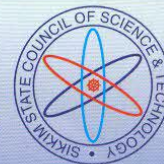


BIOGYAN

VOLUME VIII, Issue March 2014 to March 2015



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VIGYAN BHAWAN INAUGURATION

On 22nd February, 2014, a new office building of Department of Science & Technology and Climate Change "Vigyan Bhawan" was inaugurated by Hon'ble Chief Minister, Shri. Pawan Chamling in presence of Ministers including Minister, Department of Science & Technology and Climate Change Shri. Bhim Dhungel, public representatives, Secretaries, Head of the departments and officials of Department of Science & Technology and Climate Change and Sikkim State Council.

During the inaugural function, Hon'ble Chief Minister also released a compendium book on "Ethno-medicinal Plant Research of Sikkim Himalaya", authored by Dr. B.C. Basistha, Shri. Laydong Lepcha and Shri. K.B. Subba. The compendium was published by Bioinformatics Sub-DISC, Sikkim State Council of Science & Technology, Department of Science & Technology and Climate Change, with the support of Department of Biotechnology, Government of India.



Fig. The Hon'ble CM releasing a compendium

The compendium contains all the major research papers on Ethno-Medicinal plant species of Sikkim, published so far in peer reviewed national and international journals, published by various scientists and researchers.



Fig. The Hon'ble CM inaugurating Vigyan Bhawan

Training on Bioinformatics in Plant Genomic Research

Bioinformatics Sub-DISC, Sikkim State Council of Science & Technology, Department of Science & Technology and Climate Change has organized a training programme on Bioinformatics in Plant Genomic Researches, at Vigyan Bhawan, Deorali, on 14th March, 2015, with the support of Department of Biotechnology, Government of India.

Dr. Anil Mainra, IFS, Member Secretary, Sikkim State Council of Science & Technology, was the Chief Guest of the training program, while Shri. T.W. Khangsarpa, Additional Secretary, Department of Science & Technology, was the Guest of honor of the training

programme. Dr. B.C. Basistha, Additional Director & Coordinator, Shri. K.B. Subba, Assistant Scientific Officer & Co-coordinator, and Shri Laydong Lepcha, Information Officer, Bioinformatics Sub-DISC, were also present in the training programme.



Fig. Trainees along with Chief Guest and Resource Personals.

The Resource Persons Dr. Pardeep Kumar Bhardwaj, Scientist, Regional Centre for Institute of Bioresources and

Sustainable Development (RCIBSD), Government of India and Dr. Bikram Saha, North Bengal University, made an important presentation on plant genomic pathways, gene sequencing, expressed sequence tags, Gene mapping, development of gene construction targeting code, protein and suppressor gene of *Citrus iristeza* and transformation of Citrus plant and viral genes. Later a hands-on training to the trainees on Bioinformatics softwares in genomic research were also conducted. The participants of the training programmes were the research scholars of various research institutes including the Council and MSc. students from Sikkim University.

The trainees were awarded with certificates from the hands of Dr. Mainra.

Bioinformatics Education Programme (BEP)

A month long out reach programme on Bioinformatics education for the science students in the state was successfully completed by the Bioinformatics Sub-DISC, Sikkim State Council of Science & Technology, Department of Science & Technology and Climate Change.

The programme began from North Sikkim on 19th August 2014 in Mangan Senior Secondary School, followed by Hee Gyathang Senior Secondary School, Passingdang High Secondary School and Phodong Senior Secondary School, on 20th, 21st and 22nd August, 2014 respectively. In West Sikkim the Bioinformatics Education Programmes were held in Pelling, Govt. Senior Secondary



Fig. BEP programme in various colleges and schools of Sikkim

Training on NATURE on-site journals

On 18th November, 2014, Bioinformatics Sub Distributed Information Centre (Sub-DISC), Sikkim State Council of Science & Technology has organized a training programme on NATURE journals on-site access.



Fig. NATURE on-site journals training.

