

**Rapid counting method for 2-MIB-producing cyanobacteria
(*Pseudanabaena* sp.) using fluorescence detection of phycocyanin
pigments in algal cells**

Supplementary Information

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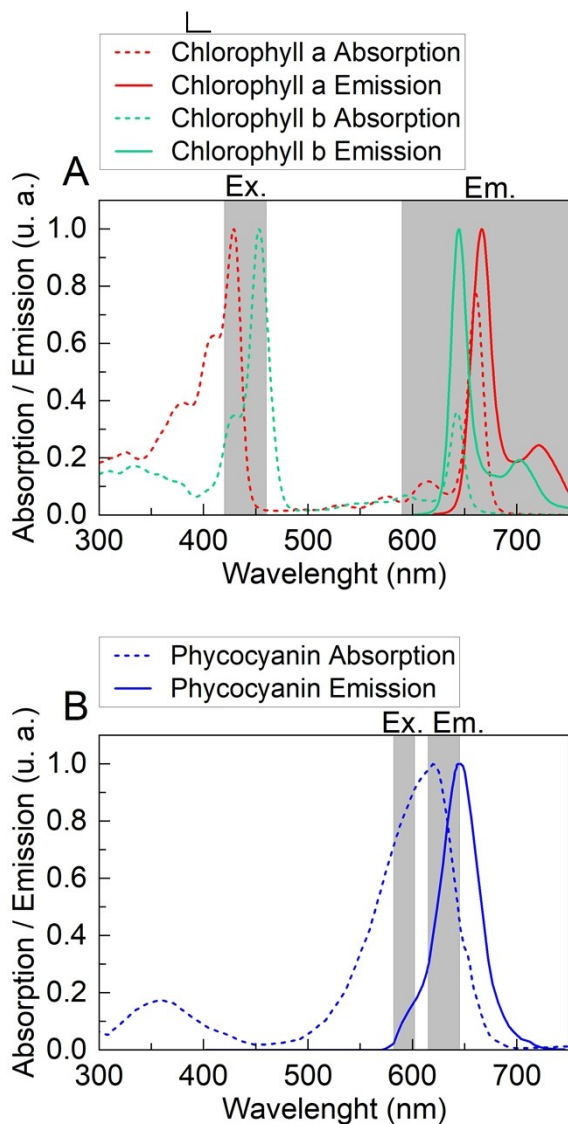


Fig. S1 Absorbance (dot line) and fluorescence emission (solid line) spectra of chlorophyll a, chlorophyll b, and phycocyanin, as well as the excitation (Ex.) and emission (Em.) ranges of the filter selected for (A) chlorophyll and (B) phycocyanin fluorescence. All spectra were normalized. Chlorophyll a and b spectra were obtained from PhotochemCAD™ (<http://www.photochemcad.com>). Phycocyanin data were adapted from “The phycobilisomes: an early requisite for efficient photosynthesis in cyanobacteria.” By Singh NK, Sonani RR, Rastogi RP, Madamwar D., 2015 EXCLI Journal, 14:268-289. doi: [10.17179/excli2014-723](https://doi.org/10.17179/excli2014-723) Copyright © 2015 Singh et al.

