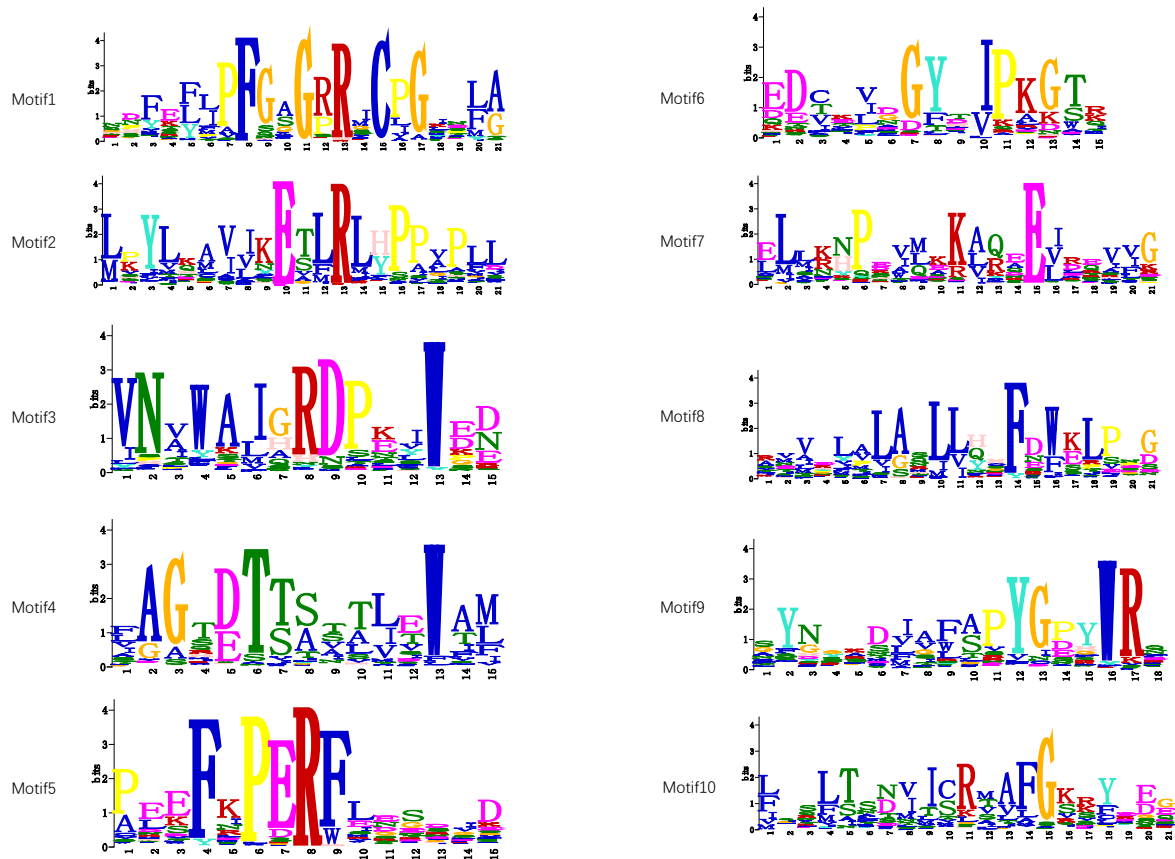
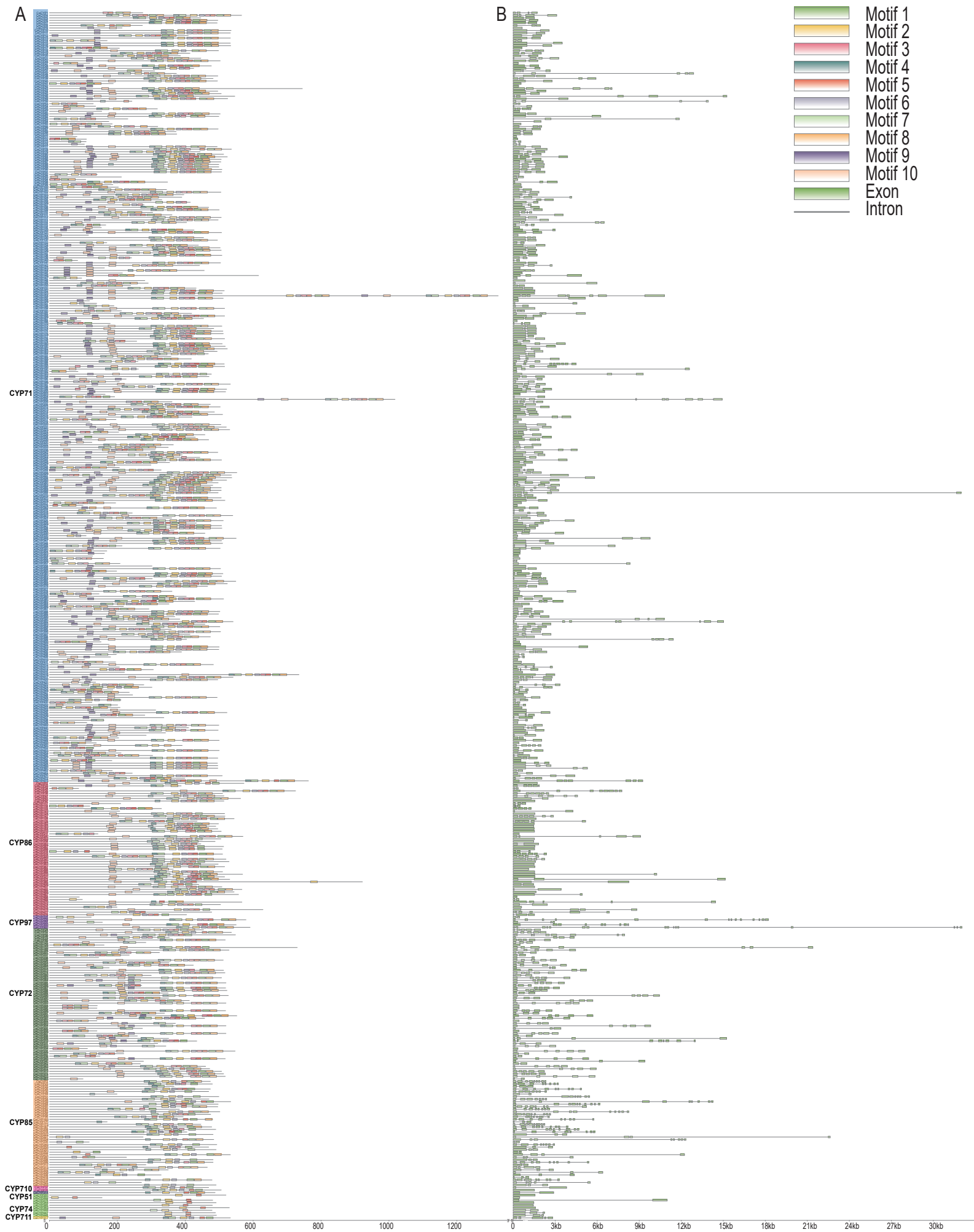


