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Coastal water quality of Tioman Island: effects of human activity and the distance from shoreline

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Abstract

A study was conducted to know the (i) effect of anthropogenic activity and (ii) effects of distance from shoreline on the coastal water quality of Tioman Island, Malaysia. This study was a part of marine expedition conducted on 4 July 2012 to understand coral diversity and distribution around coastal water of Tioman Island. A series of physicochemical parameters namely temperature, dissolved oxygen (DO), pH, salinity, transparency, total suspended solids, nitrate, ammonia, phosphate phosphorus, and silicate were determined in this study. A total of 16 different study sites (stations 1–16) were selected in the coastal water around the Tioman Island. Half of the study sites was located within 1 km from the shoreline and other half was located approximately 6 km away from the shoreline. Some study sites are characterized by no human activity, while some sites are characterized by diving activities. A few study sites are characterized with both diving activity and near residential area. The overall mean values of different water quality parameters recorded in the all sampling stations were temperature 27.98 ± 0.40°C, pH 8.34 ± 0.02, DO 6.92 ± 0.43 (mg l^{-1}), salinity 33.54 ± 0.11 pss, TSS 0.39 ± 0.03 g l^{-1}, nitrate 0.85 ± 0.55 μM, ammonia 1.89 ± 0.56 μM, phosphate 0.16 ± 0.09 μM, and silicate 2.62 ± 0.76 μM. Temperature, DO, transparency, salinity, and ammonia were significantly affected by anthropogenic activity, while anthropogenic activity had no significant effect on pH, total suspended solids, nitrate, and phosphate. No significant difference was observed between the water quality of 1 km from shoreline and 6 km away from shoreline. Good and careful management by the authorities of this island may save the biodiversity and beauty of the coastal water of Tioman Island. Therefore, a balance between human activity and conservation of biodiversity on the coastal water of Tioman Island is needed.

Keywords: Salinity, Dissolved oxygen, Ammonia, Transparency, Malaysia