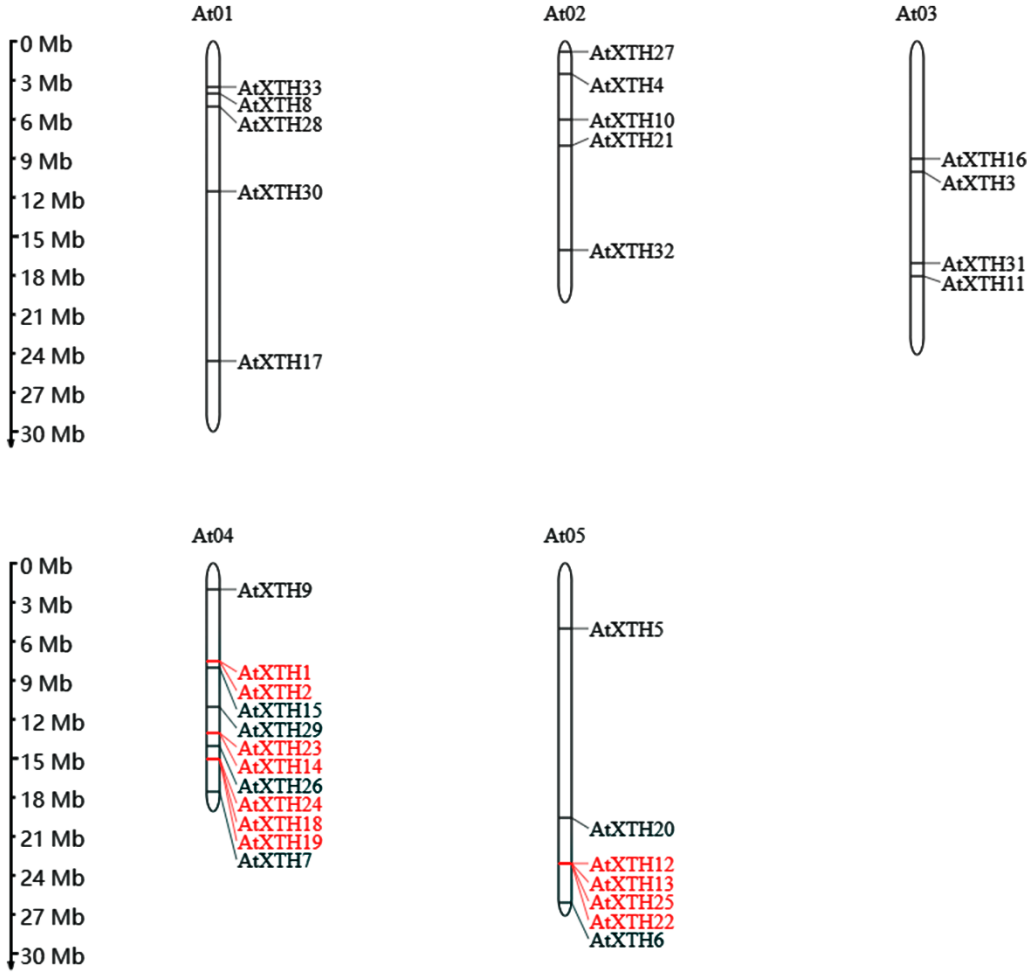
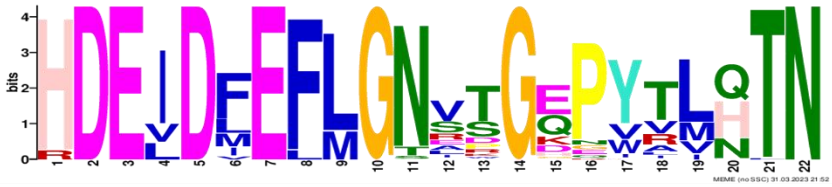


Supplementary figure S1 Distribution of *XTH* genes on *A.thaliana* chromosomes. *AtXTH* genes in red are tandem duplication genes. The number of chromosomes was indicated at the top of each chromosome. The scale on the left is in megabases (Mb).

