

# University of North Bengal

## Curriculum Vitae of Teachers of the University The Department of BOTANY



- 1. NAME:** : **Dr. Palash Mandal**
- 2. DESIGNATION** : **Associate Professor of Botany, University of North Bengal**
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- 6. ACADEMIC QUALIFICATIONS** : **M.Sc; Ph.D**

**TITLE OF Ph.D THESIS:** “Bioactivity of low molecular weight peptides isolated from some important crop plants under various treatments and conditions”

**OTHER QUALIFICATIONS:** Diploma in Computer Application course from ‘The Institute of Computer Engineers (India)’

**7. SUBJECT SPECIALIZATION:** Plant Physiology and Biochemistry

**8. AREA OF RESEARCH INTEREST:**

- 1) Understanding the role of oligopeptides in plant physiological system
- 2) Nitric oxide and calcium based signalling and their association with abiotic stress tolerance
- 3) Physiology of sprouts and upregulation of important metabolites through priming
- 4) Enhancing the economic attributes of silkworm through elicitation of mulberry leaf quality
- 5) Antioxidant and nutraceutical quality assessment of underexplored fruits and vegetables
- 6) Ethnomedicinal survey, pharmacognostic characterization and pharmacological evaluation
- 7) Phytochemical analysis and metabolic profiling
- 8) Synthesis of nano silver using green technology and its application in economic field.
- 9) Preparation of nanoconjugates and their application in agriculture
- 10) Understanding network pharmacology by protein-protein interactomics

**9. NUMBER OF Ph.D STUDENTS** : Supervised : **07**  
Ongoing : **04**

**10. NUMBER OF RESEARCH ARTICLES:** **98**  
**11. NUMBER OF BOOKS:** **06**  
**12. NUMBER OF BOOK CHAPTERS AND PROCEEDINGS:** **05**

### 13. LIST OF PUBLICATIONS:

#### 2022

1. Ali S, Sikdar S, Basak S, Das D , Roy D , Haydar MS , Dakua VK , Adhikary P ,**Mandal P**, Roy MN (2022) Synthesis of  $\beta$ -cyclodextrin grafted rhombohedral-CuO antioxidant nanozyme for detection of dopamine and hexavalent chromium through off-on strategy of peroxidase mimicking activity. *Microchemical Journal*. [Impact Factor: 4.821]
2. Misra TK, Bhutia TT, Biswas R, **Mandal P** (2022) Suitability Estimation of some Bioengineered Grass species in terms of their Root Reinforcement Ability, Conservation and Forage Value under various Landslide Prone Hill Forest of Darjeeling Himalaya. *Indian Forester*.148(3) : 263-271, 2022 DOI: 10.36808/if/2022/v148i3/156040. [Impact Factor: 0.11]
3. Haydar MS, Das D, Ghosh S, **Mandal P** (2021) Implementation of Mature Tea Leaves Extract in Bioinspired Synthesis of Iron Oxide Nanoparticles: Preparation, Process Optimization, Characterization and Assessment of Therapeutic Potential. *Chemical Papers*. [Impact Factor: 2.097]

#### 2021

4. Haydar MS, Ghosh S, **Mandal P** (2021) Application of Iron Oxide Nanoparticles as Micronutrient Fertilizer in Mulberry Propagation. *Journal of Plant Growth Regulation*. <https://doi.org/10.1007/s00344-021-10413-3> [Impact Factor: 4.169]
5. Das D, Ghosh D, **Mandal P** (2021) Preservative potential of biosynthesized silver nanoparticles: prevention of xylem occlusion and microbial proliferation at postharvest stage of preservation. *Environmental Science and Pollution Research*. <https://doi.org/10.1007/s11356-020-11832-7> [Impact Factor: 4.223]
6. Das D, Haydar MS, **Mandal P** (2021) Impact of Physical Attributes on Proficient Phytosynthesis of Silver Nanoparticles Using Extract of Fresh Mulberry Leaves: Characterization, Stability and Bioactivity Assessment. *Journal of Inorganic and Organometallic Polymers and Materials* 31:1527–1548. <https://doi.org/10.1007/s10904-020-01794-1> [Impact Factor: 3.543]
7. Chouhan D, **Mandal P** (2020) Applications of chitosan and chitosan based metallic nanoparticles in agrosiences-A review. *International Journal of Biological Macromolecules*. <https://doi.org/10.1016/j.ijbiomac.2020.11.035>. [Impact Factor: 6.953]

#### 2020

8. Das D, Basak B, Chouhan D, **Mandal P**, Sikdar S, Roy MN (2020) Green Synthesis of Cu<sup>2+</sup> doped ZnO nanoparticles to investigate their Structural, Optical, Morphological properties and Antifungal activities. *Journal of Chemical, Biological and Physical Sciences*. 11(1):066-081. DOI: 10.24214/jcbps.A.11.1.06681.
9. Das D, **Mandal P** (2020). Use of biogenic silver nanoparticles in enhancing shelf life of *Morus alba* L. at post harvest stage. *Scientific Reports* doi.org/10.1038/s41598-020-65953-7 [Impact Factor: 4.379]

**10.** Das D, Roy SS, Mandal P (2020). Investigation of protein profile of nano-silver preserved mulberry leaves and silkworm larvae fed with the same leaves. *Applied Nanoscience* doi.org/10.1007/s13204-020-01416-9 [Impact Factor: 3.674]

**11.** Ghosh R , Roy K, Subba A, Mandal P, Basak S, Kundu M and Roy MN (2020). Case to case study for exploring inclusion complexes of an antidiabetic alkaloid with  $\alpha$  and  $\beta$  cyclodextrin molecules for sustained dischargement. *Journal of Molecular Structure* doi.org/10.1016/j.molstruc.2019.126988. [Impact Factor: 2.011]

**12.** Sen SK, Chouhan D, Das D, Ghosh R and Mandal P (2020). Improvisation of salinity stress response in mung bean through solid matrix priming with normal and nano-sized chitosan. *International Journal of Biological Macromolecules* 145 108-123. [Impact Factor: 6.953]

## **2019**

**13.** Subba A, Sahu RK, Bhardwaj S and Mandal P (2019). Alpha glucosidase inhibiting activity and in vivo antidiabetic activity of Fraxinus floribunda bark in streptozotocin-induced diabetic rats. *Pharmacognosy Research* 11(3) 273-278 [Impact Factor: 1.664]

**14.** Mukhia S, Mandal P, Singh DK and Singh D (2019). The abundance of epiphytic liverworts on the bark of *Cryptomeria japonica* in relation to different physical and biochemical attributes, found in Senchal Wildlife Sanctuary, Darjeeling, Eastern Himalaya *BMC Ecology* doi:10.1186/s12898-019-0253-9 [Impact Factor: 3.054]

**15.** Mukhia S, Mandal P, Singh DK and Singh D (2019). Comparison of pharmacological properties and phytochemical constituents of in vitro propagated and naturally occurring liverwort *Lunularia cruciata*. *BMC Complementary and Alternative Medicine* doi:10.1186/s12906-019-2534-4 [Impact Factor: 3.659]

**16.** Subba A and Mandal P (2019). Standardization of a traditional phytoherbal formulation with pharmacognostic study; its phytochemical content, antioxidant and antidiabetic activity. *Asian Journal of Pharmaceutical and Clinical Research* 12(5) 182-190

**17.** Das D , Ghosh R and Mandal P (2019). Biogenic synthesis of silver nanoparticles using S1 genotype of *Morus alba* leaf extract: charecterization, antimicrobial and antioxidant potential assessment. *SN Applied Sciences* doi:10.1007/s42452-019-0527-z

## **2018**

**18.** Jha S, Gupta S K, Bhattacharyya P, Ghosh A, Mandal P (2018). In Vitro Antioxidant and Antidiabetic Activity of Oligopeptides Derived from Different Mulberry (*Morus alba* L.) Cultivars. *Pharmacognosy Research* doi: 10.4103/pr.pr\_70\_18.

