CURRICULUM VITAE

Name : **Brijmohan Singh Bhau**

Father's Name : Late Sh. Balwant Singh Bhau

Designation : Head, Biological Sciences & Technology Division

Specialisation : Plant Biotechnology

Qualification : Ph.D. (Botany)

Corresponding address: Professor Brijmohan Singh Bhau,
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Education:

- 1999 Ph.D. Botany, Jammu University (Tissue culture studies of some difficult-to-root temperate varieties of *Morus alba* L. and *Morus multicaulis* PERR.)
- 1993 M.Sc Botany, Jammu University
- 1990 B.Sc. GGM Science College, Jammu University
- 1987 12th Kendriya Vidyalaya-2, Satwari Jammu
- 1985 10th Kendriya Vidyalaya, Panchmarhi, Madhya Pradesh (MP)

Research Interests

Plant biotechnology, Molecular markers, Genetic diversity, Plant genetic transformation, Plant tissue culture, PGPR, Medicinal plants, Conservation of plants, Plant microbe interaction.

Recognition/Fellowship/awards received:

1. NET (CSIR/UGC) Fellowship (1993-1998) at University of Jammu, Jammu, India
2. Research Associate-DBT sponsored Project (Dec. 1999 – March 2000) with Professor S. N. Raina at Department of Botany, Delhi University, Delhi.
3. Research Associate (CSIR) Fellowship (April 2000-2002) at TERI, New Delhi
4. BOYSCAST Fellowship by DST, Govt. of India (Worked in Dundee University from March 2004-March 2005)

5. National award: Professor YS Murthy Gold Medal by IBS -2005 for excelling in field of plant biotechnology research.
6. Included in the 2009 Edition of Marquis Who's Who in the World®.
7. Young Achiever Award for outstanding contributions in the field of Agricultural Microbiology by the Organizing Committee of the National Workshop on "Advances in PGPR Research" held from October 7-8, 2014 at Institute of Agricultural Sciences, Banaras Hindu University, Varanasi, India
8. Member of research advisory group member of Rain Forest Research Institute (RFRI).
9. Visiting Associate Professor, Vidyasagar University, Midnapore, West Bengal. 2011-12
10. Nominated by Assam State Biodiversity Board as member of Expert Committee for declaring Majuli as Biodiversity Heritage site.

Research Experience

1. Twenty year's experience in Plant tissue culture, Genetic transformation of plant & biotechnology.
2. Twenty years' experience in different biotechnology/molecular techniques such as SSAP, AFLP, ISSR, RAPD, RFLP, cloning, genetic transformation, Plant tissue culture, nanoparticle synthesis & Nano biotechnology and plant microbe interaction.
3. Organised a Department of Biotechnology (DBT), Government of India sponsored National training program (2 weeks) on Biotechnological tools & techniques for plant biodiversity & conservation studies from 19th Jan – 31st Jan 2009 at CSIR-NEIST Jorhat, Assam.

Teaching experience:

Taught Plant Genetics, Applied Molecular Genetics & Biotechnology, Bioinformatics, Molecular tools & techniques, Plant Biotechnology Management and Regulatory Issues. Functional Genomics courses to AcSIR Ph.D students & Botany to students of integrated M.Sc. Botany Course.

Professional and Practical Training:

1. Attended training program on "Application of tissue culture technology for Micropropagation and Regeneration of Agro-forestry species at Central Arid Zone Research Institute, Jodhpur" (1994).
2. Eighth National Workshop of Electron Microscopy at Regional Sophisticated Instrumentation Centre, Punjab University, Chandigarh (1995).
3. Basic Computer application Course from CEDTI (Govt. of India) Jammu (1994).
4. Micropropagation technology for commercialisation. TERI New Delhi (1996).
5. Micropropagation technique to technology. TERI New Delhi (2000)
6. Winter School on Molecular Biology at CIMAP, Lucknow (2002).

