

Table S1 Results of the two-way analysis of variance (ANOVA) and post hoc analyses on the effects of N sources, nitrification inhibitors, and their interactions on the pakchoi fresh biomass of the edible parts, pakchoi cadmium concentration, soil $\text{NH}_4^+\text{-N}$, soil $\text{NO}_3^-\text{-N}$, soil pH, and soil diethylenetriamine pentaacetate (DTPA)-extractable Cd

Factors	Fresh biomass of edible parts g/plant	Cadmium concentration mg/kg (FW)	Cadmium concentration mg/kg (DW)	$\text{NH}_4^+\text{-N}$ mg/kg (DW)	$\text{NO}_3^-\text{-N}$ mg/kg (DW)	pH	DTPA-extractable Cd mg/kg (DW)
<i>nitrification inhibitor</i>							
F value	3.36 *	14.97 ***	4.80 **	614.10 ***	55.99 ***	51.23 ***	69.44 ***
<i>Post-hoc test</i>							
Control	16.94 ± 3.01 b	2.10 ± 0.59 a	33.03 ± 10.94 a	3.57 ± 3.46 c	68.21 ± 24.59 a	7.17 ± 0.06 c	1.28 ± 0.07 a
DCD	18.31 ± 3.84 ab	1.62 ± 0.59 b	26.59 ± 7.45 b	123.92 ± 74.36 a	49.43 ± 44.46 b	7.33 ± 0.13 b	1.02 ± 0.23 b
DMPP	18.71 ± 3.09 a	1.53 ± 0.73 b	25.22 ± 10.00 b	120.92 ± 81.27 a	35.59 ± 41.62 c	7.39 ± 0.15 a	0.97 ± 0.28 b
Nitrapyrin	17.13 ± 3.34 b	2.06 ± 0.67 a	32.46 ± 11.10 a	16.96 ± 20.55 b	63.13 ± 32.01 a	7.31 ± 0.08 b	1.30 ± 0.08 a
<i>N sources</i>							
F value	66.73 ***	96.29 ***	28.94 ***	422.85 ***	559.52 ***	76.27 **	71.95 ***
<i>Post-hoc test</i>							
$\text{CO}(\text{NH}_2)_2$	14.8 ± 1.72 c	1.12 ± 0.36 c	19.56 ± 6.39 b	94.37 ± 78.65 a	36.18 ± 23.02 b	7.41 ± 0.16 a	1.04 ± 0.27 b
$(\text{NH}_4)_2\text{SO}_4$	21.4 ± 2.06 a	2.34 ± 0.39 b	35.05 ± 7.72 a	92.23 ± 91.7 a	26.01 ± 20.12 c	7.25 ± 0.08 b	1.07 ± 0.22 b
$\text{Ca}(\text{NO}_3)_2$	17.12 ± 1.93 b	2.39 ± 0.35 a	33.37 ± 8.88 a	12.43 ± 8.84 b	100.08 ± 10.7 a	7.25 ± 0.06 b	1.32 ± 0.09 a
<i>N sources × nitrification inhibitor</i>							
F value	0.60	4.23 **	0.98	135.26 ***	21.62 **	13.10 ***	19.29 ***

Note: *** $P < 0.001$; ** $0.001 < P \leq 0.01$; * $0.01 < P \leq 0.05$, Different letters represent significant differences (Duncan's test; $P < 0.05$).

Table S2 Permutational multivariate analysis of variance (PERMANOVA) is used to explain the effect of different factors on the microbial community structure

	Df	Sum of Sq.	Mean Sq.	F. Model	R ²	Pr(>F)
N sources	2	0.35234	0.17617	8.2949	0.28239	0.001 ***
nitrification inhibitor	3	0.16128	0.053761	2.5313	0.12926	0.001 ***
N sources × nitration inhibitor	6	0.22437	0.037395	1.7607	0.17983	0.003 **
Residuals	24	0.50972	0.021238		0.40852	
Total	35	1.24772			1	

Note: *** $P < 0.001$; ** $0.001 < P \leq 0.01$; * $0.01 < P \leq 0.05$; Df: degree of freedom; Sq: squares

Table S3 Permutational multivariate analysis of variance (PERMANOVA) of Functional annotation of prokaryotic taxa (FAPROTAX) results, showing the effect of different factors on functional diversity

	Df	Sum of Sq.	Mean Sq.	F. Model	R ²	Pr(>F)
N sources	2	0.05136	0.025679	2.5552	0.08102	0.048 *
nitrification inhibitor	3	0.16860	0.056200	5.5922	0.26598	0.001 ***
N sources × nitration inhibitor	6	0.17273	0.028789	2.8646	0.27250	0.012 *
Residuals	24	0.24119	0.010050		0.38050	
Total	35	0.63388			1	

