Mark St. John

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Education

2005 ***Ph. D., Ecology*** (D. H. Wall, advisor)
Colorado State University, Fort Collins, Colorado, USA.

1998 ***Master of Science, Biology*** (J. D. Shorthouse, advisor)
Laurentian University, Sudbury, Ontario, Canada.

1994 ***Bachelor of Science, Honours, Biology***
Carleton University, Ottawa, Ontario, Canada.

Professional experience

2012–present Visiting scientist, Agriculture and Agri-food Canada. Co-authored manuscripts for publication. Managed ecosystem datasets. Conducted statistical analysis of ecosystem data. Invited to (Leipzig, Germany) and co-organized (Dijon, France) Global Soil Biodiversity Initiative workshops to establish a framework for the management of global soil biodiversity data. Trained Colorado State University researchers in invertebrate biodiversity data collection, soil ecology, and data management and analytics. Advised University of Alaska researchers on soil biodiversity methods.

2007–2012 Scientist, Landcare Research NZ. Researched biodiversity conservation, ecosystem restoration, nutrient cycling and carbon sequestration in native and invaded New Zealand terrestrial ecosystems with a focus on soil invertebrates (insects, mites and nematodes). Led the development of an integrated expert-metagenomics-database system for rapid species-level identification of soil invertebrate communities. Developed R code to automate the correction of common data entry errors in biodiversity databases. Led and participated in field campaigns for the collection of invertebrate samples and plot data involving access to remote locations by foot, 4WD vehicles, boats and aircraft, and overnight camping. Successfully developed and co-developed research funding proposals. Managed multiple projects and staff.

2007 Postdoctoral researcher, Agriculture and Agri-food Canada. Investigated methods for molecular probing of agricultural soils for the presence of known arthropod species. Performed species-level identifications of soil arthropods. (With V. M. Behan-Pelletier, principal investigator).

2005–2007 Instructor, Nipissing University and Laurentian University. Developed and taught undergraduate courses in entomology and graduate courses in ecology. Co-organized graduate program promotional materials and events. Advised on the development of university partnerships with government agencies.

2003–2007 Scientific consultant. Analysed data and reported on soil biology and ecological

processes as part of an ecological risk assessment of an industrially altered landscape for Gartner Lee Ltd., ***Sudbury Soils Study***. Provided expertise in biodiversity assessments, soil invertebrates, experimental design, research methods, data management, multivariate data analysis and data interpretation for Colorado State University.

2001–2004 Graduate fellow, Cary Institute of Ecosystem Studies, ***Ecological Circuitry Collaboratory*** (ECC). Trained in multiple ecological modeling and data analysis approaches. Collaboratively developed a biogeochemical model of continental mercury cycling. Independently developed a model selection approach for biodiversity and ecosystem functioning studies. (With H. A. Ewing and P. M. Groffman, principal investigators).

1999–2004 Graduate research assistant, Natural Resource Ecology Laboratory, Colorado State University, ***Identifying Ecosystem Controls on Biodiversity***. Researched soil invertebrates and their relationship to native and invasive alien plants and ecosystem functioning in tallgrass prairie. Trained and supervised research assistants. (With D. H. Wall, advisor).

1998 Research assistant, Natural Resource Ecology Laboratory, Colorado State University. Sampled and chemically analyzed soils, managed and analyzed data, and assisted with manuscript preparation for projects investigating effects of elevated atmospheric CO_2 on soils, distributions of agricultural pests, and trophic relationships in Antarctic dry valleys. (With D. H. Wall and A. N. Parsons, supervisors).

1997–1998 Research associate, Laurentian University and Agriculture & Agri-food Canada, ***Mite Biodiversity as a Measure of Ecosystem Sustainability on Restored Mine Tailings***. Co-designed experimental approach, sampled, identified and curated soil invertebrates, analyzed soil chemistry, managed and analyzed data, and interpreted results for publication. (With J. D. Shorthouse and G. Bagatto, principal investigators).

1994–1997 Graduate teaching assistant, Department of Biology, Laurentian University. Taught prepared laboratories, graded assignments and lectured on an ad hoc basis. Courses included Entomology, Forest Entomology, Canadian Environmental Biology and Introductory Biology. (With L. Brosseau, coordinator).

1993–1994 Research associate, Canadian Forest Service. Designed and managed projects testing the effectiveness of biological control agents against forestry pests. (With R. Bourchier , S. M. Smith and D. B. Lyons, principal investigators).

