Paul Marek

Curriculum Vitae

Assistant Professor
Department of Entomology
Virginia Tech
Price Hall, 216A
Blacksburg, Virginia 24061
540 231-5653 (phone)
pmarek@vt.edu
www.jointedlegs.org

Education

Ph.D. in Biology, East Carolina University, NC 2008
M.A. in Systematic Biology and Ecology, San Francisco State University, CA 2002
B.S. in Biology, Loyola University of Chicago, IL 2000

Research Grants

NSF Advancing Revisionary Taxonomy and Systematics Grant, sole PI, 2017-present
National Science Foundation ($383,130)

NSF Collections in Support of Biological Research Grant, sole PI, 2015-present
National Science Foundation ($467,249)

NSF Biodiversity: Discovery & Analysis Grant, co-PI, 2013-present
National Science Foundation ($783,747)

Field Surveys for forest sensitive millipede species (*Cleidogona hoffmani*, *Buotus carolinus* and *Dixioria fowleri*) in Jefferson National Forest, Bland County Virginia, Appalachian Power, sole PI, 2016 ($26,000)

NSF Phylogenetic Systematics Grant, sole PI, 2011-2015
National Science Foundation ($254,385)

Expeditions Council Grant, sole PI, 2012-2014
National Geographic Society ($17,050)

NSF Doctoral Dissertation Improvement Grant, co-PI, 2006-2008
National Science Foundation ($10,510)

Publications

Rodriguez, J., T.H. Jones, P. Sierwald, P.E. Marek, W.A. Shear, M.S. Brewer, J.E. Kocot, and J.E.Bond 2018. Step-wise evolution of complex chemical defenses in millipedes: a phylogenomics approach, *Scientific Reports*, 8: 3209.

Marek, P.E., J.C. Means, and D.A. Hennen. 2018. *Apheloria polychroma*, a new species of millipede from the Cumberland Mountains (Polydesmida: Xystodesmidae), *Zootaxa*, 4375: 409-425.

Yang, F., K. Chan, P.E. Marek, P.M. Armstrong, P. Liu, J.E. Bova, J.N. Bernick, B.E. McMillan, B.G. Weidlich, and S.L. Paulson 2018. Cache Valley Virus in *Aedes japonicus japonicus* mosquitoes, Appalachian Region, United States. *Emerging Infectious Diseases*, 24: 553-557.

Means, J.C. and P.E. Marek. 2017. Is geography an accurate predictor of evolutionary history in the millipede family Xystodesmidae? *PeerJ*, 5:e3854.

Shear, W.A., P. Nosler, and P.E. Marek 2017. The identity of *Amplaria nazinta* (Chamberlin, 1910): a century-old millipede mystery resolved (Diplopoda, Chordeumatida, Striariidae), *Zootaxa*, 4311: 233-240.

Marek, P.E. 2017. Ultraviolet-induced fluorescent imaging for millipede taxonomy, *Research Ideas and Outcomes*, 3: 1-14.

Marek, P.E., J. Krejca, and W.A. Shear. 2016. A new species of *Illacme* Cook & Loomis, 1928 from Sequoia National Park, California, with a world catalog of the Siphonorhinidae (Diplopoda, Siphonophorida), *ZooKeys*, 626: 1-43.

Shear, W.A., R.L. Ferreira, L.F.M. Iniesta, and P.E. Marek 2016. A millipede missing link: Dobrodesmidae, a remarkable new polydesmidan millipede family from Brazil with supernumerary rings (Diplopoda, Polydesmida), and the establishment of a new suborder Dobrodesmidea, *Zootaxa*, 4178: 371-390.

Dellinger, T., V. Wong, and P.E. Marek. 2016. Makelabels: a Bash script for generating data matrix codes for collection management, *Biodiversity Data Journal*, accepted.

Garcia, A.J., S. Priya, and P.E. Marek. 2015. Understanding the locomotion and dynamic controls for millipedes: Part 1 – Kinematic analysis of millipede movements, *Proceedings of the ASME 2015 Conference on Smart Materials, Adaptive Structures and Intelligent Systems*, 1 – 10.

Meyer, W.M., J. Eble, K. Franklin, R.B. McManus, S.L. Brantley, J. Henkle, P.E. Marek, W.E. Hall, C.A. Olson, R. McInroy, E.M. Bernal Loaiza, R.C. Brusca, and W. Moore. 2015. Ground-Dwelling Arthropod Communities of a Sky Island Mountain Range in Southeastern Arizona, USA: Obtaining a Baseline for Assessing the Effects of Climate Change, *PLoS ONE*, 10, 1-18.

