Artificial sputum medium (ASM) composition

$NaNO_3$ (170 mg·L^{-1}), K_2HPO_4 (17.4 mg·L^{-1}), Na_2HPO_4 (14.2 mg·L^{-1}), $MgCl_2{\cdot}6H_2O$ (40.62 mg·L^{-1}), $MgSO_4{\cdot}7H_2O$ (49.33 mg·L^{-1}), $CaCl_2{\cdot}2H_2O$ (29.4 mg·L^{-1}), $FeCl_3{\cdot}6H_2O$ (1.0835 mg·L^{-1}), H_3BO_3 (2.47 mg·L^{-1}), $MnCl_2{\cdot}4H_2O$ (1.3683 mg·L^{-1}), $ZnCl_2$ (0.44 mg·L^{-1}), Na_2EDTA (6.64 mg·L^{-1}), $CoSO_4{\cdot}7H_2O$ (0.0216 mg·L^{-1}), $CuCl_2{\cdot}2H_2O$ (0.00013 mg·L^{-1}).

Solar light spectrum

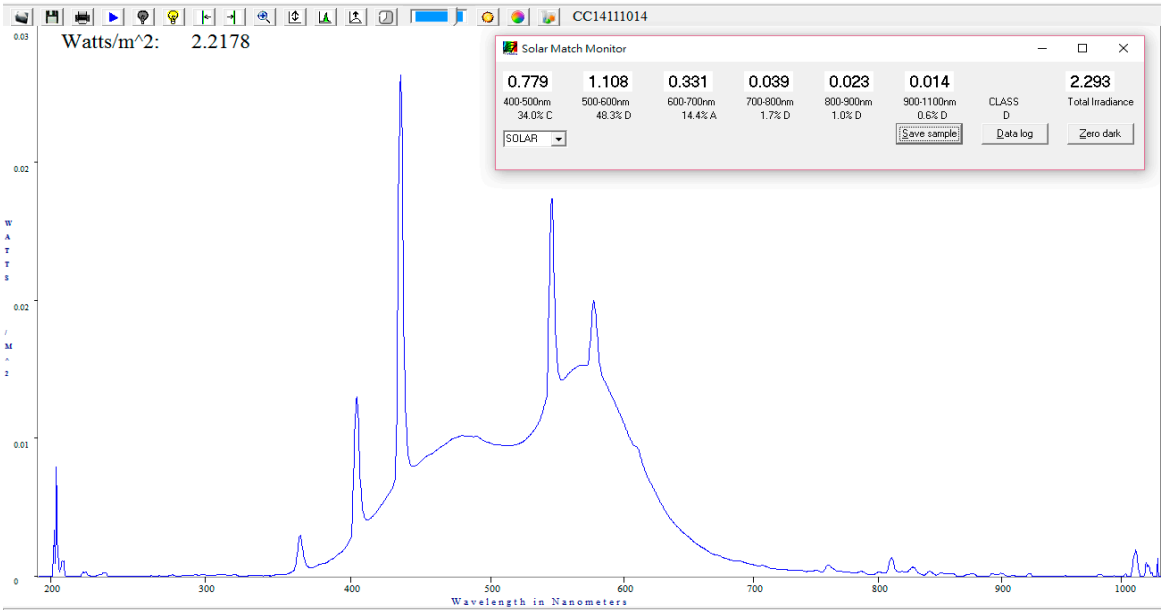

Figure S1. Solar light spectrum utilized in the present study for the day-like simulation with a total solar wavelength radiance of 2.3 W·m^{-2}.

2.3 W·m^{-2} is the light intensity used for culturing *M. aeruginosa*, and that light intensity mimics real environmental conditions for reservoir water in the depth of ~3 m [90].

Table S1. Copper sulfate pentahydrate and hydrogen peroxide concentrations.