**19.** Das D, Mandal P (2018). A Comparative Study of Foliar Micro–Morphology of Six Genotypes of *Morus alba* L. from Darjeeling District, West Bengal, India. *Plant Archives*. 18 (2): 1471 – 1478.

20. Roy P, **Mandal P**, Panda S, Roy SM, Subba A. (2018). Pharmacognosy and Phytochemical Screening of some Plant Derived Medicine to Treat Dysmenorrheal Pain by the Rajbanshi Community. *Pharmacognosy Journal*. 10(4): 738-746.
21. Sen SK and Mandal P (2018). Application of solid matrix priming to ameliorate salinity stress in mung bean (*Vigna radiata*). *Australian Journal of Crop Science*. 12(03): 458-466. [Impact Factor: 0.72]
22. Das D, **Mandal P** (2018). Evaluating the effect of silver ions in preservation of mulberry leaves and its impact over silk worm rearing system. *International Journal of Recent Scientific Research*. 9 (4): 25833 – 25839.
23. Misra TK, Nanda AK, **Mandal P**, Saha A. (2018). Physicochemical Properties of Soils under Different Tea Growing Regions of North Bengal: A study from 2006 to 2010. *International Journal of Research in Chemistry and Environment*. 8(1): 44 – 48.
24. Das D, Paul P, Choudhury M, **Mandal P**. (2018). Understanding the role of calcium elicitors and their cross-talk with hormones on growth form, biochemical and antioxidant attributes of *Drosera burmanni* Vahl under *in situ* condition. *Biochemical and Cellular Archive*. 18(2): 1661-1670.

## 2017

25. Roy P, **Mandal P**, Panda S. (2017). An Ethnomedicinal survey with the Rajbanshi community of Terai and Duars region in West Bengal part of India for the treatment of Primary Dysmenorrhea. *World Scientific News*. 90 : 243 - 250.
26. Gupta SK, **Mandal P**. (2017). Elicitation of trigonelline, a hypoglycemic agent in fenugreek sprouts by calcium and nitric oxide priming. *Asian Journal of Pharmaceutical and Clinical Research*. 2017; 10(5): 120 - 125.
27. Gupta SK, Islam N, Choudhuri C, **Mandal P** (2017). Elicitation of therapeutic potential and oxidative stress assessment of fenugreek sprouts under UV irradiation. *International Journal of Pharmacy and Pharmaceutical Sciences*. 9(5): 91 - 99.
28. Mukhia S, **Mandal P**, Sing DK, Singh D. Study of bioactive phytoconstituents and In-Vitro pharmacological properties of thallose liverworts of Darjeeling Himalaya. *Journal of Pharmacy Research*. (2017). 11(6): 490 - 501.
29. Subba A, Dutta B, Sahu RK, **Mandal P** (2017). Antioxidant, anti-inflammatory, and hepatoprotective activity of *Fraxinus floribunda* bark and the influence of extraction process in their bioactivity. *Journal of Pharmacy Research*. 11(4): 983 - 990.
30. Bhattacharyya P, Jha S, Ghosh A and **Mandal P** (2017). Effect of artificial diet components with antioxidant activity on mulberry leaf dependent silkworm rearing system. *Harvest*. 2: 31 – 48.
31. Bhattacharyya P, Ghosh A, **Mandal P** and Jha S. (2017). Assessment of antioxidant level in young leaves and inflorescences in different varieties of mango. *Indian Journal of Multidisciplinary Academic Research*. 4(2): 01 - 22.

## **2016**

32. Gupta SK, **Mandal P** (2016). Bioinformatic characterization of SOD under UV in fenugreek (family: Fabaceae). *International Journal of Pharmacy and Pharmaceutical Sciences*, 8(2): 231-37.
33. Gupta SK, **Mandal P** (2016). Assessment of the effect of nitric oxide and calcium ion on the therapeutic potential and oxidative stress status of fenugreek sprouts. *Asian Journal of Pharmaceutical and Clinical Research*, 9(2): 271-77.
34. Jha S, Ghosal M, Gupta SK, Ghosh A, **Mandal P** (2016). *In-vitro* free-radical scavenging potential of oligopeptides derived from wheat and mung bean. *International Journal of Pharmacy and Pharmaceutical Sciences*, 8(1): 428-432.
35. Jha S, Bhattacharyya P, Ghosh A, **Mandal P** (2016). Feeding preference of silkworm larvae depending on biochemical attributes related to mulberry genotypes. *International Journal of Pharmacy and Pharmaceutical Sciences*, 8(4): 307-314.
36. Bhattacharyya P, Jha S, **Mandal P**, Ghosh A (2016). Artificial Diet Based Silkworm Rearing System-A Review. *International Journal of Pure and Applied Bioscience*, 4(6): 114-122. [Impact Factor: 0.654]
37. Sen S, **Mandal P** (2016). Solid matrix priming with chitosan enhances seed germination and seedling invigoration in mung bean under salinity stress. *Journal of Central European Agriculture*, 17: 749-762. [Impact Factor: 0.60]
38. Sen S, Jha S, **Mandal P** (2016). Evaluation of phytotoxicity of mung bean genotypes against salinity stress. *International Journal of Scientific and Research Publications*, 6: 1-6.
39. Roy P, Panda S, **Mandal P** (2016). Traditional healing practices by some Polyherbal formulations of Rajbanshi community. *Journal of Chemical and Pharmaceutical Research*, 8(10): 146-150.
40. **Mandal P**, Choudhury D, Ghosal M, Prasad Das A (2016). TLC based Chemotaxonomic approach of some Laurels Present in Sub-Himalayan Terai & Duars Region of West Bengal, India. *International Journal of Pharmaceutical Sciences Review and Research*, 41(2): 193-196.
41. Chowdhury A, Sarkar S, Chowdhury A, Bardhan S, **Mandal P**, Chowdhury M (2016). Tae waste management: A case study from West Bengal, India. *Indian Journal of Science and Technology*, 9(42):1-5.
42. Sarkar S, Chowdhury A, Das S, Chakraborty B, **Mandal P**, Chowdhury M (2016). Major tea processing practices in India. *International Journal of Bioassays*, 5(11): 5071-5083.
43. Gupta SK and **Mandal P**. Nitric oxide and calcium signaling in plants under salinity stress and their crosstalk. *NBU Journal of Plant Sciences*. 2016; 10:31-44
44. Misra TK, Nanda AK, **Mandal P**, Saha A. (2016). Climatic variation of antioxidative properties, phenolic and mineralnutraceuticals in tea (*Camellia sinensis* (L.) Kuntze) grown in North Bengal, district Darjeeling. *International Journal of Applied Research*. 2(1): 601 – 605.
45. Misra TK, Nanda AK, **Mandal P**, Saha A. (2016). Climatic variation of polyphenols, flavour index, PPO activities and antioxidative properties in hand made orthodox tea (*Camellia sinensis* (L.) Kuntze) obtained from the different variety of tea cultivars grown in North Bengal. *International Journal of Applied Research*. 2(5): 77 - 85.

