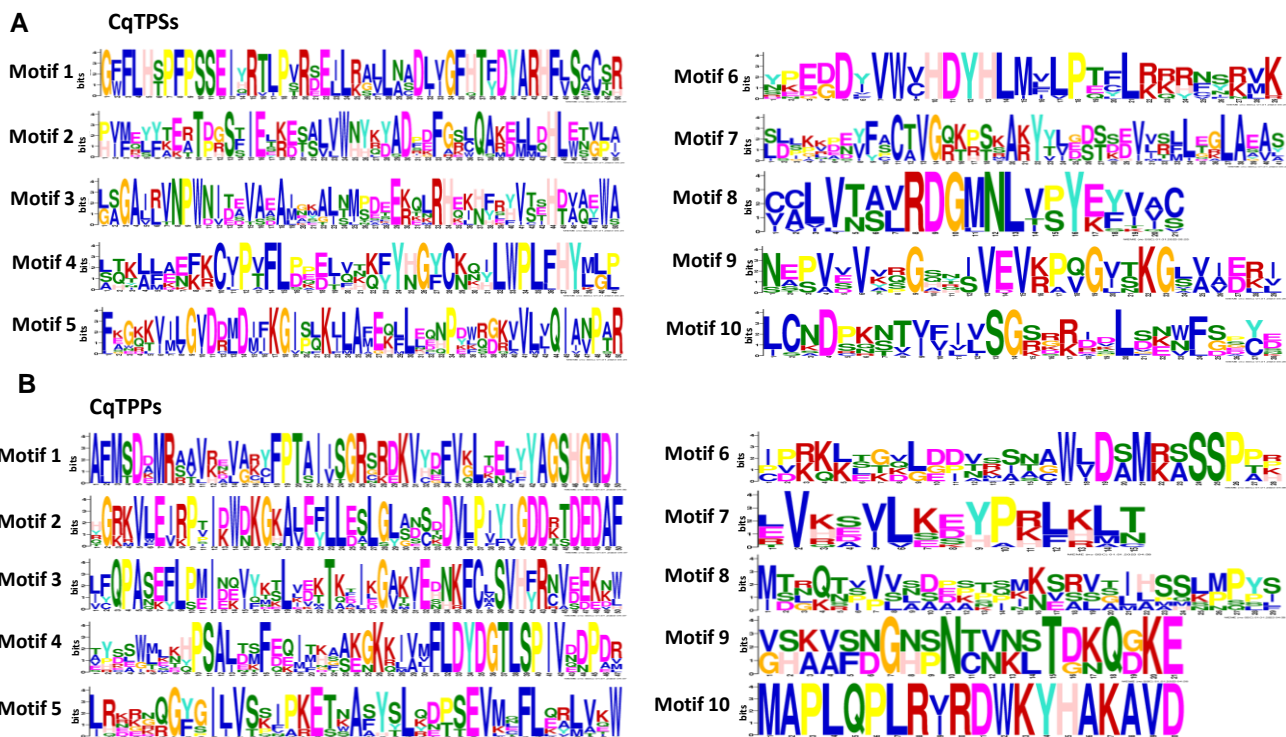
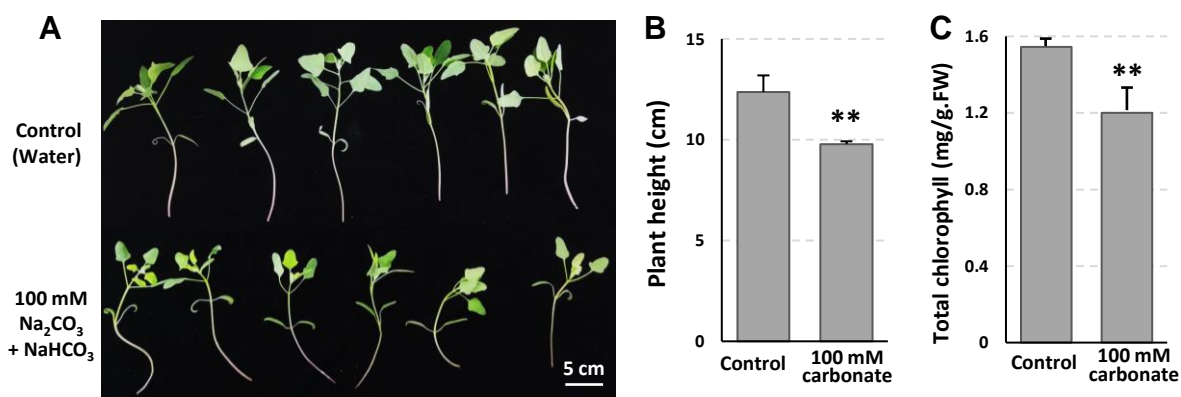


CqTPS1	LDYDGTMPQTSI	DKKPSQEV	SI	LNLSADP	PRNTVFI	VS	SGRGKDS	L	GKWF	SP	CKKVG	AAEHGYF	NRWS	AEDEW	ENC	GQN	CDF	GW	86																																																																										
AtTPS7	LDYDGTLMQNSI	NKAPSQEV	LN	LDAL	CEDKNSI	FI	VS	SGRGRES	L	SKWF	TP	CKKI	GI	AAEHGYF	LKWSG	SEEW	ETC	GQS	SDF	GW	87																																																																								
CqTPS3	LDCCDGTMMQSS	SVSTNP	NVEAVK	VLNS	LCKDS	KNVVF	LVS	GKDKRKL	SE	WFSS	SCENL	GI	AAEHGYF	VR	YDNDAD	WEI	C	KPI	SNF	DW	86																																																																								
CqTPS8	LLDCDGTMMQSS	SVSTNP	NVEAVK	VLNS	LCKDS	KNVVF	LVS	GKDKRKL	SE	WFSS	SCENL	GI	AAEHGYF	VR	YDNDAD	WEI	C	KPI	SNF	DW	87																																																																								
AtTPS5	LLDYDGTNVQPGSI	RTTPTRETI	EI	LNNLS	SDPKNI	VY	LVS	GKDRRLT	TE	WFSS	CDL	GL	GAEHGYF	IR	PN	DGTD	WETS	SLV	S	GFEW	87																																																																								
AtTPS6	LLDYDDTLMPQGS	DKRPSKSI	DI	LNTLCRD	KGNL	VFI	VS	AKSRET	LS	DWFS	PCEK	GI	AAEHGYF	LRLR	KAVEW	ENC	VAA	VDCS	W	87																																																																									
CqTPS2	LDYDGTI	VPQTSNNKCP	SP	SEVI	SV	LNAL	CNDPKNTI	FI	VS	SGRGAOL	SE	W	SPCQLL	GI	AAEHGYF	LRSN	KAAD	WESN	...	T	AELDW	84																																																																							
CqTPS7	LDYDGTI	VPQTSNNKCP	SP	SEVI	SV	LNAL	CNDPKKHN															57																																																																							
CqTPS4	LDYDGT	VVS	DMSI	VKTP	SP	ELI	SI	LNNL	CNDPKNTVFI	VS	SGRG	RDP	SE	W	SPCEK	GI	AAEHGYF	L	RWNQNC	D	WEI	S	PVT	ADNDW	86																																																																				
