

**Janice Edgerly-Rooks, PhD**  
**Professor, Biology**  
**Santa Clara University**

**Education**

State University of New York, College at Cortland, Biology, B.A., 1977.

State University of New York, College of Environmental Science and Forestry, Entomology, M.S., 1982.

Cornell University, Entomology, Ph.D., 1986.

Clark University, Ecology, Postdoctoral Research Associate, 1986–1988.

**Research**

I investigate questions about the behavior and ecology of insects and have studied tent caterpillars, treehole mosquitoes, and embiids (web-spinning insects; Order Embioptera). Presently, my students and I are concentrating our attention on the group of insects, the embiopterans also called web-spinners. I studied web-spinners for my Ph.D. work at Cornell University and continued to study them off and on over the years. They remain one of the least known of all the insect orders, perhaps because they are quite secretive. They live within silken domiciles that they spin with silk produced by glands in their front feet. They travel to and from their food within silk tubes. They exhibit maternal behaviors by guarding their eggs and spinning silk for their young and they often live in colonies. My current research seeks to discover which factors influence their behavior especially their use of silk. Recently I began collaborating with other scientists to examine a range of research problems: the evolution of the silk protein within the order, mechanical features of the silk and how it relates to environmental factors, phylogeny of the order based on morphological, genetic, molecular and behavioral characters, and adaptations to stressful environments (such as production of heat shock proteins).

See [PBS Deep Look Youtube](#) highlighting my research and the insects in my lab.

## Awards

- President's Special Recognition Award, Santa Clara University, 1995
  - Distinguished Environmental Service Award, Santa Clara University, 2002
  - Bernard Hubbard, S.J., Creative Collaboration Award, Santa Clara University, 2006
  - Professor Joseph Bayma, S.J., Scholarship Award, Santa Clara University, 2015-2016
  - Endowed Chair, Michael and Elizabeth Valeriotte (2017-2022)
- Lifetime Fellow, American Association for Advancement of Science (awarded 2022)

## Publications

(\* = SCU student; \*\*undergrads from other institutions; ^corresponding author)

1. Fitzgerald, T. D.^ and J. S. Edgerly. 1979. Exploration and recruitment in field colonies of eastern tent caterpillars. *Journal of the Georgia Entomological Society*. 14: 312-314.
2. Fitzgerald, T. D.^ and J. S. Edgerly. 1979. Specificity of trail markers of forest and eastern tent caterpillars. *Journal of Chemical Ecology*. 5: 565-574.
3. Edgerly, J. S.^ and T. D. Fitzgerald. 1982. An investigation of behavioral variability in colonies of the eastern tent caterpillar, *Malacosoma americanum* (Lepidoptera: Lasiocampidae). *Journal of the Kansas Entomological Society*. 55: 145-155.
4. Fitzgerald, T. D.^ and J. S. Edgerly. 1982. Site of secretion of the trail marker of the eastern tent caterpillar. *Journal of Chemical Ecology*. 8: 31-39.
5. Shaw, S. R.^ and J. S. Edgerly. 1986. A new braconid genus (Hymenoptera) parasitizing webspinners (Embiidina) in Trinidad. *Psyche*. 92: 505-511.
6. Edgerly, J.S.^ 1987. Maternal behavior of a webspinner (Order Embiidina). *Ecological Entomology*. 12: 1-11.
7. Edgerly, J. S.^ 1987. Colony composition and some costs and benefits of facultatively communal behavior in a Trinidadian webspinner (Embiidina: Clothodidae). *Annals of the Entomological Society of America*. 80: 29-34.
8. Livdahl, T. P. and J. S. Edgerly.^ 1987. Hatching inhibition: population regulation in a treehole mosquito. *Ecological Entomology*. 12: 395-399.
9. Edgerly, J. S.^ 1988. Maternal behaviour of a webspinner (Order Embiidina): mother-nymph associations. *Ecological Entomology*. 13: 263-272.
10. Edgerly, J. S.^ and T. P. Livdahl. 1992. Density-dependent interactions within a complex life cycle: the roles of cohort structure and mode of recruitment. *Journal of Animal Ecology*. 61: 139-150.
11. Edgerly, J. S.^ and Michelle A. Marvier\*. 1992. To hatch or not to hatch? Egg hatch response to larval density and to larval contact in a treehole mosquito. *Ecological Entomology*. 17: 28-32.

12. Edgerly, J. S., M. S. Willey, and T. P. Livdahl<sup>^</sup>. 1993. The community ecology of *Aedes* egg hatching: implications for a mosquito invasion. *Ecological Entomology*. 18: 123–128.
13. Edgerly, J. S.<sup>^</sup> 1994. Is group living an antipredator defense in a facultatively communal webspinner? *Journal of Insect Behavior*. 7: 135-147.
14. Edgerly, J. S.<sup>^</sup> 1997. Life Beneath Silk Walls: A Review of the Primitively Social Embiidina. Chapter in *The Evolution of Social Behavior in Insects and Arachnids*, (Eds. J. Choe and B. Crespi). Cambridge University Press.
15. Edgerly, J. S.<sup>^</sup>, M. McFarland, P. Morgan, T. Livdahl. 1998. A seasonal shift in egg-laying behaviour in response to cues of future competition in a treehole mosquito. *Journal of Animal Ecology*. 67: 805-818.
16. Edgerly, J.S., A. Shachter, and W. Calder<sup>^</sup>. 1999. Course-based campus environmental research projects. *The Declaration*. (a newsletter published by the Association of University Leaders for a Sustainable Future). 3: 10-12.
17. Edgerly, J.S., M. S. Willey, and T. Livdahl<sup>^</sup>. 1999. Intraguild predation among larval treehole mosquitoes, *Aedes albopictus*, *Ae. aegypti*, and *Ae. triseriatus* (Diptera: Culicidae), in laboratory microcosms. *Journal of Medical Entomology*. 36: 394-399.
18. Shachter, A. M.<sup>^</sup> and J. S. Edgerly. 1999. Campus environmental resource assessment projects for non-science majors. *Journal of Chemical Education*. 76: 1667-1670
19. Edgerly, J. S.<sup>^</sup>, J. A. Davilla\*, and N. Schoenfeld\*. 2002. Silk spinning behavior and domicile construction in webspinners. *Journal of Insect Behavior*. 15: 219 – 242.
20. Szumik, C.<sup>^</sup>, J. S. Edgerly and C. Y. Hayashi. 2003. Phylogenetics of Embioptera (=Embiidina). *Entomologische Abhandlungren*. 61(2): 131.
21. Edgerly, J. S.<sup>^</sup> and E. C. Rooks. 2004. Lichens, sun, and fire: a search for an embiid-environment connection in Australia (Order Embiidina: Australembiidae and Notoligotomidae). *Environmental Entomology*. 33(4): 907 - 920.
22. Edgerly, J. S.<sup>^</sup>, Archana Tadimalla\*, and Elizabeth P. Dahlhoff. 2005. Adaptation to thermal stress in lichen-eating webspinners (Embioptera): habitat choice, domicile construction, and the potential role of heat shock proteins. *Functional Ecology*. 19: 255-262.
23. Edgerly, J. S.<sup>^</sup>, S. M. Shenoy\*, and V. G. Werner\*. 2006. Relating the cost of spinning silk to the tendency to share it for three embiids with different lifestyles (Order Embiidina: Clothodidae, Notoligotomidae, and Australembiidae). *Environmental Entomology*. 35: 448-457.
24. Edgerly, J. S.<sup>^</sup>, Claudia Szumik, Chanel N. McCreedy\*. 2007. On new characters of the eggs of Embioptera with the description of a new species of *Saussurembia* (Anisembiidae). *Systematic Entomology*. 32: 387-395.

