

Table S1. Lipid composition in the BX1.5 cells.

FAMES	BG11	-N	-P	-N-P
	6 days	6 days	6 days	6 days
C16:0	21.9 \pm 0.02	22.7 \pm 0.11	23.8 \pm 0.05	20.3 \pm 0.38
C16:1	1.0 \pm 0.05	0.8 \pm 0.15	0.7 \pm 0.02	0.6 \pm 0.01
C16:2	2.5 \pm 0.15	1.0 \pm 0.01	1.1 \pm 0.05	1.1 \pm 0.02
C16:3	0.8 \pm 0.04	0.9 \pm 0.02	1.1 \pm 0.02	0.9 \pm 0.05
C18:0	5.5 \pm 0.23	7.8 \pm 0.08	7.1 \pm 0.06	6.5 \pm 0.19
C18:1	13.0 \pm 0.52	17.9 \pm 0.18	19.5 \pm 0.08	18.3 \pm 1.89
C18:2	45.2 \pm 0.33	32.1 \pm 0.05	39.0 \pm 0.09	43.6 \pm 1.26
C18:3	10.0 \pm 0.23	16.9 \pm 0.14	7.7 \pm 0.14	8.8 \pm 0.10

Lipid composition as FAMES in the BX1.5 cells cultivated in the BG11, BG11-N, BG11-P, and BG11-N-P medium shown in Figure 7 was evaluated and displayed as percentage values with standard deviations.

