

**O29.4****Effects of the Mose closure on ecosystem functioning in the Venice lagoon (northern Adriatic Sea): A preliminary experimental study**

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**Abstract**

The MOSE, consisting of rows of mobile gates installed at the three inlets, will be able to isolate the Venice lagoon temporarily from the Adriatic Sea during extreme high tides. We set up a 48h field experiment to investigate how the lagoon ecosystem will be affected by a prolonged period of segregation from the oxygenating seawater by artificially secluding small portions of the lagoon. We simulated the worst-case scenario, i.e. the potential effects of prolonged MOSE closure times on an organic-enriched shallow (<75 cm) area often subjected to hypoxia. In July 2019, we positioned 18 enclosures (~ 0.8 m<sup>3</sup> each) in Palude di Cona to study short-term (4h, t1) and long-term (24h, t2; 28h, t3 and 48h, t4) effects on planktonic and benthic communities at different trophic levels (prokaryotes, microalgae, consumers). We registered lower oxygen concentration inside the enclosures (mean O<sub>2</sub>: 58.7±14.8% inside vs 73.5±21.5% outside) though hypoxia was not reached. From t0 to t4, we observed a mean reduction of 68% for Chl *a* and 91% for Primary Production (PP) in the water inside the enclosures. Contemporaneous molecular analyses (DNA metabarcoding) performed on prokaryotes and microalgae revealed a 32× increase of the Alteromonadales and a 10× decrease of Synechococcales relative abundances, and a 4× decrease of the planktonic diatom genus *Thalassiosira*. In contrast, Prokaryotic C Production (PCP) increased from t0 (8.06-9.36 μgC L<sup>-1</sup>h<sup>-1</sup>) to t2 (12.97-19.30 μgC L<sup>-1</sup>h<sup>-1</sup>) likely stimulated by the nutrient efflux from sediments. In sediments, we obtained the highest PCP rates at t1 whereas PP more than doubled after 48h due to an abundant benthic diatom community. Our results suggest that the lower hydrodynamic regime induced by the MOSE closure could likely lead to the deposition of the suspended material over time, affecting the main biological processes and the pelagic-benthic coupling in the Venice lagoon.

**Keywords**

ecosystem functioning, plankton , benthos, Venice lagoon