

Supplementary Tables

Table S1. Primers used for qRT-PCR validation

Transcript ID		Primer Sequence
Rna15138	F	ATCTCACAGAAGGTTGCTGCTTGG
	R	AGTCCTTCTACTCCCTAGATGGTTG
Rna17727	F	TCCCATCTCCATCTTCTTCCCTCAG
	R	GTGTGCTCCAGATAAGGCTACCATG
Rna17731	F	AAGCCCTCTCCATCATCAGATCCTC
	R	CAGAACAGAAGCGTCACATCCATTG
Ran19869	F	AACTCAGACGAAGTGCTTCTTGTTG
	R	GAATCCAGTGAGAGGACGAAGGTTG
Ran26850	F	TGCCAACACCTCCCTTCCTTCTC
	R	AATTGACATTGCGAACGACCAAAGG
Ran45674	F	GTTGGATGAAATGGTGACGCTGTTG
	R	CATATTGGGGTCGTTGAGCCTGTC
Rna44057	F	TCCGCTTGTTCTTCCACGATTGC
	R	TCCTGTTGGGGTTTGCGTTCTTC
Ran35220	F	TGCTTGGAACACTACACTGCTTCTC
	R	GCATACGAGGATCAGACTGGGAAAC
Ran39145	F	CAGACGCTGTTACCTCTCAATCC
	R	CCGTTGGAAGCAGTGAGGACATC
Rna45348	F	GGGCTGTGAGGGTTCTGTGTTG
	R	CTTGGGTTGTTGGCAGGATGGTC

Table S2. Quality inspection results of transcriptome samples

Sample ID	Tissue	RNA concentration (ng/ μ L)	Volume (μ g)	OD260/280	OD260/230	Results
A1	root	504.80	17.67	2.08	1.41	A
A2	root	310.90	10.88	2.16	1.89	A
A3	root	444.40	15.55	2.12	1.94	A
B1	root	424.50	14.86	2.13	1.89	A
B2	root	326.50	11.43	2.15	1.89	A
B3	root	307.50	10.76	2.17	1.83	A
C1	root	200.30	7.01	2.21	1.25	A
C2	root	438.30	15.34	2.13	1.81	A
C3	root	310.30	10.86	2.17	1.59	A
D1	root	321.30	11.25	2.19	1.32	A
D2	root	291.50	10.20	2.18	1.42	A
D3	root	512.60	17.94	2.08	2.01	A

Supplementary Figures

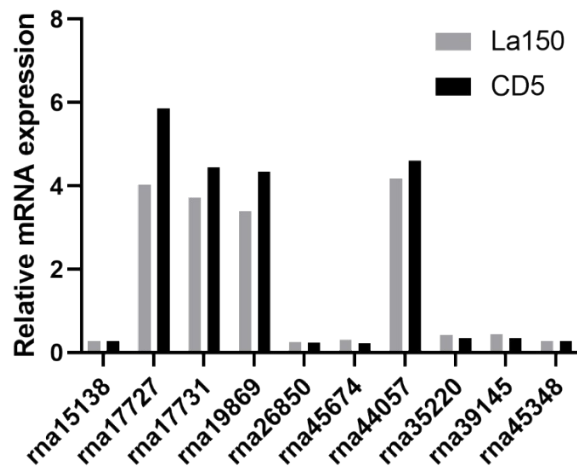


Fig. S1. qRT-PCR validation results of RNA-seq (Peroxidase-related genes; Liaolv 28). Note: CD5 means 0.05mg/ mL C-CDs treated mung bean seedling, La150 means 150 μ mol/L LaCl₃ treated mung bean seedling

