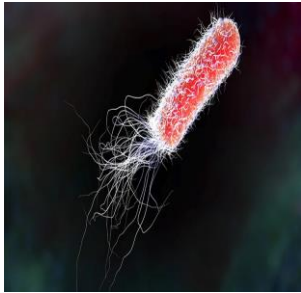# Exercise 1
To take behavioural observations

LS2203 (Biology Laboratory IV)

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Presenter: Bhavya Pratap Singh

What is behaviour?

- An action or series of actions **exhibited by an organism** in response to a particular environment or a change.
- Behaviours can be called as 'emergent/higher-order phenotypes'.

Swimming of a cell

Glowing jellyfish

Folding of leaves in *mimosa pudica*

Lice picking

Swarming

Organism

- https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1469-185X.2008.00057.x
- https://www.cell.com/current-biology/pdf/S0960-9822(09)01910-1.pdf

Biology lacks a central concept that unambiguously marks the distinction between organism and non-organism because the most important questions about organisms do not depend on this concept   ~ J.A. Wilson (2000).

- Organism = Individual ? (most of the times yes, but not always!)

- the fundamental unit of natural selection - organism
- selection acts on phenotype, as phenotypes are in direct contact with the environment.

Credit: Kushankur Bhattacharyya

- *Diacamma indicum* is a queenless ponerine ant found in India, Sri Lanka and Japan.
- Fertile individual: **Gamergate**.

Task 1: To identify all individuals uniquely

Identity: WWY

W-Y

Task 2: Behaviour sampling

- **Ad-libitum**: observer notes whatever is visible or seems relevant at the time (not systematically).

- **Scan sampling**: at regular intervals, the instantaneous behaviour of all individuals is recorded.

- **Focal sampling**: focus on an individual/unit or a particular type of behaviour
- Focal animal sampling
types of behaviours, frequency of each behaviour, amount of time spent exhibiting particular behaviour - **time activity budget**
- Focal behaviour sampling

Aim: (i) To quantify the proportion of active/inactive individuals using scan sampling.

How would you sample (~ 13 - 14 scans): At every 3-minute, pause the video and note down the identity of all visible individuals and their behaviour at that instant.

S.No.	Identity	Behaviours	Location
1.	XYZ -----	Running/Stationary	Track/Around nest entry/Inside

Active: physical movement
Inactive: no movement

Calculate the proportion of active/inactive behaviours out of the repertoire that you observed. Calculate the proportion of active/inactive individuals in the colony and plot it.

Aim: (ii) To quantify the work-load of leaders during tandem-run using focal sampling.

Follower   Leader

How would you sample: Throughout the video, identify each leader involved in tandem-run and note the amount of time spent and frequencies of tandem runs.

S.No.	Identity	Frequency
1.	XYZ	-

● Plot the number of tandem runs by each leader. Calculate the proportion of leaders with heavy/light work-load (consider average tandem runs of a leader as your threshold).

Lab Record (-soft copies)

Aim
Theory (10-12 lines)
Methods
Observations (qualitative; describe all kinds of behaviours that were observed along with their frequencies)
Results
Limitations
Conclusions
Supplementary

● Put your raw tables in supplementary section of the record.