46. Jha S, Bhattacharyya P, Ghosh A, Datta Gupta P and **Mandal P**. (2016). Impact of feeding low molecular weight mulberry peptides on cocoon and silk development by *Bombyx mori* L., (Bombycidae). *Indian Journal of Sericulture*, 55(1-2): 08-17.
47. Chowdhury A, **Mandal P**, Chowdhury A., Sarkar S and Chowdhury M. (2016). Prospects and problems of small tea growers in Terai & Duars of West Bengal, India. *International Journal of Current Advanced Research*. 5(2): 587-590.

## 2015

48. Gupta SK and **Mandal P** (2015). Involvement of calcium ion in enhancement of antioxidant and antidiabetic potential of fenugreek sprouts. *Free Radicals and Antioxidants*, 5(2):74-82.
49. Jha S, Bhattacharyya P, Ghosh A and **Mandal P** (2015). A comparative study of silkworm (*Bombyx mori* L.) rearing under different sources of peptides isolated from Dudhiya and S1 mulberry leaves. *NBU Journal of Plant Sciences*, 9(1): 98-106.
50. Jha S, **Mandal P**, Bhattacharyya P, Ghosh A (2015). Influence of antioxidant rich mulberry peptides on the growth rate pattern and economic attributes of silkworm. *International Journal of Pure & Applied Bioscience*, 3(2): 63-71. [Impact Factor: 0.654]
51. Mukhia S, **Mandal P**, Singh DK and Singh D (2015). Evaluations of antidiabetic, antioxidant activity and phytochemical constituents of liverworts of Eastern Himalaya. *Journal of Chemical and Pharmaceutical Research*, 7(10): 890-900. Impact Factor-0.35.
52. Subba A and **Mandal P** (2015). Antioxidant potential of *Fraxinus floribunda* Bark extracted through Various Aqueous Processing. *Free Radicals and Antioxidants*, 5(1):1-7.
53. Subba A and **Mandal P** (2015). Pharmacognostic studies and *in vitro* antioxidant potential of traditional polyherbal formulation of West Sikkim with *Asparagus* spp. *Pharmacognosy Journal*, 7(6):348-55. Impact Factor-1.26.

## 2014

54. Gupta SK, Ghosal M, Choudhury D and **Mandal P** (2014). Assessment of antioxidant activity and polyphenolic content of *Couroupita guianensis* during flower and fruit maturation. *International Journal of Recent Scientific Research*, 5(5):940-947.
55. Gupta SK, Ghosal M, Biswas R, Saha BK, Das AP and **Mandal P** (2014). Evaluation of *in vitro* antioxidant activity of methanolic extracts of some ferns from Mawsynram of Meghalaya, India. *International Journal of Current Science*, 4:87-97.
56. Gupta SK, Mitali G, Dibakar C and **Mandal P** (2014). Dynamic Changes in Antioxidant Activity during Floral Development of *Couroupita guianensis*. *British Journal of Pharmaceutical Research*, 4(6): 676-694.
57. Ghosal M and **Mandal P** (2014). Deterioration of Antioxidant and Antidiabetic activity of seven taruls through boiling. *NBU Journal of Plant Sciences*, 8(1):71-81.
58. Mukhia S, **Mandal P**, Singh DK, Singh D and Choudhury D (2014). *In-vitro* free-radical scavenging potential of three liverworts of Darjeeling Himalaya. *International Journal of Pharmaceutical Sciences and Research*, 5(10):4552-4561. Impact Factor-0.01.
59. Choudhury D, Biswas R, **Mandal P** and Das AP (2014). Diversity of *Litsea* Lamarck [Lauraceae] in Terai and Duars regions of West Bengal, India. *Pleione*, 8(1):68-78.

60. Gupta SK and **Mandal P** (2014). Free radical scavenging activity and histochemical localisation of reactive oxygen species in fenugreek sprouts primed with Nitric Oxide Donors. *American Journal of Phytomedicine and Clinical Therapeutics*, 2(11):1310-1322.
61. **Mandal P** and Gupta SK (2014). Improvement of antioxidant activity and related compounds in fenugreek sprouts through Nitric Oxide priming. *International Journal of Pharmaceutical Science Review and Research*, 26(1):249-257.
62. Jha S, **Mandal P**, Bhattacharya P and Ghosh A (2014). Free-radical scavenging properties of low molecular weight peptide(s) isolated from S1 cultivar of mulberry leaves and their impact on *Bombyx mori* (L.). (Bombycidae). *Journal of Animal Science and Biotechnology*, Impact Factor-1.689.

### 2013

63. Choudhury D, Ghosal M, Das AP and Mandal P (2013). *In vitro* antioxidant activity of methanolic leaves and barks extracts of four *Litsea* plants. *Asian Journal of Plant Science and Research*, 3(1): 99-107.
64. Choudhury D, Ghosal M, Das AP and Mandal P (2013). Development of single node cutting propagation techniques and evaluation of antioxidant activity of *Curcuma aeruginosa* Roxburgh rhizome. *International Journal of Pharmacy and Pharmaceutical Sciences*, 5(2): 227-234. Impact Factor-1.59.
65. Ghosal M and **Mandal P** (2013). *In-vitro* antidiabetic and antioxidant activity of *Calamus erectus* Roxb. fruit: a wild plant of Darjeeling Himalaya. *International Journal of Pharma and Bio Sciences*, 4(2): 671-684.
66. Goswami P, **Mandal P**, Jha P, Misra TK and Barat S (2013). Antioxidant activities of different spices on the lipid oxidation of cooked and uncooked fillet of two fish species belonging to the genus *Puntius*. *Journal of Agricultural Science and Technology*, 15: 737-746. Impact Factor- 0.70.
67. Lama B, Ghosal M, Gupta SK and **Mandal P** (2013). Assessment of different preservative solutions on vase life of cut roses. *Journal of Ornamental Plants*, 3(3): 171-181. Impact Factor-0.54.
68. Ghosal M, Chhetri P K, Ghosh M K and Mandal P (2013). Changes in antioxidant activity of *Cyphomandra betacea* (Cav.) Sendtn. fruits during maturation and senescence. *International Journal of Food Properties*, 16(7): 1552-1564.
69. Choudhury D., Biswas R., Mandal P. and Das A.P. (2013). Diversity of *Cinnamomum* Schaeffer (Lauraceae) in Terai and Duars region of West Bengal, India. *Pleione*. 7(2): 441-448.
70. Ghosal M and **Mandal P** (2013) Evaluation of antidiabetic activity of *Calamus erectus* in streptozotocin induced diabetic rats. *Asian Journal of Plant Science and Research*, 2013, 3(1):47-53

### 2012

71. Ghosal M and **Mandal P** (2012). Phytochemical screening and antioxidant activities of two selected 'bihi' fruits used as vegetables in Darjeeling Himalaya. *International Journal of Pharmacy and Pharmaceutical sciences*, 4(2): 567-574.
72. **Mandal P** and Ghosal M (2012). Antioxidant activities of different parts of tree tomato fruit. *International Journal of Pharmaceutical Sciences Review and Research*, 13(2): 39-47.



