Seedling Recruitment Dynamics in the *Lumnitzera–Excoecaria* Zone of Kadolkale Mangrove Park, Negombo

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The landward vegetation zone of mangrove forests, characterized by transitional species assemblages and reduced tidal influence, remains comparatively under-studied with respect to seedling recruitment dynamics. This study investigated overstory structure, light availability, seedling regeneration, and herbivory pressure in the *Lumnitzera–Excoecaria* zone of Kadolkale Mangrove Park, Negombo, Sri Lanka (7.196°N, 79.84°E). Three 100m transects were established landward of the *Avicennia* zone. Overstory vegetation was assessed using the Point-Centered Quarter Method, seedling abundance was quantified in 1m × 1m quadrats at 5m intervals (n=77), and herbivory damage was scored on a standardized 0–5 scale. Canonical Correspondence Analysis (CCA) assessed relationships between overstory composition and seedling recruitment. The *Lumnitzera–Excoecaria* zone exhibited high species richness and stem density (2,883 individuals ha^{-1}). *Lumnitzera racemosa* was the structurally dominant species (Importance Value Index=222; basal area=245 m^2 ha^{-1}), co-dominated by *Excoecaria agallocha* (IVI=108). Mangrove-associated species, including *Premna microphylla* and *Acacia auriculiformis* occurred exclusively in this zone, reflecting edge effects and anthropogenic influence. Light intensity was relatively uniform (2,900–3,400 lux), likely facilitating multi-species coexistence. Seedling regeneration was dominated by *E. agallocha* (6,753 seedlings ha^{-1}; Regeneration Index = 71), followed by *L. racemosa* (3,377 seedlings ha^{-1}; RI=36). The higher seedling dominance of *E. agallocha* relative to its overstory representation suggests an emerging successional shift toward *Excoecaria* dominance warranting long-term monitoring. Herbivory severity was broader in *Lumnitzera–Excoecaria* than in the seaward zone, with *L. racemosa* recording damage across all severity classes (Scores 1–4). Canonical Correspondence Analysis confirmed overstory composition as the primary driver of recruitment patterns (Axis 1: Pearson r=0.922 for *L. racemosa*; r=0.890 for *E. agallocha*). These findings highlight the need for site-specific conservation strategies that account for compositional shifts and non-native species encroachment in the transitional landward zones of heterogeneous mangrove ecosystems.

Keywords: *Lumnitzera racemosa*, *Excoecaria agallocha, Seedling recruitment, Vegetation zonation, Herbivory*