

ZOOLOGY DEPARTMENT, PUC

DBT STAR COLLEGE  
DEPARTMENTAL ANNUAL  
ACTIVITY REPORT  
(2019-2020)

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**Department of Zoology,  
Pachhunga University College**

Dr H. Lalthanzara

6/23/2020

*Submitted to- Dr HS Thapa, Coordinator, DBT Star College Scheme, Pachhunga University College*

## STAR COLLEGE REPORT 2019-2020

Name of Department: Zoology

Name of Institution: Pachhunga University College, Aizawl, Mizoram

No. of faculty in the Dept.: 6+2=8

NO. of students in the Dept.: 81

- I. **EQUIPMENT PROCURED:** The following equipment and Teaching aids were procured from DBT Star College Scheme during 2019-2020.

S/ No	Items	Made & Model	Qty	Remarks
1	Micro-pipette 1000µl	GLASSCO 501.303.11	15	In used
2	Fixed pipette 100ml	GLASSCO 501.303.	05	In used
3	Fixed pipette 500ml	GLASSCO 501.303.	05	In used
4	Pipette Stand		06	In used
5	Haemocytometer	MARIENFELD	30	In used
6	Haemoglobinometer	Igene	30	In used
7	Compound microscope	MOTIC ECO-BINO-LED-PLAN, Japan	12	In used
8	Stereo-zoom microscope	MAGNUS Magstereo FM24	04	In used
9	Digital Sphygmomanometer	Micromat	01	In used
10	Sphygmomanometer with Stethoscope (Mercury)	Lifetone/Diamond	05	In used
11	Digital Blood Pressure Monitor	Optima	01	In used
12	BOD Incubator	IGENE IG-1711C	01	On the way*
13	Hot Air Oven	BR Biochem BRIN45	01	On the way*
14	Human Skeleton	Biocraft	01	On the way*
15	Chemicals and glassware			In used

\*delayed due to the pandemic SARS CoV-2 Corona Virus (Covid-19) outbreak and nationwide lockdown.

## II. MAJOR ACTIVITY

**II.A. Popular Invited Lecture:** Four popular invited lecture programme was conducted as follows.

### Lecture 1

Date: 4.10.2019 Friday

Resource person: Dr. Samuel Lalronunga, M.Sc. Ph.D, DST, Post-Doctoral Fellow

Topic: Biodiversity and its Conservation with Special Reference to Mizoram, India

Number of Beneficiaries: 36



### Lecture 2

Date: 16.10.2019

Resource Person: Prof. P.B. Kavi Kishor, Dept. of Genetics, Osmania Univ. Hyderabad

Topic: Human Genome - What did we learn by sequencing it?

Number of Beneficiaries: 49



### Lecture 3

Date: 23.10.2019

Resource Person: Prof. S. Swarnakar, FNAC, Senior Principal Scientist & HoD, Cancer Biology and Inflammatory Disorder Division, CSIR,

Topic: Human Genome - What did we learn by sequencing it?

Number of Beneficiaries: 38



#### Lecture 4

Date: 07.02.2020

Resource Person: Dr.Lallianpuii, Scientist, Wildlife Institute of India(WII), Dehradun

Topic: Biodiversity of India – Research scope and future prospects

Number of Beneficiaries: 97

(Inter-departmental activity with Biotechnology Department)





## II.B. STUDENT PROJECTS

Final Semester students were grouped into 4, the total number of beneficiaries is 26. Under the supervision of department teachers, they are given a separate project for 4 months.

