

Driving Factors and Dynamics of Phytoplankton Community and Functional Groups in an Estuary Reservoir in the Yangtze River, China

Changtao Yang, Jing Nan and Jianhua Li *

College of Environmental Science and Engineering, Tongji University, Shanghai 200092, China;
1410400@tongji.edu.cn (C.Y.); 1510396@tongji.edu.cn (J.N.)

* Correspondence: leejianhua@tongji.edu.cn; Tel.: +86-021-6598-3319

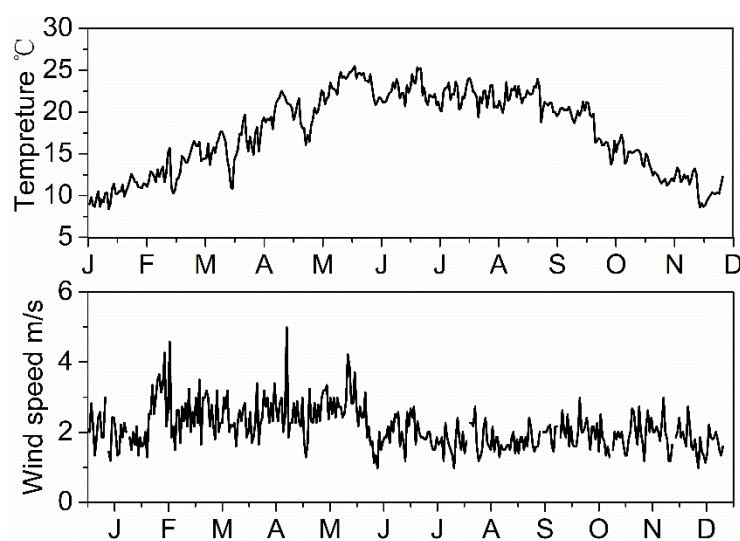


Figure S1. Daily temperature and wind speed variation in Qingcaosha reservoir during our study.

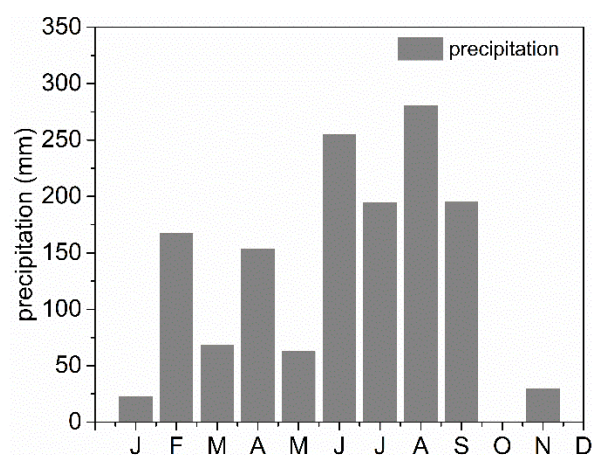


Figure S2. Monthly Precipitation in Qingcaosha reservoir during our study period.

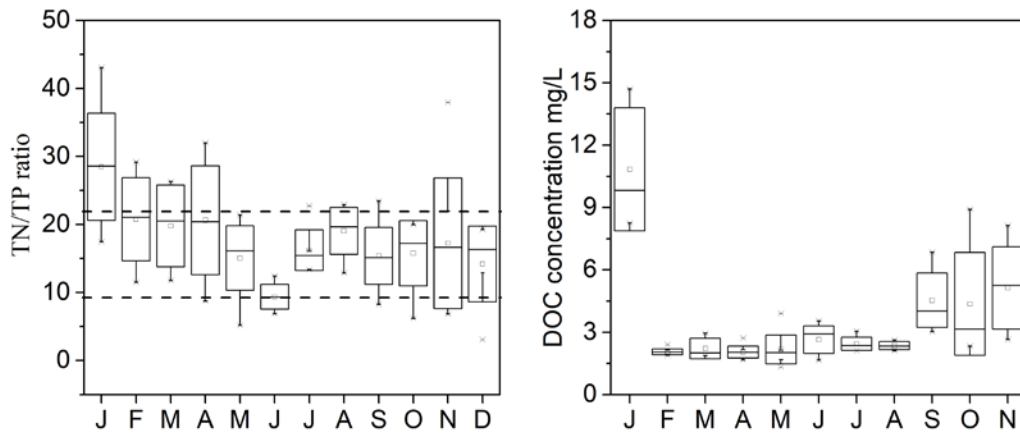


Figure S3. Box charts for seasonal variation of TN/TP ratio and DOC concentration in the reservoir.

