Matthew J. Vavrek, PhD

Research Associate, Royal Ontario Museum

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EDUCATION

PhD McGILL UNIVERSITY (Montreal, Quebec, Canada)

Palaeontology, February 2011

THESIS: 'Palaeomacroecology: Large Scale Patterns in Species Diversity Through the Fossil Record'

BSc UNIVERSITY OF ALBERTA (Edmonton, Alberta, Canada)

Palaeontology (Honours), April 2004.

THESIS: 'Palaeobotany and Palaeoecology of the Munce's Hill locality near Red Deer, Alberta'

WORK EXPERIENCE

Head Palaeontologist/Curator, September 2013 - December 2014

Philip J. Currie Dinosaur Museum. Head of research and collections for the museum, and principal scientific lead for exhibits design.

Content Coordinator, January 2013 - August 2013

University of Alberta. Online course project lead for Massive Open Online Course (MOOC) in Palaeontology.

Assistant Curator, March 2011 - August 2012

Royal Ontario Museum. Scientific exhibit advisor for the major exhibition "Ultimate Dinosaurs: Giants from Gondwana". Supervisor: Dr. David Evans.

Sessional Instructor, September 2010 – December 2010

University of Alberta. Prepared and delivered lectures and organized labs for Bot 411 (Palaeobotany). Supervisor: Dr. Declan Ali.

Palaeobotany Contract Employee, Yukon Government, June 2009 – March 2010

Collection and identification of plant fossils from the Peel River, northern Yukon Territory, under contract to the Yukon Territorial Government.

Graduate Student Researcher, September 2004 - February 2011

Redpath Museum, McGill University. Thesis advisors: Dr. Hans Larsson and Dr. Brian McGill.

Research Assistant, Summer 2004

University of Alberta, Earth and Atmospheric Sciences. Photographic documentation of invertebrate fossils in Lebanon. Supervisor: Dr. Brian Chatterton.

Research Assistant, Summer 2003

University of Alberta, Department of Biological Sciences. Excavation, collection and identification of plant fossils from the Munce's Hill locality near Red Deer, Alberta. Supervisor: Dr. Ruth Stockey.

Research Assistant, Summer 2002

University of Alberta, Laboratory for Vertebrate Palaeontology. Collection and classification of verebrate microfossils from Chambery Coulee, southern Saskatchewan. Supervisor: Dr. Michael Caldwell.