Supplementary Figure 1 | Phylogenetic tree of P450 genes from 4 species. The gene in Arabidopsis are marked in green, the gene in capsicum are marked in red, the gene in tomato are marked in yellow, the gene in potato are marked in blue. The different color lines represents different clan.

Motif	E-value	Amino acid sequence composition of motif	Width
1	6.2e-2052	NDFEFJPFAGRRICPGINLA	21
2	1.4e-1831	LPYLKAVIKETLRLHPPVPLL	21
3	2.7e-972	VNVWAIGRDPKIWEB	15
4	1.8e-1110	FAGTDTTSTLEWAM	15
5	4.6e-879	PEEFKPERFLESDID	15
6	1.5e-859	EDCKVDGYTIPKGT	15
7	2.8e-1112	ELLKNPEVMKKAQEEIRZVVG	21
8	9.0e-885	AVVELALASLLHHFDWKLPNG	21
9	8.5e-634	SYNGKDIAFAPYGPYWRQ	18

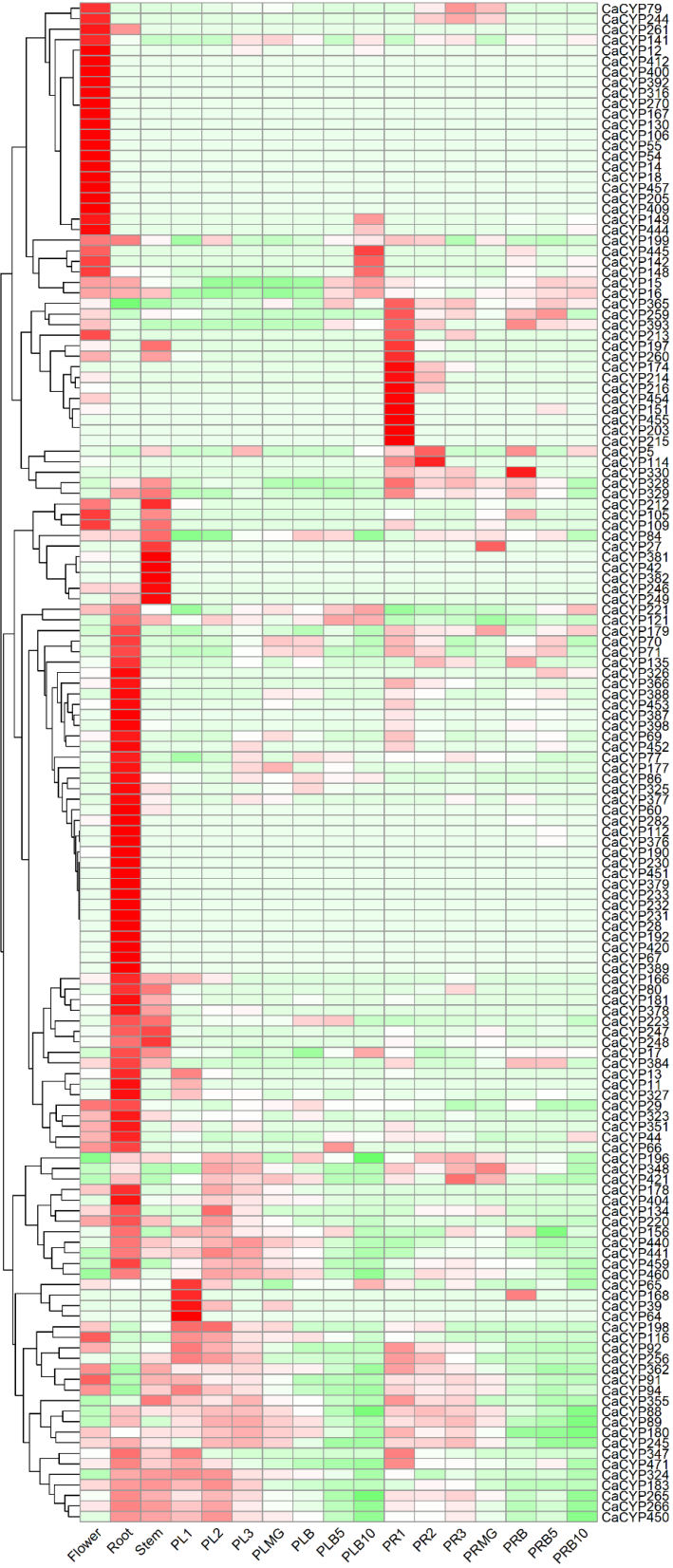