25. Miller, Kelly B.^ and J. S. Edgerly. 2008. Systematics and natural history of the Australian genus *Metoligotoma* Davis (Embioptera: Australembiidae). *Invertebrate Systematics*. 22: 329-344.
26. Szumik, C.^, J.S. Edgerly, and C. Hayashi. 2008. Phylogeny of Embiopterans (Insecta). *Cladistics*. 24: 993-1005.
27. Collin, M. A.^, Jessica E. Garb, J S. Edgerly, and Cheryl Y. Hayashi. 2009. Characterization of silk spun by the embiopteran, *Antipaluria urichi*. *Insect Biochemistry and Molecular Biology*. 39: 75-82.
28. Collin, M. A.^, E. Camama\*\*, B.O. Swanson, J. S. Edgerly, and C. Y Hayashi. 2009. Comparison of embiopteran silks reveals tensile and structural similarities across taxa. *Biomacromolecules*. 10(8): 2268-2274.  
<http://pubs.acs.org/doi/abs/10.1021/bm900449p?prevSearch=collin&searchHistoryKey=>
29. Poolprasert, P. and J. S. Edgerly^. 2011. A new species of *Eosembia* Ross (Embiodea: Oligotomidae) from Northern Thailand. *Journal of the Kansas Entomological Society*. 84: 12-21.
30. Collin, M.A.^, Edgerly, J.S. and Hayashi, C.Y. 2011. Comparison of fibroin cDNAs from web-spinning insects: insight into silk formation and function. *Zoology (Jena)*. 114(4): 239-46.
31. Edgerly, J. S., Sebastian Büsse\*\*, Thomas Hörnschemeyer^. 2012. Spinning behaviour and morphology of the spinning glands in male and female *Aposthonia ceylonica* Enderlein, 1912 (Embioptera: Oligotomidae). *Zoologischer Anzeiger - A Journal of Comparative Zoology*. 251:297-306.
32. Proaño, C.B.\*\*, S. Cruz\*\*, D.M. McMillan\*, J.S. Edgerly^. 2012. Exploration of substrate vibrations as communication signals in a web-spinner from Ecuador (Embioptera: Clothodidae). *Neotropical Entomology*. 41:196-203.
33. Miller, K.B.^, C.Y. Hayashi, M.F. Whiting, G.J. Svenson, J.S. Edgerly. 2012. The phylogeny and classification of Embioptera (Insecta). *Systematic Entomology*. 37: 550-570.
34. Dejan, K.A.\*, J.M. Fresquez\*, A.M. Meyer\*, J.S. Edgerly^. 2013. Maternal territoriality achieved through shaking and lunging: an investigation of patterns in associated behaviors and substrate vibrations in a colonial embiopteran, *Antipaluria urichi*. *Journal of Insect Science*. 13: Article 82  
(<http://www.insectscience.org>)
35. Hodson, A.M\*\*^, S.E. Cook\*, J.S. Edgerly, K.B. Miller. 2013. Parthenogenetic and sexual species within the *Haploembia solieri* species complex (Embioptera: Oligotomidae) found in California. *Insect Systematics and Evolution*. DOI 10.11163/1876312X-44032095.
36. Poolprasert, P. and J.S. Edgerly^. 2014. Description of four new species of the genus *Ptilocerembia* Frederichs, 1923 (Embioptera: Ptilocerembiidae) from Thailand. *Zootaxa*. 3825 (3): 359-372. <http://dx.doi.org/10.1164/zootaxa.3852.3.5>

