

Vincent A. Formica

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EDUCATION

- 2001–06 Ph.D., Indiana State University, Life Science, Title: Spatial Dynamics of Alternative Reproductive Strategies (Elaina Tuttle, advisor)
1997–01 B.A., St. Mary's College of Maryland, Major: Biology, Focus: Environmental Studies

PROFESSIONAL APPOINTMENTS

- 2018–*present* Associate Professor, Swarthmore College
2012–2018 Assistant Professor, Swarthmore College
2010–12 Post-doctoral Research Associate, University of Virginia
2008–10 Visiting Associate Research Professor, University of Virginia
2007–08 Visiting Assistant Professor, Swarthmore College
2007 Faculty, Mountain Lake Biological Station
2006–07 Visiting Assistant Professor, Gettysburg College

RESEARCH FUNDING

- 2014–19 NSF IOS 135503, “RUI: The Evolvability Of Social Networks,” \$620,000 (Lead PI)
2010–13 NSF IOS 1027251 “Phenotypic Selection Resulting From Social Interactions,” \$450,000, (senior personnel; Edmund D. Brodie III, PI)
2008–09 University of Virginia Centers and Labs Union Technology Grant, \$2000
2002–06 Indiana State University Graduate School Research Grants, \$2470
2002 Animal Behavior Society Research Grant, \$500

PUBLICATIONS (* Undergraduate collaborator)

Vilella-Pacheco, Zoromar.* , Lisa Mitchem, **Vincent Formica**, & Edmund Brodie III, 2021. Male competition reverses female preference for male chemical cues. *Ecology and Evolution*, 00:1–10

Vincent Formica, Hannah Donald, Hannah Marti, Zhazira Irgebay, Edmund D. Brodie III. 2020. Social network position experiences more variable selection than weaponry in wild subpopulations of forked fungus beetles. *J. Anim. Ecol.* 00: 1– 15

- Mitchem, Lisa, Reena Debray*, **Vincent Formica**, Edmund D. Brodie III. 2019. Contest interactions and outcomes: relative body size and aggression independently predict contest status. *Animal Behaviour*. 157, 43-49
- Grunst, Andrea, Melissa Grunst, **Vincent Formica**, Marisa Korody, Adam Betuel, Margarida Barcelo-Serra, Sarah Ford, Rusty Gonser, & Elaina Tuttle. 2018. Morph-specific patterns of reproductive senescence: connections to discrete reproductive strategies. *American Naturalist*, 191: 744-755
- Grunst, Melissa, Andrea Grunst, **Vincent Formica**, Rusty Gonser, & Elaina Tuttle. 2018. Multiple signaling functions of song in a polymorphic species with alternative reproductive strategies. *Ecology and Evolution*, 8: 1369-1383
- Formica, Vincent**, Corlett Wood, Phoebe Cook*, & Edmund Brodie III. 2017. Consistency of animal social networks after disturbance. *Behavioral Ecology*. 28 (1): 85-93
[Selected by Faculty of 1000, Ecology]
- Formica, Vincent**, Hannah Donald-Cannon, & Ian Perkins-Taylor*. 2016. Consistent patterns of male mate preference in the laboratory and field. *Behavioral Ecology & Sociobiology*. 70: 1805-1802
- Formica Vincent** & Amanda Chan*. 2015. No effect of host species on phenoloxidase activity in a mycophagous beetle. *PLOS One* 10(10): e0141167
- Wood, Corlett, Hannah Donald*, **Vincent Formica**, & Edmund Brodie III. 2013. Surprisingly little population genetic structure in a fungus-associated beetle despite its exploitation of multiple hosts. *Ecology and Evolution*, 3: 1484-1494.
- Benowitz*, Kyle, Edmund Brodie III, & **Vincent Formica**. 2012. Morphological correlates of a combat performance trait in the forked fungus beetle, *Bolitotherus cornutus*. *PLOS One* 7: e42738.
- Donald*, Hannah, Corlett Wood, Kyle Benowitz*, Rebecca Johnson*, Edmund Brodie III, & **Vincent Formica**. 2012. Nondestructive sampling of insect DNA from defensive secretion. *Molecular Ecology Resources*, 12: 856-860.
- Formica, Vincent**, Whitney Larsen*, Corlett Wood, Malcolm Augat, Rebecca Butterfield*, Helen Hougen,* & Edmund Brodie III. 2012. Fitness consequences of social network position in a wild population of forked fungus beetles (*Bolitotherus cornutus*). *Journal of Evolutionary Biology*, 25: 130-137.
- Formica, Vincent**, Joel McGlothlin, Corlett Wood, Malcolm Augat*, Rebecca Butterfield*, Mollie Barnard*, & Edmund Brodie III. 2011. Phenotypic assortment mediates the effect of social selection in a wild beetle population. *Evolution*, 65: 2771-2781.