73. Chhetri P K and **Mandal P** 2012. *In-vitro* free radical scavenging activities of the leaves of *Malva verticillata* L. **NBU Journal of Plant Sciences**, 6(1): 49-55
74. Dutta B, Ghosal M, Chakrabarty P, **Mandal P** (2012). Anthelmintic and free-radical scavenging potential of various fractions obtained from foliar parts of *Glinus oppositifolius* (Linn.) DC. *International Journal of Pharmacy and Pharmaceutical sciences*. 4(4): 233-239

### 2011

75. Mishra T, Goyal AK, **Mandal P** and Sen A (2011). Free radical scavenging activity of ornamental and edible cultivars of *Canna* found in Eastern India. **NBU Journal of Plant Sciences**, 5(1): 41-45.

### 2010

76. Lepcha L, **Mandal P**, Misra TK and Sharma NP (2010). Comparative study of plant biodiversity and physic-chemical parameters of soil of landslide prone areas. **International Journal of Ecology and Development**, 17 (F10): 66-76.
77. **Mandal P**, Ghosal M, Misra TK and Das AP (2010). Pharmacognostic and free-radical scavenging activity in the different parts of Ashwagandha [*Withania somnifera* (L. Dunal)]. **International Journal of Drug Development and Research**, 2(4): 830-843. *Impact Factor-0.18*.
78. Ghosh A, **Mandal P** and Sircar PK (2010). Wheat (*Triticum aestivum*) peptide(s) mimic gibberellin action and regulate stomatal opening. **Indian journal of Experimental Biology**, 48: 77-82. *Impact Factor-0.84*.
79. **Mandal P**, Misra TK and Singh ID (2010). Antioxidant activity in the extracts of two edible aroids. **Indian Journal of Pharmaceutical Sciences**, 72 (1): 105-108. *Impact Factor-0.48*.
80. Lepcha L, Misra TK, Ansari AA and **Mandal P** (2010). Plant biodiversity and soil erodibility of landslide prone areas of East Sikkim. **Journal of Ecobiology**, 26: 101-112.
81. Ghosal M and **Mandal P** (2010). *In vitro* antioxidant activity of two edible Timbur fruits of Darjeeling Himalaya. **NBU Journal of Plant Sciences**, 4: 47-52.

### 2009

82. **Mandal P**, Misra TK and Basu PK (2009). *In vitro* antioxidant potential of *Astilbe rivularis* rhizome. **Canadian Journal of Pure and Applied Sciences**, 3 (1): 649-654.
83. **Mandal P**, Misra TK, Singh ID, Das JK and Bhunia M (2009). Free-radical scavenging activity in the inflorescence of European Nettle/Sisnu (*Urtica dioica* L.). **Journal of Young Pharmacist**, 1(2): 129-35.
84. **Mandal P**, Misra TK and Ghosal M (2009). Free-radical scavenging activity and phytochemical analysis in the leaf and stem of *Drymaria diandra* Blume. **International journal of Integrative Biology**, 7(2): 80-85.



85. **Mandal P**, Misra TK, Das AP and Singh ID (2009). Agronomic suitability assessment for growth, yield and antioxidant quality attributes of patchouli plant. *Journal of Medicinal and Aromatic Plant Sciences*, 31(4): 292-296.
86. Bhattacharya M, **Mandal P** and Sen A (2009). *In vitro* detection of antioxidants in different solvent fractions of ginger (*Zingiber officinale* Rosc.). *Indian Journal of Plant Physiology*, 14 (1): 23-27.
87. Lepcha L, **Mandal P** and Misra TK (2009). Relative distribution pattern of tree biodiversity in landslide prone areas of east Sikkim, India. *Research in Environment and Life Sciences*, 2 (4): 201-206.
88. Misra TK, Saha A, Nanda AK, Biswas R and **Mandal P** (2009). Shade trees in tea plantations in different soil conditions of North Bengal. *Pleione*, 3(2): 219-223.
89. Misra TK, **Mandal P** and Lepcha L (2009). Relationship of erodibility with soil properties and vegetation buffers at landslide prone areas in Sikkim. *Journal of Hill Research*, 22 (1): 43-49.
90. **Mandal P**, Misra TK, Ghosh A and Sircar PK (2009). Role of germination induced peptide pool in plant tissue culture. *NBU Journal of Plant Sciences*, 3: 53-58.
91. **Mandal P** and Misra TK (2008). *In-vitro* evaluation of free-radical scavenging potential of Pakhenbed leaves [*Bergenia ciliata* (Haw.) Sternb.]. *International journal of Natural and Engineering Sciences*, 3 (1): 01-04.

## 2008

92. **Mandal P**, Misra TK, Singh ID and Nayak CR (2008). Chemical phytotoxicity and use of ethrel as ripening agent on productivity and quality of tomato (*Lycopersicon esculentum*). *The Indian Journal of Agricultural Sciences*, 78 (7): 581-583. *Impact Factor-0.14*.
93. **Mandal P**, Misra TK, Sarkar A, Ghosh A and Sircar PK (2008). Dynamic peptide profiles of germinating mungbean: In relation to their nature and separation pattern. *Indian Journal of Plant Physiology*, 13 (2): 111-117.
94. **Mandal P**, Misra TK, Ghosh A and Sircar PK (2008). Germination induced peptide pool regulate water homeostasis in plants. *Journal of Plant Biology*, 35 (2): 121-130. *Impact Factor-1.28*.
95. **Mandal P**, Misra TK and Singh ID (2008). *In vitro* evaluation of free-radical scavenging potential of Tetapati leaves. *Journal of Hill Research*, 21 (2): 31-35.
96. Misra TK, Saha A, Nanda AK and **Mandal P** (2008). Variation of antioxidant properties and phytochemical constituents of tea cultivated under various agronomic conditions at Terai region of North Bengal. *NBU Journal of Plant Sciences*, 2: 58-66.

## 2007

97. Kunduchoudhuri R, Ghosh A, **Mandal P**, Chaudhuri RK and Sircar PK (2007). *Vigna catjang* intermodal peptides (0.5-3.0 KDa) modulate root tip mitosis of *Allium sativum*. *Journal of Botanical Society of Bengal*, 61(1): 51-54. *Impact Factor-0.52*.
98. Misra TK and **Mandal P** (2007). Tea polyphenols: Variation with respect to agro-climatic condition, their impact in human health and soil environment. *NBU Journal of Plant Sciences*, 1: 18-31.

