

SCHOOL OF LIFE SCIENCES

The School of Life Sciences came into existence in 1974 with the establishment of the Department of Botany and Zoology. Later on, in 1982 the Department of Biochemistry was opened and subsequently the Department of forestry has been included in the School of Life Sciences.

There is a wide range of courses available which are constantly revised and reviewed. These are based upon a modern approach incorporating pure and applied aspects as well as recent developments. Biology is among the most rapidly changing and innovative discipline in the Sciences with important advances in ecology and ecosystem dynamics, biotechnology, genetic engineering, immunology, molecular and cell biology, microbiology, physiology, experimental morphology, endocrinology, parasitology, entomology, parasitology, cancer biology, freshwater biology, enzymology, betelnut carcinogenesis and nitrogen metabolism. Advances in these areas have profound implications for society in medicine, health care, environmental management, forestry and agriculture. The courses in the School of Life Sciences are taught by competent faculty members, a few of them commanding international reputation in their area of specialisation. The School provides good facilities and equipments needed for their specialised courses. At present, over seventy research scholars are working for their M.Phil. and Ph.D. degree programmes.

During the last twenty five years, the academic departments have made a notable impact on the chosen areas of activities with emphasis on the North-Eastern regional and national requirements. The School aims at being an active centre for post-graduate studies and research on the frontiers of biological sciences.

Thus during last 25 years the School of Life Sciences has emerged as a centre of excellence of higher education and research in the North-Eastern Region.

DEPARTMENT OF BOTANY

The Department of Botany was established in 1974. Since its inception the Department has been conducting teaching and research in priority areas of regional and national importance. Forest Biology is the thrust area of research. During the past 25 years the department has made valuable contributions in different disciplines of Forest Biology. The department is fulfilling the regional aspirations through its well developed

teaching programme. The students passing out from the department are occupying important positions in prestigious educational institutions, research organisations both in the NE region and in the country.

The department is covered under Special Assistance Programme (SAP) of the U.G.C. Higher Plant Ecology and Microbial Ecology are the thrust areas under SAP. The department has also been extended assistance by the UGC for strengthening infrastructure under Science & Technology Infrastructure Development Programme (COSIST). Ecology, Biodiversity and conservation in NE India are thrust areas of the COSIST programme. Other major areas of research in which the department has made notable contributions are Plant Physiology, Experimental Morphology, Cytogenetics and Plant Taxonomy.

The department conducts U.G.C. refresher courses regularly for improving the teaching standards in colleges and universities of the region.

Head : Professor R. R. Mishra (up to June, 1998)
Professor H.N. Pandey (w.e.f. July, 1998).

Faculty :

Professors : R. R. Mishra, M.Sc., Ph.D. (B.H.U.)
R. S. Tripathi, M.Sc.(Agra), Ph.D. (B.H.U.)
Y. S. Chauhan, M.Sc., Ph.D. (Agra)
P. Tandon, M.Sc. (L'now), Ph.D.(Jodh)
H.N.Pandey, M.Sc., Ph.D. (B.H.U.)

Readers : G.D.Sharma, M.Sc. (Meerut), Ph.D (NEHU) (on lien)
A.K. Misra, M.Sc., Ph.D. (Meerut)
R.C. Laloo, M.Sc., Ph.D. (Gau) (up to 23.3.99)
N.K.Chrungoo, M.Sc., Ph.D. (Kashmir)
(Miss) M.S. Dkhar, M.Sc., Ph.D. (NEHU)

Lecturers : Y. Kumar, M.Sc.(Agra), Ph.D. (NEHU)
L. Kharlukhi, M.Sc.(NEHU) Ph.D. (I.A.R.I)
N. Venugopal, M.Sc., Ph.D. (Madras)
H. Kayang, M.Sc., Ph.D. (NEHU)
(Mrs.) S. Kùmaria, M.Sc., Ph.D. (NEHU)

Student Intake:

(a) Enrolment capacity :	M.Sc. - 20, Ph.D. - Not fixed			
(b) Actual admission :	SC/ST	General	Total	
	Male	Female	Male	Female
	6	13	1	-
				20

Degree Awarded :

Ph.D.

Babu John, " Dynamics of fine roots in pine forest ecosystem". Supervisor: Professor H.N. Pandey, Professor R.S. Tripathi (Joint Supervisor).

Varjnia Kalita, "Cryo preservation of germplasm of Pinus kesiya Royle ex. Gord - An important tree of north- east India". Supervisor : Professor. P. Tandon

Funds received from agencies other than NEHU/UGC :

1. Ministry of Environment & Forests, Govt. of India	Rs. 21.07 lakhs
2. DST	Rs. 12.07 lakhs
3. C S I R	Rs. 10.00 lakhs
Total	Rs. 43.14 lakhs

Courses Conducted:

M.Sc. : Algae, Bryophyta & Pteridophyta; Gymnosperms & Plant Anatomy; Mycology & Plant Pathology; Plant Taxonomy & Biostatistics; Plant Biochemistry & Molecular Biology; Microbiology & Biotechnology; Genetics & Plant Breeding; Ecology & Environment; Plant Physiology; Morphology, Embryology & Differentiation; Ecosystem Analysis & Phytogeography.

Special Papers : Angiosperm Taxonomy; Biology of Reproduction in Angiosperms; Applied Molecular Biology.

