

Figure S6. Consensus sequences for transport of boron and CO₂. Alignment of putative amino acids of aquaporins of *V. Vinifera* (cv. Touriga nacional) obtained from present study and previous study (Leitão, 2012) with the sequences of aquaporins reported to transport (A) boron and (B) CO₂. ar/R constrictions and P1-P5 positions are shown to demonstrate the conserved amino acid residue. Accession numbers of presented protein sequences are: *At*PIP1;2 (Q06611), *At*NIP5;1 (NP_192776), *Hv*PIP1;3 (BAA23745), *Hv*PIP2;1 (BAA23744), *Nt*AQP1 (O24662), *Os*NIP2;1 (Q6Z2T3), *VvTn*PIP1;1 (HQ913643), *VvTn*PIP1;4 (KJ697714), *VvTn*PIP2;1 (KJ697715), *VvTn*PIP2;2 (HQ913642), *VvTn*PIP2;3 (KJ697716), *VvTn*TIP1;1 (KJ697717), *VvTn*TIP2;1 (HQ913640), *VvTn*TIP2;2 (KJ697718), *VvTn*TIP4;1 (KJ697719), *Zm*PIP1;1 (Q41870). *At*: *Arabidopsis thaliana*, *Hv*: *Hordeum vulgare*, *VvTn*: *V. vinifera* (cv. Touriga nacional), *Zm*: *Zea mays*.

A

	TMH2(ar/R) F/A/G	LC-P1-(ar/R) Q/F/I	TMH5(ar/R) H/I/S	LE1(ar/R)T/G/A, LE2-R, P2-S/T, P3-A	TMH6-P4-F/Y, P5-W/L
VvPIP _s	VvTnPIP1;1	AWAFGG	GFEKG	LVHLA	TGTGINPARSLGAAII
	→VvTnPIP1;4	AWAFGG	GFOGH	LVHLA	TGTGINPARSLGAAII
	→VvTnPIP2;1	AWSEGG	AFQSA	MVHLA	TGTGINPARSLGAAVI
	VvTnPIP2;2	AWAFGG	AFMKS	MVHLA	TGTGINPARSLGAAVI
	→VvTnPIP2;3	AWAFGG	LFQDI	MVHLA	TGTGINPARSLGAAVI
	→VvTnTIP1;1	ALA ^H GF	FST ^I GG	ANILA	DGASMNPAVSFGPAAVV
	VvTnTIP2;1	AVA ^H GF	LVT ^I GG	ANILA	SGGSMNPARSF ^G PAAVV
	→VvTnTIP2;2	AIA ^H AF	FAT ^I NG	ANILA	SGGSMNPARSF ^G PAAVV
	→VvTnTIP4;1	AMA ^H AL	FLT ^I GG	ANVMA	SGASMNPA ^R SFGP ^A LV
	ZmPIP1;1	AWSEGG	GFOQG	LVHLA	TGTGINPARSLGAAVI
	AtPIP5;1	AACAGL	GVFHP	LNILV	TGGSMNPVR ^T LGPAVA
	OsNIP2;1	SIAGGL	AVIHP	ITSIF	SGGSMNPARTL ^G GPALA
	HvPIP1;3	AWSEGG	GEQTT	LVHLA	TGTGINPARSLGAAII

B

	TMH2(ar/R)F	LC -P1-(ar/R) M/Q	TMH5(ar/R) H	LE1(ar/R)T, LE2 (ar/R)R, P2-S, P3- A	TMH6-P4-F, P5-W
VvPIP _s	VvTnPIP1;1	AWAFGG	GFEKG	LVHLA	TGTGINPARSLGAAII
	→VvTnPIP1;4	AWAFGG	GFOGH	LVHLA	TGTGINPARSLGAAII
	→VvTnPIP2;1	AWSEGG	AFQSA	MVHLA	TGTGINPARSLGAAVI
	VvTnPIP2;2	AWAFGG	AFMKS	MVHLA	TGTGINPARSLGAAVI
	→VvTnPIP2;3	AWAFGG	LFQDI	MVHLA	TGTGINPARSF ^G AAVI
	→VvTnTIP1;1	ALA ^H GF	FST ^I GG	ANILA	DGASMNPAVSFGPAAVV
	VvTnTIP2;1	AVA ^H GF	LVT ^I GG	ANILA	SGGSMNPARSF ^G PAAVV
	→VvTnTIP2;2	AIA ^H AF	FAT ^I NG	ANILA	SGGSMNPARSF ^G P ^A LV
	→VvTnTIP4;1	AMA ^H AL	FLT ^I GG	ANVMA	TGTGINPARSLGAAVI
	NtAQP1	AWAFGG	GFMVG	LVHLA	TGTGINPARSLGAAII
	AtPIP1;2	AWAFGG	GEQPK	LVHLA	TGTGINPARSLGAAII
	HvPIP2;1	AWAFGG	GEQSS	MVHLA	TGTGINPARSLGAAVI

Supplementary references

Leitão L, Prista C, Moura TF, Loureiro-Dias MC, Soveral G (2012) Grapevine aquaporins: gating of a tonoplast intrinsic protein (TIP2;1) by cytosolic pH. PLoS One 7: e33219.