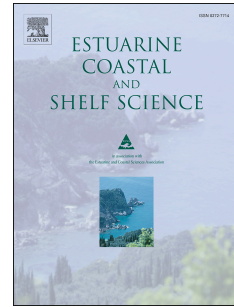


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Focal plant species and soil factors in Mediterranean coastal dunes: An undisclosed liaison?

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1 **Focal plant species and soil factors in Mediterranean coastal dunes: an undisclosed**  
2 **liaison?**

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7

8 **Abstract**

9 Understanding the response of plant species to soil factors on coastal sand dunes is critical for  
10 effective conservation of coastal habitats in the Mediterranean basin. Our main objectives  
11 were to investigate: i) the main soil factors driving species composition in a Mediterranean  
12 coastal dune environment; ii) the ecological requirements of focal plant species with respect  
13 to single soil factors; iii) whether the focal species of a given macrohabitat (including EU  
14 habitats) have similar edaphic needs. We identified 108 plots with three macrohabitats as  
15 strata (embryo dunes; mobile dunes; fixed dunes) by random stratified sampling design along  
16 the Tyrrhenian coast of central Italy in areas with a high degree of biodiversity and  
17 naturalness. Vegetation and soil data were collected in the plots.

18 Canonical Correspondence Analysis (CCA) confirmed that soil had a main role in driving  
19 focal dune species composition as found in other Mediterranean areas and indicated that three  
20 factors (field capacity, pH and CaCO<sub>3</sub>) sufficiently explain patterns of plant species. An  
21 inverse relation between field capacity, which proves to be the most decisive feature for  
22 differences in species ecological requirements between macrohabitats, and pH was observed.

23 Generalized Additive Models (GAMs) showed that: i) the focal species of fixed dunes have a  
24 higher probability of occurrence and response curves that overlap at high field capacity and  
25 TOC values and at low pH, showing an opposite trend with respect to the species of  
26 embryonic and mixed dunes; ii) species of mixed dunes have a probability of occurrence

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