

Michele M. Skopec
Department of Zoology
Weber State University
1415 Edvalson Ogden, UT 84408
Phone: 801-626-6177
Email: micheleskopec@weber.edu

Education:

2003 **Ph.D.** in Nutritional Sciences, University of Wisconsin – Madison
Advisor: Dr. William Karasov
Thesis: Polyphenolics in the mammalian gut: effects on glucose absorption and the efficacy of a salivary defense mechanism.

1999 **B.S.** in Animal Sciences, Cornell University

Employment:

2017-present Professor
Department of Zoology, Weber state University

2012-2017 Associate Professor
Department of Zoology, Weber State University

2006-2012 Assistant Professor
Department of Zoology, Weber State University

2003-2006 Postdoctoral Researcher
Department of Biology, University of Utah
Advisor: Dr. Denise Dearing
Project: Dietary specialization in mammals: constraints and costs of detoxification of plant secondary compounds

Teaching experience:

2017-present Professor, Department of Zoology, Weber State University

2012-2017 Associate Professor, Department of Zoology, Weber State University

2006-2012 Assistant Professor, Department of Zoology, Weber State University
Courses: Zool 1020, Human Biology
Zool 2200, Human Physiology
Zool 3600, Comparative Physiology
Zool 4680, Mammalogy
Hrs 1510, Perspectives in Life Science, “Omnivores Dilemma”

2005 Instructor, Department of Biology, University of Utah
Course: Biology 1210, Principles of Biology

Professional experience:

1998-1999 Laboratory technician, USDA plant protection research unit, Ithaca, NY

Grants and Awards:

2020 United States Fish and Wildlife Grant (\$34,000) “Clay phacelia herbivore protection”

2018 College of Science Spence Segar Distinguished Teaching Award (\$3000)

- 2017 Office of Undergraduate Research, Weber State University (\$1000) “Presentations at Society of Integrative and Comparative Biology Conference”
- 2016 College of Science Endowed Scholar award (\$15,000)
- 2015 Academic Resources and Computing Committee, Weber State University (\$10,890) coPI Jonathan Clark “Molecular Imaging System for Teaching and Research.”
- 2015 Research Scholarship and Professional Growth Committee, Weber State University (\$3276.75) “Effects of grazing on the endangered Autumn Buttercup”
- 2014 United States Fish and Wildlife Grant (\$11,525) “Clay phacelia herbivore exclusion study”
- 2014 Utah Partners for Conservation and Development Grant (\$8,860) “Foraging Patterns of Pygmy Rabbits in Box Elder County”
- 2014 Research Scholarship and Professional Growth Committee, Weber State University (\$1,640) “Presentation of Research at Society of Integrative and Comparative Biology annual meeting.”
- 2013 Utah Partners for Conservation and Development Grant (\$25,497) “Foraging Patterns of Pygmy Rabbits in the Woodruff Area”
- 2012 United States Fish and Wildlife Grant (\$25,000) “The Effects of Grazing on the Endangered Autumn Buttercup”
- 2011 Utah Partners for Conservation and Development Grant (\$9,523.20) “Pygmy Rabbits in the Woodruff Area: Vegetation and Diet Analysis” co PIs Traci Allen (BLM), Barb Wachocki (WSU Botany), Masako Wright (Utah DWR) and Sam Zaveloff (WSU Zoology).
- 2011 Research Scholarship and Professional Growth Committee, WSU, (\$2,100) “The role of COMT in woodrat hoarding behavior”
- 2010 Honors Nye Cortez Professor of the year
- 2010 Academic Resources and Computing Committee, Weber State University (\$8,100) coPI Barbara Trask “SMART technology for Zoology classrooms”
- 2010 Research, Scholarship and Professional Growth Committee, Weber State University (\$1,000) “Attendance and presentation at Comparative Nutrition Society biennial meeting”
- 2008 Research Opportunity Award, National Science Foundation (\$25,415) “The role of catecholamine-O-methyltransferase in the detoxification of terpenes by a juniper specialist (*Neotoma stephensi*)”
- 2007 Research, Scholarship and Professional Growth Committee, Weber State University (\$3,300): “Field analysis of the habitat and behavior of dietary specialist and generalist woodrats”
- 2007 Academic Resources and Computing Committee, Weber State University (\$2,000): coPI Bob Okasaki and Nicole Berthelemy “Enhancement of Physiology Instruction”
- 2006 Research, Scholarship and Professional Growth Committee Weber State University (\$3,500): “Understanding the role of salivary tannin binding proteins in plant-animal interactions”
- 2003 1st place, Interdepartmental Graduate Program in Nutritional Science annual poster competition, University of Wisconsin - Madison
- 2003 3rd place, ASNS Dietary Bioactive Components RIS student poster competition, Experimental Biology, San Diego, CA
- 1999 Award of Excellence, USDA plant protection unit, Ithaca NY