### **BOOK PUBLISHED**

1. **Mandal P**, Roy P, Sarkar K (2021) *Pristine Treasure Trove: Exploring Sacred Groves of Uttar Dinajpur, West Bengal, India*. **LAP LAMBERT Academic Publishing, Maldova** ISBN: 978-6204201818
2. Das D, Haydar MS, Mandal P, Ghosh S, **Mandal P** (2021) *Electrophoretic Separation: A Laboratory Handbook*. **Palok Publishers, India** ISBN: 978-81-949644-1-4
3. Das D, Ghosh D, Paul P and **Mandal P** (2020). *Handbook on Bio-Staining Procedures: A Quick Practical Approach*. **Orange Book Publication, India** ISBN: 978-93-90169-51-1
4. Das D, Paul P and **Mandal P** (2020). *Textbook of Basic-Bhemistry: A Fundamental Concept for the Beginners*. **HSRA Publication, India** ISBN: 978-81-94675-95-2
5. Sen SK, Chouhan D and Mandal P (2020). *A quick look into Chitosan and Chitosan Nano-conjugates: To make a long story short*. **LAP LAMBERT Academic Publishing, Mauritius** ISBN: 978-6203463613

### **BOOK CHAPTERS**

1. Ghosal M and Mandal P (2012). Antioxidant activity of three spices of Darjeeling Himalaya. In: *Biology of plants and microbes*. Eds. S Roy and D Bose. Levant Books, Kolkata. pp. 309.
2. Choudhury D, Ghosal M, Das AP and **Mandal P** (2011). Improvement of propagation techniques and evaluation of *in vitro* antioxidant activity of *Curcuma aeruginosa* Roxburgh. In: *Recent studies in biodiversity and traditional knowledge in India*. Eds. C Ghosh and A P Das. Gour Mahavidyalaya, Malda. pp 287-293.
3. **Mandal P** and Sircar PK (2005). High proton mediated phytotoxicity, alteration of peptide profile and sugar partitioning in germinating seedlings of *Vigna radiata* (L.) Wilczek. In: *Stress Biology*. Eds. U Chakraborty and BN Chakraborty. Narosa Publishing House, New Delhi. pp. 158-163

### **PROCEEDINGS**

1. Misra TK, Saha A, Nanda AK and **Mandal P** (2008). Study of free-radical scavenging activity of different grades of organically and non-organically produced tea. *Proceedings of National Seminar on Improving Productivity and Quality of Tea through Traditional Agricultural Practices, held on 15-16 November, 2008* at University of North Bengal, Siliguri and published in **Rajasthan Chapter of Asian Agri-History Foundation, Udaipur, Rajasthan**.
2. Misra TK, Saha A, Nanda AK and **Mandal P** (2008). Integrated nutrient management packages for organic tea cultivation in North-East India Plains and Darjeeling Hills. *Proceedings of National Seminar on Improving Productivity and Quality of Tea through Traditional Agricultural Practices, held on 15-16 November, 2008* at University of North Bengal, Siliguri and published in **Rajasthan Chapter of Asian Agri-History Foundation, Udaipur, Rajasthan**.

**14. ACHIEVEMENTS AND AWARDS :**

- 1) Junior Research Fellowship, DST, Govt. of India.
- 2) CSIR-UGC Junior Research Fellowship & Lecturership (NET), Govt. of India.
- 3) Gold Medal at Post Graduate Level, University of Kalyani for 1<sup>st</sup> Position in M.Sc.
- 4) Graduate Aptitude Test for Engineering (GATE); Score 83.94 Percentile.

**15. RESEARCH PROJECTS:**

<b>RESEARCH PROJECTS COMPLETED</b> <b>[More than 10 Lakhs]</b>					<b>01</b> (as Co-investigator)	
<i>Sl. No.</i>	<i>Title of the Project</i>	<i>Sanctioned Authority &amp; Ref. No.</i>	<i>Tenure of the Project</i>	<i>Whether PI or Co-I</i>	<i>Total Grants Sanctioned</i>	<i>Current Status of Project</i>
1.	Prevalence, survival, growth characteristics and toxigenicity of Foodborne Bacterial pathogens in processed food, marketed in the town of Siliguri [Under Thrust Area: 'Microbiology including Mycology & Plant Pathology and Plant Diversity']	<b>UGC-SAP Programme</b> [No. F. 3-4/2013(SAP-II), Dated 25.03.2013]	2013-2018	<b>Co-Investigator</b> (Joint project with Prof. P.K. Sarkar, Department of Botany, University of North Bengal)	Rs. 57.75 Lakhs / 3 = <b>Rs. 19.25 Lakhs for Project-I</b> of Departmental Research Support (DRS-III) under Special Assistance Programme (SAP)	Completed
<b>RESEARCH PROJECTS COMPLETED</b> <b>[Less than 10 Lakhs]</b>					<b>05</b> (as Single Investigator: <b>04</b> as Co-investigator: <b>01</b> )	
<i>Sl. No.</i>	<i>Title of the Project</i>	<i>Sanctioned Authority &amp; Ref. No.</i>	<i>Tenure of the Project</i>	<i>Whether PI or Co-I</i>	<i>Total Grants Sanctioned</i>	<i>Current Status of Project</i>
1.	Evaluation of physico-chemical feasibility of manufacturing process for maintaining the antioxidant properties in different grades of tea of North Bengal	<b>UGC</b> [F. No. 34-536 / 2008 (SR), Dated 15.01.2009]	2009-2011	<b>Principal Investigator</b> (Single Investigator, Minor Research Project)	Rs. 1, 00, 000/-	Completed
2.	Profile study of peptides and antioxidants of Mulberry leaves: In relation to their potential in artificial diet rearing system of silkworm	<b>UGC</b> [F. No. 39-346 / 2010 (SR), Dated 09.11.2012]	2011-2014	<b>Co-Investigator</b> (Joint Research Project with Dr. Amitava Ghosh, Asutosh College, University of Calcutta)	Rs. 7, 22, 930/-	Completed

