

## Deptt. of Bio-Chemistry

This department started in 1982 with the aim to produce highly skilled technical personnel and researchers in the multi-disciplinary area of biochemistry those who could contribute their valuable services to the people of this region and improve their quality of life. Since its inception this department has offered courses like M.Sc. (Biochemistry) and M.Phil./Ph.D. programmes to meet its aim and deal with various challenging and fundamental problems of biology and medicine..

The main areas in which the department is conducting research are Enzymology, Protein Chemistry, Medical Biochemistry, Immunology, Radiation and Molecular Biology, Betel-nut Carcinogenesis, Drug delivery system, High Altitude Adaption and Nitrogen Fixation.

Our M.Sc./research students compete successfully at National Entrance Test (NET) and GATE every year. Many M.Sc./M.Phil 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 this department. The major funding agencies in India like DST, CSIR and UGC have regularly funded major research projects in this department.

This department has also contributed research publications in international journals and the faculty have also authored/edited a few books and have contributed several book chapters.

Head of Department: Dr. R. Sharma.

### Faculty :

Name	Designation	Specialization
1. Dr. R. Lalithantluange (On Lien)	Professor	Protein Chemistry
2. Dr. A.N. Rai	Professor	Nitrogen Fixation
3. M.Y. Khan	Reader (On leave)	Protein Chemistry and Enzymology
4. Dr. R. Sharma	Reader	Medical Biochemistry
5. Dr. R.N. Sharan	Reader	Radiation and Molecular Biology
6. Dr. A. Alam	Lecturer	Immunology

Student intake:

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

(b) Actual admission under the heading:

	( SC/ST/GENL )	( Male/Female )
M.Sc.	0 / 5 / 4	4 / 5
M.Phil	0 / 1 / 2	2 / 1
Ph.D.	0 / 3 / 9	4 / 8

Courses conducted: (Titles only)

Chemistry. Introductory Biochemistry and Biostatistics, 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 (Nitrogen Fixation), Biochemistry practicals

Seminars/Conferences/Symposia/Extension programmes:

Organised: Nil

Attended: European Society for Radiation Biology & European Hypothermia Society meeting, Amsterdam, Holland, June, 1994. A paper titled "Determination of ADP-ribosylation of cytoplasmic and nuclear proteins following gamma-irradiation of human glioblastoma cells" was presented ( R. N. Sharan ).

12th International Congress of Pharmacology, Montreal, Canada, July, 1994. Two papers titled "Liposome-entrapped drugs show enhanced radiomodulation" and "Biochemical and cytotoxic properties of hormonotoxins" were presented ( A. Alam ).

International Conference on Molecular Biology of Development and Ageing, Bhubaneswar, India, September, 1994. A paper titled "Hepatic glucocorticoid receptor during development:

Its level and binding to DNA-cellulose and nuclei" was presented (R. Sharma).

International Symposium on Gerontology and VIIIth Conference of Association of Gerontology, New Delhi, India, November, 1994. A paper titled "Kinetic difference in liver inorganic pyrophosphatase during development of chick" was presented (D. K. Svieml).

Visiting professors/Fellows:

Prof. K. C. Upadhyay (JNU, New Delhi)  
(September 01 to October 15, 1994)

Publications:

Sharan, R. N. "Biochemical investigation of carcinogenic potency of betel nut (Kwai) of North-East India". In: Oral Oncology, vol. III, pp. 173-177, Mac Millan India, 1994.

Sharma, R. "Enzymatic changes during ageing". in: Timiras, P.S. (ed) Physiological Basis of Ageing and Geriatrics, 2nd Edition, pp 50-52, CRC Press, USA, 1994.

Sharma, R. "Theories of ageing". in, Timiras, P.S. (ed) Physiological Basis of Ageing and Geriatrics, 2nd Edition, pp 37-46, CRC Press, USA, 1994.

10. Study Tour/Field Trip of students:

Nil

11. Thrust area of research:

Enzymology, Medical Biochemistry, Nitrogen Fixation, Protein chemistry, Betel-nut carcinogenesis and Drug delivery system

12. Research programmes/research projects: (under taken during the year under review)

DST sponsored research project to Dr. R. Sharma:  
Biochemical changes in glucocorticoid receptors during development and aging of mice (10.5 lakhs).

UGC sponsored research project to Dr. R. Sharma:  
Regulatory changes in enzymes of malate-aspartate shuttle during development and aging of mice (3.5 lakhs).

CSIR sponsored research project to R.N. Sharan: The role of high mobility group (HMG) proteins in cellular response during induced carcinogenesis (Rs. 3.75 lakhs).

13. Any other remarks:

Dr. R.N. Shanar was Visiting Professor at Institute of Medicine, KFA, Juelich (Germany) from January, 1994 to January, 1995 under the auspices of Indo-German R & D Cooperation Programme of the two Governments.

