Root-to-shoot Cd translocation via the xylem is the major process determining shoot and grain cadmium accumulation in rice

Shimpei Uraguchi[1, 2], Shinsuke Mori[1], Masato Kuramata[1], Akira Kawasaki[1], Tomohito Arao[1] and Satoru Ishikawa[1]

[1] Soil Environment Division, National Institute for Agro-Environmental Sciences, 3-1-3 Kannondai, Tsukuba, Ibaraki, 305-8604, Japan

[2] Present address: Biotechnology Research Center, University of Tokyo, Yayoi, Bunkyo-ku, Tokyo, 113-8657, Japan

Supplementary materials

Figure S1. Metal concentrations in shoots of low-Cd-accumulating *japonica* cultivar 'Sasanishiki' and high-Cd-accumulating *indica* cultivar 'Habataki'. 14-d-old seedlings were exposed to a nutrient solution with or without 0.18 μM $CdSO_4$ for 14 d. Data are presented as means with SD (n = 3). Asterisks represent significant difference between control and Cd treatment tested by Student's t-test (*, $p < 0.05$; **, $p < 0.01$).

Figure S2. Metal concentrations in shoots (A) and grains (B) of low-Cd-accumulating *japonica* cultivar 'Sasanishiki' and high-Cd-accumulating *indica* cultivar 'Habataki' cultivated with the moderately Cd-polluted paddy soil under intermittent flooded condition. Asterisks represent significant difference between the cultivars tested by Student's t-test (*, $p < 0.05$; **, $p < 0.01$).

Figure S3. Genotypic variation of metal concentrations in shoots of diverse rice cultivars. Seedlings (1-month-old) of 69 genotypes from the world rice core collection (WRC), 3 major *japonica* cultivars in Japan ('Koshihikari', 'Akitakomachi' and 'Hitomebore'), and a Cd-accumulative *indica* cultivar 'Chou-kou-koku' were cultured under upland condition for 1 month in a pot filled with paddy soil that had been moderately contaminated with Cd.

Figure S4. Relationships between Cd and essential metals concentrations in shoots of various genotypes. The data on Figure S3 were plotted for correlation analysis. CKK,

‘Cho-ko-koku’; JAR, ‘Jarjan’ (WRC28);ANJ, ‘Anjana Dhan’ (WRC30).

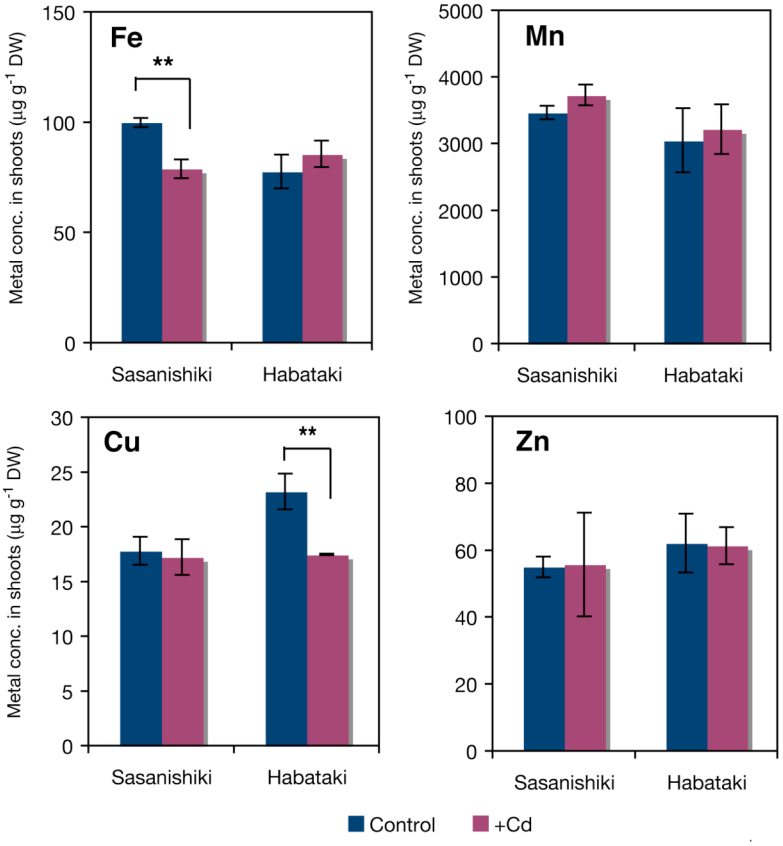

Figure S1 Uraguchi et al.

