# ACTIVITY REPORT

**Dr Shahla Yasmin, Mentor,**
**Professor & Head, Department of Zoology,**
**Patna Women's College, Patna, Bihar, India**

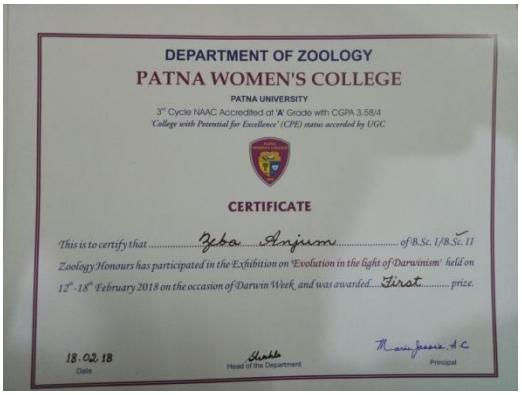
Twenty students from Patna Women's College participated in the Women in STEM Road show on 13th & 14th February at Gargi Grand Hotel, Patna. The resource persons were Dr. Sultana Nahar, Dr. Karen Irving and Dr. Anil Pradhan from Ohio State University, U.S. Thereafter, students were involved in various activities. They also faced university final examinations between March th May 2018.

## ACTIVITIES IN DEPARTMENT OF ZOOLOGY

## Department of Zoology organized model exhibition on the occasion of Darwin Week (12th-18th February 2018).

### 1. MODEL ON ALLOPATRIC SPECIATION.

**Zeba Anjum of B.Sc II** made the model on the topic allopatric speciation as she was interested in depicting how one species of squirrel changed into two different species due to blockage in gene flow among them. Originally only one squirrel species inhabited the Ponderosa pine forest around the rim of the Grand Canyon i.e, the Albert's squirrels. About 10,000 years ago when the last ice age ended, physical formations in the canyon changed in a way that blocked the squirrels access to the Colorado River, much less cross it. The canyon became a geographic barrier separating the forests and squirrels on each rim. One population of squirrels had become two separate populations that could no longer interbreed, the Kaibab squirrels. Albert's squirrels (*Sciurus alberti*) are a North American species, found across a range of locations. Kaibab squirrels (*Sciurus aberti kaibabensis*) are a subspecies of Albert's squirrels, found only in one area in the United States.
She along with her batch mates made this model with the help of various stones and mud. They kept two big stones apart from each other so that the space in between depicted the grand canyon. **They bagged the first prize in the model making.**


DEPARTMENT OF ZOOLOGY
PATNA WOMEN'S COLLEGE
PATNA UNIVERSITY
3rd Cycle NAAC Accredited at 'A' Grade with CGPA 3.58/4
'College with Potential for Excellence' (CPE) status accorded by UGC

CERTIFICATE

This is to certify that Zeba Anjum of B.Sc. I/B.Sc. II Zoology Honours has participated in the Exhibition on 'Evolution in the light of Darwinism' held on 12th-18th February 2018 on the occasion of Darwin Week and was awarded First prize.

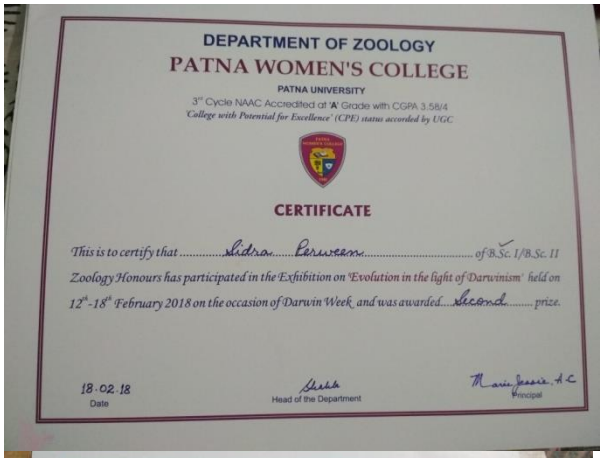
18.02.18
Date
Head of the Department
Principal