Note: *** $P < 0.001$; ** $0.001 < P \leq 0.01$; * $0.01 < P \leq 0.05$; Df: degree of freedom; Sq: squares

Supplementary material

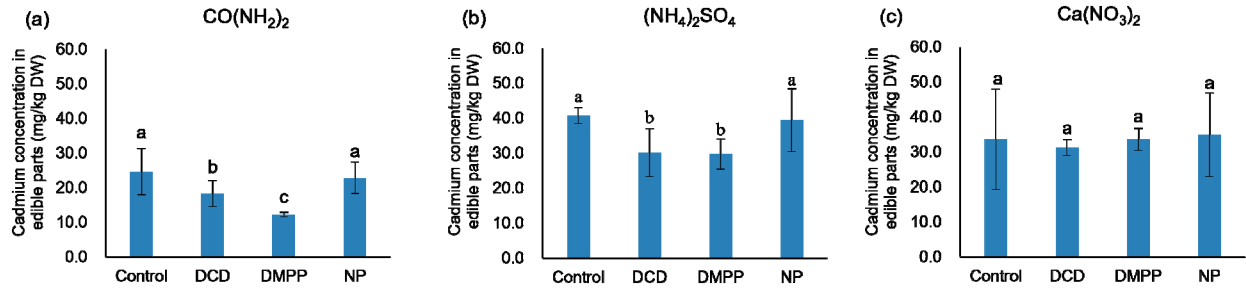


Fig. S1 Effects of the nitrification inhibitors on the cadmium (Cd) concentration (a–c) in the edible parts of pakchoi (dry weight). $\text{CO}(\text{NH}_2)_2$, $(\text{NH}_4)_2\text{SO}_4$, and $\text{Ca}(\text{NO}_3)_2$ were used as the N fertilizers. Nitrification inhibitors were not applied to the control treatment. Data are expressed as mean \pm standard deviation (SD) ($n=5$). Different letters represent significant differences (Duncan's test; $P < 0.05$). DCD: dicyandiamide; DMPP: 3,4-dimethylpyrazole phosphate; NP: nitrapyrin; DW: dry weight.

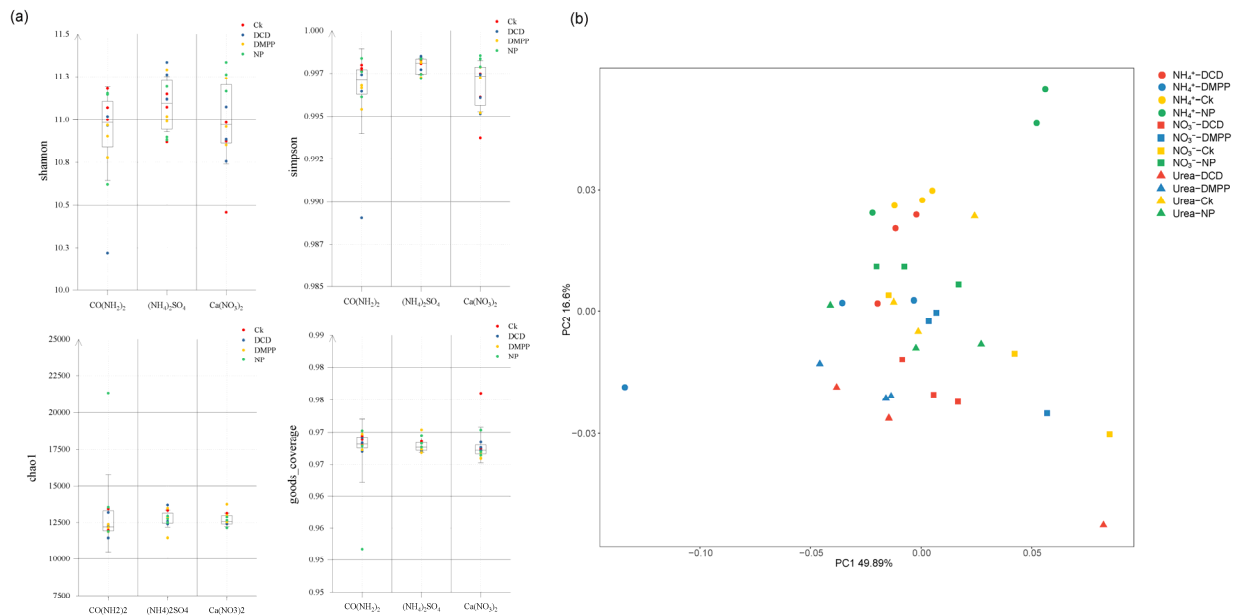


Fig. S2 Effects of different nitrification inhibitors on soil microbial diversity (a) Soil α -diversity in different treatments. Significant differences among the treatments were not observed in the Shannon diversity index, Simpson index, Chao1 richness estimator, or goods coverage. (b) Principal component analysis (PCA) was used to characterize the differences in β -diversity between different treatments. The percentage on the axis corresponds to the fraction of the total variance. Treatments with stronger inhibitory effects (blue and red dots) tend to separate on the y-axis from treatments with weaker inhibitory effects (green and yellow dots). Ck: control check; DCD: dicyandiamide; DMPP: 3,4-dimethylpyrazole phosphate; NP: nitrapyrin.

