SCHOOL OF LIFE SCIENCES

Dean: Professor R. Lalthantluanga (till 6th November, 2005)
Professor Veena Tandon (w.e.f. 7th November, 2005)

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The School of Life Sciences comprises four academic departments: Biotechnology & Bioinformatics, Biochemistry, Botany and Zoology. The Department of Biotechnology & Bioinformatics started functioning from the beginning of May, 2005 and launched its post-graduate teaching programme, M. Sc. Biotechnology, with an intake of 10 students w.e.f. July, 2005. All the three other Departments have been supported by the UGC's Special Assistance Programme (SAP), as also by the DST under its 'Fund for Infrastructure in Science & Technology' (FIST) programme. While Botany and Zoology, after having successfully completed their third phase of SAP, are awaiting a visit by the UGC's Review Committee for another tenure, viz., continuation or next rung of SAP, the three Departments also completed the tenure of FIST and have applied for consideration for the next phase of FIST. Each department has identified its thrust areas of research that include Biodiversity (assessment, conservation and value addition), Biosystematics, Biotechnology, Enzymology, Ecology, Entomology, Endocrinology, Genetics, Immunology, Limnology, Medical Biochemistry, Microbiology, Nitrogen Fixation, Parasitology, Physiology, Protein Chemistry, Radiation Biology, and Reproductive Biology. All the Departments received substantial research grants from national and international funding agencies. The faculty members in the School are actively involved in research, have received several awards and have collaborative research programmes with national and international research groups. In awarding the 'University with potential for excellence' – status to NEHU, the UGC has recognized "Biosciences" as one of the two identified research foci under the programme. During the year 61 students were awarded M. Sc. and 8 Ph. D. degrees, while the first batch of M. Sc. Biotechnology students completed their first semester of the course. Five students qualified the UGC-CSIR NET during the year.

DEPARTMENT OF BIOCHEMISTRY

Head : Professor A. N. Rai (till 13th November 2005)
Professor R. Lalthantluanga (w.e.f. 14th November.2005)

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Thrust Area of Research: Adaptation Biochemistry is the thrust area of research in the Department of Biochemistry. It is divided into two main areas: (a) Plant-microbe interactions with special emphasis on the interactions between rice and diazotrophic cyanobacteria, and (b) Medical Biochemistry

which includes (1) Hormone and Aging Research, (2) Carcinogenesis and Radiation Molecular Biology, (3) Drug Delivery/Targeting and Immunotherapy, (4) Medicinal plants and Biodiversity, and (5) Protein Chemistry and Enzymology.

Brief Statement of Academic Activities: The Department admitted 15 students for M. Sc. programme and 3 students for Ph. D. programme during this year. The DRS programme is running for the 2nd year. In addition financial assistance for various funding agencies in the form of projects has also been received. During this period two students were awarded Ph. D. degree and one student cleared NET. Faculty members participated in/ organized various seminars/workshops/conferences/symposia etc.

Faculty:

Professors : R. Lalthantluanga, M. Sc./Ph. D. (Pune)
A. N. Rai, M. Sc.(BHU), Ph. D. (Dundee)*
R.. Sharma, M. Sc./Ph. D. (BHU)
R. N. Sharan, M. Sc./Ph. D. (JNU)
A. Alam, M. Sc.(AMU), Ph. D. (Moscow)

Readers : D. Syiem, M. Sc./Ph. D. (NEHU)
A. K. Singh. M. Sc.(Gorakh), Ph. D.(Hyd.)

Lecturers : P. K. Ambasht, M. Sc./Ph. D. (BHU)
M. B. Syiem, M. Sc./Ph. D. (NEHU)
L. Kma, M. Sc./Ph. D. (NEHU)
K. Shah, M. Sc./Ph. D. (BHU)*
(*On lien)

Visiting Professors/Fellow/Scholars: Dr. J. Bhattacharjee visited Plant Microbe Interaction group of the Department from 17th to 25th March, 2006 to conduct experiments on herbicide toxicity in Cyanobacteria.

Student Intake:

A. Enrolment capacity: M. Sc. - 15; Ph. D. - variable

B. Actual admission:

	SC/ST	Gen	Male	Female	Meghalaya	Non-Meghalaya
M. Sc.	14	1	4	11	15	-
Ph. D.	3	-	2	1	3	-

Degrees Awarded:

	SC/ST	Gen	Male	Female	Total
M. Sc.	12	3	4	11	15
Ph. D.	-	2	-	2	2

Ph. D.

Nonibala Khumanthem, "Studies on nitrogen metabolism and sporulation in the thermophilic cyanobacteria - *Mastigocladua laminosus*". Supervisor: Professor A.N. Rai.

Debipreeta Dutta, "Regulation of glucocorticoid receptors during dietary restriction in mice". Supervisor: Professor R. Sharma.

Placement of Students: (i) Mr. D. Goyary as a Scientist 'B', DRDO, Haldwani, Uttaranchal, (ii) Ms. Y. Choudhary as a Lecturer, Biotechnology

Department, St. Anthony's College, Shillong, (iii) Mr. Thy Answer Challam as a Lecturer, Biotechnology Department, St. Anthony's College, Shillong, (iv) Mr. James Wahlang as a Lecturer, Biochemistry Department, St. Edmund's College, Shillong, and (v) Ms. K. S. Nakhru as a Scientist 'B', DRDO, Tezpur.

Courses Conducted: Following courses were conducted for M. Sc.:

Semester I: Introductory Biological Chemistry; Environmental Biochemistry & Metabolic Pathway-I; Enzymology; Practicals.

Semester II: Techniques in Biochemistry; Physiological Chemistry; Bioenergetics; Practicals.

Semester III: Genetics; Medical Biochemistry; Metabolic Pathway-II; Practicals.

Semester IV: Molecular Biology; Microbiology; Immunology; Practicals.

Seminars/Conferences/Symposia/Workshops/Extension Programmes etc. Organized

A oneday seminar was organized on the topic "Trends in Biochemical Research" on 31st March 2006. The seminar was organized under DRS programme.

Attended

Prof. A. N. Rai chaired a session in "Workshop on Biodiversity of Agriculturally Impertinent Microbes in National Bureau of Agriculturally Impertinent Microbes", Mau, January 6-20, 2006.

Prof. R. Sharma (i) attended 11th Congress of International Association of Biomedical Gerontology held at Aarhus, Denmark, August 13-16, 2005 and presented a paper entitled, "Age dependent decrease in renal glucocorticoid receptor function is reversed by dietary restriction in mice", and (ii) participated as an invited team member in an ICMR sponsored Brain Storming Session on 'Priority Area in Aging Research' at NIN, Hyderabad on 13th October 2005 and presented a paper entitled "Dietary restriction and anti-aging properties".

Prof. R. N. Sharan (i) attended the 1st Asian Congress of Radiation Research (ACRR) held at Hiroshima, Japan, November 16-17, 2005 and presented his work entitled 'Plasmid DNA model reveals qualitatively different spectra of gamma-rays and Fenton oxidant induced DNA strand breaks and their processing in vitro and in vivo, (ii) presented a poster entitled 'Up regulated p53 plateaus with pre-cancerous nodulation in liver of mice chronically exposed to low-dose aqueous extract of betel nut (AEBN) in drinking water, in the 4th JSH-Single Topic Conference on Hepatocellular Carcinogenesis at Awaji Island, Japan, December 2-3, 2005, and (iii) delivered an invited talk entitled "Understanding qualitative difference between swift heavy ions and other quality of radiations on a plasmid DNA model: Medical implications" at the Inter-University Science Centre (IUSC), New Delhi on 21st October, 2005.

Dr. D. Syiem (i) chaired a session in SPIKAP & NEC sponsored 'Workshop for promotion of Indigenous-Mountain Herbal Therapy' organized Shillong on 25-26 April 2005, and (ii) presented a paper entitled "Intellectual

Property Rights and Patents" in the Center for Science Education at NEHU, November 12, 2005.

Dr. P. K. Ambasht presented a paper entitled "Application of Biochemistry to Global Pollution Management: A new Approach" at the UGC sponsored 'National Conference on Global Pollution: A serious threat to Indian Biodiversity' held at S. B. P. G. College, Baragaon, Varanasi, 31st January - 1st February, 2006.

Mr. R. K. S. Singh (Supervisor: Prof. A. N. Rai) attended 7th Agricultural Science Congress held at College of Agriculture, Pune, February 16-18, 2005 and presented a paper entitled 'Colonization of the roots and shoots of rice variety (RCPL-1-87-8) by *Nostoc* sp. Isolated from *Anthoceros punctatus'*.

Mr. A. Turtoi (Joint Supervisor: Prof. R. N. Sharan) delivered a talk titled 'Early Response of Lymphocyte proteins after gamma-radiation' in the "International Conference on Application of Radiotracers in Chemical, Environmental and Biological Sciences (ARCEBS-06)" at SINP, Kolkata, January 23-27, 2006.