### GROUP A:

Title of the project: **PARTIAL GENOME SEQUENCE OF SOME WASPS CONSUMED FOR FOOD BY THE MIZOS**

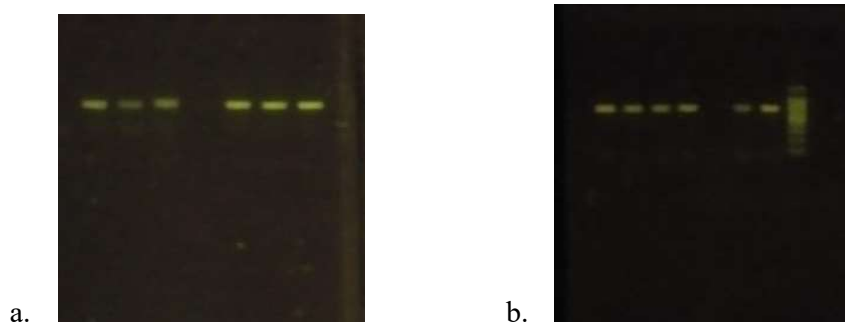
Teacher-in-charge: Dr. Vanramliana, Dr. B. Lalruatfela & Ms Lalringngheti

Major findings: From the result of the CO1 sequence, two species of wasps *Vespa bicolour* and *Provespabarthelemyi* were obtained.

### Morphological Characterization

The morphological features of the identified species are as follows:

1. *Vespa bicolour* (Fabricius, 1787)
  - Vertex black; metanotum yellow; first and second metasomal tergum yellow, with black apical band.
  - Punctures on central part of clypeus larger, separated by one puncture diameter.
  - Posterior margin of head in dorsal view barely concave.
  - Ventrolateral part of pronotum smooth.
2. *Provespabarthelemyi* (du Buysson, 1905)
  - Ocelli enlarged; posterior ocelli closer to inner eye margin than to each other
  - Vertex short; distance from the posterior ocellus to posterior margin of vertex slightly longer than that between posterior ocelli.
  - Apical margin of clypeus shallowly emarginate medially, with lateral angles not prominent or projecting.
  - Scutum nearly as wide as long.
  - Clypeus pale yellow.



**Figure 1:** a. Gel electrophoresis for genomic DNA S1A, S3B, S4B, and S5A;  
b. Gel electrophoresis for PCR amplification of the CO1 region.

### Sequence analysis

Two species of wasps of the subfamily Vespinae were obtained from the four samples that were processed. The BLAST result of NCBI GenBank showed that samples S1A, S3B and S5A have 98.53-99.65% similarity with *Vespa bicolour* and S4B showed

99.10% similarity with *Provespabarthelemyi* with an intraspecific distance of 0.1-0.3% and 0.2% respectively which revealed that they belonged to the same species respectively.

*(Please see details in Annexure A)*

#### **GROUP B:**

Title of the project: **STUDY OF SOIL MACROFAUNA IN THREE DIFFERENT ECOSYSTEMS IN AND AROUND AIZAWL, INDIA**

Teacher-in-charge: Dr. H. Lalthanzara & Dr. Betsy Zodinpuui

Major findings:

The density of soil macrofauna was found to be highest in Site 1 with 1443.6 ind./m<sup>2</sup>. Among all the specimens collected, Formicidae were the most abundant with a density of 556.8 ind./m<sup>2</sup> while Opiliones were the least abundant with a density of 3.2 ind./m<sup>2</sup>. Shannon diversity index was highest in site 1 and lowest in site 2 indicating that thick natural forest harbors the greatest density and diversity of soil macrofauna as compared to plantation site and river banks.

Soil temperature was highest in site 3 followed by site 1 and then site 2 which is statistically significant ( $p < .05$ ). pH of the soil was highest in site 1 and lowest in site 3 and is also statistically significant ( $p < 0.05$ ). Soil moisture content was highest in site 1, followed by site 3 and lowest in site 2 and these variations are significant ( $p < .05$ ). There were positive and significant ( $p < .05$ ) correlations between soil macrofauna diversity and soil moisture content whereas negative correlations were observed for temperature and pH of the soil.

