

POOJA GUPTA

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PROFESSIONAL SUMMARY

- 8+ years of research experience in molecular ecology, phylogenetics and population genetics
- 10 years of experience in molecular lab techniques including DNA/RNA extraction, PCR optimization, in-house sequencing and genotyping, microsatellite scoring
- Hands-on-experience in preparation of high-throughput sequencing libraries (e.g., Kapa and NEB libraries)
- Skilled in basic and advanced statistical data analyses, including GLMs, Bayesian approaches and phylogenetic analyses using genetic and high-throughput sequencing data (e.g., UCE data)
- Experience with scripting and programming (R, Python), bioinformatic tools, Github

EDUCATION

Doctor of Philosophy University of Georgia, USA Dissertation: “ <i>Avian Haemosporidian dynamics in the Western Ghats Sky Island bird system</i> ”	2016 - 2020
Master of Science in Biotechnology University of Madras, Madras, India Thesis: “ <i>Screening of MDR1 gene Polymorphisms in non-tribal population of Kerala</i> ”	2008 - 2010
Bachelor of Science in Biotechnology M.G.M College, R.D. University, Jabalpur, India	2006 - 2008

RESEARCH INTERESTS

Understanding patterns and processes in ecology and evolutionary biology through the lens of phylogenomics, microbial omics and comparative genomic approaches, with the overarching goal of improving human/wildlife health and biodiversity conservation

RESEARCH EXPERIENCE

GRADUATE RESEARCH ASSISTANT Advisors: Drs. Guha Dharmarajan and James Beasley <i>Warnell School of Forestry and Natural Resources and Savannah River Ecology Laboratory, University of Georgia</i> <ul style="list-style-type: none">• Generated mitochondrial gene dataset for avian haemosporidians (<i>Plasmodium</i> and <i>Haemoproteus</i>) parasites by screening 28 bird species across the tropical Sky Islands system of Western Ghats, southern India• Built parasite phylogenetic trees, performed host specificity and co-phylogenetic analyses to study the host range and evolutionary diversification	2016 - 2020
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- of avian haemosporidians
- Performed AMOVA and multiple regression analyses to study parasite genetic structure and factors affecting avian haemosporidian community structure
- Employed Bayesian phylogenetic mixed effect modelling approach to assess the host ecological and morphological correlates of avian haemosporidian infection risk
- Optimized a novel UCE probe set to obtain genomic data from malaria parasites, conducted NGS data analyses and examined evolutionary relationships among malaria parasites using phylogenomics tools

Other Projects

- Led microsatellite genotyping of Raccoons and Opossums to understand spatial genetic structure at the Savannah River Site
- Optimized molecular markers and managed Chagas disease diagnostics project to understand disease prevalence across different habitats at the Savannah River Site

JUNIOR RESEARCH FELLOW

2012-2014

Mentors: Drs. Uma Ramakrishnan and Robin Vijayan
National Centre for Biological Sciences, Bangalore, India

Project I

- Examined comparative phylogeographic patterns in a tropical Sky Island bird community across three biogeographic gaps
- Collected blood samples from birds in the Western Ghats as part of the field team
- Generated mitochondrial and nuclear gene dataset for 25 bird species
- Performed gene sequence alignment, built phylogenetic trees, and helped with phylogeographic analyses
- Generated more comprehensive genetic data and helped with phylogenetic analysis for another study that led to understanding the origins of two independent endemic radiations from the Sky Islands of the Western Ghats

Project II

2010-2012

- Examined the effects of natural and anthropogenic fragmentation in two Western Ghats Sky Island endemic birds
- Led the molecular genetics aspect of the project
- Generated microsatellite data at 15 loci and assessed the population genetic structure and patterns of gene flow in these two species
- Performed microsatellite scoring and analyzed population genetic data with the help of basic statistical methods and various population genetics programs

RESEARCH TRAINEE (MASTERS THESIS)