AtTPS8	FLDYDGT	LV	PSSI	VQDPS	NEVVS	VL	KAL	CEDP	PNTVFI	VS	SGRGRES	L	SNWLS	PCENL	GI	AAEHGYF	IR	WKS	KDEW	ETC	YSP	TDTEW	87																																																																						
AtTPS9	FLDYDGT	LV	PSSI	I	KTPNAE	VL	SVLKS	L	CGDP	KNTV	VVS	GRGWES	L	SDWLS	PCENL	GI	AAEHGYF	IR	WKS	KDEW	ETC	YSS	AEAEW	87																																																																					
AtTPS10	FLDYDGT	LV	PETSI	VKDP	SAEVI	S	ALKAL	CS	DP	NNTI	FI	VS	SGRKVS	L	SEW	AP	CENL	GI	AAEHGYF	TR	WNKS	SD	WETS	GLS	DDLEW	87																																																																			
CqTPS13	LLDYDGT	M	PQTS	VNMAP	TTEV	LS	LLNS	L	CNDPKNA	VFI	VS	GRSRET	LS	KWFS	ACEK	GI	SAEHGYF	TR	WS	QNS	EWESS	...	I	LGTN	FEW	87																																																																			
AtTPS11	LLDYDGT	NMDQ	DTL	DKRP	SD	DLI	S	LLNRL	CD	PS	NL	VFI	VS	SGRKDP	LS	KWFS	CP	NL	GI	SAEHGYF	TR	WS	NS	P	WETS	...	EL	PADL	SW	87																																																															
CqTPS5	...	GDQVKD	NS	KLNP	EL	KGPL	S	VL	CN	DS	NS	TI	VI	LS	GS	RRI	DL	VNNF	GEYD	MW	AAEHGM	FL	RHTR	GD	WKT	T	PEL	L	NLDW	79																																																															
CqTPS10	...	GDQVKD	NS	KLNP	EL	KGPL	S	VL	CN	DS	NS	TI	VI	LS	GS	RRI	DL	VNNF	GEYD	MW	AAEHGM	FL	RHTR	GD	WKT	T	PEL	L	NLDW	79																																																															
CqTPS6	...	LHPEL	NG	PLS	VL	CN	PKS	TI	VI	LS	GS	RRI	DL	DNNF	GDYD	MW	AAEHGM	FL	RHTR	RRG	D	WATT	T	PEH	L	NLDW	70																																																																		
CqTPS9	...	LHPEL	NG	PLS	VL	CN	PKS	TI	VI	LS	GS	RRI	DL	DNNF	GDYD	MW	AAEHGM	FL	RHTR	RRG	D	WATT	T	PEH	L	NLDW	70																																																																		