## DEPARTMENT OF BOTANY

The Department is actively involved in teaching and research in priority areas of regional and national importance. Keeping the regional relevance in view, Forest Biology was identified as the thrust area since its inception in 1974. Since then the Department continues to make valuable contribution in the field of Forest Biology and allied disciplines. The teaching programme of the Department has so developed during last two decades that students passing out from here are successfully serving the region in various capacities.

The Department is covered under SAP of U.G.C. In view of its research contributions, U.G.C. has recognised Ecology - Higher Plant Ecology and Microbial Ecology as thrust area under SAP. Other major areas of research in which the Department has made notable contribution are Plant Physiology, Experimental Morphology, Cytogenetics and Plant Taxonomy. Research papers related to all these areas have found place in prestigious national and international journals.

In order to help improve the teaching standards in Colleges and Universities of the region, the Department is regularly conducting U.G.C. refresher courses. During 1993-94 alone about 60 lecturers from different states of north-eastern region successfully completed the three refresher courses organised by the Department.

Head of the Department : Professor P. Tandon

### Faculty:

Name	Designation	Specialization
1. Prof. R.R. Mishra	Professor	Microbial Ecology
2. Prof. R.S. Tripathi	Professor	Population Ecology
3. Prof. Y.S. Chauhan	Professor	Experimental Morphology
4. Prof. P. Tandon	Professor	Plant Physiology
5. Dr. H.N. Pandey	Reader	Plant Ecology
6. Dr. G.D. Sharma	Reader	Microbial Ecology
7. Dr. R.C. Laloo	Reader	Ecology (on leaf)
8. Dr. A.K. Misra	Reader	Genetics
9. Dr. N.K. Churugoo	Reader	Plant Physiology

10. Dr. (Miss) M.S. Dkhar	Reader	Microbial Ecology
11. Dr. Y. Kumar	Lecturer	Plant Taxonomy
12. Dr. L. Kharlukhi	Lecturer	Plant Physiology
13. Dr. N. Venugopal	Lecturer	Plant Anatomy

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**Student Intake :**

M.Sc. : 20  
 Pre-Ph.D/Ph.D. : Not fixed

**Actual Admission :**

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	ST		SC		GEN		TOTAL	
	Male	Female	Male	Female	M	F	M	F
M.Sc.	9	6	-	-	3	2	12	8
Ph.D.	2	1	-	-	2	2	3	4

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**Courses Conducted :**

**I. M.Sc. Course :**

**Core Papers :**

Algae, Bryophyta and Pteridophyta  
 Gymnosperms and Plant Anatomy  
 Mycology and Plant Pathology  
 Plant Taxonomy and Phytogeography  
 Microbiology  
 Plant Biochemistry and Molecular Biology  
 Genetic and Plant Breeding  
 Population and Community Ecology  
 Plant Physiology  
 Morphology, Embryology and Differentiation  
 Ecosystem Analysis and Biostatistics

**Special Papers :**

Plant Biotechnology  
 Microbial Ecology  
 Ecology and Management of Forest Ecosystem  
 Radiation Botany  
 Ecology and Physiology of Algae  
 Protein Chemistry  
 Physiology of Plant Growth and Development  
 Applied Cell and Molecular Genetics  
 Angiospermic Taxonomy

II. M.Phil/Pre-Ph.D.Course :

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Analysis of Forest Ecos-tem  
Dynamics and Regulation of Plant Population  
Microbial Ecology  
Plant Pathology  
Ecology and Control of Soil Borne Pathogen  
Microbiology of roots and its Environment  
Experimental Morphology  
Experimental Taxonomy  
Systematic Botany  
The Control of Growth and Differentiation in Plants  
Algal Ecology and Physiology  
Molecular and Hormonal Basis of Plant Regulation Genetics  
Ecology of Successional Plant Communities  
Molecular Basis of Cell-structure and Function

School Level Course :

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Techniques in Microbiology

Seminars/Conferences/Symposia/Extension Programme :

I. (a) Refresher Course :

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The Department conducted three refresher courses for College and University teachers during 1994-95.

(b) Attended :

J. Prof. R.S. Tripathi :

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I. (i) Delivered a series of three lectures at the Department of Botany, University of Poona, Pune on 21 and 22 October, 1994.

- (a) Modern concepts in Population Ecology.
- (b) Regeneration Ecology of forest trees in north-east India as related to disturbance.
- (c) Weed-crop interaction.

(ii) Delivered a lecture on "Development and ecological impera-tives with special reference to north-east India". in the last week of October, 1994 on special invitation by the Assam state Council of Science, Technology and Environment at Guwahati. Prof. U.R.Rao, the eminent Space Scientist chaired the lecture.

(iii) Delivered a lecture on "Man in the ecosystem" at a seminar on "Religion and Environment" held during 4-5 November, 1994 at Pastoral Centre, Shillong.

ii. Chaired the special lecture delivered by Dr. Monique S.J. Simmons (Head of Biological Interactions, Jodrell Laboratory, Royal Botanic Gardens, Kew, England) on 7.1.95 in the Botany Section of the 82nd Session of the Indian Science Congress Association held at Jadavpur University, Calcutta.

