

LIST OF FIGURES

FIGURE No.	FIGURE DETAILS	PAGE No.
FIGURE 3.1.	Gram staining of the isolates (PB1 – PB 10)	42-43
FIGURE.3.2.	Endospore forming characteristics: A; non-spore forming rods, B; non-spore forming cocci bacteria, C; Spore forming rods.	45
FIGURE.3.3.	The observation showed the single colonies that were obtained for the different isolates on MRS agar media which was placed on the Colony counter device.	47
FIGURE 4.1	SEM images of the selected isolates (PB1- PB10)	64
FIGURE 4.2.	The biochemical characterizations of the selected isolates which includes; A: Catalase Test, B: Oxidase Test, C: Starch Hydrolysis Test, D: Arginine Hydrolysis Test, E: Carbohydrate fermentation test.	65
FIGURE 4.3.	Anti-oxidant activity of all the isolates (PB1 – PB10) by DPPH.	67
FIGURE 4.4.	. Tolerance of the isolates (PB1 – PB10) to bile salt.	68
FIGURE 4.5. (a)	The anti-microbial activity against the human pathogens.	69
FIGURE 4.5. (b)	The zone of inhibition against the human pathogens.	69
FIGURE 4.6.	Simulated gastric fluid tolerance at two different pH (2 & 7).	71
FIGURE 4.7.	The auto-aggregation and the surface hydrophobicity of the selected isolates (PB1-PB10).	72
FIGURE 4.8.	The cholesterol reducing rate of the isolates (PB1 – PB10).	73
FIGURE 4.9.	The investigation of optimum temperature (A) and pH (B) of the selected isolates.	74 - 75
FIGURE 4.10.	The agarose gel electrophoresis of amplified PCR product of all the isolates (PB1 – PB10). The lane represents the DNA of the following isolates respectively; In A: PB1, PB2, PB3, PB4, PB5 and 1 kb ladder	76

	In B: PB6, PB7, PB8, PB9, PB10 and 1 kb ladder.	
FIGURE 4.11.	The phylogenetic tree of PB1 which showed maximum homology with the genus <i>Bacillus</i> and species <i>cereus</i> and the strain name designated to this isolate is BURD CU1.	78
FIGURE 4.12.	The phylogenetic tree of PB2 which showed maximum homology with the genus <i>Streptococcus</i> and species <i>thermophilus</i> and the strain name designated to this isolate is BURD 1.	78
FIGURE 4.13.	The phylogenetic tree of PB3 which showed maximum homology with the genus <i>Streptococcus</i> and species <i>thermophilus</i> and the strain name designated to this isolate is BURD PB3.	79
FIGURE 4.14.	The phylogenetic tree of PB4 which showed maximum homology with the genus <i>Streptococcus</i> and species <i>thermophilus</i> and the strain name designated to this isolate is BURD PB4.	79
FIGURE 4.15:	The phylogenetic tree of PB5 which showed maximum homology with the genus <i>Streptococcus</i> and species <i>thermophilus</i> and the strain name designated to this isolate is PB5.	80
FIGURE 4.16.	The phylogenetic tree of PB6 which showed maximum homology with the genus <i>Bacillus</i> and the strain name designated to this isolate is BURD CU7.	80
FIGURE 4.17.	The phylogenetic tree of PB7 which showed maximum homology with the genus <i>Lactobacillus</i> and species <i>fermentum</i> and the strain name designated to this isolate is BURD PB7.	81
FIGURE 4.18.	The phylogenetic tree of PB8 which showed maximum homology with the genus <i>Streptococcus</i> and species	81

	<i>thermophilus</i> and the strain name designated to this isolate is BURD PB8.	
FIGURE 4.19:	The phylogenetic tree of PB9 which showed maximum homology with the genus <i>Streptococcus</i> and species <i>thermophilus</i> and the strain name designated to this isolate is BURD PB9.	82
FIGURE 4.20.	The phylogenetic tree of PB10 which showed maximum homology with the genus <i>Streptococcus</i> and species <i>thermophilus</i> and the strain name designated to this isolate is BURD PB10.	82
FIGURE 4.21.	The overall phylogenetic tree of all the isolates (PB1 to PB10) showed maximum homology with different genus <i>Bacillus</i> , <i>Lactobacillus</i> and <i>Streptococcus</i> and which are all constructed under one tree and showed the detailed relationship between the entire isolates.	84
FIGURE 4.22.	The GC analysis showing best match to confirm the species of the selected isolates.	85
FIGURE 5.1	The flow chart diagram of the design of the study with the animal model.	92
FIGURE 5.2.	A comparative study of loss of body mass of BALB/c mice during the colitis induction.	100
FIGURE 5.3.	A comparative study of loss of body mass of DSS induced BALB/c mice.	102
FIGURE 5.4:	A comparative study of gain of body mass for DSS induced BALB/c mice during treatment with different combinations of probiotics and prebiotics.	104
FIGURE5.5(a,b).	The arrows indicates the irregular crypts, damage of epithelial surface, inflammations and shedding of the smooth muscle linings, infiltrations of inflammatory cells in sub mucosa,	105

	edema in sub mucosa.	
FIGURE 5.6.	The evaluation of the level of conjugated bilirubin, unconjugated bilirubin and total bilirubin.	107
FIGURE 5.7.	The comparative study of LFT enzymes in R1, R2 and R9.	108
FIGURE 5.8.	The haemoglobin assay of the R1, R2 and R9.	108
FIGURE 5.9.	The comparative study of the count of Gram negative anaerobes in the faecal matter of the animal models that is either diseased or treated with respect to the control.	110
FIGURE 6.1.	Western blot of anti-inflammatory cytokine (IL-10) and pro-inflammatory cytokines (TNF- α , IL-1 β , IL6, NF- κ β , IL-12 and IFN γ). The designated animal models referred here are, R1: Control; R2: Diseased with DSS; R9: Treated with synbiotics on colitis induced mice.	120
FIGURE 6.2.	The comparative analysis of the pro-inflammatory and anti-inflammatory cytokines by ELISA.	122