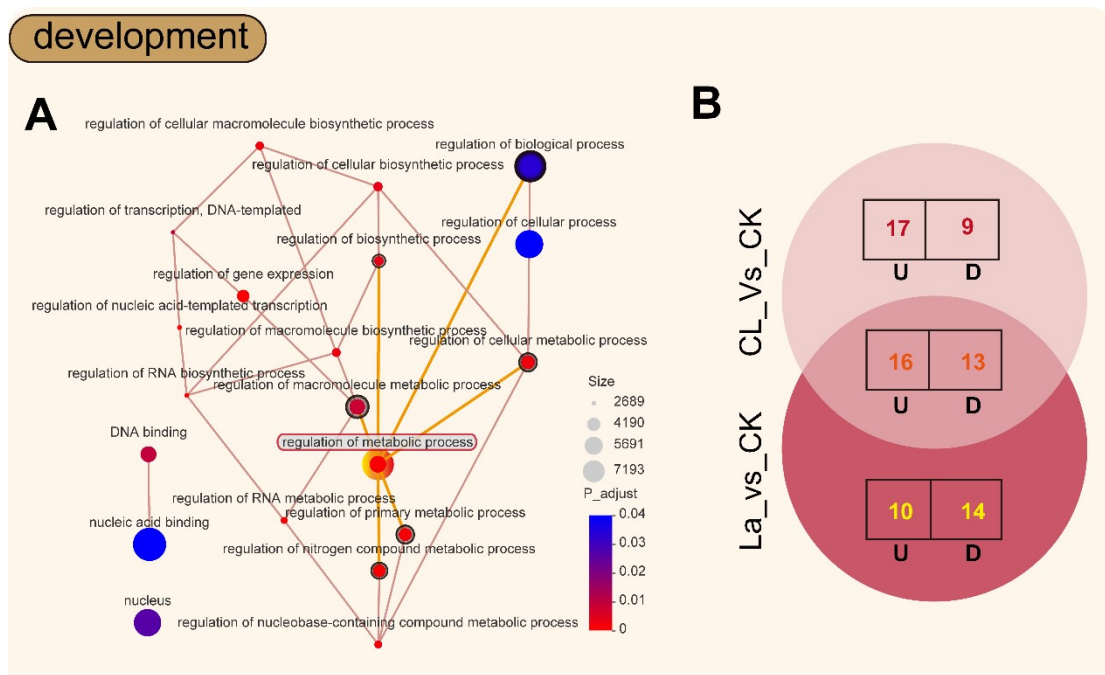


Fig.S2. Functional network analysis (A) and Venn diagram of development related genes (B).

Note: “U” in B means up regulates, and “D” means down regulates.

