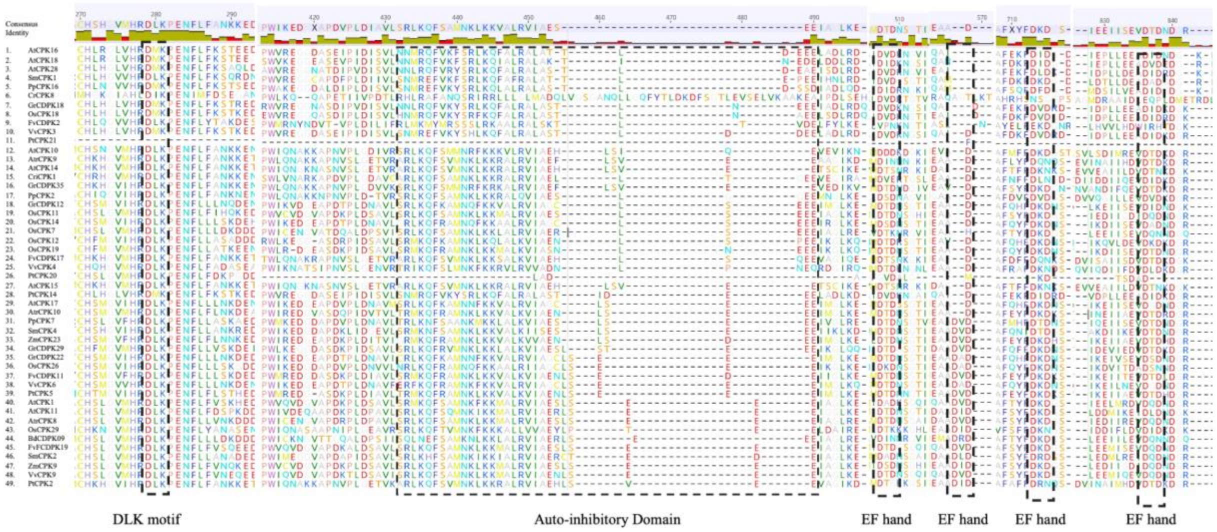
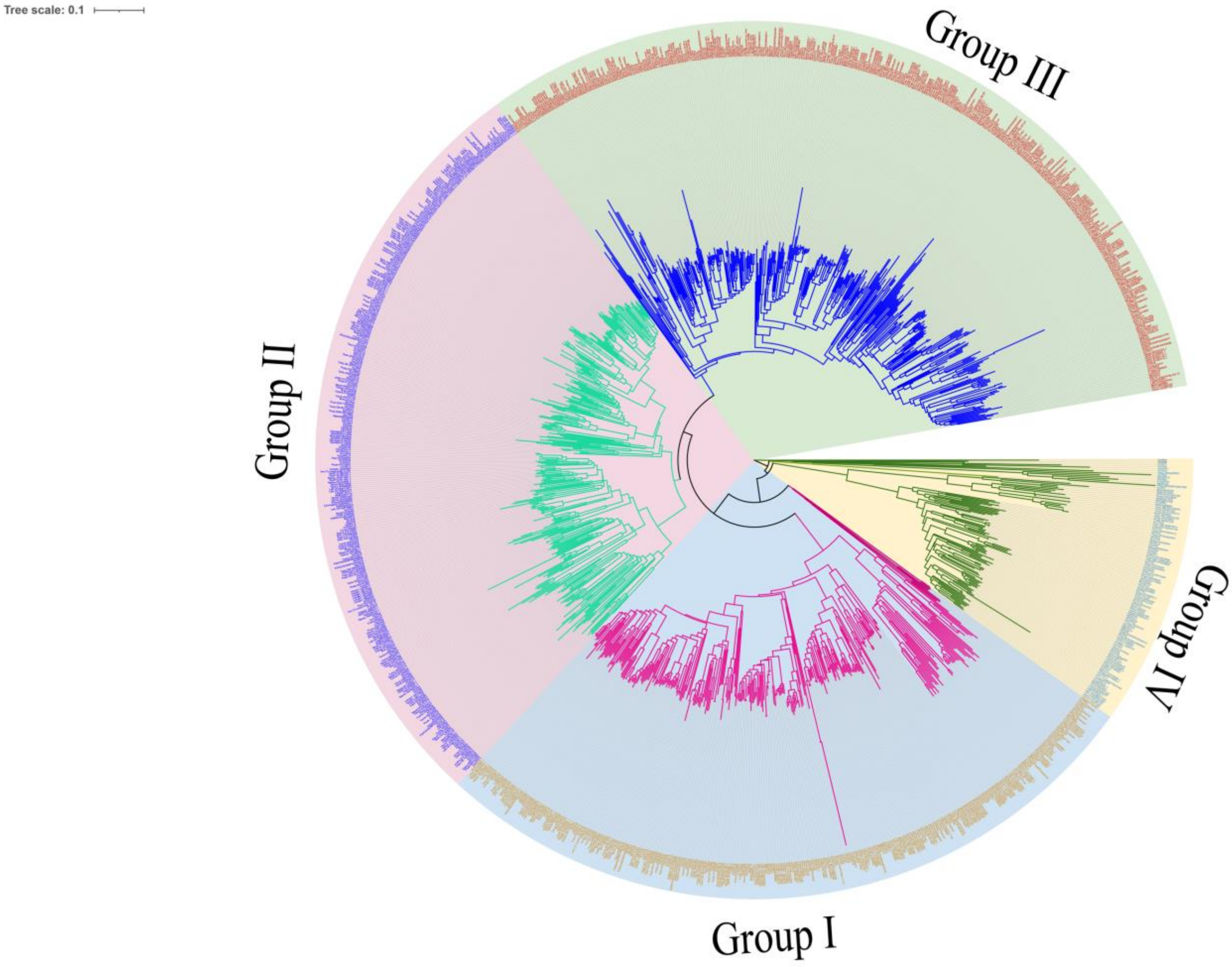
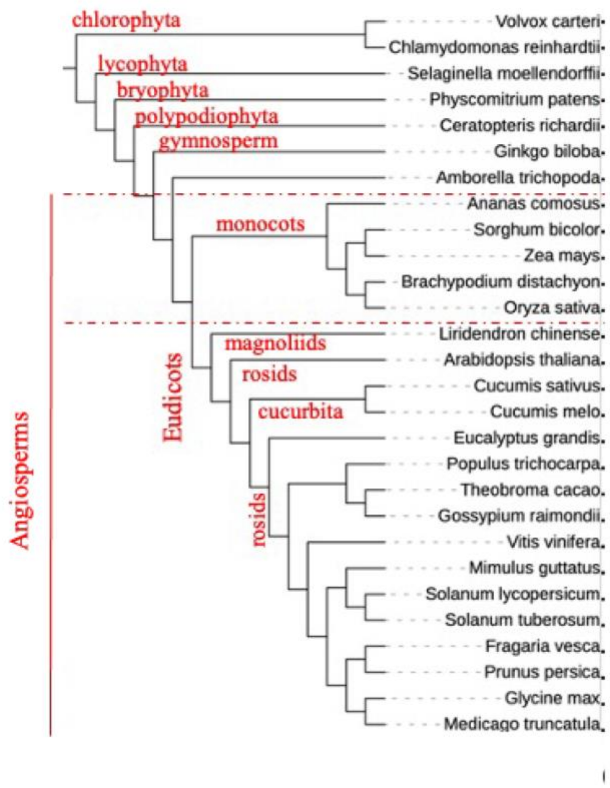
Supplementary File: Fig S1. Conserved domain analysis of the *CDPK* gene families of 52 plant species. The data were generated using the MEME online tool (http://meme-suite.org/; accessed on 23 April 2023) and visualized using TBtools software.



