

Supporting information

Supplementary Table S1. Amount of total Cd and Zn in each organ harvested at 6 DAA (after anthesis) and at 15 DAA (after anthesis) in rice. Values are means \pm standard error of 4 independent replicates.

Harvest	Cd amount (μg)			Zn amount (μg)		
	6 DAA	15 DAA		6 DAA	15 DAA	
	6 DAA	CK	ABA	6 DAA	CK	ABA
Grains	0.00* \pm 0.00	0.12 \pm 0.02 a	0.13 \pm 0.03 a	1.33 \pm 0.94	32.11 \pm 5.22 a	30.42 \pm 4.73 a
H+R	0.12 \pm 0.05	0.10 \pm 0.04 a	0.12 \pm 0.03 a	38.06 \pm 3.18	15.18 \pm 1.87 a	21.76 \pm 3.61 b
Flag leaves	1.53 \pm 0.19	1.65 \pm 0.11 a	1.02 \pm 0.15 b	21.82 \pm 4.8	11.11 \pm 0.81 a	13.68 \pm 3.20 a
Node-I	0.00* \pm 0.00	0.02 \pm 0.00 a	0.01 \pm 0.00 a	6.49 \pm 0.75	11.10 \pm 0.68 a	15.98 \pm 0.53 b
Stems	0.04 \pm 0.01	0.08 \pm 0.01 a	0.08 \pm 0.03 a	65.24 \pm 10.91	49.40 \pm 6.88 a	80.64 \pm 9.71 b
Lower leaves	0.21 \pm 0.03	0.97 \pm 0.57 a	0.32 \pm 0.07 a	65.16 \pm 4.44	27.70 \pm 3.92 a	37.89 \pm 6.40 a
Other tillers	0.46 \pm 0.05	0.73 \pm 0.28 a	1.17 \pm 0.20 a	244.29 \pm 40.64	214.03 \pm 9.21 a	330.21 \pm 15.83 b
Roots	1.92 \pm 0.58	3.39 \pm 0.47 a	2.05 \pm 0.33 a	476.19 \pm 148.15	739.54 \pm 162.47 a	507.42 \pm 102.56 b
Labeling tiller	1.91 \pm 0.15	2.95 \pm 0.46 a	1.69 \pm 0.18 a	198.10 \pm 15.41	146.59 \pm 12.55 a	200.38 \pm 17.57 a
Straw	2.37 \pm 0.20	3.56 \pm 0.57 a	2.73 \pm 0.37 a	441.06 \pm 55.12	328.52 \pm 16.10 a	500.17 \pm 30.10 b
Shoots	2.37 \pm 0.20	3.68 \pm 0.58 a	2.86 \pm 0.36 a	442.39 \pm 56.06	360.62 \pm 19.12 a	530.60 \pm 28.92 b
Whole plant	4.29 \pm 0.79	7.08 \pm 1.00 a	4.92 \pm 0.56 a	918.58 \pm 92.09	1100.16 \pm 156.10 a	1038.01 \pm 160.86 a

Whole plant was the sum of the dry weight of each organ. Shoot, total aboveground biomass. Labeling tiller, total aboveground biomass of labeling tiller. Straw, the total amount of aboveground parts except grains. H+R, husk+rachis. * The value is very small, and it is 0 after two decimal places. For each element, different letters within a row indicate significant differences ($p < 0.05$).

Supplementary Table S2. Cd_{lab} and Zn_{lab} absorption in flag leaves during 24 hours. Values are means ± standard error of 4 independent replicates.

	Amount of Cd _{lab} before treatments (µg)	Amount of Zn _{lab} before treatments (µg)
CK	0.82±0.03	1.20±0.16
ABA		

Supplementary Table S3. The amount Cd_{lab} and Zn_{lab} among the rice in two treatments at 6 DAA (after anthesis) and at 15 DAA (after anthesis). Values are means \pm standard error of 4 independent replicates.

