

Field visit for Fossil Collection and Studies -2021

**Department of Botany
Banwaria Bhalotia College, Asansol**

Synthesized By – Dr. Sanjeev Pandey

Palaeobotany is an important subject area in the field of Botany that deals with the study of plant fossils. This subject area is also included in the Honours Syllabus at Kazi Nazrul University as per UGC regulations. Interestingly our college and our University are situated in the coalfield area which is considered suitable for finding fossils, collecting them, and studies. Every year we go on a local field visit to one or the other collieries of our choice for this purpose. Official permissions are taken from both sides, that is from the College authorities and the Colliery we are visiting.

In this connection, in the year 2021 during March when covid situations were near normal and lockdown and other restrictions were lifted for some days we took this opportunity to visit the nearby colliery that is the Chattapathar Open Coalpit dumping site for field study. This site had been earlier studied by us and as supervisors, we knew that this site is going to be fruitful for a purpose of field study from students' perspectives. The site is safer with respect to accidents also that might happen during such occasions.

This time one of our senior professors Dr. Jnan Bikash Bhandary from North Bengal University was also joining the trip for his own research purpose. He was accompanied by three Research Scholars - Shilpa, Samsuddoha and Soumya. I also took this opportunity to organize a one day seminar on this occasion. The field visit with students was on 18th March 2021 and the next day i.e. on 19th March there was a seminar and mine visit. We visited Satgram Incline colliery on that very occasion. In mine visit only research Scholar and one of our senior student of 5th sem Arghya Mukherjee assisted us. Myself Dr. Sanjeev Pandey guided the entire team as being local and visited several times I was well acquainted with the environment.

Description of the localities and the trip has been given in the field reports submitted by the students. Though a brief introduction to that -

Chatapatthar OCP is situated at

Lat N 23° 40' 11.9784"

Long E 87° 0' 26.2296"

Altitude - ~60 metres

Temperature during March 37-40 ° C

Rainfall - It was a Sunny hot day with many students not able to tolerate the heat that long and were given rest.

Distance from College - 2.5 km

Distance from Asansol Rly Station - 5.5 km

Fossils collected - *Glossopteris* (leaf) and *Vertebraria* (root) most common, others include *Gangamopteris*, *Schizoneura*, Stems of Sphenopsids etc.

Links to the Projects Reports submitted by some students -

<https://drive.google.com/file/d/1e1dGnHLj1hxzeK9lzETbGOZhIJAYSmX9/view?usp=sharing>

Submitted by - Amisha Bhagat

<https://drive.google.com/file/d/17dKhPwXLONPVipvYhQT7WAaJYPtrX0ip/view?usp=sharing>

Submitted By- Promita Mondal

<https://drive.google.com/file/d/1bDp9jPzoD8x6djF3rmiWD1qNheHAAK-H/view?usp=sharing>

Submitted by - Bindi Shaw

List of students, Research Scholars and Supervisor participated –

Program Name	Program Code	List of students undertaking project work/field work/ internship
B.Sc. Botany Honours	BSCHBOTC202	kripal mondal
		Sweta Shaw
		Rupak chakraborty
		Promita Mondal
		Rohit Kumar Yadav
		Amisha Bhagat
		Shafquat Perveen
		BIDISHA ROY
		Kesar Kumari
		SUBHRANEEL ROY

BSCHBOTC303

Bindi kumari shaw
Priya kumari
MD SULTAN
ABIRA MONDAL
Anisha Mukherjee
ASHISH SHAW
Asmita Mukherjee
DEBOMITRA GHOSH
JITAMANNU DEB
MADHUMITA PARAMANIK
MONALISHA MAJI
Neha Ojha
Priyanka Mukherjee
Purnima Kumari
Purnima Sharma
RAKHEE CHATTERJEE
Rani chakraborty
RANJANA KUMARI
Samayeeta Dasgupta
Sanjiv Pandey
SUJAAN MUKHERJEE
Sumana Mukherjee

B.Sc. Botany Program

BSCPBOTC301

SOUVIK GHOSH
Sanjana Lal
PRITI GOSWAMI
ANTARA BARUA
ANSHIKA KUMARI SHAW
PRATIVA KARMAKAR
ANTARA BARUA

Some Evidence -



Pic 1 - Fossil Collection and study at Chatapathar PCP, Ushagram, Asansol, West Bengal, India



Pic 2 - Pics of Seminar and Mine visit with Research Scholars at Satgram Incline, Rabuganj Coalfield Area, West Bengal, India.

