



CURRICULUM VITAE OF PROFESSOR BOLIN KUMAR KONWAR

Name : Prof. Bolin Kumar Konwar **Designation** : Vice Chancellor
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Date of birth : 01.09.1958 **Marital status** : Married with two children

Educational qualification

Institute	Place	Examination	Year	Div/ Class & Marks/OGPA	Prize/ Scholarship
BPBMHS School	Sonari	HSLC	1975	Ist Divn, 68.63%	National/ICAR/ITA Scholarship
Assam Agril University	Jorhat	B Sc (Agri)	1981	Ist Class, OGPA 3.34 in 4.0 scale (71.6%)	Gold Medal & Gr I Merit Scholarship
Assam Agril University	Jorhat	M Sc (Agri) in Plant Breed. & Genetics	1984	Ist Class, OGPA 3.79 in 4.0 scale (85.8%)	DISTINCTION (above 80% marks)

M Sc (Agri) thesis : Phenotypic stability for yield and morphophysiological traits of soybean [*Glycine max* (L) Merrill]

Imperial College of Sci, London Tech & Medicine DIC (Microb) 1992 - Certificate

Imperial College, Univ. of London London Ph D (Plant Biotech) 1992 - Certificate

Ph D thesis : *In vitro* culture and genetic transformation of sugarbeet (*Beta vulgaris* L.)

Experience

Institute	Place	Job	Duration	Nature of work
Towkok Gr of T Es	Sonari	Management trainee	June ó Sept, 1980	Tea garden & factory management
Assam Agril Univ	Jorhat	SRA	April, 84-July, 85	Farmers field expts, ICAR Scheme
Assam Agril Univ	Jorhat	Lecturer	Aug. 85-Dec, 85	Teaching UG & PG courses, Res on pulse crops & mutation breed
Assam Agril Univ	Jorhat	Asstt. Prof	Jan, 86-Aug, 94	As above
Assam Agril Univ	Jorhat	Assoc Prof	Aug, 94-April, 95	Teaching UG & PG in Agril Biotech, Genet & Plant Breed, Res on blue green algae
Tocklai Expt Station Tea Res Association	Jorhat	Biotechnologist	April, 95-Dec, 97	Tea tissue & Proto-plast cult, genome analysis, genet transformation, Microb degradation of tea litters, vegetations to value added compost
Tocklai Expt Station	Jorhat	Dept Incharge	Dec, 97-Aug, 2K	Same as above
Tocklai Expt Station	Jorhat	Head of Dept	Sept, 2000 ó March, 02	As above
Tezpur University	Tezpur	Professor & Head	March 02- April 08	Teaching M Sc & Ph D courses; Res on Petroleum Biotech, genomics & biochem of Medicinal Plants; yeast genomics.

Present position with the pay scale

Vice Chancellor (Professor), Nagaland University (Central), Lumami-798627, Nagaland

The present pay is Rs. 75,000/- + 5,000/- pm

Research Project carried out as Principal Investigator

Project title	Funding agency	Duration (yrs)	No of sci./ associates	Fund (Rs in lakh)
1. Collection, evaluation and improvement of <i>Azolla-Anabaena</i> symbiosis	ICAR	3 (1994-97)	1 RA	3.70 (completed)
2. Embryo rescue and haploidy for cold tolerant rice improvement	AAU	5 (1993-98)	PG student 1 Scientist (left)	2.00
3. Breeding tomato for fruit size and resistance/tolerance to late blight	AAU	5 (1993-98)	PG student 1 Scientist (left)	1.20
4. Advanced work on Plant Biotechnology	Tea Board	5 (1995-00)	RFs 2 2 Scis.	130.00 (completed)
5. A study on the utilisation of improved planting materials by the tea industry of NE India	Tea Board	1 (1999-00)	Sci. 1	1.80 (completed)
6. Recycling of tea and other organic wastes to value added compost	DBT	2 (1999-01)	RAs 2 Sci. 1	14.30 (Completed)
7. Collection, conservation and evaluation of tea germplasm	Tea Board	5 (1999-04)	Scis. 3	40.40
8. Characterisation and improvement of tea through biotechnological tools	DBT	3 (2001-04)	RFs 2 RAs 3	38.20 (left completed)
9. Studies on functional genomics of tea, mentha and ashwagandha (New Millenium Technology Initiative: NMITLI)	CSIR	3 (2001-04)		42.00
10. Petroleum Biotechnology	ONGCL	9 (1998-07)	SRFs 2	189.00
11. Medicinal plants of NE India	NMPB	3 (2005-08)	PF 1	10.00
12. Bioremediation of contaminated	ONGC	5 (2009-10)	RF 4	Sanctioned

Research achievements

1. Isolation and cloning of GUS gene into the pBin 19 plasmid; construction of the vector pBI 121 having the marker NPT II and reporter B-glucuronidase (GUS) genes.
2. Mobilisation of plasmid into *Eschericia coli* and *Agrobacterium tumefaciens* using electrical pulse.
3. *Agrobacterium tumefaciens*-mediated genetic transformation of sugar beet with NPT II and GUS genes.
4. Electroporation-mediated transient expression of GUS gene in sugar beet protoplasts.
5. Histochemical assaying of GUS gene expression.
6. Polyacrylamide gel electrophoretic determination of GUS protein.
7. Gene copy number determination.
8. Associated with the development of green gram varieties AAU 34 and AAU 39.
9. Standardised the rapid *in vitro* culture technique of sugar beet.
10. Standardised the tissue culture technique of tea with *in vitro* rooting, hardening, acclimatisation and establishment of plants in the field.
11. Isolation and culture of tea protoplasts.
12. Genetic transformation of tea with *Agrobacterium rhizogenes* carrying the Ri plasmid for hairy root development.
13. Isolation and multiplication of 12 strains each of anaerobic bacteria and fungi involved in the degradation of tea pruning litters and tea garden weeds.
14. Fifteen TV clones were nationally registered at the NBPGR, New Delhi with detailed characterisation including RAPD-based genetic fingerprinting.
15. Developed a bacterial consortium which can degrade crude oil contaminant in 180 days.
16. Isolated bacterial bio-surfactant was found to be much superior (55% recovery) to commercial surfactant SDS in the recovery of crude oil from the saturated sand pack column. The bio-surfactant was found to be stable at 100°C and also in a wide range of pH from 4 to 12.
17. The flavourous compound anethole (86%) was isolated from the wild plant *Etilingera linguiformis*. The chemical can be potentially used as food and medicine additives. The

anti-microbial activity of the compound was assessed. The karyotype and genotype of the plant was determined.

Research management

Tocklai Expt Station, TRA: The institute was in great turmoil when I joined as the Biotechnologist (Sr. Scientist) in 1995 due to prolonged agitation by the employees. There was no work ethics; scientists lost interest to carry on research works. Moreover, the agitating office bearers were mostly from the department of Botany where I joined and took over the charge.

The situation called for our full time effort to get the support of all members to bring back the work culture, regular attendance and punctuality. Clone improvement work which was almost abandoned was brought back to the right track with the preparation for the release of clones TV31 and TV32. The result-less tea biotechnology (tissue culture) work of 12 years was given a sound footing with the planting and cultivation of tissue culture-derived plants in the field.

With a step-by-step approach we were successful in introducing the daily work report by all employees of the department in spite of the initial stiff resistance. Prior to moving out of the institute, we could manage to get three mega research projects from Tea Board, DBT and DST.

The result oriented efforts were well appreciated by all concerned including the management, scientists and staff members of the institute.