Means, J.C., E.A. Francis, A.A. Lane, and P.E. Marek. 2015. A general methodology for collecting and preserving xystodesmid and other large millipedes for biodiversity research, *Biodiversity Data Journal*, 3, 1-17.

Marek, P.E. and W. Moore. 2015. Discovery of a glowing millipede in California and the gradual evolution of bioluminescence in Diplopoda, *Proceedings of the National Academy of Sciences, USA*. 112, 6419-6424.

Harris, M.C., E.J. Dotseth, B.T. Jackson, S.L. Paulson, P.E. Marek, and D.M. Hawley. 2015. Detection and isolation of La Crosse virus in field-collected *Aedes japonicus japonicus* (Diptera: Culicidae) in the Appalachian Region, *Emerging Infectious Diseases*, 21.

Marek, P.E., T. Tanabe, and S. Sierwald. 2014. A species catalog of the millipede family Xystodesmidae (Diplopoda: Polydesmida), *Virginia Museum of Natural History Special Publications*, 17: 1 – 117.

Kamali, M., Peery, A., P.E. Marek, C. Antonio-Nkondjio, C. Ndo, Z. Tu, F. Simard, and I.V. Sharakhov. 2014. Temporal diversification of major African malaria vectors inferred from multigene phylogenetics, *PLoS ONE*, 9, 1-9.

Marek, P.E., W.A. Shear, and J.E. Bond. 2012. A redescription of the leggiest animal, the millipede *Illacme plenipes*, with notes on its natural history and biogeography (Diplopoda, Siphonophorida, Siphonorhinidae), *ZooKeys*, 241, 77–112.

Marek, P.E., J. Yeager, S. Molina, D. Papaj, and W. Moore. 2011. Bioluminescent aposematism in millipedes, *Current Biology*, 21, R680-R681.

Marek, P.E. 2010. A revision of the Appalachian millipede genus *Brachoria* Chamberlin, 1939 (Polydesmida, Xystodesmidae, Apheloriini), *Zoological Journal of the Linnean Society*, 159, 817-889.

Shear, W.A. and P.E. Marek. 2009. *Andrognathus hoffmani*, n. sp., a second species in the genus and the first species of Andrognathidae from México (Diplopoda, Platydesmida, Andrognathidae). Festschrift in honor of Richard Hoffman, *Memoirs of the Virginia Museum of Natural History*, 16, 149-158.

Marek, P.E. and J.E. Bond. 2009. A Müllerian mimicry ring in Appalachian millipedes, *Proceedings of the National Academy of Sciences, USA*. 106, 9755-9760.

Walker, M.J., A.K. Stockman, P.E. Marek, and J.E. Bond. 2009. Pleistocene glacial refugia across the Appalachian Mountains and coastal plain in the millipede genus *Narceus*: Evidence from population genetic, phylogeographic, and paleoclimatic data, *BMC Evolutionary Biology*. 9, 25.

Marek, P.E. and J.E. Bond. 2007. A reassessment of apheloriine millipede phylogeny: additional taxa, Bayesian inference, and direct optimization. *Zootaxa*. 1610, 27-39.

Marek, P.E. and J.E. Bond. 2006. Phylogenetic systematics of the colorful, cyanide-producing millipedes of Appalachia (Polydesmida, Xystodesmidae, Apheloriini) using a total evidence Bayesian approach. *Molecular Phylogenetics and Evolution*. 41, 704-729.

Marek, P.E. and J.E. Bond. 2006. Biodiversity hotspots: Rediscovery of the world's leggiest animal. *Nature*. 441, 707.

Marek, P.E. and D.H. Kavanaugh. 2005. The evolutionary relationships of North American *Diplous* Motschulsky (Coleoptera: Carabidae: Patrobini) inferred from morphological and molecular evidence. *Invertebrate Systematics*. 19, 145-168.

Marek, P.E., J.E. Bond, and P. Sierwald. 2003. Rhinocricidae Systematics II: A species catalog of the Rhinocricidae (Diplopoda: Spirobolida) with synonymies. *Zootaxa*. 308, 1-108.

Bond, J.E. and P.E. Marek. 2003. Rhinocricidae Systematics I: The taxonomic placement of the species of *Zipyge* Chamberlin, 1925 and *Oxypygides* Chamberlin, 1922 (Diplopoda: Spirobolida: Rhinocricidae: Oxypyginae). *Zootaxa*. 292, 1-8.

Websites

Wong, V.L. and P.E. Marek 2016. Iridescent.life, Structural color database, online at http://www.iridescent.life.