Awards and competitive funding

2011–2013	Capability Fund, Landcare Research. $500 000 NZD.
2001–2004	Ecological Circuitry Collaboratory Fellowship, National Science Foundation. $300,000 USD.
2002	Graduate Student of the Year, Natural Resource Ecology Laboratory.
2000	Francis and Evelyn Clark Soil Biology Scholarship, Colorado State University. $2600 USD.
1995	Student Travel Award, Entomological Society of Ontario. $250 CND.
1995–1996	Summer Research Fellowship, Laurentian University. $2,500 CND.
1994	Dean's List, Carleton University.

Refereed publications and book chapters

Dickie, I. A. and **M. G. St. John**. 2016. ***Second-generation molecular understanding of mycorrhizas in soil ecosystems***. In: F. Martin (ed.), Pages 473–491. Molecular Mycorrhizal Symbiosis. Wiley & Sons, Hoboken, New Jersey.

Ramirez, K. S., M. Döring, N. Eisenhauer, C. Gardi, J. Ladau, J. W. Leff, G. Lentendu, Z. Lindo, M. C. Rillig, D. Russell, S. Scheu, **M. G. St. John**, F. T. de Vries, T Wubet, W. H. van der Putten and D. H. Wall. 2015. Toward a global platform for linking soil biodiversity data. Frontiers in Ecology and Evolution 3:91.

Orwin, K. H., D. A. Wardle, D. R. Towns, **M. G. St. John**, P. J. Bellingham, C. Jones, B. M. Fitzgerald, R. G. Parrish and P. Lyver. 2015. ***Burrowing seabird effects on invertebrate communities in soil and litter are dominated by ecosystem engineering rather than nutrient addition***. Oecologia 180: 217–230.

Kardol, P., I. A. Dickie, **M. G. St. John**, S. W. Husheer, K. I. Bonner, P. J. Bellingham and D. A. Wardle. 2014. ***Soil-mediated effects of invasive ungulates on native tree seedlings***. Journal of Ecology 102:622–631.

Dickie, I. A., **M. G. St. John**, G. W. Yeates, C. W. Morse, K. I. Bonner, Kate Orwin, and D. A. Peltzer. 2014. ***Belowground legacies of*** Pinus contorta ***invasion and removal result in multiple mechanisms of invasional meltdown***. AoB Plants 6:1–15.

Forgie, S. A., **M. G. St. John**, and S. K. Wiser. 2013. ***Invertebrate communities and drivers of their composition on gravel beaches in New Zealand***. New Zealand Journal of Ecology 37: 95–104.

St. John, M. G., P. J. Bellingham, L. R. Walker, K. H. Orwin, K. I. Bonner, I. A. Dickie, C. W. Morse, G. W. Yeates and D. A. Wardle. 2012. ***Loss of a dominant nitrogen-fixing shrub in primary succession – consequences for plant and belowground communities***. Journal of Ecology 100:1074–1084.

Richardson, S. J., P. A. Williams, N. W. H. Mason, R. P. Buxton, S. P. Courtney, B. D. Rance, B. R. Clarkson, R. J. B. Hoare, **M. G. St. John**, and S. K. Wiser. 2012. ***Rare species***

drive local trait diversity in two geographically disjunct examples of a naturally rare alpine ecosystem in New Zealand. Journal of Vegetation Science 23: 626–639.

St. John, M. G., D. A. Crossley Jr., and D. C. Coleman. 2012. ***Microarthropods***. In: P. M. Huang, Y. Li, and M. E. Sumner, editors. Handbook of Soil Sciences, Vol. 1. Taylor and Francis, London.

Dickie, I. A., G. W. Yeates, **M. G. St. John**, B. A. Stevenson, J. T. Scott, M. C. Rillig, D. A. Peltzer, K. H. Orwin, M. U. F. Kirschbaum, J. E. Hunt, L. E. Burrows, M. M. Barbour, and J. Aislabie. 2011. ***Ecosystem service and biodiversity trade-offs in two woody successions***. Journal of Applied Ecology 48: 926–934.

Orwin, K. H., M. U. F. Kirschbaum, **M. G. St. John**, and I. A. Dickie. 2011. ***Organic nutrient uptake by mycorrhizal fungi enhances ecosystem carbon storage: a model-based assessment***. Ecology Letters 14: 493–502.

St. John, M. G., K. H. Orwin, and I. A. Dickie. 2011. ***No 'home' versus 'away' effects of decomposition found in a grassland–forest reciprocal litter transplant study***. Soil Biology & Biochemistry 43: 1482–1489.