Tezpur University: At the time of my joining in the department of Molecular Biology & Biotechnology as the lone Professor in March 2002, there were three Lecturers, joined before me in Feb ó March 2002. The Reader and HoD left the University; another Reader was removed owing to some legal verdict, the lone Reader left for the USA for Post-doctoral research. It was indeed a very difficult period to carry out teaching and research with fresh three lecturers. We were fortunate to garner support from departments like Chemical Sciences and Mathematics to impart teaching alongside our Lecturers to DBT-sponsored students. We could get full support and cooperation from our students admitted through CEEB. All throughout, scholars and students helped us to manage laboratories. They dedicatedly took part in the organization of various seminars, trainings and also in shifting the entire department to the present building from the temporary shed.

For gearing up the departmental laboratories, M Sc research project was successfully introduced in 2004, long before DBT's decision. At the time of joining, most of the equipment were out of order and few sophisticated ones were lying uninstalled. Necessary repairing and installations were done with full support of the University administration.

The Centre for Petroleum Biotechnology established for five years in 1999 with ONGC's funding lacked progress. With the support of all concerned, bioremediation of contaminant petroleum (microbial consortium) and enhanced oil recovery (bacterial biosurfactant) technologies were subsequently transferred to the funding agency.

From 2005-08, a total of eight scholars obtained Ph D degree from the department. Over sixty research papers so far were published and almost equal numbers presented by faculties in national/international journals and seminars. Almost all our students (95%) have been appointed and pursuing Ph D/Post Doc research in national and international institutes of the country and abroad.

The department succeeded in getting FIST level-I support. A BIF was established in the department with funding of the DBT. We were also assured of providing sizable funding for research and teaching by the DBT. The 11th plan visiting team highly appreciated the activities of the department. The department was assessed to be the 16th best in the country in biotechnology teaching.

Acted as Resource Person in

1. DBT sponsored popular lecture series for college and university students.
2. DBT sponsored national training and demonstration on tissue culture and genetic engineering
3. ICAR sponsored national training and demonstration on crop germplasm conservation and crop breeding.
4. Summer Institute of Central School, College and University teachers
5. TRA sponsored training of Sr. and Jr. Executives of the tea industry
6. TRA sponsored field management courses.
7. To train state Government officials of Nagaland in tea cultivation and processing.
8. In refreshers/training courses of Assam University, Defense Research Laboratory, Assam Agril. University, Regional Research Laboratory etc.

Acted as Referee/Expert/Member in National bodies/research projects/journals

1. Expert member, Assessment Committee, All India Co-ordinated project on *Albizzia* species operated by the Indian Forest Research Institute.

2. Referee-Indian Journal of Genetics and Plant Breeding, IARI, New Delhi
3. UGC-Refresher Course Centre-Resource Person on Life Sciences in Assam University, Silchar.
4. Expert Member, Research Committee, National Research Centre on Yak, ICAR, Dirang, Arunachal Pradesh.
5. Organizing Secretary, National Seminar on "Hydrocarbon degrading microbes", 22nd- 23rd Dec., 2003.
6. Member, Organizing Committee of the National Workshop on "Science & Technology for regional development: case for North east India" Feb. 3rd to 6th, 2004, Indian Institute of Technology, Guwahati.
7. Expert, nominated by the Director General, ICAR, New Delhi to the DPC for the promotion of ARS scientists.
8. Chairman, Selection Committee for the appointment of Project Assistants/Fellows and Research Associates in NEIST (RRL), CSIR, Jorhat in 2003, 2004 and 2005
9. External Expert for the appointment and promotion of scientists and others in National Research Institute on Rain Forests and Deciduous Trees, ICFR, Jorhat.
10. External expert for the appointment and promotion of scientists and others in DRL, DRDO, Tezpur.
11. Organizing Secretary, DNA double helix Golden Jubilee National Seminar-cum-Exhibition, Tezpur University (Central), Napaam on 31st October, 2003.
12. Member, National Organizing Committee, First National Symposium on "Muga Silkworm Biochem., Mol. Biol. & Biotech. to improve silk production", RRL, Jorhat on 11 to 12th Nov., 2004.
13. Expert Member of the Research Council of the Yak Research Centre, ICAR, Dirang, Arunachal Pradesh
14. Member, Board of PG Studies of North East Hill University, Shillong.
15. Member, Planning Board, Rajiv Gandhi University (Central), Itanagar, Arunachal Pradesh.
16. Executive Editor, International J. of Crop Science, India (2007-08)
17. Advisory Board Member, Institute of Biotech. and Allied Sci. Training, Sikar, Rajasthan
18. Reviewer of *J of Genet & Plant Breed*, *Afr. J. of Envnt. Sci. & Tech.* (Permanent), *Colloids and Surfaces B: Biointerfaces*, *J. of Hazard. Mat. and Chemosphere*.
19. Member, Scientific Advisory Committee, Central Muga and Eri Research Institute, Lahdoigarh, Jorhat, Assam.

Administrative Experience

1. Member, Board of Studies, Faculty of Agriculture, Assam Agricultural University, Jorhat from August, 1994 to April, 1995.
 2. Incharge, Botany Department, Tocklai Experimental Station, TRA, Jorhat from Dec., 1997 to August, 2000.
 3. Head, Botany Department, Tocklai Experimental Station, TRA, Jorhat from Sept., 2000 to March, 2002.
 4. Member, Scientific Advisory Committee, Tocklai Expt. Station, TRA, Jorhat from Dec., 1997 to March, 2002.
 5. Member, Agricultural Sub-Committee, Tocklai Expt. Station, TRA, Jorhat from Dec., 1997 to March, 2002.
 6. Head, Deptt. of Mol. Biology & Biotechnology, Tezpur University (Central), Napaam, Tezpur from April, 2002 to till date.
 7. Member, Research Committee, Tezpur University (Central), Napaam, Tezpur from April, 2002 to 2004.
 8. Chairman, Board of Studies, Deptt. of Mol. Biol. & Biotechnology, Tezpur University (Central), Napaam, Tezpur from April, 2002 to till date.
 9. Chairman, Departmental Research Committee, Deptt. of Mol. Biol. & Biotechnology, Tezpur University (Central), Napaam, Tezpur from April, 2002 to till date.
 10. Chairman, Training & Placement Committee, Tezpur University (Central), Napaam, Tezpur from 2003 to 2004.
 11. Chairman, Quality Control Committee, Tezpur University (Central), Napaam, Tezpur from 2003 to 2009.
 12. Member, Security Committee, Tezpur University (Central), Napaam, Tezpur from 2003 to 2009.
 13. Chairman, Quarter Allotment Committee, Tezpur University (Central), Napaam, Tezpur from 2008 and Member from 2003 to 2011.
 14. Member, Review Committee, Act, Statutes and Ordances of the Tezpur University (Central) in 2003, and 2008 to 2011.
 15. Member, Library Committee, Tezpur University (Central), Napaam, Tezpur from April, 2002 to 2011.
 16. Presenting Officer, Tezpur University (Central), Napaam, Tezpur twice in 2003 and in 2004.
 17. Enquiry Officer, Irregularity and Misconduct of an employee, 2006 ó 2007.
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18. Member, Space Allotment Committee, Tezpur University (Central), Napaam, Tezpur for the year 2004-05.
 19. Member, Insurance Investment Committee, Tezpur University (Central), Napaam, Tezpur from 2003 to till date.
 20. Member, Purchase Improvement Committee, Tezpur University (Central), Napaam, 2003.
 21. Head, ONGC-sponsored Centre for Petroleum Biotechnology, Tezpur University (Central), Napaam, Tezpur from April, 2002 to till date.
 22. Secretary, Executive Committee, Centre for Petroleum Biotechnology, Tezpur University (Central), Napaam, Tezpur from April, 2002 to till date.
 23. Chairman, Construction Monitoring Team, Tezpur University, Napaam from 2007.
 24. Member, Panning and Academic Committee, TU, Napaam from 2002 - 06.
 25. Member, Academic Council, Tezpur University, Napaam, from 2006.
 26. Member, Board of Management, Tezpur University, Napaam from 2005 ó 07.
 27. Dean, School of Science & Technology, TU, Napaam, Tezpur-784028, Assam
 28. Chairman, Grievance Redressal Committee, TU, Napaam.
 29. Chairman, Campus Beautification Committee, TU, Napaam.
 30. Coordinator-cum-Director, IQAC (NAAC), TU, Napaam (May 2005 to till date)
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Industrial Research