Spring 2009

Advisor: Dr. Moinak Banerjee

Rajiv Gandhi Centre for Biotechnology, Trivandrum, India

- Undertook a project involving the screening of Single Nucleotide Polymorphisms of the human MDR1 gene in various non-tribal ethnic population of Kerala
- Performed DNA isolation from blood samples, restriction fragment length polymorphisms and SNP genotyping of individuals using PCR
- Conducted population genetic analyses to investigate the association between the MDR1 gene polymorphisms and response to anti-epileptic drugs

ACADEMIC PUBLICATIONS

PEER-REVIEWED ARTICLES

[Google Scholar Link](#)

*Authors Contributed equally

1. **Gupta, P.**, Vishnudas, C. K., Robin, V. V., & Dharmarajan, G. (2020). Host Phylogeny Matters: Examining Sources of Variation in Infection Risk by Blood Parasites Across a Tropical Montane Bird Community in India. In Press, *Parasites and Vectors*.
2. **Gupta, P.**, Robin, V. V., & Dharmarajan, G. (2020). Towards a more healthy conservation paradigm: Integrating disease and molecular ecology to aid biological conservation. *Journal of Genetics*, 99(1), 1-26.
3. **Gupta, P.**, Vishnudas, C. K., Ramakrishnan, U., Robin, V. V., & Dharmarajan, G. (2019). Geographical and host species barriers differentially affect generalist and specialist parasite community structure in a tropical sky-island archipelago. *Proceedings of the Royal Society B*, 286(1904), 20190439. [Press coverage](#)
4. Sapp, S. G., **Gupta, P.**, Martin, M. K., Murray, M. H., Niedringhaus, K. D., Pfaff, M. A., & Yabsley, M. J. (2017). Beyond the raccoon roundworm: The natural history of non-raccoon *Baylisascaris* species in the New World. *International Journal for Parasitology: Parasites and Wildlife*, 6(2), 85-99.
5. Robin, V. V., Vishnudas, C. K., **Gupta, P.**, Rheindt, F. E., Hooper, D. M., Ramakrishnan, U., & Reddy, S. (2017). Two new genera of songbirds represent endemic radiations from the Shola Sky Islands of the Western Ghats, India. *BMC evolutionary biology*, 17(1), 31. [Press coverage](#)
6. Robin, V. V., **Gupta, P.***, Vishnudas*, C. K., & Ramakrishnan, U. (2015). Deep and wide valleys drive nested phylogeographic patterns across a montane bird community. *Proceedings of the Royal Society B: Biological Sciences*, 282(1810),20150861. [Press coverage](#)
7. Robin, V. V.*, **Gupta, P.***, Thatte, P., & Ramakrishnan, U. (2015). Islands within islands: two montane palaeo-endemic birds impacted by recent anthropogenic fragmentation. *Molecular ecology*, 24(14), 3572-3584. [Press coverage](#)

MANUSCRIPTS IN REVIEW/PREPARATION

1. **Gupta, P.**, Glenn, T., & Dharmarajan, G. (*In Prep*). Target sequence capture for phylogenomic research of diverse haemosporidian parasites infecting mammal and bird host species

FELLOWSHIPS AND AWARDS

- Graduate Research Assistantship, University of Georgia 2016 - 2020
- Travel award (\$650) by University of Georgia Graduate School July 2019
- Junior Research Fellowship, Indian Institute of Science Education and Research, Kolkata, India 2014 - 2016
- Travel grant (\$1000) by NSF-sponsored Malaria Research Coordination Network Sept 2015
- Scholarship award (\$900) towards registration costs by the Department of Biostatistics, University of Washington July 2015
- Travel grant (\$1300) by Indian Institute of Science Education and Research, Kolkata July 2015

CONFERENCES

ORAL PRESENTATIONS

- *Geographical and host species barriers differentially affect generalist and specialist parasite community structure in a tropical sky-island archipelago.* 1st Annual Savannah River Ecology Laboratory Graduate Student Symposium, Windsor, South Carolina, USA. July 2019
- *Eco-evolutionary dynamics of avian haemosporidian parasites in a tropical sky island archipelago of Western Ghats, India.* Evolution, Providence, Rhode Island, USA. June 2019
- *Biogeography of Haemosporidian Parasites Infecting Diverse Bird Communities in the Shola Sky Islands of the Western Ghats, India.* 9th Biennial Conference International Biogeography Society, Malaga, Spain. January 2019
- *Bugs in birds: Hitch-hiking across the tropical sky-island bird community of Western Ghats India.* 4th International Workshop on Avian Malaria, National Conservation Training Center, Shepherdstown, USA. September 2015
- *Exploring the effects of patchiness and fragmentation: genetic connectivity of a sky island bird in the Western Ghats,* Student conference on Conservation Science, Indian Institute of Science, Bangalore, India. September 2013 [Press coverage](#)

