

## ABSTRACT

Spatial and temporal distributions of phytoplankton were investigated at Carey Island, Banting, Selangor. Sampling was started on April 2009 until March 2010 and was done during high tide and low tide at 3 different stations (ST1, ST2 and ST3). In this study the relations of spatial and temporal composition of phytoplankton with environmental parameters which mainly the physiochemical parameters were determined. A total of 84 species of phytoplankton that comprised of 23 orders, 32 families and 41 genera were identified with aid from light microscopy and SEM. Spatially, though recorded with the lowest cells abundance, the highest  $H'$  and  $E$  were displayed at ST1 with the values of 3.761 and 0.601 respectively, whereas ST3 that was recorded with the highest abundance displayed the lowest  $H'$  and  $E$  with the values of 3.143 and 0.493 respectively. ST3 showed the highest number of species with 83 species were sampled, ST2 (81 species) and finally, ST1 (73 species). UPGMA Modified Morisita's Similarity showed all the 3 stations shared more than 90% species composition. Temporally, during high tide, phytoplankton composition has at least more or almost 80% similarity on species composition between months. However, there was an exception for the composition in July 2009; in which the composition displayed less than 5% similarity with phytoplankton composition in other months. Phytoplankton abundance and species richness in high tide was higher compared to low tide. ST3 in June 2011 during high tide observed to have the highest species richness with 50 species recorded concurrently with high  $H'$  of 3.924. *Skeletonema costatum*, *Pseudo-nitzschia pungens*, *Thalassiothrix fraunfeldii*, *Leptocylindrus danicus*, *Coscinodiscus* spp. and *Campylodiscus daemilianus* were the most common species at study site. Effect on relationships of phytoplankton and physiochemical factors were done in general, in which the specific parameters those effected spatial and temporal distribution of phytoplankton were not established. Generally, Pearson's correlation ( $r$ ) proved 2

nutrients concentrations which were nitrate and silicate had significant linear correlation with phytoplankton abundance in both tides, whereas both phosphate and sulphate showed significant correlation to abundance only in low tide. The physical parameters, temperature and dissolved oxygen showed moderate significant linear correlation with cells abundance in high tide and low tide. Nevertheless, rainfall and tidal variations were observed as the main cause influencing the phytoplankton abundance and distribution at study site, whereas the physiochemical factors became the indirect causes. Both rainfall and tidal variation were observed to influence most of the physiochemical parameters at Carey Island mangrove ecosystem. Via seasonal observation, 2 occasions of phytoplankton bloom were recorded at study site. The first bloom was caused by chain-forming species which was the *S. costatum*, which was detected in April, May and August 2009, while the second bloom was caused by *Pinnularia* spp. which was observed in July 2009.