

Origin of life and its continuity

ESEB funded outreach Programme

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A Report

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Outreach activity- Summary

The concepts of evolution as taught in Indian schools is with only a focus on the historical developments in evolutionary process. However, basic concepts such as selection and neutral theory are left out. Study of molecular evolution and its significance is lacking. This activity tries to reach both high school students and under-graduate students in a novel way. Initially, a poster contest on the topic of “Evolutionary biology in the 21st century” was organized to encourage the students of under-graduate programmes to learn more about evolution and prepare posters. These posters were judged by experts in the field of evolutionary biology to select 10 best posters.

These selected 10 groups of under-graduate students were mentored and guided by mentors who are experts in the field of evolutionary biology to prepare posters in English that will explain concepts such as What is evolution, proof for evolution: fossils, genome synteny, selection, genetic drift, study of molecular evolution, study of macro evolution, convergent evolution and adaptation, recent developments in evolutionary biology, utility of evolutionary biology to the common man etc. The students were mentioned to deliver these concepts in a simple and attractive manner to the school children.

These trained groups of undergraduate volunteering students presented the posters at three different high schools in and around Mysore district. The students of 8th and 9th grade participated in this two hour interactive session. Around 300 students from three different identified were benefited from this program. After the workshop, the posters were handed over to respective schools to display in a prominent place on a permanent basis and also be used as a teaching aid.

Mysore as an Educational Hub

MYSORE city, known as the cultural capital of Karnataka, has always been considered a good destination for higher education and being elevated as Education hub which is committed to the tradition of liberal education, the inherent value of the pursuit of learning and the principle that knowledge must be an end in itself. The *Education* hub is a dynamic and creative space which aims to provide a vigorous inter- and multi-disciplinary set of forums for the examination and evaluation of education and the contexts where education is delivered. Using inter-disciplinary perspectives to look at historical and contemporary aspects and applied aspect of science and other subjects are given due importance.

Rationale for selecting Undergraduates and High school students

Though basic idea of elementary evolution is taught in schools, clear conceptualization and orientation towards study of evolution of man is lacking. To understand the subject, its guiding principles, its practical functions and its role in a multicultural society is not being given a serious thought in the present curriculum. There is a dire necessity to introduce and engage the young minds of undergraduates’ students with the emerging technologies within education and

explore the future for education in a globalised world especially with respect to the study of evolution of man and its fascinating for the young minds to explore their own origin.hence, this program aims to provide a glimpse of scientific developments towards the study of human evolution.

Activities

Poster presentation competition held at SJCE, Mysore on 20th March 2013.

Poster presentation contest on **“Origin of life and its continuity”** for first and second year undergraduate students was organized at Department of Biotechnology, SJCE on 20th March 2013 as part of outreach programme of European Society for Evolutionary Biology (ESEB). Expert committee short listed the 10 best posters and best posters three were given cash prizes of Rs. 5,000/-, 3,000/- and 2,000/-. Winning team members were mentored by three eminent professionals to prepare posters in different areas of Evolutionary biology to conduct an interactive exhibition in schools.



Participants explaining the evolutionary concept during poster presentation competition





Selection of Mentors- A brief profile

Different professionals working the area of Evolutionary Biology were consulted and explained about the objectives of the proposed program. The following three professionals agreed to be the mentors for the selected group of students.

Prof. N. B. RAMACHANDRA

Working as Professor (Genetics) and coordinator for M.Sc. Genetics, at department of studies in Zoology, Univ. of Mysore, Mysore, has many years of research and teaching experience in the field of (a) *Drosophila* Genetics and Evolution; and (b) Human Genetic diseases and Genomics. Under his expertise three groups who were selected among best posters in the competition were trained to prepare posters and present the same at different schools.

Prof. SUBHASH CHANDRA HIREMATH

Working as Visiting Professor, Department of Genetics, Karnatak University, Dharwad, Karnataka, India has extensive knowledge of Genetics, Genetic engineer and evolution. Has worked on evolution of DNA content in higher plants at Royal Botanical garden, Kew, England. He has understood the education model system at different countries and through his wide experience of teaching for more than forty years motivates students to take up research in basic and applied Biology. Three groups were mentored by him.

Dr. DEEPA AGHASE

Working as Young Investigator at National Center for Biological Sciences, Bangalore, India. Her research is largely focused on understanding the evolutionary and ecological processes underlying adaptive evolution, to address some key questions about adaptation. How do ecological conditions and genetic factors determine the basis and dynamics of adaptation? At the molecular level, what is the nature of selection acting on genome structure (e.g. arrangement of genes on chromosomes) and composition (e.g. GC%)? Conversely, how do these genomic characteristics affect adaptation?

She was approached to mentor some of the students as she is working in the area of ecology and evolutionary aspects of some of the insects. She readily agreed and mentored four groups of students.

Action Research Intervention:

Students worked under the mentorship of all three experts by continuous discussions, to prepare different posters to give an overview of some of the renowned historical cases of the evolution, human evolution and diseases.

Pictures taken during student- mentor meeting on 23rd March 2013



Dr. N Haraprasad , PI, introducing the mentors to the selected undergraduate students



Prof. N B. Ramachandra, discussing with selected undergraduate Students



Selected undergraduate **Students** discussing with **Prof. S. C. Hiremath**



Dr. Deepa Aghase with selected undergraduate **students**

Prize winners of poster preparation competition





Background of the schools selected for the outreach programme

Sumukha (Ind) P.U. college is a private school in Hebbal, Mysore run by few enthusiastic industrialists as trustee under the name Sumukha Institutions. This institution has student from different economical background. The President of the institution is Mr.Manjunath, who initially started with the Pre-University and later expanded it to high school.

