

Kevin Surya

Directed Interdisciplinary Studies, Honors College
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Curriculum Vitae

3/1/2019

Education

- 2015– B.S. Montana State University, Directed Interdisciplinary Studies
(earth sciences, biology, and statistics), GPA: 3.83
- 2012–15 SMA Kanisius (high school), Jakarta, Indonesia

Lab Work

- 2017– Varricchio Lab (lab member; PI: David J. Varricchio)
- 2016– MSU Macroevolution Lab (undergraduate research assistant; PI: Chris L. Organ)
- 2015– DinoChicken Lab (undergraduate research assistant; PI: Dana J. Rashid)

Publications

- 4. **Surya, K.**, and C. L. Organ. Does trait evolution follow time or genetic substitutions? *In preparation*.
- 3. **Surya, K.**, I. M. Brenes, J. D. Gardner, N. J. Rawlence, A. J. D. Tennyson, L. W. Viñola López, C. L. Organ, and D. J. Varricchio. Avian prelaying egg rotation. *In preparation*.
- 2. Gardner, J. D., **K. Surya**, C. L. Organ. Phylogeography of the tetrapod water-land transition. *To be submitted to Comptes Rendus Palevol*.
- 1. Rashid, D. J., **K. Surya**, L. M. Chiappe, N. R. Carroll, K. L. Garrett, B. Varghese, A. Bailleul, J. K. O'Connor, S. C. Chapman, and J. R. Horner. (2018). Avian tail ontogeny, pygostyle formation, and interpretation of juvenile Mesozoic specimens. *Scientific Reports* 8: 9014.

Grants & Awards (\$18,091)

- 14. MSU Undergraduate Scholars Program (USP) Travel Grant: Which phylogenetic branch length unit better represents trait evolution: Time or Substitution? *In preparation*.
- 13. MSU USP Research Grant: Which phylogenetic branch length unit better fits species' phenotypic traits: Time or genetic substitution? Advisor: Chris L. Organ. (2018–2019). \$1,800.
- 12. MSU Organization of Student Engagement (OSE) Student Club Mass Funding: Dead Lizards Society (paleontology club). Advisor: David J. Varricchio. (2018–2019). \$1,726.
- 11. Sigma Xi Grants-In-Aid of Research Program: Which phylogeny better fits species' trait data: Time or molecular tree? Advisor: Chris L. Organ. (2017–2018). \$1,000.
- 10. GSA (Geological Society of America) Rocky Mountain Section Travel Grant. (2017). \$90.
- 9. MSU USP Research Grant: Which phylogeny better fits species' trait data: Time or molecular tree? Advisor: Chris L. Organ. (2017–2018). \$1,800.
- 8. MSU CLS (College of Letters and Science) Student Research Travel Grant. (2017). \$375.
- 7. GSA On To The Future Travel Awards. (2017). \$500.
- 6. MSU USP Travel Grant: Paleohistology technique for sub-fossilized bone. Mentor: Ellen-Thérèse Lamm. (2017). \$500.
- 5. Kenny Dye Memorial Scholarship. (2017–2018). \$1,900.
- 4. NHMLA (Natural History Museum of Los Angeles) Student Collections Study Award: Avian pygostyle fusion. Advisor: Dana J. Rashid. (2017). \$1,300.
- 3. MAS (Montana Academy of Sciences) Student Research Grant: Pygostyle fusion sheds light on ankylosing spondylitis pathology. Advisor: Dana J. Rashid. (2017–2018). \$700.

2. Montana INBRE (IDeA Network of Biomedical Research Excellence) Undergraduate Student Research Program: Pygostyle fusion sheds light on ankylosing spondylitis pathology. Advisor: Dana J. Rashid. (2017). \$4,600.
1. MSU USP Research Grant: Pelvic sexual dimorphism in Palaeognathae (Aves: Neornithes) and its evolutionary relationship with relative egg size. Advisor: David J. Varricchio. (2016–2017). \$1,800.

