

SCHOOL OF LIFE SCIENCES

Department of Zoology

The teaching and research programmes of the department of Zoology, are meant to fulfil the aims and objectives envisaged in the Act of the University. This has helped to develop the academic infra-structure of the hill states under the jurisdiction of this University. Eighty five percent of the Tribal population inhabiting these states subsist mainly on Agriculture. The department of Zoology identified those basic needs of the region and to launch out on problems of immediate needs. As the region is a part of the Indian sub-division of the oriental, these hill states are endowed with wide variety of fauna both terrestrial and aquatic. Moreover, with a fairly high rainfall, these areas abound in hill streams of all dimensions inhabited by both macro and micro fauna.

The objective of the department is two fold, viz, (i) to train post - graduate students to take up teaching in schools and colleges and to work as research personnel in scientific institutions of the Central and State governments and (ii) to take up research programmes on various problems related to the animal life in these hill regions with a view to utilize such knowledge for future development. Seized with such objectives the department of Zoology, along with its sister department of Botany, with experts available on the faculty in various field of research, have been concentrating on regionally oriented problems in either Forest Ecology or Fresh Water Biology both in the larger perspective of Ecology. Hence, fields like Limnology, Developmental Biology, Cell Biology, Cytogenetics, Biochemistry & Adaptational Physiology, Ecophysiology of aquatic invertebrates, Fish Biology and Biosystematics were all directed towards the understanding of a particular ecosystem - first a fresh water and then the populations and community inhabiting them.

Problems have been identified on a regional basis and various research scholars are given different aspects of the major theme to enable them to build up in the near future definite approach to Zoological studies in general and to that discipline in particular.

Thrust areas of the department of Zoology are Fresh water Biology and Forest Biology and it offers to the students a number of specializations such as Altitudinal limnology, Development and Morphogenesis, Aquatic entomology, Fish and Fisheries Biochemical limnology and Forest Entomology. Students gain not only basic knowledge of these special areas, but are also trained in Research Methodology by conducting a research project of two semesters duration. Thus, the training of post-graduate students have generated so far the much needed scientific man power for this region as many of the students are employed as College lecturers and Research officers in Fisheries, Agriculture and Forest departments. Of course, some return to the department for research towards the Doctoral degree.

Analysis of Students' intake :

M.Sc. (Zoology)	Male	Female	Total	of SC / which ST.
Previous I and II Semesters.	10	10	20	8
Final III & IV Semesters	14	6	20	4*
M. Phil.	—	—	—	—
Ph. D.	29	8	37**	6

* These were the only applications from tribal students

** Out of the 37 students 7 students admitted in 1980-81. had to take Pre. Ph. D. Course, but those having 3 years teaching experience in affiliated Colleges were later exempted from this course.

Awards and Honours :

- Prof. R. George Michael, F. N. A. Sc., was elected as a member of Governing Council of the National Academy of Sciences of India for 1980-81.
- Dr. S. A. K. Nasar was awarded Toyota Scholarship to participate at the First Workshop on the promotion of limnology in developing countries at Kyoto Japan (August 1981).

- (c) Prof. M. K. Khare was elected Fellow of the National Academy of Sciences India (F.N.A.Sc.) Oct. 1980.

Following candidates were conferred the degree of Doctor of Philosophy at the Convocation in May 1981.

Name of candidate.	Year of submission of thesis	Supervisor.
1. Dr. (Mrs) Debjani Roy	1979	Dr. M. K. Khare.
2. Dr. Vikram Reddy	1980	Dr. J. R. B. Alfred.
3. Dr. Arabinda Majhi	1980	Dr. K. Chatterjee.
4. Dr. Abhik Gupta	1980	Dr. R. G. Michael
5. Dr. Parimal Kanti Das	1980	Dr. R. G. Michael
6. Dr. (Mrs) Sabitry Choudhury	1980	Dr. M. K. Khare.
7. Dr. Donbor Roy Thangkhiew	1980	Dr. R. G. Michael
8. Dr. Bidhan Bhattacharya	1980	Dr. R. G. Michael

