SCHOOL OF LIFE SCIENCES

The School of Life Sciences was started in 1974 and comprises Botany, Zoology, Biochemistry and Centre for Environmental Studies in the Shillong Campus and Department of Forestry at Aizawl. The School aims at being an active centre for post-graduate teaching and research in frontiers of constituent subjects.

The major areas of specialization and thrust areas of academic activities are : Environmental Biology, (Immunology, Endocrinology & Reproductive Physiology, Entomology, Parasitology, Genetics & Developmental Biology, Limnology and Molecular Biology) in Zoology; Forest Biology in the Department of Botany; Enzymology, Protein Chemistry, Medical Biochemistry, Immunology, Radiation & Molecular Biology, Hormone-Receptor Mechanism, Betel nut carcinogenesis, Drug delivery system, High altitude Adaptation, and Nitrogen Fixation in Biochemistry; multidisciplinary areas of Forestry in the Department of Forestry, Biodiversity of plants, and remedial methods for prevention of Soil Erosion, and methods to exploit mineral resources in the soil as well as developing measures in safeguarding environment in the Centre for Eco-Development.

During the last two decades, 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. Several faculty members of the School have won national awards and honours in recognigion of their pioneering and excellent work in their respective research areas. Especially, during the last five years, the School has acquired national and international recognigion in terms of Organizing National and International Conferences, Seminars and Symposia on various aspects of biology such as Agriculture, Micro-biology, and Cellular and Molecular aspects of Radiation Biology and Carcinogenesis. This is in fact a joint academic venture for the School of Life Sciences. In the light of the academic accomplishments, the U.G.C. has awarded the second phase of DRS project under Special Assistance Programme, and G.S. Pant Institute of Himalayan Environment and Development (DOEn, Government of India) and other foreign collaborative awards to other departments as well.

DEPARTMENT OF BOTANY

The Department of Botany was established in 1974 and ever since it is actively involved in teaching and research in

priority areas of regional and national importance. Keeping the regional relevance in view, Forest Biology has been the thrust area of research. During the 24 years of its existence the department has made valuable contributions in the field of Forest Biology and allied disciplines. The teaching programme of the department is well developed and the students passing out from the department are in great demand and a number of them are occupying important positions in prestigious educational institutions,research organisations and other important sectors.

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. Other major areas of research in which the department has made notable contributions are Plan Physiology, Experimental Morphology, Cytogenetics and Plant Taxonomy.Researches carried out in the department have been published in prestigious national and international journals.

To improve the teaching standards in colleges and universities of the region, the department conducts U.G.C. refresher courses regularly.

Head : Professor R.R. Mishra.

Faculty :

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

Readers : G.D. Sharma, M.Sc. (Meerut), Ph.D. (NEHU) (on lien)
A.K.Misra, M.Sc./Ph.D. (Meerut)
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. (Madr.)
H.Kayang, M.Sc./Ph.D. (NEHU)
S.Kumaria, M.Sc./Ph.D. (NEHU)

Student Intake :

(a) Enrolment capacity : M.Sc.= 23, Ph.D.= Not fixed.
(b) Actual admission :

	SC/ST		General		Total
	Male	Female	Male	Female	
	7	9	2	5	23
	1	2	1		3

Degrees Awarded :

Ph.D.
Kusum Maithani, "Microbial nutrient and mineralization in

degraded subtropical forest ecosystem undergoing recovery". Supervisor : Professor R.S. Tripathi.

Shiv Kumar Dhyani, "An analysis of effects of agro-forestry system on crop yield and soil characteristics in Meghalaya". Supervisor : Professor R.S. Tripathi.

A. Arunachalam, "The role of litter & fine roots in organic matter and nutrient dynamics during the recovery of degraded subtropical Forest Ecosystem".Supervisor : Professor H.N. Pandey.

N.K. Rout, "Studies on seed storage protein metabolism in common buckwheat (*Fagopyrum esculentum Moench*) Supervisor : Dr. N.K. Chrungoo.

Funds received from agencies other than NEHU/UGC :

1. Ministry of Environment & Forests	Rs.	8,00,000.00
2. G.B. Pant Institute, Almora	Rs.	2,93,160.00
3. N.E.C., Shillong	Rs.	1,50,39,700.00
4. D.S.T.	Rs.	3,00,000.00
5. ICRFRE	Rs.	6,27,000.00
Total =	Rs.	1,70,59,860.00

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 Paper : (Microbial Ecology, Radiation Botany, Angiosperm Taxonomy).

