

Supplemental Table 2: Distribution of TCS genes across various classes in the 3 legumes analysed in this study (marked by *) and other plants

Species	HK	HPt	Type-A RR	Type-B RR	Type-C RR	Pseudo-RR	Total
<i>Cicer arietinum</i> *	19	8	10	16	9	5	67
<i>Medicago truncatula</i> *	21	8	11	35	12	9	96
<i>Cajanus cajan</i> *	20	10	12	16	11	6	75
<i>Arabidopsis thaliana</i>	8	6	10	12	2	9	47
<i>Oryza sativa</i>	8	5	13	13	2	8	49
<i>Lotus japonicus</i>	14	7	7	11	1	5	45
<i>Glycine max</i>	21	13	18	15	3	13	83
<i>Zea mays</i>	11	9	16	9	3	11	59
<i>Physcomitrella patens</i>	18	3	7	5	2	4	39
<i>Brassica rapa</i>	11	8	21	17	4	15	76
<i>Solanum lycopersicum</i>	20	6	7	23	1	8	65
<i>Cucumis melo</i>	18	5	7	8	0	6	44
<i>Triticum aestivum</i>	7	10	41	2	0	2	62
<i>Cucumis sativus</i>	18	7	8	8	0	5	46
<i>Citrullus lanatus</i>	19	6	8	10	1	5	49

Further distribution of TCS members in the 3 legumes

	Cytokinin rec	Ethylene rec	Phytochrome receptor	AHK1	CKI1	CKI2	HP	PHP	Type-A RR	Type-B RR	Type-C RR	Pseudo-RR	Total
<i>Cicer arietinum</i> *	4	5	4	2	2	2	6	2	10	16	9	5	67
<i>Medicago truncatula</i> *	5	6	3	2	2	3	6	2	11	35	12	9	96
<i>Cajanus cajan</i> *	4	6	4	2	2	2	8	2	12	16	11	6	75

Supplemental Table 3A: A list of paralogs in chickpea, *Medicago* and *C. cajan* genome

Ca_TCS	Ca_TCS	Ka	Ks	Ka/Ks	MT_TCS	MT_TCS	Ka	Ks	Ka/Ks
CaHK1	CaHK16	0.1177	0.6406	0.183733999	MTHK1	MTHK13	0.1494	0.7407	0.201701094
CaHK10	CaHK3	0.1375	0.7002	0.196372465	MTHK12	MTHK20	0.1138	0.7157	0.15900517
CaHK5	CaHK6	0.3375	2.1854	0.154433971	MTHK15	MTHK19	0.1476	0.8078	0.182718495
CaHK5	CaHK13	0.1828	0.9816	0.186226569	MTHK3	MTHK4	0.169	0.8182	0.206550966
CaHK7	CaHK18	0.1013	0.6644	0.152468393	MTHK5	MTHK18	0.1745	0.7424	0.235048491
CaHK8	CaHK4	0.1039	0.5556	0.18700504	MT-HP1	MT-HP6	0.2152	0.6662	0.323026118
CaHP1	CaHP5	0.2888	0		MT-HP2	MT-HP3	0.325	0	
CaHP3	CaHP2	0.1792	0.6691	0.267822448	MT-HP6	MT-HP7	0.0797	1.1673	0.068277221
CaHP4	CaHP6	0.1243	0.79	0.157341772	MRR1	MRR36	0.4126	1.5367	0.26849743
CaPHP1	CaPHP2	0.0928	0.9633	0.096335513	MRR1	MRR21	0.2134	0.5977	0.357035302
CaPRR3	CaPRR1	0.5458	1.5912	0.343011564	MRR10	MRR58	0.172	0.5771	0.298041934
CaRR12	CaRR3	0.1686	0.7857	0.21458572	MRR11	MRR33	0.1866	0.5605	0.332917038
CaRR13	CaRR15	0.3612	1.0141	0.356177892	MRR14	MRR32	0.1597	0.9564	0.166980343
CaRR18	CaRR14	0.2016	0.8833	0.228235028	MRR15	MRR60	0.2222	0.609	0.364860427
CaRR25	CaRR21	0.1572	0.5749	0.273438859	MRR17	MRR56	0.7303	1.6914	0.431772496
					MRR17	MRR54	0.5935	1.5411	0.385114529
					MRR2	MRR35	0.5972	1.6431	0.363459315
					MRR31	MRR39	0.1808	0.5867	0.308164309
					MRR32	MRR40	0.3523	1.7214	0.204658998
					MRR54	MRR56	0.4135	0.8055	0.513345748
					MRR6	MRR29	0.5169	2.1639	0.238874255
					MRR7	MRR34	0.1866	0.8556	0.218092567

