



Identify the Floristic Composition and the Mangrove Diversity Within the Nayaru Lagoon Area, Sri Lanka

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Nayaru Lagoon, located in the dry-zone lowland of northern Sri Lanka, is a significant blue-carbon ecosystem adjacent to the sea. Despite ongoing mangrove restoration efforts since 2015, comprehensive baseline data remain limited. This study assessed mangrove diversity and community structure across the lagoon. Twelve sampling sites were selected using stratified random sampling to represent the entire lagoon gradient during the southwest monsoon period (May-June 2025). A 1m wide belt transect was deployed across twelve representative sampling stations. At each site, the transects were established perpendicular to the shoreline, initiating at the low-tide water margin and extending landward until the last true mangrove or mangrove associate individual was encountered. Five true mangrove species were recorded: *Avicennia marina*, *Lumnitzera racemosa*, *Rhizophora mucronata*, *Excoecaria agallocha*, and *Aegiceras corniculatum*, along with the mangrove associate *Acanthus ilicifolius*. The highest species richness was recorded at sites 4, 5, 6 (left bank) and 10 (right bank) ($S = 4$), while sites 1 and 7 (left bank) exhibited monospecific stands dominated by *A. marina*. Shannon diversity index (H') ranged from 0 (sites 1 and 7) to 1.075 (site 10), while Simpson's diversity index (D) varied from 0 to 0.583 for the same sites, respectively. The highest species evenness was recorded at site 3 (left bank) ($J' = 0.811$). Based on the Sorenson index, sites 1 and 7 exhibit a high degree of similarity since both sites have only *A. marina*, whereas sites 4, 5 and 10 also constitute another cluster of similar sites where all *A. marina*, *L. racemosa*, *R. mucronata* and *E. agallocha* are present. Results indicate a heterogeneous distribution of mangrove species across the lagoon. Some areas show moderate diversity, while a single species dominates others. These findings highlight the importance of site-specific conservation and management strategies to maintain ecosystem stability.

Keywords: Blue carbon ecosystem, Species diversity, Species richness, Species dominance