Publications :

(a) Papers Published :

- Anders A., Kollinger, G. and Chatterjee, K. 1980 Cytogenetics of Heritable and Induced Melanoma in *Xiphophorus*. *Yale Journal of Biology and Medicine* 53:420.
- Kollinger, G., Chatterjee, K. and Anders, A. 1980. Cytological studies on spontaneous and induced melanoma in *Xiphophorus*. *European Journal of Cell Biology* 22: 542.
- S. A. K. Nasar, Munshi J. D. 1980. Studies on the seasonal variations in the fungal population of a fresh-water pond of Bhagalpur, India. *Limnological (Berlin)* (12): 137-139.
- S. A. K. Nasar, Sarkar, A., Badre, R. V. 1980. An abnormal record of high oxygen production in the KOL of River Ganga at Bhagalpur, India, *Jour. Ichthyol.* 1: 41-42.

- S. A. K. Nasar., and Sharma, M. 1980. Primary productivity in relation to the abiotic factors in a temporary fresh-water pond. *Acta Hydrochim. Hydrobiol.* 8 (5) 435-442.
- S. A. K. Nasar. 1980. Primary productivity studies on Fresh water fish-ponds of Bhagalpur (India). *Acta Hydrochim. Hydrobiol.* 8(6) : 569-581.
- Pardhasaradhi A. and J R B Alfred, 1981. A longitudinal and altitudinal distribution of fish in two hill streams of N. E. India. *Matsya.*
- Pardhasaradhi, A. and J.R.B. Alfred, 1981. A note on the biogeographical relictness of *Pillaia indica* Yazdani (Pillaiidae : Mastacembeloidei). *J. Bombay Nat. Hist. Soc.*, 78(1) : 175-177.
- Raghu Varman, A., 1981. Resilin in the abdominal enticle of workers of the honey ants, *Myrmecocystes mexicanus* J. Georg. Ent. Soc. (U.S.A.), 16(1) : 11.
- Ramanujam S. N. and B. K. Ratha 1980. Glucose-6-phosphate Dehydrogenase (G_6 PDH) and Lactate Dehydrogenase (LDH) Activities into air breathing and two gill breathing species of a fish - a comparative study. *Proc. Ind. Nat. Sci. Acad.* 46(B) : 168-171.
- Ramnujam S. N. and B. K. Ratha, 1980. Comparative studies on acetyl cholinesterase activity in different tissues of two air-breathing fish two gill breathing species of fishes. *Comp. Physiol. Ecol.* 6:233-237.
- Sharma, B. K. 1980. New records of eurotatoria from Assam State, India, Bangladesh. *Zool.* 8(1) : 149-150.
- Sharma B. K. 1980. Contributions to the rotifer fauna of Punjab State, India, I. Family Brachionidae. *Hydrobiologia*, 76 : 249-253.
- Sharma, B. K. 1980 A New Lecanid Rotifer from West Bengal, India, Bangladesh *J. Zool.*, 8(2) : 131-132.
- Tandon, V. 1981. Stereoscan observations on the surface topography of *Gastrothylax crumenifer* (Creplin, 1847) Poirer, 1883 and *Paramphistomum epiclitum* Fiscoeder 1904 (Trematoda L. Digenea). *Journal of Helminthology*, 55,231.237 (1981).
- Chauhan, Y. S. and Singh, R. P. Effect of chronic gamma rays

on *Chenopodium album* L. Journal of Indian Botanical Society 59 : 170-172.

