

# **DBT STAR COLLEGE SCHEME ANNUAL PROGRESS REPORT (2021 -2022)**

**DEPARTMENT OF ZOOLOGY**

**RAMAKRISHNA MISSION VIVEKANANDA  
CENTENARY COLLEGE (AUTONOMOUS)**

**RAHARA, KOLKATA 700118  
WEST BENGAL**

## New Practical introduced in 2021-2022 (DBT STAR COLLEGE SCHEME)

Date	Topic/Subject	Resource Person	Semester involved	Number of beneficiary	Topic under CBCS courses
17.11.21; 18.11.21; 19.11.21	Preparation of permanent slides of liver, testes, kidney, ovary, pancreas	Dr. Debkumar Datta; Dr. Pannalal Das	III	41	CC VI
21.01.21	Paper Chromatography	Piryabrata Sinha & Dr. Suvajit Maity	III	39	CC VI
23.12.01	Demonstration of Antibiotic sensitivity / resistance of <i>E. coli</i>	Dr. Subham Mookerjee	V	34	CC XI
19.03.22; 26.03.22	Use of Binoculars, GPS and various types of Cameras	Samir Sardar & Dr. Arunava Mukherjee	VI	36	DSE III
31.03.22	Demonstration of ELISA	Dr. Subham Mookerjee & Dr. Suvajit Maity	V	36	DSE II
25.11.2020	Estimation of Lipase and Trypsin activity	Dr. Suvajit Maity; Priyobrata Sinha; Dr. Arunava Mukherjee	IV	41	CC X
23.03.22; 30.03.22	Estimation of Alkaline and Acid Phosphatases activity	Dr. Suvajit Maity; Priyobrata Sinha; Dr. Arunava Mukherjee	IV	40	CC X
23.11.21	Estimation of TDS, Conductivity and Salinity of water samples	Dr. Arunava Mukherjee & Samir Sardar	I	39	CCII
February – May , 2022	Bioinformatics (Mega11, Biopython, NCBI ORF finder, Primer designer, NCBI Blast, NCBI, EMBL, DDBJ, UniprotKB, PDB, Pfam	Dr. Ajoy Mallick	VI	36	DSE IV

## **Repeat of Practical in 2021-22 those introduced in 2020-21 (DBT STAR COLLEGE SCHEME)**

<b>Date</b>	<b>Topic/Subject</b>	<b>Resource Person</b>	<b>Semester involved</b>	<b>Number of beneficiary</b>	<b>Topic under CBCS courses</b>
<b>18.11.21; 16.12.21</b>	<b>PCR</b>	Dr. Subham Mookerjee Dr. Suvajit Maity Priyobrata Sinha	V	<b>36</b>	CC XI
<b>17.11.21; 15.12.21</b>	<b>DNA isolation</b>	Priyobrata Sinha & Dr. Subham Mookerjee	V	<b>36</b>	CC XI
<b>19.11.21; 17.12.21</b>	<b>Media preparation for microbiology study</b>	Priyobrata Sinha & Dr. Subham Mookerjee	V	<b>36</b>	CC XI
<b>23.11.21; 24.11.21</b>	<b>Use of Spectro-Photometer for biochemical &amp; molecular study</b>	Dr. Subham Mookerjee Dr. Suvajit Maity, Dr. Tanmoy Paul	III, V	<b>76</b>	CC VII, XI
<b>25.11.21; 20.12.21</b>	<b>Use of Horizontal Gel Electrophoresis</b>	Dr. Ajoy Mallick, Dr. Subham Mookerjee Dr. Suvajit Maity	III	<b>41</b>	CC VII
<b>13.12.21</b>	<b>Gel filtration chromatography</b>	Dr. Suvajit Maity, Dr. Arunava Mukherjee	III	<b>41</b>	CC VII
<b>10.12.21</b>	<b>Estimation of SGPT &amp; SGOT</b>	Dr. Suvajit Maity; Priyobrata Sinha, Dr. Arunava Mukherjee	III	<b>41</b>	CC VII

# METHODOLOGY OF ENVIRONMENTAL WATER SAMPLING

SELECTION OF SAMPLING SITES  
(RIVER, LARGE WATER  
BODIES, SOIL, RIVER SIDE MUD FLATS)

COLLECTION OF SAMPLES  
DEPENDING ON THE LUNAR  
CYCLE & TIDES

STATIONARY SAMPLING,  
TRANSECT SAMPLING,  
FRACTIONATION SAMPLING

COLLECTION OF SUB  
SAMPLES,  
POOLING OF SAMPLES,  
STORING OF SAMPLES IN  
ICE OR 4o C

SAMPLES READY FOR  
ANALYSIS EITHER IN THE  
FIELD (PHYSICO-CHEMICAL)  
AND IN LABORATORY  
(BIOLOGICAL)

## BACTERIAL LOAD DETECTION OF ENVIRONMENTAL SAMPLES.

SAMPLES ARE  
CULTURED ON THE  
BACTERIAL MEDIA  
PLATES

BY SPREAD PLATE  
TECHNIQUE &  
INCUBATED AT 37°C IN  
INCUBATOR

COUNTING OF  
BACTERIAL COLONY IN  
THE DIFFERENT MEDIA  
PLATES BY COLONY  
COUNTER/ OR  
MANUALLY

SAMPLES WITH  
HIGH BACTERIAL  
LOAD

SPREAD PLATE CULTURE  
DONE AFTER SERIAL  
DILUTION

COUNTING AND  
CALCULATION TAKING  
THE DILUTION INTO  
ACCOUNT

SAMPLES WITH LOW  
BACTERIAL PLATE

SAMPLE  
CONCENTRATED AND  
PLATING DONE

COUNTING THE  
BACTERIAL COLONY  
TAKING THE  
CONCENTRATED  
SAMPLE UNDER  
CONSIDERATION

# BIOCHEMICAL IDENTIFICATION OF THE BACTERIA

BIOCHEMICAL IDENTIFICATION OF BACTERIAL SPECIES IS DONE BASED ON THEIR BIOCHEMICAL REACTIONS WITH CARBOHYDRATES AND OTHER MEDIA CONTENT

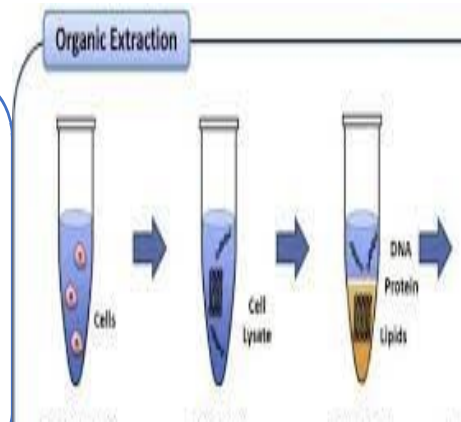


DIFFERENT BIOCHEMICAL REACTIONS OF VIBRIO CHOLERAEE

# MOLECULAR DETECTION OF THE BACTERIAL SPECIES USING THE KNOWLEDGE OF DNA ISOLATION, PCR AND HORIZONTAL GEL ELECTROPHORESIS.

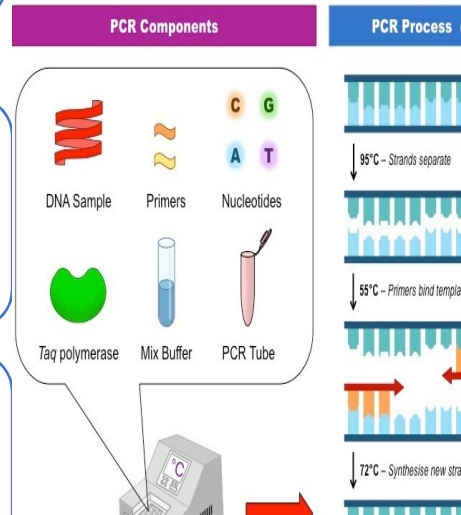
## BACTERIAL DNA ISOLATION

- LYSIS OF BACTERIAL CELL BY SDS AND PROTEINASE K
- PHENOL- CHLOROFORM- ISOAMYL ALCOHOL METHOD FOR SEPERATION OF DNA FROM CELLULAR DEBRIS
- SEPARATION BY CENTRIFUGATION
- CONCENTRATION AND PURIFICATION BY ETHANOL



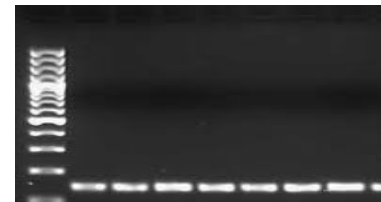
## PCR

- PCR MIXTURE IS PREPARED.
- SPECIES SPECIFIC PRIMERS ARE ADDED
- TEMPLATE DNA IS ADDED
- THERMAL CYCLING PERFORMED



## HORIZONTAL GEL ELECTROPHORESIS

- AGAROSE GEL IS PREPARED.
- PCR PRODUCT IS LOADED IN THE AGAROSE GEL
- ELECTROPHORESIS IS CONDUCTED
- DNA BANDS ARE ANALYSED UNDER UV LIGHT.



# STUDY THE ENZYMATIC ACTIVITY OF LIPASE

## Working Principle -

The pancreatic lipase in presence of colipase and calcium ions hydrolyses the substrate (Glycerol ester). The sequence of reactions involved in the enzymatic direct lipase determination is the following: -

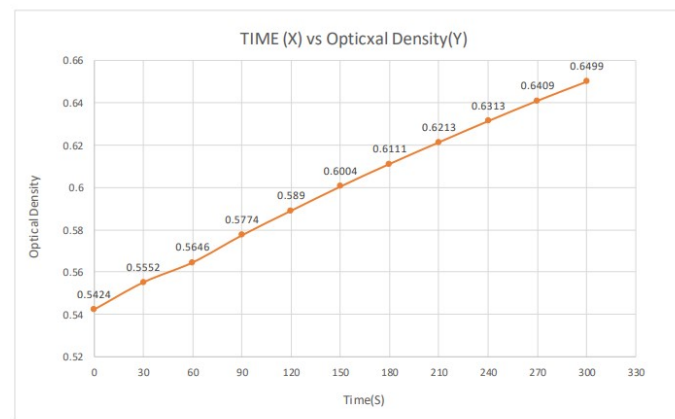
1-2-O-diauryl-rac-glycerol-3-glutaric (6'-methylresorufin)-ester (Unstable)

1-2-O-diauryl-rac-glycerol + 3-glutaric (6'-methylresorufin)-ester (Unstable)

Glutaric acid + Methylresorufin

- The rate of methylresorufin formation measured photometrically is proportional to the catalytic concentration of lipase present in the sample.

