
LIST OF TABLES

Table No.	Caption	Page No.
1.1	List of primers sequences used for RT-PCR experiments.	37
3.1	Haematological (Total blood profiling) and biochemical examination of serum (Liver/ kidney function tests) from mice infected with <i>E. cloacae</i> SBP-8, after 6 h (i.p) and 24 h (i.p and i.g) post infection	62
4.1	List of bacterial strains and plasmids used in this study	73
4.2	List of primer used in this study	76
4.3	List of T6SS orthologs of <i>E. cloacae</i> SBP-8 and their proposed function.	81

LIST OF FIGURES

Figure No.	Captions	Page No.
1.1	Schematic depiction of infections caused by <i>E. cloacae</i> in humans	3
1.2	Schematic illustration of antibiotic emergence of <i>E. cloacae</i> outbreak in France	7
1.3	Diagrammatic representation of possible virulence factors involved in the pathogenicity of <i>E. cloacae</i> .	12
1.4	Genetic organization and T6SS-encoding gene clusters in different pathogenic bacteria	14
1.5	Schematic model of the overall structure of T6SS according to current information and its comparison with bacteriophage T4	23
1.6	Schematic representation of different pathways involved in the regulation of T6SS	21
1.7	Life cycle of <i>C. elegans</i>	29
2.1	<i>E. cloacae</i> SBP-8 decreases the lifespan of <i>C. elegans</i>	38
2.2	<i>E. cloacae</i> SBP-8 colonize in worm	40
2.3	Confirmation of Koch's Postulates	40
2.4	<i>E. cloacae</i> SBP-8-GFP colonization in intestine of <i>C. elegans</i>	41
2.5	Exposure to <i>E. cloacae</i> SBP-8 induce ROS production	42
2.6	Exposure to <i>E. cloacae</i> SBP-8 induce DNA damage in the worm	43
2.7	<i>C. elegans</i> does not show any behavioural changes to minimize contact with <i>E. cloacae</i> SBP-8	46
2.8	Physiological and reproductive defects in worms infected with <i>E. cloacae</i> SBP-8	47
2.9	Relative expression of the antimicrobial and reproduction related genes in <i>E. cloacae</i> SBP-8 infected worms	48
3.1	Kinetics of <i>E. cloacae</i> SBP-8 infection in mice	58
3.2	Image showing the amplicons obtained <i>via ERIC</i> PCR of bacterial colonies obtained in CFU analysis of different organs of infected mice	58

3.3	Analysis of cytokine levels in the sera of Swiss albino mice infected with <i>E. cloacae</i> SBP-8	59
3.4	Histopathological evaluation (H&E staining, 40X) of various organs of Swiss albino mice infected with <i>E. cloacae</i> SBP-8 at 6 h and 24 h of infection for i.p route while 24 h for i.g route of infection	61
3.5	Percentage of <i>E. cloacae</i> SBP-8 invading and phagocytosed in HT-29 cells and RAW 264.7 murine macrophages cell lines, respectively and Fold change (from 2 h to 16 h) in CFU recovered from <i>E. cloacae</i> SBP-8 infected HT-29 and RAW 264.7 cell lines.	64
3.6	Representative fluorescent microscopic images depicting lysosomal fusion of <i>E. cloacae</i> SBP-8-GFP in RAW 264.7 & and HT-29 cell lines at 2 and 16 h.p.i	65
4.1	<i>In-silico</i> identification T6SS of <i>E. cloacae</i> SBP-8.	80
4.2	Identification of functional and active T6SS in <i>E. cloacae</i> SBP-8	84
4.3	Role of the <i>E. cloacae</i> SBP-8 T6SS in virulence against <i>C. elegans</i>	85
4.4	Relative expression of the antimicrobial and <i>tol-1</i> gene in <i>E. cloacae</i> SBP-8 wild type and <i>clpV</i> knockout infected worms.	87
4.5	Role of the <i>E. cloacae</i> SBP-8 T6SS in intracellular proliferation	88
4.6	<i>E. cloacae</i> SBP-8 T6SS plays role in bacterial competition	89

List of Abbreviations

Symbol	Abbreviation
ATCC	American Type Culture Collection
bp	Base pair
BLAST	Basic local alignment search tool
BITS	Birla Institute of Technology and Science
C	Celsius
cm	Centimeter
cDNA	Complementary Deoxyribonucleic acid
CFU	Colony forming unit
<i>clec</i>	C-Type Lectin
cAMP	Cyclic adenosine monophosphate
DNA	Deoxyribonucleic acid
DCFH-DA	2,7-dichlorodihydrofluorescein diacetate
ECC	<i>Enterobacter cloacae</i> Complex
<i>ERIC</i>	Enterobacterial Repetitive Intergenic Consensus
g	Gram
GM-CSF	granulocyte-macrophage colony-stimulating factor
GFP	Green fluorescent protein
Hcp	Hemolysin-coregulated protein
h	Hour
hpi	Hours Post-Infection
i.g	Intragastric
i.p	Intraperitoneal
IFN- γ	Interferon gamma
IL	Interleukin
IMTech	Institute of Microbial Technology
kDa	Kilo dalton
LPS	Lipopolysaccharide
LB	Luria bertani
<i>lys</i>	Lysozyme-Like Protein
MTCC	Microbial Type Culture Collection and Gene Bank
μ g	Microgram
μ l	Microlitre
mg	Milli gram

List of Abbreviations

mL	Milli litre
min	Minutes
MAPK	Mitogen-Activated Protein Kinase
nm	Nanometer
OD	Optical density
PBS	Phosphate buffered saline
PCR	Polymerase Chain Reaction
qRT-PCR	Quantitative real-time polymerase chain reaction
RAW 264.7	Ralph And William's cell line 264.7
ROS	Reactive Oxygen species
rRNA	Ribosomal ribonucleic acid
RNA	Ribonucleic acid
RT	Room temperature
S. No.	Serial number
SDS-PAGE	Sodium Dodecyl Sulphate–Polyacrylamide Gel Electrophoresis
<i>tol</i>	Toll-like receptor
TNF- α ,	Tumour Necrosis Factor alpha
Tss	Type VI secretion system
T1SS	Type I Sceretion System
T2SS	Type II Sceretion System
T3SS	Type III Sceretion System
T4SS	Type IV Sceretion System
T5SS	Type V Sceretion System
T6SS	Type VI Sceretion System
T7SS	Type VII Sceretion System
T8SS	Type VIII Sceretion System
T9SS	Type IX Sceretion System
UV-vis.	Ultraviolet-visible
VgrG	Valine-Glycine-Rich Proteins