

Supplementary Data

Title: Comparative phylogenomic analysis provides insights into TCP gene functions in

Sorghum

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Supplementary Table 1. The percentage similarity among duplicated TCP proteins of *Sorghum*.

S. No.	Protein 1	Protein 2	Percent Identity
1	SbTCP1	SbTCP3	49.51
2	SbTCP3	SbTCP18	58.65
3	SbTCP5	SbTCP16	65.22
4	SbTCP9	SbTCP19	51.81
5	SbTCP11	SbTCP15	66.47
6	SbTCP12	SbTCP20	70.22
7	SbTCP13	SbTCP15	58.59

Supplementary Table 2. GC content at first, second and third codon positions in TCP genes of *Sorghu*.

S. No.	Gene Model	% GC in 1st codon position	% GC in 2nd codon position	% GC in 3rd codon position
1	SbTCP1.1	0.67	0.57	0.87
2	SbTCP1.2	0.67	0.57	0.87
3	SbTCP2	0.62	0.53	0.77
4	SbTCP3	0.7	0.57	0.88
5	SbTCP4	0.71	0.63	0.92
6	SbTCP5	0.72	0.52	0.78
7	SbTCP6	0.77	0.58	0.82
8	SbTCP7.1	0.69	0.56	0.86
9	SbTCP7.2	0.69	0.56	0.86
10	SbTCP7.3	0.73	0.55	0.81
11	SbTCP8	0.69	0.54	0.82
12	SbTCP9	0.71	0.46	0.88
13	SbTCP10	0.76	0.52	0.89
14	SbTCP11	0.73	0.63	0.97
15	SbTCP12	0.71	0.61	0.81
16	SbTCP13	0.71	0.66	0.94
17	SbTCP14.2	0.7	0.62	0.86
18	SbTCP14.3	0.7	0.62	0.86
19	SbTCP15	0.73	0.64	0.96
20	SbTCP16	0.71	0.56	0.83
21	SbTCP17	0.74	0.57	0.92
22	SbTCP18	0.71	0.58	0.85
23	SbTCP19.1	0.69	0.51	0.82
24	SbTCP19.2	0.69	0.51	0.82
25	SbTCP19.3	0.7	0.5	0.84
26	SbTCP19.4	0.7	0.5	0.84
27	SbTCP20	0.69	0.59	0.8

Supplementary Table 3. Predicted subcellular localization of *Sorghum* TCP proteins (High confidence predictions are highlighted in yellow)

Gene Name	Final Prediction	Plant-mPLoc	WoLFP SORT	WoLFP SORT Confidence (No of Nearest Neighbors)	DIST ILL	DIST ILL confidence	MultiLoc2	Multi Loc2 Confidence	SubLoc v1.0	Sub Loc v1.0 Expected accuracy	CELL O v.2.5	CELL O v.2.5 Reliability
SbTC P1.1	Nuclear	Nuclear	Nuclear	12	Chloroplast	medium	Cytoplasmic	0.5	Nuclear	97%	Nuclear	3.073
SbTC P1.2	Nuclear	Nuclear	Nuclear	12	Chloroplast	medium	Cytoplasmic	0.5	Nuclear	97%	Nuclear	3.073
SbTC P2	Nuclear	Nuclear	Nuclear	14	Nuclear	high	Cytoplasmic	0.43	Nuclear	100%	Nuclear	4.589
SbTC P3	Nuclear	Nuclear	Nuclear	14	Chloroplast	medium	Cytoplasmic	0.35	Nuclear	94%	Nuclear	3.222
