

**Table S1.** The JIP-test parameters used for monitoring of the microalgal cultures in the present work (according to [54,55]).

Parameter	Description
$F_O, F_J, F_{300}, F_m$	Fluorescence yield at the points O (minimal fluorescence, when all PS II reaction centers, RC are open), J (2 ms), at 300 $\mu$ s (K-step), and at the point of the maximum of OJIP, M, when all PS II RC are closed
PS II $Q_y = \varphi_{P_0} = \frac{F_m - F_O}{F_m} = \frac{F_V}{F_m}$	Maximum potential quantum yield of primary photochemistry in photosystem II
$NPQ = \frac{F_m}{F_m'} - 1$	A non-photochemical quenching parameter according to Stern-Volmer
$\psi_0 = 1 - \frac{F_J - F_O}{F_M - F_O}$	The probability of electron transfer from PS II to PQ pool
$M_0 = 4 \frac{F_{300} - F_O}{F_M - F_O}$	An approximation of the initial slope of OJIP attributed to QA reduction
$\phi_{D_0} = \frac{F_O}{F_M}$	Quantum yield of energy dissipation
$\phi_{E_0} = \psi_0 \left( 1 - \frac{F_O}{F_M} \right)$	Quantum yield of electron transport
$ABS/RC = M_0 \cdot \frac{1}{V_J} \cdot \frac{1}{\varphi_{P_0}}$	Absorbed energy flux per RC
$TR_0/RC = M_0 \cdot \frac{1}{V_J}$	Trapped energy flux per RC
$DI_0/RC = ABS/RC - TR_0/RC$	Thermally dissipated energy flux per RC
$PI_{ABS} = ABS/RC \cdot \left( \frac{\varphi_{P_0}}{1 - \varphi_{P_0}} \right) \cdot \left( \frac{\psi_0}{1 - \psi_0} \right)$	Performance index expressed on the light absorption basis

**Table S2.** Elemental composition and localization the inclusions in the ruptured cells *Micractinium simplicissimum* IPPAS C-2056 (for explanation, see text)

Medium type or time after P <sub>i</sub> re-feeding	Cell wall	Cytosol	Vacuole		Chloroplast stroma	Nucleus
			Small spherules	Large globules		
BG-11 <sub>K</sub>	ND	ND	ND	ND	ND	ND
P-free medium	ND	ND	ND	ND	ND	ND
4 h*	ND	ND	ND	ND	ND	ND
24 h	**Fe, Fe-P, Fe-P-S, P-Ca-Mg, P-Ca, P-Mg, P†	P-Na-Mg-Ca, P-N-Mg	P-Mg-Ca† P-N-S-Ca-Mg P-N-Mg	P-N-Mg, P-N-Ca	P-S†, P-Mg-Ca	P†
72 h	Fe, P, S, P-Fe-Na-Ca	ND	ND	ND	ND	ND
168–240 h	P	P-N-Mg, P-N, P	P-Na-Mg, P-Na-Mg-Ca	ND	P-N	ND

\*Time after re-feeding of the P-starved cultures with P<sub>i</sub>.

\*\*Elements are ordered according to an increase in the magnitude of the corresponding element peak in the EDX spectrum.

†The EDX spectrum possessed the peak of uranium (U).

ND—no data.