Publications:

Journal Publications:

Published Abroad:

Sharan, R. N. 2005. UV-C Radiation Induced Confor-mational Relaxation of pMTa4 DNA in *Escherichia coli* may be the Cause of Single Strand Breaks. *International Journal of Radiation Biology*, 81: 919-927.

Devi, B. J., Schneeweiss, F. H. A. and Sharan, R. N. 2005. Negative Correlation Between Poly-ADP-Ribosylation of Spleen Cell Histone Proteins and Initiation Duration of Dimethylnitrosamine Exposure to Mice *In Vivo* Measured by Western Blot Immunoprobe Assay: A Possible Biomarker for Cancer Detection. *Cancer Detection and Prevention*, 29: 66-71.

Devi, B. J. and Sharan, R. N. 2005. Progressive Reduction in Poly-ADP-ribosylation of Histone Proteins During Dalton's Lymphoma Induced Ascites Tumorigenesis in Mice. *Cancer Letters*, doi:10.1016/j.canlet. 2005.07.014.

Odyou, M. and Sharan, R. N. 2005. Differential Strand Breaking Abilities of OH and ROS Generating Radiomimetic Chemicals and Gamma Rays: Study of Plasmid DNA, pMTa4, *In Vitro*. *Free Radical Research*, 39 (5): 499-506.

Sharan, R. N., Devi, B. J., Humtsoe, J. O., Saikia, J. R. and Kma, L. 2005. Detection and Quantification of Poly-ADP-ribosylated Proteins of Spleen and Liver Tissues of Mice *In Vivo* by Slot and Western Blot Immunoprobing Using Polyclonal Antibody Against Mouse ADP-Ribose Polymer. *Molecular and Cellular Biochemistry*, 278(1-2): 213-221.

Sharma, R., Nakamura, A., Takashshi, R., Nakamoto, H. and Goto, S. 2006. Carbolyl Modification in Rat Liver Histones: Decrease with Age and Increase by Dietary Restriction. *Free Radical Biology and Medicine*, 40: 1179-1184.

Published in India:

Bhattacharya, J., Singh, A.K., Singh, R. K. S. and Rai, A. N. 2005. Evidence for Metronidazole as a Specific Inhibitor of Nitrogenase Activity in Cyanobacterium *Nostoc* ANTH. *Indian Journal of Microbiology*, 45: 115-120.

Goyary, D. and Sharma, R. 2005. Dietary Restriction and Triiodothyronine Regulation of Malate-Aspartate Shuttle Enzymes in the Liver and Kidney of Mice. *Indian Journal of Biochemistry and Biophysics*, 42: 345-349.

Laskar, M. A., Lyngdoh, J. P., Buam, J.J. and Syiem, D. 2005. Plantlet Regeneration via Adventitious Shoot Bud Proliferation from Leaf Explants in *Potentilla Fulgens* Wall. Ex Hook. - A Plant Possessing Hypoglycemic Activity. *Indian Journal of Biotechnology*, 4: 257-260.

Syiem, M. B. 2005. Entrapped Cyanobacteria: Implications for Biotechnology. *Indian Journal of Biotechnology*, 4: 209-215.

Syiem, D., Joshi, S.R. and Syiem, M. B. 2005. Intellectual property Rights and North East India - issues and relevance. *Proc. National Seminar on Intellectual Property Rights*, St. Anthony's College, Shillong, pp. 145-149.

Book/ Book Chapter Publications:

Ambasht, R. S. & Ambasht, P. K. 2005. Environment and Pollution. 4th Edition, CBS Publishers and Distributors, New Delhi, India, pp. 314.

Humtsoe, J. O. and Sharan R. N. 2005. Molecular Radiobiology: Plasmid pMTa4 as a Tool for Studying Effects of Gamma-radiation *in vitro* and *in vivo*. In: *Radiobiology and Bio-Medical Research* (Ed. K. P. Mishra), pp 51-61. Narosa Publication, India.

Schneeweiss, F. H. A., Zerhuesen, S. and Sharan, R. N. 2005. Effects of Auger Emitting Radionuclide on Human Cells. In: *Radiobiology and Bio-Medical Research* (Ed. K. P. Mishra). Narosa Publication, India.

Funds Received from Agencies Other than NEHU:

SAP –DRS programme, UGC: Rs. 3.5 lakhs
DST, New Delhi: Rs. 18.5 Lakhs
NEC, Shillong: Rs. 10 lakhs

Infrastructure Facilities: The Department developed/procured Cell culture facility, Glass house, D Code System, and High Speed Table Top Cooling Centrifuge (Hermle make).

Research Projects:

Ongoing

SAP-DRS Programme, Coordinator: Prof. A. N. Rai; Dy. Coordinator: Prof. R. Sharma (UGC), Rs. 3.5 Lakhs.

Cyanobacteria as N-biofertilizer in sustainable agriculture: Biological nitrogen fixation in newly established artificial association between rice and cyanobacteria; Prof. A. N. Rai, Rs. 7.0 Lakhs.

North Eastern Biodiversity Research Cell, NEHU; Dr. D. Syiem, Rs. 10.0 Lakh, NEC, Shillong.

New
Fingerprinting of cyanobacterial strains isolated from North Eastern region, Shillong; Dr. A. K. Singh, Rs. 18.91 Lakhs, DST, New Delhi.

Academic/Professional Collaboration:

Prof. A. N. Rai collaborated with Universities of Dundee (UK) and Uppsala & Stockholm (Sweden).

Prof. R. Sharma collaborated with the Department of Cell and Molecular Biology, University of California, Berkley (USA); Institute of Enzyme Research, Tokushima University (Japan), and Department of Biochemistry, School of Pharmaceutical Sciences, Toho-University, Chiba (Japan).

Prof. R. N. Sharan collaborated with Research Centre, Jülich (Germany), Osaka University (Japan), University of Cambridge (UK) and JNU (New Delhi).

Dr. D. Syiem collaborated with several national agencies including NEC, MOEF, NBSAP, NEBRC.

Dr. P. K. Ambasht collaborated with Prof. M. V. Jagannathan, Molecular Biology Unit, Institute of Medical Science, BHU, Varanasi and Dr. A. M. Kayastha, School of Biotechnology, BHU, Varanasi.

Honours/ Awards/Recognition:
Prof. R. Sharma was nominated as a member of Editorial Board of 'Okinawa Wellness and Longevity Journal' Japan, 2005-2007.

Dr. D. Syiem was nominated as a member of Editorial Board for the *Journal of Applied Biosciences & Biotechnology, Assam*, 2005-2006.

Other Activities : A team from DRDO visited the Department for exploring collaborative work with Defense Labs. As a follow up, the team visited again on 7th April, 2006 led by the Chief Controller (R & D), DRDO.

Prof. A. N. Rai (i) visited Dibrugarh University, Assam (2-4 March, 2006) and delivered lecture to M. Sc. Biotechnology students and research scholars on "Energy Transformation in Biological Systems", and (ii) delivered a lecture at CAS in Botany, Madras University, Chennai, (27th March, 2006) on "Cyanobacterial-Plant Interactions".

Prof. R. Sharma delivered (i) a series of lectures in the Refresher Course in Zoology organized by the Department of Zoology, NEHU, Shillong (March 4, 11, 13 and 14, 2006), and (ii) a lecture on "The Role of Nutrition in Health and Longevity" organized by Govt. of India, MYAS, NSS, NER, Guwahati on 16th September, 2005).

Prof. R. N. Sharan visited Osaka University, Japan as an 'Invited Professor" for 3 weeks (Nov.-Dec. 2005). During the stay he delivered a seminar at the

University besides a special lecture in the newly established national research facility, the Institute of Biomedical Innovation, Osaka.

Dr. D. Syiem acted as a consultant to the Khasi Hills Autonomous District Council for establishment of a Park cum Botanical Garden (2006).

Dr. L. Kma participated in the UGC-sponsored Refresher course in Zoology organized by the Department of Zoology, NEHU, Shillong from 22nd February to 15th March, 2006.

DEPARTMENT OF BOTANY

Head : Professor Nikhil K. Chrungoo

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Thrust Area of Research: The Department of Botany has been in the forefront of teaching and research in plant sciences since its establishment in 1974. The thrust areas of research in the Department are (i) Ecological analysis of forest and agroforestry ecosystems of Northeast India including biodiversity inventorization and conservation, (ii) Molecular profile based characterization and documentation of plant genetic resources of the region, (iii) Bioprospecting of novel genes, promoters, biomolecules and enzymes from the floral diversity of Northeast India, (iv) Microbial diversity inventorization of forest and agroecosystems, (v) Conservation biotechnology of rare, endangered and endemic plants of Northeast India, (vi) Electronic herbarium and computer aided storage and retrieval systems for plant genetic resources, (vii) Development of molecular markers for native and transgenic bioinoculants, and (viii) Reproductive biology of plants and establishment of seed banks.

Brief Statement of Academic Activities: Intake capacity was increased from 20 to 23 students at M. Sc. level. A total of 16 Ph. D. students were admitted during the year. Externally funded research projects received a grant of Rs. 45.54 lacs. Distinguished visitors delivered lectures to the faculty and students from time to time. Four meetings of national importance were organized. Establishment of on-campus Botanic Garden at the University was completed. The Department organised a meeting of the Advisory Committee of the UGC-DSA (Phase II) and the Advisory Committee of the UGC-COSIST Programme. Educational excursion for Post Graduate students was undertaken during February, 2006. Two students qualified NET.