During the training Shri. Rajesh Kumar from NATURE Publishing group (NPG), highlighted upon the importance of NATURE journals in research publication and also provided hands-on training regarding the access of NATURE on-site journals.

The training was attended by the scientific personals who are involved in research in a various institutes like Sikkim State Council of Science & Technology, Regional Centre of Institute of Bioresources and Sustainable Development (RCIBSD).

School and Kyongsa Girls Senior Secondary School, Geyzing on 27th and 28th August, 2015, respectively.

In South Sikkim the BEP were conducted in Jorethang Senior Secondary School, Kamrang Government College, and Namchi Government Senior Secondary School, on 1st, 11th and 12th September, 2014 respectively. Similarly in East Sikkim the programmes were conducted in Tashi Namgyal Government Senior Secondary School, Rhenock Senior Secondary School and Sikkim Government College, Tadong on 13th, 16th and 22nd September, 2014 respectively.

During these month long Bioinformatics education programmes, Shri. Laydong Lepcha, Information Officer, Bioinformatics Centre, Sikkim State Council of Science & Technology, accompanied by Miss Ongkit Lepcha, DEO, made power point presentation and informed about the important aspects of Bioinformatics in Life Sciences and its recent contributions towards the development of Biological researches. The programme also inspired the science students to pursue innovative scientific studies like Bioinformatics in their career, which will not only develop their career; but also build resources of the state and the nation. The students were benefited by this programme as it help them to understand the recent advance in the fields of Biological sciences such as Bioinformatics. This Bioinformatics programme is first of its kind ever initiated in Sikkim.

7th North East Bioinformatics Network Coordinators' Meet

Bioinformatics Infrastructure Facility (BIF), Lumami, Nagaland University, has organized an annual 7th NEBINet (North East Bioinformatics Network) Coordinators' meeting, w.e.f. 11th-12th November, 2014.



Fig. 7th NEBINet 2014, Lumami, Nagaland University.

The meeting was attended by Coordinators and officials from all 29 Bioinformatics centers situated in various institutes, universities and colleges of North East India. Dr. B.C. Basistha, Additional Director & Coordinator, and Shri. Laydong Lepcha, Information

Officer, Bioinformatics Sub-DISC, Sikkim State Council of Science & Technology, Department of Science & Technology and Climate Change, have represented Sikkim Bioinformatics Sub-DISC. During the meeting all the centers presented their progress and activities by means of power point presentation. For Sikkim Bioinformatics Sub-DISC, Shri. Laydong Lepcha, presented progress of activities of the center.

In the meeting Dr. T. Madhan Mohan, Senior Adviser, Department of Biotechnology, Government of India and other higher authorities of Department of Biotechnology, Government of India, were also present.

On the final day of the meeting, venue of 8th NEBINet meeting was also selected, which will be taking place next year in Tripura University. The NEBINet coordinators' meet was first started from Sikkim in the year 2008.

Training on Phylogenetic Analysis in Molecular Biology

Bioinformatics Centre, Sikkim State Council of Science & Technology, Department of Science & Technology and Climate Change, organized a training programme on Phylogenetic Analysis in Molecular Biology, in the conference hall of Vigyan Bhawan, Deorali, Gangtok.

The chief guest of the inaugural function was Shri. S.K. Shilal, Member Secretary, Sikkim State Council of Science & Technology. The training was also attended by

Dr. B.C. Basistha, Additional Director & Coordinator, and Shri. K.B. Subba, Assistant Scientific Officer and Co-coordinator, Bioinformatics Sub-DISC, Sikkim State Council of Science & Technology.

The resource persons of the training programme were Dr. Mahua Rudra of North Bengal University and



Fig. Trainees along with resource persons of the meeting

Training on Application of Bio-informatics in Biological Research

Bioinformatics Centre, Sikkim State Council of Science & Technology, Department of Science & Technology and Climate Change conducted a Training Programme on "Application of Bioinformatics in Biological Research" on 13th March 2014, in Vigyan Bhawan.



