

# VIDYASAGAR UNIVERSITY



**MUGBERIA GANGADHAR MAHAVIDYALAYA**  
**BHUPATINAGAR :: PURBA MEDINIPUR**

**Labratory Note Book**  
**B.Sc (Honours)**

**SEMESTER - 6 SEM**



**ROLL - 1126129 NO. - 200141**

**REGN NO. - 1290671**

**SESSION - 2020-2021.**

# MUGBERIA GANGADHAR MAHAVIDYALA

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West Bengal :: India

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**NCTE recognised & NAAC Accredited with CHLA 2.71**

**institution**

Http:// www.mugberiangangadharmahavidyalaya.org



## **Certificate of completion**

This is to certify that Mr./Miss. Anwesa Manna  
Roll. 1126129 number 200141 a  
UG student of 6<sup>th</sup> sem. , **Zoology** Department has  
successfully completed a project entitled **Field report**  
**and biodiversity study on Chandipur , Debkunda &**  
**Bramhani river region** for the paper **DSE4** in the year  
2023.

U. U. T. Ghosal 26.07.2023

Signature of HOD

HOD  
Department of Zoology  
Mugberia Gangadhar Mahavidyalaya

S. S. Ghosh 26.07.2023

Signature of principal

Principal  
Mugberia Gangadhar Mahavidyalaya

# ACKNOWLEDGEMENT

At first, we extend our gratitude to vidyasagar university and Megheria Gangadhar Mahavidyalaya authority for giving us permission to organize such a valuable educational excursion.

I would like to express my special thank of gratitude to our HOD "Dr. Kousik Kumar Mondal" as well our teachers [SubhadEEP Maity, Raju Majumdar, Sarbani Mahata] who helped me by their guidance, suggestion during the excursion.

I am thankful to my friend who helped in this excursion.

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# INTRODUCTION

For the sake of conservation of an ecosystem knowledge and understanding of the biotic and abiotic factors are essential. As student of zoology we need to understand the geographical distribution of different animals, their relation with the respective habitats and possible threats to the ecosystem and for what we need to study the biodiversity of a certain area of interest. To study the biodiversity in its all aspects, we need to visit areas which are full of diverse flora and fauna, for knowing and gathering information about surrounding animals and plants. People have to travel long distance in the midst of the nature and this is how the notion of the excursion i.e. field study has been emphasized. It is a good way to enrich our knowledge about the distribution of different species through out the globe and break free from shackle of theoretical learning. Not only that we can learn the facts about animals, but also we can gather a lot of information regarding the biodiversity of well as biogeography of the particular space.

## OBJECTIVE

Objective of the field study are as follows :-

- It is first-hand knowledge for a student to learn the basis of biodiversity.
- To provide a general idea about a forest's ecosystem biodiversity and understanding its all aspects.
- Enable a student to know about the particular habitat and niche of concerned animal.
- To study about various aspects of a particular forest especially the flora and fauna and prevailing vegetation.
- To observe the change of soil, water, flora and fauna according to the change of place.
- To give an idea about the breeding season of the organism.
- Our primary object is to assess biodiversity of the forest.

## OUR TEAM

### ◆ Student List : →

- 1) Anwesha Manna
- 2) Rumpa Mondal
- 3) Gargi Maity
- 4) Pratima Kotal
- 5) Sanchita Majity
- 6) Sujata Maji
- 7) Susmita Giri
- 8) Swagata Mahapatra
- 9) Monalisha Giri
- 10) Manisha Mondal
- 11) Souradip Patra
- 12) Sudip Mondal
- 13) Shyamsundar Shit
- 14) Krishnapada Barman
- 15) Prantik Maji
- 16) Triparna Pradhan
- 17) Swagata Chakraborty.