Professional affiliations and activities:

2015-present Ecological Society of America

2013-present American Society of Mammalogy
 2007-present Comparative Nutrition Society
 2002-present American Society of Nutritional Sciences
 2002-present Society of Integrative and Comparative Biology
 2003-present Peer reviewer of articles and grants: Journal of Chemical Ecology, Ecology, Journal of Basic Microbiology, Oikos, Comparative Physiology and Biochemistry, Journal of Experimental Zoology, Journal of Zoology, PLOS One

Seminars and speechmaking:

2013 “Consuming toxic plants: how differences in biotransformation enzymes allow for dietary specialization in a species of woodrat” Department of Biology, Utah Valley University
 2012 “Pygmy Rabbits in the Woodruff Area: Vegetation and Diet Analysis” Utah Department of Natural Resources
 2011 “Nutritional Ecology of the Average American” Nye Cortez Honors Banquet, Weber State University
 2011 “Eating Sustainably” 2nd Annual Recycling & Sustainability Summit
 2010 “The Herbivore’s Dilemma” Science in Society Seminar, Weber State University
 2005 “Dietary Specialization in Mammalian Herbivores” Research Experiences for Undergraduates Seminar Series, University of Utah
 2005 “Differential hepatic gene expression of a dietary specialist and generalist in response to juniper ingestion” Estacion Biologie de Donana, Seville, Spain
 2003 “Polyphenolics in the mammalian gut: effects on glucose absorption and the efficacy of a salivary defense mechanism” Department of Biology, University of Utah

Professional Presentations:

2021 “Is object caching in woodrats a spillover behavior?” American Society of Mammalogists Annual Meeting.
 2020 “The efficacy of small versus large fences to protect the clay phacelia (*Phacelia argillacea*), an endangered endemic plant, from free-ranging ungulates” Ecological Society of America Annual Meeting.
 2019 “Dietary and habitat specialization in woodrats (genus *Neotoma*) is associated with differences in caching behavior” American Society of Mammalogists Annual Meeting.
 2019 “The efficacy of small versus large fences on protecting the clay phacelia (*Phacelia argillacea*) from free-ranging ungulates” Utah Rare Plant Meeting
 2017 “Biotransformation Enzyme Expression in Nasal Epithelium of Woodrats Consuming Juniper” Society for Integrative and Comparative Biology Annual Meeting.
 2015 “Effect of grazing on the endangered Autumn Buttercup” Ecological Society of America Annual Meeting.
 2014 “Effect of grazing on the endangered Autumn Buttercup” Utah Rare Plant Meeting.
 2011 “Role of cytochrome P450s in juniper versus creosote specialization in woodrats” Society for Integrative and Comparative Biology Annual Meeting.
 2010 “The effects of juniper consumption of catechol-O-methyl transferase (COMT) expression and activity in *Neotoma stephensi* a juniper specialist and *Neotoma albigula* a sympatric generalist” Comparative Nutrition Society Biennial meeting.
 2008 “Catechol-O-methyl transferase may play an important role in allowing *Neotoma stephensi* to specialize on juniper” Society for Integrative and Comparative Biology Annual Meeting.
 2007 “Differential hepatic gene expression in a dietary specialist and generalist in response to juniper ingestion.” Plant herbivore Interaction Gordon Research Conference.

