LIST OF FIGURES

Figure No.	Description	Page Number
r		
1	Google Earth Image of Akaipur Beel	27
2	Akaipur Dwarbasini Wetland	28
3	Google Earth Image of East Kolkata Wetland	29
4	East Kolkata Wetland	30
5	Google Earth Image of Chhara Ganga Beel	30
6	Chhara Ganga Wetland	31
7	Vallisneria spiralis in natural habitat	44
8	TLC of VsF7 of Vallisneria leaf extract.	47
9	A: Microscopic view of nauplii stage of <i>Artemia salina</i> ; and B: Hatching of dormant cysts of <i>A. salina</i> .	53
10	A: Microscopic view of <i>Microcystis aeruginosa</i> ; B: Culture of <i>M.aeruginosa</i> under laboratory conditions and C: View of Microcystis bloom infested fish gut	54
11	Left: - <i>P. hypophthalmus</i> uninfected (A) and infected (B) at the beginning of the experiment; Right: - Experimental set up for KP (+), PF-I, PI-F & KP (-)	57
12	Paraffin molds for tissue sectioning by microtome and staining accessories in coupling jars.	60
13	Graphical representation of the biochemical parameters of the 80% HE fraction (VsE80) and F7 of <i>V. spiralis</i>	65

Figure No.	Description	Page Number
------------	-------------	-------------

	-	
14	Pictorial representation of the zone of inhibition of the Ethanol 80% of <i>V. spiralis</i> against <i>M. globosa</i>	66
15	Well diffusion assay of VsF7 fraction against Aeromonas popoffi (MEE2) and Aeromonas hydrophila (MK6)	67
16	Pictograph representation for MIC & MFC of the VsE80 fraction of <i>V.spiralis</i> on <i>Mallesizia globosa</i> .	67
17	Non-Monotonic curve - Inhibition Zone diameter <i>vs</i> plant sample concentration.	68
18	Graphical representation of LC25, LC50 and LC75 against log of concentration for VsE80 and VsF7 of <i>V. spiralis</i> at 1hr, 6hrs, 12hrs, 18hrs and 24hrs exposure time	69
19	Anti-algal activity of V. spiralis	70
20	Graphical representation of anti-algal assay of Vt & Vp of VsE80 of <i>V. spiralis</i>	70
21	A pie chart representation of the distribution of Chlorophyll a, b & c for Vt and Vp against <i>Microcystis aeruginosa</i>	71
22	Left: <i>L. minor</i> bioassay, A- 1000ppm, B- 500ppm, C- Control, D-100ppm and E- 10ppm; Right: Laboratory growth of <i>Lemna minor</i>	71
23	The picto-graphical representation of the % distorted frond count against the concentration of the F7 fraction of the leaf extract of <i>V. spiralis</i>	72

Figure No.	Description	Page Number
------------	-------------	-------------

24	Sections of <i>P.hypophthalmus</i> liver (40X) from four experimental sets. A: Normal Liver (KP+); B: PI-F liver; C: PF-I liver & D: Infected Liver (KP-)	74
25	Section of <i>P.hypophthalmus</i> kidney (40X) from four experimental sets. A: Normal Kidney; B: PI-F Kidney; C: PF-I Kidney & D: Infected Kidney	75
26	TOF-MS of the crystal obtained from VsE80 fraction of the leaf sample of <i>V. spiralis</i>	76
27	FT-IR spectrum of VsE80 fraction of the leaf sample of <i>V. spiralis</i> (Chakraborty <i>et al.</i> , 2015)	78
28	Microscopic view of an isolated white cubic crystal from VsE80 fraction of <i>V. spiralis</i> leaf extract	79
29	Graphical representation of the model summary and IC50 value of antioxidant activity of VsE80 (A) and VsF7 (B) fractions extracted from the leaves of <i>V.spiralis</i>	90
30	Test of normality, Chi-square test and Z-statistics of <i>V. spiralis</i> at 1hr and 6hrs interval	92
31	Test of normality, Chi-square test and Z-statistics of VsF7 fraction of <i>V. spiralis</i> at 6hrs interval	92
32	<i>Ipomoea aquatica</i> in natural habitat	96
33	Preparative TLC of F2 fraction of Ipomoea leaves	98
34	Bio-autography of $F2a_{II}$ fraction ($R_f - 0.76$). Zone of Inhibition (ZOI) shown within encircled area	110
35	Picto-graphical display of phenols, flavonoids & tannins of F2a _{1a} fraction of <i>Ipomoea aquatica</i>	112

Figure No.	Description	Page Number
------------	-------------	-------------

36	% scavenging activity of F2a _{1a} and F3; Cubic (polynomial) equation model	113
37	Zone of Inhibition (mm) clockwise : <i>Edwardsiella</i> <i>tarda</i> (CGH9); <i>Citrobacter freundii</i> (M7) and <i>Bacillus safensis</i> (MOH1)	115
38	Picto-graphical representation of LC25, LC50 and LC75 for <i>I. aquatica</i> at 1hr, 6hrs, 12hrs, 18hrs and 24hrs exposure time	116
39	Histopathology of Liver tissues of <i>P. hypophthalmus</i>	118
40	Histopathology of kidney tissues of <i>P. hypophthalmus</i>	119
41	Mass spectrum of Fraction F3 fraction extracted from the leaves of <i>Ipomoea aquatica</i>	120
42	FT-IR of F3 fraction extracted from the leaves of <i>Ipomoea aquatica</i>	121
43	¹ H-NMR of F3 fraction extracted from the leaves of <i>Ipomoea aquatica</i>	122
44	¹³ C-NMR of F3 fraction extracted from the leaves of <i>Ipomoea aquatica</i>	123
45	Right; Cubic crystal view under microscope, Left; structure of N-hexa - decanoic acid	124
46	Atomic force microscopy of the crystals obtained from $F2a_{1a}$ fraction of the <i>I. aquatica</i> leaves	125
47	FT-IR of F2a _{1a} fraction of the leaf sample of <i>Ipomoea aquatica</i>	126