37. Addison, J. B., T. O. Popp, W.S. Weber, J. S. Edgerly, G. P. Holland, and J. L Yarger<sup>^</sup>. 2014. Structural characterization of nanofiber silk produced by embiopterans (webspinners). *Royal Society of Chemistry Advances*. Published 5 September 2014 online. DOI: 10:1-39/c4ra07567f
38. Büsse, S.<sup>^</sup>, T. Hörnschemeyer, K. Hohu\*, D. McMillan and J. S. Edgerly. 2015. The spinning apparatus of webspinners – functional-morphology, morphometrics and spinning behaviour. *Scientific Reports*. 5: 9986. DOI: 10.1038/srep09986
39. McMillan, D., K. Hohu\*, J.S. Edgerly<sup>^</sup>. 2016. Choreography of silk spinning by webspinners (Insecta: Embioptera) reflects lifestyle and hints at phylogeny. *Biological Journal of the Linnean Society*. 118: 430–442, <https://doi.org/10.1111/bij.12749>
40. Osborn Popp, T. M. (ASU\*), J. B. Addison, J.S. Jordan (ASU\*), V. G. Damle, K. Rykaczewski, S. L. Y. Chang, G. Y. Stokes, J. S. Edgerly, J. L. Yarger<sup>^</sup>. 2016. Surface and wetting properties of embiopteran (webspinner) nanofiber silk. *Langmuir*. DOI: 10.1021/acs.langmuir.6b00762.
41. Edgerly, J. S.<sup>^</sup> 2017. Characterization of the nano-fiber silk of Embioptera. *Metaleptea*. The Newsletter of the Orthopterists' Society. 37: 22-23. ISSN 2372-2517 (online).
42. Edgerly, J.S.<sup>^</sup> 2018. Biodiversity of Embioptera. (pp 219-244) In *Insect Biodiversity: Science and Society* (Eds. R. Fottitt and P. Adler). Wiley Blackwell.
43. Edgerly, J. S.<sup>^</sup>, Brody Sandel, Isabel Regoli\*, and Onyekachi Okolo\*. 2018. Silk spinning motifs of the Embioptera: Insights from musicology. *Metaleptea*. The Newsletter of the Orthopteristis' Society. 38: 37-38. ISSN 2372-2517 (online).
44. Stokes, G. Y.<sup>^</sup>, E. N. DiCicco\*, T. J. Moore\*, V. C. Cheng\*, K. Y. Wheeler\*, J. Soghigian, R. P. Barber, and J. S. Edgerly. 2018. Structural and wetting properties of nature's finest silks (Order Embioptera). *Royal Society Open Science*. 5: 180893. <http://rsos.royalsocietypublishing.org/content/5/9/180893>
45. Kelly, Erin T\*. J. B. Whittall, and J. S. Edgerly<sup>^</sup>. 2018. Resolving two Haploembia (Embioptera: Oligotomidae) cryptic species: molecular data confirms parthenogenetic females can be distinguished by their antisocial behavior. *Zootaxa*: 4504(2): 225-242. <https://doi.org/10.11646/zootaxa.4504.2.4>
46. Wipfler<sup>^</sup> with J. Edgerly and 23 others. 2019 (Jan. 14) Evolutionary history of Polyneoptera and its implications for our understanding of early winged insects. *PNAS*: 1817794116 (<https://doi.org/10.1073/pnas.1817794116>)
47. Salisbury, A.<sup>^</sup>, V. Valkova, S. Reid, J. S. Edgerly. 2019. *Aposthonia ceylonica* (Embioptera: Oligotomidae), the first established colony of a webspinner to be found in Britain. *British Journal of Entomology & Natural History*. 32:35-41.
48. Büsse, S.<sup>^</sup>, T.H. Büscher, E.Taylor Kelly\*, L. Heepe, J. S. Edgerly, and S.N. Gorb. 2019. Pressure-induced silk spinning mechanism in webspinners (Insecta: Embioptera). *Soft Matter*. 15: 9742 DOI: 10.1039/c9sm01782h

49. Edgerly, J.S.^, B. Sandel, Isabel Regoli\* and Onyekachi Okolo\*. 2020. Silk spinning behavior varies from species-specific to individualistic in Embioptera: Do environmental correlates account for this diversity? *Insect Diversity and Systematics*. 4(2). <https://doi.org/10.1093/isd/ixaa007>
50. Shenoy, S.\*, K. Ing\*, R.P. Barber, E.C. Rooks, and J. S. Edgerly^. 2020. A multi-scale characterization of two tropical embiopteran species: nano- and micro-scale features of silk, silk spinning behavior, and environmental correlates of their distributions. *Environmental Entomology*: doi:10.1093/ee/nvaa073.
51. Harper, J. R.\*, N. Sripada\*, P. Kher\*, J. Whittall, J. S. Edgerly^. 2021. Interpreting nature's finest insect silks (Order Embioptera): hydrophobicity, interrupted repetitive motifs, and fiber-to-film formation for two neotropical species. *Zoology*. <https://doi.org/10.1016/j.zool.2021.125923>
52. Poolprasert, Pisit, K.^ Tanruen, Senarat, S. & Edgerly, J. S. *Diastolembia thailandensis*, a remarkable new genus and species of embiids (Embioptera: Embiidae) from Thailand. 2021. *Journal of Hunan University (Natural Sciences)*. 48: 57-63.
53. Edgerly, J.S.^ 2022. Dispersal risks and decisions shape how non-kin groups form in a tropical silk-sharing webspinner (Insecta: Embioptera). *Frontiers in Ecology and Evolution*. Special Collection on Non-Kin Groups in Invertebrates. (under review)
54. Kelly, E. Taylor\*^, Justen B. Whittall, Brody Sandel, Pisit Poolprasert2, Janice S. Edgerly. 2022. Another Bulky Genome in the Polyneoptera: Characterizing the Order Embioptera. *Insect Diversity and Systematics*. (under review)

## External Grants

- National Academy of Sciences, Research Grant in the Pure and Applied Sciences (#617, The Bache Fund; \$1,500), 1982. Investigation of the Biology of Webspinners—Primitively Social Insects.
- National Academy of Sciences, Research Grant in the Pure and Applied Sciences (#640, The Bache Fund; \$1,470), 1983–1984. A Study of the Evolution of Social Behavior in the Little Known Order of Insects, the Embiidina.
- National Science Foundation, Doctoral Dissertation Improvement Grant (BSR–8312897; \$5,802), 1983–1984. Social Behavior of Embiids (Class Insecta).
- National Institutes of Health, Academic Research Enhancement Award (1 R15 AI28039–01A1; \$89,003), 1990–1993. Effect of Larval Behavior on Mosquito Population Ecology.
- American Philosophical Society Research Award (\$4,600), 2000–2001. Ecology and Evolution of Social Behavior in Embiids.

