

# WINOGRADSKY COLUMN

Guided by

Dr Mitali Mukherji and Dr Mansi Mukherjee.

Chaitravi Kane B21EE091

HarshVardhan B21BB012

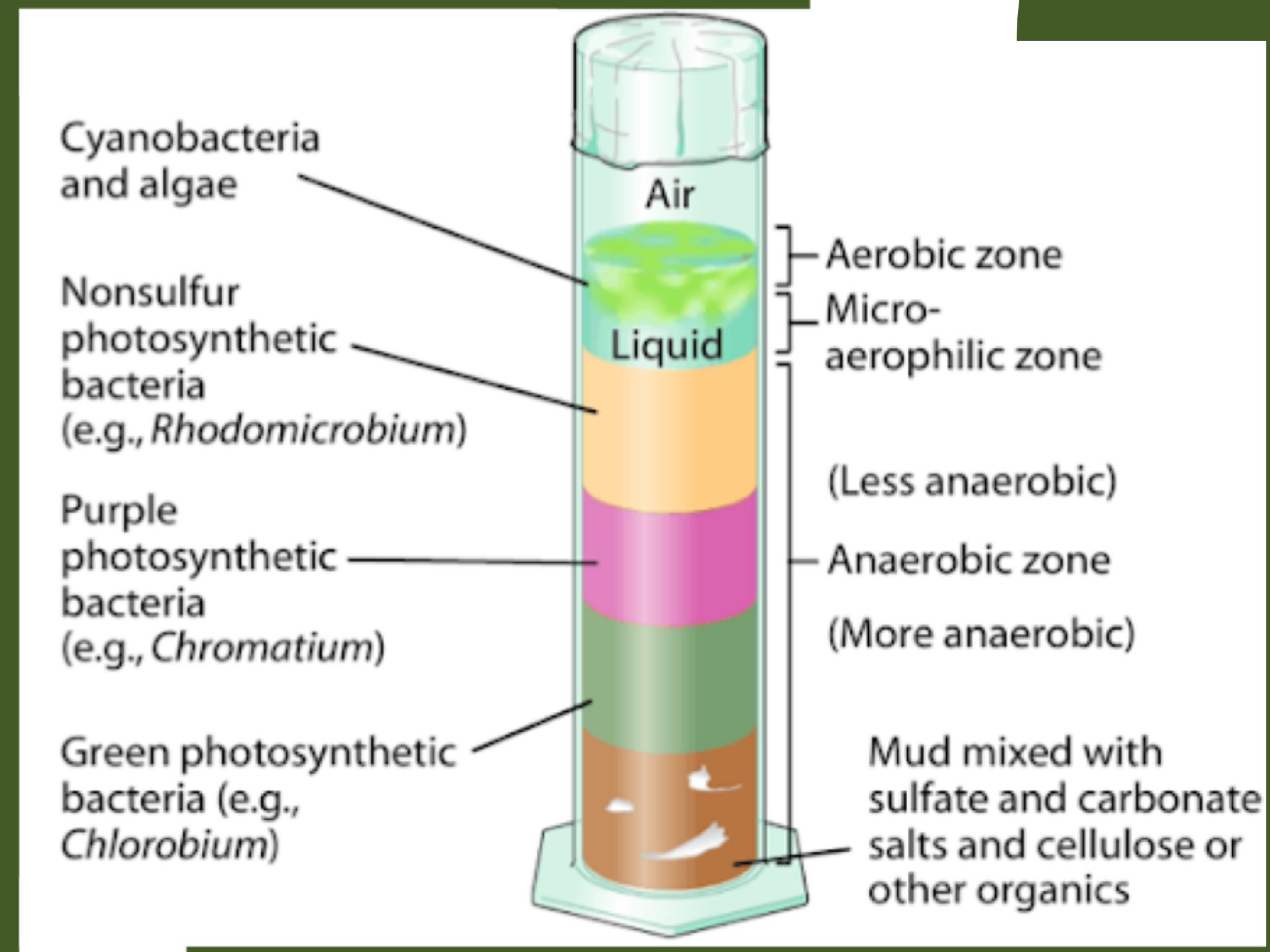


## INTRODUCTION

Invented in the 1880s by Sergei Winogradsky, the device is a column of pond mud and water mixed with a carbon source such as newspaper (containing cellulose), blackened marshmallows or egg-shells (containing calcium carbonate), and a sulfur source such as gypsum (calcium sulfate) or egg yolk.