Wall, D. H., M. A. Bradford, **M. G. St. John**, J. A. Trofymow, V. Behan-Pelletier, D. D. E. Bignell, J. M. Dangerfield, W. J. Parton, J. Rusek, W. Voigt, V. Wolters, H. Z. Gardel, F. O. Ayuke, R. Bashford, O. I. Beljakova, P. J. Bohlen, A. Brauman, S. Flemming, J. R. Henschel, D. L. Johnson, T. H. Jones, M. Kovarova, J. M. Kranabetter, L. Kutny, K. C. Lin, M. Maryati, D. Masse, A. Pokarzhevskii, H. Rahman, M. G. Sabara, J. A. Salamon, M. J. Swift, A. Varela, H. L. Vasconcelos, D. White, and X. M. Zou. 2008. ***Global decomposition experiment shows soil animal impacts on decomposition are climate-dependent***. Global Change Biology 14: 2661–2677.

Behan-Pelletier, V. M., **M. G. St. John** and N. Winchester. 2008. ***Canopy Oribatida: tree specific or microhabitat specific?*** European Journal of Soil Biology 44: 220–224.

St. John, M. G., D. H. Wall and V. M. Behan-Pelletier. 2006. ***Does grass species co-occurrence influence soil mite diversity?*** Ecology 87: 625–633.

St. John, M. G., D. H. Wall and H. W. Hunt. 2006. ***Are soil mite assemblages structured by the identity of native and invasive alien grasses?*** Ecology 87: 1314–1324.

Lavelle, P., D. E. Bignell, M. C. Austen, V. K. Brown, V. M. Behan-Pelletier, J. R. Garey, P. Giller, S. J. Hawkins, G. G. Brown, **M. G. St. John**, H. W. Hunt and E. A. Paul. 2004. ***Connecting soil and sediment biodiversity: the role of scale and implications for management***. In: D. H. Wall (ed.), Pages 193–224, Sustaining biodiversity and ecosystem services in soils and sediments. Island Press, Washington, DC.

van der Putten, W., J. M. Anderson, R. D. Bardgett, V. M. Behan-Pelletier, D. E. Bignell, G. G. Brown, V. K. Brown, L. Brussaard, H. W. Hunt, P. Ineson, T. H. Jones, P. Lavelle, E. A. Paul, **M. G. St. John**, D. A. Wardle, T. Wojtowicz and D. H. Wall. 2004. ***The sustainable delivery of goods and services provided by soil biota***. In: D. H. Wall (ed.), Pages 45–72, Sustaining biodiversity and ecosystem services in soils and sediments. Island Press, Washington, DC.

Wardle, D. A., V. K. Brown, V. M. Behan-Pelletier, **M. G. St. John**, T. Wojtowicz, R. D. Bardgett, G. G. Brown, P. Ineson, P. Lavelle, W. H. van der Putten, J. M. Anderson, L. Brussaard, H. W. Hunt, E. A. Paul and D. H. Wall. 2004. ***Vulnerability to global***

change of ecosystem goods and services driven by soil biota. In: D. H. Wall (ed.), Pages 101–136, Sustaining biodiversity and ecosystem services in soils and sediments. Island Press, Washington, DC.

St. John, M. G., G. Bagatto, V. M. Behan-Pelletier, E. E. Lindquist, J. D. Shorthouse and I. M. Smith. 2002. ***Mite (Acari) colonization of vegetated mine tailings near Sudbury, Ontario, Canada***. Plant and Soil 245: 295–305.

St. John, M. G. and J. D. Shorthouse. 2000. ***Allocation patterns of organic nitrogen and mineral nutrients within stem galls of*** Diplolepis spinosa ***and*** D. triforma ***(Hymenoptera: Cynipidae) on wild roses (Rosaceae)***. The Canadian Entomologist 132: 635–648.

Other publications

St. John, M. G., D. A. Peltzer and I. A. Dickie. 2011. ***Trade-offs in biodiversity conservation and carbon sequestration: kanuka versus pine***. Indigena (May 2011): 23–25.

Marburg, A. E., F. E. Carswell, **M. G. St. John**, and A. B. Rose. 2010. ***Baseline carbon stocks in a broadleaved-hardwood forest at the initiation of catchment-scale herbivore control***. Landcare Research Contract Report LC0910/074.

Dickie, I. A., **M. G. St. John**, J. Aislabie, M. M. Barbour, L. E. Burrows, J. E. Hunt, M. U. F. Kirschbaum, D. A. Peltzer, K. H. Orwin, J. T. Scott, B. A. Stevenson, and G. W. Yeates. 2009. ***Unlocking the black-box of soil microbial function through integrative research across a gradient of vegetation change***. Landcare Research Internal Report LC0809/161.

