Supplementary Information for

Spatiotemporal Variations in Co-occurrence Patterns of Planktonic Prokaryotic Microorganisms along the Yangtze River

Authors: Wenran Du[1,2], Jiacheng Li[2], Guohua Zhang[2], Ke Yu[1], Shufeng Liu[3]*

Author affiliations:

[1]School of Environment and Energy, Peking University Shenzhen Graduate School, Shenzhen 518055, China

[2]The Key Laboratory of Water and Sediment Sciences, Ministry of Education; Department of Environmental Engineering, Peking University, Beijing 100871, China

[3]College of Resources and Environmental Sciences, China Agricultural University, Beijing 100193, China

*__Correspondence:__ Shufeng Liu, China Agricultural University, No. 2 Yuanmingyuan West Road, Beijing 100193, P.R. China. E-mail: liushufeng@cau.edu.cn



Figure S1. Boxplots displaying the comparisons of environmental factors between spring and autumn (**a**), among plateau, mountain/hill, basin, and plain regions (**b**), and between the source and non-source regions (**c**).

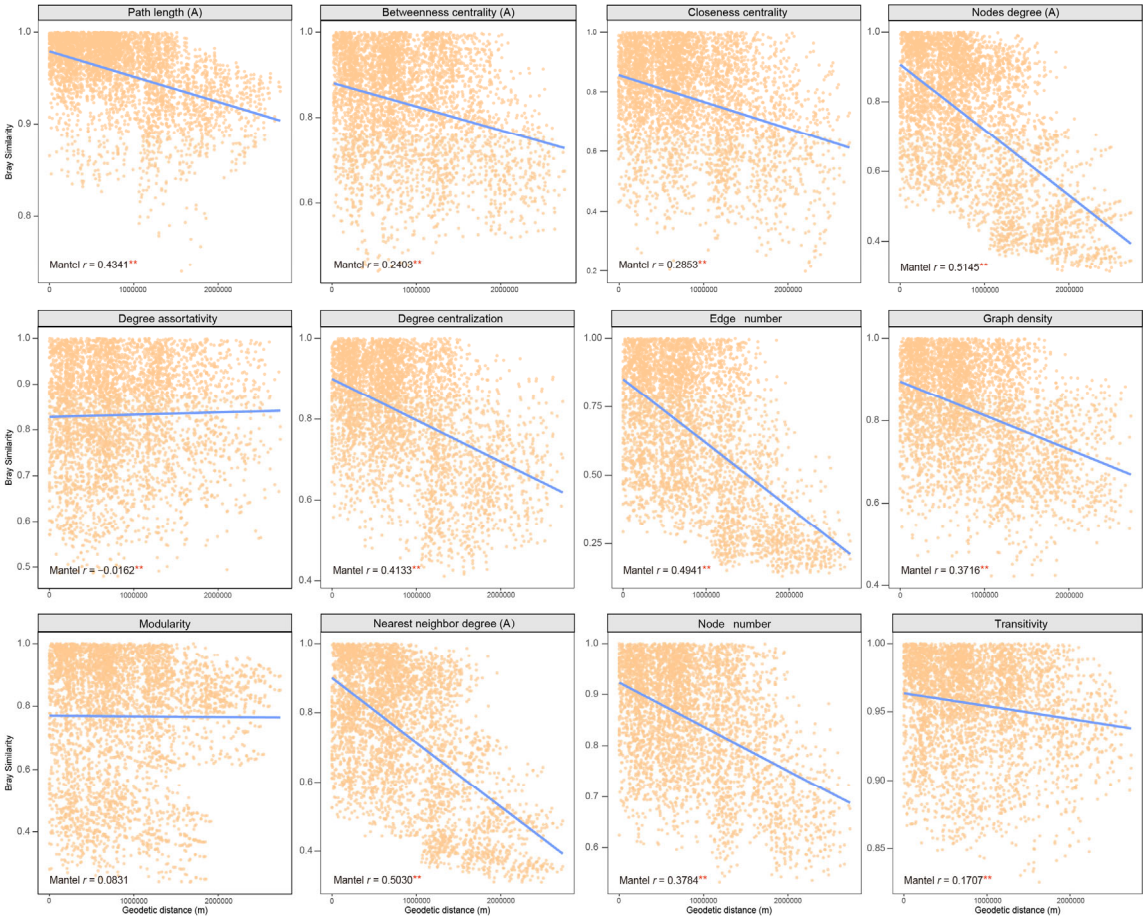


Figure S2. Geodetic distance-decay curves of Bray-Curtis similarities calculated based on the selected network topological parameters across all the sites in two seasons. Mantel Spearman's *r* and *p* values are stated. All the asterisks denote the significance of correlations (***$p < 0.001$, **$0.001 < p < 0.01$ and *$0.01 < p < 0.05$). The "A" in the brackets means "average".

