TONOPLAST H^+-PUMPS IS MODULATED UPON DROUGHT STRESS IN *Cyperus rotundus* L.

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Cyperus rotundus is a weed of high reproductive vigor and rusticity that express high capacity to cope with abiotic stress. The cell turgor is partially controlled by vacuolar H^+-pumps, which generate a H^+-gradient that energize the uptake of ions and water into the vacuole. The analysis of the vacuolar H^+-pumps of plants harvested from their natural environment exhibited a PP_i hydrolysis about 30% of their ATP hydrolysis, while the H^+-gradients coupled to either PP_i and ATP hydrolytic activities were quite similar. These data suggest that, on field conditions, the tonoplast H^+-PPase present a much higher coupling efficiency than the V-ATPase. Analyzing this weed development under drought stress the activity of both tonoplast H^+-pumps were progressively inhibited under drought stress by 10 days. After rewatering, the H^+-PPase activity exhibited a striking stimulation at 24h (70-100%), but this activation declines to the level of control plants 48h after rehydration. In contrast, the V-ATPase activity was only barely changed, suggesting that the vacuolar turgor capacity of *C. rotundus* could be mainly regulated by the H^+-PPase during drought stress. It is likely that an up-regulation of the H^+-PPase could be more feasible since this enzyme is a single peptide chain that can be overexpressed much easier than the complex polypeptidic V-ATPase, as suggested by western blot analyses.

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