Botany -
BSc Botany Honours -
Semester - II

Course name: Archegoniatae: Bryophytes, Pteridophytes, Gymnosperms

Course Code: BSCHBOTC202

Theory -

Unit III: Pteridophytes

- **Introduction to Palaeobotany** – Important terminologies and definitions; Types of fossil on the basis of modes of preservation; Nomenclature, Conditions suitable for fossilization; Importance of fossils and their study; Stratigraphy – Law of superposition, Stratigraphic correlation and stratigraphic deduction based on megafossil and microfossil assemblages. Geological time scale and important events of plant life.

Practical -

- Study (including mode of preservation) of the following: *Lepidodendron*, (stem in T. S.), *Calamites* (stem in T. S.), *Bucklandia* (stem, specimen), *Glossopteris* (leaf, specimen), *Lyginopteris* (stem in T. S.), *Vertebraria* (root, specimen).

[NB. Practicals will also include field study with specimen collection, preservation and their submission with proper documentation. It also includes temporary and where ever necessary permanent slide submission.]

Objective –

Palaeobotany is the branch of biology that deals with plant fossils. Fossils give us informations about our past environment, past flora and fauns and it also gives us informations about the evolutionary relationships among different groups of plants (or animals). Fossils are also used to explore oil deposits in the strata. Fossils help us to correlate among the strata of a geological region and to build a geological profile.

Fortunately our college is located in coalfield areas which are considered rich source of fossils. Here at this level only macrofossils have been considered but this area is also very good for microfossil studies. Though field visit, specimen identification, collection and storage students develop skill of fossil identification, collection methods and storage. This makes them proficient in this branch of biology which is mainly fundamental.

Semester - III
Course name: Plant Systematics
Course Code: BSCHBOTC303

Practical

- Field visit (local or outside depending on situation) –
- Mounting of a properly dried and pressed specimen of any 20 wild plants with Herbarium label (to be submitted in the record book).
- Construction of plant phylogenetic trees using various loci (rbcL, ITS, trnL etc) with various phylogenetic methods (Neighbour Joining, Maximum Likelihood etc)

Objective –

Plant taxonomy or systematics is the basic branch of botany. This particular subject gives you experience on identification of herbs, shrubs and trees of your and distant locality. This subject area may be considered as job oriented as one good in plant identification have scope in the medicinal field.

Through field visit several times to local areas, to Botanical Survey of India, Shibpur Kolkata and AJC Bose botanical Garden and to a distant place (for long excursion) like Darjeeling and Sikkim area gives immense experience of plant identification, their habit and habitats etc.

The best way to learn plant taxonomy is through field visit. Students get extremely benefitted by these field visits that we normally do every session.

BSc Botany Program -

Semester-III

Course name: Archegoniatae: Bryophytes, Pteridophytes, Gymnosperms

Course Code: BSCPBOC301

Theory -

Unit III: Pteridophytes

- **Introduction to Palaeobotany** – Important terminologies and definitions; Types of fossil on the basis of modes of preservation; Nomenclature, Conditions suitable for fossilization; Importance of fossils and their study; Stratigraphy – Law of superposition, Stratigraphic correlation and stratigraphic deduction based on megafossil and microfossil assemblages. Geological time scale and important events of plant life.

Practical -

- Study (including mode of preservation) of the following: *Lepidodendron*, (stem in T. S.), *Calamites* (stem in T. S.), *Bucklandia* (stem, specimen), *Glossopteris* (leaf, specimen), *Lyginopteris* (stem in T. S.), *Vertebraria* (root, specimen).

[NB. Practicals will also include field study with specimen collection, preservation and their submission with proper documentation. It also includes temporary and where ever necessary permanent slide submission.]