*(Please see details in Annexure B)*

#### **GROUP C:**

Title of the project: **ISOLATION AND IDENTIFICATION OF BACTERIA FROM LIBRARY BOOKS AND DETERMINATION OF THEIR ANTIBIOTIC SENSITIVITY.**

Teacher-in-charge: Dr. Lalramliana, Dr. Kaushalendra & Ms Mary Lalramchuanii

Major findings:

The bacteria of the genera, *Bacillus* are well dominant microflora in our sampling site ie. PUC Library. Besides, we can say that the activity of different antibiotics to different samples varies from species to species. This could be attributed to the possibility for bacteria to mutate and react differently to the action of different antibiotics.

*(Please see details in Annexure C)*

**GROUP D:**

Title of the Project: **ANTI-MICROBIAL ACTIVITY OF *CALLICARPA ARBOREA* AND *HEMIGRAPHIS ALTERNATA***

Teacher-in-charge: Dr. K. Lalhminghlui, Dr K. Lalchhandama & Ms. PB Lalthanpui

Major findings:

From the present study, *Callicarpa arborea* bark extract showed antimicrobial activity by inhibiting the growth of all the bacteria tested, therefore, it may be concluded that it could be a potential source of antibiotic. However, *Hemigraphis alternata* does not show antimicrobial activity for all the bacteria tested.

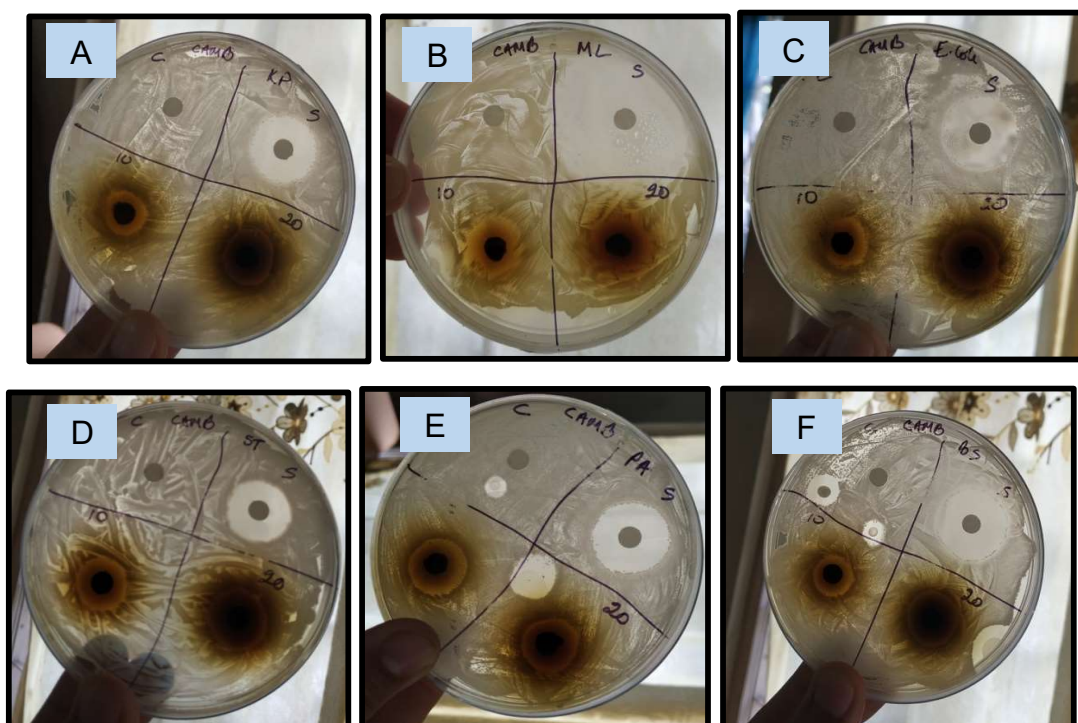


Figure: A - *Klebsiella pneumoniae*, B- *Micrococcus luteus*, C -*Escherichia coli*, D - *Salmonella typhimurium*, E -*Pseudomonas aeruginosa* and F -*Bacillus subtilis*.

