

SANDRA R. SCHACHAT  
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## Education

Ph.D.	<b>Geological Sciences</b> with a minor in <b>Communication</b> , Stanford University	In progress
M.S.	<b>Entomology</b> , Mississippi State University	2016
	<b>Fossilworks Intensive Workshop in Analytical Palaeobiology</b>	2014
B.A.	<b>Art History &amp; Archaeology</b> , University of Maryland, <i>summa cum laude</i> (Honors in Art History & Archaeology, High Honors in Entomology)	2013

## Research grants and fellowships

Graduate Research Opportunities Worldwide Academy of Finland & National Science Foundation	<i>travel and stipend</i>	In review
Chair's Fellowship Stanford University, Department of Geological Sciences	<i>tuition and stipend</i>	2017–2018
Graduate Research Fellowship # DGE-1125191 National Science Foundation	<i>tuition and stipend</i>	2014–2017
Graduate Research Opportunities Worldwide Australian National University & National Science Foundation	<i>travel and stipend</i>	2015–2016
Graduate Research Internship Program National Science Foundation	<i>travel and stipend</i>	2016
Graduate Student Fellowship Smithsonian Institution	<i>travel and stipend</i>	2015
Grant-in-Aid of Research # G201503151194219 Sigma Xi	<i>travel</i>	2015

## Refereed scientific publications

16. **S.R. Schachat**, C.C. Labandeira, and S.A. Maccracken<sup>†</sup>. The importance of sampling standardization for comparisons of insect herbivory in deep time: a case study from the late Paleozoic. *Royal Society Open Science*: RSOS-171991. In revision
15. **S.R. Schachat** and P.Z. Goldstein. Acronictinae (Lepidoptera: Macroheterocera: Noctuidae) demonstrate the variable role of wing venation in the evolution of the nymphalid groundplan. *Insect Systematics and Diversity*: ISD-2017-0054. In revision
14. **S.R. Schachat**, C.C. Labandeira, M.R. Saltzman, B.D. Cramer, J.L. Payne, and C.K. Boyce. Phanerozoic  $pO_2$  and the early evolution of terrestrial animals. *Proceedings of the Royal Society B: Biological Sciences*: RSPB-2017-2631. DOI: 10.1098/rspb.2017.2631. In press
13. **S.R. Schachat** and R.L. Brown. Wing patterns of ditrysian moths (Lepidoptera: Psychidae) include variants and violations of predictive models. *Austral Entomology*: Early view. DOI: 10.1111/aen.12284. 2018
12. **S.R. Schachat**, R.G. Robbins, and J. Goddard. Color patterning in hard ticks (Acari: Ixodidae). *Journal of Medical Entomology* 55(1): 1-13. DOI: 10.1093/jme/tjx173. 2018
11. **S.R. Schachat**. Connecting the dots: Spots and bands on the wings of *Lichenaula* Meyrick, 1890 (Lepidoptera: Xyloryctidae) share a uniform relationship with wing venation. *Arthropod Systematics & Phylogeny* 75(3): 363-371. 2017
10. **S.R. Schachat**. The wing pattern of *Moerarchis* Durrant, 1914 (Lepidoptera: Tineidae) clarifies transitions between predictive models. *Royal Society Open Science* 4(3): 161002. DOI: 10.1098/rsos.161002. 2017