Palaeobotany is the branch of biology that deals with plant fossils. Fossils give us informations about our past environment, past flora and fauns and it also gives us informations about the evolutionary relationships among different groups of plants (or animals). Fossils are also used to explore oil deposits in the strata. Fossils help us to correlate among the strata of a geological region and to build a geological profile.

Fortunately our college is located in coalfield areas which are considered rich source of fossils. Here at this level only macrofossils have been considered but this area is also very good for microfossil studies. Though field visit, specimen identification, collection and storage students develop skill of fossil identification, collection methods and storage. This makes them proficient in this branch of biology which is maily fundamental.



BANWARILAL BHALOTIA COLLEGE

Asansol, West Bengal-713304

Session-2021-22

Zoology Field Work

Topic- Measurement of Turbidity by Secchi Disc



INSTRUCTOR- Pankaj Dutta

DONE BY- Jiya Sen, Ishani Roy ,Tania Bharttacharjee, Shreejita Mukherjee, Monalisa Das, Rima Mondal, Riya Banerjee, Srimonty Ghosh ,Ankan Bhowmick , Shreyasi Adhikary,Manav Chatterjee ,Aniket Dawn , Debraj Mondal , Sana Parween , Jyotirmoy Banerjee ,Soma Ghosh , Sourakar Biswas, Kazi Naser Rahman, Rubab Fatima , Noor Fatima ,Bushra Rahman, Rooqaiya Khatun, Anjishnu Mukherjee , Atul kumar Lal ,Mantu Singha Babu , Dev Khan



P. Dutt



REDMI NOTE 5 PRO
MI DUAL CAMERA

2022/1/21 22:46

MEASUREMENT OF TURBIDITY BY SECCHI DISC :-

INTRODUCTION :- The Secchi disc, as created in 1865 by the Italian Astronomer, Father Pietro Angelo Secchi, is a plain white circular disc, 30 cm in diameter and 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 disc is no longer visible is taken as a measure of the transparency of the water. This measure is known as the Secchi depth, and is related to water turbidity. Since its invention, the disc has also been used in a modified, smaller (20 cm in diameter). Black and white provides the maximum contrast regardless of the colour of the light transmitted by the water body. The disc is most easily used from a boat or a bridge.

Materials Required :- 1) Secchi Disc 2) Pole or Cord
3) Measuring tape.

Procedure :-

- i) A Cord is attached to the side Secchi disc with black and white quadrants.
- ii) Disc is lowered slowly in water until it disappears. The depth on the Cord is noted.
- iii) Sufficient time (approx. 2 min) is allowed when looking at the disc near its extinction point for the eyes to adapt completely to the prevailing luminance level.