Supplementary Figure 2 | The conserved motifs identified by MEME tools in CYP450 proteins.

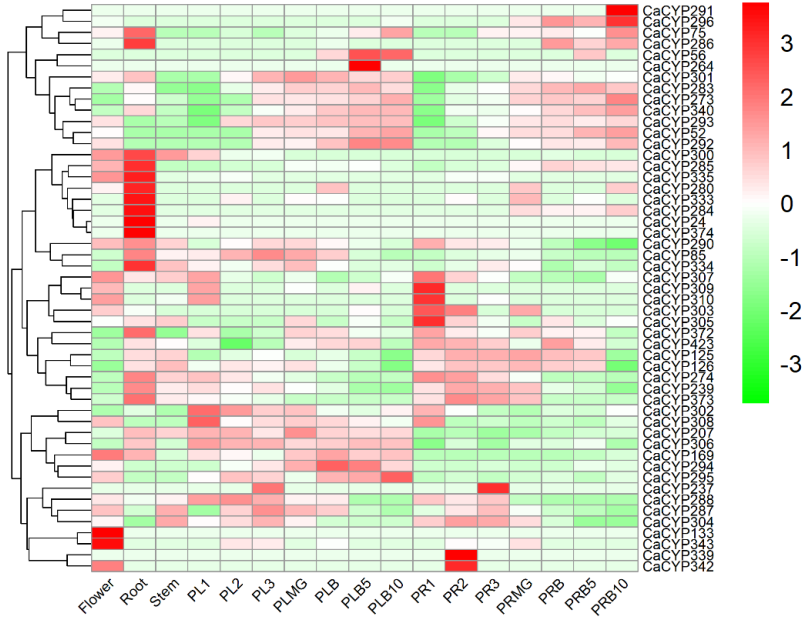


Supplementary Figure 3| Conserved motifs and gene structure of the P450 family in pepper. (A) Subfamily classification and protein motifs of CaCYP members. The nine main subfamilies are marked with different colors. The colorful boxes represent different motifs. Motif sequence are provided in Supplementary Figure 2. (B) Analysis of Gene structure. Green blocks represent exon and black dashed lines represent intron.

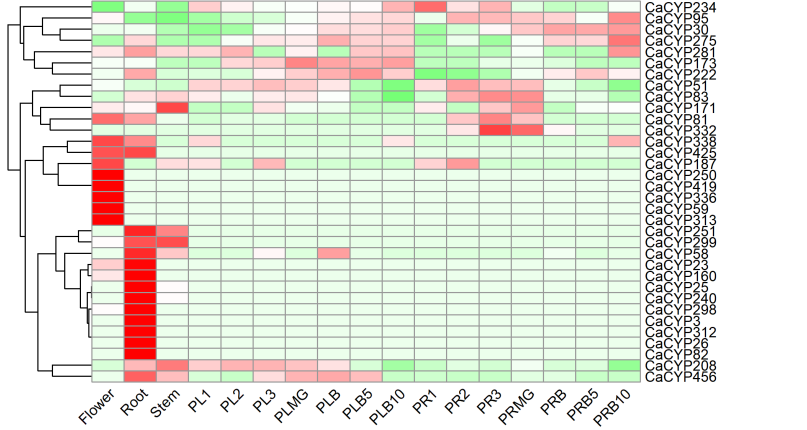
CYP71 clan



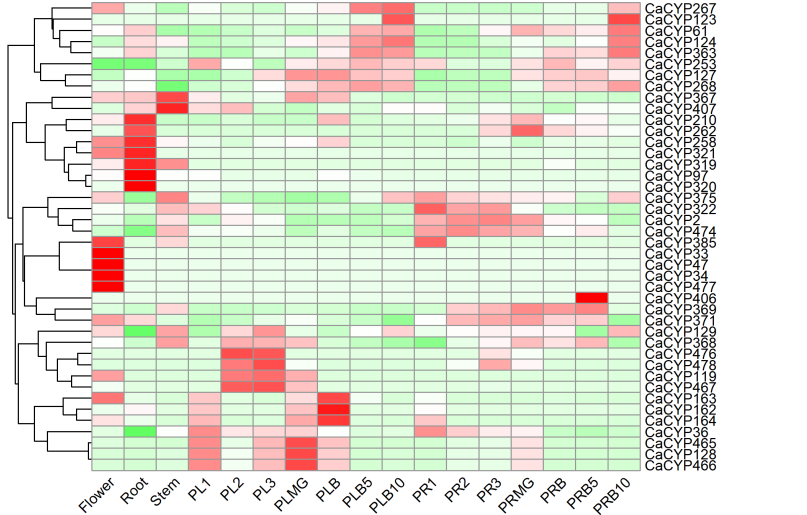
CYP72 clan



CYP85 clan



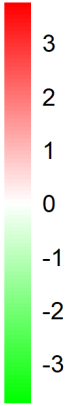
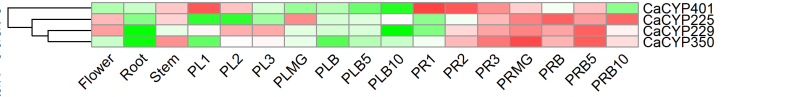
CYP86 clan



