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Species Diversity and Vegetation Structure of Mangroves in Vidattaltivu, Mannar, Sri Lanka

Cooray P.L.I.G.M.^{1,2*}, Marynathan E.², Prasad S.A.A.³

¹Department of Forestry and Environmental Science, University of Sri Jayewardenepura, Nugegoda, Sri Lanka

²Marine Environment Protection Authority, Baseline Road, Colombo 09, Sri Lanka

³Department of Wildlife Conservation, Jayanthipura, Battaramulla, Sri Lanka

*iroshakacooray@gmail.com

Abstract

Vidattaltivu resembles a complex coastal ecosystem and has been declared as a protected area primarily because of its rich but fragile mangrove vegetation. However, currently it is under a great threat mainly due to anthropogenic interventions such as illegal felling and destruction of mangroves and pollution. Unavailability of scientific data on species composition and vegetation structure of mangroves in Vidattaltivu has made it more difficult to implement conservation strategies to protect this ecosystem. Therefore, this study was mainly focused on bridging that gap. Seven mangrove representative sites were selected and PCQM protocol and quadrat method were employed to acquire data on species composition, DBH (D_{130}), tree height and regeneration-potential of mangroves in each site. Floristic study revealed the presence of seven true mangrove species namely *Avicennia marina*, *Rhizophora mucronata*, *Ceriops tagal*, *Bruguiera cylindrica*, *Lumnitzera racemosa*, *Pemphis acidula* and *Excoecaria agallocha*. *A. marina* was recorded as the most abundant species (70.15%) and followed by *R. mucronata* (20.99%) and *C. tagal* (6.57%). Relative abundances of *B. cylindrica*, *L. racemosa*, *P. acidula* and *E. agallocha* were estimated as 0.52%, 0.66%, 0.79% and 0.32% respectively. Stand densities of mangroves were recorded as $1,602 \pm 154$ trees/ha, $2,678 \pm 202$ stems/ha, $64,852 \pm 19,816$ seedlings/ha and 337 ± 86 saplings/ha respectively. The mean DBH and mean tree height were recorded as 8.6 ± 0.2 cm and 4.4 ± 0.1 m respectively while the stand basal area was ranged from 8.23 m²/ha to 36.13 m²/ha. Morisita index manifested a uniform distribution for *A. marina* ($I_s=0.84$) and *E. agallocha* ($I_s=0.00$) and rest of the species demonstrated a clustered distribution ($I_s>1$). The Shannon-Weiner index for diversity was ranged from 0.0000 to 1.5960. Moreover, the stem diameter class distribution exhibited an exponential distribution (reverse-J curve) suggesting that Vidattaltivu is an uneven aged forest with continuous natural regeneration. Nevertheless, a complete absence of medium and larger stem diameter classes of certain species such as *C. tagal* and *B. cylindrica* was also observed indicating a presence of species and size selective harvesting of the mangroves in Vidattaltivu. Therefore, protection and restoration of such species must receive a highest priority in mangrove management and conservation efforts.

Keywords: Vidattaltivu, Mangroves, Conservation, PCQM, Selective Harvesting