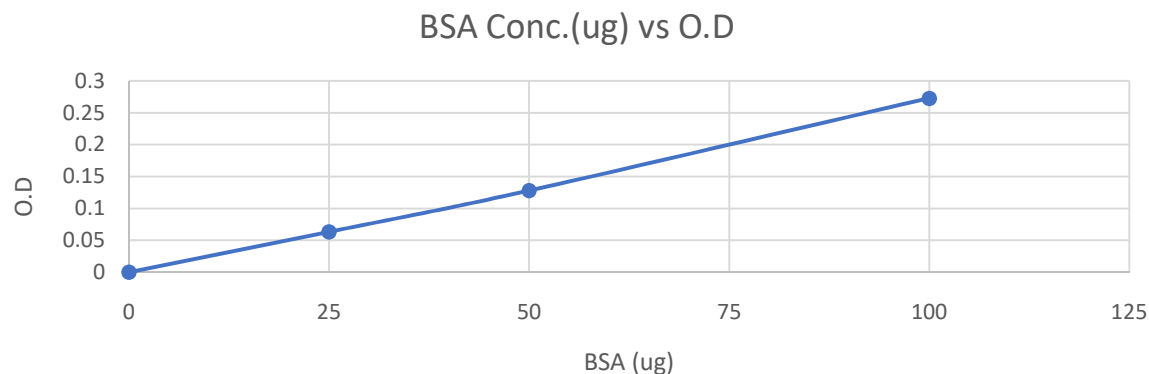
Time (Second)	Optical Density
0	0.5424
30	0.5552
60	0.5646
90	0.5774
120	0.589
150	0.6004
180	0.6111
210	0.6213
240	0.6313
270	0.6409
300	0.6499



## Estimation of Total Protein in Given Solution (Human Serum/Hemolysate) by Lowry's Method

### Working Principle -

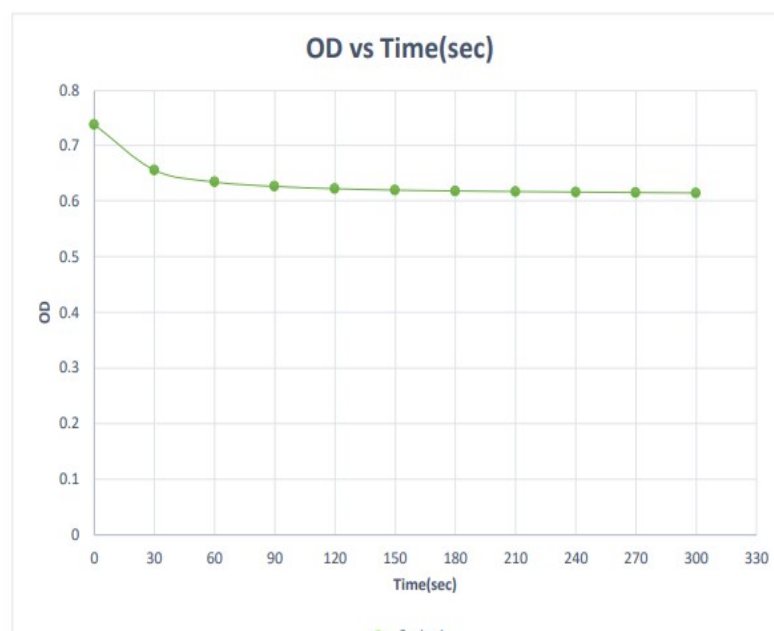
The phenolic group of tyrosine to tryptophan residues in a protein will produce a blue purple colour complex with max. absorption in the region of 660 nm wavelength with Folin-ciocalteu reagent which consist of sodium tungstate molybdate to phosphate. Thus, the intensity of colour depends on the amount of these aromatic amino acids present and will thus vary for different proteins. Most protein estimation technique use BSA (Bovum Serum Albumin) universally as a standard protein because of its low cost. The method is sensitive down to about to 10 ug /ml & is probably the most widely used protein assay despite its only being a relative method, subject to interference from Tris buffer, EDTA, non-ionic and ionic detergents, lipids, carbohydrates & some salts. The incubation time is very critical for a reproducible assay; The reaction is also dependent on pH and a working range of pH 9-10.5 is essential.



## Detection of SGOT (Aspartate transaminase) in serum

- **Working Principle -**
- SGOT catalyses the transfer of amino acids between L-aspartate & alpha – Ketoglutarate to form Oxaloacetate & Glutamate. The Oxaloacetate formed reacts with NADH in presence of Malate dehydrogenase to form NAD. The rate of oxidation of NADH of oxidation of NADH to measured as a decrease in absorbance which is proportional to the SGOT or aspartate transaminase activity in the sample.

Time(sec)	O.D
0	0.7373
30	0.6543
60	0.634
90	0.6262
120	0.622
150	0.6195
180	0.618
210	0.6169
240	0.616
270	0.6151
300	0.6144

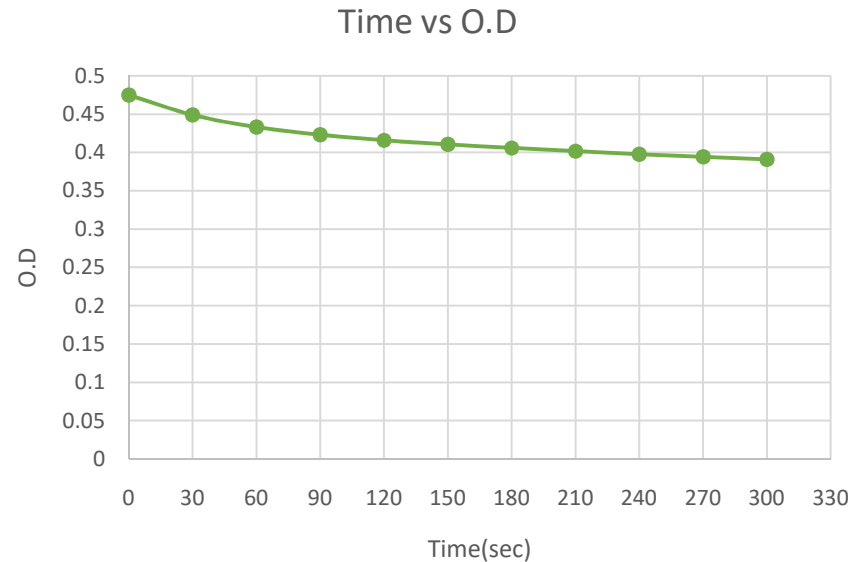


## Detection of SGPT in serum (Alanine transaminase)

### Working Principle –

SGPT catalyses the transfer of amino group between L-alanine &  $\alpha$ -ketoglutarate to form Pyruvate & L-Glutamate. The Pyruvate formed reacts with NADH in the presence of Lactate dehydrogenase to form  $\text{NAD}^+$ . The rate of oxidation of NADH to  $\text{NAD}^+$  is measured as a decrease in absorbance which is proportional to the SGPT activity in the sample.

Time(sec)	O.D
0	0.4749
30	0.449
60	0.4331
90	0.4231
120	0.4159
150	0.4105
180	0.4059
210	0.4017
240	0.3978
270	0.3943
300	0.391



# STUDY OF DEVELOPMENTAL STAGES OF CHICK EMBRYO FROM FERTILIZED EGG (Inter Departmental event)



## Participating Semesters

Semester VI Zoology (H)

Semester IV Botany (H)

Semester II Physics (H) and  
Chemistry (H)



**FERTILIZED EGG AT 24 HRS  
OF INCUBATION IS PLACED  
INSIDE THE INCUBATOR AT  
37°C FOR 6 DAYS**

**THEY EXTRACTED CHICK EMBRYO AT 7  
DAYS  
INCUBATION FOR STUDYING THE  
IMPORTANT FEATURES AND  
DEVELOPING STRUCTURES**

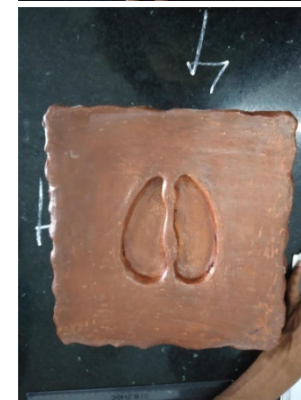
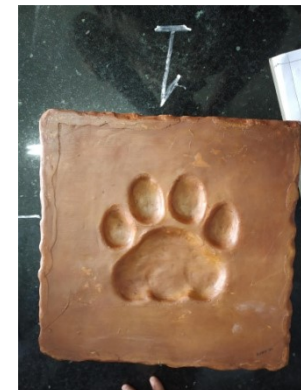
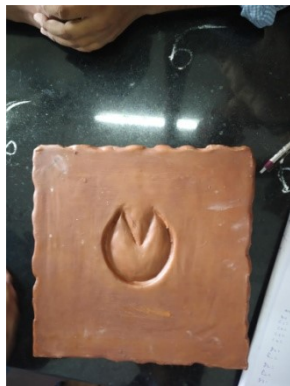


