

Sarah E. Bush - Curriculum Vitae

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Address: School of Biological Sciences
University of Utah
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Salt Lake City, Utah 84112

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Education: Ph.D. in Biology, University of Utah, UT, 2004
Molecular Evolution, Woods Hole, MA, 2004
B.S. in Biology, University of Utah, UT, 1999

Research Interests:

Co-evolutionary ecology of hosts and parasites
Biodiversity, biogeography, and systematics of parasites

Positions:

Current: Associate Professor, Department of Biology, University of Utah (since 2017)
Adjunct Curator-Vertebrate Zoology, Natural History Museum of Utah (since 2011)
President, International Society of Phthirapterists (2018-2022)
Council Member-at-Large, American Society of Parasitologists (2016-2020)

2014-2018: Executive Committee Councilor (elected), International Society of Phthirapterists

2010-2017: Assistant Professor, Department of Biology, University of Utah
(half-time 2010-2014; full-time 2014-2017)

2008 - 2010: Research Assistant Professor, University of Utah

2004 - 2010: Postdoctoral Researcher, Natural History Museum and Biodiversity Research Center,
University of Kansas

2004 - 2005: Co-director, Center for Alternate Strategies of Parasite Removal (CASPeR), University of
Utah

2001 - 2004: NIH Genetics Training Grantee, University of Utah

1995 - 1999: Undergraduate researcher, Department of Biology, University of Utah

1993: Howard Hughes Summer Research Program, Inst. Human Genetics, University of Utah

Teaching:

Current: Co-instructor: "Bootcamp for Graduate Students" (fall semester 2018)
Instructor: "Ecological Speciation" (Biol 7406, fall semester 2018)
Co-instructor: "Evolution & Diversity of Life" (Biol 2010 fall semesters, since 2015)
Instructor: "Ecology & Evolution of Parasites & Pathogens" (Biol 5555, Lecture/Lab, 3 cr,
every other spring since 2012)

2012, 2016: Instructor: "SpeakerFest" (Biol 7406), University of Utah

2010-- Lecturer in: "Advanced Topics in Ecology & Evolution" (Biol 7964, fall semesters),
University of Utah

2010-- Lecturer in: "Bootcamp for Graduate Students" (Biol 7964, spring semesters)

2009: Instructor; Continuing Education Course: "In the footsteps of Darwin, Evolutionary Biology
in the 21st Century", OSHR Institute of Learning

2006: Co-instructor; Graduate Core Seminar: "Geographic Mosaic of Coevolution", University of
Utah

2004 - 2005: Guest Lecturer & Field Support: Ornithology & Adv. Field Ornithology, University of Utah

2004: Guest Lecturer: Heredity and Genetics for high school teachers, Genetic Science Learning
Center, Department of Human Genetics, University of U



Removing ectoparasites from an American White Pelican on the flats of the Great Salt Lake, Utah.

Grants & Honors:

- 2018: Golden Commemorative Badge of the University of Veterinary and Pharmaceutical Sciences, Brno, Czech Republic (in honor of significant contributions to Phthiraptera research)
- 2017: Fellow of the American Ornithological Society
- 2016: University of Utah Funding Incentive Seed Grant: Conditions of engagement - are hosts more likely to resist or tolerate parasites under different environmental conditions? (\$15,362, 1yr).
- 2016: NSF DDIG: Effect of Phoretic Dispersal on the Structure of Parasite Populations (\$19,503, with Ph.D. candidate Emily DiBlasi).
- 2015: Early Career Teaching Award, University of Utah
- 2014: NSF REU supplement for undergraduate research (\$6,600).
- 2013: NSF Dimensions of Biodiversity: Experimental adaptive radiation - genomics of diversification in bird lice (\$1,999,069; amount to University of Utah \$1,370,098, 5yrs; one of 4 PIs).
- 2013: NSF REU supplements for undergraduate research (\$19,050).
- 2013: Swedish Taxonomic Initiative: Chewing lice on birds in Nordic countries (\$290,000, 3yrs). Lead PI. Co-PIs: Daniel Gustafsson, (postdoctoral fellow in Bush lab, Univ. UT) and Urban Olsson, Professor, University of Gothenburg, Sweden.
- 2012: NSF REU supplements for undergraduate research (\$7,500).
- 2011: NSF- REVSYS: Unlocking the black box of feather louse diversity, a comprehensive revision of the hyper-diverse genus *Brueelia* (\$407,000, 3 yrs). Lead PI. Co-PI: K.P. Johnson, Illinois Natural History Survey.
- 2011: NSF- OPUS: The ecological basis of coevolutionary history - lessons from lice (\$150,000, 2yrs; one of 3 PIs).
- 2009: Elected Member of the American Ornithologists' Union
- 2008: NSF-Biotic Surveys & Inventories Grant: *A Comprehensive Biotic Survey of Philippine Land Vertebrates and their Parasites* (\$900,000, 5yrs; one of 4 PIs).
- 2005: Utah Centers of Excellence Grant (renewal) Co-director: *Center for Alternate Strategies of Parasite Removal* (\$150,000, 1 yr.)
- 2004: Utah Centers of Excellence Grant Co-director: *Center for Alternate Strategies of Parasite Removal* (\$135,000, 1 yr).

