

Duane McKenna

University of Memphis
Department of Biological Sciences
Center for Biodiversity Research

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INTEGRATED STUDIES OF INSECT SYSTEMATICS, GENOMICS, EVOLUTION & DIVERSITY

Research: I study insect systematics and the evolution of insect-plant interactions, with a focus on beetles (order Coleoptera). Related interests include the evolution of specialized plant-feeding, gene and genome evolution, and temporal and geographic patterns of insect and plant evolution, diversity and endemism. Most studies involve genomic and morphological data obtained from contemporary specimens, temporal information from fossils, and ecological data, such as host plant associations and geographic distributions. I collaborate extensively and participate in field studies on all continents, with a particular focus on the Neotropics. **Broader Impacts:** I seek to catalyze biodiversity science, education, and conservation through generating new knowledge and building a diverse and inclusive community of naturalist-scientists trained in traditional and cutting-edge methods (field, collections, wet lab, & analytical). Locally, my efforts are focused on community-building, outreach, education, mentoring, and research engagement with underserved populations. At a global-scale, I am focused on growing capacity, particularly in Earth's most biodiverse regions. I am also broadly engaged in relevant advocacy and policy development. **Funding:** My research has been supported by grants from the US National Science Foundation, the US Department of Agriculture, the US Environmental Protection Agency, the FedEx Institute of Technology, and other organizations.

APPOINTMENTS

Professor	University of Memphis	Biological Sciences	2019–
William Hill Endowed Chair	University of Memphis	College of Arts & Sciences	2018–
Director (Founding)	University of Memphis	Center for Biodiversity Research (CBio)	2019–
Director (Founding)	University of Memphis	Agriculture & Food Tech Research, FedEx Institute	2019–
Research Fellow	University of Memphis	FedEx Institute of Technology	2019–
Research Associate	Harvard University	Organismic & Evolutionary Biology (OEB)	2018
Associate Professor	University of Memphis	Biological Sciences	2016–2019
Research Associate	Harvard University	Museum of Comparative Zoology	2010–2017
Assistant Professor	University of Memphis	Biological Sciences	2010–2016

Faculty Associate: University of Memphis Program in Bioinformatics, Computational Research on Materials Institute, Center for Research & Innovation in STEM Teaching & Learning, Feinstone Center for Genomic Research

EDUCATION & POSTDOCTORAL EXPERIENCE

Postdoctoral Fellowship	Harvard University, Museum of Comparative Zoology Advisor: Brian Farrell; Project: NSF, Assembling the Beetle Tree of Life	2006–2009
Ph.D.	Harvard University, Organismic & Evolutionary Biology Advisor: Brian Farrell; Project: Molecular phylogenetics & evolution of Neotropical 'hispid' beetles (Coleoptera: Cassidinae) US EPA Science to Achieve Results (STAR) Graduate Research Fellowship Research Associate, Harvard University David Rockefeller Ctr for Latin American Studies	2000–2006
M.S.	University of Illinois at Urbana-Champaign, Entomology Advisor: May Berenbaum; Project: Ecology & evolution of <i>Depressaria</i> (Lepidoptera: Elachistidae) & their host plants in western North America	1998–2000
B.S.	Western Michigan University, Biology, Chemistry (<i>magna cum laude, honors</i>) Honors Advisor: Stephen Malcolm; Honors Project: Chemical ecology of interactions between monarch butterflies (<i>Danaus plexippus</i>) & their host plants (<i>Asclepias</i> spp.)	1993–1997

OTHER WORK EXPERIENCE (SELECT)

Database Indexer Univ of IL, Urbana-Champaign; Dept of Crop Sciences, Soybean Insect Research Info Cntr
Curatorial Assistant Univ of IL, Urbana-Champaign; Dept of Plant Biology, Herbarium (ILL)