Cc_TCS	Cc_TCS	Ka	Ks	Ka/Ks
CcHK20	CcRR32	0.1363	0.6408	0.212702871
CcHK20	CcHK6	0.32	1.7609	0.181725254
CcHP8	CcHP2	0.2964	-1	-0.2964
CcRR21	CcRR1	0.0836	0.5071	0.164859002
CcRR37	CcRR6	0.2176	0.7925	0.274574132
CcRR8	CcRR12	0.1039	0.7482	0.138866613

Ca

Mt

Ca

Mt

Mean of Ka and Ks values

Mean Ka_values HKS	0.16345
Mean Ka_values RRS	0.28688
Mean Ka_values HKS	0.15086
Mean Ka_values RRS	0.352686
Mean Ks_values HKS	0.954633
Mean Ks_values RRS	0.96984
Mean Ks_values HKS	0.76496
Mean Ks_values RRS	1.131864

Ratio of Ka and Ks values RRs Vs HKS

Ca_Ka ratios	
Ka_RRS/Ka_HKS	1.755154
Mt_Ka ratios	
Mt_Ka_RRS/Ka_HKS	2.337835
Ca_Ks ratios	
Ca_Ks_RRS/Ks_HKS	1.015929
Mt_Ks ratios	
Mt_Ks_RRS/Ks_HKS	1.479639

