

Morphological responses of *Posidonia oceanica* to experimental nutrient enrichment of the canopy water

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Abstract

To simulate an anthropogenic loading, experimental N and P enrichment was performed on a *Posidonia oceanica* meadow in the western Mediterranean Sea (Calvi, Corsica, France) during an annual cycle. The aim was to assess the morphological responses of the plant and the impact on the epiphytic index in order to test those parameters as indicators of coastal nutrient enrichment. Monthly monitoring of nutrient levels of the water (canopy and sediment) and of the epiphytic index was performed in parallel to investigations on plant morphology and leaf dynamic (leaf length, leaf surface, number of leaves per shoot, *A* coefficient: % of leaves that lost their apex, number of produced and fallen leaves, leaf longevity). To consider grazing interactions of *Sarpa salpa*, which can influence plant response, the reaction of the meadow was observed in an enriched zone, both unprotected and cage-protected, and compared with a reference zone. The epiphytic index and the leaf length are particularly impacted by nutrient enrichment, respectively, in summer and in spring, and in summer. However, data suggest that the epiphytic index increase is a specific but not systematic response, and that the reduced leaf length is more systematic in summer but not specific to nutrient enrichment. Their use is recommended to reveal nutrient enrichment including in association with other descriptors.

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