

Supplementary Table S4 Comparisons of the QTL regions identified in this study for salinity tolerance at seedling stage, with previously mapped QTLs from different populations and for different growth stages

Gene/QTL name	Chr.	Growth Stage	Mapping Population	Evaluation index	Interval/peak	Position (cM)	PVE (%)	References	Remarks
QNa	1	Seedling	RIL	High Na uptake				Flowers et al. 2000 qNa2 (134.4 cM), qNa10 (68.8cM) – This study	Absent
Trait-based QTL	1	Seedling	RIL	Na ⁺ uptake	E12M55-3	74 cM	8.9	Koyama et al. 2001 <i>qNa2</i> (134.4 cM), <i>qNa10</i> (68.8cM) – This study	„
Trait-based QTL	1	Seedling	RIL	K ⁺ concentration	E12M37-1	56 cM	10.6	Koyama et al. 2001 <i>qK1</i> (156.5 cM) – This study	Novel
Trait-based QTL	1	Seedling	RIL	Na: K ratio	E12M57-1	74 cM	9.1	Koyama et al. 2001 <i>qNaKR12</i> (39.4 cM) – This study	Absent
<i>Saltol</i>	1	Seedling	RIL	Na ⁺ uptake	RM140 - C1733S	between 51.6 and 65.9cM / 13.87 Mb	39.2	Bonilla et al. 2002 <i>qSUR11</i> (21 cM) – This study	Novel
<i>Saltol</i>	1	Seedling	RIL	K ⁺ uptake	RM140 - C1733S	between 51.6 and 65.9cM / 13.87 Mb	43.9	„ <i>qK1</i> (156.5 cM) – This study	„
<i>Saltol</i>	1	Seedling	RIL	Na/K ratio	RM140 - C1733S	between 51.6 and 65.9cM / 13.87 Mb	43.2	„ <i>qNaKR12</i> (39.4 cM) – This study	„
<i>qSDW1</i>	1	Seedling	BIL	Shoot dry weight	36.09-36.28	0.75 cM	28.6	Nakhla et al. 2021 <i>qSDW1</i> (123.4 cM), <i>qSDW10</i> (68.6) – This study	„
<i>qSDS-1</i>	1	Seedling	F _{2:3}	Seedling survival	C813 - C86	-	18.0	Lin et al. 2004 <i>qSUR11</i> (21 cM) – This study	Novel
<i>qSKC-1</i>	1	Seedling	F _{2:3}	Shoot K ⁺ concentration	C1211 - S2139	-	40.1	„ <i>qK1</i> (156.5 cM) – This study	Absent