### ◆ Teacher's List : →

- 1) Dr. Kousik Kr. Mondal
- 2) Raju Majumdar
- 3) Subhadeep Maity
- 4) Sarbani Mahata

## TOUR SCHEDULE

- 18.05.2023 : DEP: Bus leaved at 10.25 PM  
From college.
- 19.05.2023 : ARR: 4.23 PM at Chandipur  
\* visited Chandipur  
Sea beach at 7 AM  
DEP: Bus leaved at 8.30 AM  
From Chandipur to Devkund  
\* visited Devkund at 1.00 PM  
ARR: 10.00 PM at Chandipur.
- 20.05.2023 : \* visited Chandipur sea  
beach at 10 A.M.  
\* Reached Chandipur  
Sea beach at 4.30 PM  
for quadrate study.
- 21.05.2023 : DEP: Bus leaved at 4.30  
A.M From Chandipur to  
Bhitarkanika.  
ARR: 9.00 AM at Joy nagar  
\* visited Brahmani River  
at 10.00 AM.  
DEP: Bus leaved at 5.40 PM  
From Joy nagar.
- 21.05.2023 : ARR: Reached home  
at 5:15 A.M.



## SELECTION OF EXCURSION SITE

Bhitarkanika is a well-known place to observe the giant salt water crocodile, some growing to 23 feet in length, along with over semi-aquatic reptiles like the Asian water monitors and numerous snakes. Eight varieties of kingfisher are found here and can be found along the many creeks and rivering system within the park.

The role travels along a man-made creeks as if passes through dense mangrove forests, providing a glimpse into the estuarine ecosystem and its wealth of fauna.

Bhitarkanika has a very rich historical and cultural past. It is used to be the hunting grounds of the erstwhile king of Kanika. It is also the home of medieval Hindu temples, found dotted throughout the sanctuary yet the major attraction remains the wildlife.

## CHANDIPUR SEA BEACH

□ INTRODUCTION Chandipur, also known as Chandipur-on-sea, is a small sea resort in Baleswar District, Odisha. The resort is on the Bay of Bengal and is approximately 16 kilometers from the Baleswar Station. Due to its unique circumstances, the beach supports biodiversity. Horse Shoe crab is also found here.

□ LOCATION Chandipur is located at  $21^{\circ}28'N$   $87^{\circ}01'E$  /  $21.47'N$   $87^{\circ}02'E$

□ Normal Indian weather In summer the temperature is  $25^{\circ}-40^{\circ}C$  but in winter it's  $17^{\circ}-28^{\circ}C$ . November - March is the suitable time for travelling here.

### QUADRAT STUDY OF MOLLUSCAS IN CHANDIPUR

□ INTRODUCTION: → The most important aspect for any study on biodiversity (either plant or animal biodiversity) is to select some representative plot and then record the number of all plants and animals lying within the plot and at last calculating the study average diversity index from the recorded observation.

□ What is a quadrat Quadrat is well defined geometric structure which is further divided into sub-quadrat and is useful for measuring the relative

□ QUADRAT STUDY: →

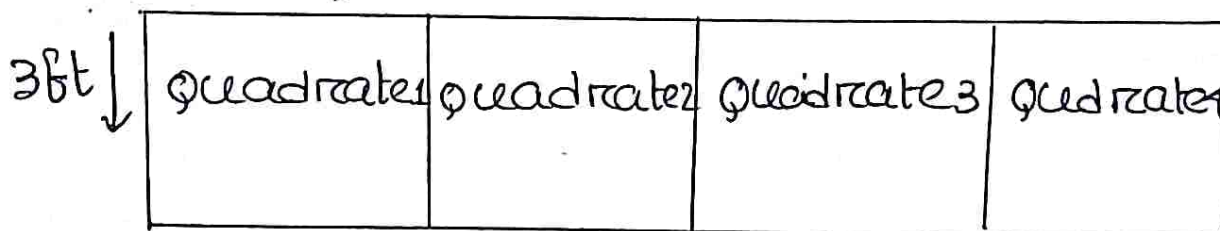
Place → Chandipur

DATE → 20.05.2023

TIME → 4.50 pm

□ REQUIREMENT: →

- i) ROPE      ii) Field note book      iii) Pen, pencil  
3ft →



□ SOLUTION

Name of Species	Quadrat 1	Quadrat 2	Quadrat 3	Quadrat 4	Total no	
					of individuals	Total number
M <sub>1</sub>		1			1	
M <sub>2</sub>	513	173	23	359	1068	1238
M <sub>3</sub>	25	3	38	25	91	
M <sub>4</sub>	19	4	37	13	73	
M <sub>5</sub>				1	1	
M <sub>6</sub>				1	1	
M <sub>7</sub>	1				1	
M <sub>8</sub>			2		2	