Professional Memberships:

- American Ornithologists' Union
(Elected Member 2009, Fellow 2017)
- American Society of Parasitologists
(Council Member-at-Large, 2016-2020)
- International Society of Phthirapterists
President (2018-2022), Executive Committee Councilor (2014-2018)
- Society for the Study of Evolution
- Society for Systematic Biology

Field Work:

United States: Arizona, Florida, Hawaii, Oregon, Nevada, Texas, and Utah.

International: Australia, Bahamas, China, Galapagos, Grenada, Hungary, Papua New Guinea, Philippines, and Slovakia.



Parasite groups under study from projects in Australia, China, Papua New Guinea, Philippines, Sweden and the United States: A) lice, B) helminths, C) fleas, D) hematozoans, E) ticks, F) coccidians, G-H) flies, I) mites.

Publications:

Books and Monographs:

- Clayton, D. H., **S. E. Bush**, and K. P. Johnson. 2016. Coevolution of life on hosts: Integrating ecology and history. University of Chicago Press. 320pp ([Univ. Chicago Press website](#))
- Gustafsson, D. R., and **S. E. Bush**. 2017. Morphological revision of the hyperdiverse *Brueelia*-complex (Insecta: Phthiraptera: Ischnocera: Philopteridae) with new taxa, checklists and generic key. *Zootaxa* 4313: 1-443.
◆ Contains descriptions of 21 new genera, 37 new species, and 186 new host records

Papers and Book Chapters:

66. **Bush, S.E.**, S. M. Villa, J. C. Altuna, K. P. Johnson, M. D. Shapiro, and D. H. Clayton. Host defense triggers rapid adaptive radiation in experimentally evolving parasites. *In review*. Preprint available on bioRxiv: <https://www.biorxiv.org/content/biorxiv/early/2018/09/18/420380.full.pdf>
65. Villa, S. M., J. C. Altuna, J. S. Ruff, A. B. Beach, L. I. Mulvey, E. J. Poole, H. E. Campbell, K. P. Johnson, M. D. Shapiro, **S. E. Bush**, and D. H. Clayton. Reproductive isolation arises as a by-product of rapid local adaptation in a natural population. *In review*. Preprint available on bioRxiv: <https://www.biorxiv.org/content/biorxiv/early/2018/10/05/436287.full.pdf>
64. Gustafsson, D. R., L. Lei, X. Chu, F. Zou and **S. E. Bush**. New genus and two new species of chewing lice from Southeast Asian trogons (AVES:Trogoniformes), with a revised key to the *Philopterus*-complex. *In press*. *Acta Parasitologica*
63. Gustafsson, D. R., X. Chu, F. Zou, and **S. E. Bush**. Seven new species of *Resartor* (Phthiraptera: Ischnocera: Philopteridae) from Asian "babblers" (Passeriformes: Leiotrichidae, Paradoxornithidae). *In press*. *Folio Parasitologica*
62. Gustafsson, D. R., E. DiBlasi, U. Olsson, T. Najer, and **S. E. Bush**. *In press*. Checklist and key to the lice (Insecta: Phthiraptera) of Sweden. *Entomologisk Tidskrift*.
61. **Bush, S. E.** and D. H. Clayton. 2018. Anti-parasite behaviour of birds. *Philosophical Transactions of the Royal Society, B*. 373: 20170196. DOI:10.1098/rstb.2017.0196 [PDF](#)
60. Gustafsson, D. R., X. Chu, **S. E. Bush**, and F. Zou. 2018. Ten new species of *Brueelia* Kéler, 1936 (Phthiraptera: Ischnocera: Philopteridae) from nuthatches (Aves: Passeriformes: Sittidae), tits and chickadees (Paridae), and goldcrests (Regulidae). *Acta Parasitologica* 63:527-557. DOI:10.1515/ap-2018-0063. [PDF](#)
59. DiBlasi, E., K. P. Johnson, S. A. Stringham, A. N. Hansen, A. B. Beach, D. H. Clayton, and **S. E. Bush**. 2018. Phoretic dispersal influences parasite population genetic structure. *Molecular Ecology* 27: 2647-2779. DOI: 10.1111/mec.14719 [PDF](#) and [Supp.Info \(PDF\)](#)
58. **Bush, S. E.**, D. R. Gustafsson, and D. H. Clayton. 2018. New records of ectoparasites from passerine birds in the High Tatras of Slovakia. *Oecologia Montana* 27:43-45. [PDF](#)
57. Gustafsson, D. R., D. H. Clayton, and **S. E. Bush**. 2018. Twelve new species of *Priceiella* (Phthiraptera: Ischnocera: Philopteridae) from Old World babblers, with keys to species of two subgenera and checklists of species in the genus. *Zootaxa* 4382:401-449. [PDF](#)
56. Villa, S. M., M. D. Evans, Y. K. Subhani, J. C. Altuna, **S. E. Bush**, and D. H. Clayton. 2018. Body size and fecundity are correlated in feather lice (Phthiraptera: Ischnocera): Implications for Harrison's Rule. *Ecological Entomology* 43:394-396. <https://doi.org/10.1111/een.12511>. [PDF](#)
55. Sweet, A. D., **S. E. Bush**, D. R. Gustafsson, J. M. Allen, E. DiBlasi, H. R. Skeen, J. D. Weckstein, and K. P. Johnson. 2018. Host and parasite morphology influence congruence between host and parasite phylogenies. *International Journal of Parasitology* 48: 641-648. <https://doi.org/10.1111/een.12511> [PDF](#)
◆ **Editor's Choice**
54. Boyd, B. M., J. A. Allen, N. Nguyen, A. D. Sweet, T. Warnow, M. D. Shapiro, S. M. Villa, **S. E. Bush**, D. H. Clayton, and K. P. Johnson. 2017. Phylogenomics using target restricted assembly resolves intrageneric relationships of parasitic lice (Phthiraptera: *Columbicola*). *Systematic Biology* 66:896-911. [PDF](#)
53. Harnos, A., Z. Lang, D. Petrás, **S. E. Bush**, and L. Rózsa. 2017. An evolutionary allometry of bird and louse (Phthiraptera) body sizes: comparative tests controlled for host, rather than parasite phylogeny. *Evolution* 71: 421-431. [PDF](#)

