



**Supplementary Fig. S1.** Production of superoxide ( $O_2^{\cdot-}$ ) in liquid-cultured *Sphagnum capillifolium* in response to treatment with  $0.5 \text{ mg ml}^{-1}$  chitosan (CHN). The arrow indicates the time point of CHN addition. Superoxide measurement was based on chemiluminescence of the luciferin analog MCLA. Error bars indicate standard deviation ( $n=3$ ).

For the experiment, axenic gametophyte tissue of “small red peat moss” *Sphagnum capillifolium* (Ehrh.) Hedw. (family Sphagnaceae) (kind gift from Prof. Liisa Simola, University of Helsinki), was grown in 250 ml Erlenmeyer flasks containing 70 ml of modified Y-medium [2.7 mM KCl, 1.5 mM  $KH_2PO_4$ , 0.8 mM  $MgSO_4$ , 1.8 mM  $CaCl_2$ , 2.4 mM  $NH_4NO_3$ , 90  $\mu\text{M}$   $MnSO_4$ , 90  $\mu\text{M}$   $FeSO_4$ , 180  $\mu\text{M}$  ethylenediaminetetraacetic acid disodium salt ( $Na_2$ -EDTA) with 1  $\text{ml l}^{-1}$  of micronutrient solution (1.5 g boric acid, 0.15 g ammonium molybdate, 0.1 g Sequestrene  $Na_2Cu$ , 0.1 g Sequestrene  $Na_2Co$  and 0.3 g Sequestrene  $Na_2Zn$   $l^{-1}$ ), pH 5.9 adjusted with NaOH and 10  $\text{g l}^{-1}$  sucrose] (Simola, L. 1977. The tolerance of *Sphagnum fimbriatum* towards lead and cadmium. Ann. Bot. Fenn. 14:1-5). The cultures were grown in a growth chamber (Model 3755, Forma Scientific, Marietta, OH, USA) at 23 °C (photoperiod 12 h, light intensity 60  $\mu\text{mol m}^{-2}\text{s}^{-1}$ ).

Superoxide ( $O_2^{\cdot-}$ ) production in liquid moss culture medium was measured by chemiluminescence of a luciferin analog MCLA [2-methyl-6-(p-methoxyphenyl)-3,7-dihydroimidazo(1,2-*b*)pyrazin-3-one] (Sigma, St. Louis, MO, USA). Three or four small shoots (gametophytes) of *S. capillifolium* were placed in the cuvette (Sarstedt No. 68.750; Sarstedt, Nümbrecht, Germany) containing 1.0 ml of modified Y-medium and incubated in the dark at 23 °C for 30 min before starting the measurements. First, 1  $\mu\text{M}$  MCLA (final concentration) was added to the cuvette for background measurement, followed by addition of CHN. Chemiluminescence was measured for 5 seconds at each time point using Luminoskan TL Plus luminometer (Thermo Labsystems, Waltham, MA, USA).