Seminars/Conferences:

Attended:

Professor R.S. Tripathi delivered (i) an invited lecture on "Plant population ecology in India" at the national conference on "Ecology in India : Retrospects and Prospects" held at Banaras Hindu University, Varanasi during 12-13 March, 1999; he also chaired one of the Technical Sessions, (ii) attended the Seminar on "Protection and Management of National Parks and Sanctuaries" held during 17-18 April, 1998 at Indira Gandhi Institute of Development Research at Mumbai and sponsored by the AFC Regional Centre of National Afforestation and Ecodevelopment Board, Ministry of Environment and Forests, Government of India, and presented a paper on "Strategies for conservation of national parks and sanctuaries"; he also chaired one of the Technical Sessions at the said seminar, (iii) delivered invited lecture on opening day (9 March, 1999) of International Conference on "Geo-informatics : Beyond 2000" organised by the Department of Space, Government of India, at Indian Institute of Remote Sensing, Dehra Dun, (iv) participated in the workshop-cum training programme on "Joint forest management and microplanning" held at Guwahati during 28-29 December, 1998 and delivered a lecture on "Joint forest management in north-east India".

Professor P. Tandon delivered (i) an invited lead talk on "Role of biotechnology in conservation of phytodiversity of north-east India" at a workshop on "Perspective for Planning and Development in North- East India" organised by G. B. Pant Institute of Himalayan Environment and Development, North-East Unit, Arunachal Pradesh during April 27-29, 1998, (ii) delivered a lecture on "Environmental Physiology & Biotechnology at High altitudes" during the meeting on Task Force for the Science at High Altitudes of Bose Institute held at Darjeeling during May 8-10, 1998, (iii) delivered an invited plenary lecture on

"Conservation of phyto-diversity of north-east India using in Vitro technique" at National Seminar on "Management Strategies for North Eastern Hilly Ecosystem" at ICAR, Research Complex for NEH Region, Umiam, Shillong during August 8-10, 1998, (iv) presented a paper entitled "Somatic embryogenesis and plant regeneration in *Pinus kesiya* (Royle. ex Gord.)" at IX International Congress on "Plant Tissue and Cell Culture Plant Biotechnology and In Vitro Biology in the 21st Century", held at Jerusalem, Israel during June 14-19, 1998.

Professor H.N. Pandey presented a paper "Recovery of degraded subtropical humid forest of north-east India" at the national conference on "Ecology in India : Retrospects and Prospects" held at Banaras Hindu University, Varanasi during 12-13 March, 1999. He also chaired the Valedictory Session at the said conference.

Dr. N. K. Chrungoo delivered an extension lecture on "Dehydrin like activity of seed storage proteins during seed maturation" in the Department of Biochemistry & Microbiology, University of Victoria, BC, Canada.

Dr. N. Venugopal presented a research paper on "Ecological and functional aspects of xylem structure in the mycoparasitic plant *Cymbidium macrorhizon* Lindl. (Orchidaceae)." at the national seminar on "Role of Microbes in Environmental Protection and Rural Development" during October 23-25, 1998 at NEHU, Shillong.

Organised :

The Department organised a national seminar on the "Role of Microbes in Environmental Protection and Rural Development" during 23-25 October, 1998 in collaboration with International Society for Conservation of Natural Resources, Department of Botany, Banaras Hindu University, Varanasi. Dr(Miss) M.S. Dkhar and Dr. H.Kayang of the Department were the convenor and organising Secretary respectively.

Publications

Arunachalam, A., Maithani, K., Pandey, H.N. & Tripathi, R.S. (1998). Fine litter fall and nutrient dynamics during forest regrowth in the humid subtropics of north-eastern India. *Forest Ecology and Management* (The Netherlands), 110 :209-219.

Arunachalam, A., Maithani, K., Pandey, H.N. & Tripathi, R.S.(1998). Leaf litter decomposition and nutrient mineralization patterns in regrowing stands of a humid sub-tropical forest after tree cutting. *Forest Ecology and Management* (The Netherlands). (accepted).

Chauhan, Y.S. and Katiyar, S.R. (1998). Effect of radiation and growth hormones on pollen germination, pollen tube growth and modulation of radiation responses of *Pinus kesiya* Royle ex Gord., *Cytologia*. 63: 341-348.

Dhyani, S.K. & Tripathi, R.S. (1998). Tree growth and crop yield under agri-silvicultural practices in north-east India. *Agroforestry Systems*, (The Netherlands). (accepted).

Dkhar, D.N., and M. S. Dkhar (1998). Earthworm population and enzyme activities of two pine forest stands. *In New Trends in Microbial Ecology* (eds. Bharat Rai & M.S. Dkhar). pp

Gajurel, P.R., Rethy, P. & Kumar Y. (1998). Piper lonchites Roem. & Sch. - A lesser known species of Piper from Arunachal Pradesh, India. *J. Econ. Tax. Bot.* 22(3), 1-3.

Govil, Sudha Rani & Pandey, H.N. (1998). Growth response of maize to crop density. *Indian Journal Plant Physiol.* 3 (4) NS :276-278.

Kayang, H. (1998). Effect of isopod grazing on microbial population and nutrient release in decomposing leaf litter of *Alnus nepalensis* D. don, In *New trends in Microbial Ecology* (eds. Bharat Rai & M. S. Dkhar.) pp. 137-149.

Kumar Y. 1998. Future prospect of orchid cultivation as a horticulture industry in north-eastern India. In : *International Festival of Orchids* (ed. S. N. Hedge), SFRI, Itanagar, Arunachal Pradesh, pp. 88-92.

Maithani, K., Arunachalam, A., Tripathi, R.S. & Pandey, H.N. (1998). Nitrogen mineralization as influenced by climate, soil and vegetation in a subtropical humid forest in north-east India. *Forest Ecology and Management* (The Netherlands). (accepted).

Maithani, K., Arunachalam, A., Tripathi, R.S. & Pandey, H.N. (1998). of leaf litter quality on N-mineralization in soils of regrowing subtropical humid Influence forest. *Biology and Fertility of Soils* (U.K.), 27:44-50

Mishra, J., Pandey, H.N. & Tripathi, R.S. (1998). Population dynamics and growth of *Galinsoga ciliata* in relation to method of cultivation, crop type and altitude. *Indian Journal of Agricultural Sciences*, 68:28-32.

