

ARYEH HERSHEL MILLER

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RESEARCH AND ACADEMIC APPOINTMENTS

Research Fellow, Smithsonian Institution, National Museum of Natural History | August 2018 – August 2020

Curatorial Assistant, Zoology Collection, University of North Carolina Asheville | August 2017 – May 2019

EDUCATION

Ph.D., Evolution, Ecology and Population Biology (in progress) | Washington University in St. Louis
(Advisor: Jonathan B. Losos)

B.S., Biology, 2020 | University of North Carolina at Asheville (Honors College)
(Advisor: R. Graham Reynolds)

SELECT FUNDING AWARDS (\$21,800 USD)

Society for Systematic Biology Travel Award (\$500) | November 2022

Society for Systematic Biology Workshop Grant (\$500) | January 2020

UNC Asheville Honors Program Great Ideas Grant (\$200) | October 2019

Iguana Specialist Group Travel Award (\$750) | July 2019

Smithsonian Institution Global Genome Initiative Award, Principal Investigator (\$15,000, with R. Graham Reynolds and Kevin de Queiroz) | August 2018

UNC Asheville Undergraduate Travel Grant (\$1,900) | May 2018, July 2018, September 2019, January 2020

UNC Asheville Undergraduate Research Summer Grant (\$2,950) | May 2017, May 2019

AWARDS, SCHOLARSHIPS, AND FELLOWSHIPS

National Science Foundation Graduate Research Fellowship Program Honorable Mention | 2020, 2021

Research Fellow, Smithsonian Institution, National Museum of Natural History | 2018 - 2020

University Research Scholar, UNC Asheville | 2020

Distinction in Biology, UNC Asheville | 2020

Bernhardt-Perry Award for Undergraduate Research, UNC Asheville | 2020

Thomas W. Fisher Conservation & Environmental Studies Scholar | May 2016

The International Herpetological Symposium Junior Herpetologist Award | May 2015

Lazarus Leadership Fellow | January 2015

PEER-REVIEWED PUBLICATIONS

IN REVIEW/ IN REVISION:

16. Reynolds, R.G., M.E. Reger, K.J. Peek, B. L. Raphael, G. Colosimo, **A.H. Miller**, A. A. Vanerelli, and G.P. Gerber. Spatial Ecology of the Turks & Caicos Boa, *Chilabothrus c. chrysogaster* Cope, 1871 (Serpentes: Boidae) and a review of the genus *Chilabothrus*. *In review*
15. Stroud, J.T., Swiston, S., **Miller, A.H.** Climatic constraints and the latitudinal diversity gradient: Why are arboreal lizards a tropical phenomenon? *In revision*

PUBLISHED:

14. **Miller, A.H.**, Stroud, J.T., and Losos, J.B. The ecology and evolution of key innovations. (2022). *Trends in Ecology and Evolution*.
13. Reynolds, R. G., **Miller, A. H.**, Pasachnik, S. A., Knapp, C. R., Welch, M. E., Colosimo, G., ... & Iverson, J. B. (2022). Phylogenomics and Historical Biogeography of West Indian Rock Iguanas (genus *Cyclura*). *Molecular Phylogenetics and Evolution*, 107548.
12. Vanerelli, A. A., **Miller, A. H.**, Comsa, L. C., Geneva, A. J., & Reynolds, R. G. (2022). Mitochondrial genome of the critically Endangered silver boa (*Chilabothrus argentum*; Squamata: Boidae). *Mitochondrial DNA Part B*, 7(6), 1180-1182.
11. **Miller, A.H.**, & Stroud, J.T. Novel Tests of the Key Innovation Hypothesis: Adhesive toepads in arboreal lizards. (2021). *Systematic Biology*, 71(1), 139-152.
 - ScienceDaily, Phys.org, Newswise, ScienceNewsNet, Futurity, SverigeRadio (Swedish), St. Louis Public Radio
10. **Miller, A.H.**, G.R. Zug, G.O.U. Wogan, J.L. Lee, and D.G. Mulcahy. Phylogeny, Diversity, and Distribution of *Micryletta* (Anura: Microhylidae) in Myanmar. (2021). *Ichthyology & Herpetology*, 109(1): 245-257.
9. Reynolds, R.G., **A.H. Miller**, A. Ríos-Franceschi, C. Huffine, J. Fredette, N.F. Angeli, S.I. Vega-Castillo, L.J. Revell, and A.R. Puente-Rolón. (2021). Molecular phylogeny of Puerto Rico Bank dwarf geckos (Squamata: Sphaerodactylidae: *Sphaerodactylus*) with redescription of *S. macrolepis*. **bioRxiv [preprint]**. <https://doi.org/10.1101/2021.03.23.436310>
8. **Miller, A.H.**, H.R. Davis, Q. Do, M. Anh, C.T. Pham, T. Ziegler, J. L. Lee, K. de Queiroz, R.G. Reynolds, T.Q. Nguyen. (2020). Discovery of a New Species of Enigmatic Odd-Scaled Snake (Serpentes: Xenodermidae: *Achalinus*) from Ha Giang Province, Vietnam. *Copeia*, 108: 796-808.
 - CNN, Smithsonian Magazine, AJC, Daily Mail, National Geographic
7. Freitas, E. S., **Miller, A. H.**, Reynolds, R. G., & Siler, C. D. (2020). A taxonomic conundrum: Characterizing a cryptic radiation of Asian gracile skinks (Squamata: Scincidae: *Riopa*) in Myanmar. *Molecular Phylogenetics and Evolution*, 146: 106754.
6. Lee, J. L., **Miller, A.H.**, Zug, G.R., & Mulcahy, D.G. (2019). The discovery of Rock Geckos *Cnemaspis* Strauch 1887 (Squamata, Gekkonidae) in the Tanintharyi Region, Myanmar with the description of two new species. *Zootaxa*, 4661(1), 40-64.
5. **Miller, A.H.**, Jackson, A., van den Burg, T., Knapp, C.R., Welch, M.E., and Reynolds, R.G. (2019). The complete mitochondrial genome of the critically endangered Lesser Antillean iguana (*Iguana delicatissima*; Squamata: Iguanidae). *Mitochondrial DNA Part B*, 4:2, 2479:2481.