(ii) Served as the Recorder of the Botany Section at the 82nd Session of the Indian Science Congress Association held at Jadavpur University, Calcutta during January 5-8, 1995.

(iii) Organised workshop Integrated Afforestation and Eco-development Projects (IAEP) schemes in north-east India : "Problems and prospects" at Shillong on 13th December, 1994.

(iii) "Experience sharing workshop among NGOs/VAs involved in afforestation and eco-development activities in north-east India" at Sepahijola Forest Training School, Tripura during 15-17 March, 1995.

(iv) Organised consultation/discussion meetings on Joint Forest Management (JFM) at Itanagar (May 9, 1994), Kohima (February 20-21, 1995), Guwahati (March 6, 1995) and Imphal (March 13, 1995) and finalised the JFM Resolution for adoption by the respective state Governments.

Dr. H.N. Pandey participated in the Conference held in New Delhi during 11th-12th January, 1995 and presented a paper entitled, "Biodiversity of sacred groves of North Eastern India : an ecological perspective in INSA-IUBS workshop on Bio-diversity genes to ecosystems : towards sustainable management. He also attended the VI International Congress of Ecology held at Manchester, U.K. during 20th-26th August, 1994 and presented a research paper entitled, "Gap phase regeneration in a sub-tropical humid forest of north-east India".

Dr. G.D. Sharma presented papers on "Forest degradation and afforestation in the workshop held at Forest Research Institute, Bynihat, Meghalaya from 22nd-27th February, 1994.

Dr. A.K. Misra visited University Claude-Bernard Lyon 1 France during December, 1994 to February, 1995 in connection with collaborative research work sponsored by Indo-French Centre for Promotion of Advanced Research.

Dr. Y. Kumar acted as the Chairman in one of the technical sessions of the National Seminar on "Conservation and Development in Tropics". He presented a paper on "Prospects of Orchid Industry in India during 23rd-25th March, 1995 at Banaras Hindu University, Varanasi. He also presented a paper in Biodiversity at Bhagalpur University during 28th-29th October, 1994.

#### Visiting Professors :

During March, 1995 Prof. T. Prasad of Bhagalpur University and Dr. S.C. Pal of Vishva Kharati University visited the Department and gave the lectures on "Microtoxins in Human Food" and "N fixation and its role in agriculture" respectively.

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Dr. Phillips Normand and Dr. Pascal Simonet Universite' Claude Bernard, Lyon, France visited the laboratory of the Department during November to December, 1994 under the Indo-French Centre for promotion of Advance Research sponsored Research Project.

#### Publication :

Chhetry, G.K.N., Mishra, R.R. and Sharma, G.D. Effect of microclimatic factors on epidemiology of leaf spot diseases caused by *Colletotrichum lindemuthianum* and *Phaeoisariopsis griseola* of French bean (*Phaseolus vulgaris*) Indian Journal Agric. Sci. 64 (9) : 667-670 (1994).

Chhetry, G.K.N., Mishra, R.R. and Sharma, G.D. (1994). Spatial distribution of Anthracnose disease cause in french bean by *Colletotrichum lindemuthianum*. Ind. Jour. Mycol. Pl. Pathol. 24 (1) : 65-66 (1994).

Chhetry, G.K.N., Sharma, G.D. and Mishra, R.R. New report on virulent strain of *Phaeoisariopsis griseola* (SACC) on french bean (*Phaseolus vulgaris* L.) Acta Bot. Indica, 22 : 150-151 (1994)

Chhetry, G.K.N., Mishra, R.R. and Sharma, G.D. Spatial dispersion statistics and sequential sampling plan for leaf spot disease caused by *Colletotrichum lindemuthianum* in french bean. Indian Phytopath., 46: 64-69 (1993)

Corrie, S. and Tandon, P. Plantlet regeneration from cotyledonary cultures of a forest tree (*Erythrina cerasoides* D. Don). Indian Journal of Forestry 17 (1) : 84-85 (1994).

Govil, S.R. and Pandey, H.N. Expression of Physiological characteristics associated with growth in wheat under competition plant. *Physiol and Bio-chem.* 22 (1): 1-4 (1995).

Govil, S.R. and Pandey, H.N. Growth analysis of wheat and maize as affected by plant population. A comparison of Classical and

regression methods. Crop Research 9 : 114-120.

Jha, D.K., sharma, G.D. and Mishra, R.R. (1994) Ecology of vesicular arbuscular mycorrhiza. In: Prasad, A.B. and Bilgrami, K.S.(ed) Microbes and Environment pp 199-208. Narendra Publ. House, New Delhi. (1994).