Formica, Vincent, Malcolm Augat*, Molly Barnard*, Rebecca Butterfield *, Corlett Wood, & Edmund Brodie III. 2010. Using home range estimates to construct social networks for species with indirect behavioral interactions. *Behavioral Ecology & Sociobiology*, 64: 1199-1208.

Formica, Vincent & Elaina Tuttle. 2009. Examining the social landscapes of alternative reproductive strategies. *Journal of Evolutionary Biology*, 22: 2395-2408.

Holliday, Alison Walker*, Edmund Brodie III, & **Vincent Formica**. 2009. Differences in defensive volatiles in the forked fungus beetle, *Bolitotherus cornutus*, living on two species of fungus. *Journal of Chemical Ecology*, 35: 1302-1308.

Tuttle, Elaina, Ryan Jensen, **Vincent Formica**, & Rusty Gonser. 2006. Using remote sensing image texture to study habitat use patterns: A case study using the polymorphic white-throated sparrow (*Zonotrichia albicollis*). *Global Ecology and Biogeography*, 15: 349-357.

Formica, Vincent, Rusty Gonser, Scott Ramsay, & Elaina Tuttle. 2004. Spatial dynamics of alternative reproductive strategies: The role of neighbors. *Ecology*, 85: 1125-1136. [Selected by Faculty of 1000]

SUBMITTED (* Undergraduate co-author)

Mitchem, Lisa, **Vincent Formica**, Dana Homer*, Rehnay Debray*, & Edmund Brodie III (in review). Females do not behave competitively during intrasexual interactions in the presence of a fungal resource in a mycophagous beetle species, *Bolitotherus cornutus*.

Mitchem, Lisa, **Vincent Formica**, & Edmund Brodie III (in review). Grumpy Old Beetles: Older males initiate more aggressive behaviors in forked fungus beetles (*Bolitotherus cornutus*)

INVITED TALKS

- 2019 Université du Québec À Montréal
- 2018 Harvard University
- 2017 Rutgers University
- 2015 Villanova University
- 2015 St. Mary's College of Maryland
- 2014 University of Pennsylvania
- 2013 Texas Tech University
- 2013 Swarthmore College (Sigma Xi Speaker)
- 2013 Indiana State University (Darwin Day Speaker)
- 2011 University of Virginia
- 2011 Swarthmore College
- 2010 Mountain Lake Biological Station
- 2010 Bucknell University

- 2010 Rhodes College
- 2010 Canisius College
- 2007 Swarthmore College
- 2007 Mountain Lake Biological Station
- 2006 Florida Southern College
- 2006 Gettysburg College
- 2005 DePauw University

PROFESSIONAL PRESENTATIONS

- 2019 Costello, R., P. Cook, V. Formica, E Brodie III. How habitat structure influences multilevel selection in experimental populations of forked fungus beetles. Evolution Providence, RI
- 2017 **Formica, V.**, D. Tian,* and E. Brodie III. Social network position shapes nonlinear selection on weaponry. Evolution 2017, Portland, OR .
- 2016 **Formica, V.** and E. Brodie III. Sexual selection for social network position in multiple populations. Evolution 2016, Austin, TX
- 2015 **Formica, V.**, C.Wood, **P. Cook***, and E. Brodie III. Repeatability and resilience in social networks. Evolution 2015, Guarujá, Brazil
- 2013 Wice, E. W.*, C. W. Wood, , **V. A. Formica**, and E. D. Brodie III. Multivariate patterns of oviposition and kin-structuring in *Bolitotherus cornutus*. Evolution 2013, Snowbird, UT.
- 2012 Johnson*, R., E. Brodie III, and **V. Formica**. Comparison of behavioral and genetic Bateman gradients in forked fungus beetles (*Bolitotherus cornutus*). Evolution 2012, Ottawa, ON, Canada.
- 2012 Wood, C., H. Donald*, **V. Formica**, and E. Brodie III. No evidence for habitat-associated population structure in a beetle that uses three sympatric fungi. Evolution 2012, Ottawa, ON, Canada.
- 2012 Kahrl, A., **V. Formica**, H. Donald*, E. Wice*, and E. Brodie III. Evidence for post-copulatory selection in the forked fungus beetle. Evolution 2012, Ottawa, ON, Canada.
- 2011 **Formica, V.**, A. Cowley, A. Hsiesh, and E. Brodie III. Using agent-based simulations to explore behavioral mechanisms of sexual selection. Evolution 2011, Norman, OK.
- 2010 **Formica, V.**, W. Larsen*, C. W. Wood, and E. Brodie III. Sexual selection for social network position in a wild population of forked fungus beetles. Evolution 2010, Portland, OR.
- 2009 **Formica, V.**, E. Brodie III, and J. McGlothlin,. Phenotypic social selection in a wild population of forked fungus beetles (*Bolitotherus cornutus*). Evolution 2009, Moscow, ID.
- 2006 **Formica, V.** Modifying the landscape through social niche construction. 43rd Annual Meeting of the Animal Behavior Society, Snowbird, UT.