National Science Foundation (DEB-0515865; \$78,150 for SCU portion)  
Collaborative Research: Phylogeny, behavior and silk evolution of  
webspinners (Embioptera), a little-known insect order. Collaborators are  
Cheryl Hayashi of UC Riverside, Kelly Miller of University of New Mexico and  
J. Edgerly-Rooks of SCU. Funded 2005-2008. Extended to 31 August 2009.

## **Internal Grants (SCU)**

Presidential Research Grant (\$1,448), Behavioral Ecology of Webspinners, 1989.

Thomas Terry Teaching Grant (\$3,000), Development of Laboratory Course in  
Animal Behavior, 1991.

Dorina & Louis Brutocao Teaching Innovation Grant (in collaboration with Dr. Amy  
Shachter; \$5,500), Implementation of the New Interdisciplinary Environmental  
Studies Minor at SCU: Assessment, Colloquium Series, and Capstone  
Seminar, 1992.

Dorina & Louis Brutocao Teaching Innovation Grant (in collaboration with Dr.  
Dennis Gordon; \$4,275), Development of a Summer Study Abroad Program  
and an Interdisciplinary Course: The Natural and Cultural History of a Tropical  
Nation, 1993.

Thomas Terry Research Grant (\$2,500), Field Study of Egg-Laying Behavior in  
Mosquitoes. Summer 1994.

Technology Steering Committee Grant (\$2,335), Computer Upgrade and Computer  
Software for Courses. January 1996.

Leaders for a Just World Grant (\$7,700), Environmental Research @ SCU.  
(co-author: A. Shachter), Summer 1997.

Presidential Research Grant (\$6907.50). Applying the Comparative Method to  
Investigate the Evolution of Maternal Care in Insects: The Case of Trinidadian  
Webspinners. Summer 1998.

Thomas Terry Teaching Grant (\$7,903), Preliminary Investigation of Behavioral  
Evolution in Webspinners. 2000.

College of Arts and Sciences, International Faculty Associates Program Grant  
(\$9,000), Research on the Order Embiidina in Australia, 2000-2001.

Presidential Research Grant (\$4590). An investigation of the relationship between  
social tendency and the cost of silk production in primitively social,  
silk-spinning insects. 2002.

Presidential Research Grant (\$5100). A comparison of physiological adaptations  
to diverse thermal environments in insects in the Order Embiidina. 2003.

Institute on Globalization Grant. (\$4250). Project Directors D. Gordon (Political  
Science) and J. Edgerly-Rooks. Title: Conservation, sustainable development  
and globalization. (Funded teaching overload in Spring 2003)

Technology Innovation Grant. (\$9000) Enhancement of teaching and learning  
through projected microscopy in biology. 2004.

Presidential Research Grant. (\$4756) Support for Undergraduates in Collaborative Research: Phylogeny, Behavior and Silk Evolution of Webspinners. 2005.

Dean's Grant (\$688) in support of page charges for publication in Environmental Entomology. 2006.

Presidential Research Grant. A Santa Clara University Grant Fund. (\$2984) Collaborative Research: Phylogeny, Behavior and Silk Evolution of Webspinners. 2006.

Presidential Research Grant. (\$1902) Collaborative Insect Research 2007.

Technology Innovation Grant. (\$3500) For the purchase of THEME software in support of research. 2008.

Dean's Grant (\$2,700) to fund part-time summer research assistant. 2009.

Technology Innovation Grant. (\$5462.50). Upgrading our ability to analyze behavior in research and in BIOL 165. 2009.

FSRAP program. (\$1000) To fund a work-study student as a research assistant. 2006. 2007. 2008. 2009. 2010. 2011. 2012. 2014. 2015. 2016, 2017, 2019.

Thomas Terry Grant. A Santa Clara University Grant Fund. (\$5018) An investigation of the evolution of silk in embiids. 2010.

University Research Grant (\$5018) An investigation of complex behavior in embiids. 2011.

University Research Grant (\$4000) An investigation of silk and silk spinning and an assessment of heat stress in embiids. 2012.

University Research Grant (\$5000) Investigation of sociality and the evolution of asexuality in a silk-spinning insect. 2016.

Faculty Summer Stipend Award for Summer (\$6000 plus \$2000 research funds) 2016.

Travel Grant to support silk project, in collaboration with Grace Stokes. (\$5000). Awarded January 2016.

University Research Grant. (\$4000) Characterization of Embioptera Silk and Structures. With Rich Barber of Physics Department. 2017.

## **Presentations**

### **Invited Seminars and Lectures**

Behavioral ecology of Embioptera. Departmental Seminar Series, Department of Entomology, University of California, Berkeley, April 9, 1990.

Ecology of a Tropical Rainforest. Featured speaker for the Annual Initiation Banquet for Sigma Xi, Scientific Research Society SCU Club, May 7, 1990.

Costs and benefits of facultative communal behavior in an insect (Webspinners). Speaker for Ecology/Evolutionary Biology Seminar, University of California, Santa Cruz, February 6, 1991.

Behavioral ecology of a tropical web-spinning insect. Speaker for Departmental Seminar Series, Biology, California State University, Hayward, April 11, 1991