Joshi, S.R., Sharma, G.D. and Mishra, R.R. Effect of disturbance on microbial population and their activities in forest soils at Higher altitude of Meghalaya. In: Pandey, Y.P.S. and Rawal, R.S. (ed) High Altitudes of the Himalaya, (Biography, Ecology and Conservation) pp 298-309 Gyanodaya Prakashan, Nainital (1994)

Joy, K.A., Kumar, Y. and Sharma, J. "A study on the palynology of Paphiopedalum Pfity". in: Pandey, A.K. (ed) Taxonomy and Biodiversity pp. 172-178, CBS Publication and Distribution, New Delhi (1995).

Kayang, H., Sharma, G.D. and Mishra, R.R. Effect of isopods grazing upon microbes and nutrient release from decomposing leaf litter of Alnus nepalensis D. Don. European Jour., Soil Biol. 30 (4) : 11-15 (1994)

Kshattniya, S., Sharma, G.D. and Mishra, R.R. Fungal succession on leaf litters of different tree species at two altitude. Pedobiologia 38. 125-137 (1994).

Kshattniya, S., Sharma, G.D. and Mishra, R.R. Litter decomposition in tropical forests of north-east India. Acta Botanica Indica 22 : 279-281 (1994).

Kumar, Y., Joy, K.A. Biodiversity and conservation of Dendrobium species of North Eastern India. In : Pandey A.K. (ed) Taxonomy and Biodiversity pp. 59-67, CBS Publ. and Distr., New Delhi (1995).

Pandey, H.N. Ecology of Parthenium hysterophorus Linn. In : Chauhan, D.D. (ed) Environment and Adaptive Biology of Plants. pp. 23-26 Scientific Publishers, Jodhpur. (1995).

Sahoo, U.K., Tripathi, R.S. and Pandey, H.N. (1995). Dynamics of buried weed seed populations as influenced by conventional tillage and no-tillage in Meghalaya. Indian Journal of Agricultural Sciences 65 (1) : 49-53 (1995).

Sahoo, U.K., Tripathi, R.S., Pandey H.N. and Mishra, J. Population dynamics of buried weed seeds as influenced by shifting and terrace cultivation in humid sub-tropics of India. Weed Research 34 : 157-165 (1994).

Tripathi, R.S., Uma Shankar and Pandey, H.N. Present status and

strategies for eco-restoration of degraded ecosystems at Cherrapunji : present status and strategies for eco-restoration in : Tiwari, B.K. and Singh, S (ed) Eco-restoration of Degraded Hills pp. 23-50. Kaushal Publication, Shillong (1995).

Upadhyay, M.P., Ishikawa, M., Tandon, P., Kunihiro, Y., Ozawa, K. and Nakajima, K. Improvement of embryogenic calli and their cryopreservation of vitrification. Japanese Journal of Plant Breeding. 43 (1) : 198(1993).

Venugopal, N. and Krishnamurthy, K.V. Seasonal pattern of cell division in the vascular cambium of some tropical timber trees. Cytologia 59 : 323-332 (1994).

Study tour/Field Trips of the Department :-

The M.Sc. students went for the study tour to Bangalore and Trivandrum during December 1994 to January, 1995. During the tour they visited Tropical Botanical Garden and Environmental Resource Centre at Trivandrum, Indian Institute of Science at Bangalore and Centre for Advance Studies in Botany at the University of Madras. Apart from these institutions, they also visited other places of Botanical importance.

Thrust area of research : Forest Biology

Research Programme/Research Project undertaken during the year :

<u>Title of the Project</u>	<u>Sponsoring Agency</u>	<u>Investigators</u>
"Studies on nutrient restoration mechanism in soil during recovery of degraded forest ecosystems in Meghalaya" (Extended for one year)	CSIR	Prof.R.S.Tripathi(CI) Dr. H.N. Pandey (PI)
"Preparation of report on State of Meghalaya's Environment	Govt.of Meghalaya Dept. of Urban Affairs	Prof.R.S.Tripathi (PI) Dr. H.N.Pandey (CI) Dr. B.K.Tiwari (CI)
"Studies on sacred groves of Meghalaya, strategies for conservation	NEC	Prof. R.S.Tripathi(CI) Dr. S.K.Barik (CI) Dr. B.K.Tiwari (PI)
"Screening and selection of Woody species for energy Plantation programme in north-east India".	Dept.of Non-Conventional Energy Source Govt.of India (DNES)	Prof.R.S.Tripathi(CI) Dr. B.K.Tiwari (PI)
"Fine root dynamic of dominant tree species of sub-tropical forest of Meghalaya"	UGC	Dr. H.N.Pandey Prof.R.S.Tripathi

"Assessment of modulation competence.....DNA amplifications"

DST

Dr. A.K.Misra

"Role of earthworm on litter decomposition and dispersal of microbes in maize fields"

UGC

Dr.(Miss)M.S.Dkhar

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Honours/ Awards etc:

The publication entitled, "Spatial dispersion statistics and sequential sampling plan for leaf spot disease caused by *Colletotrichum lindemuthianum* in french bean has been awarded best research paper of 1994 by Indian Phytopathological Society, New Delhi.