P. D. D. D.

REDMI NOTE 5 PRO
MI DUAL CAMERA

2021/12/15 15:55

REDMI NOTE 5 PRO
MI DUAL CAMERA

2022/1/21 22:47

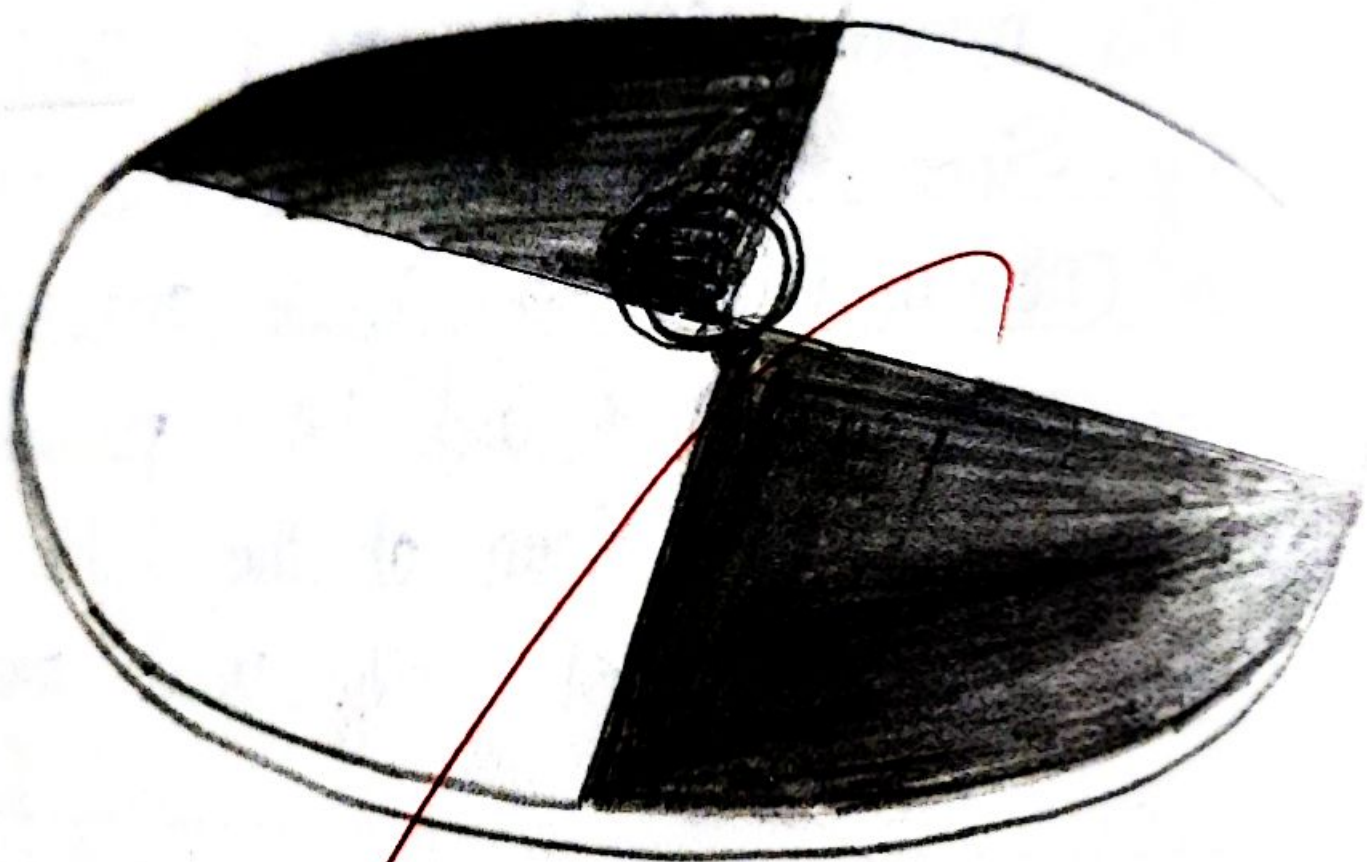


Fig:- Secchi disc

iv) The disc is lowered a few more centimeter and then is slowly raised again until it reappears. This second reading of depth is also noted.

v) Calculate the average of the depths at two points (the depth of disappearance and reappearance). This measure is known as Secchi depth.

RESULTS (SECCHI DISC READINGS) :-

Reading number	Depth at which disc disappear	Depth at which disc reappears	Average Value (Secchi Depth)
1	28	22	25 cm
2	31	25.5	28.25 cm
3	36	22	29 cm

$$\text{Common depth} = \frac{25 + 28.25 + 29}{3} = \frac{82.25}{3} = 27.41$$

COMMENTS :-

Hence, the turbidity of the water is 27.41 cm.

P. Datta
23/12/21

*Relevant Document for
Students Undertaking
Fieldwork in the Year
2021(UG Sem I Hons, PG
Dept. Of Zoology)*

SEMESTER - I

Course Name		ECOLOGY	
Course Code		BSCHZOOC102	
Course Type		Core	
Course Details	CC-1	CA (Continuous Assessment)	Theory : 10 marks
			Practical : 30 marks
		ESE (End Semester Examination)	Theory : 40 marks
			Practical : 20 marks
Credits		Theory 4 + Practical 2 = Total 6 credits	
About the course :			
This course will take students on a journey through the physical workings of the Earth, the interactions between species and their environments. The course highlights on some of the important aspects viz. growth and survival of populations and communities in different habitats, energy flow in the ecosystems, interactions between the communities, exclusion of niches and consequences of changing environment on the biodiversity.			
Learning outcomes :			
After successfully completing this course, the students will be able to:			
<ul style="list-style-type: none">➤ Know the evolutionary and functional basis of animal ecology.➤ Understand what makes the scientific study of animal ecology a crucial and exciting endeavour.➤ Engage in field-based research activities to understand well the theoretical aspects taught besides learning techniques for gathering data in the field.➤ Analyse a biological problem, derive testable hypotheses and then design experiments and put the tests into practice.➤ Solve the environmental problems involving interaction of humans and natural systems at local or global level.			