- Speaker in the Workshop entitled Strategic Use of Media. Sponsored by SCU's Teaching and Learning Center Series: Skills and Strategies for Effective Teaching, October 24, 1991.
- Diseases, Ecology and the Encounter. Presented with Drs. Bellinger-Kawahara, Eisinger, and Thompson of the Department of Biology as part of "Columbus and After: Encounter, Conflict, Challenge," Quincentennial Institute. November 2, 1992.
- SCU's Landscape: History, Community, and Nature. Presented with Dr. Russell Skowronek (Anthropology) in the "Back to the Classroom" series of SCU's Alumni Association, at SCU on April 24, 1993.
- Coevolution of Plants and Animals in Trinidad. Lecture to the Tropical Rainforest Coalition, San Jose, May 23, 1993.
- Native Flora of Santa Clara. Docent Training Seminar at the DeSaisset Museum. Santa Clara University. October 1996.
- Life Within Silken Sheets: An Introduction to the Order Embiidina. Departmental Seminar, Department of Entomology, University of Kansas. May 1996.
- Discovering Webspinners (order Embiidina): coloniality, neoteny and the choreography of silk spinning. Departmental Seminar, Department of Entomology, UC Davis. November 2000.
- Research on the insect order Embiidina: coloniality, neoteny, and the choreography of silk spinning. Tropical Biology Seminar Series. James Cook University. Townsville, Queensland, Australia. May 2001.
- Life in a Silken Domicile: The Choreography of Silk Spinning, and Other Attributes of Behavior of the Obscure Insects Known as Webspinners (Order Embiidina). Brigham Young University Systematics Division Seminar. March 2002.
- A Behaviorists View of Stealing, Chasing, Yelling and Other Penguin Antics. Featured speaker for the Sigma Xi Scientific Research Society's Annual Initiation Banquet. Santa Clara University. May 2002.
- Lichens, Heat and Shade: The Search for Embiid-Environment Link in Queensland. Departmental Seminar, Department of Entomology, UC Davis. March 2003.
- Evolution and ecology of embiids. Queen Sirikit Botanical Garden, Chiang Mai, Thailand. 3 March 2008. (departmental seminar)
- Evolution and ecology of embiids. Chulalonghorn University. Departmental Seminar (Biology) Bangkok. Thailand. 20 March 2008.
- Embiids: the most extraordinary insects you never knew. Michener Lecturer, in honor of Professor Charles Michener of the University of Kansas. April 9, 2009.
- Choreography of silk spinning behavior. University of Kansas, Departmental seminar (entomology) April 10, 2009.

- Behavior and ecology of the extraordinary subsocial insects of the Order Embioptera. Departmental seminar (entomology). University of California, Riverside. 7 November 2011.
- Lessons on Behavior from an Insect's Silk Road (Order Embioptera). Departmental seminar (Animal Behavior Group). University of California, Davis. 3 March 2017.
- Silk as Armor and a Web of Adaptation (the Order Embioptera). Invited Departmental Speaker, Kiel University. March 2018.
- Silk spinning motifs of the Embioptera: Insights from Musicology. Sonoma State, Dept. of Biology. April 17, 2018.

### **Invited Conference Papers** (student speakers are underlined)

- Endangered Insects of the Forests. Santa Clara Valley Audubon Society's Native Forests of the Americas Conference held at Stanford University, May 5, 1990.
- To hatch or not to hatch? Inter- and intraspecific egg hatch response to larvae in *Aedes*. Speaker in a Symposium entitled "The Larval Ecology of Treehole Mosquitoes" at the National Meeting of the American Mosquito Control Association, Corpus Christi, TX, March, 1992.
- Is group-living beneficial for mosquito larvae? Paper presented by Miguel Ramírez, 24th Annual Conference of the Society for Vector Ecology, San Francisco, November, 17, 1992.
- Group living as an antipredator device in facultatively communal silk-spinning insects. Presented at the 2nd Annual Research Day Poster Session, A W.I.S.E.+ Event (featuring women in science, engineering and mathematics), May 24, 1993.
- Density-dependent egg-laying strategies of *Aedes triseriatus*. Presented by T. Livdahl (co-author), Annual Meeting of the American Mosquito Control Association. Salt Lake City. March 1997.
- Weaving together the threads of an embiid's life. J. S. Edgerly & Kelly Miller (BYU). Invited symposium speaker (Symposium: The Other Social Arthropods). Annual Meeting of the Entomological Society of America. Fort Lauderdale, FL. Dec. 15-18 2005.
- Functional-morphological study of the forelegs of *Aposthonia ceylonica* (♀,♂) via SRμCT (Insecta: Embioptera). Büsse, S., Edgerly, J. S. & Hörnschemeyer, Th. Research Poster presented at the European XFEL Users' Meeting 2010 – HASYLAB Users' Meeting 2010, Hamburg (Germany).
- A silk road to subsociality (Insecta; Order Embioptera). (2014) International Congress of Behavioral Ecology. Invited symposium speaker. Edgerly, J. S. New York City. July 31–August 6, 2014.
- Lessons from the embiopteran silk road. Edgerly, J. S. and B. Addison. Invited symposium speaker (Symposium: Utilizing orthopteroid insects to overcome

- grand challenges in an ever-evolving world). Annual Meeting of the Entomological Society of America. Portland, OR. Nov. 18, 2014.
- Lessons from the embiopteran silk road. Edgerly J. S. and Bennett Addison (ASU). Symposium: Utilizing Orthopteroid Insects to Overcome Grand Challenges in an Ever-Evolving World. 62nd Annual Meeting of the Entomological Society of America. Nov. 16-19, 2014, Portland, OR.
- Adaptations for tube living produces a silly (but fast) backward gait in Embioptera. Edgerly, J. S., T. Libby (UCB), and R. Full (UCB). 63rd Annual Meeting of the Entomological Society of America. Nov. 15-18, 2015. Minneapolis, MN.
- Clumsy dynamics of rapid backwards running in tube-dwelling webspinners. Society for Integrative and Comparative Biology. Libby, T. (speaker), Edgerly J. and Full, R. J. January 2016. Portland, OR.
- Characterization of the nano-fiber silk of embioptera. International Congress of Entomology. Edgerly, J. S., G.Y. Stokes, and J. Yarger. September 2016. Orlando, FL.
- Silk as Armor and a Web of Adaptation (the Order Embioptera). Annual Meeting of the Royal Entomological Society. *Keynote Address*, September 2017, Newcastle, U.K.
- Edgerly, J.S., Isabel Regoli\*, Onye Okolo\*, Brody Sandel. 2017. Silk spinning motifs of the Embioptera: Insights from Musicology. 65th Annual Meeting of the Entomological Society of America. Nov. 4-8, 2017. Denver, Colorado.
- Edgerly, J.S., T.H. Büscher, F. Doneth\*\*, E. T. Kelly\*, L. Heepe, SN Gorb, S. Büsse. Stepping to spin or to run? How embiopterans resolve the conflicting functions of their unique front feet. Annual Meeting of the Entomological Society of America. Nov. 2019. St. Louis, Missouri.
- Edgerly, J. S. 2020. Exploring Embiodea: bulky genomes and “silky” genes. Annual Meeting of the Entomological Society of America. Nov.2020. Virtual Conference. *Keynote Address*.

