Electronic Supplementary Material (ESI) for Environmental Science: Nano.

Cd stress alleviation in mung-bean seedlings with biogenic hydroxyapatite nanoparticles as ecofriendly remediation agents

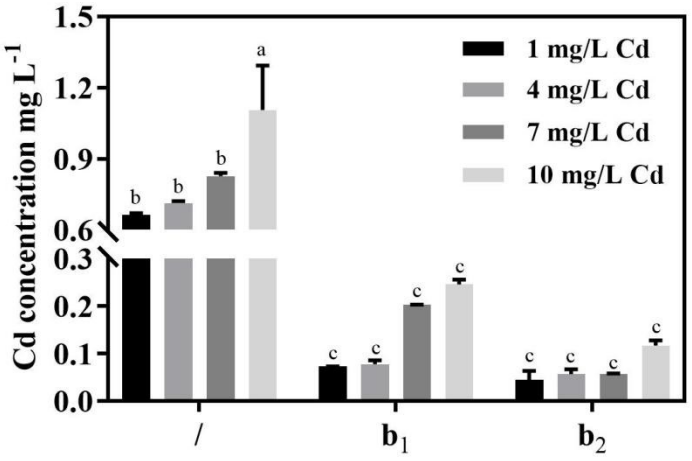

Fig. S1 Cd concentration in mung-bean seedling culture solution after14-d of hydroponic growth