Sl. No.	Title of the Project	Sanctioned Authority & Ref. No.	Tenure of the Project	Whether PI or Co-I	Total Grants Sanctioned	Current Status of Project
3.	Developmental stimulation of antioxidants in dark germinated <i>Trigonella foenum-graecum</i> L. by Nitric Oxide Donors and Scavengers	<b>University of North Bengal</b> [Ref. No. 3773/R-2013 dated 27.05.2013]	2013-2014	<b>Principal Investigator</b> (Single Investigator , Minor Research Project)	Rs. 75, 000/-	Completed
4.	Improving the economic attributes of silkworm rearing by mulberry leaves elicitation with plant growth regulators	<b>University of North Bengal</b> [Ref. No. 114/R-2018 (SF-15) dated 08.01.2018]	2018-2019	<b>Principal Investigator</b> (Single Investigator , Minor Research Project)	Rs. 75, 000/-	Completed
5.	Inventorization of Sacred Groves in Uttar and Dakshin Dinajpur Districts of West Bengal	<b>West Bengal Bio-Diversity Board</b> [490 / 5K(Bio)-6/2017 dated 29/06/2017]	2018-2019	<b>Principal Investigator</b> (Single Investigator Minor Research Project)	Rs. 4,00,000/-	Completed
<b>RESEARCH PROJECTS ON-GOING</b> [More than 10 Lakhs]					<b>02</b> (as Single Investigator: <b>01</b> as Multi-Institutional Joint Principal Investigator: <b>01</b> )	
Sl. No.	Title of the Project	Sanctioned Authority & Ref. No.	Tenure of the Project	Whether PI or Co-I	Total Grants Sanctioned	Current Status of Project
1.	Molecular characterization and assessment of the efficacy of low molecular weight peptides isolated from mulberry leaves against flacherie disease of silkworm	<b>Central Silk Board under Department of Biotechnology (DBT), Government of India (GoI)</b> [No. CSB-31/2(BER-NP)/2017-18/RCS Dated 10.05.2019]	2019-2022	<b>Joint Principal Investigator</b> (Joint Research Project with Dr. Pooja Makwana, CSR&TI, Berhampore, Central Silk Board)	Rs. 24, 75, 000/-	On-going
2.	Improving the productivity in sericulture by oligopeptides and plant growth regulator (PGR) based post harvest elicitation of mulberry leaves	<b>Department of Science &amp; Technology, Govt. of West Bengal</b> [263(Sanc.)/ST/P/S&T/1G-65/2017 Dated: 25.03.2018]	2018-2021, Extended up to 2022	<b>Principal Investigator</b> (Single Investigator, Major Research Project)	Rs. 14, 99, 800/-	On-going
<b>RESEARCH PROJECTS ON-GOING</b> [Less than 10 Lakhs]					<b>00</b>	

## 16. PROFESSIONAL EXPERIENCES :

**PG Teaching:** 21 years, **Research:** 22 years

### Participation in Refresher and Orientation Courses

1. Participated in UGC Sponsored Short Term Course on Research Methodology, Organized by Department of Botany, University of North Bengal from August 24, 2018 to August 30, 2018.
2. Participated in UGC Sponsored Refresher Course in Life Science (Inter-disciplinary) Organized by Department of Botany, University of North Bengal from September 08, 2011 to September 28, 2011
3. Participated in UGC Sponsored Refresher Course in Biochemical Science Organized by Department of Botany, University of North Bengal from August 16, 2008 to September 5, 2008.
4. Participated in UGC Sponsored Orientation Course Organized by Department of Botany, University of North Bengal from June 07, 2005 to July 4, 2005.

## 17. Ph.D. THESIS SUPERVISED [Awarded / Submitted]:

- I. Name of Candidate:** Dr. Mitali Ghosal  
**Title of the Thesis:** "Evaluation of antioxidant activities of some locally available edible plants of Darjeeling Himalaya"  
**Date of Award:** 18<sup>th</sup> August, 2015  
**Whether acted as Supervisor / Co-Supervisor:** Supervisor  
**Present Status:** Awarded
- II. Name of Candidate:** Dr. Dibakar Choudhury  
**Title of the Thesis:** "Distribution and chemotaxonomy of some members of Lauraceae in Terai and Duars region of West Bengal"  
**Date of Award:** 13<sup>th</sup> February, 2017  
**Whether acted as Supervisor / Co-Supervisor:** Co-supervisor  
**Present Status:** Awarded
- III. Name of Candidate:** Dr. Saran Kumar Gupta  
**Title of the Thesis:** "Elicitor induced biochemical changes associated with nitric oxide and calcium signaling during seed germination in *Trigonella foenum – graecum* L."  
**Date of Award:** 12<sup>th</sup> February, 2018  
**Whether acted as Supervisor / Co-Supervisor:** Supervisor  
**Present Status:** Awarded
- IV. Name of Candidate:** Dr. Suchisree Jha  
**Title of the Thesis:** "Studies of biochemical attributes of mulberry leaves and silk worm rearing system through elicitation by peptides and other growth regulators"  
**Date of Award:** 05<sup>th</sup> June, 2018  
**Whether acted as Supervisor / Co-Supervisor:** Supervisor  
**Present Status:** Awarded

- V. **Name of Candidate:** Dr. Sumira Mukhia  
**Title of the Thesis:** "Studies of phytochemical and antioxidant properties of selected liverworts of Darjeeling Himalaya"  
**Date of Award:** 08<sup>th</sup> August, 2019  
**Whether acted as Supervisor / Co-Supervisor:** Supervisor  
**Present Status:** Awarded
- VI. **Name of Candidate:** Ms. Arunika Subba  
**Title of the Thesis:** "Pharmacognostic evaluation and in vitro antioxidant potential of some ethnomedicines used by traditional practitioners of West Sikkim"  
**Date of Submission:** 08<sup>th</sup> April, 2021  
**Whether acted as Supervisor / Co-Supervisor:** Supervisor  
**Present Status:** Awarded
- VII. **Name of Candidate:** Mr. Dipayan Das  
**Title of the Thesis:** "Application of nano silver and silver ions in preservation of mulberry leaves and their utilization in silkworm rearing system"  
**Date of Submission:** 28<sup>th</sup> September, 2021  
**Whether acted as Supervisor / Co-Supervisor:** Supervisor  
**Present Status:** Submitted

#### 18. MEMBER OF ACADEMIC AND ADMINISTRATIVE BODIES:

1. Member of Post Graduate Board of Studies in Botany
2. Member of Board of Research Studies
3. Member of Departmental Committee
4. Ex-Member of the Executive Council
5. Ex-Member of the Faculty Council for Post Graduate Studies in Science
6. Ex-Member of Under Graduate Board of Studies in Botany
7. Ex-Member of Sports Board
8. Ex-Member of Library Committee

#### 17. MEMBERSHIP OF SCIENTIFIC SOCIETIES:

1. Life member, Indian Journal of Sericulture, Central Silk Board, Ministry of Textiles, GOI
2. Member, Society for Ethnopharmacology
3. Member, East Himalayan Society for Spermatophyte Taxonomy.

#### 18. PATENTS FILED/ PUBLISHED:

**Title of the invention :** ENHANCEMENT OF SHELF LIFE OF MULBERRY LEAVES BY THE IMPLEMENTATION OF PHYTOSYNTHESIZED SILVER NANOPARTICLES AT POST HARVEST STAGE

**Publication Date :** 13/12/2019

**Name of applicants:** Dipayan Das and Dr. Palash Mandal

**Application Number:** 201931046198 A

**Country:** India

**19. SEMINAR/ SYMPOSIUM/ CONFERENCE ORGANISED:**

**Title of Symposium:** National symposium on '*Advances in Plant and Microbial Research*'

**Organised by:** DRS Department of Botany, University of North Bengal

**Date:** December 12-13, 2014

**Place:** University of North Bengal

**Organising Secretary:** Dr. Palash Mandal

**Sponsored by:** UGC & DST, Govt. of INDIA

**20. INTERNATIONAL VISITS:**

**Country:** Peoples Republic of China

**Venue:** Shenzhen, China

**Purpose:** For participation in "*XIX International Botanical Congress*"

**Organised by:** IBC 2017

**Date:** 23<sup>rd</sup> to 29<sup>th</sup> July, 2017 (one week)

**21. LIST OF INVITED LECTURES / SEMINARS / CONFERENCES / WORKSHOPS / RESOURCE PERSON:****International (Abroad): Participated in Seminar as Invited Speaker / Presenter:**