Faculty:

Professors : P. Tandon, M. Sc. (Lucknow), Ph. D. (Jodh.)
H. N. Pandey, M. Sc./Ph. D. (BHU)
A. K. Misra, M. Sc./Ph. D. (Meerut)
N. K. Chrungoo, M. Sc./Ph. D. (Kashmir)
R. C. Laloo, M. Sc./Ph. D. (Gau.)
M. S. Dkhar, M. Sc./Ph. D. (NEHU)

		N. Venugopal, M. Sc./Ph. D. (Madras)
Readers	:	Y. Kumar, M. Sc./Ph. D. (NEHU)
		L. Kharlukhi, M. Sc. (NEHU), Ph. D. (IARI)
		S. K. Barik, M. Sc. (Berhampur), Ph.D. (NEHU)
		Uma Shankar, M. Sc. (Agra), Ph.D. (NEHU)
Lecturers	:	H. Kayang, M. Sc./Ph. D. (NEHU)
		S. Kumaria, M. Sc./Ph. D. (NEHU)
		P. Ramanujam, M. Sc./Ph. D. (NEHU)

Visiting Professors/Fellows/Scholars:

Prof. R. N. Gohil, Department of Botany, University of Jammu visited the Department and delivered an extension lecture on "Two Track Heridity" in the Department on 6th October, 2005.

Members of the Governing Body of ICIMOD visited the Department on November 11, 2005 and interacted with the faculty and research scholars of the Department.

Dr. U. Dhar, Director, G. B. Pant Institute of Himalayan Environment and Development, Almora, visited the Department and delivered an extension lecture on "Biodiversity and Conservation in Indian Himalayan Region" on November 12, 2005.

Student Intake:

(a) Enrolment capacity: M. Sc.: - 23; Ph. D. - Variable

(b) Actual admission:

	SC/ST	Gen.	Male	Female	Meghalaya	Non-Meghalaya
M. Sc.	22	1	10	13	15	8
Ph. D.	13	5	7	11	18	-

Degrees Awarded:

	SC/ST	Gen.	Male	Female	Total
M. Sc.	17	1	8	10	18
Ph. D.	3	3	3	3	6

Ph. D.

Sanghamitra Purkayastha, "Developmental Physiology and Biochemistry of Somatic Embryogenesis in *Pinus Kesiya* Royle Ex. Gord". Supervisor: Prof. P. Tandon.

N. Odyo, "Ecological studies of some important tree species of subtropical humid forest of Meghalaya". Supervisor: Prof. H. N. Pandey.

V. Ralte, "Impact of shifting cultivation and mining on land degradation and soil biological processes in Nokrek biosphere reserve of Meghalaya". Supervisor: Prof. H. N. Pandey, Joint Supervisor: Dr. S. K. Barik.

Swapna D. Prabhu, "Impact of human activities on plant biodiversity of Nokrek Biosphere Reserve of Meghalaya". Supervisor: Prof. R. S. Tripathi, Joint Supervisor : Dr. S. K. Barik.

H. Lalruatsanga, "Morphological and Embryological studies of some *Podostemaceae* members of North Eastern India". Supervisor: Prof. N. Venugopal.

Ksh. Lal Bihari Singha, "Site-specificity, growth and productivity of Rui bamboo (*Arundinaria maling* Gamble) in Jang area of Arunachal Pradesh". Supervisor : Prof. R. S. Tripathi, Joint Supervisor : Dr. M. L. Khan.

Placement of Students:
(i) Dr. Sangeeta Bharali as Post Doctoral Fellow, Department of Biotechnology, IIT, Guwahati, (ii) Ms. Anusuya Rout as Research Associate, Department of Biotechnology, IIT, Guwahati, (iii) Dr. N. Odyo as Scientist in the Botanical Survey of India, Kolkata, (iv) Dr. V. Ralte as Lecturer in the Department of Botany, Pachunga College, Aizwal, (v) Dr. Vineeta Chauhan as Post Doctoral Fellow at University of Hyderabad, (vi) Dr. Swapna D. Prabhu as Research Associate in National Chemical Laboratory, Pune, (vii) Mr. Mangminlum Khongsai as Scientist in Division of Biotechnology, Regional Research Laboratory, Jorhat, (viii) Dr. Adani Lokho as Research Associate at Bio Resource Center of Department of Science & Technology, DST, Govt. of India, Upper Shillong, and (ix) Dr. H. Lalruatsanga as Lecturer in Botany at P. U. College, Mizoram University, Aizwal.

Courses Conducted:

Semester I: Mycology, Plant Pathology and Microbiology; Algae, Bryophytes and Pteridophytes; Gymnosperms and Plant Anatomy

Semester II: Plant Taxonomy and Phytogeography; Plant Biochemistry and Molecular Biology; Plant Development and Reproduction

Semester III: Genetics, Cytogenetics and Plant Breeding; Plant Ecology and Biostatistics; Plant Physiology

Semester IV: Plant Physiology; Biotechnology and Genetic Engineering of Plants and Microbes; Ecosystem Analysis and Environmental Conservation; Special papers (through Project work*)

*Project work in any one of the eight areas listed below:

(i) Higher Plant Ecology, (ii) Microbial Ecology, (iii) Plant Molecular Biology, (iv) Advanced Plant Physiology, (v) Taxonomy and Biodiversity of Angiosperms, (vi) Development and Reproduction of Angiosperms, (vii) Plant Biotechnology, and (viii) Plant Genetics and Cytogenetics.

Study Tours/Field Trips of Students: Dr. S. K. Barik took the M. Sc. students on a study tour to Central Institute of Medicinal and Aromatic Plants (CIMAP), Bangalore; Foundation for Revitalization of Local Health Tradition (FRLHT), Bangalore; Botanical Garden, Bangalore; Chamunda Hills, Mysore; Bandipur National Park, Madumallai Wildlife Sanctuary, Tamil Nadu; Ooty Botanical Garden, Ooty; Dodopeta; Medicinal plant conservation in Cinchona Village, Kerala Forest Research Insitute, Neelambur; First Teak Plantation plot, Neelambur; Teak Museum, Neelambur; Forest Department, Neelambur; KFRI, Peechi; Mangrove vegetation, Cochin; Marine ecosystems at Kanyakumari and Kovalam; and Tropical Botanical Garden and Research Institute, Trivandrum. 16th January, 2006 to 1st February, 2006.

The visit to scientific institutions and conservation areas of botanical interest forms an integral part of M. Sc. (Botany) syllabus. It is a credited

activity and the study tour report is evaluated by the external examiner during the practical examination of IV semester under the course BP-404. During the tour, a series of lectures and demonstrations were organized at the visiting institutes, where the eminent scientists of the country delivered lectures to our visiting students.

Prof. N. Venugopal and Dr. Y. Kumar took the M. Sc. students to Pontung, Pynursla and Dawki areas of Khasi Hills during April, 2005 for plant collection and field study.

Seminars/Conferences/Symposia/Extension Programmes:

Organized

The Department organized (i) one day workshop entitled "Interface for Technology Development and Transfer" on November 10, 2005, and (ii) a workshop on "State of Environment Reporting in Meghalaya" involving all the stakeholders at Shillong on 29th June, 2005.

Attended

Prof. P. Tandon (i) delivered an invited lecture on 'Biodiversity: Conservation and Sustainable Utilization' at the National Symposium on Molecular Ecology and Biodiversity held at the Bioinformatics Centre, Ranchi on 6th June, 2005 and also chaired a Technical Session at this symposium, (ii) chaired a session on Proteomics and in silico drug and vaccine design at the National Bioinformatics Symposium, February 1-2, 2006, Karnataka Veterinary, Animal and Fisheries Sciences University, Mangalore, and (iii) delivered an invited lecture on 'Strategies for *ex situ* Conservation of Plant Diversity' at the National Conference on Biodiversity Related International Conventions: Role of Indian Scientific Community during March, 8-10, 2006 at Indian National Science Academy, New Delhi.

Prof. H. N. Pandey (i) delivered a lecture in the U.G.C. refresher course for college and university teachers organized by Department of Botany, Rajiv Gandhi University, Itanagar, Arunachal, (ii) chaired session in the "National Symposium on Environmental Management in the 21st Century" held in the Centre of Advanced Study, Banaras Hindu University, Varanasi, 16-18 February, 2006, and (iii) chaired a session and delivered lecture in the "Brain Storming Session in Conservation of Forest Resources in North-East India: Issues and Challenges" organized by RC-NAEB, NEHU, Shillong, March 2006. He also delivered three invited lectures entitled (i) Plant diversity status and community structure of sacred forests of Meghalaya, (ii) Dynamics of sacred forest ecosystem, and (iii) Ecological analysis of agro-forestry systems in Meghalaya in the Agriculture and Ecology Research Unit of the Indian Statistical Institute, Kolkata, March 2006.