- 2006 Korody*, M., V. Formica, R. Gonser, and E. Tuttle. Patterns of parental investment in sex ratio: A birds-eye view using geographic information systems. 43rd Annual Meeting of the Animal Behavior Society, Snowbird, UT.
- 2004 Formica, V. A. and E. M. Tuttle. Evidence for social selection in a polymorphic passerine. Midwest Ecology and Evolution Meeting, Notre Dame, IN.
- 2003 Adank*, K. R. Gonser, V. Formica, and E. Tuttle. Nest site story: nest attributes of the polymorphic White-throated Sparrow. Poster, 40th Annual Meeting of the Animal Behavior Society, Boise, ID.
- 2002 Formica, V. and E. Tuttle. The milkman's child: strategic neighborhood choice in the polymorphic White-throated Sparrow. Poster, 9th Congress of the International Society for Behavioral Ecology, Montreal, Canada
- 2001 Formica, V. and E. Tuttle. Location, location, location. Spatial correlates of reproductive success in the polymorphic White-throated Sparrow. Poster, 38th Annual Meeting of the Animal Behavior Society, Corvallis, OR.

PROFESSIONAL SERVICE

Associate editor for Special Section in the American Naturalist: How Systems of Power and Oppression Shape Theory and Practice in Behavior, Ecology, and Evolution 2020-*present*

American Society of Naturalists Diversity Committee 2019-*present*

Associate editor for Ecology and Evolution 2012-2018

Reviewer for MITACS Accelerate program 2018, 2020

Panelist for the National Science Foundation, IOS, Animal Behavior 2020

Ad-hoc reviewer for IOS-Animal Behavior, the National Science Foundation

Ad-hoc reviewer for DEB-Evolutionary Processes, the National Science Foundation

Reviewer for:

Animal Behavior

The American Naturalist

Behavioral Ecology

Behavioral Ecology and Sociobiology

Ecology and Evolution

Ecology Letters

Evolution

Functional Ecology

Journal of Evolutionary Biology

Molecular Ecology Resources

PLOS One

Proceedings of the Royal Society B

TEACHING EXPERIENCE

2012-*present* **Swarthmore College**

Honors Seminar: Evolution of Animal Societies

Evolution with laboratory

Population and Organismal Biology with laboratory

Biology Scholars Program Attachment

Honors Seminar: Molecular Ecology and Evolution

ENVS Student Led Research Project: Science and Culture of Beekeeping

2008-10 **University of Virginia**

Experimental and Investigative Evolution

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| 2007–08 | Molecular Ecology and Evolution Swarthmore College Evolution with laboratory Population and Organismal Biology with laboratory Honors Seminar: Molecular Ecology and Evolution |
| 2007 | Mountain Lake Biological Station Ecological Applications of GIS |
| 2006–07 | Gettysburg College Introduction to Ecology and Evolution with laboratory (for majors) Introduction to Molecules, Genes and Cells (for non-majors) |

SWARTHMORE COLLEGE COMMITTEE SERVICE

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| 2020 | Ad hoc committee on Curriculum Continuity during COVID |
| 2020–present | Elected to the Committee of Faculty Procedures (COFP) |
| 2017–19 | Elected to The Council on Educational Policy (CEP) |
| 2016–19 | Secretary of the Swarthmore Chapter of Sigma Xi |
| 2018– <i>present</i> | Manger of Endowed Field Funds Swarthmore Biology Department |
| 2016 | Crum Woods Stewardship Committee |
| 2014–15 | Pre-Professional Advisory Committee College Judiciary Committee |
| 2013–14 | College Judiciary Committee Department Rep for HHMI External Funding Departmental Tenure Track Search Committee |

INDEPENDENT RESEARCH STUDENTS MENTORED

* NSF REU Student, † research credit or directed reading credit

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|------|---|------|---|
| 2021 | Jon Kim † Julie Xu | | Mika Menga Lillian Price |
| 2020 | Jon Kim † Sophia Schlenz Sarah Gilman Julie Xu Bailey Jones Jorge Lopez-Nava | 2017 | Saadiq Garba Alexis Davis Julia Barbano Elizabeth Wainright Lillian Fornof Marianne Lotter-Jones † Zhazira Irgebay † David Tian† |
| 2019 | John Kim † Vitor dos Anjos † Daria Syskine † Victoria Overbeck Chelsea Semper | 2016 | Marianne Lotter-Jones Soumba Traore Robert Hwang Reena Debray* Zhazira Irgebay † |
| 2018 | Dana Homer † Hana Gutow Cedric Lary Sophie Nasrallah † | 2015 | Hazel Galloway Desta Pulley |