Seminars/Conferences :

Attended :

Professor R.S.Tripathi participated (i)as a member of the Expert Committee in the Review Workshop-cum-Training Programme on Biosphere Reserve organised under the Ministry of Environment and Forests, Govt. of India at Joshimath during 11-15 June, 1997. He presided over the Inaugural Session of the Workshop, (ii) in the Seminar on "Protection of Medicinal Plants in Meghalaya"organised by the Meghalaya Pensioners Association at Shillong on 12th July, 1997 and delivered a special lecture on "some important medicinal plants of Meghalaya and strategies for their conservation", (iii) he attended the discussion meeting on "Biodiversity characterization at landscape level using remote sensing statellite" organised by the Department of Space at NRSA, Hyderabad on 25.9.97 and presented an approach paper on"Biodiversity-disturbance relationships", (iv) delivered the key note address on the JFM concept in the Workshop on joint Forest Management held at Itanagar during 3-4 October, 1997 organised by the State

Forest Research Institute, Government of Arunachal Pradesh and NEHU Regional Centre of National Afforestation and Ecodevelopment Board, Ministry of Environment and Forests, Government of India, (v) presided over the Inaugural Session of the Workshop-cum-Training Programme on Microplanning held at Guwahati during 23-24 December, 1997 and delivered a lecture on "Participatory Forest Management and its status in India" organised by the State Forest Department of Assam and NEHU Regional Centre of National Afforestation and Ecodevelopment Board, (vi) participated in National Symposium on "Fifty Years of Botany in India: an assessment" held at Banaras Hindu University, Varanasi during 27-28 February,1998. delivered a special lecture on "Progress of plant population ecology in India" and chaired the Valedictory Session.

Professor Y.S.Chauhan (i)participated in IUFRO symposium, on innovations in Forest Tree Seed Science & Nursery Technology held at Pt.Ravishankar Shukla University, Raipur during `November 22-25,1997 and presented a paper entitled "Seed development studies in *Schima*: Seed germination and seed sterility"- Y.S.Chauhan, S.Goswami and L.Kharlukhi, (ii) attended the National symposium cum workshop on Plant Morphogenesis held at Sardar Patel University, Vallabh Vidyanagar during December 29-30, 1997 and delivered a plenary lecture on "Differentiation of female fertile and female sterile pistil in *Solanum*, (iii)chaired a session in the conference and acted as a judge for selection of award winning poster presentation.

Professor Tandon (i) chaired the Session on Biological and Environmental Sciences at Symposium on "Science at High Altitude" at Darjeeling organised by Bose Institute, Calcutta during May 8-11,1997 and delivered invited lecture on "Threats to Plant Diversity in High Altitudes of North East India and Conservation of Rare and Endangered Plants using Biotechnological Approaches",(ii) participated in the Workshop on `Agriculture, Biodiversity and Climate Change' organised by ASNINC, NEHU during March 9-10, 1998., and delivered a lecture on "Conservation of Biodiversity of North East India using Biotechnological Approaches".

Dr. Venugopal participated and presented a research paper on "Anatomy and histochemistry of absorptive and secretory glands of endemic plant Nepenthes Khasiana Hk.f." in the 13th International symposium on Morphology, Anatomuy and Systematics, organised by Katholeik University, Leuven, Belgium during April 6-11, 1997.

Dr.Y.Kumar attended(i)the National Seminar on Systematics and Diversity, at Aurangabad, Maharashtra during 16-18th October,1997 and presented a paper on Systematics and Database, (ii)the International workshop on `Plants Species Diversity Index data base for South Asia' held at NBRI, Lucknow during 3-7 March, 1997 and presented a paper entitled, "Data base of Indian Orchids".

Dr. H.Kayang participated in the Training on New Develop-

ments in HPLC instrumentation by waters organised by RSIC, NEHU, Shillong on August 1, 1997.

Publications :

Arunachalam,A., John,B., Maithani,K., Pandey,H.N. and Tripathi, R.S. "Vegetational and edaphic changes during secondary seccession in subtropical pine and broad-leaved forests of north-east India". *Ekologia Bratislava* 16: 253-264 (1997).

-----Maithani,K.,Pandey,H.N. and Tripathi,R.S., "Strach dynamics in fine roots following tree cutting in a sub-tropical humid forest of Meghalaya,India". *Ecoprint* (Nepal) 4(1) : 75-80(1997).

Augustine,J. and Kumar,Y. "Stauts of Bulbophyllum and allied genera of North East India". *J. Orchid Soc.* India 11(I & II): (1997).

Borthakur,M., Sen,A. and Misra,A.K. "Exogenons nitrogen sources do not drastrically reduce nitrogenase activity in polymer entrapped Frankia".Indian J. Exptl. Biol. 35:173-175 (1997).

Chauhan,Y.S. "Ionizing radiation as a research tool in the study of plant morphognesis: S. Khasianum Cl. a model system". ISRB News letter 4(2): 2-3 (1997).

------and Joshee,N. "Differentiation of female fertile and female sterile pistil (Carpellodia) in Solanum Khasiasum Clarke". in: Ramana Rao, T.V. & Kothari, I.L. (ed) *Plant Structure and Morphogenesis*, pp 43-52, Sardar Patel University, Vallabh Vidyanagar (1997).

Das,A.K., Boral, L., Tripathi, R.S. and Pandey, H.N. "Nitrogen mineralization and microbial biomass-N in subtropical humid forest of Meghalaya, India". *Soil Biology and Biochemistry* (U.K) 29:1609-1612 (1997).