# **TRAINING WORKSHOP FOR STUDENTS HAEMATOLOGY & HISTOPATHOLOGY LABORATORY TECHNOLOGY**

- **Supervisor:** Dr. Debkumar Datta , Dr. Pannalal Das, Dr. Tanmoy Paul
- **In collaboration with:** THEISM CEEMEC PVT. LTD.
- **Semester involved:** IV and VI (60 students)
- **Erythrocyte Disorder with Its Laboratory Diagnosis:**
  - Anemia - Definition with Classification, Morphologic- Microcytic, Hypochromic, Macrocytic Anemia, Iron Deficiency Anemia, Hemolytic Anemia, Aplastic Anemia, Pernicious Anemia, Sideroblastic Anemia, Anemia of Chronic Renal Insufficiency, Hereditary Spherocytosis, Hereditary Elliptocytosis, Sickle Cell anemia, Hemolytic Disease of The Newborn.
- **Leukocyte Disorders with Its Laboratory Diagnosis**
  - Leukemia – Definition with Classification
- **Abnormal Haemoglobin and Related Disorders**
  - Thalassemia
- **Diagnostic Cytopathology Specimen Collection and Preparations**
  - Introduction, Cytological preparation, Cytological fixatives, Specimen preparation, Special techniques
- **Medical Histopathology**
  - Processing of histology tissue for paraffin embedding,
  - Study of microtome and sharpening of the microtome knife,
  - Section cutting of paraffin wax embedding tissue and to fix the sections of the slides,
  - Staining of tissue section by using haematoxylin and eosin staining method,
  - Staining of cells by using papanicolaou staining method,
  - Staining of tissue using crystal violet staining,
  - Gram's stain of Paraffin sections,
  - AFB (ZN) stain of Paraffin sections,

# **New practical introduced in Wildlife & Conservation Biology: Pug mark analysis of Carnivores and Herbivores**

- **Semester:** VI
- **Paper :** DSE III
- **Teacher:** Dr. Arunava Mukherjee
- **Objectives:** development of ideas & skills about indirect evidences of wildlife



# Minor Project Work of Students

**Title: Evolution of Snake Venom Metalloproteinase (SVMP) in the context of Atrajin from *Naja atra***

- **Submitted By:-** Sukriti Maity, UG | Semester-V
- **Supervisor:** Dr. Ajoy Mallick
- **Outcomes:**
  - The Disulfide bonds resemble a “Molecular Stitching” pattern in SVMPs
  - ASR studies show Green Sea Turtle as the most common ancestor for SVMPs in snakes
  - Elapid snakes acquired the SVMPs, then got transferred into Viperids
  - King cobra can be an important link for venom correlation and evolution studies between Vipers and Elapids
  - Structural analysis shows close resemblance except the King cobra protein
  - There is no significant correlation between Mitochondrial gene cytB diversity and SVMP venom evolution

# Minor Project Work of Students

- **Title:** Phylogenetic study of different snake species with respect to their geographic variation by using mitochondrial gene cyt-b and finding the anomalous origin by using multiple sequence
- **Submitted By:** - Dhruva Datta, UG | Semester-V |
- **Supervisor:** Dr. Ajoy Mallick
- **Outcomes:**
  - In the same region all the species may not stay in monophyletic or paraphyletic group and the vice versa different region's same species may occupy monophyletic position.
  - The same region's species occupy monophyletic group but also others show similar category which interpret about their common ancestry and previous relation among them from which they became diverge.

# Minor Project Work of Students

- **Title:** Is nucleotide diversity in mitochondrial gene as an early diagnostic of snake's conservation status?
- **Submitted By:-** Arghya Acharyy, UG | Semester-V |
- **Supervisor:** Dr. Ajoy Mallick
- **Outcomes:**
  - It has been observed that there are no significant relationships between the nucleotide diversity in mitochondrial gene and snake's conservation status.
  - According to IUCN red list, the world's largest venomous snake, the King Cobra (*Ophiophagus hannah*), is listed as vulnerable.
  - King Cobra have very less amount of neurotoxic venom PLA 2 than all other snakes of Elapidae family. King Cobra also have a decent amount of hemotoxic venom SVMP whereas other snakes of Elapidae family have very low amount of SVMP. The SVMP structure comparison revealed that the SVMP of King cobra is of primitive type as compared to the others.

# Minor Project Work of Students

- **Title:** Annotations and Analysis of Whole Mitochondrial Genome of Snake Species of India
- **Submitted By:-** Titas Koley, UG | Semester-V |
- **Supervisor:** Dr. Ajoy Mallick
- **Outcomes:**
  - Based on the phylogenetic relationships among the tested snakes and the comparisons of their gene organizations, we estimated the processes of evolutionary events occurred in snake mitochondrial genomes.
  - The above study shows that the rates of snake mitochondrial genome evolution incorporate broad temporal (Branch specific and depend on Family of snake species) and spatial (gene and gene-region specific) dynamics.
  - In phylogenetic tree of cyt b families Viperidae and Colubridae possess a common ancestor. But in case of cox 1 families Elapidae and Colubridae are closely related and possess a common ancestor.
  - It shows that the evolutionary pattern depends on specific gene region changes.
  - Though *Sinomicrurus maccllellandi* belongs to family Elapidae, it is outgrouped and distantly related with other species of family Elapidae but is closely related with the most common ancestor.

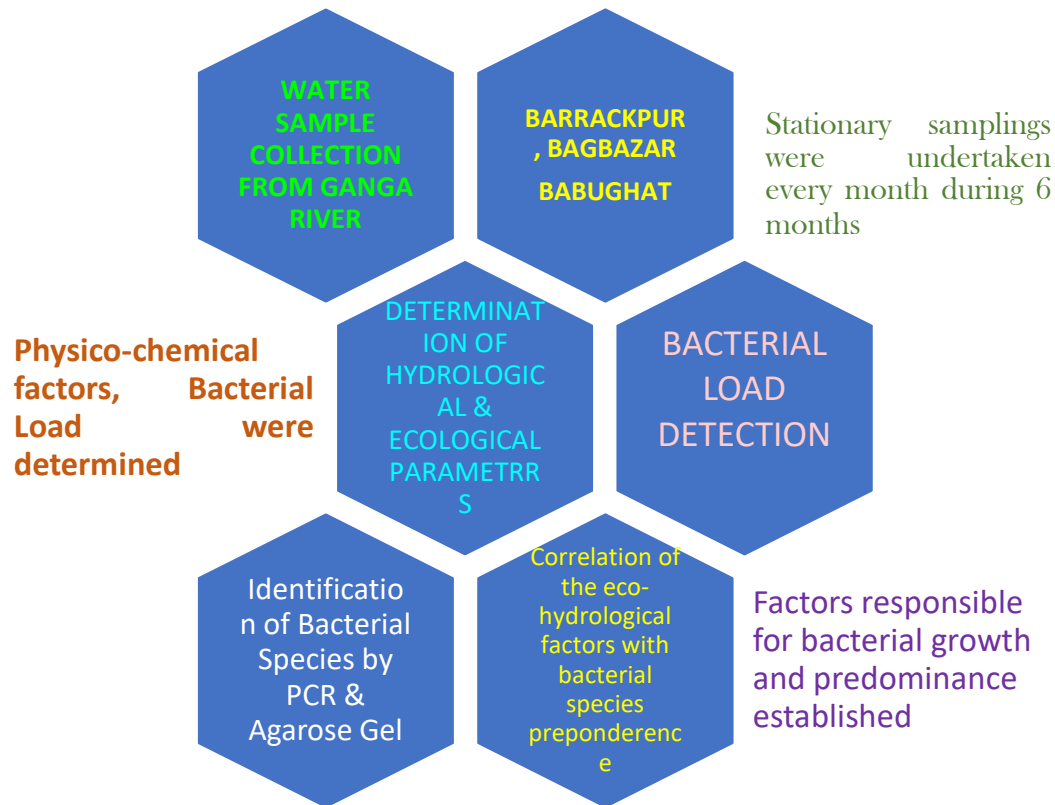
# Minor Project Work of Students

- A Study to find the evolutionary trend of snake species present in Indian subcontinent in respect of Mitochondrial Genes, Cytochrome B and COX1
- **Submitted By:** - Anomitra Neogy, UG | Semester-V
- **Supervisor:** Dr. Ajoy Mallick
- **Outcomes:**
  - It is observed that, many paraphyletic groups are emerging from the same ancestor. As, the species differ from each other by their geographical distribution and habitat.
  - The venomicity of the snakes doesn't depends on the mitochondrial genes.
  - It is observed from the phylogenetic tree that many venomous species emerged from a non- venomous or mildly venomous ancestor. So, the venomicity comes as evolution occurs within the species from time to time.

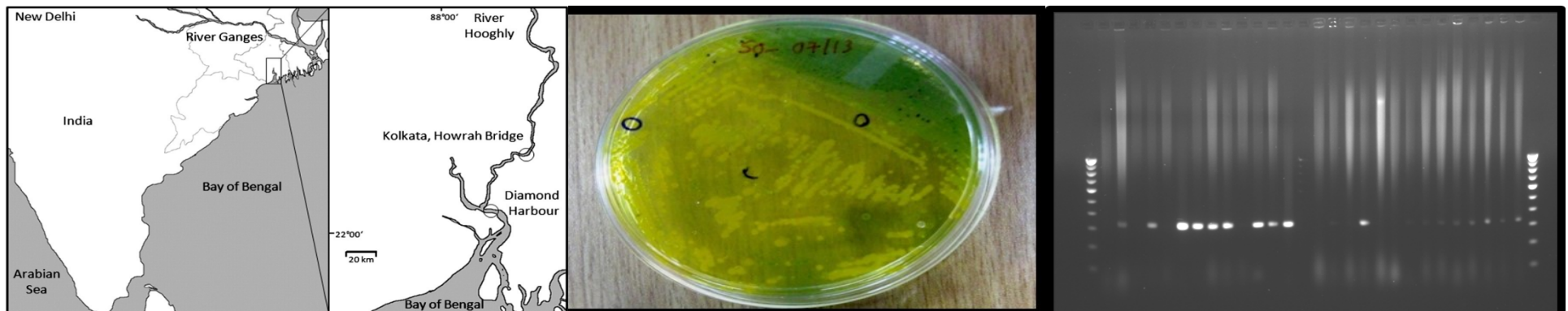
# Minor Project Work of Students

- **Title:** Comparison between the Cox1 and Cytb Gene Data of the Common Snake Species Found in India.
- **Submitted By:-** Shashwata Roy, UG | Semester-V
- **Supervisor:** Dr. Ajoy Mallick
- **Outcomes:**
  - It has been observed that there is more diversity in the cox 1 phylogeny as compared to the cytb gene.
  - Species like, Naja naja, Naja kaiuthia, Elaphe taeniura, Ptyas mucosa, Australotaenia bunthangi are the monophyletic group based on both the cytb and cox1 gene.

