

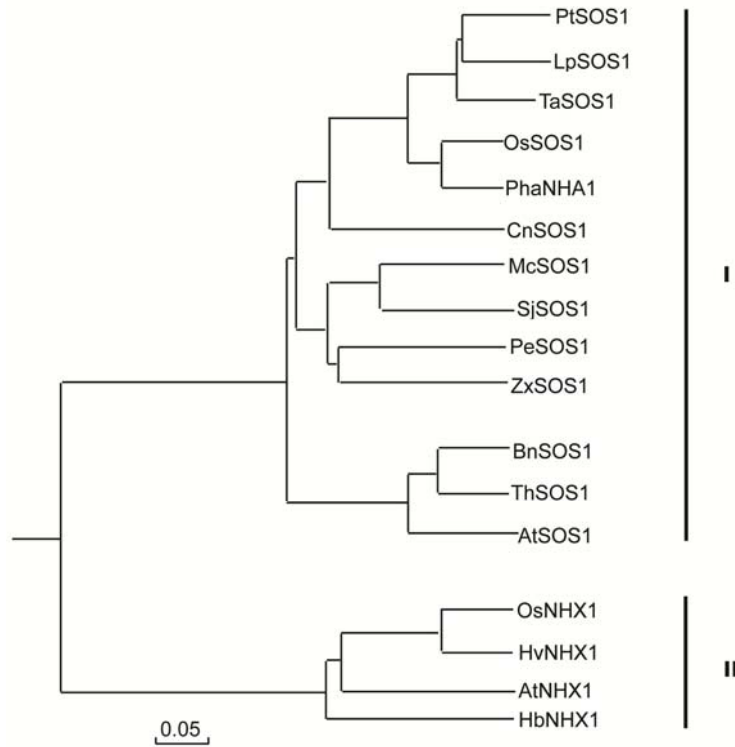
## Supplementary material

TaSOS1	MEITGEAGSESPDDAVIEFGVAVLVGDA SRHLIRGTRVYTYVALIVLGVAGCEYGTAKHGLGKLGAGIRIWAANPDLLLAVELFALLFE	90
PtSOS1	..MEEAGS..SPDDAVIEFGVSLVLGICSRHLIRGTRVYTYVALIVLGVAGCEYGTAKHGLGKLGAGIRIWAANPDLLLAVELFALLFE	87
	<div style="display: flex; justify-content: space-around; width: 100%;"> <span>TM 1</span> <span>TM 2</span> <span>TM 3</span> </div>	
TaSOS1	SSFSMEVHQIKKCAQCVLLAVPCVVISTVLLGAVKLTFFPYDINWKTSEFLSGLLSATDFVAVVALLKDLGASKRLSTIIEGESIMNDG	180
PtSOS1	SSFSMEVHQIKKCAQCVLLAVPCVVISTVLLGAVKLTFFPYDINWKTSEFLSGLLSATDFVAVVALLKDLGASKRLSTIIEGESIMNDG	177
	<div style="display: flex; justify-content: space-around; width: 100%;"> <span>TM 3</span> <span>TM 4</span> <span>TM 5</span> </div>	
TaSOS1	TAIVVYQLFYRMVIGITFDAGSIIRKFLSQVSLGAVALGLAFGIASVWLWGFINDTIIIEISLTLAVSYIAFFTAQDAIEVSGVLAVMTLG	270
PtSOS1	TAIVVYQLFYRMVIGITFDAGSIIRKFLSQVSLGAVALGLAFGIASVWLWGFINDTIIIEISLTLAVSYIAFFTAQDAIEVSGVLAVMTLG	267
	<div style="display: flex; justify-content: space-around; width: 100%;"> <span>TM 6</span> <span>TM 7</span> </div>	
TaSOS1	MFYAAFAKTAFKGDSQCSLHHEWEMAYIANLIFILSGVVIADGVLDQNIHEERHCA SWGFLVLYLVEVQLSRVVVGVLPDLLRHFGY	360
PtSOS1	MFYAAFAKTAFKGDSQCSLHHEWEMAYIANLIFILSGVVIADGVLDQNIHEERHCA SWGFLVLYLVEVQLSRVVVGVLPDLLRHFGY	357
	<div style="display: flex; justify-content: space-around; width: 100%;"> <span>TM 7</span> <span>TM 8</span> <span>TM 9</span> </div>	
TaSOS1	GMDVREATVIVWSGLRCAVALSLSLVKRASDADQFYIRSEVGVVVFVFTGGIVFLTLINNGSTTQFLLHLLGLKLSATKIRVVKYTRQY	450
PtSOS1	GMDVREATVIVWSGLRCAVALSLSLVKRASDADQFYIRSEVGVVVFVFTGGIVFLTLINNGSTTQFLLHLLGLKLSATKIRVVKYTRQY	447
	<div style="display: flex; justify-content: space-around; width: 100%;"> <span>TM 10</span> <span>TM 11</span> </div>	
TaSOS1	EMINRAEAFGDLRDEELGEPDVAIVKKYITCLNNLEDEQAHPHAPDKDENVHTMNLKPTRVRLINGVQAAYWMLLEGRITQSTANI	540
PtSOS1	EMINRAEAFGDLRDEELGEPDVAIVKKYITCLNNLEDEQAHPHAPDKDENVHTMNLKPTRVRLINGVQAAYWMLLEGRITQSTANI	537
TaSOS1	LMRSVDEAMDVLSQSIDCWGRGRLSNVHFENYRFLQMSRLPRVYTYFTVERLELGCYCAAFRAHRIARRQLHDFLGDSEIARIVID	630
PtSOS1	LMRSVDEAMDVLSQSIDCWGRGRLSNVHFENYRFLQMSRLPRVYTYFTVERLELGCYCAAFRAHRIARRQLHDFLGDSEIARIVID	627
TaSOS1	ESTAVGEGAKKFLIEDVRFVFPQVIRALKTRCVTYAVLTHLSEYIQDLGKTGLLEEKEMVHDDALQTDLKKLKRNPPIARMFRVRELINT	720
PtSOS1	ESTAVGEGAKKFLIEDVRFVFPQVIRALKTRCVTYAVLTHLSEYIQDLGKTGLLEEKEMVHDDALQTDLKKLKRNPPIARMFRVRELINT	717
TaSOS1	HPIVGALEAVVRDPLLSMTKETIRVHGTYLYEGSRRTGIWLVSTGIVRWTSRRICSTRHSIDPILSHGSTLGLYEALVGRPKYICDIITES	810
PtSOS1	HPIVGALEAVVRDPLLSMTKETIRVHGTYLYEGSRRTGIWLVSTGIVRWTSRRICSTRHSIDPILSHGSTLGLYEALVGRPKYICDIITES	807
	Cyclin Nucleotide Binding Domain	
TaSOS1	VVHCFEAEKIEQLRQSDPSIEDFMWQESAVIARIILPQIFEKAMREMRVLISERSMNVYIRGEAIELGHNVGILLEGFLKTNR	900
PtSOS1	VVHCFEAEKIEQLRQSDPSIEDFMWQESAVIARIILPQIFEKAMREMRVLISERSMNVYIRGEAIELGHNVGILLEGFLKTNR	896
	Cyclin Nucleotide Binding Domain	
TaSOS1	TLITFAVLLPSNTDNLVFLQSSVMNEIDYCYTAPSYCVARARAILDERSPEASDMQRSASLLSPRLGPEPTQSKHEHGLLRWES	990
PtSOS1	TLITFAVLLPSNTDNLVFLQSSVMNEIDYCYTAPSYCVARARAILDERSPEASDMQRSASLLSPRLGPEPTQSKHEHGLLRWES	986
TaSOS1	FR.RSSGGPGNLSLAETRCQPGSFSARALQVSMYG.SMIDGMHFAKRCPLAFVEGNQKHSVSYFVPSR.AADTRPLLSVSEGSNMKRR	1077
PtSOS1	FR.HHRSRGPGRNLSLAETRCQPGSFSARALQVSMYGSMDDEMETAQPRPDRPDRVFNQKHSVSYFVPSRPLSNRTRPLLSVSEGSNMKRR	1076
TaSOS1	K.....SAFAFAFAFALAPFFPLAPGQQRFAVGEDDSSDESAGEEVIVRVDSPSMLSENFPSCPPFG	1141
PtSOS1	KSAFAFAFAFALAPFFPLAPGRHFAITEDGNSDESAGEEVIVRVDSPSMLAFCF...PPQG	1142