Figure No.	Description	Page Number
------------	-------------	-------------

48	Mass spectrum of the $F2a_{1a}$ fraction of the leaf extract of <i>Ipomoea aquatica</i>	127
49	¹ H-NMR of F2a _{1a} fraction extracted from the leaves of <i>Ipomoea aquatica</i>	128
50	Cubic crystal view under microscope 63X magnification	129
51	Model summary and IC50 value of antioxidant activity of F3 & F2 a_{1a} fraction	130
52	Test of normality (Shapiro Wilk) and Kolmogorov- Smirnov Test of Hexane, Ethylacetate, Chloroform and Methanol fraction of <i>Ipomoea aquatica</i>	136
53	Probit and logit analysis of hexane fraction of <i>I.aquatica</i> on brine shrimp lethality at 1hr, 6hrs, 12hrs, 18hrs and 24hrs interval.	138
54	Probit and logit analysis of chloroform fraction of <i>I.aquatica</i> on brine shrimp lethality at 1hr, 6hrs, 12hrs, 18hrs and 24hrs interval.	140
55	Probit and logit analysis of chloroform fraction of <i>I.aquatica</i> on brine shrimp lethality at 1hr, 6hrs, 12hrs, 18hrs and 24hrs interval.	142
56	Probit and logit analysis of Methanol fraction of <i>I.aquatica</i> on brine shrimp lethality at 1hr, 6hrs, 12hrs, 18hrs and 24hrs interval.	144
57	Probit and logit analysis of Water fraction of <i>I.aquatica</i> on brine shrimp lethality at 1hr, 6hrs, 12hrs, 18hrs and 24hrs interval.	146

Figure No.	Description	Page Number
------------	-------------	-------------

58	Inflorescence of Cyperus rotundus L.	150
59	TLC showing 1D (A) and 2D (B) chromatogram of CrM fractions.	152
60	CrM, CrCh & CrP fraction of the inflorescence of <i>C.rotandus</i> .	161
61	Antioxidant activity of CrP, CrCh and CrM Fraction of the inflorescence of <i>C.rotandus</i> using DPPH.	162
62	Antioxidant activity of CrP, CrCh and CrM Fraction of the inflorescence of <i>C.rotandus</i> using ABTS	163
63	Graphical representation of the zone of inhibitions against fish bacteria by CrP, CrCh and CrM fraction of <i>C. rotandus</i>	164
64	The antimicrobial assay of methanol fraction (CrM) of <i>C.rotandus</i> against seven fish pathogenic bacteria	165
65	The antimicrobial assay of Chloroform fraction (CrCh) of <i>C.rotandus</i> against seven fish pathogenic bacteria	166
66	The antimicrobial assay of Petroleum Ether (CrP) fraction of <i>C.rotandus</i> against seven fish pathogenic bacteria	167
67	Graphical representation of LC25, LC50 and LC75 against log of concentration for <i>C.rotandus</i> at 1hr, 6hrs, 12hrs, 18hrs and 24hrs exposure time	168
68	Anti-algal activity of CrM of Cyperus inflorescence extract.	169

Figure No.	Description	Page Number
------------	-------------	-------------

69	A pie chart representation of the distribution of Chlorophyll a, b & c for Ct and Cp against <i>Microcystis aeruginosa</i>	170
70	Clockwise, Root cutting of <i>S.polyrhiza</i> under sterile condition; Graphical representation of the regenerated root length at five different concentrations of CrM of <i>C.rotandus</i> ; <i>S. polyrhiza</i> bioassay and Laboratory grown <i>S. polyrhiza</i>	171
71	A: Fish sample from KP (+); B: Fish sample from PI- F; C: Fish sample from PF-I & D: Fish sample from KP (-)	172
72	Sections of <i>P.hypophthalmus</i> liver (40X) from four experimental sets. A: Normal Liver; B: PI-F liver; C: PF-I liver & D: Infected Liver	173
73	Section of <i>P.hypophthalmus</i> kidney (40X) from four experimental sets. A: Normal Kidney; B: PI-F Kidney; C: PF-I Kidney & D1, D2: Infected Kidney	174
74	Model summary and IC50 value of antioxidant activity of CrP, CrCh and CrM fraction of Inflorescence of <i>C.rotandus</i> .	193
75	Test of normality (Shapiro Wilk) and Kolmogorov- Smirnov Test and Probit and logit analysis of CrP fraction of <i>C. rotandus</i> on brine shrimp lethality at 1hr, 6hrs, 12hrs, 18hrs and 24hrs interval	196
76	Test of normality (Shapiro Wilk) and Kolmogorov- Smirnov Test and Probit and logit analysis of CrCh fraction of <i>C. rotandus</i> on brine shrimp lethality at 1hr, 6hrs, 12hrs, 18hrs and 24hrs interval.	199

Figure No.	Description	Page Number
77	Test of normality (Shapiro Wilk) and Kolmogorov- Smirnov Test and Probit and logit analysis of CrM fraction of <i>C. rotandus</i> on brine shrimp lethality at 1hr, 6hrs, 12hrs, 18hrs and 24hrs interval.	202
78	Comparative Zone of Inhibition of CrM, OTC & CrM + OTC against <i>A. hydrophila</i>	220