- Chauhan, Y. S. 1980. Radioprotective effects of 2,4- Dichlorophenoxyacetic acid. Phytomorphology 30 (2) : 159-163.
- Ravindran, S. and Chauhan, Y. S. 1980 Studies in the reproductive biology of alkaloid yielding solanums. I. Temperature, sucrose and boron requirements for pollen germination and pollen tube elongation. Journal of Paly-nology 16 (1 and 2) : 1-8.
- Chauhan, Y. S. and Ravindran, S. 1980. Hormonal regulation of gamma ray induced effect on heterostyly in *Solanum khasianum* Clarke. Physomorphology 30 (4) : 317-320.
- Rao, R. R. and Razi, B. A. 1981. A synoptic flora of Mysore district. A book published by Today and Tomorrow's Publishers, New Delhi.
- Rao, R. R. 1980. Ethnobotanical studies on the flora of Meghalaya. Some curious reports of herbal medicines. "Glimpses of Indian Ethnobotany" (ed. S. K. In Jain) pp. 137-148.
- Rao, R. R. 1981. Ethnobotany of Meghalaya Medicinal Plants. Econ. Bot. 35 : 4-9.
- Rao, R. R. and Neogi, B. 1980. Observations on the Ethnobotany of Khasi & Garo tribes in Meghalaya. J. Econ. Tax. Bot. 1 : 157-162.
- Rao, R. R. and Dam D. P. 1980. Non indigenous plant in the flora of Shillong and its neighbouring areas. Bull. Meghalaya Sci. Soc. 3 : 43-65.
- Rao, R. R. and Rao M. K. V. 1980. The genus *Eupatorium* in N.E. India. Proc. Ind. Nat. Sci. Acad. 46(4) : 587-592.
- Rao, R. R. and Baishya, A. K. 1980. Some ecological & phyto-geographical observations on the pteridophytic flora of Meghalaya. J. Econ. Tax. Bot. 2 : 31-39.
- Neogi, B. and Rao, R. R. 1980. Floristic composition of the weed flora and seasonal variation and phenological pattern of some dominant weeds of Agricultural lands in Meghalaya. Proc. Ind, Nat. Sci. Acad. 46(4) : 579-586.

- Haridasan, K. Kumar, Y. and Rao, R. R. 1981. Enumeration of some important forest weeds of Meghalaya with special reference to their role and distribution. *J. Econ. Tax. Bot.* 2 : 161-171.
- Haridasan, K. Kumar, Y. and Rao, R. R. 1981. *Chirita hamoca* R. Br. (Gesneriaceae) and interesting plant record from Meghalaya. *J. Econ. Tax. Bot.* 2: 241-42.
- Tandon, P. and Arya, H. C. 1980. Auxin autotrophy and hyperauxinity of *Eriophyes* induced *Zizyphus* stem galls in culture. *Biochem. Physiol. Pflanzen.* 175 : 539-543.
- Tandon, P. and Arya, H. C. 1980. Presence of auxin protectors in *Eriophyes* induced *Zizyphus* stem galls. *Experientia.* 36(8) : 958-959.
- Tandon, P. and Arya, H. C. 1980. Separation of auxin protectors from *Zizyphus* gall tissues by Sephadex gel filtration. *Curr. Sci.* 49 (22) : 864-865.
- Tandon, P. 1980. Genetic information in Chloroplast DNA. In *Proceedings of Plant Tissue Culture, Genetic manipulation and somatic cell hybridization of Plant cells.* Deptt. of Atomic Energy, Govt. of India, 255-265.
- Dutta, B. K. 1979. Effect of foliar application of organic and inorganic chemicals (antibiotics, growth substances and fungicides) on disease development and plant vigour in sunflower (*Helianthus annuus* L.) plants infected with *V. albo-atrum* R. & B. *Journal of Gauhati University XXVI - XXVII.* Science 41-46.
- Dutta, B. K. and Issac, I. 1981. Control of *Verticillium* wilt of tomato by antibiotic chemotherapy. *Zeitschrift für pflanzenkrankheiten und pflanzenchult.* 88(5) : 276-285.
- Dutta, B. K. and Elizabeth Bremner 1981. Trace elements as plant chemotherapeutant to control *Verticillium* wilt. *Zeitschrift für pflanzenkrankheiten und pflanzenchult.* 88(7) : 405-412.
- Reddy, P.M. and Talpasayi, F. R. S. 1981. Some observations related to Red, Far Red antagonism in germination

of spores of the cyanobacterium *Anabaena fertilissima*.
Biochem. Physiol. Pflanzen 176, 105.

