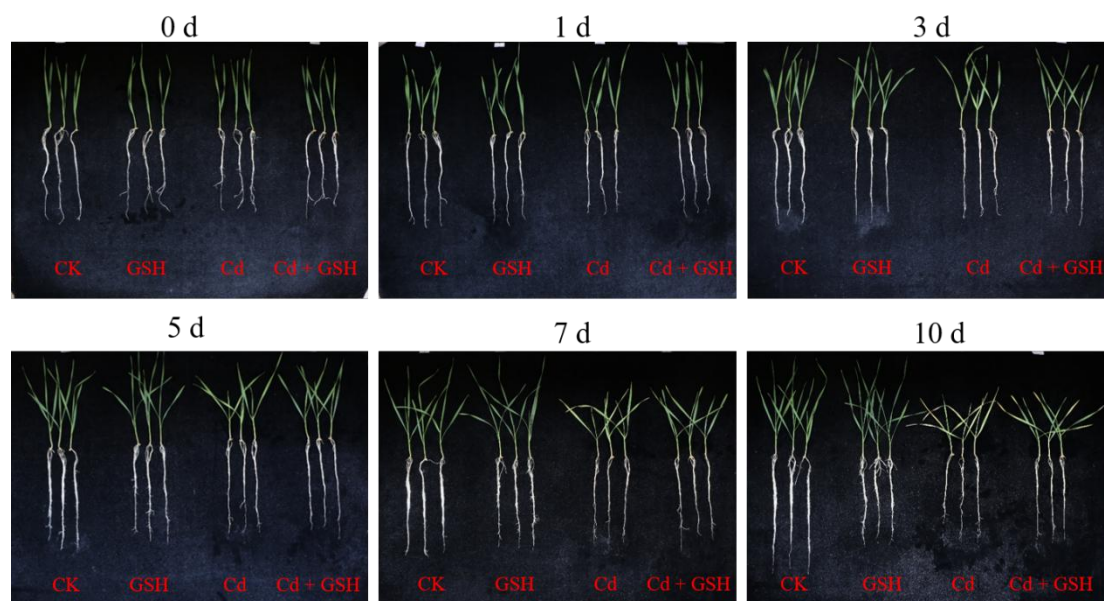
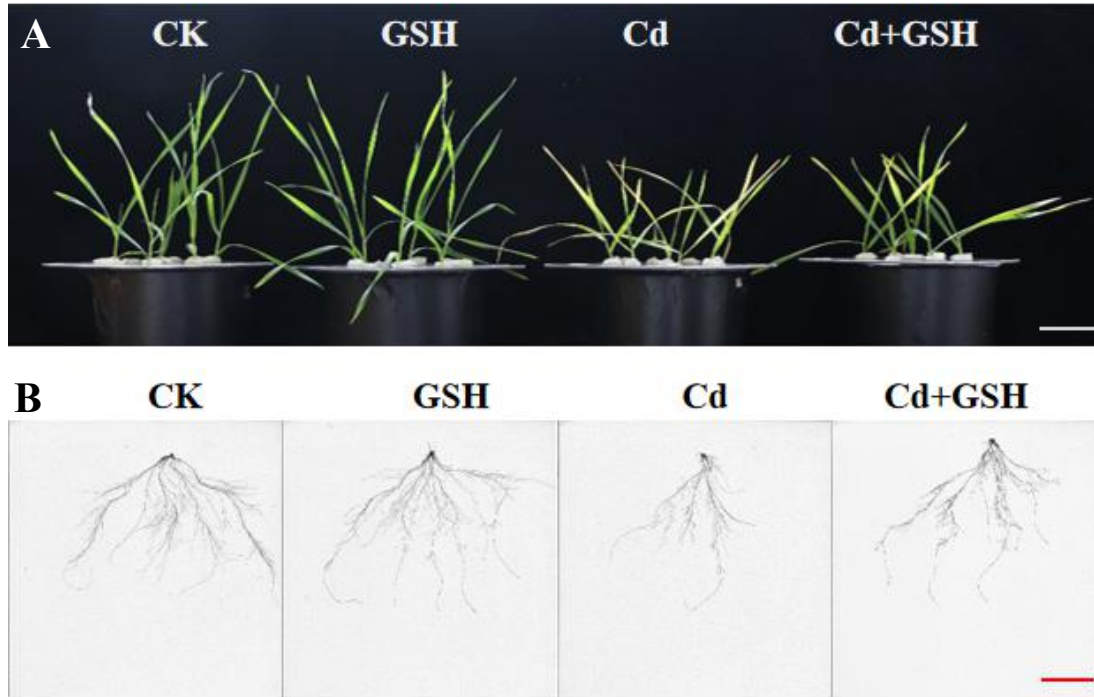
