

MATTHEW R. BORTHS

Curator, Division of Fossil Primates
Duke Lemur Center
Duke University
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Education

- 2015 **Ph. D.** Anatomical Sciences. Stony Brook University, Stony Brook, NY
Erik Seiffert, Academic Adviser. Committee: Gregg Gunnell, Maureen O’Leary, Dave Krause
“Phylogeny and Biogeography of Hyaenodontidae (Placentalia, Mammalia)”
- 2012 **M.S.** Basic Health Sciences. Stony Brook University, Stony Brook NY
Erik Seiffert, Academic Adviser, Qualification Topics: Human Anatomy, Embryology,
Vertebrate Evolution
- 2008 **B.S.** Anthropology with Honors. The Ohio State University, Columbus, OH
John Hunter Ph.D., Honors Advisor.
- 2008 **B.S.** Geological Sciences with Honors. The Ohio State University, Columbus, OH
William Ausich, Honors Advisor.

Fellowships and Scholarships

- 2017–2019 **National Science Foundation Postdoctoral Research Fellowship in Biology.** DBI 1612062
NSF, Washington, D.C.
- 2009–2015 **Graduate Council Fellowship.** Stony Brook University, Stony Brook, NY
- 2009–2015 **Turkana Basin Fellowship.** Turkana Basin Institute, Stony Brook, NY
- 2009–2014 **National Science Foundation Graduate Research Fellowship.** NSF, Washington, D.C.
- 2008–2009 **Fulbright Student Grant.** U.S. Department of State, Washington, D.C. and Fulbright
Kommission, Berlin, Germany
- 2004–2008 **Presidential Scholarship.** The Ohio State University, Columbus, OH

Professional Experience

- 2018–Present **Curator, Division of Fossil Primates.** *Responsible for outreach, development, and maintenance of over 35,000 specimens with a team of preparators, a collections manager, volunteers, and student researchers.* Division of Fossil Primates, Duke University, Durham, NC.
- 2015–2016 **Lab Coordinator, Collections Manager, and Postdoctoral researcher.**
Researched African Paleogene mammal faunas, served as collections manager for the Rukwa Basin Project collections, coordinated graduate and undergraduate assistants, and organized outreach efforts. Nancy J. Stevens Lab, Biomedical Sciences, Heritage College of Osteopathic Medicine and Center for Ecology and Evolutionary Studies, Ohio University, Athens, OH
- 2015-2016 **Postdoctoral Research Associate,** Center for Ecology and Evolutionary Studies, Ohio University
- 2015-2016 **Museum Studies Certificate.** Ohio University

Research Grants

- 2017 **Co-Investigator.** Ohio University Innovation Strategy. “Ohio University Museum Complex on The Ridges.” For renovation of historic space for natural history collections and exhibit space (\$999,680—pending, submitted 8/18)
- 2017 **Co-Investigator.** Konneker Fund for Learning and Discovery. “Ohio University Museum Complex on The Ridges.” For gallery renovation, natural history collections/exhibit space and educational programming (\$88,000, awarded)

- 2016 **Principal Investigator.** Nation Science Foundation Postdoctoral Fellowship in Biology. DBI 1612062. "Mammalian carnivore diversity, replacement, and extinction when the modern African ecosystem emerged." Host Institution: Ohio University. Sponsor: Nancy Stevens (\$138,000, awarded)
- 2015 **Principal Investigator.** The Explorers Club Exploration Fund - Mamont Scholars Program. For fieldwork in Tanzania and Kenya (\$2,500, awarded)
- 2015 **Principal Investigator.** Society for Integrative and Comparative Biology Fellowship of Graduate Student Travel Award. For research travel to Kenya and Namibia (\$2,000, awarded)
- 2014 **Principal Investigator.** Stony Brook Distinguished Travel Award. For travel to Germany for annual meeting of the Society of Vertebrate Paleontology and research in German museum collections (\$1,500, awarded)
- 2014 **Principal Investigator.** JSG Student Travel Award through the Society of Vertebrate Paleontology. For travel to annual meeting and research in German museum collections (\$600, awarded)
- 2014 **Principal Investigator.** Stony Brook King/Miller Travel Scholarship. For travel to Germany for annual meeting of the Society of Vertebrate Paleontology and research in German museum collections (\$400, awarded)
- 2013 **Co-Principal Investigator.** National Science Foundation Doctoral Dissertation Improvement Grant: "Phylogeny and Biogeography of Hyaenodontidae (Mammalia, Placentalia)" (\$16,349, awarded)
- 2012 **Principal Investigator.** Doris O. and Samuel P. Welles Fund, California Museum of Paleontology, Berkeley, CA: "Systematic relationships of Hyaenodontidae" and "Cranial morphometrics of mammalian carnivores". (\$1,065, awarded)

