

# Curriculum Vitae of Samuel Bolton

## Synopsis

Mite morphologist with skills in the following areas: taxonomy, phylogenetics, functional morphology, segmental homology, 3D models, scientific animation, and outreach.

Highlights of recently published research:

- A [shared body plan for all mites and other arachnids](#).
- The [phylogenetic position](#) of [Eriophyoidea](#) (gall mites).
- The use of non-fungible tokens (NFTs) as a [funding mechanism](#) for taxonomic research and 3D digitization of natural history collections.
- Conspicuity of [spider mites described as different species](#).
- Synonymized the genus [Speleorchestes](#) with [Caenonychus](#).

Current research:

- The mouthpart morphology of basal acariform mites, especially functional morphology.
- The use of 3D digitization to determine novel diagnostic characters in spider mites.
- The taxonomy of Endeostigmata (basal Acariformes)

## Employment

- May 2017 – present: Division of Plant Industry, Florida Department of Agriculture and Consumer Services (FDACS).
  - May 2017 – Apr 2022: Biological Scientist IV: IDs, especially mites on plants; curation of the FSCA mite collection; research on taxonomy, morphology and systematics of mites.
  - Apr 2022 – present: Research Scientist: Same duties as Biological Scientist IV but with greater emphasis on research.
- Aug 2016 – Apr 2017: Department of Entomology, University of Arkansas, USA.  
Postdoc: lecturing *Introduction to Entomology* (100 students); research on the morphology, taxonomy and phylogenetics of Acariformes.
- Oct 2009 – Apr 2015: Teaching and Research Associate (during PhD) at the Department of Evolution, Ecology and Organismal Biology, Ohio State University, USA.
- Oct 2007 – Sep 2008: See education.
- Jan 2004 – Apr 2007 National Museum of Wales, Cardiff, UK.  
Freshwater entomologist: IDs and survey reports (mostly Chironomidae); training parataxonomists.
- Nov 2002 – Jan 2004 Microbee Pest Control, London, UK.  
Company Biologist at an urban pest control company: training and managing technicians; managing and setting up contracts for clients; insect and mite IDs; treatments and inspections

## Education

- Sep 2009 – May 2016 PhD in acarology (GPA: 4.0) at the Ohio State University, Columbus, Ohio, USA  
Dissertation on morphology and systematics of Nematolycidae.
- Oct 2007 – Sep 2008 MRes in Biosystematics (Merit) at Imperial College, London, UK.
- Oct 2000 – Sep 2001 MSc in Applied Entomology (Pass) at Imperial College, London, UK.
- Sep 1996 – Jul 2000 BSc in Bioarchaeology) (First-class honours) University of Bradford, Yorkshire, UK.
- **Academic Publications**