1. Tocklai Experimental Station, Tea Research Association, Jorhat is the premier organization carrying out research exclusively on the Indian Tea Industry. I had the experience of working as a senior scientist and Head of the Botany Deptt. of the Organization for 7 years.
2. In Tezpur University, Napaam, Tezpur, Assam Headed the ONGC sponsored Centre for Petroleum Biotechnology for the last 7 years.

Syllabus prepared

1. Agricultural Biotechnology at Assam Agril. University, Jorhat, Assam
2. Molecular Biology & Biotechnology in Tezpur University, Tezpur, Assam
3. *Part of Food Processing & Technology (FPT): Microbiology, Food Microbiology and Food Biotechnology (for establishing the Dept of FPT in TU, Tezpur)*
4. Nanotechnology course (in part).
5. Preparation of course syllabus on Forest Science and Environmental Science at Nagaland University (Central).

Teaching Courses

Genetics and Cytogenetics, Cytology, Plant Breeding (General and Advanced-Ph D), Genetic Engineering (M Sc and Ph D), Plant Tissue and Cell Culture, Plant Biotechnology (M Sc and Ph D), Management and Legal Issues in Biotechnology (IPR and Patenting), Nanotechnology, Bioelectronics (Biology part), *Food Microbiology, Food Biotechnology (teaching since the establishment of the Dept of FPT in TU in 2005).*

Departmental achievements during the Headship

1. The Department of Mol Biol & Biotechnology, Tezpur University was adjudged to be the 16th best in the country in a nation-wide survey conducted by IIM on behalf of the DBT, Govt of India. In fact it is the best in East and North-East and 9th in North, East and NE India.
2. The Department was provided special assistance of Rs. 10.0 lakh by the UGC for limited infrastructure creation.
3. The Department was granted FIST-level 1 grant (*ca.* Rs. 2.0 crore) by the Department of Science & Technology, Govt. of India.
4. The Department was sanctioned an amount of Rs 3.00 crore by the Department of Biotechnology for infrastructure development under a special assistance program.
5. During the last seven years the Department generated about Rs. 4.50 crore external funding through various research projects granted by DBT, NMPB, DRL and the oil industry ONGC.
6. Faculties of the Department published about 50 research papers in good impact factor bearing national and international journals.
7. About 85% of the passed out students are pursuing higher studies securing various fellowships in some of the best national (CCMB, IISc, JNU, BARC, IITG etc) and international institutes in Germany, USA, Singapore etc; 12% in jobs in University, College and Industry.

Experience in Laboratory building layout

Tocklai Expt. Station, TRA, Jorhat ó Designed the floor area and labs in the new Botany & Biotechnolgy (1,600 sq m) building, shifted the entire 90 year old dept to the new building in 1999.

Tezpur University, Tezpur, Assam ó The Dept of Mol Biol & Biotech was shifted to the allotted administrative building from a temporary shed in 2004. The big halls were modified as per requirement of laboratories with glass walls.

Research Contribution

Pre – Doctoral Research

Since joining as a Lecturer in Assam Agricultural University (Deptt. of Plant Breeding & Genetics) I started working on pulse crops like soyabean and greengram alongwith my teaching assignments. The sole cause for the attraction towards pulse crops was dietary protein deficiency in NE India.

Green gram: In collaboration with the Asian Vegetable Research and Development, Taiwan 120 breeding lines of green gram were assessed in the University. Two high yielding varieties were developed and released as AAU34 and AAU39.

Fruit size improvement and late blight tolerance in tomato

The wild tomato species *Lycopersicon pimpinellifolium*, resistant to late blight disease was hybridized with the variety VC 48-1 (*L. esculentum*). Lines with large fruits and tolerance to the disease were selected.

(a) Doctoral Research (including DIC)

Genetic transformation of sugarbeet

A rapid and large scale multiplication through tissue culture of this crop was standardized. Suspension culture and leaf mesophyll protoplasts were successfully isolated and cultured with the development of macro-calli.

The marker NPT II and reporter GUS genes were cloned in to plasmids pBin 19 and pUC8:GUS using CaMV-35S promoter and NOS-terminator sequences. The recombinant plasmids were mobilized in to *A. tumefaciens* by tri-parental mating and finally genes were transferred in to sugar beet. A total of 40-50 copies were integrated in 6 different sites of the sugar beet genome and expressed.

(b) Post – Doctoral period

Embryo rescue and haploidy in cold tolerant rice improvement

Boro season is the best for rice cultivation in Assam. But, most of the high yielding varieties can not be cultivated during this season due to their cold injury during tillering, flowering and grain filling resulting in low productivity. Japonica varieties are cold tolerant; but

hybridization with indica varieties for the transfer of this trait leads to hybrid seed sterility and immature seed drop.

Japonica 4 varieties were crossed with five indica varieties. The immature hybrid embryos were cultured in suitable media. The F₁ plants obtained were planted in pots and F₂ plants were developed through selfing. The F₂ plants exhibited tolerance to low temperature during winter.

Cytogenetic study of diploid and colchiploid tea

The karyotype of Assam tea (*Camellia assamica*), China tea (*C. sinensis*) and Cambod tea (*C. assamica* ssp lasio calyse) was established. Tetraploid shoots were developed by treating buds with 0.2% colchicine.

Externally funded projects

At AAU, Jorhat: ICAR Project: Study on morphogenetic variation in *Azolla pinnata* & *Anabaena azollae* (Rs 10.0 lakh)

Azolla strain collected from different parts of the region were studied for their growth and development. Their cultivation practices under laboratory condition throughout the year was standardized. A total of 19 strains were found to be fast growing. The BGA from leaf cells was isolated and the characteristics like cells and heterocysts per chain/per cell as well as their nitrogen fixing ability were studied. Two strains were found to be better nitrogen fixer. The plasmid DNA was isolated from each strain of BGA. Most of the strains were found to contain only one plasmid except one having two plasmids. Esterase and GOT isozymes were studied in *Azolla* strains; the strains were found to have 4 loci for the esterase and 2 loci for GOT.

At Tocklai

Tea Board 8th plan project – Application of biotechnology in tea (Rs 1.33 crores)

Tea tissue culture was standardized with the field establishment of plants. Three somaclonal variant clones were identified to be tolerant to the pest tea mosquito bug (*Helopeltis theivora*). The technique of genetic transformation by infecting *in vitro* tea shoots with *Agrobacterium rhizogenes* carrying the root hair inducing Ri plasmid. The transformed tea shoots produced roots not only from the base but also from all over the surface.

Tea Board project – Use of improved planting materials by the tea industry of NE India (Rs 2.0 lakh)

Since 1949 Tocklai developed 195 improved cultivars of tea (30 TV, 151 TRA/garden clones and 14 bicalonal seed stocks). Commercial cultivation of improved cultivars began since 1955-60. In 1960, tea productivity in NE India was about 900 kg/ha MT. But; with the

popularization of improved cultivars, productivity increased beyond 1,800 kg/ha MT by 1999-2000. The area under improved cultivars has increased from 0% in 1955-60 to 48.6% in 1999-2000.