SbTC P4	Chloroplast	Chloroplast, Nuclear	Chloroplast, Cytosol	7, 7	Chloroplast	high	mitochondrial	0.47	Extracellular	91%	Nuclear	2.035
SbTC P5	Nuclear	Nuclear	Nuclear	13	Nuclear	medium	Cytoplasmic	0.56	Nuclear	91%	Nuclear	3.307
SbTC P6	-	Nuclear	Nuclear	7	Chloroplast	medium	Cytoplasmic	0.49	Extracellular	91%	Nuclear	3.331
SbTC P7.1	Nuclear	Nuclear	Nuclear	14	Nuclear	high	Chloroplast	0.48	Nuclear	91%	Nuclear	4.137
SbTC P7.2	Nuclear	Nuclear	Nuclear	14	Nuclear	high	Chloroplast	0.48	Nuclear	91%	Nuclear	4.137
SbTC P7.3	Nuclear	Nuclear	Chloroplast	10	Chloroplast	medium	Secretory pathway	0.4	Nuclear	95%	Nuclear	4.299
SbTC P8	Nuclear	Nuclear	Nuclear	12.5	Nuclear	medium	Secretory pathway	0.51	Nuclear	84%	Nuclear	4.274
SbTC P9	-	Nuclear	Nuclear	7	Chloroplast	medium	Secretory pathway	0.48	Nuclear	84%	Nuclear	3.515
SbTC P10	Cytoplasmic	Nuclear	Nuclear	6	Chloroplast	medium	Cytoplasmic	0.78	Nuclear	94%	Nuclear	3.412
SbTC P11	-	Nuclear	Nuclear	7	Chloroplast	medium	Chloroplast	0.37	Mitochondrial	84%	Nuclear	2.09
SbTC P12	Nuclear	Nuclear	Nuclear	14	Nuclear	medium	Cytoplasmic	0.53	Nuclear	94%	Nuclear	4.161
SbTC P13	-	Nuclear	Nuclear	10.5	Chloroplast	medium	Chloroplast	0.45	Extracellular	84%	Nuclear	2.379
SbTC P14.2	Chloroplast	Nuclear	Chloroplast	9	Chloroplast	medium	Chloroplast	0.71	Nuclear	74%	Nuclear, Chloroplast	1.702, 1.352
SbTC P14.3	-	Nuclear	Chloroplast	9	Chloroplast	medium	Chloroplast	0.41	Nuclear	74%	Nuclear, Chloroplast	1.702, 1.352
SbTC P15	Nuclear/chloroplast	Nuclear	Nuclear	7	Chloroplast	low	Chloroplast	0.81	Nuclear	100%	Nuclear	3.46
SbTC P16	Nuclear	Nuclear	Nuclear	9	Nuclear	high	Cytoplasmic	0.49	Mitochondrial	94%	Nuclear	1.698
SbTC P17	Nuclear	Nuclear	Nuclear	13	Chloroplast	medium	Cytoplasmic	0.36	Extracellular	91%	Nuclear	2.905
SbTC P18	-	Nuclear	Nuclear	11	Nuclear	medium	Chloroplast	0.41	Extracellular	56%	Nuclear	2.724
SbTC P19.1	-	Nuclear	Nuclear, cytosol	5, 5	Chloroplast	medium	Chloroplast	0.38	Nuclear	94%	Nuclear, Mitochondrial	1.779, 1.340
SbTC P19.2	-	Nuclear	Nuclear, cytosol	5, 5	Chloroplast	medium	Chloroplast	0.38	Nuclear	94%	Nuclear, Mitochondrial	1.779, 1.340