Krishnamurthy,K.V., and Venugopal,N. "Tension phloem in some Legumes" *J. Plant Anat. Morph.* 7 (1) : 20-23 (1997).

Kayang,H., Sharma,G.D. and Kharbuli,B. "The effect of isopod feeding activities on litter microbial population". *Geobios* 24: 42-46 (1997).

----- Sharma,G.D. and Mishra,R.R. "Micro flora associated with gut content of isopod (Barmoniscus Sp. Nova; Philosciidae). *J. Soil Biol. Ecol.* 16 (2): 120-123 (1996).

----- Sharma,G.D. and Mishra,R.R."The influence of isopod grazing on microbial dynamics in decomposing leaf litter of Alnus nepalensis D. Don". Eur. J.Soil Biol. 32 (1): 35-39 (1996).

Maithani,K., Arunachalam,A., Pandey,H.N. and Tripathi,R.S. "Dry matter and nutrient dynamics of litter during forest regrowth in humid subtropics". *Ekologia Bratislava* 16 (1): 49-57 (1997).

------ and Tripathi,R.S. "Species diversity of soil Micro- fungi in humid subtropical forest of north-eastern India". J. Swamy Bot.Club 13:63-66 (1996).

Rao,P., Barik,S.K., Pandey,H.N. and Tripathi,R.S. "Tree seed germination and seedling establishment in treefall gaps and understorey in a subtropical forest of North-East India". *Australian Journal of Ecology* 22(2) : 136-145 (1997).

Rout,M.K., Chrungoo,N.K. and Rao,K.S. "Amino acid sequence of the basic sub-unit of 13S globulin of common buckwheat". *Phytochemistry* 45: 865-867 (1997).

Shukla,A.K., and Mishra,R.R. "Persistence of fertilizers on microbial population and enzyme activity in potato (Solanum tuberosum) field soil". *Indian Journal of Agriculture Science* 68(1) : 44-5, (1998).

------ and Mishra,R.R."Effect of Herbicide Butachlor on nitrogen transformation and soil microbes". *Jr. Indian Soc. Soil Sc.* 45 (3) : (1997).

------ and Mishra,R.R. "Response of microbial population and enzyme activities to fungicides in potato field soil". *Proc. Indian Natn. Sci.* Acad. B62 (5), 435-438, (1996).

Tawnenga, Uma Shanker and Tripathi, R.S. "Evaluating second year cropping on jhum fallows in Mizoram, north-eastern India: Energy and economic efficiencies". *Journal of Biosciences* 22: 605-613 (1997).

-----Uma Shanker and Triupathi,R.S. "Evaluating second year cropping on jhum fallows in Mizoram, north-eastern India: Soil fertility". *Journal of Biosciences*, 22: 615-623 (1997).

Study Tour/Field Trips of Students :

A study tour of the III Semester M.Sc. students was organised during winter vacation, in December-January, 1997-98. Twenty students alongwith two teachers (Prof.H.N.Panday and Dr.H.Kayang) visited a large number of places of botanical interest and scientific institutions/historical monuments located in Calcutta, Bangalore, Mysore, Ooty, Goa and Mumbai during 21 days of their trip to South and Western India.

Thrust Area : Forest Biology.

Research Programmes/Projects :

A research Project of Rs.8,00,000.00 titled "Analysis of Biodiversity and population behaviour of Keystone species in sacred Groves of Meghalaya" was sanctioned by the Ministry of

Environment & Forests, New Delhi,to Prof. H.N.Pandey as Principal Investigator and Prof. R.S.Tripathi as Co-Investigator.

A research Project of Rs. 9,77,400.00 titled "Development of RAPD/PCR-RFLP markers for Alnus nepalensis genotypes showing better nitrogenase activity in actinorhizal symbiosis", sponsored by ICFRE World Bank to Dr. A.K.Misra as Principal Investigator.

A research Project of Rs. 2,93,160.00 titled "Biodiversity of Dendrobium (Orchidaceae,in North-Eastern India: Conservation and sustainable use",sponsored by G.B.Pant Institute of Himalayan Environment and Development Almora to Dr. Y.Kumar as Principal Investigator.

"Scheme for Establishment of Biodiversity Research Cell in NEHU", sanctioned by North Eastern Council, Shillong,Meghalaya to Dr. H.Kayang as one of the Project Investigator for Rs. 1,50,93,700.00

Other activities :

Prof.R.S.Tripathi was nominated by the Ministry of Environment and Forests, Govt.of India as a member of the Expert Committee to consider the proposal to set up an Institute of Biodiversity in Arunachal Pradesh.

Prof.P.Tandon was appointed a member of the Task Force on Biodiversity Conservation and Environment,Department of Biotechnology, Ministry of Science & Technology,Government of India for a period of 3 years. He was also appointed a member of the Task Force on Science at High Altitude, Bose Institute, Calcutta.