7. Molecular biology databanks and integrated data analysis tools: A bioinformatics approach, North-Eastern Hill University, Shillong (2008)

Academic Involvements

1. Fellow Royal Society of Biology (FRSB) - UK
2. Fellow & Member International Association for Plant Tissue Culture and Biotechnology - USA
3. Life member Indian Botanical Society-INDIA
4. Life member –The Biotech Research Society of India
5. Life Member Medicinal & Aromatic Plants Association of India
6. Member Society for Biology & Biotechnology-INDIA
7. Member Indian Cactus and Succulent Society-INDIA
8. Member International Society of Plant Morphologists-INDIA
9. Recognized PhD guide of Biotechnology Department Guwahati University.
10. Ph.D. examiner to IIT Guwahati, NEHU, Dibrugarh University, Assam Agriculture University, Guhati University & Lucknow University

Editorial board member

1. Journal of Genomes & Proteomes.
2. European Journal of Medicinal Plants
3. EC Agriculture Journal
4. Journal Biotechnological Studies
5. Journal Cell Structure and Development

Refereed for the journals

1. Plant cell Reports
2. Plant Cell Tissue & Organ Culture
3. Biotechnology Advances
4. Current Science (India).
5. Indian Journal of Biochemistry & Biophysics (India).
6. Indian Journal of Biotechnology (India).
7. International Journal of Fruit Science (France)
8. Plant Omics (Australia).
9. African Journal of Biotechnology
10. African Journal of Agricultural Research
11. Biochemical Genetics
12. Biological Control
13. Industrial Crops and Products
14. Biochemical Genetics

Patents

Patent filed:

India

1. Process for nio-nanocellulose hybrid nanocomposites and their antimicrobial activities. AM Das, MP hazarika, D Baruah, BS Bhau, PD Bhuyan, B Borah201611000000

Abroad

1. A nio-nanocellulose hybrid nanocompositesfor their antibacterial and antifungal activities. AM Das, MP hazarika, D Baruah, BS Bhau, PD Bhuyan, B Borah. PCT/IN2017/050099

Selected list of general articles published

1. **Bhau BS** - Miracles of plant tissue culture- Science Reporter, July 1998.
2. **Bhau BS** and Koul V - Switching on *Bacillus thuringienesis* to reduce selection for resistance- Current Science 75 (8): 771-777 (1998).
3. **Bhau BS** - Synthetic seeds for plant propagation. Popular Science 4: 39-40 (1996).
4. **Bhau BS** - Micropropagation of cacti through tissue culture. The Journal of India Society of Cacti and Succulent 1:12-15 (1999)
5. **Bhau BS** and Lakshmikumaran MS - Plant genetic transformation technology-Developments and applications. The Botanica 51: 1-9. 2001, India
6. **Bhau BS**, Medhi K, Saikia SP, Kanjilal PB and Sarma TC – Development of tools and strategies towards marker assisted selection and gene cloning – A review. Journal of Advance Plant Sciences (2008) 4: 1-9.

Some Imporatant Research Publications

1. Gogoi B & **Bhau BS** (2018) DNA barcoding of the genus Nepenthes (Pitcher plant): a preliminary assessment towards its identification. BMC Plant Biology. Aug., 3; 18(1):153. doi: 10.1186/s12870-018-1375-5.
2. Borah B, Ahmed R, Hussain M, Phukon P, Wann SB, Sarmah DK & **Bhau BS** (2018) Suppression of root-knot disease in *Pogostemon cablin* caused by *Meloidogyne incognita* in a rhizobacteria mediated activation of phenylpropanoid pathway. **Biological Control** 119: 43–50. doi.org/10.1016/j.biocontrol.2018.01.003
3. Gogoi B, Gogoi D, Silla Y, Kakoti BB & **Bhau BS** (2017) Network Pharmacology-based Virtual Screening of Natural Products from *Clerodendrum* species towards the Identification of Novel Anti-cancer Therapeutics. **Molecular BioSystems 13:** 406-416 (DOI: 10.1039/C6MB00807K)
4. Baruah J, Gogoi B, Das K, Ahmed NM, Sarmah DK, Lal M & **Bhau BS** (2017) Analysis of genetic diversity amongst *Cymbopogon* species from NE-India using

RAPD and ISSR markers. **Industrial Crops and Products** 95: 235-243**.** dx.doi.org/10.1016/j.indcrop.2016.10.022