Peer Reviewed Papers (Published/In Press)

- Borths MR**, Stevens NJ. 2019. *Simbakubwa kutokaafrika* gen. et sp. nov. (Hyainailourinae, Hyaenodonta, 'Creodonta,' Mammalia), a gigantic carnivore from the earliest Miocene of Kenya. *Journal of Vertebrate Paleontology* 39(1):UJVP1570222.
- Borths MR**, Stevens NJ. 2017. Taxonomic affinities of the enigmatic *Prionogale breviceps*, early Miocene, Kenya. *Historical Biology*. <https://doi.org/10.1080/08912963.2017.1393075>
- Borths MR**, Stevens NJ. 2017. Deciduous dentition and dental eruption of Hyainailouroidea (Hyaenodonta, Placentalia, Mammalia). *Palaeontologia Electronica* 20.3.55A:1-34. <https://doi.org/10.26879/776>
- Borths MR**, Stevens NJ. 2017. The first hyaenodont from the late Oligocene Nsungwe Formation of Tanzania: paleoecological insights into the Paleogene-Neogene carnivore transition. *PLOS ONE* 12(10):e0185301.
- Borths MR**, Seiffert ER. 2017. Craniodental and humeral morphology of a new species of *Masrasector* (Teratodontinae, Hyaenodonta, Placentalia) from the late Eocene of Egypt and locomotor diversity in hyaenodonts. *PLOS ONE* 12(4):e0173527
- Borths MR**, Holroyd PA, Seiffert ER. 2016. Hyainailourine and teratodontine cranial material from the late Eocene of Egypt and the application of parsimony and Bayesian methods to the phylogeny and biogeography of Hyaenodonta (Placentalia, Mammalia). *PeerJ* 4:e2639.
- Solé F, Eli A, **Borths MR**, Dominique V, Bastl K. 2015. A new large hyainailourine from the Bartonian of Europe and its bearings on the evolution and ecology of massive hyaenodonts (Mammalia). *PLOS One* 10(9): e0135698.
- Borths MR**, Ausich WI. 2011. Orodovician–Silurian Lilliput crinoids during the end–Ordovician biotic crisis. *Swiss Journal of Palaeontology* 130:7–18.

Publications in preparation

- Borths MR**, Gunnell G, Friscia A, Seiffert E. Persistence of an ancient endemic African clade of diminutive hyaenodonts into the latest Eocene of Egypt. For submission to *Acta Palaeontologica Polonica*.
- Borths MR**, Seiffert ER. Remains of the oldest carnivores (Hyaenodonta, "Creodonta", Mammalia) from the Fayum Depression, Egypt. For submission to *Journal of Palaeontology*.
- Borths MR**, Seiffert ER. Associated skeleton of a new species of *Apterodon* (Hyaenodonta, "Creodonta", Mammalia) from the Fayum Depression, Egypt. For submission to the *Journal of Vertebrate Paleontology*.

Holroyd PA, Gunnell GF, Tilden CD, **Borths MR**. A revision of *Apterodon* and *Quasiapterodon* (Hyaenodonta, Mammalia) from the Qasr el Sagha and Jebel Qatrani Formations, Fayum Province, Egypt. For submission to *Palaeontologia Electronica*.

