RESCON 2025 EES 30

CARBON STOCK ANALYSIS OF SEAGRASSES (*Enhalus* sp., *Cymodocea* sp., and *Halophila* sp.) IN PUTTALAM LAGOON, SRI LANKA

R.M.K.S. Rathnayaka[1]* and C.S. Munasinghe[2]

[1]Department of Environmental and Industrial Sciences, University of Peradeniya, Peradeniya, Sri Lanka.
[2]Department of Zoology, University of Peradeniya, Peradeniya, Sri Lanka.
*kaveeshya2019@gmail.com

Seagrass ecosystems are considered as one of the most threatened coastal ecosystems, which provide numerous ecological benefits including acting as a carbon sink by storing considerable amounts of organic carbon as blue carbon in their biomass and sediments. In Sri Lanka, studies conducted on carbon stocks in seagrass ecosystems are extremely rare. This study aimed to assess the biomass and quantify the organic carbon stock in aboveground and belowground living biomass of three seagrass species in Puttalam Lagoon. *Enhalus* sp., *Cymodocea* sp., and *Halophila* sp. were collected from Sinna Arichchal and Palakudawa with six repetitions at each station, and the organic carbon content were determined using PerkinElmer® 2400 Series II CHNS/O elemental analyzer. Total biomass of seagrass species followed the order; *Enhalus* sp. > *Cymodocea* sp. > *Halophila* sp. The total organic carbon stored in the biomass was significantly different ($p < 0.05$) among selected seagrass species. *Enhalus* sp. had the highest organic carbon storage of 1.342±0.196 Mg C ha^{-1} in their biomass, while the seagrass *Halophila* sp. had the lowest organic carbon content of 0.156±0.012 Mg C ha^{-1}. The organic carbon stock in biomass of *Cymodocea* sp. was 0.373±0.118 Mg C ha^{-1}. In addition, the organic carbon stored in belowground biomass of each seagrass species was significantly greater ($p < 0.05$) than the organic carbon in their aboveground biomass with *Enhalus* sp. having the highest organic carbon in their belowground biomass of 1.082±0.167 Mg C ha^{-1}. This study revealed that seagrass species with larger structural sizes can store more organic carbon in their biomass, with a positive correlation ($r = 0.99$, $p < 0.001$) between biomass and organic carbon content strengthening this relationship. This suggests that the implementation of conservation and restoration practices are required to improve seagrass ecosystems as nature-based solutions to mitigate climate change.

Keywords: Aboveground biomass, Belowground biomass, Blue carbon, Organic carbon, Seagrasses