**COMPARISON OF PHOTOSYNTHETIC CO2 UPTAKE AND PHOTOSYSTEM II YIELD DURING DESICCATION OF LICHENS**

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Lichens as symbiotic associations between a mycobiont and green algal and/or cyanobacterial photobionts are poikilohydric organisms passively regulated by external water sources. Classical studies by Prof. O.L. Lange showed that excess water often limits photosynthetic CO2 uptake by reducing CO2 diffusion rates. In theory, measurement of photosystem II yield in light (ΦPSII) can be used as a proxy of photosynthetic CO2 uptake. Here, thalli of *Lobaria pulmonaria*, *Parmelia sulcata* and *Xanthoria aureola* were sprayed with excess water and shaken carefully. Photosynthetic CO2 uptake and ΦPSII were then measured simultaneously at 200 µmol photons m-2 s-1 while drying. Afterwards, wet thalli were dark adapted and Fv/Fm was measured in darkness until dryness. For all species, photosynthetic CO2 uptake was maximal at a water holding capacity (WHC) corresponding to WHCblotting, i.e., the hydration level achieved after removing external water by blotting paper (WHCblotting). CO2 uptake and ΦPSII were highly correlated (r2 = 0.91-0.97) during drying at hydration levels below WHCblotting, but weakly correlated (r2 = 0.21-0.57) while supra-saturated above WHCblotting. The slope of the regression between CO2 uptake and ΦPSII was similar for all three lichen species. Because the slope will depend on cortical transmittance, calibration of ΦPSII against CO2 uptake for other lichen species is necessary. The kinetics of the spatial distribution of ΦPSII in *P. sulcata* during drying initially showed an increase along thallus margins before it later reached maximum values in central portions at WHCblotting. Maximum PSII efficiency (Fv/Fm) showed no decrease at supra-saturation probably because Fv/Fm does not depend on CO2 diffusion. In conclusion, ΦPSII can be an easily measured proxy of photosynthetic CO2 uptake in thalli without external water pools, whereas ΦPSII provides an inaccurate overestimation of photosynthesis in supra-saturated thalli.