St. John, M. G. 2009. ***Soil fauna from the Oban Sewerage Scheme Land Disposal Field***. Landcare Research Contract Report LC0809/108.

Stevenson, B. A., and **M. G. St. John**. 2009. ***Soil sampling protocol for WACEM***. Landcare Research Contract Report LC0809/077.

The SARA Group. 2009. ***Sudbury Soils Study. Volume III: Ecological Risk Assessment***. Report for Ontario Ministry of the Environment, Sudbury District.

St. John, M. G. 2005. ***Soil mite biodiversity: its relationship to grass species and influence on decomposition in the Konza tallgrass prairie.*** Ph. D. Dissertation, Colorado State University, Fort Collins, Colorado, USA.

St. John, M. G. 1998. ***Occurrence of Ca, Fe, K, Mg, N, Na, S, and P within rose-stem galls and ungalled wild roses: implications for the nutrition hypothesis of gall evolution***. M. Sc. Thesis, Laurentian University, Sudbury, Ontario, Canada.

Invitations

2014 Institut national de la recherche agronomique (INRA), Dijon, France. Co-organized this second Global Soil Biodiversity Initiative workshop. Presented the opening talk ***Towards a global system of soil biodiversity information*** which summarized the previous workshop and laid the direction for the current and future workshops.

2014 Synthesis Centre of Biodiversity Sciences (sDiv), Leipzig, Germany. Contributed expertise in soil invertebrates and ecological data management at the Global Soil Biodiversity Initiative workshop: ***A framework to improve our understanding of the distribution of global soil biodiversity: establishing the first quantitative synthesis***. Presented the opening talk ***Soil biodiversity data: perspectives and challenges*** which outlined the scope of the problems faced by soil biology researchers.

2013 School of Global Environmental Sustainability, Colorado State University, Fort Collins, Colorado, USA. Trained researchers on methods of collection, extraction and identification of soil biota, and ecological data management and analytical techniques.

2006 Society of Environmental Toxicology and Chemistry, 11th annual general meeting, Sudbury, Ontario, Canada. Designed and presented the workshop ***Measuring ecological function (decomposition)***.

2005 DIVERSITAS, Open Science Conference, Oaxaca, Mexico. Wall, D. H. and M. G. St. John. ***Faunal diversity in the soil food web and its implications for ecosystem processes***.

2005 Global Litter Invertebrate Decomposition Experiment (GLIDE) ***Integrating Soil Biodiversity and Ecosystem Process: Analysis of a Global Experiment***, San Ramon, California, USA. Provided expertise in soil biota, data management and data analysis. Contributed to synthesis and interpretation of results and drafting of manuscripts.

2003 Global Litter Invertebrate Decomposition Experiment (GLIDE) ***Data Synthesis Workshop***, Giessen, Germany. Provided expertise in soil biota, data management and data analysis.

2002 Scientific Committee on Problems of the Environment (SCOPE) ***Soil and Sediment Biodiversity and Ecosystem Functioning Meeting***, Estes Park, Colorado, USA. Provided expertise in soil biota. Co-authored several resulting book chapters.

2000 Graduate Degree Program in Ecology, Colorado State University. Designed and presented ***Soil ecological research methods***, a lecture and laboratory exercise for graduate students in the class ***Research Methods in Ecology***.

1998 Department of Biology, Laurentian University. Designed and presented ***Field entomology***, a lecture and laboratory exercise for undergraduate students in the class ***Field Camp***.

1996–1998 Department of Biology, Laurentian University. Designed and presented recurring lectures and laboratories on insect and arachnid biology to undergraduate students in ***General Entomology*** and ***Forest Entomology*** classes.

Selected presentations

2011 **St. John, M. G.**, R. B. Allen, F. E. Carswell, S. Husheer, S. J. Richardson, D. A. Wardle. ***No detectable ecosystem carbon changes despite community-***

level impacts of invasive deer in New Zealand conifer-hardwood forests. Ecological Society of America. Austin, Texas, USA.

2010 **St. John, M. G.**, K. H. Orwin, and I. A. Dickie. ***Home vs. away effects of litter decomposition in two New Zealand habitats; expect the unexpected***. Ecological Society of New Zealand. Dunedin, New Zealand.

2010 **St. John, M. G.**, L. R. Walker, P. J. Bellingham, D. A. Wardle, K. H. Orwin, I. A. Dickie, G. W. Yeates, C. Morse, and K. I. Bonner. ***Belowground consequences of an early-colonist N-fixing shrub as revealed through a decade-long removal experiment.*** Ecological Society of America. Pittsburgh, Pennsylvania, USA .