**Submitted Presentations** (students\* & if presenters are underlined)

- Self-management of production by mosquito larvae? A life cycle manipulation experiment. Annual Meeting of the Entomological Society of America, Louisville, KY, December 1988.
- Silk as an antipredator device in webspinners (Order Embidiina). Annual Meeting of the Entomological Society of America, San Antonio, Tx. December 1989.
- Mosquito larvae both inhibit and stimulate mosquito egg hatch. Michelle Marvier\*, (co-author J. S. Edgerly), at the Annual Meeting of the Ecological Society of America, San Antonio, TX, August 1991.
- Group living as an antipredator device in a facultatively communal silk-spinning insect. National Meeting of the Animal Behavior Society, Queen’s University, Ontario, June 1992.

- Mosquito larvae benefit from living in groups. Miguel Ramírez\*, (sponsored by J. S. Edgerly), Annual Conference of the Society for Advancement of Chicanos and Native Americans in Science, Albuquerque, NM, January 1993.
- Mosquito larvae benefit from living in groups. Miguel Ramírez\*, (sponsored by J. S. Edgerly), Sigma Xi National Meeting and Forum: Ethics, Values and the Promise of Science. San Francisco, February 1993.
- Can larval mosquitoes gain an advantage from group living? Eickwort Symposium, Cornell University. April 23, 1995.
- Oviposition decisions by a tree-hole mosquito: a test of multiple hypotheses in the field. Presented at the International Congress of Entomology (Florence). August 1996.
- Course-based campus environmental assessment projects. Presented with Amy Shachter, Greening of the Campus II Conference, Ball State University. September 1997.
- Environmental research at SCU (student research poster presentation). Jenefer Olds\*. Irvine Leaders for a Just World EXPO, February 1998.
- Larval group effect in treehole mosquitoes. Jenefer Olds\*. (sponsored by J. Edgerly-Rooks), West Coast Biological Sciences Undergraduate Research Conference. University of San Francisco. May 1998.
- Larval group effect in treehole mosquitoes. Jenefer Olds\*. (sponsored by J. Edgerly-Rooks), Sigma Xi Research Society Annual Poster Session for Undergraduates. SCU. May 1998.
- Environmental research in Trinidad. An Environmental Studies Colloquium by Kelly Warren, Noelle Andrews, Shauna Roitenberg, Marc Hanson, and Anne Duncan (all students sponsored by J. Edgerly and Peg Graham, Anthropology), Fall 1998.
- Ethnobotany of Brasso Seco, Trinidad: How rainforest villagers use plants. Slide presentation by Noelle Andrews\* and Kelly Warren\* (sponsored by J. S. Edgerly-Rooks), West Coast Biological Sciences Undergraduate Research Conference, UC Irvine, May 1999. Winner of Best Speaker Award in the Ecology Session
- Ethnobotany of Brasso Seco, Trinidad: How rainforest villagers use plants. Poster presentation by Noelle Andrews\* and Kelly Warren\* (sponsored by J. Edgerly-Rooks), Sigma Xi Initiation Banquet Poster Session, Santa Clara University, May 1999.
- An investigation of the costs of spinning silk in embiidids (Class Insecta: Order Embiidina). Samantha Shenoy\* (sponsored by J. Edgerly-Rooks) SCU Community of Science Scholars 2001 Summer Symposium: NSF REU Chemistry Program and by HHMI CSSI. August 2001.
- The metabolic cost of spinning in silk producing insects (Order Embiidina). Samantha Shenoy\* (sponsored by J. Edgerly-Rooks) Sigma Xi Scientific Research Society Initiation Banquet. May 2002.

- Silk-spinning tendency and colonial behavior in the insect Order Embiidina. Vanessa Werner\* and J. Edgerly-Rooks. Santa Clara University Community of Science Scholars 2002 Summer Symposium: NSF-RUI and HHMI. August 22, 2002.
- Measuring the metabolic cost of spinning silk: developing a method for investigating a silk-spinning insect. J. Edgerly (presenter) and Samantha Shenoy\*. Measuring Behavior. 4th International Conference on Methods and Techniques in Behavioral Research. Amsterdam. 27-30 August 2002.
- Thermal adaptation in three species of web spinning insects living in different thermal environments. Archana Tadimalla\*, J. Edgerly-Rooks and E. Dahlhoff. Sigma Xi Scientific Research Society Initiation Banquet. May 2003.
- Phylogenetics of Embioptera (= Embiidina). C.A. Szumik (presenter; Instituto Miguel Lillo), J. Edgerly-Rooks, C. Y. Hayashi (UC Riverside). International Congress on The Phylogenetic Relationships within the Insect Orders, Dresden, Germany. September 19 – 21, 2003.
- An investigation of the relationship between the tendency to produce silk and the tendency to share it in embiids (Order Embiidina). J. Edgerly-Rooks, Samantha Shenoy\*, Vanessa Werner\* (presenter). Society for the Advancement of Chicanos and Native Americans in Science National Conference. Albuquerque, October 2 - 5, 2003.
- An investigation of the relationship between the tendency to produce silk and the tendency to share it in embiids (Order Embiidina). J. Edgerly-Rooks (presenter), Samantha Shenoy\*, Vanessa Werner\*. The 51<sup>st</sup> Annual Meeting of the Entomological Society of America. Cincinnati, October 26-29, 2003.
- A review of the diversity in the use of silk by arthropods, with an emphasis on the Order Embiidina. In Symposium entitled “Understanding Arthropod Silk: Weaving Together Animal Evolution and Human History with a Biotechnological Future” (co-organizers and moderators: J. Edgerly-Rooks and C. Craig of Harvard University), The 52nd Annual Meeting of the Entomological Society of America. Salt Lake City, Utah, November 14 – 17, 2004.
- Does variation in silk spinning behavior reflect habits and habitat in embiids (Order Embiidina)? Natasha Calvert\* (sponsored by J. Edgerly-Rooks) The 30th Annual West Coast Biological Sciences Undergraduate Research Conference, SCU. April 30, 2005.
- Does variation in silk spinning behavior reflect habits and habitat in embiids (Order Embiidina)? Natasha Calvert\* (sponsored by J. Edgerly-Rooks) Sigma Xi Scientific Research Society Initiation Banquet. May, 2005.
- 3rd Annual Successfest, Environmental Studies Institute. Does variation in silk spinning behavior reflect habits and habitat in embiids (Order Embiidina)? Natasha Calvert\* (sponsored by J. Edgerly-Rooks) May, 2005.