# ENVIRONMENTAL MONITORING OF DIARRHEAGENIC BACTERIAL SPECIES IN LOWER SOUTH BENGAL

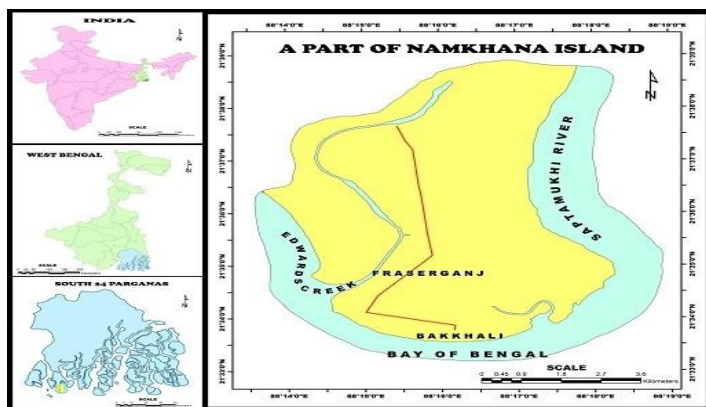


- A salinity dependant zone demarcation exists a “sweet water” or “no saline” zone, a “medium saline” zone.
- Inflow of water during high tide is a major factor which helps to disseminate diarrhoea pathogens from its estuarine origin to inland riverine settings.
- Two different pools of *pathogens* exists at the aquatic environment with distinct circulation pattern in the riverine hydrosphere:
- One pool as a part of the autochthonous pathogen pool, where they originate from an avirulent progenitor and swept inland into the riverine aquatic milieu via tidal and wind pressure.
- Another pool of pathogens is swept into the river through untreated sewage disposal and flood water from adjoining metropolis carrying in organic debris with bacterial community.
- 4 students of Semester VI were involved



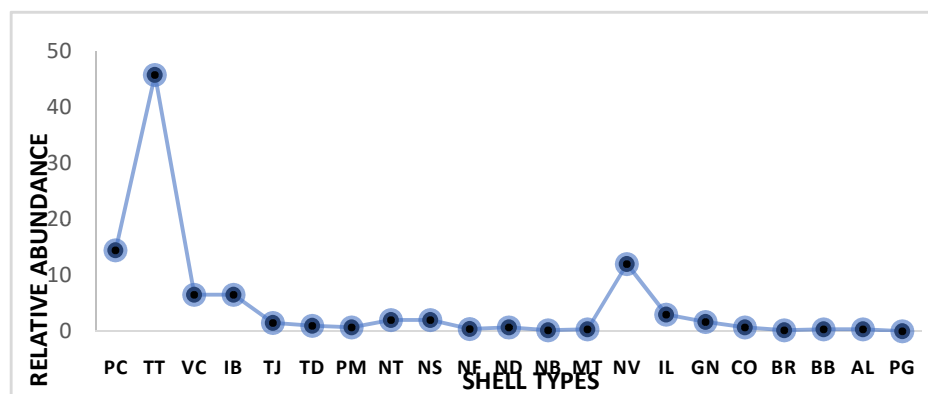
# Minor Project Work of Students

- **Title:** Gastropod Shell use by Sympatric Species of Hermit Crabs from the Intertidal Zone of Indian Sundarbans
- **Semester involved:** DSE II (Animal behavior), Semester V (8 students involved)
- **Supervisor:** Samir Sardar
- The assemblage of different crab species in the shore line ecotone region are potential indicators for maintaining structural and functional integrity of the ecosystem. The hermit crabs among the different crab species of this habitat is notable for understanding the intrinsic relationship of the crab dependence on gastropod shells which is important to explain the shell use pattern in nature. The notable shell use pattern of anomuran hermit crabs from the natural habitat of intertidal coastal regions of Sundarban Biosphere Reserve, South 24 Parganas, West Bengal, India may have a preference for shell choice or the selection pattern may be site specific or species specific which is the prime objective of this study. Random sampling of specimens was done from the intertidal zone of extended mud flats of Bakkhali and Frazerganj for a year that showed greater availability of one type of gastropod shell *Telescopium telescopium* relative to other types of shells like *Cerithidea(C.) cingulate*, *Natica vitellus*, *Thais blanfordi* etc. Twenty one different types of gastropod shells were chosen by two sympatric species of hermit crabs as their microhabitat. *Clibnarius infraspinus* and *Clibnarius padavensis* are two species of hermit crabs among which later shows greater affinity for *Telescopium* shells. The statistical analysis showed that the crab weight and shell weight are positively correlated at a significant level ( $p < 0.01$ ). Microhabitat selection preference of hermit crabs depends on various factors like- spatial distribution and availability of resources, durability of the shells, inner columellar space, coiling of shells and association of epibiotic covering of the shells (scallops and barnacles).

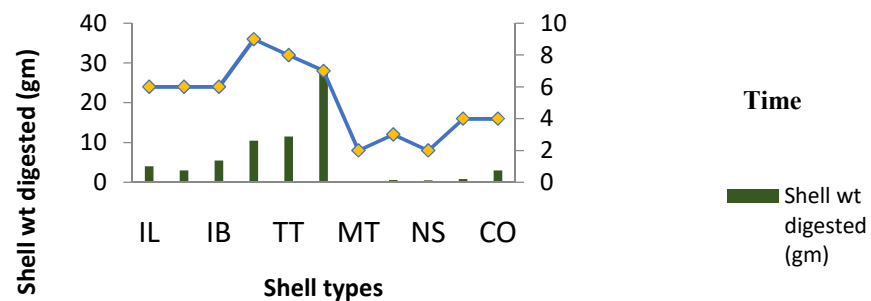


Shell characters	F value	Significance
Shell length	25.893	p<0.01
Shell weight	17.535	p<0.01
Shell aperture length	87.379	p<0.01
Shell aperture breadth	57.264	p<0.01

Male	TCL	CAL	SL	SW	SAL	SAB
TCL	1	0.826**	0.717**	0.634**	0.739**	0.607**
CAL		1	0.795**	0.716**	0.471**	0.577**
SL			1	0.819**	0.489**	0.615**
SW				1	0.462**	0.596**
SAL					1	0.611**
SAB						1



Acid digestion of different chosen gastropod shells



# Interdepartmental Workshop for students

## How to write a Review- through Computational approach

Resource Person:

**Dr. Ajoy Mallik**

(Assistant Professor,  
Department of  
Zoology, RKMVCC)

Semester involved:


**I, III, V**

Departments:

**Zoology, Botany &  
Microbiology**

Dates:

**9<sup>th</sup> May to 28<sup>th</sup> May, 2021**



Interdepartmental Workshop  
on

## HOW TO WRITE A REVIEW : THROUGH COMPUTATIONAL APPROACH

Organised by  
Department of Zoology  
DBT STAR College Scheme  
Ramakrishna Mission Vivekananda Centenary College, Rahatgarh

Resource person: Dr. Ajoy Mallik, Asst. Professor, Department of Zoology, Ramakrishna Mission Vivekananda Centenary College, Rahatgarh

🚩 **Target areas of the workshop:**

- How to search literature in a systematic manner
- Identification of important journals, organisations and researchers
- Basic idea about impact factor and citation indices
- Identification of trending topics in a particular research area
- Thematic evolution of different areas
- Guidelines for writing a review paper

🚩 **Schedule:**

- 4 weeks programme
- 8 online live sessions: 1 hour each, 8:00 PM-9:00 PM
- Dates: 09/5/2021, 11/5/2021, 14/5/2021, 16/5/2021, 18/5/2021, 20/5/2021, 22/5/2021, 24/5/2021, 26/5/2021, 28/5/2021

🚩 **Instructions:**

- Students of our college from the Departments of Botany, Microbiology and Zoology can register themselves for the workshop through the link provided below.

# Inter departmental workshop on Review paper writing: processes and prospects for future research

Resource Person:

**Dr. Ajoy Mallik**

(Assistant Professor,  
Department of  
Zoology, RKMVCC)

Semester involved:


**I, III, V**

Departments:

**Physics, Chemistry,  
Mathematics &  
Computer Science**

Dates:

**20<sup>th</sup> September to 5<sup>th</sup>  
October , 2021**



Interdepartmental Workshop  
on  
**REVIEW PAPER WRITING  
: PROCESSES & PROSPECTS IN  
FUTURE RESEARCH**

Organised by  
Department of Zoology  
DBT STAR College Scheme  
Ramakrishna Mission Vivekananda Centenary College, Rahbari

Resource person: Dr. Ajoy Mallik, Asst. Professor, Department of  
Ramakrishna Mission Vivekananda Centenary College, Rahbari

🚩 **Target areas of the workshop:**

- How to search literature in a systematic manner
- Identification of important journals, organisations and research
- Basic idea about impact factor and citation indices
- Identification of trending topics in a particular research area
- Thematic evolution study of research areas
- Guidelines for writing a review paper

🚩 **Schedule:**

- 3 weeks programme
- 10 online live sessions: 1 hour each, 8:00 PM-9:30 PM
- Dates: 20/9/2021, 21/9/2021, 23/9/2021, 25/9/2021, 26/9/2021, 01/10/2021, 03/10/2021, 04/10/2021, 05/10/2021

🚩 **Instructions:**

- Students of our college from the Departments of Physics, Chemistry, Mathematics & Computer Science

# **Interdisciplinary workshop on The Art of Science Communication**

<b>12<sup>th</sup> February 2022</b>	<b>One Day workshop under DBT STAR College Scheme on “The Art of Science Communication”  Organised by Dept. of Zoology, RKMVCC, Raha ra</b>	<b>Dr. Manas Pratim Das,</b> Programme Executive, All India Radio, Kolkata
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## **Objectives**