52. Villa, S. M., H. E. Campbell, **S. E. Bush**, and D. H. Clayton. 2016. Does anti-parasite behavior improve with experience: An experimental test of the priming hypothesis. *Behavioral Ecology* 27: 1167-1171. [PDF](#)
51. Bartlow, A. W., S. M. Villa, M. W. Thompson, and **S.E. Bush**. 2016. Walk or Ride? Phoretic behavior of amblyceran and ischnoceran lice. *International Journal of Parasitology* 46: 221-227. [PDF](#)
◆ Journal cover article
50. **Bush, S. E.**, J. D. Weckstein, D. R. Gustafsson, J. Allen, E. DiBlasi, S. M. Shreve, R. Boldt, H. R. Skeen, and K. P. Johnson. 2016. Unlocking the black box of feather louse diversity: a molecular phylogeny of the hyper-diverse genus *Brueelia*. *Molecular Phylogenetics and Evolution* 94: 737-751. [PDF](#)
49. **Bush, S. E.**, J. D. Weckstein, D. R. Gustafsson, J. Allen, E. DiBlasi, S. M. Shreve, R. Boldt, H. R. Skeen, and K. P. Johnson. 2015. Data supporting a molecular phylogeny of the hyper-diverse genus *Brueelia*. *Data in Brief* 5: 1078-1091. [PDF](#)
48. Gustafsson, D. R. and **S. E. Bush**. 2015. Four new species of *Brueelia* Kéler, 1936 (Phthiraptera: Ischnocera: Philopteridae) from African songbirds (Passeriformes: Sturnidae and Laniidae). *Zootaxa* 4013: 503-518. [PDF](#)
47. Gustafsson, D. R., and **S. E. Bush**. 2015. The chewing lice (Insecta: Phthiraptera: Ischnocera, Amblycera) of Japanese pigeons and doves (Columbiformes), with descriptions of three new species. *Journal of Parasitology* 101: 304-313. [PDF](#)
46. Makarikov, A. A., V. V. Tkach, S. M. Villa, and **S. E. Bush**. 2015. Description of two new species of *Hymenolepis* Weinland, 1858 (Cestoda, Hymenolepididae) from rodents on Luzon Island, Philippines. *Systematic Parasitology* 90:27-37. [PDF](#)
45. Gustafsson, D. R., and **S. E. Bush**. 2014. Two new species of *Paraphilopterus* Mey, 2004 (Insecta: Phthiraptera: Ischnocera: Philopteridae) from New Guinean bowerbirds (Passeriformes: Ptilonorhynchidae) and satinbirds (Passeriformes: Cnemophilidae) *Zootaxa* 3873:155-164. [PDF](#)
44. McAllister, C. T., Seville, R. S., Duszynski, D. W., and **S. E. Bush**. 2014. A new species of coccidia (Apicomplexa: Eimeriidae) from Cordillera striped shrew-rat, *Chrotomys whiteheadi* (Rodentia: Muridae), from the Philippines. *Acta Parasitologica* 59: 686-689. [PDF](#)
43. Hastriter, M. W. and **S. E. Bush**. 2014. Description of *Medwayella independencia* (Siphonaptera: Stivaliidae), a new species of flea from Mindanao, Island, the Philippines and their phoretic mites, and miscellaneous flea records from the Malay Archipelago. *Zookeys* 408:107-123. [PDF](#)
42. Gustafsson, D. R., and **S. E. Bush**. 2014. Three new species of chewing lice of the genus *Emersoniella* Tendeiro, 1965 (Insecta: Phthiraptera: Ischnocera: Philopteridae) from Papua New Guinean kingfishers and kookaburras (Aves: Coraciiformes: Alcedinidae). *Zootaxa* 3796:528-544. [PDF](#)
41. McAllister, C. T., R. S. Seville, D. W. Duszynski, **S. E. Bush**, R. N. Fisher, C. C. Austin. 2013. Two new species of *Eimeria* Schneider, 1875 (Apicomplexa: Eimeriidae) from emerald tree skinks, *Lamprolepis smaragdina* (Lesson) (Sauria: Scincidae) from Papua New Guinea and the Philippines. *Systematic Parasitology* 86:165-171. [PDF](#)
40. **Bush, S. E.**, M. Reed, and S. Maher. 2013. Impact of forest size on parasite biodiversity: implications for conservation of hosts and parasites. *Biodiversity and Conservation* 22: 1391-1404. DOI: 10.1007/s10531-013-0480-x. [PDF](#)
◆Reviewed by Faculty of 1000
39. Morse, S. F., **S. E. Bush**, B. D. Patterson, C. W. Dick, M. Gruwell, K. Dittmar. 2013. Evolution, multiple acquisition, and localization of endosymbionts in bat flies (Diptera: Hippoboscoidea, Streblidae, Nycteribiidae). *Applied and Environmental Microbiology* 79:2952-2961. [PDF](#)
38. Makarikov, A. A., V. V. Tkach, and **S. E. Bush**. 2013. Two new species of *Hymenolepis* (Cestoda: Hymenolepididae) from murid rodents (Rodentia: Muridae) in the Philippines. *Journal of Parasitology* 99:847-855. [PDF](#)
37. Kuzmin, Y., J. M. Kinsella, V. V. Tkach, and **S. E. Bush**. 2013. New species of *Kalicephalus* (Nematoda: Diaphanocephalidae) from a snake *Oxyrhabdium leporinum* on Luzon Island, Philippines. *Comparative Parasitology* 80:240-246. [PDF](#)
36. Tkach, V. V., O. I. Lisistyna, J. L. Crossley, T. T. Binh, and **S. E. Bush**. 2013. Morphological and molecular differentiation of two new species of *Pseudoacanthocephalus* Petrochenko, 1958 (Acanthocephala: Echinorhynchidae) from amphibians and reptiles in Philippines, with identification keys for the genus. *Systematic Parasitology* 85:11-26. [PDF](#)

