

**Supplemental Table 2** Nomenclature of plant MAPKs divided on groups based on sequence homology with *Arabidopsis* MAPKs

Motif	Group	Gene name	ID / GenBank Acc No.	Polypeptide length (aa)	Other names	References
<b><i>Arabidopsis thaliana</i></b>						
T-E-Y	MAPK group A	AtMPK3	At3g45640	370		Droillard et al., 2002
		AtMPK6	At2g43790	395		Droillard et al., 2002
		AtMPK10	At3g59790	393		Lee et al., 2008a
	MAPK group B	AtMPK4	At4g01370	376		Teige et al., 2004; Kong et al., 2012; Rodriguez et al., 2010; Kosetsu et al., 2010
		AtMPK5	At4g11330	376		Teige et al., 2004; Lee et al., 2008a
		AtMPK11	At1g01560	369		Lee et al., 2008a
		AtMPK12	At2g46070	372		Meszaros et al., 2006; Lee et al., 2009
	MAPK group C	AtMPK13	At1g07880	363		Teige et al., 2004; Lee et al., 2008a
		AtMPK1	At1g10210	370		Lee et al., 2008a; Doczi et al., 2012
		AtMPK2	At1g59580	376		Lee et al., 2008a; Doczi et al., 2012
		AtMPK7	At2g18170	368		Lee et al., 2008a; Doczi et al., 2012
		AtMPK14	At4g36450	361		Lee et al., 2008a; Doczi et al., 2012
	T-D-Y	MAPK group D	AtMPK8	At1g18150	589	
AtMPK9			At3g18040	510		Doczi et al., 2012
AtMPK15			At1g73670	576		Doczi et al., 2012
AtMPK16			At5g19010	567		Doczi et al., 2012
AtMPK17			At2g01450	486		Lee et al., 2008a
AtMPK18			At1g53510	615		Wang et al., 2011; Doczi et al., 2012
AtMPK19			At3g14720	598		Doczi et al., 2012
AtMPK20	At2g42880	606		Wang et al., 2011; Doczi et al., 2012; Lee et al., 2008a		
<b><i>Brassica napus</i></b>						
T-E-Y	MAPK group A	BnaMPK3	JQ708040	370		Liang et al. 2013
		BnaMPK6	JQ708043	395		Liang et al. 2013
	MAPK group B	BnaMPK4	JQ708041	373		Liang et al. 2013
		BnaMPK5	JQ708042	373		Liang et al. 2013
	MAPK group C	BnaMPK1	JQ708034	369		Liang et al. 2013
		BnaMPK2	JQ708038	370		Liang et al. 2013
T-D-Y	MAPK group D	BnaMPK8	JQ708044	581		Liang et al. 2013
		BnaMPK9	JQ708045	501		Liang et al. 2013
		BnaMPK16	JQ708035	558		Liang et al. 2013
		BnaMPK17	JQ708036	487		Liang et al. 2013
		BnaMPK19	JQ708037	599		Liang et al. 2013
		BnaMPK20	JQ708039	611		Liang et al. 2013
<b><i>Chlamydomonas reinhardtii</i></b>						
T-E-Y	MAPK group C	CreinMPK4-1	Cre01.g010000.t1.2	389		Mohanta et al., 2015
		CreinMPK4-2	Cre12.g508900.t1.2	375		Mohanta et al., 2015
		CreinMPK4-3	Cre12.g509000.t1.3	353		Mohanta et al., 2015
T-D-Y	MAPK group D	CreinMPK15	Cre08.g385050.t1.3	740		Mohanta et al., 2015