Published abstracts

- Borths MR** and Stevens, N.J. 2018. Changes in hyaenodont diversity during the carnivoran invasion of Afro-Arabia. *Journal of Vertebrate Paleontology*, Program and Abstracts.
- Yan Y, Base J, **Borths MR**, Farke A. 2018. Anatomy of the malleus and ectotympanic in *Hyaenodon mustelinus* (Mammalia, Hyaenodonta). *Journal of Vertebrate Paleontology*, Program and Abstracts.
- Borths MR**. 2017. Teaching core phylogenetic systematic concepts through practical experience building a hominin family tree. *Journal of Vertebrate Paleontology*, Program and Abstracts.
- Borths MR**, Stevens NJ. 2017. Gigantic hyainailourine (Hyaenodonta, “Creodonta”) from the early Miocene of Kenya. *Journal of Vertebrate Paleontology*, Program and Abstracts.
- Nestler JH, Drumheller-Horton SK, Rook DL, Pritchard AC, Gold EL, **Borths MR**, Miller-Camp J, Claeson KM. 2017. Horse-sized ducks and duck-sized horses: three years of large-scale outreach on the internet forum AskScience. *Journal of Vertebrate Paleontology*, Program and Abstracts.
- Borths MR**, Roberts EM and N.J. Stevens. 2016. The first hyaenodont from the late Oligocene Nsungwe Formation, Rukwa Rift Basin, Tanzania: ecological diversity of Afro-Arabian mammalian carnivores near the Paleogene/Neogene boundary. *Journal of Vertebrate Paleontology*, Program and Abstracts.
- Borths, M.R.** 2015. The phylogenetic relationships and biogeography of Hyaenodontida: using the Afro–Arabian record to expand character and taxon sampling. *Romer Prize Finalist*. *Journal of Vertebrate Paleontology*, Program and Abstracts.
- Borths, M.R.** and K. Corbin. 2015. Using geometric morphometrics to examine cranial disparity in extinct and extant marsupial and placental carnivores. *American Association of Anatomists*, Program and Abstracts.
- Borths, M.R.** 2014. The phylogenetic relationships and biogeography of African Hyaenodontidae. *Journal of Vertebrate Paleontology*, Program and Abstracts.
- Nestler, J., **M.R. Borths**, A.C. Pritchard. 2014. Applying flipped classroom techniques in the digital age: How podcasts and video conferencing can connect students with scientists. *Journal of Vertebrate Paleontology*, Program and Abstracts.
- Borths, M.R.**, E.L. Simons, and E.R. Seiffert. 2013. The most complete African hyaenodontid (Mammalia, ‘Creodonta’) from the latest Eocene of Egypt and the evolution of Apterodontinae. *Journal of Vertebrate Paleontology* 30(3); 95A.
- Borths, M.R.**, A. Gosselin–Ildari, and B. Patel. 2012. The functional and ecological morphology of terrestrially in primates and non–primate mammals. *American Journal of Physical Anthropology* 147(54, Supplement):103.
- Borths, M.R.**, A. Goswami, N. Milne, and S. Wroe. 2011. Cranial variation in ‘Creodonta’ and implications for convergence in placental and marsupial carnivores. *Journal of Vertebrate Paleontology* 30: 75A.
- Borths, M.R.**, E.R. Seiffert, K.E. Goodenberger, and E.L. Simons. 2010. The oldest Fayum creodont: dental and humeral morphology of a new proviverrine hyaenodontid from the earliest late Eocene of Egypt. *Journal of Vertebrate Paleontology* 30: 63A.
- Borths, M.R.** and T. Marin. 2009. Clawing through the Guimarota: Distal phalanx diversity in a Late Jurassic mammalian fauna. *Journal of Vertebrate Paleontology* 29: 3A.
- Borths, M.R.** and J.P. Hunter. 2008. Gimme Shelter? Locomotor trends and mammalian survivorship at the K–Pg boundary. *Journal of Vertebrate Paleontology* 28:3A.
- Borths, M.R.** and W.I. Ausich. 2007. Crinoids in Lilliput: Morphological Change in the Class Crinoidea across the Ordovician–Silurian Boundary. 2007 GSA Annual Meeting Abstracts with Programs 39:6.