DBT project – Recycling of tea and other organic wastes to value added compost

(Rs 16.0 lakh)

Vermi-composting of tea pruning litter was found to be ineffective. On the basis of composting ability through weight reduction, nutrient (N:P:K) enrichment, cellulose and pectin degradation and production of cellulase enzyme 6 bacterial and 7 fungal strains were used to formulate a mixed microbial broth for the anaerobic composting of tea garden weeds and tea pruning litters. The compost produced contained 3-4 fold more nitrogen and phosphorous as compared to the raw material (N-0.8%, P₂O₅-0.1% and K₂O-1.1%). However, there was a depletion of potassium.

Tea Board 9th Plan Project – Collection, conservation and evaluation of tea germ-plasm (Rs 39.0 lakh)

Establishment of Tea Field Gene Bank: Under the project we have established the largest Tea Field Gene Bank of the country in the station with 2,303 germplasm accessions. The bank has been developed as a National facility.

Categorization and characterization of accessions: Germplasm accessions have been categorized on the basis of their resemblance to Assam, China, Cambod and hybrid types and also on various branch and leaf characteristics. Metric and other morphological, physiological, anatomical and biochemical characters of the germplasm accessions were also studied. Characterization at molecular level, starting with TV and generative clones, has been taken up using 16 different oligo-primers. Banding profile of genomic DNA of the clones has been documented for registration purpose.

CSIR NMITLI coordinated project (New) – Functional genomics of tea, mentha and

Aswagandha (Rs 40.0 lakh)

Under the project biochemical analysis of total catechins, EC, ECG, EGCG has been done from the shoots of extreme type clones. Owing to joining in Tezpur University, the PIship was handed over to the Head & Dy Director, Biochemistry, TES, TRA, Jorhat.

DBT-coordinated project –Characterization and Biotechnological improvement of tea (Rs 40.0 lakh)

Just after the receipt of the sanction letter of the project, the PIship was handed over to the Head & Dy Director, Biochemistry, TES, TRA, Jorhat.

At Tezpur University

ONGC sponsored project: Petroleum biotechnology (Rs 1.89+0.57crores, Industrial)

1. Developmental bacterial consortia to degrade petroleum hydrocarbon contamination

Under the ONGC-sponsored Petroleum biotechnology project, two bacterial consortia were developed which could degrade crude oil contamination from soil in 180 days. The bio-remediated soil was found to be suitable for the cultivation of rice crop. In field scale bio-remediation experiments, the bacterial consortia developed could reduce 10 and 20% crude oil contamination level to 3 - 5% in 180 days making it suitable for rice cultivation. The technology generated has been tried in a Group Gathering Station of ONGC, Jorhat, Assam.

2. Bio-surfactant in microbial enhanced oil recovery

Bio-surfactant producing 4 bacterial isolates was obtained from oil well sites of Assam and Assam-Arkan basin. The bio-surfactant was isolated, purified and dried for subsequent use. The microbial bio-surfactant was bio-chemically characterized and was found to be mostly rhamnolipids, C₈₋₁₀ and C₁₀₋₈. The bio-surfactant could recover 60% crude oil from saturated sand pack column, which was 4 to 5 times higher than the commercial surfactant sodium dodecyl sulphate (SDS). The requirement of the bio-surfactant was lower than that of SDS for the critical micelle concentration (CMC). The bio-surfactant was found to be thermo-stable at 100°C and also stable over a wide range of pH 4 to 11. Bio-surfactant was also found to enhance bio-remediation of crude oil as well as solubility of polycyclic aromatic hydrocarbon component of crude oil, which are highly carcinogenic and hydrophobic in nature.

National Medicinal Plants Board sponsored project – Assessment of medicinal plants of North East India used in different ailments (Rs 10.0 lakh)

1. Isolation and structural elucidation of an aromatic compound from medicinal plant

The flavoury compound from the medicinal plant *Etingera llinguiformis* f. *assamica* was isolated. The compound was identified to be anethole. The rhizome of the plant possesses the highest composition of anethole with 86% as compared to 82-84% in anise seed. The compound has the vast potentiality for the food and medicinal industries.

Chromosome number, Karyotype and genome size of the plant were determined. For genome size determination, a new method was developed and published.

2. Nutraceutical potentiality of *Spondias pinnata* (amara)

The mature Fruits of this perennial local plant of North East India was found to be rich in crude protein, crude fiber, starch and reducing sugars. The fruits were also found to be rich in mineral compositions of phosphorous, iron, calcium and potassium.

3. Antimicrobial activity of fruit extracts of *Meyna spinosa* (kutkura)

The methanolic extract of the fruits of the medicinal plant *Meyna spinosa* possessed antimicrobial activity against the bacteria *Bacillus subtilis*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Escherichia coli* and yeast *Candida albicans*.

4. Karyotype determination of *Schumannianthus dichotmus*, a traditional plant of Assam

The karyotype study of this perennial shrub revealed chromosome number to be $2n=20$, with the total genome length of 12.7 μm . The length of chromosome was found to vary between 0.8 to 2.2 μm with the predominance of metacentric and sub-metacentric behaviour.

Genomics of yeasts used in the traditional beer industry of Assam

The starter culture used by the Ahom community of Assam for the preparation of homestead liquor contains a yeast load of 5.06×10^6 per g and fungal load of 5.92×10^6 per g. Three yeast isolated were identified as *Candida versatilis* and 2 fungal strains isolated were identified as *Mucor indicus* and *Amylomyces rouxii*. The fungal species hydrolyze starch to glucose prior to fermentation by yeast to alcohol.

Bioremediation of crude oil contaminated soils (ONGC funded, Rs. 70.03 lakh for 5 yrs)

The project has been started from April, 2009. We have could identify some bacterial products which could reduce the bioremediation time period from 180 days (generated under the ONGC-Petroleum biotechnology project). Moreover, we isolated a number of new bacterial isolates showing potential for the task.

Two very promising bacterial isolated were isolated and cultured for the production of biopolymer. The polymer was biochemically characterized to be one of the best.

Biosurfactant producing superior bacterial strains and culture media were formulated. The biosurfactants were found to be superior.

Carbon sequestering and biodiesel producing micro algae were isolated and their culture conditions were standardized. Two strains were found to be very promising.

Supervision of Students/Scholars

Completed: M. Sc. research project supervision - 24 nos.

Ph D research - 06

On-going: Ph. D. research project supervision - 08

Ph D Scholars and title of thesis (completed)

1. Naba Bordoloi: Biochemical and molecular characterization of certain bacteria for application in bioremediation of petroleum contaminated soil.
Technical Officer, Deptt. Of MBBT, Tezpur University
2. Dhiren Chowdhury: Floral biology, karyotype, biochemical and genomic study of *Etlingera species* ó A medicinal and aromatic plant.
Plant Breeder, RARS, (AAU) Assam Agricultural University
North Lakhimpur, Assam
3. Ranjan Kandali: Structural elucidation of major bioactive compounds and genome analysis of *Spondias pinnata* Kurz and *Streblus asper* Lour.
Associate Professor, Bishwanath College of Agriculture
Assam Agricultural University, Bishwanath Chariali, Assam
4. Jitu Buragohain: Assessment on biodiversity of medicinal plants: cytological, biochemical and molecular characterization of a few major plants.
Lecturer (Selection Grade), Namrup College, Namrup, Assam
5. Khanindra Ratna Barman: Biochemical and molecular genetic assessment of yeast strains used by certain tribal communities of Assam in alcohol production.
Deptt. Of Agriculture, Govt of Assam, Tezpur.
6. Jyoti Prasad Saikia: Molecular and Biochemical characterization of four edible aroids,
Scientist II, Department of Mol Biol & Biotech, Tezpur University, Napaam,
Tezpur, Assam.