Gene/QTL name	Chr.	Growth Stage	Mapping Population	Evaluation index	Interval/peak	Position (cM)	PVE (%)	References	Remarks
<i>qRNTQ-1</i>	1	Seedling	F _{2:3}	Root Na ⁺ total quantity	C813 - C86	-	12.4	„	„
<i>OsHKT1;5 (SKC1)</i>	1	Seedling	Advanced backcross	Shoot K ⁺ concentration	K159 - K061	11.46 Mb	-	Ren et al. 2005 <i>qK1</i> (156.5 cM) – This study	Absent
<i>qST1</i>	1	Seedling	RIL		Est1-2 & RZ569A	40 cM	27.8	Lee et al. 2006	„
<i>qSESI</i>	1	Seedling	F ₂	SES	RM8094- RM582	-	19.6	Bimpong et al. 2014 <i>qSESI</i> (151.8 cM) – This study	Novel
<i>qSur1.1</i>	1	Seedling	F ₂	Survival	RM472-RM14	162.9 cM	16.0	Rahman et al. 2019 <i>qSUR11</i> (21 cM) – This study	Novel
<i>qSL1.1</i>	1	Seedling	RIL	Shoot length	id1023892– id1024836	162.6 cM	20.6	Bizimana et al. 2017 <i>qSL1</i> (156 cM), <i>qSL8</i> (22 cM) – This study	Same
<i>qSL1.2</i>	1	Seedling	RIL	Shoot length	id1024972– id1025983	168.6 cM	11.8	„, <i>qSL1</i> (156 cM), <i>qSL8</i> (22 cM) – This study	Absent
<i>qSIS1.39</i>	1	Seedling	IL	Salt injury score (SIS)	RM3810	39.5 cM	6.4	De Leon et al. 2017	Novel
<i>qSHL1.39</i>	1	Seedling	IL	Shoot length	RM3810	39.5 cM	8.2	„, <i>qSL1</i> (156 cM), <i>qSL8</i> (22 cM) – This study	Same
<i>qSHL1.41</i>	1	Seedling	IL	Shoot length	RM5362	41.1 cM	6.8	„	-
<i>qK2</i>	2	Seedling	BIL	K ⁺ uptake	19.80-20.15	1.37 cM	26.1	Nakhla et al. 2021 <i>qK1</i> (156.5 cM) – This study	„
<i>qSHL2.3</i>	2	Seedling	IL	Shoot length	RM211	3.0 cM	6.6	„	Absent
<i>qYLD2.1</i>	2	Reproductive	F ₂	Yield	Id2004774	40.1cM	14.6	Mondal et al. 2019	„
<i>qSES2.1</i>	2	Seedling	RIL	SES	id2004774– id2007526	64.8 cM	11.1	Bizimana et al. 2017 <i>qSESI</i> (151.8 cM) – This study Mondal et al. 2019	„
<i>qNFS2.1</i>	2	Reproductive	F ₂	Filled spikelet		40.1 cM	15.3	„	„
<i>qPFS2.1</i>	2	Reproductive	F ₂	number	id2004774	122.1 cM	18.4	Nakhla et al. 2021	„
<i>qNa2.1</i>	2	Reproductive	BIL	Filled spikelet (%)	id20133434 4.15-4.26	0.43 cM	5.3	„	„
<i>qNa2.2</i>	2	Seedling	BIL	Na ⁺ uptake	4.26-5.43	4.59 cM	17.8	„, <i>qNa2</i> (134.4 cM), <i>qNa10</i> (68.8cM) – This study	„
		Seedling		Na ⁺ uptake					

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<i>qSIS2.3</i>	2	Seedling	IL	Salt injury score (SIS)	RM211	3.0 cM	6.5	„	„
<i>qSHL2.3</i>	2	Seedling	IL	Shoot length	RM211	3.0 cM	6.6	„, <i>qSL1</i> (156 cM), <i>qSL8</i> (22 cM) – This study	Absent
<i>qST3</i>	3	Seedling	RIL		RG179 - RZ596	138 cM	9.2	Lee et al. 2006	Novel
<i>qSES3.1</i>	3	Seedling	F _{2:3}	SES	RM5626-R3M53	111.0 cM	23.0	Rahman et al. 2019 <i>qSES1</i> (151.8 cM) – This study „, <i>qSUR11</i> (21 cM) – This study	Novel
<i>qSur3.2</i>	3	Seedling	F _{2:3}	Survival	RM5626-R3M53	111.0	18.0		Novel
Q _{NaK}	4	Seedling	RIL	Na:K discrimination				Flowers et al. 2000 <i>qNaKR12</i> (39.4 cM) – This study	
Trait-based QTL	4	Seedling	RIL	K ⁺ uptake	E12M65-1	10 cM	6.8	Koyama et al. 2001 <i>qK1</i> (156.5 cM) – This study	Novel
Trait-based QTL	4	Seedling	RIL	K ⁺ concentration	E15M53-2	90 cM	8.8	„, <i>qK1</i> (156.5 cM) – This study	„
	4	Seedling	RIL	Na ⁺ concentration	E12M73-1; E12M75-5; E15M50-5; E12M79-1	24 cM	6.7	„, <i>qNa2</i> (134.4 cM), <i>qNa10</i> (68.8cM) – This study	„
Trait-based QTL	4	Seedling	RIL	Na:K ratio	E12M65-1	14 cM	9.6	„, <i>qNaKR12</i> (39.4 cM) – This study	„
<i>qRKC-4</i>	4	Seedling	F _{2:3}	Root K ⁺ concentration	C891 - C513	-	21.6	Lin et al. 2004	„
qSDM-5	5	Seedling	Double haploid lines	Seedling dry matter	RZ70-RZ225	-	17.9	Prasad et al. 2000 <i>qSDW1</i> (123.4 cM), <i>qSDW10</i> (68.6) – This study	„
<i>qSHL-5</i>	5	Seedling	F _{2:4}	Shoot length	RM13-RM164	106.8 cM	19.5	Ghomi et al. 2013 <i>qSL1</i> (156 cM), <i>qSL8</i> (22 cM) – This study	Absent
<i>qSHL5.04</i>	5	Seedling	IL	Shoot length	RM17749	0.4 cM	8.5	De Leon et al. 2017	„
Q _{K1}	6	Seedling	NIL	K ⁺ uptake				Flowers et al. 2000	„