Teaching Experience

Medical and Dental Anatomy Teaching Experience

- 2010–2015 **Medical and Dental Anatomy Tutor.** Department of Anatomical Sciences, Stony Brook University, Stony Brook, NY
- 2010 Fall **Teaching Assistant.** The Body: Human Gross Anatomy, School of Medicine, Stony Brook University, Stony Brook, NY

Other Teaching Experience

- 2017 Spring **Instructor.** Human Evolution. Turkana Basin Institute Origins Field School.
- 2015 Fall **Co-Advisor.** Sustainability and Conservation Discussion Group
- 2015 Spring **Course Director.** Introduction to Earth Science. Elementary School Supplementary Program.
- 2014 Fall **Course Director.** The Human Body. Elementary School Supplementary Program.
- 2014 Spring **Course Director.** Introduction to Research: Rocks Fossils, and the Biology of Ancient Life. Women in Science and Engineering Program, Stony Brook University, Stony Brook, NY
- 2013 Spring **Project Co-advisor.** Stony Brook University, Stony Brook, NY
- 2013–Present Co-advise four undergraduates in preparation of fossil material from Wyoming
- 2013 Spring **Teaching Assistant.** Turkana Basin Field School. Semester-long program covering Vertebrate Paleontology, Human and Primate Evolution, Archaeology, Ecology, and Geology, Turkana Basin Institute, Turkana, Kenya
- 2012–Present **Project Advisor.** Smithtown West High School, Smithtown NY

Invited Talks and Outreach

- 2015–Present **Advisory Board.** Ohio University Museum of Natural History and the Environment, currently in planning phases, with site designated by OU with substantial financial support guaranteed.
- 2016–Present **Scientific consultant.** *Zoodinos Magazine* (affiliated with *Zoobooks*).
- 2017 **Invited Speaker.** “Finding Fossils: New methods for extinct monsters.” COSI After Dark: Dinosaurs. Center of Science and Industry in Columbus, Ohio.
- 2017 **Invited Speaker.** “Before Lions were King: Discovering Africa’s first meat-eaters.” Ohio University *Science Café* < <https://livestream.com/ohiocas/events/7671713>>
- 2017 **Invited Symposium.** Postdoctoral Research Fellowship in Biology Symposium on the future of natural history collections at Harvard University
- 2017 **Scientific consultant.** *Dinosaurs* issue of *Koala imagine!* Magazine for preschoolers. KiwiCo.
- 2017 **Invited Speaker.** Research in museum collections. Presented to students and staff at the Nairobi National Museum
- 2016 Spring **Exhibit Designer.** *Merging Concepts* Exhibit at the Kennedy Museum of Art (4/15–9/18/2016) as part of Museum Certificate Program at Ohio University
- 2016 **Invited Speaker.** The Evolution of African Carnivores. Presented to Ecology and Evolution Lecture series at Ohio University and invited colloquium at SUNY-Geneseo
- 2015–2016 **Advisory Board.** Science Café, Ohio University. Coordinate informal science lectures for the Athens Community.
- 2013–Present **Co-creator of Past Time.** www.pasttime.org
A free podcast and blog that introduces a non-specialized audience to paleontological research through regular episodes and posts.
- 2014–Present **Skype in the Classroom.** Invited by educators to discuss paleontology with 1st graders through 11th graders with videos and lectures tailored to curricula. 800 students reached <https://education.skype.com/users/85584-past-time-paleontology>
- 2015 **Educator.** TED–Ed video lesson. *When will the next mass extinction occur?*
- 2015 **Interview.** Upvoted.com *Why are most dinosaur bones discovered in North America?*, *Meet Yi: The closest extinct animal to a dragon.* Reddit *Ask Me Anything* as part of paleontology panel at Society of Vertebrate Paleontology meeting 2014, 2015
- 2015 **Invited speaker.** Ohio University, EcoLunch, Dept. of Biological Sciences. *The Evolution of Africa’s First Mammalian Carnivores.*
- 2015 Summer **Instructor and Consultant.** Collaborated with Education Department at Harvard Museum of Natural History to design Gallery Guide training program for new museum volunteers.
- 2015 Summer **Invited Speaker.** Digging Dinosaurs Summer Science week. 3rd–5th grade. Harvard Museum of Natural History
- 2014 Spring **Invited Speaker.** Fulbright New York Open Salon. The New School, New York, NY *The First African Carnivores.* A general audience lecture.
- 2014 Spring **Student with the Alan Alda Center for Communicating Science,** Stony Brook, NY Coursework: “Improvisation for Scientists”, “Distilling Your Message”, “Connecting with the Community”