PUBLICATIONS AND PRESENTATIONS

Publications in Refereed Journals

- Evans, D.C., **M.J. Vavrek**, and H.C.E. Larsson. Pachycephalosaurin pachycephalosaurid (Dinosauria: Ornithischia) cranial remains from the latest Cretaceous (Maastrichtian) Scollard Formation of Alberta, Canada. Palaeobiodiversity and Palaeoenvironments, in press.
- Brown, C.M., and **M.J. Vavrek**. Small sample sizes in the study of ontogenetic allometry; implications for palaeobiology. PeerJ, in press.
- Brown, C.M., C.S. VanBuren, D.W. Larson, K.S. Brink, N.E. Campione, **M.J. Vavrek**, and D.C. Evans. Tooth counts through growth in diapsid reptiles: Implications for interpreting individual and size-related variation in the fossil record. Journal of Anatomy, in press.
- Stockey, R.A., G.L. Hoffman, and **Vavrek, M.J.**. Paleobotany and paleoecology of the Munce's Hill fossil locality near Red Deer, Alberta, Canada. Annals of the Missouri Botanical Garden, in press.
- **Vavrek, M.J.**, A.M. Murray and P.R. Bell. 2014. An early Late Cretaceous (Cenomanian) sturgeon (Acipenseriformes) from the Dunvegan Formation, northwestern Alberta, Canada. Canadian Journal of Earth Sciences, 51: 677-681.
- **Vavrek, M.J.**, B.C. Wilhelm, E.E. Maxwell, and H.C.E. Larsson. 2014. Arctic plesiosaurs from the Lower Cretaceous of Melville Island, Nunavut, Canada. Cretaceous Research, 50: 273-281.
- Burns, M.E., and **M.J. Vavrek**. 2014. Ankylosaur ossicles from the middle Cenomanian Dunvegan Formation of northwestern Alberta, Canada. PLoS ONE, 9(5):e96075.
- Vavrek, M.J., L.V. Hills, and P.J. Currie. 2014. A Late Cretaceous hadrosaurid (Dinosauria: Ornithischia) from Axel Heiberg Island, Nunavut, Canada. Arctic, 67: 1-9.
- Brown, C.M., N.E. Campione, H.C. Giacominia, L.J. O'Brien, **M.J. Vavrek**, and D.C. Evans. 2013. Ecological modelling, size distributions, and taphonomic size bias in dinosaur faunas: a comment on Codron et al., 2012. Biology Letters, 9: 20120582.
- **Vavrek, M.J.**, D.C. Evans, D.R. Braman, N.E. Campione, and G.D. Zazula. 2012. A Paleogene flora from the upper Bonnet Plume Formation of northeast Yukon Territory, Canada. Canadian Journal of Earth Sciences, 49: 547-558.
- Evans, D.C., **M.J. Vavrek**, D.R. Braman, N.E. Campione, T.A. Dececchi, and G.D. Zazula. 2012. Vertebrate Fossils (Dinosauria) from the Bonnet Plume Formation, Yukon Territory, Canada. Canadian Journal of Earth Sciences, 49: 396-411.
- **Vavrek**, **M.J.** 2011. fossil: Palaeoecological and palaeogeographical analysis tools. Palaeontologia Electronica, 14 (1): 16p.
- **Vavrek, M.J.** and H.C.E. Larsson. 2010. Low beta diversity of Maastrichtian dinosaurs of North America. Proceedings of the National Academy of Sciences, 107: 8265–8268.
- **Vavrek**, **M.J.**, H.C.E. Larsson and N. Rybczynski. 2007. A Late Triassic flora from east-central Axel Heiberg Island, Nunavut, Canada. Canadian Journal of Earth Sciences, 44: 1653–1659.
- **Vavrek, M.J.**, R.A. Stockey, and G.W. Rothwell. 2006. *Osmunda vancouverensis* sp. nov. (Osmundaceae), permineralized fertile frond segments from the Lower Cretaceous of British Columbia, Canada. International Journal of Plant Sciences 167: 631–637.

Books

- Persons IV, W. Scott (ed.) Dino 101: An Introduction to Dinosaur Biology. University of Alberta Press, Edmonton, Canada, in press. (Author on chapters 1-5, 7 and 10)
- Evans, D.C. and **M.J. Vavrek**. 2012. *Ultimate Dinosaurs: Giants from Gondwana* (exhibition guide book). ROM Press, Toronto, Ontario.

Scientific Software

Vavrek, M.J. 2010. parfossil: Parallelized functions for palaeoecological and palaeogeographical analysis (R statistical package). http://cran.r-project.org/web/packages/parfossil/.

- **Vavrek, M.J.** 2008 2010. fossil: Palaeoecological and Palaeogeographical Analysis Tools (R statistical package). http://cran.r-project.org/web/packages/fossil/.
- **Vavrek, M.J.** 2008. PostGPS, A plugin for the Quantum GIS program to convert between data formats. http://pyqgis.org/repo/contributed/.