<i>Events</i>	<i>Theme</i>	<i>Organized by</i>	<i>Place</i>	<i>Appeared as</i>	<i>Date</i>
International Conference	"XIX International Botanical Congress"	IBC 2017	Shenzhen, China	<b>Poster Presentation:</b> Topic entitled: "Role of Calcium and Nitric Oxide in Enhancement of Therapeutic Potential and Oxidative Stress Management in <i>Trigonella foenum-graecum</i> L."	23 <sup>rd</sup> to 29 <sup>th</sup> July, 2017

**International (Within Country): Participated in different Seminars as Invited Speaker / Presenter / Chairperson:**

<i>Events</i>	<i>Theme</i>	<i>Organized by</i>	<i>Place</i>	<i>Appeared for</i>	<i>Date</i>
International Seminar	"Current Avenues in Microbial and Plant Sciences"	Department of Botany, University of Gour Banga	Malda, West Bengal	<b>Invited Speaker:</b> Topic entitled: "Systems Pharmacology approach for determining the therapeutic insight of Traditional Herbal Medicine"	23 <sup>rd</sup> to 25 <sup>th</sup> February, 2019
International Seminar	"Current Avenues in Microbial and Plant Sciences"	Department of Botany, University of Gour Banga	Malda, West Bengal	<b>Convenor</b> of Scientific Session – III and VI	23 <sup>rd</sup> to 25 <sup>th</sup> February, 2019
International Conference	"Advances in Development, Delivery Systems and Clinical Monitoring of Drugs"	Columbia Institute of Pharmacy	Raipur, Chhattisgarh	<b>Oral Presentation:</b> Topic entitled: "Enhancement of therapeutic potential in <i>Trigonella foenum-graecum</i> L. by Calcium & Nitric Oxide elicitation"	23 <sup>rd</sup> and 24 <sup>th</sup> September, 2017



<i>Events</i>	<i>Theme</i>	<i>Organized by</i>	<i>Place</i>	<i>Appeared for</i>	<i>Date</i>
International Conference	“Advances in Development, Delivery Systems and Clinical Monitoring of Drugs	Columbia Institute of Pharmacy	Raipur, Chhattisgarh	<b>Chairperson</b>	23 <sup>rd</sup> and 24 <sup>th</sup> September, 2017
International Conference	“Contemporary Issues in ... Management for sustainable development (AGROTECH-2017)”	Himalayan Scientific Society for Fundamental and Applied Research	Kalimpong, West Bengal	<b>Oral Presentation:</b> Topic Entitled: “Influence of Mulberry Genotypes and Mulberry Peptides on Silkworm Rearing System”	11 <sup>th</sup> and 12 <sup>th</sup> May, 2017
2 <sup>nd</sup> International Conference, INNOPHAR M2	“Bridging innovations in Pharmaceutical, Medical and Biosciences”	Innovare Academic Sciences	Bhopal, Madhya Pradesh	<b>Oral Presentation:</b> Topic entitled: “Evaluation of phytochemical and pharmacological activities of ... Darjeeling Himalaya”	11 <sup>th</sup> and 12 <sup>th</sup> February, 2017
International Conference	“The Green Planet: past, present and future”	Department of Botany, university of Calcutta	Kolkata, West Bengal	<b>Poster Presentation:</b> Topic entitled: “Evaluation of antioxidant ... of Darjeeling Himalaya”	21 <sup>st</sup> to 23 <sup>rd</sup> December, 2016
International Conference	“Food Processing and Technology”	OMICS Group	Hyderabad	<b>Oral Presentation:</b> Topic Entitled: “Antioxidant activity of three cultivars of <i>Mangifera indica</i> L.”	22 <sup>nd</sup> to 24 <sup>th</sup> November, 2012

**National: Participated in different Seminars as Invited Speaker / Presentation / Chairperson as Symposium Resource Person:**

<i>Events</i>	<i>Theme</i>	<i>Organized by</i>	<i>Place</i>	<i>Appeared for</i>	<i>Date</i>
National Seminar	“New Horizon in Botanical Research”	Department of Botany, University of North Bengal	Siliguri, West Bengal	<b>Oral Presentation:</b> Topic entitled: “Pharmacognostic quality control and analysis of therapeutic potential of herbal drugs”	20 <sup>th</sup> and 21 <sup>st</sup> February, 2020
National Seminar	“Current Trends in Plant and Microbial Research”	Department of Botany, Raiganj University	Raiganj, West Bengal	<b>Oral Presentation:</b> Topic entitled: “Elicitor induced therapeutic potential ... in <i>Trigonella foenum-graecum</i> L.”	23 <sup>rd</sup> March, 2017
National Seminar	“Variation and Prospects of Eco-tourism at Darjeeling and Dooars”	Higher Education Department, West Bengal and Gorubathan Government College	Gorubathan, Darjeeling, West Bengal	<b>Invited Talk</b>	20 <sup>th</sup> December, 2016
National Seminar	“Plant and Microbe: Diversity and Utilization”	Department of Botany, Visva-Bharati	Santiniketan, West Bengal	<b>Oral Presentation:</b> Topic entitled: “Evaluation of antioxidant and antidiabetic activity of underexplored wild fruit of <i>Calamus erectus</i> Roxb.”	19 <sup>th</sup> and 20 <sup>th</sup> March, 2016