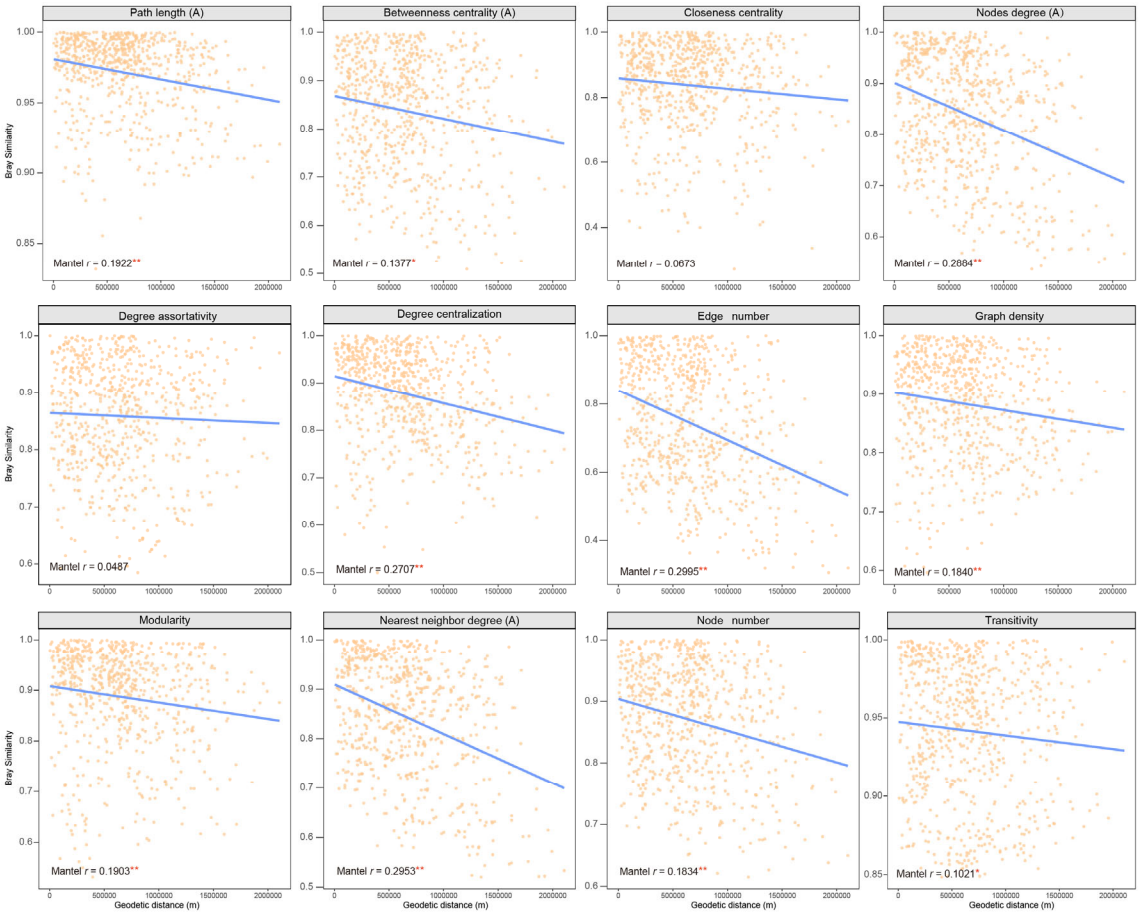


Figure S3. Geodetic distance-decay curves of Bray-Curtis similarities calculated based on the selected network topological parameters across all the sites in spring. Mantel Spearman's *r* and *p* values are stated. All the asterisks denote the significance of correlations (***$p < 0.001$, **$0.001 < p < 0.01$ and *$0.01 < p < 0.05$). The "A" in the brackets means "average".

