CHAPTER 8

CONCLUSIONS AND SUGGESTIONS

This research focused on the characterization of *Nostochopsis* spp. Morphological, genetic diversity, ultrastructural and biochemical characteristics were used to characterize these cyanobacteria. Furthermore, cultivation and prebiotic usage of polysaccharide from these cyanobacteria were studied. The results were concluded as follows:

1. *Nostochopsis* spp. were found attached on rocks, concrete, granite, baked clay, limestone and free floating in slow flowing water and clean - moderate water quality.
2. The DNA extraction protocols for *Nostochopsis* spp. were compared. These methods used cheap, convenient and available chemicals and agents, such as NaCl, glass bead, sonicator, liquid nitrogen and PVPP. Some methods have their own pros and cons which could be chosen and adapted according to the availability in each laboratory. Moreover, this improved method could be used for other cyanobacteria such as *Nostoc* and *Phormidium* and other groups of algae.
3. A polyphasic methodology, which integrates phenotypic, genotypic data, ultrastructure of cell is a better method for characterization of *Nostochopsis* spp. although, pigments were not suitable for use in this study.

Nostochopsis is mostly related to *Fischerella*, *Hapalosiphon* and *Westiellopsis*. *Nostochopsis* sp.2 morphotype CM4, NT2, NP1, MP2 and TISTR8894 showed 98% similarity with *Nostochopsis* sp. HA4207- MV1. *Nostochopsis* sp.1 morphotype CM1, CM2, CM3, NT1 and MP1 may represent a new genus.

4. Limestone is the best natural substrate for cultivation of *Nostochopsis* sp.2 CM4. The substrate was suitable for cyanobacterial attachment. Suitable period for harvesting *Nostochopsis* sp.2 CM4 biomass was 60 days.

5. Polysaccharide yield of *Nostochopsis* spp. from different sites varied. The major monosaccharides from *Nostochopsis* spp. were rhamnose, mannose, fructose and glucose. Oligosaccharide from *Nostochopsis* was determined in pure and mixed culture. It was found that *Lactobacillus fermentum* CM33 was able to grow in oligosaccharide containing medium. However, inhibition of pathogens; *Salmonella enteritidis* and normal flora; *Escherichia coli* O157:H7 growth was not observed. The relationship between the prebiotic effectiveness and DP should be studied. Structure of oligosaccharide and monosaccharides composition should be studied for biomarker. Pure enzyme for hydrolysis of oligosaccharide should be used.