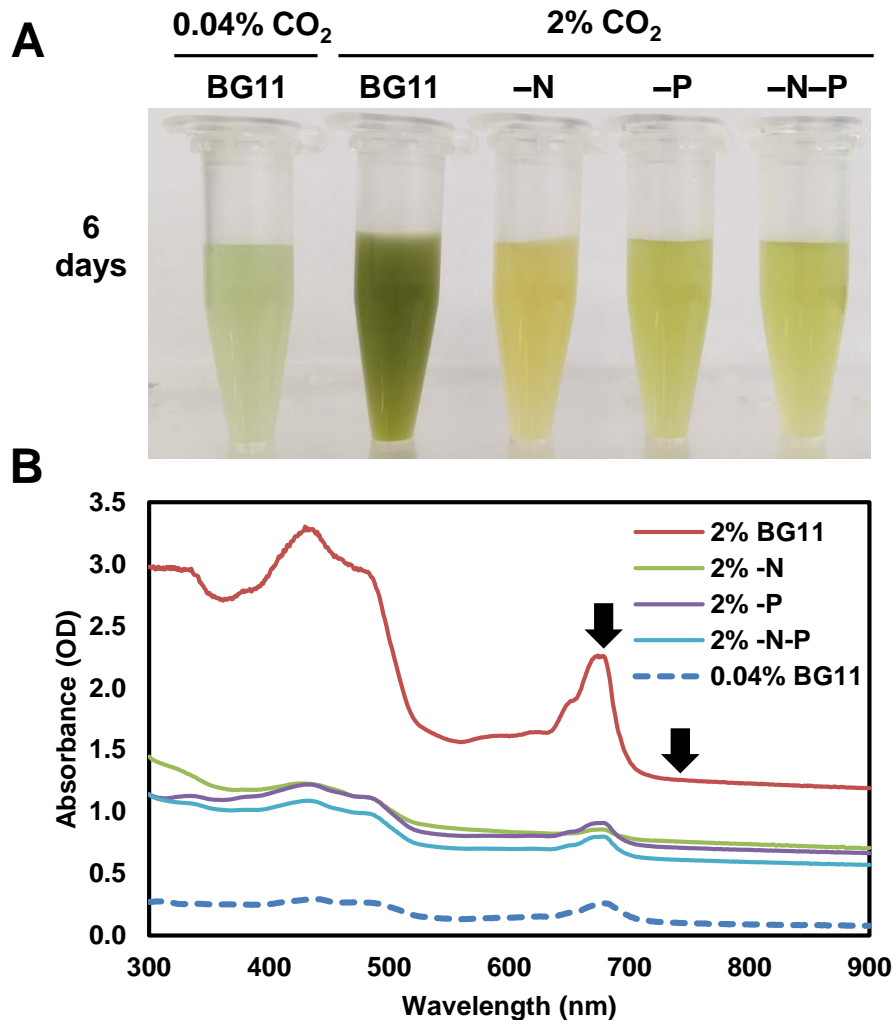


Fig. S1. Culture profile and absorption spectrum. (A) Cells were harvested on the 6th day under induction cultivation conditions, as shown in Fig. 2A. (B) This sample was directly subjected to analysis by absorption spectrophotometry. The main peak at OD₆₇₄ for chl *a* and OD₇₃₀ for cell turbidity measurement (Fig. 2B) are shown with arrows.