Ph.D. Scholars (Continue)/ Research Group

1. **Pinkee Phukon**: Bacterial Biopolymer.
2. **Pranjal Bhorali**: Bioremediation of Crude oil contaminated soil.
3. **Moyur Mousum Phukon**: Algal Biodiesel.
4. **Angana Ray**: Phytopharmaceuticals for Hair Growth
5. **Krishna Gogoi**: Isolation of medicinal compound and use of waste for alcohol production.
6. **Kalpna Sagar**: Metagenomics for catalase enzyme.
7. **Salam Pradeep Singh**: Metagenomics and Bioinformatics
8. **Yasir Basir**: Metagenomics for cellulase enzyme.

Publications of Prof. Bolin Kumar Konwar

Articles on Science topics - English 15 Assamese 6 70 Book and chapters: 03
Popular articles (Assamese): 62 Project reports: 12 Scientific reports: 12

List of Research Publications/Presentations– 155

(a) Publications in referred national and international journals (49)

01. Environmental influence on the estimates of genetic parameters in soybean. **Konwar, B. K.** and Talukdar, P., *J. Res* 5 (2): 135-142, 1984.
02. Environmental sensitiveness of genetic association of yield and yield attributing characters in soybean (*Glycine max* L. Merrill.). **Konwar, B. K.** and Talukdar, P., *J. Res.* 5 (2): 9-14, 1987.
03. Pattern of genetic variability in soybean. **Konwar, B. K.**, *J.Res.* 11 (1): 20-25, AAU, Jorhat, Assam, 1991.
04. *Agrobacterium tumefaciens*-mediated genetic transformation of sugar beet (*Beta vulgaris* L.), **Konwar, B. K.**, *Plant Biochem. & Biotech.* 3: 37-41, 1994.
05. Genetic engineering in tea: I. molecular genetic markers. Bera, B., **Konwar, B. K.** and Singh, I. D. *Two and a Bud*, 42(1): 2-6, 1995.
06. Genetic engineering in tea: II. gene transfer. **Konwar, B. K.** *Two and a Bud*, 42(2):13-20, 1995.
07. Isolation and culture of leaf mesophyll protoplasts of sugar beet. **Konwar, B. K.**, *Crop Improvement* 20 (1):69-77, 1993.
08. Plant regeneration in three genotypes of sugar beet. **Konwar, B. K.**, *Crop Improvement*, 20 (1): 88-97, 1993
09. Genetic variability in pigeon pea. **Konwar, B. K.** and Hazarika, M. H. *Crop Improvement* 15 (1): 100-104, 1988.
10. Environmental impact on different characteristics of soybean (*Glycine max* L Merrill.). **Konwar, B. K.** and Talukdar, P., *Soybean Genetics Newsletter*, Iowa State University, USA12: 28-32, 1988.
11. Stability analysis of yield and its components in soybean. **Konwar, B. K.** and Talukdar, P., *Crop Improvement* 13 (1): 172-175, 1986.
12. Phenotypic stability of soybean genotypes for field germination. Talukdar, P. and **Konwar, B. K.**, *Soybean Genetics Newsletter*, Iowa State University, USA 11: 38-41, 1984.

13. Japonica x indica rice hybrids through embryo rescue technique. Sarma, D., **Konwar, B. K.** and Deka, P. C. *Rice Biotechnology Quarterly* Vol. 25, 1996, RBQ 9.
14. Patenting and its application for the legal protection of crop plants including tea. **Konwar, B. K.**, *Two and a Bud* 45 (1): 5-7, 1998.
15. Hairy root development in tea through *Agrobacterium rhizogenes*-mediated genetic transformation. **Konwar, B. K.**, Das, S. C., Bordoloi, B. J. and Dutta, R. K., *Two and a Bud* 45 (2): 21-22, 1998.
16. Female fertility in clones KP 6/25 and Mornoi 30, Ahmed, N. and **Konwar, B. K.**, *Two and a Bud* 46 (2): 37-39, 1999.
17. Rooting of in vitro shoots and field establishment of tissue culture-derived tea plants in the field. **Konwar, B. K.**, Bordoloi, B. J., Dutta, R. K. and Das, S. C., *Two and a Bud* 46 (2): 26-32, 1999.
18. Biodiversity of tea in North East India and their conservation at Tocklai. **Konwar, B. K.**, *Two and a Bud* 46 (2): 7-12, 2001.
19. Transient expression of B-glucuronidase activity in electroporated sugar beet protoplasts. **Konwar, B. K.**, *JASS* 10(1):14-18, 2001.
20. Biodiversity and molecular characterization of tea genetic resources using DNA markers. Bera, B. **Konwar, B. K.**, Saikia, H. and Mazumder, S. C., *Two and a Bud* 49, 2005: 30 ó 37.
21. Morphophenology and karyotype study of *Patidoi* (*Schumannianthus dichotomus* (Roxb.) Gagnep. synonym *Clinogyne dichotoma* Salisb.) ó a traditional plant of Assam. Dhiren Chowdhuri and **Bolin Kr. Konwar** (2006). *Curr. Sci*, Vol. 91 (5): 648.
22. A new less expensive method for genome size determination of plants. **B.K. Konwar**, D. Chowdhury, J. Buragohain & R. Kandali (2007). *Asian J. Plant Sci.* 6 (3): 565 ó 567.
23. Ethnomedicinal plants used in skin diseases by some Indo-Mongoloid communities of Assam. Jitu Buragohain and **B. K. Konwar** (2007). *Asian J. Expt. Sci.* 21 (2): 283- 290.
24. An efficient and reliable method of DNA extraction from *Meyna spinosa*: a traditional medicinal plant from North East India. Jitu Buragohain and **B. K. Konwar** (2008). *J of Biochem and Biotech* 17 (1): 103-105.
25. Microbial surfactant-enhanced mineral oil recovery under laboratory conditions. Bordoloi, N. K. and **Konwar, B. K.** (2008). *Colloids and Surfaces B: Biointerfaces* 63: 73 - 82.
26. Genome size determination of *Zanthoxylum oxyphyllum* and *Meyna spinosa* by flow cytometry: A preliminary study. Jitu Buragohain and **B. K. Konwar** (2008). *J Cell Tissue Research* 8(1): 1249-1252.