Conference Presentations

- **Vavrek, M.J.**, R.C. McKellar, A.P. Wolfe, and H.C.E. Larsson. 2014. A partial bird with preserved feathers from the Paleocene of the central Yukon Territory, Canada. Journal of Vertebrate Paleontology, 33(3) suppl., pg. 247A (poster presentation).
- Arbour, V., **Vavrek, M.J.**, E. Koppelhus, and P.J. Currie. DINO 101: A massive open online course about dinosaur paleobiology. Journal of Vertebrate Paleontology, 33(3) suppl., pg. 81A (poster presentation).
- **Vavrek, M.J.**, L.B. Harrison, S.L. Cumbaa, M.S. Becker and H.C.E. Larsson. 2013. Latitudinal gradients and provinciality in chondrichthyan faunas from the Late Cretaceous of North America. Journal of Vertebrate Paleontology, 32(3) suppl., pg. 231A (symposium presentation).
- **Vavrek, M.J.** and H.C.E. Larsson. 2012. Late Cretaceous (Santonian-Maastrichtian) vertebrate faunas from the Arctic of Appalachia. Journal of Vertebrate Paleontology, 31(3) suppl., pg. 188A (symposium presentation).
- **Vavrek, M.J.** and D.B. Brinkman. 2011. Baseline levels of alpha and beta diversity in vertebrate microfossil assemblages. Journal of Vertebrate Paleontology, 31(3) suppl., pg. 208A (symposium presentation).
- L.B. Harrison, **Vavrek, M.J.**, M.S. Becker and H.C.E. Larsson. 2011. Insight into the Cenomanian (Late Cretaceous) terrestrial and marine vertebrate fauna of Bylot Island, Nunavut. Journal of Vertebrate Paleontology, 31(3) suppl., pg. 122A (poster presentation).
- **Vavrek, M.J.** 2009. New methods of network paleobiogeography with an empirical example from Miocene mammals. Journal of Vertebrate Paleontology, 29(3) suppl., pg. 195A.
- **Vavrek, M.J.** and H.C.E. Larsson. 2009. Dinosaurs of North America show ancient association between low beta diversity and homogeneous climates. Frenchman Formation Terrestrial Ecosystem Conference Abstracts, pg. 63.
- Vavrek, M.J. and H.C.E. Larsson. 2007. Relationships of dinosaur assemblages during the Maastrichtian (Latest Cretaceous) of North America. 4th Interdisciplinary Graduate Student Research Symposium Abstracts Volume, pg. 29.
- **Vavrek, M.J.** and H.C.E. Larsson. 2006. Analysis of dinosaur diversity and provinciality in Late Cretaceous North America. Journal of Vertebrate Paleontology, 26(3) suppl., pg. 135A.
- Larsson, H.C.E., M. de Boef, T.A. Dececchi, E.E. Maxwell, S.C. Tissandier, M.J. Vavrek. 2006. Marine Reptiles from Melville and Cameron Islands, Nunavut. Canadian Paleontology Conference Proceedings No. 4: pg 26.
- **Vavrek, M.J.**, R.L. Church and H.C.E. Larsson. 2006. Biogeography of North and South American Triassic floras. Canadian Paleontology Conference Proceedings No. 4: pg 39-40.
- **Vavrek, M.J.** 2006. Analysis of dinosaur endemism in Late Cretaceous North American assemblages. Interdisciplinary Graduate Student Research Symposium 2006.
- **Vavrek, M.J.** 2005. A new Late Triassic floral assemblage from Axel Heiberg Island, Nunavut. Interdisciplinary Student Symposium 2005.
- **Vavrek, M.J.**, R.A. Stockey, and G.W. Rothwell. 2004. Permineralized *Osmunda* pinnae with attached sporangia containing spores from the Lower Cretaceous of British Columbia, Canada. Botany 2004 abstracts volume.

Invited Presentations

- Vavrek, M.J. April 1, 2010. Palaeomacroecology. Invited speaker, University of Toronto.
- **Vavrek, M.J.** October 24, 2006. Biodiversity in the fossil record. Invited speaker, Concordia University.

Vavrek, M.J. April 8, 2004. Osmundaceous sporangia from the Early Cretaceous of Vancouver Island. Invited speaker, Symposium on the Evolution of Ferns, University of Alberta.