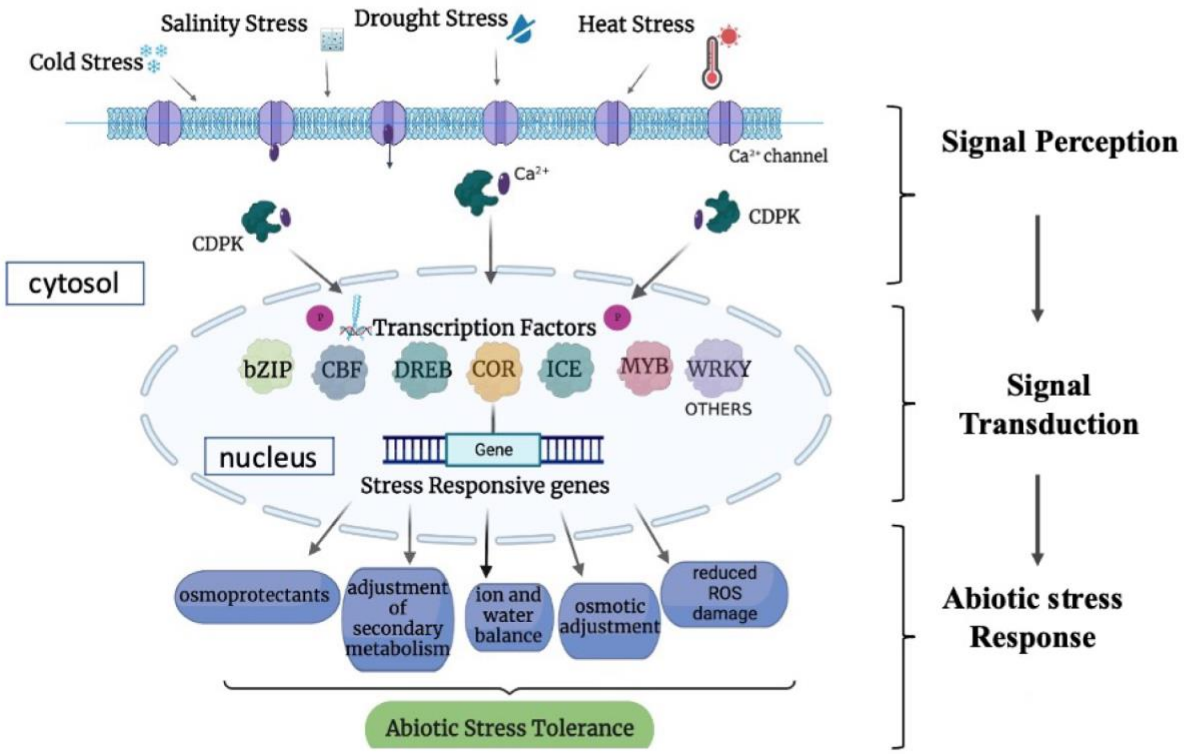
Supplementary File: Fig S2. Conserved motifs and domains of the CDPK protein in 49 plant species.



Supplementary File: Fig S3. Phylogenetic analysis of 52 plant CDPKs showing the evolution of full CDPK protein sequences. The phylogenetic tree was generated using the maximum likelihood (ML) Mega X; prior, sequences were merged and aligned using MUSCLE in Mega X. Different color backgrounds show different groups denoted as I-IV.



Supplementary File: Fig S4. The Interspecies phylogenetic tree of 40 plants from the lower to higher plant order. Different color codes indicate different plant orders, and each plant species is labeled adjacent to its branch. The tree was generated using Xshell software and visualized with iTOL.



Supplementary File: Fig S5. Signal transduction responses are involved in the regulation of abiotic stress by *CDPK* genes. Signal transduction is mainly characterized by the phosphorylation of downstream proteins through the interaction of CDPKs with several pathways, such as the MAPK cascade. Subsequently, abiotic stress is alleviated through different response mechanisms, such as reductions in reactive oxygen species (ROS) damage and osmotic adjustments.