# Our Purpose

- 01** To study the change in microbiota present in the rewilding region before and after rewilding
- 02** To study the biogeochemical processes , to investigate diversity and metabolic potential of microorganisms.



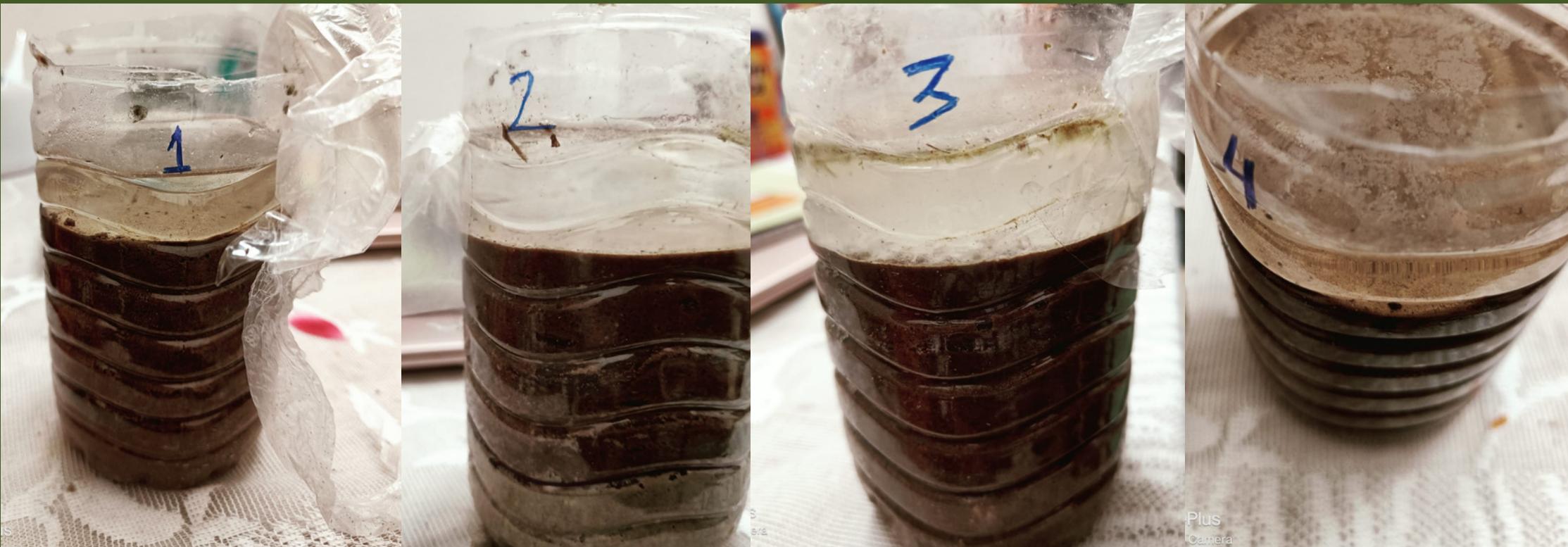
- **Sulfur cycling:** Sulfate-reducing bacteria and sulfur-oxidizing bacteria interact to cycle sulfur compounds, such as sulfate, sulfide, and elemental sulfur.
- **Carbon cycling:** Photosynthetic bacteria and algae in the upper layers of the column produce organic matter through photosynthesis, which is then broken down by heterotrophic bacteria in the lower layers. This results in the cycling of carbon compounds, such as CO<sub>2</sub> and organic carbon.
- **Nitrogen cycling:** Different groups of bacteria in the column convert nitrogen compounds, such as ammonium and nitrate, into different forms through processes such as nitrification, denitrification, and nitrogen fixation.
- **Phosphorus cycling:** Phosphate-reducing bacteria and phosphate-accumulating bacteria interact to cycle phosphorus compounds, such as phosphate and organic phosphorus.
- **Methane production:** Methane-producing bacteria can be found in the anaerobic layers of the column, where they convert organic matter into methane.