(Please see details in Annexure D)

**II.C. FIELD VISIT**

During 17-21 February 2020 a group of 22 students, comprising 5 boys and 17 girls underwent nature study camp at Phawngpui National Park, commonly known as the



Blue Mountain in southern Mizoram under the Guidance of Dr. B. Lalruatfela, Assistant professor as Teacher in-charge and Mr. R. Vanlalhriata, Laboratory Technician and Mr. Vanlalmalsawma, Field Assistant of the Department of Zoology.

Phawngpui National Park is one of the two national parks situated in the state of Mizoram. The park is located approximately 300 kms from Aizawl city with a coordinate of 22°40'N 93°03'E. Besides being a national park, the highest mountain peak of the state, Phawnpuitlang, often called Blue Mountain, is present. The peak of the mountain is reported to be 2157 m above sea level. The national park is habitat to many wild flora and fauna, some of which are reported to be endemic to the Indo-Myanmar forests. Among these plants and animals, the famous Mrs. Hume's pheasant, the state bird of Mizoram is one of them.

The students made careful observations on the various flora and fauna of the national park. However, no specimens were collected since no biological article must not be collected from a national park. However, the students got to witness many important wild plants and animals in their biological habitat. Real-time on the spot lectures on the biodiversity of Phawngpui National Park was conducted by the faculty.



Students Field Visit at Phawngpui National Park

**FACULTY DEVELOPMENT PROGRAMME:**

1. Dr Vanramliana, Assistant professor attended Special Summer School conducted by HRDC, Mizoram University, Tanhril Aizawl during 10-24 June 2019



2. Dr B. Lalruatfela, Assistant Professor of the department of Zoology attended Faculty Induction Programme at Mizoram University from 18<sup>th</sup> November to 12<sup>th</sup> December 2019 sponsored by BDT Star College Scheme.



3. **International Conference on Recent Advances in Animal Sciences (ICRAAS-2019)** was organized by the Department of Zoology, Pachhunga University College, Aizawl during 6-8<sup>th</sup> November 2019 under the chairmanship of the Head of the Department Dr K. Lalhandama, convened by Dr H. Lalthanzara, Associate Professor and DBT Star College Departmental Coordinator. All faculties take a major role in the successful organization of the conference. Some faculties presented their research findings. The Conference was funded by DBT, SERB(DST) and NEC in collaboration with Mizoram State Government Agriculture department and Fishery department.

A total of 186 registered participants from various institutions attended the conference. 53% of the participants are male and 47% are females. About 40% are faculties, scientists & professionals, 31% are research scholars and about 22% are students. The participants came from about 42 different institutions from 17 states of India. We have nine resource persons from Germany and India. Altogether, there were 132 abstracts accepted by the technical committee for presentations. Out of which 70 oral presentations and 60 posterpresentations are presented. The selected papers are being published in SCOPUS index journal, the Journal of Environmental Biology as special issue named Advances in Animal Science.



Group photo of ICRAAS participants after inauguration by Hon'ble Higher & Technical Education Minister Dr. R. Lalthangliana

**NOTE:**

The outbreak of the Pandemic SARS CoV-2 Coronavirus seriously affects the proposed/scheduled students and departmental as well as inter-departmental activities under Star College Scheme. Therefore, some scheduled activities that were not materialized will be taken up in the second year.

The department is very grateful to DBT. The initiation of the PG section as M.Sc (Life sciences) in the department in the 2019-2020 academic session takes some time to adapt among faculties. This has now been settled and the faculties are now ready to carry out additional activities to achieve the goals of the DBT Star College Scheme.

