

## Field trip report

SCHOOL OF EARTH, OCEAN AND ATMOSPHERIC SCIENCE,

GOA UNIVERSITY



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Phadte  
seen  
9/12/22

Submitted by

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Under guidance

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## ACKNOWLEDGEMENT

I take this opportunity to thank the University Goa for allowing the 'students to go for a field trip. My special thanks goes to the head of department marine microbiology SEOAS

GOA The trip became successful and enjoyable with senior Finally, I want to thank all those who were present in frild trip and for the safe journey good health, protection and care that he gave we could not have made it by our own strength. Thank you so much.



### Introduction

Station: malim jetty, offshore Miramar, near choral island, old goa.

Purpose: To study environmental variables related to marine, coastal and aquatic ecosystems, water quality and sediment characteristic.

Date of visit: 9 March 2022 (one day only)

Name : Sonali phadte seat no: 21P039020



Department of ~~School~~ of Earth ~~Ocean~~ and ~~Atmospheric~~ Science

I attended the Field trip on 9 March in mandovi estuaries we collected the sample of surface water, near bottom, sediment of 4 different Station water sample were collected in plastic bottle, cans and nisskine bottle. Thermometer was use to check temperature and salinity was analysis by using the instrument called refractometer .on 8 March we were



	Station I		Station II		Station III		Station IV	
Sample collection	Surface Bucket	Near bottom Net	Surface Bucket	Near bottom Net	Surface Bucket	Near bottom Net	Surface Bucket	Near bottom Net
MPN	Agman + Crischa SDM 1 x 2	Agman + Crischa + Sonali	Agman + Crischa + SDM 1 x 2	Agman + Crischa + SDM 1 x 2	Agman + Crischa SDM 1 x 2	Agman + Crischa + SDM 1 x 2	Agman + Crischa + SDM 1 x 2	Agman + Crischa + SDM 1 x 2
DO	Shivam + Aarti	Shivam + Aarti	Shivam + Aarti	Shivam + Aarti	Shivam + Aarti	Shivam + Aarti	Shivam + Aarti	Shivam + Aarti
Temp	Shivam	Shivam	Shivam	Shivam	Shivam	Shivam	Shivam	Shivam
Salinity	Shivam	Shivam	Shivam	Shivam	Shivam	Shivam	Shivam	Shivam
phyla fixation	Shivam	Shivam	Shivam	Shivam	Shivam	Shivam	Shivam	Shivam
SPM + chlorophyll	Shivam	Shivam	Shivam	Shivam	Shivam	Shivam	Shivam	Shivam
Noting	Shivam	Shivam	Shivam	Shivam	Shivam	Shivam	Shivam	Shivam
Sediment collection (Grab)	Agman + Crischa + Sonali	Agman + Crischa + Sonali	Agman + Crischa + Sonali	Agman + Crischa + Sonali	Agman + Crischa + Sonali	Agman + Crischa + Sonali	Agman + Crischa + Sonali	Agman + Crischa + Sonali

planning the Field trip how would we conduct or handle instrument? 8 day was only discussion and distributed our work. ✓



Station 1: malim jetty ; Latitude 15.503'N; Longitude 73.83'E; Depth 6 meter

Zone of sampling      temperature      salinity

Surface      31°C      25

Near bottom      30.5°C      26

Sediment      no sediment, Rocky bottom therefore no sediment was found . ✓





Station 2: offshore Miramar; Latitude 15.47°N; Longitude 73.77°E; Depth 10 meter.

Zone of sampling	temperature	salinity
Surface	30°C	33
Near bottom	30°C	34
Sediment	sediment was collected	



Station 3: choral island ; Latitude 15.505°N; 73.86°E; Depth 3.5 meter

Zone of sampling	temperature	salinity
Surface	30°C	25



Near bottom	30°C	26
Sediment	no sediment, degraded bottom.	



Station 4:old goa;Latitude 15.508'N;Longitude 73.91'E Depth 5.25meter

Zone of sampling	temperature	salinity
Surface	31°C	20
Near bottom	31°C	23
Sediment	no sediment	

#### Principle:

**Bacteria:** Fecal coliform found in the Intestine of warm blooded animals do not cause disease but Are used as an indicator of disease causing pathogens in the aquatic environment higher bacteria Levels can limit the use of water for swimming or contaminant drinking water in ground water The presence of excessive bacteria also may indicate other problem such as low DO. Typical source of bacteria are sewage from septic system failure and stormwater overflows ,poor pasture management and animal keeping practices pet waste and urban runoff.

