

## Supplementary S2. Chlorophyll *a* fluorescens induction curves of *Coelastrella rubescens* NAMSU R1 cells

Stationary chlorophyll fluorescence (CF) induction curves for assessment of non-photochemical quenching of the excited chlorophyll states were recorded in a quartz cell (2 mm pathlength) with Fluorpen FP100 s PAM-fluorimeter (Photon System Instruments, Czech Republic) after 15-min dark adaptation according to previously reported protocol [1]. Photon flux densities of the measuring and the saturating light were of 5 and of 3,000  $\mu\text{mol quanta/m}^2/\text{s}$ , respectively. CF was excited by a light-emitting diode ( $\lambda = 455 \pm 5 \text{ nm}$ ) and detected within the range of 697–750 nm. Optical aperture diameter was of 5 mm. To induce regulatory non-photochemical quenching of the excited chlorophyll states, dark-adapted cells were exposed to actinic light of high photon flux density ( $\lambda = 455 \pm 5 \text{ nm}$ , 800  $\mu\text{mol quanta/m}^2/\text{s}$ ), saturation pulse. was applied each 12 s during acclimation to actinic light for detection of maximal CF intensity in the light-adapted state ( $F_m'$ ). Before actinic light exposure,  $F_o$  and  $F_m$  values were registered. Representative CF induction curves of *C. rubescens* NAMSU R1 treated by low light (50  $\mu\text{mol/m}^2/\text{s}$ ) (Figure S2a), treated by high light (150  $\mu\text{mol/m}^2/\text{s}$ ) (Figure S2b), c - treated by high light (150  $\mu\text{mol/m}^2/\text{s}$ ) and UV-A (2.9  $\text{W/m}^2$ ) (Figure S2c). There were a total of 5 flashes of saturation light during actinic light illumination. Representative Following parameters were calculated at each saturation light pulse during acclimation to the actinic light according to Lazár [2]: the Stern-Volmer NPQ parameter,

$$\text{NPQ} = \frac{F_m - F_m'}{F_m'}$$

the quantum yield of non-regulatory,  $\phi(\text{NO})$ , and regulatory,  $\phi(\text{NPQ})$ , dissipation,