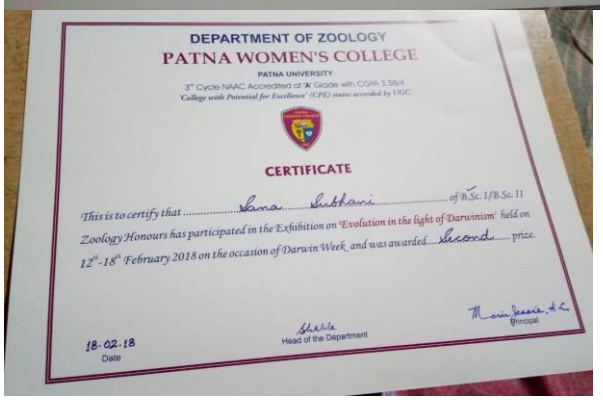

**Model prepared by Zeba Anjum & group of B.Sc II**

## 2. MODEL ON EVOLUTION OF GIRAFFE

**Sidra Perween and Sana Subhani of B.Sc I** wrote as follows:

We made the model on the topic Evolution of giraffe's neck with the help of Darwin's survival of the fittest and natural selection theory. He believed that some of the giraffe initially had longer neck due to genetic mutation. The one having longer neck enabled them to eat foliage which is beyond the reach of shorter browsers since they were found in sub- Saharan area where the ground vegetation was scarce. So these individuals were able to eat more and more and became stronger and could possibly breed better. So were able to reproduce and this genetic code was passed on to the next generations. And those that couldn't get enough to eat weren't strong enough to mate and eventually died without having offsprings. So gradually giraffe's neck became longer over the generations and short neck was wiped out due to absence of food. So his idea was accepted against the Lamarck's use and disuse theory to prove giraffe's neck evolution. So we have enjoyed working on this and tried to use waste products to prepare the model.


**Model prepared by Sidra and Sana & group of B.Sc I**

3. ADAPTIVE RADIATION IN MARSUPIAL MAMMALS
**Blessy of B.Sc I** wrote as follows:

The Zoology Department of Patna Women's College never steps back when it comes to pay tribute to nature and the one who discloses the facts regarding the amazements of our Mother Earth.
I along with my team mates prepared a model depicting the adaptive radiation in marsupials.Adaptive radiation is an evolutionary pattern whereby a single ancestral form diversifies into several related forms.Darwin explained that metatherians in presence of less number of eutherians survived, flourished and evolved along different lines by divergent evolution. .Animals adapted to different feeding habits and habitat according to their needs.Tasmanian wolves were cave dwellers mostly preying small animals while the kangaroos lived in varied habitats.

The exhibition built the sense of team work within me and my co-partners. Tackling different ideas and the execution were challenging but overall enthusiastic.

4. **MODEL ON EVOLUTION OF HORSE**.

**Sabrah Rahman of B.Sc I** wrote as follows:

I made this model on the topic adaptive radiation. As I was interested in depicting the transforming of the small , dog sized , forest dwelling *Eohippus* into the modern horse due to segregation and selection from a gene pool already present in *Eohippus* rather than involving the production of new genes.

Actually, at each level from *Eohippus* to *Eqqus*, adaptive radiation had occured & numerous groups evolved, thrived & became extinct except *Eqqus. Miohippus*, was ancestral not only to *Merychippus*, but also to *Anchitherium* and *Hypohippus* (The three-toed browsing, forest horse and to three other lineages). Similarly, *Merychippus* was ancester to *Hipparion*, *Protohippus* and *Pliohippus* (First one-toed horse). Of them only *Pliohippus* gave rise to *Eqqus* and other became extinct. Even from *Pliohippus*, the forms radiated were not only *Eqqus* but also *Hippidion* and *Onohippidium* which underwent independent adaptive radiation.This suggest that the process of evolution is chiefly based on adaptive modifications and changes occurring in all direction. **Sabrah Rahman** along with my classmates made this model with the help of thermocol.


**Model prepared by Blessy & group of B.Sc I I**


**Model prepared by Sabrah & group of B.Sc**

## 5. MODEL ON INDUSTRIAL MELANISM

**Smriti Mishra** and **Amita of B.Sc II** prepared a model on Industrial melanism is an example of Natural Selection. She wrote as follows:

Industrial Revolution in Britain burnt vast amount of coal producing $SO_2$ that reduced the lichens cover, while soot blackened the bark of urban trees. Due to this light peppered moth species which live on the lichen covering were camouflaged, and after pollution they were spotted by predators and eaten. We used handmade papers for making factories, grasses, trees & barks, cotton for showing the smoke, and socks cloth for making the peppered moths (white for light & brown for dark moths), mud for its body and artificial birds. We were awarded for our hard work as well.