THEORY (CC-2)**UNIT I: An overview of Ecology, Ecosystems and Biomes (13 Lectures)**

1. Introduction and scope of Ecology. Multidisciplinary relevance in current perspective.
2. Structure and function of ecosystem;
3. Abiotic factors affecting survival and sustenance of organisms e.g., water, temperature, light, pH and salinity.
4. Role of limiting factors in survival of biotic components.
5. Major ecosystems of the world: Ecological features, limiting factors, zonation and classification of organisms of fresh water and marine ecosystems.
6. Introduction to Biome: Ecological features of Tundra, Desert, Savannah and Tropical Rain Forest Biomes.
7. Energy flow in ecosystem, food chain and food web.
8. Productivity and ecological efficiencies.
9. Mineralization and recycling of nutrients: C, N, P & S.

UNIT II: Population ecology (13 Lectures)

1. Ecology of populations: Unitary and Modular populations.
2. Unique and group attributes of population: Density, natality, mortality, life tables, fecundity tables, survivorship curves.
3. Unique and group attributes of population: mortality, age ratio, sex ratio, dispersal.

4. Concept of carrying capacity, Factors regulating population dispersal and growth: Exponential and logistic growth.
5. Population regulation: density-dependent and independent factors; r and K strategies.

UNIT III: Biotic community, characteristics and attributes (13 Lectures)

1. Community characteristics: stratification; Dominance, diversity, species richness, abundance, Evenness, Similarity.
2. Diversity and food-web indices.
3. Ecotone and edge effect;
4. Positive interactions: commensalism, proto-cooperation, and mutualism.
5. Negative interactions: parasitism and allelopathy; predation and predator-prey dynamics; herbivory.
6. Interspecific competition and coexistence, Inter and intra-specific; abundance.
7. Niche concept, types, Niche overlap and Resource partitioning.
8. Gause's Principle with laboratory and field examples.
9. Ecological succession: Definition, Process, types, theories of succession.

UNIT IV: Environmental degradation; Biodiversity, Environmental movement etc. (13 Lectures)

1. Environmental degradation : Environmental ethics; Pollution: Air, water and noise pollution and their control; Solid Waste management and EIA ; Natural resources: Mineral, water and forest, their significance and conservation.
2. Biodiversity : Types and Hotspots of biodiversity. Threat and Major drivers of biodiversity. Conservation strategies ; Biodiversity status in India, monitoring and documentation; Biodiversity mapping using GPS, GIS and remote sensing. Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value. Application of ecology in management and Conservation programmes.
3. Environmental movement : Role of gender and cultures in environmental conservation. Environmental movements: Bishnois. Chipko, Silent valley, Big dam movements. Environmental education and public awareness, Green bench.

PRACTICAL (CC2)

1. To **measure microclimatic variables** viz., temperature, humidity and light conditions in a microhabitat.
2. **Making an ecosystem** in a wide-mouthed bottle.
3. **Constructing a food web** by observing organisms from a given area.
4. Preparing **an essay (write up)** based on few ecology related publications.
5. **Studying the impact of herbivore** on plant species (planted in pots under specific conditions).
6. **Constructing distribution map of species** of a genus through **GPS** by estimating the coordinates (virtual demonstration).
7. Estimation of the ratio of the producers and consumers.
8. Determination of **pH**, and Dissolved **O₂** (Winkler's Method) and Free **CO₂** in water.

9. Preparation of **nested quadrat and estimation** of effective quadrat size.
10. **Study of an aquatic ecosystem**: Major Phytoplankton (Up to Family) and zooplankton (Up to Genus).
11. Group discussion or **Seminar presentation** on one or two related topics (Given Below).
12. Field study in a biodiversity rich area like national park, biosphere reserve, sea shore or nearby places.