***, M. Mahony, and B.P. Noonan. 2018. Differential responses of avian and mammalian predators to phenotypic variation in Australian Brood Frogs. Early Career Scientists Symposium. Ann Arbor, Michigan.
- Kelly, M.B.J.\*, G. Taylor-Dalton, **J.P. Lawrence**, P.G. Byrne, and K.D.L. Umbers. 2016. Does the spectacular colouration protect the Southern Corroboree Frog, *Pseudophryne corroboree*, from predation? Australasian Society for the Study of Animal Behaviour Meeting. Katoomba, New South Wales, Australia.
- Lawrence, J.P.\***, B. Rojas, A. Fouquet, E.A. Courtois, J. Mappes, and B. Noonan. 2014. Directional Selection in the Dyeing Poison Frog (*Dendrobates tinctorius*). University of Mississippi Graduate Research Symposium. Oxford, Mississippi.
- Lawrence, J.P.\*** and G.R. Urquhart. 2011. Population Demographic Changes Due to Addition of Artificial Rearing Sites in the Strawberry Poison Dart Frog (*Oophaga pumilio*). Joint Meeting of Ichthyologists and Herpetologists. Minneapolis, Minnesota.
- Lawrence, J.P.\*** 2009. Conservation of a Polymorphic Frog (Dendrobatidae: *Oophaga pumilio*) in Western Panama. Michigan State University Fisheries and Wildlife GSO Symposium. East Lansing, Michigan.

## Awards and Honors

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| 2018 | Science Communication Workshop Award Recipient<br><i>International Wildlife Film Festival, Missoula, Montana</i>                                |
| 2017 | Hamilton Symposium Award Finalist<br><i>Evolution 2017 Conference</i><br>Graduate Student Achievement Award<br><i>University of Mississippi</i> |
| 2016 | Runner-up for Talk Given by PhD Student<br><i>2016 Australian Society of Herpetologists Meeting</i>   |
| 2014 | First Place Poster<br><i>University of Mississippi Research Symposium</i>   |

## Teaching Experience

### Michigan State University

- 2020 *Instructor, Biology II: Cell and Molecular Biology (LB 145) – 1 Semester*  
Co-instructor with Dr. Cassie Dresser-Briggs. Created course material for lectures and labs. Designed course activities, honors options, and methods to evaluate student progress and retention for 96 students. Supervised 1 graduate teaching assistant and 10 undergraduate learning assistants.

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## University of Mississippi

- 2011-2018     *Lab Coordinator, Genetics (BISC 336) – 2 Semesters*  
Created lab modules, exams, quizzes, syllabi, and assignments for ~430 students while supervising 5 graduate teaching assistants. Designed barcoding lab to explore concepts of sequencing and phylogenetic trees.
- Teaching Assistant, Genetics (BISC 336) – 10 Semesters*  
Sophomore-Junior level course teaching Mendelian, Molecular, and Population genetics.
- Teaching Assistant, Biological Science I Laboratory (BISC 161) – 1 Semester*  
Freshmen level course for introductory biology including statistics, ecology, and genetics. Created presentations and graded material.

## Michigan State University

- 2005-2012     *Course Instructor, Environmental Studies in Costa Rica (NSC 475, NSC 491, ZOL 490, ZOL 494) – 2 Programs*  
Junior-Senior level study abroad program that covered tropical ecology and biodiversity and the environmental issues facing tropical countries with a particular focus on Costa Rica. Created syllabus and graded material.
- Course Instructor, Wild Borneo! Biodiversity in Southeast Asia (NSC 490, NSC 491) – 1 Program*  
Junior-Senior level study abroad program that covered tropical ecology and biodiversity of southeast Asia, focusing on Borneo. Responsible for creating syllabus and graded material.
- Teaching Assistant, Wild Borneo! Biodiversity in Southeast Asia (NSC 490, NSC 491) – 1 Program*  
Junior-Senior level study abroad program that covered tropical ecology and biodiversity of southeast Asia, focusing on Borneo.
- Teaching Assistant, Environmental Studies in Costa Rica (NSC 490, NSC 491) – 2 Programs*  
Junior-Senior level study abroad program that covered tropical ecology and biodiversity and the environmental issues facing tropical countries with a particular focus on Costa Rica.
- Teaching Assistant, Tropical Biodiversity and Conservation in Panama (LB 493) – 2 Programs*  
Upperclassmen study abroad program that used scientific observation to teach tropical biology in lowland tropical rainforest and high elevation cloud forest.
- Teaching Assistant, Biology of Amphibians and Reptiles (ZOL 384) – 4 Semesters*  
Junior-Senior level course for biology of amphibians and reptiles, which included taxonomy, evolutionary history, and species identification.
- Teaching Assistant, Introductory Biology (LB 144) – 7 Semesters*  
Freshmen level course for introductory biology including ecology, genetics, evolution, and comparative biology.