Copper Sulfate Pentahydrate $CuSO_4.5H_2O$ (mg·L^{-1})	Copper Cu (II) (mg·L^{-1})	Hydrogen Peroxide H_2O_2 (mg·L^{-1})
0	0	0
0.05	0.013	1
0.1	0.026	2
0.5	0.13	3
1	0.26	5
1.5	0.38	10
2	0.51	20

Microcystin-LR chemical structure

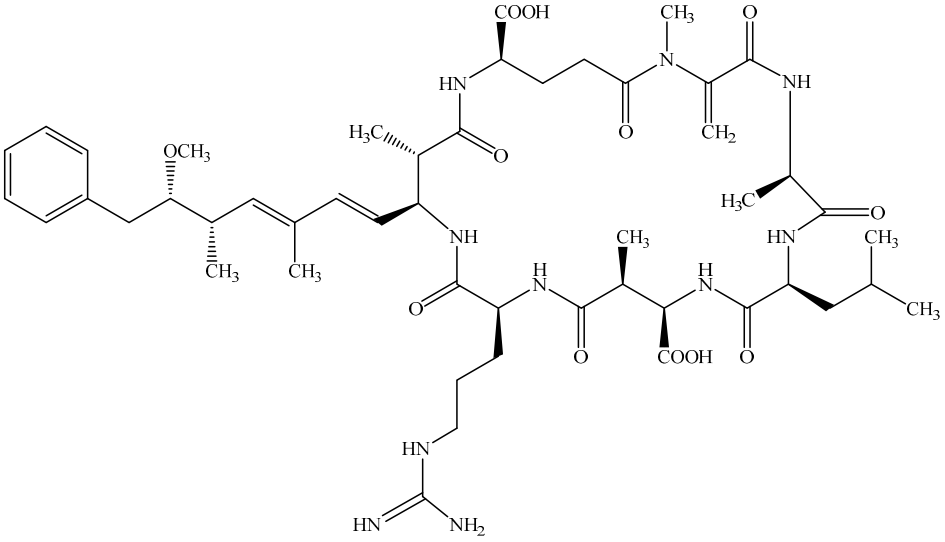

Figure S2. Structure of MC-LR.

Quantification of residual hydrogen peroxide

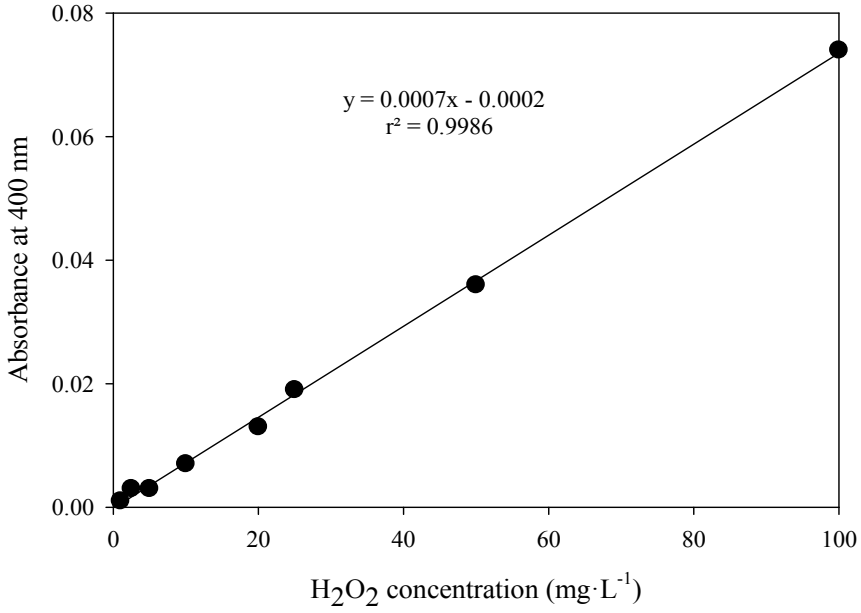

Figure S3. Hydrogen peroxide concentration calibration curve.