CYP74 clan

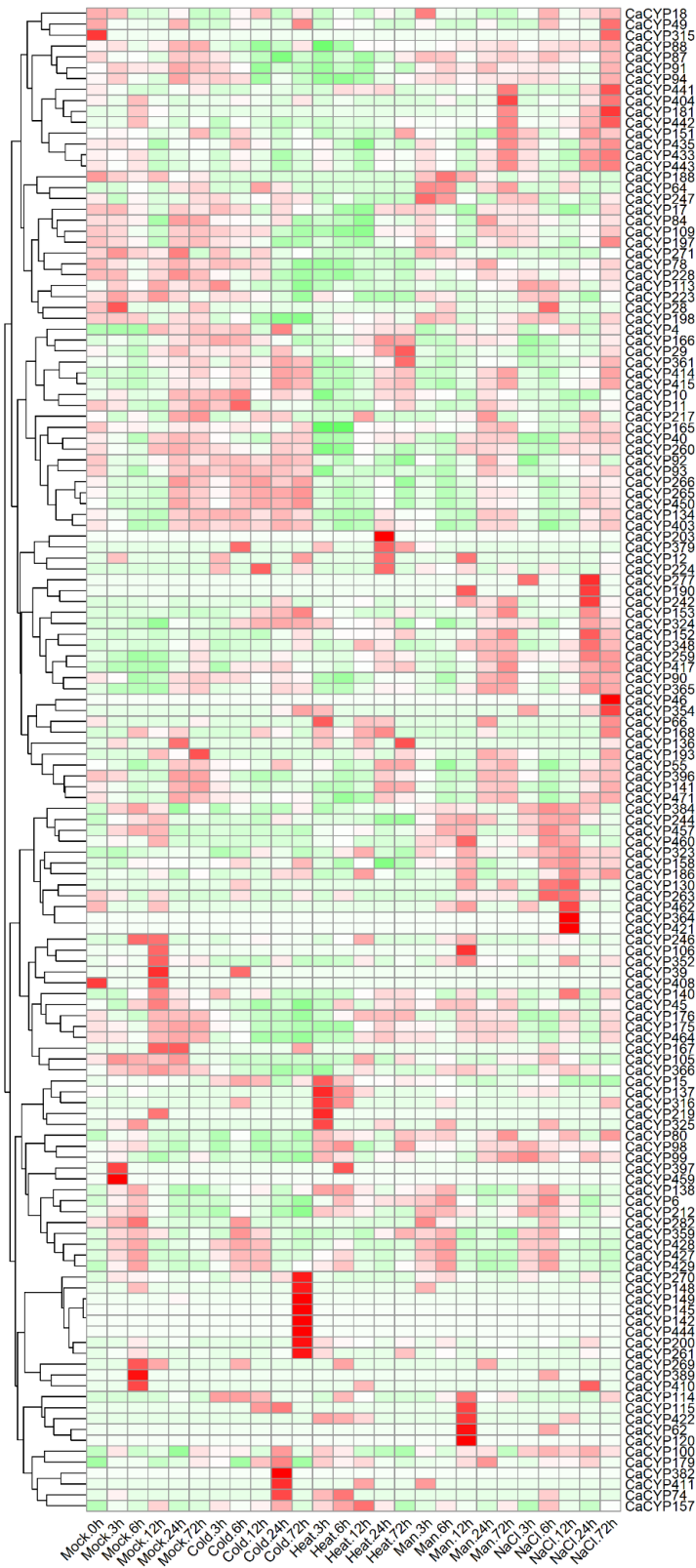


CYP97clan

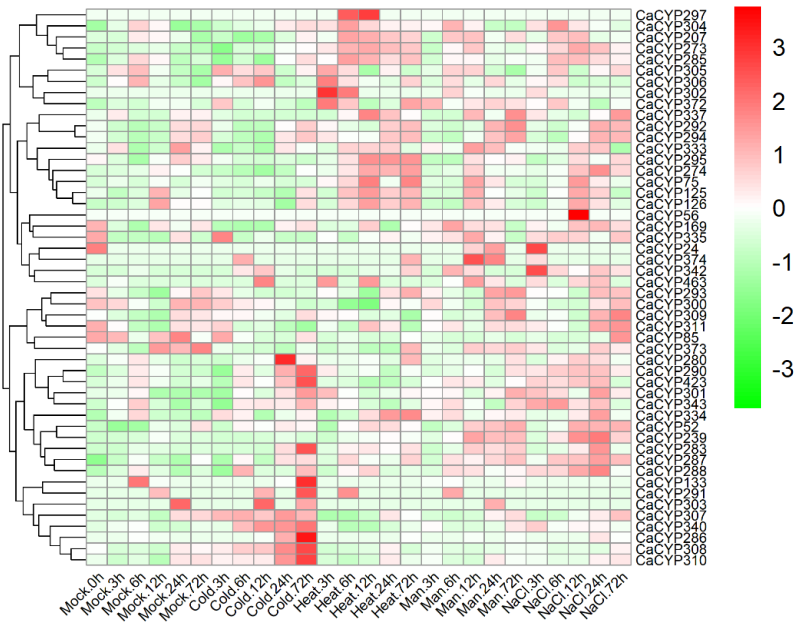


Supplementary Figure 4| Analysis of the expression patterns of remaining CaCYP genes in different tissues and fruit development stages, which is corresponding to Figure 5.

