LIST OF FIGURES

Figure 1: Major fermentation pathways for glucose by lactobacilli	7
Figure 2: Starch conversion by lactobacilli	8
Figure 3: Sucrose utilization by lactobacilli	8
Figure 4: Raffinose utilization by lactobacilli	9
Figure 5: Chemical structure of α-galactosides	10
Figure 6: Isomers of lactic acid.	12
Figure 7: Methods for production of lactic acid.	14
Figure 8: Flours made from different pulse dal	41
Figure 9: Microscopic images of isolated microbial colonies from fermented batters	45
Figure 10: Colony morphology of isolated bacteria from fermented batters	46
Figure 11: Catalase test of isolates	47
Figure 12: An electropherogram of pulse dal flour isolates	51
Figure 13: A representative sequence of pulse dal flour isolates	52
Figure 14: Phylogenetic tree based on 16S rRNA gene sequence	53
Figure 15: Profile of growth, pH, lactic acid production and titratable acidity	55
Figure 16: Growth kinetics fitted with modified Gompertz equation during fermentation.	57
Figure 17: Cell growth, pH as well as starch + sucrose consumption profile	59
Figure 18: Cell growth, pH as well as sucrose consumption profile	61
Figure 19: Cell growth, pH as well as raffinose consumption profile	62
Figure 20: Cell growth, pH as well as raffinose + starch consumption profile	63
Figure 21: Evaluation of isolates for α-galactosidase activity	65
Figure 22: Effect of different parameters on the production of α -galactosidase enzyme	66
Figure 23: Change in parameters during pigeon pea fermentation with by TIP culture	68
Figure 24: A flow chart for preparation of fermented beans	70
Figure 25: Flask containing different pulses inoculated with respective strains	71
Figure 26: Effect on pH	71
Figure 27: Effect on cell growth	72
Figure 28: Effect on pH upon addition of yeast extract	73
Figure 29: Effect on cell growth upon addition of yeast extract.	74
Figure 30: Effect of manganese sulphate, yeast extract and beans on pH	75
Figure 31: Effect of manganese sulphate, yeast extract and beans on cell growth	76

Figure 32: Chromatogram of standard lactic acid	77
Figure 33: Chromatogram peaks of lactic acid at different fermentation time in PP	78
Figure 34: Chromatogram peaks of lactic acid at different fermentation time in RL	79
Figure 35: Chromatogram peaks of lactic acid at different fermentation time in BG	80
Figure 36: Chromatogram peaks of lactic acid at different fermentation time in BB	81
Figure 37: Concentration of LA in pulse-based medium at various time intervals	82
Figure 38: Chromatogram of standard acetic acid and ethanol	82
Figure 39: Chromatogram peaks of acetic acid and ethanol in PP	83
Figure 40: Chromatogram peaks of acetic acid and ethanol in RL.	84
Figure 41: Chromatogram peaks of acetic acid and ethanol in BG	84
Figure 42: Chromatogram peaks of acetic acid and ethanol in BB	85
Figure 43: Flask containing different beans inoculated with respective cultures	87