Rout, M.K. and Chrungoo, N.K. (1999). Proteolytic activity and mobilization of reserve proteins during early stages of germination in seeds of common buckwheat (*Fagopyrum esculentum* Moehch). *Biol. Plantarum*, 42 (1) :81-87.

Rout, M.K. and Chrungoo, N.K. (1998). The nutritionally rich 26kD seed storage legumin of common buckwheat: *A structural insight. Biochem. & Mol. Biol. Intl.* (Accepted).

Ranee, L. and M. S. Dkhar, (1998). Comparative study on fungal population of soil, casts and the gut contents of earthworm. In : *New Trends in Microbial Ecology* (eds. Bharat Rai & M. S. Dkhar) pp. 158-169.

Sarma, G., A. Sen., R. Varghese and A. K. Misra (1998). A novel technique for isolation of *Frankia* and generation of single spores cultures. *Canadian J. Microbiol.* 44:490-492.

Tandon, P., Ishikawa, M, Komamine, A. and Fukunda, F. (1999). Incorporation of Fluorescein conjugated anti mouse immunoglobulin G into permeabilized *Nicotiana tabacum* By-2 cells. *Plant Sciences*, 140: 63-69.

Tandon, P, and Kumaria, S.(1998). Threats to plant diversity in high altitude of north-east India and conservation of rare and endangered plants using biotechnological approaches. In : Science at High Altitudes (eds. S. Raha, P.K. Ray and B. Sinha.). *Proceedings of the National Symposium*, Darjeeling, Allied Publishers Limited, 140-147.

Tiwari, B.K., Barik, S.K. & Tripathi, R.S. (1998). Biodiversity value, status and strategies for conservation of sacred groves of Meghalaya, India. *Ecosystem Health* (USA), 4:20-32.

Tiwari, B.K., Barik, S.K. & Tripathi, R.S.(1998). Sacred groves of Meghalaya. In : *Conserving the Sacred for Biodiversity Management* (eds. Ramakrishnan, P.S., Saxena, K.G. and Chandrashekara, U.M.), pp. 253-262. UNESCO, Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.

Venugopal, N., (1999). An interesting observation on the epidermal digestive glands of *Nepethes khasiana* Hk.f., *Current Science*, 76 (1), 31-33.

Thrust Areas : Forest Biology

Research Programmes/Projects :

A research project entitled "Study of impact of human activities on buffer zone ecosystems of Nokrek biosphere reserve" was sanctioned by the Ministry of Environment and Forests, Government of India, New Delhi to Professor R.S. Tripathi as Principal Investigator and Professor H.N. Pandey and Dr. S.K. Barik as Co-Investigators.

A research project entitled "A study on the environmental information in the tree rings of some north-eastern Himalayan tree species" was sanctioned by CSIR, New Delhi, to Dr. N. Venugopal.

A research project entitled "Assessment of moisture oriented feasibility for storage of seeds of timber yielding, wild tree species of Meghalaya" was sanctioned by D.S.T., New Delhi to Dr. L. Kharlukhi.

Other Activities:

Professor Tripathi was nominated as a National Consultant to the Forestry Research Education and Extension Projects (FREEP) of the Indian Council of Forestry Research and Education (ICFRE) under World Bank Funds administered by Winrock International, USA and acted as national expert of the Institute Review Team for ICFRE Institutes. He was nominated by the Govt. of Meghalaya as a member of the Meghalaya State Pollution Control Board, Shillong. Professor P. Tandon visited a few research organizations and universities in Jordan and Israel. He was appointed as a member of monitoring-cum-evaluation committee of the review committee on genetic manipulation of department of Biotechnology, Ministry of Science & Technology, Government of India for a period of 3 years. He was elected as a member of the Council of The National Academy of Sciences, India. Dr. Y. Kumar participated in refresher course "Recent advances in life Sciences" during 20th Feb-

12 March, 1999 at Visva Bharti, Santiniketan.

Dr. A. K. Misra was the visiting faculty in the Department of Molecular Biology and Biotechnology, Tezpur Central University in March 1998.

Dr. N. K. Chrungoo worked as a visiting scientist at the Department of Biochemistry & Microbiology, University of Victoria, BC, Canada from Aug.1,1998 to Oct.31,1998. The programme was sponsored by the Department of Biotechnology, Govt. of India, New Delhi. Was also the visiting fellow at the International Centre for Genetic Engineering and Biotechnology, New Delhi from Dec. 1998 to Feb. 1999, under the INSA visiting fellowship programme.

DEPARTMENT OF BIO-CHEMISTRY

The Department of Biochemistry became operational in 1982 with the intake of the first batch of M. Sc. (Biochemistry) students and research scholars. Since then, the department has been imparting high quality education in this subject and producing highly skilled technical personnel and researchers in the specialized disciplines of biochemistry. The department has so far produced 16 Ph. Ds. and 1 M. Phil. The courses and research areas offered are a judicious blend of the regional needs as well as the technological input and challenges of modern science. Thereby, the department has been meeting the needs and aspirations of the people of the region.

In its 17 years of existence, the department's quality services has been manifested by way of producing M. Sc. or Ph. D. students who have successfully competed/qualified in the National Entrance Test (NET) and GATE, and their placement in many reputed technical and scientific institutions of the State and the country. Our students are employed as teachers in several colleges besides Forensic Laboratory, Pasteur Institute in Meghalaya. At the same time, our students have been pursuing higher studies in the country's premier institutions like CCMB (Hyderabad), JNU (Delhi), TIFR (Bombay), IISc (Bangalore) and abroad. In addition to its human resource development activity, the members of the faculty are also involved in a number of collaborative research programmes with both national and international groups. Separate individual project inputs with funding from various agencies like DST, CSIR, UGC and NEC have contributed and enhanced the rapid growth and development of the Department.