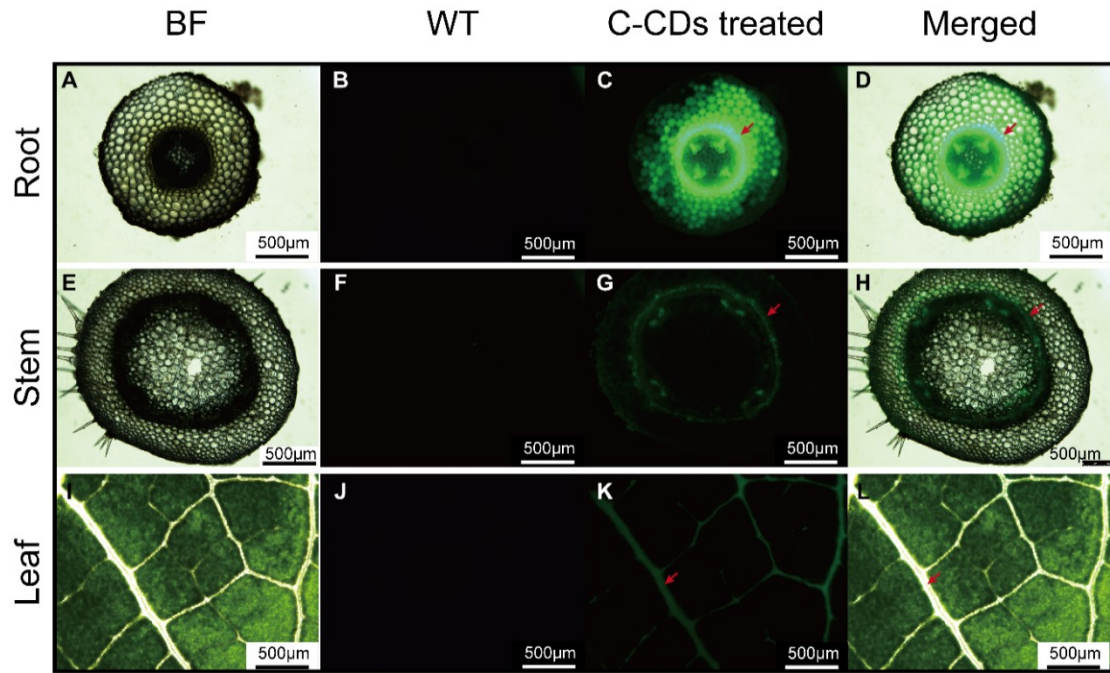


Fig. S3 Fluorescence microscopy observation of Mung bean seeding. Note: A~D: root; E~H: stem; I~L: leaf. A, E, I are seeding section under bright light; B, F, J are sections of Control group under the 500-550nm excite fluorescence; C, G, K are sections of C-CDs treated group under the 500-550nm excite fluorescence. D, H, L are merged image of BF and fluorescence view.