- 2013–Present **Invited speaker.** Birch Wathen Lenox School, New York City, NY; St. James School, Cincinnati, OH. *What is Paleontology?:* An original presentation by Skype or in-person for middle school students.
- 2013 Spring **Blogger.** Turkana Basin Institute, Kenya
<http://www.turkanabasin.org/author/matthewborths/>
- 2013–2014 **Judge.** Long Island Science and Engineering Fair. Plainview, NY
- 2010–2012 **Invited speaker.** St. Xavier High School, Cincinnati, OH. *From Dinosaurs to Health Care.* An original presentation about the Madagascar Ankizy Fund, an NGO started by Stony Brook Paleontologists.
- 2007–2012 **Invited Speaker.** Endeavor Elementary School, West Chester, OH; Freedom Elementary School, West Chester, OH; St. Ignatius School, Cincinnati, OH; Cranbrook Elementary School, Columbus, OH. *Prehistoric Ohio!* An original presentation for early elementary school students about the fossil record of Ohio.

Research Experience

Fieldwork and museum research

- Vertebrate Paleontology.** Rukwa Rift Basin Project, southwestern Tanzania. Nsungwe, Lake Beds, and Galula formations. PI: Nancy J. Stevens and Patrick O'Connor, Ohio University. Annually 2016-present
- Researcher.** Nairobi National Museum, Kenya. Natural History Museum. London, United Kingdom. American Museum of Natural History, NY. Peabody Museum of Natural History, New Haven. 2016
- Vertebrate Paleontology.** Clovery Formation Project. Powell, Wyoming. Early Cretaceous dinosaurs and mammals. PI: Michael D'Emic, Ph.D. Adelphi University, NY. 2013-2015
- Researcher.** National Museum of Natural History. Paris, France; Natural History Museum. London, UK. 2014
- Researcher.** Nairobi National Museum. Nairobi, Kenya; National Museum of Natural History. Paris, France; Institute for Vertebrate Paleontology and Paleoanthropology. Beijing, China; Paleontological Institute. Moscow, Russia; Royal Belgian Institute of Natural Sciences. Brussels, Belgium; Natural History Museum. London, United Kingdom. 2013
- Teaching Assistant and Field Leader.** Turkana Basin Field School, Turkana, Kenya PI: Meave Leakey, Ph.D. Stony Brook University, Stony Brook, NY. Lead excavations and prospected for hominin material at Plio-Pleistocene localities. 2013
- Researcher.** Nairobi National Museum, Kenya; Peabody Museum of Natural History. New Haven, CT. 2013
- Researcher.** University of California Museum of Paleontology. Berkeley, CA; Senckenberg Naturmuseum. Frankfurt, Germany; Institute for Paleontology and Historical Geology. Munich, Germany; Geiseltalmuseum at Martin Luther University, Halle, Germany; Natural History Museum. Basel, Switzerland; Stuttgart State Museum of Natural History. Stuttgart, Germany. 2012
- Vertebrate Paleontology.** Fayum Paleontological Expedition. Fayum Depression, Egypt. PI: Erik Seiffert, Ph.D. Stony Brook University, Stony Brook, NY. 2012
- Researcher.** Cairo Geological Museum. Cairo, Egypt. 2012
- Vertebrate Paleontology.** Dhofar Paleontological Expedition, Dhofar Governate, Oman. Prospected for Eocene and Oligocene localities near the recovery site of *Omanitherium*. PIs: Erik Seiffert, Stony Brook University; Nancy Stevens, Ohio University; Brian Kraatz, Western University of Health Sciences. 2012
- Researcher.** American Museum of Natural History. New York, New York. 2010-present
- Vertebrate Paleontology.** Mahajunga Basin Project. Maevarano Formation, Madagascar. Quarrying and prospecting for Late Cretaceous dinosaurs and mammals. PI: David Krause, Ph.D. Stony Brook University, Stony Brook, NY. 2010
- Vertebrate Paleontology.** University of Bonn Graduate Geology Excursion. Bonn, Germany. Prospected and quarried for Paleogene mammals in Southwestern Germany PI: Thomas Martin, Ph.D. University of Bonn, Bonn, Germany. 2009
- Vertebrate Paleontology.** Mammalian Survivorship across the K–Pg. Bowman, ND. Quarrying and prospected for mammals after the Cretaceous/Paleogene extinction. PI: John P. Hunter, The Ohio State University, Columbus, OH. 2006-2008
- Vertebrate Paleontology.** Koobi Fora Field School. Koobi Fora, Kenya. A field school that taught excavation and survey methods at hominin fossil localities. PI: John W. K. Harris, Rutgers University, New Brunswick, NJ

