

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

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Abstract

To simulate anthropogenic nutrient loading of coastal waters, experimental N and P enrichment was performed on a *Posidonia oceanica* meadow in the Western Mediterranean Sea (Calvi, Corsica, France) for the duration of an annual cycle. To identify the physiological descriptors of nutrient enrichment, certain parameters were selected for this study: the chlorophyll *a* and *b* content, the total water-soluble phenolic compounds present in the leaves, the nitrogen and carbon contents of the leaves and epiphytes. This study was conducted in parallel with a monthly monitoring program, which measured nutrient levels in the water (canopy and sediment water). Neither the total phenol nor the carbon content of the leaves showed any response to nutrient enrichment. The carbon content of epiphytes, the chlorophyll content and the nitrogen content of the leaves increased significantly with nutrient enrichment. The chlorophyll content and the nitrogen content of the leaves appeared to be effective physiological indicators for assessing water quality. These indicators provide information on nutrient availability, but to use them correctly other influences will also have to be taken into account, in particular irradiance.

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