Variation of Plankton Composition in Ballast Water of Ships Visiting Colombo Harbour and Western Coastal Area of Sri Lanka

I. L. Balasooriya [a]*, J. M. C. K. Jayawardana [a] and W. I. H. K. Wijerathne [b]

[a] *Department of Natural Resources, Sabaragamuwa University of Sri Lanka, P.O. Box 02, Belihuloya 70140, Sri Lanka.*
[b] *Marine Environment Protection Authority, No. 758, Baseline Road, Colombo 09.*

*Correspondence: *Iresha.balasooriya@gmail.com*

Accidental introduction of alien invasive species through ballast water discharges from ships has raised global attention as a major cause of marine invasions. Colombo harbour facilitates a large number of ships annually and a great amount of ballast water is discharged into the harbour during deballasting operations. The present study was carried out to identify variation of plankton assemblages in ballast water of ships arrived at Colombo harbor, and Western coastal area of Sri Lanka in order to identify possible introductions of marine planktons through ballast water. Plankton samples were collected from five ships arrived at Colombo harbour and three local sites including Colombo harbour, Panadura and Pamunugama. Physical and chemical parameters including water temperature, pH, turbidity, salinity, Electrical conductivity, total dissolved solids, nitrate and orthophosphate were also recorded at sampling locations. Plankton assemblages of local sites and ballast water were evaluated using univariate and multivariate statistical tests.

A total of 126 plankton taxa were recorded in the samples. Twenty six out of 70 taxa recorded in ballast water were totally alien to Western coastal area of Sri Lanka. A significant ($p<0.05$) difference was observed in physical and chemical parameters excluding conductivity and nitrate among four sampling sites. Zooplankton communities were dominated by Copepod nauplii in all four sites. Alien plankton species observed in ballast water samples included Peridinium spp., Ceratium declinatum, Ceratium dens, Rhizosolenia setigera and Prorocentrum spp which are known to be toxic and some of them are well known for bloom forming.

Findings of this research revealed a greater potential of accidental introduction of alien planktons to Sri Lankan coastal waters via ballast water. Therefore adoption of ballast water discharge related regulations and implementation of effective management measures are important. This study also suggests that the continuous monitoring programmes in harbours and neighboring coastal area are important in early detection of new threats arising from plankton introductions.

Keywords: Alien species, Marine invasions, Toxic, Zooplankton