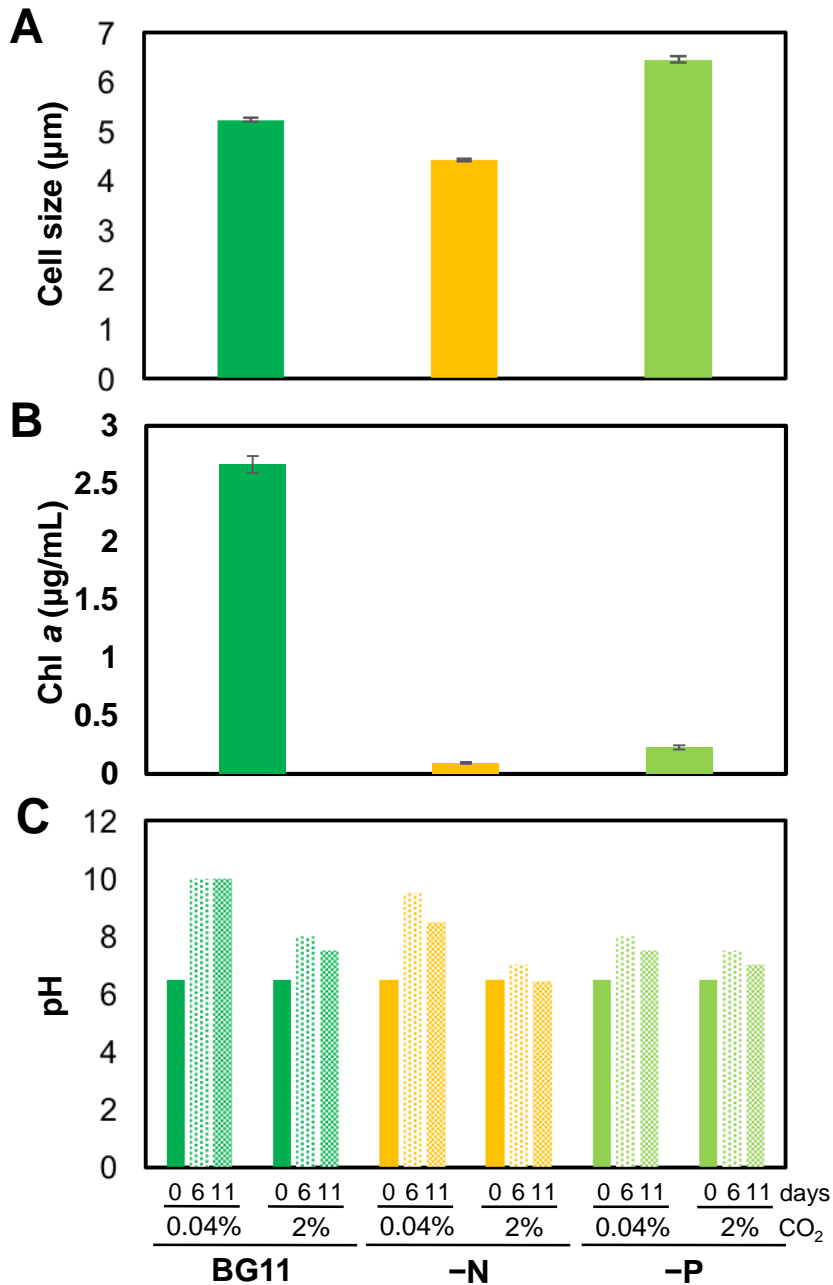


Fig. S2. Cell size, chlorophyll *a*, and pH of BX1.5. **(A)** Diameters of the cells cultivated under the supply of 2% CO₂-air shown in Fig. S1 and S3, and that with standard deviations from the photography profiles are shown in Fig. 4. Sample numbers: BG11, $n = 28$; BG11–N, $n = 13$, and BG11–P, $n = 19$, respectively. **(B)** The amount of chlorophyll *a* from the cell culture in panel A was measured by the methanol-extraction method [17]. **(C)** pH of the cell culture shown in Fig. 2 was sequentially measured for 0, 6, and 11 days under the induction cultivation condition supplying with 2% CO₂-air or under the standard condition of 0.04% CO₂-air.