Marek, P.E. 2014. Virginia Tech Insect Collection, online at http://collection.ento.vt.edu.

Marek, P.E. 2010. *Brachoria* Chamberlin 1939. Version 16 September 2010, online at http://tolweb.org/Brachoria *in The Tree of Life Web Project*, http://tolweb.org/.

Teaching Experience

Assistant Professor, Virginia Tech
Course: Insect Biology Lecture and Lab (2013 - present)
Course: Insect Evolution and Diversity Lecture and Lab (2015, 2018)
Course: Practical Computing for Biologists (2016)

Adjunct Professor, Pima Community College, 2009
Course: General Biology II Lecture and Lab

Teaching Assistant, East Carolina University, 2007
Course: Phylogenetic Theory

Teaching Assistant, East Carolina University, 2004
Course: Terrestrial Arthropod Biology

Teaching Assistant, San Francisco State University, 2001-2002
Course: Insect Taxonomy Lab

Student advising

Doctoral students: Jackson Means (2014-present), Derek Hennen (2015-present)

Masters students: Victoria Wong (2015-2017, graduated)

Undergraduate students: Nina Zegler (2014-2015), Kathryn Lawler (2014-2015), Tessa Metz (2015-2016), Pat Shorter (2015-2017), Joseph Montemayor (2016-2017)

Insect Curation Experience

Curator, Virginia Tech Insect Collection, 2013-present
Curation of Virginia Tech Insect Collection

Curator, San Francisco State University, 2001-2002
Curation of San Francisco State University Entomology Museum

Research Assistant, CalBug. California Academy of Sciences. May-June 2002
Retrospective databasing and georeferencing entomology collections

Undergraduate Volunteer, University of Central Florida, February-August 2000
Curation and identification of Florida Carabidae backlog

Undergraduate Volunteer, Field Museum of Natural History, 1998-1999
Curation of Austral rove beetles

Awards & Honors

Recognition for contributions to the field of taxonomy and discovery of a new species of tarantula named *Aphonopelma mareki*, by colleagues in 2016
ZooKeys, doi:10.3897/zookeys.560.6264

Sigma Xi Helms Award for Student Research, 2010
East Carolina University

Faculty Standards Teaching Award, 2009
Pima Community College

Ernst Mayr Award Nomination, 2009
Society for Systematic Biology, Annual Meeting

Postdoctoral Excellence in Research and Teaching (PERT) Fellowship, 2008
National Institutes of Health, Center for Insect Science, University of Arizona

Second Place Presentation, 2007
Student Paper Competition, Entomological Society of America

First Place Presentation, 2007
Student Paper Competition, East Carolina Graduate Student Research Day

Partnerships for Enhancing Expertise in Taxonomy (PEET) Fellowship, 2003-2008
National Science Foundation, East Carolina University

Scholars Award 2003-2005
Graduate School, East Carolina University

Graduate Assistantship 2000-2002
Division of Research, California Academy of Sciences

Partnerships for Enhancing Expertise in Taxonomy Internship 2000
Department of Zoology, Field Museum of Natural History

REU Internship, Summer Systematics Institute 1999
Division of Research, California Academy of Sciences

Professional Appointments

Assistant Professor, Virginia Tech, 2013-present
Department of Entomology, Insect Taxonomy & Systematics.

Editor of Diplopoda, Pauropoda and Symphyla, *Zootaxa*, 2016-present

Secretary, Virginia Natural History Society, 2017-present

Councilor, Virginia Natural History Society, 2015-2017

Research Associate, Virginia Museum of Natural History, 2013-present

Research Associate/Principal Investigator, University of Arizona, 2011-2013
Evolution of bioluminescence in millipedes.

NIH Postdoctoral Research Associate, University of Arizona, 2008-2011
Evolution of luminescence in Californian millipedes. Advisors, Wendy Moore and Dan Papaj

Doctoral Fellow, East Carolina University, 2003-2008
Systematics and evolution of mimicry in Appalachian millipedes. Advisor: Jason Bond

Graduate Assistant, San Francisco State University, 2000-2002
Systematics of the North American ground beetle *Diplous*. Advisor: David Kavanaugh

Expedition Entomologist, California Academy of Sciences, 2002
Spider biodiversity of the Gaoligong Mountains of China. Advisor: Charles Griswold

Curator, San Francisco State University, 2001-2002
Curation of San Francisco State University Entomology Museum. Advisor: John Hafernik

Undergraduate Research Assistant, Field Museum of Natural History, 2000
Classification and systematics of the millipede family Rhinocricidae. Advisor: Petra Sierwald