Head : Dr. R. N. Sharan

Faculty :

Professors : R. Lalthantluanga, M. Sc., Ph. D. (Pune)
A. N. Rai, M. Sc. (BHU), Ph. D. (Dun)

Readers : R. Sharma, M. Sc., Ph.D. (Ban)
 R. N. Sharan, M. Sc., Ph.D. (J.Nehru)
 A. Alam, M. Sc. (Alig.), Ph.D. (Moscow)

Lecturer : D. Syiem, M. Sc., Ph.D. (NEHU)
 A. K. Singh, M. Sc. (Gorak), Ph.D. (Hyd.)

Student Intake:

	M. Sc.	M. Phil./Ph. D.
(i) Enrolment capacity	10	Open
(ii) Actual admission :	(SC/ST/Gen)	(Male/Female)
M. Sc.	0 / 6 / 4	5 / 5
Ph. D.	0 / 0 / 3	0 / 3

Funds received from agencies other than NEHU/UGC.

DST (Indo-German Project): Rs. 8 Lakhs (approx.)

Financial assistance for International Conference & Indo-German Symposium : Rs. 15 lakhs (approx.)

Courses Conducted:

M. Sc.

Chemistry; Introductory Biochemistry and Environmental Biochemistry; Enzymology; Biochemistry Practicals (I, II, III & IV); Genetics; Medical Biochemistry; Biosynthetic Pathways; Techniques in Biochemistry; Physiological Chemistry, Bioenergetics Pathways; Molecular Biology, Microbiology and Immunology.

M. Phil.

Biological Research Techniques; Biophysics and Physiological Chemistry; Cellular and Molecular Biology.

Ph. D.

On the topics related to thrust areas.

Seminars/Conferences.

Organised:

"International Conference on Radiation Biology: DNA Damage, Repair and Carcinogenesis" and "Indo-German Symposium on Molecular Biology of Radiation Damage and Repair" were organized from April 07 to 10, 1998 with Dr. R. N. Sharan as the Organising Secretary and Dr. D. Syiem as the Treasurer. About 180 participants from 16 countries participated in the twin events which was a grand academic success. Several national and

international organisations jointly sponsored the conference and symposium.

Attended:

All members of the faculty. (Professor R. Lalthantluanga, Professor A. N. Rai, Dr. R. Sharma, Dr. R. N. Sharan, Dr. A. Alam, Dr. D. Syiem and Dr. A. K. Singh) were members of the organising committee of the International Conference on Radiation Biology : DNA Damage, Repair and Carcinogenesis and Indo-German Symposium on Molecular Biology of Radiation Damage and Repair (April 07-10, 1998). All attended the conference and participated in their proceedings.

Dr. R. N. Sharan presented a paper titled "Immunodetection of Cellular Poly-ADP-ribosylation" in the above international conference.

Dr. A. Alam presented two papers titled "Enhancement of radiomodulatory effect through liposome encapsulated radiomodifier on cancer bearing mice" and "Tumor-associated antigen expression in mice exposed to diethylnitrosamine" in the above international conference.

Dr. R. N. Sharan participated and presented an invited talk titled "7-Li Particle Induced Plasmid DNA Damage is Influenced by Nucleotide Sequence" in the 41st Japan Radiation Research Society meeting at Nagasaki (Dec. 02-04, 1998).

Dr. D. Syiem presented a paper titled "Medicinal plants and Herbal medicine : a case study in Meghalaya" in Biodiversity workshop, March 4-6, 1999, at NEHU, Shillong organised by the NEBRC on the theme "peoples participation in Biodiversity conservation".

Publications:

Sharan, R. N. "Trends in Radiation and Cancer Biology". *International Co-operation Bilateral Seminars series*, Vol. 29, Germany, Forschungszentrum Juelich GmbH, 1998 [ISBN 3-89336-230-4].

Rai, A. N. and Borthakur, M. In: Verma, B.N. Kargupta, A.N. and Goyal, S.K, ed. *Advances in Phycology*, New Delhi, APC publications Pvt. Ltd., 1998, pp. 81-108,

Rai, A.N. "Cyanobacterial Nitrogen metabolism: Relevance in agricultural Biotechnology" In Subramaniam, G. Kaushik, BD and Venkataraman, G.S, ed. *Cyanobacterial Biotechnology*, Oxford, IBM publishing Co.Pvt. Ltd., New Delhi, 1998, pp. 223-232

Dey, S and Sharma, R. (1998). Hormonal regulation of the malate -aspartate shuttle enzymes during postnatal development of mice. *Indian Journal Biochem & Biophysics*. 35, 224-228.

Singh, L.S. and Sharma, R (1998) Alloxan diabetes regulates adenosine deaminase activity in mice: Tissue- and age-specific correlation. *Biochemistry Molecular Biology International*. 46, 55-61.

Pariat, T. & Sharan, R. N. (1998). Qualitative Changes in Mice Liver HMG Proteins

After Low Dose Chronic Administration of Aqueous Extract of Betel Nut and Diethylnitrosamine, *Hepatology Research*. 12 (3), 177-185.

Sharan, R. N., Schneeweiss, F. H. A., Saikia, J. R. & Feinendegen, L. E. (1998). Poly-ADP-ribosylation of Histone Proteins of Human Kidney T1-Cells in vitro Following Gamma-Irradiation. *Indian Journal of Biochemistry and Biophysics*. 35, 97-102,

Saikia, J. R., Schneeweiss, F. H. A & Sharan, R. N. (1998). Effects of Chronic Low-dose Arecoline Administration on the Macromolecular Components of Bone Marrow and Spleen Cells of Mice. *Cancer Journal* 11 (2), 94-98,

Humtsoe, J. O., Schrodeder, C. H. & Sharan, R. N. Is There a Relationship Between Nucleotide Sequence and Radiation Induced DNA Damage ? In Sharan, R. N, ed. Trends in Radiation and Cancer Biology. *International Co-operation Bilateral Seminars series*, Germany, Forschungszentrum Juelich GmbH, 1998, vol. 29, pp. 29-32.