□ Shannon diversity index (H') is calculated by animal into

$$H' = \sum \frac{n_i}{N} \ln \left( \frac{n_i}{N} \right)$$

Where  $n_i$  = number of species  
 $N$  = Total number  
 $i$  = species  $1, 2, \dots$

$$\begin{aligned}
&= - \left[ \left\{ \frac{1}{1238} \ln \left( \frac{1}{1238} \right) \right\} + \left\{ \frac{1068}{1238} \ln \left( \frac{1068}{1238} \right) \right\} + \left\{ \frac{91}{1238} \ln \left( \frac{91}{1238} \right) \right\} + \right. \\
&\quad \left. \left\{ \frac{73}{1238} \ln \left( \frac{73}{1238} \right) \right\} + \left\{ \frac{1}{1238} \ln \left( \frac{1}{1238} \right) \right\} + \left\{ \frac{1}{1238} \ln \left( \frac{1}{1238} \right) \right\} + \left\{ \frac{1}{1238} \ln \left( \frac{1}{1238} \right) \right\} \right. \\
&\quad \left. + \left\{ \frac{2}{1238} \ln \left( \frac{2}{1238} \right) \right\} \right] \\
&= - [(-0.005) + (-0.129) + (0.185) + (-0.149) + (-0.005) \\
&\quad + (-0.005) + (-0.005) + (-0.0069)] \\
&= - [-0.0475] \\
&= 0.0475
\end{aligned}$$

Calculation :  $\rightarrow$  The result of Shannon Index diversity is less than 1 so, this diversity is highly polluted.

▣ Dominancy (D) of the diversity is calculated by  $\rightarrow D = \sum \left( \frac{n_i}{N} \right)^2$  where  $n_i$  = number of animal into species

$$\begin{aligned}
&= \left[ \left( \frac{1}{1238} \right)^2 + \left( \frac{1068}{1238} \right)^2 + \left( \frac{91}{1238} \right)^2 + \left( \frac{73}{1238} \right)^2 + \left( \frac{1}{1238} \right)^2 + \left( \frac{1}{1238} \right)^2 + \left( \frac{1}{1238} \right)^2 + \left( \frac{2}{1238} \right)^2 \right] \\
&= 0.74
\end{aligned}$$

$N = \text{Total number}$

▣ Simpson Index ( $D_s$ ) is calculated by  $D_s = 1 - D$  [where  $D$  = Dominancy]

$$= 1 - 0.74 = 0.26$$

Name of species	Total no of individuals (n <sub>i</sub> )	No of sample	Density = $\frac{\text{Total no of individuals}}{\text{no of sample}}$	Abundance = $\frac{\text{Total no of indivi}}{\text{Total no}}$	Relative Abundance = $\frac{\text{Abundance}}{100}$
M <sub>1</sub>	1	8	$\frac{1}{8} = 0.125$	$\frac{1}{1238} = 0.0008$	0.08
M <sub>2</sub>	1068	8	$\frac{1068}{8} = 133.5$	$\frac{1068}{1238} = 0.86$	86
M <sub>3</sub>	91	8	$\frac{91}{8} = 11.37$	$\frac{91}{1238} = 0.07$	7
M <sub>4</sub>	73	8	$\frac{73}{8} = 9.12$	$\frac{73}{1238} = 0.05$	5
M <sub>5</sub>	1	8	$\frac{1}{8} = 0.125$	$\frac{1}{1238} = 0.0008$	0.08
M <sub>6</sub>	1	8	$\frac{1}{8} = 0.125$	$\frac{1}{1238} = 0.0008$	0.08
M <sub>7</sub>	1	8	$\frac{1}{8} = 0.125$	$\frac{1}{1238} = 0.0008$	0.08
M <sub>8</sub>	2	8	$\frac{2}{8} = 0.25$	$\frac{2}{1238} = 0.0012$	0.1

## SPECIES AT CHANDIPUR SEA BEACH

### Invertebrates Fauna : →

#### 1/ Sea Urchin

Scientific name → Paracentrotus lividus

IUCN Status → This species has not yet been assessed for the IUCN Red list.