**Do :**Knowledge of the dissolved oxygen concentration in seawater is often necessary in environmental and marine science it may be used by physical oceanography to study water masses in the ocean it provides the marine biologist with a means of measuring primary productions particularly in laboratory cultures for a marine chemist it provide measures of the redox potential of the water column. The diesel oxygen concentration of seawater is defined as the number of millilitres of dioxygen gas per litters of seawater. The chemical determination of oxygen concentration in seawater is based on the method first proposed by Winkler1888.And modified by Strickland and Parson (1968).Oxygen in water sample oxidise iodide ion to iodine.Quantitatively The amount of iodine Generated is determined by Titrating with the thiosulfate solution. The endpoint is determined by Using the starch as the visual indicator. Natural organic detritus and organic waste from waste water treatment plants, failing septic systems, and agricultural and urban runoff, acts as a food source for water-borne bacteria. Bacteria decompose these organic materials using dissolved oxygen, thus reducing the DO present for fish.



**Salinity :** Salinity is the term used to define the total amount of dissolved inorganic salts in the ocean. Definition Salinity is the total mass, expressed in grams, of all substances dissolved in one kilogram of sea water when all carbonate has been converted to oxide, all bromine and iodine has been replaced by chlorine and all organic compounds have been oxidized at a temperature of 480°C. On average, concentration of dissolved salts, i.e., the salinity in seawater is 35‰.

**Temperature:** measures by Thermometer.

**MPN:** Water to be tested is diluted serially and inoculated in MacConkey broth, coliforms if present then produce acid and gas. The presence of acid is indicated by the colour change of the medium and the presence of gas is detected as gas bubbles collected in the inverted Durham tube present in the medium. The number of total coliforms is determined by counting the number of tubes giving positive reaction (*both colour change and gas production*) and comparing the pattern of positive results (*the number of tubes showing growth at each dilution*) with standard statistical tables.

*different font!*

**Secchi disk :** The Secchi disk, as created in 1865 by Angelo Secchi, is a plain white, circular disk 30 cm (12 in) in diameter used to measure water transparency or turbidity in bodies of water. The disk is mounted on a pole or line, and lowered slowly down in the water. The depth at which the disk is no longer visible is taken as a measure of the transparency of the water.

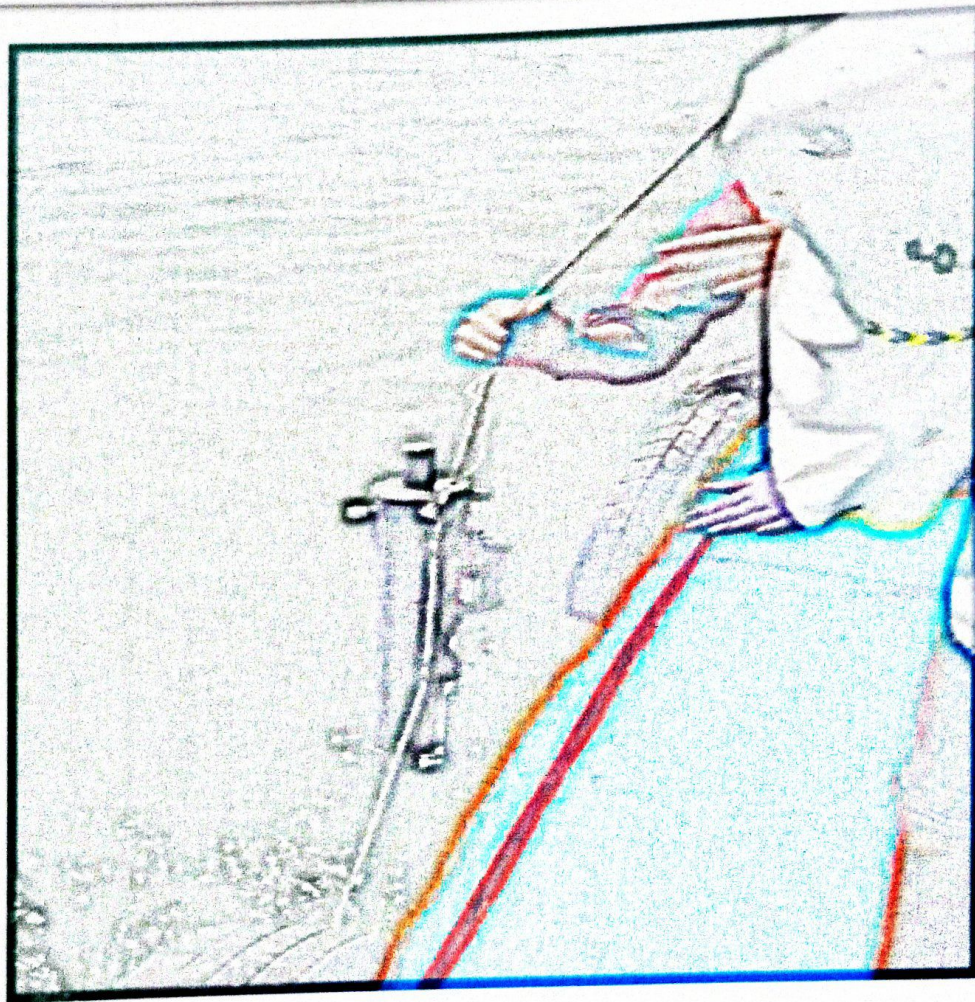
**pH:** The carbonate buffer system keeps the pH of most waters around 7 - 7.5, unless large amounts of acid or base are added to the water. In waters with high algal concentrations, pH varies diurnally, reaching values as high as 10 during the day when algae are using carbon dioxide in photosynthesis. pH drops during the night when the algae respire and produce carbon dioxide. Most streams draining coniferous woodlands tend to be slightly acidic (6.8 to 6.5) due to organic acids produced by the decaying of organic matter.