Quantification of residual hydroxyl radicals

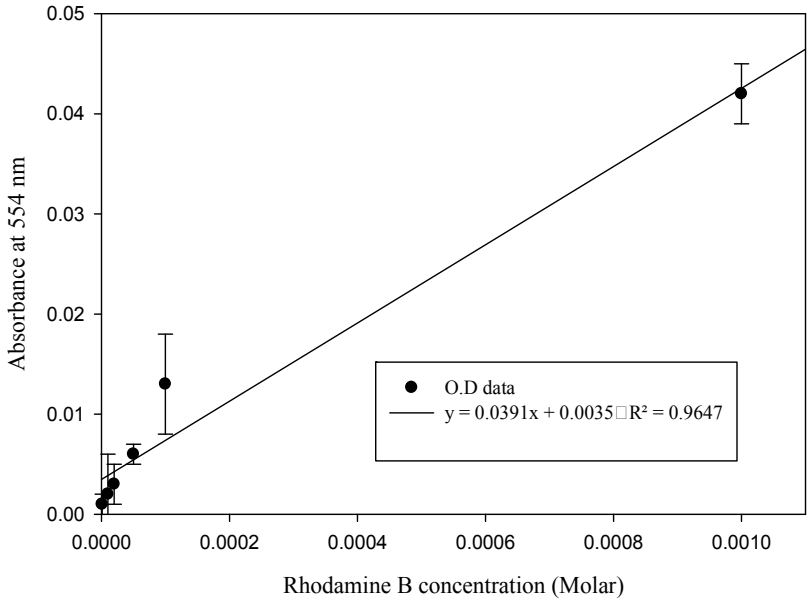

Figure S4. Rhodamine B absorbance calibration curve. The error bars represent one standard deviation for three measurements.

pH evolution in *Microcystis* culture incubated with H_2O_2 and copper sulfate

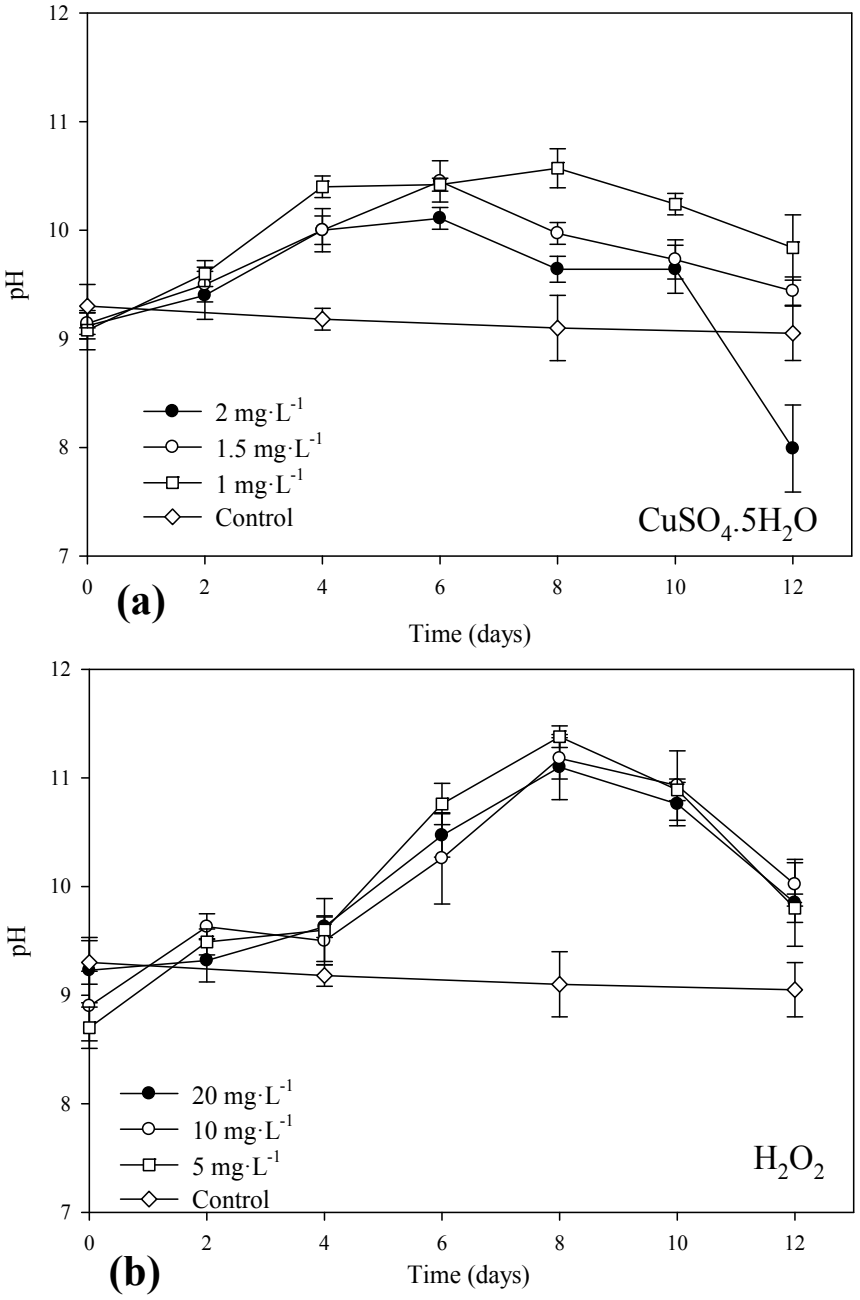

Figure S5. Variation of the pH during *M. aeruginosa* growth under different dosages of (**a**) copper sulfate; (**b**) H_2O_2 at 25 °C. The error bars represent one standard deviation for three measurements.