Prof. N. K. Chrungoo delivered 3 lectures during the UGC sponsored refresher course for college and University teachers organized by the Department of Botany, Rajiv Gandhi University, Itanagar, Arunachal Pradesh.

Dr. S. K. Barik (i) chaired a session in the workshop on "Policy intervention for the conservation of tropical forests in Meghalaya" organized by ATREE and Meghalaya Forest Department, held at Shillong on 19 July, 2005, (ii) acted as an invited expert member to present on "Joint Forest Management in North-East India: Past, Present and Future" in the workshop of National Forest Commission held at New Delhi on 16-17 December, 2005,

(iii) acted as an invited expert to the workshop on "Preparation of Third CBD (Convention on Biological Diversity) Country Report" organized by the MoEF, New Delhi held at Gurgaon on 20-21 May, 2005 and contributed/ spoke on Mountain Ecosystems, (iv) delivered a Keynote Address on "Biodiversity of Eastern Himalayas" by the International Centre for Integrated Mountain Development, Kathmandu to the Regional Workshop on "Access and benefit sharing of Biodiversity for the Eastern Himalayas" held at Kathmandu during 19-22 July, 2005, (v) delivered a special lecture on "Strengthening, Evaluation and Monitoring Mechanism under National Afforestation Programme" in the "Interactive workshop on evaluation and monitoring of National Afforestation Programme" held at Shillong on 23rd July, 2005 organized by the National Afforestation and Eco development Board, Govt. of India, New Delhi, (vi) delivered a talk on "Issue and Problems of tropical forest management in North-east India" in the workshop on "Tropical forest management" organized by ATREE held at Guwahati on 14th December, 2005, (vii) presented a paper on "Critical assessment of NAP project in West Bengal" at a workshop on "Evaluation and Monitoring of NAP" held at Jadavpur University, Kolkata during 3rd November, 2005, and (viii) presented a paper on "Spatial and temporal variations in shifting cultivation practices in north-east India and an insight into the question, whether sustainable land management is possible with jhum around?" in JNU-UNY-NIRD collaborative international workshop on "Shifting agriculture, Environmental Conservation and Sustainable livelihoods of Marginal Mountain Societies" held at Guwahati during 6-10 October, 2005, (ix) presented a paper on "Systems approach to conservation of traditional knowledge and indigenous knowledge-based biodiversity conservation practices" in the USEFI- sponsored Regional workshop on "Traditional Knowledge-based Biodiversity Conservation practices in north-eastern India" held at Shillong on 23-24 March, 2005, and (x) presented an invited paper entitled "Ecological and taxonomic diversity of plants in Nokrek Biosphere Reserve" in the WII-USDA Forest Service sponsored workshop on "Management of Forests in India for Biological Diversity and Forest productivity" held at Shillong on 13-14 December, 2005.

Dr. Suman Kumaria presented a paper in the Workshop on Interface for Technology Development and Transfer, NEHU, Shillong, 10th November, 2005 on the 'Technology for Mass Micropropagation of Some Orchids of Northeast India for Socio-Economic Upliftment of Womenfolk in Meghalaya'.

Dr. P. Ramanujam delivered a lecture on 'Photosynthesis' in the "Workshop on Teaching Biology for Secondary & Higher Secondary School/College Teachers of Meghlaya" organized by the Center for Science Education, NEHU, 7th -12th November, 2005.

Publications

(a) Journal Publications

Published in India:

Jeeva, S., Mishra, B. P., Kiruba, S., Venugopal, N., Kharlukhi, L., Regini, G. S., Das, S. S. M. and Laloo, R. C. 2005. Diversity of Medicinally Important Plant Species under Coconut Plantation in the Coastal Region of Cape Comorin. *Flora and Fauna*, 11 (2): 226-230.

Jeeva, S., Laloo, R. C. and Mishra, B. P. 2006. Traditional Agricultural Practices in Meghalaya, Northeast India. *Indian Journal of Traditional Knowledge*, 5 (1): 7-18.

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Kayang, H. 2005. Biological Diversity in Northeast India: Conservation Strategies. *Hills and Mountain Today*, 1 (1): 30-37.

Kumaria, S., Corrie, S., Sharma, A. and Tandon, P. 2005. *In Vitro* Conservation of Some Commercially Important Orchids of Northeast India. *International Journal of Forest Usufructs Managements*, 6 (2): 36-40.

Laloo, R. C., Kharlukhi, L., Jeeva, S. and Mishra, B. P. 2006. Sacred Forests of Meghalaya as a Treasure House of Medicinal Plants: Effect of Disturbance on Population Structure and Natural Regeneration of Important Species. *Current Science*. 90 (2): 225-232.

Mishra, B. P., Laloo, R. C., and Jeeva, S. 2005. Water Resources and Management. *Souvenir of Scott Research Forum, Nagercoil*, 1(1): 93-97.

Upadhaya, K., Pandey, H. N., Law, P. S. and Tripathi, R. S. 2005. Plants of Ethnobotanical Importance in the Sacred Groves of Jaintia Hills of Meghalaya. *Indian Forester*, 131: 819-828.

Venugopal, N. and Lalruatsanga, H. 2005. A New Record of *Hydrobryum Griffithii* (Wall Ex. Griffith) Tul. and *Podostemum Subulatus* Gardner (Podostemaceae) from Meghalaya, North East India. *Journal of Swamy Botanical Club*, 22 (1 & 2): 11-14.

Published Abroad:

Bhattacharjee, A. and Dkhar, M. S. 2005. Seed Mycoflora and Storage Effect in the Germination of French Bean (*Phaseolus vulgaris* Linn.). *Asian Journal of Microbiology, Biotechnology and Environmental Sciences*, 7(3): 577-582.

Chrungoo, N. K., Bharali, S. and Jamir, C. 2005. Seed Storage Proteins: Structure, Properties and Approaches for Improvement by Genetic Engineering. *International Treatise Series on Advances in Plant Physiology*, 8: 201-220.

Chrungoo, N. K. and Rout. A. 2006. Genetic Variation and Species Relationships in Himalyan Buckwheats as Revealed by SDS PAGE of Endosperm Proteins Extracted From Single Seeds and RAPD Based DNA Finger Prints. *Gen. Research Crop. Evolution online verion*, DOI: 10.1007/s 10722-006-0006-4.

Malabadi, R. B., Choudhary, H. and Tandon, P. 2004. Initiation, Maintenance and Maturation of Somatic Embryos From Thin Apical Dome Sections in

Pinus Kesiya (Royle Ex. Gord) Promoted by Partial Desiccation and Gellan Gum. *Scientia Horticulturae,* 102: 449-459.

Ralte, V. Pandey, H.N., Barik, S.K., Tripathi, R.S. and Prabhu, S. D. 2005. Changes in Microbial Biomass and Activity in Relation to Shifting Cultivation and Horticultural Practices in Subtropical Evergreen Forest Ecosystem of North-East India. *Acta Oecologia*, 28:163-172.

Upadhaya, K., Pandey, H. N., Law, P. and Tripathi, R. S. 2005. Dynamic of Fine Roots and Coarse Roots and Nitrogen Mineralization in a Humid Subtropical Forest Ecosystem of Northeast India. *Biology and Fertility of Soils,* 41: 144-152

Uma Shankar 2006. Seed Size as a Predictor of Germination Success and Early Seedling Growth in 'Hollong' (*Dipterocarpus macrocarpus* Vesque). *New Forests*, 31: 305-320.

Book/Book Chapter/Proceedings Publications

Tandon, P., Sharma, M. and Swarup, R. 2005. *Biodiversity - Status and Prospects*. Narosa Publishing House, New Delhi.

Darlong, V. T. and Barik, S. K. 2005. Recent Advances in EIA Procedure for Mining Projects. In: *Mining Environment: Problems and Remedies* (Ed. O.P. Singh), pp. 236-239. Regency Publications, New Delhi.

Pandey, H. N., Upadhaya, K., Jamir, S. A., Law, P. S. and Tripathi, R. S. 2005. Floristic Diversity in Sacred Groves of Meghalaya. In: *Plant taxonomy: Advances and Relevance* (Eds. A. K. Pandey, J. Wen and J. V. V. Dogra). pp. 83-99. CBS Publishers and Distributors, New Delhi.

Sarma, K. and Barik, S. K. 2005. Impact of Coal Mining on Vegetation of Nokrek Biosphere Reserve of Meghalaya. In: *Mining Environment: Problems and Remedies* (Ed. O. P. Singh). pp. 77-104. Regency Publications, New Delhi.

Tandon, P. and Kumaria, S. 2005. Prospects of Plant Conservation Biotechnology in India with Special Reference to Northeastern Region. In: *Biodiversity: Status and Prospects* (Eds. P. Tandon, M. Sharma and R. Swarup). pp. 79-92. Narosa Publishing House, New Delhi, India.

