LIST OF FIGURES

Figure No.	Figure No. and details	Page Number
1.	Conceptual diagram showing relationship between hosts, pathogens and the environment for development of diseases.	8
2.	Different types of stressors in aquaculture farms	9
3.	Types of disease transmission in fish	9
4.	Geographical location of sampling from aquaculture farms of West Bengal, India	24
5.	Infected fish species	25
6.	Schematic flow chart of biochemical tests	32
7.	Flow diagram for genomic DNA isolation	33
8.	Formula for determination of MAR value	41
9.	Flow diagram describing steps for Liquid hemolysin assay	42
10.	Schematic representation of steps for LD ₅₀ determination	44
11.	Schematic representation of Hypermucoviscosity test	47
12.	Gram negative pink rods after gram staining (A) Purple and mucoid colonies of <i>K. pneumoniae</i> on selective agar (B).	60
13.	K. pneumoniae biochemical test result	61
14.	Comparative biochemical test of isolated strains K1- K10 and ** <i>K. pneumoniae</i>	62
15.	Positive Biochemical test results of K1 in vitek compact 2.0	62
16.	Gel image of the PCR amplified samples	63
17.	Phylogenetic analysis of K1 isolate with other NCBI <i>Klebsiella</i> species based on 16S rRNA nucleotide sequences.	65
18.	Phylogenetic relationship between <i>Klebsiella pneumoniae</i> isolated from different aquaculture farmed diseased fishes of West Bengal	66
19.	Phylogenetic relationship of <i>Klebsiella pneumoniae</i> strains used in this study with <i>Klebsiella pneumoniae</i> strains reported from different part of the world.	67

20.	PCR ribotyping gel image with M- 100 bp ladder, L1-L10- <i>K. pneumoniae</i> (K1- K10), L 11-12- <i>Klebsiella oxytoca</i> , L13- L14 <i>Vibrio parahaemolyticus</i>	68
21.	Antibiotic study of K1- K10 strains against various antibiotics	69
22.	Solid hemolysin assay on bloog agar plate supplemented with sheep blood; B Liquid hemolysin assay on sheep blood R.B.C.	70
23.	Mortality rate of <i>Labeo rohita</i> after artificially challenged with K1 at different concentrations.	71
24.	Haemorrhages and reddening developed by fishes after the interperitonial region	71
25.	Photomicrograph of artificially infected <i>L. rohita</i> Kidney [A]: tissue necrosis, ultra structural alterations in glomeruli and renal tubules (*); [B]: vacuolation in kidney (X) (H & E staining; 60X)	73
26.	Photomicrograph of artificially infected <i>L. rohita</i> liver showing [A]: hepatocytes disruption, vacuolation and necrosis (Z); [B]: melanomacrophages center (M) were observed (H & E staining; 60X)	73
27.	Formation of viscous string by <i>Klebsiella pneumoniae</i> on blood agar plate	74
28.	Agarose gel image of the amplified virulent genes	74
29.	Non-specific immune response of <i>Labeo rohita</i> after <i>Klebsiella pneumoniae</i> infection at different time scale	75-79
	a. Respiratory burst activity	75
	b. Myeloperoxidase activity	76
	c. Antiprotease activity	77
	d.Alpha 2-macroglobulin	78
	e. Lysozyme activity	79
30.	Relative Expression of C3, IL6, IL-1 β genes relative to β -actin gene	81