4. Mulcahy, D.G., Lee, J.L., **Miller, A.H.**, Chand, M., Thura, M.K., & Zug, G.R. (2018). Filling the BINs of life: An amphibian and reptile inventory survey of the Tanintharyi (Tenasserim) Region of Myanmar, with DNA barcode data. *Zookeys*, (757), 85-152.
3. Lee, J. L., Vogel, G., **Miller, A. H.**, & Zug, G. R. (2018). Rediscovery of *Xenochrophis bellulus* (Stoliczka, 1871) from Myanmar (Serpentes: Natricinae) with comments on its taxonomic status. *Proceedings of the Biological Society of Washington*, 131(1), 19–35.
2. Mulcahy D.G., Lee J.L., **Miller A.H.**, & Zug G.R. (2017). Troublesome Trimes: Potential cryptic speciation of the *Trimeresurus (Popeia) popieorum* complex (Serpentes: Crotalidae) around the Isthmus of Kra (Myanmar and Thailand). *Zootaxa*, 4347: 301–315.
1. **Miller, A.H.**, & Zug, G.R. (2016). Morphology and biology of the Asian Common Mockviper, *Psammodynastes pulverulentus* (Boie, 1827) (Serpentes: Lamprophiidae): a focus on Burmese populations. *Proceedings of the Biological Society of Washington*, 129(1), 173–194.

NATURAL HISTORY NOTES AND CONSERVATION ASSESSMENTS:

4. **Miller, A.H.**, H.N. Ngo, H. Quoc, P.Q. Tien, H.R., Davis, and R.G., Reynolds. 2021. *Protobothrops mucrosquamatus* (Brown Spotted Pitviper). Egg-guarding. *Herpetological Review*, 52(1): 169.
3. Reynolds, R. G., **Miller, A.H.**, & Puente-Rolón, A.R. 2021. *Chilabothrus schwartzi*. *The IUCN Red List of Threatened Species*. <https://www.iucnredlist.org/species/162923732/162923901>
2. Lee, J. L., **Miller, A.H.**, Connette, G.M., Oo, K.S., Zug, G.R., & Mulcahy, D.G. (2018). First record of the Malaysian Bridle Snake *Dryocalamus subannulatus* (Dumeril, Bibron & Dumeril, 1854) in Myanmar (Reptilia, Serpentes, Colubridae). *Check List*, 14(2), 341–345.
1. **Miller, A.H.**, & Zug, G.R. (2016). An enigmatic Lygosoma (Reptilia: Squamata: Scincidae) from northern Myanmar. *Herpetological Review*, 47(3): 373–374.

CONFERENCE PRESENTATIONS

- Miller, A.H.**, & Stroud, J.T. (2021). Novel Tests of the Key Innovation Hypothesis: Adhesive toepads in arboreal lizards. *Virtual Evolution 2021* [**Oral Presentation**].
- Miller, A.H.**, & Reynolds, R.G. (2020). Phylogenomic Bayesian species delimitation in West Indian iguanas (*Cyclura*). *Society for Systematic Biology Standalone Meeting* [**Lighting Talk**].
- Miller, A.H.**, & Reynolds, R.G. (2019). Phylogenomic Bayesian species delimitation in West Indian iguanas (*Cyclura*). *IUCN Iguana Specialist Group Meeting, Roatán, Honduras* [**Oral Presentation**].
- Miller, A.H.**, & Reynolds, R.G. (2019). Phylogenomic Bayesian species delimitation in West Indian iguanas (*Cyclura*). *University of North Carolina Asheville Undergraduate Research Symposium* [**Oral Presentation**].
- Miller, A.H.**, & Reynolds, R.G. (2018). Mitogenomics of West Indian iguanas (*Cyclura*). *University of North Carolina Asheville Undergraduate Research Symposium* [**Oral Presentation**].
- Miller, A.H.**, & Reynolds, R.G. (2018). Elucidating cryptic diversity in Burmese Supple Skinks (*Lygosoma*). *Joint Meeting of Ichthyologists and Herpetologists, Rochester, NY* [**Poster**].