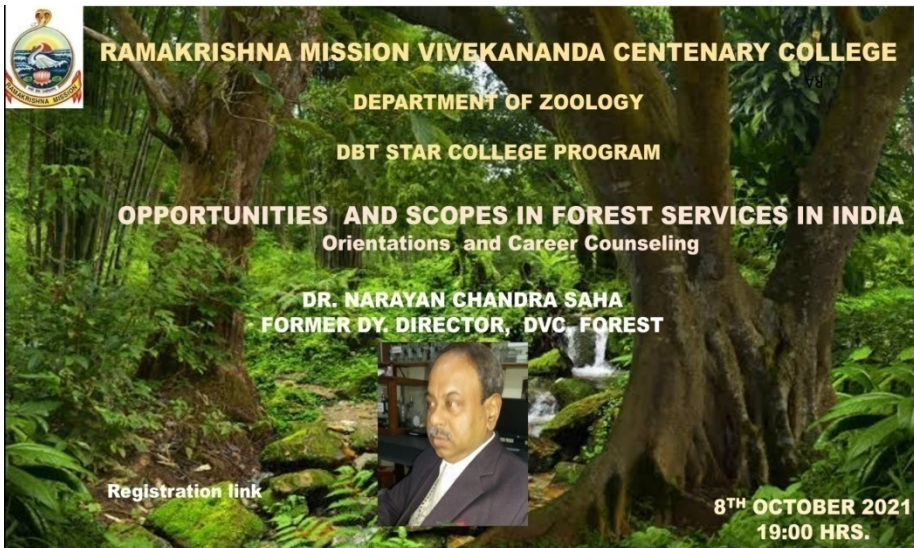
- **Development of Science writing skills**
- **Prospects in Science Journalism**

**Number of participants: 120**

**Semester: II, IV, VI**

# Online workshop on preparation of Indian Forest Services and allied services


- **Dates:** 08.10.2021 & 16.11.2021
- **Semester:** I, III, V (All Departments)
- **Number of students :** 100
- **Resource Person:** Dr. N.C. Saha (former Dy. Director DVC Forest; Mr. Chandan Paul (Director, Education)
- **Objectives:** basic knowledge development for preparation and scopes in IFS and other allied services



**RAMAKRISHNA MISSION VIVEKANANDA CENTENARY COLLEGE**  
DEPARTMENT OF ZOOLOGY  
DBT STAR COLLEGE PROGRAM

**OPPORTUNITIES AND SCOPES IN FOREST SERVICES IN INDIA**  
Orientations and Career Counseling

**DR. NARAYAN CHANDRA SAHA**  
FORMER DY. DIRECTOR, DVC, FOREST



Registration link

**8<sup>TH</sup> OCTOBER 2021**  
**19:00 HRS.**



**RAMAKRISHNA MISSION VIVEKANANDA CENTENARY COLLEGE**  
DEPARTMENT OF ZOOLOGY  
DBT STAR COLLEGE PROGRAM

**PREPARATION FOR APPEARING IN FOREST SERVICES AND ALLIED EXAMINATION IN INDIA: Orientations and Career Counseling**

**DR. NARAYAN CHANDRA SAHA**  
FORMER DY. DIRECTOR, DVC, FOREST  
And  
**MR. CHANDAN PAUL**  
FOUNDER & SECRETARY  
ARISE EDUCATION

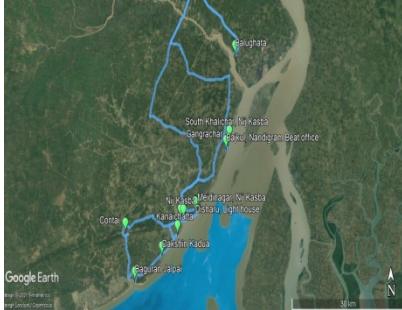


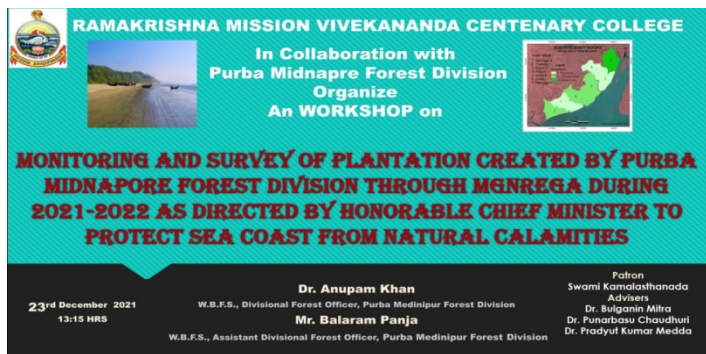
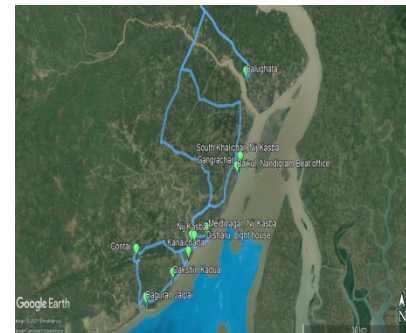
Patron  
Swami Kamalasthanada  
DBT Coordinator  
Swami Vedanuragananda  
Departmental Coordinator  
Dr. Arunava Mukherjee

Convener  
Dr. Subhajit Maity  
Joint Convener  
Dr. Ajoy Mallick  
Dr. Subham Mookerjee

**16<sup>TH</sup> NOVEMBER 2021**  
**20:15 HRS.**

# Workshop & field Training on Monitoring and Survey of Plantation in Mangrove Forest of Purba Midnapur District of West Bengal

- **Date:** November, December, 2021 & February and March, 2022
  - **Semester:** IV & VI
  - **Number of beneficiary (online):** 79
  - **Field training (offline):** 15
  - **Resource Persons:** Dr. Anupam Khan (DFO, W.B.F.S); Mr. Balaram Panja (ADFO, WBFS); Dr. Bulganin Mitra
  - **Objectives:** Identification and survey of mangrove flora; estimation of density of mangroves; understanding impacts of abiotic & biotic factors on plantation programme
- 





Location	Type	Area	Remarks of Survey
Gangrachar	Mangrove	5 Ha	Fishbone pattern has adopted, as the area don't have regular tidal flow specially during winters. Mangroves planted here are already established. <i>Avicinia marina</i> , <i>Avicinia officinalis</i> , <i>Bruguiera gymnorhiza</i> , <i>Aegiceras coriculatum</i> , <i>Rhizophora apiculata</i> , <i>Acanthus ilicifolius</i> etc. Mangrove plantation has already been made in different tidal zones of this region and restoration good.
Nijkasba	Vegetative barriers	30 KM	<i>Pandanus</i> sp., <i>Ipomea biloba</i> , <i>Vitex negundo</i> , <i>Saccharum</i> sp. ( Wild), <i>Chrysopogon zizanioides</i> and cacti and succulents have been planted here as Vegetative Barrier to minimize the effect of tidal and wind erosion.
Nijkasba	CSB	10 Ha	The land of plantation has been reclaimed from anthropogenic invasions. A very successful plantation with mostly <i>Casuarina</i> sp., <i>Acacia auriculiformis</i> and <i>Ipomea biloba</i> has been planted as soil binder ground vegetation
Meldinagar	Nursery	20 Ha	<i>Avicennia marina</i> , <i>Avicennia officinalis</i> , <i>Bruguiera gymnorhiza</i> , have been planted. But high anthropogenic activities were noticed, which is ultimately affecting the survival percentage.
	Mangrove		
Southkalicher	Mangrove GAP	25 Ha	A successful Mangrove plantation predominantly with <i>Bruguiera gymnorhiza</i> was created earlier, which proved to be savior during recent cyclones, hence got damaged, and they are being gap filled with <i>Avicennia marina</i> , <i>Avicennia officinalis</i> , <i>Bruguiera gymnorhiza</i> , <i>Aegiceras coriculatum</i> , <i>Acanthus ilicifolius</i> . Mangrove Biodiversity will definitely be augmented with this attempt



# Workshop on Sampling, Isolation, Preservation and Identification of Soil Microarthropods

- **Date:** 21.12.2021
- **Semester:** II, IV & VI (Zoology)
- **Number of Students:** 64
- **Resource Person:** Dr. Gurupada Mondal, Scientist E, Zoological Survey of India
- **Objectives:** 1. Skill development regarding sampling, isolation and preservation of soil microarthropods, 2. Understanding the ecosystem services are provided by the organisms



 **RAMAKRISHNA MISSION VIVEKANANDA CENTENARY COLLEGE**  
**DEPARTMENT OF ZOOLOGY**  
**DBT STAR COLLEGE PROGRAM**  
**WORKSHOP ON SAMPLING, ISOLATION, PRESERVATION & IDENTIFICATION OF SOIL MICROARTHROPODS**

**DR. GURU PADA MANDAL**  
**SCIENTIST E ZOOLOGICAL SURVEY OF INDIA**

**21<sup>st</sup> December 2021**  
**13:15 Hrs**

**Convener**  
Mr. Samir Sardar

**Program Coordinator**  
Dr. Tuhin Chatterjee

**Patron**  
Swami Kamalasthanada  
**DBT Coordinators**  
Swami Vedanuragananda  
Dr. Arunava Mukherjee  
**Joint Conveners**  
Dr. Subham Mookerjee  
Dr. Suvajit Maity  
**Organizing Members**  
Dr. Pradyut Kumar Medda  
Dr. Deb Kumar Datta  
Dr. Bulganin Mitra  
Dr. Koutilya Bhattacharjee  
Dr. Ajoy Mallick

# Workshop on Arc GIS

- **Dates:**  
11.02.22, 12.02.22, 25.02.22, 26.02.22, 11.03.22, 12.03.22, 25.03.22, 26.03.22
- **Semester:** II, IV & VI
- **Number of beneficiary:** 55
- **Resource Person:** Dr. Tanoy Mukherjee, Research Associate, Zoological Survey of India
- **ESRI ArcGIS Pro –**
  1. Installation and library setup
  2. Vector and raster data download from DivaGIS and Bhuvan
  3. Basic operation of "Extract by Mask" and "Hillshade" tools
  4. Adding of legends and layers
- **Objectives:** skill development for future researches in fields of biodiversity, wildlife, conservation biology

