

Table S1. The list of phytoplankton species at sampling site 1&2 in the Shending River Backwater (March - August 2021).

	Class	Species	sampling site 1	sampling site 2
1	Bacillariophyceae	<i>Cocconeis placentula</i>	+	
2		<i>Asterionella formosa</i>		+
3		<i>Cyclotella meneghiniana</i>	+	+
4		<i>Diatoma sp.</i>		+
5		<i>Cocconeis placentula var.euglypta</i>	+	
6		<i>Fragilaria biceps</i>	+	
7		<i>Fragilaria crotonensis</i>	+	+
8		<i>Chaetoceros sp.</i>	+	
9		<i>Gomphonema sp.</i>	+	+
10		<i>Cymbella sp.</i>		+
11		<i>Gyrosigma sp.</i>	+	+
12		<i>Melosira varians</i>	+	
13		<i>Navicula rhynchocephala</i>	+	+
14		<i>Skeletonema costatum</i>		+
15		<i>Nitzschia sp.</i>	+	+
16		<i>Pinnularia sp.</i>	+	+
17		<i>Schroederia nitzschioides</i>	+	+
18		<i>Synedra sp.</i>	+	
19	Cyanophyceae	<i>Merismopedia punctata</i>		+
20		<i>Merismopedia sinica</i>	+	
21		<i>Merismopedia sp.</i>	+	
22		<i>Microcystis aeruginosa</i>		+
23		<i>Microcystis sp.</i>	+	+
24		<i>Oscillatoria tenuis</i>		+
25		<i>Oscillatoria sp.</i>	+	+
26		<i>Dactylococcopsis acicularis</i>	+	
27		<i>Pseudanabaena sp.</i>	+	+
28		<i>Chroococcus sp.</i>	+	+
29		<i>Dolichospermum planctonicum</i>	+	
30		<i>Gomphosphaeria lacustris</i>	+	+
31		<i>Anabaena variabilis</i>		+
32		<i>Nostoc spongiaeforme</i>	+	
33		<i>Raphidiopsis sinensis</i>	+	+
34		<i>Cylindrospermopsis</i>	+	+
35		<i>Raphidiopsis curvata</i>	+	+
36	Chlorophyceae	<i>Actinastrum sp.</i>	+	
37		<i>Ankistrodesmus falcatus</i>	+	
38		<i>Ankistrodesmus sp.</i>	+	+

39		<i>Chlamydomonas simplex</i>	+	+
40		<i>Chlorella vulgaris</i>	+	
41		<i>Cosmarium sp.</i>	+	+
42		<i>Crucigenia sp.</i>	+	
43		<i>Dictyosphaerium sp.</i>	+	+
44		<i>Euastrum ansutum</i>	+	
45		<i>Pediastrum duplex</i>	+	+
46		<i>Pediastrum simplex</i>	+	
47		<i>Pediastrum tetras</i>		+
48		<i>Scenedesmus bicaudatus</i>	+	+
49		<i>Scenedesmus bijuga</i>	+	+
50		<i>Scenedesmus brasiliensis</i>		+
51		<i>Scenedesmus dimorphus</i>	+	+
52		<i>Scenedesmus granulatus</i>		+
53		<i>Scenedesmus protuberans</i>	+	+
54		<i>Scenedesmus quadricauda</i>	+	+
55		<i>Scenedesmus quadricauda var parvus</i>		+
56		<i>Scenedesmus sp.</i>	+	+
57		<i>Staurastrum sp.</i>	+	+
58	Cryptophyceae	<i>Chroomonas acuta</i>		+
59		<i>Cryptomonas ovata</i>		+
60		<i>Cryptomonas erosa</i>		+
61	Euglenophyceae	<i>Euglena oxyuris</i>	+	
62		<i>Euglena sp.</i>	+	
63		<i>Phacus sp.</i>		+
64		<i>Strombomonas sp.</i>		+
65	Dinophyceae	<i>Ceratium hirundinella</i>	+	+
66		<i>Gymnodinium sp.</i>		+
67		<i>Peridinium bipes</i>	+	+
68	Phaeophyceae	<i>Khawkinea acutecouato</i>	+	
69	Chrysophyceae	<i>Chromulina sp.</i>		+

The identified species were categorized into taxa using the modern systematics known as Catalogue of Life.