AtTPS1	PVDN	Q	RRG	DQI	KEND	L	NHPEL	KGPL	KAL	CS	DP	S	TTI	VVLS	GS	S	RS	VL	DKNF	GEYD	MW	AAENGM	FL	R	LTN	GEW	ATT	T	PEH	L	NNEW	87																																																													
AtTPS2	...	LGF	F	GT	L	AE	P	N	S	T	G	T	K	E	...	MDL	KL	NPEL	K	ETL	KAL	CND	P	TT	V	V	LS	RS	G	KNI	L	N	KNF	GESN	I	W	AAENGM	F	E	KQTT	GEW	T	N	P	Q	N	V	NLDW	90																																												
AtTPS3	...	I	L	G	F	Y	G	T	L	T	E	P	R	N	S	L	S	K	E	...	MDL	XL	NPEL	K	ETL	KAL	CND	P	TT	V	V	LS	RS	G	KNI	L	N	KNF	GEYK	I	W	AAENGM	F	L	KH	T	EEW	T	N	P	Q	N	V	NLDW	91																																						
AtTPS4	...	I	L	G	F	Y	G	T	L	T	E	P	R	N	S	L	S	K	E	...	MDL	XL	NPEL	K	ETL	KAL	CND	P	TT	V	V	LS	RS	G	KNI	L	N	KNF	GEYK	I	W	AAENGM	F	L	KH	T	EEW	T	N	P	Q	N	V	NLDW	91																																						
CqTPS11	...	I	L	G	F	Y	G	T	L	T	E	P	R	N	S	L	S	K	E	...	MDL	XL	NPEL	K	ETL	KAL	CND	P	TT	V	V	LS	RS	G	KNI	L	N	KNF	GEYK	I	W	AAENGM	F	L	KH	T	EEW	T	N	P	Q	N	V	NLDW	91																																						
CqTPS12	...	I	L	G	F	Y	G	T	L	T	E	P	R	N	S	L	S	K	E	...	MDL	XL	NPEL	K	ETL	KAL	CND	P	TT	V	V	LS	RS	G	KNI	L	N	KNF	GEYK	I	W	AAENGM	F	L	KH	T	EEW	T	N	P	Q	N	V	NLDW	91																																						
Consensus	...	I	L	G	F	Y	G	T	L	T	E	P	R	N	S	L	S	K	E	...	MDL	XL	NPEL	K	ETL	KAL	CND	P	TT	V	V	LS	RS	G	KNI	L	N	KNF	GEYK	I	W	AAENGM	F	L	KH	T	EEW	T	N	P	Q	N	V	NLDW	91																																						
CqTPS1	VQI	AEP	V	N	K	L	Y	T	E	A	D	G	S	F	I	E	T	K	E	S	A	L	V	Y	H	R	D	A	D	P	G	F	G	S	C	A	K	E	M	L	D	E	L	E	S	V	L	A	N	E	P	V	S	V	K	S	Q	H	I	V	E	N	K	P	C	G	V	S	K	G	L	V	A	E	K	I	F	T	K	M	A	E	S	G	...	K	H	A	181				
AtTPS7	MQI	VEP	V	N	K	L	Y	T	E	A	D	G	S	F	I	E	T	K	E	S	A	L	V	Y	H	R	D	A	D	P	G	F	G	S	C	A	K	E	M	L	D	E	L	E	S	V	L	A	N	E	P	V	S	V	K	S	Q	H	I	V	E	N	K	P	C	G	V	S	K	G	L	V	A	E	K	I	F	T	K	M	A	E	S	G	...	K	H	A	182				
