

**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 (webspinning insects; Order Embioptera). Presently, my students and I are concentrating our attention on the little known group of insects, the embiids also called webspinners. I studied webspinners 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. Adult females, often living in colonies, guard their eggs and spin silk for their young. My current research seeks to discover which factors influence their behavior especially their use of silk. I also work to describe basic behavior in a detailed manner, because until now most reports were anecdotal. 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 those relate to environmental factors, phylogeny of the order based on morphological, molecular and behavioral characters, and adaptations that allow them to run backwards quickly (a quirky result of evolution of locomotion by tube-walker).

Publications

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. 1993. The community ecology of *Aedes* egg hatching: implications for a mosquito invasion. *Ecological Entomology*. 18: 123–128.
13. Edgerly, J. S. 1994. Is group living an antipredator defense in a facultatively communal webspinner? *Journal of Insect Behavior*. 7: 135-147.
14. Edgerly, J. S. 1997. Life Within 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., 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. 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. Lidvahl. 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. 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., 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., J. S. Edgerly and C. Y. Hayashi. 2003. Phylogenetics of Embioptera (=Embiidina). *Entomologische Abhandlungen*. 61(2): 131.
21. Edgerly, J. S. 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., 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., 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., 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. Published online 2009. *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 (Embioidea: Oligotomidae) from Northern Thailand. *Journal of the Kansas Entomological Society*. 84: 12-21.
30. Collin, M.A., J. S. Edgerly, and Hayashi, C. Y. 2011. Comparison of fibroin cDNAs from web-spinning insects: insight into silk formation and function. *Zoology (Jena)*. 114: 239-246.
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. Addison, J.B., T.O. Popp, W.S. Weber, J.S. Edgerly, G. P. Holland, J. L. Yarger. 2014. Structural characterization of nanofiber silk produced by embiopterans (web-spinners). *Royal Society of Chemistry Advances*. 10:1-39/c4ra07567f
37. Büsse, S., T. Hörnschemeyer, Hohu, K, D. McMillan, J. S. Edgerly. 2015. The spinning apparatus of web-spinners-functional-morphology, morphometrics and spinning behaviour. *Scientific Reports*. 5:9986. DOI: 10.1038/2srep09986.
38. McMillan, D., K. Hohu, J.S. Edgerly. 2015. Choreography of silk spinning by web-spinners (Insecta: Embioptera) reflects lifestyle and hints at phylogeny. *Biological Journal of the Linnean Society*. In press