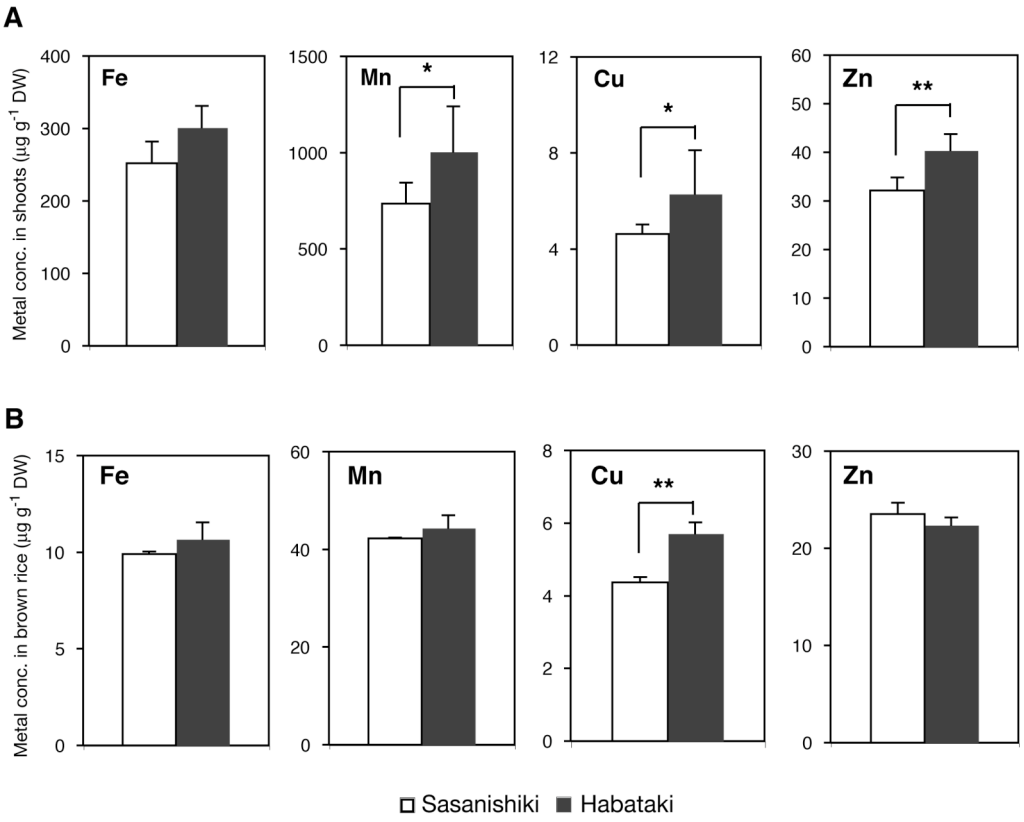

Figure S2 Uraguchi et al.