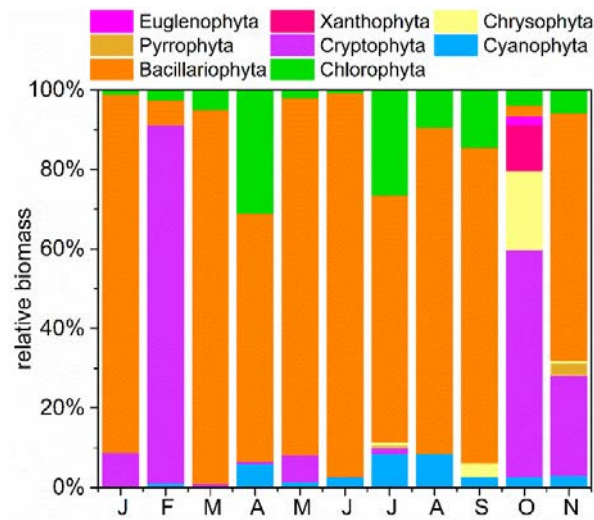


Figure S4. Seasonal variation of relative biomass for taxonomic groups in the reservoir.

Table S1. Significant Spearman correlations between the abundance of three taxonomic groups and 13 environmental variables in the reservoir (n=110).

Environmental Variables	Cyanobacteria	Chlorophyta	Bacillariophyta
TP			
TN	-0.28**	-0.22*	
PO ₄ ³⁻	-0.34**	-0.36**	-0.32**
NO ₃ ⁻	-0.30**	0.20*	
NH ₄ ⁺			
Chl a	0.38**	0.21**	
EC	-0.32**		
Temp	0.52**	0.29**	
pH		0.29**	
DO	-0.33**		
TDP	-0.21*	-0.23*	
SS			
Zeü	0.35**	0.21**	0.21**

*P<0.05, **P<0.01.

Table S2. List of the phytoplankton species identified during our study period.

Taxonomic Categories	Species
Cyanophyta	<i>Anabaena azotica</i> Ley.
	<i>Aphanocapsa delicatissima</i> W.et G.S.West.
	<i>Aphanocapsa elachista</i> W.et.G.S.West.
	<i>Aphanocapsa incerta</i> Lemm.
	<i>Aphanocapsa pulchra</i> (Kütz.) Kab.
	<i>Chroococcus minor</i> (Kütz.) Näg.
	<i>Chroococcus minutus</i> (Kütz.) Näg.
	<i>Chroococcus tenax</i> (Kirch.) Hier.
	<i>Dactylococcopsis raphidioides</i> f. falciformis Printz.
	<i>Dactylococcopsis raphidioides</i> Hansg.
	<i>Dolichospermum circinale</i> Rab.
	<i>Geitlerinema splendidum</i> Grev.
	<i>Gloeobacter violaceus</i> Rip.
	<i>Gloeocapsa kuetzingiana</i> Näg.
	<i>Leptolyngbya laminosa</i> (Gomont ex Gomont) Anag.
	<i>Leptolyngbya tenuis</i> (Gomont) Ana.
	<i>Limnococcus limneticus</i> (Lemm) Kom.
	<i>Limnospira maxima</i> Setchell & N.L.Gardn.
	<i>Merismopedia elegans</i> A.Br.
	<i>Merismopedia tenuissima</i> Lemm.
	<i>Merismopedia tranquilla</i> (Ehr) Trevisan.
	<i>Merismopedia trolleri</i> Backmann.
	<i>Microcystis aeruginosa</i> Kütz.
	<i>Microcystis densa</i> G.S.West
	<i>Microcystis flosaquae</i> (Wittr.) Kirchner.
	<i>Nostoc muscorum</i> C.Ag.
	<i>Nostoc punctiforme</i> Kütz.
	<i>Oscillatoria princeps</i> Vauch.ex Gom.
	<i>Oscillatoria tenuis</i> C.Ag.
	<i>Phormidium favosum</i> (Mont.) Gom
	<i>Planktolyngbya limnetica</i> Lemm.
	<i>Planktothrix agardhii</i> Gom.
	<i>Pseudanabaena catenata</i> Lauterborn.
	<i>Raphidiopsis curvata</i> Fritsch
	<i>Raphidiopsis sinensia</i> Jao
	<i>Synechocystis aquatilis</i> Sauvageau
	<i>Tetrarcus ilsteri</i> Skuja.
	<i>Trichormus variabilis</i> Kütz.
Cryptophyta	<i>Chroomonas acuta</i> Uterm.
	<i>Chroomonas caudata</i> Geitler
	<i>Cryptomonas erosa</i> Ehr.
	<i>Cryptomonas ovata</i> Ehr.
Pyrrophyta	<i>Ceratium hirundinella</i> (O.F.Müller) Dujardin.
	<i>Peridinium pusillum</i> (Pen.) Lemm.
	<i>Peridinium umbonatum</i> F.Stein
Chrysophyta	<i>Chrysocapsa planctonica</i> (W.et West) Pasch
	<i>Kephyrion ovum</i> Pascher
	<i>Synura uvella</i> Ehr.
Xanthophyta	<i>Tribonema affine</i> (Kützing) G.S.West
Euglenophyta	<i>Euglena geniculata</i> Duj.
	<i>Euglena gracilis</i> G.A.Klebs
Bacillariophyta	<i>Achnanthes exigua</i> var. <i>constricta</i> Tork.
	<i>Amphora ovalis</i> Kütz.
	<i>Asterionella formosa</i> Hass.
	<i>Bacillaria paxillifera</i> (O.F.Müller) T.Mar.
	<i>Cocconeis lineata</i> (Ehr.) Hust.