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|------|------------------------|------|----------------------|
| | Adam Kapilow | | Rebecca Johnson* |
| | Shelby Daniel-Wayman † | | Eric Wice* |
| 2014 | Rudolfo Pérez † | | Ian Perkins-Taylor* |
| | Amanda Chan † | | Kyle Benowitz |
| | Harris Hoke | | Hannah Donald |
| | Ian Grant | 2010 | Molly Siegel* |
| | Hazel Galloway | | Ashley Troth* |
| | Angela Menna | 2009 | Whitney Larsen* |
| | Jonas Oppenheimer† | | Helen Hougen |
| 2013 | Phoebe Cook* † | | David Montgomery* |
| | Stephanie Carrera * † | | Amy Heilman |
| | Laura Katz | 2008 | Malcolm Augat |
| | Rudolfo Pérez | | Eileen Butterfield* |
| | Amanda Chan | | Mollie Barnard |
| | Rachel Crane † | 2007 | Whitney Nekoba† |
| | Patrick Monari † | | Jennifer Richardson* |
| | Yvonne Socolar † | 2006 | Shaun Viechweg |
| | Ray Watson † | | Katie Greenfield † |
| | Ian Perkins-Taylor † | 2005 | Tiffany Ko |
| | | 2004 | Marisa Korody |
| 2012 | Stephanie Carrera † | 2002 | Lyndsey Foster |
| | Ray Watson † | | Kathryn Adank |
| | Rebecca Johnson | | Erin Wilman |
| | Kyle Benowitz | 2001 | Anthony Clemons |
| 2011 | Nelson Milano* | | |

SWARTHMORE COLLEGE COMMUNITY INVOLVEMENT

Lectures and Public Panels:

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| 2017 | “The Evolution of Social Networks” – lecture to the faculty of the College |
| 2015 | “Romance, Love, and Attraction” – Public Panel and Discussion for student run group, Peripeteia |
| 2014 | Teaching, Research, Governance and Work-Life Balance at Swarthmore |
| 2013 | Critical Examinations of "Community" Faculty Panel – part of Swarthmore College’s Institute for the Liberal Arts |
| 2013 | “Looking glass or Jabberwocky? Explorations into animal social networks” – presentation at Swarthmore Sigma Xi Strawberry Festival |
| 2013 | “What is important in the discipline: Biology” – presentation to the faculty |
| 2013 | “Knowledge Begins in Wonder” – presentation to Swarthmore Parents Council |
| 2012–13 | “The Righteous Mind” – Participated a multi-semester discussion of Jonathan Haidt’s recent book; part of Swarthmore College’s Institute for the Liberal Arts |

Student Development

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| 2017 | “March for Science” Organized buses for students, faculty, and staff to attend the march in Washington D.C. |
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- 2016 “Participation in the classroom” Workshop for first generation students run by the dean’s office
- 2014 “Participation in the classroom” Workshop for first generation students run by the dean’s office
- 2014 The Science and Culture of Beekeeping – Faculty of record for student-organized environmental studies research project; 18 students enrolled
- 2014 Conducted large-scale statistical analysis of BIOL 01 and BIOL 02 grades for HHMI sponsored development of the BIOL SP program.
- 2012–13 Served on two Biochemistry Course Major Theses: Elizabeth Williams and Travis Mattingly

Outreach:

- 2014-18 Science For Kids Workshop Leader – developed and led a workshop for evolution of insects for middle school children

OTHER PROFESSIONAL EXPERIENCE & OUTREACH

- 2014–15 Philadelphia Zoo Crew Field Trip Mentor
- 2014 Field Trip Research Mentor, Ecological Society of America SEEDS program
- 2013 Mentor for Workshop and Writing Retreat to Increase the Productivity of Biology Faculty, a workshop for early career URM faculty and post-docs.
- 2009 Field Trip Research Mentor, Ecological Society of America SEEDS program
- 2006–07 Faculty Mentor, Biosphere Biology Club at Gettysburg College
- 2003 Science Olympiad Coach, Sullivan Jr. High, 2003 regional champions
- 2002–06 Workshop Leader, Indiana Junior Science and Humanities Symposium
- 1999–01 GIS Analyst, Natural Capital Group, Center For Environmental Studies at the Chesapeake Biological Laboratories, University of Maryland