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

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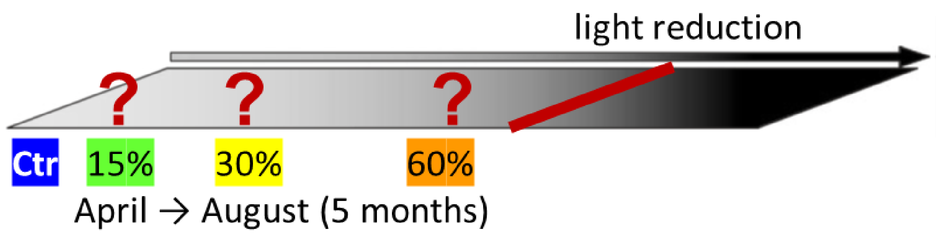
## I - Introduction

- Seagrasses are coastal higher plants. They build structurally complex (engineer species) and highly productive systems that provide many goods and services (high financial value).
- As primary producers, they require light to grow. Light deprivation due to eutrophication and suspended particles, an issue expected to worsen in the future, is therefore a major stress.

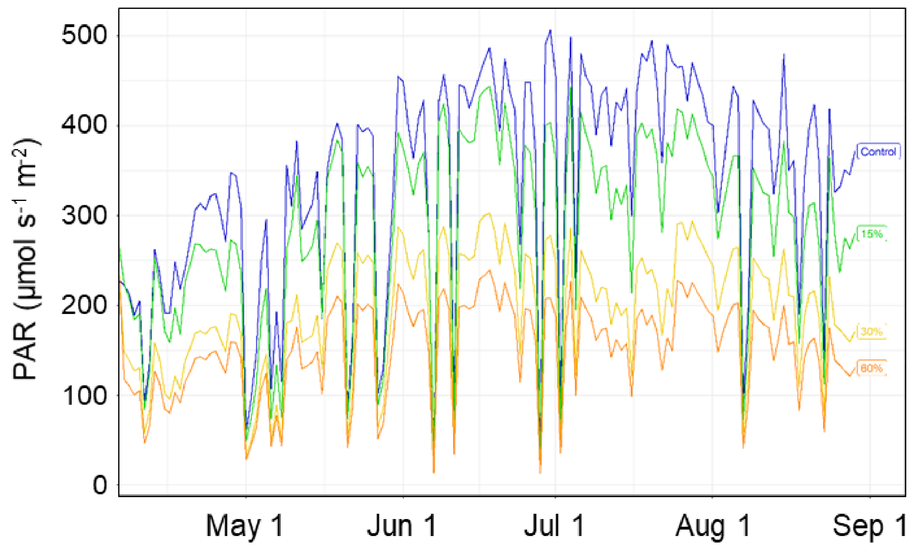
=> The main **objective** of this study was **to experimentally assess the effects of environmentally relevant shading on** a keystone seagrass endemic to the Mediterranean Sea, ***Posidonia oceanica***.

## II - Material and methods




Experiment performed in a well-preserved, oligotrophic Corsican (France) bay.

*In situ* deployment of 9 $m^2$ shading screens, 2 m above sediment.




### Monitored parameters

Environment:

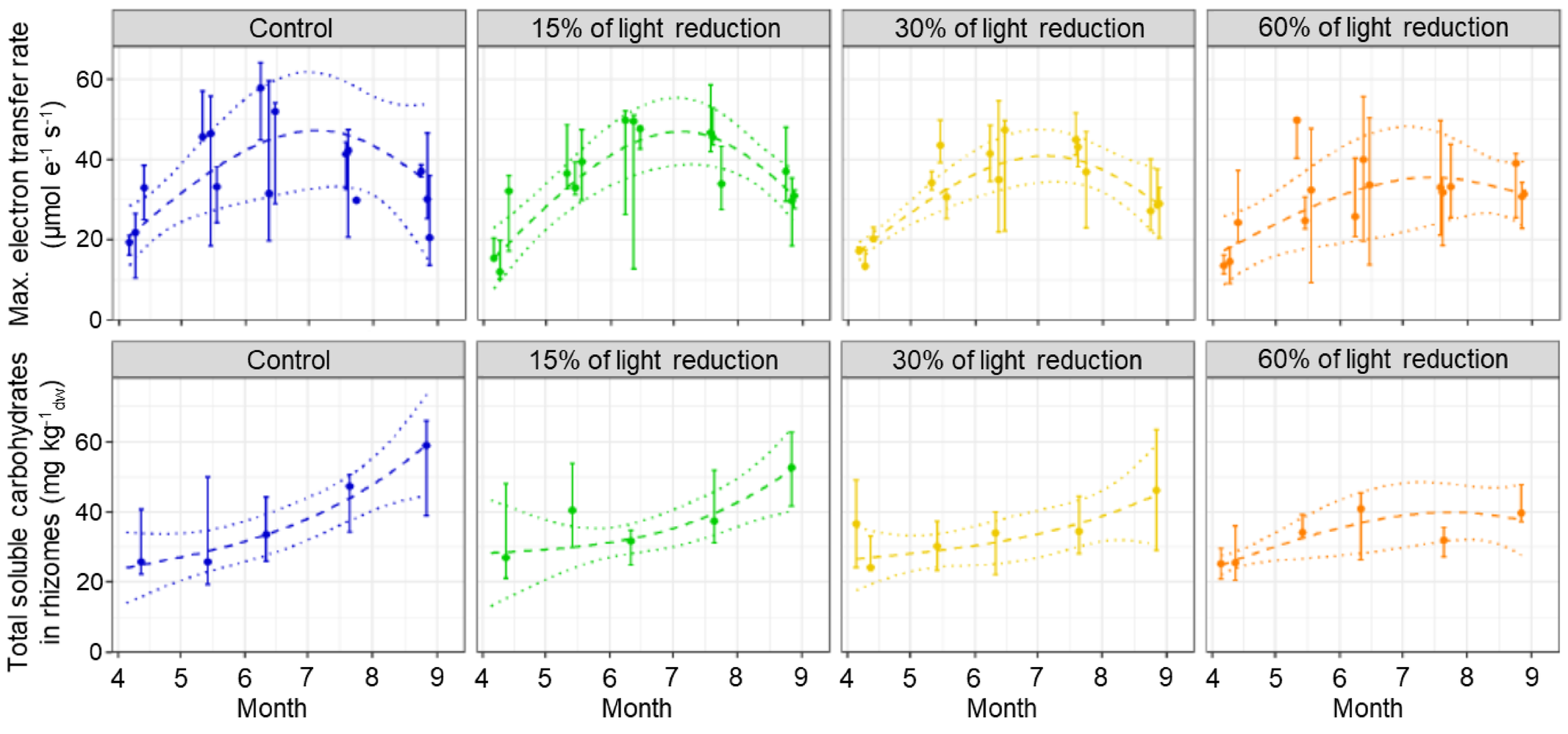
light and sediment porewater chemistry ($H_2S$, $CH_4$, $N_2O$, nutrients).

Seagrass physiology:

leaf pigments, photosynthesis (RLC, P/I curve and quantum yield), carbohydrates, shoot biometry and leaf biomass productivity.

## III - Results

- The chemistry of sediment porewater, in particular toxic $H_2S$ was not altered by shading treatments.
- *P. oceanica* adapted its photosynthetic activity (RLC, graphs of maximum electron transfer rate) and efficiency (effective quantum yield) to cope with light reduction; neither the pigment contents nor the P/I curves differed between light treatments.
- *P. oceanica* shoots maintained their growth and leaf biomass productivity despite the decrease in light, but at the expense of storing carbohydrates (graphs of total soluble carbohydrates in rhizomes).




## IV - Take home message

- High resistance and resilience of *P. oceanica* to five months light deprivation stress.
- 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 as early warning indicators of light reduction stress ?

## Funding

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