

CHAPTER 6

CONCLUSIONS

The diversity, taxonomic evaluation and eco-physiology of cyanobacteria from some solar saltfields of Thailand were characterized. Totally, thirty-three species in twenty-three cyanobacterial genera, which are almost in filamentous form, were found in this study. *Coleofasciculus chthonoplastes*, *Spirulina subsalsa* and *Oxynema thaianum* were considered as dominant species because they were found throughout the whole studied areas with salinity ranging from 50-250 ppt. The number of cyanobacterial species declined when salinity increased.

In this study, only 12 monospecific strains were successfully obtained in BG-11 agarized medium, mostly in media with 3 % of NaCl. Unfortunately, all of dominant species in this study cannot successfully grow in cultures. As it is well known, the isolation and cultivation is the basic important methods for study cyanobacteria, their ecophysiology and also genetic position in phylogenetic tree. However, in fact there are less than 1 % of strains which found in nature can be successfully transferred into cultures. Therefore, the methods of cultivation and isolation of halophilic cyanobacteria should be intensively improved in future. Some small amounts of soil sample should be added also in media.

The ecophysiology of some selected strains was studied as well. The growth dependence under salinity gradients showed that most of them are halotolerant

species. The only exception is *Oxynema thaianum*. From the result follows that this strain is evidently halophilic species. The growth of two strains of *Nostoc* (*Nostoc* sp.1 and *Nostoc* sp.2) under light and temperature gradients were studied. It was found that both two strains grow quite well under the temperature range from 20-24 °C but in different ranges of light irradiance. *Nostoc* sp. 1 grows under light intensity between 100-500 $\mu\text{mol.m}^{-2}.\text{s}^{-1}$ and 70-100 $\mu\text{mol.m}^{-2}.\text{s}^{-1}$ for *Nostoc* sp. 2, respectively. Both species differed also in their relations to salinity. *Nostoc* sp. 2 does not grow in higher salt concentrations.

The combined methods (so called “polyphasic approaches”) including morphology, eco-physiology, molecular evaluation and ultrastructure were employed to study of the strain of *Oxynema thaianum* CCA 960 which morphology is similar to *Phormidium*. The result from 16S rRNA gene sequencing showed that the cluster containing this species represented in the phylogenetic tree an isolated clade with less than 93 % similarity to the nearest cluster. It means that this whole cluster should be separated into a new genus: *Oxynema* gen. nov. with the type species *Oxynema thaianum* comb. nov., sp. nov. was therefore described (Chatchawan *et al.*, 2012). The polyphasic evaluation was applied also to other isolated strains, but this study was not yet published (*Halomicronema*, *Halothece*, *Wolleea*, and others).

This study give an idea and provide some information about diversity, distribution and appearance of cyanobacteria in saltwork biotopes in Thailand. The diversity of cyanobacterial flora found in our localities, is relatively low. Most of them are unknown species which do not correspond to any described taxon or they are still unclear up to now. The cyanobacterial diversity may be diverse more than in this

study. Therefore, further study must be continued to solve the problematics of unclear the species and their taxonomic position in phylogenetic trees. The modified methods for cultivation of halophilic species have to be developed and the species found in nature should be transferred into cultures as many as possible. The knowledge of ultrastructure, eco-physiological characteristic and molecular evaluation of each strain were strongly recommended to apply for studying cyanobacteria not only in such our hypersaline habitats but also from all environments.