Poster Presentations

- Vavrek, M.J., L.B. Harrison, S.L. Cumbaa, M. Becker, and H.C.E. Larsson. 2013. A Late Cretaceous (?Campanian) Selachian Fauna From Bylot Island, Nunavut: Biodiversity and Biogeographic Implications. Alberta Palaeontological Society 17th Annual Symposium.
- Harrison, L.B., **M.J. Vavrek**, M. Becker, and H.C.E. Larsson. 2011. Insight into the Cenomanian (Late Cretaceous) terrestrial and marine vertebrate fauna of Bylot Island, Nunavut. Journal of Vertebrate Paleontology, 31(3) suppl., pg. 122A.
- Vavrek, M.J., L. B. Harrison, E. Bamforth, N. Bayani, L. Baret, A. Ebn-al-Nassir, C. Erana, W. Long, E. Maxwell, J. Rousseau, R. Tahara and H.C.E. Larsson. 2007. Systematic exploration of Grasslands National Park, Saskatchewan 2007 McGill Field Course. Canadian Paleontology Conference Proceedings No. 5.
- Vavrek, M.J. and H.C.E. Larsson. 2006. Turnover rates in Late Cretaceous dinosaur assemblages. Canadian Society for Ecology and Evolution Inaugural Meeting (list of poster presentations - pg 89).
- **Vavrek, M.J.** 2004. Palaeoenvironmental implications of fossil salamander taxa from the Upper Cretaceous (Maastrichtian) Frenchman Formation of Southwestern Saskatchewan. Journal of Vertebrate Paleontology, 24(3) suppl., pg. 125A.
- **Vavrek, M.J.** 2004. Fossil salamanders from the Cretaceous (Maastrichtian) of southwestern Saskatchewan and their association with climate and environment. Alberta Palaeontological Society Eighth Annual Symposium Abstracts pg. 69-70.
- **Vavrek, M.J.** 2004. Palaeoecology and the Palaeoenvironment of the Paleocene Munce's Hill locality near Red Deer, Alberta, Canada. Prairie Universities Biological Symposium pg. 79.
- **Vavrek, M.J.** 2003. Late Cretaceous Salamanders of the Frenchman Formation and their palaeoen-vironmental implications. Canadian Paleontology Conference Proceedings No. 1: pg 43–44.

TEACHING EXPERIENCE

University of Alberta, Department of Biological Sciences

Seminar Instructor, Introduction to Statistics with R, November 18, 2010

A 2 hour introduction to the R Statistical Language for graduate students in biology. I initiated and organized the course, and created a number of examples for the students to follow along with.

McGill University, Biology Department

Teaching Assistant, Vertebrate Palaeontology Field Course, Summer 2007 – 2009

A 2.5 week long field course in vertebrate palaeontology, with a focus on hands on learning. I helped organize transportation, meals and lodging, as well as giving lectures and preparing and marking the course exam.

Teaching Assistant, Methods in Biology of Organisms, Fall 2005 – 2007

An introductory laboratory-based class, with a focus on methods and hands on experimentation in a variety of disciplines of organismal biology. I led introductory lectures, provided one-on-one assistance to students, and marked oral presentations and written assignments and essays.

Teaching Assistant, Animal Diversity, Winter 2005 – 2007

A broad course meant as an introduction to the major phyla of animals, with a focus on their morphology, evolution and relationsips to one another. I led lab sections, which included being able to identify all of the different phyla and exxplain their defining characteristics, and marked lab and lecture exams.

Teaching Assistant, Large Scale Ecology, Winter 2007

Ecological patterns and processes at large spatial, taxonomic and temporal scales. I led computer lab sessions doing statistical analyses using Excel, assisted on a field trip to a nearby forest preserve to identify and census tree species, and marked assignments and exams.

Teaching Assistant, Biological Oceanography, Winter 2006

An overview of plankton biology and ecology, at both small and large scales. I assisted students in experimental growth studies of various plankton species under varying environmental conditions, and marked poster presentations and lab assignments.

Guest Lecturer, Animal Diversity, Winter 2005

A broad course meant as an introduction to the major phyla of animals, with a focus on their morphology, evolution and relationsips to one another. Lectured on the diversity and morphology of modern and fossil echinoderms.

Teaching Assistant, Cell and Molecular Biology, Winter 2005

An introductory course for all students in the biological sciences stream. I supervised students as they learned techniques including basic microscopy and sterile techniques, up through gel electrophoresis, and graded oral presentations, lab assignments and quizzes.

Teaching Assistant, Introduction to Ecology and Evolution, Fall 2004

An introduction to the fundamental patterns and processes of ecology and evolution. I gave review sessions on course material, led journal article discussions, and marked exams and assignments.

Concordia University, Department of Geography, Planning and Environment

Guest Lecturer, Paleobiology, Winter 2007

An overview of palaeontology, covering vertebrates, invertebrates and plants. Lectured on the history and evolution of plants, from the first land land plants through to modern floras.