		<b>CreinMPK18</b>	g18025.t1	765		Mohanta et al., 2015
	MAPK group E	<b>CreinMPK7</b>	Cre13.g607300.t1.2	433		Mohanta et al., 2015
<b><i>Coccomyxa subellipsoidea</i></b>						
<b>T-E-Y</b>	MAPK group C	<b>CsubMPK4</b>	11831	377		Mohanta et al., 2015
<b>T-D-Y</b>	MAPK group D	<b>CsubMPK15</b>	54284	537		Mohanta et al., 2015
<b>T-R-M</b>	MAPK group E	<b>CsubMPK3</b>	14112	359		Mohanta et al., 2015
<b>T-D-Y</b>		<b>CsubMPK7</b>	47764	391		Mohanta et al., 2015
<b><i>Medicago sativa</i></b>						
<b>T-E-Y</b>	MAPK group A	<b>MsMPK3</b>	X82270	371	MsSAMK, MsMMK4	Cardinale et al., 2002; Daxberger et al., 2007
		<b>MsMPK6</b>	X66469	387	MsSIMK, MsK7, MsMMK1	Cardinale et al., 2002; Jonak et al., 1993; Daxberger et al., 2007
	MAPK group B	<b>MsMPK4</b>	X82268	371	MsMMK2	Cardinale et al., 2002
		<b>MsMPK13</b>	AJ224336	374	MsMMK3	Cardinale et al., 2002
<b>T-D-Y</b>	MAPK group D	<b>MsMPK19</b>	AF129087	608	MSTDY1	MAPK Group 2002
<b><i>Micromonas pusila</i> CCMP1545</b>						
<b>T-E-Y</b>	MAPK group C	<b>MpMPK2</b>	203785	374		Mohanta et al., 2015
		<b>MpMPK4</b>	27380	426		Mohanta et al., 2015
<b>T-D-Y</b>	MAPK group D	<b>MpMPK15</b>	44271	362		Mohanta et al., 2015
	MAPK group E	<b>MpMPK13</b>	14294	380		Mohanta et al., 2015
<b><i>Nicotiana tabacum</i></b>						
<b>T-E-Y</b>	MAPK group A	<b>NtMPK3</b>	AB052964	375	NtWIPK, NtMPK5	MAPK Group 2002; Zhang et al., 2013
		<b>NtMPK6-1</b>	AF165186	357	NtSIPK, NtMPK6	MAPK Group 2002; Zhang et al., 2013
		<b>NtMPK6-2</b>	X83880	393	NtNTF4, NtMPK7	MAPK Group 2002; Zhang et al., 2013
<b>M-E-Y</b>	MAPK group B	<b>NtMPK4-1</b>	AB212070	373	NtMPK4, NtMPK1	Gomi et al., 2005; Zhang et al., 2013
		<b>NtMPK4-2</b>	JX076820	374	NtMPK2	Zhang et al., 2013
		<b>NtMPK4-3</b>	JX076821	380	NtMPK3	Zhang et al., 2013
<b>T-E-Y</b>	MAPK group C	<b>NtMPK13</b>	AB055515	371	NtNRK1, NtNTF6, NtMPK4	MAPK Group 2002; Zhang et al., 2013
		<b>NtMPK1</b>	X69971	372	NtMPK14, NtNTF3	Berberich et al., 1999; MAPK Group 2002
		<b>NtMPK7</b>	JX076817	370	NtMPK15	Zhang et al., 2013
<b>T-D-Y</b>	MAPK group D	<b>NtMPK9-1</b>	JX076815	594	NtMPK12	Zhang et al., 2013
		<b>NtMPK9-2</b>	JX076816	590	NtMPK13	Zhang et al., 2013
		<b>NtMPK15</b>	JX076814	509	NtMPK11	Zhang et al., 2013
		<b>NtMPK16</b>	JX076813	566	NtMPK10	Zhang et al., 2013
		<b>NtMPK18</b>	JX076823	373	NtMPK9	Zhang et al., 2013
