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Photosynthetic responses in *Sphagnum* spp.  
in temperate mires to temperature, pH and salinity

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*Sphagnum* spp. are dominant peat forming plants mainly distributed in low temperature, high acidity and low salinity environments. We investigated photosynthetic responses of *Sphagnum* spp. to temperature, pH and salinity to test if *Sphagnum* spp. are physiologically adapted to these environments. We investigated the temperature dependency (range 5-40 °C) of gross photosynthetic rates for *Sphagnum palustre*, *S. fimbriatum*, *S. papillosum*, *S. fuscum* and *S. fallax*. The maximum photosynthetic rate was obtained at 30-35 °C for all species. Photosynthetic rates of all these species showed a maximum at 300-500 micromol m<sup>-2</sup> s<sup>-1</sup> of PPFD and it decreased at higher PPFD (> 500 micro-mol m<sup>-2</sup> s<sup>-1</sup>) under low temperature (5-10 °C). The pH dependence (range 3.8-10.0) of gross photosynthetic rate was investigated for *S. palustre*, *S. cuspidatum*, *S. squarrosum*, *S. girgensohnii*, *S. fuscum*, *S. rubellum* and *S. magellanicum*. Most of the species showed optimal pH at 5.0-6.0, although the rate at pH=9.0 was 50-80 % of the rate at the optimal pH for photosynthesis. The salinity dependence (range 0-40 mM NaCl) of gross photosynthetic rate was investigated for *S. palustre* and *S. fimbriatum*. The rate of plants cultivated in 1-40 mM NaCl solution (pH=6.0) for 2 days showed ca. 2/3 of that in plants cultivated in pure water. These results on temperature, pH and salinity dependency of photosynthetic rate imply that *Sphagnum* spp. are not specifically adapted to the mire environments where they dominate.