Sinha, T. K. & Sharan, R. N. A Model for DNA and DNA Repair. In Sharan, R. N. ed. Trends in Radiation and Cancer Biology. *International Co-operation Bilateral Seminars series*, Germany, Forschungszentrum Juelich GmbH, 1998, vol. 29, pp. 128-134.

Pariat, T. & Sharan. R. N. Betel Nut and Diethylnitrosamine induced conformational changes in the liver HMG proteins In Vivo. In Sharan, R. N. ed. Trends in Radiation and Cancer Biology. *International Co-operation Bilateral Seminars series*.Germany, Forschungszentrum Juelich GmbH, 1998, vol. 29, pp. 162-165.

Rapthap, C., Imliwati, L. K., Sharan, R. N. & ALAM. A. Tumor-associated Antigen Expression in Mice Exposed to Diethylnitrosamine. In Sharan, R. N. ed. Trends in Radiation and Cancer Biology. *International Co-operation Bilateral Seminars series*, Germany, Forschungszentrum Juelich GmbH, 1998, vol. 29, pp. 177-180.

Sharan, R. N., Devi, B. J., Humtsoe, J. O. & Schneeweiss. F. H. A. "Immunodetection of Cellular Poly-ADP-ribosylation". In by Sharan, R. N. ed. Trends in Radiation and Cancer Biology. *International Co-operation Bilateral Seminars series*, Germany, Forschungszentrum Juelich GmbH, 1998, vol. 29, pp. 240-243.

Rapthap, C, Imliwati, L. K, Sharan R. N. and Alam, A "Tumor-associated antigen expression in mice exposed to diethylnitrosamine" In Sharan, R N. ed. *Trends in Radiation and Cancer Biology*. 1998, vol 29, pp. 177-180.

Study Tour/ Field Trips :

The M. Sc. students participated in a study tour to visit and see institutes of higher learning at Bangalore and Mysore. The tour, lasting about 2 weeks, was headed by Dr. A. K. Singh. Lecturer in the Department.

Thrust Areas of Research:

Enzymology, Medical Biochemistry, Carcinogenesis, Molecular Radiobiology, Nitrogen Fixation, Protein Chemistry, Medicinal Plants and Drug Delivery system.

Research Programs/ Projects:

(i) Dr. R. N. Sharan: DST project (Indo-German Co-operative Research Program) on "Molecular Biology Of Radiation Damage And Repair" sanctioned [1998-2001]; approximately Rs. 8 lakhs from DST and approx. Rs. 15 lakhs from DLR, Bonn.

Other Activities:

Dr. R. N. Sharan was unanimously elected as "President-elect" of the Indian Society of Radiation Biology for the term of 2000-2002.

Professor A. N. Rai was invited as a Visiting Professor at Botaneska Institutionen, Stockholm Universitet, Sweden for 1 year from Nov., 1998. He is presently on study leave from NEHU.

Dr. R. Sharma has been included in the panel of experts for selection/assessment committees (1998-2000) in Biochemistry & Biophysics of CSIR (National Institute of Science Communication), New Delhi.

Dr. R. Sharma delivered extension lectures at the Department of Zoology, Guwahati University (Dec 23-24, 1998) and at the Department Life Sciences, Manipur University (March 17-19, 1999).

Dr. R. N. Sharan was a Visiting Professor at Institute of Medicine, FZ, Juelich (Germany) during July-August, 1998.

Dr. R. N. Sharan was an Invited Senior Scientist at the Faculty of Medicine, Osaka University, Osaka (Japan) under the auspices of "Research for the Future A new technology to evaluate the effects of environmental pollutants on humans" for 2 weeks (November-December, 1998). During the stay, two seminars titled "Betel nut of north-east India and carcinogenesis: What have we learnt?" and "Low and high LET radiations and DNA: New insights from plasmid DNA model" were delivered at the Faculty of Medicine, Osaka University.

Dr. D. Syiem, was the organising secretary of the Workshop on "Peoples Participation In Biodiversity Conservation", March 4-6, 1999 sponsored by NEC.

DEPARTMENT OF FORESTRY

The Department of Forestry was established in 1990 to bring out highly skilled technical, Extension and researchers in multi-disciplinary areas of Forestry for rendering valuable services to the people of this region. It started the M.Sc. programme from the year 1997. It offers specialisations in Agroforestry at masters level.

Head : Dr. Rakesh Mohan

Faculty :

Professor : L.K.Jha, M.Sc. (Bhagal), Ph.D.(L.N.Mith.)
Reader : Rakesh Mohan, M.Sc.(Kanpur), Ph.D. (B.C.K.V)
Lecturers : U.K.Sahoo, M.Sc.,M.Phil (Utkal), Ph.D. (NEHU)
D. Paul, M.Sc.,Ph.D. (NEHU)

Student Intake :

a) Enrolment capacity : 6
b) Actual admission :

SC	ST	Gen.	Male	Female	Total
-	6	0	4	2	6

Degrees Awarded :

Ph.D

J.H.Lalramnghinglova "Studies on plants of ethnobotanical importance in the tropical wet evergreen forest of Mizoram", : Supervisor, Professor L.K. Jha.

Funds received from agencies other than UGC/NEHU :

Ministry of Environment & Forest, New Delhi Rs. 7,66,494/-.