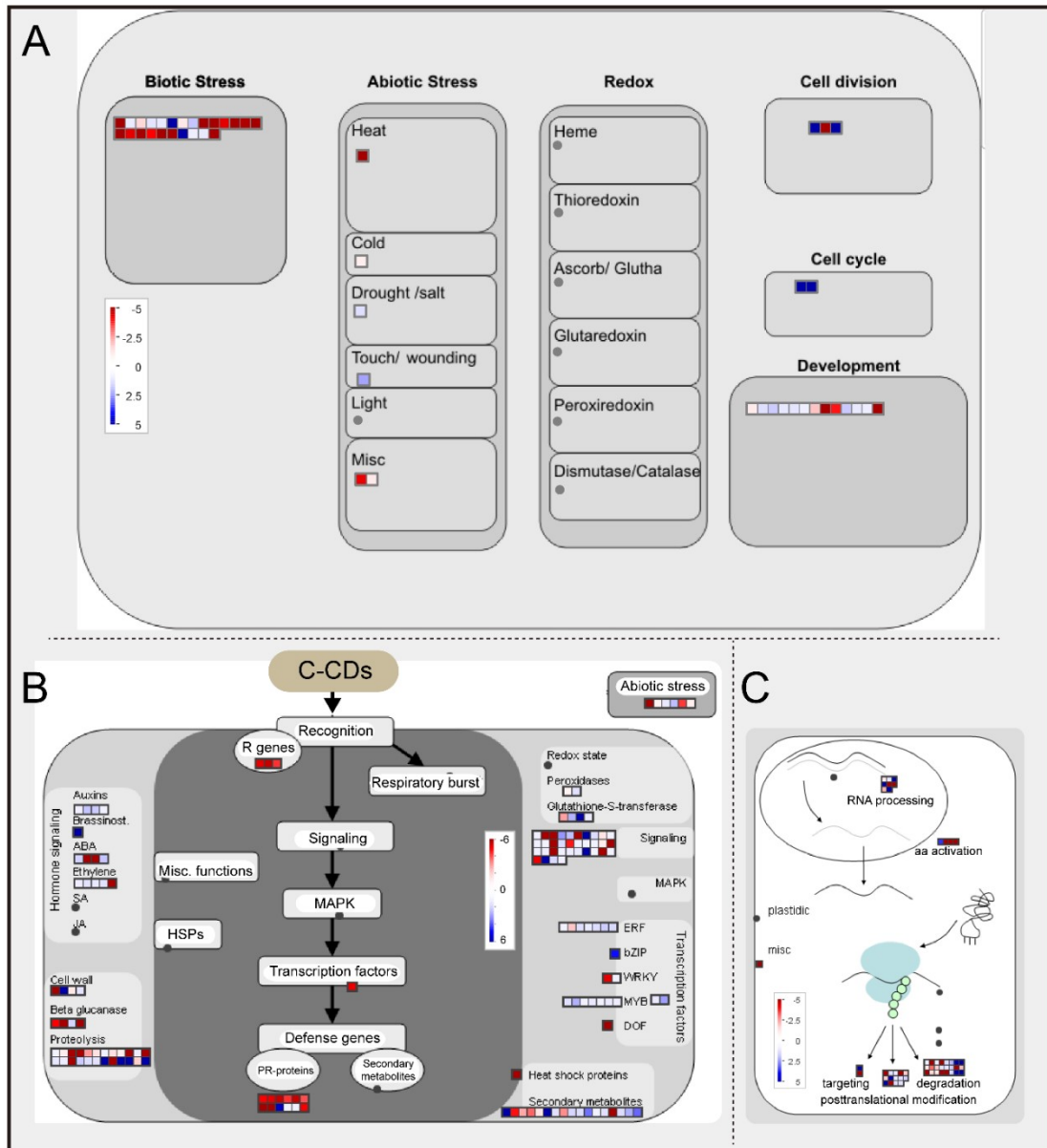


Fig. S4. Effect of C-CDs treatment on cell response (A), stress (B) and protein synthesis of RNA_Protein