Other Dissection experience 2011–Present

Mammals	Red-necked Wallaby (<i>Macropus rufogriseus</i>): All systems dissected and created an original dissection guide for the species Dog (<i>Canis familiaris</i>): Cranial dissection Two-toed sloth (<i>Choloepus didactylus</i>): Assisted in complete dissection Domestic Cat (<i>Felis silvestris cats</i>): Complete dissection
Reptiles	Savannah monitor lizard (<i>Varanus exanthematicus</i>): Assisted in complete dissection Alligator (<i>Alligator mississippiensis</i>): Cranial dissection
Fish	Spiny dogfish (<i>Squalus acanthias</i>): Cranial dissection Sea lamprey (<i>Petromyzon marinus</i>): Complete dissection

Representative positions and service

2017–Present	Editorial Board. Journal of Vertebrate Paleontology. The Society of Vertebrate Paleontology
2014–Present	Committee member. Communications Committee, Social Media Team Leader. Society of Vertebrate Paleontology.
2017–Present	Peer Reviewer. Journal of Morphology.
2015–Present	Peer Reviewer. Palaeontology. The Palaeontological Association. United Kingdom
2013–Present	Peer Reviewer. Zoological Journal of the Linnean Society. London, United Kingdom.
2011–2013	Grant Reviewer. Graduate Distinguished Travel Award, Graduate Student Organization, Stony Brook University, Stony Brook, NY.
2010–2014	President and Founder. Evolutionary Biology Discussion Group, Stony Brook University
2010–2013	Senator. Anatomical Sciences Representative, Graduate Student Organization Senate, Stony Brook University, Stony Brook, NY
2011–2013	Senator. Graduate Student Representative. Stony Brook University Senate
2012–2013	Graduate Student Representative. Committee on Academic Planning and Resource Allocation. Stony Brook University, Stony Brook, NY

Professional Affiliations

Society of Vertebrate Paleontology
American Association for the Advancement of Science
American Association of Anatomists
American Association of Physical Anthropologists
Society for Integrative and Comparative Biology
Paleontological Society
Geological Society of America
Turkana Basin Institute
Phi Beta Kappa

Professional References

Erik Seiffert, Ph.D.
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Senior Curator of Vertebrate Paleontology

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