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Biofouling Community Assemblage in Coastal Waters Adjacent to Port of Colombo, West Coast of Sri Lanka

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Abstract

Port of Colombo which controls majority of country's foreign cargo has been the major trading center of the country for decades. Although, the port has been subjected to Port biological baseline surveys for non-indigenous species, adjacent coastal waters have obtained limited attention. Hence present study was conducted in three sampling locations; Dikkowita Fisheries Harbour, Kirulapone canal opening, Panadura Fisheries Harbour along the coastal waters adjacent to Port of Colombo. Panadura Fisheries Harbour was taken as the reference point due to its distance from Colombo Port and relatively low international shipping activities. Combination of environmental surveys with photo quadrant sampling, and submerged structure sampling was conducted to detect fouling and associated organisms. A modified version of survey procedure and protocol developed by Marine Biological Association of United Kingdom was followed for the study. Convenience sampling method was used to select sampling points where four replicates of quadrants were randomly placed within 12 m long belt transect. Coral Point Count with Excel Extension version 4.1 software was used to quantify the abundance of the species by estimating the percentage cover and the individual count from each photo quadrant. Environmental surveys were carried out once in two months' intervals along the inter-tidal zone of each study location. Artificial structures having four substrate types were deployed at a depth of 2 m from the water surface in all 3 sampling locations and sampled once in two months' intervals. Randomised Complete Block Design analysis were conducted using number of individuals, percentage area covers, study locations, monsoon seasons and tide hitting attributes as variables. A total of 49 taxa were recorded during the course of the study. Highest number of species were recorded from phylum Mollusca. Oysters species were the dominant macro fouling organisms in terms of percentage area cover in Dikkowita (33.39% cover) and Wellawatte (49.80% cover) study locations. Recording the presence of three Non-indigenous species; *Isognomon alatus*, *Cassostrea virginica*, *Ostrea edulis* together with four globally known invasive species: *Balanus amphitrite*, *B. reticulatus*, *Perna viridis*, was alarming. Randomised Complete Block Design analysis for both biofouling organisms number and percentage area coverage confirmed a significant paired interaction between tide hitting attributes and study locations. Similarly, significant paired interactions were yielded between monsoon seasons and study locations. Submerged structure sampling recorded tube-worm species as the climax species in the wooden substrate, conversely no climax species were observed on other substrate types.

Keywords: Biofouling, Port of Colombo, Port biological baseline survey, Non-indigenous species