

Table S1. Comparison of diversity and abundance of ammonia-oxidizing communities in different alpine soils.

	AOA			NO <sub>3</sub> <sup>-</sup> -N mg·kg <sup>-1</sup>	NH <sub>4</sub> <sup>+</sup> -N mg·kg <sup>-1</sup>	Substantial Dominance	AOB			Citation
	Phylotypes	Abundance	Main impact factors				Phylotypes	Abundance	Main impact factors	
Antarctic Soils		0.039×10 <sup>3</sup> ~4.0×10 <sup>3</sup>	Temperature (4~10°C)	6.1~6.5	1~3	AOB		1.9×10 <sup>4</sup> ~2.5×10 <sup>4</sup>	Temperature and N	Jung et al., 2011
Arctic tundra soils	9	2×10 <sup>6</sup> ~2×10 <sup>8</sup>	Tundra types	0.01~83.46	3.32~90.47	AOA		4×10 <sup>5</sup> ~2×10 <sup>6</sup>		Alves et al., 2013
Icelandic grassland soils	12	1.55×10 <sup>3</sup> ~8.15×10 <sup>5</sup>	Soil pH and clay content	5~38	40~150	AOA		Too low for detection		Daebeler et al., 2012
QTP* fir forest soils	16	7.63×10 <sup>5</sup> ~8.35×10 <sup>8</sup>	Temperature (-1.90~11.41°C)	2.34~36.30	84.79~ 420.50	AOA		1.03×10 <sup>5</sup> ~2.49×10 <sup>8</sup>		Wang et al., 2012
QTP alpine and permafrost soils	31	4.63×10 <sup>3</sup> ~2.72×10 <sup>4</sup>	Altitude			≥5700m	35	5.41×10 <sup>4</sup> ~3.1×10 <sup>6</sup>	Altitude	Zhang et al., 2009
	37	5.17×10 <sup>7</sup> ~3.79×10 <sup>8</sup>				≤5400m	50	6.97×10 <sup>5</sup> ~1.59×10 <sup>7</sup>		
QTP alpine meadow soils	41	5.6×10 <sup>2</sup> ~1.5×10 <sup>3</sup>	Vegetation coverage	0.06~2.83	86.2~91.8	AOA	55	0 ~4.5×10 <sup>2</sup>	Vegetation coverage	In this study

\*QTP stands for Qinghai-Tibetan Plateau.