Chandra, S. and Prasad, M. N.V. 1979-80. Two new species of *Zaleskioxylon* from Kamthi Formation. Phyta. 2,3 : 1-10.

Prasad, M. N. V. and Chandra, S. 1980. *Palaeospirozylon* a new gymnospermous wood from Raniganj Coalfield, India. Palaeobotanist, 26(3) : 230-236.

Prasad, M. N. V. and Chandra, S. 1981. Two species of *Australoxylon* from the Kamthi Formation of Chandrapur District, Maharashtra. Geophytology, 11(1) : 1-5.

Papers accepted for Publication :

Anders, F., Chatterjee, K., Schwab, M., School, E. and Anders, A. 1981. Tumor gene expression and interphase chromatin appearance in *Xiphophorus*. American Zoologist 21.

Anders, A., Kollinger, G. and Chatterjee, K. 1981. Heritable and Induced Melanoma in *Xiphophorus*. Pigment Cell Vol. 6.

Bhagwati, A. and A. R. Varman, 1981. Changes in the free amino acid composition in the haemolymph of the fresh water crab, *Parathelphusa levis* during various conditions. Sci. & Cult.

Darlong, V. T. and J. R. B. Alfred 1981. Differences in arthropod structure in soils of forest and Jhum of North-East India. Pedobiologia.

Kaur, S. and Nasar, S. A. K., 1981. On the length-weight relationship and condition factor of *Channa gachua* (Ham.) Arquivos do Museu Bocage.

Khare, M. K., D. Roy and A. Kumar 1981. Induced breeding in two Indian frogs. Proc. Nat. Acad. Sci. India 51(B).

Khare, M. K. and S. Choudhury 1981. Appearance and localization of the eye differentiation tendencies in the chick embryo. Proc. Nat. Acad. Sci. India. 51(8).

- Nasar, S.A.K. and M. Dasgupta, 1981 Preliminary observations on the biology of the juveniles of *Barilius bendelis* Ham. from River Simsang. Meghalaya (India) Arquivos do Museu Bocage.
- Nasar, S.A.K. 1981. Limnology in India: What should we do next? Proc. First. workshop on the promotion of Limnology in Developing countries. Kyoto, Japan.
- Nasar, S.A.K. and S. Kaur, 1981. Observations on the abiotic factors and planktonic periodicity in a shallow pond from the highlands of Shillong (India.) Acta Hydrochim. Hydrobiol. 9.
- Ratha, B. K. and A. K. Bhagowati, 1981. Inhibition of Tyrosine amino Transferase activity during severe hypoxic stress in a fish, *Cyprinus carpio*. Ind. J. Biochem Biophys.
- Sahu, A. K. and M. K. Khare, 1981. Field key of *Rana alticola* tadpoles. Jour. Bon. Nat. Hist. Soc.
- Sharma, B. K. and Tiwari, K. K. 1981. Studies on head pores of some Indian species of Chydorids (Cladocera : Chydoridae). Bull. Zool India. 4(2).
- Sharma, B. K. and Sharma (Ne Das), Sumita. 1982. A note on some enrotatoria from Punjab State, India. *Hydrobiologia*.
- Tandon V, 1981. Amphistome Fauna of ruminants in Himachal Pradesh. Ind. J. Parasitol.
- Tandon V., 1981. On *Deuterobaris intestinalis* Mehrotra, 1973 and *Octangium takenoi* Kobayashi, 1921 (Trematoda : Microscaphididae) from a marine turtle in India. Proc. Ind. Acad. Sci.
- Tandon V., 1981. Observations on the neurosecretory cells of the sheep's rumen fluke, *Paramphistomum epiclitum* Fishoeder. Ind. J. Helminthol.
- Vikram Reddy, M and J. R. B. Alfred 1981. Population dynamics of the aphid *Neomyzus circumflexus*. Colemania.

