Supplementary Materials

Table S1 Oligonucleotides used for PCR amplification and sequencing of denitrification function gene fragments

gene	Primer	Primer fragments（5-3）	Length (bp)	annealing temperatures (℃)	Reference
NosZ	*NosZ*-1F	GGTAACCTTGACAACACCGA	1100	56	(Scala and Kerkhof, 1999)
	NosZ-2R	ATGACGAAGCCGTGAGACA			
NirK	*NirK*-1F	GG(A/C)ATGGT(G/T)CC(C/G)TGGCA	514	56	(Braker et al., 1998)
	NirK-2R	GCCTCGATCAG(A/G)TT(A/G)TGG			
NapA	*NapA* -1F	TCTGGACCATGGGCTTCAACCA	877	59	(Huang et al., 2013)
	NapA-2R	ACGACGACCGGCCAGCGCAG			
NirS	*NirS* -1F	CCTA(C/T)TGGCCGCC(A/G)CA(A/G)T	890	56	(Braker et al., 1998)
	NirS-2R	CGTTGAACTT(A/G)CCGGT			
NorB	*NorB* F	CGNGARTYCTSGARCARCC	669	55	(Garbeva et al., 2007)
	NorB R	CRTADGCVCCRWAGAAVGC			

Table S2 Oligonucleotides used for qPCR amplification and sequencing of denitrification function gene fragments

gene	Primer	Primer fragments（5-3）	Length (bp)	annealing temperatures (℃)	Reference
NosZ	*NosZ*-1527F	CGCTGTTCHTCGACAGYCA	250	56	(Wang et al., 2015)
	NosZ-1773R	ATRTCGATCARCTGBTCGTT			
NirK	*NirK*-1F	TCATGGTGCTGCCGCGKGACGG	326	64	(Wang et al., 2015)
	NirK-2R	GAACTTGCCGGTKGCCCAGAC			
NapA	*NapA* -1F	CCCAATGCTCGCCACTG	130	60	(Cheng et al., 2019)
	NapA-2R	CATGTTKGAGCCCCACAG			
NorB	*NorB*-1F	GCAGCCGATTTTACTCAGCG	171	55	(Pal et al., 2015)
	NorB-2R	TCTTTGGCGGCCACGATATT			
16S rRNA	16S rRNA-F	CGGTGAATACGTTCYCGG	142	55	(He et al., 2017)
	16S rRNA-R	GGHTACCTTGTTACGACTT			

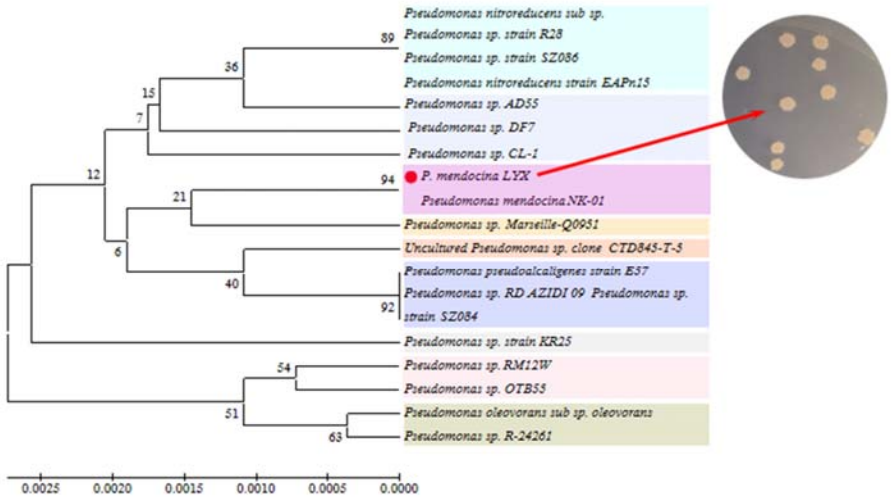

Fig. S1 Phylogenetic tree based on the 16S rRNA gene sequence of *Pseudomonas mendocina* LYX.

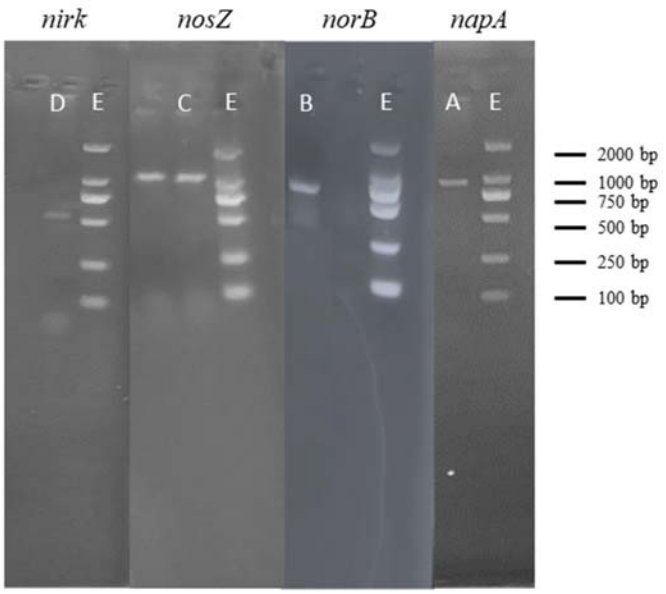

Fig. S2 Agarose gel electrophoresis of PCR amplified *napA*, *nirK*, *nosZ* and *norB* gene fragments from bacteria DNA, *napA*-1F/*napA*-2R(lanes A), using *norB*F/ *norB*R(lanes B), *nosZ*-1F/*nos*-2R(lanes C), *nirK*-1F/*nirK*-2R(lanes D). Lanes E, DNA marker