Nominated as a member of the Expert Committee to evaluate the nominations for the Indira Priyadarshini Vrikshamitra Award instituted by the Ministry of Environment and Forest, Govt. of India.

\*\*\* Nominated as a member of the Meghalaya State Council of Science, Technology and Environment by Government of Meghalaya.

Dr. N.K.Chrungoo was awarded the National Associateship of the Department of Biotechnology, Ministry of Science and Technology, Govt. of India, New Delhi.

## DEPARTMENT OF ZOOLOGY

The department of zoology was established in 1974 with limited number of Faculty and Facilities. It offers specializations in all major disciplines of zoology. The department has been granted a DRS project by the University Grants Commission to undertake advanced research work in the leading branches of zoology. For the last many years, the department has been selected for conducting refresher courses in Zoology for the college and University teachers.

Head of the Department: Prof. (Mrs.) V. Tandon.

### Faculty :

S.N.	Name	Designation	Specialization
1.	Dr. K. Chatterjee	Professor	Cytogenetics
2.	Dr. H. Raghuraman	Professor	Entomology
3.	Dr. (Mrs) V. Tandon	Professor	Parasitology
4.	Dr. B.K. Sharma	Professor	Biosystematics
5.	Dr. B.B.P. Gupta	Reader	Endocrinology
6.	Dr. S.B. Prasad	Reader	Cell Biology, Immunobiology
7.	Dr. (Mrs) R.N.K. Hooroo	Reader	Developmental Biology.
8.	Dr. B. Kharbuli	Lecturer	Animal Physiology
9.	Dr. N. Saha	Lecturer	Adaptational Bio- chemistry.
10.	Dr. A. Chatterjee	Lecturer	Cytogenetics
11.	Dr. A.K. Yadav	Lecturer	Parasitology
	Vacant	Professor (2)	
		Reader (2)	

### Student intake :

- (a) Enrolment capacity : 1. M.Sc. - 20  
2. M.Phil. - 10

### (b) Actual Admission under the following headings :

	SC	ST	Genl	Male	Female
1. M.Sc.	1	12	7	11	9
2. M.Phil.	Nil	3	9	5	7
3. Ph.D.	Nil	6	11	7	10

Courses conducted : Following courses were conducted :-

M.Sc. Semester I : Cell Biology & Immunology; Molecular Biology and Biotechnology; Functional Anatomy - I

- M.Sc. Semester II : Biological Chemistry; Genetics and Developmental Biology; Functional Anatomy - II.
- M.Sc. Semester III : Animal Ecology and Behaviour; Parasitology, Applied Entomology, Fish & Fisheries; Special Paper - I.
- M.Sc. Semester IV : Biosystematics & Evolution; Techniques in Biology and Biometrics; Special Paper - II.

Special Papers offered : Cell Biology & Immunology, Endocrinology & Reproductive Physiology, Entomology, Genetics, Limnology.

**M.Phil. :**

Department Papers : Animal Cytogenetics, Animal Parasitic Helminthology, Adaptational Physiology, Advanced Endocrinology, Entomology, Experimental Limnology.

School Level Paper : Basic Techniques in Biological Research.

Seminars/conferences/symposia etc. organized and attended:-

The department organized the following refresher courses sponsored by the UoD (New Delhi) for college and University teachers:

1. "Recent Advances in Zoology - I" (11.7.94 to 2.8.94)  
(Course Co-ordinator: Dr. B. B. P. Gupta)
2. "Recent Advances in Zoology - II" (17.10.94 to 7.11.94)  
(Course Co-ordinator : Dr. S.B. Prasad)
3. "Recent Advances in Zoology - III" (14.2.95 to 7.3.95)  
(Course Co-ordinator : Dr. B. Kharlukhi)

Dr. B. Kharlukhi was one of the Organizers of the "National Symposium on Cancer Research" (February 6-8, 1995) which was held at NEHU, Shillong and organized in collaboration with Indian Association of Cancer Research (IACR).

Faculty of the department attended the following seminars/conferences/symposia etc.:

Prof. K. Chatterjee attended a project monitoring workshop held at Regional Research Laboratory, Bhubaneswar in October, 1994 organized by the Ministry of Environment & Forest, and presented a paper entitled "Genetic studies of Chocolate Mahaseer, *Acrossocheilus hexagonolepis* in relation to its environment".

Prof. A. Raghuvaman attended the satellite Symposium on "Complex carbohydrates" affiliated to 16th International Congress of Biochemistry and Molecular Biology held at Roorkee University, and presented a paper entitled "Bound sugars, amino acids and B-ecdysone in the Royal jelly of the honey bee, *Apis cerana* var. *indica*".