Uma Shankar 2005. Information Technology and its Applications in Teaching Life Sciences. In: *Proceedings of the UGC Sponsored National Seminar on Information Technology*, 26-28 October, 2004 (Eds. K. C. Sumi and I. W. Imchen), pp. 51-54. Fazl Ali College, Mokokchung, Nagaland.

Uma Shankar 2005. Indigenous Agroforestry Tree Species for Conservation and Rural Livelihoods. In: *Agroforestry in Northeastern India: Opportunities and Challages*, (Eds. B. P. Bhatt and K. M. Bujarbaruah), pp. 149 – 174. ICAR Research Complex for NE Region, Umiam, Meghalaya.

Funds Received from Agencies Other than NEHU :

Source	Amount (in Rs. Lakhs)
DBT	16.41
CIFOR	4.97
MoEF	7.90
DST-NSF	0.04
CFI*	7.46
GBPIHED	1.50
WAPCOS (MOWR)	7.26
Total	**45.54**

Infrastructure Facilities : The Department established a fully air conditioned 'Central Instruments Facility' with funds received from DST under its FIST programme. Most of the major equipments procured by the department from funding by the University as well as other sources have been transferred to the facility. The facility is manned by a STA who is assisted by a laboratory attendant. Besides construction of a Seminar hall, three research laboratories and one faculty chamber was completed under the IXth Plan.

A recent addition to the Botanical Garden has been the Controlled Environmental Facility for growing plants (Phytotron). This is the only facility of its type in the entire north eastern part of the country. This facility shall give tremendous boost to our ongoing teaching and research activities.

Research projects:

Ongoing

Conservation of rare and commercially important indigenous orchids of North-East India. Prof. P. Tandon (P.I), Dr. S. Kumaria (Co-P.I), Rs. 9.61 Lakhs, DBT, New Delhi.

Isolation and functional characterization of the gene and promoter for the lysine rich 26kDa seed globulin from common buckwheat. Prof. N. K. Chrungoo, Rs. 4.76 Lakhs, DBT, New Delhi.

Inventory and spatial mapping and modeling of sacred biodiversity landscapes for conservation in Meghalaya. Dr. Uma Shankar, Rs. 1.42 Lakhs, GBPIHED.

Study of forest fragmentation and its impact on population ecology of ethno and threatened plants of Khangchendzonga Biosphere Reserve, Sikkim. Prof. H. N. Pandey, Dr. S. K. Barik and Prof. R. S. Tripathi, Rs. 7.0 Lakhs, MoEF, New Delhi.

Ecorestoration of degraded sacred groves in Meghalaya. Prof. H. N. Pandey and Dr. S. K. Barik, Rs. 10.5 Lakhs, IERP-GBPHIED.

Ecological Studies in Bhagirathi and Alanknanda catchment area of Uttaranchal, S. K. Barik, Rs. 4.96 Lakhs, WPC MoWR.

New

NTFPs for livelihood development: Analysis of NRM policy environment in Meghalaya. Dr. S. K. Barik, Rs. 4.97 Lakhs, CIFOR.

Completed

Ecological studies in Ranswandi and Diwangor catchment areas of Arunachal Pradesh. Dr. S. K. Barik, Rs. 2.30 Lakhs, WPC MoWR.

State of environment reporting in Meghalaya. Dr. S. K. Barik, Prof. R. S. Tripathi and Prof. H. N. Pandey, Rs. 0.90 Lakhs, MoEF.

Development of sustainable landscape Model for Manipur and Meghalaya, North-East India. Dr. S. K. Barik and Prof. B. K. Tiwari, Rs. 7.46 Lakhs, CFI, Mac Arhtur Foundation.

Mass micropropagation of orchids towards socio-economic upliftment of women folk in Meghalaya. Dr. S. Kumaria and Prof. P. Tandon, Rs. 2.04 Lakhs, DBT.

Molecular Diversity and Ecology of actinorhizal symbionts found in the Sikkim region of Eastern Himalayas, A. K. Misra (P.I), R.S. Tripathi (Co-Investigator) and David Myrold, DST-NSF USA, Rs. 0.04172 Lakhs.

Microbial diversity of North-Eastern region with special reference to wood rotting fungi. Prof. M. S. Dkhar and Dr. H. Kayang, Rs. 8.79 Lakhs, DBT.

Academic Collaboration

Dr. S. K. Barik had collaboration with International Centre for Integrated Mountain Development, Kathmandu, Centre for International Forestry Research, Bogor, and Community Forestry International, USA.

Prof. A. K. Misra had collaboration with Oregon State University, USA.

Prof. N. K. Chrungoo had collaboration with National Institute of Nutrition, Rome and University of Ljubljana, Slovenia.

The Department collaborated with the following organisations:

(i) ICAR Research Complex for NE. Hill Region, Barapani, Shillong, (ii) Meghalaya Pollution Control Board, Shillong, (iii) Indian Institute of Science, Bangalore, (iv) Botanical Survey of India, Shillong, (v) Forest Department, Government of Meghalaya, Shillong, (vi) NBPGR Regional Centre, Shillong, (vii) North-Eastern Institute of Science and Technology, Nirjuli (Itanagar), Arunachal Pradesh, (viii) Indian Institute of Remote Sensing, Dehra Dun (Deptt. of Space, Govt. of India), (ix) Centre for Environmental Studies, NEHU, (x) Regional Centre, National Afforestation and Ecodevelopment Board (MoE&F, Govt. of India) established at NEHU; and (xi) Tea Research Association, Toklai.

Honours/Awards/Recognitions:

Prof. P. Tandon was appointed (i) Vice-Chancellor, North-Eastern Hill University, Shillong, and (ii) Member, Task Force, Bioinformatics, Department of Biotechnology, Ministry of Science and Technology, Government of India.

Prof. P. Tandon was awarded (i) "Professor Panchanan Maheshwari Medal Award" of Indian Botanical Society, and (ii) Dr. "T. N. Khoshoo Memorial Lecture Award" of The Orchid Society of India , 2006.

DEPARTMENT OF ZOOLOGY

Head : Professor B. B. P. Gupta (till 31st July 2005)
Professor S. B. Prasad (w.e.f. 1st August 2005)

Telephone : 272 2304 (O); 0364-2550093 (R)
E-mail : sbprasad@nehu.ac.in

Thrust Area of Research: The Department is engaged in research under the thrust area "Functional Biology" in various leading disciplines such as (i) Diversity of helminths and nematodes in N. E. region, and bioprospection of anthelmintic efficacy of plants used in traditional medicine, (ii) Biodiversity of freshwater Zooplankton and fishes and limnological studies in N.E. region, (iii) Adrenergic signal transduction in pineal gland, hormonal regulation of oxidative metabolism, and breeding biology of endangered fishes and amphibians, (iv) Mode of action of cisplatin as anticancerous drug, and efficacy of putative anticancerous plants from N.E. region, (v) Ecology, breeding, and developmental biology of amphibians (vi) Biochemical adaptations to nitrogen and carbohydrate metabolism, and nitric oxide signaling under various environmental stresses in air-breathing fishes, and (vii) Biodiversity of insects in N.E. region, and plant-based bio-pesticides and anti-diabetic compounds.

Brief Statement of Academic Activities: The Department offered M. Sc. and Ph. D. courses. During the year, 24 students were admitted in M. Sc. and 6 in the Ph. D. programmes. The Department conducted UGC-sponsored 30th Refresher course in Zoology for College and University Teachers, and also organized a Regional Symposium on Research Thrust in Animal Sciences in N.E. region – An Appraisal. The Department completed successfully the third phase of DRS programme (DRS-III), which was granted in the year 2001 by the UGC under its Special Assistance Programme (SAP). The Department also completed the 5 year DST-sponsored FIST programme, and received Rs. 57.00 Lakhs under various extramural research projects, which have a direct relevance to the socio-economic development of the N.E. region. Two students qualified CSIR-UGC NET.

Faculty:

Professors	:	V. Tandon, M. Sc.(Hons.)/Ph. D. (Panj.)
		B. K. Sharma, M. Sc.(Hons.)/Ph. D. (Panj.)
		B. B. P. Gupta, M. Sc./Ph. D. (BHU)
		S. B. Prasad, M. Sc./Ph. D. (BHU)
		R. N. K. Hooroo, M. Sc./Ph. D. (NEHU)
		N. Saha, M. Sc./Ph. D. (NEHU)
		B. Kharbuli, M. Sc./Ph. D. (NEHU)
Readers	:	A. Chatterjee, M. Sc.(Burdwan), Ph. D. (BHU) (on lien)
		S. N. Ramanujam, M. Sc.(Bangalore), Ph. D. (NEHU)

		A. K. Yadav, M. Sc.(Agra), Ph. D. (NEHU)
		A. S. Dixit, M. Sc.(Gorakh.), Ph. D. (BHU)
Lecturers	:	S. Choudhury, M. Sc./Ph. D. (NEHU)
		S. R. Hajong, M. Sc./Ph. D. (NEHU)
		B. Roy, M. Sc.(N. Bengal), Ph. D. (NEHU)

Visiting Professors/Fellows/Scholars:

Dr. V. P. Sharma, "M. N. Saha Distinguished Fellow" of NASI and former Additional Director General, ICMR visited the Department, and delivered a lecture on '*Artemisia annua* - a herbal remedy for severe malaria' on August 18, 2005.