- Exploring a silken empire: a review of behaviour and diversity in females of the little known orthopteroid order Embioptera). 9th International Conference of the Orthopterists' Society. Canmore, Alberta, Canada, August 2005.
- Nueva evidencia: huevos de Embiodea y su ajuste a la clasificación actual. Janice S. Edgerly, C. A. Szumik (presenter), & Chanel N. McCreedy\*. La VI Reunión Argentina de Cladística y Biogeografía. Provincia del Chubut. April 27-29, 2006.
- Choreography of silk spinning by insects of the little-known order Embiidina. Francis Las Pinas\* and Jennifer Davila\* (sponsored by J. Edgerly-Rooks) The 31st Annual West Coast Biological Sciences Undergraduate Research Conference, Point Loma Nazarene University, San Diego. April 29, 2006. Winner of Best Speaker Award in the Ecology Session.
- An investigation of step pattern and diversity in silk spinning embiids. Jennifer Davila\* and J. Edgerly-Rooks. Annual Meeting of the Entomological Society of America, Indianapolis, Dec. 10-13, 2006. (award-winning presentation)
- Embioptera systematics: The tangled web. Kelly Miller (UNM, presenter), J. Edgerly-Rooks, Cheryl Hayashi (UC Riverside) and Michael F. Whiting (BYU), Annual Meeting of the Entomological Society of America, Indianapolis, Dec. 10-13, 2006.
- Measuring the silk footprint of embiids (Class Insecta) (Part 1), Kathleen Powers\* (presenter) & Sarah Cook\* (sponsor: J. Edgerly-Rooks), Winter 2008. Undergraduate Science & Engineering Symposium at SCU. 7 March 2008. (award-winning presentation)
- Measuring the silk footprint of embiids: Does one size fit all? (Part 2), Whitney Knott\* (presenter) & Khaaliq Dejan\* (sponsor: J. Edgerly-Rooks) Winter 2008. Undergraduate Science & Engineering at SCU Symposium. 7 March 2008.
- Measuring the silk footprint of embiids. J. Edgerly-Rooks and all research assistants presented talks (students\*: Sarah Cook, Khaaliq Dejan, Whitney Knott, Kathleen Powers, Ava Schlossmacher). At the Collaborators' Conference on the Biology of Embiids. Motte Rimrock Research, UC Riverside. May 2- 4 2008. (organized by Dr. Cheryl Hayashi of UC Riverside).
- Measuring the silk footprint of embiids (Class Insecta). Kathleen Powers\* (presenter), W. Knott\*, K. Dejan\* and S. Cook\*. 34<sup>th</sup> Annual West Coast Biological Sciences Undergraduate Research Conference April 12, 2008, Point Loma Nazarene University. \*Winner of Best Speaker Award in the Ecology Session
- Measuring the silk footprint of embiids (Embioptera): Does one size fit all? The 56th Annual Meeting of the Entomological Society of America, Whitney Knott\* and J. S. Edgerly. Reno, NV Nov. 16 – 19, 2008.
- Vibrational communication: A language of its own. Khaaliq Dejan\* and J. S. Edgerly. Undergraduate Science & Engineering at SCU Symposium. (SCU) 9 May 2009. (award-winning presentation)

- Comparative morphological study of the prothoracic legs of male and female *Aposthonia ceylonica* (Insects: Embioptera). Büsse, S., J. S. Edgerly, T. Hörschemeyer. Research Poster presented on Sept. 18-19, 2009. The 4th Dresden Meeting on Insect Phylogeny. Germany.
- Analysis of shaking and lunging, the signaling behavior of egg-guarding insects of the order Embiidina. Khaalig DeJan\*, Annika Meyer\* and J. S Edgerly. 35<sup>th</sup> Annual West Coast Biological Sciences Undergraduate Research Conference. SCU April 24, 2010. \*Winner of Best Speaker Award in the Ecology Session.
- Shaking and lunging: analysis of signaling by silk-spinning insects (*Antipaluria urichi* Order Embiidina). Khaalig DeJan\* and J.S. Edgerly. The 58<sup>th</sup> Annual Meeting of the Entomological Society of America. San Diego, Dec. 13, 2010. (an award-winning presentation)
- Creating silk tubes and patches with embiid style. J. S. Edgerly. The 58<sup>th</sup> Annual Meeting of the Entomological Society of America. San Diego, Dec. 13, 2010.
- Using Theme software to discover complex patterns of behavior displayed by embiopterans (Order Embioptera). J. S. Edgerly and D. McMillan. The 59<sup>th</sup> Annual Meeting of the Entomological Society of America. Reno, November 15, 2011.
- Choreography of silk spinning and evolution of behavioral diversity in the insect order Embioptera. (poster) Hohu, K., J. Fresquez, J.S. Edgerly. Applied Bioscience Mini-symposium at SCU. August 17, 2012.
- Unweaving the web: methodologies for analyzing phylogenetic signal in silk spinning behavior. Hohu, K\* (D. McMillan and J. S. Edgerly). 38th Annual West Coast Biological Sciences Undergraduate Research Conference. April 20, 2013. Point Loma Nazarene University. San Diego, CA. \*Winner of Best Speaker Award in the Ecology Session.
- Choreography of silk spinning behavior in webspinners (Embioptera): phylogenetic signal or a microhabitat dance? Edgerly, J. S., D. McMillan, K. B. Miller. The 61<sup>st</sup> Annual Meeting of the Entomological Society of America. Austin, November 10–13, 2013.
- Kelly, E. Taylor \* and J. S. Edgerly, 2016. Body slamming and bolt-back behavior—characterizing embiopteran’s bizarre backwards run. West Coast Biological Sciences Undergraduate Research Conference at the Point Loma Nazarene, April 2016.
- Kelly, E. Taylor \* and J. S. Edgerly, 2016. Body slamming and bolt-back behavior—characterizing embiopteran’s bizarre backwards run. International Congress of Entomology. Orlando, FL. September 2016.
- DiCicco, Evangelea\*. 2016. Scanning electron microscopy for the characterization of Embioptera silk. Physics Department Special Symposium: Student research in physics. Santa Clara University. November 12, 2016. (Advisors: Rich Barber (Physics) and J. S. Edgerly. A STEM Collaboration at SCU)