NSF Undergraduate REU Intern, California Academy of Sciences, 1999
Beetle systematics (Summer Systematics Institute). Advisor: David Kavanaugh

Undergraduate Research Assistant, Loyola University Chicago, 1999
Effects of elevated CO_2 on leaf chemistry and crane fly detritivory. Advisor: Nancy Tuchman

Undergraduate Research Assistant, Loyola University Chicago, 1999
Cladistic analysis of the leaf-rolling weevil genus group Attelabina. Advisor: Robert Hamilton

Undergraduate Volunteer, Field Museum of Natural History, 1998-1999
Curation of Austral rove beetles. Advisors: Margaret Thayer and Alfred Newton

Community Engagement and Public Outreach

Interviewed by the New York Times and highlighted on Saturday Night Live's Weekend Update for research on the discovery of *Illacme tobini*, 2016

Science advisor for BBC film "Attenborough's Life that Glows", 2016

Interviewed by the New York Times, National Science Foundation, and National Geographic News for research on the discovery of a bioluminescent millipede in California, 2015

Interviewed by National Public Radio's Science Friday Radio Show for research on the leggiest animal on the planet, *Illacme plenipes*, 2012

Interviewed by the BBC News for research on the leggiest animal on the planet, the enigmatic *Illacme plenipes*, 2012.

Arizona Insect Festival, co-organized "Luminous Insect" exhibit, 2012

Scientific advisor for National Geographic Television's Series, "Wild Wild West". Traveled with NGS photographers to film bioluminescent millipedes, 2012

Interviewed by National Public Radio's Science Friday Radio Show for research on bioluminescent and biofluorescent millipedes, 2012

Scientific contributor for Xylem and Phloem's educational iPad app, "Isopod: The Roly Poly Science Game" featuring scientific topics authored by entomologists, biologists and teachers.

Scientific advisor for American Museum of Natural History's science exhibit "Creatures of Light: Nature's Bioluminescence" (included as part of the exhibit, an educational iPad app, which includes the bioluminescent millipede *Motyxia sequoiae* and our recent study in *Current Biology*).

BioBlitz Saguaro National Park, National Geographic/National Park Service, Organized public arthropod inventory focused on bioluminescence, fluorescence, and arthropod coloration, 2011

Interviewed by Canadian Broadcast Corporation's Quirks & Quarks Radio Show, LiveScience, Discover Magazine, New Scientist, MSNBC, and National Geographic for research on bioluminescent aposematism in millipedes, 2011

Arizona Insect Festival, Organized "D.E.A.D." tent (Decomposer Education and Appreciation Destination), 2011

Undergraduate Biology Research Program Small Group Leader, University of Arizona, 2011

Natural History, millipedes and insects blogger, http://jointedlegs.org and http://www.apheloria.org/Paul/millipedia_blog/millipedia_blog.html, 2009 - present

Meet the Beetles! Playing live at the Arizona-Sonora Desert Museum, 2010

Darwin Day, Darwin 200th Birthday Celebration, University of Arizona, 2009

Interviewed by National Public Radio, Voice of America, New York Times, BBC News, Reuters, and Associated Press for research on *Illacme plenipes*, "leggiest animal on the planet," and biodiversity, 2006 (VOA interview broadcast globally through shortwave radio)

BugFest, North Carolina State Museum of Natural History, 2005

"Don't Bug Me" event tutor, Science Olympiad, C.M. Eppes Middle School, NC, 2005-2007

Teacher Services Assistant, California Academy of Sciences, 2000-2002

Research Talks

Invited seminar, James Madison University 2018: "Millipede biodiversity and the evolution of bioluminescence"

Research paper, International Congress of Myriapodology, Thailand 2017: "Evolution of bioluminescence in Sierra luminous millipedes"

Invited seminar, Smithsonian Institution 2016: "Glow-in-the-dark millipedes, mimicry rings and the 750-legged minibeast"

Invited seminar, Peaks of Otter, Blue Ridge Parkway, National Park Service 2016: "Discovery and description of new millipede species in Appalachia"

Invited seminar, University of Maryland 2016: "Millipede biodiversity and the evolution of bioluminescence"

Invited seminar, East Carolina University 2016: "Millipede biodiversity and the evolution of bioluminescence"

Research paper, Entomological Society of America 2015: "Discovery of a glowing millipede in California and the gradual evolution of bioluminescence in Diplopoda"

Invited seminar, Highlands Biological Station 2015: "Glow-in-the-dark millipedes, mimicry rings and the 750-legged minibeast"