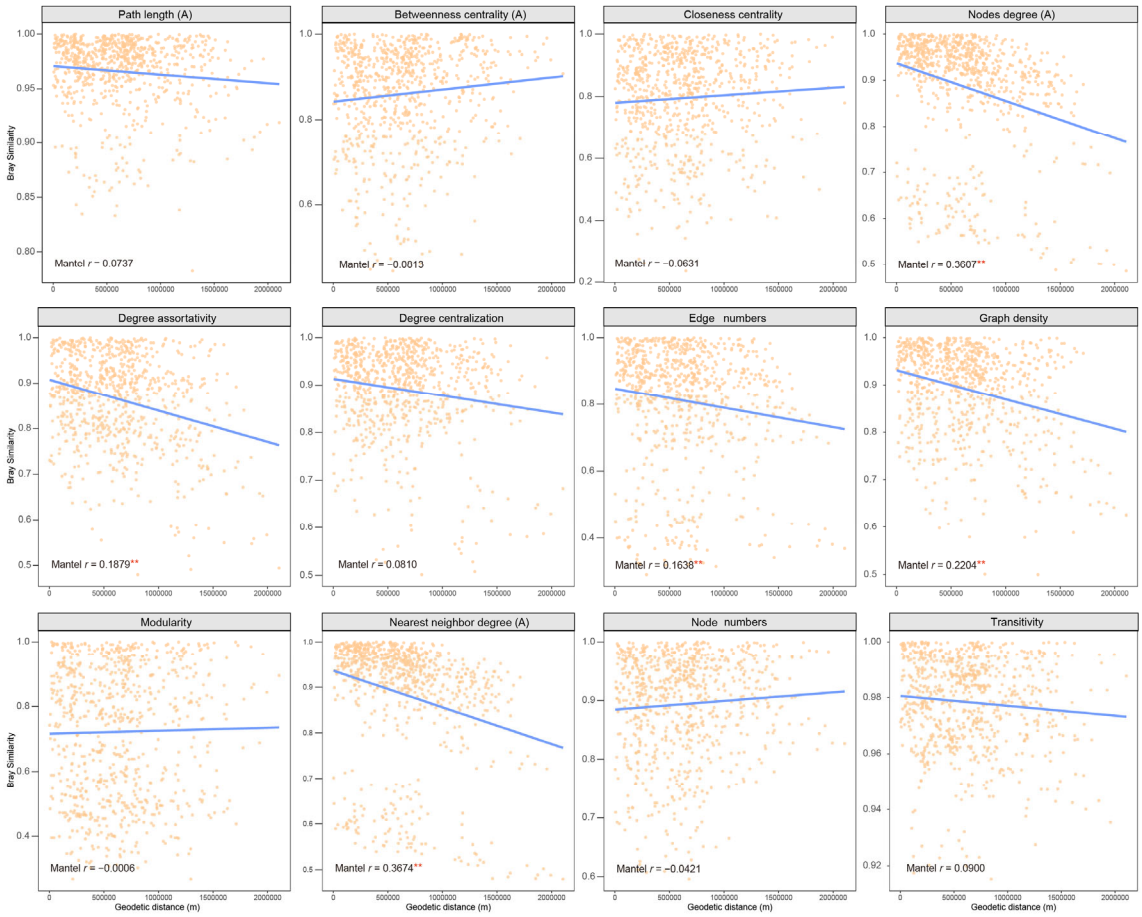


Figure S4. Geodetic distance-decay curves of Bray-Curtis similarities calculated based on the selected network topological parameters across all the sites in autumn. Mantel Spearman's *r* and *p* values are stated. All the asterisks denote the significance of correlations (***$p < 0.001$, **$0.001 < p < 0.01$ and *$0.01 < p < 0.05$). The "A" in the brackets means "average".

Table S1. Detailed information of the sampling sites along the Yangtze River.