**Model prepared by Smriti Mishra and Amita & group of B.Sc II**

## SEMINAR ON STEM

**The participants of STEM Workshop (Zoology Honours students)** gave tips to **other students of Chemistry, Botany, Mathematics**, as to how they can prepare themselves to apply in US universities. They learnt these tips in two days workshop on Women in STEM roadshow on 12th and 13th February 2018 in Patna. The resource persons were Dr Sultana Nahar, Dr Karen Irving and Dr Anil Pradhan of Ohio State University. These students were greatly motivated and shared their experience with their friends at Patna Women's College on 22.02.2018. they explained how to prepare resume and how to apply for different courses in US.

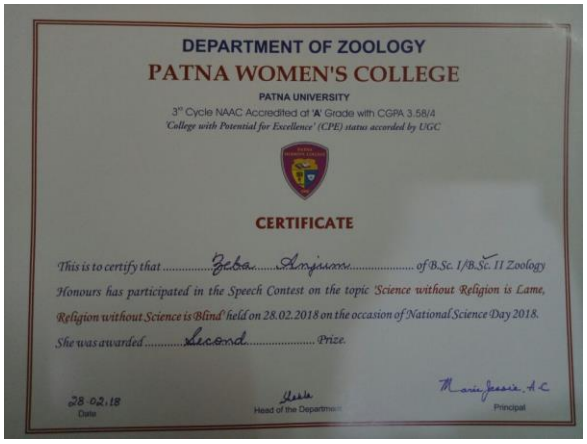


**Seminar on STEM**

**March for science** organized by Patna Women's College on 28.02.2018. **Science students including the STEM participants participated in the event.**


**March for Science**

Speech contest on the topic '**Science without Religion is lame, Religion without Science is blind'** was organized by Department of Zoology on 28.02.2018. Twelve students participated. **Zeba Anjum of B.Sc II** got second prize.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CERTIFICATE

This is to certify that Zeba Anjum of B.Sc. I/B.Sc. II Zoology Honours has participated in the Speech Contest on the topic 'Science without Religion is Lame, Religion without Science is Blind' held on 28.02.2018 on the occasion of National Science Day 2018.

She was awarded Second Prize.

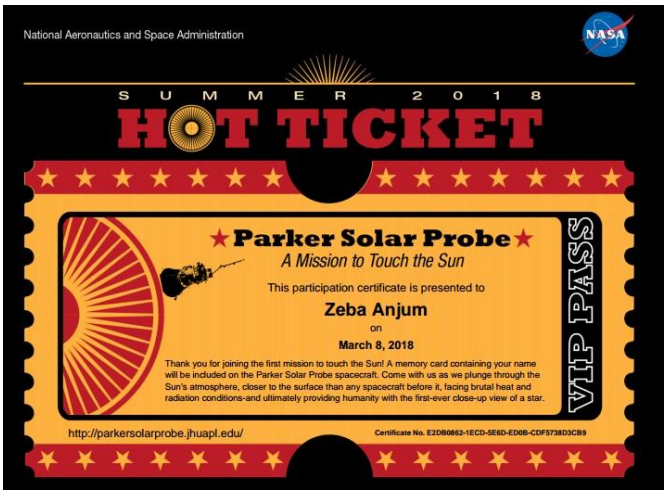
28.02.18
Date

Head of the Department

Principal

**Zeba Anjum of B.Sc II participating in the speech contest**

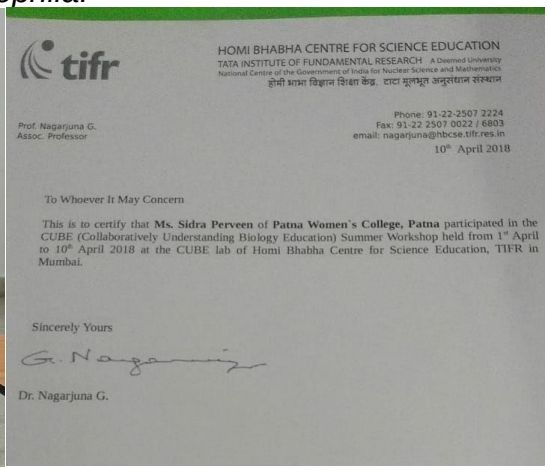
**Zeba Anjum of B.Sc II** participated in NASA'S parker solar probe mission which included online registration. The chip containing th **Zeba Anjum of B.Sc II** e name of the registered candidate was to be sent to the sun as it was stated "**Mission to touch the Sun".**