<b>Events</b>	<b>Theme</b>	<b>Organized by</b>	<b>Place</b>	<b>Appeared for</b>	<b>Date</b>
National Seminar	“Plant and Microbe: Diversity and Utilization”	Department of Botany, Visva-Bharati	Santiniketan, West Bengal	<b>Chairperson</b>	19 <sup>th</sup> and 20 <sup>th</sup> March, 2016
National Seminar	“Current Trends in Plant and Microbial Research”	Department of Botany, Raiganj University	Raiganj, West Bengal	<b>Oral Presentation:</b> Topic entitled: “Influence of cultivars and antioxidant rich mulberry peptides on silkworm rearing”	16 <sup>th</sup> and 17 <sup>th</sup> March, 2016
National Seminar	“Defining Modern Biology: Plants and Microbes”	Department of Botany, University of Gour Banga	Malda, West Bengal	<b>Oral Presentation:</b> Topic entitled “Variation of Antioxidant ... During Maturation and Thermal Processing”	10 <sup>th</sup> March, 2016
National Symposium	“Advances in Plant and Microbial Research”	Department of Botany, University of North Bengal	Siliguri, West Bengal	<b>Oral Presentation:</b> Topic entitled “Mung bean seed germination and seedling invigoration of chitosan treatment through solid matrix under salinity stress”	12 <sup>th</sup> and 13 <sup>th</sup> December, 2014
National Symposium	“Recent Trends in Plant and Microbial Research”	Department of Botany, University of North Bengal	Siliguri, West Bengal	<b>Lead Lecture:</b> Topic entitled: Some recent approaches of ... research”	22 <sup>nd</sup> and 23 <sup>rd</sup> March, 2013
National Symposium	“Advances in Abiotic and Biotic Stress Management of Plants”	Department of Botany, University of North Bengal	Siliguri, West Bengal	<b>Oral Presentation:</b> Topic entitled: “Changes of <i>in vitro</i> antioxidant activity of Broccoli sprouts under heat stress”	23 <sup>rd</sup> and 24 <sup>th</sup> September, 2011
National Conference	“Emerging trends in Natural Product Research”	School of Natural Product studies, Jadavpur University	Kolkata, West Bengal	<b>Oral Presentation</b> Topic entitled: “ <i>In vitro</i> antioxidant and <i>in vivo</i> antidiabetic activity of <i>Calamus erectus</i> Roxb. fruits in Streptozotocin induced diabetic rats.”	12 <sup>th</sup> and 13 <sup>th</sup> February, 2011
National Seminar	“Diversity, Conservation and Sustainable Utilization of Plants and Traditional Knowledge in Eastern Himalaya”	East Himalayan Society for Spermatophyte Taxonomy & Department of Botany, University of North Bengal	Siliguri, West Bengal	<b>Oral Presentation:</b> Topic entitled: “Phytochemical screening and polyphenolic ... Darjeeling Himalaya”	14 <sup>th</sup> to 16 <sup>th</sup> December, 2010
National Symposium	“Current Perspectives in Stress Biology”	Department of Botany, University of North Bengal	Siliguri, West Bengal	<b>Oral Presentation:</b> Topic entitled: “Changes in profile of low molecular weight peptides ... associated with low pH stress”	6 <sup>th</sup> to 8 <sup>th</sup> February, 2004
National Workshop	“Plant and Wildlife’s Photography”	Department of Botany, University of North Bengal	Siliguri, West Bengal	<b>Participation</b>	9 <sup>th</sup> and 10 <sup>th</sup> August, 2018
National Workshop	“600 MHz Nuclear Magnetic Resonance Spectroscopy”	IIT, Bombay	Mumbai	<b>Participation</b>	24 <sup>th</sup> and 25 <sup>th</sup> May, 2018

<i>Events</i>	<i>Theme</i>	<i>Organized by</i>	<i>Place</i>	<i>Appeared for</i>	<i>Date</i>
National Workshop	“High Resolution Liquid Chromatography, Mass Spectrometer – Orbitrap Biopharma”	IIT, Bombay	Mumbai	<b>Participation</b>	23 <sup>rd</sup> May, 2018
National Workshop	“1-week Hands-on Workshop on Human / Cancer Cell Culture Techniques and MTT Assay”	International Centre for Stem Cells, Cancer and Biotechnology (ICSCCB)	Pune, Maharashtra	<b>Participation</b>	23 <sup>rd</sup> to 29 <sup>th</sup> December, 2013
National Workshop	“Entrepreneurship Development based on Chemical and Agro Technologies”	Eastern India Horticulture and Biotechnology Centre, Baharu and Department of Chemistry & Department of Chemical Engineering, Jadavpur University	Baharu, Nimpith & Kolkata, West Bengal	<b>Participation:</b> In Workshop topic entitled: “Plant tissue culture and Micropropagation of plant”	28 <sup>th</sup> February, 1999

**State / University: Participated in different Seminars as Invited Speaker / Presentation / Chairperson as Symposium Resource Person:**

<i>Events</i>	<i>Theme</i>	<i>Organized by</i>	<i>Place</i>	<i>Appeared for</i>	<i>Date</i>
State Symposium	“13 <sup>th</sup> State Science and Technology Congress”	West Bengal State Science and Technology Department and University of Calcutta with Paschim Banga Vigyan Mancha	Ballygaung Science College, Kolkata	<b>Oral Presentation:</b> Topic entitled: “Sprouted seed ... “	28 <sup>th</sup> February and 1 <sup>st</sup> March, 2006
Conference	“22 <sup>nd</sup> West Bengal State Science and Technology Congress-2015”	Department of Science and Technology, Govt. of West Bengal & University of North Bengal	Siliguri, West Bengal	<b>Oral Presentation:</b> In regional language	28 <sup>th</sup> February and 1 <sup>st</sup> March, 2015

**PARTICIPATED IN STATE WORKSHOP**

<i>Events</i>	<i>Theme</i>	<i>Organized by</i>	<i>Place</i>	<i>Appeared for</i>	<i>Date</i>
Workshop	“Cultivation of Medicinal and Aromatic Plants”	Department of Botany, University of North Bengal	Siliguri, West Bengal	<b>Participation</b>	10 <sup>th</sup> March, 2015
Workshop	“Intellectual Property and Innovation Management in Knowledge Era”	National Research Development Corporation, New Delhi & University of North Bengal	Siliguri, West Bengal	<b>Participation</b>	12 <sup>th</sup> February, 2013
Workshop	“Polymerase Chain Reaction in Medical and Biological Science”	USIC and Department of Biophysics, Molecular Biology and Genetics, University of Calcutta	Kolkata, West Bengal	<b>Participation</b>	11 <sup>th</sup> to 13 <sup>th</sup> September, 2002
Workshop	“Electron Microscopy for Beginners”	USIC, Jadavpur University	Kolkata, West Bengal	<b>Participation</b>	23 <sup>rd</sup> and 24 <sup>th</sup> July, 2002
Workshop	“Application of Biochemistry in Forensic Science”	Department of Biochemistry, University of Calcutta	Kolkata, West Bengal	<b>Participation</b>	16 <sup>th</sup> and 17 <sup>th</sup> November, 1998

**PARTICIPATED IN NATIONAL SEMINAR:**

<i>Events</i>	<i>Theme</i>	<i>Organized by</i>	<i>Place</i>	<i>Appeared for</i>	<i>Date</i>
Annual Conference of Indian Society	“Microbial Wealth – Plant Health”	Department of Botany, University of North Bengal & Indian Society of Mycology and Plant Pathology	Siliguri, West Bengal	<b>Participation</b>	23 <sup>rd</sup> to 25 <sup>th</sup> October, 2009
National Symposium	“Sustainable Utilization of Plant and Microbial Resources”	Department of Botany, University of North Bengal	Siliguri, West Bengal	<b>Session Chairperson</b>	28 <sup>th</sup> February and 1 <sup>st</sup> March, 2009
National Seminar	“Recent Advances in Plant Biology”	Society for plant Physiology & Biochemistry with Central Plantation Crops Research Institute	Kasaragod, Kerala	<b>Participation</b>	3 <sup>rd</sup> to 5 <sup>th</sup> February, 2000

**PARTICIPATED IN STATE SEMINAR:**

<i>Events</i>	<i>Theme</i>	<i>Organized by</i>	<i>Place</i>	<i>Appeared for</i>	<i>Date</i>
Seminar	“Advances in Plant Biology”	Department of Botany, University of North Bengal	Siliguri, West Bengal	<b>Participation</b>	18 <sup>th</sup> March, 2018
Satellite Conference	“Science in Bengal”	Department of Science and Technology, Govt. of West Bengal & University of North Bengal	Siliguri, West Bengal	<b>Participation</b>	3 <sup>rd</sup> and 4 <sup>th</sup> June, 2015