- 2005 “Differential gene expression in the livers of wild mammals consuming a toxic diet”
Society for Integrative and Comparative Biology Annual Meeting
- 2004 “Do salivary proline-rich proteins counteract dietary hydrolysable tannin in laboratory rats?” Plant Herbivore Interaction Gordon Research Conference
- 2003 “Do salivary proline-rich proteins decrease the metabolic cost of tannin consumption?”
Society for Integrative and Comparative Biology Annual Meeting
- 2003 “Flavonoids decrease 3-O-methyl D-glucose absorption in laboratory rats” Experimental
Biology Annual Meeting

Publications:

- Skopec, MM, Dearing, MD, Halpert, JR. (2022) Mammalian cytochrome P450 biodiversity: Physiological importance, function and protein and genomic structures of cytochromes P4502B in multiple species of woodrats with different dietary preferences. *Advances in Pharmacology*. 95: 107-129.
- Jimenez, A, Schmalz, J, Wright, MN, Skopec, MM. (2020) Sagebrush characteristics influencing foraging patterns of pygmy rabbits. *Journal of Wildlife Management*. 84: 1306-1314. Doi: 10.1002/jwmg.21923
- Orr, TJ, Kitanovic, S, Schramm, KM, Skopec, MM, Wilderman, PR, Halpert JR, Dearing, MD. (2020) Strategies in herbivory by mammals revisited: The role of liver metabolism in a juniper specialist, (*Neotoma stephensi*) and a generalist (*Neotoma albigula*). *Molecular Ecology*. 29: 1674-1683. Doi: 10.1111/mec.15431
- Skopec, MM, Adams, RP, Muir, JP. (2019) Terpenes may serve as feeding deterrents and foraging cues for mammalian herbivores. *Journal of Chemical Ecology*. 45(11-12): 993-1003. doi: 10.1007/s10886-019-01117-w
- Skopec, MM, Lewinsohn, J., Sandoval, T., Wirick, C., Murray, S., Pence, V. and Whitham, L. (2018) Managed grazing is an effective strategy to restore habitat for the endangered autumn buttercup (*Ranunculus aestivalis*). *Restoration Ecology*. 26(4): 629-635. doi:10.1111/rec.12633
- Adams, RP, Skopec, MM, Muir, JP. (2016) Comparison of leaf terpenoids and tannins in *Juniperus osteosperma* from woodrat (*Neotoma lepida*) browsed and non-browsed trees. *Phytologia*. 98(1): 17-25.
- Skopec, MM, Kohl, KD, Schramm, K, Halpert, JR, Dearing, MD. (2015). Using the specialization framework to determine degree of dietary specialization in a herbivorous woodrat. *Journal of Chemical Ecology*. 41: 1059-1068.
- Schmalz, JM, Wachocki, B, Wright, M, Zeveloff, SI, Skopec, MM. (2014) Habitat selection by the pygmy rabbit (*Brachylagus idahoensis*) in Northeastern Utah. *Western North American Naturalist*. 74(4): 456-466
- Malenke, J, Skopec, MM, Dearing MD. (2014) Evidence for functional convergence in genes upregulated by herbivores ingesting plant secondary compounds. *BMC Ecology*. 14(1): 23.
- Adams, RP, Skopec, MM, Kohl, K, Dearing MD. (2014) Comparison of volatile leaf terpenoids from *Juniperus monosperma* and *J. osteosperma* leaves intact, ground and exposed to ambient temperature. *Phytologia*. 96: 207-217.