## STAR COLLEGE REPORT 2021-2022

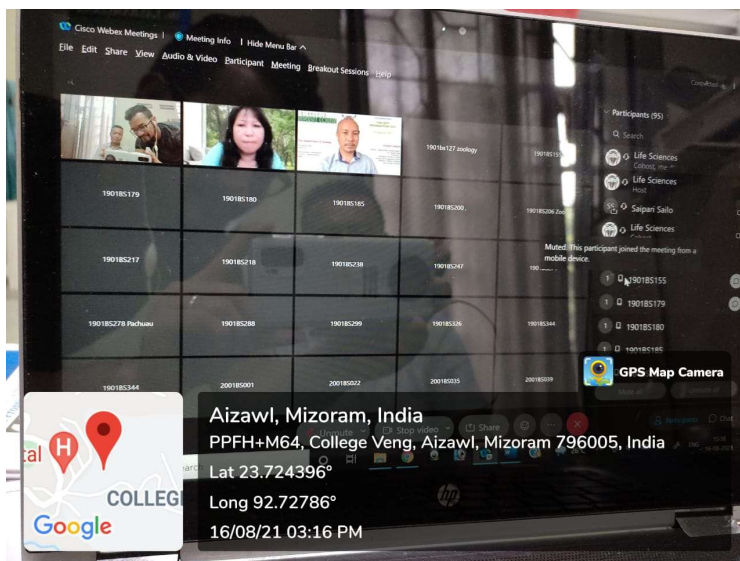
Name of Department : Zoology  
 Name of Institution : Pachhunga University College, Aizawl, Mizoram  
 No. of faculty in the Dept. : 6+2=8  
 No. of students in the Dept. : 126

### **MAJOR ACTIVITY**

#### **I. Invited lecture**

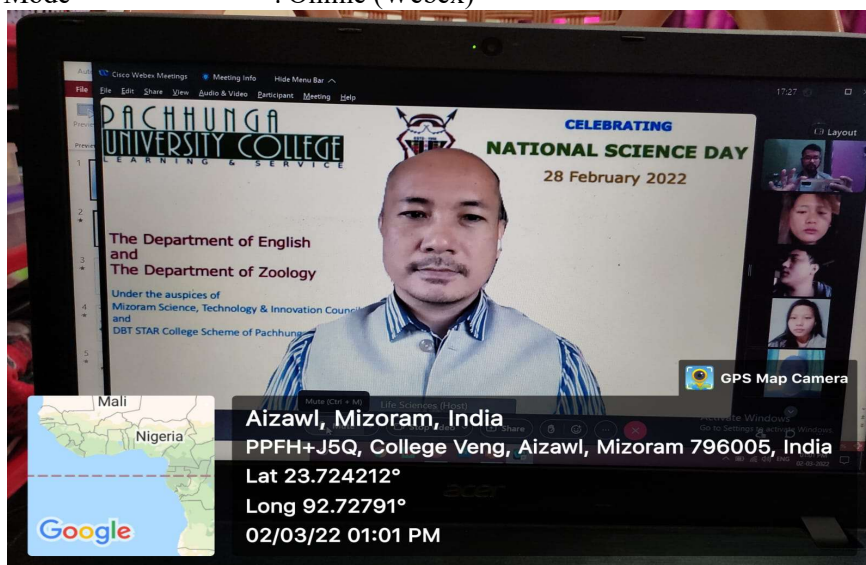
Date : 16<sup>th</sup> August 2021  
 Resource Person : Dr Saipari Sailo, Scientist C, Zoological Survey of India (ZSI).  
 Topic : Biodiversity Conservation  
 Mode : Online