5. **Bhau BS**, Borah Bitupon, Reshma Ahmed, Barbie Gogoi, P. Phukon, Sarmah DK, Lal M, Wann SB (2016) The influence of root-knot nematode (*Meloidogyne incognita*) infestation on antioxidant enzymes, chlorophyll contents and growth in Patchouli plant (*Pogostemon cablin*). **Indian Journal of Experimental Biology** 54 (4) 254-261.
6. Paul R, **Bhau BS**, Zaman K & Sharma HK (2016). RAPD analysis of DNA isolated from turmeric rhizomes collected from northeast India. **Advancement in Genetic Engineering** 5(1): 1-2. DOI 10.4172/2169-0111.1000146
7. Borah B, Phukon P, Hazarika MP, Ahmed R, Sarmah DK, Wann SB, Das AM, **Bhau BS** (2016) *Calamus leptospadix* Griff. a high saponin yielding plant with antimicrobial property. **Industrial Crops and Products** 82 (April) 127–132. DOI 10.1016/j.indcrop.2015.11.075
8. Lal M, Dutta S, Saikia D & **Bhau BS** (2016). Assessment of Selection Criteria in Sesame by using Correlation and Path Coefficient Analysis under High Moisture and Acidic Stress Soil Condition. **Indian Journal of Science and Technology** 9(4):1-5
9. Singh P, Nag A, Parmar R, Ghosh S, **Bhau BS** and Sharma RK (2015) Genetic diversity and population structure of endangered *Aquilaria malaccensis* revealed potential for future conservation. **Journal of Genetics 94 (4): 697-704.** DOI 10.1007/s12041-015-0580-3.
10. **Bhau BS** and Wakhlu AK (2015) A highly efficient in vitro propagation protocol for elephant tusk cactus: *Coryphantha elephantidens* (Lem.) Lem. **Journal of Genetic Engineering and Biotechnology** 13 (2): 215-219.
11. **Bhau BS**, Gogoi G, Baruah D, Ahmed R Hazarika G, S Ghosh, Borah B Sarmah DK, Nath SC and Wann SB (2015) Development of An effective and efficient DNA isolation method for *Cinnamomum* species. **Food Chemistry** 188 (1): 264-270.
12. Debajit S, Sukriti D, Sneha G, Lal Mohan, **Bhau BS** (2015) RAPD and ISSR based intra-specific molecular genetic diversity analysis of *Cymbopogon flexuosus* L. Stapf with a distinct correlation of morpho-chemical observations, **Research Journal of Biotechnology** 10 (7): 105-113.
13. **Bhau, B.S,** Ghosh S, Puri S, Borah B, Sarmah DK, Khan R (2015) Green synthesis of gold nanoparticles from the leaf extract of *Nepenthes khasiana* and antimicrobial assay. **Advanced Materials Letters** 6(1): 55-58.
14. Singh P, Sharma H, Nag A, **Bhau BS**, Sharma RK (2015) Development and characterization of polymorphic microsatellites markers in endangered *Aquilaria malaccensis*. **Conservation Genetics Resources** 7(1): 61-63.
15. Borah B, Ahmed R, Baruah D, Sarmah DK, Wann SB, **Bhau BS** (2014) In-vitro antioxidant activity of tender shoot of *Calamus leptospadix* Griff. **World Journal of Pharmaceutical Sciences** ISSN (Print): 2321-3310; ISSN (Online): 2321-3086.
16. Medhi K, Sarmah DK, Deka M, **Bhau BS** (2014) High gene flow and genetic diversity in three economically important *Zanthoxylum* Spp. of Upper

Brahmaputra Valley Zone of NE India using molecular markers, **Meta Gene**, Vol. 2, 706-721,