## Refereed scientific publications (cont'd)

9. **S.R. Schachat** and G.W. Gibbs. Variable wing venation in *Agathiphaga* (Lepidoptera: Agathiphagidae) is key to understanding the evolution of basal moths. *Royal Society Open Science* 3(10): 160453. DOI: 10.1098/rsos.160453 2016
8. **S.R. Schachat** and R.L. Brown. Forewing color pattern in Micropterigidae (Insecta: Lepidoptera): Homologies between contrast boundaries, and a revised hypothesis for the origin of symmetry systems. *BMC Evolutionary Biology* 16(116). DOI: 10.1186/s12862-016-0687-z 2016
7. **S.R. Schachat**, D.G. Mulcahy, and J.R. Mendelson III. Conservation threats and the phylogenetic utility of IUCN Red List rankings in *Incilius* toads. *Conservation Biology* 30(1): 72-81. DOI: 10.1111/cobi.12567 2016
6. S. Ho\*, **S.R. Schachat**, W.H. Piel, and A. Monteiro. Attack risk for butterflies changes with eyespot number and size. *Royal Society Open Science* 3(1): 150614. DOI: 10.1098/rsos.150614 2016
5. **S.R. Schachat**, C.C. Labandeira, and D.S. Chaney. Insect herbivory from early Permian Mitchell Creek Flats of north-central Texas: Opportunism in a balanced component community. *Palaeogeography, Palaeoclimatology, Palaeoecology* 440: 830-847. DOI: 10.1016/j.palaeo.2015.10.001 2015
4. **S.R. Schachat** and R.L. Brown. Color pattern on the forewing of *Micropterix* (Lepidoptera: Micropterigidae): Insights into the evolution of wing pattern and wing venation in moths. *PLoS One* 10(10): e0139972. DOI: 10.1371/journal.pone.0139972 2015
3. **S.R. Schachat** and C.C. Labandeira. Evolution of a complex behavior: The origin and initial diversification of foliar galling by Permian insects. *The Science of Nature — Naturwissenschaften* 102(14): 1-8. DOI: 10.1007/s00114-015-1266-7 2015
2. **S.R. Schachat**, J.C. Oliver, and A. Monteiro. Nymphalid eyespots are co-opted to novel wing locations following a similar pattern in independent lineages. *BMC Evolutionary Biology* 15(20). DOI: 10.1186/s12862-015-0300-x 2015
1. **S.R. Schachat**, C.C. Labandeira, J. Gordon\*, D.S. Chaney, S. Levi\*, M.S. Halthore\*, and J. Alvarez\*. Plant-insect interactions from Early Permian (Kungurian) Colwell Creek Pond, north-central Texas: The early spread of herbivory in riparian environments. *International Journal of Plant Sciences* 175(8): 855-890. DOI: 10.1086/677679 2014

\* denotes undergraduate student coauthor; † denotes graduate student coauthor

## Refereed art history publications

2. **S.R. Schachat**. Insect biodiversity in Meiji and Art Nouveau design. *American Entomologist* 61(4): 215-222. DOI: 10.1093/ae/tmv071 2015
1. **S.R. Schachat**. Drawn before *Wonderland*: Bizarre illustrated insects of the nineteenth century. *American Entomologist* 60(3): 162-165. DOI: 10.1093/ae/60.3.162 2014

## Honors

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| Snodgrass Memorial Award   | 2017 |
| Entomological Society of America: Systematics and Evolutionary Biology |      |
| Graduate Student Hall of Fame  | 2016 |
| Office of the Graduate School, Mississippi State University            |      |
| M.S. Graduate Research Assistant of the Year                           | 2016 |
| Office of the Graduate School, Mississippi State University            |      |
| Graduate Student Award for Excellence in Research                      | 2016 |
| College of Agriculture and Life Sciences, Mississippi State University |      |

## Honors (cont'd)

Best Student Oral Presentation, <i>first place</i> Australian Entomological Society	2015
President's Prize for best student presentation, <i>second place</i> Entomological Society of America: Systematics and Evolutionary Biology	2014
Harry K. Clench Memorial Award for best student presentation, <i>second place</i> The Lepidopterists' Society	2014
President's Prize for best student presentation, <i>first place</i> Entomological Society of America: Plant-Insect Ecosystems	2013
Harry K. Clench Memorial Award for best student presentation, <i>first place</i> The Lepidopterists' Society	2013
Undergraduate Student Achievement Award Entomological Society of America: Plant-Insect Ecosystems	2013
Judith K. Reed Commencement Award University of Maryland, Department of Art History & Archaeology	2013

