

**Table1** PERMANOVA data demonstrating the significant difference between the *Cyanobacteria* and *Proteobacteria* communities under nitrogen (N), phosphorus (P) and potassium (K) fertilization. **N fertilization**, NK, NP and NPK; **no N fertilization**, CK and PK; **P fertilization**, PK, NP and NPK; **no P fertilization**, CK and NK; **K fertilization**, NK, PK and NPK; **no K fertilization**, CK and NP.

	<i>Cyanobacteria</i>		<i>Proteobacteria</i>	
	<i>F</i>	<i>P</i>	<i>F</i>	<i>P</i>
N fertilization vs no N fertilization	3.388	0.011	3.247	<0.001
P fertilization vs no P fertilization	1.711	0.056	2.447	0.003
K fertilization vs no K fertilization	0.817	0.625	0.993	0.411

**Table2** SIMPER analysis and one-way ANOVA of the effects of fertilization on the relative abundance (% , mean±SE) of active *Cyanobacteria* and *Proteobacteria*. CK, no fertilizer; PK, chemical phosphorus and potassium fertilizer; NK, chemical nitrogen and K fertilizer; NP, chemical N and P fertilizer; NPK, chemical N, P and K fertilizer.

ID	Phylum	Class	Order	Family	Genus	Variation explained(%)	Treatment					Treatment effect	
							CK	NK	NP	PK	NPK	F	P
OTU57909		<i>Nostocophycideae</i>	<i>Nostocales</i>	<i>Nostocaceae</i>	<i>Unclassified</i>	<b>6.54</b>	6.12±2.26	1.48±0.77	3.96±1.67	18.7±4.68	1.73±0.74	<b>8.17</b>	<b>0.001</b>
OTU98889		<i>Unclassified</i>	<i>Unclassified</i>	<i>Unclassified</i>	<i>Unclassified</i>	<b>5.96</b>	2.81±0.28	2.34±0.68	4.72±1.28	1.11±0.29	18.40±7.90	<b>3.9</b>	<b>0.02</b>
OTU1084518		<i>Unclassified</i>	<i>Unclassified</i>	<i>Unclassified</i>	<i>Unclassified</i>	<b>5.18</b>	9.68±4.55	8.65±1.43	3.16±0.80	1.54±0.33	6.75±5.30	1.19	0.35
OTU117089		<i>Nostocophycideae</i>	<i>Nostocales</i>	<i>Nostocaceae</i>	<i>Unclassified</i>	<b>2.90</b>	1.97±0.47	0.49±0.27	1.18±0.22	8.80±1.42	0.54±0.21	<b>25.55</b>	<b>&lt;0.001</b>
OTU855841	<i>Cyanobacteria</i>	<i>Oscillatoriothycideae</i>	<i>Oscillatoriales</i>	<i>Phormidiaceae</i>	<i>Phormidium</i>	<b>2.82</b>	8.68±6.29	2.08±0.60	0.79±0.13	0.99±0.23	0.58±0.12	1.48	0.26
OTU972830		<i>Unclassified</i>	<i>Unclassified</i>	<i>Unclassified</i>	<i>Unclassified</i>	<b>2.64</b>	3.12±1.37	6.06±2.36	3.82±0.77	0.82±0.17	5.18±0.99	2.25	0.11
OTU336609		<i>Synechococcophycideae</i>	<i>Pseudanabaenales</i>	<i>Pseudanabaenaceae</i>	<i>Leptolyngbya</i>	<b>2.58</b>	1.7±0.19	2.89±0.61	6.85±0.96	4.33±2.38	4.65±1.09	2.32	0.1
OTU108933		<i>Unclassified</i>	<i>Unclassified</i>	<i>Unclassified</i>	<i>Unclassified</i>	<b>2.47</b>	1.52±0.78	0.86±0.39	1.57±0.47	2.54±1.18	6.77±3.56	1.89	0.16
OTU603876		<i>Synechococcophycideae</i>	<i>Pseudanabaenales</i>	<i>Pseudanabaenaceae</i>	<i>Leptolyngbya</i>	<b>2.07</b>	2.12±0.73	6.10±0.36	2.79±0.85	1.05±0.26	1.35±0.58	<b>5.88</b>	<b>0.004</b>
OTU225033		<i>Nostocophycideae</i>	<i>Nostocales</i>	<i>Unclassified</i>	<i>Unclassified</i>	<b>1.96</b>	0.27±0.12	0.38±0.19	2.98±1.26	4.63±0.69	1.93±0.66	<b>6.64</b>	<b>0.003</b>
OTU499318		<i>Betaproteobacteria</i>	<i>Nitrosomonadales</i>	<i>Nitrosomonadaceae</i>	<i>Unclassified</i>	<b>6.39</b>	0.75±0.31	3.10±0.51	2.79±0.57	1.20±0.64	11.40±3.33	<b>7.8</b>	<b>0.001</b>
OTU439795	<i>Proteobacteria</i>	<i>Betaproteobacteria</i>	<i>Nitrosomonadales</i>	<i>Nitrosomonadaceae</i>	<i>Unclassified</i>	<b>4.81</b>	0.36±0.08	8.24±0.77	2.06±0.48	0.30±0.04	2.95±0.46	<b>50.35</b>	<b>&lt;0.001</b>
OTU1057714		<i>Betaproteobacteria</i>	<i>MND1</i>	<i>Unclassified</i>	<i>Unclassified</i>	<b>2.39</b>	4.65±1.07	3.29±0.82	4.57±1.00	5.04±0.88	4.02±0.26	0.63	0.65
OTU1061114		<i>Betaproteobacteria</i>	<i>MND1</i>	<i>Unclassified</i>	<i>Unclassified</i>	<b>2.37</b>	3.37±0.72	1.94±0.51	4.05±0.79	4.66±0.83	3.92±0.54	2.21	0.12