- Klimov, P.B., Chetverikov, P.E., Dodueva, I.E., Vishnyakov, A.E., Bolton, S.J., Paponova, S.S., Lutova, L.A., Tolstikov, A.T. 2022. Symbiotic bacteria of the gall-inducing mite *Fragiariocoptes setiger* (Eriophyoidea) and phylogenomic resolution of the eriophyoid position among Acari. *Scientific Reports*, **12**, 3811.
- Bolton, S.J. 2022. *Proteonematalycus wagneri* Kethley reveals where the opisthosoma begins in acariform mites. *PLoS ONE*, **17**, e0264358.
- Sharkey, E.R., Beaulieu, F., Moore, M.R., Bolton, S.J. 2022. Morphological and molecular data reveal the conspecificity of the spider mites *Tetranychus gloveri* and *T. okinawanus* (Acari: Trombidiformes: Tetranychidae). *Systematic and Applied Acarology*, **27**, 250–268.
- Bolton, S.J. & Bauchan, G.R. 2022. *Caenonychus*, a senior synonym of *Speleorchestes* (Acariformes: Nanorchestidae). *Systematic and Applied Acarology*, **27**, 241–249.
- Bolton, S.J. & Cora, J.R. 2021. Virtual Equivalent of Real Objects (VEROs): A type of non-fungible token (NFT) that can help fund the 3D digitization of natural history collections. *Megataxa*, **6**, 93–95.
- Chetverikov, P.E., Craemer, C., Cvrković, T., Klimov, P.B., Petanović, R., Romanovich, A.E., Sukhareva, S.I., Zukoff, S.N., Bolton, S.J. & Amrine, J. 2021. Molecular phylogeny of the phyt parasitic mite family Phytoptidae (Acariformes: Eriophyoidea) identified the female genitalic anatomy as major macroevolutionary factor and revealed multiple origins of gall induction. *Experimental and Applied Acarology*, **83**, 31–68.
- Fife, A., Bolton, S., Griesheimer, J., Paret, M. & Martini, X. 2020 First report of *Phyllocoptes fructiphilus* Keifer (Eriophyidae), the vector of the rose rosette virus, in Florida, USA. *Florida Entomologist*, **103** 411–414.
- Carrillo, D., Cruz, L.F., Revynthi, A.M., Duncan, R.E., Bauchan, G.R., Ochoa, R., Kendra, P.E. & Bolton, S.J. 2020. Detection of the Lychee Erinose Mite, *Aceria litchi* (Keifer) (Acari: Eriophyidae) in Florida, USA: A comparison with other alien populations. *Insects*, **11**, 235.
- Chetverikov, P.E., Bolton, S.J., Burlakovskiy, M.S., Craemer, C., Efimov, P.G., Klimov, P., Nesor, S., Papanova, S.S., Romanovich, A., Sukhareva, S.I. & Amrine, J. 2019. Supplementary descriptions and DNA barcodes of two rarely encountered *Trisetacus* species (Eriophyoidea, Phytoptidae) associated with Tertiary relict conifers from the Mediterranean region. *Systematic and Applied Acarology*, **24**, 1631-1652.
- Chetverikov, P.E., Desnitskaya, E.A., Efimov, P.G., Bolton, S.J., Cvrkovic, T., Petanovic., R.U., Zukoff, S., Amrine, J.W., Jr. & Klimov, P. 2019. The description and molecular phylogenetic position of a new conifer-associated mite, *Setoptus tsugivagus* n. sp. (Eriophyoidea, Phytoptidae, Nalepellinae). *Systematic and Applied Acarology* **24**, 683-700.
- Chetverikov, P.E., Bolton, S.J., Gubin, A.I., Letukhova, V.Y., Vishnyakov, A.E. & Zukoff, S. 2019. The anal secretory apparatus of Eriophyoidea and description of *Phyllocoptes bilobospinosus* n. sp. (Acariformes: Eriophyidae) from Tamarix (Tamaricaceae) from Ukraine, Crimea and USA. *Systematic and Applied Acarology* **24**, 139-158.
- Gulbranson, C.J., Mowery, J., Pooley, C., Ochoa, R. Bolton, S. & Bauchan, G. 2018. Three-dimensional printing of agriculturally important mites generated from confocal microscopy. *Microscopy and Microanalysis* **24**, 1360-1361.
- Bolton, S.J., Bauchan, G.R., Chetverikov, P.E., Ochoa, R. & Klompen, H. 2018. A rudimentary sheath for the smallest of “biting” chelicerae: the mouthparts of *Cunliffea* (Nematalycidae) and a new hypothesis on the origin of the stylet sheath of Eriophyoidea (Acariformes). *International Journal of Acarology* **44**, 374-381.
- Demite, P.R., da Cruz, W.P., Bolton, S. & de Moraes, G.J. 2018. Redescription of *Honduriella maxima* Denmark & Evans (Acari: Mesostigmata: Phytoseiidae), description of a new species of *Honduriella* Denmark & Evans from the Amazonian Forest, and a modified characterisation of the genus. *Zootaxa* **4442**, 331-337.
- Klimov, P.B., OConnor, B.M. Chetverikov, P.E., Bolton, S.J., Pepato, A.R., Mortazavi, A.L., Tolstikov, A.V., Bauchan, G.R. & Ochoa, R. 2018. Comprehensive phylogeny of acariform mites (Acariformes) provides insights on the origin of the four-legged mites (Eriophyoidea), a long branch. *Molecular phylogenetics and Evolution* **119**, 105-117.