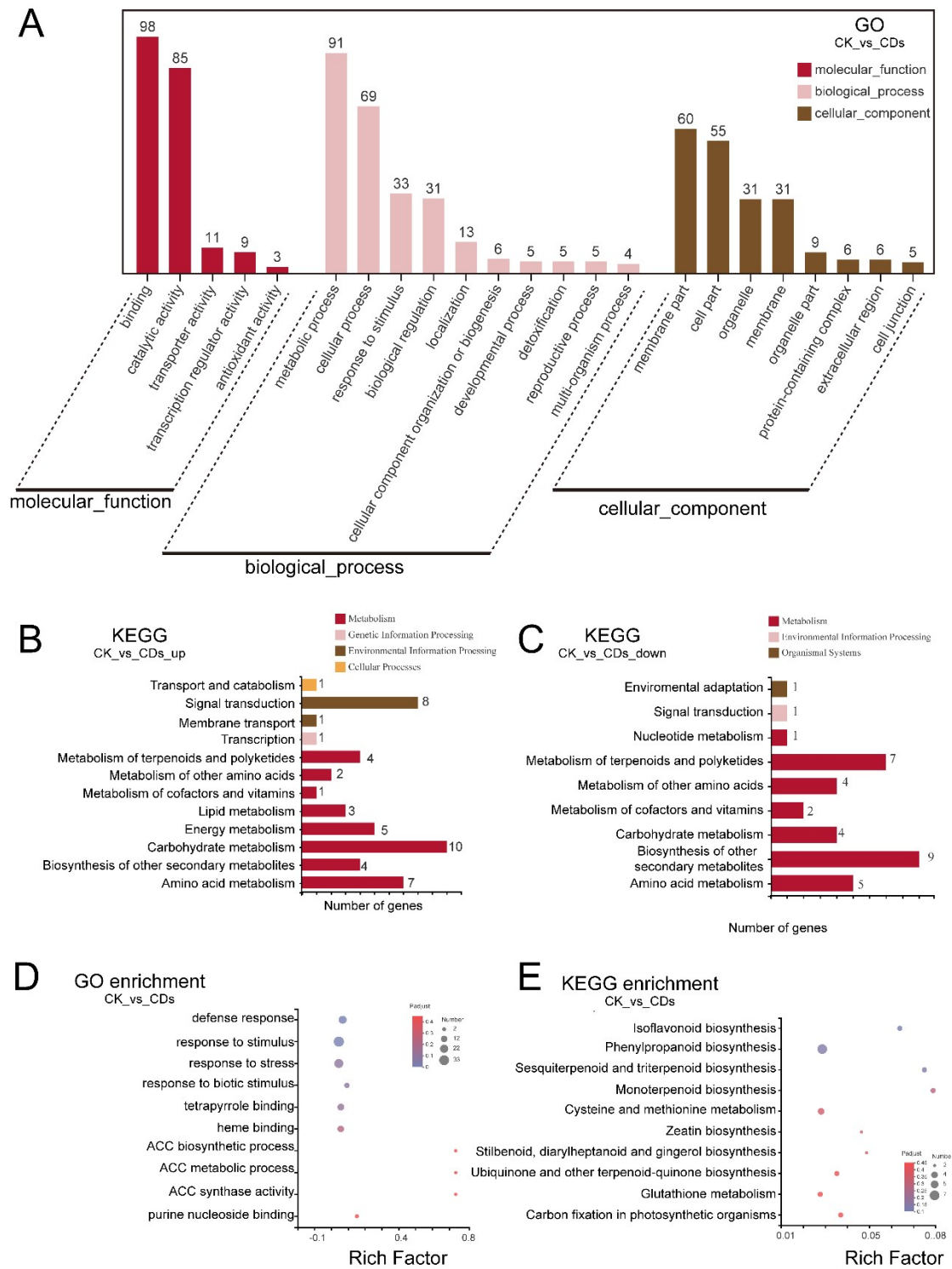


Fig. S5. GO functional annotation (A) and functional enrichment (D), KEGG functional annotation (B, C) and functional enrichment (E) in CDs treatment group

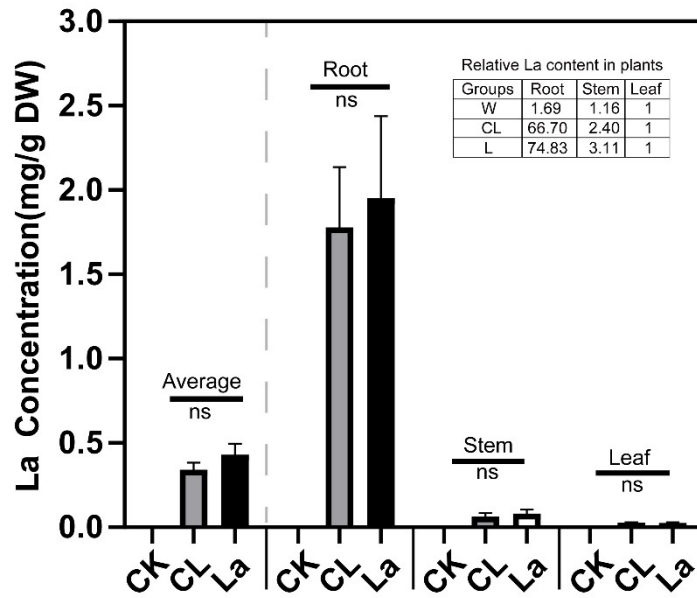


Fig. S6. Total La content of the mung bean seedling. Note: mung bean seedling in CK, CL, La groups were treated with water (CK), 30 $\mu\text{mol/L}$ La (La30), 60 $\mu\text{mol/L}$ La (La60), 0.01 mg/ml C-CDs+30 $\mu\text{mol/L}$ La (CL), respectively. Different uppercase letters (a, b, c) indicated significant differences between different treatment groups, and “ns” represent no significant difference ($P < 0.05$).

