

Assessment of Macroalgae Diversity along the Economically Important Southern Coastal Zone of Sri Lanka during North East (NE) Monsoon Period

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Southern coastal zone acts as a highly productive ecosystem with rich macroalgae diversity. However, limited scientific studies have been conducted on macroalgae diversity in the southern coastal belt of Sri Lanka. The current study is focused on the assessment of the intertidal, macroalgae diversity along this coastal belt. This study was conducted using systematic sampling technique along the intertidal zone at 12 selected regional coasts (Hambantota, Godawaya, Rekawa, Tangalle, Dickwella, Polhena, Mirissa, Weligama, Unawatuna, Galle Fort, Dodanduwa and Hikkaduwa) representing three districts (Hambantota, Matara, Galle) of the southern province during NE monsoon period (December 2019 to February 2020). NE monsoon period was selected to minimize the climatic effects during sampling in different seasons. Macroalgae species were taxonomically identified using the recommended pictorial guides and literature records. Oneway Analysis of Variance (ANOVA) was employed to identify the variations of macroalgae diversity with sampling location ($p < 0.05$). According to the results, a total of 26 macroalgae species (10 belong to Chlorophyta: >38% richness, 10 in Rhodophyta: >38% richness, and 6 from Phaeophyta: >23 % richness) were identified in this coastal belt. Ecologically dominant species belong to division Chlorophyta out of all the sampling sites. Shannon-Wiener biodiversity index (H') of the macroalgae in respective ecosystems significantly changed with sampling locations ($p < 0.05$). The spatial variation pattern of biodiversity is correlated with unsustainable anthropogenic activities and natural factors. Shannon-Wiener biodiversity index (H') ranged at 0.67-2.59 in the study sites. The highest composition of macroalgal species (20) was recorded from the Godawaya site due to the minimum anthropogenic effect. Mirissa (02) and Dodanduwa (01) regions had the lowest macroalgae species richness and commercial activities were relatively higher along these coastal zones compared to all other sites. Accordingly, macroalgae act as the biological indicators reflecting the health status of respective ecosystems. So, the findings of this study would be important to identify the quality of the coastal zones and apply appropriate coastal conservation and management measures in the future. Also, the commonly recorded macroalgae species which belong to Chlorophyta and Rhodophyta can be sustainably utilized in processing value-added foods and other products. In conclusion, this study reveals the current status of macroalgae diversity on the southern coast during the NE monsoon period and detailed investigation of species composition is strongly recommended throughout the year.

Keywords: Biodiversity assessment, North east monsoon, Macroalgae, Intertidal zone, Coastal ecosystems