Photosynthetic performance, epiphyte biomass and nutrient content of two seagrass species in two areas with different level of nutrients along the Dar es Salaam Coast

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Abstract

Heavy nutrient loads in coastal waters often lead to excessive growth of microalgal and macroalgal epiphytes on seagrass leaves, with varying effects on the underlying seagrasses. This study evaluates the photosynthetic performance, epiphytic biomass and tissue nutrient content of two tropical seagrasses, Cymodocea serrulata and Thalassia hemprichii, in two intertidal areas along the Dar es Salaam coast in the Indian Ocean, a nutrient-rich region at Ocean Road (near the city centre), and a nutrient-poor region at Mjimwema (south of the city centre). Epiphyte biomass was significantly higher at the nutrient-rich site, and epiphytes were associated with reduced photosynthetic performance in both seagrass species at both sites. Likewise, nitrogen and phosphorus tissue content was higher in both species at the nutrient-rich site than at the nutrient-poor site. Epiphytic species composition on the seagrass leaves varied between seagrass species and between sites. Cymodocea serrulata had a higher number of epiphytic species at Mjimwema than at Ocean Road, whereas Thalassia hemprichii had more epiphytic species at Ocean Road than at Mjimwema. Seagrass photosynthetic performance, epiphytic biomass and nutrient content of the seagrasses were shown to be affected by nutrient concentration in the water column. Thus, for the future monitoring of the seagrass meadow, we recommend the use of combined measures such as seagrass performance, epiphytic biomass, nutrient contents and nutrient concentration levels in the water column.

Keywords
C:N:P ratio, Cymodocea serrulata , photosynthetic activity, Thalassia hemprichii