CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusion

Diversity study of *Pediastrum* spp. at 68 sampling sites in some freshwater resources of Thailand was carried out from June 2011-May 2012. A total of 26 species consisting of 60 taxa were found. Twenty two taxa were new records of Thailand. In term of the numbers of *Pediastrum* taxa, *P. duplex* was the most widely distributed of the total *Pediastrum* population. *P. boryanum* and *P. simplex* were the second largest species followed by *P. tetras*, *P. biradiatrum, P. angulosum, P. araneosum, P. clathratum, P. integrum* and 17 remaining species i.e. *P. alternans, P. argentinense, P. asymmetricum, P. biwae, P. braunii, P. emarginatum, P. kawraiskyi, P. longicornutum, P. muticum, P. obtusum, P. orbitale, P. pertusum, P. privum, P. sculptatum*, *Pediastrum* sp. 1, *Pediastrum* sp. 2 and *Pediastrum* sp. 3. were found in smaller number

The water quality at the 68 sampling sites as determined by the Applied Algal Research Laboratory Physical and Chemical Score (AARL-PC Score) and based on trophic status were classified as oligo-mesotrophic to hypereutrophic and clean-moderate to very polluted water quality. Hypereutrophic water were found in 2 sampling sites: SMP1 (Samut Prakan province) and SKN1 (Sakon Nakhon province) where *Pediastrum* spp. were not found.

Pediastrum spp. can be found in oligo-mesotrophic, mesotrophic, meso-eutrophic and eutrophic conditions, they were most commonly found in meso-eutrophic and mesotrophic conditions. So, they could be used to assess water quality in the meso-eutrophic status. *P. alternans* Nygaard, *P. angulosum* Ehrenberg ex Meneghini, *P. angulosum* var. *coronatum* (Raciborski) J.Komárek & V.Jankovská and *P. braunii* Waetm. Schweiz could be used to assess water quality in oligo-mesotrophic status.

Dominant species in this study: *P. boryanum, P. duplex, P. simplex* and *P. tetras* were selected for optimal study of media, pH and temperature. *P. boryanum* was found to grow best in BBM followed by JM and AM. *P. duplex, P. simplex* and *P. tetras* grew best in JM followed by the growth in BBM and AM respectively. *P. boryanum* grew best at pH 7.5 in BBM and *P. duplex, P. simplex* and *P. tetras* grew better at pH 8.0 in JM. *P. boryanum, P. duplex, P. simplex* and *P. tetras* exhibited highest growth at room temperature.

After the optimal conditions for growth were identified, the algae were cultivated and scaled up to get higher biomass for nutritional value determination. Protein and carbohydrate were the major components in these algae which can be applied as food supplement in human and animal feed.

A total of 21 strains were isolated from different sampling sites for molecular analysis. Phylogenetic analysis of *Pediastrum* spp. 26S rDNA and rbcL were performed. The species identification was consistent with morphological characteristics, photographs

from light and scanning electron microscope and phylogenetic study. This congruent confirmed the morphology of *Pediastrum* spp.

6.2 Recommendations

From this investigation, the following recommendations are proposed:

1. This study focused on the diversity of *Pediastrum* in various parts of Thailand. Although, many new record species were found and water quality was also assessed, routine monitoring is required for clearer correlation between *Pediastrum* spp. distribution and water quality.
2. According to the phylogenetic approach, more samples and more genes should be analyzed to improve the understanding of the diversity of *Pediastrum* spp. in Thailand.