

Meghana Natesh

Curriculum Vitae

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Education:

PhD, SASTRA University, Tanjavur, Tamil Nadu	(2012–2019)
Masters in Zoology, Dept. of Zoology, University of Delhi, Delhi	(2007– 2009)
Bachelor of Science (Major in Zoology), University of Delhi, Delhi	(2004–2007)

Research Experience:

Current Affiliation: Junior Research Consultant, Salim Ali Centre for Ornithology and Natural History
(Dec, 2019 – Present)

Bridging Post-doctoral Fellow, National Center for Biological Sciences, Bangalore (2018 – 2019)

PhD research (2012–2018)

- Thesis title ‘Interrogation of Pan-Indian Tiger Genetic Variation’.

Tigers have lost 97% of their historical range and three subspecies have driven to extinction. The Indian subcontinent is one of the few remaining refuges of the *Panthera tigris tigris* subspecies. Populations are now restricted to protected areas across most of their range. Genetic tools can be used to effectively monitor wild species of conservation concern such as tigers. Microsatellite markers are currently used across many laboratories to study tiger populations. However, non-invasive samples obtained from tiger feces continue to present challenges such as high error rates and low genotyping success for microsatellite markers.

In my PhD work, I used genome-wide Single Nucleotide Polymorphism (SNP) data to explore patterns of genetic differentiation, diversity, and selection among populations of Bengal tigers (*Panthera tigris tigris*). I tested a new protocol to genotype a panel of SNP markers from non-invasive samples using next-generation sequencing. This method is ideal for low quality and quantity of DNA obtained from samples typical of conservation scenarios. Finally, I applied this

new protocol to test for fine-scale population structure with the central Western Ghats tiger populations and compare these results to microsatellite data. This work generated the first genome-wide SNP data on Indian tigers and highlights the use of genomic data and analyses to study and monitor populations of wild and endangered species

International Exchange

(October, 2016)

- I spent a month in Dr. Elizabeth Hadly's lab at Stanford University to test a panel of single nucleotide polymorphism (SNP) markers on fecal DNA from tigers. During this time, I helped design the study and performed the lab work testing one set of primers on fecal and tissue DNA from captive tigers in the USA.

Research Assistant at the Center for Wildlife Studies, Bengaluru

(2011–2012)

- Conducted field-based surveys in the forests of Karnataka including Line Transect Surveys, Camera Trap Surveys, Small Cell Occupancy Surveys and Scat Route Surveys.
- Analysed camera-trap data to estimate density of predators and prey in Tiger Reserves.

Functional analysis of *Bombyx mori* intersex gene through RNA interference

(July–August, 2006)

- I spent 8-weeks as a student trainee in **Dr. J. Nagaraju's lab at the Centre for DNA Fingerprinting and Diagnostics, Hyderabad**, India working on a project aimed at understanding the sex determination pathway in *Bombyx mori* moths, particularly the role of the intersex gene.

The role of aggressive behavior of the potential queen in *Ropalidia marginata* paper wasp nests

(July–August, 2005)

- I spent 8-weeks as a student trainee in **Dr. R. Gadagkar's laboratory at the Centre for Ecological Sciences, Indian Institute of Science, Bangalore**, India studying the aggressive behavior in the potential queen in the paper wasp *Ropalidia marginata*.

Publications:

- **Natesh, M.**, Taylor, R. W., Truelove, N. K., Hadly, E. A., Palumbi, S. R., Petrov, D. A., & Ramakrishnan, U. (2019). Empowering conservation practice with efficient and economical genotyping from poor quality samples. *Methods in Ecology and Evolution*, 10:853-859. doi:10.1111/2041-210X.13173

- **Natesh, M.**, Atla, G., Nigam, P., Jhala, Y. V., & Zachariah, A. (2017). Conservation priorities for endangered Indian tigers through a genomic lens. *Scientific Reports*, 1–11. doi:10.1038/s41598-017-09748-3
- Lamba, S., Kazi, Y. C., Deshpande, S., **Natesh, M.**, Bhadra, A., & Gadagkar, R. (2007). A possible novel function of dominance behaviour in queen-less colonies of the primitively eusocial wasp *Ropalidia marginata*. *Behavioural Processes*, 74, 351–356. doi:10.1016/j.beproc.2006.12.003

Talks and Poster Presentations:

- Presented a poster titled ‘Genetic differentiation among tiger populations in central Western Ghats: Inferences from two genetic markers’, at the SGRF NextGen Genomics, Biology, Bioinformatics and Technology (NGBT) in Jaipur, India. Won the best poster award (one of 10). (2018)
- Presented a poster entitled ‘SNP genotyping to monitor wild tigers for conservation’, at the SGRF NextGen Genomics, Biology, Bioinformatics and Technology (NGBT) in Bhubaneswar, India. Won the best poster award (one of 12). (2017)
- Presented a poster entitled ‘Genome-wide SNP data reveal fine-scale population structure in the Indian tiger populations’ at the International Congress for Conservation Biology in Montpellier, France. (2015)
- Presented a talk entitled ‘Connectivity in the Tiger Landscape’ at the Student Conference on Conservation Science, Bangalore. (2013)

Workshops Attended:

- Workshop on population and speciation genomics conducted by evomics.org in Cesky Krumlov, Czech Republic from 21 January – 4 March, 2018 (2018)
- School and Discussion Meeting on Population Genetics and Evolution conducted by the ICTS in Bangalore in February, 2014 (2014)

Fellowships and Awards:

DST International Travel support (2018)
 DBT Travel grant (2015)

Teaching and Teaching Assistantship:

- **Co-taught a module on basic Population Genetics with Dr. Shomita Mukherjee** at the Salim Ali Centre for Ornithology and Natural History (March, 2019)
 - **Teaching Assistant** for a course on **Population Genetics and Evolutionary Biology** taught by Dr. Uma Ramakrishnan at the National Center for Biological Sciences. (2018)
 - **Co-taught a module on basic Population Genetics with Dr. Robin Vijayan** at the Indian Institute of Science Education and Research. (March, 2018)
 - **Teaching Assistant** for a course on **Human Evolution** taught by Dr. Uma Ramakrishnan at the National Center for Biological Sciences. (2017)
 - **Lecturer at Shaheed Rajguru College of Applied Sciences for Women,** University of Delhi (2009–2011)
During this time, I taught a module of human physiology to students of BSc Biomedical Sciences, and basic biology to students of BSc Instrumentation, BSc Food Sciences, and BSc Instrumentation. I also jointly conducted practicals for biology, biochemistry and human physiology.
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Outreach:

- Conducted a one-day workshop on genetic diversity for students from the Government Science College, Bangalore (2017)
 - Talk entitled ‘Genetic Diversity in Tigers’ and discussion with students from Devanhalli Government school (2016)
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Papers Reviewed:

Current Science	(2018)
Ecology and Evolution	(2019)
Conservation Biology	(2019)