

Vishwanath Varma, Ph.D.

Animal Behaviour and Cognition Programme
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RESEARCH EXPERIENCE

- **August, 2018 – present.** Post-Doctoral Fellow
Project: Coping with the changing environment: Exploring the role of behavioural plasticity and personality traits in determining behavioural adaptation strategies in Deccan Mahseer.
Affiliation: Social Cognition Lab, Animal Behaviour and Cognition Programme, School of Natural Sciences and Engineering, National Institute of Advanced Studies, Bangalore.
Advisor: Dr. V. V. Binoy
 - **August, 2011 – April, 2018.** Doctoral Student
Project: Evaluating the role of circadian clock properties and developmental processes in the evolution of accurate eclosion rhythms in *Drosophila melanogaster*.
Affiliation: Chronobiology Lab, Evolutionary and Organismal Biology Unit, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore.
Advisor: Late Prof. Vijay Kumar Sharma, Dr. Sheeba Vasu (Advisor-in-Charge)
 - **December, 2010 – March, 2011.** Master's Dissertation
Project: Transcription Factors induced by FSH and their possible role in expression of Insulin Receptor Substrate 2 gene in Rat Granulosa cells.
Affiliation: Department of Zoology, University of Delhi, Delhi.
Advisor: Prof. Rita Singh
 - **May, 2010 – June, 2010.** Summer Research Fellowship
Project: Circadian activity and adult emergence rhythms under semi-natural conditions in *Drosophila melanogaster*.
Affiliation: Chronobiology Lab, Evolutionary and Organismal Biology Unit, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore.
Advisor: Late Prof. Vijay Kumar Sharma
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AWARDS

- **2019 - Diversity Travel Grant** from the University of Konstanz, Germany to attend Association for the Study of Animal Behaviour (ASAB) 2019 Summer Conference.
- **2018 - DBT Research Associateship Program** (Post-doctoral Fellowship) from the Department of Biotechnology, Government of India.

- **2011 - Shyama Prasad Mukherjee fellowship** (Doctoral fellowship) from the Council of Scientific and Industrial Research, Government of India (All India Rank 7 in CSIR-National Eligibility Test, 2010).
- **2010 - Summer Research Fellowship Program** from Indian Academy of Sciences.

EDUCATIONAL QUALIFICATION

Name of Examination	Year	Institution/Board	%age
M.Sc. Biotechnology	2011	St. Joseph's College (Autonomous), Bharathidasan University (T.N.)	80%
B.Sc. Advanced Zoology and Biotechnology	2009	Loyola College (Autonomous), Madras University (T.N.)	68%
All India Senior School Certificate Examination (CBSE 12 th)	2006	CMR National Public School, Bangalore	90%
All India Secondary School Examination (CBSE 10 th)	2004	Bangalore Military School, Bangalore	92%

RESEARCH INTERESTS

- Animal Behaviour, Ecology and Evolution.
- Population genetics and population dynamics.
- Circadian rhythms.
- Social Behaviour.
- Mathematical modeling of behavioural processes.

METHODOLOGICAL SKILLS

- Drosophila and freshwater fish stock maintenance.
- Behavioural experimentation and analysis.
- Time-Series Analysis of Activity in CLOCKLAB (software based on MATLAB).
- Statistical Modeling and Data Visualization in R.
- Agent-Based Modelling in NetLogo and Python.
- Familiarity with Computer Vision using OpenCV.

CONFERENCES/WORKSHOPS

- Poster presentation on ‘*Correlates of subterranean personalities: Morphology, personality and learning ability in a subterranean fish, Monopterus sp.*’ at the Student Conference on Conservation Science, Bangalore on 17th October, 2019.
- Attended workshop on ‘*Practical Foundation on Artificial Intelligence & Deep Learning*’ offered by Opencube Labs, Bangalore on 29th September, 2019.
- Attended workshop on ‘*Low-cost automation of behavioural experiments with raspberry pi’s*’ at ASAB 2019 Summer Conference on ‘New Frontiers in the Study of Animal Behaviour’ organized by the Association for the Study of Animal Behaviour at University of Konstanz, Germany from August 26th-28th, 2019.
- Poster presentation on ‘*Can boldness of shoal-mate affect behavioural flexibility in Deccan Mahseer?*’ at ASAB 2019 Summer Conference on ‘New Frontiers in the Study of Animal Behaviour’ organized by the Association for the Study of Animal Behaviour at University of Konstanz, Germany from August 26th-28th, 2019.
- Oral presentation on ‘*Exploring the link between personality traits and lateralized utilization of brain hemispheres in Deccan Mahseers (Tor khudree)*’ at National Symposium on ‘Animal Behaviour, Biodiversity and Human Future’ organized by the Ethological Society of India at University of Calicut from December 4-6, 2018.
- Oral presentation on ‘*Evolution of accurate circadian rhythms in Drosophila populations*’ at the International Congress on Chronobiology (Focal Theme: Biological Clocks and Health Issues in the 21st Century), A Joint Congress of the 27th Conference of the International Society for Chronobiology, and 24th Conference of the Indian Society for Chronobiology held at University of Delhi, New Delhi from October 3-7, 2012.
- Participated and won Best Participant and Best Student Awards at the SERC School in Chronobiology in October 2011.