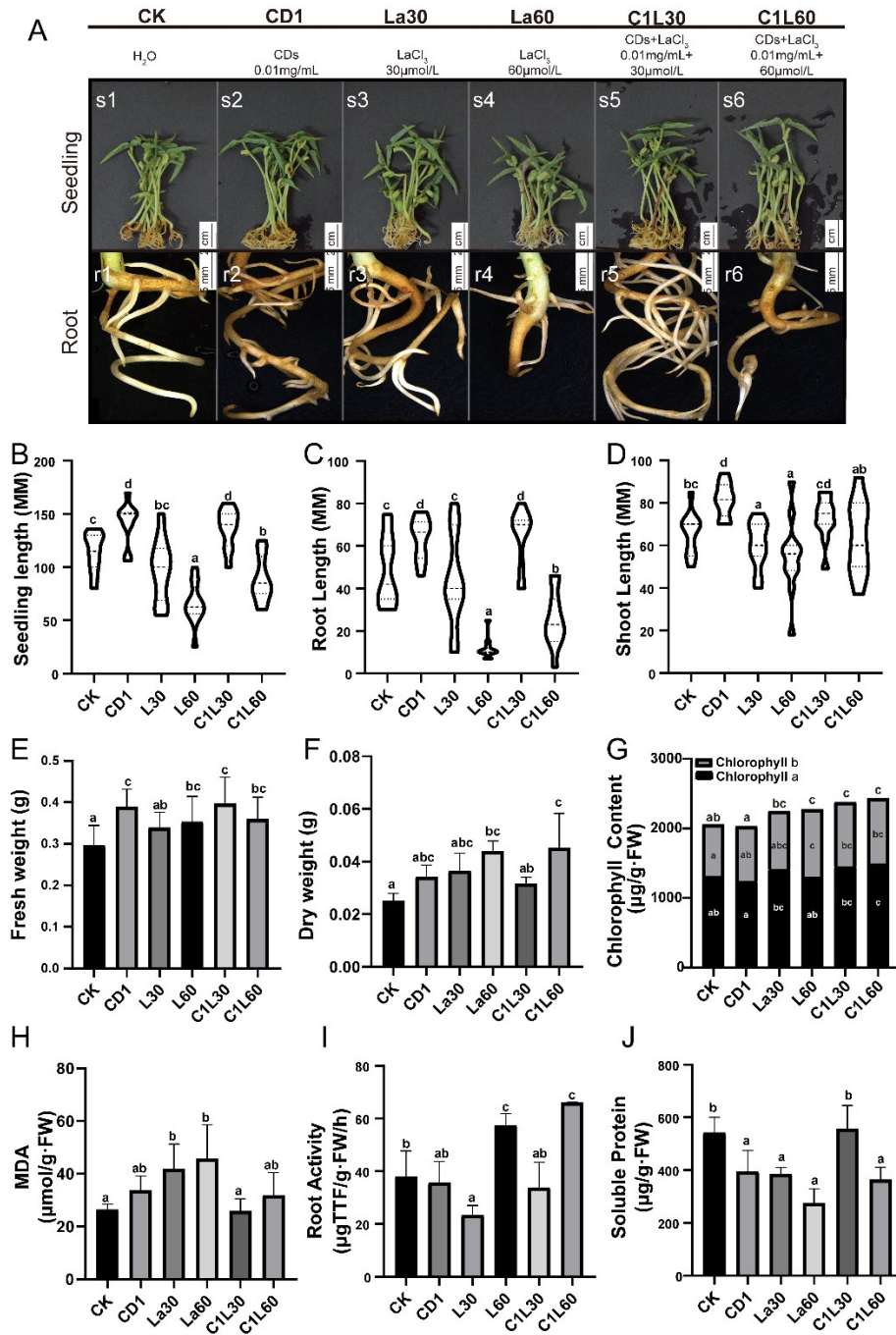


Fig. S7. Effect of C-CDs on La treated mung bean seedling. Note: Morphology (A), Seedling length (B), root length (C), shoot length (D), Fresh weight (E), Dry weight (F), chlorophyll content (G), MDA content (H), root activity (I), and soluble protein (J) of mung bean seedling treated with water (CK), 0.01 mg/ml C-CDs (CD1), 30 μmol/L La (La30), 60 μmol/L La (La60), 0.01 mg/ml C-CDs+30 μmol/L La (C1L30), 0.01mg/ml C-CDs+60 μmol/L La (C1L60); Different uppercase letters (a, b, c) indicated significant differences between different treatment groups, and “ns” represent no significant difference ($P < 0.05$).