17. **Bhau BS,** Mech J, Borthakur S, Bhuyan M, and Bhattacharya PR (2014) Morphological and genetic diversity studies of Tea Mosquito Bug, Helopeltis theivora from Assam, India. **Molecular Biology Reports** 41(12): 7845-7856.
18. Subbarayudu S, Naik BS, Sunitibala Devi H, **Bhau BS**, Khan PSSV (2014) Microsporogenesis and pollen formation in *Zingiber officinale* Roscoe. **Plant Syst Evol** 300 (4): 619-632.
19. Medhi K, Deka M, **Bhau BS** (2013) The Genus Zanthoxylum – A Stockpile of Biological and Ethnomedicinal Properties. **Omics**. 2: 697
20. **Bhau BS (2012)** Molecular Markers in the Improvement of the Medicinal Plants**. Medicinal Aromatic Plants** 1:2-3.
21. **Bhau BS**, Medhi K, Sarkar T & Saikia SP (2009) PCR based molecular characterization of *Nepenthes khasiana* Hook. f.- pitcher plant. **Geetic Resources & Crop Evolution**. 56: 1183-1193 (DOI- 10.1007/s10722-009-9444-0).
22. **Bhau BS**, Medhi K, Das AP, Saikia SP, Neog K & Choudhury SN (2009). Analysis of genetic diversity of *Persea bombycina* "Som" using RAPD based molecular markers. **Biochemical Genetics** (2009) 47: 486-497. (DOI-10.1007/s10528-009-9242-6).
23. Saikia SP**, Bhau BS**, Rabha A, Dutta Sujata P, Choudhury RK, Chutia M, Mishra BP & Kanjilal PB (2009). Study of accession source variation in morpho-physiological parameter and growth performance of *Jatropha curcas* Linn. **Current Science,** (2009) 96**:** 1631-1636.
24. Unni BG, Bora U, Singh HR, Dileep Kumar BS, Devi B, Wann SB, Bora A, **Bhau BS**, Neog K, Chakravorty R - High yield and quality silk fibre production by muga silkworm, *Antheraea assama* through the application of Plant Growth Promoting Rhizobacteria. **Current Science**, (2008) 94: 768-774.
25. **Bhau BS**, Negi MS, Jindal SK, Singh M and Lakshmikumaran M – Assessing genetic diversity of *Tecomella undulate* (Sm.) - an endangered tree species using amplified fragment length polymorphisms (AFLP) based molecular marker. **Current Science**, (2007) 93: 67-72.
26. Muehlbauer GJ, **Bhau BS**, Syed NH, Heinen S, C Seungho, M David, P Stephanie, B Nicolas, C Blos and Flavell AJ - A hAT superfamily transposase recruited by the cereal grass genome. **Molecular Genetics & Genomics** (2006) 275: 553–563
27. Syed NH, Sureshsundar S, Wilkinson M, **Bhau BS**, Cavalcanti JJV and Flavell AJ - Ty1-copia retrotransposon-based SSAP marker development in Cashew (*Anacardium occidentale* L.). **Theoretical & Applied Genetics** (2005) 110: 1195–1202
28. Mudoi KD, Sarmah D, Hazarika J, **Bhau BS** and Borthakurn M – Effect of different antioxidants on in vitro formed *Plumbago rosea* plantlets. In: **Proc. Natl. Symp., ISAB-JC – Bioprospecting of Commercially Important plants**: 263-268 (2004)

29. **Bhau BS** and Wakhlu AK - Rapid micropropagation of five cultivars of mulberry. **Biologia Plantarum** 46 (3): 349-355, 2003 (Netherlands).

30. **Bhau BS**, Sabarval V, Choudhary A and MS. Lakshmikumaran – *In vitro* regeneration and genetic transformation of *Brassica juncea* via *Agrobacterium* using cotyledonary petiole explants. **Brassica** 5(1&2): 16-23, 2003 (India).

31. **Bhau BS** and Wakhlu AK - Effect of some antibiotics on the in vitro morphogenetic response from callus cultures of *Coryphantha elephantidens* (Lem.) Lem. (Cactacaea). **Biologia Plantarum**. 44 (1): 19-24, 2001.

32. **Bhau BS** and Wakhlu AK - Effect of genotype, explant source and growth regulators on organogenesis in *Morus alba* L. **Plant Cell Tissue and Organ Culture**. 66 (1): 25-29, 2001 (Netherlands).

33. Wakhlu AK and **Bhau BS** - Callus formation and plant regeneration of *Coryphantha elephantidens* (Lem.) Lem. **In Vitro Cellular & Developmental Biology. Plant** 35 (6): 211-214, 2000 (USA).

34. Wakhlu AK and **Bhau BS** - A review of tissue culture studies in mulberry (*Morus*). **Sericologia**. 40: 1-20, 2000 (France).

35. **Bhau BS** - Regeneration of *Coryphantha elephantidens* (Lem.) Lem. From root explants. **Scientia Horticulturae** 81/3: 337-344, 1999. (Netherlands).

Book Chapters

1. Borah B, Joshi B, Sharma DK & **Bhau BS** (2017). An Expedition to the Mechanism of Plant–Microbe Interaction by Utilization of Different Molecular Biology Tools. D.P. Singh et al. (eds.), Plant-Microbe Interactions in Agro-Ecological. Springer Nature Singapore Pte Ltd. Pp 431-446

2. **Bhau BS**, Sharma DK, Bora M, Gosh S, Puri S, Borah B, Guru Kumar D & Wann SB (2016). Molecular marker and crop improvement. In: Abiotic stress response in plants (Eds) Tuteja N & Gill SS. Wiley-VCH, Germany. Pp 379-406.