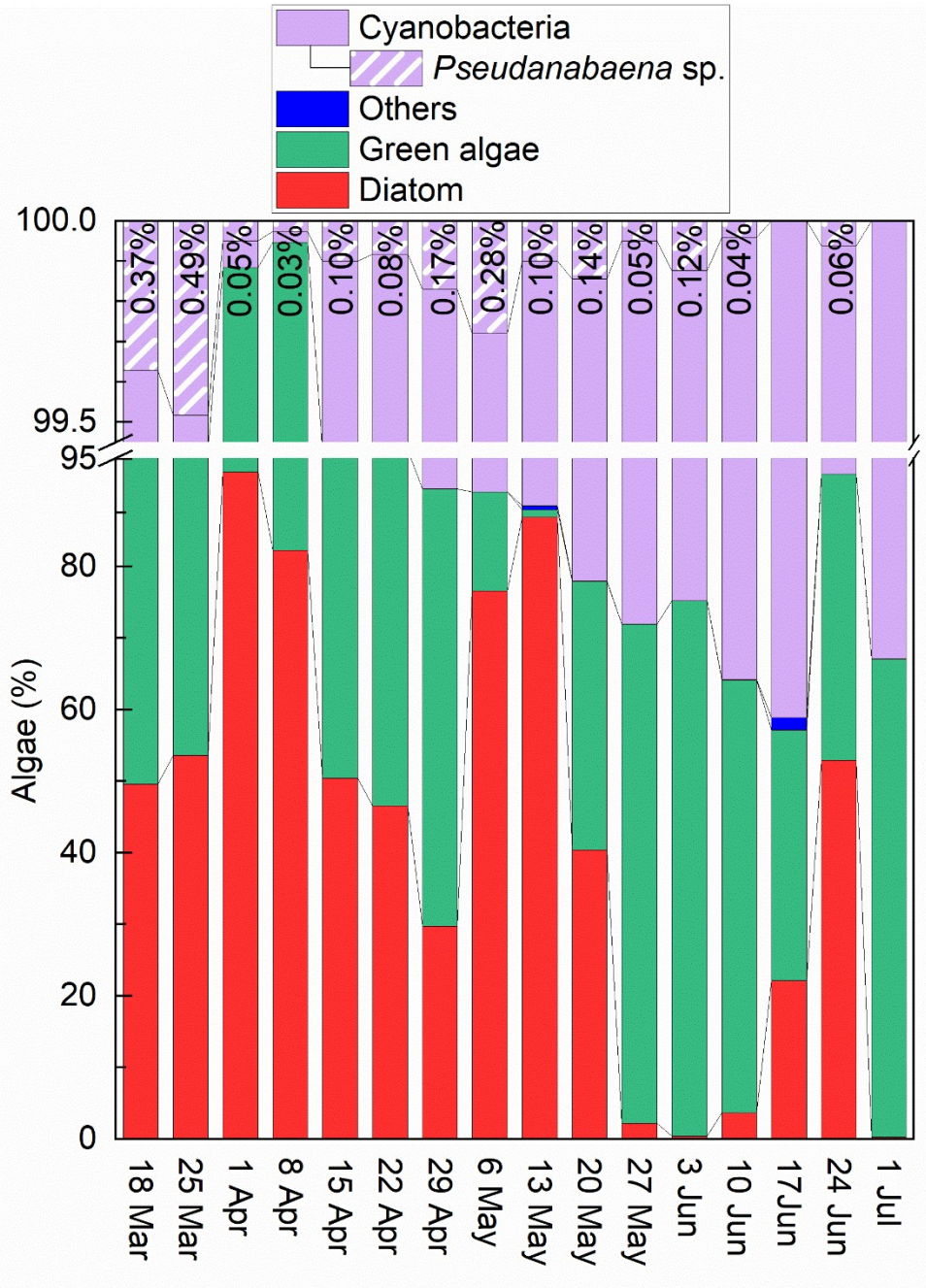


Fig. S2 Percentage of each alga type in Lake Y from March 18 to July 1, 2022. Their concentrations were obtained from manual observations in the bright-field mode.

Table S1 Water quality of samples collected from Lake Y from March to July 2022.

Day	Temperature	Chlorophyll a	Geosmin	2-MIB	pH	Dissolved oxygen
Unit	°C	µg/L	ng/L	ng/L	—	mg/L
11 March	11.0	30.3	0.8	3.6	9.0	13.3
18 March	14.2	13.3	0.9	4.7	9.1	12.8
25 March	12.0	51.5	0.9	7.4	8.8	12.3
01 April	12.2	46.4	0.9	13.4	8.9	11.2
08 April	13.0	34.6	0.9	8.9	8.2	12.6
15 April	15.1	11.3	0.9	3.7	8.4	10.9
22 April	14.0	20.2	0.9	3.0	7.8	10.7
28 April	17.3	10.3	1.2	32	7.6	9.8
06 May	16.5	26.7	1.0	2.9	7.5	10.5
13 May	16.0	36.3	0.9	4.1	9.2	11.1
20 May	19.3	8.7	1.2	2.9	9.1	11.2
27 May	19.7	4.8	1.1	0.7	8.0	9.5
03 June	23.1	3.4	0.8	0.3	7.6	9.0
10 June	22.0	5.5	0.8	0.5	7.9	9.5
17 June	21.6	9.9	0.6	0.5	7.8	9.8
24 June	22.0	15.6	0.4	0.0	7.4	8.7
01 July	23.5	12.8	0.4	0.6	7.4	8.1