35. Hastriter, M. W., and **S. E. Bush**. 2013. Description of *Lentistivalius philippinensis*, a new species of the flea (Siphonaptera: Pygiosyllomorpha: Stivalidae), and new records of the Ascodipterinae (Streblidae) on small mammals and bats from the Philippines. *Zookeys* 260:17-30. [PDF](#)
34. **Bush, S. E.**, S. M. Villa, T. J. Boves, D. Brewer, and J. R. Belthoff. 2012. Influence of bill and foot morphology on the ectoparasites of Barn Owls. *Journal of Parasitology* 98:256-261. [PDF](#)
33. Lisistyna, O. I., V. V. Tkach, and **S. E. Bush**. 2012. New records of Acanthocephalans from birds in the Philippines with a description of a new *Porrorchis* species and identification keys for the genus. *Journal of Parasitology* 98:1176-1184. [PDF](#)
- ◆ **Journal cover article**
32. **Bush, S. E.** and R. G. Robbins. 2012. New host and locality records for *Ixodes simplex* Neumann and *Ixodes vespertilionis* Koch (Acari: Ixodidae) from bats (Chiroptera: Hipposideridae, Rhinolophidae, and Vespertilionidae) in southern China. *International Journal of Acarology* 38:1-5. [PDF](#)
- ◆ **Journal cover article**
31. Kuzmin, Y., V. V. Tkach, and **S. E. Bush**. 2012. A new species of *Rhabdias* (Nematoda: Rhabdiasidae) from Agamid Lizards in Luzon Island, Philippines. *Journal of Parasitology* 98: 608-611. [PDF](#)
30. **Bush, S. E.**, A. N. Rock, S. L. Jones, J. R. Malenke, D. H. Clayton. 2011. Efficacy of the LouseBuster, a new medical device for treating head lice. *Journal of Medical Entomology* 48: 67-72. [PDF](#)
29. Johnson, K. P., J. D. Weckstein, **S. E. Bush**, and D. H. Clayton. 2011. The evolution of host specificity in dove body lice. *Parasitology* 138:1730-1736. [PDF](#)
28. **Bush, S. E.**, D. Kim, M. Reed, and D. H. Clayton. 2010. Evolution of cryptic coloration in ectoparasites. *American Naturalist* 176:529-535. [PDF](#)
27. Clayton, D. H., Koop, J. A., Harbison, C. W., Moyer, B. R., and **S. E. Bush**. 2010. How birds combat ectoparasites. *Open Ornithology Journal* 3:41-71. [PDF](#)
26. Hastriter, M.W. and **S.E. Bush**. 2010. Notes and new records of fleas (Insecta: Siphonaptera) from small mammals and birds collected in southern China. *Proceedings of the Entomological Society of Washington* 112:214-228. [PDF](#)
25. Tkach, V. V. and **S. E. Bush**. 2010. *Serpentoanisocladium sinensis* n. gen., n. sp. (Digenea: Cryptogonimidae) from the Eastern Water Snake *Sinonatrix percarinata* (Serpentes: Colubridae) in Guizhou Province, China. *Systematic Parasitology* 76:205-210. [PDF](#)
24. **Bush, S. E.** 2009. Does microhabitat flexibility facilitate host switching by parasites? *Functional Ecology* 23: 578-586. [PDF](#)
23. **Bush, S. E.**, C. W. Harbison, D. Slager, A. T. Peterson, R. D. Price, and D. H. Clayton. 2009. Geographic variation in the community structure of lice on Western Scrub-jays. *Journal of Parasitology* 95:10-13. [PDF](#)
22. **Bush, S. E.**, R. D. Price, and D. H. Clayton. 2009. Descriptions of eight new species of feather lice in the genus *Columbicola* (Phthiraptera: Philopteridae), with a comprehensive world checklist. *Journal of Parasitology* 95:286-294. [PDF](#)
21. M. W. Hastriter, **S.E. Bush**, K. Dittmar, S. S. Hla Bu, and M. F. Whiting. 2009. *Nycteridopsylla quadrispina* Lu and Wu, a junior synonym of *Nycteridopsylla iae* Beaucournu and Kock (Siphonaptera: Ischnopsyllidae) as determined by DNA analysis. *Proceedings of the Entomological Society of Washington* 111: 598-602. [PDF](#)
20. **Bush, S. E.**, D. W. Duszynski, and B. B. Nickol. 2009. Acanthocephala from amphibians in China with description of a new species of *Pseudoacanthocephalus*. *Journal of Parasitology* 95:1440-1445. [PDF](#)
19. **Bush, S. E.** and J.R. Malenke. 2008. Host defense mediates interspecific competition in parasites. *Journal of Animal Ecology* 77: 558-564. [PDF](#)
18. Harbison, C. W., **S. E. Bush**, J. R. Malenke, D. H. Clayton. 2008. Comparative transmission dynamics of competing parasite species. *Ecology* 89: 3186-3194. [PDF](#)
17. Peterson, A. T., **S. E. Bush**, E. Spackman, D. E. Swayne, and H. Ip. 2008. Influenza A Virus Infections in Land Birds, People's Republic of China. *Emerging Infectious Diseases* 14: 1644-1646. [PDF](#)
16. Clayton, D. H., R. J. Adams and **S. E. Bush**. 2008. Phthiraptera, the Chewing Lice. Pp. 515-526 in C. T. Atkinson, N. J. Thomas, and D. B. Hunter (eds). *Parasitic Diseases of Wild Birds*. Wiley-Blackwell, Ames, Iowa.