Site No.	Full name	Abbreviation	Longitude (°E)	Latitude (°N)	Mainstream/tributaries	Landforms
1	TuoTuoHe	TTH	92.44	34.22	Source-area mainstream	Plateau
2	TongTianHe	TOTH	93.03	34.15	Source-area mainstream	Plateau
3	ZhiMenDa	ZMD	97.24	33.01	Source-area mainstream	Plateau
4	ShiGu	SG	99.98	26.88	Mainstream	Mountain/Hill
5	PanZhiHua	PZH	101.7	26.57	Mainstream	Mountain/Hill
6	XiLuoDu	XLD	103.66	28.25	Mainstream	Mountain/Hill
7	PingShan	PS	104.17	28.65	Mainstream	Mountain/Hill
8	XiangJiaBa	XJB	104.38	28.65	Mainstream	Mountain/Hill
9	YiBin	YB	104.65	28.77	Mainstream	Basin
10	LuZhou	LZ	105.55	28.9	Mainstream	Basin
11	ZhuTuo	ZT	105.85	29.02	Mainstream	Basin
12	CunTan	CT	106.6	29.62	Mainstream	Basin
13	BaDong	BD	110.4	31.04	Mainstream	Mountain/Hill
14	MiaoHe	MH	110.9	30.88	Mainstream	Mountain/Hill
15	HuangLingMiao	HLM	111.12	30.85	Mainstream	Mountain/Hill
16	YiChang	YC	111.28	30.69	Mainstream	Mountain/Hill
17	ShaShi	SS	112.26	30.29	Mainstream	Plain
18	ChengLingJiLian	CLJL	113.15	29.45	Mainstream	Plain
19	LuoShan	LS	113.32	29.67	Mainstream	Plain
20	WuHan	WH	114.32	30.62	Mainstream	Plain
21	JiuJiang	JJ	116	29.74	Mainstream	Plain
22	DaTong	DT	117.64	30.78	Mainstream	Plain
23	WuHu	WHU	118.34	31.46	Mainstream	Plain
24	MaAnShan	MAS	118.47	31.77	Mainstream	Plain
25	NanJing	NJ	118.94	32.17	Mainstream	Plain
26	ZhenJiang	ZJ	119.66	32.18	Mainstream	Plain
27	XuLiuJing	XLJ	120.96	31.77	Mainstream	Plain
28	ChuMaErHe	CMEH	94.47	35.08	Source-area tributary	/

29	DanQu	DQ	93.83	32.88	Source-area tributary	/
30	DeLieChuKa	DLCK	91.76	33.67	Source-area tributary	/
31	YanShiPing	YSP	91.96	33.38	Source-area tributary	/
32	DangQuDaQiao	DQDQ	93.03	33.4	Source-area tributary	/
33	MoQu	MQ	93.69	34.14	Source-area tributary	/
34	YaQu	YQ	94.23	34.12	Source-area tributary	/
35	KeQianQu	KQQ	94.9	34.19	Source-area tributary	/
36	LongBaoHe	LBH	96.45	33.2	Source-area tributary	/
37	GaoChang	GC	104.41	28.8	Tributary-Minjiang River	/
38	WuSheng	WS	106.27	30.26	Tributary-Wujiang River	/
39	BeiBei	BB	106.39	29.88	Tributary-Jialingjiang River	/
40	XiaoHeBa	XHB	105.84	30.18	Tributary-Jialingjiang River	/
41	LuoDuXi	LDX	106.58	30.35	Tributary-Jialingjiang River	/
42	WuLong	WL	107.75	29.33	Tributary-Jialingjiang River	/
43	XiaoXiTa	XXT	111.3	30.78	Tributary-Huangbohe River	/
44	YeMingZhu	YMZ	111.3	30.75	Tributary-Huangbohe River	/
45	ChengLingJi	CLJ	113.13	29.42	Tributary-Dongting Lake	/
46	NanZui	NZ	112.31	29.06	Tributary-Dongting Lake	/
47	ZhouWenMiao	ZWM	112.06	28.92	Tributary-Dongting Lake	/
48	XiangYin	XYN	112.89	28.8	Tributary-Dongting Lake	/
49	BaiHe	BH	110.11	32.83	Tributary-Hanjiang River	/
50	DanJiangKouBaXia	DJKBX	111.52	32.51	Tributary-Hanjiang River	/
51	XiangYang	XYA	112.15	32.03	Tributary-Hanjiang River	/
52	XianTao	XT	113.45	30.58	Tributary-Hanjiang River	/
53	JiJiaZui	JJZ	114.23	30.57	Tributary-Hanjiang River	/
54	TaoCha	TC	111.65	32.66	Tributary-Hanjiang River	/
55	HuKou	HK	116.21	29.74	Tributary-Poyang Lake	/
56	(P) LongKou	PLK	116.21	29.02	Tributary-Poyang Lake	/
57	(P) SheShan	PSS	116.37	29.08	Tributary-Poyang Lake	/
58	(P) HuKou	PHK	116.22	29.75	Tributary-Poyang Lake	/
59	(P) XingZi	PXZ	116.04	29.44	Tributary-Poyang Lake	/