27. Bacterial biosurfactant in enhancing solubility of petroleum hydrocarbons. **B. K. Konwar** and N. K. Bordoloi (2008). *Journal of Petrotech Society* V: 45-52.
28. Genome size determination of *Zanthoxylum oxyphyllum* and *Meyna spinosa* by flow cytometry: a preliminary study. Buragohain, J. and **Konwar, B. K.** (2008). *Journal of Cell and Tissue Culture* 8: 1249-1252.
29. Bacterial biosurfactant in enhancing solubility and metabolism of petroleum hydrocarbons. N. K. Bordoloi and **B. K. Konwar.** *Journal of Hazardous Materials* 170 (2009): 495-505.
30. Investigation of antioxidant property of iron oxide particles by 1'-1' diphenylpicryl-hydrazyle (DPPH) method. S. Paul, J. P. Saikia, S. K Samdarshi and **B. K. Konwar** (2009). *Journal of Magnetism and Magnetic Materials*, 321 (21): 3621-3623 (November).
31. Biocompatible epoxy modified bio-based polyurethane nanocomposites: mechanical property, cytotoxicity and biodegradation. S. Dutta, N. Karak, J. P. Saikia and **B. K. Konwar** (2009). *Bioresource Technology*, 100 (24): 6391-6397 (December).
32. Antioxidant activity and haemolysis prevention efficiency of polyaniline nanofibers. Somik Banerjee, Jyoti P. saikia, A. Kumar, **B. K. Konwar** (2010) *Nanotechnology* 21: 045101 (8pp).
33. Antibacterial property of medicinal plants used in Assamese traditional medicine for the treatment of dysentery and diarrhea. . Luna Barooah and **B. K. Konwar** (2010), *Journal of Eco-friendly Agriculture* 5 (1):40-42:2010.
34. Swift heavy ion irradiation induced enhancement in the antioxidant activity and biocompatibility of polyaniline nanofibers. A Kumar, Somik Banerjee, Jyoti P saikia and **B K Konwar** (2010), *Nanotechnology* 21: 175102 (8pp, cited by **Nature India**).
35. Nickel oxide nanoparticles: A novel antioxidant. Jyoti Prasad Saikia, Samrat Paul, **Bolin Kumar Konwar**, Sanjoy Kumar Samdarshi (2010), *Colloids and Surfaces B: Biointerfaces* 78: 146 ó 148.
36. Biodegradation of Epoxy/MF Modified Polyurethane Films Derived From a Sustainable Resource. Suvangshu Dutta, Niranjan Karak, Jyoti Prasad Saikia and **Bolin Kumar Konwar.** (2110), *Journal of Polymer and Environment* (DOI 10.1007/s10924-010-0161-8).
37. Physicochemical properties of starch from aroids of north east India. Jyoti Prasad Saikia, **B K Konwar** (2010), *International Journal of Food Properties* (ACCEPTED)
38. Ultrasonication: enhances the antioxidant activity of metal oxide nanoparticles. Jyoti Prasad Saikia, Samrat Paul, **Bolin Kumar Konwar**, Sanjoy Kumar Samdarshi (2010), *Colloids and Surfaces B: Biointerfaces* (In press).
39. Biocompatible novel starch/polyaniline composites: characterization, anti-cytotoxicity and

- antioxidant activity. Jyoti Prasad Saikia, Somik Banerjee, **Bolin Kumar Konwar**, Ashok Kumar. *Colloids and Surfaces B: Biointerfaces* 81 (2010): 158 - 64.
40. Biochemical composition and bioactivity of four edible aroids. J. P. Saikia and **B. K. Konwar**. 2011. *Journal of Root Crops* (Accepted).
41. Poly(ethyl glycol)-magnetic nanoparticles-curcumin ϕ trio: directed morphogenesis and synergistic free radical scavenging. R. Konwar, J. P. Saikia, N. Karak, 2011. **B. K. Konwar**. *Colloids and surfaces B: Biointerface* (Accepted).
42. Synthesis of silver ϕ polystyrene nanocomposite particles using water in supercritical carbon dioxide medium and its antimicrobial activity. I.R. Kamrupi, P.Phukon, **B.K.Konwer**, S. K. Dolui (2011) *The Journal of Supercritical Fluids*. Volume 55, Issue 3, January, Pages 1089-1094.
43. R. Kataki. Microalgae *Chlorella* as a potential bioenergy feed stock. M. M. Phukon, R. S. Chutia, **B. K. Konwar** (2011). *Applied Energy* (in press).
42. Genome size determination and rapid analysis of four edible aroids of North East India. Jyoti Prasad Saikia and **Bolin Kumar Konwar** (2011). *IIOAB Journal* (Accepted).
43. Biochemical composition and bioactivity of four edible aroids. Jyoti Prasad Saikia and **Bolin Kumar Konwar** (2011). *Journal of Root Crops* (Accepted).
44. P. Bharali and **B. K. Konwar** (2011). Production and physiochemical characterization of a biosurfactant produced by *Pseudomonas aeruginosa* OBPI isolated from the petroleum sludge. P. Bharali and **B. K. Konwar** (2011). *Applied Biochem. & Biotech.* (in press).
45. Crude biosurfactant from thermophilic *Alcaligenes faecalis*: Feasibility in petro-spill bioremediation. P. Bharali, S. Das, **B. K. Konwar** and A. J. Thakur (2011). *Int J Biodeterioration & Biodegradation* (accepted).
46. Enhancing the stability of colloidal silver nanoparticles using polyhydroxyalkanoates (PHA) from *Bacillus circulans* (MTCC 8167) isolated from crude oil contaminated soil *Colloids and Surfaces B: Biointerfaces*. Pinkee Phukan, J. P.Saikia and **B. K. Konwar** (2011). *Colloids and Surfaces B: Biointerfaces* (accepted, MS No.: COLSUB-D-11-00079)
47. Isolation and Characterization of Active Compound from Fruits of Medicinal Plant *Spondias pinnata* Kurz. R. Kandali and **B. K. Konwar** (2011). *Indian Journal of Agricultural Biochemistry* 24(1), p. 29-33 (NAAS rating 4.2).
48. Biosynthesis and characterization of medium chain length (mcl) polyhydroxyalkanoates by *Pseudomonas aeruginosa* MTCC7814 isolated from crude oil contaminated soil. Pinkee Phukan, Binod Pokhrel, **B. K. Konwar** and S. K. Dolui,

49. *In silico* structure assessment analysis of core domain of six protein data bank entries of HIV-1 Integrase, Salam Pradeep Singh and **B. K. Konwar** (2011), *J of Computational Biology and Bioinformatics Research*, Vo. 3 (3)

(b) Papers published in Proceedings/Souvenirs of national/international seminars (33)

1. N₂-fixing ability and genetic variability in *Azolla-Anabaena* symbiosis. Borgohain, R; Hazarika, M. H. and **Konwar, B. K.**, *Proc. on Recent Advances in Sciences*, National Sem., Dibrugarh University, 1994, pp 101-108.
2. Collection, evaluation of azollae of NE India and its application to rice crop. Borah, R. C.; Barthakur, D. and **Konwar, B. K.**, *Proc. Int. Symp. on Rainfed Rice Prod. Strategy for 21st Century*, AAU, Jorhat, 25-27th Nov., 1997.
3. Plant transformation through *Agrobacterium tumefaciens*. **Konwar, B. K.** Course Manual on *Tissue Culture and Biochemical Techniques for Crop Improvement with special reference to citrus and tea*. Nov., 1995, Agril. Biotech, AAU and Tockali Expt. Station, TRA, Sponsored by DBT, Govt. of India, New Delhi, pp 66-75.
4. *Agrobacterium*-mediated leaf disc transformation. **Konwar, B. K.** Course Manual on *Tissue Culture and Biochemical Techniques for Crop Improvement with special reference to citrus and tea*. Nov., 1995, Agril. Biotech, AAU and Tockali Expt. Station, TRA, Sponsored by DBT, Govt. of India, New Delhi, pp 180-182.
5. Embryo rescue in japonica X indica hybrid rice (*Oryza sativa* L). Sarma, D, and **Konwar, B. K.**, *Proc. on Recent Advances in life sciences*, National Seminar, Dibrugarh University, 1994 pp 95-100.
6. Electroporation and genetic transformation in plants. **Konwar, B. K.**, *Lect. series organised by Tocklai Expt. Station, TRA, Jorhat; Sponsored by the DBT, New Delhi* 1997 (booklet).
7. Gene transfer in plants. **Konwar, B. K.** *Research booklet on DIC & Ph D work, Published by the Agril. Biotech. Prog., AAU, Jorhat; sponsored by DBT, New Delhi*, 1992.
8. Rapid regeneration of sugar beet (*Beta vulgaris* L) from in vitro cultures. **Konwar, B. K.** and Coutts, R. H. A., *Proc. VII Int. Conf. on Plant Cell and Tissue culture*, Amsterdam, The Netherlands, 1990.
9. Contribution of the North Eastern region for the enrichment of citrus wealth in India. **Konwar, B. K.**, *Proc VI National Citrus Seminar, AAU, Jorhat*, 1997.