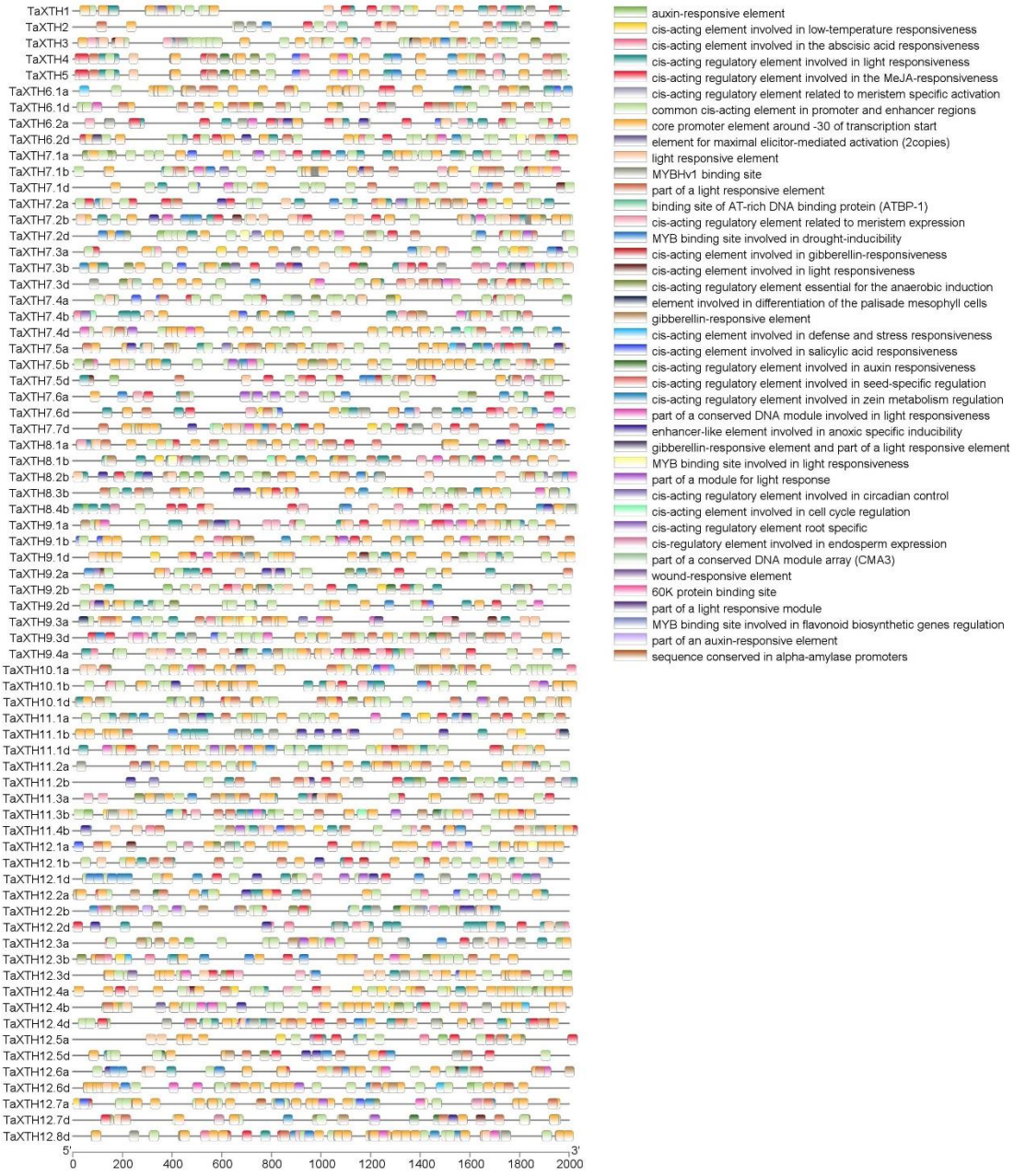
A



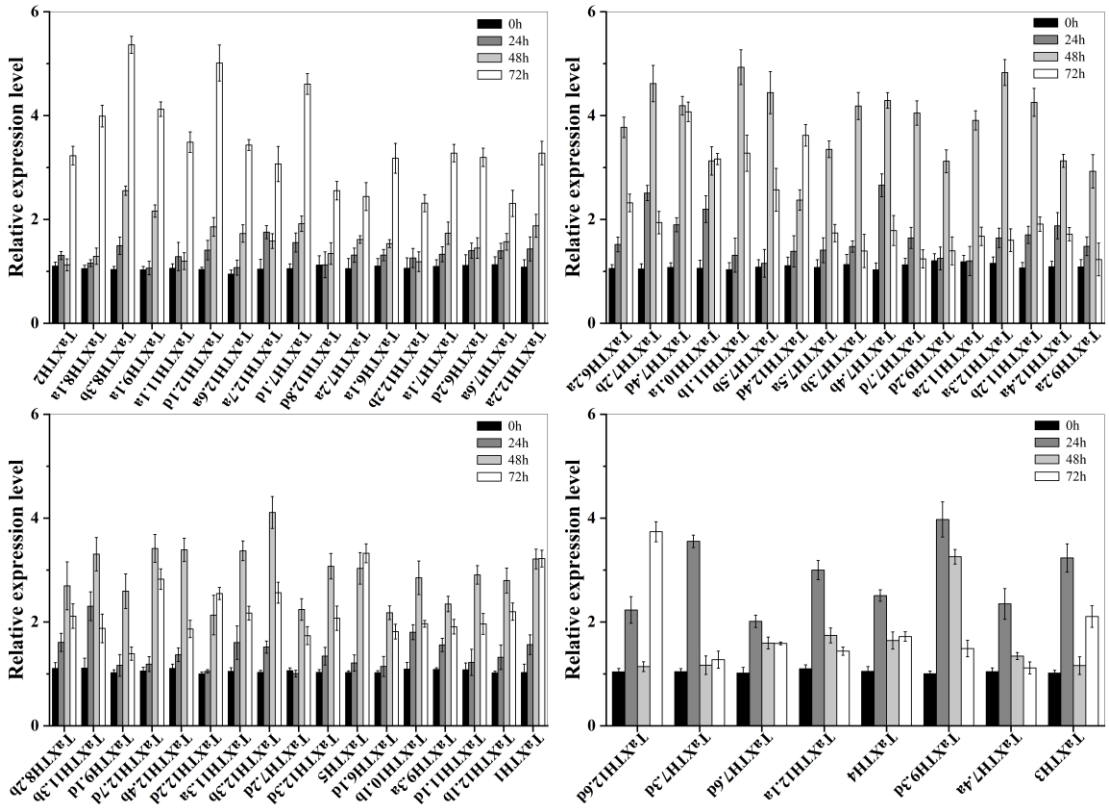
B

Gene name		Gene name	
TaXTH1	FYLTSGEGDGHDEIDIEFMGNLSGDPYVMNTNVWASGDGKKE	TaXTH9.2b	LSNNEVYPGYHDEIDVELLGTVPGEPYTLQTNVYVRGTGDAH
TaXTH2	FYLTSGEGDGHDEIDIEFMGNLSGDPYVMNTNVWASGDGKKE	TaXTH9.2d	MSNGDVYEKTHDELDFEFLGNVKGKEWRVQTNVYGDGSTAVG
TaXTH3	FYLTSGEGDGHDEIDIEFMGNLSGDPYVMNTNVWAGGDGKKE	TaXTH9.3a	LSNGDVFEATHDELDFEFLGNRAGHRWRMQTNVYGNGSTARG
TaXTH4	FYLTSGESATHDEIDIEFMGNSSGDPYVMNTNVWASGDGKKE	TaXTH9.3d	LSNNEVYPGYHDEIDVELLGTVPGEPYTLQTNVYVRGTGDAH
TaXTH5	TFYLSSQGTAHDEIDFEFLGNVTGEPYTLHTNVFAKGQGQRE	TaXTH9.4a	FYLSSGDGPGHDEIDMEFMGNSTGQPVALNTNVWANGDGKKE
TaXTH6.1a	LSNWDEYPKNHDELDFELLGNRRGHGWRVQTNMYGNGSTARG	TaXTH10.1a	LSNNEAYPGYHDEIDVELLGTVPGEPYTLQTNVYVRGTGDAH
TaXTH6.1d	LSNWDEYPKNHDELDFELLGNRRGHGWRVQTNMYGNGSTARG	TaXTH10.1b	FYLSSGDGPGHDEIDMEFMGNSTGQPVVLNTNVWANGDGKKE
TaXTH6.2a	FYLTSGEGDGHDEIDIEFMGNLSGDPYVMNTNVWASGDGKKE	TaXTH10.1d	FYLSSGDGPGHDEIDMEFMGNSTGQPVVLNTNVWANGDGKKE
TaXTH6.2d	FYLTSGEGDGHDEIDIEFMGNLSGDPYVMNTNVWASGDGKKE	TaXTH11.1a	TSNGDVFPKTHDELDFEFLGNIRGKPWRMQTNMYGNGSVSRG
TaXTH7.1a	YMLTEGPWEEHDEVDLEFLGNSSGEPYTLHTNIYARGRGGRE	TaXTH11.1b	TSNGDVFPKTHDELDFEFLGNIRGKPWRMQTNMYGNGSVSRG
