5. OVERALL SUMMARY AND CONCLUSION

The aim of the current research work was to isolate and partially identify the microalgal associated bacteria from the selected Marine microalgae cultures like *Chlorella salina, Chaetoceros calcitrans, Dicarteria inorta, Dunaliella salina, Pavlova sp., Isochrysis galbana, Nannochloropsis occulata* and *Tetraselmis suecica*. The isolated bacteria were identified through Gram’s staining and Biochemical tests. Then the isolated bacteria were screened for antagonistic property against the aquatic pathogens and finally the potent antagonistic bacteria was molecularly identified through 16S rRNA sequencing. Ten different bacteria were isolated, and identified. They were *Alteromonas* sp., *Bacillus* sp., *Halomonas* sp., *Planococcus* sp., *Pseudoalteromonas* sp., *Vibrio* sp., *Micrococcus* sp., *Enterococcus* sp. *Pseudomonas* sp. and *Photobacterium* sp. Among these isolates, *Vibrio* sp., MMB2 had the best antagonistic property against all tested pathogens and hence it was selected for the present study.

The potent bacteriogenic bacteria identified through 16S rRNA sequencing was found to be a new strain and named as *Vibrio* sp. MMB2. Inorder to achieve the maximum cell growth (Biomass) and BLIS activity, the culture media were optimized through various physico-chemical factors such as different culture media, pH, temperature, different carbon sources, nitrogen sources, organic nitrogen, metal ions, vitamins and surfactants. All the tested culture media MRS media had the maximum biomass and BLIS activity. Among the carbon sources, the lactose had maximum biomass the optimum pH was pH6. Of the various NaCl concentration tested for biomass production and BLIS activity, the 3% had maximum growth and activity. Among all the studied nitrogen and organic nitrogen sources, the maximum
growth and activity was observed in ammonium nitrate and yeast extract respectively.

The BLIS was partially characterized through various physico-chemical parameters like pH, temperature, UV radiation, NaCl concentration, agar concentrations, enzymes, solvents, surfactants and mode of activity of BLIS was also studied. From the studies, the BLIS activity was slightly affected by pH, temperature, enzymes, surfactants and solvents. The pathogenic bacterial cell membrane was destroyed by BLIS compound. The molecular weight determined by SDS-PAGE showed two bands which were observed as 12 kDa and 32 kDa. From this studies, the bacteriocins was identified as a heat labile and high molecular weight peptide and hence it can be included under class IV type bacteriocins.

The last chapter was carried out to screen the enzymes like amylase, protease, lipase and phytase found in the new strain of probiotics bacteria which promote growth and digestion in P. monodon by secreting these enzymes in the gut and thereby digest the carbohydrates, lipids and protein substances.

From this study, it has been evident that the microalgal associated bacteria Vibrio sp. MMB2 produces BLIS, that has antagonistic effect against aquatic pathogens and also efficient in digesting the carbohydrates, lipid and protein substances and hence this strain could be used as probiotic in aquaculture field. Considering the significance in the application of bacteriocins in different area of industrial utility mainly in aquaculture disease management instead of antibiotics and preservatives in food industry, this study has placed an important step stone in this area.