CqTPS3	KHVAEP	V	N	K	L	Y	T	E	A	D	G	S	F	I	E	T	K	E	S	A	L	V	Y	H	R	D	A	D	P	G	F	G	S	C	A	K	E	M	L	D	E	L	E	S	V	L	A	N	E	P	V	S	V	K	S	Q	H	I	V	E	N	K	P	C	G	V	S	K	G	L	V	A	E	K	I	F	T	K	M	A	E	S	G	...	K	H	A	181					
CqTPS8	KHVAEP	V	N	K	L	Y	T	E	A	D	G	S	F	I	E	T	K	E	S	A	L	V	Y	H	R	D	A	D	P	G	F	G	S	C	A	K	E	M	L	D	E	L	E	S	V	L	A	N	E	P	V	S	V	K	S	Q	H	I	V	E	N	K	P	C	G	V	S	K	G	L	V	A	E	K	I	F	T	K	M	A	E	S	G	...	K	H	A	182					
AtTPS5	KQI	AEP	V	N	K	L	Y	T	E	A	D	G	S	F	I	E	T	K	E	S	A	L	V	Y	H	R	D	A	D	P	G	F	G	S	C	A	K	E	M	L	D	E	L	E	S	V	L	A	N	E	P	V	S	V	K	S	Q	H	I	V	E	N	K	P	C	G	V	S	K	G	L	V	A	E	K	I	F	T	K	M	A	E	S	G	...	K	H	A	182				
AtTPS6	KQI	AEP	V	N	K	L	Y	T	E	A	D	G	S	F	I	E	T	K	E	S	A	L	V	Y	H	R	D	A	D	P	G	F	G	S	C	A	K	E	M	L	D	E	L	E	S	V	L	A	N	E	P	V	S	V	K	S	Q	H	I	V	E	N	K	P	C	G	V	S	K	G	L	V	A	E	K	I	F	T	K	M	A	E	S	G	...	K	H	A	182				
CqTPS2	KDI	VEP	I	N	R	S	Y	T	E	A	D	G	S	F	I	E	T	K	E	S	A	L	V	Y	H	R	D	A	D	P	G	F	G	S	C	A	K	E	M	L	D	E	L	E	S	V	L	A	N	E	P	V	S	V	K	S	Q	H	I	V	E	N	K	P	C	G	V	S	K	G	L	V	A	E	K	I	F	T	K	M	A	E	S	G	...	K	H	A	182				
CqTPS7	KDI	VEP	I	N	R	S	Y	T	E	A	D	G	S	F	I	E	T	K	E	S	A	L	V	Y	H	R	D	A	D	P	G	F	G	S	C	A	K	E	M	L	D	E	L	E	S	V	L	A	N	E	P	V	S	V	K	S	Q	H	I	V	E	N	K	P	C	G	V	S	K	G	L	V	A	E	K	I	F	T	K	M	A	E	S	G	...	K	H	A	182				
CqTPS4	KKI	AEP	V	N	K	L	Y	T	E	A	D	G	S	F	I	E	T	K	E	S	A	L	V	Y	H	R	D	A	D	P	G	F	G	S	C	A	K	E	M	L	D	E	L	E	S	V	L	A	N	E	P	V	S	V	K	S	Q	H	I	V	E	N	K	P	C	G	V	S	K	G	L	V	A	E	K	I	F	T	K	M	A	E	S	G	...	K	H	A	182				
AtTPS8	RSMVEP	V	M	R	S	Y	N	E	A	D	G	S	F	I	E	T	K	E	S	A	L	V	Y	H	R	D	A	D	P	G	F	G	S	C	A	K	E	M	L	D	E	L	E	S	V	L	A	N	E	P	V	S	V	K	S	Q	H	I	V	E	N	K	P	C	G	V	S	K	G	L	V	A	E	K	I	F	T	K	M	A	E	S	G	...	K	H	A	182					
AtTPS9	KTNVEP	V	M	R	S	Y	N	E	A	D	G	S	F	I	E	T	K	E	S	A	L	V	Y	H	R	D	A	D	P	G	F	G	S	C	A	K	E	M	L	D	E	L	E	S	V	L	A	N	E	P	V	S	V	K	S	Q	H	I	V	E	N	K	P	C	G	V	S	K	G	L	V	A	E	K	I	F	T	K	M	A	E	S	G	...	K	H	A	182					
