Rachel K Osborn

CURRICULIM VITAE (February 2021)

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EDUCATION

PhD: Entomology 2014-present
Michigan State University, East Lansing, MI
Research*: Diversity of South American ambrosia beetles (Curculionidae: Scolytinae: Xyleborini) and their fungal partners*
Candidacy achieved September 2018
Advisor: Anthony Cognato

Bachelor of Arts: Conservation Biology, Entomology 2003-2008
Hampshire College, Amherst, MA
Thesis: *The evolution of insect-fungus symbiosis*

INSECT COLLECTIONS EXPERIENCE

Graduate Research Assistant, Holistic Insect Systematics Laboratory, Michigan State University 2016-2019
Contributed to digitization efforts of the MSU AJ Cook Arthropod Research Collection
Transferred specimen records to the Symbiota Collections of Arthropod Network (SCAN)
Archived ~1000 specimen records from ethanol-preserved larvae, slides, and pinned specimens
Supervisors: *Gary Parsons, Anthony Cognato*

Graduate Research Assistant, Holistic Insect Systematics Laboratory, Michigan State University 2016-2018
Assisted on US Farm Bill project producing a key to Southeast Asian Xyleborini (Curculionidae: Scolytinae)
Maintained and improved scientific specimen photography equipment
Designed and implemented workflow to generate montage imaged of insect specimens
Produced >1200 photographs of xyleborine beetles for use in online interactive identification key
Supervisors: *Sarah Smith, Anthony Cognato*

Graduate Research Assistant, Holistic Insect Systematics Laboratory, Michigan State University 2014-2016
Collaborated on the Advancing Digitization of Biodiversity Collections Project
Organized data and trained other in use of a Linux-based whole-drawer imaging robot
Created digital photographs of whole drawers of insects from the MSU AJ Cook Arthropod Research Collection
Supervisors: *Gary Parsons, Anthony Cognato*

Photographer of Entomology types, Smithsonian National Museum of Natural History, Washington, DC 2011-2014
Cooperated with curators across entomology departments: Hymenoptera, Coleoptera, Diptera, and Hemiptera
Generated montaged digital images of holotype specimens for the USNM EMu and Hymtypes databases
Supervisors*: David Furth, Patricia Gentili-Poole, Michael Gates, Robert Kula, Matthew Buffington, Steven Lingafelter, Christian Thompson, Torsten Dikow, Thomas Henry*

Entomology Type Database Contributor, Smithsonian National Museum of Natural History 2007-2011
Researched and vetted type information for the USNM Lepidoptera and Hymenoptera holotype collections
Compiled type description citations and collection records for integration into the museum's EMu catalog
Supervisors: *John Brown, Alma Solis, Michael Gates, Robert Kula, Matthew Buffington*

INSECT COLLECTIONS EXPERIENCE (Continued)

Seasonal Employee, Maryland Department of Natural Resources 2008-2009
Located moths from Maryland in the Smithsonian USNM entomological collection
Assembled moth collection data into a Microsoft Access database
Supervisor: *Jennifer Frye*

COLLECTIONS AND INSECT TAXONOMY WORKSHOPS

Natural Science Collections Fellowship ($6,000), Michigan State University 2019
Participated in cross-disciplinary discussions about Natural History collection management and maintenance
Curated the Mecoptera in the MSU AJ Cook Arthropod Research Collection
Constructed a digital and physical teaching collection of local insects identified to species
Instructors: *Barbara Lundrigan, L. Alan Prather, Anthony Cognato*

Entomological Collections Management Workshop, Milwaukee Public Museum, Milwaukee, WI 2017
Took part in interactive workshop sponsored by the Entomological Collections Network
Joined in discussions and hand-on training focused on the curation and managements of insect collections
Instructors/Coordinators: *Floyd Shockley, David Furth, Jennifer Zaspel*

Ecology and Evolution of Coleoptera (Beetles), La Selva Biological Station, Costa Rica 2017
Studied taxonomy and identification of Coleoptera in course organized by the Organization for Tropical Studies
Discovered field collection techniques for tropical ecosystems
Assessed the diversity of beetles associated with fungal fruiting bodies at La Selva, Costa Rica
Fabricated, deployed and serviced flight intercept traps for bark beetles at the biological station
Instructors: *Richard Leschen, Chris Carlton, Nathan Lord, Victoria M. Bayless*

RESEARCH EXPERIENCE

Sesiidae Phylogeny Project, Holistic Insect Systematics Laboratory, Michigan State University 2018-present
Supported laboratory research efforts
Documented project progress and organized lab mores and records
Extracted, amplified and sequenced DNA from 97 clearwing moths
Collaborators: *Anthony Cognato, William Taft*