TaXTH7.1b	YMLTEGPWEEHDEVDLEFLGNSSGEPYTLHTNIYARGRGGRE	TaXTH11.1d	LMPEDVPWDYHDEVDLEFLGNVTGEPYTLHTNIFANGVGNRE
TaXTH7.2a	YMLTEGAWEEHDEVDLEFLGNSSGEPYTLHTNIYARGRGGRE	TaXTH11.2a	LSNGDVYEKTHDELDFEFLGSRWGGQWRVQTNVYGNGSTSRG
TaXTH7.2b	TYYTSSVGDDHDEIDFEFLGNETGQPYTLHTNVYAAGVGGKE	TaXTH11.2b	LSNGDVYEKTHDELDFEFLGSRWGGQWRVQTNVYGNGSTSRG
TaXTH7.2d	MCSDLDAAPERDELDFEFLGNRTGEPYIIQTNVYRSGVGGRE	TaXTH11.3a	LMPEDVPWDYHDEVDLEFLGNVTGEPYTLHTNIFANGVGNRE
TaXTH7.3a	SKDPTAAGDGHDEIDFEFLGNVSGEPYLMQTNVFAQGVGGRE	TaXTH11.3b	LMPEDVPWDYHDEVDLEFLGNVTGEPYTLHTNIFANGVGNRE
TaXTH7.3b	SKDPTAVGDGHDEIDFEFLGNVSGEPYLMQTNVFAQGVGGRE	TaXTH11.4b	FYLTSGESATHDEIDIEFMGNSSGDPYVMNTNVWASGDGKKE
TaXTH7.3d	SKDPTAAGDGHDEIDFEFLGNVSGEPYLMQTNVFTQGVGGRE	TaXTH12.1a	FYLSSGDGPGHDEIDMEFMGNATGQPVVLNTNVWANGDGKKE
TaXTH7.4a	YFLSEGSWANHDEIDLEFLGNSTGEPYTLHTNVYINGTGSKE	TaXTH12.1b	ASEAPYDGSDRDEVDFEFLGNVDGENITLQTNVFVNGDGDRE
TaXTH7.4b	YFLSEGSWANHDEIDLEFLGNSTGEPYTLHTNVYINGTGSKE	TaXTH12.1d	FYLSSGDGPGHDEIDMEFMGNATGQPVVLNTNVWANGDGKKE
TaXTH7.4d	YFLSEGSWANHDEIDLEFLGNSTGEPYTLHTNVYINGTGSKE	TaXTH12.2a	FYLSSGEGPGHDEIDMEFMGNTTGQPVALNTNVWANGDGKKE