**Methodology:**



1. Bacteria collection :gloves when u collecting sample . Rinse the bottle and cap three times with sample water and fill the bottle to within one to two inches from the top. Place the sample into a cooler with ice for immediate delivery or shipment to the laboratory. Sterile 125 or 150 mL plastic bottles must be used.

2. Do, dissolve oxygen :for Do sampling Water was collected from surface of seawater in bucket than Do bottle and second collected from nisskine for bottom water. Surface water: Bottle



was rinse with water. No air bubbles should be transferred in Do bottles when we collected water sample. Winkler A and Winkler was added to the Do bottle without air bubbles.

Bottom water: nisskine pipe was put in Do bottle for bottom water sample collection. No air bubbles should be transferred in Do bottle when we had collected water sample Winkler A and Winkler B were added without air bubbles keep the DO bottles in shade Titration was carried in laboratory. Sample- Fixed sample with settled precipitate

Acidified sample: 2ml conc. sulfuric acid • Take 50ml in conical flask • burette was filled with thiosulfate solution allow few drop in conical flask colour change to pale



yellow • 2ml starch until blue colour was form • continue until clear solution form in conical flask • note the reading.

Blank reading-blue colour did not develop

Therefore standardization 11.9

Surface water

Pilot reading	Burette reading			Average
1)2-3	2.8	2.8	2.7	2.76
2)3-4	3.6	3.6	3.5	3.56
3)3-4	3.6	3.7	3.7	3.66
4)3-4	3.2	3.1	3.2	3.16

Calculation  $DO = 2.7 \times 1.011 \times 0.0098 \times 8 \times 1000 \div 50$

=4.28mg/L

Near bottom

Pilot reading	Burette reading			Average
1)2-3	2.4	2.4	2.5	2.43
2)3-4	3.4	3.3	3.4	3.36
3)1-2	1.2	1.3	1.3	1.23
4)3-4	3.6	3.6	3.5	3.6

3. Secchi disk : plain white, circular disk 30 cm (12 in) in diameter used to measure water transparency or turbidity in bodies of water. The disc is mounted on a pole or line, and lowered slowly down in the water. The depth at which the disk is no longer visible is taken as a measure of the transparency of the water. 4 different Station were measure water clarity by using secchi disk.

4 temperature was check with Thermometer when water was removed at once. For both surface sample and bottom water

5. salinity anlysis by refractometer when water was removed at once for both surface sample and bottom water.

5. Chl extraction using 90% acetone Diatoms were grown in bulk in Tarsons containers using f/2 media. After incubation the Diatom cultures were filtered using GF/F filter paper. Filter papers were crushed in 10ml of 90% acetone and kept in fridge overnight. Next day the tubes were centrifuged and the supernatant was transferred to fresh tube. The volume was made to 15ml and absorbance was taken at different wavelength (480, 510, 630, 647, 664, 665, 750nm). Acidification: with 50% HCl (for phaeopigments). Repeat the ODs again. Precaution: A drop of 1%



MgCO<sub>3</sub>(preservative) was added on the filter paper at end of filtration; filters were stored at -20°C till estimation. Followed by spectrophotometry.

SPM: is determined by filtering a known volume of water sample through a 0.45  $\mu$  pre-weighed filter, drying and then weighing again. The difference between the initial weight and the final weight (in mg) divided by the amount of water sample filtered (in liters) is given as the SPM (mg/L).

MPN: 1. Take 5 tubes of double strength and 10 tubes of single strength for each water sample to be tested. Using a sterile pipette add 10 mL of water to 5 tubes containing 10 mL double strength medium. Similarly, add 1 mL of water to 5 tubes containing 10 mL single strength medium and 0.1 mL water to the remaining 5 tubes containing 10 mL single strength medium. Incubate all the tubes at 37°C for 24 hrs. If no tubes appear positive re-incubate up to 48 hrs. Compare the number of tubes giving a positive reaction.

