

Chloroplast K^+/H^+ EXCHANGE ANTIPORTER 3 modulates abscisic acid-induced reactive oxygen species generation in guard cells

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Table S1A. ABA-induced stomatal closure is impaired in mutant *kea3-1*.

ABA(μ M)	0		10		30	
genotype	Col-0	<i>kea3-1</i>	Col-0	<i>kea3-1</i>	Col-0	<i>kea3-1</i>
stomatal aperture (μ m)	4.43	4.38	3.28	4.61	3.68	4.71
	4.48	4.57	3.35	4.45	3.65	4.48
	5.01	4.64	3.82	4.42	3.84	4.25
average	4.64	4.53	3.48	4.50	3.72	4.48
std	0.15	0.06	0.14	0.05	0.05	0.11
sem	0.09	0.03	0.08	0.03	0.03	0.06
ANOVA	a	a	b	a	b	a

These data were used to create Figure 1A.

Table S1B. ABA-induced stomatal closure is impaired in mutant *kea3-2*.

ABA(μ M)	0		10		30	
genotype	Ws	<i>kea3-2</i>	Ws	<i>kea3-2</i>	Ws	<i>kea3-2</i>
stomatal aperture (μ m)	4.62	4.87	3.53	4.59	3.26	4.69
	4.50	4.69	3.62	4.64	3.05	4.70
	4.66	4.55	3.55	4.74	3.22	4.60
average	4.59	4.70	3.57	4.66	3.18	4.66
std	0.07	0.13	0.04	0.06	0.09	0.04
sem	0.04	0.08	0.02	0.04	0.05	0.03
ANOVA	a	a	b	a	c	a

These data were used to create Figure 1B.

Epidermal strips containing pre-opened guard cells were incubated with 0-30 μ M ABA. Different letters indicate significant differences at $P < 0.01$.

Table S2A. Calcium and H₂O₂ induced stomatal closure in *kea3-1*.

treatment	Untreated	CaCl ₂	H ₂ O ₂
stomatal aperture (μm)	4.38	4.02	3.66
	4.50	3.75	3.98
	4.53	4.08	3.66
average	4.47	3.95	3.77
std	0.08	0.18	0.18
sem	0.05	0.10	0.11
ANOVA	a	b	b

These data were used to create Figure 1C.

Table S2B. Calcium and H₂O₂ induced stomatal closure in *kea3-2*.

treatment	Untreated	CaCl ₂	H ₂ O ₂
stomatal aperture (μm)	4.45	4.20	3.93
	4.79	4.08	3.97
	4.55	4.06	4.23
average	4.60	4.11	4.04
std	0.17	0.08	0.16
sem	0.10	0.04	0.09
ANOVA	a	b	b

These data were used to create Figure 1D.

Epidermal strips containing pre-opened guard cells were incubated with 100 μM H₂O₂ or 2 mM CaCl₂ for 2 h. Different letters indicate significant differences at $P < 0.01$.

Table S3A. Nigericin induced stomatal closure.

Nigericin (μM)	0	0.1	1	10
stomatal aperture (μm)	4.51	4.44	4.18	3.56
	4.53	4.52	4.33	3.59
	4.80	4.71	4.40	3.97
average	4.61	4.56	4.30	3.71
std	0.13	0.11	0.09	0.19
sem	0.08	0.07	0.05	0.11
ANOVA	a	a	b	C

Epidermal strips containing pre-opened guard cells were treated with 0-10 μM nigericin for 2 h. Different letters indicate significant differences at $P < 0.05$. These data were used to create Figure 4A.

Table S3B. Photosynthetic inhibitors prevent nigericin-induced stomatal closure.

treatment	Untreated	Nigericin	Nigericin +DCMU	Nigericin +DBMIB
stomatal aperture (μm)	4.71	3.79	4.66	4.68
	4.95	4.02	4.79	4.84
	4.53	3.9	4.59	4.67
average	4.73	3.90	4.68	4.73
std	0.21	0.11	0.10	0.10
sem	0.12	0.07	0.06	0.06
ANOVA	a	b	a	a

Epidermal strips containing pre-opened guard cells were simultaneously treated with 10 μM nigericin, 10 μM DCMU and/or 0.2 μM DBMIB for 2 h. Different letters indicate significant differences at $P < 0.01$. These data were used to create Figure 4B.

Table S4A. Nigericin induced stomatal closure in *kea3-1*

genotype treatment	WT(Col-0)		<i>kea3-1</i>	
	Untreated	Nigericin	Untreated	Nigericin
stomatal aperture (μm)	4.51	3.56	4.69	3.75
	4.53	3.59	4.41	3.94
	4.80	3.97	4.84	3.87
average	4.61	3.71	4.65	3.85
std	0.13	0.19	0.22	0.10
sem	0.08	0.11	0.13	0.06
T-test		**		**

These data were used to create Figure 4C.

Table S4B. Nigericin induced stomatal closure in *kea3-2*.

genotype treatment	WT(Ws)		<i>kea3-2</i>	
	Untreated	Nigericin	Untreated	Nigericin
stomatal aperture (μm)	4.62	3.22	4.44	3.68
	4.53	3.05	4.70	3.80
	4.66	3.22	4.88	3.88
average	4.60	3.16	4.67	3.79
std	0.05	0.08	0.22	0.08
sem	0.03	0.05	0.13	0.05
T-test		**		**

These data were used to create Figure 4D.

Epidermal strips containing pre-opened guard cells were incubated with 10 μM nigericin for 2 h. Double asterisk (**) indicates a significant difference ($P < 0.01$) compared with the value for untreated cells.