**Sidra Perween of B.Sc I**, participated in the workshop conducted by **Collaborative Undergraduate Biology Education (CUBE) of Homi Bhabha Centre for Science Education (HBCSE), Tata Institute of Fundamental Research (TIFR), Mumbai** from **1st-10th April 2018**. She learnt how to trap and culture *Drosophila*, which can be used as an excellent model organism for basic research.

She wrote as follows:

Each one has been provided with model organism and I got Drosophila to work on. Our group has cultured the native fruitflies keeping in mind the objective to compare olfaction between CsBz flies (which is lab bred *Drosophila melanogaster* for several years) and native fruit flies. During the experiment, we have collected trapped native fruit flies and isolated the female gravid flies for single line culture, culturing in the cornmeal media after identifying the *D. melanogaster* species. And then extracting the second instar larvae of both variety and comparing its olfaction first using paraffin oil and then iso- amyl acetate (IAA) at different concentrations. It was an excellent opportunity for me to learn not only to perform research work but also the basics about the habit, behaviour and structure of *Drosophila.*



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HOMI BHABHA CENTRE FOR SCIENCE EDUCATION
TATA INSTITUTE OF FUNDAMENTAL RESEARCH A Deemed University
National Centre of the Government of India for Nuclear Science and Mathematics
होमी भाभा विज्ञान शिक्षा केंद्र, टाटा मूलभूत अनुसंधान संस्थान

Prof. Nagarjuna G.
Assoc. Professor

Phone: 91-22-2507 2224
Fax: 91-22 2507 0022 / 6803
email: nagarjuna@hbcse.tifr.res.in

10th April 2018

To Whoever It May Concern

This is to certify that **Ms. Sidra Perveen** of **Patna Women's College, Patna** participated in the CUBE (Collaboratively Understanding Biology Education) Summer Workshop held from 1st April to 10th April 2018 at the CUBE lab of Homi Bhabha Centre for Science Education, TIFR in Mumbai.

Sincerely Yours

G. Nagarjuna

Dr. Nagarjuna G.

**Sidra Perween of B.Sc I, at CUBE workshop, Mumbai.**

**Save trees and save sparrow campaign** was collaboratively organized by ECO Task Force, Tarumitra, St Xaviers, St Michaels, Mount Carmel on the eve of World Sparrow Day that falls on **20/03/2018**. Sparrow is Bihar's state bird. Attention is needed to save this little cute bird. Zoology Honours students including the STEM participants participated in the event.


ECO Task Force members participated in the activity at Tarumitra Ashram along with school children on the occasion of Earth Day 2018 and deliberated on environmental issues. **Zeba Anjum of B. Sc II** gave a speech on how to limit the usage of plastics and to lower the wastage of water.


**Zeba Anjum of B. Sc II speaking on the occasion of EARTH DAY**

**Sidra Parween and Sana Subhani of B. Sc I** participated in the cleanliness drive on Krishna Ghat, Patna organized by Bihar State Pollution Control Board on **24/05/2018**


**Cleanliness drive on Krishna Ghat**

ECO Task Force organized speech contest on the occasion of World Population Day 2018. Topic was **'Family Planning is Human Right'**


**Smriti Mishra of B. Sc III speaking**

ECO Task Force organized poster contest on the occasion of World Population Day 2018. **Zeba Anjum of B.Sc III got third prize**.



Poster contest on **'Family Planning is Human Right'**

On **12.07.2018, the STEM participants** again organized a Seminar for freshers (new B.Sc I students) and explained how they can apply to Universities in US.


