

TABLE S1. Effect of threshold similarity utilized for calling OTUs on the analysis of rarified *narG*, *nirK*, *nirS*, and *nosZ* derived from palsa peat soil.

Gene marker	Threshold similarity (%)	Soil layer (cm)	α-Diversity							β-Diversity				
			No. of OTUs observed ^a	Comparison observed OTUs	No. of OTUs estimated ^b	Comparison estimated OTUs	H^c	Comparison H	E^d	Comparison E	S_s^e	BC_s^f	D_{UU}^g	D_{WU}^h
<i>narG</i> forward	67	0 to 20 > 20	2.89 ± 0.07 2.76 ± 0.04	$P=0.11^i$	3.00 ± 0.09 2.76 ± 0.04	$P=0.02^g$	0.56 ± 0.003 0.81 ± 0.002	$P<0.001^g$	0.40 ± 0.01 0.58 ± 0.01	$P<0.001^g$	0.19 ± 0.01	0.11 ± 0.001	0.34 ± 0.021	0.06 ± 0.001
	97	0 to 20 > 20	88.9 ± 0.50 47.0 ± 0.29	$P<0.001$	196 ± 4.4 92 ± 2.7	$P<0.001$	3.29 ± 0.008 2.17 ± 0.006	$P<0.001$	0.51 ± 0.001 0.39 ± 0.001	$P<0.001$	0.65 ± 0.003	0.67 ± 0.001	0.61 ± 0.003	0.42 ± 0.001
<i>narG</i> reverse	67	0 to 20 > 20	1.54 ± 0.05 1.00 ± 0.00	$P<0.001$	1.54 ± 0.05 1.00 ± 0.00	$P<0.001$	0.07 ± 0.001 0.00 ± 0.000	$P<0.001$	0.01 ± 0.00 n.a.	$P<0.001$	0.18 ± 0.02	0.00 ± 0.00	0.27 ± 0.025	0.00 ± 0.000
	97	0 to 20 > 20	95.6 ± 0.55 53.0 ± 0.34	$P<0.001$	219 ± 4.8 115.1 ± 3.5	$P<0.001$	3.12 ± 0.009 2.44 ± 0.005	$P<0.001$	0.48 ± 0.001 0.43 ± 0.001	$P<0.001$	0.69 ± 0.003	0.66 ± 0.001	0.61 ± 0.003	0.41 ± 0.001
<i>nirK</i>	83	0 to 20 > 20	4.00 ± 0.01 7.70 ± 0.04	$P<0.001$	4.00 ± 0.01 8.56 ± 0.11	$P<0.001$	1.50 ± 0.001 0.71 ± 0.001	$P<0.001$	0.75 ± 0.001 0.24 ± 0.001	$P<0.001$	0.64 ± 0.002	0.87 ± 0.001	0.61 ± 0.003	0.32 ± 0.001
	97	0 to 20 > 20	26.4 ± 0.19 46.1 ± 0.12	$P<0.001$	35.5 ± 1.21 66.2 ± 0.72	$P<0.001$	2.33 ± 0.003 1.72 ± 0.001	$P<0.001$	0.49 ± 0.001 0.31 ± 0.001	$P<0.001$	0.85 ± 0.001	0.87 ± 0.001	0.79 ± 0.002	0.39 ± 0.001
<i>nirS</i>	82	0 to 20 > 20	4.00 ± 0.01 7.97 ± 0.10	$P<0.001$	4.00 ± 0.01 8.38 ± 0.16	$P<0.001$	0.78 ± 0.001 2.29 ± 0.015	$P<0.001$	0.39 ± 0.001 0.77 ± 0.004	$P<0.001$	0.82 ± 0.004	0.92 ± 0.003	0.86 ± 0.001	0.34 ± 0.001
	97	0 to 20 > 20	7.00 ± 0.01 15.4 ± 0.21	$P<0.001$	7.50 ± 0.01 24.6 ± 1.07	$P<0.001$	1.10 ± 0.001 3.09 ± 0.017	$P<0.001$	0.39 ± 0.001 0.79 ± 0.003	$P<0.001$	0.97 ± 0.005	1.00 ± 0.001	0.95 ± 0.001	0.40 ± 0.001
<i>nosZ</i> forward	80	0 to 20 > 20	4.66 ± 0.05 5.96 ± 0.02	$P<0.001$	4.66 ± 0.05 5.96 ± 0.02	$P<0.001$	1.30 ± 0.002 1.48 ± 0.001	$P<0.001$	0.59 ± 0.004 0.57 ± 0.001	$P<0.001$	0.34 ± 0.004	0.07 ± 0.001	0.36 ± 0.005	0.02 ± 0.001
	97	0 to 20 > 20	28.3 ± 0.15 24.7 ± 0.06	$P<0.001$	35.5 ± 0.6 28.8 ± 0.2	$P<0.001$	2.22 ± 0.004 2.37 ± 0.001	$P<0.001$	0.46 ± 0.001 0.51 ± 0.001	$P<0.001$	0.55 ± 0.002	0.21 ± 0.001	0.53 ± 0.002	0.04 ± 0.001
<i>nosZ</i> reverse	80	0 to 20 > 20	4.00 ± 0.00 5.67 ± 0.05	$P<0.001$	4.00 ± 0.00 5.68 ± 0.05	$P<0.001$	1.26 ± 0.002 1.45 ± 0.002	$P<0.001$	0.63 ± 0.001 0.58 ± 0.003	$P<0.001$	0.17 ± 0.004	0.07 ± 0.001	0.19 ± 0.003	0.02 ± 0.001
	97	0 to 20 > 20	24.4 ± 0.16 24.8 ± 0.15	$P=0.10$	31.5 ± 0.7 32.1 ± 0.9	$P=0.65$	2.02 ± 0.004 2.31 ± 0.003	$P<0.001$	0.44 ± 0.001 0.50 ± 0.001	$P<0.001$	0.53 ± 0.002	0.20 ± 0.001	0.40 ± 0.002	0.05 ± 0.001

^a Number of OTUs observed in rarified OTU tables ± standard error.

^b Chao1 richness estimate of rarified OTUs ± standard error.

^c Shannon diversity index of rarified OTUs ± standard error.

^d Species Evenness of rarified OTUs ± standard error.

^e Sørensen similarity index of rarified OTUs ± standard error.

^f Bray Curtis similarity index of rarified OTUs ± standard error.

^g Unweighted Unifrac distance of rarified OTUs ± standard error.

^h Weighted Unifrac distance of rarified OTUs ± standard error.

ⁱ P -values of T-test for pairwise comparisons of values from upper and lower soil layers are given