# **Workshop on Uses of R software**

- **Dates:** 12.02.22, 09.04.22, 22.04.22, 23.04.22
- **Semester:** IV & VI
- **Number of beneficiary:** 40
- **Resource Person:** Dr. Tanoy Mukherjee, Research Associate, Zoological Survey of India
- **R Studio –**
  1. Installation and library setup, package installation
  2. Basic operation of "ggplot2" & "Rcmdr" packages
  3. 2D density map plotting, scatterplot and histogram by using "ggplot2"
- **Objectives:** development of analytical skills

# Special Workshop on Vermicompost Preparation and Sustainable Farming

- **Date:** 28.03.2022
- **Semester:** II, IV & VI (Zoology, Botany & Chemistry)
- **Number of Students:** 80
- **Resource Person:** Mr. Krishnapada Biswas (Biofarmer)
- **Objectives:** Alternative livelihood generation, Entrepreneurship development, Ecosystem sustainability



**RAMAKRISHNA MISSION VIVEKANANDA CENTENARY COLLEGE**

**DBT STAR COLLEGE PROGRAM**  
Organized by  
Department of Zoology  
in collaboration with  
Swami Vivekananda Centre for Multidisciplinary Research in Basic Sciences and Social Sciences

**AN WORKSHOP ON**  
**VERMICOMPOST PREPARATION AND SUSTAINABLE FARMING**

**Mr. Krishnapada Biswas**

**28<sup>TH</sup> MARCH 2022**  
**15:00 HRS**

**RKMVC College, Rahara**

**Patron**  
Swami Kamalasthanada

**DBT Coordinator**  
Swami Vedanuragananda  
Dr. Arunava Mukherjee

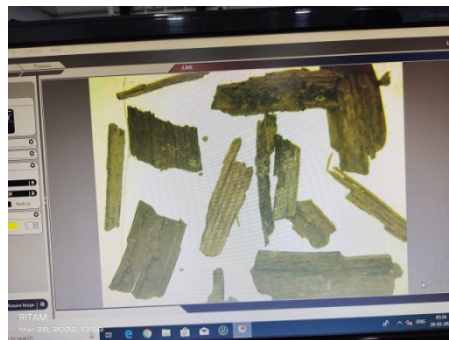
**Convenor**  
Mr. Samir Sardar

**Joint Convener**  
Dr. Tuhin Chatterjee  
Dr. Tanmoy Paul

**Members**  
Dr. Pradyot Medda,  
Dr. Deb Kumar Dutta, Dr.  
Subhajit Maity, Dr. Kautilya  
Bhattacharya, Dr. Subhajit  
Maity, Dr. Subham  
Mookerjee

# Special workshop on Tiger Scat analysis

- **Date:** 29.03.2022
- **Semester** II & VI (Zoology and Botany)
- **Number of beneficiary:** 40 students
- **Resource Person:** Dr. Arunava Mukherjee
- **Fresh scat** was collected from Bashirhat.
- **Objectives:** basic skill development on prey base analysis for big cat



# **Workshop for Faculty Development Role of Research Publication in NIRF ranking and Methodology for Computational and scientometrics review writing**

- **Workshop on** “Role of Research Publication in NIRF ranking and Methodology for Computational and scientometrics review writing”
- **Organised by:** Department of Zoology, DBT STAR College Scheme, Ramakrishna Mission Vivekananda Centenary College, Rahara
- **Resource person:** Dr. Ajoy Mallick
- **Duration:** 1 week

# Visit to The Zoological Survey of India

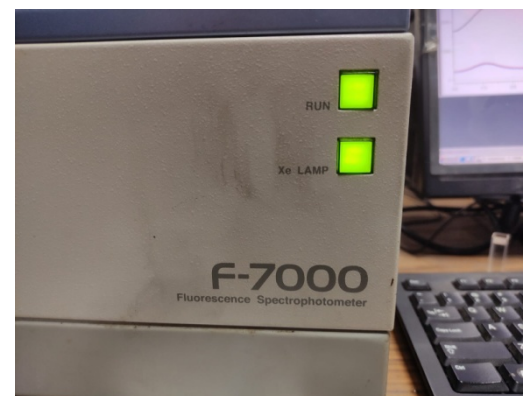
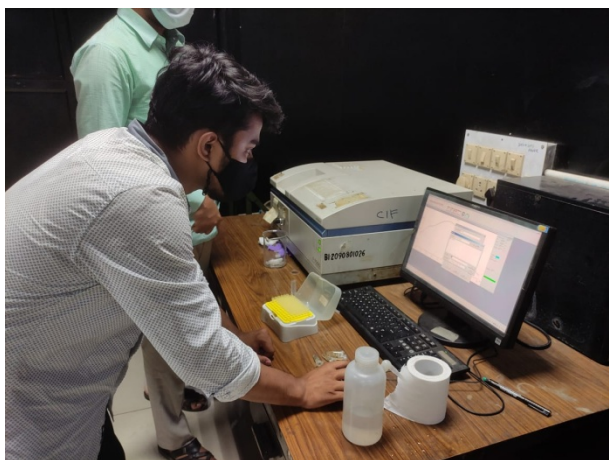
- **Date:** 21.02.2022
- **Semester II Zoology**, 27 students
- **Coordinator:** Dr. Arunava Mukherjee
- **Gallery visit** (Mammals, Birds, Mollusca, Hemiptera, Coleoptera, Lepidoptera, Orthoptera)
- **Objectives :** 1. Importance of Taxonomy & Molecular Taxonomy, 2. Specimen preservation techniques; 3. Taxidermy, 4. Museums development



## Visit to Institute of Eminence: Bose Institute, Kolkata

- **Date:** 22.03.22
- **Semester:** VI
- **Number of students:** 10
- **Mentor:** Dr. Subhajit Maity
- **Objectives:** development of knowledge regarding modern Instrumentations for biological research

**Instrumentations demonstrated:** Fluorescence Spectroscopy (hands on); Protein gel electrophoresis (hands on)



# Outreach program organised for school students and science teachers of schools

- **Date:** 23.03.2022
- **Number of Schools:** 5 (Sodepur Chandrachur school, Madhyamgram High School, Madhyamgram Girls' School, Bhabanath Girls' School, Taki Govt School for Boys)
- **Number of students:** 50 (10 from each school)
- **Grade:** XI / XII
- **Resource Persons:** Dr. Subham Mookerjee, Dr. Subhajit Maity, Dr. Arunava Mukherjee, Mr. Priyobrata Sinha
- **Topics:** 1. DNA isolation, 2. Tiger pug marks identification

**Objectives:** Hands on training, Knowledge sharing & Inspiring for Higher Education in Science



# **Outreach activities for Colleges & University**

## **(DBT STAR COLLEGE SCHEME)**

<b>Date</b>	<b>Topic</b>	<b>Resource person</b>	<b>Institution</b>	<b>Number of Participants</b>
<b>06.04.2021</b>	<b>Galapagos – a wild destination</b>	<b>Dr. Bulganin Mitra (Emeritus Professor of Zoology dep. of RKMVC Rahara)</b>	<b>Lady Brabourne College, Kolkata  (online)</b>	<b>61</b>
<b>11.02.2022</b>	<b>Ecuador: The land of Amazonian forest</b>	<b>Dr. Bulganin Mitra (Emeritus Professor of Zoology dep. of RKMVC Rahara)</b>	<b>Department of Environmental Science, University of Calcutta</b>	<b>41</b>
<b>22.02.2022</b>	<b>The Land of Anacondas, Hummingbirds and Iguanas</b>	<b>Dr. Bulganin Mitra (Emeritus Professor of Zoology dep. of RKMVC Rahara)</b>	<b>Department of Zoology, Bijoygarh Jyotish Roy College, Kolkata</b>	<b>78</b>
<b>28.02.2022</b>	<b>Destination to Wild</b>	<b>Dr. Bulganin Mitra (Emeritus Professor of Zoology dep. of RKMVC Rahara)</b>	<b>Contai Prabhat Kumar College</b>	<b>145</b>




## **Basiswar Sen Journal Club (B.S.J.C)**

- Inaugurated by Swami Vedanuragananda (DBT Coordinator) on 24<sup>th</sup> July, 2021
- Special talk on Wild to Wild Translocation: The Story of Conservation Tools – Dr. Kuladeep Roy (WWF-INDIA)
- Mentors: Dr.Arunava Mukherjee
- Objectives: sharing of information and knowledge among peers, discussions for future research planning

Topic of discussion	Dates	Semester involved
Feeding guilds of neighboring birds	24.07.21, 29.08.21	I, III& V
Bat's pathway	6.10.21, 5.12.21,	I, III & V
Migration of Locust	19.02.22	II, IV & VI

**RAMAKRISHNA MISSION VIVEKANANDA CENTENARY**  
DEPARTMENT OF ZOOLOGY  
**BASISWAR SEN JOURNAL CLUB (B.S.J.C.)**  
ORGANIZES  
A DBT STAR COLLEGE PROGRAMME