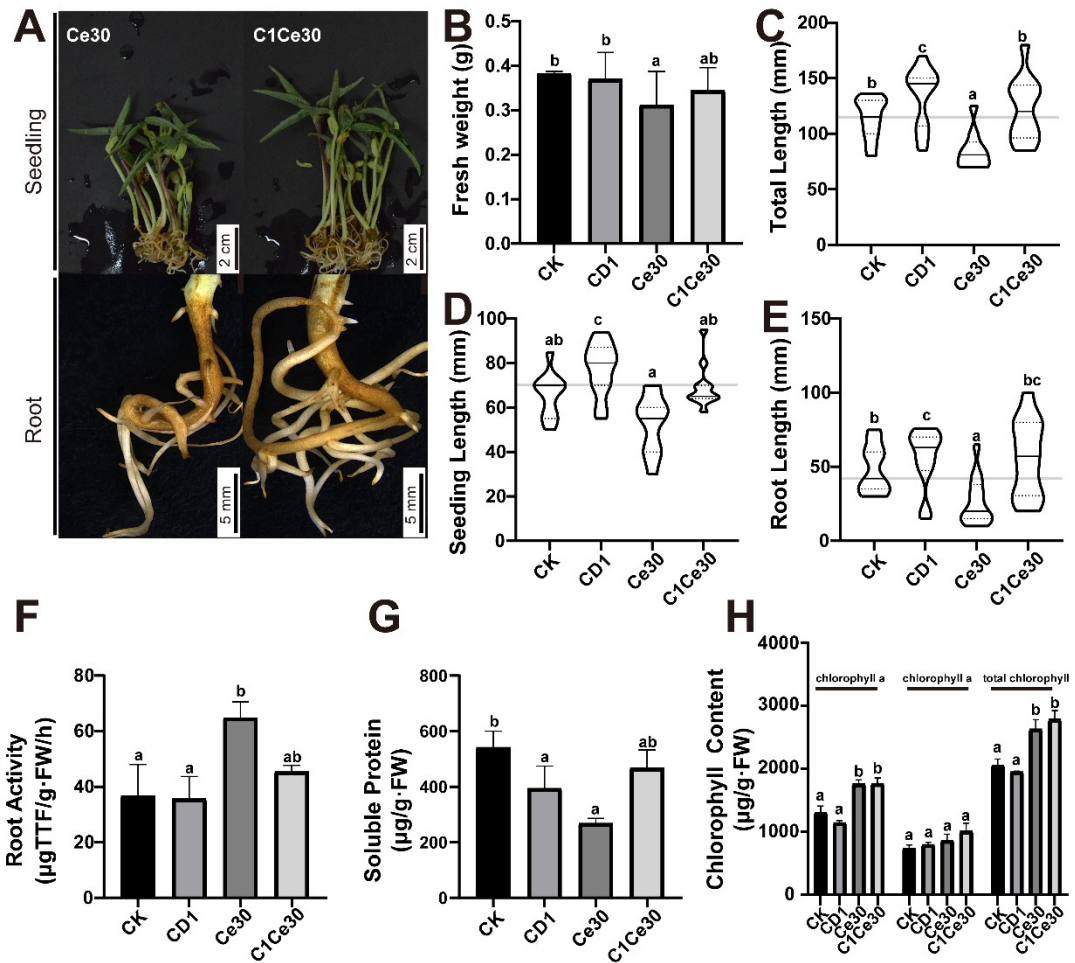


Fig. S8. Effect of C-CDs on Ce - treated mung bean seedlings. Note: Morphology (A), fresh weight (B), total length (C), seedling length (D), root length (E), root activity (F), soluble protein (G), and chlorophyll content of mung bean seedlings. Different uppercase letters (a, b, c) indicated significant differences between different treatments ($P < 0.05$).