Courses Conducted :

General Silviculture; Tree seed technology & propagation; Forest Policy, acts & law; Silvics of tree species; Forest Management; Pasture & Grassland Management; Forestry in watershed management; Tree Improvement; Soil science; Disease, pest & weed management; Research methodology, design analysis of field experiment & Computer programming; Principles of social forestry; Practice of Social forestry; Principles of Agronomy & Cropping systems; Research Project.

Seminars/Conferences/Symposia:

Organised:

The Department organised one-day Workshop on "Role of Forests in Environmental Conservation" in collaboration with Centre for Adult and Continuing Education, NEHU on 25.3.99.

Attended:

Rakesh Mohan : Attended 2nd International Conference on Land Degradation-"Meeting the Challenges of Land Degradation in the 21st Century" at KHON KAEN, Thailand during January 25-29,1999 and presented a paper entitled "Reconciling farmer's need and Government's action in controlling shifting cultivation in Mizoram".

LK Jha: Presented a paper entitled "Integrated Pest management in Agroforestry system" at National Symposia on Integrated Pest management in North East India, Department of Life Science, Assam University, Silchar (Assam) on 15-17 March, 1999. (ii) presented a paper entitled "Research Priority in Mizoram: An overview" at State level Workshop on setting Forestry Research Priority in Mizoram conducted by the Department of Environment & Forests, Government of Mizoram in collaboration with ICFRE, Dehradun on August 24-25, 1999.

U K Sahoo : Presented a paper entitled "Ecological concern in North East India and their impact on Society" on 12th September, 1998 organised by Aizawl Theological College in collaboration with North-East Students Christian Movement.

Publications :

Sahoo,U.K(1998) "Species composition and dynamics of soil seed bank in crop fields under terrace cultivation in Meghalaya". *Geobios New Reports*, 7:17-22.

Study Tour/Field Trip :

The students of this department visited Assam, Meghalaya and Mizoram forest areas for a period of 16 days from 26.10.98 to 10.11.98 to study the present aspect of Forest Management.

Thrust Area of Research :

Sustainable Hill Farming system, Ethnobotany, Agrogorestry and Watershed Management.

DEPARTMENT OF ZOOLOGY

The department of Zoology was established in 1974 with a limited number of faculty and facilities. In the last two decades, this department has made all round progress and acquired a position among the leading Departments of NEHU and other Universities of India. It offers specializations in all major disciplines of Zoology. For the last many years, the Department has been selected by UGC for conducting Refresher Courses in Zoology for the college and university teachers. Several research students have qualified NET and GATE. A large number of its students are holding important faculty positions in the colleges, universities and research institutions of the N.E. region and other parts of our country.

Head : Professor B. K. Sharma.

Faculty :

Professors : K.Chatterjee, M.Sc., Ph.D. (Kal)
A. Raghavarman, M.Sc.,Ph.D. (Madr)
V. Tandon, M.Sc.(Hons.), Ph.D. ,(Panj)
B.K. Sharma, M.Sc.(Hons.), Ph.D. Panj)

Readers : B.B.P. Gupta , M.Sc.,Ph.D. (Ban)
S. B. Prasad, M.Sc.,Ph.D. (Ban)
R.N.K. Hooroo, M.Sc.,Ph.D. (NEHU)
B. Kharbuli, M.Sc.,Ph.D. (NEHU)
N. Saha, M.Sc.,Ph.D. (NEHU)

Lecturers : A. Chatterjee, M.Sc.(Burd.), Ph.D. (Ban)
A.K. Yadav, M.Sc. (Agra), Ph.D.(NEHU).

Vacant Posts : Professor (2); Lecturer (2)

Students Intake :

(a) Enrolment capacity : M. Sc. : 20

(b) Actual Admission :	SC	ST	Gen	Male	Female	Total
	-	12	8	10	10	20

Degrees Awarded :

M.Phil

Ms. Sentimenla : "Studies on certain physiological and biochemical aspects of vision in the freshwater fish, *Heteropneustes fossilis*". Supervisor : Professor A. Raghavarman.

Mr. R. Imkongwapang : "A study on the helminth parasite spectrum in anuran amphibia in Nagaland". Supervisor : Professor V. Tandon.

Ms. Mumubai Lakiang : "Composition and ecology of plankton in Thadlaskein lake

(Meghalaya)". Supervisor : Professor B.K. Sharma.

Ms. Jenifer Lyngdoh : "Species composition and ecology of Zooplankton in a sub-tropical lentic ecosystem of Meghalaya". Supervisor : Professor B.K. Sharma.

Ms. Icydora Nangtraw: "Composition and ecology of plankton in some fish ponds in Meghalaya". Supervisor : Professor B.K. Sharma.

Ms. Banridor Royce Nongbri : "Studies on structural and biochemical changes in tadpoles during metamorphosis and adult of *Rana limnocharis*". Supervisor : Dr. R.N.K. Hooroo.

Ph.D.

Mr. Summerland Lyngdoh : "Studies on some aspects of the biology and behaviour patterns of Anophiline mosquitoes". Supervisor : Professor A. Raghavarman.

Ms. Papri Pal : "An in vitro study on the antihelmintic efficacy of the root tuber peel extract of *Flemingia vestita* against the cestode, *Raillietina echinobothrida*". Supervisor : Professor V. Tandon.

Funds received from agencies other than NEHU/UGC : Rs. 17.5 Lakhs

Courses conducted :

Cell Biology & Immunology; Molecular Biology ; Animal Physiology, Biological Chemistry; Genetics and Developmental Biology; Parasitology and Entomology, Ecology and Environmental Biology; Endocrinology and Reproductive Biology; Aquatic Biology and Fisheries, Biosystematics & Evolution; Techniques in Biology and Biometrics; Special Paper-I.

Special Papers offered : Biochemical Adaptation, Cell Biology & Immunobiology, Endocrinology and Reproductive Physiology; Entomology, Genetics.