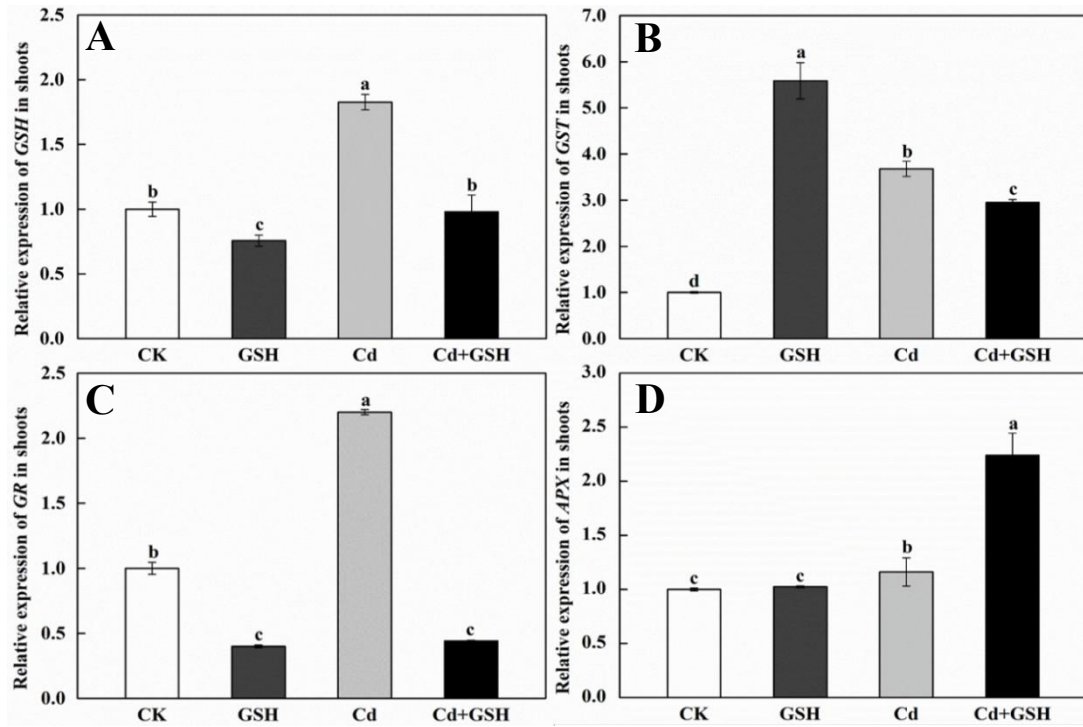