## Scholarships and conference travel grants

Bio-X Travel Award Stanford University, Bio-X	2017
Shell Fund Award Stanford University, Department of Geological Sciences	2017
Mississippi Entomological Association Scholarship Mississippi Entomological Association	2016
Student Travel Grant Award Entomology & Plant Pathology Club, Mississippi State University	2014, 2015
Pat and Linda Harris Scholarship Mississippi Entomological Association	2014
Student Travel Grant Geological Society of America	2012
Ernest N. Cory Scholarship University of Maryland, Department of Entomology	2012
Judith K. Reed Scholarship University of Maryland, Department of Art History & Archaeology	2012

## Teaching experience

"Insect evolution in the fossil record" (50-minute lecture) EPP6164: Insect Taxonomy, Mississippi State University	2015
" <i>Japonisme</i> and biodiversity in <i>fin-de-sicle</i> French art" (75-minute lecture) ART3623: Art in France 1850-1900, Mississippi State University	2015

## Presentations

### Invited presentations

"The comparative morphology of wing pattern in Lepidoptera." Annual meeting of the Entomological Society of America: Systematics and Evolutionary Biology, Denver CO.	2017
"Insects in Japanese and French art, ca. 1900." International Congress of Entomology, Orlando FL.	2016
"Reconstructing the evolution of wing pattern in moths." Lightning Talks, Senate of Scientists, National Museum of Natural History.	2016

## Invited seminars

“The evolution of wing pattern in moths and butterflies.” Department of Biology, Santa Clara University.	Invited
“Color pattern on the wings of Lepidoptera: Bridging the gap between butterflies and tiny brown moths.” Ad-hoc seminar, Smithsonian Department of Entomology.	2016
“‘Disorder is systematically organized’: Pre-Darwinian evolutionary theory in the art of J.J. Grandville.” Regular meeting, Washington DC Guild of Natural Science Illustrators.	2016
“The evolving role of natural history in nineteenth-century European art.” Ad-hoc seminar, Smithsonian Department of Paleobiology.	2016
“Drawn before <i>Wonderland</i> : Bizarre insect illustrations of nineteenth-century Europe.” Regular meeting, Entomological Society of Washington.	2013

## Published abstracts (last 3 years)

S.R. Schachat. “Phanerozoic $pO_2$ and the early evolution of terrestrial animals.” Society of Integrative and Comparative Biology Annual Meeting Abstracts, pg. 365.	2018
S.R. Schachat. “Unexpected morphology and unprecedented polymorphism: Does <i>Agathiphaga</i> clarify or confuse relationships at the base of the moth tree of life?” Society of Integrative and Comparative Biology Annual Meeting Abstracts, pg. 370.	2017
S.R. Schachat. “The evolutionary morphology of wing pattern in basal moths: Implications for the origin of butterfly symmetry systems” (poster). Society of Integrative and Comparative Biology Annual Meeting Abstracts, pg. 317.	2016

## Additional presentations (last 3 years)

S.R. Schachat. “The comparative morphology of wing pattern in Lepidoptera” (poster). Bio-X Symposium, Stanford University, Stanford CA.	Invited
S.R. Schachat. “Why is there a 62-million-year gap in the insect fossil record?” Department of Ecology and Evolutionary Biology, Stanford University, Stanford CA.	2017
S.R. Schachat. “The evolution of specialized herbivory in Permian insects.” Species Interactions Workshop, University of California, Santa Cruz CA.	2016
S.R. Schachat. “Reconstructing the evolution of morphology in the absence of an informative fossil record: The relationship between wing venation and color pattern in moths (Insecta: Lepidoptera).” Geobiology Symposium, University of Pennsylvania, Philadelphia PA.	2016

## Professional and community service

Representative, Student Affairs Committee	Entomological Society of America	2017–2019
Organizer, “Brown Bag” seminar series	Stanford University	2017
Judge, undergraduate poster competition	Entomological Society of America	2015
Media and Communications Officer	Entomological Society of Washington	2012–2013
Committee Member, Written in Leaf exhibit	Smithsonian Institution	2011–2013
Mentor, Youth Engagement in Science	Smithsonian Institution	2011

*Updated: 10 January 2018*