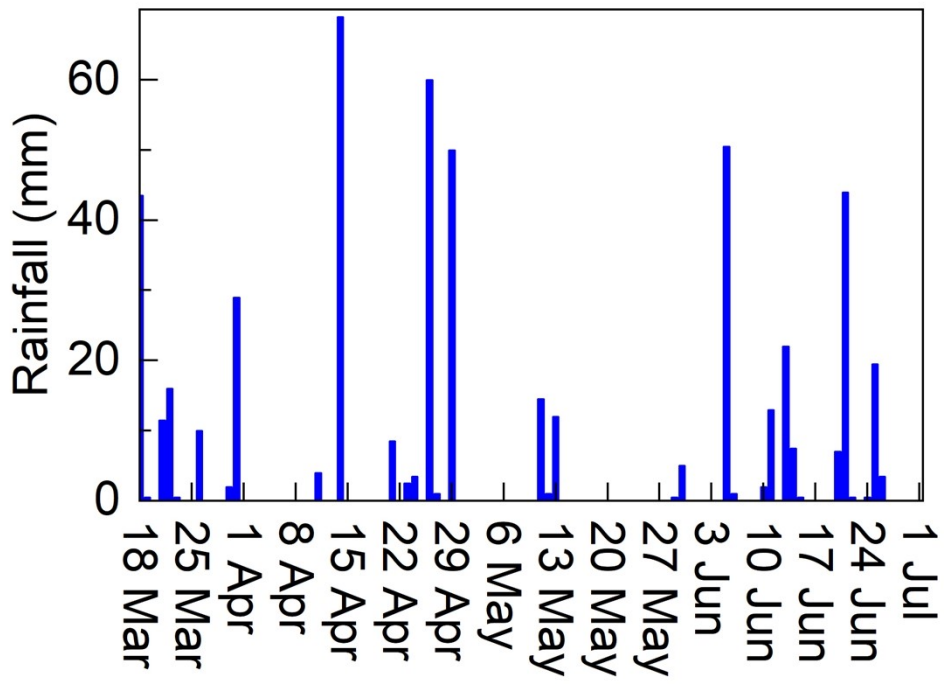


Fig. S3 Rainfall during the assessment of Lake Y from March to July 2022.

Table S2 Algae population (units/mL) in Lake Y from March to July 2022.