CaRR12	Glyma.04G177900	0.1785	0.4579	0.389823105
CaRR12	Glyma.02G027400	0.3698	0.4674	0.79118528
CaRR12	Glyma.01G037500	0.3627	0.4685	0.773105656
CaRR13	Glyma.17G217100	0.2252	0.5029	0.447802744
CaRR13	Glyma.14G110600	0.2326	0.5036	0.461874504
CaRR13	Glyma.06G063500	0.1597	0.5231	0.305295355
CaRR13	Glyma.04G062500	0.1558	0.5601	0.278164613
CaRR14	Glyma.17G030600	0.1755	0.8558	0.205071278
CaRR14	Glyma.15G145200	0.1647	0.9407	0.175082385
CaRR14	Glyma.09G040000	0.1699	1.7179	0.09889982
CaRR14	Glyma.07G243300	0.1717	2.0549	0.083556377
CaRR15	Glyma.17G217100	0.2077	0.6037	0.344045055
CaRR15	Glyma.14G110600	0.2054	0.6046	0.339728746
CaRR15	Glyma.06G063500	0.2836	0.6405	0.442779079
CaRR15	Glyma.04G062500	0.2481	0.6415	0.386749805
CaRR16	Glyma.07G171200	0.1543	0.6374	0.242077189
CaRR16	Glyma.02G085900	0.1421	0.65	0.218615385
CaRR17	Glyma.18G010800	0.1301	0.4977	0.261402451
CaRR17	Glyma.11G246400	0.1223	0.5119	0.23891385
CaRR17	Glyma.08G100900	0.1853	0.5124	0.361631538
CaRR17	Glyma.05G144500	0.1698	0.5356	0.317027633
CaRR18	Glyma.17G030600	0.0817	0	
CaRR18	Glyma.15G145200	0.1557	0.3842	0.405257678
CaRR18	Glyma.09G040000	0.1561	0.4215	0.370344009
CaRR18	Glyma.07G243300	0.0784	0.4367	0.17952828
CaRR19	Glyma.17G076000	0.2287	0	
CaRR19	Glyma.13G155400	0.25	0.4047	0.617741537
CaRR21	Glyma.17G152800	0.1581	0.5334	0.29640045
CaRR21	Glyma.11G041300	0.101	0	
CaRR21	Glyma.05G070200	0.1599	0	
CaRR21	Glyma.01G200800	0.1061	0	
CaRR25	Glyma.17G152800	0.1401	0.3075	0.455609756
CaRR25	Glyma.11G041300	0.1584	0.4153	0.381411028
CaRR25	Glyma.05G070200	0.1292	0.441	0.292970522
CaRR25	Glyma.01G200800	0.157	0.4697	0.334255908
CaRR3	Glyma.18G130900	0.425	0.4962	0.856509472
CaRR3	Glyma.17G093900	0.1819	0.5018	0.362495018
CaRR3	Glyma.08G292400	0.4023	0.5196	0.774249423
CaRR3	Glyma.06G187000	0.0993	0.5308	0.187076112
CaRR3	Glyma.05G033000	0.1813	0.5401	0.335678578
CaRR3	Glyma.04G177900	0.0953	0.5487	0.173683251
CaRR3	Glyma.02G027400	0.3101	0.5725	0.541659389
CaRR3	Glyma.01G037500	0.3371	0.5766	0.584634062
CaRR31	Glyma.19G169700	0.2857	0.7022	0.406864141
CaRR32	Glyma.19G171300	0.1952	0.6999	0.278896985
CaRR32	Glyma.03G170100	0.1382	0.7905	0.174826059
CaRR4	Glyma.06G114900	0.1332	0.5345	0.249204864
CaRR4	Glyma.04G247800	0.1305	0.5526	0.236156352
CaRR5	Glyma.02G027400	0.1449	0.488	0.29692623
CaRR5	Glyma.01G037500	0.1096	0.4901	0.223627831
CaRR6	Glyma.15G236200	0.0684	0.3526	0.193987521
CaRR6	Glyma.13G197600	0.0724	0.4108	0.17624148
CaRR6	Glyma.11G155100	0.1151	0.4129	0.27875999
CaRR6	Glyma.04G137600	0.1357	0.4556	0.29784899
CaRR9	Glyma.06G142300	0.0506	0.5329	0.094952149
CaRR9	Glyma.04G223000	0.0573	0.5521	0.103785546

MTRR60	Glyma.11G246400	0.1947	0.6063
MTRR60	Glyma.08G109900	0.1412	0.4183
MTRR60	Glyma.05G144500	0.1339	0.4161
MTRR7	Glyma.17G030600	0.1815	0.6728
MTRR7	Glyma.15G145200	0.1521	0.5421
MTRR7	Glyma.09G040000	0.1489	0.5045
MTRR7	Glyma.07G243300	0.1723	0.6811