Distribution : → Paracentrotus lividus is found throughout the Mediterranean Sea and in the eastern Atlantic ocean.



Habitat : → Paracentrotus lividus is usually found almost below low water mark at depth down to twenty meters and sometimes also in rock pool.

It is eating a range of red, green and brown algae in addition to sea grass.

#### ii) Barzoe

Scientific name : → Barzoe cucumis

IUCN STATUS : → This species has not yet been assessed for the IUCN Red list.

Distribution : → It is found in the North Atlantic ocean and the North sea.



Habitat : → It is a predator and mostly feeds on other comb jellies.

The general body colour is pink, especially along the rows of cilia and the plates are bioluminescent.

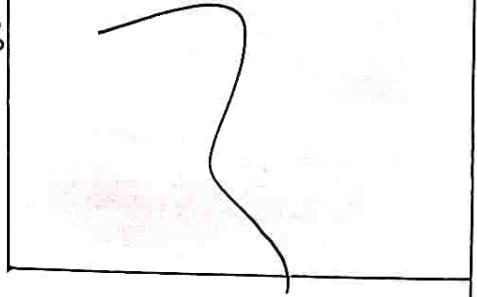
### iii) Jellyfish : →

▣ scientific name : Rhopilema nomadica

▣ IUCN STATUS : The species has not yet been assessed for the IUCN Red list.

▣ Distribution : It is found in Indian and Pacific oceans.

▣ Habitat : It is mainly planktonic, meaning that they feed on plankton. It can cause very painful injuries to human.



### iv) Sea Anemones

▣ scientific name : → Paracon dyactis

▣ Distribution : Sinensis It is found in Arabian Sea, west coast of India.

▣ Habit : Anemones are typically sessile.

Sea anemones use their foot to slowly move around the bottom or "swim" by flexing and twisting their body.

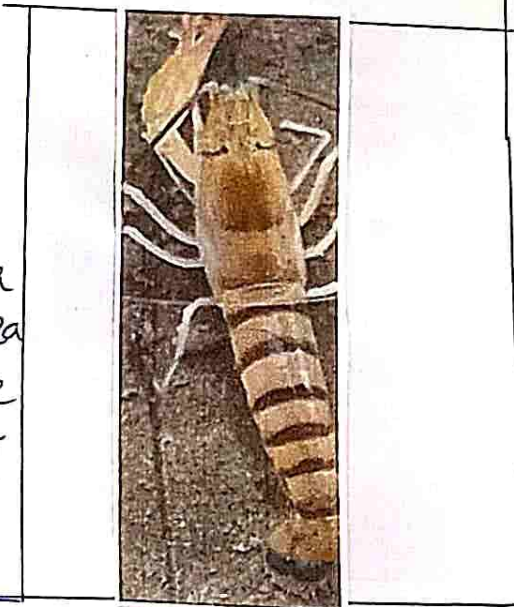


### v) Giant tiger prawn : →

▣ scientific name : → Penaeus

▣ Distribution : Its monodon natural distribution is the Indo-Pacific ranging from the eastern coast of Africa and the Arabian Peninsula.

▣ Habit : Penaeus monodon typically feed on detritus, polychaete worms, mollusks and smaller crustaceans. They also commence mating at night and can produce around 800,000 eggs.



## ◦ VERTEBRATES FAUNA

### i) Grass puffer

▣ Scientific name: Takifugu  
niphobites

▣ IUCN status: Least concern  
(IUCN 3.1)

▣ Distribution: This common to abundant species is found in the northwest Pacific ocean in China, Japan, Korea etc.

▣ Habit: The grass puffer has a highly unusual breeding behaviour where large groups gather seasonally in shallow water along certain beaches during high tide.

They are popular for children to catch and even popular as pets but their intestines contain the extremely potent pufferfish poison tetrodotoxin which is potentially lethal to humans.