10. Plant tissue culture. Das, S. C. and **Konwar, B. K.** Presented in the lecture series organised at the Tocklai Expt. Station, TRA, Jorhat and sponsored by the DBT, New Delhi, Govt of India, New Delhi, 12th Sept., 1997 (booklet).
11. Karyotype study and polyploidy inducibility in tea (*Camellia sinensis* L. O. Kuntze). Matharoo, A. K. and **Konwar, B. K.**, *Proc of Seminar on Agric. Sci. Soc. of NE India*, AAU, Jorhat, Assam, Nov 27-28, 1997, pp 64-68.
12. Segregating lines from embryo rescued japonica x indica rice (*Oryza sativa* L.) crosses for cold tolerance. Sarma, D. and **Konwar, B. K.** *Proc of Seminar on Agric. Sci. Soc. of NE India*, AAU, Jorhat, Assam, Nov 27-28, 1997, pp 58-63.
13. Innovative approaches in tea breeding and fertility maintenance by microbes. **Konwar, B. K.**, *Hand book of the field management course*, Tocklai Expt. Station, TRA, Jorhat, Assam, July 30th 1997.
14. Sustained assessment and improvement of medicinal plant wealth of North East India. **Konwar, B. K.**; Buragohain, J. and Chaudhary, D. *Proce. National Workshop on 'Science & Technology for regional development: case for North East India'*. Feb. 3rd ó 6th, 2004, Indian Institute of Technology, Guwahati, pp 105-115.
15. Morphological and floral biology of karpful ó a promising aromatic and medicinal plant of North East India. **Konwar, B. K.** and Chaudhary, D. *Proce. National Workshop on 'Science & Technology for regional development: case for North East India'* Feb. 3rd ó 6th, 2004, Indian Institute of Technology, Guwahati, pp 99-104.
16. Science and Technology in the development of the North Eastern region. **Konwar, B. K.** In: *Souvenir, National Workshop on Science & Technology for Regional Development: Case for North-East India*, Feb 3 ó 6, 2004, IIT, Guwahati, pp 8-12.
17. Naturally occurring microbes for the control of human diseases. **Konwar, B. K.**, Key note address presented in the inaugural session of the 'Continuing Education Programme', Defense Research Lab., DRDO, Tezpur, 11th Oct., 2004.
18. Biodiversity and intellectual property rights. **Konwar, B. K.** *Proce. National Seminar on Intellectual Property Rights*, 6-8 Oct., 2004, St. Anthony's College, Shillong, pp134-138.
19. Patenting of plants in India. **Konwar, B. K.** *Proce. National Seminar on Intellectual Property Rights*, 6-8 Oct., 2004, St. Anthony's College, Shillong, pp 139-142.
20. Application of recombinant DNA technology for control of human diseases, **Konwar, B. K.**, paper presented in the Technical session I of the 'Continuing Education Programme', Defense Research Lab., DRDO, Tezpur, 11th Oct., 2004.

21. Intellectual property right in relation to biodiversity and biotechnology. **Konwar, B. K.**, *Proce. National Workshop on Intellectual Property Right (IPR)*, Nov. 5th, 2004, Tezpur University, Napaam, pp 1-15.
22. Isolation of the flavoury compound 1-methoxy-4-(1-propenyl)-benzene from a threatened medicinal plant of North Eastern India. Chaudhury D. and **Konwar, B. K.** *Proc. Nat. Seminar on Medicinal Plants of North Eastern India*, Oct. 7 ó 10, 2004, Guwahati.
23. An overview on microbes. **Konwar, B. K.**, Key Note Address, *Continuing Education Programme: Naturally occurring microbes for the control of human diseases*. (Lecture Notes), 11-15th October 2004, pp 6-15.
24. Application of recombinant DNA technology for control of human diseases. **Konwar, B. K.**, *Continuing Education Programme: Naturally occurring microbes for the control of human diseases*, Technical Session I. (Lecture Notes), 11-15th October 2004, pp 15-17.
25. Prospects of value addition to bio-resources through biotechnology. **Konwar, B. K.**, Full keynote paper, *Souvenir cum Abstract: Value addition to bioresources of NE India, Post harvest technology and Cold chain, National Seminar*, Gauhati University, Guwahati, Assam, 19 ó 21 May 2006, pp15 ó 31.
26. The age of bioinformatics. **B. K. Konwar** (2008). *Bioinformatics Training Manual*, 15th ó 28th December, BIF, Tezpur University, pp 9-12.
27. Nucleotide base pairs in deoxyribonucleic acid and its sequence determination. **B. K. Konwar** (2008). *Bioinformatics Training Manual*, 15th ó 28th December, BIF, Tezpur University, pp 13-16.
28. Hydrogen: the future fuel from biological agents. M. Mandal and **B. K. Konwar** (2008). Shakti, Workshop on Renewable energy Resource Assessment: Present status and future strategy, 16th Oct., pp25-27.
29. Value addition to Bio-resources. **B. K. Konwar** (2009), *Souvenir-cum-Proce National Seminar on Bioresources of North East India: industrial potentials and intellectual property rights issues* (Keynote Lecture), 2nd and 3rd January, pp 17-34, Nawgaon College, Nagaon.
30. Removable of crude oil from contaminated soil. **B. K. Konwar** (2009), *Fortnightly Faculty Seminar* (Friday), School of Science & Technology, Tezpur University, Napaam, 14th August.
31. Microalga *Chlorella* and *Scenedesmus* as a potential bioenergy source. M. M. Phukan and **B. K. Konwar** (2010), *Proce. National Conf on Renewable energy for Development of Underdeveloped Areas with Special Reference to North East India*, 23rd ó 25th March (in press).

32. Creative structure and leadership. **B. K. Konwar** (2010), *Seminar on Creativity in Education*, Tezpur University, Napaam, 6th April (oral presentation).
33. Bioresources as Economic Growth of North East India: An Appraisal, **B. K. Konwar** (2011), *National Seminar on Biochemical and Biotechnological Research Approaches for Bio-resource Management of North East India towards Sustainable Rural Development*, B. N. College of Agriculture, Assam Agricultural University, Biswanath Chariali, Sonitpur, Assam, 11 - 12th November 2011 (Chief Guest Lecture).