Prof. (Mrs) V. Tandon attended VIII International Congress of Parasitology (ICOPA VIII) held at Izmir, Turkey (October 10-14, 1994) and presented two research papers entitled "Anthelmintic activity of *Cannabis sativa*; effect of leaf extract of *Flemingia vestata*, an indigenous plant in Shillong, India".

Prof. (Mrs.) V. Tandon was invited for and attended a workshop on "Gender, Health and Sustainable development", held at Singapore organized by International Development Research Centre in collaboration with global Commission on Women's Health (WHO) and the Special Programme for Research and Training in Tropical Diseases (TDR) and jointly coordinated with ENGENDER, the Centre for Environment, Gender and Development, Singapore. She delivered a plenary lecture entitled "Macroparasitic infections in Meghalaya, North East India", acted as Facilitator and Reporteur for two group meetings, and was nominated as Co-ordinator for task Force on Gender and Environmental Health in Asia Pacific region.

Prof. B. K. Sharma attended "International Congress on Tropical Limnology" (July 4-8, 1994) organized by Satya Wacana University, Indonesia. He acted as Chairperson of a scientific session, and also presented two research papers entitled "Limnological studies in a small reservoir in Meghalaya (N.E. India)" and "Species composition, distribution and abundance of rotifers in river Narmada, Madhya Pradesh (Central India)".

Prof. B.K. Sharma attended "National Symposium on Perspective in Biodiversity" (March 24-25, 1995) organized by the Zoological Society at Calcutta and presented a research paper entitled "Biodiversity of Indian fresh water rotifers - Status and scope".

Prof. B.K. Sharma attended the 82nd session of the Science Congress Association held at Jadavpur University, Calcutta (January 3-8, 1995).

Dr. (Mrs.) R.N.K. Tiwari attended the XIX conference of Electron Microscope Society of India (December 14-16, 1994) held at National Physical Laboratory, New Delhi - 110002, and

presented a paper entitled "Morphology and distribution of sensilla and other cuticular structures on the antenna of butter fly (*Graphium sariento*) and their physiological significance".

Dr. N. Saha attended the "National Seminar on Fish Biology" (January 27-28, 1995) held at the Department of Zoology, Visva Bharati University, Santiniketan, and presented two phosphate papers entitled "Different isoenzymic forms of carbamyl phosphate synthetase and sub-cellular localization on urea cycle enzymes in a fresh water air breathing teleost, *Heteropneustes fossilis*" and "Induction of ureogenesis in perfused liver of a fresh water air breathing teleost, *Heteropneustes fossilis*".

Dr. A. K. Yadav attended "Regional Workshop on Electron Microscopy" (June 28-30, 1994) organized by RSIC, NEHU, Shillong.

Dr. A. K. Yadav attended a workshop on "Cultivation of parasites of biomedical importance" (November 28 - December 10, 1994) held at CDRI, Lucknow.

#### Visiting Professors/Fellows :

Dr. A. R. Khuda Bukhsh, Deptt. of Zoology, University of Kalyani visited the Department as a Visiting Fellow for one month.

Dr. Fritz Anders, Institute of Genetics, Justus Liebig University, Heinrich - Buff Ring, Giessen, Germany visited the Department for one week and delivered two lectures on genetics and cancer.

Dr. S. B. Prasad visited Department of Life sciences, Dibrugarh University as UGC Visiting Fellow for 15 days.

#### Publications:

1. Deb M. K. and Varman R. "Glycosaminoglycan fractions in the cornea of two fishes". *Current Sci.* 67 : 1020 (1994).
2. Lynchoh R D and Tandon V. "Nervous system in the monozoic cestode, *Dioambanilla penetrans* (Caryophyllidae) as revealed by nonspecific esterases and cholinesterase activity". *Acta Parasitologica* 39(2) : 82 (1994).
3. Tandon V and Roy B. "Analysis of trace elements of some edible trematodes parasitizing the bovine hosts". *Current Science* 67(7): 548 (1994).
4. Dutta M and Tandon V. "The nervous system of *Polystoma*

indicum (Monogenea : Polystomatidae) as revealed by non-specific esterase localization". *Folia Parasitologica* 41 : 177 (1994).

5. Prasad S B, Khokhan A R and Siddik Z H. "Potentiation by L-buthionine sulfoximine (BSO) of cytotoxicity of platinum (IV) complexes in sensitive and resistant human ovarian carcinoma cells", in : Collery, P., Gairier, L.A., Littlefield, N.A. and Etienne, J. (eds) *Metal ions in Biology and Medicine*, Vol. 3, pp. 365-370. John Libbey Eurotext, Paris (1994).
6. Saha N and Ratha B K. "Induction of ornithine-urea cycle in a freshwater teleost, *Heteropneustes fossilis*, exposed to high concentrations of ammonium chloride". *Comp. Biochem. Physiol.* 108B : 315-325 (1994).
7. Chatterjee A, Chattopadhyay A and Lawlor C J Z. "Effects of glutathion on sister chromatid exchanges in normal and buthionine sulfoximine-treated mice". *Mutation Research*, 327 : 171-177 (1995).
8. Yadav A K and Tandon V. "SEM study and cuticular armature of *Gnathostoma dolores* (Nematoda, Gnathostomatidae)". *Acta Parasitologica* 39 : 150-152 (1994).