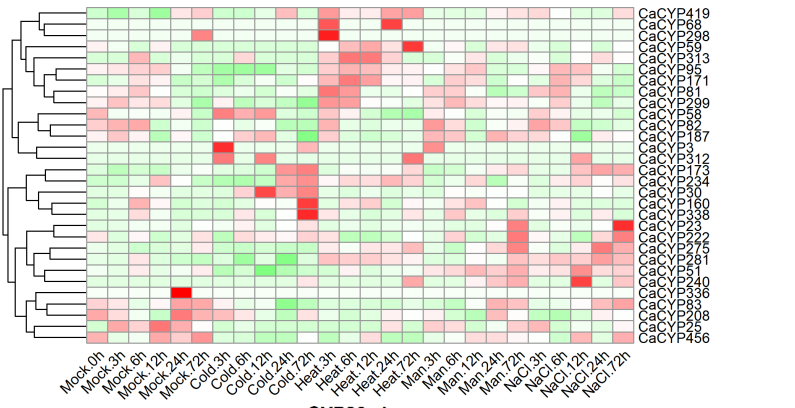
CYP71 clan



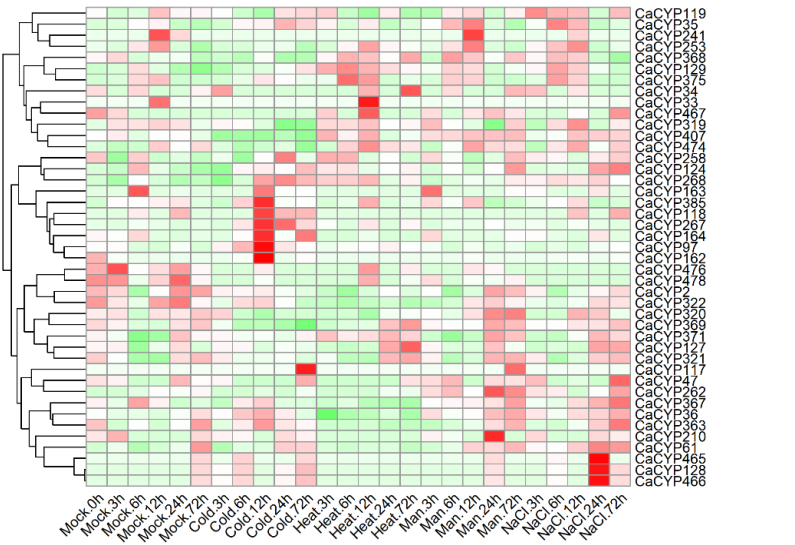
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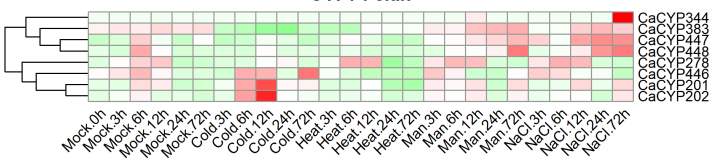
CYP85 clan