Professor Samir Bhattacharya (FNA, FNASc, FASc), former Director of IICB, Kolkata, Department of Zoology, Visva-Bharati University, Santiniketan visited the Department, and delivered a lecture on 'Molecular mechanisms involved in Diabetes mellitus: a global epidemic disease' on September 9, 2005.

Professor Shelly Bhattacharya, Department of Zoology, Visva-Bharati University, Santiniketan visited the Department and delivered a lecture on 'Cellular interaction with xenobiotics in animals' on September 9, 2005. The lecture was sponsored by the NASI NE Region Chapter and the Bioinformatics Centre, NEHU.

Mr. Brian D. K. Daly, President, Meghalaya Adventurers' Association, Shillong delivered an invited lecture on "An overview of caves in Meghalaya" on November 25, 2005

Student Intake:

A. Enrolment capacity: M. Sc. - 24; Ph. D. – Variable

B. Actual Admission:

	SC/ST	Gen	Male	Female	Meghalaya	Non-Meghalaya
M. Sc.	20	4	11	13	12	9
Ph. D.	4	2	1	5	4	2

Degrees Awarded:

	SC/ST	Gen	Male	Female	Total
M. Sc.	20	3	12	11	23
Ph. D.	-	1	-	1	1

Ph. D.

Y. Premabati, "Study of thyroid-pineal interrelationship in the fish, *Glarias gariepinus*". Supervisor: Prof. B. B. P. Gupta.

Placement of Students:

(i) Dr. Carina Goswami as a lecturer in St. Mary's B. Ed. College, Shillong, (ii) Dr. Y. Premabati as a P. G. Teacher in J. N. V., Kohima, (iii) Dr. Pradip Kumar Kar as a lecturer in the P.G. Department of Zoology, Darjeeling Govt. College (University of North Bengal), Darjeeling, (iv) Dr. Arundhati Bhattacharjee as a lecturer in the St. Peter's College, Shillong, (v) Ms. E. M. Pala as a Lecturer of Zoology in Shillong College, Shillong, and Ms. Chumbeni Kikon as a P. G. Teacher in Govt. Higher Secondary School, Wokha, Nagaland.

Courses Conducted: Following courses were conducted for M. Sc.:

Semester I: Cell Biology & Immunology; Molecular Biology; Animal Physiology.

Semester II: Biological Chemistry; Genetics and Developmental Biology; Parasitology and Entomology.

Semester III: Ecology and Environmental Biology; Endocrinology and Reproductive Biology; Aquatic Biology and Fisheries.

Semester IV: Biosystematics & Evolution; Techniques in Biology and Biometrics; Special Paper*.

*Special Papers offered: Biochemical Adaptation and Metabolic Regulation; Developmental Biology and Differentiation; Endocrinology and Reproductive Physiology; Insect Physiology; Helminth Parasitology; Limnology; Molecular Cell Biology & Immunology.

Study Tour/Field Trips of Students: Dr. S. Choudhury and Dr. S. R. Hajong took the M. Sc. Students on study tour to Trivandrum, Kanyakumari, Thekkadi Wildlife Sanctuary, Chennai and Kolkata (January 10 - 30, 2006).

Seminars/Conferences/Symposia etc.:

Organised

The Department organized (i) a "Regional Symposium on Research Thrust in Animal Sciences in N. E. Region - An Appraisal", March 24-25, 2006, and (ii) the 30th Refresher Course on "Recent Advances in Zoology" from February 22 to March 15, 2006 (Coordinator: Prof. R. N. K. Hooroo).

Attended

Prof. V. Tandon attended "17th National Congress of Parasitology, RMRC (ICMR)", Dibrugarh, October 24-26, 2005 and chaired a session.

Prof. B. B. P. Gupta attended the "XVII National Symposium on Chronobiology", October 1-3, 2005, Department of Zoology (Centre for Advanced Study), Banaras Hindu University, Varanasi, delivered an invited lecture entitled, "Adrenergic signal transduction and melatonin rhythm in mammalian pineal" and chaired a session.

Prof. B. Kharbuli (i) attended the "11th All India Peoples' Science Congress", 2-5 February 2006, Srimanta Sankaradeva Kalakhetra, Panjabari, Dispur and presented a paper entitled "Biodiversity Conservation in North East India", and (ii) "Capacity Building Workshop on Farmers' Rights to Livelihood in Hindu-Kush Himalayan Region Phase – II", February 8, 2006, Shillong and presented a paper entitled, "Commercialisation of Traditional Knowledge and Benefit Sharing".

Mr. P. K. Prasad (supervisor: Prof. V. Tandon) attended (i) International Transfer of Technology Initiative Workshop on Parasitology & Genotoxicity in Sustainable Aquaculture', Department of Zoology, Allahabad University, September 14-16, 2005, presented a poster of a paper entitled, "Surface fine topography of metacercaria of *Paragonimus sp.* from edible crabs in Arunachal Pradesh" and received the Late Prof. Sohan Lal Mishra award for best poster presentation, and (ii) 17th National Congress of Parasitology, RMRC (ICMR)", Dibrugarh, October 24-26, 2005 and presented a paper entitled, "PCR-based determination of second internal transcribed spacer

(ITS2) region of ribosomal DNA of giant intestinal fluke *Fasciolopsis buski*: egg and adult stages".

Following research students of the Department attended the "Regional Symposium on "Research Thrust in Animal Sciences in the N.E. Region - An Appraisal", March 24-25, 2006, organized by the Department of Zoology, N.E.H.U., Shillong, and presented papers as per details given below:

(i) Mr. P. K. Prasad (Supervisor Prof. V. Tandon): "PCR-based determination of metacercaria of Paragonimus sp. from edible crabs in Arunacahal Pradesh, North-east India".

(ii) Mr. C. Kikon (Supervisor: Prof. B. B. P. Gupta): Effects of leptin on the plasma levels of triiodothyronine (T_3) and thyroxine (T_4) in the air-breathing fish, *Clarias gariepinus*.

(iii) Ms. K. Kharshiing (Supervisor: Prof. B. B. P. Gupta): Phase-dependent changes in diurnal rhythm of sensitivity of arylalkylamine-N-acetyltransferase (AA-NAT) activity to norepinephrine in the photoreceptive pineal of air-breathing catfish, *Clarias gariepinus*.

(iv) Mr. L. Yanthan (Supervisor: Prof. B. B. P. Gupta): *In-Vitro* effects of steroid hormones on arylalkylamine-N-acetyltransferase (AA-NAT) activity in the fish pineal during different phases of the breeding cycle.

(v) Mr. Th. Nilachandra (Supervisor: Prof. B. B. P. Gupta): Induced breeding of endangered chocolate mahseer, *Neolissocheilus hexagonolepis* (McClelland) with ovaprim.

(vi) Mr. B. K. Saha (Supervisor: Prof. B. B. P. Gupta): Biodiversity of amphibians in the Kakoijana reserve forest: breeding ground of the endangered frog, *Rana leptoglossa* (Cope, 1868).

(vii) Mr. G. Rosangkima (Supervisor: Prof. S. B. Prasad): Antitumour potential of herbal plant, *Dillenia pentagyna*, against murine ascites alton's lymphoma.

(viii) Ms. A. J. Iangrai (Supervisor: Prof. R. N. K. Horoo, Joint Supervisor: Prof. B. B. P. Gupta): Observations on mating, nest site selection and foam nest construction of the tree frog *Polypedates leucomystax* in Meghalaya.

(ix) Ms. S. Sailo (supervisor: Prof. R. N. K. Horoo): Studies on the breeding and development of *Rana nicobariensis* (Stoliczka, 1870) (Anura: Ranidae).

(x) Ms. S. Datta (Supervisor: Prof. N. Saha): Air-breathing walking catfish, *Clarias batrachus* upregulates the glutamine synthetase and carbamyl phosphate synthetase III to avoid ammonia toxicity during aerial exposure.

(xi) Ms. K. Biswas (Supervisor: Prof. N. Saha): Expression of different isoforms of nitric oxide synthases, and the effects of osmotic and oxidative stress on the production of nitric oxide in the air-breathing catfish, *Clarias batrachus*.

(xii) Mr. V. Tangpu (Supervisor: Dr. A. K. Yadav): Antidiarrhoeal activity of *Cymbopogon citratus* Stapf (Gramineae), a plant used in the folk medicine system of Tangkhul Naga tribe.

(xiii) Lalramliana (Supervisor Dr. A. K. Yadav): Biocontrol potentials of entomopathogenic nematodes against *Colocasia* corm borer, *Haplosonyx chalybaeus* Hope (Coleoptera: Chrysomellidae).

Publications:

Journal Publications

Published Abroad:

Das, B., Tandon, V. and Saha, N. 2006. Effects of Isoflavone from *Flemingia Vestita* (Fabaceae) on the Ca^{2+} Homeostasis in *Raillietina echinobothrida*, the Cestode of Domestic Fowl. *Parasitology International*, 55: 17-21.