pH evolution in MC-LR and *Bacillus sp.* incubated with H_2O_2 and copper sulfate

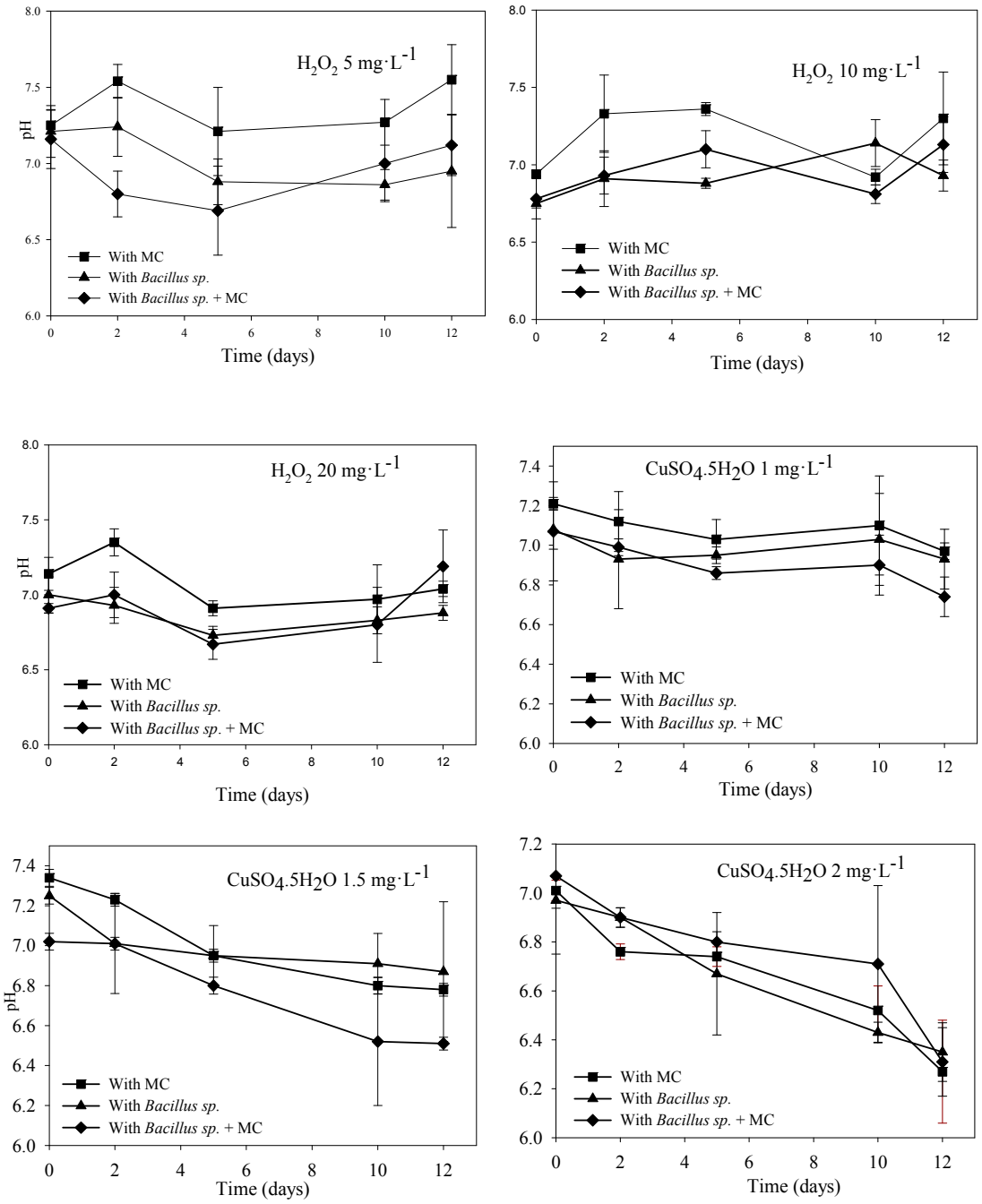

Figure S6. pH evolution under different concentrations of copper sulfate pentahydrate speciation and hydrogen peroxide at 25 °C. The error bars represent one standard deviation for three measurements.