Gene/QTL name	Chr.	Growth Stage	Mapping Population	Evaluation index	Interval/peak	Position (cM)	PVE (%)	References	Remarks
qSGEM-6	6	Germination	Double haploid lines	Seed germination	RZ398-RG213 -		16.3	<i>qK1</i> (156.5 cM) – This study Prasad et al. 2000	„
Trait-based QTL	6	Seedling	RIL	Dry mass	E12M55-2	34 cM	9.7	Koyama et al. 2001	Novel
Trait-based QTL	6	Seedling	RIL	K ⁺ uptake	OSR19; E12M80-2	30 cM	7.6	„	Absent
Trait-based QTL	6	Seedling	RIL	Na ⁺ concentration	E12M35-2	106 cM	6.4	„ <i>qNa2</i> (134.4 cM), <i>qNa10</i> (68.8cM) – This study	„
<i>qSDS-6</i>	6	Seedling	F _{2:3}	Seedling survival	C214 - R2549 -		17.0	Lin et al. 2004 <i>qSUR11</i> (21 cM) – This study	Novel
<i>qSES6</i>	6	Seedling	F2	SES	RM586- RM253	-	39.7	Bimpong et al. 2014 <i>qSES1</i> (151.8 cM) – This study	„
<i>qSHL-6</i>	6	Seedling	F2:4	Shoot length	RM402- RM549	87.4 cM	14.6	Ghomi et al. 2013 <i>qSL1</i> (156 cM), <i>qSL8</i> (22 cM) – This study	„
<i>qSL6.1</i>	6	Seedling	RIL	Shoot length	fd13-id6004343	18.5 cM	12.1	Bizimana et al. 2017 <i>qSL1</i> (156 cM), <i>qSL8</i> (22 cM) – This study	Novel
<i>qSIS6.5</i>	6	Seedling	IL	Salt injury score (SIS)	RM253	5.4 cM	7.0	De Leon et al. 2017	„
<i>qSHL6.5</i>	6	Seedling	IL	Shoot length	RM253	5.4 cM	12.6	„	Absent
<i>qSDS-7</i>	7	Seedling	F _{2:3}	Seedling survival	R2401 - L538T7	-	13.9	Lin et al. 2004 <i>qSUR11</i> (21 cM) – This study	„
<i>qSNC-7</i>	7	Seedling	F _{2:3}	Shoot Na ⁺ concentration	C1057 - R2401	-	48.5	„	Absent
<i>qSNTQ-7</i>	7	Seedling	F _{2:3}	Shoot Na ⁺ total quantity	C1057 - R2401	-	16.1	„	„
<i>qRKC-7</i>	7	Seedling	F _{2:3}	Root K ⁺ concentration	C1057 - R2401	-	17.8	„	Absent
<i>qRKTQ-7</i>	7	Seedling	F _{2:3}	Root K ⁺ total quantity	C1057 - R2401	-	17.3	„	„
<i>qSL7</i>	7	Seedling	RIL	Higher shoot length	SNP7-191- SNP7-226	86.31 cM	9.9	Jahan et al. 2020	„

