

# Jewel Johnson

BS-MS Dual Degree in Biological Sciences



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## About Me



Hi, my name's Jewel Johnson. I completed my Masters in Biological Sciences from the Indian Institute of Science Education and Research, Thiruvananthapuram (IISER-TVM). My research interests include behavioural ecology, visual ecology, the effect of pollution and climate change on pollinating insects, social behaviour and interactions in social insects. I have had experience in doing experiments with the Asian Honeybee (*Apis cerana*), the Giant Honeybee (*Apis dorsata*) and the Greater Banded Hornet (*Vespa tropica*). I am also proficient in R programming and have experience in data visualization and data wrangling using various packages available in R. In my free time I write science articles and various tutorials in my blog named '[One-carat Blog](#)'. Currently, I am applying for a Ph.D.

## Education

### Integrated BS-MS Dual Degree in Biological Sciences

Indian Institute of Science Education and Research Thiruvananthapuram

August 2015 - August 2020

CGPA 8.31/10

### Biology with Maths, Class XII

St. Michael's Anglo Indian Higher Secondary School Kannur

August 2013 - June 2015

Percentage marks: 93%

### Class X

St. Michael's Anglo Indian Higher Secondary School Kannur

June 2013

Percentage marks: 90%

## Skillset

Proficient in using `ggplot2`, `ggstatsplot`, `tidyR`, `dplyr`, `Rmarkdown` and `distill` packages in R. Experience in doing behavioural experiments in honeybees and hornets. Intermediate knowledge in `HTML5` and `CSS`. Adobe Illustrator and PremierePro. Photography. Presentation and communication skills. Team-work and organizational decision making.

## Research Experience

### Limits and adaptations for nocturnal vision in the Giant Honeybee (*Apis dorsata*)

#### Major Degree Thesis

IISER-TVM, India

May 2019 - April 2020

This project was carried out under the supervision of Prof. Hema Somanathan. The Giant Honeybee (*Apis dorsata*) is known to be facultative nocturnal species of bees who occasionally forage on flowers during crepuscular and full-moon periods. Despite having day adapted eyes, it is not known how *A. dorsata* can forage at low light conditions. So my project was aimed at understanding the visual ecology *A. dorsata* in lowlight conditions.

During this project, I developed a novel training paradigm for training *A. dorsata* as they are open nesting species that are quite aggressive and cannot be reared or handled in a controlled lab environment. I performed classical conditioning experiments and conducted video observations. I learned how to use the software `BORIS` for video analysis. Data analysis and data visualization was done using R.

#### Semester Project

IISER-TVM, India

May 2018 - Dec 2018

### Morphometric analysis on Asian Bees

For this project, I managed and stored around 100 different species of insect specimens and performed basic morphometric measurements on them using the `ImageJ` software.

### Investigating the role of phenylalanine in the Asian Honeybee (*Apis cerana*)

It is known that honeybees rely on pollen as their primary source of protein and we also know that flowers primarily pollinated by honeybees contain a cocktail of amino acids in its nectar. In this project I investigated the role of phenylalanine, an essential amino acid for honeybees in terms of learning in the Asian Honeybee (*Apis cerana*).

During this project I performed classical conditioning experiments and did data analysis using R.

### Visual associative learning and olfactory preferences of the Greater Banded Hornet (*Vespa tropica*)

The Greater Banded Hornet (*Vespa tropica*) is a hymenopteran predator who is declared as an invasive species by many countries in Europe. They are also generalists who employ a wide variety of foraging strategies which makes them excellent model organisms to study cognition and vision.

In this study, I performed classical conditioning experiments to study colour and shape learning abilities in *V. tropica*. Later I checked their olfactory preferences by performing a dual choice experiment. The data from the experiments were analyzed using R. I also received first-hand experience in writing the manuscript of this study which was later published in 2021. The study also garnered media attention from [The Wire Science](#).

## Awards and Honors

- Achieved all India rank of 52 in Graduate Aptitude Test in Engineering (GATE) 2020 in Ecology and Evolution Paper. GATE score 606 and GATE Reg no: EY20S57226002.
- Achieved all India rank of 91 in Council of Scientific & Industrial Research - Junior Research Fellowship (CSIR-JRF) and National Eligibility Test (NET) Exam 2019 Fellowship (Reg no. 367970). This is the qualifying exam for PhD and lectureship in India.
- Recipient of Innovation in Science Pursuit for Inspired Research (INSPIRE) fellowship. For the duration of 5 years of study in IISER-TVM.

## Publications

- Balamurali, G. S., Reshnraj, R. S., [Johnson, J.](#), Kodandaramaiah, U., & Somanathan, H. (2021). Visual associative learning and olfactory preferences of the greater banded hornet, *Vespa tropica*. In *Insectes Sociaux* (Vol. 68, Issues 2–3, pp. 217–226). Springer Science and Business Media LLC. <https://doi.org/10.1007/s00040-021-00820-w>. (You can email me if you want a copy)

## Conferences & Presentations

- Poster:** Visual associative learning and odour preferences in a hymenopteran predator | Biology across kingdoms : School of Biology Symposium and Department day (September 2019) | IISER-TVM, India
- Presentation:** Role of phenylalanine in learning in Asian honeybee (*Apis cerana*) | Second Bangalore Meeting On Asian Bees (March 2019) | NCBS Bangalore, India
- Poster:** Visual associative learning in the Greater Banded Hornet (*Vespa tropica*) | Young Ecologists Talk & Interact (YETI) 2018 (January 2018) | Maharaja Sayajirao University of Baroda, India

## Extra Curricular Activities

- R programming enthusiast. Made [tutorials](#) for `ggplot2`, `tidyR` and `dplyr` packages in R.
- Writes science articles at [One-carat Blog](#).
- Makes data visualizations at [whatsthisdata](#), an initiative to promote science communication for the public.
- Co-founder of The Ecological Society of IISER-TVM, a student body for promoting environmental awareness and safe guarding the greenery in the campus.
- Initiated 'EcoGO', an ambitious project for mapping the entire fauna and flora in IISER-TVM via iNaturalist.
- Received best exhibit award for the project presentation on DNA Hard drives in the IISER-TVM Annual Science Fest (2016).

## Interests and Hobbies

- Photographing wildlife ([500px account](#))
- Birding
- Trekking and cycling
- Video games
- Listening to instrumental songs
- Postal stamp and coin collection

For the pdf version of this resume please click [here](#).