POSTER PRESENTATIONS

- *Host and Environmental Factors Differentially Affect Parasite Community Structure and Infection Dynamics in a Montane Biodiversity Hotspot.* Evolution, Providence, Rhode Island, USA. June 2019
- *Host and Environmental Factors Differentially Affect Parasite Community Structure and Infection Dynamics in a Montane Biodiversity Hotspot.* 29th Molecular Parasitology & Vector Biology Symposium, CTEGD, Athens, Georgia, USA. May 2019
- *Avian malaria dynamics in a tropical sky-island bird community of Western Ghats, Southern India.* Warnell Graduate Student Symposium, Athens, Georgia, USA. January 2018
- *Bugs in birds: Hitch-hiking across the tropical sky-island bird community of Western Ghats India.* Frontiers in Modern Biology, IISER, Kolkata, India. December 2015
- *Mind the Gap: effect of geographical barriers and rivers on genetic structure in animals.* Annual talks, National Centre for Biological Sciences, Bangalore, India. January 2013

WORKSHOPS ATTENDED

- 7th Summer Institute in *Statistics and Modeling in Infectious Diseases*, University of Washington, Seattle, Washington, USA. July 2015
- Winter School on *Analysis of Massively parallel sequencing (NGS) data*, National Institute of Biomedical Genomics, Kolkata, West Bengal, India. March 2015
- Student conference *Young Ecologist Talk and Interact* held at Indian Institute of Science, Bangalore, Karnataka, India. October 2010

TEACHING EXPERIENCE

Teaching Assistant

Savannah River Ecology Laboratory, University of Georgia

- Assisted with instruction of molecular genetics module of a 10-day course on Field and Molecular Techniques in Wildlife Research and Management

Summer
2019

- Created course structure and prepared class activities focusing on molecular techniques
- Trained undergraduate and graduate students in basic molecular techniques (e.g., DNA extraction, PCR, disease diagnostics), population genetics and phylogenetics

ACADEMIC SERVICE

- Co-organized Graduate Student Symposium at the Savannah River Ecology Laboratory. Responsible for planning content, organization and oversight of various Symposium committees and aided non-student personnel communication **July - 2019**
- Served as Facilities Committee Representative as part of the Graduate Student Organization at SREL **Fall 2019 - Spring 2020**
- Reviewer for: Molecular Ecology
- Member: American Ornithological Society, International Biogeography Society, Society for the Study of Evolution

ADDITIONAL PROFESSIONAL SKILLS

- Assisted in small mammal (e.g., Raccoons and Opossums) trapping at the Savannah River Site
- Performed Lab manager duties for Dr. Guha Dharmarajan's lab - Responsible for routine organization, lab maintenance, management of inventory and procurement of lab supplies **Aug 2017 - May 2020**
- Trained five newly hired Research Technicians in molecular techniques (e.g., DNA extraction, quantification, PCR) and microsatellite genotyping while at SREL
- Purchase in-charge for Dr. Uma Ramakrishnan's lab - Helped with ordering of consumables, lab supplies and coordinating with company representatives **Dec 2010 - Dec 2012**
- Lab manager for Dr. Uma Ramakrishnan's lab - Responsible for routine organization of the lab and other management work **Aug 2013 - Dec 2014**
- Trained four visiting students and three intern students in basic molecular techniques and population genetics data analysis during my time at NCBS

REFERENCES

- **Dr. Guha Dharmarajan, Assistant Research Scientist**
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- **Dr. Travis C. Glenn, Professor**
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- **Dr. Robin Vijayan, Assistant Professor**
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