He organised the Workshop on Agriculture,Biodiversity and Climate Change sponsored by the National Committee of Indian National Science Academy for International Geosphere Biosphere Programme under ANICS.

Dr.N.K.Chrungoo, was awarded the Biotechnology National Associateship in Plant Molecular Biology by the Department of Biotechnology, Ministry of Science and Technology, Govt.of India. New Delhi. He was also selected by the Department of Biotechnology, Ministry of Science and Technology, Govt. of India to under go three month advanced training in Plant Molecular Biology at the University of Victoria, British Columbia, Canada.

Dr.Yogendra Kumar delivered lectures on systematics in the Department of Botany, Nagaland University, as Visiting Fellow during December 1997.

DEPARTMENT OF BIOCHEMISTRY

The Department of Biochemistry was established in 1980 with an objective to produce highly skilled personnel and researchers in multidisciplinary areas of biochemistry who could render their valuable services to the people of this region and improve the quality of life. Since its inception, the department has been offering courses like M.Sc.(Biochemistry) and M.Phil/Ph.D. programmes from 1982, keeping in view various challenging and fundamental problems of biology and medicine.

The main areas of research in the department are Enzymology, Protein Chemistry, Medical Biochemistry, Development and Aging, Immunology, Radiation and Molecular Biology, Betel-nut Carcinogenesis, Drug delivery System, High Altitude Adaptation and Nitrogen Fixation.

Our M.Sc/Ph.D students compete successfully at NET and GATE every year. Students of this department have been placed in many important institutions of higher learning in India and abroad. Beside this, a number of national and international collaborative research programmes have been established by the faculty members of the department. The major funding agencies in India like DST,CSIR and UGC have regularly funded major research projects in this department. It has also contributed exceptionally good research publications in highly reputed international journals and the faculty have also authored/edited books and have contributed several book chapters.

Head : Dr. R.N. Sharan.

Faculty :

Professors : R.Lanthantluanga, M.Sc./Ph.D. (Poona) (on lien)
A.N. Rai, M.Sc. (Ban.), Ph.D. (Dun.)

Readers : R.Sharma, M.Sc./Ph.D. (Ban.)
R.N.Sharan, M.Sc./Ph.D. (J.Nehru)

Lecturers : A.Alam, M.Sc. (Alig.), Ph.D. (Moscow)
D.Syiem, M.Sc/Ph.D (NEHU)
A.K.Singh, M.Sc. (Gorak.), Ph.D. (Hyd.)

Student Intake :

	M.Sc.	M.Phil/Ph.D
(a) Enrolment capacity :	10	Open

(b) Actual admission :

	SC/ST	Genl.	Male	Female	Total
M.Sc.	7	3	6	4	10
Ph.D.	0	3	0	3	03

Degrees Awarded :

Ph.D. :

J.R. Saikia : "Role of Poly (ADP) ribosylation of chromosomal

proteins in carcinogenesis". Supervisor Dr. R.N.Sharan.
Nandini Choudhury : "Purification and properties of Buffal (Bubalus bubalis) plasma fibronectin". Supervisor Dr. R. Sharma and Dr. M.Y. Khan.
Santa Dey : "Regulatory changes in enzymes of malate-aspatate shuttle during development and aging of mice". Supervisor Dr. R. Sharma.
Theisara Pariat : "Role of high mobiligy group (HMG) proteins in notrosamine induced cancer in mice". Supervisor : Dr.R.N. Sharan.
Monsur A. Borbhuiya : "Physicochemical changes in the glucocorticoid receptor during development of mice". Supervisor Dr. R.Sharma.
L.Shanjukumar Singh : "Developmental changes in adenosine deaminase of mice". Supervisor Dr. R. Sharma.
Sanghmitra Chakraborty : "Liposme mediated delivery of 2-mercaptopropionyl glycine (MPG) and chrcinogenesis response modulation". Supervisor Dr. R.N.Sharan and Dr. A.Alam.

Courses Conducted :
Chemistry, Introductory Biochemistry and Environment Biochemistry, Enzymology, Biochemistry practicals, Genetics, Medical Biochemistry, Biosynthetic Pathways, Biochemistry practicals, Techniques in Biochemistry, Physiological Chemistry, Bioenergetic pathways, Biochemistry practicals,Molecular Biology, Microbiology and Immunology. Special paper (Hormone Biochemistry), Biochemistry Practicals.

M.Phil
Biological Research Techniques, Biophysics and Physiological Chemistry, Cellular and Molecular Biology.

Seminars/Conferences/Symposia :

Attended
Dr.R.Sharma attended the 13th FAOBMB symposium at Manila, Philippines (Dec.2-5, 1997) and delivered a lecture on "Malate-asparate shuttle enzymes : Developmental and harmonal regulations in mice Bull. Phils, Soc. Biochem. Mol. Biol. Vol. 16, ppA.21.
L.S.Singh and R.Sharma presented a paper titled, "Alloxan induces mice adenosine diaminase in a tissue- and age-specific manner. Natl. Conf. on Gerontology and symp. Molecular Markers of Aging, April 7-9, 1997 at Gwalior.
Dr.R.N.Sharan gave invited talk (Poly ADP-ribosilation: A possible molecular drug against betel-nut induced carcinogenesis) in the Intl. Symp. on Trends in Life Sciences, JNU, Dec. 17-19, 1997.