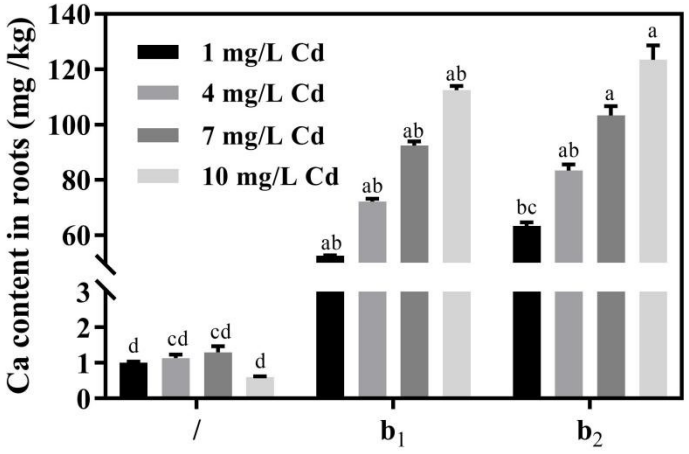

Fig. S2 Ca content in roots after14-d hydroponics

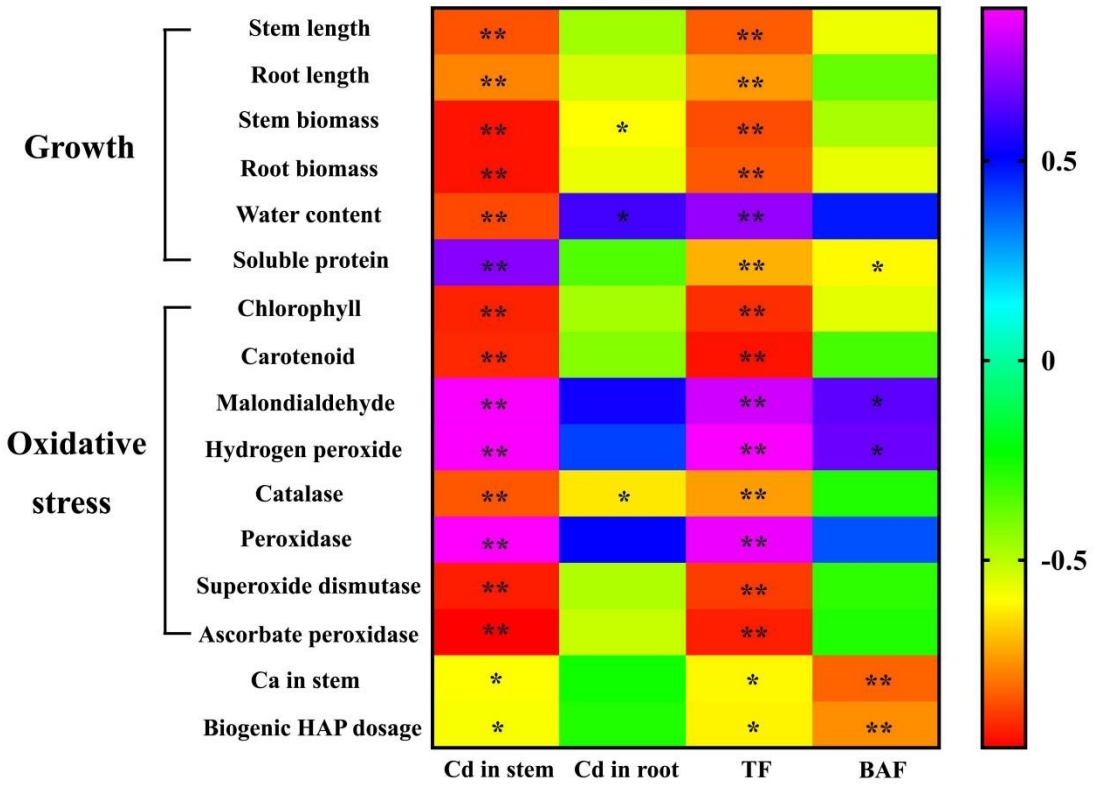

Fig. S3 Pearson-correlation analysis of the relationships among plant development, antioxidant systems, and Cd contents under the biogenic hydroxyapatite nanoparticle treatments

Table S1

Experimental design for different treatment conditions

Treatments	Cd concentration (mg/L)	Biogenic HAP dosage	
		0.25 mg/mL	0.5 mg/mL
CK	0	/	/
1 mg/L Cd		/	/
1+b_1	1	√	/
1+b_2		/	√
4 mg/L Cd		/	/
4+b_1	4	√	/
4+b_2		/	√
7 mg/L Cd		/	/
7+b_1	7	√	/
7+b_2		/	√
10 mg/L Cd		/	/
10+b_1	10	√	/
10+b_2		/	√

Table S2

Effects of different treatments on photosynthetic pigments. Chl *a*: chlorophyll *a*; Chl *b*: chlorophyll *b*; Total chl: total chlorophyll; Car: total carotenoids.

Treatments	Chl *a*	Chl *b*	Total chl	Chl *a* /chl *b*	Total car	Car/ total chl
CK	23.34±0.919^{a}	8.18±0.255^{bc}	31.52±1.174^{ab}	2.85±0.024^{b}	6.22±0.071^{a}	0.20±0.005^{abc}
1 mg/L Cd	17.51±0.919^{bc}	5.71±0.156^{e}	23.22±0.919^{cd}	3.07±0.050^{ab}	4.22±0.297^{de}	0.18±0.006^{bcd}
4 mg/L Cd	14.47±1.103^{cd}	4.70±0.156^{f}	19.17±1.386^{de}	3.08±0.011^{ab}	3.46±0.339^{ef}	0.18±0.005^{bcd}
7 mg/L Cd	11.52±0.891^{d}	3.30±0.184^{g}	14.82±1.082^{e}	3.49±0.214^{a}	3.38±0.113^{f}	0.23±0.009^{ab}
10 mg/L Cd	3.71±0.735^{e}	1.24±0.057^{h}	4.95±0.114^{f}	2.99±0.020^{ab}	1.14±0.071^{g}	0.23±0.037^{a}
1 mg/L Cd +b_1	24.23±0.198^{a}	8.67±0.283^{b}	32.90±2.234^{a}	2.80±0.382^{b}	5.19±0.057^{b}	0.16±0.018^{cde}
1 mg/L Cd +b_2	25.60±0.891^{a}	9.49±0.170^{a}	33.84±0.948^{a}	2.70±0.163^{ab}	5.63±0.339^{ab}	0.16±0.015^{cde}
4 mg/L Cd +b_1	23.28±1.018^{a}	8.41±0.283^{bc}	31.69±0.735^{ab}	2.77±0.046^{b}	5.21±0.283^{b}	0.16±0.009^{cde}
4 mg/L Cd +b_2	25.04±1.499^{a}	8.80±0.170^{ab}	33.84±1.640^{a}	2.85±0.128^{b}	5.05±0.057^{bc}	0.15±0.009^{cde}
7 mg/L Cd +b_1	20.36±0.679^{ab}	7.09±0.424^{d}	27.45±0.611^{bc}	2.81±0.125^{ab}	4.28±0.127^{cd}	0.16±0.011^{cde}
7 mg/L Cd +b_2	23.17±1.188^{a}	7.85±0.297^{c}	31.02±1.112^{ab}	2.95±0.174^{ab}	4.23±0.170^{de}	0.14±0.006^{de}
10 mg/L Cd +b_1	20.03±0.071^{ab}	7.08±0.113^{d}	27.11±1.485^{bc}	2.83±0.068^{ab}	3.44±0.226^{ef}	0.13±0.013^{e}
10 mg/L Cd+b_2	21.77±1.372^{ab}	8.21±0.170^{bc}	29.98±2.464^{ab}	2.65±0.123^{b}	4.23±0.198^{de}	0.14±0.005^{de}