COMMUNITY SERVICE AND OUTREACH

Canadian Palaeontology Conference Organizing Committee, 2013

University of Alberta, Edmonton, Alberta. Sat on organizing committee, lead editor for abstract volume.

Canadian Palaeontology Conference Organizing Committee, 2012

Royal Ontario Museum and University of Toronto, Toronto, Ontario. Set up webiste/online registration site.

Gallery Interpretive Volunteer, 2011

Royal Ontario Museum, Toronto, Ontario. Answered visitor questions about palaeontology, dinosaurs and evolution.

Assistant Coach, 2008 – 2009

Westlock Wrestling Club, Westlock, Alberta. Led practices and taught new techniques to high school students.

Audio-visual volunteer technician, 2006

Interdisciplinary Graduate Student Research Symposium, McGill University. Organized and set up all the audio-visual equipment for the conference, and helped troubleshoot problems with presentations.

Executive member, 2004 - 2006

Biology Graduate Students Association, McGill University. Helped in the organization of events for the graduate student community in biology.

Assistant Coach, 2005 – 2006

McGill University Wrestling Club. Led practices, taught new techniques and organized trips for tournaments.

Student volunteer, 2004 - 2006

'Let's Talk Science' science education outreach, McGill University. Gave guided tours to school groups with a focus on the different types of science research being conducted at the university, and judged science fair competitions.

Student Representative, 2003 - 2004

Student member of the Systematics and Evolution Research Interest Group at the University of Alberta.

Volunteer interpreter, 2003 - 2004

University of Alberta Museums. Gave museum tours and presentations to school and community groups of various ages.

Secretary, 2002 - 2004

University of Alberta Palaeontological Society

Assistant Coach, 2003

Special Olympics Edmonton Softball Team.

HONORS & AWARDS

Research Grants

Polar Continental Shelf Project (logistical support grant) 2012–2013 Dinosaur Research Institute Fieldwork Grant 2012–2014 (declined 2013)

Fellowships

Northern Scientific Training Program grant	2005 – 2008 (declined 2005 and 2007)
FQRNT Doctoral Research Scholarship	2008–2009
NSERC CGS-D Graduate Student Award	2006–2008
NSERC PGS-D Graduate Student Award	2005 (declined)
NSERC CGS-M Graduate Student Award	2004 – 2006
NSERC Undergraduate Summer Research Award	2002 – 2004

Awards

Dean's Honour Roll, University of Alberta	2000–2004
CIS Academic All-Canadian	2000–2002; 2004–2006
German Government Book Prize	2003
Jason Lang Scholarship	2002–2004
Canada Millenium Bursary	2002–2004
PS Warren Prize in Geology	2001
St Josephs College Scholarship	2001
Jimmie Condon Award	2000–2001
Faculty of Science Entance Scholarship	2000
Willis Teskey Scholarship	2000
Alexander Rutherford Scholarship	2000
University of Alberta Entrance Scholarship	2000
Gulf Canada Resources Science Award	2000
Shell Canada Award	2000

FIELD EXPERIENCE

Northern Alberta Dinosaur Project

Location: Northern Alberta, Canada Date: July 21–August 9, 2014

Role: project leader

Activities: organized the inaugural year of an international collaboration designed to study the evolution of northern Alberta terrestrial Cretaceous ecosystems. Obtained external funding, led field party, arranged field equipment and activities, report writing, budget preparation.

Brazeau Formation Reconaissance

Location: Alberta foothills, Canada

Date: June 10–12, 2014 Role: project collaborator

Activities: prospected for vertebrates in a little studies area in the foothills of Alberta

Yukon North Slope Prospecting Expedition

Location: Northern Yukon and northwestern Northwest Territories, Canada

Date: July 12–22, 2013 Role: project leader

Activities: arranged logistics in conjunction with larger expedition from the Yukon Geological Survey, obtained external (federal) funding, led field party, arranged field equipment and activities, report writing, budget preparation

Tertiary Hills Prospecting Expedition

Location: Tertiary Hills, east central Northwest Territories, Canada

Date: August 23-September 3, 2012

Role: project leader

Activities: arranged logistics, obtained external (federal) funding, led field party, arranged field equipment and activities, report writing, budget preparation