15. Peterson, A. T., T. Brooks, A. Gamauf, J. C. T. Gonzalez, N. A. D. Mallari, G. Dutson, **S. E. Bush**, D. H. Clayton and R. Fernandez. 2008. The avifauna of Mt. Kitanglad, Bukidnon Province, Mindanao, Philippines. *Fieldiana: Zoology* 114: 1-43. [PDF](#)
14. **Bush, S. E.** and D. H. Clayton. 2006. The role of body size in host specificity: reciprocal transfer experiments with dove lice. *Evolution* 60: 2158-2167. [PDF](#)
13. Goates, B. M., J. S. Atkin, K. G. Wilding, K. G. Birch, M. R. Cottam, **S. E. Bush**, and D. H. Clayton. 2006. An effective non-chemical treatment for head lice: a lot of hot air. *Pediatrics* 118: 1962-1970. [PDF](#)
12. **Bush, S. E.**, and R. D. Price. 2006. Reconsideration of the *longiceps* species group of the feather louse genus *Columbicola* (Phthiraptera: Philopteridae) with descriptions of two new species. *Journal of Parasitology* 92:949-952. [PDF](#)
11. **Bush, S. E.**, D. Kim, J. Lever, B. R. Moyer and D. H. Clayton. 2006. Is melanin a defense against feather-feeding lice? *Auk* 123:153-161. [PDF](#)
10. **Bush, S. E.**, E. Sohn and D. H. Clayton. 2006. Ecomorphology of parasite attachment: experiments with feather lice. *Journal of Parasitology* 92:25-31. [PDF](#)
9. Hastriter, M. W. and **S. E. Bush**. 2006. Description of *Maabella stomalata*, n. gen., n. sp. (Diptera: Streblidae: Ascodipterinae) from Guangxi Province, China and Vietnam with notes on the preservation of Ascodipterinae. *Zootaxa* 1176:27-40. [PDF](#)
8. Robbins, R.G. and **S.E. Bush**. 2006. First report of *Amblyomma papuanum* Hirst (Acari: Ixodida: Ixodidae) from the dwarf cassowary, *Casuarius bennetti* Gould (Aves: Struthioniformes: Casuariidae), with additional records of parasitism of *Casuarius spp.* by this tick. *Proceedings of the Entomological Society of Washington* 108:1002-1004. [PDF](#)
7. Price, R. D., D. C. Arnold, and **S. E. Bush**. 2006. Five new species of *Myrsidea* (Phthiraptera: Menoponidae) from Asian Babblers (Passeriformes: Timaliidae). *Journal of the Kansas Entomological Society* 79:369-377. [PDF](#)
6. Clayton, D. H., B. R. Moyer, **S. E. Bush**, D. Gardiner, B. Rhodes, T. Jones and F. Goller. 2005. Adaptive significance of avian beak morphology for ectoparasite control. *Proceedings of the Royal Society of London: B*. 272: 811-817. [PDF](#)
5. Johnson, K.P., **S.E. Bush**, D.H. Clayton. 2005. Correlated evolution of host and parasite body size: tests of Harrison's rule using birds and lice. *Evolution* 59: 1744-1753. [PDF](#)
4. Price, J. J., K. P. Johnson, **S. E. Bush**, and D. H. Clayton. 2005. Phylogenetic relationships of the Papuan Swiftlet *Aerodramus papuensis* and implications for the evolution of avian echolocation. *Ibis* 147: 790-796. [PDF](#)
3. Clayton, D. H., **S. E. Bush** and K. P. Johnson. 2004. The ecology of congruence: Past meets present. *Systematic Biology* 53:165-173. [PDF](#)
2. Clayton, D. H., **S. E. Bush**, B. M. Goates and K. P. Johnson. 2003. Host defense reinforces host-parasite cospeciation. *Proceedings of the National Academy of Sciences* 100:15694-99. [PDF](#)
1. Clayton, D. H., **S. E. Al-Tamimi [Bush]**, and K. P. Johnson. 2003. The ecological basis of coevolutionary history. Pp. 310-341 in R. D. M. Page (ed.) *Tangled Trees: phylogeny, cospeciation, and coevolution*. University of Chicago Press, Chicago, Illinois. [PDF](#)