Lecture, Highlands Biological Station 2015: "How to collect millipedes"

Research paper, International Firefly Symposium 2014: "The evolution of bioluminescence in the Sierra luminous millipedes"

Invited seminar, Mountain Lake Biological Station, University of Virginia 2014: "Systematics and the evolution of bioluminescence and mimicry in millipedes:

Invited seminar, University of Illinois, Urbana-Champaign 2014: "The evolution of mimicry and bioluminescence in millipedes"

Invited seminar, College of William and Mary 2014: "The glow means no: The evolution of bioluminescence in millipedes"

Invited seminar, Auburn University 2014: “Systematics and the evolution of bioluminescence in millipedes”

Invited seminar, Virginia Museum of Natural History 2014: “The evolution of bioluminescence in millipedes”

Invited seminar, Virginia Tech 2013: “Phylogenetic systematics and the evolution of bioluminescence in cyanide-producing millipedes”

Invited seminar, University of Missouri - St. Louis 2012: “Millipede systematics and the evolutionary ecology of warning coloration”

Invited seminar, Purdue University 2012: “Millipede systematics and the evolutionary ecology of warning coloration”

Invited seminar, Field Museum of Natural History, Watson Armour Research Seminar Series 2012: “The glow means No: the evolution of bioluminescence in millipedes”

Invited seminar, University of Illinois at Chicago 2012: “The glow means No: the evolution of bioluminescence in millipedes”

Invited lecture, Millsaps College Moreton Lecture 2012: “Glow-in-the-dark millipedes, mimicry rings and the 750-legged beast”

Invited lecture, University of Arizona, Topics in Behavioral Ecology class 2012: “Behavioral ecology of color and light”

Invited seminar, University of Vermont 2011: “Millipede systematics and the evolutionary ecology of warning coloration”

Invited seminar, Stephen F. Austin University 2011: “Millipede systematics and the evolutionary ecology of warning coloration”

Invited seminar, California Academy of Sciences 2011: “The glow means No: the evolution of bioluminescence in millipedes”

Invited seminar, Stetson University 2011: “Millipedes, mimicry, and bioluminescence”

Invited seminar, Cleveland Museum of Natural History 2011: “Mimicry, bioluminescence, and the 750-legged beast”

Invited lecture, San Diego State University, Biology Department 2011: “The future of taxonomy and cybertaxonomy”

Invited seminar, San Diego State University, Biology Department 2011: “The glow means No: the evolution of bioluminescence in millipedes”

University of Arizona, Ecology and Evolutionary Biology Department 2010: “The glow means, No: the evolution of bioluminescence in millipedes”

University of Arizona, Center for Insect Science, Hexapodium 2010: “The glow means, No: the evolution of bioluminescence in millipedes”

Society of Systematic Biologists, Evolution 2009: “Mimicry in Appalachian millipedes”

Invited seminar, University of Arizona, Entomology Department 2008: “Warning, cyanide and masquerade: A Müllerian mimicry ring in Appalachian millipedes”

Invited seminar, University of Tennessee Martin, Biology Department 2008: “Mimicry in Appalachian millipedes”

Richard Hoffman Birthday Festschrift 2007: “A molecular phylogenetic approach to genus delimitation within the xystodesmid tribe Apheloriini (Polydesmida)”

North Carolina Academy of Science 2007: “Systematics and color mimicry evolution of the cyanide-producing millipedes of Appalachia”

East Carolina University, Graduate Student Research Day 2007: “Systematics and color mimicry evolution of the cyanide-producing millipedes of Appalachia”

Entomological Society of America 2007: “Systematics and color mimicry evolution of the cyanide-producing millipedes of Appalachia”

Invited lecture, East Carolina University, Field Zoology Class 2006: “Bizarrodiversity”

Southeastern Population Ecology and Evolutionary Genetics 2006: “Systematics and color mimicry evolution of the cyanide-producing millipedes of Appalachia”

Society of Systematic Biologists, Evolution 2006: “An exemplar phylogenetic approach to evaluating higher-level classification problems in cyanogenic xystodesmid millipedes in Appalachia”

Association of Southeastern Biologists 2006: “Systematics and color mimicry evolution of the cyanide-producing millipedes of Appalachia”

Entomological Society of America 2005: “Systematics and mimicry evolution of colorful cyanide-producing millipedes of Appalachia”

Southeastern Ecology and Evolution Conference 2005: “Systematics and mimicry evolution of cyanide producing millipedes”

East Carolina University, Graduate Student Research Day 2005: “Systematics and mimicry evolution of cyanide producing millipedes”