

APPENDIX A: List of Thesis related publications

In Journals

1. **Ray P**, Chakraborty AP and Chakraborty BN. Biochemical and Molecular Characterization of *Streptomyces* species isolated from Agricultural field of North Bengal and evaluation for growth improvement and suppression of sclerotial blight diseases of *Vigna radiate*. *J. Mycol. Pl. Pathol.*, **46(4)**: 219-228, 2016.
2. **Ray P**, Chakraborty AP and Chakraborty BN. Evaluation of streptomyces and non-streptomyces actinomycetes isolates for growth promotion in *Vigna radiata* and their use as biocontrol agent against *Sclerotium rolfsii*. *NBU J. Pl. Sci.*, **10(1)**:73-79,2016

APPENDIX B: List of Abbreviation

1. BLAST- Basic local alignment search tool
2. BSA- Bovine serum albumin
3. $\text{Ca}_3(\text{PO}_4)_2$ - Tri-calcium phosphate
4. CaHPO_4 - Calcium phosphate
5. CAS- Chrome azurol S
6. CAT- Catalase
7. CDA- Chitinase detection agar
8. cfu- Colony forming unit
9. CHT- Chitinase
10. CuSO_4 - Copper sulphate
11. DAPG- 2,4-Diacetylphloroglucinol
12. dATP- Deoxy adenosine tri-phosphate
13. dCTP- Deoxy cytosine tri-phosphate
14. DEAE cellulose- diethyl aminoethyl cellulose
15. dGTP- Deoxy guanosine tri-phosphate
16. DMAB- Di methyl amino benzaldehyde
17. DNA- Deoxyribonucleic acid
18. dNTPs- Deoxy nucleotide tri-phosphates
19. DNSA- Dinitro salicylic acid
20. dTTP- Deoxy thymidine tri- phosphate
21. EDTA- Ethylene diamine tetra acetic acid
22. FeCl_3 - Ferric chloride
23. FITC- Fluorescein isothiocyanate
24. g- gram
25. GlcNAc- N-acetyl glucosamine
26. H_2O_2 - Hydrogen peroxide
27. H_2SO_4 - Sulphuric acid
28. HCl- Hydrochloric acid
29. HCN- Hydrocyanic acid
30. IAA- Indole acetic acid
31. ISR- Induced systemic resistance

32. ISP3 –International *Streptomyces* project media 3
33. KCl- Potassium chloride
34. KH₂PO₄ – Potassium dihydrogen phosphate
35. MEGA 4- Molecular Evolutionary Genetics Analysis 4
36. mg- Mili gram
37. MgCl₂- Magnesium chloride
38. ml- Mili litre
39. Na₂CO₃- Sodium carbonate
40. Na₂HPO₄- Di sodium hydrogen phosphate
41. Na₂MoO₄- Sodium molybdate
42. NaCl- Sodium chloride
43. NaN₃- Sodium azide
44. NaNO₂- Sodium nitrite
45. NaOH- Sodium Hydroxide
46. NA- Nurient Agar
47. NB- Nutrient Broth
48. NBT/BCIP substrate- Nitro blue tetrazolium/ (5-bromo-4-chloro-1H-indol-3-yl)
49. dihydrogen phosphate substrate
50. NCBI- National Center for Biotechnology Information
51. NCM- Nitrocellulose membrane
52. NH₄Cl- Ammonium chloride
53. PAL- Phenylalanine ammonia lyase
54. PBS-Tween- Phosphate buffer saline- Tween
55. PCA- Phenazine-1-carboxylic acid
56. PCI- Water saturated phenol: Chloroform: Isoamyl alcohol
57. PCR- Polymerase chain reaction
58. PDA- Potato Dextrose agar
59. PGPR- Plant Growth Promoting Rhizobacteria
60. POX- Peroxidase
61. PPO- Polyphenol oxidase
62. PR proteins- Pathogenesis related proteins
63. PVK- Pikovskaya's agar
64. PVP- Poly vinyl- pyrrolidone
65. RNA- Ribonucleic acid
66. RP- Rock phosphate

67. RS- Rhizosphere soil
68. SA- Salicylic acid
69. SAR- Systemic acquired resistance
70. SDS- Sodium dodecyl sulphate
71. SCN- Starch casein nitrate agar
72. TAE buffer- Tris Acetic Acid and EDTA buffer
73. TE buffer- Tris-EDTA buffer
74. TEMED- N,N,N',N'-Tetramethylethylenediamine
75. Tris Hcl- Tris hydrochloric acid
76. UPGMA- Unweighted Pair Group Method with Arithmetic Mean
77. yr- Year.
78. β -1,3-GLU- β -1,3 glucanase
79. μ l- Micro litre.

APPENDIX C: List of Chemicals

1. Ammonium chloride
2. Bovine serum albumin
3. Calcium phosphate
4. Carboxy methyl cellulose
5. Chrome azurol S
6. Colloidal chitin
7. Copper sulphate
8. Deoxy nucleotide tri-phosphates
9. Di methyl amino benzaldehyde
10. Di sodium hydrogen phosphate
11. Diethyl aminoethyl cellulose
12. Dinitro salicylic acid
13. Ethylene diamine tetra acetic acid
14. Ferric chloride
15. Fluorescein isothiocyanate
16. Helicase (3%)
17. Hexa-decytrimethyl ammonium bromide
18. Hydrochloric acid
19. Hydrocyanic acid
20. Hydrogen peroxide
21. Indole acetic acid
22. Magnesium chloride
23. N-acetyl glucosamine
24. Nitro blue tetrazolium/ (5-bromo-4-chloro-1H-indol-3-yl) dihydrogen phosphate
25. O-dianisidine (5 mg/ml methanol)
26. p- nitrophenyl phosphate
27. Phosphate buffer saline- Tween
28. Potassium chloride
29. Potassium dihydrogen phosphate
30. Sodium azide
31. Sodium carbonate
32. Sodium chloride
33. Sodium dodecyl sulphate

34. Sodium Hydroxide
35. Sodium molybdate
36. Sodium nitrite
37. Sulphuric acid
38. Tri-calcium phosphate
39. Tris Acetic Acid and EDTA buffer
40. Tris hydrochloric acid
41. Tris-EDTA buffer
42. Water saturated phenol: Chloroform: Isoamyl alcohol
43. 0.05(M) sodium phosphate buffer (pH 6.8)
44. 0.1M sodium phosphate buffer pH (7.4)
45. 0.1(M) sodium acetate buffer (pH 5.0)
46. 0.2M Na-phosphate buffer (pH 5.4)
47. 0.3mM borate buffer (pH 8.0)
48. 1 M K-PO₄ buffer (pH 7.1)
49. 1-amino-cyclopropane-1-carboxylic acid hydrochloride 1M Na-acetate buffer (pH 4) Sodium borate buffer (pH 8.8)
50. 2 mM β- mercaptoethanol
51. 1 M Na-borate buffer (pH 9.8)
52. 2% L-phenylalanine
53. 2,4-Diacetylphloroglucinol
54. 4 mM H₂O₂.
55. 4% laminarin
56. 30%-90% absolute alcohol
57. 1% aqueous toluidine blue solution
58. 0.2% lead acetate