### ii) Flat fish

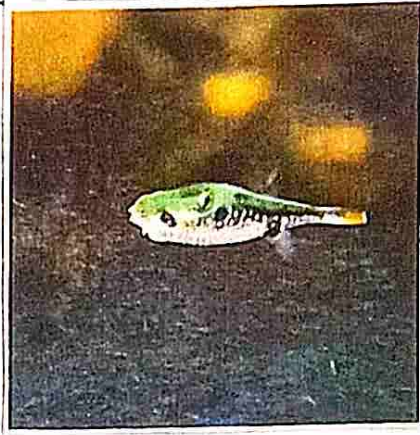
▣ Scientific name: Pleuronectes  
platessa

▣ IUCN status: Least concern

▣ Distribution: It is found in South America, India, Malaysia and Southern Hemisphere.

▣ Habit: It feeds on molluscs. It swims by undulating movement.

The flat is also an important food fish.



iii) Chestnut-tailed Starling

Scientific name: Sturnia malabarica

IUCN Status: Least concern

Distribution: It is a resident or partially migratory species found in wooded habitats in India and Southeast Asia.

Habit: It is fairly omnivorous, eating fruit, nectar and insects.

They fly in tight flocks and often rapidly change directions with great synchrony.

iv) Oriental Magpie-robin : →

Scientific name: Copsychus saularis

IUCN Status: Least concern

Distribution: This magpie-robin is a resident breeder in tropical southern Asia from Nepal, Bangladesh, India.

Sri Lanka and Eastern Pakistan, Indonesia etc.

Habit: → They nest in tree hollows or niches in

walls or building, often adopting nest boxes.

The diet of magpie-robin includes mainly insects and other invertebrates. Although they are mainly insectivorous

They sometimes bathe in rain water collected on the leaves of a tree.





### v) Little Egret : →

Scientific name: Egretta garzetta

IUCN Status: Least concern

Distribution: Its breeding distribution is in wetlands in warm temperature to tropical parts of Europe, Africa, Asia and Australia. A successful colonist, its range has gradually expanded north with ~~the~~ stable and self-sustaining populations now present in United Kingdom.



Habit: Little egrets are sociable birds and often seen in flocks.

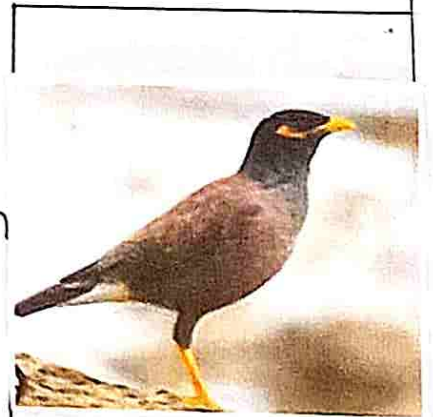
Their diet is mainly fish but amphibians, small reptiles and birds are also eaten as well as crustaceans.

### vi) Common Myna : →

Scientific name → Acridotheres tristis

IUCN Status : → Least concern

Distribution: → The common myna is native to Asia, with its initial home range Iran, Pakistan, Sri Lanka etc.



### vii) Lesser Sand Plover : →

Scientific name

IUCN Status

Distribution: It breeds above the tree line in the Himalayas and across to bare coastal plains in north-eastern Siberia.

This species is strongly migratory, wintering on sandy beaches in east Africa and south Asia.



### viii) Greater sand plover : →

Scientific name : Charadrius leschenaultii

IUCN Status : Least concern

Distribution : This is strongly migratory wintering on sandy beaches in East Africa and Australia.

Habit : → Its food consists of insects crustacean and annelid worms which are obtained by a run-and-pause technique, rather than the steady probing of some other wader groups.

Its flight call is a soft trill.

### ix) Jungle myna : →

Scientific name - Acridotheres fuscus

IUCN Status - Least concern

Distribution - The jungle myna is a common resident breeder in tropical Southern Asia from Nepal, Bangladesh to India.

Habit : → Jungle mynas are omnivorous feed mainly on insects, fruit and seeds. The breeding season is in summer and before the rains.



# DEVKUND

## INTRODUCTION : →

Devkund is naturally created pond located in the Mayurbhanj district of Odisha, India and is part of the Simlipal National Park. The following water from an adjacent waterfall has created the pond. There is a temple called "Ambika Mandira".

