ANNEXURE

Annexure-I. List Of Abbreviations Used:

α = Alpha

β = Beta

- = minus

% = percentage

µ = micro

µg = microgram

µl = microlitre

µM = micromolar

$(Ca_3)_2PO_4$ = Tri Calcium Phosphate

$(NH_4)_2SO_4$ = Ammonium Sulphate

A. flavus = Aspergilus flavus

A. thialiana = Arabidopsis thialiana

ACC = 1-Aminoayclopropane 1-Carboxylic acid

ANOVA = Analysis of Variance

Ar = Absorbance of reference

ARA = Acetylene Reduction Assay

As = Absorbance of sample

ATP = Adenine Triphosphate

B. siamensis = Bacillus siamensis

B. subtilis = Bacillus subtilis

BLAST = Basic Local Alignment Search Tool

BSL = Brine Shrimp Lethality

C_2H_4= Acetylene

Ca = Calcium

$CaCO_3$= Calcium Carbonate

CaOx = Calcium Oxalate

CAS = Chrome Azurol S

$CaSO_4.2H_2O$ = Calcium Sulphate

CFU = Colony Forming Unit

cm = centimeter

Da = Dalton

DAI = Day after innoculation

DNA = Deoxyribo Nucleic Acid

DPPH = 1, 1- diphenyl-2-picrylhydrazyl

EEAA = Ethanol Extract of *Achyranthes aspera*

F =Forward

F. graminearum = *Fusarium graminearum*

Fe = Iron

$FeCl_3$ = Ferric Chloride

$FeSO_4.7H_2O$ = Ferrous Sulphate

gm = gram

g = gravitation

G. diazotrophicus = *Gluconacetobacter diazotrophicus*

GA = Gibberellic Acid

GC-FID = Gas Chromatography Flame Induction Detector

GFP = Green Fluorescent Protein

gr = Glutathione Reductase

h = hour

ha = hacter

HDTMA = HexaDecylTrimethyl Ammonium

i.e. = that is

IAA = Indole Acetic Acid

IAM = Indole-3-acetamide

IC = Inhibition Concentration

IPyA = Indole 3-pyruvate

K_2HPO_4 = Di potassium hydrogen phosphate

KCl = Potassium Chloride

Kg = kilogram

KH_2PO_4 = Potassium dihydrogen phosphate

Km^r = Kanamycin Resistance

L = Linn

LB = Luria Bertani

LDH = Lactate Dehydrogenase

LDL = Low Density Lipid

Lux = Light Intensity

m = meter

MEGA = Molecular Evolutionary Genetic Analysis

mg = milligram

$MgSO_4.7H_2O$ = Magnesium Phosphate

min = minute

mM = millimoles

$MnSO_4.2H_2O$ = Manganese Sulphate

MR = Methyl Red

MS = Murashige and Skoog

N_2= Nitrogen

N_2FA = Nitrogen Fixing Ability

NA = Nutrient Agar

NaCl = Sodium Chloride

NaOH = Sodium Hydroxide

NB = Nutrient Broth

NCBI = National Center for Biotechnology Information

NFb = Nitrogen Free Medium

nm = nanometer

nmol = nanomole

NPK = Nitrogen Phosphate Potassium

O. D. = Optical Density

O_2= Oxygen

ºC = Degree celcius

P = Phosphate

P. aeruginosa = Pseudomonas aeruginosa

P. indica = Pseudomonas indica

P. putida = Pseudomonas putida

PCR = Polymerase Chain Reaction

PGP = Plant Growth Promotion

PGPR = Plant Growth Promoting Bacteria

pH = Hydrogen Ion Concentration

PSB = Phosphate Solubilizing Bacteria

R = Reverse

rev = revolution

RH = Reducing Humidity

RNA = Ribonucleic Acid

rpm = revolution per minute

RT PCR = Real time Polymerase Chain Reaction

S = Second

S. aquamarine = Sporosarcina aquamarine

S. griseus = Streptomyces griseus

S. marcescens = Serratia marcescens

S. mutabilis = Streptomyces mutabilis

SEML = Soil and Environmental Molecular Laboratory

SM = Succinic medium

Sod = superoxide dismutase

sp. = species

SPSS = Statistical Package for Social Science

Tryp = Trytophan

VP = Voges Proskauer

w/v = weight by volume

WHO =World Health organization

YEMA = Yeast Extract Mannitol Agar

YEMB = Yeast Extract Mannitol Broth

Annexure- II. Media And Reagents Used

(A) MEDIA

1. Dworkin and Foster minimal medium (g/l)

KH_2PO_4	4.0
Na_2HPO_4	6.0
$MgSO_4.7H_2O$	0.2
Glucose	2.0
Gluconic acid	2.0
Citric acid	2.0
$FeSO_4.7H_2O$	1 mg
H_3BO_3	10 mg
$MnSO_4.H_2O$	11.19 mg
$ZnSO_4.7H_2O$	124.6 mg
$CuSO_4.5H_2O$	78.22 mg
MoO_3	10 mg