OTU84674	<i>Deltaproteobacteria</i>	<i>Syntrophobacterales</i>	<i>Syntrophobacteraceae</i>	<i>Unclassified</i>	<b>1.59</b>	2.30±0.37	3.00±0.55	1.75±0.57	1.54±0.49	1.14±0.35	2.33	0.10
OTU839475	<i>Alphaproteobacteria</i>	<i>Rhodospirillales</i>	<i>Rhodospirillaceae</i>	<i>Skermanella</i>	<b>1.06</b>	2.03±0.30	1.46±0.09	2.25±0.21	3.03±0.53	1.96±0.15	<b>3.66</b>	<b>0.03</b>
OTU607672	<i>Betaproteobacteria</i>	<i>MND1</i>	<i>Unclassified</i>	<i>Unclassified</i>	<b>1.05</b>	1.09±0.27	1.23±0.29	1.42±0.29	1.54±0.64	1.64±0.51	0.27	0.89
OTU812970	<i>Deltaproteobacteria</i>	<i>Entotheonellales</i>	<i>Entotheonellaceae</i>	<i>Unclassified</i>	<b>1.04</b>	1.82±0.38	1.02±0.09	1.43±0.05	2.07±0.59	1.40±0.28	1.41	0.28
OTU878509	<i>Deltaproteobacteria</i>	<i>Myxococcales</i>	<i>Unclassified</i>	<i>Unclassified</i>	<b>0.85</b>	1.51±0.57	1.41±0.51	0.99±0.12	1.27±0.12	0.99±0.19	0.44	0.78
OTU1010593	<i>Gammaproteobacteria</i>	<i>Xanthomonadales</i>	<i>Sinobacteraceae</i>	<i>Unclassified</i>	<b>0.80</b>	0.49±0.26	0.21±0.05	0.80±0.19	0.84±0.53	0.86±0.33	0.79	0.54

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Values in bold represent significant differences between treatments.