TaXTH7.5a	YMISEKDWKTHDEIDLEFLGNATGQPYTLHTNIFANGEGGRE	TaXTH12.2b	TYYTSSVGDDHDEIDFEFLGNETGQPYTIHTNVFADGVGAKE
TaXTH7.5b	YMISEKDWKTHDEIDLEFLGNATGQPYTLHTNIFANGEGGRE	TaXTH12.2d	FYLSSGDGPRHDEIDMEFMGNSTGQPVALNTNVWANGDGKKE
TaXTH7.5d	YMISEKDWKTHDEIDLEFLGNATGQPYTLHTNIFANGEGGRE	TaXTH12.3a	ASEAPYDGGDRDEVDFEFLGNVDGENITLQTNVFVNGDGDRE
TaXTH7.6a	TYYTSSVGADHDEIDFEFLGNETGQPYTLHTNVFADGVGKKE	TaXTH12.3b	LSNNEAHPGFHDEIDMEFLGTIPGEPYTLQTNVYVRGSGDGR
TaXTH7.6d	TYYTSSVGADHDEIDFEFLGNQTGQPYTLHTNVFADGVGKKE	TaXTH12.3d	ASEAPYDGSDRDEVDFEFLGNVDGENITLQTNVFVNGDGDRE
TaXTH7.7d	TYYTSSVGADHDEIDFEFLGNETGQPYTLHTNVFADGVGKKE	TaXTH12.4a	TYYTSSVGDDHDEIDFEFLGNETGQPYTIHTNVFADGVGAKE
TaXTH8.1a	YLTTQPEYGDHDEVDFEFLGNVDGKPVALQTNIFLNGQGYRE	TaXTH12.4b	AYYLSSQGPTHDEIDFEFLGNVTGEPYTLHTNVFTQGQGQRE
TaXTH8.1b	FYLSSGDDEWRDEIDMEFMGNSTGHPVVLNTNVWANGDGKKE	TaXTH12.4d	TYYTSSVGDDHDEIDFEFLGNETGQPYTIHTNVFADGVGAKE
TaXTH8.2b	FYLSSGDGDGHDEIDMEFMGNSSGPGHPVVLNTNVWVNGDGK	TaXTH12.5a	AYYLSSQGPTHDEIDFEFLGNVTGEPYTLHTNVFTQGQGQRE
TaXTH8.3b	YLTTQPEYGDHDEVDFEFLGNVDGKPVALQTNIFLNGQGYRE	TaXTH12.5d	LSNNEAHPGFHDEIDMEFLGTIPGEPYTLQTNVYVRGSGDGR
TaXTH8.4b	YLTTEPDYGDHDEVDFEFLGNVDGKPVALQTNIFLNGQGYRE	TaXTH12.6a	AYYLSSQGPTHDEIDFEFLGNVTGEPYTLHTNVFTQGQGQRE