Popular press & textbook coverage of published research:

- Topic - evolution of cryptic coloration in ectoparasites (Bush et al. 2010. Am. Nat.):* featured in *New York Times*, *Science Times*, *Nature*, *Science NOW*, *Science Year - World Book*, *Evolutionary Analysis* (textbook by Herron & Freeman) and *Evolution: Making Sense of Life* (e-text by Zimmer & Emlen).
- Topic - evolutionary ecology of hosts and parasites (Bush & Clayton 2006. Evol. and Clayton, Bush, et al. 2003. PNAS):* featured in *New York Times*, *Japan Times*, *Evolution* (textbook by Bergstrom & Dugatkin), *Evolution* 2nd ed. (textbook by Futuyma), *Evolutionary Analysis* 4th ed. (textbook by Freeman and Heron)

Recent invited talks and seminars:

- 2019: University of Bahamas, Department of Life Sciences (fall semester 2019)
- 2019: Guangdong Institute of Biological Resources, Guangzhou, China (summer 2019)
- 2017: Royal Society, Kavali Royal Society Centre, Chicheley, England. Symposium Speaker.
- 2017: Pennsylvania State University, Department of Entomology. Research Seminar
- 2017: University of Alberta, Edmonton, Canada, Department of Biological Sciences, Research Seminar.
- 2016: University of Illinois, Champaign-Urbana, Illinois Natural History Survey, Research Seminar.
- 2015: College of Science Day - November 2015, University of Utah.
- 2015: Hungarian Natural History Museum, Budapest, Hungary, Research Seminar.
- 2015: Utah State University, Ecology Center. Public Seminar.
- 2015: Utah State University, Ecology Center. Research Seminar.
- 2015: Washington State University, Department of Entomology, March 2015. Research Seminar .
- 2015: University of North Dakota, Department of Biology, January 2015. Research Seminar.
- 2014: University of Southern Mississippi Gulf Coast Research Laboratory, Department of Coastal Sciences, Research Seminar.
- 2014: Utah Coalition of Reason & Humanists of Utah's "Darwin Day: A celebration of science", Keynote Address.
- 2014: Symposium in Honor of Dr. Roger D. Price. 5th International Conference on Phthiraptera, Park City, Utah.
- 2013: Avian Parasites: models for understanding processes and patterns of diversification. American Ornithologists' Union. Symposium co-organizer and speaker.
- 2012: University of the Philippines- Dilliman. Manila, Philippines. Research Seminar.

Service:

University Service:

- 2017 - 2020: (Elected) Academic Senator, University of Utah
- 2015 - 2017: (Elected) College of Science Council Member, University of Utah
- 2011-- (Appointed) Rio Mesa Center Advisory Committee Member, University of Utah

School of Biological Sciences Service:

- 2017 - Curriculum reform taskforce
- 2018 - SoBS website committee
- 2016 - 2017: Development and award committee (Chair)
- 2015 - 2016: Biology undergraduate research advisory committee
- 2014 - 2015: Seminar committee
- 2010 - 2014: Communications committee

Service to Scientific Societies and Institutions:

- 2018 - 2022: (Elected) President, International Society of Phthirapterists
- 2016 - 2020: (Elected) Council Member-at-Large, American Society of Parasitologists
- 2018: (Appointed) Member, American Ornithological Society Nominations Committee
- 2014 - 2018: (Elected) Executive Committee Councilor, International Society of Phthirapterists
- 2015, 2017: NSF panelist
- 2013 - 2014: (Elected) Chair of Nomination Committee, American Society of Parasitologists
- 2012 - 2014: Co-organizer, 5th International Conference on Phthiraptera, held in Park City in 2014, UT.
- 2010 - 2013: Student Awards Committee Member, American Society of Parasitologists
- 2007 - 2010: Question writer for the Biology GRE
- 2006-- Grant reviewer for: NSF, Marsden (New Zealand grant agency), Graduate Women In Science, University of Utah Undergraduate Research Program, and the Global Change and Sustainability Center.
- 2004-- Manuscript reviewer for: *Auk*, *Behavioral Ecology*, *Canadian Entomol.*, *Evolution*, *Evolutionary Ecology*, *Functional Ecology*, *Int. Journal of Acarology*, *Journal of Animal Ecology*, *Journal of Avian Biology*, *Journal of Parasitology*, *Journal of Medical Entomology*, *Oecologia*, *Oikos*, *Molecular Ecology*, *Molecular Phylogenetics and Evolution*, *Parasitology*, *Parasitology Research*, *Proceedings of the Royal Society, B.*, *Zootaxa*, and others.

1999-- Museum specimen collection and preparation: Hundreds of parasite samples deposited in collections worldwide, including: lice, fleas, flies, ticks, mites, acanthocephalans, cestodes, nematodes, trematodes, haematozoans, viruses, and other misc. parasites and pathogens. Birds: >300 skins, skeletons and anatomicals deposited in the Field Museum (IL), Kansas Museum of Natural History, Utah Museum of Natural History, Guangxi Provincial Museum (China), the Philippine National Museum, and the National Museum of Papua New Guinea.

Public Outreach

2012 - 2018: Presentations with interactive activities at SLC elementary schools covering topics of parasitism, evolution, ecology, and field biology. Beacon Heights, Bonneville Elementary, Dilworth Elementary Community, Community Cooperative Nursery School, and Uintah Elementary.

2015 -- Educational lab tours for youth groups (Summer camps at the Natural History Museum of Utah).

2013-- Teaching Toolbox designed, demonstrated and constructed for the Natural History Museum of Utah. The toolbox is a series of educational modules with specimens, lesson plans and interactive activities based on inquiry based learning protocols. This toolbox is freely available to any educator (K-12) in the state of Utah. <http://nhmu.utah.edu/educators/teaching-toolboxes>

2013 - 2014: Workshops for Salt Lake City School Board, Extended Learning Program Educators (K-12): "Evolutionary lessons for Utah students" and "Using the Parasite Teaching Toolbox", Natural History Museum of Utah

2010: Contributed information and photos to "Dirty and Dangerous Jobs: Parasite Collector" by J. Cohn (Marshall Cavendish Publishing, 2010).

Trainees:

Postdoctoral Associates

2016-- Scott M. Villa, Ph.D., Experimental adaptive radiation: genomics of diversification in bird lice

2012 -- 2017 Daniel R. Gustafsson, Ph.D., Biodiversity of ectoparasitic lice on songbirds

Ph.D. Students

2017-- **Emiko Waite** (co-advised), Coevolution of hosts and parasites.

2016-- **Jordan Herman** (co-advised), Bird-parasite interactions.

2014-- **Graham Goodman** (co-advised), Host-parasite behavioral ecology.

2012- 2018 **Sabrina McNew** (co-advised), Evolutionary ecology of avian blood parasites. (Now a postdoc at Cornell Laboratory of Ornithology, New York)

2012- 2018 **Andrew Bartlow** (co-advised), Parasite diversity in changing environments. (Now a postdoc at Los Alamos National Laboratory, New Mexico)

2011- 2018 **Emily DiBlasi** (advisor), Influence of dispersal on host and parasite population genetic structure. (Now a postdoc at University of Utah School of Medicine, Department of Psychiatry, Utah)

2010 - 2016: **Scott M. Villa** (co-advised) Dissertation: Evolutionary ecology of parasite diversification: experiments with pigeons and their ectoparasites. Ph.D. Defense: 8/2016. (Now a FIRST postdoctoral fellow at Emory University, Georgia)

Other Graduate Students

2014- 2018: Committee chair for five students in the Masters of Science for Secondary School Teachers (MSSST) program: Cameron Dixon (2018), Sarah Conner (2018), Matthew Reynolds (2016), Scott Ripple (2016), and Amanda Johnson (2014)

2010-2018: Served on graduate committee of three students in the College of Science: Payel Kar (2017, Ph.D., Physics & Astronomy), Douglas Cornwall (2015-2017, Ph.D. Biology), Craig Gritzen (2010-2012, M.S. Biology),

Undergraduate Research Associates

2010 - 2018: Mentor to 22 undergraduate students at the University of Utah, 11 of which have co-authored papers.