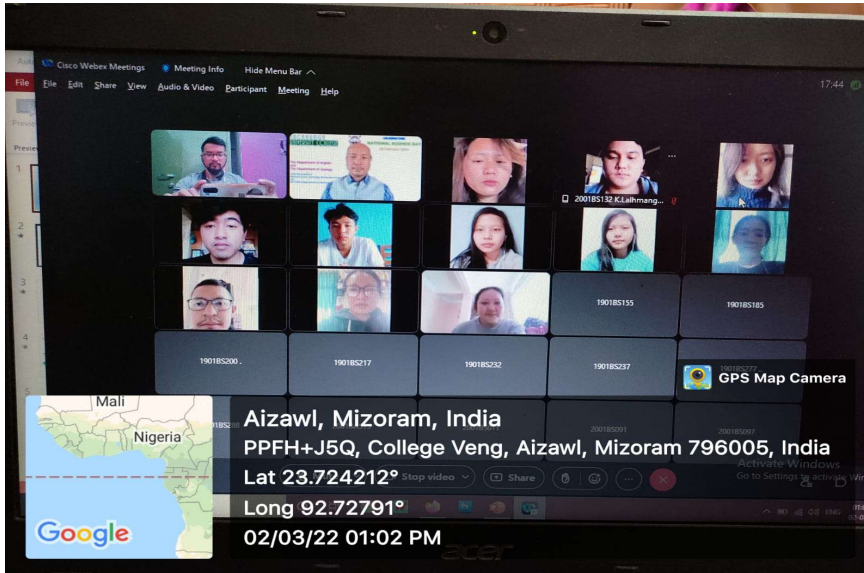


## II. Celebration of National Science Day 2022

- Date : 3<sup>rd</sup> March, 2022  
 Host : Prof. K.Lalchandama  
 Resouce person : Dr B.Lalruatfela, Assistant Professor, Dept of Zoology, PUC  
 Topic : Integrated Approach in Science & Technology for Sustainable Future  
 No. of beneficiaries : 249  
 Mode : Online (Webex)

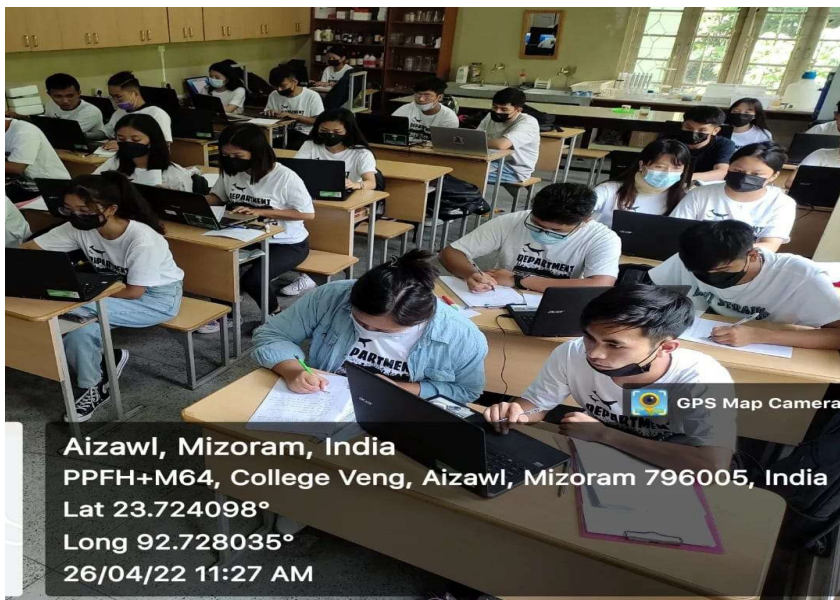






### III. Practicals on bioinformatics

Date : 26<sup>th</sup> April, 2022  
 Place : Dept of Zoology, PUC  
 Expert : Dr Vanramliana, Assistant Professor, Dept of Zoology, PUC  
 No. of beneficiaries : 29



### IV. FIELD VISIT

During 26<sup>th</sup>-28<sup>th</sup> May, 2022, a group of 26 students, comprising 15 boys and 11 girls underwent field trip at Tam Dil, Saitual district. The field visit was carried out under the guidance of Dr. K.Lalhminglui, Ms HC Lalramnghaki as Teacher in-charge and Mr PC Vanlalruata, Field Assistant of the Department of Zoology.

