Kevin Surya

Curriculum Vitae

5/6/2019

Directed Interdisciplinary Studies, Honors College
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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

2017–18 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. *To be submitted to Proceedings of the Royal Society B.*
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. Society for the Study of Evolution (SSE)/BEACON Center for the Study of Evolution in Action Undergraduate Diversity at Evolution travel award. (2019).
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: Chicken 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: Chicken 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

15. **Surya, K.**, and C. L. Organ. (2019) Which phylogenetic branch length unit better represents trait evolution: Time or Substitution? Evolution. *Accepted*.
14. Gardner, J. D., **K. Surya**, and C. L. Organ. (2019) Phylogeography of the tetrapod water-land transition. MSU Earth Sciences Colloquium.
13. **Surya, K.**, and C. L. Organ. (2019) Does trait evolution follow time or genetic substitution? National Conference of Undergraduate Research.
12. **Surya, K.**, D. J. Rashid, and S. C. Chapman (2019) Chicken tail vertebral fusion sheds light on a human backbone disease. Montana Academy of Sciences Annual Meeting.
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 | 406 589 6462

2. **Dana J. Rashid**
   Department of Cell Biology and Neuroscience
   Montana State University, Bozeman, MT 59717
   danarashid5@gmail.com | 406 994 6525

3. **David J. Varricchio**
   Department of Earth Sciences
   Montana State University, Bozeman, MT 59717
   djv@montana.edu | 406 994 6907

4. **John J. Borkowski**
   Department of Mathematical Sciences
   Montana State University, Bozeman, MT 59717
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