3. **Bhau BS**, Phukon P, Ahmed R, Gogoi B, Borah B, Baruah J, Sharma DK & Wann SB (2016). A novel tool of Nanotechnology: Nanoparticle mediated control of nematode infection in plants. In: (Eds. Singh DP, Singh HB & Prabha R) Microbial inoculants in sustainable agricultural productivity Vol. 2: Functional Applications. Springer (India) Pvt. Ltd. Pp 253-269.

4. Wann SB, Borah B, Ahmed R, Gogoi B, Phukon P, Baruah J, Sharma DK & **Bhau BS** (2016). Isolation, characterization of nematode-controlling bacteria and fungi from nature. In: (Eds. Singh DP, Singh HB & Prabha R) Microbial inoculants in sustainable agricultural productivity Vol. 1: Research Perspectives. Springer (India) Pvt. Ltd. Pp 271-295.

5. Saikia SP, Dutta SP, Goswami A, **Bhau BS** & Kanjilal PB (2010). Role of *Azospirillum* in the improvement of legumes. In (Eds. Khan MS, Zaidi A & Musarrat J) Microbes for legume improvement. SpringerWien New York. Pp. 389-408.

6. **Bhau BS**, Sarkar T, Medhi K, Rabha A, Choudhary RK, Mishra BP, Saikia SP, & Kanjilal PB, (2009). Molecular marker and its impacts in phylogenetic analysis and genetic improvement in *Jatropha curcas*. In: (Ed. S. John Britto SJ) Diversity of Plants – A Molecular Approach, The Ranipat Herbarium and Centre

for Molecular Systematics, St. Joseph's College, Tiruchirappalli 620002, India, Pp. 123-138.

7. Medhi K, A Patel, Y Yadav, Sarkar T, Saikia SP, Kanjilal PB & **Bhau BS** (2009) Molecular Markers for study of genetic diversity in Plants and its implication in conserving genetic resources. In: (Ed. S. John Britto SJ) Diversity of Plants – A Molecular Approach, The Ranipat Herbarium and Centre for Molecular Systematics, St. Joseph's College, Tiruchirappalli 620002, India, Pp. 201-215.
8. Medhi K, Purohit BP, Gogoi AJ, Saikia SP, Kanjilal PB and **Bhau BS** Molecular marker based genetic diversity analysis of two economically important plants (*Zanthoxylum hamiltonianum* and *Nepenthes khasiana*) of North-East India. In: (Eds. Marngar D and Jyrwa S) Biodiversity in Herbal Medicine. IQAC Synod College and Akansha Publishing House, New Delhi. 2008. Pp. 47-55
9. Saikia SP, **Bhau BS**, Medhi K and Kanjilal PB – Current status and future strategy for development of medicinal plants sector in India. In: (Eds. Marngar D and Jyrwa S) Biodiversity in Herbal Medicine. IQAC Synod College and Akansha Publishing House, New Delhi. 2008. Pp. 56-73
10. **Bhau BS**, Kanjilal PB, Barua NC and Rao PG – Biodiversity conservation with special reference to medicinal plants. In: (Eds. Seema A, Sharma A, Jha AK and Imti NL) North East – Emerging horizons in Agri-business. Nagaland University, SASRD Mediziphema Campus & ICAR Research Complex for NEH Region, Nagaland. 2006. Pp. 4-23
11. **Bhau BS** - Hairy root culture and secondary metabolite production. In: (Ed. Irfan Khan) Role of Biotechnology in Medicinal and Aromatic Plants Vol. 2. Ukaz Publication, Hyderabad. Pp. 496-510.

Participation in International Scientific Meets:

1. First Indian National Seminar on Plants in Diabetes: Prospects & Challenges held at North East Institute of Science & Technology- Jorhat, Assam from 05-06 November 2007.
2. Third International Conference on Plant Tissue Culture held at Dhaka (Bangladesh). 8th-11th March 1999.
3. International Tree Science Congress held at India International Centre (New Delhi). 4th- 8th April 1998.