Peace River/Dunvegan Prospecting Expedition

Location: Peace River, western Alberta, Canada

Date: August 13–17, 2012 Role: project leader

Activities: initiated project, arranged external funding (institutional), arranged logistics, led field party, arranged field equipment and activities, report writing, budget preparation

Yukon palaeobotany consultant

Location: Peel River Basin, Yukon Territory, Canada

Date: July 20–29, 2009 Role: consultant

Activities: logistical assistance, plant identification, report writing, budget preparation

Vertebrate Palaeontology Field Course (Biol 573)

Location: Eastend and Grasslands National Park, Saskatchewan and Dinosaur Provincial

Park, Alberta, Canada Date: May 17–June 4, 2009 Role: teaching assistant

Activities: logistical assistance, student management, exam preparation

Yukon fossil reconnaissance expedition

Location: Peel River Basin, Yukon Territory, Canada

Date: August 1–14, 2008 Role: research partner

Activities: logistical assistance, plant identification, report preparation, permit application

Vertebrate Palaeontology Field Course (Biol 573)

Location: Eastend and Grasslands National Park, Saskatchewan, Canada

Date: May 1–19, 2008 Role: teaching assistant

Activities: logistical assistance, student management

Panama collaborative work

Location: Smithsonian Tropical Research Institute, Panama City, Panama

Date: January 15 - April 15, 2008

Role: visiting researcher

Activities: collaborative research, fossil prospecting

Vertebrate Palaeontology Field Course (Biol 573)

Location: Eastend and Grasslands National Park, Saskatchewan, Canada

Date: May 1–19, 2007 Role: co-leader

Activities: logistical assistance, student management

Missinaibi River expedition

Location: Missinaibi River, northern Ontario, Canada

Date: September 14–21, 2006 *Role:* expedition leader/coordinator

Activities: logistical coordination, permit applications, trip leader

High Arctic palaeontological exploration

Location: Ellesmere and Melville Islands, Nunavut, Canada

Date: July 1-30, 2006

Role: student

Activities: logistical assistance, fossil prospecting/excavation

Vertebrate Palaeontology Field Course (Biol 573)

Location: Dry Island Buffalo Jump Provincial Park, Alberta, Canada

Date: July 15-30, 2005

Role: student

Activities: logistical assistance, fossil prospecting/excavation, stratigraphic mapping

Lebanon fossil invertebrate exploratory trip

Location: Byblos, Lebanon Date: June 5–15, 2004

Role: student

Activities: fossil inventorying, stratigraphic mapping

British Columbia Cretaceous plant collecting

Location: Vancouver Island, British Columbia, Canada

Date: July 15-30, 2003

Role: student

Activities: fossil prospecting/excavation

Munce's Hill plant locality survey

Location: Red Deer, Alberta, Canada

Date: August 2-4, 2003

Role: student

Activities: excavation coordination, stratigraphic mapping

"Scotty" the T. rex quarrying

Location: Eastend, Saskatchewan, Canada

Date: July 10-30, 2002

Role: student

Activities: quarry excavation, microsite collection, stratigraphic mapping

Saskatchewan marine vertebrate prospecting

Location: Lake Diefenbaker, southern Saskatchewan, Canada

Date: June 15-30, 2002

Role: student

Activities: fossil prospecting Geology field school (EAS 234)

Location: Jasper, Alberta, Canadaa

Date: May 1-8, 2002

Role: student

Activities: stratigraphic mapping

RELEVANT SKILLS AND TRAINING

Languages

English: fluent

French: intermediate Spanish: intermediate

German: basic

Computer Skills

Microsoft Office (Word, Excel, PowerPoint, Access)

OpenOffice

GIS (Quantum GIS, PostGIS)

Linux (Ubuntu)

R Statistical Language

SQL (PostgreSQL)

MEX.

Certifications

Non-restricted Firearm Possession and Acquisition Licence

Wilderness First Aid Certification

Class 5 drivers license

PADI Open Water Diver

REFERENCES

Hans C. E. Larsson, Adjunct Professor Redpath Museum McGill University 859 Sherbrooke St. W. Montréal, QC H4A 2K6 514-398-4086 ext. 089457 hans.ce.larsson@mcgill.ca

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