Submission of Ph. D. Theses :

Following candidates submitted their theses for Ph. D. degree during 1980-81.

Name of student	Title of thesis	Month of submission	Guide
1. Mr. Sudip Dey	Studies on Certain biochemical aspects of vision in some arthropods.	July, 1980.	Dr. A. Raghu Varman
2. Mr. Abhik Gupta.	The taxonomy and biology of Ephemeroptera (may flies) of Meghalaya State, India.	August, 1980	Dr. R. George Michael.
3. Ms. Sabitry Choudhury.	Studies on Establishment of Neural differentiation pattern in prospective Prosencephalic area of chick embryo (<i>Gallus domesticus</i>).	Sept, 1980.	Dr. M. K. Khare.
4. Mr. Parimal Kanti Das.	Studies on the limnology of Tasek lake and adjacent water bodies in Garo Hills, Meghalaya with special reference to the chocolate Mahseer <i>Accrossocheilus hexagonolepis</i> McLelland.	Sept, 1980	Dr. R. George Michael.
5. Mr. Bidhan Bhattacharya	Studies on Biology of cladocera of altitudinal lakes and ponds of North Eastern Hill Region.	Dec., 1980	Dr R. George Michael

6. Mr. Donbor Roy Thangkhiew. Studies on the breeding and rearing of *Cyprinus Carpio* L. and *Labeo rohita* (Ham) in the altitudinal situations of Meghalaya alongwith an experiment on composite fish culture. Jan. 1981 Dr. R. George Michael.
7. Mr. Anup Kumar Sahu. Studies on System and Ecology of certain anuran tadpoles of North Eastern India. April, 1981 Dr. M. K. Khare.
8. Mr. S. N. Ramanujam. Some physiological and biochemical studies on the effects of a piscicidal plant *Xanthoxylum armatum* DC, on fresh water fishes. July 1981. Dr. B. K. Ratha.
9. Mr. Sukhbir Kaur. Studies on some aspects of ecology and biology of *Channa gachhua* (Hamilton) and *Channa stewartii* (Pray Fair) July, 1981. Dr. S.A.K. Nasar
10. Mr. Pramod Kumar Vatsaluja. The ecological study of Jhum with particular references to soil arthropods of North Eastern Hill regions of India. July, 1981. Dr. J. R. B. Alfred.

Department of Botany

The Department of Botany a constituent of the School of Life Sciences came into existence in 1974. Starting of a post-graduate department of Botany in the North-Eastern Hill Region under the North-Eastern Hill University has special significance as the entire area is extremely rich in forests and forest resources. Also this area has the unique distinction of being one of the richest geographical regions both from the floristic and faunistic point of view. On the contrary, the the North-Eastern Hill Region has also the unique problem of rapid degradation of its forest resources, germplasm resources and its environment due to slash and burn agriculture (Jhum) and cutting down of the trees for timber and fire wood.

In view of the above, Forest Biology was identified as the major thrust area of the department. At present, research is being carried out on various aspects of forest ecosystem, weed biology and population ecology, microbial ecology and plant pathology, Cytogenetics, experimental morphology and morphogenesis, floristic and ethnobotany, algal ecology and physiology and tree physiology.

Apart from the emphasis on general botanical studies special emphasis is laid on integrated approach to the study of forest biology and freshwater biology at M.Sc. level. The department offers specialization in forest ecosystem/freshwater ecosystem studies and a second level specialisation in any of the biological areas mentioned above. The research activities of the department are the same as given in the report last year. In addition, Dr. M. N. V. Prasad has initiated studies on Palaeobotany.

Awards, Honours and participation in Seminars and Symposia.