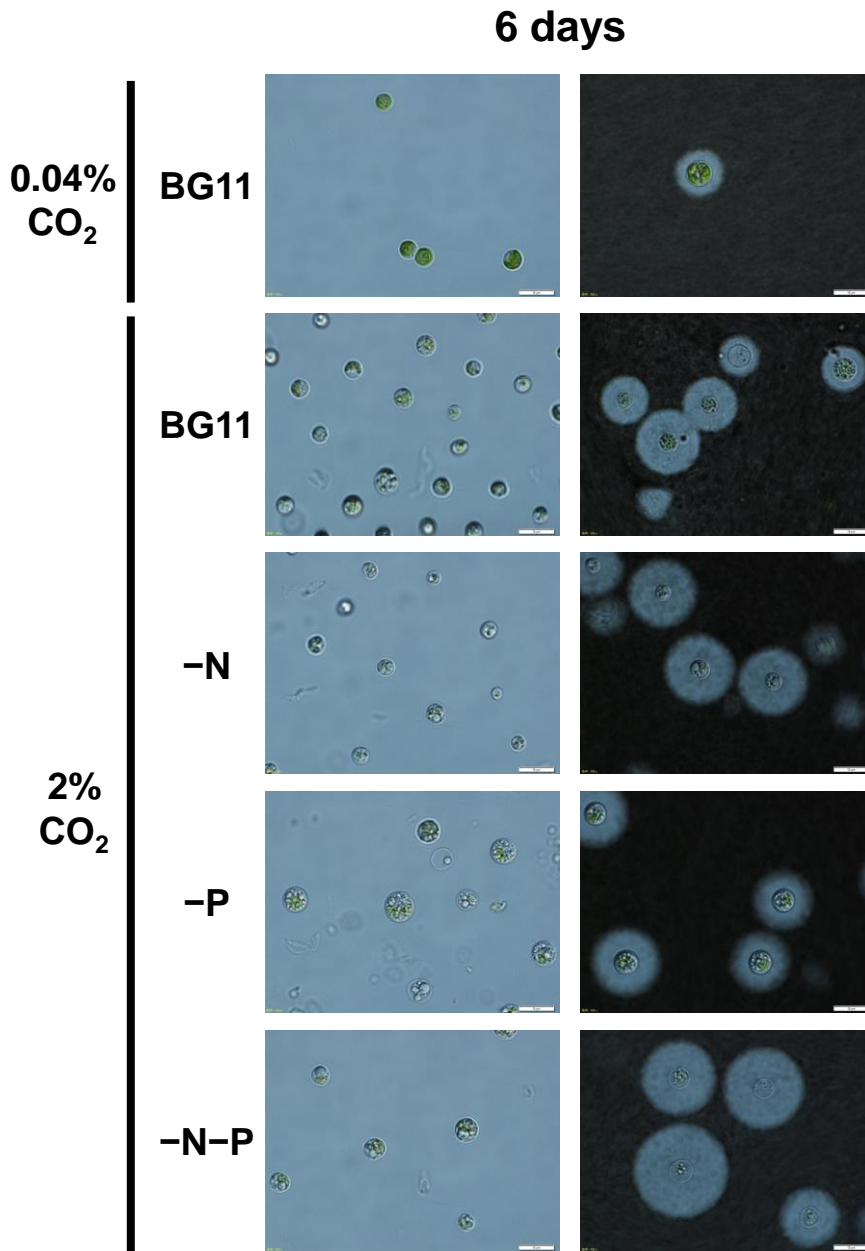


Fig. S3. Cells were harvested on the 6th day under induction cultivation condition as shown in Fig. 2A or Fig. S1. The samples were subjected to microscopic observations without (**left**) or with (**right**) India-ink stain. More details are described in the text.

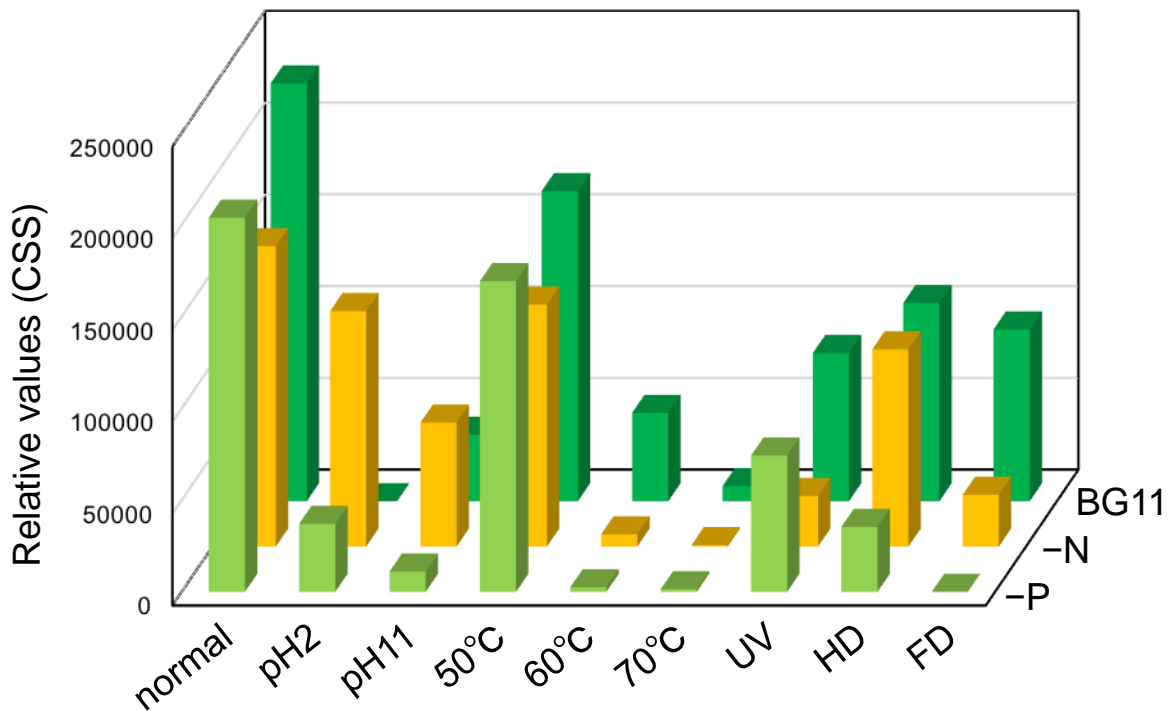


Fig. S4. Cell resistance to respective stresses. Relative cell-spot signal intensities (CSS) for the cell resistance on the BG11 plate, shown in Fig. 8B, were evaluated by a densitometry image analyzer (Bio1D Optical Density: Vilber Lourmat, Wielandstrasse, Germany) and presented as a profile with relative values. More details are described in the text.