

Project summary

Overview

Intellectual merit

Broader impacts

DISSERTATION RESEARCH:
Cenozoic mammals and the biology of extinction

PI: Kenneth D. Angielczyk, Co-PI: Peter D. Smits

Introduction

Preliminary results and proposed work

Intellectual merit

Broader impacts

Biographical sketch

Peter D. Smits

Committee on Evolutionary Biology, University of Chicago

Professional preparation

University of Washington	Biology (Ecology and Evolution)	B.S. 2010
Monash University	Biological Sciences	M.Sc. 2012
University of Chicago	Evolutionary Biology	M.S. 2014
University of Chicago	Evolutionary Biology	Ph.D. 2017 (expected)

Appointments

September 2012–present, Ph.D Candidate, Committee on Evolutionary Biology, University of Chicago.

July 2010–August 2010, Lab Assistant, Vertebrate Paleontology, Burke Museum of Natural History, University of Washington.

July 2009–August 2009, REU Intern, Mammalogy, American Museum of Natural History.

September 2006–September 2008, Lab and Field Assistant, Mammalogy, Burke Museum of Natural History and Culture, University of Washington.

Products

Related publications

- Gregory P Wilson, Alistair R Evans, Ian J Corfe, Peter D Smits, Mikael Fortelius, and Jukka Jernvall. Adaptive radiation of multituberculate mammals before the extinction of dinosaurs. *Nature*, 483:457–460, 2012.

Unrelated publications

- Liliana M. Davalos, Paul M Velazco, Omar M Warsi, Peter D Smits, and Nancy B Simmons. Integrating Incomplete Fossils by Isolating Conflicting Signal in Saturated and Non-Independent Morphological Characters. *Systematic Biology*, 2014.
- Christopher W Walmsley, Peter D Smits, Michelle R Quayle, Matthew R McCurry, Heather S Richards, Christopher C. Oldfield, Stephen Wroe, Phillip D Clausen, and Colin R McHenry. Why the fong face? The mechanics of mandibular symphysis proportions in crocodiles. *PLoS ONE*, 8(1):e53873, January 2013.
- Peter D Smits and Alistair R Evans. Functional constraints on tooth morphology in carnivorous mammals. *BMC Evolutionary Biology*, 12(1):146, August 2012.

Synergistic activities

Reviewer for *Systematic Biology*, *PLOS One*.

Volunteer graduate student peer mentor with SAIL at University of Chicago, 2014.

Volunteer instructor for peer led programming class, University of Chicago, 2012–2013.

Volunteer expert at “Dino-Day” at the Burke Museum of Natural History and Culture, 2010.

Volunteer expert at “Meet the Mammals” at the Burke Museum of Natural History and Culture, 2007, 2008, 2009.

Collaborators and other affiliations

Collaborators and co-editors

Philip D. Clausen (University of Newcastle), Liliana M. Davalos (Stony Brook University), Alistair R. Evans (Monash University), Matthew R. McCurry (Monash University), Colin R. McHenry (Monash University), Christopher C. Oldfield (University of Newcastle), P. David Polly (University of Indiana–Bloomington), Michelle R. Quayle (Monash University), Richard H. Ree (Field Museum of Natural History), Heather S. Richards (University of Newcastle), Nancy B. Simmons (American Museum of Natural History), Christopher W. Wamsley (Monash University), Omar M. Warsi (Stony Brook University), Stephen Wroe (University of New England), Paul M. Velazco (American Museum of Natural History).

Graduate advisors and postdoctoral sponsors

Kenneth D. Angielczyk (Field Museum of Natural History), Michael J. Foote (University of Chicago).

Facilities, equipment, & other resources

Major equipment

Calipers, both small (12”) and large (24”), are available through the Committee on Evolutionary Biology.

Laboratory

NA

Clinical

NA

Animal

NA

Computer

All data collected from both databases and personal measurements will be stored on a personal computer owned by the Co-PI as well as in both cloud storage and external hard drives. Computer expertise is available at the University of Chicago and the Co-PI has access to large-scale computer clusters via the University of Chicago. All analysis software is free and open-source and is installed on the Co-PI's personal computer and can be installed on all additionally necessary computing clusters.

Office

The PI has dedicated office space at the Field Museum of Natural History. The Co-PI has dedicated office space provided by both the Committee on Evolutionary Biology and the Department of Geophysical Sciences.

Other

NA

Data management plan

The major data and analytical products of the proposed project are 1) anatomical measurements of specimens from museum collections, 2) organized and updated ecological information, and 3) statistical analysis code. All information gathered will be stored indefinitely on both the PI's and Co-PI's personal computers. Additionally, they will be archived on an external hard drive indefinitely in case of the loss of either personal computer.

All anatomical measurements and ecological information used in the proposed study will be provided as supplementary material for all papers produced from this research. These data will also be archived using the data storage service Dryad (<http://datadryad.org>). Finally, all measurements and ecological information will be available through the Co-PI's personal website (<http://home.uchicago.edu/psmits/home.html>).

Museums and other institutions where specimens will be measured will be named in all subsequent presentations and papers. These institutions will also be provided with all measurements made to housed specimens, as well as reprints of all related papers.

Anatomical measures, body mass estimates, and updated ecological information will be sent to the Paleobiology Database (<http://paleobiodb.org>) which is the largest repository of paleontological taxonomic, occurrence, and ecological information.

All code used in the proposed analyses will be archived using Dryad, along with the relevant data as discussed above. Code will also be made available through the Co-PI's GitHub page (<http://github.com/psmits>), a free code sharing and archiving service, as well as through the Co-PI's website (<http://home.uchicago.edu/psmits/home.html>).

The Co-PI will present the results of the proposed research at conferences and publish said results in peer-reviewed journals in the fields of evolution, paleontology, evolutionary ecology, and global conservation.