(c) Papers presented in National/International Seminars/Conferences (73)

1. Transient expression of the B-glucuronidase gene in electroporated leaf mesophyll protoplasts of sugar beet (*Beta vulgaris* L.). **Konwar, B. K.** and Coutts, R. H. A., presented in the *World Cong. on Cell & Tissue Culture*, Anaheim, California, USA, 1991.
2. Genetic transformation in plant. **Konwar, B. K.**, *Seminar talk at the Dept. of Applied Bot. & Biotech.*, Gauhati University, 1992.
3. *Agrobacterium*-mediated genetic transformation in sugar beet (*Beta vulgaris* L.). **Konwar, B. K.**, *1st National Symp. on Plant Biotechnology*, IARI, New Delhi, 1992.
4. Hybrid rice: a future prospect. **Konwar, B. K.** and Hazarika, M. H., *33rd Annual Conf. of Assam Sci. Society*, AAU, Jorhat, Assam, 1987.
5. Selection value of the period from flowering to maturity and its relation with seed yield over environment in soybean (*Glycine max* L. Merrill). **Konwar, B. K.** and Talukdar, P., *31st Annual Conf. of Assam Sci. Society*, AAU, Jorhat, Assam, 1985.
6. Haploid regeneration from embryo rescued japonica x indica rice (*Oryza sativa* L) hybrids. **Konwar, B. K.**, Sarma, D. and Pathak, M., paper presented in the *Golden Jubilee Int Symp on "Rainfed rice for sustainable food security"*, Sept. 23-25, 1996, CRRI, Cuttack.
7. Biotechnology and tea improvement. **Konwar, B. K.**, *Seminar in Tocklai Expt. Station*, TRA, Jorhat, Assam, July 12th, 1995.
8. Tea improvement: conventional Vs innovative approaches. **Konwar, B. K.**, *Seminar in Tocklai Expt. Station*, TRA, Jorhat, Assam, July 31st, 1995.
9. Production of haploids from embryo rescued plants of japonica x indica rice hybrids. Pathak, M. and **Konwar, B. K.**, paper presented in the poster session II of the Golden Jubilee Int. sym. on 'Rainfed rice for sustainable food security', 23-25th Sept, 1996, Cuttack.
10. Classification of plants, its identification and collection of specimen. **Konwar, B. K.**, *Workshop on Environment and Nature Conservation*, 17 ó 25th Nov, 1997, Jorhat.

11. Plant Biodiversity. **Konwar, B. K.**, workshop on Environment and Nature conservation, 17-25th Nov, 1997, Jorhat.
12. Indian tea: present position and future prospects. **Konwar, B. K.**, concept paper presented in the Brain Storming session on *Improvement of tea through biotechnological tools*, December 1st, 1999, DBT, New Delhi.
13. Genetic transformation: model plant sugar beet (*Beta vulgaris* L.). **Konwar, B. K.**, Seminar organized by the Indian Soc of Biochem & Biotech, AAU, Jorhat, 1992.
14. An appraisal on the popularity of Tocklai released clones and bicultural seed stocks in the North Eastern region. **Konwar, B. K.** and Neog, N. J., presented in the *poster session of the 33rd Tocklai Conference*, 11th-13th Feb., 2001
15. Promising clones for the coming decade. **Konwar, B. K.**, Bordoloi, S. C. and Bordoloi, R. K., presented in the *oral Technical session IV: Genetic modification and tea improvement-the new dimension, 33rd Tocklai Conference*, 11th-13th Feb., 2001.
16. Biodiversity and molecular characterisation of tea (*Camellia sinensis* (L.) O. Kuntze) cultivars using DNA markers. Bera, B., **Konwar, B. K.**, Saikia, H. and Mazumder, C. S., presented in the *oral Technical session IV: Genetic modification and tea improvement-the new dimension, 33rd Tocklai Conference*, 11th-13th Feb., 2001.
17. Recycling of tea garden weeds and pruning litters. **Konwar, B. K.**, Das, M. and Das, J., presented in the *poster session of the 33rd Tocklai Conference*, 11th-13th Feb., 2001.
18. Studies on stomata in TV and generative clones with particular reference to drought tolerance. Handique, A. C., Barman, T. S. and **Konwar, B. K.**, presented in the *poster session of the 33rd Tocklai Conference*, 11th-13th Feb., 2001.
19. Somaclonal variation through tissue culture of tea. Das, S. C., **Konwar, B. K.**, Bordoloi, B. J. and Dutta, R. K., presented in the *poster session of the 33rd Tocklai Conference*, 11th-13th Feb., 2001.
20. Biotechnology. **Konwar, B. K.** *Science Week Key Note Seminar Talk, The Assam Valley School*, Balipara, Sonitpur, Assam. dtd. March 1st, 2003.
21. DNA: the molecule of life and its voyage beyond the realm. **Konwar, B. K.** Key note Address, *Commemoration of 50th Anniversary of DNA Discovery*, Defense Research Laboratory, DRDO, Tezpur, Assam. Dtd. 28th Feb., 2003.
22. The self forming biomaterial DNA, its characterization and contribution. **Konwar, B. K.** *National Workshop on 'Advanced Materials: processing and characterization (Oral Presentation)*, Oct. 29th ó 30th, 2003, Deptt of Physics, Tezpur University, Napaam, Tezpur.

23. Human genome. **Konwar, B. K.** *Scientific Semina (Oral Presentation)*, 18th Sept., 2002, Zoological Society of Assam, Tezpur.
24. Biosurfactant induced enhanced oil recovery. Bordoloi, N. K. and **Konwar, B. K.** *National Seminar on 'Hydrocarbon degrading microbes'*. 22nd ó 23rd Dec., 2003, Tezpur University, Napaam.
25. Bioremediation of petroleum hydrocarbons by microbial consortia. Bordoloi, N. K. and **Konwar, B. K.** *National Seminar on 'Hydrocarbon degrading microbes'*. 22nd ó 23rd Dec., 2003, Tezpur University, Napaam.
26. Degradation of crude oil by bacterial consortia. Bordoloi, N. K. and **Konwar, B. K.** *National Workshop on 'Science & Technology for regional development: case for North East India'*. (**Oral Presentation**), Feb. 3rd ó 6th, 2004, Indian Institute of Technology, Guwahati.
27. Lectin typing of *Pseudomonas* isolates from petroleum rich soils of Assam. B. Tanti, A. K. Buragohain, S. K. Ray and **B. K. Konwar** (2003) *National Seminar on Hydrocarbon Degrading Microbes (Oral Presentation)*, Tezpur University 22-23 Dec.
28. Potential application of biosurfactant produced by thermophilic *Pseudomonas* sp. DM-02 strain in microbial enhanced oil recovery (MEOR) and Bioremediation. Das K., Mukherjee, A.K. & **Konwar, B.K.** (2003) *National Seminar on Hydrocarbon Degrading Microbes (Oral Presentation)*, Tezpur University 22-23 Dec.
29. Evaluation of nutraceutical potentiality of a minor fruit of Assam ó *Spondias pinnata* Kurz. Kandali, R. and **Konwar, B. K.** Souvenir cum *Abstract: Value addition to bioresources of NE India, Post harvest technology and Cold chain, National Seminar (Oral Presentation)*, Gauhati University, Guwahati, Assam, 19 ó 21 May 2006, pp 99.
30. Antimicrobial activity of the fruits of *Meyna spinosa* Roxb. Ex Link: a potential medicinal plant of North East India. Buragohain, J. and **Konwar, B. K.**, Souvenir cum *Abstract: Value addition to bioresources of NE India, Post harvest technology and Cold chain, National Seminar*, Gauhati University, Guwahati, Assam, 19 ó 21 May 2006, pp 113.
31. Microbial consortium in bioremediation of contaminant hydrocarbon. Bordoloi, N. K. and **Konwar, B. K.**, Souvenir cum *Abstract: Value addition to bioresources of NE India, Post harvest technology and Cold chain, National Seminar*, Gauhati University, Guwahati, Assam, 19 ó 21 May 2006, pp 121.
32. Studies on the microflora of fermentation starter culture used by the Ahom community of Asom. Barman, K. R. and **Konwar, B. K.**, Souvenir cum *Abstract: Value addition to bioresources of NE India, Post harvest technology and Cold chain (Oral Presentation)*, National Seminar, Gauhati University, Guwahati, Assam, 19 ó 21 May 2006, pp 123.

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