Visiting Professor/Fellows : Prof.H.N.Singh (till August 1997).

Publications :
Bergman,B., Gallon,J., Rai,A.N. and Stal,A. "Nitrogen fixation by non-heterocystous cyanobacteria". *FEMS MICROBIOL. Rev.*. 19 : 139-185 (1997).
Bohm,L., Schneeweiss, F.H.A., Sharan,R.N. and Feinendegen,L.E. "Influence of Histone Acetylation on the Modification of

Cytoplasmic and Nuclear Proteins by ADP-ribosilation in Response to Free Radicals". *Biochim. Biophys. Acta*, 1334, 149-154,1997.
Borbhuiya,M.A. and Sharma,R. "Hepatic glucocorticoid receptor during development of mice:. Its level and binding to DNA-cellulose and nuclei". *In: Molecular Biology of development and Aging* (ed. M.S. Kanungo), pp 149-157, New Age Int. Publisher, New Delhi(1997).

Chakraborty,S., Rapthap,A., Alam,A., Srivastava,P.N. and Sharan, R.N. "Liposome as a carrier for delivery of radiomodulatory drugs and its advantages in chemo-radiotherapy. in *Radiation Radiomodifiers in Human Health"* (P.Uma Devi et al., eds.), pp 111-123, NICS, New Delhi, 1997.
Choudhury,S., Lamsal, M., Agarwal,S.K., Sharma,R. and Khan,M.Y. "On the tissue/species dependence of cathepsin B isoenzymes". *Mol. Cell. Biochem.* 177: 89-95 (1997).
Rai,A.N., Borthakur,M. and Paul, D. "Cyanobacterial symbiosis. In *Advances in Phycology* (B.N.Verma, A.K.Kargupta & S.K.Goyal ED), pp.57-84. APC Publ., New Delhi.
Saikia,J.Ra., Schneeweiss F.H.A. and Sharan,R.N. "Effects of chronic low-dose arecoline administration on the macromolecular components of bone marrow and spleen cells of mice". *Cancer J.* 1998.
Singh,L.S. and Sharma,R. "Developmental and hormonal regulation of intestinal adenosine deaminase in mice". *J. Biochem. Mos. Biol. Biophys.* 1(2) : 125-132 (1997).
Sharma,R. "Teorias sobre el envejecimiento". In *Bases fisiologicas del envejecimiento Y geriatria* (trans : M.D. Catala), pp. 43-55, Mansson, S.A., Barcelona (1997).
Sharma,R. "Enzimatica los cambios durante el envejecimiento". In *Bases fisiolcgicas del envejecimiento Y geriatrica* (Trans : M.D.Catala), pp. 59-61, Masson, S.A., Barcelona (1997).
Syiem,D. and Sharma,R. "Age-and tissue- specific regulation of chicken inorganic pyrophosphatase". *Biochem. Mol. Biol. Intl.* 42: 809-815 (1997).
Sharma,R. "Les Theories Du Vieillessement" In: *Viellissement et Geriatrie Les Bases Physiologigues* (Trans: M. Jobin), pp. 82-103, Les Presses de L' Universite Laval, Quebec (1997).
Sharma,R. "Les Effets Du Viellissement Sur Les Enzymes" In: *Viellissement et Geriatrie Les Bases Physiologigues* (Trans : M.Jobin), pp. 115-119, Les Presses de L' Univerite Laval, Quebec (1997).
Singh,S., Singh,A.K., Chakravarty, D., Singh,T.P.K. and Singh, H.N. "The diazotrophic defective caesium resistant (Cs-R) mutant of the cyanobacterium Nostoc muscorum showing dependence on Cs or Rb for normal diazotrophy and osmotolerence". New Phytol. 136: 223-229 (1997).

Thrust Areas :

Enzymology, Medical Biochemistry, Development and Aging, Nitrogen Fixation, Protein Chemistry, Betel-nut carcinogenesis and drug delivery system.

Other Activities :

Dr.R.N.Sharan was visiting Prof. at IME Research Centre Julich and DKF2, hEIDELBERG (28.12.97 to 27.1.1998).

CENTRE FOR ECO-DEVELOPMENT

Large scale deforestation and consequent loss of biodiversity and soil erosion due to intensive agriculture and over grazing on steep hill slopes, habitat destruction, undesireable charges in flora and fauna, siltation of river beds and unplanned land use practices are some of the important environmental problems of north-eastern India that directly influence the bio-economic condition of the people. Certain other aspects such as air pollution due to automobile exhaust, absence of proper sewage and waste disposal system in cities and towns and industrial effluents also affect adversly the environment.region. Therefore to achieve socio-economic upliftment of the people of the region these problems need to be addressed urgently by employing scientifically sound appropriate technologies conforming to ecological principles.

