

SANDRA R. SCHACHAT
Department of Geological Sciences, Stanford University
Department of Paleobiology, Smithsonian Institution
schachat@stanford.edu

Education

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

Research grants and fellowships

Chair's Fellowship	\$40,360	2017–2018
Stanford University, Department of Geological Sciences		
Graduate Research Fellowship # DGE-1125191	\$134,000	2014–2017
National Science Foundation		
Graduate Research Opportunities Worldwide	\$12,500	2015–2016
Australian National University and National Science Foundation		
Graduate Research Internship Program	\$5,000	2016
National Science Foundation		
Graduate Student Fellowship	\$7,000	2015
Smithsonian Institution		
Grant-in-Aid of Research # G201503151194219	\$550	2015
Sigma Xi		

Refereed scientific publications

15. **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-2017-1927. Submitted
14. **S.R. Schachat**, C.C. Labandeira, and S.A. Maccracken[†]. The importance of sampling standardization for comparisons of insect herbivory in deep time: a case study from the late Paleozoic. *New Phytologist*: NPH-MET-2017-25179. In review
13. **S.R. Schachat**, R.G. Robbins, and J. Goddard. Color patterning in hard ticks (Acari: Ixodidae). *Journal of Medical Entomology*. DOI: 10.1093/jme/tjx173 In press
12. **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(2): 13-22. In press
11. **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 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
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

Refereed scientific publications (cont'd)

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 | |
| Best Student Oral Presentation, <i>first place</i> | 2015 |
| Australian Entomological Society | |
| President's Prize for best student presentation, <i>second place</i> | 2014 |
| Entomological Society of America: Systematics and Evolutionary Biology | |

Honors (cont'd)

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 travel grants

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

"Wing venation and wing pattern homologies in Lepidoptera." Annual meeting of the Entomological Society of America: Systematics and Evolutionary Biology, Denver CO.	Invited
"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

- “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 *Wonderland*: Bizarre insect illustrations of nineteenth-century Europe.” Regular meeting, Entomological Society of Washington. 2013

Selected published abstracts (last 3 years)

- S.R. Schachat. “Unexpected morphology and unprecedented polymorphism: Does *Agathiphaga* 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
- S.R. Schachat and R.L. Brown. “Venation predicts the location, but not the color, of forewing pattern elements in jaw moths (Lepidoptera: Micropterigidae).” 63rd Entomological Society of America Abstracts, pg. 169. 2015
- S.R. Schachat. “Wing pattern evolution in jaw moths (Lepidoptera: Micropterigidae).” 46th Australian Entomological Society Abstracts, pg. 75. 2015
- S.R. Schachat and R.L. Brown. “The relationship between wing venation and wing patterning in Micropterigidae.” 62nd Entomological Society of America Abstracts, pg. 137. 2014

Selected additional presentations (last 3 years)

- S.R. Schachat. “The evolution of moth wing patterns: Insights from the Australian National Insect Collection.” 7th ANIC Moth Weekend, Australian National Insect Collection, Canberra ACT. 2015
- S.R. Schachat. “Pre-Darwinian visualizations of micro- and macroevolution” (poster). Visualizing Biological Data, Broad Institute, Cambridge MA. 2015

Professional and community service

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|---|-------------------------------------|-----------|
| 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: 5 September 2017