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THE ROLE OF WATER QUALITY ON STRUCTURING THE FOULING COMMUNITY SETTLED IN LONG TERM TEST PANELS DEPLOYED IN COLOMBO PORT, SRI LANKA

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Abstract

Quality and quantity of the fouling community, breeding period, breeding intensity and subsequent larval abundance and survival of fouling organisms are greatly depending on environmental variations. Specifically, changes in water quality might have act collectively or individually along with adaptations of species, in order to complete the life cycle of fouling organisms that make up the fouling community. Therefore, understanding of the changes in water quality in the port environment was recognized as important. Thus, the present study demonstrates the role of water quality parameters in structuring the fouling community in different depths of the sampling locations in Colombo Port. The study was conducted in six sampling locations (NPS-New Pilot Station, PJ-Passenger Jetty, BQ-Bandaranayake Quay, DOCB-Dockyard Berth, UCT-Unity Container Terminal, CICT- Colombo International Container Terminal) within the Colombo Port for a period of one year and water quality parameters such as pH, conductivity, salinity, temperature, total dissolved solids (TDS), and dissolved oxygen (DO) were measured at the site itself using a multiparameter (YSI ProPlus). The fouling community was investigated long-term in four sampling locations (PJ, BQ, UCT, and CICT) using locally fabricated experimental structures that were submerged in four depths (1 to 4m). Results of the experimental panels ratified that fouling community was varied with the location and it was depth-specific. Further, physico-chemical parameters of water in sampling locations showed a significant difference. This may occur due to locations specific port activities, and it caused changes in the fouling community composition in the port environment. As per the statistical analysis of long-term community along with PCA of water quality, there was a marked correlation among the water quality, species composition and settlement of fouling organisms at different depths of the locations. MANOVA test results further confirmed the PCA results of long-term test panels where a significant difference ($p < 0.05$) was observed towards different depths of sampling locations in terms of species settlement; further indicating the effect of physico-chemical factors on the settlement of fouling organisms in different locations in Colombo Port.

Keywords: experimental panels, fouling community succession, physicochemical parameters