



Species Composition, Mangrove Diversity, and Abundance of Kokkilai Lagoon in Sri Lanka

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As an ecologically significant coastal ecosystem, mangroves play a vital role in maintaining biodiversity, carbon sequestration, and supporting human livelihoods. This study was conducted to assess mangrove diversity in Kokkilai Lagoon, Sri Lanka, a relatively understudied ecosystem. A 1-meter-wide belt transect was set up perpendicular to the shoreline across 12 representative stations. Each transect extended landward from the low-tide margin to the last mangrove or mangrove associate. Six mangrove species were identified: *Avicennia marina*, *Lumnitzera racemosa*, *Rhizophora mucronata*, *Excoecaria agallocha*, *Bruguiera cylindrica*, and *Aegiceras corniculatum*. The highest species richness (four species) was recorded at sampling sites 2, 5, 9, and 11, while sampling site 12 exhibited the lowest species richness (one species) and was dominated by *Excoecaria agallocha*. Margalef's richness index ranged from 0 at site 12 to 1.36 at site 2, indicating variation in species richness across different parts of the lagoon. The highest Shannon diversity index ($H' = 1.37$) and Simpson index (0.74) were observed at sampling site 2 (right bank), while the lowest Shannon diversity index ($H' = 0$) and Simpson index (0) were recorded at sampling site 12 (near lagoon mouth), indicating monospecific dominance at that location. Evenness (Pielou's index) was also highest at site 2 (0.99) and lowest at site 12 (0), indicating differences in species distribution patterns among sites. Bray–Curtis similarity analysis revealed a high similarity between sites 1 (right bank) and 8 (along the tributary), while sites 10 (along Mee Oya) and 11 (left bank) formed another group with similar species composition. Varying species richness, diversity, and evenness reveal clear zonation across the lagoon, driven by habitat heterogeneity from tidal gradients and local factors. Monospecific stands signal stress or poor habitat suitability, while diverse sites show stable, favourable growth conditions. These baseline data help plan targeted conservation and restoration for long-term resilience.

Keywords: Kokkilai lagoon, Mangroves, Species diversity, Species richness, Species dominance