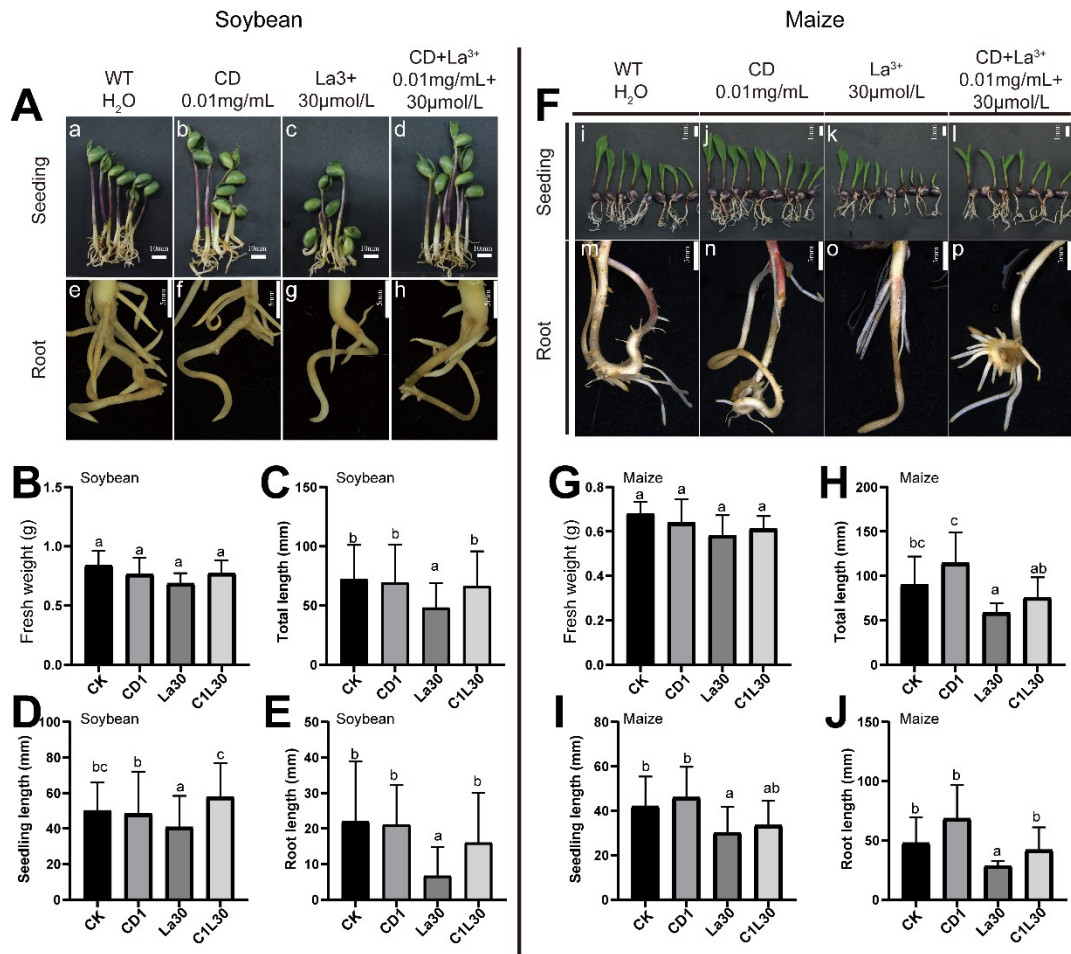


Fig. S9. Effect of C-CDs on La treated soybean and maize seedlings. Note: Morphology (A), fresh weight (B), total length (C), seedling length (D), and root length (E) of soybean seedlings; morphology (F), fresh weight (G), total length (H), seedling length (I), and root length (J) of maize seedlings. Different uppercase letters (a, b, c) indicated significant differences between treatments ($P < 0.05$).

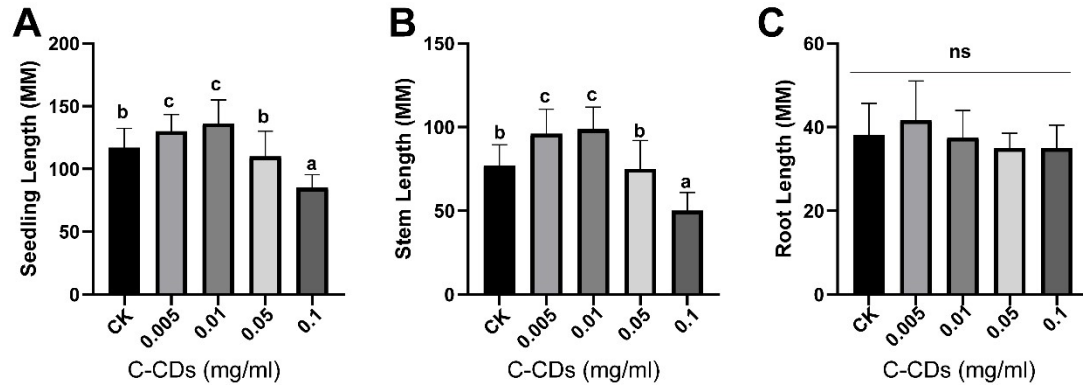


Fig. S10. Effect of C-CDs on the seedling length (A), stem length (B), Root length (C) of mung bean. Different uppercase letters (a, b, c) indicated significant differences between treatments ($P < 0.05$).