TaXTH9.1a	MSNGDVYEKTHDELDFEFLGNVKGKEWRVQTNVYGDGSTAVG	TaXTH12.6d	AYYLSSQGPTHDEIDFEFLGNVTGEPYTLHTNVFTQGQGQRE
TaXTH9.1b	MSNGDVYEKTHDELDFEFLGNVKGKEWRVQTNVYGDGSTAVG	TaXTH12.7a	TFYLSSQGSAHDEIDFEFLGNASGQPYTVHTNVYSQGKGGRE
TaXTH9.1d	AFYLSSQNSEHDEIDFEFLGNRTGQPYILQTNVFSGGKGDRE	TaXTH12.7d	AYYLSSQGPTHDEIDFEFLGNVTGEPYTLHTNVFTQGQGQRE
TaXTH9.2a	AFYLSSQNSEHDEIDFEFLGNRTGQPYILQTNVFSGGKGDRE	TaXTH12.8d	AYYLSSQGPTHDEIDFEFLGNVTGEPYTLHTNVFTQGQGQRE

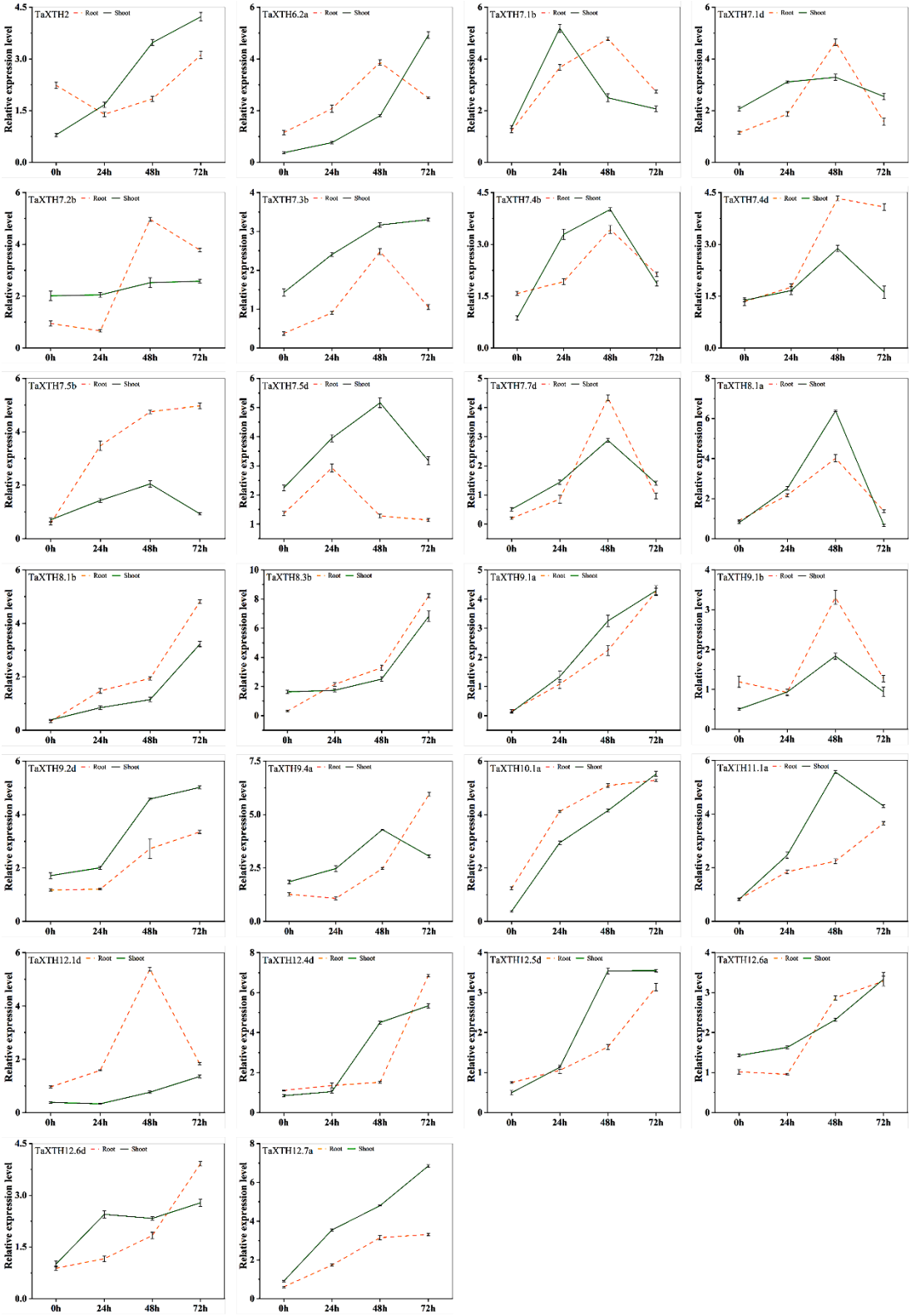
Supplementary figure S2 Conserved protein motifs in wheat XTHs. (A) Catalytically active motifs in the TaXTH proteins. (B) Alignment of the putative-site amino acid residues in TaXTH proteins constructed with the CLUSTALW2. Amino acid residues with the same motif were highlighted with orange shadows.



Supplementary Figure S3 Analysis of the binding sites in the promoter regions of *TaXTH* genes. The promoter sequences of 2,000 bp of the *XTH* genes were retrieved from the wheat genome database to analyze the cis-acting regulatory elements (CAREs). PlantCARE (http://bioinformatics.psb.ugent.be/webtools/plantcare/html/) was used for identifying and analyzing the CAREs.



Supplementary Figure S4 The expression of the *TaXTH* gene in the spring wheat line 'Xinchun11' was analyzed using real-time quantitative PCR. The relative expression level of *TaXTH* in wheat was measured after subjecting it to different durations (h) of drought stress with -0.5 MPa D-sorbitol. The 2-day-old germinated wheat seedlings were immersed in -0.5 MPa D-sorbitol and sampled at 0, 24, 48, and 72 hours after treatment to assess the expression of *TaXTH*. Genes exhibiting similar expression patterns are depicted in the same image.



Supplementary Figure S5 qRT-PCR analysis of *TaXTH* genes expressed under drought stress. Samples for expression profiling were collected from wheat at 0, 24, 48, and 72 h post drought stress. Expression profiles were detected by qRT-PCR and normalized to Actin. Note that the relative expression of *TaXTHs* was on a different scale. Orange dashed lines indicate roots, and green solid lines represent shoots. The name of the gene is shown in the upper left corner of each line graph. Results were analyzed in three biological replicates.