		<b>NtMPK20</b>	JX076822	610	NtMPK8	Zhang et al., 2013
<b>T-E-Y</b>	MAPK group E	<b>NtMPK22-1</b>	JX076818	425	NtMPK16	Zhang et al., 2013
		<b>NtMPK22-2</b>	JX076819	470	NtMPK17	Zhang et al., 2013
<b><i>Ostreococcus lucimarinus</i></b>						
<b>T-E-Y</b>	MAPK group C	<b>OIMPK6</b>	C_Ch_9000126	405		Mohanta et al., 2015
<b>T-S-Y</b>		<b>OIMPK7</b>	e_gwEuk.9.247	449		Mohanta et al., 2015
<b>T-D-Y</b>	MAPK group D	<b>OIMPK9</b>	gwEuk.8.109.1	387		Mohanta et al., 2015
<b><i>Oryza sativa</i></b>						

<b>T-E-Y</b>	MAPK group A	<b>OsMPK3</b>	Os03g17700	369	OsMPK5, OsMAP1, OsMAPK2, OsMSRMK2, OsBIMK1	Reyna and Yang, 2006; Wen et al., 2002; Huang et al., 2002; Agrawal et al., 2002; Song and Goodman, 2002
		<b>OsMPK6</b>	Os06g06090	398	OsMPK1, OsMAPK6, OsSIPK	Reyna and Yang, 2006; Lieberherr et al., 2005; Lee et al., 2008b
<b>M-E-Y</b>	MAPK group B	<b>OsMPK4-1</b>	Os10g38950	376	OsMPK6	Reyna and Yang, 2006
		<b>OsMPK4-2</b>	Os08g06060	394	OsMPK2	Reyna and Yang, 2006
<b>T-E-Y</b>	MAPK group C	<b>OsMPK7</b>	Os06g48590	369	OsMPK4, OsMAPK4, OsMAPkinase2, OsMSRMK3, OsBIMK1, OsMPK3	Reyna and Yang, 2006; Jonak et al., 1993; Song and Goodman, 2002; Hamel et al., 2006
		<b>OsMPK14</b>	Os02g05480	370	OsMPK3, OsMAPK3, OsMAP3	Reyna and Yang, 2006; Jonak et al., 1993; Cardinale et al., 2002
<b>T-D-Y</b>	MAPK group D	<b>OsMPK16-1</b>	Os11g17080	498	OsMPK15	Reyna and Yang, 2006
		<b>OsMPK16-2</b>	Os05g05160	542	OsMPK14	Reyna and Yang, 2006
		<b>OsMPK17-1</b>	Os06g49430	580	OsMPK12, OsBWMK1	Reyna and Yang, 2006; Cheong et al., 2003
		<b>OsMPK17-2</b>	Os02g04230	506	OsMPK13, OsBIMK2, OsRMAPK2	Reyna and Yang, 2006; Song et al., 2006; Hamel et al., 2006
		<b>OsMPK20-1</b>	Os01g43910	611	OsMPK9, OsMPK10	Reyna and Yang, 2006
-	MAPK group D	<b>OsMPK20-2</b>	Os05g50560	349		
<b>T-D-Y</b>		<b>OsMPK20-3</b>	Os06g26340	570	OsMPK11	Reyna and Yang, 2006
		<b>OsMPK20-4</b>	Os01g47530	569	OsMPK8, OsWJUMK1, OsMPKG1	Reyna and Yang, 2006; Hamel et al., 2006
	<b>OsMPK20-5</b>	Os05g49140	592	OsMPK7	Reyna and Yang, 2006	
	<b>OsMPK21-1</b>	Os05g50120	582	OsMPK17	Reyna and Yang, 2006	
		<b>OsMPK21-2</b>	Os01g45620	501	OsMPK16, OsMPKG2	Reyna and Yang, 2006; Hamel et al., 2006
<b><i>Picea abies</i></b>						
<b>T-E-Y</b>	MAPK group A	<b>PaMPK6</b>	MA_10437020g0010	469		Mohanta et al., 2015