Early Detection and Rapid Response Project, Michigan State University 2014-2017
Sorted bark and ambrosia beetles from baited trap residue
Assigned preliminary identification to collected bark and ambrosia beetles
Supervisor: *Anthony Cognato*

Molecular Forest Ecology, Hulcr Laboratory, School of Forest Resources and Conservation, University of Florida 2015
Developed aptitude for collecting ambrosia beetles and isolating their fungi
Retrieved GenBank sequence data from ambrosia fungi for analysis
Hosts: *Jiri Hulcr, Adam Black, Caroline Storer*

NSF Research Experience for Undergraduates Research Intern, Harvard Forest, Petersham, MA 2006
Curated the Formicidae collection at the Harvard Forest Station
Measured and analyzed soil respiration data at the Harvard Forest LTER Site
Conducted biodiversity survey of Coleoptera and Formicidae at the Harvard Forest LTER Site
Supervisor: *Aaron Ellison*

RESEARCH EXPERIENCE (Continued)

NSF Research Experience for Undergraduates Research Intern, Mountain Lake Biological Station, Pembroke, VA 2005
Observed and recorded the nocturnal mating and dispersal behavior of *Bolitotherus cornutus* (Tenebrionidae)
Supervisor: *Patrice Ludwig*

RESEARCH TRAVEL

Pontifica Universidad Católica del Ecuador (PUCE), Quito Ecuador July 28 – August 4, 2019
Extracted and amplified DNA from cultured fungal samples

Pontifica Universidad Católica del Ecuador (PUCE), Quito Ecuador January 14 – March 18, 2018
Initiated collaborative relationships with collections staff at the university
Liaised with Biological Stations staff and governmental employees to organize field research
Hired and supervised indigenous community member to provide research assistance in the field
Collected ambrosia beetles in the provinces of Orellana and Napo
Obtained collection and mobilization permits for research materials
Isolated ambrosia fungi from collected beetles at PUCE in Quito

Universidad Técnica Estatal de Quevedo (UTEQ), Quevedo, Ecuador March 1 – 28, 2017
Gained practical knowledge about molecular fungal culturing techniques to isolate ambrosia fungi
Collected bark and ambrosia beetles in the provinces of Los Rios, Cotopaxi, and Guayas, Ecuador
Isolated ambrosia fungi from collected beetles at UTEQ laboratory in Quevedo
Informed UTEQ students about the diversity and ecological importance of bark and ambrosia beetles
Assisted in training government employees in scolytine identification and population monitoring

Universidad Técnica Estatal de Quevedo (UTEQ), Quevedo, Ecuador May 10 – 23, 2015
Assisted in formation of cooperative relationship between UTEQ and MSU for Cognato Lab research in Ecuador
Collected bark and ambrosia beetles in the provinces of Los Rios, and Cotopaxi, Ecuador
Isolated ambrosia fungi from collected beetles at UTEQ laboratory in Quevedo
Trained UTEQ students how to collect bark and ambrosia beetles

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TEACHING EXPERIENCE

Teaching Assistant: MSU ISB 201L *Insects, Globalization and Sustainability Laboratory* SP2020, FA2019
Taught biology to non-science major undergraduates SP2016, FA 2015
Added content and polished lectures
Created quizzes and exams
Performed general classroom maintenance including cleaning, setup and breakdowns of hands-on activities
Instructed 12 sections pf 27 students each
Supervisors: Gabe Ording, Ryan Kimbirauskas, Amanda Lorenz

Curriculum Development: *Diversity and taxonomy of insects*
Developed classroom unit for 875 non-science major undergraduate students
Fabricated lecture introducing systematics and taxonomy, basic insect classification, anatomy, and identification
Constructed peer-led classroom game to familiarize students with the defining characters of major insect orders
Designed cooperative activity to teach students how to identify major insect orders using modified taxonomic key

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GRANTS AND AWARDS (total $20,705)

