Sujittra Suwan 2014: Correlation of Algal Proliferation and Water Quality in Bang Phra Reservoir. Master of Engineering (Environmental Engineering), Major Field: Environmental Engineering, Department of Environmental Engineering. Thesis Advisor: Associate Professor Patcharaporn Suwanvitaya, M.Appl.Sc. 188 pages.

Bang Phra Reservoir (BPR) is a source of water supply for domestic and industrial use in Sri Racha District, Chonburi Province, Thailand. In recent years there have been a number of severe algal blooms in the reservoir. The bloom will affect the production process and the quality of the water supply. This research aimed to determine the seasonal and spatial changes in the population of the various algal groups which was found in BPR. This involved water quality analyses, in particular, the parameters vital to the growth of algae. This study was conducted during April 2013 to March 2014. Samples were collected, once a month during study period, from eight points in the reservoir. Algal population density was determined by chlorophyll-a content, algae identified by morphological and molecular (PCR-DGGE) methods. It was found that chlorophyll a content in BPR varied in the broad range of 7.46 to 82.09 μg/L with an average value over the eutrophication threshold of 10 μg/L. Algal population was high in rainy season to cold months (from July 2013 to January 2014 with peak in August), and low in summer (April to June 2013).

By morphological identification, 54 genus in 7 divisions of algae were found in BPR. Chlorophyta was the division with the highest degree of diversity with 26 genus found. Molecular identification of Cyanophyta in proliferation period was carried out. The results obtained from nucleotide sequencing of PCR-DGGE products showed 98% similarity to *Synechococcus* sp. Water quality analysis showed that nutrient contents varied with seasonsal change. Orthophosphate (0.007-0.085 mgP/L), ammonia (0.03-0.21 mgN/L) and nitrate (0.2-0.6 mgN/L) contents were conformed to Thailand Pollution Control Department standard for surface water. However, the contents were in the range higher than those required for algal growth. Variation of chlorophyll a content followed the same trend as those of orthophosphate. Considering N:P ratio, phosphorus was found to be the limiting factor algal growth for algal growth in BPR.

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