Fig. Training under progress

Shri S.K. Shilal, Member Secretary, Sikkim State Council of Science & Technology was the Chief Guest of the training programme. The training was attended by the Research Scholars, students from State Bio-Tech Hub SSCS&T and Sikkim University. During the inaugural session, Shri. D.G. Shrestha, Additional Director and Shri. D.T. Bhutia, Additional Director, Sikkim State Council of Science & Technology were also present.

The Resource persons of this training programme, Dr. Pardeep K. Bhardwaj, Scientist, Regional Centre for Institute of Bioresources and Sustainable Development, Dr. Kiran Sunar, North Bengal University and

Short Article

Understanding Molecular Database in Bioinformatics

Laydong Lepcha and B.C. Basistha
Bioinformatics Centre, SSCST/DST&CC

Molecular database can be divided into two groups; a sequence databases, and Sequences related databases. The sequence database consists of actual Deoxyribonucleic Acid (DNA) and protein sequence. The online computational sources for sequence databases are EMBL (European Molecular Biological Laboratory), NCBI (National Centre of Biotechnological Information) and the DDBJ (DNA Data Bank of Japan). All above three database sources have a collaborative efforts containing identical data, albeit in a different format.

Sequencerelated databases contains further advance information about the sequences in the sequence databases. Entries in sequences related database always provide an explicit link to a sequence database.

Shri. Laydong Lepcha, Information Officer, Bioinformatics Sub-DISC, Sikkim State Council of Science & Technology.

During the training, methodology of Phylogenetic analysis by introducing MEGA-5 software, Phylip and fundamental of Phylogenetics research were introduced to the trainees. A hands-on session was also provided to the trainees. The training programme was attended by scientists, researchers from JICA institute, Sikkim Biodiversity Conservation Management Forest Project (SBCMFP), Sikkim State Council of Science & Technology and science students of Sikkim Government College, Tadong. The day long training was concluded by certificate distribution to the trainees.

Shri. Laydong Lepcha, Information Officer, Sikkim State Council of Science & Technology, delivered a valuable presentation to the participants on Bioinformatics tools and techniques, Bio-synthetic pathways, Primer designing, Metagenomics and phylogeny respectively. Shri. Laydong Lepcha, also gave a hands-on training to the trainees on protein sequence identification by using Bioinformatics tools and access of online journals.

The trainees were awarded certificates from the hands of Chief Guest.



Fig. Trainees along with the Chief Guest and the resource persons of the meeting

PDB (Protein Data Bank) is one of the best example, whose archives have further information about the sequences such as experimentally determined three-dimensional structures of biological macromolecules and contains atomic coordinates, bibliographic citations, primary and secondary structure information as well as crystallographic structure factors.



Fig. Molecular database in Bioinformatics

The Bioinformatics database are represented as a network, that forms a link between specific database resources. There are considerable number of molecular biology and related database available. While some are freely available such as EMBL and GENE BANK.

Research Journal publication 2014

Research Title: Understanding Significant Value of *Rhododendron arboreum* Smith Scarleti of Sikkim, India.

Laydong Lepcha*, B.C. Basistha, Sushen Pradhan, K.B. Subba, Rajdeep Gurung, N.P. Sharma

**Abstract:**

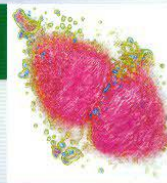
Rhododendron arboreum is one of the renowned *Rhododendron* plant species of Sikkim. It is vastly known for its scenario beauties and remained as attractive flower tree plant. *Rhododendron arboreum* is medicinally and economically a very important plant species. But, with the unceasing approaches of indecent factors and features the species is under threat in the state. In the study vital research was concluded by contributing an extensive field visit in natural habitat elevations of Sikkim. The morphological studies were conducted along with all the geographical and medicinal parameters. In order to authenticate the database local experts and scientific literatures were equally compared and analyzed. The main objective of the study was to analyze the significant value of *Rhododendron arboreum* and promote the importance of this species in the state, which ultimately helps to build a perception of conservative parameter of this species in the state.