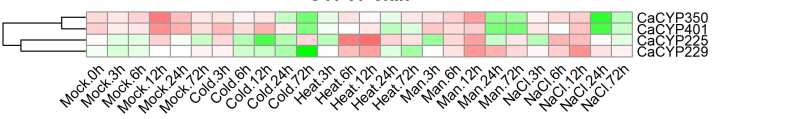
CYP86 clan



CYP74 clan

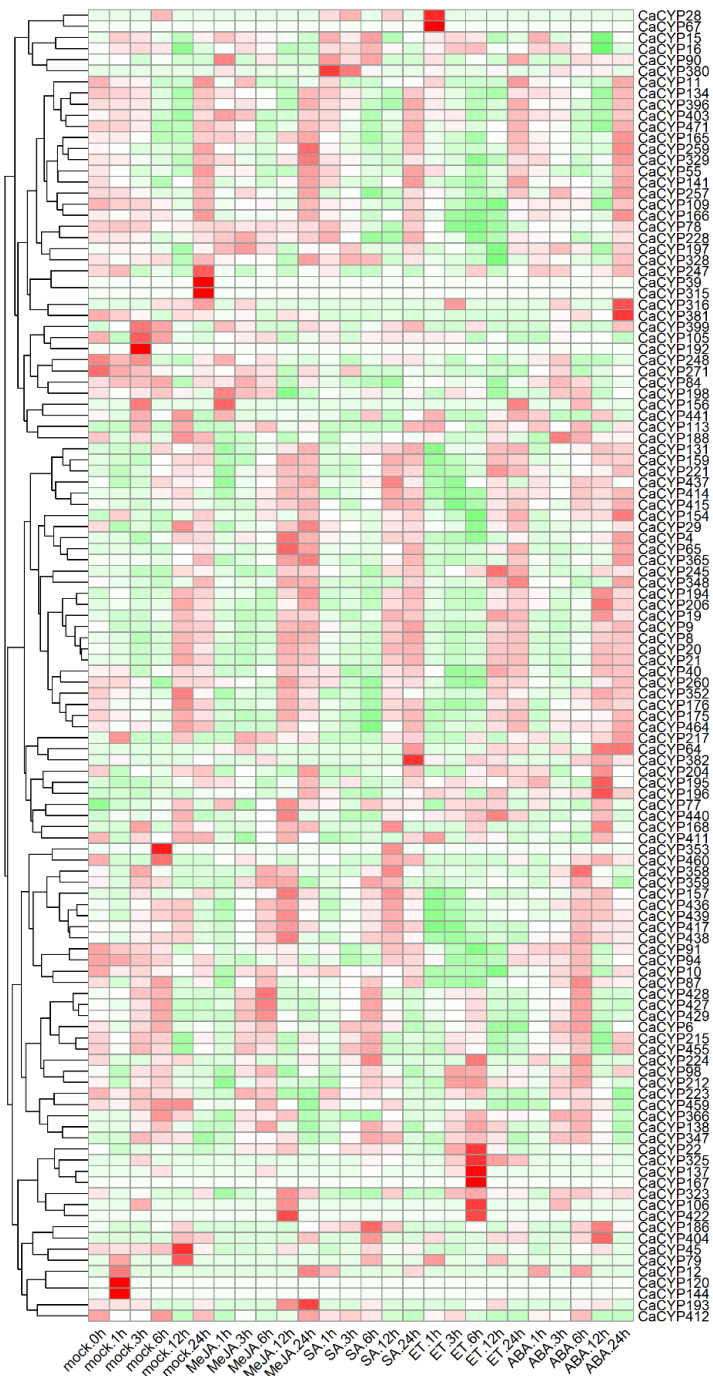


CYP97 clan

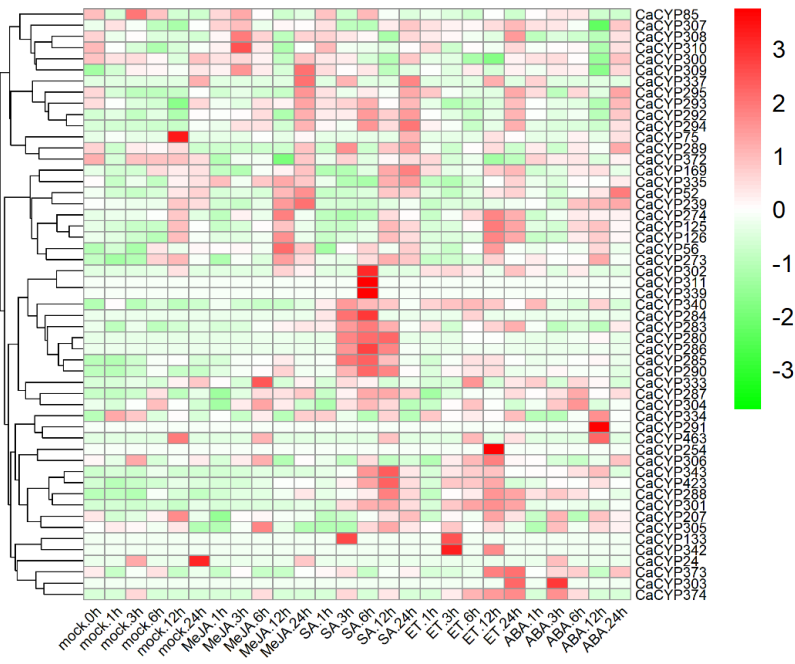


Supplementary Figure 5 | Analysis of the expression patterns of remaining CaCYP genes in different abiotic stress, which is corresponding to Figure 6.