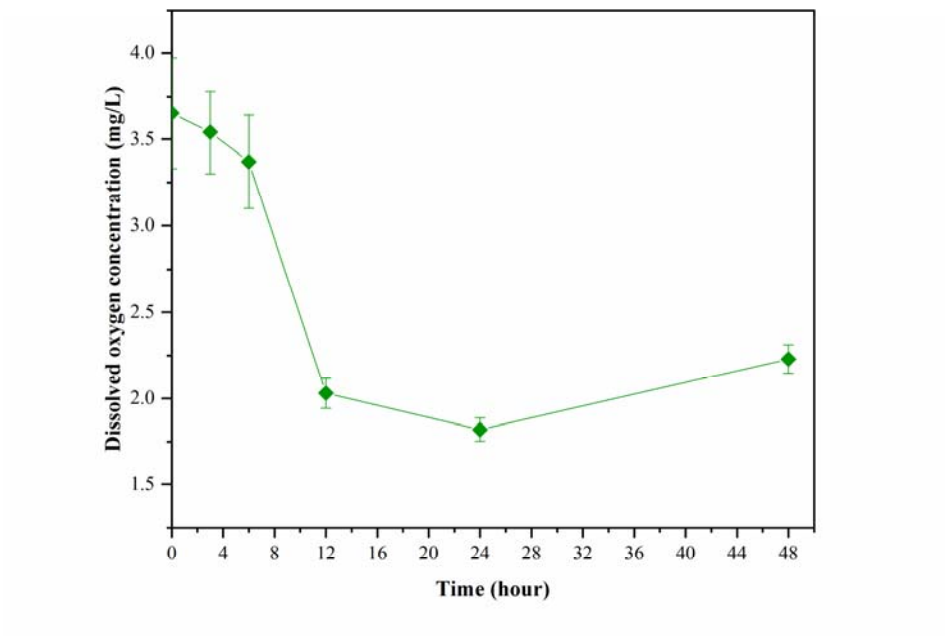

Fig. S3 Changes of dissolved oxygen concentration during nitrogen balance experiments

16SrRNA sequencing fragments:

AAATGCCGAGCCTACACATGCAAGTCGAGCGGATGAAAAGAGCTTGCTCCCTGATTTAGCGGCGGAC
GGGTGAGTAATGCCTAGGAATCTGCCTGGTAGTGGGGGATAACGTTCCGAAAGGAACGCTAATACCG
CGTACGTCCTACGGGAGAAAGCAGGGGACCTTCGGGCCTTGCGCTATCAGATGAGCCTAGGTCGGATT
AGCTAGTTGGTGAGGTAATGGCTCACCAAGGCGACGATCCGTAACTGGTCTGAGAGGATGATCAGTCA
CACTGGAACTGAGACACGGTCCAGACTCCTACGGGAGGCAGCAGTGGGGAATATTGGACAATGGGCG
AAAGCCTGATCCAGCCATGCCGCGTGTGTGAAGAAGGTCTTCGGATTGTAAAGCACTTTAAGTTGGGA
GGAAGGGCAGTAAGTTAATACCTTGCTGTTTTGACGTTACCGACAGAATAAGCACCGGCTAACTTCGT
GCCAGCAGCCGCGGTAATACGAAGGGTGCAAGCGTTAATCGGAATTACTGGGCGTAAAGCGCGCGTA
GGTGGTTCGTTAAGTTGGATGTGAAAGCCCCGGGCTCAACCTGGGAACTGCATCCAAAACTGGCGAGC
TAGAGTACGGTAGAGGGTGGTGGAATTTCCTGTGTAGCGGTGAAATGCGTAGATATAGGAAGGAACA
CCAGTGGCGAAGGCGACCACCTGGACTGATACTGACACTGAGGTGCGAAAGCGTGGGGAGCAAACAG
GATTAGATACCCTGGTAGTCCACGCCGTAAACGATGTCAACTAGCCGTTGGAATCCTTGAGATTTTAGT
GGCGCAGCTAACGCATTAAGTTGACCGCCTGGGGAGTACGGCCGCAAGGTTAAAACTCAAATGAATT
GACGGGGGCCCGCACAAGCGGTGGAGCATGTGGTTTAATTTGAAGCAACGCGAAGAACCTTACCTGG
CCTTGACATGCTGAGAACTTTCCAGAGATGGATTGGTGCCTTCGGGAACTCAGACACAGGTGCTGCAT
GGCTGTTGTCAGCTCGTGTCGTGAGATGTTGGGTTAAGTCCCGTAACGAGCGCAACCCTTGTCCTTAGT
TACCAGCACGTTATGGTGGGCACTCTAAGGAGACTGCCGGTGACAAACCGGAGGAAGGTGGGGATGA
CGTCAAGTCATCATGGCCCTTACGGCCAGGGCTACACACGTGCTACAATGGTCGGTACAAAGGGTTGC
CAAGCCGCGAGGTGGAGCTAATCCCATAAAACCGATCGTAGTCCGGATCGCAGTCTGCAACTCGACTG
CGTGAAGTCGGAATCGCTAGTAATCGTGAATCAGAATGTCACGGTGAATACGTTCCCGGGCCTTGTAC
ACACCGCCCGTCACACCATGGGAGTGGGTTGCTCCAGAAGTAGCTAGTCTAACCTTCGGGGGGACGGT
ACCACGGAAGGATCCAGG

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