Cocconeis placentula var. *euglypta* (Ehr.) Grun.
Cyclotella comta (Ehr.) Kütz.ing
Cyclotella meneghiniana Kütz.
Cymbella cistula (Hempr.) Kirchner
Cymbella parva (W. Smith) Cleve
Cymbella tumida (Breb. ex Kütz.) Van Heurck
Cymbella ventricosa Kütz.
Cymbopleura cuspidata Kütz.
Cymbopleura naviculiformis Auersw.
Diploneis elliptica (Kütz.) Cl.
Diploneis ovalis (Hilse) Cl.
Diploneis puella (Schum.) Cl.
Discostella stelligera (Cleve & Grunow) Hou.
Encyonopsis microcephala Grun.
Fragilaria acus Kütz.
Fragilaria amphicephaloides Lan.
Fragilaria capucina Desm.
Fragilaria vaucheriae (Kütz.) Peter.
Fragilariforma virescens Ralfs.
Gomphonema angustatum (Kütz.) Rabenh.
Gomphonema constrictum Ehr.
Gomphonema constrictum var. *clavatum* Ehr.
Gomphonema parvulum (Kütz.) Grun.
Gomphonema productum (Grunow) Lange.
Gyrosigma acuminatum (Kütz.) Rabenh.

Hantzschia amphioxys (Ehr.) Grun.
Iconella spiralis Kütz.
Melosira granulata (Ehr.) Ralfs.
Melosira granulata var. *angustissima* f. *spiralis* Hust.
Melosira granulata var. *angustissima* Müll.
Melosira islandica Müll.
Melosira varians C.Ag.
Navicula anglica var. *minuta* Cleve.
Navicula cari Ehrenberg.
Navicula cincta (Ehr.) Kütz.
Navicula minima Grun.
Navicula oblonga Kütz.
Navicula pseudobacillum var. *elapsa* Her.
Navicula pupula var. *minor* Kütz.
Navicula rhynchocephala Kütz.
Navicymbula pusilla Grun.
Neidium kozlowii var. *parvum* Mer.
Nitzschia amphibia Grun.
Nitzschia denticula Grun.
Nitzschia frustulum (Kütz.) Grun.
Nitzschia linearis W. Smith
Nitzschia microcephala Grun.
Nitzschia palea (Kütz.) W. Smith
Nitzschia umbonata (Her.) Lange.
Pantocsekiella comensis Grun.
Pinnularia gentilis (Donk.) Cl.
Placoneis dicephala (Ehr.) Ralfs.
Placoneis elginensis (W. Gregory) E.J.Cox.
Planothidium lanceolatum Breb.
Pseudostaurosira brevistriata Grun.
Sellaphora verecunda Hust.
Stauroneis anceps Ehr.
Stauroneis anceps var. *linearis* (Ehr.) Cl.
Stauroneis phoenicenteron f. *brunii* Her.