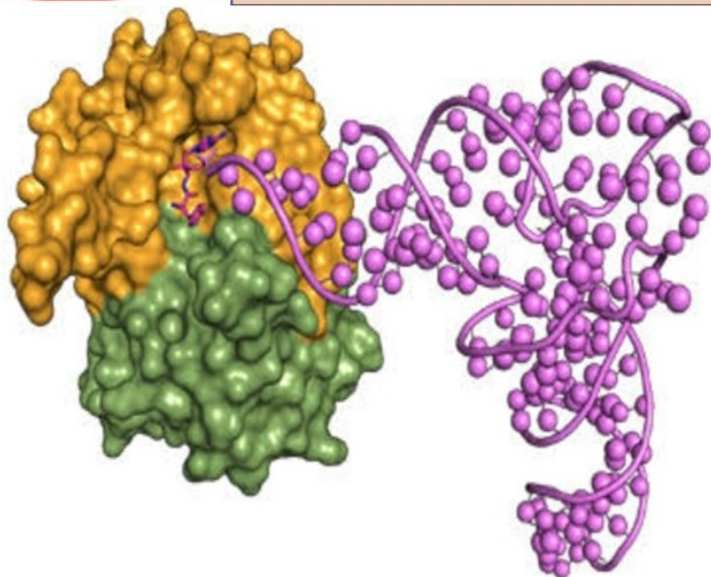
**WILD TO WILD TRANSLOCATION:  
THE STORY OF A CONSERVATION TOOL**

HONORABLE SPEAKER  
**DR. KULADEEP ROY**  
ASSISTANT MANAGER  
WWF-INDIA  
NORTH BENGAL STATE OFFICE

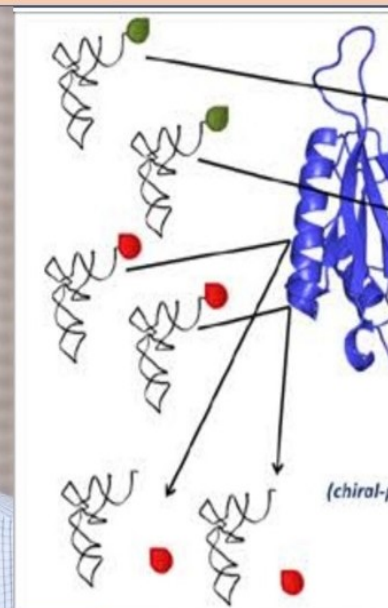
# Interdisciplinary webinar on Chiral Checkpoints during Protein Biosynthesis



**ONE DAY INTERDISCIPLINARY WEBINAR**  
Organised by  
**RAMAKRISHNA MISSION VIVEKANANDA CENTENARY COLLEGE**  
(Department of Zoology)  
Under  
**DBT STAR COLLEGE SCHEME**



**DR. RAJAN SANKARANARAYANAN**



# Science for All: How to do Cutting-Edge Research at Trifling Cost?

**RAMAKRISHNA MISSION VIVEKANANDA CENTENARY COLLEGE**

**DBT STAR COLLEGE PROGRAM**

**Organized by**

**Department of Zoology**

**Prof. Ra**

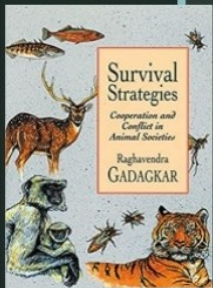
Centre  
India

**24**

**20**

Patron: S  
DBT Cool  
Vedanura  
Convenor  
Joint Con  
& Dr. Ajoy  
Members

**Science For All: How To Do Cutting-Edge Research At Trifling Cost?**



**Interdisciplinary Webinar on  
The story of how life could have originated on earth**



**RAMAKRISHNA MISSION VIVEKANANDA CENTENARY**

**DBT STAR COLLEGE PROGRAM**

**Organized by  
Department of Zoology**

**THE STORY OF HOW LIFE COULD HAVE ORIGINATED**

**Honorable Speaker**

**DR. SUDHA RAJAMANI**

**INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH (IISER)**

**26<sup>TH</sup> OCTOBER  
18:00 HRS**

**Interdisciplinary seminar on  
Chiron amino acids derived heterocycles and natural products: isolation,  
design, synthesis and biological activity**



**RAMAKRISHNA MISSION VIVEKANANDA CENTENARY**

**DBT STAR COLLEGE PROGRAM**

**Organized by  
Department of Zoology**

**CHIRON AMINO ACIDS DERIVED HETEROCYCLES AND NATURAL  
ISOLATION, DESIGN, SYNTHESIS AND BIOLOGICAL ACTI**



**Dr. Goutam Panda, CDRI**

**8<sup>TH</sup> MARCH 2022**

**16:00 HRS**

**Swami Vivekananda  
Auditorium, RKMVC College,  
Rahara**



# Earth Day 2021 Celebration

## Ways to back our home in equilibrium



DBT STAR COLLEGE  
Department of Zoology  
(Ramakrishna Mission Vivekananda  
Centenary College)  
Initiatives for  
EARTH DAY 2021



**Think &  
Innovate  
the  
PLANS**

**WAYS TO BACK OUR  
HOME IN  
EQUILIBRIUM**

**Present  
your Ideas  
to  
RESTORE**



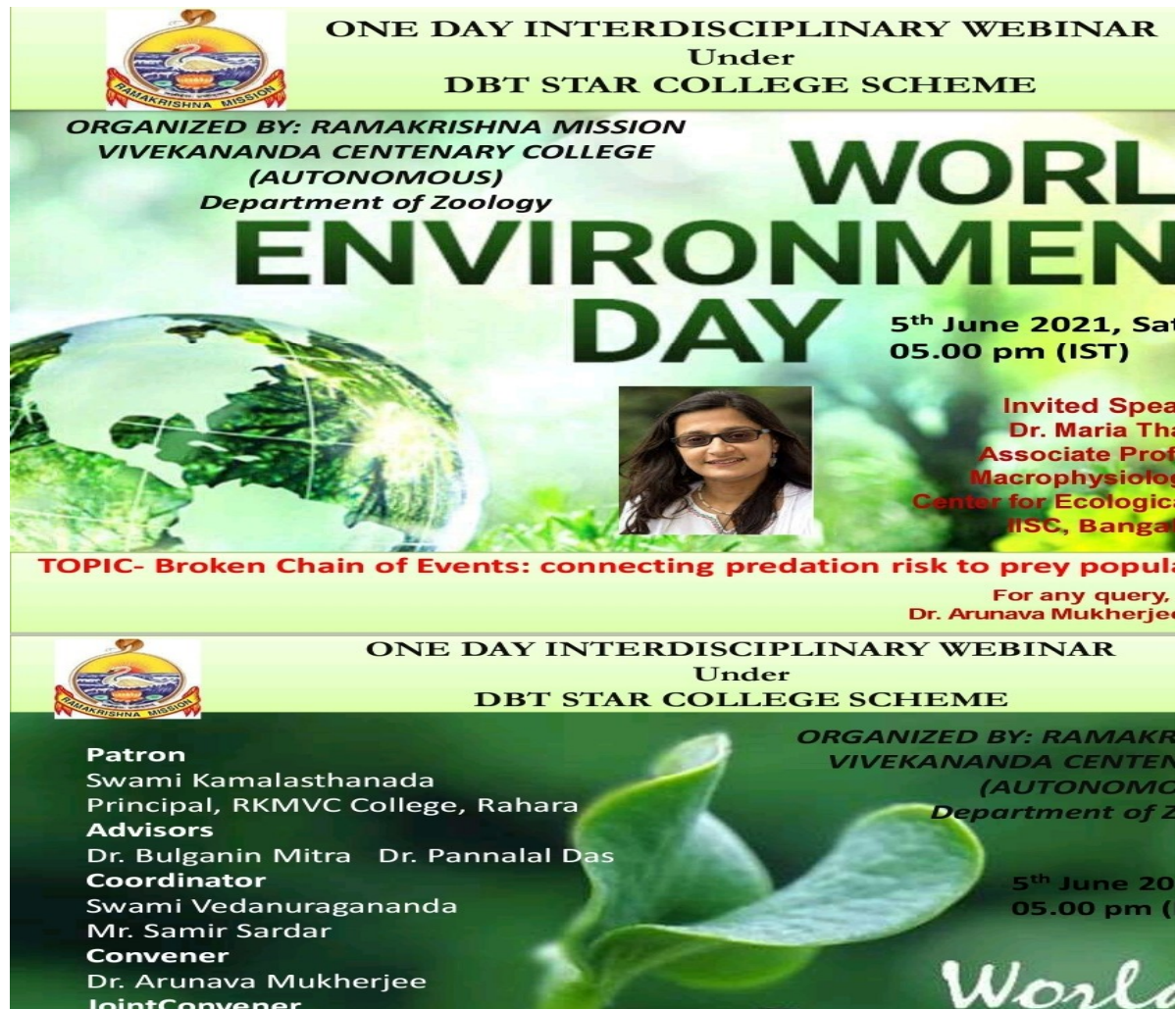
Date: 30<sup>th</sup> April 2021 Time: 19:45 Hrs  
Guest of Honour in Occasion: Dr. Surojit Das ( Bio-Medical  
Laboratory Science & Management, Vidyasagar University)  
Time for presentation & discussions of each group is 10 minutes  
(8+2). Each participant of any group should actively present the  
plans during their presentation  
Apply through:  
<https://surveyheart.com/form/6087f248b631526c2f5eeba6>



Ideas and  
Presentation by  
the 10 groups of  
UG students of  
Semester II &  
Semester IV

Rank	Group	Semester	Topic
1st	Sukriti Maity, Debapratim Pramanik	IV	Work, power & green energy
2nd	Arghya Acharya, Manas Saha, Animitra Neogy, Manas Mukherjee	IV	Restore our Earth
3rd	Anamitra Sen, Aakash Chatterjee, Mayukh Mitra	II	An integrated waste water treatment : utilization of marsh, pisciculture and hydroponics tower
3rd	Sandip Acharyya, Atri Bhattacharya, Debojyoti Goswami, Prithwish Ray	II	Sustainable development

**Interdisciplinary webinar  
in occasion of  
World Environment Day celebration  
Broken chain of events: connecting predation risk to Prey  
population abundance**



**ONE DAY INTERDISCIPLINARY WEBINAR**  
Under  
**DBT STAR COLLEGE SCHEME**

**ORGANIZED BY: RAMAKRISHNA MISSION**  
**VIVEKANANDA CENTENARY COLLEGE**  
**(AUTONOMOUS)**  
*Department of Zoology*

**WORLD ENVIRONMENT DAY**

5<sup>th</sup> June 2021, Sat  
05.00 pm (IST)

Invited Speaker  
Dr. Maria Th  
Associate Prof  
Macrophysiology  
Center for Ecological  
IISc, Bangalore