Table S2. Results of the Pearson correlation analysis at sampling site 1.

	WT	DO	PAR	WL	COD _{Mn}	NH ₃ -N	TP	TN	N/P	Bacillariophyceae	Chlorophyceae	Cyanophyceae	Other algae
WT		0.032	0.194	0.356	0.363	0.360	0.167	0.192	0.133	0.386	0.325	0.446	0.454
DO	-0.851		0.720	0.446	0.070	0.983	0.005	0.042	0.004	0.395	0.343	0.424	0.434
PAR	0.615	-0.189		0.243	0.993	0.145	0.915	0.728	0.897	0.489	0.468	0.536	0.537
WL	0.462	-0.389	0.565		0.183	0.883	0.517	0.088	0.312	0.026	0.027	0.020	0.022
COD _{Mn}	0.457	-0.776	0.005	0.627		0.343	0.027	0.002	0.006	0.176	0.171	0.157	0.163
NH ₃ -N	-0.459	-0.011	-0.671	-0.078	0.473		0.665	0.592	0.610	0.788	0.844	0.729	0.726
TP	0.644	-0.941	-0.057	0.334	0.863	0.227		0.035	0.001	0.524	0.480	0.522	0.535
TN	-0.617	0.829	-0.184	-0.747	-0.968	-0.279	-0.844		0.005	0.082	0.073	0.076	0.080
N/P	-0.685	0.947	-0.069	-0.501	-0.935	-0.266	-0.968	0.940		0.279	0.250	0.280	0.289
Bacillariophyceae	0.437	-0.430	0.355	0.866	0.635	0.142	0.329	-0.756	-0.531		0.000	0.000	0.000
Chlorophyceae	0.489	-0.474	0.372	0.864	0.640	0.104	0.362	-0.771	-0.558	0.998		0.000	0.000
Cyanophyceae	0.389	-0.407	0.321	0.881	0.656	0.183	0.331	-0.765	-0.530	0.997	0.991		0.000
Other algae	0.383	-0.398	0.319	0.878	0.649	0.185	0.321	-0.759	-0.522	0.997	0.991	1.000	

The lower half of the table contains values of r , while the upper half of the table contains values of p .

Table S3. Results of the Pearson correlation analysis at sampling site 2.

	WT	DO	PAR	WL	COD _{Mn}	NH ₃ -N	TP	TN	N/P	Cryptophyceae	Chlorophyceae	Cyanophyceae	Other algae
WT		0.181	0.221	0.360	0.084	0.280	0.925	0.027	0.560	0.000	0.242	0.445	0.253
DO	-0.629		0.622	0.094	0.010	0.007	0.727	0.621	0.793	0.267	0.042	0.010	0.005
PAR	0.587	-0.257		0.242	0.731	0.654	0.517	0.097	0.227	0.212	0.282	0.536	0.502
WL	0.459	-0.738	0.565		0.137	0.023	0.736	0.747	0.664	0.457	0.235	0.021	0.012
COD _{Mn}	0.752	-0.919	0.181	0.680		0.011	0.436	0.510	0.589	0.138	0.212	0.075	0.018
NH ₃ -N	0.529	-0.932	0.235	0.873	0.913		0.443	0.838	0.427	0.392	0.178	0.005	0.000
TP	0.050	-0.184	-0.334	0.178	0.397	0.392		0.755	0.057	0.998	0.655	0.711	0.552
TN	0.863	-0.258	0.733	0.170	0.340	0.108	-0.165		0.165	0.015	0.373	0.929	0.743
N/P	0.302	0.139	0.581	-0.228	-0.282	-0.404	-0.798	0.647		0.471	0.475	0.629	0.561
Cryptophyceae	-0.994	0.542	-0.596	-0.380	-0.679	-0.432	0.001	-0.900	-0.370		0.303	0.579	0.358
Chlorophyceae	0.566	-0.828	0.528	0.572	0.596	0.633	-0.234	0.448	0.366	-0.509		0.071	0.117
Cyanophyceae	0.389	-0.918	0.320	0.880	0.767	0.942	0.195	0.047	-0.253	-0.288	0.774		0.002
Other algae	0.555	-0.939	0.346	0.909	0.887	0.991	0.308	0.173	-0.302	-0.461	0.706	0.965	

The lower half of the table contains values of r , while the upper half of the table contains values of p .