Graduate School Writing Fellowship in the Disciplines, *Michigan State University*; ($2,000) 2019-2020
Research Enhancement Award, *Michigan State University College of Graduate Studies;* ($2,005) 2019
Natural Science Collections Fellowship, *Michigan State University;* ($6,000) 2019
Robert R. Dreisbach Endowed Memorial Fellowship, *Dept. of Entomology, Michigan State University;* ($2,000) 2019
J.E. and Jean M. McPherson Graduate Student Award, *Dept. of Entomology, Michigan State University;* ($1,200) 2018
Bug House Fellowship, *Dept. of Entomology, Michigan State University;* ($500) 2017
Hutson Endowment for PhD Award, *Dept. of Entomology, Michigan State University;* ($2,500) 2016
President's Prize, *First place, student poster competition – phylogeny; Entomological Society of America Systematics, Evolution and Biodiversity* 2015
Graduate Student Research Enrichment Award, *Coleopterists Society;* ($3,000) 2014
Award for Graduate Student Research, *Society of Systematic Biologists;* ($1,500) 2014

PUBLICATIONS

Osborn, R. 2020. At MSU a 153-year-old insect collection is being used to solve modern problems. *Lansing State Journal*. August 7, 2020.

ORAL PRESENTATIONS

Osborn, R., and A.I Cognato. 2019. Relations across kingdoms: Ecuadorian *Coptoborus* and *Theoborus* (Curculionidae: Scolytinae: Xyleborini) and their fungal partners. SOGA: Sacred Order of the Geniculate Antennae. Annual meeting of the Entomological Society of America, St. Louis, MO, USA

Osborn, R., M. Jusino, C. Bateman, and A.I. Cognato. 2018. Continuing illumination of the South America ambrosia beetle (Coleoptera: Curculionidae: Scolytinae) diversity and their fungal associates. Graduate student oral competition. Annual meeting of the Entomological Society of America, Vancouver, BC, Canada.

Osborn, R. 2017. Diversidad de escarabajos de ambrosias xyleborina sudamericanos y sus hongos asociados. Universidad Técnica Estatal de Quevedo. Quevedo, Ecuador.

Osborn, R. 2016. Preliminary phylogeny of the South American xyleborine genera Coptoborus and Theoborus (Coleoptera: Curculionidae: Scolytinae). Graduate student oral competition. International Congress of Entomology, Orlando, FL, USA

POSTER PRESENTATIONS

Osborn, R., and A.I. Cognato. 2015. Preliminary phylogeny of the South American xyleborine genera *Coptoborus* and *Theoborus* (Coleoptera: Curculionidae: Scoytinae), poster. Entomological Society of America Meeting, Minneapolis, MN, USA

MENTORSHIP

Peer mentees, Cognato Lab: *Erica Fischer*, Masters Student (2018-2020); *Gina Sari*, Masters Student, (2016-2019)
Estudiantes de ingeniería, Universidad Técnica Estatal de Quevedo: *Joselyn J Bas*, (2015-2017); *Denny Carriel*, (2015-2017); *Eduardo Gutierrez Lara;* (2017); *Jonathan Chavez* (2017); *Shirley Thyago* (2017)

OUTREACH AND SERVICE

Student Group for Diversity, Equity and Inclusion, Dept. of Entomology, Michigan State University 2020-present
Read books and articles regarding social and cultural inclusion in academia and scientific research
Publicized group meetings to students in the department and encouraged participation
Supported and participated in thoughtful group discussions
Organized meeting logistics and choice of discussion topics

Skype a Scientist 2020-present
Explained my research on ambrosia beetles to elementary school-aged students via video chat
Engaged students' questions about ecology, evolutionary biology, and entomology

Science Writing for News Outlets, Graduate School, Michigan State University 2020
Trained in basic journalism skills including interviewing, ethics, and science writing for the public
Developed a focused reporting plan for news article advocating for the importance of natural history collections
Published news story for general audience about the function of the MSU insect collection in research
Mentor: *Matt Miller*, Editor and Storytelling Coach for the Lansing State Journal and Battle Creek Observer

Bug House Fellow, Dept. of Entomology, Michigan State University 2014-2018
Presented to visitors about insect anatomy and biology
Instructed visitors how to hold and interact with live specimens
Trained less experienced guides how to give Bug House tours

Curriculum Committee, Dept. of Entomology, Michigan State University 2015-2016
Contributed to departmental initiatives to standardize course syllabi and student learning outcomes

Partners in Evolution volunteer, Smithsonian National Museum of Natural History, Washington, DC 2008-2009
Educated visitors to live butterfly exhibit about butterfly biology

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LANGUAGES

English – Native fluency
Spanish – Basic working proficiency

PROFESSIONAL MEMBERSHIPS

Lepidopterists' Society, *since February 2019*
Society for the Preservation of Natural History Collections, *since July 2017*
Entomological Collections Network, *since November 2016*
Entomological Society of America, *since November 2014*
Coleopterists' Society, *since January 2015*