CSIR Network Projects

1. Management of nematode infection and genome wide expression profiling for biomass and oil yield improvement in patchouli through root associated bacteria. Participating laboratories: NEIST, CCMB, IIIM, IICB, IHBT, CIMAP & NCL. **Nodal Scientist & Principal Investigator**
2. Bio -prospection of plant resources and other natural products (BioprosPR). . Participating laboratories: CIMAP, CDRI, CFTRI, CSMCRI, NIIST, IHBT, IIIM, IITR, NCL. **Co-Principal Investigator**

International Projects

1. Selection of *Jatropha curcas* L. Accessions capable of stable and high yield of oil production for renewable fuel. Co-Investigator, Funded by Joint Research CNR, Italy-CSIR, India. 2010-2012

2. Eco-friendly management of plant pathogens using natural plant extract from Northeast India by inducing resistance in plants. ASCR, Czech Republic-CSIR, Govt. of India. 2011-2013

3. Comparative antimicrobial activity and molecular characterization of *Clerodendrum* species of Thailand & India. Ministry of Science and Technology, Thailand Govt & DST, Govt of India. 2013-2015

4. Screen Printed Electrodes (SPEs) Functionalized with Organic-Inorganic Hybrid Nano-Composites for Bio-sensing Applications" under DST (India) & RFBR (Russia) bilateral S&T Programme. 2013-2015

SOME OF THE IMPORTANT R&D PROJECTS:

1. Application of DNA barcoding to detect contamination and substitution from selected herbal products available in the market. **Principal Investigator** Funded by Food Safety & Standards Authority of India (FSSAI), Government of India. 2016-2018. 50.00 Lakhs

2. Nanoparticle supported self-assembled conducting polymer monolayer based platform for rapid detection of monosodium glutamate in food products. **Co-Principal Investigator** Department of Biotechnology (DBT) Funded, Govt. of India. 2017-2020. 54.40 Lakhs

3. Economic and bio-geographic evaluation of the *Cinnamomum* species in some selected parts of India through morphological, chemical and molecular biology studies. **Principal Investigator** Funded by Department of Biotechnology (DBT) Funded, Govt. of India. 2013-2016.

4. Yield enhancement strategies for production of therapeutic compounds by cell & tissue culture ot *Tinospora cordifolia* (willd.) Misers ex Hook. F. & Thoms. **Principal Investigator**, Funded by: Department of Biotechnology (DBT) Funded, Govt. of India. 2011-2014. Collaborating Institutes: IIT-Guwahati & IIT-Delhi. 12.97

5. Biotech Interventions on selected medicinal and aromatic plants (MAP) of NER for their effective utilization. **Co-Principal Investigator** Department of Biotechnology (DBT) Funded, Govt. of India. 2010-2013.

6. Development of Molecular Markers for evaluation of population Genetic structure of *Aquilaria malaccensis* in Northeast India: Implications for its Use and Conservation. **Principal Investigator**, Funded by: Department of Biotechnology (DBT) Funded, Govt. of India. 2010-2014. Collaborating Institute: IHBT Palampur.

7. Biotechnological interventions for production of androgenic haploids to speed and support breeding of ginger. **Principal Investigator**, Funded by: Department of Biotechnology (DBT) Funded, Govt. of India. 2010-2013. Collaborating Institutes: IBSD Imphal & Kaddapa University

8. Screening and molecular characterization of microbial pathogen diversity of *Staphylococci* and development of diagnostic test for rapid detection. **Co-Principal Investigator,** Funded by: Department of Biotechnology (DBT) Funded, Govt. of India. 2012-2015.

9. Preparation of project report for setting up of biotechnological tools facilities for development of medicinal plants in Mizoram. Funded by **Science Technology & Environment Wing, Government of Mizoram** 2009-2010.

10. Development of integrated genetic linkage map and marker assisted selection in tea, **Principal Investigator**, Funded by: **Department of Biotechnology** (DBT) Funded, Govt. of India- 2006-2009. **Total Cost of the project: Rs.49.70 Lakhs.**

11. Improved biomass production in Som *(Machilus bombycina*) through molecular markers and plant growth promoting rhizobacteria (PGPR) and their application in muga silkworm culture, **Co- Principal Investigator,** Funded by: **Department of Science & Technology (DST)**, Govt. of India. Ongoing project (2004-2007), **Total cost of the project: Rs. 22.20 Lakhs.**

12. Assessment of genetic diversity in Zanthoxylum spp. of Northeast India using PCR based molecular markers**, Principal Investigator**, Funded by: **Department of Biotechnology (DBT)** Funded, Govt. of India. 2005-2008. **Total Cost of the project: 24.75 Lakhs.**