## LOCATION : →

DEVKUND is located at  $21.5883^{\circ}\text{N } 86.3666^{\circ}\text{E}$

## SPECIES AT DEVKUND : →

### Invertebrates Fauna

#### i) Peacock Parsy

scientific name: Junonia almana

IUCN status: Least concern

Distribution: Junonia almana is found in India, Sri Lanka, South East Asia to China and Japan

Habit: The caterpillars of Junonia almana feed on a variety of plants, including phyllanthoid plants etc.

#### ii) Mottled Emigrant : →

scientific name: Catopsilia sp.

IUCN status: The species has not yet assessed for the IUCN Red list

Distribution: The species found in India, Malaya, Myanmar.

Habit: Long yellow ribbons consisting of several hundreds of both common and mottled emigrants are seen flying across during migration.



# BRAHMANI RIVER

▣ INTRODUCTION: → The Brahmani is a major seasonal river in the Odisha state of eastern India. Together with the river Baitarani, Brahmani forms a large delta before emptying into the Bay of Bengal at Bhamra. It is the second widest river in Odisha after Mahandi.

▣ LOCATION: → The Brahmani is located at  $22^{\circ}14'45''\text{N } 84^{\circ}47'02''\text{E}$

▣ FLORA AT JAYNAGAR: →

i) Ashvatha tree:

▣ Scientific name: Ficus religiosa

▣ IUCN status: Least concern

▣ Distribution: Ficus religiosa is native to most of the Indian and subcontinent - Bangladesh, Nepal, Bhutan, Pakistan etc.

▣ Habit: Ficus religiosa is used in traditional medicine for about 55 types of disorders asthma etc.

iii) Holy Mangrove (Aegiceras)

▣ Scientific name: Acanthus

▣ IUCN status, ilicifolius

▣ Distribution: This species is wide spread Southeast Asia, Indochina.

▣ Habitat: This plant is reported to be used is asthma. The leaves and tender shoot are used in snake bite



## SPECIES AT JAYNAGAR

### • Invertebrates FAUNA

#### i) Common picture wing

Scientific name: Rhyothem variegata

IUCN status: Least concern

Distribution: The species found in South Asia.

Habit: This species breeds in marshes, ponds and Paddy fields. They appear to have weak flight and can easily be mistaken for butterflies.

#### ii) plain tiger

Scientific name: Danaus chrysippus

IUCN status: Least concern

Distribution: The plain tiger is found across the entirety of Africa. Its range extends across the majority of Asia.

Habitat: Adult plain tiger butterflies obtain nectar from various flowering plants.

#### iii) Common tiger

Scientific name: Danaus genutia

IUCN status: Least concern

Distribution: Danaus genutia is distributed throughout India.

Habit: This species are leathery tough to kill and faked eat.

The most common food plants of the common tiger in peninsular India are small herbs, twiners and creepers.



## ☑ VERTEBRATES FAUNA : →

### i) Purple-rumped Sunbird

☑ scientific name: Leptocoma zeylonica

☑ IUCN status: Least concern

☑ Distribution: The purple-rumped sunbird is a common resident breeder in southern India → Sri Lanka and Bangladesh.

☑ Habit: They breed throughout the year and may have two broods.

### ii) Pond Heron

☑ scientific name: Ardeola sp.

☑ IUCN status: Least concern

☑ Distribution: It breeds in southern Europe and middle East and winters in Africa.

☑ Habit: Their breeding habitat is marshy wetlands

This heron feeds on insect fish and amphibians.

### iii) Little Cormorant

☑ scientific name: Microrcarbo

☑ IUCN status: niger Least concern

☑ Distribution: The little cormorant is found across India, Sri Lanka, Bangladesh.

☑ Habit: The breeding season of the little cormorant is between November and February in southern India.

They swim underwater to capture their prey, mainly fish.



#### iv) Oriental darter: →

Scientific Name: *Anhinga melanogaster*

IUCN Status: Near threatened

Distribution: The oriental darter is a water bird of tropical South Asia and Southeast Asia.

Habit: The breeding season is June to August in northern India, April-May in southwestern India.

The oriental darter feeds mainly fishes.