Professor R. R. Mishra attended an International Symposium on "Microbiology of Leaf Surfaces" held at Aberdeen, U. K. in September 1980 and presented a paper entitled "Fungal succession on conifer needles". During his visit to U.K he also participated in the 2nd International Symposium on Microbial Ecology at the University of Warwick, Coventry and presented a paper entitled "Biological Activity measurements and heterotrophic bacterial populations in a freshwater lake". He founded the "Society for Microbial Ecologists of the Tropics" during the period under report. He was also elected as General Secretary of this Society. He was elected as the Vice President of Mushroom Growers' Association. Prof. Mishra attended the 68th Session of Indian Science Congress Association held at Banaras Hindu University in January, 1981, and presented a paper on mycorrhiza of weeds (with Mr N. K. Verma). He also presented two papers one dealing with populations of mycorrhizae (with Dr. G. D. Sharma and Miss I. B. Kharsyntiew) and the other entitled "fungi in aquatic ecosystems" (with Dr. B. K. Tiwari) in the focal theme symposium of the Indian Science Congress.

Professor P. S. Ramakrishnan gave a plenary lecture on "Role of forests in Environmental management" during the Varanasi session of the Indian Science Congress Association in January, 1981. He spoke on "Some aspects of Environmental degradation in the North-Eastern Hill areas of India", in a symposium organised by the Indian Environmental Society at New-Delhi in June, 1981. At a seminar organized by the National Productivity Council at Shillong in February 1981, Professor Ramakrishnan spoke on "Forestry Problems in the North-East" as an aspect on "Productivity in Forestry Operations". He also participated in a plant physiology convention and presented a 'State of art report' on "Forest Biology" in the Country during June, 1981 at Nainital.

He was commissioned by the Department of Environment to lead a team of experts to make an ecological assessment of the proposed hydro-electric project at Silent Valley. In this connection he visited Silent Valley in March, 1981 and submitted a report to the Govt. of India.

Professor Ramakrishnan was associated with the following Academic Bodies/Institutions during the period under report :

- i) Members of the Editorial Board of the proceedings of the Indian Academy of Sciences (Plant Sciences).
- ii) Executive Councillor of the Indian Botanical Society.
- iii) Member of a Task Force on "Citrus Gene Sanctuary" at Garo Hills, Meghalaya constituted by the Deptt. of Environment, Govt. of India.
- iv) Members of a Forestry Committee constituted by the Science Advisory Committee to the Cabinet, Govt. of India for reorganization of forestry research in the Country.
- v) Executive Council member and member of the Research Advisory Committee of Regional Research Laboratory, Jorhat.
- vi) Member of the working group for the School of Life Sciences, Kanpur University.
- vii) Member of the Board of Studies in Life Sciences, Dibrugarh University and Environmental Sciences, Andhra University.

Dr. R. S. Tripathi participated in the symposium on "Development without Destruction" jointly organised by the Forest Department, Govt. of Meghalaya and School of Life Sciences, NEHU in October 3-4, 1980 and presented a paper entitled 'DDT in our Environment'. He also attended the seminar on Resource Potentials of North-East India organised by Meghalaya Science Society during April 28 to May 1 1981 and presented a paper, "Bamboos as renewable resource of North-Eastern India" Jointly with Mr Sudhir Trivedi.

The research paper entitled "RRL Jor-3-1970" an improved strain of Java Citronella "*Cymbopogon winterionus* Jorwitt Indian perfumer 23 (2) : 107-111, 1979" by Dr. Y. S. Chauhan and co-authors (D. Ganguly, Singh. K. K., Bhagat, S. D., Upadhyay, D.N., Gupta. N.K., and Singh, H.S.) was awarded the Dr. Sadgopal memorial medal for best research paper by Essential Oils Association of India, 1980.

Dr R. R. Rao participated in the symposium on Development without Destruction jointly organised by the Forest Department, Govt. of Meghalaya and School of Life Sciences, NEHU, during Oct. 3-4, 1980 and presented a paper entitled "Forest of North-Eastern India-prospects and constraints on utilization."