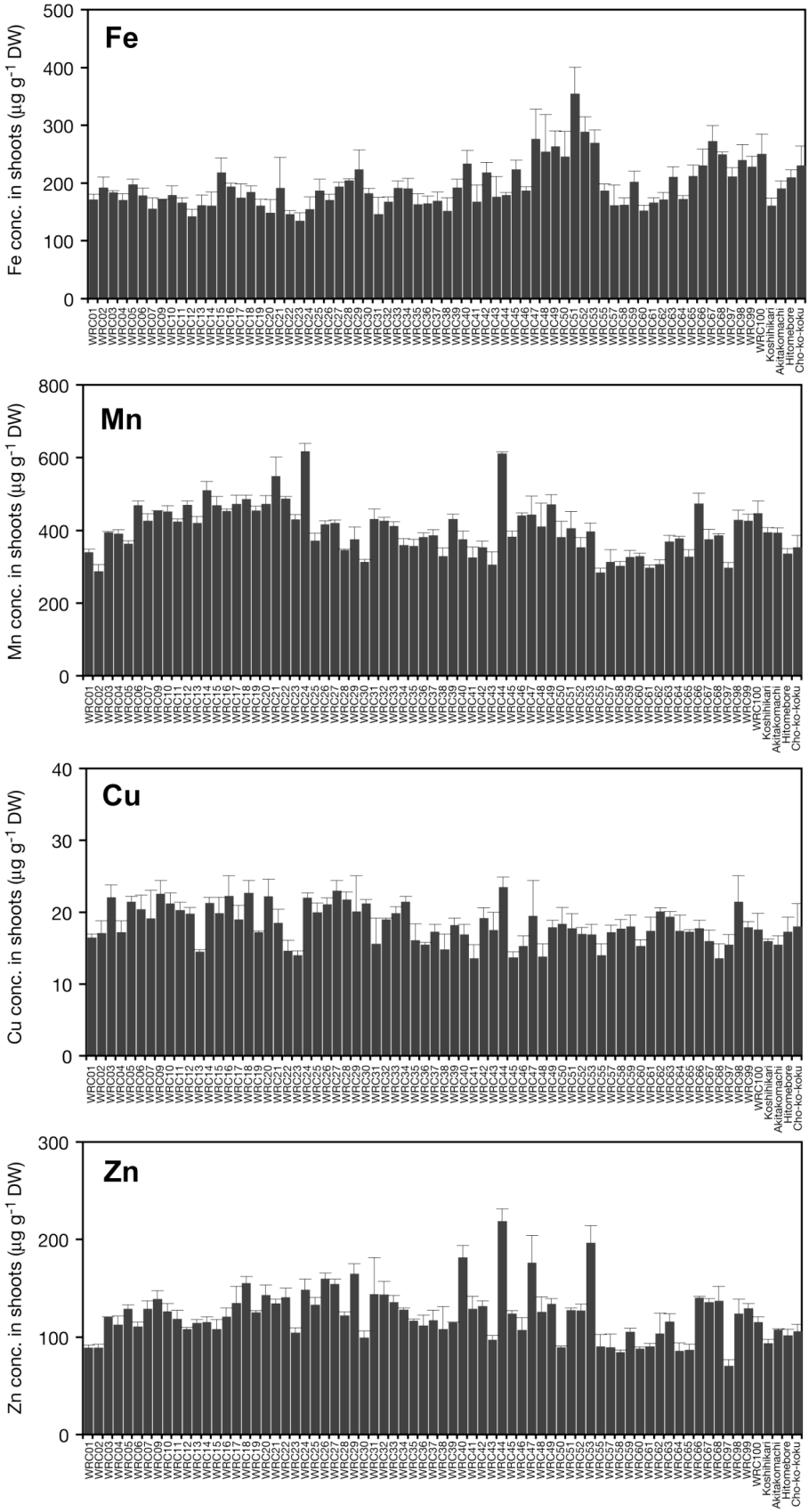

Figure S3 Uraguchi et al.

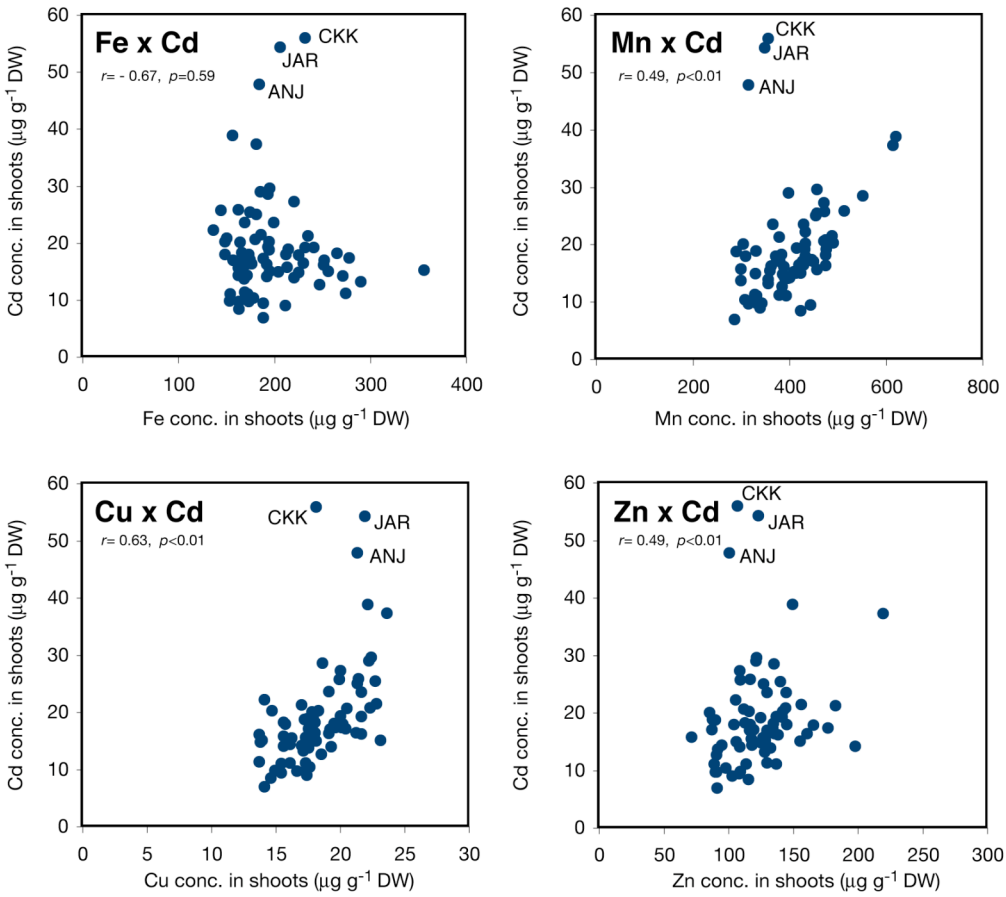

Figure S4 Uraguchi et al.