Field Assistant	University of Michigan; Dr Edward G Voss (Michigan flora, plant systematics)
Intern (Botanist)	The Nature Conservancy & MI Dept of Natural Resources; Natural Features Inventory
Curatorial Assistant	Michigan State University; Dept of Botany & Plant Pathology; Dept of Entomology
Curatorial Assistant	Western Michigan University; Dept of Biology; Herbarium (WMU)
Research Fellow	Western Michigan University, Center for Research in Environmental Signal Transduction
NSF-REU Fellow	Hope College, Dr. Greg Murray (seed/seedling ecology, ants; Costa Rica)

PUBLICATIONS (10 SELECT: see www.duanemckenna.com/publications for others)

- Baird, HP, DD McKenna, & SL Chown et al. 2021. Fifty million years of beetle evolution along the Antarctic Polar Front. PNAS. 118 (24) e2017384118.
- Beza-Beza, CF, L Jiménez-Ferbans, & DD McKenna. 2021. Historical biogeography of New World passalid beetles (Coleoptera, Passalidae) reveals Mesoamerican tropical forests as a center of origin and taxonomic diversification. Journal of Biogeography. <https://doi.org/10.1111/jbi.14134>.
- Thomas, GWC, et al. 2020. Gene content evolution in the arthropods. Genome Biology. 21(1): 1-14.
- McKenna, DD, et al. 2019. The evolution & genomic basis of beetle diversity. PNAS. 116(49): 24729-24737.
- McKenna, DD, et al. 2016. Genome of the Asian longhorned beetle (*Anoplophora glabripennis*), a globally significant invasive species, reveals key functional and evolutionary innovations at the beetle-plant interface. Genome Biology. 17:227.
- McKenna, DD, et al. 2015. The beetle tree of life reveals Coleoptera survived end Permian mass extinction to diversify during the Cretaceous Terrestrial Revolution. Systematic Entomology. doi: 10.1111/syen.12132.
- Misof, B, et al. 2014. Phylogenomics resolves the timing & pattern of insect evolution. Science 346: 763-767.
- Niehuis, OG, DD McKenna, & B Misof et al. 2012. Genomic and morphological evidence converge to resolve the enigma of Strepsiptera. Current Biology. DOI:10.1016/j.cub.2012.05.018.
- McKenna, DD, et al. 2009. Temporal lags and overlap in the diversification of weevils and flowering plants. PNAS. 106: 7083–7088.
- McKenna, DD, & BD Farrell. 2006. Tropical forests are both evolutionary cradles and museums of leaf beetle diversity. PNAS. 103(29): 1047–1051.

CURRENT GRANTS (>\$10,000 USD)

\$1,271,532 (2021-2026) United States National Science Foundation

(Jointly awarded) DEB: Phylogenetic Systematics Program & IOS: Integrative Ecological Physiology Program. D. McKenna (PI), S. Haddad Co-PI (University of Memphis), R. Mitchell Co-PI (University of WI Oshkosh). Title: Investigating chemosensory evolution in longhorned beetles using a comparative phylogenomic framework that integrates genomic, morphological, and biochemical data.

\$884,474 (2020-2025) United States National Science Foundation

DEB: Phylogenetic Systematics Program. D. McKenna Senior Personnel (subaward PI), H. Song PI (Texas A&M Univ.), S. Shin Co-PI (Seoul National Univ.). Title: NSF-DEB-NRC: Multidisciplinary approach to bioacoustics: Integrating phylogenomics, biophysics, and functional genomics to unravel the evolution of hearing and singing in katydids

SERVICE (CURRENT, SELECT)

IPBES observer and stakeholder-contributor; Editorial Board: Systematic Entomology; Associate Editor: European Journal of Entomology, Zookeys; Coordinating Committee: Insect 5000 Genomes (i5k) Project; Founding Faculty Advisor, Biological Sciences Graduate Student Association

SEMINARS & SYMPOSIA (>121 research presentations over the last 12 years [2010-2021])

TEACHING

Current: Biodiversity (BIOL4092/6092); Entomology (w/lab) (BIOL4900/6900); Evolution (BIOL4100/6100)
Other courses taught: Ecology, Plant Biology, Plant Systematics, Tropical Ecology