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## Supplementary Material

### **Proton and anion transport across the tonoplast vesicles in bromeliad species**

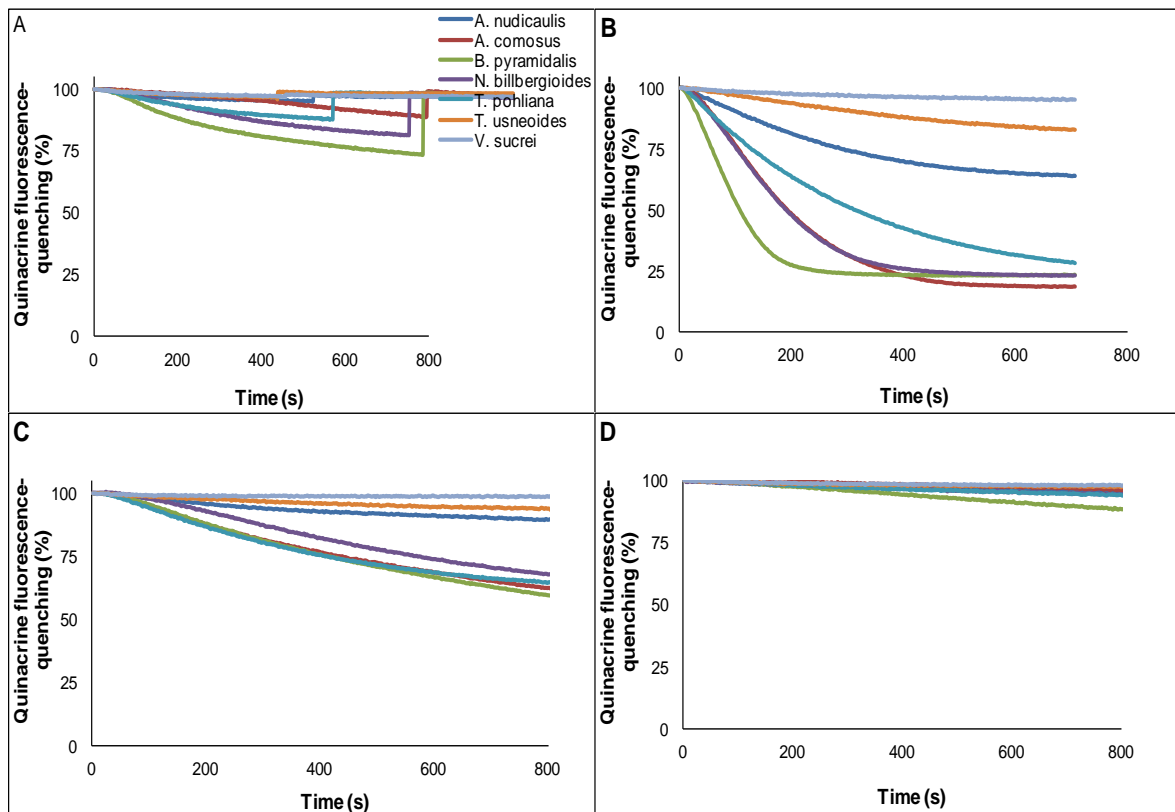
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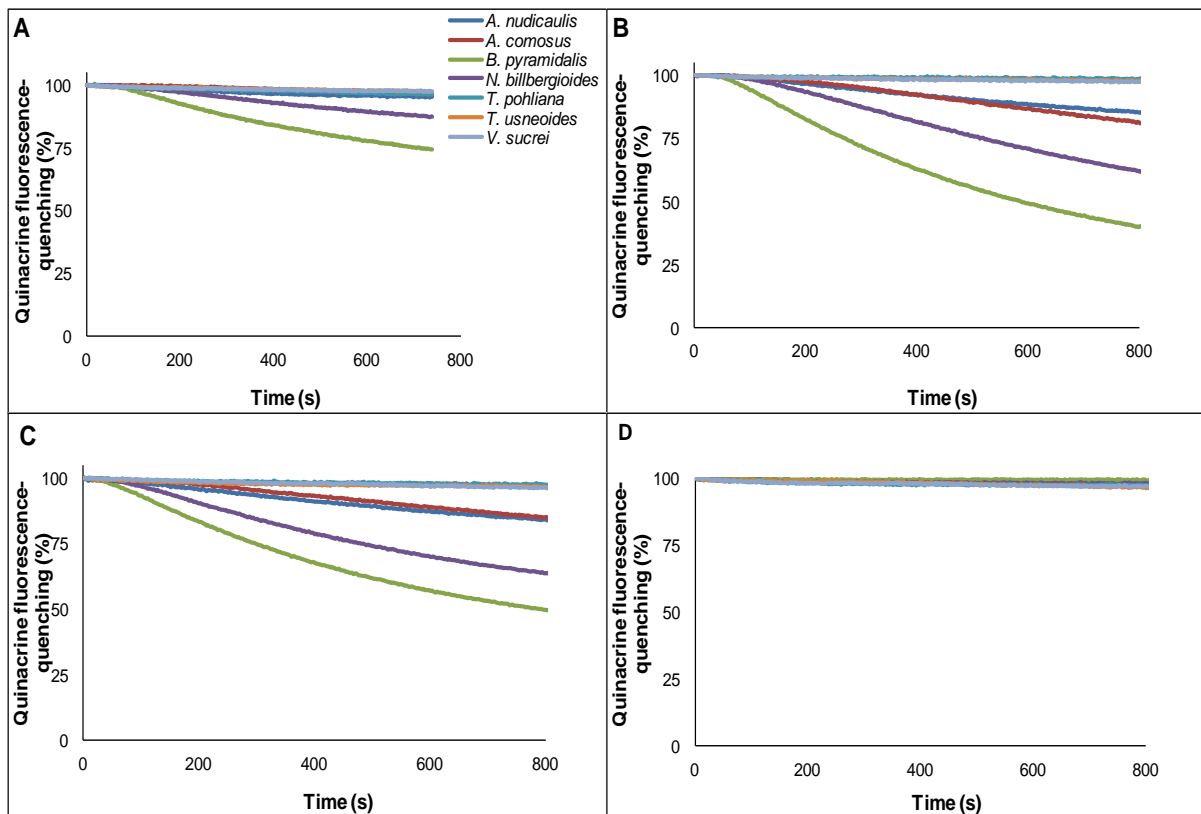
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**Fig. S1.** ATP-dependent proton transport into isolated tonoplast vesicles monitored by quinacrine-fluorescence quenching (expressed as a percentage of the starting value) in (A) control conditions (no added carboxylate anion), or in the presence of (B) 50 mM fumarate, (C) 50 mM malate, or (D) 50 mM citrate. Tonoplast vesicles were isolated as described in Materials and methods from leaves of *Aechmea nudicaulis*, *Ananas comosus*, *Billbergia pyramidalis*, *Nidularium billbergioides*, *Tillandsia pohliana*, *T. usneoides* and *Vriesea suerei*. Proton transport was initiated by the addition of ATP (3.0 mM) at the start of the time-course. In A, 2.0 mM  $\text{NH}_4^+$  was added as an uncoupler at a time between 400 s and 800 s (depending on the species) to demonstrate abolition of the pH gradient established by ATP-dependent proton transport. Results are from one experiment representative of a total of three.



**Fig. S2.** P<sub>i</sub>-dependent proton transport into isolated tonoplast vesicles monitored by quinacrine-fluorescence quenching (expressed as a percentage of the starting value) in (A) control conditions (no added carboxylate anion), or in presence of (B) 50 mM fumarate, (C) 50 mM malate, or (D) 50 mM citrate (D). Tonoplast vesicles were isolated as described in Materials and methods from leaves of *Aechmea nudicaulis*, *Ananas comosus*, *Billbergia pyramidalis*, *Nidularium billbergioides*, *Tillandsia pohliana*, *T. usneoides* and *Vriesea suerei*. Proton transport was initiated by the addition of P<sub>i</sub> (3.0 mM) at the start of the time-course. Results are from one experiment representative of a total of three.