- Chetverikov, P.E., Craemer, C. & Bolton, S. 2017. Exoskeletal transformations in Eriophyoidea: new pseudotagmic taxon *Pseudotagmus africanus* n. g. & n. sp. from South Africa and remarks on pseudotagmosis in eriophyoid mites. *Systematic and Applied Acarology* 22, 2093-2118.
- Bolton, S.J., Chetverikov, P.E. & Klompen, H. 2017. Morphological support for a clade comprising two vermiform mite lineages: Eriophyoidea (Acariformes) and Nematalycidae (Acariformes). *Systematic & Applied Acarology* 22, 1096-1131.
- Chetverikov, P.E. & Bolton, S. 2016. Suboral fork: a newly discerned gnathosomal structure from the proboscis of eriophyoid mites (Acari, Eriophyoidea). *Experimental and Applied Acarology* 70, 137-153.
- Pflegler, W.P. & Bolton, S.J. 2016. Two new families (Acari: Alicorhagiidae and Platyhelminthes: Prorhynchidae) reported for Hungarian fauna from leaf litter in the Bükk mountains. *Opuscula Zoologica Budapest* 47, 131-136.
- Bolton, S.J., Bauchan, G.R., Ochoa, R. & Klompen, H. 2015. A novel fluid-feeding mechanism for microbivory in the Acariformes (Arachnida: Acari). *Arthropod Structure and Development* 44, 313-325.
- Bolton, S.J., Bauchan, G.R., Ochoa, R., Pooley, C. & Klompen, H. 2015. The role of the integument with respect to different modes of locomotion in the Nematalycidae (Endeostigmata). *Experimental & Applied Acarology* 65, 149-161.
- Bolton, S.J., Klompen, H., Bauchan, G.R. & Ochoa, R. 2014. A new genus and species of Nematalycidae (Acari: Endeostigmata). *Journal of Natural History* 48, 1359-1373.
- Spies, M. & Bolton, S.J. 2013. On the first record from Britain of *Parachironomus elodeae* (Diptera, Chironomidae). *Dipterists digest* 20, 79-85.
- Walter, D.E., Bolton, S., Uusitalo, M. & Zhang, Z.-Q. 2011. Suborder Endeostigmata Reuter, 1909. In: Zhang Z-Q, editor. Animal biodiversity: An outline of higher-level classification and survey of taxonomic richness. *Zootaxa*, 139-140.
- Bolton, S.J., Macleod, N. & Edgecombe, G.D. 2009. Geometric approaches to the taxonomic analysis of centipede gonopods (Chilopoda: Scutigermorpha). *Zoological Journal of the Linnean Society* 156, 239-259.

## Outreach Publications

- Bolton, S.J. 2022. Mite-y waist: Correcting a 60-year error in mite morphology. *Entomology Today*. [Mite-y Waist: Correcting a 60-Year Error in Mite Morphology \(entomologytoday.org\)](https://entomologytoday.org/2022/09/16/mite-y-waist-correcting-a-60-year-error-in-mite-morphology/)
- Bolton, S.J. 2021. Could NFTs fund the discovery of new insect species? *Entomology Today*. Complete URL: <https://entomologytoday.org/2021/09/16/non-fungible-tokens-fund-discovery-new-insect-species/>
- Bolton, S.J. 2017. More Than 70 New Species of Water Mites Discovered via DNA and Color Markings. *Entomology Today*. Complete URL: <https://entomologytoday.org/2017/10/09/more-than-70-new-species-of-water-mites-discovered-via-dna-and-color-markings/>
- Bolton, S.J. 2017. A new taxon for worm-like mites: Eriophyoidea and Nematalycidae. *Entomology Today*. Complete URL: <https://entomologytoday.org/2017/08/01/a-new-taxon-for-worm-like-mites-eriophyoidea-and-nematalycidae/>
- Bolton, S.J. 2016. Escaping 2D. *OSU Bio Museum* – Blog of Museum of Biological Diversity. Complete URL: <https://u.osu.edu/biomuseum/2016/01/25/escaping-2d/>
- Bolton, S.J. 2015. In a desert, manners maketh mites: A new and unusual type of microbivory. *Entomology Today*. Complete URL: <http://entomologytoday.org/2015/06/03/in-a-desert-manners-maketh-mites-a-new-and-unusual-type-of-microbivory/>
- Bolton, S.J. 2014. Different modes of locomotion discovered in worm-like mites. *Entomology Today*. Complete URL: <http://entomologytoday.org/2014/11/04/different-modes-of-locomotion-discovered-in-worm-like-mites/>
- Bolton, S.J. 2014. New species of bizarre, worm-like mite discovered on Ohio State University Campus. *Entomology Today*. Complete URL: <http://entomologytoday.org/2014/02/20/new-species-of-bizarre-worm-like-mite-discovered-on-ohio-state-university-campus/>

## **Outreach activities**

- 2009 – 2016: Helped to organize and staff the main display of the Acarology Lab for the annual open day of the Museum of Biological Diversity (Ohio State University).
- 2018 – Present: Responsible for organizing the Entomology section's (FDACS) main outreach activity, which is a staffed display at Insect Encounters, Tampa State Fair.
- 2019 – present: Responsible for the Entomology section's contributions to the social media sites (Facebook, Twitter, etc.).

## **Organized Symposia**

- Mite Evolution. 2019. Member symposium of the Acarological Society of America (ASA) at the Annual Meeting of the Entomological Society of America, Saint Louis, Missouri, USA. Organizers: Bolton, S.J., Fisher, J.R. and Brückner, A.
- Current Advances in Acarology. 2019. Organized meeting of the Acarological Society of America (ASA) at the Annual Meeting of the Entomological Society of America, Saint Louis, Missouri, USA. Organizers: Farfan, M. and Bolton, S.J.
- Soil Mites: Minute Arthropods with a Monumental Role. 2018. Member symposium of the Acarological Society of America (ASA) at the Annual Meeting of the Entomological Society of America, Vancouver, British Columbia, Canada. Organizers: Lindo, Z., Bolton, S.J. and Farfan, M.

## **Teaching and Instructing**

- Teach Eriophyoidea (gall mites) for an annual Agricultural Acarology Workshop organized by the University of Florida (2022).
- Mite identification for a biennial graduate course (2017, 2019, 2021), Insect Diagnostics ENY 6942, University of Florida.
- Teach mite identification and symptoms to the new inspectors of the Division of Plant Industry (FDACS) (2017–present).
- Identification and taxonomy of Endeostigmata and introductory Acariformes for a biennial soil acarology course (2012, 2014, 2016, 2018), Acarology Summer Program (international taxonomic workshop), Ohio State University (cancelled since 2020 due to COVID-19).
- Lectured an undergraduate course (2016): Introduction to Entomology, University of Arkansas.
- Teaching associateships at Ohio State University (2009 – 2011; 2014 – 2015): acarology; animal form and function; ecology; evolution.

## **Governing and Editorial**

- President of the Acarological Society of America, Nov 2018 to Nov 2019
- President elect (Vice President) of the Acarological Society of America, Nov 2017 to Nov 2018
- General board member of the Acarological Society of America, Sep 2016 to Nov 2017
- Serving on the Scientific Committee of the International Congress of Acarology, 2022.
- Editorial board of the International Journal of Acarology (mite morphology) since 2017.

## **Fellowships and Studentships**

- Presidential fellowship at Ohio State University: May 2015 – Apr 2016
- Smithsonian pre-doctoral fellowship: Feb 2013 – Nov 2013
- Biotechnology and Biological Sciences Research Council Studentship: Oct 2000 – Sep 2001