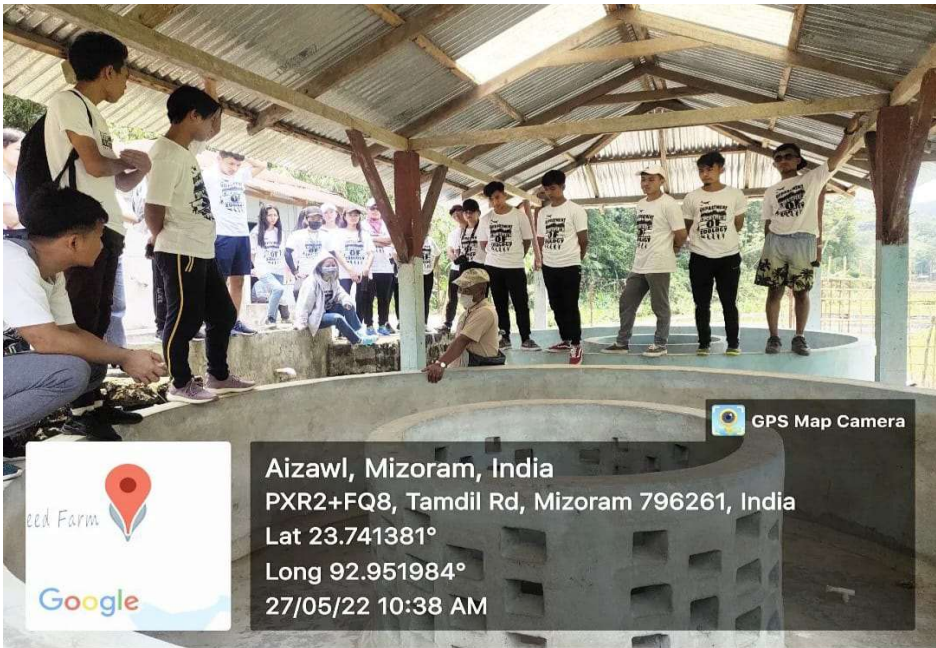
Tam Dil is a reservoir lake situated 64 km from Aizawl, the capital city of Mizoram, India. The lake is located 6km away from the nearest town which is Saitual with a coordinate of 23°44'20"N 92°57'10"E. Reconstruction of the lake was done by the Fisheries Department, Government of Mizoram as part of building a fishing reservoir. Lake-side resorts are maintained by the Tourism Department, Government of Mizoram. It was reported that *Leptolalax tamdil*, a new species of frog was described from this lake in 2010.

The students made careful observations on the various flora and fauna of the area visited. Specimens were collected and deposited at department museum, studies of various plants species was done under the guidance of Ms HC Lalramnghaki.



On the spot lectures and demonstration on the topic induced breeding and development of fishes was conducted by Pu Tea, Fisheries Department.





**RESULT ANALYSIS**

**DBT STAR COLLEGE SCHEME RESULT ANALYSIS**

Year	No. of students	Pass	Fail	Pass %	Dist	1st	2nd	3rd	Ranks	Total ranks
2016	19	19	1	94.7	0	17	1	0	1, 3, 4, 6, 8, 9	6
2017	18	15	3	83.33	0	15	0	0	1, 2, 4, 5, 6, 7, 8, 9	8
2018	36	35	1	c	0	35	0	0	1, 3, 4, 7, 8, 10	6
2019	22	19	3	86.4	15	8	0	0	2, 4, 6, 8, 9, 10	6
Changed from % to CGPA					O	A+	A	B+	Ranks	Total ranks
2020	27	26	1	96.0	3	9	14	0	1, 2, 3, 4, 6, 7, 9, 10	8
2021	22	22	0	100	1	10	11	0	2, 4, 7, 9, 10	5
2022	29	28	1	96.6	8	14	6	0	1, 2, 3, 4, 5, 6, 7, 9	8