Dr. P. Tandon attended a symposium on plant tissue-culture, Genetic Manipulation and somatic cell Hybridization of plant cells in February 1980 at Bhabha Atomic Research Centre, Bombay and presented a paper on "Genetic Information in Chloroplast DNA" He also attended the 3rd Botanical Conference in December, 1980 held at Lucknow University, and presented a paper on "Peroxidase-catalysed oxidation of IAA and GHS in presence of auxin protectors from *Zixyphus* gall tissue and anti-oxidants. He was appointed as a member of the research consultative committee for Central Coffee Research Institute, Coffee Board in May, 1981 for a period of 3 years.

Dr. B. K. Dutta attended the 68th session of the Indian Science Congress Association held at Varanasi (Jan. 3-8 1981) and presented a paper entitled "Some studies on the ecology of the soil borne plant pathogen: Sensitivity of *Fusarium Vasinfectum* to antibiotics and fungitasis". Dr. Dutta also attended the 3rd Indian Botanical Conference held at Lucknow (Dec. 28-30, 1980) and presented a paper entitled "Evidences on the biological origin of soil fungitasis".

Dr. M. N. V. Prasad attended the symposium on "Three decades of developments in Palaeontology and Stratigraphy of India" organised by Geological Survey of India in December, 1980 at Hyderabad and presented a paper entitled "Palaeoecology of the Kamthi Formation its biostratigraphic significance".

Publications :

- Ramakrishnan, P.S. 1980 Ecology in relation to taxonomy. For : Glimpses in Plant Research-Modern Trends in Plant Taxonomy (Ed. P. K. K. Nair) Vikas, New Delhi.
- Ramakrishnan, P.S. and Kanta, C. 1980 Comparative Biology of two closely related species of Euphorbia-competitive relationships. Proc. Indian Acad. Sci. (Plant Sci.) 89:421-427.
- Ramakrishnan, P.S. Form and Function in Ecologic a race formation, in "S. M. Sircar Commemoration Volume" pp. 277-274.
- Ramakrishnan, P.S., Toky, O.P., Mishra, B. K. Saxena, K. G. 1981. Slash and burn agriculture in North-Eastern in "Fire Regimes and Ecosystem Properties" (Eds. H. A. Mooney, T. M. Bonnicksen, N. L. Christensen, J. E. Lotan and W. A. Reiners). Gen. Tech. Rept. WO-- 26 USDA.
- Ramakrishnan, P.S. Toky, O.P. and Mishra, B. K. 1981. Jhum-An ecological assessment. In Souvenir Volume of Internat. Soc. Trop. Ecol. (Eds. A. Singh and P. Wahi). pp. 41-49.

- Ramakrishnan, P.S. and Toky, O.P. 1981. Soil nutrient status of hill agroecosystems and recovery pattern after slash and burn agriculture (Jhum) in North-Eastern India. *Plant and Soil* . 60 : 41-64
- Toky, O. P. and Ramakrishnan, P.S. 1981 Cropping and yields in agricultural systems of the North-Eastern Hill region of India. *Agro-Ecosystems*, 7: 11-25.
- Kushwaha, S. P. S., Ramakrishnan, P. S. and Tripathi, R. S. 1981. Population dynamics of *Eupatorium odoratum* L. in successional environments following slash and burn agriculture (Jhum). *J. Appl. Ecol.* 18:529-535.
- Ram Boojh and Ramakrishnan, P. S. 1981 Temperature responses to seed germination in two closely related tree sp. of *Schima Reinn.* *Curr. Sci.* 50. 416-418.
- Mishra, R. R. Sharma, G. D. and Gathphoh, A. R. 1980. Mycorrhiza in fern of North-Eastern Region. *Proc. Indian. Natn. Sci. Acad. B* 46:546-551.
- Mishra, R. R. and Sharma, G. D. 1980. Report on root nodule formation in *Crassocephalum* Sp. *Acta Botanica Indica* 8: 253-255.
- Mishra, R. R. Sharma, G. D. and Kharsyntiew I. B. 1981. Response of inoculum density of vesicular arbuscular mycorrhizal in maize. *Experientia* 37 : 568-569.
- Sharma, G. D. and Mishra, R.R. 1981. Mycorrhizal fungi in forest ecosystem. In symposium vol. on Development without destruction. Forest Deptt. of Meghalaya Govt. Publ. 51-61.