Gene/QTL name	Chr.	Growth Stage	Mapping Population	Evaluation index	Interval/peak	Position (cM)	PVE (%)	References	Remarks
<i>qSIS7.12</i>	7	Seedling	IL	Salt injury score (SIS)	RM214	12.8 cM	5.9	De Leon et al. 2017	„
<i>qSIS7.17</i>	7	Seedling	IL	Salt injury score (SIS)	RM5793	17.5 cM	8.1	„	„
<i>qSHL7.12</i>	7	Seedling	IL	Shoot length	RM214	12.8 cM	6.7	„ <i>qSL1</i> (156 cM), <i>qSL8</i> (22 cM) – This study	„
<i>Q_{K2}</i>	9	Seedling	NIL	K ⁺ uptake				Flowers et al. 2000 <i>qK1</i> (156.5 cM) – This study	Absent
Trait-based QTL	9	Seedling	RIL	K ⁺ uptake	E12M55-4	96 cM	19.6	Koyama et al. 2001 <i>qK1</i> (156.5 cM) – This study	„
<i>qRNC-9</i>	9	Seedling	F _{2:3}	Root Na ⁺ concentration	R1751 - R2638	-	16.7	Lin et al. 2004	„
<i>qSHL-9</i>	9	Seedling	F _{2:4}	Shoot length	E37-M60-13- E36-M60-1	136.1 cM	9.9	Ghomi et al. 2013	„
<i>qSES10</i>	10	Seedling	F ₂	SES	RM228- RM333	-	30.7	Bimpong et al. 2014 <i>qSES1</i> (151.8 cM) – This study	Absent
<i>qSHL-10</i>	10	Seedling	F _{2:4}	Shoot length	RM2863-E36-M61-13	111.4 cM	4.1	Ghomi et al. 2013 <i>qSL1</i> (156 cM), <i>qSL8</i> (22 cM) – This study	„
<i>qSPAD10.1</i>	10	Seedling	F ₂	SPAD value	RM501C- RM5806	33.2 cM	15	Rahman et al. 2019 <i>qSPAD7</i> (91.4 cM) – This study	Novel
<i>qSES11</i>	11	Seedling	F ₂	SES	RM536- RM287	-	37.2	Bimpong et al. 2014 <i>qSES1</i> (151.8 cM) – This study	„
<i>qTS11.1</i>	11	Reproductive	F ₂	Total spikelet number	Id11000858	14.0 cM	15.8	Mondal et al. 2019 Nakhla et al. 2021 <i>qK1</i> (156.5 cM) – This study	„
<i>qK11</i>	11	Seedling	BIL	K ⁺ uptake	25.75-2.59	.43 cM	9.6		„
<i>qSL12.1</i>	12	Seedling	RIL	Shoot length	id12000252- id12001321	6.9 cM	9.8	Bizimana et al. 2017 <i>qSL1</i> (156 cM), <i>qSL8</i> (22 cM) – This study	Novel
<i>qSES12.1</i>	12	Seedling	RIL	SES	id12000252- id12001321	6.9 cM	10.6	O'Connor et al. 2020 <i>qSES1</i> (151.8 cM) – This study	„
<i>qDEG-S-2-2</i>		Reproductive	Backcross	Spikelet degeneration		6.8 cM	34.44	„	„
<i>qDEG-S-4-3</i>			Backcross			4.19 cM	17.43	Rahman et al. 2019 <i>qSUR11</i> (21 cM) – This study	„
<i>qSur12.3</i>	12		F _{2:3}			67.1 cM	16.0		Novel

Gene/QTL name	Chr.	Growth Stage	Mapping Population	Evaluation index	Interval/peak	Position (cM)	PVE (%)	References	Remarks
		Reproductive Seedling		Spikelet degeneration Survival	S12055-RM28466				

Chr: Chromosome number; IL: Introgression line; PVE: Phenotypic variation explained; RIL: Recombinant inbred line; BIL: Backcross Introgression line; SES: Overall phenotypic performance; SL: Shoot length; Na: Na⁺ concentration; K: K⁺ concentration; NaK-R: Na-K ratio, Sur: Survival; indicates embedded QTLs identified in this study