Dutta, A., Chakraborty, A., Saha, A., Ray, S. and Chatterjee, A. 2005. Interaction of Radiation- and Bleomycin Induced Lesions and Influence of Glutathione Level on the Interaction. *Mutagenesis*, 20: 329-335.

Julka, M. J., Ramanujam, S. N. and Lalthanzara, H. 2005. On New Species of Earthworm Genus *Eutypjoeus* (Octochaetidae: Oligochaeta) from Mizoram, India. *Megadrologica*, 10: 69-72.

Kayang, H., Kharbuli, B., Myrboh, B. and Syiem, D. 2005. Medicinal Plants of Khasi Hills of Meghalaya, India. *Acta Horticulturae*, 675: 75-80.

Kharbuli Z. Y., Datta S., Biswas, K., Sarma, D. and Saha, N. 2006. Expression of Ornithine-Urea Cycle Enzymes in Early Life Stages of the Air-Breathing Catfish, *Clarias batrachus* and Induction of Ureogenesis Under Hyper-Ammonia Stress. *Comparative Biochemistry and Physiology*, 143B: 44-53.

Kumar, A., Solanki, G. S. and Sharma, B. K. 2005. Observations on Putrition and Allomothering in Wild Capped Langur (*Trachypithecus Pileatus*). *Primates*, 46: 215-217.

Ray, S. and Chatterjee, A. 2006. Influence of Endogenous Glutathione Level on X-Ray Induced Cell Cycle Delay in Human Lymphocytes. *Cell Proliferation* 39: 37-47.

Sharma, B. K. 2005. Rotifer Communities of Floodplain Lakes of the Brahmaputra Basin of Lower Assam (N. E. India): Biodiversity, Distribution and Ecology. *Hydrobiologia*, 533: 209-221.

Sharma, B. K. and Sharma, S. 2005. Biodiversity of Freshwater Rotifers (Rotifera: Eurotatoria) from North-Eastern India. *Mittleilungen Aus Dem Museum Fur Naturkunde Berlin, Zoologische Reihe*, 81: 81-88.

Sharma, B. K. and Bhattarai, S. R., 2005. Hydro-biological Analysis of a Peat Bog with Emphasis on its Planktonic Diversity and Population Dynamics in Bumdeling Wildlife Sanctuary: Eastern Bhutan. *Limnology*, 6: 183-187.

Tangpu, V., Temjenmongla and Yadav, A. K. 2006. Anticestodal Property of *Strobilanthes discolor*: An Experimental Study in *Hymenolepis diminuta* – Rat Model. *Journal of Ethnopharmacology*, 105: 459-463.

Temjenmongla and Yadav, A. K. 2005. Anticestodal Efficacy of Folklore Medicinal Plants of Naga Tribes in North-East India. *African Journal of Traditional and Complementary Medicines*, 2: 129-133.

Published in India:

Lalramliana, Yadav, A. K. and Shylesha, A. N. 2005. Effects of Temperature and Relative Humidity on the Emergence of Infective Juveniles of *Heterorhabditis Indica* - A Locally Isolated Entomopathogenic Nematode in Meghalaya, India. *Indian Journal of Nematology*, 35:157-159

Prasad, S. B., Rosangkima, G. and Khyniam, D. 2006. Cisplatin-induced Toxicological Effects in Relation to the Endogenous Tissue Glutathione Level in Tumor-Brearing Mice. *Asian Journal of Experimental Sciences*, 20: 55-68.

Sailo, S., Kharbuli, B. and Hooroo, R. N. K. 2005. Record of *Kaloula pulchra* (Gray, 1831) from Mizoram, North East India, with Notes on its Burrowing Behavior. *Cobra*, 62: 25-28.

Sharma, B. K. and Sharma, S. 2005. Freshwater Rotifer Taxocoenosis (Rotifera: Eurotatoria) of Orissa, with Remarks on its Composition. *Records of Zoological Survey of India*, 104: 41-55.

Sharma, B. K. 2005. Phytoplankton Communities of a Floodplain Lake of the Brahmaputra River Basin, Upper Assam. *Journal of the Indian Fisheries Association*, 31: 27-35.

Tandon, V., Chakravarty, R. and Das, B. 2005. Four New Species of the Genus *Lytocestus* (Caryophyllidea, Lytocestidae) from Edible Catfishes in Assam and Meghalaya, India. *Journal of Parasitic Diseases*, 29: 131-142.

Tandon, V., Kar, P. K., Das, B., Sharma, B. and Dorjee, J. 2005. Preliminary Survey of Gastrointestinal Helminth Infection in Herbivorous Livestock of Mountainous Regions of Bhutan and Arunachal Pradesh. *Zoo's Print Journal*, 20: 1867-1868.

Tandon, V., Imkongwapang, R. and Prasad, P. K. 2005. On Two New Species of the Trematodes Genera, *Opisthioparorchis* Wang, 1980 and *Batrachotrema* Dollfus and Williams, 1966 (Batrachotrematidae), with a Report of a Chinese Species of *Opisthioparorchis* from Anuran Amphibian Hosts in India. *Zoo's Print Journal*, 20: 1883-1887.

Temjenmongla, Tangpu, V. and Yadav, A. K. 2006. Anticestodal Efficacy of *Psidium guajava* Against Experimental *Hymenolepis diminuta* Infections in Rats. *Indian Journal of Pharmacology*, 38: 29-32.

Book/Book Chapter Publications:

Prasad, S. B. 2005. Cancer and Anticancer Drug, Cisplatin. In: *Cancer - a Cytogentic and Molecular Approach*, (Ed. V. Rai,). Bioved Research Society Publications, Allahabad, pp. 161-176.

Ramanujam, S. N. 2005. Biodiversity of Aquatic Fauna of Mizoram: The Present Scenario. In: *Aquatic Biodiversity in India*, (Eds. D. R. Khanna, A. K. Copra and G. Prasad). Daya Publication House, Delhi, pp. 61-80.

Tandon, V. and Dhawan, B. N. 2005. Infectious Diseases of Domestic Animals and Zoonoses in India. In: *Proceedings of National Academy of Sciences, India*, 75(B) - Special Issue, 2005, p. 298.

Tandon, V. and Roy, B. 2005. Status of Helminthiasis in Livestock of Northeast India. In: *Infectious Diseases of Domestic Animals and Zoonoses in India*, (Eds. V. Tandon and B. N. Dhawan,), Proceedings of National Academy of Sciences, India, Volume 75(B) Special Issue, 2005, pp. 229-245.

Tangpu, V. and Yadav, A. K. 2005. Antidiarrhoeal Efficacy of *Swertia Angustifolia*. In: *Proceedings of International Conference on Botanicals: Promotion and Development with International Coordination*, Allied Book Agency, Kolkata, pp. 418-421.

Tangpu, V., Temjenmongla and Yadav, A. K. 2006. Some Important Folklore Medicinal Plants Used by Tangkhul Nagas of Ukhrul District, Manipur. In : *Recent Progress in Medicinal Plants*. Studium Press LLC, Houston, TX, U.S.A., Volume 16, pp. 309-320.

Funds Received from Agencies other than NEHU:

Ministry of Environment & Forests, New Delhi.	Rs. 4.28 Lakhs
G. B. Pant Inst. of Himalayan Env. & Development.	Rs. 4.99 Lakhs
DST, New Delhi	Rs. 7.04 Lakhs
DBT, New Delhi	Rs.25.07 Lakhs
UGC, New Delhi	Rs. 5.63 Lakhs
DONER-NEC, New Delhi	Rs.10.00 Lakhs
Total	**Rs.57.01 Lakhs**

Infrastructure Facilities: The Department procured AO-Poster printer, Olympus microscope, Digital camera. Construction of the Biodiversity museum commenced under the Xth Five Year Plan.

Research Projects:

Ongoing

All India Co-ordinated Project on Capacity Building in Taxonomy Research on Helminths & Nematodes. Prof. V. Tandon, Rs. 4.28 Lakhs, Ministry of Env. & Forest, New Delhi.

Baseline Environmental Survey of Domiasiat and Adjacent Areas. Prof. B. K. Sharma and Prof. B. Kharbuli (Co-PIs), Rs. 143.00 Lakhs, DAE-DST, New Delhi.

In vitro Studies on Adrenergic Regulation of N-acetyltransferase (NAT) Activity in Fish Pineal. Prof. B.B.P. Gupta, Rs. 14.70 Lakhs, DST, New Delhi.

Establishment of North Eastern Biodiversity Research Cell at NEHU. Prof. B. Kharbuli, Rs. 10.00 Lakhs, DONER-NEC, New Delhi.

New

Status and PCR-based Molecular Discrimination of Paragonimiasis and other Crustacea-born Trematode Zoonoses in Northeast India; V. Tandon, Rs. 22.82 lakhs, DBT, New Delhi.

Anthelmintic Activity of Some Traditional Medicinal Plants in Mizoram. Dr. B. Roy, Rs.4.99 Lakhs, G. B. Pant Institute of Himalayan Environment and Development.