Stauroneis phoenicenteron var. *gracilis* **Dip.**
Staurosirella pinnata **Ehr.**
Surirella librile **Ehr.**
Synedra acus var. *mesoleia* **Østrup**
Thalassiosira lacustris **Grun.**
Ulnaria ulna (**Nitzsch.**) **Ehr.**
Urosolenia longiseta **Zach.**

Chlorophyta

Actinastrum hantzschii **Lag.**
Ankistrodesmus acerosus **Kom.**
Ankistrodesmus falcatus (**Corda.**) **Ralfs.**
Ankistrodesmus falcatus var. *biplex* **G.S. West**
Ankistrodesmus falcatus var. *setigerus* **G.S. West.**
Auxenochlorella pyrenoidosa **H.Chick**
Binuclearia lauterbornii **Schm.**
Characium angustum **A. Bruan**
Characium substrictum **Jao.**
Chlamydomonas globosa **Snow.**
Chlamydomonas humicola **Lucksch**
Chlamydomonas microsphaera **Pasch.et Jah.**
Chlamydomonas ovalis **Pasch.**
Chlorella miniata (**Kütz.**) **Oltm.**
Chlorella vulgaris **Beij.**
Chloroidium ellipsoideum (**Gerneck**) **Dar.**
Closterium gracile **Breb.**
Closterium venus **Kütz.**
Coccomonas orbicularis **Stein.**
Coelastrum microporum **Näg.**
Coelastrum sphaericum **Näg.**
Cosmarium laeve **Rab.**
Crucigenia quadrata **Morr.**
Desmodesmus armatus var. *bicaudatus* **Gug.**
Desmodesmus perforatus **Lemm.**
Eudorina elegans **Ehr.**
Gloeocystis vesiculosa **Nägeli**
Golenkinia paucispina **W. et G. S. West**
Golenkinia radiata **Chod.**
Kirchneriella lunaris (**Kirch.**) **Moeb.**
Kirchneriella obesa (**West**) **Schm.**
Klebsormidium flaccidum (**Kütz.**) **P.C.Silva.**
Korshikoviella limnetica **Lemm.**
Lagerheimia quadriseta **Lemm.**
Lemmermannia komarekii (**Hindák**) **C.Bo.**
Messastrum gracile (**Rein.**) **T.S.Garcia.**
Micractinium pusillum **Fres.**
Microglena braunii **Gor.**
Monoraphidium contortum (**Thuret**) **Kom.**
Monoraphidium convolutum (**Corda**) **Kom**
Monoraphidium griffithii **Lemm.**
Monoraphidium minutum (**Näg.**) **Kom.**
Neglectella solitaria **Wittr.**
Nephrocytium agardhianum **Nag.**
Nephrocytium lunatum **W. West.**
Oonephris obesa (**West.**) **Fott.**
Palmella mucosa **Kütz.**
Pandorina morum (**Muell.**) **Bory.**
Pediastrum duplex **Mey.**
Pediastrum duplex var. *guarrarianum* **Erga.**
Pediastrum duplex var. *regulosum* **Racib.**
Pediastrum simplex **Mey.**

Raphidocelis danubiana (Hindák) Mar.
Scenedesmus armatus (Chod.) Chodat.
 Scenedesmus bijugus (Turp.) Lag.
Scenedesmus quadricauda (Turp.) Breb.
Schroederia nitzschiioides (West) Korsch.
 Schroederia setigera Lemm.
 Selenastrum bibrarianum Reinsch.
Selenastrum gracile var. *minutum* Play.
 Sphaerello cystis ampla (Kütz.) Nov.
 Staurastrum brevispina Breb.
 Staurastrum indentatum W. et G. S. West.
Stauridium tetras var. *tetraodon* (Corda) Rabenhorst
Stylosphaeridium stipitatum (Bachm.) Geitler & Gimesi
 Tetradismus dimorphus (Turp.) M.J.
Tetradismus lagerheimii M.J.Wynne & Guiry
 Tetradismus obliquus (Turp.) M.J.Wynne.
 Tetraëdron bifidum (W.B.Turner) Wille.
 Tetraëdron trilobulatum (Näg.) Hansg.
Tetraëdron tumidulum (Reinsch) Hansg.
 Tetraspora gelatinosa (Vauch.) Desv.
 Tetrastrum hastiferum (Arn.) Korsch.
Trochiscia reticularis (Reinsch.) Hang.
 Ulothrix aequalis Kütz.
 Ulothrix oscillarina Kütz.
 Ulothrix tenerrima Kütz.
Ulothrix zonata (Web.et Mohr) Kütz.
 Uronema confervicolum Lag.
 Westella botryoides (W.West) Wild.
 Westellopsis linearis (G.M.Smith)
Willea apiculata (Lemm) D.M.John.