- Miller, A.H., & Reynolds, R.G.** (2018). Elucidating cryptic diversity in Burmese Supple Skinks (*Lygosoma*). *3rd Annual North Carolina Congress of Herpetology, Asheville, NC* [Poster].
- Huffine, C.A., **Miller, A.H., & Reynolds, R.G.** (2018). A new species of dwarf gecko (*Sphaerodactylus*) from the Virgin Islands. *3rd Annual North Carolina Congress of Herpetology, Asheville, NC* [Poster].
- Miller, A.H., & Reynolds, R.G.** (2018). Elucidating cryptic diversity in Burmese *Lygosoma* skinks via integrative taxonomy. *University of North Carolina Asheville Undergraduate Research Symposium* [Oral Presentation].
- Miller, A.H., & Reynolds, R.G.** (2017). A new species of Asian Scincidae from Kachin State, Myanmar. *University of North Carolina Asheville Undergraduate Research Symposium* [Poster].

FIELDWORK EXPERIENCE

- Puerto Rico, August 2021. Performance, ecology, and thermal biology of *Anolis* lizards. With Kristin Winchell (Washington University).
- Vietnam, May – July 2019. Amphibian and reptile surveys in karstic regions of northern Vietnam. With Truong Q. Nguyen (IEBR), Hayden R. Davis (University of Washington), and R. Graham Reynolds (UNCA).
- Turks and Caicos Islands, January 2019. Worked with R. Graham Reynolds (UNCA) radio tracking Turks Island boas (*Chilabothrus chrysogaster*).
- U.S. Virgin Islands, December 2018. Worked with R. Graham Reynolds (UNCA) and the NC Zoo capturing and processing endangered VI Boas (*Chilabothrus granti*).
- Costa Rica, June – July 2014. Tropical herpetology course led by Thomas C. LaDuke at El Zota Biological Field Station.
- United States, ongoing. General collecting and surveying in Maryland, Virginia, and North Carolina.

TEACHING EXPERIENCE

- BIOL 3501 *Evolution* (Washington University in St. Louis)

OTHER RELEVANT EXPERIENCE

- Experienced with phylogenetic analyses, statistical analyses, GIS, and figure design in R and RStudio®, Python, and Julia.
- Experienced with laboratory genetics, including DNA extraction manual kits and the AutoGen® system, PCR, clean-up, gel electrophoresis, Sanger sequencing, and DNA quantitation with Qubit® 3.0.
- Experienced with genetic data analysis, including Sanger and next-gen sequence data in programs such as Trimmomatic, FastQC, bwa, samtools, GATK, Geneious®, R, RevBayes, Python, Julia, MEGA, BEAST, BPP, BAMM, etc.
- Experienced with scripting in shell and command prompt; learning to push intensive projects to off-site servers like Jetstream.

COMMUNITY OUTREACH AND MEMBERSHIPS

- Mentor*, Washington University Continued Mentoring Young Scientist Program | September 2022 – Present
- Tutor/Mentor*, Washington University Young Scientist Program | June 2021 – July 2021
- Member*, Society for the Study of Evolution | June 2021 – Present
- Member*, Society of Systematic Biologists | October 2020 – Present
- Volunteer*, Christine W. Avery Learning Center | January 2020 – March 2020
- Member*, The Order of Pisgah | March 2019 – Present
- Volunteer*, Pisgah View Learning Center | January 2019 – May 2019
- President*, University of North Carolina Asheville Biology Club | August 2018 – August 2019
- Member*, American Society of Ichthyologists and Herpetologists | March 2018 – Present

Member, North Carolina Herpetological Society | November 2016 – Present

Inventory Leader, National Geographic BioBlitz (Washington D.C.) | May 2016

Member, Virginia Herpetological Society | April 2013 – Present

Volunteer, Audubon Naturalist Society at Woodend (Chevy Chase, MD) | May 2012- July 2015

PROFESSIONAL SERVICE

Peer Reviewer: *Asian Herpetological Research*, *Biological Invasions*, *Caribbean Naturalist*, *Checklist*, *Comparative Biochemistry and Physiology – Part A*, *Ecology and Evolution*, *Functional Ecology*, *Herpetozoa*, *Journal of Herpetology*, *Israel Journal of Ecology and Evolution*, *PeerJ*, *Proceedings of the Royal Society B*, *Zoological Systematics*, *Zootaxa*

Advisory Member: 2021-2025 IUCN Species Survival Commission Snake Specialist Group

REFERENCES

1. Dr. R. Graham Reynolds, Associate Professor
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828-232-5153 (office)
2. Dr. George R. Zug, Curator Emeritus
Division of Amphibians and Reptiles, Department of Vertebrate Zoology
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202-633-0738 (NHB office)
3. Dr. Daniel G. Mulcahy, Genomic Tissue and DNA Collections Manager
Leibniz Institute for Evolutionary and Biodiversity Research
Berlin Museum of Natural History
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