SbTCP19.3	-	Nuclear	Nuclear, cytosol	5, 5	Chloroplast	low	Chloroplast	0.41	Nuclear	91%	Nuclear, Mitochondrial	1.726, 1.388
SbTCP19.4	-	Nuclear	Cytosol	5	Chloroplast	low	Chloroplast	0.41	Nuclear	91%	Nuclear, Mitochondrial	1.726, 1.388
SbTCP20	Nuclear	Cell membrane, Nuclear	Nuclear	14	Nuclear	medium	Cytoplasmic	0.54	Nuclear	91%	Nuclear	4.322

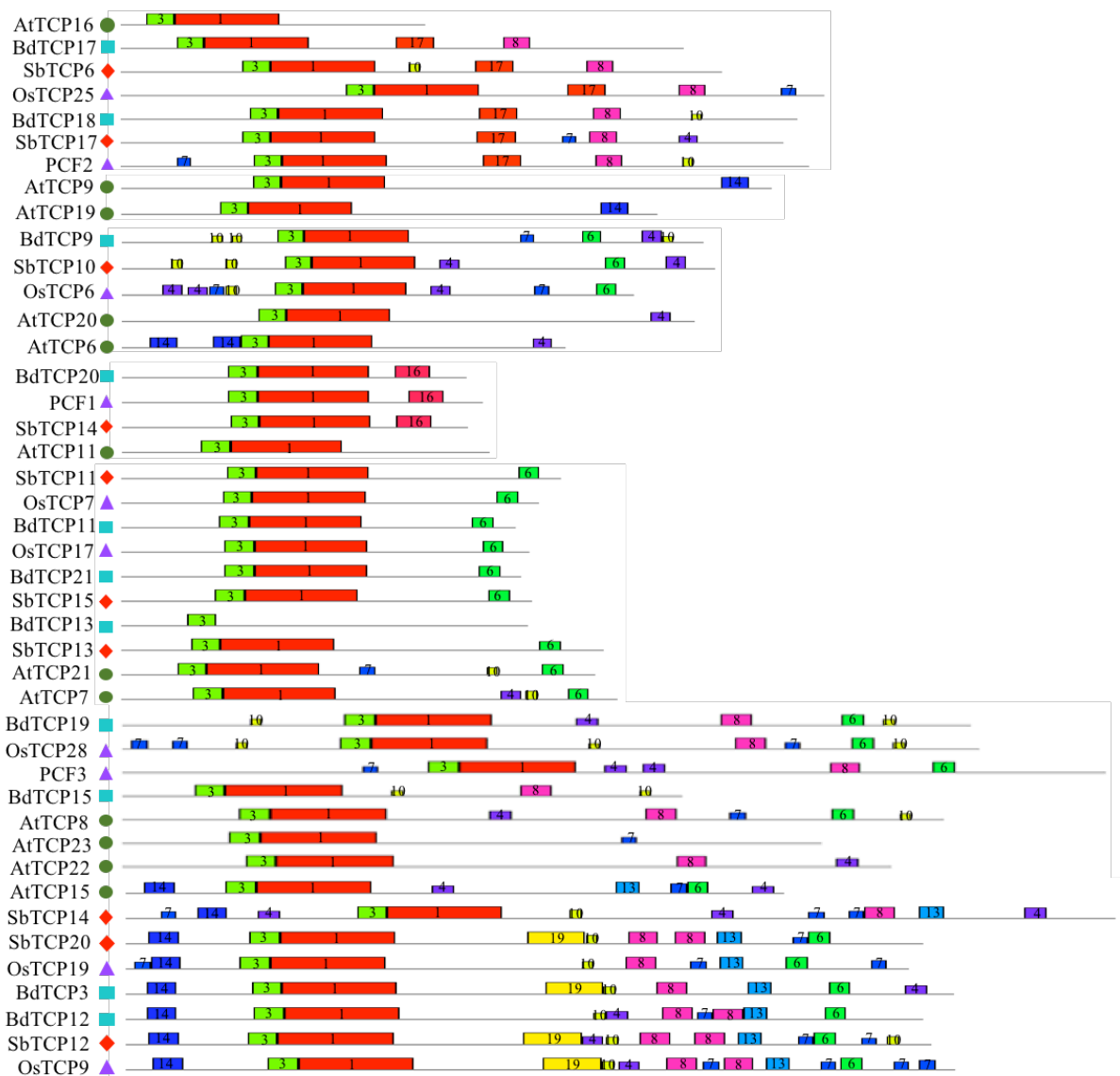
Supplementary Table 4. Results of Orthology analysis of *Sorghum* proteins with rice and *Arabidopsis*.





Sorghum Gene	Locus ID	Rice Gene Name	% Similarity	E-value	Score
SbTCP1	LOC_Os03g57190	PCF6	60.05	1E-108	327
	LOC_Os07g05720	OsTCP21	45.79	2E-70	231
SbTCP2	LOC_Os03g49880	OsTB1(Lateral Branching 1)	57.11	2E-116	348
SbTCP3	LOC_Os07g05720	OsTCP21	61.57	1E-118	358
	LOC_Os03g57190	PCF6	46.3	8E-69	227
SbTCP4	NA	NA	NA	NA	NA
SbTCP5	LOC_Os09g24480	OsTCP24	61.86	5E-61	197
	LOC_Os08g33530	OsTCP22	59.84	3E-31	119
SbTCP6	LOC_Os08g43160	PCF2	62.04	2E-77	245
	LOC_Os09g34950	OsTCP25	56.91	3E-75	239
SbTCP7	LOC_Os01g11550	PCF5	76.73	2E-178	512
SbTCP8	LOC_Os01g55100	PCF7	62.89	6E-72	232
	LOC_Os01g11550	PCF5	36.8	5E-39	148
SbTCP9	LOC_Os01g55750	OsTCP5	66.67	2E-100	300
	LOC_Os05g43760	OsTCP18	47.86	2E-58	192
SbTCP10	LOC_Os01g69980	OsTCP6	67.59	4E-93	282
	LOC_Os02g51280	OsTCP9	87.14	1E-36	138
	LOC_Os06g12230	OsTCP19	85.51	4E-36	136
	LOC_Os11g07460	PCF3	74.44	9E-35	133
	LOC_Os12g07480	OsTCP28	66.67	7E-34	130
SbTCP11	LOC_Os02g42380	OsTCP7	68.2	5E-69	214