Kohl, K., Skopec, MM, Dearing MD. (2014) Captivity results in disparate loss of gut microbial diversity in closely related hosts. *Conservation Physiology*. 2 doi: 10.1093/conphys/cou009

Adams, RP, Skopec, MM, Muir, JP. (2014) Comparison of leaf terpenoids and tannins in *Juniperus monosperma* from woodrat (*Neotoma stephensi*) browsed and non-browsed trees. *Phytologia*. 96: 63-70

Skopec, MM. (2014) "Physiological Ecology of Nutrient Acquisition in Animals." In *Oxford Bibliographies in Ecology*. Ed. David Gibson. New York: Oxford University Press. doi: 10.1093/obo/9780199830060-0070

Skopec, MM, Malenke, J, Halpert, JR, Dearing, MD. (2013) An *in vivo* assay for elucidating the importance of cytochromes P450 for the ability of a wild mammalian herbivore (*Neotoma lepida*) to consume toxic plants. *Physiological and Biochemical Zoology*. 5: 593-601.

Skopec, MM, Hale, AJ, Torregrossa, A, Dearing, MD. (2013) Biotransformation Enzyme Expression in Nasal Epithelium of Woodrats. *Comparative Biochemistry and Physiology Part C*. 157: 72-79.

Skopec, MM, Dearing, MD (2011) Differential expression and activity of catechol-O-methyl transferase (COMT) in a generalist (*Neotoma albigula*) and juniper specialist (*Neotoma stephensi*) woodrat. *Comparative Biochemistry and Physiology Part C*. 154: 383-390.

Skopec, MM, Green, AK Karasov, WH. (2010) The differential effects of flavonoids on glucose absorption in mammals and birds. *Journal of Chemical Ecology*. 36:236–243.

Skopec, MM, Haley, S, Torregrossa, AM, Dearing, MD. (2008) An oak (*Quercus agrifolia*) specialist (*Neotoma macrotis*) and a sympatric generalist (*Neotoma lepida*) show similar intakes and digestibilities of oak. *Physiological and Biochemical Zoology*. 81(4): 426-433.

Skopec, MM, Haley, SH, Dearing, MD. (2007) Differential hepatic gene expression of a dietary specialist (*Neotoma stephensi*) and generalist (*Neotoma albigula*) in response to juniper (*Juniperus monosperma*) ingestion. *Comparative Biochemistry and Physiology Part D* 2(1) 34-43 .

Dearing, MD, Skopec, MM, Bastiani, MJ. (2006) Detoxification rates of wild herbivorous rodents (*Neotoma*). *Comparative Biochemistry and Physiology A*. 145(4): 419-422.

Sorenson, JS, Skopec, MM, Dearing, MD. (2006) Application of pharmacological approaches to plant-mammal interactions. *Journal of Chemical Ecology*. 32 (6): 1229-1246.

Skopec, MM, Hagerman, AE., Karasov, WH. (2004) Do salivary proline-rich proteins counteract dietary hydrolysable tannin in laboratory rats? *Journal of Chemical Ecology* 30: 1679-1692.

Published abstracts:

Skopec, MM, Nichols, J Goodwin, CS. (2021) Is object caching in woodrats a spillover behavior? American Society of Mammalogists, Virtual Conference.

Goodwin, CS, Skopec, MM. (2021) The nose knows: Prey instinct of lab raised woodrats. American Society of Mammalogists, Virtual Conference.

Skopec, MM, Schmalz, JM, Dinsdale, J, Gardner, H, Lweinsohn, J. (2020) The efficacy of small versus large fences to protect the clay phacelia (*Phacelia argillacea*), an endangered endemic plant, from free-

ranging ungulate. Ecological Society of America, Virtual Conference

Skopec, MM. Backus, L. Smith, R. Anderton, AN. (2019) Dietary and habitat specialization in woodrats (genus *Neotoma*) is associated with differences in caching behavior. American Society of Mammalogists, Washington DC.

Goodwin, CS. Skopec, MM. (2019) Caching and building behaviors of woodrats in captivity during longer term studies. American Society of Mammalogists, Washington DC.

Skopec, MM. Jensen, D. Schramm, K. Dearing, MD. (2017) Biotransformation enzyme expression in nasal epithelium of woodrats consuming juniper. Society for Integrative and Comparative Biology, New Orleans, LA.

Nichols, J. Smith, J. Jack, A. Skopec, MM. (2017) Caching and activity levels in woodrats. Society for Integrative and Comparative Biology, New Orleans, LA.