**Fig. S1.** Sequence alignment of PtSOS1 with other SOS1 from higher plants.

Sources of plasma membrane  $\text{Na}^+/\text{H}^+$  antiporters and their GenBank accession numbers are as follows: PtSOS1 (*Puccinellia tenuiflora*, GQ452778) and TaSOS1 (*Triticum aestivum*, AY326952). The sequences were aligned with DNAMAN 6.0 software. Amino acid residues highlighted in black are conserved in the two

transporters. The identical and different amino acid residues were indicated with white and green, respectively. The eleven putative trans-membrane domains (TM 1-  
TM 11) and cyclic nucleotide binding domain are underlined, respectively.



**Fig. S2.** Phylogenetic tree of the SOS1. The tree was constructed by the Neighbor-joining method. The proteins are as follows: PtSOS1 (*Puccinellia tenuiflora*, GQ452778), TaSOS1(*Triticum aestivum*, AY326952), OsSOS1 (*Oryza sativa*, AY785147), PhaNHA1 (*Phragmites australis*, AB244217), LpSOS1 (*Lolium perenne*, AY987046), CnSOS1(*Cymodocea nodosa*, AJ427294), PeSOS1 (*Populus euphratica*, DQ517530), SjSOS1 (*Suaeda japonica*, AB198179), ZxSOS1 (*Zygophyllum xanthoxylum*, GU177864), BnSOS1 (*Brassica napus*, EU487184), McSOS1 (*Mesembryanthemum crystallinum*, EF207776), ThSOS1 (*Thellungiella halophila*, EF207775), AtSOS1 (*Arabidopsis thaliana*, AF256224), HvNHX1 (*Hordeum vulgare*, AB089197), OsNHX1 (*Oryza sativa*, AB021878), HbNHX1 (*Hordeum brevisubulatum*, DQ285410) and AtNHX1 (*Arabidopsis thaliana*, AF510074).