Presentations

13. **Surya, K.**, and C. L. Organ. (2019) Which phylogenetic branch length unit better represents trait evolution: Time or Substitution? *Evolution. Accepted.*
12. **Surya, K.**, and C. L. Organ. (2019) Does trait evolution follow time or genetic substitution? National Conference of Undergraduate Research. *Accepted.*
11. **Surya, K.**, D. J. Rashid, L. M. Chiappe, N. R. Carroll, K. L. Garrett, B. Varghese, A. Bailleul, J. K. O'Connor, S. C. Chapman, and J. R. Horner. (2018) Bird tail growth necessitates re-interpretation of Mesozoic bird fossils. MSU Earth Sciences Colloquium.
10. **Surya, K.**, and C. L. Organ. (2018) Which phylogeny better fits species' trait data: Time or molecular tree? MSU Student Research Celebration Topical Session: *Macroevolution: The Fellowship of the Tree.*
9. **Surya, K.**, and C. L. Organ. (2018) Which phylogeny better fits species' trait data: Time or molecular tree? National Conference of Undergraduate Research.
8. **Surya, K.**, I. M. Brenes, J. D. Gardner, L. W. Viñola López, C. L. Organ, and D. J. Varricchio (2017) Pelvic coevolution with egg size and shape: Implications for extinct dinosaurs. Geological Society of America Annual Meeting.
7. Rashid, D. J., **K. Surya**, S. C. Chapman, L. M. Chiappe, A. M. Bailleul, and J. R. Horner (2017) Pygostyle development and its implications for the Cretaceous long- to short-tailed avian transition. Society of Vertebrate Paleontology Annual Meeting.
6. **Surya, K.**, D. J. Rashid, and S. C. Chapman (2017) Chicken pygostyle fusion sheds light on ankylosing spondylitis pathology. Montana INBRE Summer Research Poster Session.
5. **Surya, K.**, L. W. Viñola López, and E.-T. Lamm (2017) Paleohistology technique for sub-fossilized bone. International Symposium on Paleohistology.
4. **Surya, K.**, I. M. Brenes, L. W. Viñola López, J. D. Gardner, C. L. Organ, and D. J. Varricchio (2017) Pelvic sexual dimorphism in modern birds (Aves: Neornithes) and its evolutionary relationship with relative egg size. MSU Student Research Celebration.
3. **Surya, K.**, I. M. Brenes, L. W. Viñola López, J. D. Gardner, C. L. Organ, and D. J. Varricchio (2017) Pelvic sexual dimorphism in modern birds (Aves: Neornithes) and its evolutionary relationship with relative egg size. MSU Earth Sciences Colloquium.
2. **Surya, K.**, L. W. Viñola López, I. M. Brenes, J. D. Gardner, C. L. Organ, and D. J. Varricchio (2017) Pelvic sexual dimorphism in modern birds (Aves: Neornithes) and its evolutionary relationship with relative egg size. National Conference of Undergraduate Research.
1. **Surya, K.** (2016) Assessment on the origins of avian active flight. MSU Earth Sciences Colloquium

Paleontological Field Experience

2018 Excavation, Foremost Formation, north of Rudyard, MT, USA (10 days)

2016 Excavation and prospection, Two Medicine Formation, west of Choteau, MT, USA (31 days)

Professional Service

Memberships

- Council on Undergraduate Research

- Sigma Xi (2017–2018)
- Society of Systematic Biologists
- Montana Academy of Sciences
- Society for the Study of Evolution
- Geological Society of America (2016–2018)
- Society of Vertebrate Paleontology (2015–2018)
- MSU Dead Lizards Society (paleontology club; co-president 2017–2018)

Service to Profession

- Peer reviewer (n = 3; *Biology Letters* [1] and *Journal of Evolutionary Biology* [2])

Volunteer & Public Outreach

- 2018 Montana Science Olympiad
- 2018, 19 MSU Family Science Day
- 2018 Morning Star Elementary School STEM Expo
- 2017 Society of Vertebrate Paleontology (SVP) volunteer at the GSA Annual Meeting
- 2017 Museum of the Rockies (MOR) Scout's Day
- 2016 MOR volunteer in *MSU Catapalooza*
- 2016 MOR volunteer in *Adventures in the Lost World*
- 2016–17 MOR dinosaur educational cart and fossil preparation volunteer (212.5 hours)
- 2015–16 Volunteer fossil preparator for L. J. Krumenacker, Ph.D. candidate

Conferences Attended

- 2017 Geological Society of America
- 2017 International Symposium on Paleohistology
- 2016, 17 Society of Vertebrate Paleontology Annual Meeting

Skills

- Parametric, nonparametric, and multivariate statistics (R and SAS)
- Phylogenetic comparative methods (BayesTraits and R)
- Phylogenetic inference (NCBI, MAFFT, PAGAN, TrimAl, PhyML, RAxML, SDM, PhyD*, Mesquite, MrBayes, and BEAST)
- Programming (R and Python)
- Histochemistry (picrosirius red, alcian blue, modified tetrachrome, von Kossa, Giemsa, hematoxylin, eosin, and toluidine blue stainings)
- Immunohistochemistry (tuj1, TUNEL assay, and sambucus nigra stainings)
- Light and fluorescence microscopy
- Bone demineralization with a cation exchange resin
- Dissection (embryonic and post-hatching birds)
- Paleontology field work (excavation and prospection)
- Paleontology techniques (fossil preparation, molding, and casting)
- Paleohistology techniques

References

Undergraduate Advisors

- I. **Chris L. Organ**

Directed Interdisciplinary Studies, Honors College
Department of Earth Sciences
Department of Microbiology & Immunology
Montana State University, Bozeman, MT 59717
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2. **David J. Varricchio**
Department of Earth Sciences
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3. **Dana J. Rashid**
Department of Cell Biology and Neuroscience
Montana State University, Bozeman, MT 59717
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4. **John J. Borkowski**
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