	MAPK group B	<b>PaMPK4</b>	MA_10437018g0010	423		Mohanta et al., 2015
MAPK group C		<b>PaMPK11</b>	MA_10432928g0010	290		Mohanta et al., 2015
	<b>PaMPK1</b>	MA_10428223g0010	368		Mohanta et al., 2015	
	<b>PaMPK2</b>	MA_9261976g0010	179		Mohanta et al., 2015	
	<b>PaMPK3</b>	MA_160202g0010	179		Mohanta et al., 2015	
	-	<b>PaMPK7-1</b>	MA_8212817g0010	180		Mohanta et al., 2015
		<b>PaMPK20</b>	MA_8212817g0010	180		Mohanta et al., 2015
		<b>PaMPK8</b>	MA_10427605g0010	216		Mohanta et al., 2015
<b>T-D-Y</b>	MAPK group D	<b>PaMPK16</b>	MA_91728g0010	749		Mohanta et al., 2015
<b>T-E-M</b>	MAPK group E	<b>PaMPK5</b>	MA_42176g0010	404		Mohanta et al., 2015
<b>T-Q-M</b>		<b>PaMPK7-2</b>	MA_60199g0010	145		Mohanta et al., 2015
		<b>PaMPK10</b>	MA_117156g0010	364		Mohanta et al., 2015
<b>T-E-M</b>		<b>PaMPK14</b>	MA_42176g0010	404		Mohanta et al., 2015
<b><i>Selaginella moellendorffii</i></b>						
<b>T-E-Y</b>	MAPK group B	<b>SmMPK4</b>	105143	374		Mohanta et al., 2015
	MAPK group C	<b>SmMPK1</b>	443152	374		Mohanta et al., 2015
		<b>SmMPK7</b>	75282	370		Mohanta et al., 2015

<b>T-D-Y</b>	MAPK group D	<b>SmMPK16-1</b>	74687	474		Mohanta et al., 2015
		<b>SmMPK16-2</b>	97841	408		Mohanta et al., 2015
	MAPK group E	<b>SmMPK10</b>	82767	380		Mohanta et al., 2015
<b><i>Solanum lycopersicum</i></b>						
<b>T-E-Y</b>	MAPK group A	<b>SIMP3</b>	Solyc06g005170	373	SIMAPK3, LeMPK3	Kong et al., 2012; Kandoth et al., 2007
		<b>SIMP6-1</b>	Solyc08g014420	394	SIMAPK2, LeMPK2, SIMPK2	Kong et al., 2012; Kandoth et al., 2007; Li et al., 2014a
		<b>SIMP6-2</b>	Solyc12g019460	396	SIMAPK1, LeMPK1, SIMPK1	Kong et al., 2012; Kandoth et al., 2007; Li et al., 2014a
<b>M-E-Y</b>	MAPK group B	<b>SIMP4-1</b>	Solyc05g049970	376	SIMAPK6	Kong et al., 2012
<b>T-E-Y</b>		<b>SIMP4-2</b>	Solyc01g094960	373	SIMAPK5	Kong et al., 2012
		<b>SIMP5</b>	Solyc08g081490	379	SIMAPK7	Kong et al., 2012
		<b>SIMP13</b>	Solyc11g072630	372	SIMAPK4, SIMPK4	Kong et al., 2012; Li et al., 2014a;
<b>T-E-Y</b>	MAPK group C	<b>SIMP1</b>	Solyc04g080730	372	SIMAPK9	Kong et al., 2012
		<b>SIMP7</b>	Solyc02g084870	370	SIMAPK8	Kong et al., 2012
<b>T-D-Y</b>	MAPK group D	<b>SIMP9-1</b>	Solyc06g068990	601		
		<b>SIMP9-2</b>	Solyc12g040680	575	SIMAPK16	Kong et al., 2012
		<b>SIMP15-1</b>	Solyc04g007710	512	SIMAPK14	Kong et al., 2012
