



Eshika Halder

Integrated Ph.D. Student, IISER Kolkata

Working on Behavior and Ecology on a model system, *Diacamma indicum* (Indian Ponerine ant)

Contacts



(+91) 9874086099 / 7980961573



eh19ip010@iiserkol.ac.in
eshihaldar@gmail.com



Behaviour and Ecology lab, Research Complex, IISER Kolkata, Nadia, West Bengal

Education

- Ph.D. (2022) IISER-Kolkata
- MSc. (2019-2022) IISER-Kolkata, CGPA – 8.61
- BSc. (2016-2019) St. Xavier's College, Kolkata, Microbiology – 67.83%
- Higher Secondary (2016) CBSE – 92%
- Secondary (2014) CBSE, CGPA – 10, 95%

Project Undertaken

- Ph.D.** Impact of stressors on soil engineers: a case study on an Indian ant *Diacamma indicum* and its role in maintaining soil
- IPh.D.** Environmental cues in the production of potential secondary metabolites by a unicellular Cyanobacteria, *Synechococcus moorigangaii*, in a coastal ecosystem
- B.Sc.** Study of toxigenic fungi isolated from Chilli powder and degradation parameters of the Spices

Research Experience

- Ph.D.(2022) Present** I am looking into the intraspecific competition between *Diacamma indicum*, a primitively eusocial Indian ant, for a nest. I have several field data collections and performed behavioural experiments to analyse their intraspecific interactions and dynamics in the context of competition.
- (MS-2021) (MS- thesis)** Identification of the production of secondary metabolites by the *Synechooccus moorigangaii* CMS01 and antimicrobial assay against *E.coli* and *Vibrio chemaguriensis*. I made the identification of gene clusters and the regulative factors involve in the production of secondary metabolites through Insilco approach
- Lab Project (2020)** Assay for detection of arsenic in sample water. Here, we expressed heterologous protein in *Escherichia coli* *BL21DE3* culture to estimate the quality via arsenic detection of media.
- Lab Project (2019)** Impact of calcium uptake in pollen germination. Here, we tracked the movement of pollen through pollen tube using ImageJ software.

Skills

Academic

Ethology

- Experiment Design,
- Animal Behaviour
- Biostatistics
- Various Sampling Methods

Microbiology & Molecular Biology Techniques

- Microbiological techniques (Cell culture and numerous plating techniques)
- Cell staining
- Gel electrophoresis
- Polymerase Chain Reaction
- Thin layer chromatography
- Biochemical estimation methods
- TOC/TIC Analysis
- Immunohistochemistry
- UV based Spectroscopy
- Gene Cloning
- Transformation

Microscopy:

- Fluorescence microscopy
- Inverted microscopy
- Scanning electron microscopy

Non - Academic

Leadership skills

- Active member of the Xaverian Academy of Dance and Music
- General secretary of student affairs council (SAC), IISER Kolkata (2020-2022)
- Member of NSS (2019)

Lab rotation (2019)

Effect of oncostatin on actin polymerization of HeLa cells. Here, I was looking through the effect of drug on actin polymerization by phalloidin staining and DAPI staining.

Lab Rotation (2019)

Learning experience of various Microbiology and Molecular techniques: Culture plating and staining, PCR, Gel electrophoresis

Lab Rotation (2020)

Molecular work and Microscopy: PCR, TLC/TOC, Fluorescence and Scanning electron microscopy, UV based Spectroscopy

Lab Rotation (2020)

Behaviour and Ecology lab: Various Sampling methods, Behavioural observation and Data Analysis

Teaching Experience

- Teaching Assistantship in Ecology and Behavior laboratory course (LS3204) at IISER-Kolkata (2023)
- Teaching Immunology and Microbial Ecology as a Visiting Faculty in Kalyani Mahavidyalaya

Conferences / Workshops

- 2009 - National Children's Science Congress – State level (Oral presentation)
- 2012 - National Children's Science Congress – District level (Oral presentation)
- 2016 - Modern Trends by Department of Microbiology St Xavier's, Kolkata
- 2017 - Modern Trends by Department of Microbiology St Xavier's, Kolkata (Oral presentation)
- 2019 - 106th Indian Science Congress (Poster presentation)
- 2022 - International Conference on Insect Systematics and Evolutionary Biology (ISEB3)
- 2023 – Frontiers in Modern Biology (FIMB), IISER Kolkata
- 2023 - Workshop on R programming and Plotting, NEGENOME, Bio solution Pvt Ltd
- 2023 – Workshop on 16S NGS Data Analysis, NEGENOME, Bio solution Pvt Ltd
- 2023 – Understanding Behaviour 2023 (Poster presentation), IISER Kolkata

Achievements

- Junior Research Fellowship (2022 – 2023)
- PBIP Scholarship (2019 – 2022)
- IIT – JAM Qualified (2019)
- MPST Qualified (2019)
- PMRF (2023 -Present)
- Outreach Grants
 - ◆ European Society of Evolutionary Biology (ESEB)
 - ◆ Animal behaviour Society (ABS)
 - ◆ Society for the Study of Evolution (SSE)
 - ◆ British Ecological Society (BES)
- Best Poster in Understanding Behaviour 2023 (UB 2023)

Outreach Initiatives

- **Organiser in Biology through the Lens of Evolution (EvoBio 2023), IISER, Kolkata**
- **Volunteer in Institute Open Day (2022), IISER Kolkata**
- **Volunteer In Kalyani Bookfair (2021), IISER Kolkata**
- **Understanding Behaviour 2023, IISER Kolkata**

Publications

- **Annagiri, S., & Halder, E. (2023). Marching with Ants to a New Nest: Colony Composition and Relocation Dynamics of *Diacamma indicum*. *Journal of the Indian Institute of Science*, 1-14**
- **Halder, E. and Annagiri, S. Intraspecific competition for a nest and its implication for the fitness of relocating ant colonies, <https://doi.org/10.1101/2023.01.24.525355>, PloS One (Under review)**
- **Bhattacharyya, K., Nayak, Chakrabarti, U., Halder, E., Halder, S., and Annagiri, S. Decoupling behavioral responses in the context of relocation during monsoon: a study in a tropical ant. (Under preparation)**