**TOPIC- Broken Chain of Events: connecting predation risk to prey population abundance**

For any query,  
Dr. Arunava Mukherjee

**ONE DAY INTERDISCIPLINARY WEBINAR**  
Under  
**DBT STAR COLLEGE SCHEME**

**ORGANIZED BY: RAMAKRISHNA MISSION**  
**VIVEKANANDA CENTENARY COLLEGE**  
**(AUTONOMOUS)**  
*Department of Zoology*

**Patron**  
Swami Kamalasthanada  
Principal, RKMVC College, Rahara

**Advisors**  
Dr. Bulganin Mitra Dr. Pannalal Das

**Coordinator**  
Swami Vedanuragananda

**Mr. Samir Sardar**

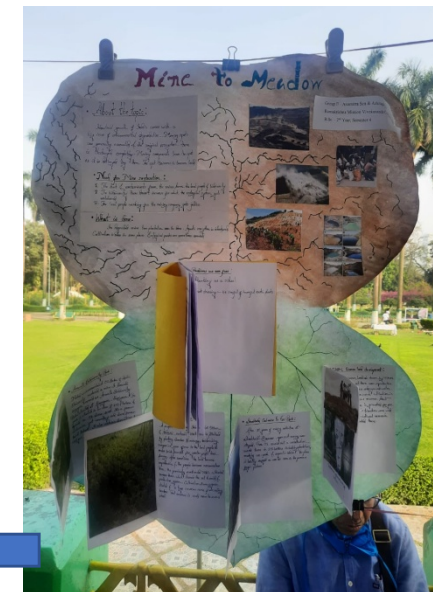
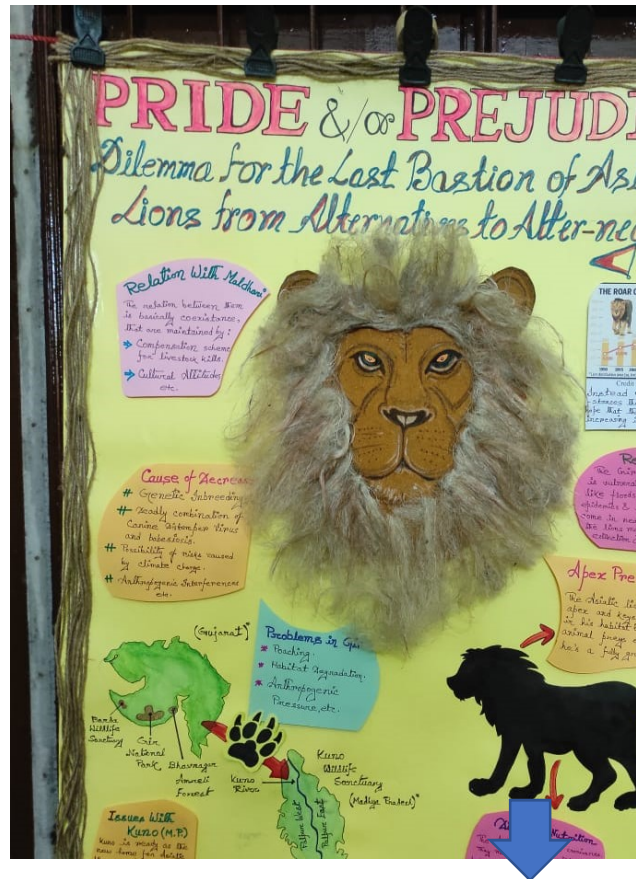
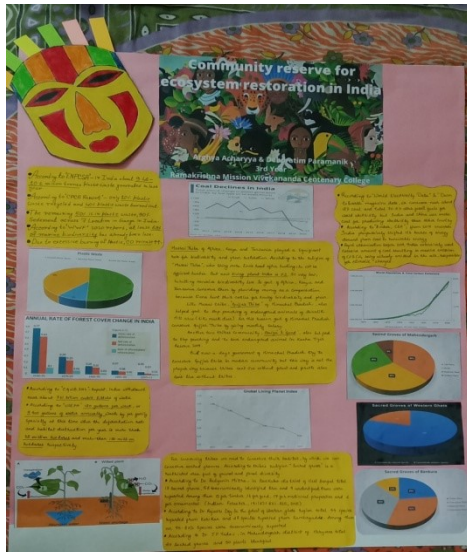
**Convener**  
Dr. Arunava Mukherjee

**Joint Convener**

5<sup>th</sup> June 2021  
05.00 pm (IST)

World

# Poster making competition for UG students in occasion of World Wildlife Day



Date: 3<sup>rd</sup> March, 2022  
Number of participants: 50  
Poster no. : 17

# **Competition for Writing of SCIENCE REPORTS in Newspapers**

Date	Guided by	Best Reporter
05.06.2021	Samir Sardar	Dhruba Datta (Semester V)
12.02.2022	Dr. Tanmoy Paul	Ankit Dutta (Semester II)
08.03.2022	Priyobrata Sinha	Rudraditya Chakraborty (Semester IV)

# Training of Lab Manpower (DBT STAR COLLEGE SCHEME)

Date	Topic	Resource person	Number of Participants
19.11.2021 & 20.11.2021	Stain and fixatives preparation	Dr. Arunava Mukherjee	3
26.11.2021 & 27.11.2021	Buffer preparation for molecular biology practical	Dr. Subham Mookerjee Dr. Ajoy Mallick	3
18.12.2021 & 19.12.2021	Use of Autoclave and Distillation plant	Samir Sardar Dr. Subhajit Maity	2
11.02.2022 & 12.02.2022	Tissue preparation and fixation	Dr. Debkumar Datta Dr. Tanmoy Paul	3
19.03.2022	Museum specimen preparation & preservation	Dr. Pradyut Medda Dr. Koutilya Bhattacharya	2



## Impact of DBT STAR COLLEGE SCHEME

Year	Number of students appeared in final semester (6 <sup>th</sup> semester)	Number of students pursued / pursuing MSc / Integrated PhD
2021	51	47
2019	41	30
2018	33	16

Examination	Number of successful students
JAM	4
JGEEBILS	2
GAT B	10
CUCET	15

### Publication of research articles:

- Sengupta, S., Mallick, S., Bhowmick, S., Mondal, A., Dutta, K. and Chattopadhyay, A. 2021. Plant Pollinator Co-ordination in Ornithophily – a Review. JASER, vol 2 (accepted).
- Maity S., Stephen J. COVID-19 Reinfections: Myth or Reality. OMICS Bootcamp Newsletter, Issue 1, Jan 2021.
- Acharyya, A. (2021). Uses of R.O.S. (H<sub>2</sub>O<sub>2</sub>) in nano-robot technology: for aggressive cancer treatment without side effects. International Journal of Scientific Development and Research. (Reg. I.D. : IJSDR\_193323) (accepted).
- Kirubaharan, K., Acharyya, A., Saha, N. C. (2022). A preliminary checklist of butterflies recorded from the campus of central academy for forest service, Burnihat, Assam. Indian Journal Of Ecology. (File No. : 120466852). (accepted)
- Maity, S., Acharyya, A., Chakraborti, A. S. (2022). Flavonoid-based polymeric nanoparticles: A promising approach for cancer and diabetes treatment. European Polymer Journal. (Manuscript Number: EUROPOL-D-22-00397).(communicated)

### Students qualified/selected for pursuing Post Graduation / Integrated PhD

Indian Institute of Sciences
Tata Institutes of Fundamental Research
National Institute of Biomedical Genomics
Department of Biochemistry & Zoology, University of Calcutta
Pondicherry University
Department of Animal Biology & Biotechnology, University of Hyderabad
Indian Institute of Technology, Bombay
Department of Marine Biology, Madurai Kamraj University
North Eastern Hilly University
Savitribai Phule Pune University
Department of Biochemistry & Zoology, West Bengal State University
Central University of Punjab

## Other Student's Achievements

- In occasion of **Concept Notes on Ecological Restoration** organised by **WWF –India**, students of Department of Zoology stood tops in 3 out of 4 sections
  - ❖ Section: Ecological restoration for wildlife and biodiversity- **Arghya Acharya** (VI) won the **1<sup>st</sup>** prize
  - ❖ Section: Ecological restoration for climate and environment – **Anamitra Sen** (IV) won the **1<sup>st</sup>** prize
  - ❖ Section: Ecological restoration for habitat and home – **Mayukh Mitra** (IV) won the **1<sup>st</sup>** prize
- **Aakash Roy & Ramit Mitra** of Semester IV, Zoology who placed **1<sup>st</sup>** in Poster presentation organized by **WWF-India** in Observation of '**World Wildlife Day**' on 3rd March, 2022.
- **Sukriti Maity** (V), won **CUBE-CURE Kishore Bharti STEM Leadership Award 2021** (HBCSE, TIFR, Mumbai)
- **Anamitra Sen** (Semester III Zoology) won **First** Prize in online inter college **paper presentation** competition on 5th October 2021 organized by **Vidyasagar Metropolitan College**.
- **Aahitagni, Anamitra, Devjyoti, Nirban & Aakash** (Semester IV) of Department of Zoology, stood **3<sup>rd</sup>** in inter college **oral presentation** competition organized by **Save The Frog, India** on 30<sup>th</sup> April, 2022
- **Young Academy of India Mentx internship program**

**Devjyoti Mondal** (**Dr. Ahmad Masood Khan**, Dept. of Wildlife Science, Aligarh Muslim University)

**Arghya Acharya** (**Dr. Dilip Vasudevan**, DBT Scientist, Institute of Life Sciences, Bhubaneswar)

## **Budget Expenditure (DBT STAR COLLEGE SCHEME)**

<b>Year 2021- 2022</b>	<b>Consumables , Workshops, Seminars &amp; Outreaches</b>
<b>Fund disbursed</b>	<b>3,00,000</b>
<b>Fund utilized</b>	<b>3,00,000</b>

# **Future Activities**

## **New Practical and Project works:**

- Realtime PCR
- Primer designing
- Cloning and sequencing
- Multiple sequence alignment
- Genome annotation and ORF finding
- RNA extraction and cDNA synthesis
- DNA isolation from forensic samples
- Gut content analysis
- Experimental design to study animal behaviours
- Water quality testing processes
- Study of bacterial conjugation

**Workshops, seminars, special lectures, outreach programs, lab trainings & faculty improvement programs will also be organized at regular intervals**

**Department of  
Zoology, Ramakrishna Mission  
Vivekananda Centenary  
College, sincerely acknowledge  
the financial helps from  
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**THANK YOU**