2004 **St. John, M. G.**, D. H. Wall, and H. Reed. ***The relationship between soil mite species richness and decomposition in a tallgrass prairie: a contest among models.*** Ecological Society of America, Portland, Oregon, USA.

2003 **St. John, M. G.**, D. H. Wall and V. M Behan-Pelletier. ***Effects of an invasive grass on the community of associated soil mites in a tallgrass prairie***. Soil Ecology Society, Palm Springs, California, USA.

2003 **St. John, M. G.**, D. H. Wall and V. M Behan-Pelletier. ***Relationships between above- and belowground diversity: grasses and soil mites in a natural, tallgrass prairie***. British Ecological Society, Lancaster, UK.

2001 **St. John, M. G.**, D. H. Wall and V. M. Behan-Pelletier. ***Roots matter! Controls of microarthropod diversity in soil: evidence from tallgrass prairie***. Ecological Society of America, Madison, Wisconsin, USA.

2001 **St. John, M. G.**, D. Wall and V. M. Behan-Pelletier. ***Effects of certain grass species on belowground microarthropod diversity at the Konza Tallgrass Prairie LTER.*** Soil Ecology Society, Pine Meadows, Georgia, USA.

2001 **St. John, M. G.**, G. Bagatto, V. M. Behan-Pelletier, E. E. Lindquist, J. D. Shorthouse and I. M. Smith. ***Soil formation and mite colonization of rehabilitated mine tailings, Sudbury, Canada.*** Soil Ecology Society, Pine Meadows, Georgia, USA.

2000 **St. John, M. G.** and D. Wall. ***Relationship between above- and belowground biodiversity and ecosystem functioning***. Front Range Student Ecology Symposium, Fort Collins, Colorado, USA.

1997 **St. John, M. G.** and J. D. Shorthouse. ***Resource allocation patterns within galls of*** Diplolepis ***(Cynipidae) on the stems of wild roses***. Entomological Society of Ontario, Guelph, Ontario, Canada.

1995 **St. John, M. G.** and J. D. Shorthouse. ***Nitrogen levels as a factor influencing the composition of communities associated with*** Diplolepis ***(Cynipidae) galls on the stems of wild roses***. Entomological Society of Ontario, Ottawa, Ontario, Canada.

Outreach

2009	Team leader, Acari, Bioblitz New Zealand.
2005–2007	Committee member, ***Vegetation Enhancement Technical Advisory Committee*** (VETAC), and ***Land Reclamation Sub-Committee***, City of Greater Sudbury. Provided expertise in soil ecology relevant to land restoration. Assisted in planning land restoration efforts and the division of resources for this purpose. Represented VETAC at outreach events.
2004	Media interviewee, Kotok, A. ***Collaboratories: encouraging remote scientific collaboration***. (http://nextwave.sciencemag.org).
2001–2002	Presenter, Denver Museum of Nature and Science. Provided interactive learning environment themed "***Biodiversity beneath your feet***" where children and adults could learn about soil organisms and use scientific equipment during museum special events.
1999–2001	Organizing committee member, ***The Colloquium in the Life Sciences***, Colorado State University. Assisted in coordinating this seminar series. Applied for funding and spearheaded a donations drive from departments and local businesses. Organized budgets and assisted in selecting, inviting and hosting scientists from other institutions for weekly lectures.
1997–1998	Presenter, Laurentian University open house events. Designed and presented lectures and displays on entomology for the public.

Scientific activities and memberships

2008	Student, Soil Acarology, Acarology Summer Program, The Ohio State University, Columbus, Ohio, USA. Participant in a three-week intensive course on mite systematics and ecology.
2007–present	Member, New Zealand Ecological Society.
2003–present	Member, British Ecological Society.
2001–2004	Workshop attendee, Ecological Circuitry Collaboratory (ECC) workshop series, Cary Institute of Ecosystem Studies, Millbrook, New York, USA. Trained as part of a select group of graduate students to be quantitative empiricists, modellers and effective collaborators.
2000–present	Member, Soil Ecology Society.
2000–present	Reviewer, Applied Soil Ecology; Arctic, Antarctic and Alpine Research; Biological Conservation; Ecography; Ecology; Experimental and Applied Acarology; Landscape Ecology; New Zealand Journal of Zoology; Pedobiologia; Proceedings of the International Congress of Acarology; Western North American Naturalist.
1999–present	Member, Ecological Society of America.
1999	Student, Introductory Acarology and Oribatida, Acarology Summer Program, The Ohio State University, Columbus, Ohio, USA. Participant in a two-week

intensive course on mite systematics and ecology.

1994–present Member, Entomological Society of Canada, Entomological Society of Ontario.