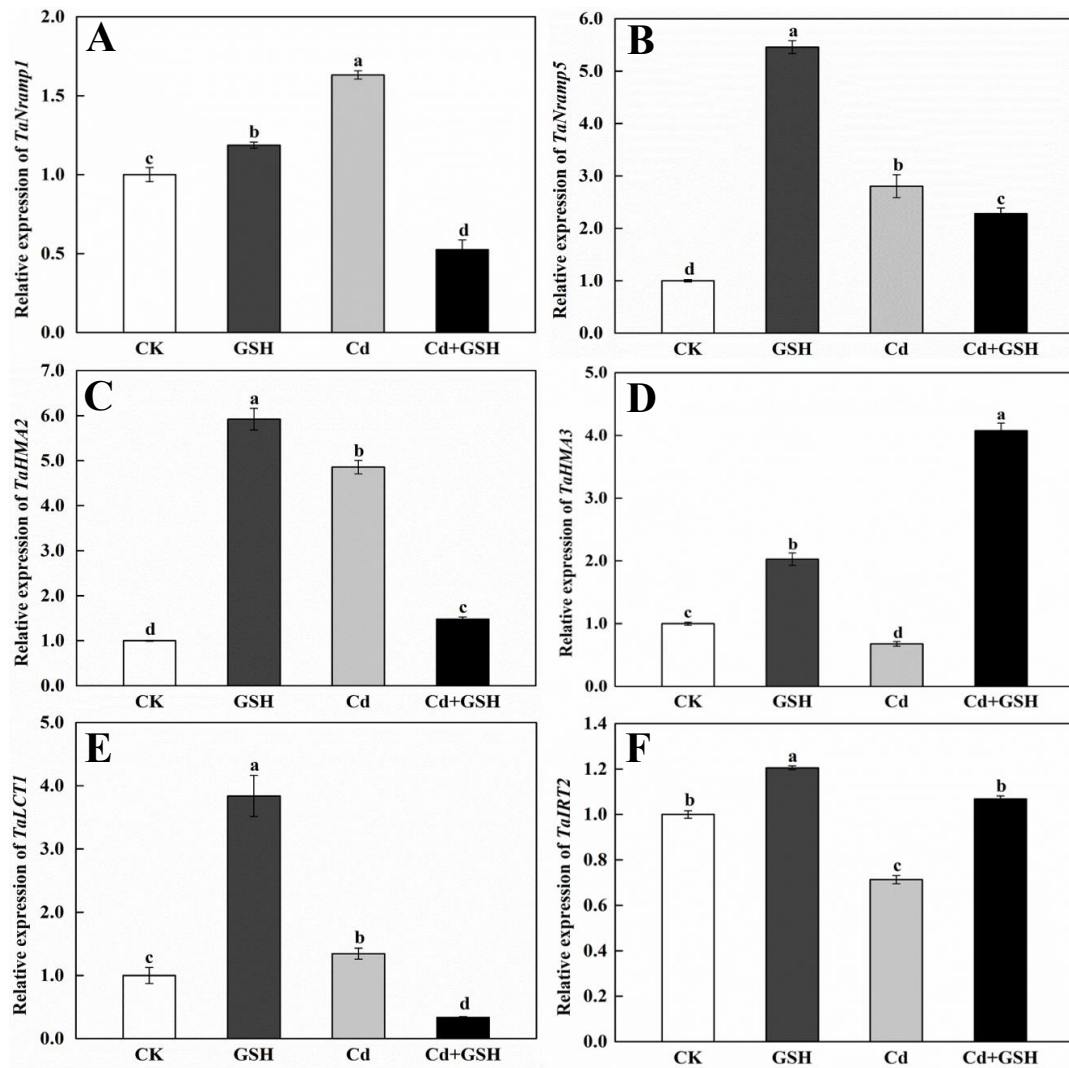
**Figure S1.** Effect of different durations of Cd stress on wheat seedlings. The phenotype of wheat seedlings were treated with CK (0.5mM  $\text{CaCl}_2$ , pH 4.5 ), GSH (0.5mM  $\text{CaCl}_2$  + 20  $\mu\text{M}$  GSH), Cd (0.5mM  $\text{CaCl}_2$  + 50  $\mu\text{M}$   $\text{CdCl}_2$ ), or Cd + GSH for different durations (1 d, 2 d, 3 d, 5 d, 7 d, 10 d). The solution was renewed every 48 h.



