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Response of four peatland emergent macrophytes to salinity and short salinity pulses

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Sea-level rise intensifies saltwater influx into coastal wetlands causing osmotic stress and probably changing vegetation composition. To determine especially the impact of salinity pulses as occurring during flooding events, dominant peatland macrophytes, *Typha latifolia*, *Carex acutiformis*, *Schoenoplectus tabernaemontani* and *Phragmites australis,* were exposed to different salinity regimes, consisting of control (permanently freshwater and permanently brackish water) and brackish-water treated groups with different durations of alternating exposure before returning to freshwater conditions (2 days brackish then 2 days fresh; 4 days brackish then 4 days fresh; 2 days brackish then 4 days fresh). We measured plant height, leaf area and chlorophyll fluorescence weekly and determined the root:shoot ratio and photosynthetic pigment concentrations upon termination of study.

Salinity suppressed the growth of *T. latifolia* and *C. acutiformis* resulting in shorter plants, smaller mean leaf area and higher root:shoot ratios whereas photosynthetic pigment ratios and chlorophyll fluorescence were not affected. Moreover, shorter, but frequent salinity pulses (alternate 2 days brackish water then 2 days freshwater, and 2 days brackish water then 4 days freshwater) decreased the height of *T. latifolia* while *C. acutiformis* did not react negatively. Height and root:shoot ratio of both *P. australis* and *S. tabernaemontani* were neither affected by salinity nor by the frequency of salinity pulses. Also photosynthetic pigment ratios and chlorophyll fluorescence yield did not differ between treatments in *S. tabernaemontani*. In contrast, *P. australis* showed signs of successful acclimation through decreased chlorophyll a:carotenoid ratio and high chlorophyll fluorescence yield under both low and high irradiances. These results imply that with increasing seawater influx into coastal peatlands, *T. latifolia* and *C. acutiformis* will probably experience growth retardation or may even be replaced eventually by *S. tabernaemontani* or *P. australis* since they are more resilient against salinity and frequent salinity pulses.