	LOC_Os04g44440	OsTCP17	56.64	3E-58	186
SbTCP12	LOC_Os02g51280	OsTCP9	86.13	8E-162	465
	LOC_Os06g12230	OsTCP19	64.85	9E-105	318
	LOC_Os01g69980	OsTCP6	69.7	1E-38	142
SbTCP13	LOC_Os04g44440	OsTCP17	45.32	3E-36	130
	LOC_Os12g07480	OsTCP28	85.71	7E-36	133
	LOC_Os11g07460	PCF3	73.56	2E-35	132
	LOC_Os02g42380	OsTCP7	90.48	1E-34	126
SbTCP14	LOC_Os04g11830	PCF1	60.64	1E-52	169
	LOC_Os11g07460	PCF3	65.38	1E-28	111
SbTCP15	LOC_Os04g44440	OsTCP17	67.89	1E-75	230
	LOC_Os02g42380	OsTCP7	55.11	1E-53	174
	LOC_Os11g07460	PCF3	53.39	4E-30	116
SbTCP16	LOC_Os08g33530	OsTCP22	46.64	3E-46	158
	LOC_Os09g24480	OsTCP24	88.73	5E-35	129
SbTCP17	LOC_Os08g43160	PCF2	75.46	2E-156	449
	LOC_Os09g34950	OsTCP25	59.93	4E-74	238
	LOC_Os11g07460	PCF3	73.49	1E-32	127
SbTCP18	LOC_Os12g42190	PCF8	64.42	2E-87	267
	LOC_Os12g02090	OsTCP27	80.46	1E-36	131
	LOC_Os07g05720	OsTCP21	57.46	1E-31	124
	LOC_Os03g57190	PCF6	73.17	7E-31	120
SbTCP19	LOC_Os05g43760	OsTCP18	61.61	6E-94	284
	LOC_Os01g55750	OsTCP5	51.37	1E-66	214
SbTCP20	LOC_Os02g51280	OsTCP9	68.3	1E-124	370
	LOC_Os06g12230	OsTCP19	75.83	5E-117	350
	LOC_Os12g07480	OsTCP28	91.03	8E-41	151
	LOC_Os11g07460	PCF3	85.37	1E-40	152

	LOC_Os01g69980	OsTCP6	75.58	2E-37	139
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Sorghum Gene	Gene ID	Arabidopsis Gene	% Similarity	E-value	Score
SbTCP1	AT4G18390	AtTCP2	42.12	2E-40	149
	AT1G30210	AtTCP24	41.08	2E-38	142
	AT3G02150	AtTCP13	65.85	4E-28	112
SbTCP2	AT3G18550	AtTCP18	38.05	2E-25	106
SbTCP3	AT4G18390	AtTCP2	58.58	5E-49	174
	AT1G30210	AtTCP24	50.78	2E-42	155
SbTCP4	NA	NA	NA	NA	NA
SbTCP5	AT3G18550	AtTCP18	63.1	6E-28	111
SbTCP6	AT2G45680	AtTCP9	40.16	1E-38	142
SbTCP7	AT3G15030	AtTCP4	41.86	9E-75	244
	AT1G53230	AtTCP3	40.19	2E-68	226
	AT2G31070	AtTCP10	47.39	2E-43	159
SbTCP8	AT3G15030	AtTCP4	40.73	2E-39	148
	AT1G53230	AtTCP3	36.8	3E-39	147
	AT2G31070	AtTCP10	79.71	3E-30	120
SbTCP9	AT5G60970	AtTCP5	81.48	2E-39	143
	AT3G02150	AtTCP13	58.33	2E-38	139
	AT5G08070	AtTCP17	63.27	1E-37	136
SbTCP10	AT3G27010	AtTCP20	50.84	5E-53	179
	AT1G58100	AtTCP8	71.28	9E-37	138
	AT1G69690	AtTCP15	85.51	1E-36	136
	AT2G45680	AtTCP9	76.83	6E-36	135
	AT3G47620	AtTCP14	86.76	8E-36	136
SbTCP11	AT5G23280	AtTCP7	44.59	2E-40	141
	AT5G08330	AtTCP21	42.03	1E-35	128
SbTCP12	AT3G47620	AtTCP14	43.47	8E-58	199
	AT1G69690	AtTCP15	68.5	5E-52	179
	AT1G58100	AtTCP8	85.88	6E-45	162
	AT1G72010	AtTCP22	39.81	1E-42	155
SbTCP13	AT5G23280	AtTCP7	63.13	5E-77	236
	AT1G35560	AtTCP23	77.78	3E-37	136
SbTCP14	NA	NA	NA	NA	NA
SbTCP15	AT5G23280	AtTCP7	45.81	9E-39	136
	AT5G08330	AtTCP21	80.82	2E-35	127
SbTCP16	AT3G18550	AtTCP18	49.18	5E-28	111
SbTCP17	AT2G45680	AtTCP9	44.54	5E-47	166
	AT5G51910	AtTCP19	44.66	2E-42	152
	AT1G72010	AtTCP22	71.43	1E-34	132
SbTCP18	AT4G18390	AtTCP2	51.85	4E-30	118
SbTCP19	AT5G60970	AtTCP5	86.67	1E-39	144
	AT3G02150	AtTCP13	52.41	1E-39	142
	AT5G08070	AtTCP17	80.26	4E-37	134
SbTCP20	AT3G47620	AtTCP14	41.52	7E-56	193
	AT1G69690	AtTCP15	67.97	3E-49	172
	AT1G58100	AtTCP8	84.71	2E-44	160
	AT1G35560	AtTCP23	86.05	2E-42	154
	AT1G72010	AtTCP22	85.19	3E-41	151



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