CHAPTER 7

SUMMARY

AND

CONCLUSION

SUMMARY AND CONCLUSION:

The microbial strains were isolated from human milk, cow milk, curd and yoghurt and subjected to investigate the probable probiotic properties. Altogether, ten isolates named as PB1 to PB10 were investigated and characterized based on their phenotypic and genotypic manifestations along with molecular taxonomical identification through 16S rDNA sequencing. Out of the ten isolates, seven were recognized as new strains of *Streptococcus thermophilus*, two of them were new strains of *Bacillus* sp. and one new strain was identified as *Lactobacillus fermentum*. The highest tolerance level to simulated gastric juice were exhibited by PB1 which was marked as *Bacillus cereus* although other nine strains also showed their maximum tolerance level to gastric juices. These isolates were also nominated for biochemical evaluation to assess their probiotic belongings. All strains were more or less vulnerable to ampicillin, erythromycin, streptomycin, tetracycline, penicillin and chloramphenicol. And they also displayed antibacterial activity against Gram (-) ve human pathogens such as, *Vibrio cholerae* 0139, *Pseudomonas aeruginosa.* Additionally, the selected bacterial strains exhibited low pH resistance, bile salt tolerance activity, anti-oxidant activity, cellular auto- aggregation ability along with cell hydrophobicity against indicator organisms. Phenotypic documentations excellently discriminate the isolated probiotic strains based on their sugar fermentation patterns along with catalase test, oxidase test, arginine dehydrolase analysis, and amylase assay which also support the strain identification through genotypic representation. The selected PB1 to PB10 probiotic strains also showed robust endurance properties and act as a potent therapeutic agent in the GI tract of mice which was confirmed through *in vivo* disease (colitis) induction and supplementation with different combinations of probiotic, prebiotic and synbiotic. The immunomodulatory effect on mice

supplemented with probiotic strains was assessed and it was confirmed that, these probiotics were able to change the host's defense mechanism through its pro- and anti- inflammatory effects.

In summary, the development of new strains and different technological approaches undertook in the present study offers exhilarating possibilities for probiotics to use as an alternative therapeutic tool to combat gastro-intestinal diseases.