Table S4. Mantel test result at sampling site 1.

Class of Phytoplankton species	Environmental factors	r value	p value
Chlorophyceae	WT	0.570	0.043
Chlorophyceae	PAR	0.370	0.068
Chlorophyceae	WL	0.399	0.060
Chlorophyceae	DO	0.011	0.424
Chlorophyceae	COD _{Mn}	-0.079	0.514
Chlorophyceae	NH ₃ -N	0.274	0.146
Chlorophyceae	TP	-0.287	0.871
Chlorophyceae	TN	0.121	0.313
Chlorophyceae	N/P	-0.132	0.681
Cyanophyceae	WT	-0.129	0.681
Cyanophyceae	PAR	-0.392	0.919
Cyanophyceae	WL	0.450	0.085
Cyanophyceae	DO	0.163	0.306
Cyanophyceae	COD _{Mn}	0.396	0.078
Cyanophyceae	NH ₃ -N	-0.454	0.975
Cyanophyceae	TP	0.230	0.224
Cyanophyceae	TN	0.539	0.024
Cyanophyceae	N/P	0.247	0.218
Bacillariophyceae	WT	-0.033	0.493
Bacillariophyceae	PAR	-0.085	0.513
Bacillariophyceae	WL	0.836	0.086
Bacillariophyceae	DO	-0.067	0.542
Bacillariophyceae	COD _{Mn}	0.261	0.167
Bacillariophyceae	NH ₃ -N	-0.249	0.651
Bacillariophyceae	TP	-0.202	0.675
Bacillariophyceae	TN	0.525	0.154
Bacillariophyceae	N/P	0.035	0.486
Others	WT	-0.036	0.504
Others	PAR	-0.060	0.479
Others	WL	0.585	0.167
Others	DO	-0.011	0.443
Others	COD _{Mn}	0.342	0.094
Others	NH ₃ -N	-0.273	0.631
Others	TP	-0.107	0.538
Others	TN	0.526	0.071
Others	N/P	0.133	0.240

Table S5. Mantel test result at sampling site 2.

Class of Phytoplankton species	Environmental factors	r value	p value
Chlorophyceae	WT	0.176	0.275
Chlorophyceae	DO	-0.097	0.465
Chlorophyceae	PAR	0.242	0.174
Chlorophyceae	WL	-0.219	0.813
Chlorophyceae	COD _{Mn}	-0.266	0.788
Chlorophyceae	NH ₃ -N	-0.178	0.710
Chlorophyceae	TP	0.155	0.283
Chlorophyceae	TN	0.342	0.161
Chlorophyceae	N/P	-0.065	0.531
Cryptophyceae	WT	0.557	0.015
Cryptophyceae	DO	-0.048	0.325
Cryptophyceae	PAR	-0.091	0.579
Cryptophyceae	WL	-0.246	0.817
Cryptophyceae	COD _{Mn}	0.206	0.221
Cryptophyceae	NH ₃ -N	-0.059	0.410
Cryptophyceae	TP	-0.136	0.689
Cryptophyceae	TN	0.121	0.260
Cryptophyceae	N/P	-0.223	0.689
Cyanophyceae	WT	0.059	0.336
Cyanophyceae	DO	0.348	0.188
Cyanophyceae	PAR	-0.269	0.751
Cyanophyceae	WL	0.328	0.208
Cyanophyceae	COD _{Mn}	0.485	0.083
Cyanophyceae	NH ₃ -N	0.549	0.033
Cyanophyceae	TP	-0.351	0.965
Cyanophyceae	TN	-0.090	0.554
Cyanophyceae	N/P	-0.401	1.000
Others	WT	0.279	0.131
Others	DO	0.415	0.097
Others	PAR	-0.147	0.657
Others	WL	0.374	0.142
Others	COD _{Mn}	0.626	0.043
Others	NH ₃ -N	0.646	0.029
Others	TP	-0.126	0.678
Others	TN	0.095	0.351
Others	N/P	-0.244	0.882