control NI-treated soil

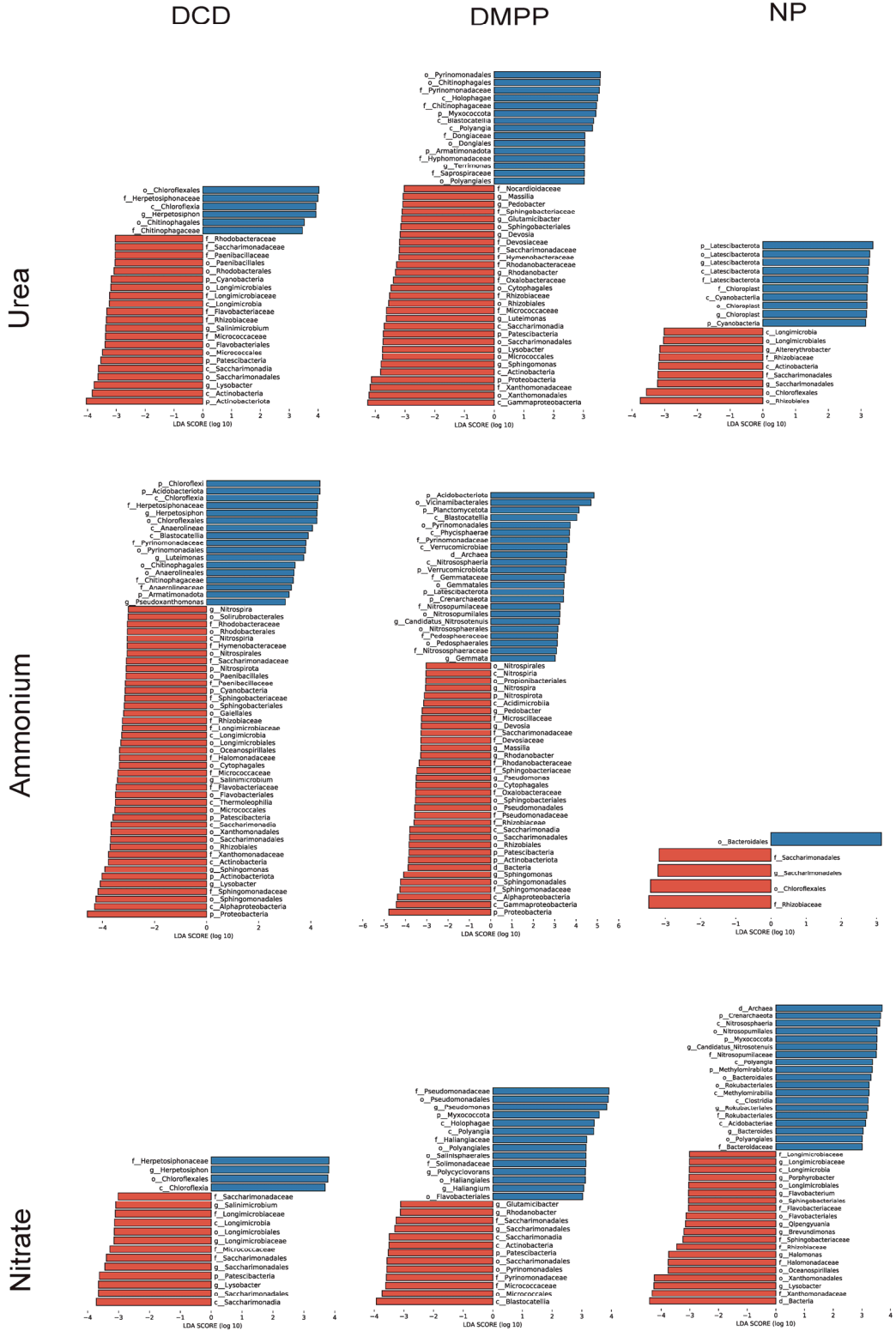


Fig. S3 Linear discriminant analysis (LDA) effect size (LEfSe) analysis was performed to identify microbial taxa with significantly different abundances between the control and nitrification inhibitor treatments in soil with different N fertilizers. Taxa with LDA scores >3 are identified as significant microbial taxa. Red bars represent taxa that showed increased abundance in the control and blue bars represent taxa that showed increased abundance in the nitrification inhibitor treatments. NI: nitrification inhibitor; DCD: dicyandiamide; DMPP: 3,4-dimethylpyrazole phosphate; NP: nitrapyrin.