Research Article

Supplementary Material

The Oxygen Paradigm—Quantitative Impact of High Concentrations of Dissolved Oxygen on Kinetics and Large-Scale Production of *Arthrospira platensis*

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1. Calibration: cell dry weight concentration of *Arthrospira platensis* PCC7345

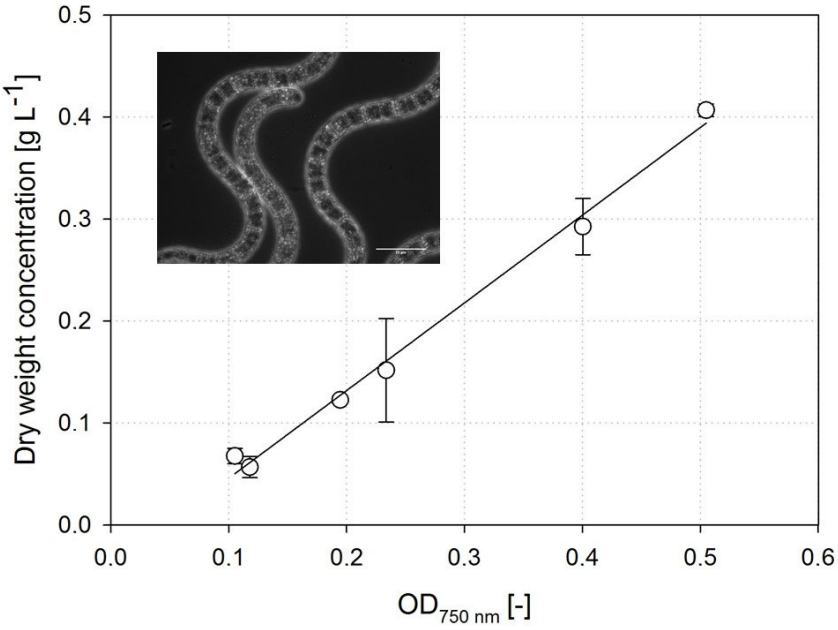
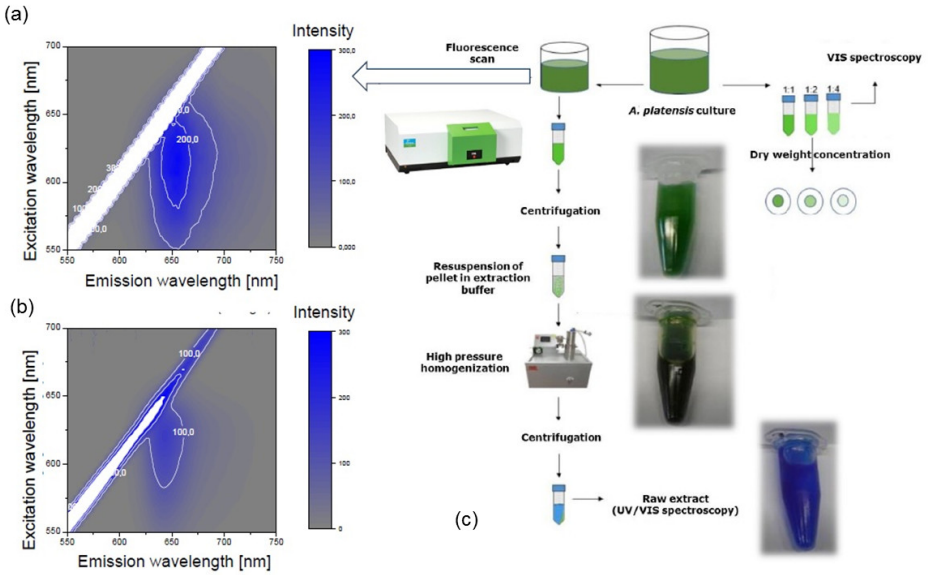


Figure S1: Calibration line to quantify dry weight concentration from OD_{750}.

2. Calibration routine *in-vivo* phycocyanin quantification of suspended cells by fluorescence spectroscopy



(a) Fluorescence scan of suspended cells (OD_{750} = 0.1), (b) Flourescence scan of a phycocyanin standard (TCI Cehmicals), (c) Downstream processing for phycocyanin extraction and quantification from suspended cells

Figure S2: Calibration routine for *in-vivo* phycocyanin quantification from diluted suspended cells.