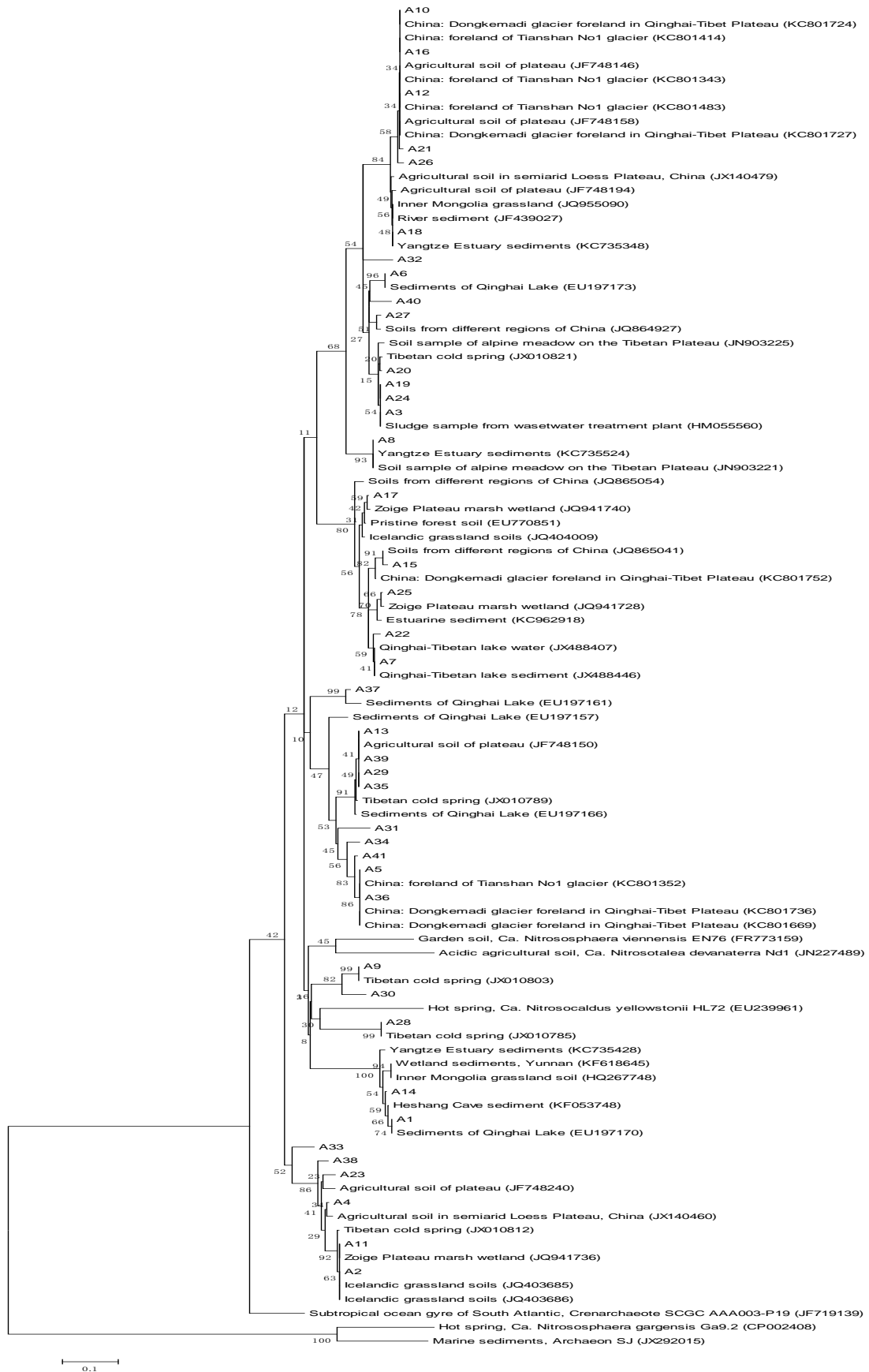


Fig. S1 Phylogenetic tree based on a comparison of the archaeal *amoA* sequences determined from the meadow soil samples and their closest phylogenetic relatives, which were obtained using BLAST.

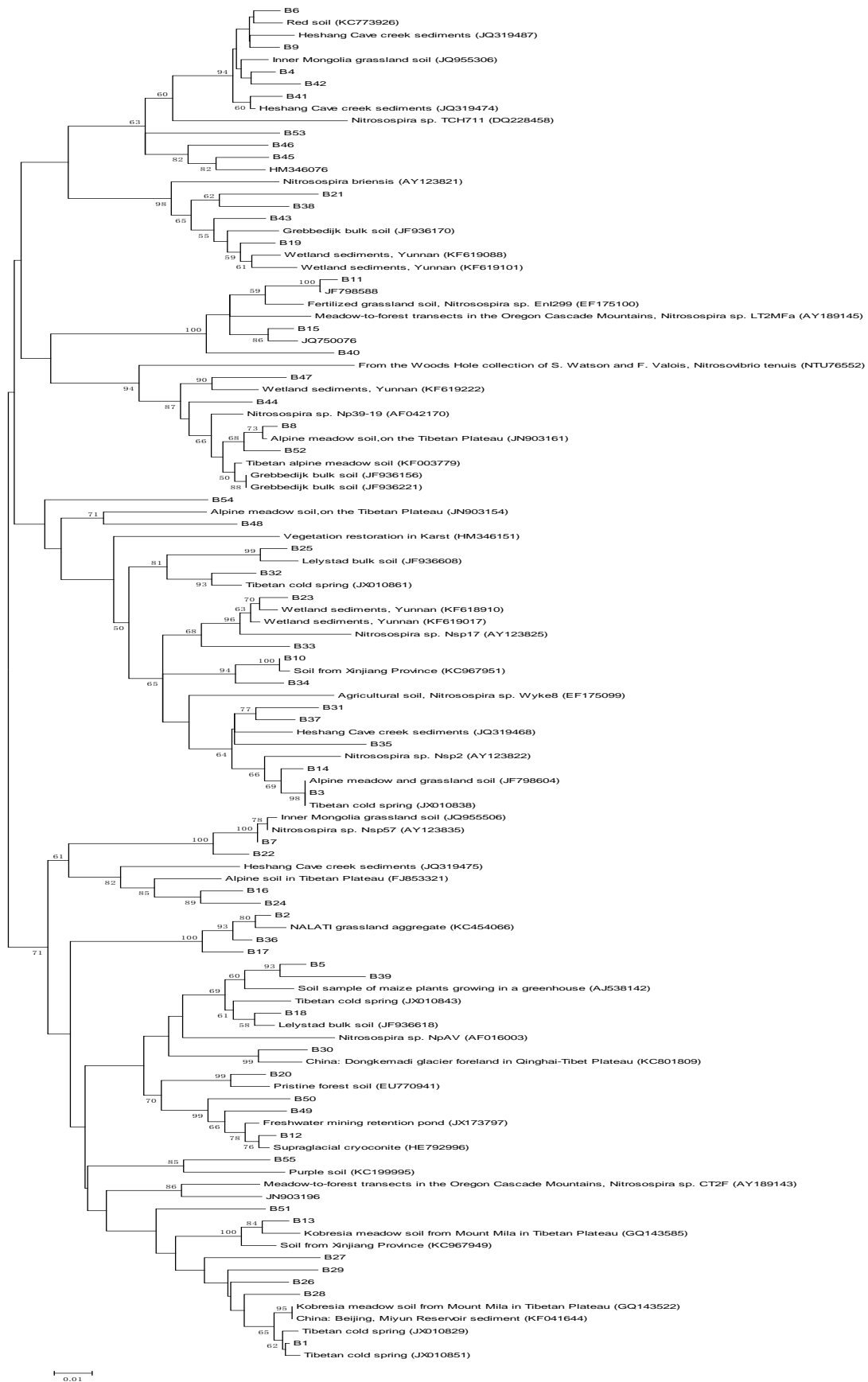


Fig. S2 Phylogenetic tree based on a comparison of the bacterial *amoA* sequences determined from the meadow soil samples and their closest phylogenetic relatives, which were obtained using BLAST.