Algal communities analysis as an assessment of the trophic status of Ayer Hitam Forest Reserve

ABSTRACT

Studies of algal biodiversity in relation to nutrient status of water bodies in Malaysia are lacking. In Ayer Hitam Forest Reserve (AHFR), succession of the freshwater algae and physico-chemical parameters were studied in 16 weeks starting from November 2014 until February 2015. Identification and enumeration of algae cells were done using Neubauer chamber (hemocytometer), whereas physico-chemical parameters including pH, water temperature, light intenstiy, dissolved oxygen, total dissolved solid were determined in situ. Parameters such as ammonia, nitrate, phosphate and silica were measured in the laboratory. Pearson Correlation Analysis principal component analysis (PCA) and canonical component analysis (CCA) were used to establish correlation with the physico-chemical parameters such as light intensity, temperature, pH, total dissolved solid, dissolved oxygen and nutrients status including the concentration of ammonia, nitrate, phosphate and silica. Dominating algae species found were Dinobryon sertularia, Gymnodinium palustre, Gonyaulax apiculata and Navicula sp. . Gonyaulax apiculata and Dinobryon sertularia were found to have correlation with total dissolved solid, nitrate, phosphate and light intensity. Shannon-weaver and evenness indices were used to measure the species diversity at the lake and indicated that the lake was low in nutrients (oligotrophic lake). The species richness and diversity was quite stable and the water in the lake was indicated as moderately polluted. Due to the acidic condition of the lake, only selected algae species tolerated, survived and dominated the lake.

Keyword: Algae; Freshwater; Ayer Hitam Forest Reserve; Succession; Diversity; Physicochemical parameters; PCA; CCA