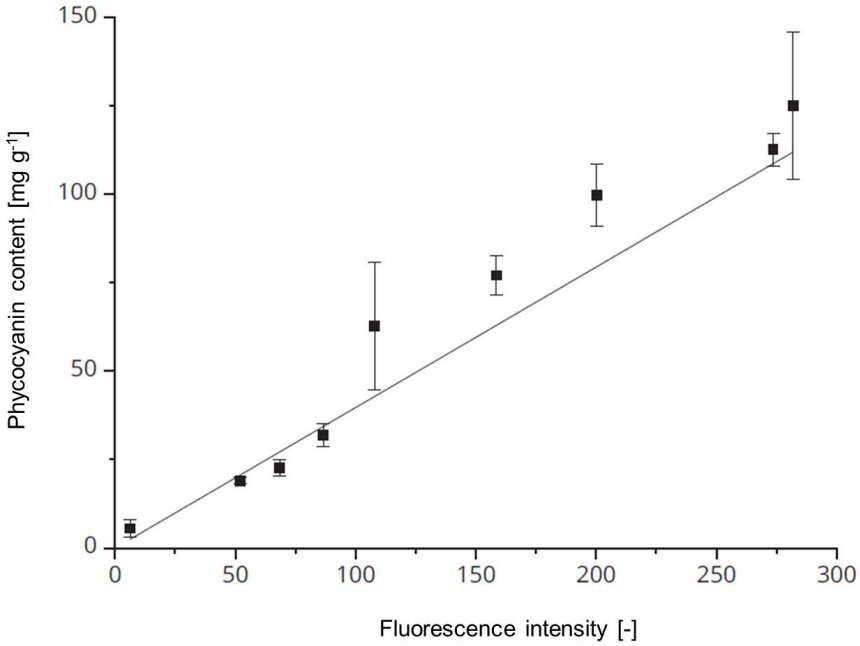


Figure S3: Calibration line for *in-vivo* phycocyanin quantification from diluted suspended cells by fluorescence spectroscopy.

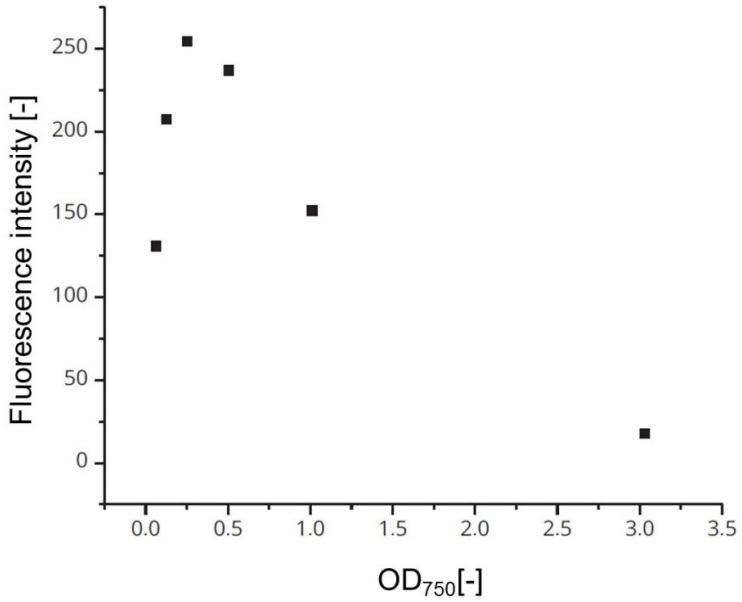


Figure S4: Fluorescence intensity obtained at increasing cell density (OD_{750}). An optimum range was detected between OD_{750} 0.1 - 0.4. A higher cell density leads to a high re-absorption of fluorescence emission and should be avoided for fluorescence spectroscopy.

Table S1: Experimental data of figure 3 (OPR_D/OCR and OPR_L/OPR) and figure 6a (KO_2).

Average Light I_{av} [µmol m^{-2} s^{-1}]	OPR_D/OCR [gO_2 g_X^{-1} d^{-1}]	OPR_L/OPR [gO_2 g_X^{-1} d^{-1}]	KO_2 [mgO_2 L^{-1}]
13	-0.220 ± 0.000	0.202 ± 0.012	24.14 ± 0.38
16	-0.326 ± 0.015	0.322 ± 0.054	16.29 ± 0.16
21	-0.267 ± 0.051	0.543 ± 0.081	25.08 ± 2.28
24	-0.192 ± 0.002	0.413 ± 0.002	20.27 ± 1.13
48	-0.264 ± 0.004	1.149 ± 0.061	13.05 ± 0.13
49	-0.410 ± 0.043	0.724 ± 0.011	10.30 ± 0.14
64	-0.385 ± 0.078	1.715 ± 0.207	21.23 ± 0.14
98	-0.583 ± 0.022	1.620 ± 0.065	8.61 ± 0.42
131	-0.575 ± 0.078	1.717 ± 0.227	8.71 ± 0.26

Table S2: Experimental data of figure 7.

I_0 [µmol m^{-2} s^{-1}]	c_X [g L^{-1}]	Average Light I_{av} [µmol m^{-2} s^{-1}]	Normalized* phycocyanin content 2 h [-]	Normalized phycocyanin content 4 h [-]	Normalized phycocyanin content 20 h [-]
100	1.0	13	0.9985 ± 0.0007	0.996 ± 0.0071	1.0267 ± 0.0033
150	0.5	24	0.8845 ± 0.0461	0.8704 ± 0.0539	0.9024 ± 0.0303
150	0.1	49	0.8571 ± 0.0186	0.8371 ± 0.0331	0.6564 ± 0.0191
400	0.5	64	0.9752 ± 0.0258	0.9163 ± 0.0017	0.9752 ± 0.0258
400	0.1	131	0.9798 ± 0.0002	0.9692 ± 0.0042	0.6845 ± 0.0506

* Data were referred to the initial cellular phycocyanin content.