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Posidonia oceanica photosynthesis along a depth gradient

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Seagrass photosynthetic rates depend largely on light availability, along with other environmental factors and the physiological condition of the plants. Along a vertical gradient, seagrasses are permanently exposed to distinct light environments, to which the photosynthetic apparatus must adapt. In this study, the response of *Posidonia oceanica* photosynthesis to light was investigated in plants collected at three different depths (3, 20 and 30m) in the Bay of Revellata, Corsica, France, in the the marine research station Stareso (42º34'4''N, 8º43'2''E) in October, 2011. Photosynthesis-irradiance curves (P-I) were measured in an oxygen electrode system (DW3/CB1, Hansatech). Photosynthetic rates were determined over an increasing range of irradiance values, from darkness to 850 µmol quanta m-2 s-1. The Jassby and Platt hyperbolic model (1957) equation was fitted to the obtained data, to calculate the relevant photosynthetic parameters. For each depth, maximum photosynthetic rate (Pmax), inicial slope (), light saturation point (Ik), light compensation point (Ic) and dark respiration (Rd) were determined. Photosynthetic parameters showed significant variations with depth, particularly between the shallowest plants (3m) and the two other depths. As expected, *P. oceanica* from 3m depth revealed a "sun-adapted" photosynthetic behavior in contrast with plants from deeper waters.

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Can the marine ecosystem of a *Posidonia oceanica* back-reef react and defend itself from the spread of *Caulerpa racemosa* var. *cylindracea*?

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A back-reef of *Posidonia oceanica* (S. Liberata, Orbetello, Italy) subject to degradation lost its typical mixed meadow of *Cymodocea nodosa*, *Nanozostera noltii* and *Caulerpa prolifera*, and was colonised by the invasive chlorophycea *Caulerpa racemosa* var. *cylindracea* (Sonder) Verlaque, Huisman, Boudouresque (Bryopsidales, Chlorophyta) between 2003 and 2004. When the flora was studied in 2005-2006, *C. r. cylindracea* constituted 25-38% of the algal biomass. In 2011, it had fallen to 2-3% and other species predominated: dead mats were covered in a turf of photophiles, dominated by balls *Cladophora albida*., while residual dead patches of the mixed meadow had been colonised by *Penicillus capitatus*. Moreover, residual clumps of *P. oceanica* in the back-reef showed plagiotropic growth, expanding into sandy areas. The lists of flora of the two periods are compared and the possible causes of these transformations discussed in relation to the characteristics of the area and human impacts. The results suggest that autochthonous populations can recover and oppose the spread of *C. r. cylindracea*; they also sustain the view that invasion occurs in degraded or altered ecosystems and may be reversible.

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Effects of *Ulva sp.* blooms and its associated decomposition in *Cymodocea nodosa* meadows

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Eutrophication is increasing the frequency and magnitude of green macroalgal blooms in coastal shallow environments, such as seagrass meadows. In order to determine the effects of green macroalgal accumulations on seagrasses, undisturbed *Cymodocea nodosa* meadows (0.24 m2) were collected from Cadiz Bay (Spain) and transferred to six mesocosms. *Ulva sp.* (210 g DW m-2) was added to 3 of them