#### v) Sand Martin: →

Scientific Name: *Riparia riparia*

IUCN Status: Least concern

Distribution: It is a Holarctic species also found in North America. It winters in eastern and southern Africa, South America, Indian subcontinent.

Habit: Their food consists of small insects, mostly gnats and other flies whose early stages are aquatic.

#### vi) Little Egret: →

Scientific Name: *Egretta* sp.

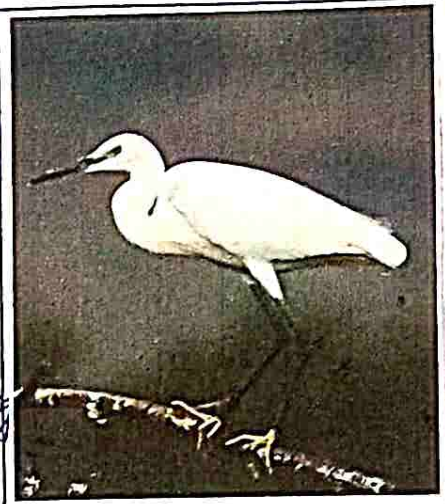
IUCN Status: Least concern

Distribution: The breeding range of the western race includes southern Europe.

Habit: Little egrets are sociable birds and are often seen in small flocks.

### vii) Great Egret : →

- ❑ Scientific Name: Ardea alba
- ❑ IUCN Status: Least concern
- ❑ Distribution: The species are found in Asia, Africa, the Americas.
- ❑ Habit: The great egret feeds mainly on fish and other amphibians.



### viii) Red-wattled Lapwing : →

- ❑ Scientific name: Vanellus indicus
- ❑ IUCN Status: Least concern
- ❑ Distribution: In breeds from West Asia, eastwards across South Asia.
- ❑ Habit: The breeding season is mainly March to August.

### ~~viii~~ ix) Open-bill Stork : →

- ❑ Scientific name: Anastomus oscitans
- ❑ IUCN Status: Least concern
- ❑ Distribution: This stork is found mainly in the Indian Subcontinent and Southeast Asia.
- ❑ Habit: The openbill feeds mainly on large molluscs, especially Pila species.



The breeding season is after the rains during July to September in Northern India Nepal and November to March in Southern India.



### x) cattle Egret : →

▣ Scientific name → Bubulcus ibis

▣ IUCN status : Least concern

▣ Distribution : It was originally native to parts of southern Spain and Portugal and subtropical Asia

▣ Habit : The cattle egret nest in colonies which are often found around bodies of water.

### xi) Greater coucal : →

▣ Scientific name : Centropus sinensis

▣ IUCN status : Least concern

▣ Distribution : A widespread resident in the Indian subcontinent and South Asia.

▣ Habit : The greater coucal is a large bird which takes a wide range of insects.

The breeding season is after the monsoon in southeast India.

### xii) Black Drongo : →

▣ Scientific name : Dicrurus macrocerus

▣ IUCN status : Least concern

▣ Distribution : It is common resident breeder in much of tropical southern Asia from southeast Iran through India Pakistan, Bangladesh, Sri Lanka.

▣ Habit : Black drongos breed mainly in February and March in southern India and until August in parts of the country.



## DETERMINATION OF pH OF WATER

Theory: → potential<sup>of</sup> hydrogen ion or simply; pH is a value on a scale ranging from 0 to 14. which gives a measure of the acidity or alkalinity of a given sample.

In formulative term, pH is the negative logarithm of hydrogen ion concentration i.e.  $\text{pH} = \log(\text{H}^+)$  where  $\text{H}^+$  = molarity of  $\text{H}^+$  in the medium under study.

observation: →

Place: Brahamni River at Jaynagar

Time: 10.45 am

Date: 21.05.23

No. of observation		pH value	Mean
1	→	7.6 →	
2	→	7.7 →	7.7
3	→	7.8 →	

Inference: → pH of water sample from Brahamni River is 7.7 (Basic)

## CONCLUSION

The excursion in a happy mode and every number of it, enjoyed the whole tour to their hearts content. Most of us went for the first time in Chandipur, Devkund etc without our parents. These gave us opportunity to face and handle various situation.

  
26.07.23