AtTPS10	KKVVEPI	N	R	L	Y	T	E	T	D	G	S	F	I	E	T	K	E	S	A	L	V	Y	H	R	D	A	D	P	G	F	G	S	C	A	K	E	M	L	D	E	L	E	S	V	L	A	N	E	P	V	S	V	K	S	Q	H	I	V	E	N	K	P	C	G	V	S	K	G	L	V	A	E	K	I	F	T	K	M	A	E	S	G	...	K	H	A	182						
CqTPS13	KKVVGPI	N	E	L	Y	A	E	A	D	G	S	F	I	E	T	K	E	S	A	L	V	Y	H	R	D	A	D	P	G	F	G	S	C	A	K	E	M	L	D	E	L	E	S	V	L	A	N	E	P	V	S	V	K	S	Q	H	I	V	E	N	K	P	C	G	V	S	K	G	L	V	A	E	K	I	F	T	K	M	A	E	S	G	...	K	H	A	182						
AtTPS11	KKI	AKP	V	N	N	H	Y	E	A	D	G	S	F	I	E	T	K	E	S	A	L	V	Y	H	R	D	A	D	P	G	F	G	S	C	A	K	E	M	L	D	E	L	E	S	V	L	A	N	E	P	V	S	V	K	S	Q	H	I	V	E	N	K	P	C	G	V	S	K	G	L	V	A	E	K	I	F	T	K	M	A	E	S	G	...	K	H	A	182					
CqTPS5	VPS	V	Y	H	I	F	E	Y	F	K	E	R	T	P	R	S	T	I	E	L	R	D	S	L	V	N	Y	K	A	D	E	F	E	G	R	L	C	A	R	D	M	L	Q	L	W	T	G	P	I	S	N	A	S	V	E	V	Q	G	S	R	S	V	E	N	R	P	V	G	T	T	G	S	A	I	D	R	I	L	G	E	I	...	V	H	S	K	P	L	K	S	P	I	178
CqTPS10	VPS	V	Y	H	I	F	E	Y																																																																																					



Supplemental Figure S2. Sequences of conservative motifs in CqTPS and CqTPP proteins. (A) Sequence analysis of CqTPS protein conserved motifs, color represents different amino acid residues, and larger font sizes represent more frequencies. (B) Sequence analysis of CqTPP protein conserved motifs, color represents different amino acid residues, and larger font sizes represent more frequencies.



Supplemental Figure S3. Saline-alkali stress affected quinoa growth and development. **(A)** Quinoa plants undergone carbonate treatment. Two-week-old quinoa seedlings were treated with a solution containing 100 mM Na_2CO_3 : NaHCO_3 =1:9, once every 5 days, three times in total. **(B)** Statistics of plant height in A. **(C)** Statistics of total chlorophyll in quinoa leaves with or without carbonate treatment. **, $p < 0.01$.