Coringa mangroves in relation to local environmental conditions on the East coast of India

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This study aimed at investigating mangrove species distribution vis-à-vis environmental conditions and was carried out at 12 sampling sites encompassing Coringa (Wildlife Sanctuary), Gaderu/seaward channels and Gautami-Godavari Estuary (~235km^2). At each site (located at 4km intervals), the tree structural measurements included stem density (nos. 0.1ha^{-1}), basal area (m^2 0.1ha^{-1}), relative density (%), relative dominance (%), absolute and relative frequency (%), and Importance Value (IV) (sum of relative density, dominance and frequency, using the PCQ-Method) (Cintron and Schaeffer-Novelli, 1984; Dahdouh-Guebas and Koedam, 2006); along with physico-chemical observations on water salinity, sediment texture (sand/silt/clay), organic matter and elevation. The mangrove species composition was represented by 9 species amongst which *Avicennia marina*, *A. officinalis* and *Excoecaria agallocha* were abundant and distributed throughout the forest. The (mean) stem density (also diversity) is rich in the sites belonging to Gaderu/seaward channels (8 species, 327nos. 0.1ha^{-1}), followed by Coringa (4 species, 260 nos. 0.1ha^{-1}) and the estuary (3 species, 240 nos. 0.1ha^{-1}). In contrast, higher basal area in Coringa (4.1m^2 0.1ha^{-1}) is attributable to the local protection status. Based on the IV, *A. marina* ranked first with its sheer dominance in 8 out of 12 sites followed by *A. officinalis* (2 sites) and *E. agallocha* (2 sites), respectively. The sediments are of silty-clay in nature, where silt levels increased in the direction of Gautami-Godavari Estuary and clay characterized the mangroves proper. The Gaderu/seaward channels with a strong neritic incursion had higher salinity (>20‰) compared to Coringa and/or the estuary. There are four mangrove species associations (Bray-Curtis similarity: 30%) of which Group-1 represents the widespread distribution of *A. marina*, *A. officinalis* and *E. agallocha*, while Group-2 (*Lumnitzera racemosa*, *Ceriops decandra* and *Aegiceras corniculatum*), Group-3 (*Sonneratia apetala*), and Group-4 (*A. alba* and *Rhizophora apiculata*) are seen only at the individual sites. The Principal Component Analysis (PCA) also revealed significant differences in the environmental conditions that are ultimately responsible for the varied mangrove species distribution at Coringa, Gaderu/seaward channels and Gautami-Godavari Estuary.
In view of possible vegetation (mangrove) structural changes with changes in the local environmental conditions (due to sustained human intervention), it is necessary to evaluate their distributional patterns on long-term field-based observations. Therefore the present results would also be able to assist future investigations in terms of better monitoring/management at Coringa.

References
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