## Mentor Experience

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- André Smith – University of Mississippi (2017 – present). Dietary specialization in the Dyeing Poison Frog (*Dendrobates tinctorius*). University of Mississippi Track-1 Summer Research Fellowship. Currently an undergraduate.
- Alex Oliveri – University of Mississippi (2018 – present). Predator learning of automimicry signals. Currently an undergraduate.
- Peter Andes – University of Mississippi (2017 – present). Invertebrate response to alkaloid toxins in the Dyeing Poison Frog (*Dendrobates tinctorius*). 2018 graduate, pursuing graduate schools.
- Matthew McPherson – University of Mississippi (2018 – present). Predator learning of automimicry signals. Currently an undergraduate.
- Matthew Amann – University of Mississippi (2015 – 2016). Toxin variation in the Dyeing Poison Frog (*Dendrobates tinctorius*). 2017 graduate.
- Winston Wolters – University of Mississippi (2015 – 2016). Toxin variation in the Dyeing Poison Frog (*Dendrobates tinctorius*). 2016 graduate.
- Michael Kelly – Western Sydney University (2016). Conservation of the southern corroboree frog (*Pseudophryne corroboree*). 2016 graduate, current masters student at University of Sydney.
- Griffin Taylor-Dalton – Western Sydney University (2016). Conservation of the southern corroboree frog (*Pseudophryne corroboree*). 2017 graduate.
- John Constan – Michigan State University (2013). Predator responses to known and novel phenotypes in the Dyeing Poison Frog (*Dendrobates tinctorius*). 2013 graduate, currently pursuing medical degree at Michigan State University.
- Tim Muhich – Michigan State University (2011 – 2013). Demographic responses to resource manipulations in the Strawberry Poison Frog (*Oophaga pumilio*). 2012 graduate, currently teaching high school.
- Keith Erickson – Michigan State University (2010). Population dynamics of the Strawberry Poison Frog (*Oophaga pumilio*). 2012 graduate of Arapahoe Community College.
- Isaac Standish – Michigan State University (2010). Population dynamics of the Strawberry Poison Frog (*Oophaga pumilio*). 2011 B.S. graduate and 2016 Ph.D. graduate from Michigan State University.

## Guest Lectures

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| 2019 | <i>Predators, Prey, and Perception: How Warning Signals Diversify and Proliferate</i><br>Invited seminar, Loyola University Chicago<br><i>Aposematism: What it is and how does it evolve?</i><br>Animal Coloration and Vision (E145), University of California, Irvine |
| 2018 | <i>Population and Evolutionary Genetics</i><br>Genetics (BISC 336), University of Mississippi  |
| 2011 | <i>Introduction to Ecology and Biomes</i><br>Introductory Biology (LB 144), Michigan State University  |

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- 2010 *Neotropical Herpetofauna Trends and Threats*  
Biology of Amphibians and Reptiles (ZOL 384), Michigan State University
- 2009 *Neotropical Herpetofauna Trends and Threats*  
Biology of Amphibians and Reptiles (ZOL 384), Michigan State University  
*Conservation Biology and Restoration Ecology*  
Introductory Biology (LB 144), Michigan State University  
*Threats to Amphibian Diversity*  
Introductory Biology (LB 144), Michigan State University
- 2008 *Neotropical Herpetofauna Trends and Threats*  
Biology of Amphibians and Reptiles (ZOL 384), Michigan State University
- 2007 *Neotropical Herpetofauna Trends and Threats*  
Biology of Amphibians and Reptiles (ZOL 384), Michigan State University

### **Service and Outreach**

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- Outreach Presentations *Tracking Snow*. 2018. Science communication film for the U.S. Forest Service and the International Wildlife Film Festival. Missoula, Montana.
- Meet Your Neighbours Photography Techniques*. 2017. North American Nature Photography Association High School Scholarship Program. Great Smoky Mountains National Park, Tennessee.
- The Overlooked Majority: Highlighting Salamander Diversity in the U.S.* 2017. North American Nature Photography Association Summit, Jacksonville, Florida.
- Conservation of a Polymorphic Frog*. 2010. Smithsonian Tropical Research Institute, Bocas del Toro, Panama.
- Conservation of a Polymorphic Frog*. 2009. Smithsonian Tropical Research Institute, Bocas del Toro, Panama.
- Amphibian Conservation: The Global Amphibian Crisis*. 2008. Potter Park Zoo, Lansing, Michigan.
- Reviewer Amphibia-Reptilia, Copeia, Evolution, Herpetological Conservation and Biology, Herpetological Review, Hydrobiologia, Integrative Organismal Biology, Journal of Natural History, Phyllomedusa

### **Professional Organizations**

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| Australian Society of Herpetologists                  | Society for the Study of Evolution               |
| American Society of Ichthyologists and Herpetologists | Society for the Study of Amphibians and Reptiles |
| Herpetologists' League                                | American Genetics Association                    |

## References

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Brice Noonan  
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University of Mississippi  
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PhD Advisor

Kate Umbers  
Hawkesbury Institute for the Environment  
Western Sydney University, Australia  
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Australian mentor for Endeavour Fellowship

Gerald Urquhart  
Lyman Briggs College  
Michigan State University  
urquhart@msu.edu  
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Masters Advisor

Bibiana Rojas  
Centre of Excellence in Biological  
Interactions  
University of Jyväskylä, Finland  
bibiana.rojas@jyu.fi  
Collaborator with *D. tinctorius* projects