**Seminar on STEM for Freshers**

## Research Activities of Students

**Zeba Anjum of B.Sc III** is currently motivating her fellow classmates to perform basic scientific research (BSR) at UG level. She has drafted the proposal and will soon start the research work. The topic is "**To observe the effects of natural and artificial sweeteners on the selected ant species ' *Camponotous* "**

**Sidra Parween of B.Sc II** is also working on the project which has the objective to **Vermicomposting using kitchen waste products** and to measure the content of nutrients in the manure produced and compare it with the nutrients of soil. She wrote as follows:
My teacher has introduced me to this project where we have planned to prepare the packets of manure and sell it at the lowest possible price. The compost is ready and our group will continue the work soon.




**Sidra Parween of B.Sc II preparing vermicompost from kitchen waste**.

**Shafia Ambreen of B.Sc III** and group are working on **'Isolation of microbes from mobile phones and writing pens'**

**ACTIVITIES OF STUDENTS OF INDUSTRIAL MICROBIOLOGY**

**Name- Shaeel Ashraf**
**Class- IMB 3rd year**
**Roll no.-14**

**POSTER ON 'THE PROTON THERAPY'**

She wrote as follows:

I made a poster on Proton Therapy which has proved itself to be a revolutionary Cancer treatment. I chose this certain topic because I wanted to increase awareness regarding a treatment so effective. Which then was not brought in India, however it has now been introduced in Apolo Hospital,Chennai.

Proton therapy piqued my interest since it promised much lesser death rates as compared to other conventional radiotherapy. Conventional radiotherapy employs high energy X-Rays for the treatment of cancer and certain benign tumors. In doing so, it also damages the surrounding healthy tissue by delivery of radiation to the healthy tissue around the tumor. In contrast, proton beam delivers a high dosage of radiation only to the tumor maximizing the chances of cure and in turn minimizing the adverse effects to the surrounding healthy tissues.

Proton therapy is used to treat many cancers and is mainly appropriate in situations where treatment options are restricted or conventional radiotherapy poses a peril to the patient. And on top of all the advantages theres one more great advantage of it is that there are minimal to no side effects.

So I decided to make people aware of this revolutionary cancer treatment therapy through the medium of this poster, where I highlighted its golden features and presented a good account of the Proton Therapy to all the teachers and students who attended the poster making competition.

**Pinki Kumari of IMB 3rd year** wrote as follows:

I have undergo one month Hands-on training in Rajendra Memorial Research Institute of Medical Science(RMRIMS), Patna, Bihar on the topic **"Isolation of *Leishmania* Parasite in culture medium".**
We have isolated the *Leishmania donovani* from the patient causing kala azar or post kala azar dermal leishmaniasis and cultured in a RPMI media.

Ihave also undergo Hands-on training in **Forensic Science Laboratory**(FSL), Patna, Bihar. from 01/06/18 to 30/06/18 in the department of toxicology, serology, biology, ballistics, physics, DNA, explosive, handwriting, finger print.

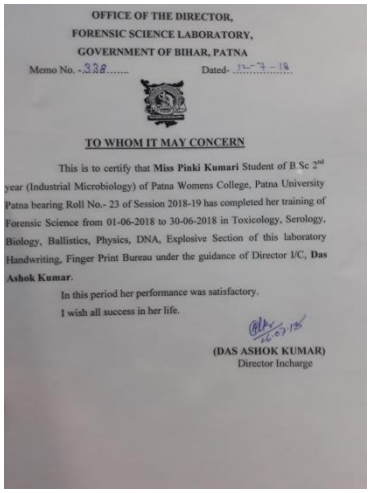
I have also undergo internship in Bihar State Pollution Control Board, Patna, Bihar on **"Environmental Pollution Monitoring**" from 09/05/18 to 30/05/18.

राजेन्द्र स्मारक चिकित्सा विज्ञान अनुसंधान संस्थान
Rajendra Memorial Research Institute of Medical Sciences
(Indian Council of Medical Research)
Ministry of Health & Family Welfare, Govt. of India
अगमकुआँ पटना- 800 007, Agamkuan, Patna - Patna-800 007, India

CERTIFICATE

This is to certify that Dissertation Report entitled "ISOLATION OF LEISHMANIA PARASITE IN CULTURE MEDIUM" is being submitted by PINKI KUMARI for partial fulfillment of the requirement for the ward of the degree of Bachelor of science in industrial Microbiology from PATNA WOMEN'S COLLEGE is record of candidate's own work carried out by her under my supervision and guidance. The work has not be published anywhere without consent of supervisor.