#### Study Tour/Field Trips of students:

Students of M.Sc. (Zoology) III Semester were taken on study tour by Dr. (Mrs.) R.N.K. Hooroo and Dr. A.K. Yadav for 27 days. They visited Udaipur, Jodhpur, Osian, Jaipur, Bhatnagar, Sariska, Agra and New Delhi. Students visited several academic Institutions, Museums and Zoos in addition to their field study of desert animals and migratory birds sanctuaries under natural habitats.

Thrust Area of Research: Environmental Biology.

Research Programme/Research Project (undertaken during the year under review):

- i) Prof. K. Chatterjee continued a research project entitled "Genetic studies of Chocolate Mahaseer, *Acrossocheilus hexagonolepis* in relation to its environment", financed by Ministry of Environment and Forest (New Delhi). (Total grant Rs. 7, 10, 944/- for 3 years).
- ii) Dr. A. Chatterjee continued a research project entitled "Relationship between cellular radio-and chemo-sensitivity and endogenous glutathion level with respect to cytogenetical end-points in vivo and in vitro"

sponsored by CSIR, New Delhi. Total grant Rs. 2.90 Lakhs for three years).

Any other remarks:-

1. Prof. B. K. Sharma was awarded a certificate of appreciation as the National representative from India at International Congress on Tropical Limnology held at Satya Wacana University, Indonesia, 1994.
2. Dr. B. B. P. Gupta was awarded senior DAAD fellowship for three months to execute a research project at Mainz University, Germany.
3. Dr. S. B. Prasad was selected as a member of the Scientific committee for the "4th International Symposium on metal ions in biology and medicine" to be held in Spain (May 19-22, 1996).

**Deptt. of Forestry  
(Aizawl)**

The Department of Forestry came into existence in 1990. The Department offers M.Sc. Forestry. Its major task of curriculum development, particularly with reference to the needs of the region has to be completed. At present it is conducting research.

Head of Department: Prof. L. K. Jha

Faculty:	Name	Designation	Specialization
	Prof. L.K. Jha	Professor	Social and Agroforestry.

Other activities: Completed two programmes in collaboration with Department of Economics, Mizoram Campus, Aizawl.

- Financial viability of agroforestry vis-a-vis. Shifting cultivation : A cost benefit analysis.

- Role of tenancy in deforestation in Mizoram and some measures for its control.

Seminars/Symposia/Workshop:

1. Prof L.K. Jha attended International Conference of "Sustainable Development of Degraded Lands through Agroforestry in Asia and the Pacific" New Delhi, November 25-30, 1994 and presented a paper entitled Land resource management and steps for transfer of Agroforestry technology.

**Publications:**

**Books:**

- (i) Jha, L. K. : Indian Forest Policies: Analysis and Appraisal, Ashish Publishing House, New Delhi, pp. 1-18 (1994).
- (ii) Jha, L.K. and Sen Sarma, P.K. (eds) : Forest Entomology, Ashish Publishing House, New Delhi, pp 1-387. (1994)
- (iii) Jha, L.K. and Sen Sarma, P.K. (eds): Forestry for the people, Ashish Publishing House, New Delhi, pp 1-411. (1994).
1. Jha, L.K. and Sen Sarma, P.K. : Concept of Social Forestry

In: Jha, L.K. Sen Sarma, P.K. (eds)  
Forestry for the people, pp. 1-  
12. Ashish Publishing House, New  
Delhi (1994).

2. Jha, L.K. and Sen Sarma, P.K. (eds): Nitrogen Fixing Trees for Social forestry. In: Jha, L.K. and Sen Sarma, P.K.(eds), Forestry for the people, pp. 184-205. Ashish Publishing House, New Delhi (1994)

**Research Programme :**

One Research project entitled "Establishing models for rehabilitation of degraded jhum land in the watershed" sanctioned to Prof. L.K. Jha by G.P. Pant Institute of Himalayan with a Environment and Development grant of Rs. 5.5 lakhs.

## CENTRE FOR ECO-DEVELOPMENT

The Centre has largely confined its activities to the environmental issues and problems that confront the people of the hills of the north-eastern India.

Head / Director of the Centre : Dr. B.K. Tiwari.

### Faculty :

<u>Name</u>	<u>Designation</u>	<u>Specialisation</u>
Dr. B.K.Tiwari	Reader	Ecology

### Activities of the Centre :

#### Courses conducted/curriculum developed

During the year for the M.Phil students the Centre developed the course content of an interdisciplinary optional paper on "Environmental impact Assessment Methods". The course has been approved by Steering and Advisory Committees of the Centre and School Board of Life Sciences.