Completed

Biodiversity and Ecology of Zooplankton of Floodplain Lake of Assam and Manipur (N.E. India). Prof. B. K. Sharma, Rs. 4.90 Lakhs, G. B. Pant Institute of Himalayan Env. & Development, Dehradun.

Culture of Carps and Air Breathing Fishes in Hilly Region and Transfer of Technology to Rural Population of Meghalaya. Prof. N. Saha, Rs. 9.31 Lakhs, DBT, New Delhi.

The Influence of Endogenous Glutathione on the Induction on Delay in Cell Cycle, Chromosome Aberrations and Apoptosis by High and Low LET Irradiation and the Involvement of p53 Dependent Pathway in it. Dr. A. Chatterjee, Rs. 3.5 Lakhs, NEC/UGC, New Delhi.

Academic/Professional Collaboration:

Prof. B. K. Sharma undertook work on Biodiversity of Zooplankton in floodplain lakes of Assam in collaboration with Zoological Survey of India, Kolkata/Shillong.

Prof. B. B. P. Gupta worked in collaboration with HSD. R. Spessert, Department of Cell Biology and Anatomy, J. G.-University of Mainz, Mainz, Germany on photoperiodic regulation of clock genes in the rat pineal.

Prof. N. Saha worked in collaboration with Prof. Dr. D. Häussinger, Director, Department of Gastroenterology, Hepatology and Infectiology, Heinrich-Heine University of Düsseldorf, Düsseldorf, Germany on molecular mechanism of induction of induced nitric oxide synthase and protein nitrotyrosine.

Honours/Awards/Recognition :

Prof. V. Tandon was admitted to the Fellowship of Indian Society for Parasitology (2005). She was elected as President, Indian Society for Parasitology (2006).

Prof. N. Saha was awarded Senior DAAD Fellowship for two months (December 1, 2005 to January 31, 2006) for carrying out postdoctoral research work in Germany.

Other Activities:

Prof. V. Tandon attended "Symposium on 'Excitement in Science': Platinum Jubilee Year Celebrations of NASI, Allahabad, October 6-7, 2005. During the inaugural event of the Platinum Jubilee celebrations, her co-edited book "*Infectious Diseases of Domestic Animals and Zoonoses in India*" was released by His Excellency, the President of India. She also attended "National Conference on Biodiversity Related International Conventions: Role of Indian Scientific Community", INSA, New Delhi, March 8-10, 2006.

Prof. B. K. Sharma and Prof. S. B. Prasad attended the workshop on "*Vision NER 2020*". March 27-28, 2005, North-Eastern Hill University, Shillong.

Prof. B. B. P. Gupta was selected by the NCERT, New Delhi as a member of its Textbook Development Committee for the Biology Textbook for Class XI.

Prof. B. Kharbuli attended the International Symposium on "Towards Sustainable Livelihoods and Ecosystems in Mountainous Regions", Chiang Mai University, Chiang Mai, March 7-9, 2006

Dr. S. N. Ramanujam acted as a resource person in the workshop on "Teaching Biology for Secondary and Higher Secondary School/College Teachers of Meghalaya", Centre for Science Education, NEHU, Shillong, from November 7-12, 2005.

Dr. A. S. Dixit acted as a Resource Person in the training programme on "Capacity Building of Functionaries in Environmental Education" conducted by North-East Regional Institute of Education, NCERT, Shillong, March 27 - 31, 2006.

Dr. B. Roy attended the UGC-sponsored "30th Refresher course in Zoology", held from 22nd February to 15th March, 2006 at the Department of Zoology, NEHU, Shillong.

Dr. Bidyadhar Das (Supervisor Prof. V. Tandon) was sanctioned a research project as Principal Investigator under the Fast Track Programme of DST, New Delhi, for a period of 3 years w.e.f. July, 2005.

DEPARTMENT OF BIOTECHNOLOGY & BIOINFORMATICS

Head: Professor A. Chatterjee (w.e.f. 27th April 2005)

Telephone : 2722401 (O); 2551693 (R)
E-mail: anupamchatterjee@nehu.ac.in

Thrust Area of Research in the Department: Biotechnology

Brief Statement of Academic Activities: The Department of Biotechnology and Bioinformatics at the North-Eastern Hill University, Shillong, started in 2005. It has Postgraduate (M. Sc. and Ph. D) academic programmes. Both the flora and fauna of the North-Eastern region of India are so rich that it is considered to be a hot spot of biodiversity. For the bio-resource development, its exploration, conservation and proper utilization, an urgent need was felt for the trained human resource in Biotechnology and the linkage of biotechnological work with the bioinformatics network. It is known that unless the trained human resource in Biotechnology is available, no research and developmental programs/activities can be initiated for the development of new products/processes/techniques and tools. Accordingly, the Department of Biotechnology has initiated the programme and is providing an excellent training and research environment which will provide the people with latest information in their respective fields and bring them closer to the rest of the world as far as scientific advancements are concerned.

This programme is intended to develop, acquire and maintain modern state-of-the-art teaching, training, research, databases and software related to biologically rich resources of the northeastern region of India, which could ultimately contribute towards socio-economic development of the tribal people of the region.

Faculty:

Professor : A. Chatterjee, M. Sc.(Burdwan), Ph. D. (BHU)
Lecturers : S. R. Joshi, M. Sc./Ph. D. (NEHU)
S. Majaw, M. Sc. (Tezpur)

Visiting Professors/Fellows/Scholars:

Prof. S. K. Ghosal visited the Department as a Visiting Professor from 14th October to 13th November, 2005, and delivered several lectures on Genetics to the M. Sc. (Biotechnology) students.

Prof. M. K. Modi, Assam Agricultural University visited the Department as a Visiting Professor from 21st to 28th September, 2005, and delivered several lectures on Bioinformatics to the M. Sc. (Biotechnology) students.

Students Intake:

A. Enrolment capacity: M.Sc. - 10; M. Phil./Ph. D. – Variable.

B. Actual Admission:

	SC/ST	Gen.	Male	Female	Meghalaya	Non-Meghalaya
M. Sc.	7	3	5	5	7	3

Courses Conducted: Following courses were conducted for M. Sc.:

Semester I: Cell Biology, Biomolecules, Genetics, Computer applications, Bio-informatics & Biostatistics.

Semester II: Molecular Biology, Macromolecules & Enzymology, Immunology, Microbiology.

Seminars/Conferences/Symposia etc.: Attended

Mr. S. Ray and Mr. B. Koch (Supervisor: Prof. A. Chatterjee) attended the Regional Symposium on "Research Thrust in Animal Sciences in N.E. Region – An Appraisal", March 24-25, 2006, and presented papers entitled "Influence of endogenous glutathione level on X-ray induced cell cycle delay in human lymphocytes", and "Antiproliferative and antitumor activity of alkyl series of oraganotin compounds", respectively.

Publications:

Book/Book Chapter Publications

Chatterjee, A. 2006 Cell Cycle and its regulation at molecular level. In: *Biochemical and Cellular Science*. (Ed. G. Tripathi) pp. 56-70. I. K. International, New Delhi.

Joshi, S. R. 2006. *Biopesticides: A Biotechnological Approach*. New Age International Publishers, New Delhi.

Infrastructure facility: Construction of the new building for the Department commenced. Further, four rooms in the old Administrative Building of NEHU

were given to the newly established Department. The Department procured several equipments for M. Sc. (Biotechnology) practical courses and research.

Research Projects:

Ongoing

The Influence of Endogenous Glutathione on the Induction of Delay in Cell Cycle, Chromosome Aberrations and Apoptosis by High and Low LET Irradiation and the Involvement of p53-dependent Pathway in it. Prof. A. Chatterjee, Rs. 3.5 Lakhs, NEC/UGC.

New

Loss of Heterozygosity on Specific Chromosomal Arms and Identification of Sister-Chromatid Separation in Oral Carcinoma Induced by Raw Betel-Nut in Meghalaya. A. Chatterjee, Rs. 14.0 Lakhs, DBT.

Academic/Professional Collaboration: A collaborative research work in the field of Molecular Genetics was started under the Educational and Scientific Exchanges between North-Eastern Hill University and the University of Tuscia, Italy. Under this programme, Prof. A. Chatterjee visited Prof. F. Palitti's laboratory, University of Tuscia (23rd December, 2005 to 15th February, 2006).

Other Activities:

Prof. A. Chatterjee attended the Regional Symposium on "Research Thrust in Animal Sciences in N.E. Region – An Appraisal", March 24-25, 2006. He also acted as a Resource person in (i) the workshop on "Teaching Biology" organized by the Centre for Science Education, North- Eastern Hill University, Shillong (November, 2005), and (ii) the Refresher course organized by the Department of Zoology, North-Eastern Hill University, Shillong (February, 2006).

Dr. S. R. Joshi acted as a Resource person in (i) the workshop for School Teachers organized by North Eastern Regional Institute of Education, Shillong (February, 2006), and (ii) the "Meet the Scientists" Programme for school children organized by the Indian Society for Analytical Scientists, Shillong (February, 2006).