Date	18 March	25 March	01 April	08 April	15 April	22 April	29 April	06 May	13 May	20 May	27 May	03 June	10 June	17 June	24 June	01 July
Cyanobacteria																
<i>Anabaeana</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Aphanocapsa</i>	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0	0
<i>Microcystis</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Pseudanabaena limnetica</i>	0	0	0	0	0	10	0	0	0	0	0	0	0	0	10	0
<i>Pseudanabaena sp.</i>	225	370	87	9	14	37	33	60	50	20	8	22	9	0	10	0
Others (unicellular cyanobacteria)	660	660	30	0	300	600	1500	2180	5600	3000	2800	3960	8800	8000	1100	8650
Total	885	1030	117	9	314	637	1533	2240	5650	3020	2808	3987	8809	8000	1120	8650
Diatoms																
<i>Aulacoseira italica</i>	0	0	0	0	0	0	10	0	0	0	0	0	0	0	0	0
<i>Aulacoseira distans</i>	0	0	20	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Cyclotella</i>	300	200	60	0	10	0	0	30	10	0	30	0	20	10	10	10
<i>Cymbella</i>	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0
<i>Fragilaria crotonensis</i>	0	0	0	0	0	10	10	0	0	0	0	0	0	0	0	10
<i>Navicula</i>	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0	0
<i>Nitzschia</i>	30360	40920	168360	31220	10100	11290	5220	19140	43500	5600	180	60	880	4300	8500	50
Others	0	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0
Total	30660	41120	168440	31220	10110	11300	5240	19170	43510	5610	220	70	900	4310	8510	70
Green algae																
<i>Ankistrodesmus</i>	40	1000	140	130	0	40	0	0	30	0	0	10	0	0	0	0
<i>Cosmarium</i>	0	0	0	0	0	0	0	0	10	10	0	10	0	0	10	10
<i>Gleocystis</i>	0	0	0	0	0	0	0	0	0	0	140	0	0	0	0	0
<i>Oocystis</i>	0	0	0	0	0	0	0	0	0	0	0	0	30	0	0	0
<i>Pleodorina</i>	0	0	0	0	0	0	0	0	0	0	0	0	10	0	0	0
<i>Scenedesmus</i>	29300	31750	11420	6200	180	470	1320	700	300	30	20	50	50	50	30	450
<i>Sphaerocystis Schroeteri</i>	130	1200	270	0	0	330	10	70	130	550	230	40	310	160	0	100
<i>Staurastum</i>	0	0	0	0	0	0	0	0	30	10	0	0	0	0	0	10
Others	540	220	270	370	9380	11480	9440	2710	0	4620	6600	12000	14500	6600	6400	17000
Total	30010	34170	12100	6700	9570	12320	10770	3480	500	5220	6990	12110	14900	6810	6440	17570
Others																
<i>Cryptomonas</i>	10	0	0	0	20	0	10	0	300	10	0	0	20	330	0	30
<i>Mallomonas, Ceratium, Trachelomonas</i>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Algae	62105	76540	180927	38299	29394	35737	26993	27600	49960	18480	16618	28167	39129	26050	22470	43320

Table S3 Algae population (units/mL) in river U in May 2022.

Date	6 May	9 May	16 May	17 May	26 May	31 May
Cyanobacteria						
<i>Aphanocapsa</i>	0	0	10	0	0	0
<i>Chroococcus</i>	0	0	10	0	0	0
<i>Microcystis aeruginosa</i>	0	0	0	0	0	10
<i>Nostoc</i>	0	0	0	0	0	20
<i>Pseudanabaena</i> sp. (2-MIB producing)	40	40	10	20	20	10
<i>Pseudanabaena limnetica</i>	0	0	0	10	10	0
Other (unicellular single cyanobacteria)	600	430	16500	1520	1000	1650
Diatoms						
<i>Aulacoseira distans</i>	40	0	0	20	0	0
<i>Aulacoseira</i> g var ang f <i>spiralis</i>	10	10	130	70	0	0
<i>Aulacoseira granulata</i>	0	0	10	0	0	0
<i>Aulacoseira italica</i>	0	0	30	0	0	0
<i>Cyclotella</i>	20	10	470	210	10	20
<i>Cymbella</i>	30	80	10	20	20	10
<i>Diatoma</i>	40	0	400	0	0	0
<i>Gomphonema</i>	0	10	0	0	10	0
<i>Navicula</i>	50	80	30	130	70	30
<i>Nitzschia</i>	80	70	60	20	120	40
Others	0	20	20	20	0	0
Green algae						
<i>Ankistrodesmus</i>	0	0	10	0	0	0
<i>Chlamydomonas</i>	10	10	10	0	0	0
<i>Closterium aciculare</i>	0	0	0	10	0	0
<i>Cosmarium</i>	110	50	340	330	10	20
<i>Micractinium pusillum</i>	0	0	10	0	0	0
Oocystis	0	0	10	0	0	0
<i>Pandorina</i>	0	20	0	0	0	0
<i>Pediastrum</i>	0	0	20	10	10	0
<i>Scenedesmus</i>	10	90	60	90	260	70
<i>Sphaerocystis</i>	0	0	40	40	0	30
<i>Staurastrum</i>	0	0	0	10	0	0
Others	2180	1910	2640	1650	3000	4290
Others						
<i>Cryptomonas</i>	10	0	0	10	0	0
<i>Mallomonas</i>	0	0	0	0	0	0
<i>Ceratium</i>	0	0	0	0	0	0
<i>Trachelomonas</i>	0	0	0	0	0	0