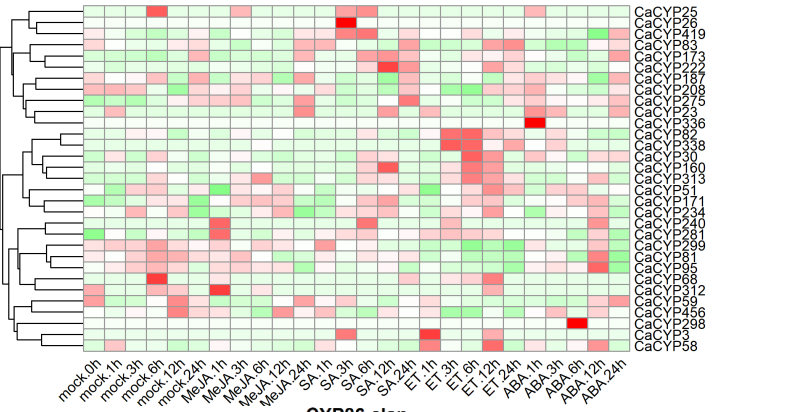
CYP71 clan



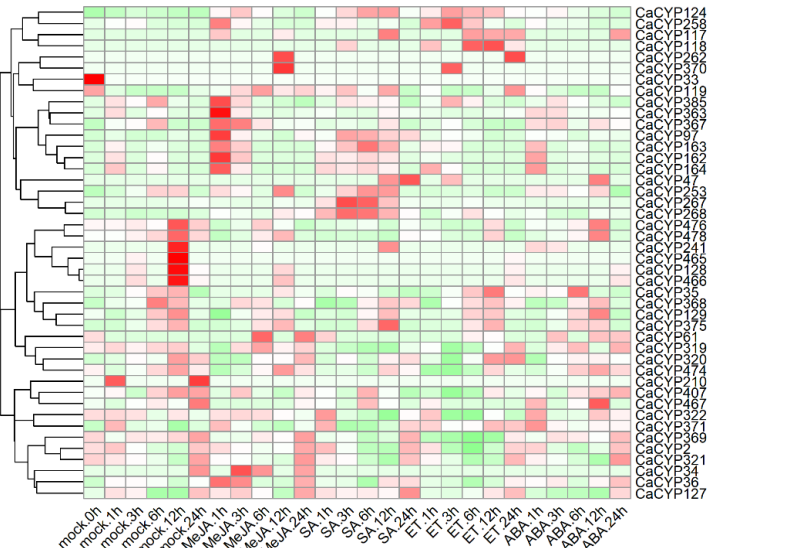
CYP72 clan



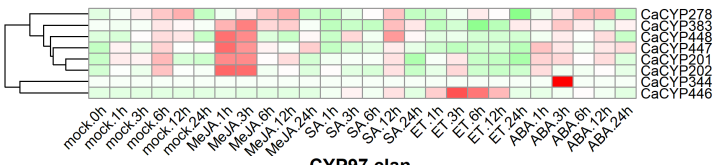
CYP85 clan



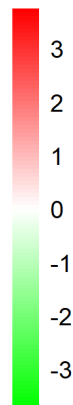
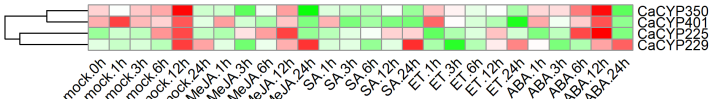
CYP86 clan