In view of the above and in pursuance of the objectives of North-Eastern Hill University (mentioned in Section 4 of the NEHU Act, 1973), the Centre for Eco-Development has been working on important environmental issues for sustainable socio-economic development of the people of the region. To accomplish the above objectives the Centre conducts teaching and research in Eco-Development,Environmental Impact Assessment and Environmental Science.Ecological Impacts of deforestation, Conservation of natural resources, Non-conventional energy sources, Shifting cultivation and alternative sustainable land technologies, Eco-development planning, Restoration ecology and Environmental Impact Assessment. The Centre has generated considerable data on various aspects of environment of the region. These are used by various user agencies. Besides, the Centre provided help to different government agencies for evolving suitable strategies for management of natural resources. A number of problem specific studies for environmental conservation conducted by the Centre have been quite useful in planning of developmental projects by the national and international agencies.

Head : Dr. B.K. Tiwari

Faculty :
Reader : Dr. B.K. Tiwari, M.Sc. (Gorak.), Ph.D (NEHU).
Lecturer : Dr. S.K. Barik, M.Sc. (Berh.), Ph.D. (NEHU).

Courses Conducted :

Certificate Course in Eco-Development

Student in-take :

i) Certificate Course in Eco-Development :

SC		ST		General		Total	
Male/Female		Male/Female		Male/Female		Male/Female	
1	Nil	2	Nil	1	Nil	4	Nil

ii) Ph.D. (Jointly with Department of Botany) :

SC		ST		General		Total	
Male/Female		Male/Female		Male/Female		Male/Female	
1	Nil	Nil	Nil	2	Nil	3	Nil

Other activities :

The Centre provided consultancy services to various agencies in the area of Environmental Impact Assessment of development projects.

Funds received from agencies other than NEHU/UGC : i) Society for Promotion of Wastelands Development/Ford Foundation : Rs.55,587/- ii) M/s.Lum Mawshun Minerals Private Limited, Shillong Rs.2,30,484/-.

Seminars/Conferences :

Organised :

The Centre organised following Workshops/Training programmes in collaboration with the Regional Centre, National Afforestation and Eco-development Board, NEHU, Shillong.

i) Workshop on "Joint Forest Management in Arunachal Pradesh" during 3-4 October, 1997 at Itanagar.
ii) Training Programme on "Microplanning for Joint Forest Management in Assam" during 23-24 December, 1997 at Guwahati.

Attended :
Dr. B.K.Tiwari (i) presented a paper on Joint Forest Management in North Eastern India with special reference to Tripura in National workshop on Joint Forest Management at Jawaharlal Nehru Centre for Advance Studies, Indian Institute of Science, Bangalore on 9-12 September, 1997 organised by CIFOR, Jakarta. (ii) Presented a paper on "Sacred Groves of Meghalaya" at the Regional Workshop on Role of Sacred Groves in Forest Research.Institute,Peechi(Kerala) on 8-12 December,1997 organised by UNESCO, New Delhi. (iii) Participated in the International Conference on Medicinal Plants and acted as a resource person in the area of Biodiversity Conservation, held at Indian Institute of Science, Bangalore, on 16-19 February, 1998 organised by FAO, IUCN, ICIMOD, FRLHT, IDRC, etc. (iv) Presented a paper "Fuelwood Consumption in Dibrugarh and Darang District of Assam, Indian" at the Seminar on Energy and Energy Resource Management in North East India organised by North East India Council of social

Science Research, Shillong during November 26-27, 1997. (v) Attended Workshop on Microplanning for Joint Forest Management held at Guwahati on 23-24 December, 1997 and presented a paper "Regulating NTFP extraction and participatory Evaluation of JFM".

Dr. S.K. Barik (i) participated as a resource person in UNESCO-ICIMCD. workshop on "Applied Ethnobotany" held at Kohima on 18-23 June, 1997. (ii) Attended a consultative meeting at ICIMOD, Kathmandu on an invitation from UNESCO, Paris in connection with the Development of a Manual for Quantitative Methods in Ethnobotany. (iii) Attended a workshop on Joint Forest Management in Arunachal Pradesh held at Itanagar on 3-4 October, 1997 as a resource person and presented a paper on "JFM experiences from North Eastern India and possible models for Arunachal Pradesh" (iv) a paper "Practical steps in Preparation of Microplan" in the workshop on Microplanning for Joint Forest Management held at Guwahati on 23-24 December, 1997.

Other Activities :

Dr. B.K.Tiwari delivered two lectures on 20 and 27 June, 1997 on "Population and Environment" in the Teachers Training Course organised by Centre for Adult and Continuing Education, (Population Resource Centre), NEHU, Shillong.

The Centre collaborated with National Atlas and Thematic Mapping Organisation, Calcutta in preparation of "District Planning Map Series" for the districts of Meghalaya.

