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.

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

- R programming: `ggplotz` `ggstatsplot` `tidyr` `dplyr` `Rmarkdown` `distill` and `quarto`
- Experience in doing behavioural experiments in honeybees and hornets
- Intermediate knowledge in `HTML5` and `CSS`
- Adobe Illustrator and PremierePro
- Photography
- Presentation and communication skills
- Driving (4-wheeler and 2-wheeler)

Research Experience

Major Degree Thesis

IISER-TVM, India

May 2019 - April 2020

Visual ecology of the Giant Honey Bee (Apis dorsata)

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*.

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.

Summer Internship

IISER-TVM, India

May 2018 - Dec 2018

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.

Summer Internship

IISER-TVM, India

May 2017 - June 2017

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., Reshnuraj, 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 `ggplotz` `tidyr` and `dplyr` packages in R.
- 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
- Birding
- Teaching
- Trekking and cycling

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