CYP74 clan

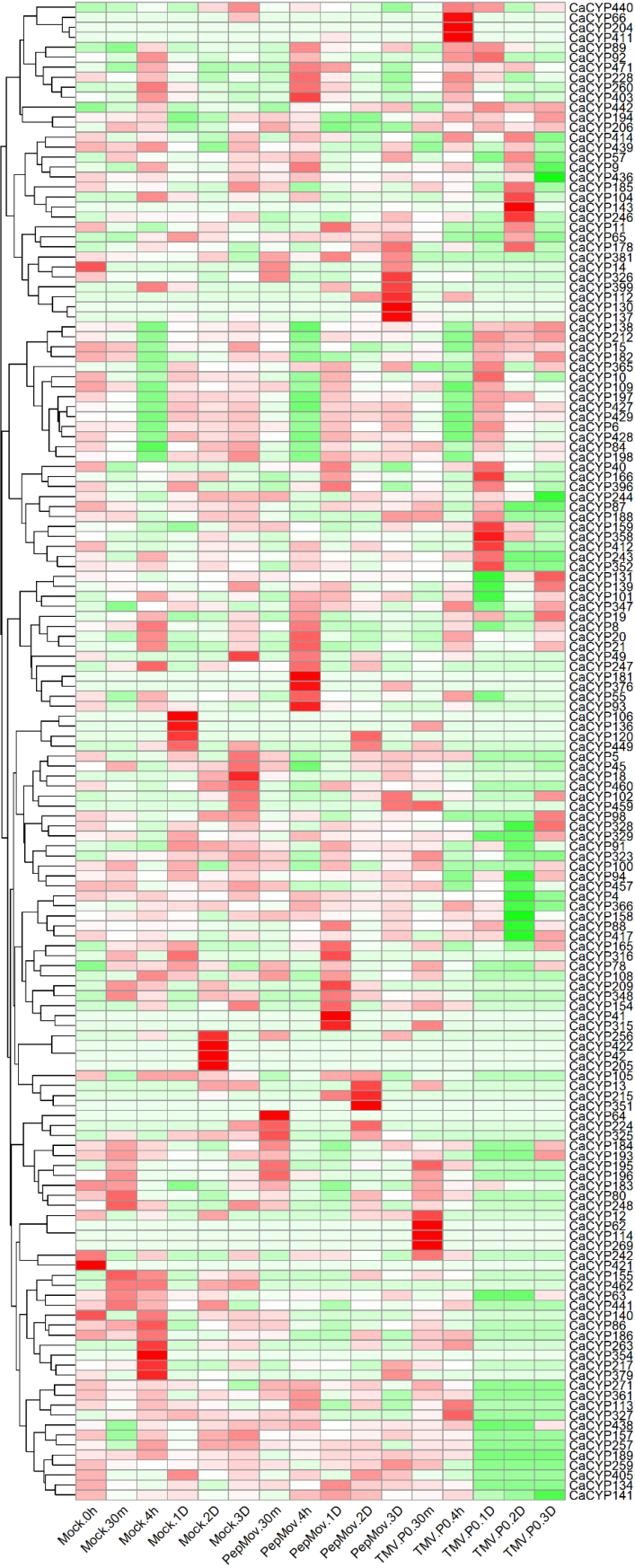


CYP97 clan

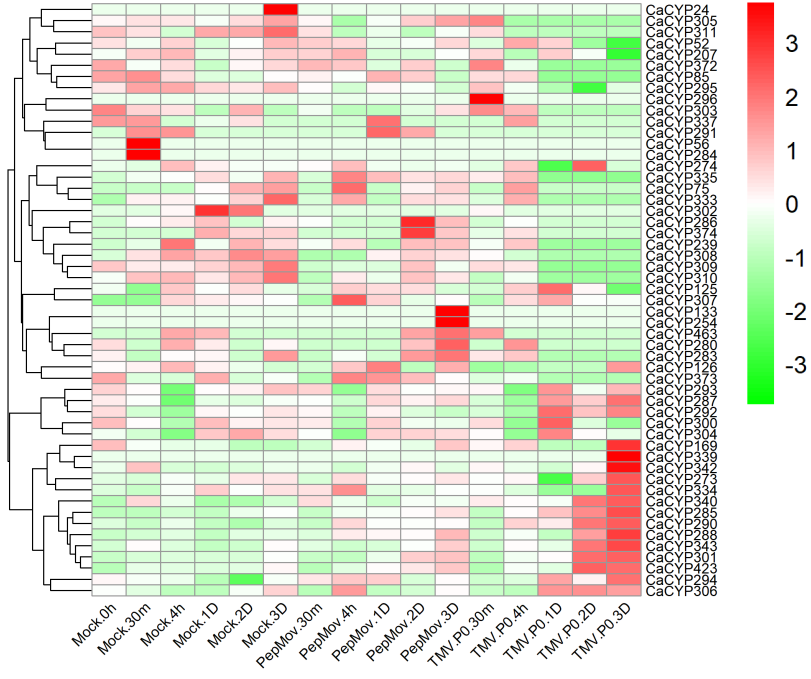


Supplementary Figure 6 | Analysis of the expression patterns of remaining CaCYP genes in different phytohormone treatment, which is corresponding to Figure 8.

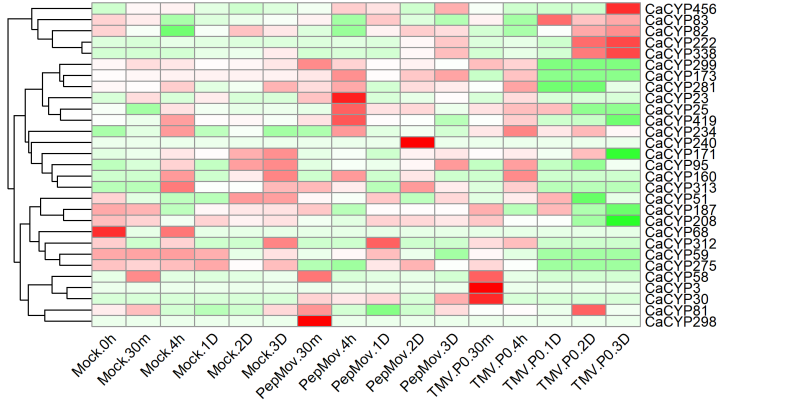
CYP71 clan



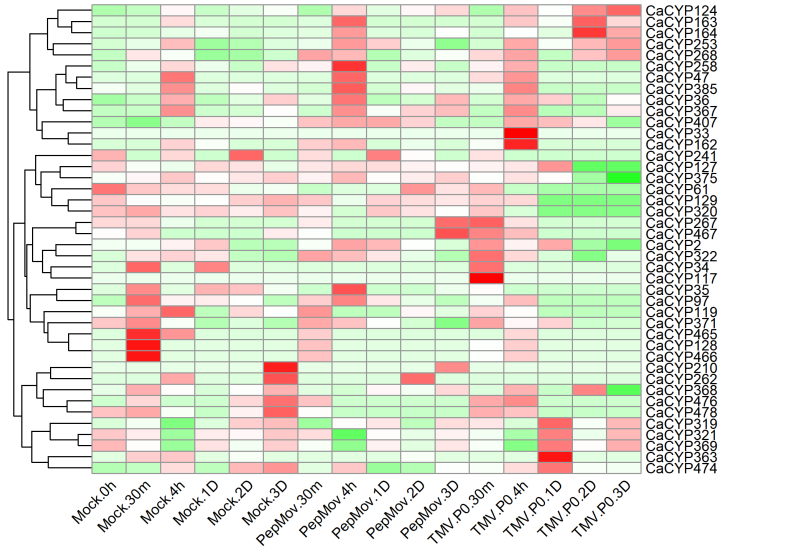
CYP72 clan



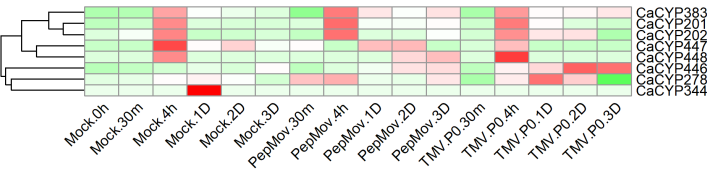
CYP85 clan



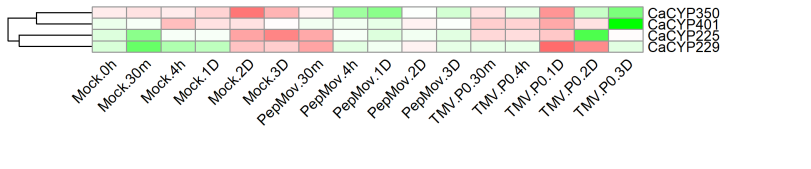
CYP86 clan



CYP74 clan



CYP97clan



Supplementary Figure 7 | Analysis of the expression patterns of remaining CaCYP Genes in different virus infections, which is corresponding to Figure 9.