Dr. Shyam Narayan
Scientist 'D'
Microbiology Division



OFFICE OF THE DIRECTOR,
FORENSIC SCIENCE LABORATORY,
GOVERNMENT OF BIHAR, PATNA

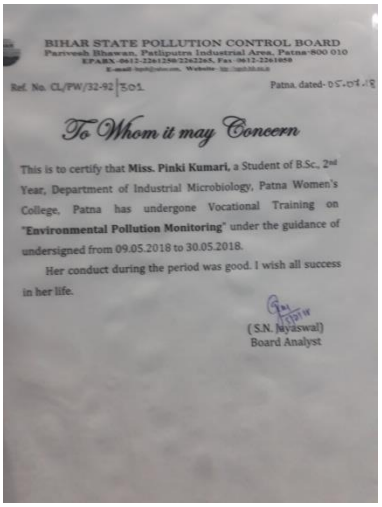
Memo No. -328..... Dated- 12-7-18

TO WHOM IT MAY CONCERN

This is to certify that **Miss Pinki Kumari** Student of B.Sc 2nd year (Industrial Microbiology) of Patna Womens College, Patna University Patna bearing Roll No.- 23 of Session 2018-19 has completed her training of Forensic Science from 01-06-2018 to 30-06-2018 in Toxicology, Serology, Biology, Ballistics, Physics, DNA, Explosive Section of this laboratory Handwriting, Finger Print Bureau under the guidance of Director I/C, **Das Ashok Kumar**.

In this period her performance was satisfactory.
I wish all success in her life.

(DAS ASHOK KUMAR)
Director Incharge



BIHAR STATE POLLUTION CONTROL BOARD
Parivesh Bhawan, Patliputra Industrial Area, Patna-800 010
EPABX -0612-2261200/2262265, Fax -0612-2261069
E-mail: bspb@yahoo.com, Website: http://bspcb.bih.nic.in

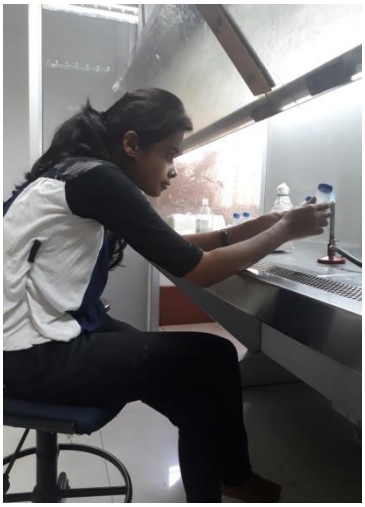
Ref. No. CL/PW/32-92/501. Patna, dated- 05.05.18

*To Whom it may Concern*

This is to certify that **Miss. Pinki Kumari**, a Student of B.Sc., 2nd Year, Department of Industrial Microbiology, Patna Women's College, Patna has undergone Vocational Training on "**Environmental Pollution Monitoring**" under the guidance of undersigned from 09.05.2018 to 30.05.2018.

Her conduct during the period was good. I wish all success in her life.

(S.N. Nyaswal)
Board Analyst



**Ayesha haque of IMB 3rd year** wrote as follows:

I have participated in **Inter University Science poster competition on "Satyendra Nath Bose and his contributions".**

This competition was all about S N Bose discoveries and inventions and what he contributed in the field of science. He was an Indian physicist specializing in theoretical physics. He is best known for his work on quantum mechanics in the early 1920s, providing the foundation for Bose–Einstein statistics and the theory of the Bose–Einstein condensate. A Fellow of the Royal Society, he was awarded India's second highest civilian award, the Padma Vibhushan 1954 by the Government of India. I with my class mate depicted his contributions in quantum physics and its applications in the field of science.

This competition was organized by Department of Physics of Patna Women's College.


CENTENARY CELEBRATIONS OF PATNA UNIVERSITY

Department of Physics, Patna Women's College

Patna University, Patna

Certificate

This is to certify that Ayisha Haque

Department of Industrial Microbiology, Patna Women's College, Patna University has

participated with

in Inter University Science Poster Competition on the topic

"Satyendra Nath Bose and his Contributions" on 3rd February 2018, at Patna Women's College