- DiCicco, Evangelea\*. 2016. The characterization of embioptera silk as a biomaterial. West Coast Undergraduate Research Conference in the Biological Sciences. J (Advisors: J. S. Edgerly and Rich Barber). Award winning presentation.
- Okolo, Onyekachi\*, Isabel Regoli.\* 2016. Exploration of behavioral sequence strings displayed by prolific silk-spinning insects. West Coast Undergraduate Research Conference in the Biological Sciences. (Advisors: J. S. Edgerly and Brody Sandel). Award winning presentation.
- Chen, Sharon\* 2016. Analysis and Comparison of Silks from Tropical Insects in the Order Embioptera. West Coast Undergraduate Research Conference in the Biological Sciences. (Advisors: J. S. Edgerly and Grace Stokes).
- DiCicco, Evangelea\*. 2016. Characterization of embioptera silk. Sigma Xi Poster Session, May 3, 2017 at SCU. (Advisors: J. S. Edgerly and Rich Barber)
- Moore, Trevor\*. 2017. Characterization of Embioptera Silks by Contact Angle and Infrared Spectroscopy. Department of Chemistry and Biochemistry Summer Research Symposium. 29 August 2017. (Advisors: J. S. Edgerly and Grace Stokes).
- DiCicco, Evangelea\*. 2016. Characterization of embioptera silk and its interaction with water. Physics Department Special Symposium (Student Research in Physics) at SCU. September 30, 2017, (Advisors: J. S. Edgerly, Rich Barber, Grace Stokes).
- Edgerly, J.S., Grace Stokes, Evangelea DiCicco\*, Rich Barber. 2017. Unraveling the mysteries of nature's finest silks (Order Embioptera). 65th Annual Meeting of the Entomological Society of America. Nov. 4-8, 2017. Denver, Colorado.
- DiCicco, Evangelea\*, Grace Stokes, Janice Edgerly, Rich Barber. 2018. The characterization of embiopteran silk and its interactions with water. American Physical Society March Meeting 2018, March 5-9, Los Angeles, California.
- Moore, Trevor\*, Evangelea DiCicco\*. 2018. Characterization of Embioptera silks by contact angle, infrared spectroscopy and electron microscopy. 43<sup>rd</sup> Annual West Coast Undergraduate Research Conference in the Biological Sciences. Saint Mary's College of California. 14 April 2018. (Advisors: Janice Edgerly, Grace Stokes, Rich Barber)
- Regoli, Isabel\*, Onyekachi Okolo\*. Analysis of behavioral sequence strings and sonification of spin-step sequences in Embioptera. 43<sup>rd</sup> Annual West Coast Undergraduate Research Conference in the Biological Sciences. Saint Mary's College of California. 14 April 2018. (Advisors: Janice Edgerly and Brody Sandel) Winner Best Speaker Award in the Ecology section.
- Edgerly, J. S., Brody Sandel, Onyekachi Okolo\*, and Isabel Regoli\*. Musicology string sequences, and motifs: analysis of phylogenetic signal in silk spinning behavior. Annual Meeting of the Animal Behavior Society. August 2019.
- Harper\*, J. René, Neeraga Sripada, J. Whittall and J. S. Edgerly. From silk fibers to shiny film: a genetic and molecular analysis of embiopteran silk protein.



Annual Meeting of the Entomological Society of America. Nov. 2019. St. Louis, Missouri.

Ederly, J.S., Keilyn Ing\*, E.C. Rooks, J. René Harper\*, R.P. Barber. Characterizing two tropical embiopteran species: nano- and micro-scale features of silk, silk spinning behavior and environmental correlates of their distributions. Annual Meeting of the Entomological Society of America. Nov. 2019. St. Louis, Missouri.

## **Reviewer**

### *Recent Journals*

- Functional Ecology
- Zootaxa
- Tropical Natural History
- Behavioral Ecology and Sociobiology
- Tropical Ecology
- Molecular Phylogenetics and Evolution
- Ethology
- PLoS Biology
- Animal Behavior

### *Books on Animal Behavior*

- Oxford University Press
- Wiley & Sons

## **Grants while at SCU**

- National Institute of Health
- American Philosophical Society
- National Science Foundation

## **Major Professional and University Service**

- Chair, Department of Biology 2008-09 through 2010-11
- Co-founder and previous Director of the Environmental Studies Program (SCU)
- Editor, journal *Animal Behaviour* (term: Sept. 2013 – November 2016)

## **Examples of Service on Committees**

- Faculty Core Curriculum Committee (Advanced Writing, 2016-present)
- Faculty Core Curriculum Committee (Science, Technology & Society, multiple times and current STS Chair, 2013-2015)

- Animal Care and Use Committee (served as Chair and as a member, multiple times)
- Academic Affairs Committee
- College of Arts and Sciences Rank and Tenure Committee
- University Research Committee (two stints, recently one year as Chair)
- International Programs (advisory committee, science study abroad advisor)
- Advisory Board, Center for Arts and Humanities (SCU)

### **Professional Societies**

- Entomological Society of America
- Animal Behavior Society
- American Association for the Advancement of Science
- Society for the Study of Evolution (past member)