## PROCESS OF MAKING COLOUMN

- **Take the soil sample and mix it with newspaper and egg.**
- **Add this soil upto 25% of the bottle.**
- **Fill the bottle upto 75% by sand.**
- **Fill the bottle neck upto water.**
- **Place it in sunlight with covered top.**
- **Growth develops in 2-4 weeks and becomes stable after 6-8 weeks.**



# FAILED ATTEMPT



## COLLECTION SITES

**Site 1 are boundaries constructed with heap of sandy soils. These heaps also locally called med allows growth of large number of *Zizyphus* sp. and tall grasses. Birds like Plain prinia ,Grey shrike ,Red vented bulbul were seen here.**



## SITE-2

**Site 2 has mudd soil, a calcareous soil filled with nodular calcite. The area has patches of feeble grasses and not much plants growing around. The calcite area is slightly low-lying and collects rain water seasonally.**



# SITE-3

**Site 3 is the lowest point of the mudd soil area where the silt soil is deposited over the calcite nodules by rain washed water. The area seems completely barren with no plants growing around**



## SITE-4

**Site 4 is a medd area with large area of Biological Soil crust that supports a number of murali trees and Zizyphus shrubs. This medd area is rewilded with Mimosa hamata. There were a number of Desert jird holes around**



Site 1 is fox den



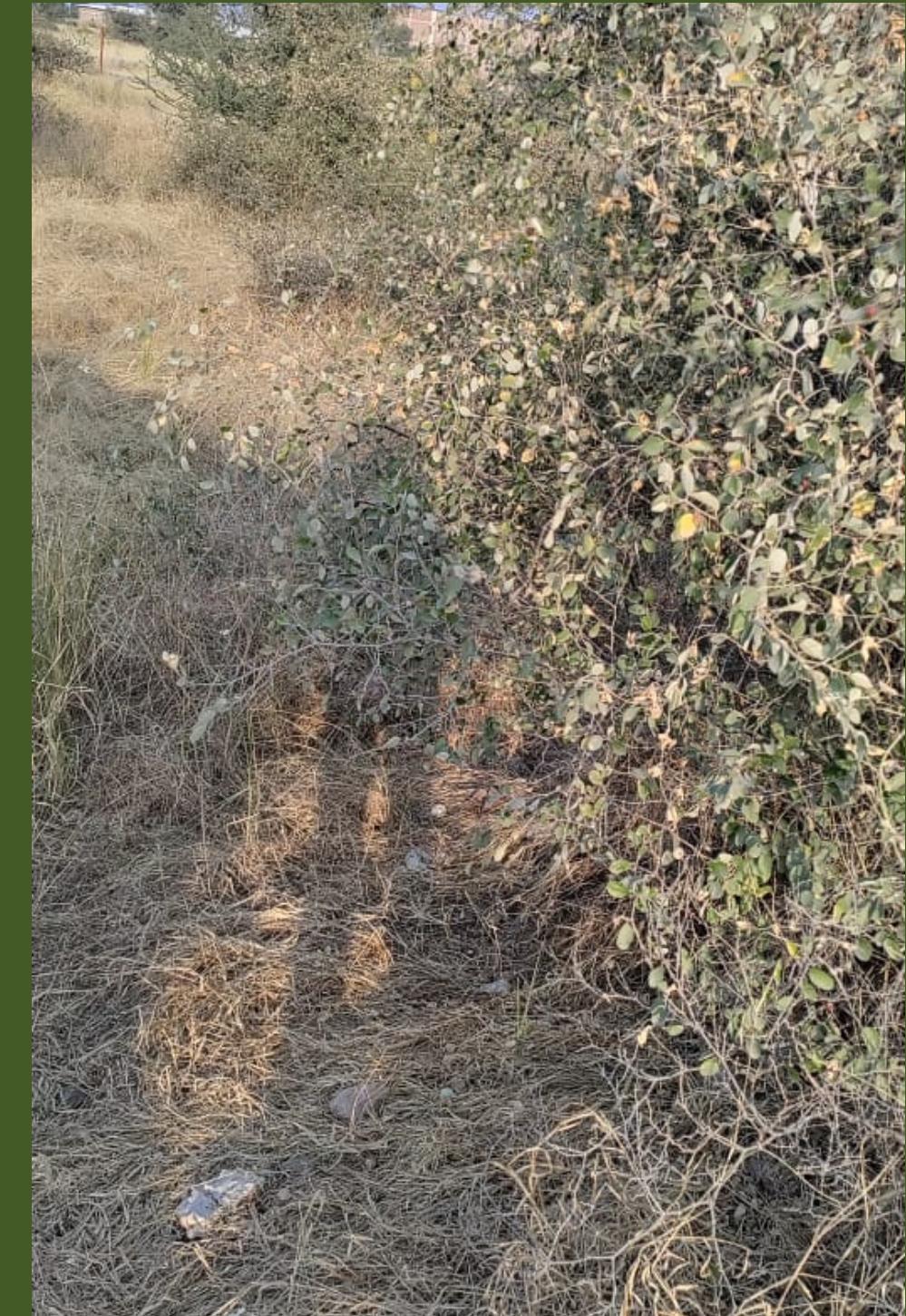
# Site 2 (Videshi Babul) is near PHC



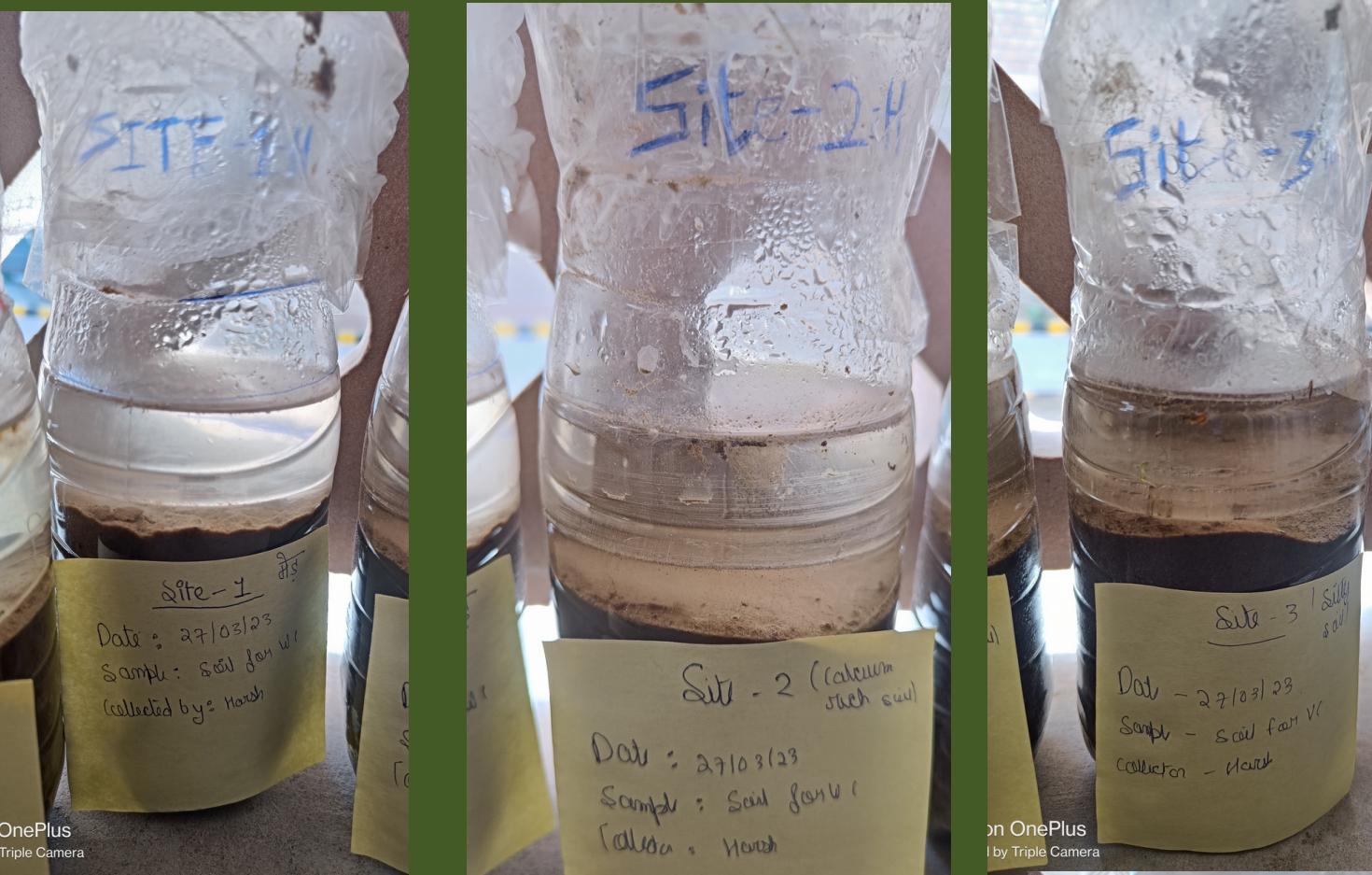
# Site 3 is in front of PHC



# Site 4 is near shamiyana

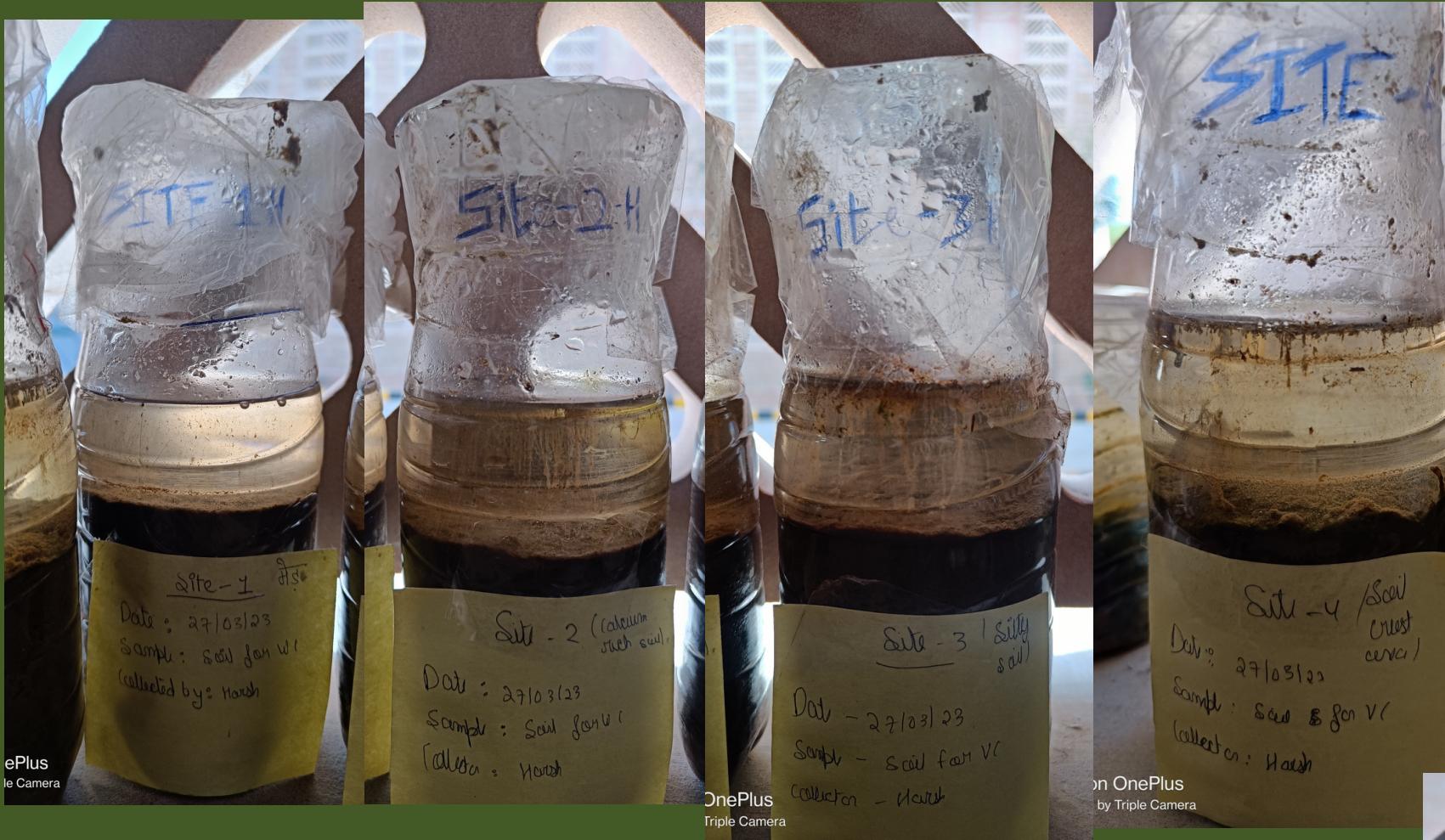


# OBSERVATIONS

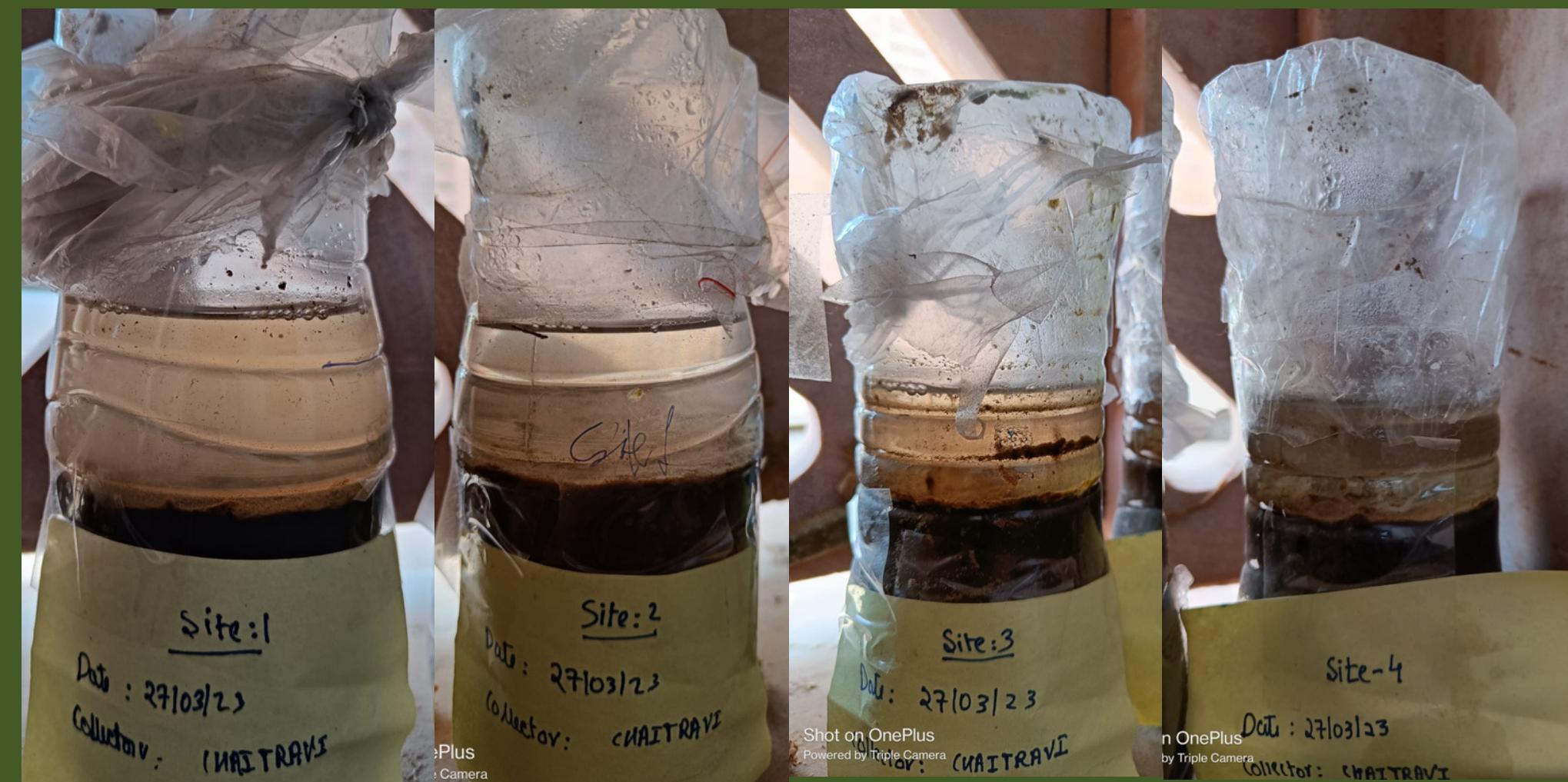


**WEEK-1**

# WEEK-2



# WEEK-3



# WEEK-4



## REFERENCES

- <http://archive.bio.ed.ac.uk/jdeacon/microbes/winograd.htm>
- <https://elizabethmcd.github.io/R-amplicons/00-project-overview.html>
- [https://en.wikipedia.org/wiki/Winogradsky\\_column#:~:text=Invented%20in%20the%201880s%20by,calcium%20sulfate\)%20or%20egg%20yolk.](https://en.wikipedia.org/wiki/Winogradsky_column#:~:text=Invented%20in%20the%201880s%20by,calcium%20sulfate)%20or%20egg%20yolk.)

A photograph of a forest floor covered in green foliage and small plants. Sunlight filters through the dense canopy of tall trees, creating a bright, dappled light effect on the ground. A narrow, dirt path leads into the distance, lined with trees on both sides.

**THANK YOU**