**Experimental assessment of light decrease on the biology of *Posidonia oceanica***

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Seagrasses have a worldwide distribution and grow from the tidal zone to more than 100 m deep. They are considered ecosystem engineers, by building structurally complex meadows. Seagrass meadows are major coastal ecosystems, are highly productive, provide many goods and services and have considerable environmental, financial, and heritage value. Just like any autotroph, seagrass development relies on light availability. Among the many stressors that threaten seagrasses, light deprivation is consequently a major one. Light availability can decrease because of environmental (e.g., river sediment transport) or anthropogenic (e.g., eutrophication, sediment resuspension) factors, an issue expected to worsen in the future. It is in this context that we experimentally assessed the effects of environmentally relevant shading on a keystone seagrass endemic to the Mediterranean Sea, *Posidonia oceanica* (Linnaeus) Delile, 1813. Screens of different transparency (nominal reduction of 15, 30 and 60% compared to control) were deployed on a healthy meadow at a depth of 15 m in Corsica, France. The experiment took place between April and August 2018, i.e., during the main annual period of productivity of the plant. Seagrass pigment contents (chlorophylls and xanthophylls), photosynthesis (rapid light curves, photosynthesis/irradiance curves and quantum yield), biometry and primary production, carbohydrates (total insoluble and soluble carbohydrates) were measured monthly. Environmental parameters light, temperature and sediment porewater chemistry (methane, nitrous oxide, sulfide, nutrients) were monitored as well. Results showed the adaptability of *P. oceanica* to light reduction treatments. The seagrass adapted its photosynthetic activity (RLC) and efficiency (effective quantum yield) to cope with light reduction. This improvement resulted from physiological plasticity because neither the pigment contents nor the photosynthesis/irradiance curves differed between light treatments. *P. oceanica* shoots further maintained their growth and biomass production despite the decrease in light, but at the expense of storing carbohydrates. Finally, the chemistry of sediment porewater, in particular toxic sulfide was not altered. Results of this work underlined the high resistance and resilience of a healthy *P. oceanica* meadow to five months *in situ* light deprivation stress. However, because of the measured decrease of storage carbohydrates, seagrass meadow perennity when exposed to longer, recurrent shading is of concern. Carbohydrates and photosynthetic activity and efficiency could further be investigated as early warning indicators in seagrasses facing light reduction stress.