**Figure S2.** Effect of cadmium (Cd) and glutathione (GSH) supplementation on the growth of wheat seedlings. A, The phenotype of wheat seedlings were treated with CK (0.5mM  $\text{CaCl}_2$ , pH 4.5 ), GSH (0.5mM  $\text{CaCl}_2$  + 20  $\mu\text{M}$  GSH), Cd (0.5mM  $\text{CaCl}_2$  + 50  $\mu\text{M}$   $\text{CdCl}_2$ ), or Cd + GSH for 10 days. The solution was renewed every 48 h. Bar = 5.5 cm. B, The morphological structure of wheat under different treatment. Bar = 8.0 cm.



**Figure S3.** Relative expression levels of genes in ASA-GSH cycles after Cd and GSH treatment for 10 days. The expression levels of *GSH* (A), *GST* (B), *GR* (C), and *APX* (D) in shoots of wheat seedlings; Data present means  $\pm$  SE ( $n = 3$ ). The different letters represent significant difference at  $P < 0.05$ .



**Figure S4.** Relative expression levels of Cd transporter genes in shoots of wheat seedlings. A, The expression levels of *TaNramp1* gene; B, The expression levels of *TaNramp5* gene; C, The expression levels of *TaHMA2* gene; D, The expression levels of *TaHAM3* gene; E, The expression levels of *TaLCT1* gene; F, The expression levels of *TaIRT2* gene. Data present means  $\pm$  SE ( $n = 3$ ). The different letters represent significant difference at  $P < 0.05$ .

Table S1 Primers for qPCR

| Gene name       | NCBI No. | Primer sequence (5'-3')                                          | Size (bp) |
|-----------------|----------|------------------------------------------------------------------|-----------|
| <i>TaGR</i>     | AY364467 | F: 5'-ATGAATACTCCCGTACATCAGT-3'<br>R: 5'-TTTGTTACATCACCCACAGC-3' | 155       |
| <i>TaGST</i>    | AJ414697 | F: 5'-TACGAGAGGTACGGCGAGTT-3'<br>R: 5'-CAGGCCGATGAAGTCGTACA-3'   | 135       |
| <i>TaGSH</i>    | AJ579382 | F: 5'-ATCGCCAAGCTCCGTCAATG-3'<br>R: 5'-ACAAGTCAGGGTTTTCAATCG-3'  | 92        |
| <i>TaAPX</i>    | FJ890988 | F: 5'-CTGAGTGGTGATAAAGAGGGA-3'<br>R: 5'-ACAAGAGGGCGGAAGACAG-3'   | 108       |
| <i>TaLCT1</i>   | AF015523 | F: 5'-CATGAGGCCGACATCCTCTC-3'<br>R: 5'-TTCCTCTCAGTTGCACGACC-3'   | 156       |
| <i>TaHMA2</i>   | KF933095 | F: 5'-GTCTCGCTCTTCGAGCACTT-3'<br>R: 5'-GCAACTGCGATGAGCATGAG-3'   | 149       |
| <i>TaHMA3</i>   | KF683297 | F: 5'-GGGATGTCGTCGTTGATGAG-3'<br>R: 5'-ACCGTCCAAGTTGAGCGTG-3'    | 249       |
| <i>TaIRT2</i>   | AB126086 | F: 5'-GTCGTCGTTTCAGGTTCTGGA-3'<br>R: 5'-CCCATCCCCTCGAACATCTG-3'  | 140       |
| <i>TaNrampl</i> | DQ431468 | F: 5'-TATGGGGTACGGAAGCTGGA-3'<br>R: 5'-GAGCCTGGGGATGAATAGCC-3'   | 132       |
| <i>TaNramp5</i> | AB698459 | F: 5'-ACAGGAAAGCATCTTGCCGA-3'<br>R: 5'-ACAGGGATGCGGAACAAGAG-3'   | 155       |
| <i>TaGAPDH</i>  | KR029492 | F: 5'-TTTTCACCGACAAGGACA-3'<br>R: 5'-AAGAGGAGCAAGGCAGTT-3'       | 179       |

Notes, F, Forward primer; R, Reverse primer.