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C0305 EFFECT OF ELEVATED INORGANIC CARBON ON THE CYTOSOLIC HOMEOSTASIS OF NITRATE IN THE MARINE ANGIOSPERM POSIDONIA OCEANICA (L.) DELILE. ()

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1 Resumen

The marine angiosperm *Posidonia oceanica* is a mediterranean endemism of great ecological significance. As other marine plants, *P. oceanica* has adapted secondarily to the marine environment and develop anew different mechanisms to colonize it. Among others, this plant has developed a plasma membrane system for the direct uptake of bicarbonate. In this work we have developed both NO_3^- and Cl^- selective microelectrodes for the continuous monitoring of the intracellular (cytosolic) NO_3^- and Cl^-. In the light, leaf mesophyll cells show a cytosolic NO_3^- concentration of 5.7±0.2 mM (n=10), while in the dark cytosolic NO_3^- raises up to 8.7±1.1 mM; these values are in the range of concentrations quoted for *Arabidopsis thaliana* (Cookson et al., 2005). The enrichment of natural seawater (NSW) with 3 mM $NaHCO_3$ caused a decrease of the cytosolic NO_3^- concentration of 1 mM and a decrease of the cytosolic concentration of Cl^- of 3.5 mM. The saturation of NSW with 1000 µL CO_2 L^{-1} produced a lower diminution of the cytosolic NO_3^- (0.3 mM). In the presence of 0.1 mM of the plasma membrane permeable inhibitor of the carbonic anhydrase (EZ) the diminution of cytosolic NO_3^- caused by the same concentration of CO_2 was much lower, 0.1 mM. The addition of inorganic carbon, either HCO_3^- or CO_2, has an effect on the cytosolic mechanisms for anionic homeostasis, one of which is the opening of the slow anion channels. These channels are permeable to NO_3^- and Cl^- and could elicit the efflux of these ions. In *P. oceanica*, the response in the presence of EZ points out that the inorganic carbon species that cause the NO_3^-/Cl^- efflux is HCO_3^-. This effect could contribute to plant biomass N dilution observed in elevated CO_2.

References:

Cookson et al. 2005. *Plant Physiology* 138, 1097–1105.

Fundings: