Preliminary Investigation on Vertical Distribution of Phytoplankton Biomass and Nutrients in Tasik Biru (Blue Lake), Bau, Sarawak.

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Abstract

Located in Bau district, Sarawak, Tasik Biru, formed from an open cast gold mining pit, was opened to the public as recreational area in 2001. Due to the gold mining activities, the water contains high content of arsenic as declared by Natural Resources and Environmental Board (NREB) of Sarawak. Therefore, this study served as a baseline data on determining the fertility of the lake in terms of phytoplankton biomass composition. The study was carried out in seven months period (May - November 2007). Water samples were taken from three different depth namely subsurface, middle and bottom layers at the shallow side of the lake for determination of chlorophyll *a* concentration. Besides that, the nutrient analyses namely orthophosphate, nitrate and ammonia were also conducted to observe their relationship with phytoplankton biomass. Tasik Biru was categorized as oligotrophic lake based on the range of the chlorophyll *a* concentration in the sampling period (0.6831 µg/ℓ to 3.1047 µg/ℓ).

Key words: phytoplankton, vertical distribution, biomass, lake

Introduction

Phytoplankton is free-floating microscopic algae which utilize photosynthesis in order to produce their own food (Sze, 1998), thus become an important primary producers in aquatic ecosystem. In addition, phytoplankton is important in maintaining the global carbon cycle (Graham & Wilcox, 2000), serves in economic benefits to human (Sze, 1998) and contribute as good indicator of environmental change (Sze, 1998; Sivonen & Jones, 1999).

The autotrophic ability of phytoplankton is contributed by one of the important pigments namely chlorophyll *a* which is the principal photosynthetic pigments for all levels of algae (Sze, 1998). The estimation of chlorophyll *a* biomass was widely utilized in order to consider the phytoplankton basically as primary producers, abundance measurements and served as better indication of the productivity of the aquatic environment (Payne, 1986).

Located in Bau district, Sarawak, Tasik Biru which was formed from an open cast gold mining pit, and opened to the public as recreational area on 2001. Due to the gold mining activities, the water contains high content of arsenic as declared by Natural Resources and Environmental Board (NREB) of Sarawak. The NREB observation in 2005 showed that Tasik Biru was heavily polluted by arsenic, which is 0.79 mg/ℓ. This concentration is greatly exceeding Class IIA/IIB of 0.05 mg/ℓ of National Water Quality Standards for Malaysia (NWQSM).