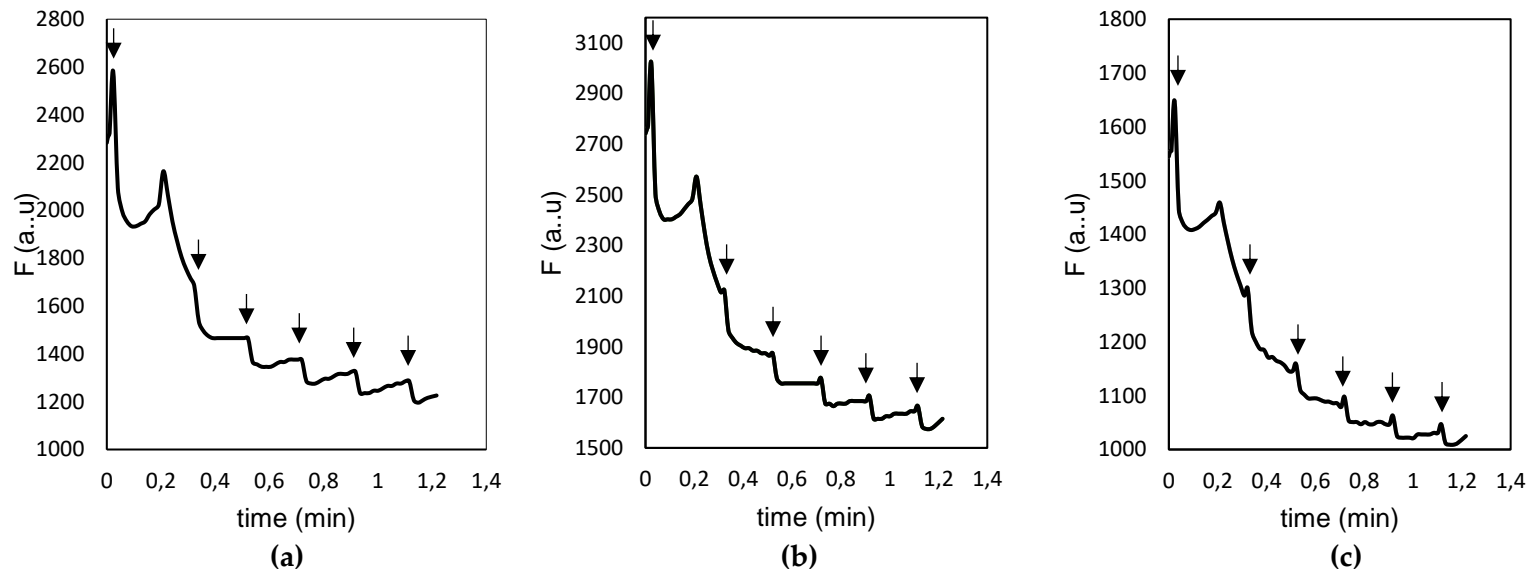
$$\phi(\text{NO}) = \frac{F_t}{F_m'}$$

$$\phi(\text{NPQ}) = \phi(\text{NO}) \times \text{NPQ},$$

where  $F_t$  is the stationary chlorophyll fluorescence intensity during actinic light acclimation,  $F_m$  and  $F_m'$  are maximal chlorophyll fluorescence intensity un the dark-acclimated and light-acclimated state, respectively. In addition, maximal PSII photochemical quantum yield was calculated as [2]

$$F_v/F_m = \frac{F_m - F_o}{F_m}$$

where  $F_o$  is the minimal chlorophyll fluorescence intensity in the dark-acclimated state. Calculated parameters of quenching of the excited chlorophyll states are presented in the Table S2.



**Figure S2.** Representative inductive curves of chlorophyll *a* fluorescens induction of *Coelastrella rubescens* NAMSU R1 cells: a – treated by low light (50  $\mu\text{mol/m}^2/\text{s}$ ), b – treated by high light (150  $\mu\text{mol/m}^2/\text{s}$ ), c - treated by high light (150  $\mu\text{mol/m}^2/\text{s}$ ) and UV-A (2.9  $\text{W/m}^2$ ). a.u. – arbitrary units of chlorophyll fluorescence intensity. Arrows indicate saturation pulses.

Table S2. Calculated parameters of quenching of the excited chlorophyll states of the cells of *Coelastrella rubescens* NAMSU R1 at each saturation pulse. Average values from three replicates and their standard deviations are shown.  $\phi(\text{NO})$  – quantum yield of non-regulatory dissipation,  $\phi(\text{NPQ})$  – quantum yield of regulatory dissipation, NPQ – Stern-Volmer non-photochemical quenching parameter. \* - zero saturating pulse applied for dark-adapted cells; in this case,  $\phi(\text{NO})$  was calculated as  $1-F_v/F_m$ ,  $\phi(\text{NPQ})$  and were assumed as 0.

# of pulse	$\phi(\text{NO})$			$\phi(\text{NPQ})$			NPQ		
	LL	HL	HL+UV	LL	HL	HL+UV	LL	HL	HL+UV
0*	0,83±0.15	0,83±0.04	0,92±0.01	0	0	0	0	0	0
1	0,47±0.16	0,65±0.13	0,66±0.06	0,34±0.21	0,40±0.11	0,23±0.05	0,40±0.18	1,06±0.32	0,35±0.07
2	0,39±0.12	0,50±0.05	0,52±0.04	0,36±0.20	0,44±0.08	0,28±0.06	0,62±0.26	1,31±0.34	0,53±0.09
3	0,34±0.10	0,46±0.06	0,45±0.06	0,37±0.22	0,45±0.05	0,29±0.08	0,74±0.34	1,42±0.37	0,62±0.11
4	0,35±0.09	0,44±0.06	0,41±0.02	0,38±0.19	0,45±0.09	0,28±0.06	0,82±0.36	1,49±0.38	0,67±0.11
5	0,32±0.11	0,42±0.14	0,46±0.01	0,32±0.02	0,36±0.13	0,30±0.02	0,88±0.37	1,54±0.39	0,69±0.12

## References

1. Chekanov, K.; Lobakova, E. Photosynthesis measurements on the upper and lower side of the thallus of the foliose lichen *Nephroma arcticum* (L.) Torss. *Photosynth Res* **2021**, *149*(3), 289-301.
2. Lazár, D. Parameters of photosynthetic energy partitioning. *J Plant Physiol* **2015**, *175*, 131-147.