Residual hydroxyl radicals

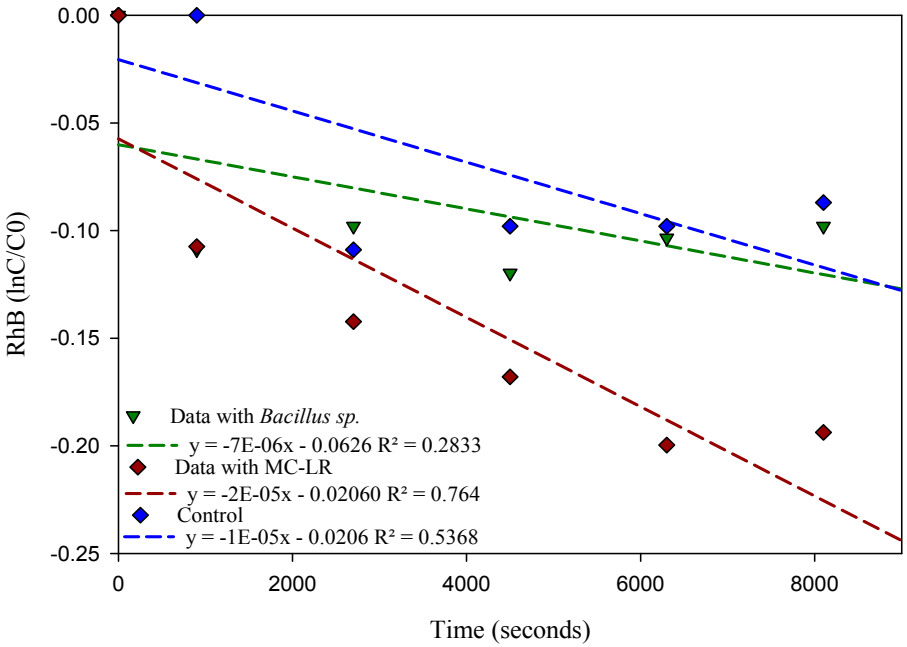

Figure S7. OH radicals estimation graphs using RhB (10^{-3} M), with *Bacillus sp.* (8.7×10^{6} CFU/mL), and MC-LR (0.2 mg·L^{-1}) under 2.293 watt-m^{-2}, at 25 °C.

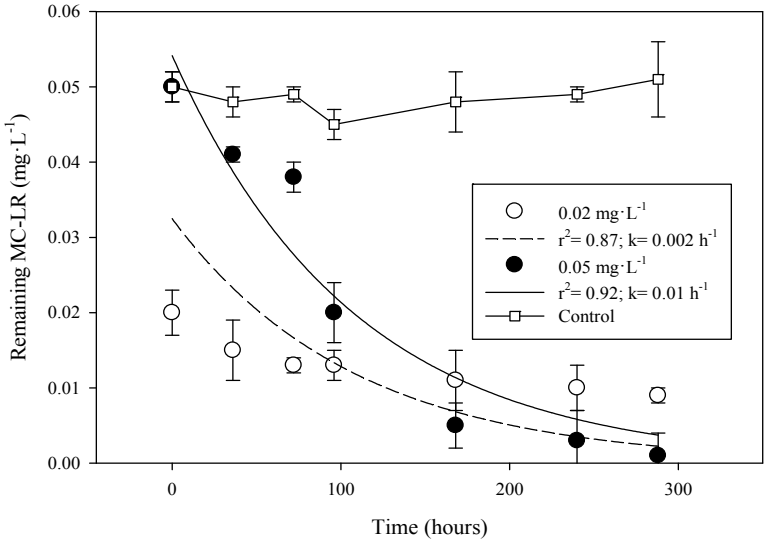

Figure S8. MC-LR degradation under 8–9 × 10^{6} CFU/mL *Bacillus sp.* at 25 °C. The error bars represent one standard deviation for three measurements.

Refenrences

1. Acevedo, M.F. *Data Analysis and Statistics for Geography, Environmental Science, and Engineering*; CRC Press: Boca Raton, FL, USA, 2012.