

Supplemental Table 1. Nomenclature of plant MAPKKs divided by various groups based on sequence homology with *Arabidopsis* MAPKKs

Group	Gene name	ID / GenBank Acc No.	Polypeptide length (aa)	Other names	References
<i>Arabidopsis thaliana</i>					
A	AtMKK1	At4g26070	354	AtMEK1	Hadiarto et al., 2006
	AtMKK2	At4g29810	363		Teige et al., 2004
	AtMKK6	At5g56580	356	AtANQ1	Kosetsu et al. 2010
B	AtMKK3	At5g40440	520		Lee et al., 2008a
C	AtMKK4	At1g51660	366		Le et al., 2014; Lau and Bergmann 2012; Kim et al., 2012a
	AtMKK5	At3g21220	348	AtMEK5, AtMAP2Kalpha	Liu et al., 2008; Huang et al. 2000
D	AtMKK7	At1g18350	307	AtBUD1	Dai et al., 2006
	AtMKK8	At3g06230	293		
	AtMKK9	At1g73500	310		Lee et al., 2008a
	AtMKK10	At1g32320	305		Lee et al., 2008a
<i>Brassica napus</i>					
A	BnaMKK1	JQ708028	355		Liang et al. 2013
	BnaMKK2	JQ708029	364		Liang et al. 2013
	BnaMKK6	JQ708032	356		Liang et al. 2013
B	BnaMKK3	JQ708030	518		Liang et al. 2013
C	BnaMKK4	JQ708031	356		Liang et al. 2013
	BnaMKK5	KC246595	332		Liang et al. 2013
D	BnaMKK9	JQ708033	306		Liang et al. 2013
<i>Chlamydomonas reinhardtii</i>					
A	CreinMKK6	XP_001693665	249		
B	CreinMKK3	XP_001696437	452		
<i>Medicago sativa</i>					
A	MsMKK2	AJ293275	356	MsPRKK	Cardinale et al., 2002
C	MsMKK4	AJ293274	368	MsSIMKK	Cardinale et al., 2002
<i>Nicotiana tabacum</i>					
A	NtMKK2	AF165186	357	NtSIPKK	Gomi et al., 2005
	NtMKK6	AJ302651	354	NtMEK1, NtNQK1	Soyano et al., 2003
B	NtMKK3	D31964	518	NtNPK2	Gomi et al., 2005
C	NtMKK4	AF325168	372	NtMEK2	Gomi et al., 2005
<i>Oryza sativa</i>					
A	OsMKK1	Os06g05520	352	OsMEK2	Singh et al., 2012
	OsMKK6	Os01g32660	355	OsMEK1	Singh et al., 2012
B	OsMKK3	Os06g27890	320	OsMEK8a, OsMEK8b ⁹	Singh et al., 2012
C	OsMKK4	Os02g54600	369	OsMEK6	Singh et al., 2012
	OsMKK5	Os06g09180	342	OsMEK7a, OsMEK7b	Singh et al., 2012
D	OsMKK10-1	Os02g46760	340	OsMEK4	Singh et al., 2012
	OsMKK10-2	Os03g12390	339	OsMEK3	Singh et al., 2012
	OsMKK10-3	Os03g50550	345		

<i>Selaginella moellendorffii</i>					
A	SmMKK6	272204	346		
B	SmMKK3-1	74697	509		
	SmMKK3-2	168690	509		
D	SmMKK7-1	90224	333		
	SmMKK7-2	186197	353		
<i>Solanum lycopersicum</i>					
A	SIMKK2	Solyc12g009020	357	LeMEK1, SIMKK1	Cardinale et al., 2002; Li et al., 2014a
	SIMKK6	Solyc03g119490	354	SIMKK3	Li et al., 2014a
B	SIMKK3	Solyc03g019850	515	SIMKK5	Li et al., 2014a
C	SIMKK4	Solyc03g123800	359	SIMKK2	Li et al., 2014a
D	SIMKK9	Solyc03g097920	335	SIMKK4	Li et al., 2014a
<i>Volvox carteri</i>					
A	VcMKK6	73333	415		
B	VcMKK3	99491	327		
<i>Zea Mays</i>					
A	ZmMKK1	GRMZM2G400470_T03	350		
	ZmMKK6	GRMZM2G167856_T01	355	ZmMEK1	Kong et al., 2013
B	ZmMKK3-1	JN972438	523	ZmMKK3	Kong et al., 2013
	ZmMKK3-2	GRMZM2G004468_T05	561		
	ZmMKK3-3	GRMZM2G367411_T01	299		
C	ZmMKK4	GU942956	357		
	ZmMKK5	GRMZM5G834697_T01	347	ZmMAPKK1	Kong et al., 2013
D	ZmMKK10-1	GRMZM2G130213_T01	375		
	ZmMKK10-2	GRMZM2G344388_T01	401		