

# Kevin Surya

Directed Interdisciplinary Studies, Honors College  
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## Curriculum Vitae

3/20/2019

### 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. Which phylogenetic branch length unit better represents trait evolution: Time or substitution? *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. Controlling for fossil record bias in phylogeographic studies of macroevolution. *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? \$500. *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**

14. Gardner, J. D., **K. Surya**, and C. L. Organ. (2019) Phylogeography of the tetrapod water-land transition. MSU Earth Sciences Colloquium. *Accepted*.
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*

1. **Chris L. Organ**  
Directed Interdisciplinary Studies, Honors College  
Department of Earth Sciences  
Department of Microbiology & Immunology  
Montana State University, Bozeman, MT 59717  
[organ@montana.edu](mailto:organ@montana.edu) | 406 589 6462
2. **David J. Varricchio**  
Department of Earth Sciences  
Montana State University, Bozeman, MT 59717  
[djv@montana.edu](mailto:djv@montana.edu) | 406 994 6907
3. **Dana J. Rashid**  
Department of Cell Biology and Neuroscience  
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4. **John J. Borkowski**  
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