	Amount of Cd _{lab} ($\mu\text{g Cd}_{\text{lab}} \text{ plant}^{-1}$)		
	6 DAA	15DAA	
	6 DAA	CK	ABA
Grains	0.001	0.06 \pm 0.01	0.05 \pm 0.01
H+R	<i>n.d.</i>	0.05 \pm 0.03	0.03 \pm 0.02
Node-I	0.0002	0.01 \pm 0.01	0.004 \pm 0.00
Stems	<i>n.d.</i>	0.01 \pm 0.00	0.02 \pm 0.01
Lower leaves	<i>n.d.</i>	<i>n.d.</i>	<i>n.d.</i>
Other tillers	<i>n.d.</i>	<i>n.d.</i>	<i>n.d.</i>
Roots	<i>n.d.</i>	<i>n.d.</i>	<i>n.d.</i>
Flag leaves	0.82 \pm 0.03	0.70 \pm 0.04	0.72 \pm 0.09
	Amount of Zn _{lab} ($\mu\text{g Zn}_{\text{lab}} \text{ plant}^{-1}$)		
	6 DAA	15DAA	
	6 DAA	CK	ABA
Grains	0.0003	0.03 \pm 0.01	0.04 \pm 0.01
H+R	0.02 \pm 0.01	0.06 \pm 0.02	0.04 \pm 0.01
Node-I	0.22 \pm 0.02	0.34 \pm 0.03	0.55 \pm 0.04
Stems	0.04 \pm 0.02	0.09 \pm 0.02	0.10 \pm 0.03
Lower leaves	0.11 \pm 0.02	0.13 \pm 0.04	0.11 \pm 0.01
Other tillers	0.23 \pm 0.07	0.39 \pm 0.05	0.32 \pm 0.04
Roots	0.10 \pm 0.05	0.21 \pm 0.05	0.23 \pm 0.07
Flag leaves	1.20 \pm 0.16	0.38 \pm 0.03	0.39 \pm 0.03

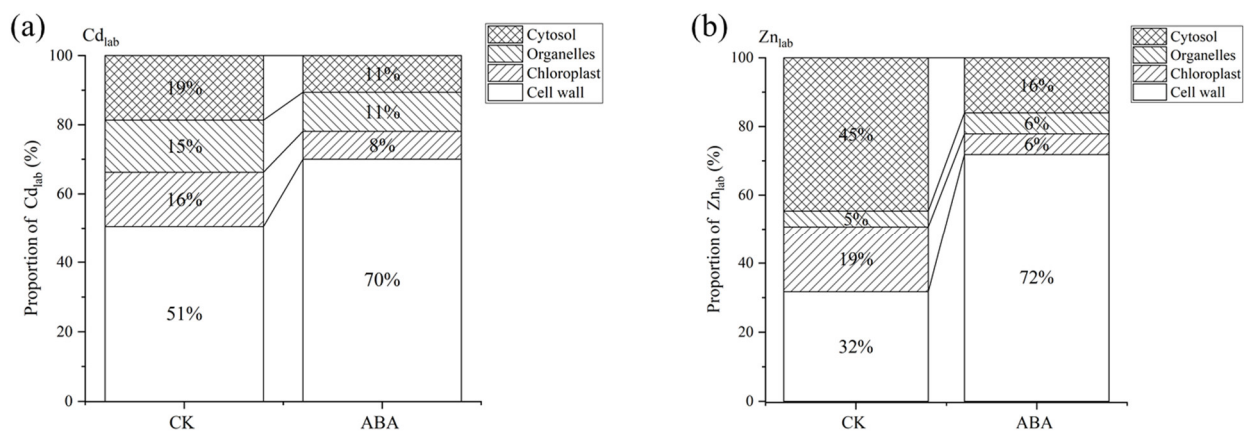
H+R, husk+rachis. *n.d.* Zn_{lab} and Cd_{lab} under detection limit. *ns* stands for no significant difference.

Supplementary Table S4. Isotopic abundances of Cd and Zn (data from the isotope certificate).

isotope	¹⁰⁶ Cd	¹⁰⁸ Cd	¹¹⁰ Cd	¹¹¹ Cd	¹¹² Cd	¹¹³ Cd	¹¹⁴ Cd	¹¹⁶ Cd
Labled source (%)	0.01	0.02	1.39	97.21	1.28	0.07	0.01	0.01
Natural source (%)	1.25	0.89	12.49	12.80	24.13	12.22	28.73	7.49
isotope	⁶⁴ Zn	⁶⁶ Zn	⁶⁷ Zn	⁶⁸ Zn	⁷⁰ Zn			
Labled source(%)	1.56	3.88	89.6	4.91	0.05			
Natural source (%)	48.63	27.90	4.10	18.75	0.62			

Supplementary Table S5. Primers for qRT-PCR.

Primer name	Primer sequence (5'to3')
F-OsLCT1	GAGTTCTTCGTCAGAGCTAC
R-OsLCT1	CAGTGCTGGATGACGAATTG
F-OsHMA2	CATAGTGAAGCTGCCTGAGATC
R-OsHMA2	GATCAAACGCATAGCAGCATCG
F-OsZIP3	GCATTGTTTCAGGCTAATTTTAAGG
R-OsZIP3	GGCAGTTGAGCTATGCACATTG
F-Actin1	GGGTTCACAAAGTCTGCCTATTGT
R-Actin1	ACGGGACACGACCAAGGA



Supplementary Figure S1. Subcellular distribution proportion of Cd_{lab} (a) and Zn_{lab} (b) in flag leaves of rice at 15DAA (after anthesis). ABA, Absciscic Acid. CK, blank control. Cd_{lab}/Zn_{lab}, the labeled source of Cd/Zn with an enriched ¹¹¹Cd /⁶⁷Zn isotope. Data are mean values calculated from 4 independent replicates.