Seminars/Conferences :

Organised :

Recent Advances in Zoology - I (3.8.98 to 24.8.98 ; Course Co-ordinator : Dr. R.N.K. Hooroo)

Recent Advances in Zoology -II (23.11.98 to 14.12.98; Course Co-ordinator : Professor K. Chatterjee).

Attended :

Professor A. Raghavarman attended the Intl. Conf. Radiation Biol., DNA damage, repair and carcinogenesis, April 7-10, 1998, NEHU, Shillong - 793 022, and presented a paper. Attended the Workshop on People's participation in Biodiversity conservation, March

4-6, 1999, Biodiversity Research Cell, NEHU Shillong - 793 022, and presented one paper. Attended the National Seminar on Role of Microbes in Environmental Protection and Rural Development, October 2-25, 1998, and presented one paper. Attended the National Symposium on Fifty Years of Zoology, February 13-14, 1999, and presented a paper.

Professor V. Tandon attended the National workshop on Prospectives for Planning & Development in North-East India, April 27-29, 1998, Itanagar, and presented a report. Attended the TCDC Intl. Workshop on Emerging Trends in Diagnosis of Infectious Diseases, December 7-12, 1998, CDRI, Lucknow, and presented a report.

Professor B.K. Sharma attended Natl. Conf. Sci. & Tech. in India in 50 Years with special reference to North-Eastern India, May 26-29, 1998, Shillong College, Shillong, Chaired a Session and presented a paper. Attended Workshop on People's participation in Biodiversity conservation, March 4-6, 1999, Biodiversity Research Cell, NEHU, Shillong - 793 022, and presented two papers.

Dr. S.B. Prasad attended the Intl. Conf. Radiation Biol., DNA damage, repair and carcinogenesis, April 7-10, 1998, NEHU, Shillong - 793 022, and presented a paper.

Dr. R.N.K. Hooroo attended Workshop on People's participation in Biodiversity conservation, March 4-6, 1999, Biodiversity Research Cell, NEHU, Shillong - 793 022, and presented two papers.

Publications:

Basu Baul, S., Basu Baul, T. Rivarola, E., Dakternieks, D., Tiekink, E.R.T., Syngai, C. and Chatterjee, A. (1998). Synthesis, characterization of Diorganotin (IV) complexes with N(2-pyridylmethelene) arylamines and in vivo mutagenicity testing of Et₂SnCl₂L₄. *Applied Organometallic Chemistry*, 12, 503-513.

Chatterjee, A. and Chattopadhyay, A. (1998). Influence of buthionine sulfoximinemediated glutathione depletion on clastogenic activity of bleomycin and (-rays. *Current Science*, 75, 604-608.

Chatterjee, A., Hodgkiss, R.J. and Rojas, A. (1998). Induction of lethal mutations in experimental tumours after single and fractionated irradiations in vivo. *Int. J. Radiat. Biolology*, 74, 119-128.

Chatterjee, A., Rojas, A. and Hodgkiss, R.J. (1999) Delayed expression of lethal mutation in experimental tumours that survive ionising radiation In R.N. Sharan ed. *Trends in Radiation and Cancer Biology*. Julich, Forschungszentrum, pp. 89-93.

Chatterjee, K. and Dey, M. (1998). Electrophoretic investigation on seven species of Indian frogs. *Cytobios*, 94, 25-30.

Chattopadhyay, A. and Chatterjee, A. (1999). Influence of buthionine sulfoximine on radiation induced chromosome aberrations in mammalian cells In F.H.A. Scheneeweiss and R.N. Sharan eds. *Recent Aspects of Cellular and Applied Radiobiology*. Julich, Forschungszentrum, pp. 89-93.

Deb, S. and Chatterjee, A. (1998). Influence of buthionine sulfoximine an reduced glutathione on arecoline induced chromosomal aberrations and sister chromatid exchanges in mouse bone marrow cells in vivo. *Mutagenesis*, 13, 243-248.

Dev Giri, S. and Chatterjee, A. (1998). Modulation of Mitomycin C induced sister chromatid exchanges and cell cycle delay by buthionine sulfoximine and reduced glutathione in mouse bone marrow cells in vivo. *Mutation Research*, 413, 227-234.

Dey, M. and Chatterjee, K. (1998). Expression of lactate dehydrogenase genes in the tree frog *Polypedates leucomystax*. *Cell and Chromosome Research*, 20, 1-7.

Dey, S., Hooroo, R.N.K. and Bhattacharjee, C.R. (1998). Electron microscopy and spectroscopical studies on the coloured patches on the wing of a butterfly, *Graphium sarpedon* (Lepidoptera : Papillionidae) with reference to their photobiological electrical properties. *Pigment Cell Research*, 11, 1-11.

Dey, S., Hooroo, R.N.K., Begum, A. and Goswami, U.C. (1998). Unique ultra structural features of photoreceptor cells and their functional significance in the retina of the frog, *Rana limnocharis* (Wiegmann). *Current Science*, 74, 502-504.

Giri, A., Khyriam, D. and Prasad, S.B. (1998). Vitamin C mediated protection on cis-platin induced mutagenicity in mice. *Mutation Research*, 421, 134-148.

Giri, A., Khyriam, D. and Prasad, S.B. (1999) Use of vitamin C against cis-platin induced mutagenicity and nephrotoxicity In R.N. Sharan ed. *Trends in Radiation and Cancer Biology*. Julich, Forschungszentrum, pp. 166-176.

Goswami, C. and Saha, N. (1998). Glucose, pyruvate and lactate efflux by the perfused liver of an air-breathing teleost, *Clarias batrachus* during aniso-osmotic exposure. *Comparative Biochemistry and Physiology*, 199A, 999-1007.