JSS Mahavidyapeetha (JSSMVP) was started in 1928 with a small hostel for poor students pursuing higher studies in Mysore. It has grown into a gigantic educational movement today with over 300 institutions under its fold and with some 50,000 students. It is a non profitable organization, is credited with over 100 years of non-formal education and over 60 years of experience in formal education, running 115 schools and more than 50 colleges in and around Mysore. Two public schools namely, JSS public school at Siddharthanagr and JSS public school at SJCE campus under the aegis of JSSMVP were selected for conducting the outreach program.

Programme schedule

The school visit was scheduled in September, November and December as there was recess in the month of October.

Programmes at different schools: SUMUKHA SCHOOL VISIT

As a part of the interactive outreach program with funding from European Society of Evolution Biology, our first venture to spread the science of evolution amongst the school students, heralded at **Sumukha Educational Institute**, Hebbal, Mysore.

Sumukha foundation was established in the year 2009 and is already one of the leading institutes in the city. When we approached the Principal Mr.Govindiah regarding this event, we were received with a lot of enthusiasm and encouragement.

On the 25th September, students from class 8th and 9th and first year Pre University eagerly participated in the workshop. The concept of Evolution was instilled in the young curious minds by our group of students. We had five different posters on various aspects of Evolution viz Origin of Life, Forces leading to Evolution, Evolution of Sharks and Horses, Genetic Disorders, Evolution of Butterflies.

Besides the posters, audio visual aids were used in the smart class that the school provided, to depict the idea of Evolution through animated video that captivated the student's interests. We signed off the event by a discussion session where in children came to us with their queries and actively went through each poster. It was indeed an eventful day teaching young minds and dwelling ourselves in the world of Evolution.

Pictures taken at school during the outreach activity





JSS PUBLIC SCHOOL, SIDDARTHANAGAR -SCHOOL VISIT ON 31ST OF OCTOBER 2013

The ESEB team went on a school visit and presented posters to the 10th grade students of JSS Public School, Siddhartha Layout on the 31st of October 2013. The program began with the Welcome speech by the JSS Public School Principal, B. Latha. The introductory note to the program was given by Dr N. Haraprasad, Head of Department, Department of Biotechnology, SJCE. Dr B. P. Hema, Assistant Professor, Dept. of Biotechnology, SJCE, emphasized on the significance of evolutionary biology.

Ms. Deepashree N. and Ms. Pooja K. Narendra involved the students in an interactive session and gave a power-point presentation on the basics of Evolution. Concepts such as ancestor-descendent relationships, origin of life, evolution of organisms, evolution of man and the definition of evolution were introduced to the students. The fact that the nearest ancestor to man are the Neanderthals was established. The students were inquisitive to know the different details about evolution; most questions were answered at the interactive session.

Then the ESEB team presented posters on various topics. The students were divided into different groups and each group got an opportunity to interact with the ESEB team and learn about each poster. The posters exhibited covered topics like theories of evolution, forces affecting evolution, evolution of sharks and horses, butterfly evolution, evolution of birds from dinosaurs and genetic disorders in humans.

The students had a good learning experience with insights into the vast field of “Evolution”. The ESEB team also had a wonderful experience in disseminating information regarding the various aspects of Evolution and evolutionary biology.

JSS PUBLIC SCHOOL, SIDDARTHANAGAR





JSS PUBLIC SCHOOL, SJCE CAMPUS VISIT ON 7th DECEMBER 2013

As a part of European Society for Evolutionary Biology's (ESEB) initiative we had various school visits to familiarize high school students about evolutionary biology. This was our third visit.

We visited JSS Public School, SJCE campus. The audience mainly consisted of students studying in the tenth standard. We started with a presentation which lasted for about 45min. The presentation was made in such a way, that it was interactive. The presentation videos to aid students to get a glimpse of the basic evolutionary process.

First we told them what evolution is. Then we introduced them to the idea how various populations can have a single ancestor. By now they were very curious. They wanted to know about human evolution. This was showcased as a video. Then we told them what DNA was, how it is passed on through generations and its role in evolution. We also introduced them to concepts like speciation and variation in population. In the end the whole process of evolution was summarized in a video.

Throughout the presentation the students were very interactive. Their curiosity had no bounds as the question and answer session lasted more than an hour. Once this session was done we showcased our posters.

Every group showcased their respective posters and explained the concepts to the students in such a manner that it was easy for them to understand. The students enthusiastically participated and interacted in understanding the concepts depicted. Ultimately we had achieved our goal and more. Along with familiarizing them about the concept of evolution we have instigated a spark in them to know more about evolution.







Outcome of the outreach project

- 1. Concepts of evolution were discussed in three different schools consisting of 300 students in a fruitful manner. Both faculty and students enjoyed and appreciated the interactive session of the programme.**
- 2. Faculty members of the schools expressed a view that there is a need to introduce a course on evolutionary biology at school level.**
- 3. A short movie in the regional language will be prepared and played in the annual fare regularly conducted at Suttur, Mysore to create more awareness among commoners.**

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