Kevin Surya

Curriculum Vitae

11/16/2019

Directed Interdisciplinary Studies, Honors College
Montana State University, Bozeman, MT 59717
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Education

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

Lab Work

2016– MSU Macroevolution Lab (undergraduate research assistant; PI: Chris Organ)
2015– DinoChicken Lab (undergraduate research assistant; PI: Dana Rashid)
2017–18 Varricchio Lab (lab member; PI: David Varricchio)

Publications

5. **Surya, K.**, and C. L. Organ. Molecular branch lengths fit trait evolution better than does time. *To be submitted to Systematic Biology*.
4. Rashid, D. J., R. Bradley, A. Bailleul, **K. Surya**, H. N. Woodward, P. Wu, Y-H. Wu, C-M. Chuong, D. B. Menke, S. G. Minchey, B. B. Parrot, S. L. Bock, C. S. Merzdorf, E. Narotzky, N. Burke, J. R. Horner, and S. C. Chapman. Distal spinal nerve development and divergence of avian groups. *To be submitted to Scientific Reports*.
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. Does prelaying egg rotation exist in all birds? *To be submitted to The Auk.*
2. Gardner*, J. D., **K. Surya***, and C. L. Organ. Early tetrapodomorph biogeography: Controlling for fossil record bias in macroevolutionary analyses. *In press at Comptes Rendus Palevol.* Paper Preprint.
   * contributed equally to the study
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. Paper.

Grants & Awards ($18,341)

14. Society for the Study of Evolution (SSE)/BEACON Center for the Study of Evolution in Action Undergraduate Diversity at Evolution travel award. (2019). $250++.
13. Montana State University (MSU) Undergraduate Scholars Program (USP) Research Grant: Which phylogenetic branch length unit better fits species' phenotypic traits: Time or genetic substitution? Advisor: Chris Organ. (2018–2019). $1,800.
12. MSU Organization of Student Engagement Student Club Mass Funding: Dead Lizards Society (paleontology club). Advisor: David 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 Organ. (2017–2018). $1,000.
10. Geological Society of America (GSA) 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 Organ. (2017–2018). $1,800.

8. MSU 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. Natural History Museum of Los Angeles Student Collections Study Award: Avian pygostyle fusion. Advisor: Dana Rashid. (2017). $1,300.
3. Montana Academy of Sciences Student Research Grant: Chicken pygostyle fusion sheds light on ankylosing spondylitis pathology. Advisor: Dana Rashid. (2017–2018). $700.
2. Montana IDeA Network of Biomedical Research Excellence (INBRE) Undergraduate Student Research Program: Chicken pygostyle fusion sheds light on ankylosing spondylitis pathology. Advisor: Dana 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 Varricchio. (2016–2017). $1,800.

Presentations

15. **Surya, K.**, and C. L. Organ. (2019) Molecular branch lengths fit trait evolution better than does time. Evolution Meeting.
14. Gardner, J. D., **K. Surya**, and C. L. Organ. (2019) Phylogeography of the tetrapod water-land transition. Montana State University (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 (NCUR).
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? NCUR.
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 IDeA Network of Biomedical Research Excellence (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. NCUR.
1. **Surya, K.** (2016) Assessment on the origins of avian active flight. MSU Earth Sciences Colloquium

Professional Service

Service to Profession

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

Memberships

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

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 volunteer at the Geological Society of America 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

2019 Evolution Meeting
2017 Geological Society of America Annual Meeting
2017 International Symposium on Paleohistology
2016, 17 Society of Vertebrate Paleontology Annual Meeting

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)

Skills

- Parametric, nonparametric, and multivariate statistics (R and SAS)
- Phylogenetic comparative methods (BayesTraits, R, and levolution)
- Phylogenetic inference (NCBI, MAFFT, PAGAN, TrimAl, PhyML, RAxML, SDM, PhyD*, Mesquite, MrBayes, and BEAST)
- Programming (R, Python, and bash)
- 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
- Mathematics (Mathematica)

References

Undergraduate Advisors

1. **Chris L. Organ**
   Department of Earth Sciences
   Montana State University, Bozeman, MT 59717
   organ@montana.edu | 406 589 6462

2. **Dana J. Rashid**
   Department of Microbiology and Immunology
   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
   john.borkowski@montana.edu | 406 994 4606