International Journal of Engineering Science and Innovative Technology (IJESIT). Volume 3, Issue 4, July 2014.

Recent developments in Science & Technology**New 3-D imaging technology for living cells**

A microscope known as 3D Cell Explorer, combines state-of-the-art hardware with cutting-edge imaging software to record stunning 3D images of entire living cells within seconds and with a higher resolution than any conventional microscope. The result is a high-resolution 3D image of the cell that can be rotated and explored in depth. To run above technique a software called STEVE will have be installed. The sophisticated software helps the scientists, medics and students all around the world to enabled to travel inside 3D cells in full processing color.

Source: <http://www.biologynews.net/archives>

**Teixobactin: a new antibiotic**

Scientists have developed a new antibiotic, which is unique not only for its potential to fight new, more dangerous and resistant versions of bacteria, but also because of the innovative way it was cultivated. Teixobactin is derived directly from bacterial grown in soil. The laboratory test have shown that the new antibiotic can kill some bacteria as quickly as established antibiotics with no toxic side-effects and can cure laboratory mice suffering from bacterial infections with no toxic side-effects.

Source: DREAM 2047, March 2015, Vol.17, No.6.

500,000-year-old Animal residue in Prehistoric stone tools

In an interesting finding recently an archaeologists working among 500,000-year-old elephant remains at a Lower Paleolithic site in Revadim, Israel, analyzed 'hand axes' and 'scrapers' universally shaped and sized prehistoric stone tools, replete with animal residue.

The research represents the first scientifically verified direct evidence for the precise use of Paleolithic stone tools: to process animal carcasses and hides.

Source: <http://www.sciencedaily.com/releases/2015/03/150319150753.htm>



Fig. Residue in Prehistoric stone

Oldest Homo fossil found

In Ethiopia a 2.8-million-year-old jawbone was recovered that may represent the earliest fossil from the genus *Homo* discovered—pushing back the known origins of humankind by nearly 500,000 years. The fossil could belong to an ancestral *Homo* species, the authors say, filling a gap in the human fossil record.

Source: [Sciencehttp://dx.doi.org/10.1126/science.aaa1343\(2015\)](http://dx.doi.org/10.1126/science.aaa1343(2015))



Fig. Oldest Homo fossil

First contracting human muscle grown in laboratory

For the first time, scientists have been able to grow human muscles in the lab that behaves just like muscles in the body and contracts and responds to external stimuli such as electrical pulses and pharmaceuticals. Source: DREAM 2047, March 2015, Vol.17, No.6.

Queen bee microbiomes are starkly distinct from worker bees

Microbiome belonging to gut microbial communities are found to play a protective role against disease, as well as the central role of the queen bees in the proper function and health of the hive, similar analyses of honey bees have previously only been performed on worker bees. (Source: <http://www.biologynews.net/archives>)



Fig. Microbiomes

Bioinformatics unit: Dr. Anil Mainra, IFS, Member Secretary, Dr. B.C. Basistha, Additional Director and Coordinator, Shri. K.B. Subba, Assistant Scientific Officer and Co-coordinator, Shri. Laydong Lepcha, Information Officer, Miss Ongkit Lepcha, DEO and Mr. Kishore Prasad Sharma, DEO, Bioinformatics Sub-DISC, Sikkim State Council of Science Technology, Department of Science & Technology and Climate Change, Government of Sikkim, Vigyan Bhawan..

Chief Editor: Dr. Anil Mainra, IFS, Member Secretary, **Editor:** Dr. B.C. Basistha, Additional Director and Coordinator, Sikkim State Council of Science Technology, Department of Science & Technology and Climate Change, Government of Sikkim, Vigyan Bhawan, Deorali-737 102, Gangtok. Phone No. 03592-280026, 03592-252200 (O), Email: stcstsikkim.btisnet@nic.in, Website: www.bioinformticssikkim.gov.in