Thrust Area : Ecology, Environment, Biodiversity, Energy.

DEPARTMENT OF FORESTRY

The Department of Forestry was created during the VIth Five Year Plan to bring out highly skilled technical, extension, and researchers in multi-disciplinary areas of forestry for rendering valuable service to the people of this region. It has started M.Sc. programme from this year by admitting six students.

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 : M.Sc. 6

(b) Actual admission :	SC	ST	Genl.	M	F	Total
	0	6	0	5	1	6

Courses conducted : General Silviculture; Tree Seed Technology and Propogation; Forest Policy; Acts and Laws; Silvics of Tree Spp; Forest Management.

Seminars/Conferences :

Attended :
Dr. U.K. Sahoo presented a paper titled "Enthnobotanical flora in the humid subtropical Semiever-green forests of Mizoram" at the National Conference on Health Care and Development of Herbal Medicine" held at Indira Gandhi Agricultural University, Raipur during 29-30, August, 1997.

Publications :

Jha,K.N. and Jha,L.K. "Chanakya the pioneer Economist. APH Publishing Corporation, 5 Ansari Road, Daryaganj, New Delhi, pp 1-332 (1997).
Lalramhinglova,J.H. and Jha,L.K. "Ethnomedicines from Mizoram North East India". Ethnobotany, (9): 105-111 (1997).
Sahoo,U.K. "The viable weed seed control of shifting agriculture and terrace agroecosystems of Meghalaya". *Seed Research*, 25 (1): 1-4 (1997).
------- "Species composition and dynamics of viable soil seed bank in crop field under slash and burn and terrace cultivation in Meghalaya". J. Indian Botanical Society, 76: 1-6 (1997).
------- and Jha, L.K. "Effect of depth and duration of burial on seed viability and dormancy of *Bidens pilosa* L. and *Richardsonia pilosa* HBK." Seed Research, 25(1): 5-10 (1997).
Upadhyaya,K.K. and Jha,L.K. "Mizoram Agriculture: Financial viability of Agroforestry". *Ind. J. of Agril. Econ.*, Vol.33(4) 1997.

Study Tour/Field Trip :

The students of this department visited Assam, Meghalaya and Mizoram forest areas for a period of 20 days to study the present aspect of Forest management.

Thrust Areas of Research Sustainable Hill Farming system Ethnobotany,Agroforestry and Watershed Management.

DEPARTMENT OF ZOOLOGY

The Department of Zoology was established in 1974 with limited number of faculty members 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. The department has been granted the second phase of DRS project under Special Assistance Programme by the University Grants Commission to undertake advance research work in the leading branches 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 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.Raghuvarman, 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.)
(Ms.) 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.Chartterjee, M.Sc. (Burd.), Ph.D. (Ban.)
A.K.Yadav, M.Sc. (Agra), Ph.D. (NEHU)

Students Intake :

(a) Enrolment capacity : M.Sc. = 20
(b) Actual admission :

	SC	ST	Genl.	Male	Female	Total
M.Sc.	0	15	5	8	12	20
Ph.D.	0	4	0	3	1	4

Degrees Awarded :

M.Phil :
M.R.Jyrwa: Investigations on temporal changes in water quality and plankton ecology in a rice-field ecosystem in Jaintia Hills District (Meghalaya). Supervisor, Prof. B.K. Sharma.
Md.Hussain : Species composition, distribution and ecology of Zooplankton of certain beels of Upper Assam. Supervisor, Professor B.K. Sharma.
Ilona Jacinta Kharkongor : Prevalence of hypothyroidism in women

of reproductive age in Meghalaya. Supervisor, Dr.B.B.P. Gupta.
Carina Goswami: Glucose efflux and the rate of gluconeogenesis in perfused liver of a freshwater air-breathing teleost, *Clarias batrachus* during cell volume changes. Supervisor, Dr.N. Saha.

Ph.D.
M.Palanichami : Cytogenetic and genetic studies on the chocolate Mahseer, *Acrossocheilus hexagonolepis*. Supervisor, Professor K.Chatterjee.
Mamoni Dutta : Studies on the monogenean parasites of anuran amphibia in Meghalaya, India-morphological, ecological and biological aspects. Supervisor, Prof.(Mrs.) V. Tandon.
Anshuman Chattopadhyay : Relationship between cellular radio and chemosensitive endogenous glutathion in mammalian cell with respect to cytogenetical end-points. Supervisor: Dr.A.Chatterjee.

Funds received from agencies other than NEHU/UGC :
Rs.4,96,400/- from G.B.Pant Institute of Himalayan Environment and Development (DOEn, Govt. of India) for the project entitled "Aspects of ascariasis and hookworm infections in tropical and montanous high rainfall areas of Meghalaya" (Principal Investigator : Professor V. Tandon).

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 : Cell Biology & Immunobiology; Endocrinology and Reproductive Physiology; Entomology; Genetics; Limnology.