		<b>SIMP15-2</b>	Solyc05g008020	513	SIMAPK15	Kong et al., 2012
		<b>SIMP16</b>	Solyc01g080240	565	SIMAPK13	Kong et al., 2012
		<b>SIMP19-1</b>	Solyc10g007500	593	SIMAPK10	Kong et al., 2012
		<b>SIMP19-2</b>	Solyc07g062080	600	SIMAPK11	Kong et al., 2012
		<b>SIMP20</b>	Solyc07g056350	621	SIMAPK12	Kong et al., 2012
<b><i>Volvox carteri</i></b>						
<b>T-E-Y</b>	MAPK group C	<b>VcMPK4-1</b>	Vocar20007163m	397		Mohanta et al., 2015
		<b>VcMPK4-2</b>	Vocar20000906m	381		Mohanta et al., 2015
<b>T-D-Y</b>	MAPK group D	<b>VcMPK9</b>	Vocar20004345m	466		Mohanta et al., 2015
		<b>VcMPK20</b>	Vocar20011355m.g	644		Mohanta et al., 2015
	MAPK group E	<b>VcMPK5</b>	Vocar20007415m	430		Mohanta et al., 2015
<b><i>Zea mays</i></b>						
<b>T-E-Y</b>	MAPK group A	<b>ZmMPK3-1</b>	GRMZM2G053987	321	ZmMPK4; ZmMPK5	Sun et al., 2015; Berberich et al., 1999
		<b>ZmMPK3-2</b>	GRMZM2G017792	376	ZmMPK3	Sun et al., 2015
		<b>ZmMPK6-1</b>	GRMZM2G002100	398	ZmMPK7	Sun et al., 2015
		<b>ZmMPK6-2</b>	GRMZM2G020216	398	ZmMPK5	Sun et al., 2015
<b>M-E-Y</b>	MAPK group B	<b>ZmMPK4-1</b>	GRMZM2G127141	372	ZmSIMK, ZmMPK4	Sun et al., 2015; Liu et al., 2013
		<b>ZmMPK4-2</b>	GRMZM2G123886	391	ZmMPK1, ZmMPK12	Sun et al., 2015; Liu et al., 2013
<b>T-E-Y</b>	MAPK group C	<b>ZmMPK7</b>	GRMZM2G048455	369	ZmMPK8, ZmMPK1	Sun et al., 2015; Liu et al., 2013
		<b>ZmMPK14</b>	GRMZM2G062914	370	ZmMPK2	Sun et al., 2015
<b>T-D-Y</b>	MAPK group D	<b>ZmMPK16</b>	GRMZM2G089484	557	ZmMPK6	Sun et al., 2015;
		<b>ZmMPK17-1</b>	GRMZM2G306028	499	ZmMPK10, ZmMPK17-2	Sun et al., 2015; Liu et al., 2013
		<b>ZmMPK17-2</b>	GRMZM2G374088	491	ZmMPK17, ZmMPK17-1	Sun et al., 2015; Liu et al., 2013
		<b>ZmMPK17-3</b>	GRMZM2G135904	289	ZmMPK9	Sun et al., 2015
		<b>ZmMPK20-1</b>	GRMZM2G131334	483	ZmMPK14, ZmMPK20-2	Sun et al., 2015; Liu et al., 2013
		<b>ZmMPK20-2</b>	GRMZM2G163861	602	ZmMPK13, ZmMPK20-1	Sun et al., 2015; Liu et al., 2013
		<b>ZmMPK20-4</b>	GRMZM2G122335	588	ZmMPK19, ZmMPK18-1	Sun et al., 2015; Liu et al., 2013
		<b>ZmMPK20-5</b>	GRMZM2G007848	589	ZmMPK18, ZmMPK18-2	Sun et al., 2015; Liu et al., 2013

		<b>ZmMPK20-6</b>	GRMZM2G034052	579	ZmMPK16, ZmMPK19	Sun et al., 2015; Liu et al., 2013
		<b>ZmMPK21-1</b>	GRMZM2G062761	601	ZmMPK12, ZmMPK15	Sun et al., 2015; Liu et al., 2013
		<b>ZmMPK21-2</b>	GRMZM2G375975	489	ZmMPK11, ZmMPK8	Sun et al., 2015; Liu et al., 2013