MENTORSHIP AND TEACHING EXPERIENCE

- Conducted a module on ‘Agent-based Modelling in Animal Cognition’ using NetLogo at the Student Conference on Conservation Science, Bangalore on 18th October, 2019 as part of a workshop on ‘Integrating Animal Cognition and Conservation’.
- Currently teaching ‘Animal cognition and its applications’ and ‘Animal decision-making and conservation’ from August-November 2019 for Ph.D. students at National Institute of Advanced Studies, Bangalore.
- Taught Biology for NEET Medical Exam preparation for 12th Standard students from February-July 2018.
- Taught ‘Circadian clock properties and their relationships’ as part of Basic Chronobiology Course at Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore for first year Ph.D and Int. Ph.D. students in 2016.

- Held practical sessions and classes for the Project Oriented Biological Education Programme from 2012-2017 at the Chronobiology Lab.
- Mentored summer research fellows in experimental design, literature review and report writing from 2012-2016 at the Chronobiology Lab and in 2019 at the Social Cognition Lab.
- Held practical sessions on Time Series Analysis for Circadian Rhythms and co-Mentored at the SERC School in Chronobiology in June 2013.
- Co-mentored Thesis Dissertations on:
 - “Characterizing activity-rest rhythms of three related ant species and examining the effect of social interactions on sleep in *Drosophila melanogaster*.”
 - “Influence of social context on flexibility of boldness in juvenile Deccan Mahseer (*Tor khudree*).”
 - “Personality, Familiarity, or Size – What determines social decision making in an endemic megafish, Deccan Mahseer (*Tor khudree*)?”

SCIENTIFIC PUBLICATIONS

- **V Varma**, S Krishna, M Srivastava, VK Sharma, S Vasu (2019). Accuracy of fruit-fly eclosion rhythms evolves by strengthening circadian gating rather than developmental fine-tuning. *Biology Open*, 8 (8), bio042176. (Accompanying First Author Interview - <https://bio.biologists.org/content/8/8/bio047027.full>)
- M Srivastava, **V Varma**, L Abhilash, VK Sharma, & V Sheeba (2019). Circadian Clock Properties and Their Relationships as a Function of Free-Running Period in *Drosophila melanogaster*. *Journal of biological rhythms*, 0748730419837767.
- M Srivastava, A James, **V Varma**, VK Sharma, & V Sheeba (2018). Environmental cycles regulate development time via circadian clock mediated gating of adult emergence. *BMC developmental biology*, 18(1), 21.
- R Shindey, **V Varma**, KL Nikhil, VK Sharma (2017) Evolution of circadian rhythms in *Drosophila melanogaster* populations reared in constant light and dark regimes for over 330 generations. *Chronobiology International* 34 (5), 537-550.
- R Shindey, **V Varma**, KL Nikhil, VK Sharma (2016) Evolution of robust circadian clocks in *Drosophila melanogaster* populations reared in constant dark for over 330 generations. *The Science of Nature* 103 (9-10), 74.
- VR Vartak*, **V Varma***, VK Sharma (2015) Effects of polygamy on the activity/rest rhythm of male fruit flies *Drosophila melanogaster*. *The Science of Nature* 102 (1-2), 3. * these authors contributed equally to this publication.
- **V Varma**, NN Kannan, VK Sharma (2014) Selection for narrow gate of emergence results in correlated sex-specific changes in life history of *Drosophila melanogaster*. *Biology open* 3 (7), 606-613.
- A Menon, **V Varma**, VK Sharma (2014) Rhythmic egg-laying behaviour in virgin females of fruit flies *Drosophila melanogaster*. *Chronobiology international* 31 (3), 433-441.

- J De*, **V Varma***, S Saha, V Sheeba, VK Sharma (2013) Significance of activity peaks in fruit flies, *Drosophila melanogaster*, under seminatural conditions. *Proceedings of the National Academy of Sciences* 110 (22), 8984-8989. * these authors contributed equally to this publication.
 - **V Varma**, N Mukherjee, NN Kannan, VK Sharma (2013) Strong (type 0) phase resetting of activity-rest rhythm in fruit flies, *Drosophila melanogaster*, at low temperature. *Journal of biological rhythms* 28 (6), 380-389.
 - NN Kannan, **V Varma**, J De, VK Sharma (2012) Stability of adult emergence and activity/rest rhythms in fruit flies *Drosophila melanogaster* under semi-natural condition. *PloS one* 7 (11), e50379.
 - J De, **V Varma**, VK Sharma (2012) Adult emergence rhythm of fruit flies *Drosophila melanogaster* under seminatural conditions. *Journal of biological rhythms* 27 (4), 280-286.
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WORKS IN PROGRESS

- **V Varma**, H Vasoya, A Jain, VV Binoy. (*Under review*) ‘The Bold are the Sociable’: Personality, sociability and lateralized utilization of brain hemisphere in the juveniles of a megafish Deccan Mahseer (Tor khudree). Link to preprint: <https://www.biorxiv.org/content/10.1101/683532v1>
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REFERENCES

- Dr. V. V. Binoy, Animal Behaviour and Cognition Programme, School of Natural Sciences and Engineering, National Institute of Advanced Studies, Bangalore, India.
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- Dr. Sheeba Vasu, Neuroscience Unit, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India.
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