Analysis of environmental variables and fouling organisms on an experimental artificial reef area of Daya Bay

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**Abstract:** Artificial reef is considered great effect on surrounding factors, and which has been developing in china. Here, we apply a case of an experimental artificial reef area in Daya Bay to indicate changes of environmental factors and fouling organisms. From Apr-2007 to Nov-2008, the result of linear fitting showed variations of environmental factors such as temperature, pH and dissolved oxygen didn’t show difference in control area (CA), reef area (RA) and experimental area (EA), they had similar slope and person correlation coefficient. Parameters investigated as salinity, ammonical nitrogen, nitrate nitrogen, phosphate and chlorophyll a showed very different variation pattern among CA, RA and EA, which demonstrated that reef affected the above environmental factors obviously. Principal component analysis (PCA) grouped sampling sites into three different groups, zone 1 mainly were comprised from sampling sites of EA and CA, the sampling stations included in zone 2 were from RA, and zone 3 included RA and EA. PCA also showed there was a relationship between salinity and chl-a for PC1, and which was associated with upwelling induced by reef. Seasonal changes of fouling organisms showed organisms biofouled on steel reef and concrete reef very quickly and reached more than 70 species after one month, the results of canonical correspondence analysis (CCA) indicated that depth, transparence and dissolved oxygen were the dominate factors in the distribution of attaching organisms, and CCA taxis fairly reflected the correlation between the distribution of attaching organisms and environmental factors. Our study demonstrated that reef probably mainly affect environmental factors such as salinity, nutrients and chlorophyll to restore the habitat environment.