Gupta, B.B.P. and Lynshiang, D.S. (1998) Dose-dependent and temperature-independent calorigenic effects of monoiodotyrosine (MIT) and diiodotyrosine (DIT) in an airbreathing fish, *Clarias batrachus* In S. Kawashima and S. Kikuyama eds. *Proc. XIIIth International Congress of Comparative Endocrinology*, November 16-21, 1997, Yokohama (Japan). Italy, Monduzzi Editore, pp1097-1100.

Gupta, B.B.P. and Mahanta, A. (1998). In vitro effects of adrenergic agonists and antagonists on tissue respiration in *Rana limnocharis* and *Rana cyanophlyctis*. *Current Science*, 75, 958-960.

Imkongwapang, R., Tandon, V. and Roy, B. (1998) Surface fine topography of *Diplodiscus* spp. (Trematoda : Pramphistomidae) parasitic in anuran frogs. *Journal of Parasitology and Applied Animal Biology*, 8(1), 55-62.

Kharkongor, I.J. and Gupta, B. B. P. (1998). Study of prevalence of hypothyroidism in women of reproductive age in Meghalaya, North-Eastern India. *Current Science*, 75, 1390-1393.

Lyngdoh, R.D. and Tandon, V. (1998). Putative neurosecretory cells in the monozoic cestode, *Lytocestus indicus* (Caryophyllidea). *Acta Parasitologia*, 43(2), 216-220.

Pal, P. and Tandon, V. (1998). Anthelmintic efficacy of *Flemingia visita* (Leguminoceae): Genistein-induced alterations in the activity of tegumental enzymes in the cestode, *Raillietina echinobothrida*. *Parasitology International*, 47, 233-243.

Pal, P. and Tandon, V. (1998). Anthelmintic efficacy of *Flemingia visita* (Leguminoceae) : Genistein-induced alterations in the ultrastructure of the tegument in the cestode, *Raillietina echinobothrida*. *Journal of Parasitic Disease*, 22(2), 104-109.

Prasad, S.B., Giri, A. and Khyriam, D. (1998). Studies on the chromosomes of murine Dalton's lymphoma cells and the effect of cis-platin on chromosomes of these cells and bone marrow cells in vivo. *Cytologia*, 63, 405-413.

Raghuvarman, A., Dey, S. and Hermann, H.R. Jr. (1998). Acid mucopolysaccharides in the body cuticle of the peripatus, *Typhloperipatus weldoni* in relation to cutaneous mode of sperm transfer. *Journal of Endocrinology and Reproduction*, 1(2), 80-85.

Saha, N. and Ratha, B.K. (1998). Ureogenesis in Indian air breathing teleosts : Adaptation to environmental constraints. *Comparative Biochemistry and Physiology*, 120A, 195-208.

Saha, N., Das, L. and Dutta, S. (1999). Types of carbamyl phosphate synthetase and subcellular localisation of urea cycle and related enzymes in air breathing walking catfish, *Clarias batrachus*. *Experimental Zoology*, 283, 121-130.

Sengupta, U. and Chatterjee, K. (1998). Biochemical genetic studies on the chocolate mahseer *Neolissocheilus hexagonolepis* (McClelland). *Fish Genetics Biodiversity Conservation*, Natcon Pub., 05, 367-373.

Sengupta, U. and Chatterjee, K. (1998). Biochemical genetics of acid phosphatase and alkaline phosphatase in chocolate mahseer *Neolissocheilus hexagonolepis* (McClelland). In G.K. Manna and S.C. Roy eds. *Prospectives in Cytology and Genetics*, Vol. 9, 1998, pp. 269-272.

Sharma, B.K. (1998). Freshwater rotifers (Rotifera: Eurotatoria) from some domestic wells of Assam (N.E. India). *Journal of Bombay Natural History Society*, 95, 524-526.

Sharma, B.K. (1998). Faunal diversity in India : Rotifers In *Faunal Diversity in India*. ENVIS Centre, Zoological Survey of India, Calcutta, pp. 57-70.

Spessert, R., Gupta, B.B.P., Rimoldi, S. and Vollrath, L. The dual adrenergic signal transduction in rat pinealocytes via cAMP and cGMP involves a common pool of G-proteins In R.N. Saxena ed. *Proc. Natl. Symp. "Trends in Research on Hormones, Reproduction and Animal Productivity"*, October 10-12, 1998, pp. 174-177.

Tandon, V., Lyndem, L.M. and Yadav, A.K. (1998). Hookworm infection : Influence of ambient climatic factors on the development and hatching of eggs and development and survival of infective larvae. *ICOPA IX 9th Intl. Cong. Parasitology*, August 24-28, 1998, Makuhan Messe, Chiba, Japan, pp. 791-794.

Tandon, V., Pal, P. and Saha, N. (1998). Anthelmintic efficacy of *Flemingia vistita* (Leguminosae) : Genistein - induced alterations in the free amino acid pool of the cestode, *Raillietina echinobothrida*. *Journal of Parasitic Disease*, 22(2), 110-115.

Study Tour/Field Trips :

The M.Sc. students were taken on a study tour of 12 days (w.e.f. 14/1/1999 to 25/1/1999) to West Bengal and Orissa. The students collected specimen from different sites of the States and have prepared field reports.

Thrust Area of Research :

Environmental Biology.

Other Activities :

Professor K. Chatterjee became a member of the Research Advisory Committee, National Research Centre on Coldwater Fisheries, I.C.A.R.

Professor V. Tandon was awarded Fellowship to National Academy of Sciences, India, Allahabad.

Professor B.K. Sharma was awarded FUWAI by United Writer's Association, Chennai.

Dr. A.K. Yadav was awarded SERC Visiting Fellowship for three months to undertake research work at the Department of Zoology, Visva Bharati University, Santiniketan.