Supplemental Table 5: A list of orthologous pairs in legumes with Arabidopsis

Ca_TCS	At_TCS	Ka	Ks	Ka/Ks	Mt_TCS	At_TCS	Ka	Ks	Ka/Ks	Cc_TCS	At_TCS	Ka	Ks	Ka/Ks
CaHK1	AT1G09570	0.1793	1.8228	0.098365153	MtHK1	AT5G10680	0.436	1.8211	0.239415738	CcHK1	AT1G27320	0.2017	2.0543	0.098184296
CaHK10	AT2G17820	0.2659	2.5319	0.105019945	MtHK12	AT1G27320	0.2195	2.1254	0.103274678	CcHK20	AT3G04580	0.272	0	
CaHK13	AT1G04310	0.4502	2.6286	0.171269878	MtHK13	AT5G10680	0.584	0		CcHK3	AT2G17820	0.225	1.8126	0.124131082
CaHK14	AT5G35750	0.3246	1.8005	0.180283255	MtHK15	AT2G17820	0.2597	1.6712	0.155397319	CcHK6	AT3G23150	0.2627	0	
CaHK15	AT2G47430	0.4869	2.4451	0.19913296	MtHK19	AT2G17820	0.2679	2.6509	0.101060017	CcHK7	AT2G01830	0.2141	2.1728	0.098536451
CaHK16	AT1G09570	0.1329	2.1955	0.060532908	MtHK20	AT1G27320	0.2106	2.1406	0.098383631	CcHP2	AT1G03430	0.3769	0	
CaHK18	AT1G27320	0.2152	1.7702	0.121568184	MtHK21	AT2G01830	0.2076	2.1336	0.097300337	CcRR16	AT3G04280	0.7306	3.036	0.240645586
CaHK19	AT2G01830	0.2111	2.6824	0.078698181	MtHK3	AT3G23150	0.338	2.3487	0.143909397	CcRR20	AT5G02810	0.4791	2.5736	0.186159465
CaHK3	AT2G17820	0.2564	1.7399	0.147364791	MtHK3	AT1G04310	0.4136	0		CcRR20	AT5G60100	0.4062	1.8963	0.214206613
CaHK4	AT5G10680	0.4402	2.4218	0.181765629	MtHK4	AT3G23150	0.2834	3.0562	0.092729533	CcRR23	AT4G00760	1.0073	1.7352	0.580509451
CaHK5	AT3G23150	0.2727	3.8381	0.07105078	MtHK4	AT1G04310	0.3969	2.6812	0.148030733	CcRR34	AT4G00760	1.0425	1.5547	0.670547372
CaHK5	AT1G04310	0.388	2.6886	0.144313025	MtHK5	AT3G04580	0.2931	1.5412	0.190176486	CcRR34	AT2G46790	0.5414	1.9751	0.274112703
CaHK6	AT3G04580	0.2835	1.6089	0.176207347	MtHK6	AT1G09570	0.1334	2.5763	0.051779684	CcRR9	AT4G18020	0.4329	3.3488	0.129270186
CaHK7	AT1G27320	0.2108	2.0551	0.102574084	MtHK7	AT2G47430	0.6035	2.8047	0.215174528					
CaHK8	AT5G10680	0.5131	2.3445	0.218852634	Mt-HP2	AT1G03430	0.3648	0						
CaPRR3	AT2G46790	0.5869	2.0003	0.293405989	Mt-HP4	AT3G16360	0.2156	1.2793	0.168529665					
CaPRR4	AT5G61380	0.3448	2.046	0.168523949	Mt-HP6	AT1G80100	0.1472	0						
CaPRR5	AT5G02810	0.5152	3.2443	0.15880159	MtRR17	AT2G46790	0.5188	2.4481	0.211919448					
CaPRR5	AT5G60100	0.5645	2.203	0.256241489	MtRR29	AT5G60100	0.4033	1.604	0.251433915					
CaRR11	AT1G68210	0.87	1.3104	0.663919414	MtRR33	AT5G61380	0.3957	1.7082	0.231647348					
					MtRR54	AT4G00760	1.1118	2.9816	0.372887041					
					MtRR54	AT2G46790	0.5403	2.5478	0.212065311					
					MtRR56	AT4G00760	1.0004	2.7112	0.368987902					
					MtRR56	AT2G46790	0.5758	2.3597	0.24401407					
					MtRR6	AT5G60100	0.4626	2.4443	0.189256638					
					MtRR6	AT5G02810	0.377	2.0548	0.183472844					

Supplemental Table 6: The ratio of total genes and TCS gene in *Medicago-C. cajan*, *Medicago-chickpea* and chickpea-*C. cajan*

Organism	Total number of genes		Gene Ratio	TCS Ratio
Chickpea (Ca)	50894	Mt/Cc	1.27	1.28
<i>Medicago</i> (Mt)	40071	Mt/Ca	1.8	1.43
<i>C. cajan</i> (Cc)	28269	Cc/Ca	1.41	1.11