- Mishra, R. R., Tiwari, R. P. 1979, Studies on phyllosphere microflora. Effects of antibiotics and fungicides on leaf surface fungi and bacteria. Acta Botanica Indica 7: 57-63 (Published in 1980).
- Mishra R. R., Tiwari, B. K. and Deka H. K. 1980. Fungistasis activity of pine (*Pinus Kesiya Royle*) needle extracts. Acta Boatnica Indica 8: 158-163.
- Mishra, R. R. and Tiwari, B. K. 1980. Diurnal variation in population of viable, heterotrophic micro-organisms alkaline phosphatase and heterotrophic activities of two small ponds. Acta Botanica Indica 9:43-49.
- Mishra, R. R., Sharma, G. D. and Tiwari, B. K. 1981. Report on *Fusarium* wilt in *Pinus Kasiya Royle*. Curr. Sci. 50:35.
- Mishra, R. R., Tiwari, B. K., Deka H. K. and Verma, N. K. 1981. Fungi associated with cellulose decomposition in natural waters. Proc. Indian. Natn. Sci. Acad. 47 : 215-219.
- Mishra, R. R., and Das, P. K. 1980. Fungal succession on conifer needles pp. 475-485. In microbial ecology of Phylloplane, Academic Press London.
- Mishra, R. R. and Grover, S. K. 1979. Phyllosphere mycoflora of *Brassica campestris* L. Environ. India. 2: 18-22.
- Mishra, R. R. 1980. On certain aspects of some soil borne diseases pp. 41-51. In "Recent Advances in Biology of Microorganisms".
- Tripathi R. S. 1980. DDT in Environment. In symposium volume on "Development without Destruction" Forest Department of Meghalaya, Govt. Publ.

- Tripathi, R. S. and Gupta, G. P. 1981. The growth of *Bothriochlva pertusa* and *Dichanthium annulatum* in competition with each other at three water regimes. *Trop. Ecol.* 22 : 1-9.
- Yadav, A. S. and Tripathi, R. S. 1981. Population dynamics of the ruderal weed *Eupatorium odoratum* and its natural regulation. *Oikos* (Copenhagen) 36: 345-361.
- Kushwahal S. P. S., Ramakrishnan, P. S. and Tripathi, R. S. 1981. Population dynamics of *Scleria tessellata* wild a shade tolerant secondary successional species in slash and burn agriculture (Jhum) fallows. *Proc. Indian natn. Sci. Acad.* B47: 768-773.
- Tripathi, R. S., Singh, R. S. and Rai, J. P. N. 1981. Allopathic potential of *Eupatorium odeneophorum*-a dominant ruderal weed of Meghalaya. *Proc. Indian natn. Acad.* B47 : 458-465.
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Department of Biochemistry.

The Department of Biochemistry was recommended by the U.G.C. Visiting Committee for the 5th Plan as an additional department under the School of Life Sciences. The University appointed the first batch of faculty in 1980. However, none except one Reader joined and he planned for the detailed requirements to start academic activities of the department. The proposal was sent to the U.G.C. for financial sanction for the 6th Plan (as the 5th Plan period was already over.)

Academic Activities :

1. The Reader helped the departments of Botany and Zoology in their teaching programmes for M.Sc. and Pre-Ph. D. courses.
2. One research scholar who was working already with the Reader joined the department for the Ph. D. Degree.
3. Dr. R. Lalthantluanga collaborated with the group of Prof. G. Braunitzer, Max-Planck Institute of Biochemistry, Martinsried, W. Germany on the Study of Structure-Function, relationship of proteins. He visited the Institute from December 18, 1980 to March 15, 1981 on Max-Planck Society Fellowship.

Publications :

1. The Primary Structure of the beta I and beta II chains of the hemoglobin of Yak in Hoppe-Seyler's X. Physiol. Chem 362, 1405-1409. R. Lalthantluanga, and G. Braunitzer.