Seminars/Conferences/Symposia :

Attended :
Prof. A. Raghu Varman attended (i) the 2nd Congress of Federation ofIndian Physiological Societies held at S.V. University,Tirupati (September 15-17,1997) and presented papers entitled "Role of haeme pigments in the colour vision of human beings and other vertebrates" and "Nature and physiology of the cuticle of the workers of the ant, Formica rufa, (ii) 85th Session of the Indian Science Congress held at Osmania University Hyderabad (January 3-7,1998) and presented a paper entitled "Permeability characteristics of the cuticles of various castes of the termite, *Odontotermes distans*".

Prof.B.K.Sharma attended the VIIIth International Rotifer symposium held at St.John's University, Minnesota,USA(June 22-28,1997) and presented a peper entitled "Biodiversity of freshwater rotifers in India, with remarks on their distribution in North Eastern India".

Dr.R.N.K.Hooroo attended the XXIst National Conference of the

Electron Microscope Society of India (December,1997) and presented a paper entitled" Transmission electron microscopical studies of the skin of frog *Rana limnocharis* during hibernating period".

Dr.N.Saha attended Falk Symposium No.103 held at Freiburg University (October 1-6, 1997) and presented a paper titled "Effect of alkalinity on ureogenesis in an air-breathing teleost, *Claria batrachus*".

Dr.A.Chatterjee attended 17th Annual convention of Indian Association for Cancer Research held at Chittaranjan National Cancer Institute, Calcutta (January 21-24, 1998) and presented a paper.

Publications :

Blum,M.S., Raghuvarman,A., Dkhar,B., Kharbuli,B. and Marak,K.R. "Wasp "Queen subtance" : 9-oxodec-trans-2-enoic acid" J. Endocrinol. Reprod. 1(1) : 20-22 (1997).

Chatterjee,A. and Chattopdhyay,A. "Influence of superoxide dismutase on chromosome aberrations induced by bleomycine alone or in combination of reduced glutathione" Current Science 73 : 693-697 (1997).

------ and Chattopdhyay,A. "Differential influence of buthionine sulfoximine on radiation induced chromosome aberrations in ammalian cells" Transactions of the Zoological Society of India 1 : 127-133 (1997).

Chattopdhyay,A., Choudhury,S. and Chatterjee,A. "Modulation of the clastogenic activity of bleomycin by reduced-gluta-thione, glutathione-ester and buthionine sulfoximine" Mutagenesis 12 : 221-225 (1997).

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

Gupta,B.B.P. "Mechanism of insulin action" Current Science 73 : 993-1003 (1997).

------ and Mahanta,A. "In vitro effects of a single dose of norepinephrine and epinephrine on tissue respiration of hibernating and non-hibernating species of frogs" Indian J. Exp. Biology 35 : 1336-1340 (1997).

Lyndem,L., Tandon,V. and Yadav,A. "Hookworm infections : A cross-sectional study of a rural community in a sub-tropical and high-rainfall area of Meghalaya, India", in : Proc. Global Meet on Parasitic Diseases, pp. 165-166.

Pal,P. and Tandon,V. "Anthelmintic efficacy of Flemingia *vestita* (Febaceae) : Genestein-induced alterations in the esterase activity in the cestode, *Raillietinz echinobothrida*" J. Biosciences 23 (1) : 101-107 (1998).

Raghuvarman,A. "Induction of puffs on the polytene chromosomes of salivary glands of the middle instar larvae of *Chironomus khasiana* by Queen substance" J. Endocrinol. Reprod. 1(1) : 23-26 (1997).

Sharma,B.K. and Sharma,S. "Lecanid rotifers (Rotifera : Monogononta : Lecanidae) from North-Eastern India" Hydrobiologia 356 : 157-163 (1997).
Sharma,S. and Sharma,B.K. "Observations on the longivity, instar durations, fecundity and growth in *Alonella excisa* (Fisher) (Cladocera : Chidoridae)" Indian J. Anim. Sciences 68 : 101-104 (1998).
Saha,N., Dkhar,J.,Anderson,P.M. and Ratha,B.K. "Carbamylphosphate synthetase in an aire-breathing teleost, *Heteropneustes fossilis* Comp. Biochem. Physiol. 116B : 57-63 (1997).
Tandon,V., Pal,P., Roy,B., Rao,H.S.P. and Reddy,K.S. "In vitro anthelmintic activity of root-tuber extract of *Flemingia vestita*, and indigenous plant in Shillong, India" Parasitology Research 83: 492-498 (1997).

Study Tour/Field Trips of students :

Students of M.Sc.(Zoology) III Semester were taken on study tour by Professor K.Chatterjee and Dr. B.Kharbuli for 17 days (w.e.f. 28.12.97 to 13.1.98). They visited several academic and research institutions in Bhubaneshwar, Sundarbans and Calcutta and collected marine and freshwater specimens for preparing field reports.

Thrust Area : Environmental Biology.

Other Activities : The Department has undertaken research projects on the biodiversity of the N.E. region with special attention to Meghalaya.