Result: gas production in tube and colour change were seen

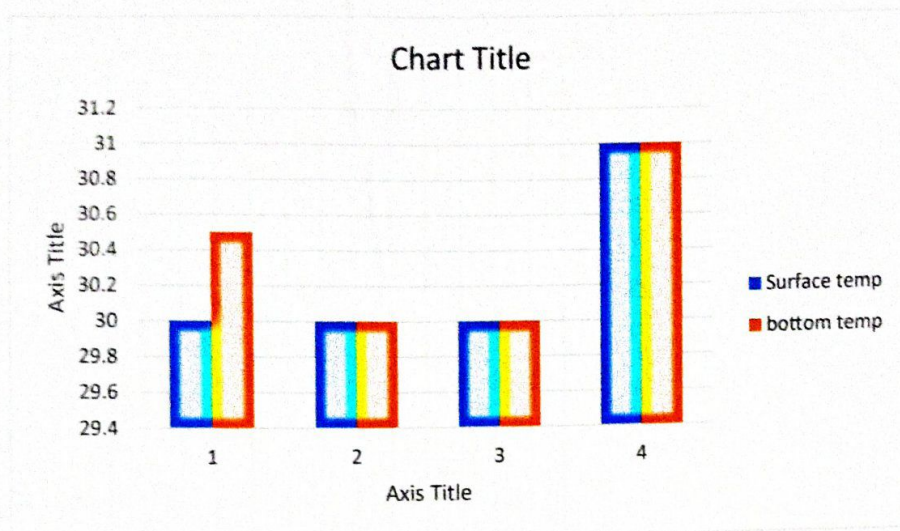
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STATION	Zone of sampling	Bacterial sampling	Dissolved oxygen	Temperature	Salinity	Phytofixing
1. Malim Jetty	surface	✓		31° C	25	
	near bottom	—		30.5°C	26	
	sediment	No sediment, rocky bottom				
2. Offshore miramar	surface	✓		30°C	33	
	near bottom	—		30°C	34	
	sediment	Sediment collected				
3. Near chorao island	surface	✓		30°C	25	
	near bottom	—		30°C	26	
	sediment	No sediment, dredged bottom				
4. Old goa	surface	✓		31°C	20	
	near bottom	—		31°C	23	
	sediment	No sediment				



Station	Surface temp	bottom temp	std dev
1	30	30.5	0.353553391
2	30	30	0
3	30	30	0
4	31	31	0
Average =	30.25	30.375	
std dev=	0.5	0.478713554	
avedev=	0.375	0.375	





Chlorophyll estimation (mg/m <sup>3</sup> )	SPM (mg/l)	Latitude	Longitude	Secchi depth (in meters)	Depth (in meters)
8.544	48	15.503	73.83	1.75	6
6.942	52				
0	0				
2.67	60	15.47	73.77	2	10
2.136	68				
0	0				
5.874	52	15.505	73.86	2.25	3.5
10.68	56				
0	0				
3.738	32	15.508	73.91	1.3	5.25
4.806	4				
0	0				



		Filter paper weight (g) (x)	Dry weight (g) (y)	Difference (g) (x-y)	SPM (mg/l)
Station 1	Surface	0.085	0.097	0.012	48
	Bottom	0.082	0.095	0.013	52
Station 2	Surface	0.088	0.103	0.015	60
	Bottom	0.084	0.101	0.017	68
Station 3	Surface	0.086	0.099	0.013	52
	Bottom	0.08	0.094	0.014	56
Station 4	Surface	0.085	0.093	0.008	32
	Bottom	0.081	0.091	0.01	4



Station 1	DS (10ml)		SS (1ml)		SS (0.1)	
	Acid	Gas	Acid	Gas	Acid	Gas
1	✓	✓				
2	✓	✓	✓	✓	?	?
3	✓	✓	✓	✓		
4	✓	✓	✓	✓		
5	✓	✓	✓	✓		

Station 2	DS (10ml)		SS (1ml)		SS (0.1)	
	Acid	Gas	Acid	Gas	Acid	Gas
1						
2			✓	✓	?	?
3	✓	✓	✓	✓		
4	✓	✓	✓	✓		
5	✓	✓	✓	✓		

Station 3	DS (10ml)		SS (1ml)		SS (0.1)	
	Acid	Gas	Acid	Gas	Acid	Gas
1	✓	✓	✓	✓		
2	✓	✓				
3	✓	✓				
4	✓	✓				
5						

Station 4	DS (10ml)		SS (1ml)		SS (0.1)	
	Acid	Gas	Acid	Gas	Acid	Gas
1	✓	✓	✓	✓		
2	✓	✓	✓	✓		
3	✓	✓	✓	✓		
4	✓	✓				
5						

No results, discussion, references, appendix?

*Bousso*  
18/11/22