pH- 7.2

2. Luria Bertani (LB) (g/l)

Casein enzymic hydrolysate	10.0
Yeast extract	5.0
NaCl	10.0

3. Murashige and Skoog medium (MS Medium) (mg/l)

Major salts

NH_4NO_3	1,650
$CaCl_2.2H_2O$	440
$MgSO_4.7H_2O$	370
KH_2PO_4	170
KNO_3	1,900

Minor salts	
H_3BO_3	6.2
$CoCl_2 \cdot 6H_2O$)	0.025
$CuSO_4 \cdot 5H_2O$	0.025
$FeSO_4 \cdot 7H_2O$	27.8
$MnSO_4 \cdot 4H_2O$	22.3
KI	0.83
$Na_2MoO_4 \cdot 2H_2O$)	0.25
$ZnSO_4 \cdot 7H_2O$)	8.6
NaFe-EDTA	5
FeSO4.7H2O	5.57 g
Na2-EDTA	7.45 g .
Vitamins and organics	
Myo-Inositol	100
Nicotinic Acid	0.5
Pyridoxine-HCl	0.5
Thiamine-HCl	0.1
Glycine	2
Indole Acetic Acid	1-30
Kinetin	0.04-10

4. Nitrogen free media (NFb) (g/l)

Mannitol	10
KH_2PO_4	0.2
$MgSO_4.7H_2O$	0.2
NaCl	0.2
CaSO4.2H2O	0.1
CaCO3	5.0

pH-7

5. Nutrient Agar (g/l)

Beef extract	10.0
Peptone	10.0
Sodium chloride	5.0
Agar	20.0
Distilled water	1000 ml
pH: 7.3±0.1 at 25°C	

6. Pikovskaya medium (g/l)

Glucose	10.0
(Ca3)2PO4	5.0
(NH4)2SO4	0.5
NaCl	0.2
$MgSO_4.7H_2O$	0.1
KCl	0.2
FeSO4.7H2O	0.002
Yeast extract	0.5
MnSO4.2H20	0.002
Agar	20
pH-7	

7. Succinic Medium (SM) (g/l)

K_2HPO_4	6.0
KH_2PO_4	3.0
$MgSO_4.7H_2O$	0.2
(NH4)2SO4	1.0
Succinic Acid	4.0
pH-7	

8. Yeast Extract Mannitol Agar (YEMA) (g/l)

Yeast extract	1.0
Mannitol	10.0
K_2HPO_4	0.5
$MgSO_4.7H_2O$	0.2
NaCl	0.1
Agar	15.0

pH-7

(B) REAGENTS

1. CAS reagent preparation:

- Pour 6 ml of 10 mM strength HDTMA into 50 ml of sterile water
- Add one and half ml of Fe^3 solution (1Mm $FeCl_3$.6H2O + 10 mM HCl) and 7.5 ml 2mM aqueous CAS solution, turning the solution into dark blue.
- Make the final volume to 100 ml.

2. Peptone water (g/l)

Peptic digest of animal tissue	10.0
Sodium chloride	5.0
Distilled water	1000 ml

pH: 7.3±0.1 at 25°C

3. Phosphate buffer saline (g/l)

Sodium chloride	8
Potassium chloride	0.20
Di-sodium hydrogen phosphate	1.15
Potassium di-hydrogen phosphate	0.20
Distilled water	1000 ml

pH: 7.2

3. Salkowski reagent preparation:

- Preparation of 50 ml of 35% perchloric acid
- Preparation of 10 ml of 0.5M $FeCl_3$
- Add 1 ml of 0.5M $FeCl_3$ to 50 ml of 35% perchloric acid.

4. Tris-borate EDTA (TBE) buffer (10X stock solution; g/l)

Tris Base	108.0
Boric acid	55.0
EDTA (pH=8.0)	20 ml
Distilled water	1000 ml

5. Tris-acetate EDTA (TAE) buffer (10X stock solution; g/l)

Tris-HCl	48.4g
Glacial acetic acid	11.42 ml
EDTA (pH=8.0)	20 ml

6. 6X loading dye/buffer (g/l)

Sucrose	40
0.04% bromophenol blue solution	50 ml

The final volume of the solution was adjusted to 100 ml.

(C) STAINING SOLUTIONS

1. Crystal Violet stain (g/l)

Solution A

Crystal Violet	2.5
Ethanol (95%)	25 ml

Solution B

Ammonium Oxalate	1.0
Distilled Water	100 ml

Solution A and solution B were mixed, filtered and stored at room temperature.

2. Gram's Iodine solution (g/l)

Stock solution:

Iodine	5.0
Potassium iodide	10.0
Distilled water	100 ml

Working solution:

The above solution was diluted in 1:5 ratio with distilled water for preparing working solution.

3. Safranin stain (g/l)

Stock solution:

Safranin	2.5 gm
Ethanol (95%)	100 ml

Working solution:

The above solution was diluted in 1:4 ratio with distilled water for preparing working solution.

4. Ethidium bromide solution (10 mg/ml)

Ethidium bromide	0.1 gm
Distilled water	10 ml

The above reagent was dissolved in distilled water and stored in room temperature.