Smith, RA. Dupont, KR. Uhl, L. Skopec, MM. (2017) Building and caching behaviors of woodrats in a laboratory setting. Society for Integrative and Comparative Biology, New Orleans, LA.

Gee, ZG. Skopec, MM. Schramm, K. Dearing MD. Downregulation of glutathione S-transferase may play a role in dietary specialization. (2017) Society for Integrative and Comparative Biology, New Orleans, LA.

Dearing, MD. Skopec, MM. Schramm, KM. Kitanovic, S. Wilderman, PR. Halpert JR. (2016) Mechanisms underlying dietary specialization in woodrats: possible role of CYP2B enzymes. Society for Integrative and Comparative Biology, Portland, OR.

Skopec, MM. Lewinsoh, J., Murray, S. Pence, V. Whitham, L. Wirick, C. (2015) The effects of grazing on the endangered autumn buttercup. Ecological Society of America, Baltimore, MD.

Young, A. Schmalz, J., Wright, M. Skopec, MM. (2015) Nutrient and demographic characteristics of sagebrush preferentially foraged on by pygmy rabbits (*Brachylagus idahoensis*) in Northern Utah. Ecological Society of America, Baltimore, MD.

Schramm, K. Skopec, M. Cox, J. Halper, J. Dearing, D. (2015). Metabolomics of juniper detoxification in a generalist and specialist mammalian herbivore. Phytochemical Society of North America, Urbana-Champaign, IL.

Abbott, J. VanLeuven, A. and M.M. Skopec. (2014). Caching behavior of non-food items in woodrats (*Neotoma albigula*). Society for Integrative and Comparative Biology, Austin, TX.

VanLeuven, A. Abbott, J. and M.M. Skopec. (2014). Caching behavior of the specialist woodrat *Neotoma stephensi*. Society for Integrative and Comparative Biology, Austin, TX.

Coombs, JM, Skopec, MM. (2011). Production of Tanning Binding Proteins in Prairie Voles (*Microtus orchrogaster*). Integrative and Comparative Biology: 51 :e177.

Hale, AJ, Skopec, MM, Dearing, MD. (2011). Detoxification Enzyme Expression in Nasal Epithelium of Woodrats. Integrative and Comparative Biology: 51 :e197.

Skopec, MM, Malenke, JR, Halpert, JR, Dearing, MD. (2011). Role of Cytochrome P450s in Juniper versus Creosote Consumption in Woodrats. *Integrative and Comparative Biology*: 51 :e128.

Skopec, MM, Dearing, MD. (2011). The effects of juniper consumption of catechol-O-methyl transferase (COMT) expression and activity in *Neotoma stephensi* a juniper specialist and *Neotoma albigula* a sympatric generalist. *Proceedings of the Comparative Nutrition Society Biennial Meeting*.

Skopec, MM, Nebeker, C, Dearing, MD. (2009) Catechol-O-methyl transferase may play an important role in allowing *Neotoma stephensi* to specialize on juniper” *Integrative and Comparative Biology*: 49: e157.

Dearing, MD, Magnanaou, E, Malenke, J, Skopec, MS. (2009) Functional genomics of mammalian herbivores. *Integrative and Comparative Biology*: 49: e4.5

Nebeker, C, Haley, SH, Dearing, MD, Skopec, MM. (2009) Quantification of biotransformation enzymes implicated in *Neotoma lepida's* ability to consume creosote. *Integrative and Comparative Biology*: 49: e280.

Skopec, MM, Haley SH, Dearing, MD. (2005) Differential gene expression in the livers of wild mammals consuming a toxic diet. *Integrative and Comparative Biology*. 44: 641.

Young, K, Skopec, MM, Dearing, MD. (2005) The efficacy of an *in vivo* assay in determining differences in detoxification rates among woodrat (*Neotoma*) species. *Integrative and Comparative Biology*. 44: 764.

Skopec, MM, Karasov, WH. (2003). Flavonoids decrease 3-O-methyl D-glucose absorption in laboratory rats. *FASEB Journal* 14: 4-5. Abstract No. 693.5