Students in-take in the Courses : Nil

During the year one Ph.D student has been registered under the joint supervision of Dr. B.K.Tiwari and Professor R.S. Tripathi of Botany department.

#### Seminar/Symposia/Workshop (Attended and organised) :

A. The Centre organised following Seminar/Workshop during the period under report.

1. Seminar on Environmental Pollution and Public Health held at Shillong on 5th June, 1994. (Jointly with NEICSSR, Shillong.)
2. Regional Workshop on Draft forest Bill-1994 held at Shillong on 19th October, 1994. (Jointly with PCNAEB, Shillong.)

B. Seminar/Symposia/Workshops attended by the faculty member :

1. Seminar on Environmental Pollution and Public Health held in Shillong, June 5th, organised by North-East India Council for Social Science Research, Shillong and Centre for Eco-development NEHU, Shillong.
2. First International Symposium on Ecosystem Health and Medicine held in Ottawa, Canada, June 19-23 1994; organised by International Society for Eco-system Health, Ottawa, Canada.

3. Workshop on Joint Forest Management in India and Meeting of National JFM Research Network, held at UNDP Conference Hall, New Delhi 14-16 September, 1994.
4. Regional Workshop on Draft Forest Bill-1994 held at Shillong on 19th October, 1994; organized by RCNAEB North-Eastern Hill University, Shillong and Centre for Eco-Development, NEHU, Shillong.
5. National workshop on Draft Forest Bill-1994 held at New Delhi on 26-29 October, 1994; organized by Indian Social Institute, New Delhi.
6. National Seminar on Wood Utilisation in 2001 and Beyond held at Shillong 5-6 December, 1994; organized by Timber Association of India and Indian Council of Forestry Research and Education, Dehradun.
7. National Workshop on Ecological and Economic assessment of Joint Forest Management System in India held at Indian Institute of Science  
field station Sirsi, Karnataka, January 16-21, 1995.

#### Publications :

1. Tiwari, S.C., Tiwari, B.K. and Mishra, R.R. "Succession of Microfungi associated with decomposing litters of pineapple (*Ananas comosus* Pedobiologia). 38: 185-192. (1994)
2. Tripathi, R.S. Pandey, H.N. and Tiwari, B.K. "State of Environment of Meghalaya. An Interim Report. School of Life Sciences, North-Eastern Hill University Shillong. 83pp (1994).
3. Tiwari, B.K. and Pandey, C.B. Jhum cultivation in Meghalaya. In: Tiwari, B.K. and Singh, S. (eds) Eco-restoration of Degraded Hills pp 61-78 Kaushal Publications, Shillong (1995).
4. Tiwari, B.K. and Shahi, S.K. Land ownership pattern in Meghalaya. In: Tiwari, B.K. and Singh, S. (eds) Eco-restoration of Degraded Hills pp-79-93. Kaushal Publications, Shillong (1995).

#### Edited Books

1. Tiwari, B.K. and Singh, S. Eco-restoration of Degraded Hills. Kaushal Publications, Shillong : 132pp. (1995)

#### Award of Fellowships

The faculty member was awarded prestigious Rothamsted International One Year Fellowship for higher research at Institute of Arable Crop Research, Harpenden, United Kingdom.

Research programmes if any :

(A) Research projects Completed during the period under report.

1. Preparation of Status of Environment Report for the State of Meghalaya. Funding agency Govt. of Meghalaya Directorate of Urban Affairs Funding Rs.2.00 Lakhs. Co-investigator: Dr. B.K. Tiwari. Interim Report submitted to the sponsoring agency.
2. Status and Strategies for Conservation of Sacred Groves in Meghalaya. Funding agency:North-Eastern Council, Shillong Total Assistance Rs.2.68,000/- Principal investigator Dr.B.K.Tiwari. Final technical report submitted to the North-Eastern Council, Shillong.

(B) On-going Research projects:

1. Regional Centre, National Afforestation and Eco-Development Board, Funded by Ministry of Environment and Forest, Govt. of India, New Delhi. Funding: Need based. Joint Co-ordinator: Dr.B.K.Tiwari.
2. Ecological and economic assessment of JFM system in north eastern India with special reference to Tripura. Funding Agency: Ford Foundation-SPWD New Delhi: Total Assistance Rs. 1,93,600 for two years. Principal Investigator: Dr.B.K. Tiwari.

(C) New Research projects Sanctioned during the period under report.

Screening, selection and performance trial of potentially woody species for energy plantation programmes in north-eastern India. Funding agency Ministry of Non-conventional Energy Sources, Govt.of India: Project cost Rs. 6,70,000/- Principal Investigator : Dr. B.K.Tiwari.

Memberships of professional bodies :

1. Member International Society for Ecosystem Health University of Guelph, Guelph, Canada.
2. Member IUFRO-Project Group on Agroforestry. University of Wales, Bangor.
3. Member of National Support Group on Joint Forest Management Constituted by the Ford - Foundation and SPWD, New Delhi.