

Supplementary material

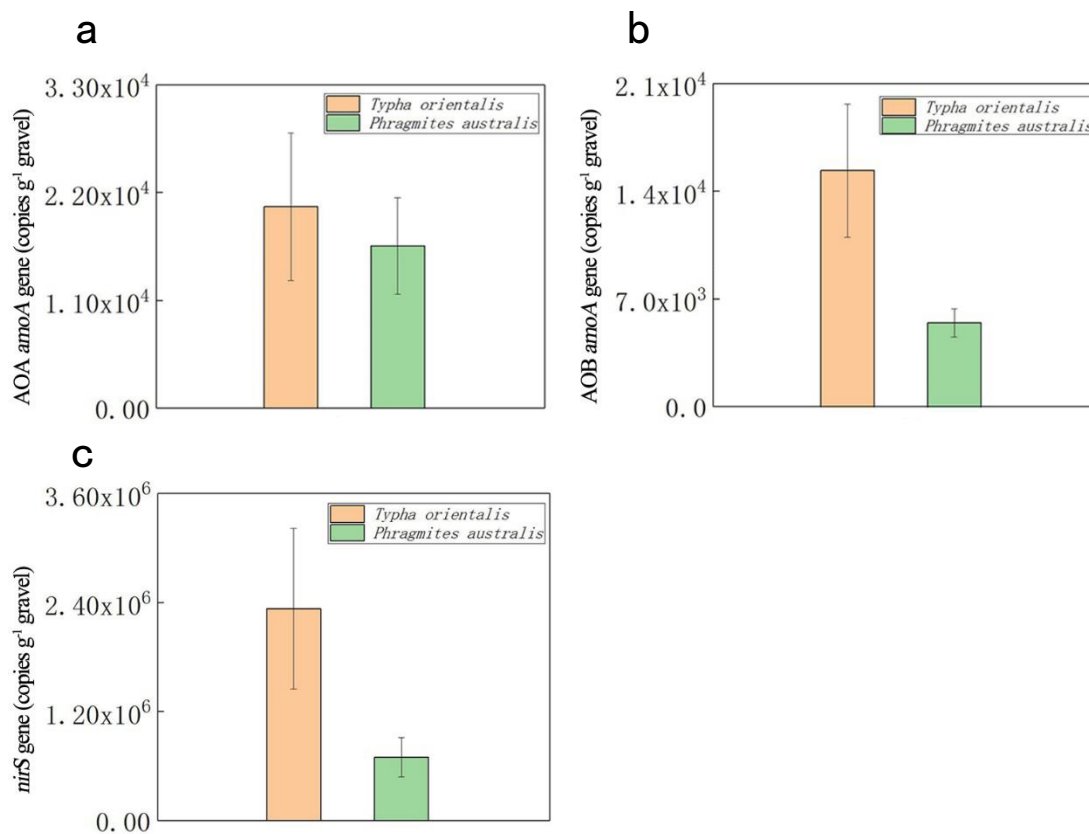
**Relationships between nitrogen removal processes and functional microorganisms in the rhizosphere soil in a horizontal surface flow constructed wetland**

Yinuo Zhu<sup>A,B</sup>, Jing Li<sup>A,B,C</sup>, Zhangjie Cai<sup>A,B</sup>, Wei Li<sup>A,B</sup>, Yinru Lei<sup>A,B</sup>, Manyin Zhang<sup>A,B</sup> and Lijuan Cui<sup>A,B,C</sup>

<sup>A</sup>Institute of Wetland Research, Chinese Academy of Forestry, Beijing Key Laboratory of Wetland Ecological Function and Restoration, Xianshan Road, Haidian District, Beijing, 100091, PR China.

<sup>B</sup>Beijing Hanshiqiao National Wetland Ecosystem Research Station, Muyan Road, Shunyi District, Beijing, 101399, PR China.

<sup>C</sup>Corresponding authors. Email: jingli\_2015@caf.ac.cn; lkyclj@126.com



**Fig. S1.** The abundances of nitrifiers (a) AOA, (b) AOB) and denitrifiers (c) *nirS*-type denitrifiers) in the rhizosphere soil of *Typha orientalis* and *Phragmites australis*

**Table S1. Primers and reaction conditions for qPCR**

Target	Primers	Sequence (5'-3')	Fragment size (bp)	Condition	Reference
AOA <i>amoA</i> gene	Arch-amoAF	STAATGGTCTGGCTTAGACG	635	95°C for 3 min; 35 cycles consisting of 95°C for 10 s, 55°C for 30 s, and 72°C for 60 s; and 72°C for 15 min.	Francis <i>et al.</i> 2005
	Arch-amoAR	GCGGCCATCCATCTGTATGT			
AOB <i>amoA</i> gene	amoA-1F	GGGGTTTCTACTGGTGTT	491	95°C for 5 min; 35 cycles consisting of 95°C for 10 s, 55°C for 30 s, and 72°C for 60 s; and 72°C for 15 min.	Rotthauwe <i>et al.</i> 1997
	amoA-2R	CCCCTCGGCAAAGCCTTCTTC			
<i>nirS</i> gene	cd3aF	GTSAACG TSAAGGARACSGG	425	94°C for 3 min; 35 cycles consisting of 95°C for 30 s, 55°C for 30 s, and 72°C for 45 s; and 72°C for 10 min.	Throbäck <i>et al.</i> 2004
	R3cd	GASTTCGGRTGSGTCTTGA			

**Table S2. The spearman correlations between the abundances of the nitrogen removal functional microorganisms (AOA, AOB and *nirS*-type denitrifiers) and potential nitrification rate and denitrification enzyme activity**

Probabilities are significant at \*,  $P < 0.05$ ; \*\*,  $P < 0.01$

Functional microorganisms	Plant species	Potential nitrification rate	Denitrification enzyme activity
AOA	<i>Typha orientalis</i>	0.51	0.294
	<i>Phragmites australis</i>	0.682*	0.900**
AOB	<i>Typha orientalis</i>	0.615*	0.867**
	<i>Phragmites australis</i>	0.773**	0.809**
<i>nirS</i> -type denitrifiers	<i>Typha orientalis</i>	0.657*	0.748**
	<i>Phragmites australis</i>	0.709*	0.836**

**Table S3. The spearman correlations between the abundances of the nitrogen removal functional microorganisms (AOA, AOB and *nirS*-type denitrifiers) and environmental factors**

Probabilities are significant at \*,  $P < 0.05$ ; \*\*,  $P < 0.01$

Functional microorganisms	Plant species	moisture	pH	SOM	NO <sub>3</sub> <sup>-</sup>	NH <sub>4</sub> <sup>+</sup>	C/N
AOA	<i>Typha orientalis</i>	0.164	0.297	0.4	-0.273	0.282	-0.873**
	<i>Phragmites australis</i>	0.582	-0.329	0.800**	0.364	0.336	-0.727**
AOB	<i>Typha orientalis</i>	0.755**	-0.518	0.699*	0.455	0.51	-0.091
	<i>Phragmites australis</i>	0.879**	-0.608	0.782**	-0.067	0.164	-0.612
<i>nirS</i> -type denitrifiers	<i>Typha orientalis</i>	0.769**	-0.709*	0.881**	0.476	0.671*	-0.217
	<i>Phragmites australis</i>	0.733*	-0.720*	0.817**	0.083	-0.133	-0.750*

## References

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