Floristic Diversity, Composition and Environmental Correlates on the Arid, Coralline Islands of the Farasan Archipelago, Red SEA, Saudi Arabia

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Abstract : Urban expansion and the associated increase in anthropogenic pressures have led to a great loss of the Red Sea's biodiversity. Floristic composition, diversity, and environmental controls were investigated for 210 relive's on twenty coral islands of Farasan in the Red Sea, Saudi Arabia. Multivariate statistical analyses for classification (Cluster Analysis), ordination (Detrended Correspondence Analysis (DCA), and Redundancy Analysis (RDA) were employed to identify vegetation types and their relevance to the underlying environmental gradients. A total of 191 flowering plants belonging to 53 families and 129 genera were recorded. Geophytes and chamaephytes were the main life forms in the saline habitats, whereas therophytes and hemicryptophytes dominated the sandy formations and coral rocks. The cluster analysis and DCA ordination identified twelve vegetation groups that linked to five main habitats with definite floristic composition and environmental characteristics. The constrained RDA with Monte Carlo permutation tests revealed that elevation and soil salinity were the main environmental factors explaining the vegetation distributions. These results indicate that the flora of the study archipelago represents a phytogeographical linkage between Africa and Saharo-Arabian landscape functional elements. These findings should guide conservation and management efforts to maintain species diversity, which is threatened by anthropogenic activities and invasion by the exotic invasive tree Prosopis juliflora (Sw.) DC.

Keywords : biodiversity, classification, conservation, ordination, Red Sea
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