

**Table 1.** Summary comparison of mean  $\pm$ SE of photosynthetic metabolites and metabolite ratios measured at ambient CO<sub>2</sub> and 25 °C and 40 °C from leaves of wild-type plants and anti-activase plants with photosynthetic rates less than 10  $\mu\text{mol CO}_2 \text{ m}^{-2} \text{ s}^{-1}$

Different letters indicate a significant difference between temperatures as determined by two sample independent *t* test ( $P < 0.05$ ).

Genotype	Wild type		Anti-activase		Two-way ANOVA results		
	25	40	25	40	Genotype	Temperature	Genotype $\times$ temperature
<b>C<sub>4</sub> metabolites</b>							
Malate ( $\mu\text{mol m}^{-2}$ )	5536 $\pm$ 863 ab	4440 $\pm$ 216 a	7586 $\pm$ 521 b	6047 $\pm$ 610 ab	$P < 0.05$	$P < 0.05$	$P = 0.70$
Aspartate ( $\mu\text{mol m}^{-2}$ )	181 $\pm$ 39 a	278 $\pm$ 47 a	1104 $\pm$ 278 b	807 $\pm$ 83 ab	$P < 0.0001$	$P = 0.48$	$P = 0.18$
Pyruvate ( $\mu\text{mol m}^{-2}$ )	501 $\pm$ 30 a	288 $\pm$ 27 b	46 $\pm$ 11 c	53 $\pm$ 19 c	$P < 0.0001$	$P < 0.01$	$P < 0.001$
PEP ( $\mu\text{mol m}^{-2}$ )	70 $\pm$ 2 a	63 $\pm$ 4 a	43.9 $\pm$ 0.1 b	45.7 $\pm$ 5.4 b	$P < 0.0001$	$P = 0.48$	$P = 0.25$
Alanine ( $\mu\text{mol m}^{-2}$ )	1217 $\pm$ 61 a	1067 $\pm$ 75 ab	438 $\pm$ 108 c	742 $\pm$ 119 bc	$P < 0.001$	$P = 0.43$	$P = 0.04$
PEP/aspartate	0.41 $\pm$ 0.07 a	0.25 $\pm$ 0.04 a	0.04 $\pm$ 0.01 b	0.06 $\pm$ 0.01 b	$P < 0.0001$	$P = 0.09$	$P = 0.054$
Alanine/aspartate	7.3 $\pm$ 1.4 b	4.1 $\pm$ 0.5 a	0.41 $\pm$ 0.10 c	0.91 $\pm$ 0.06 c	$P < 0.0001$	$P = 0.10$	$P = 0.03$
Total C <sub>4</sub> (PEP+Pyr+Asp+Alanine) ( $\mu\text{mol m}^{-2}$ )	1968 $\pm$ 110 a	1696 $\pm$ 136 a	1632 $\pm$ 364 a	1647 $\pm$ 186 a	$P = 0.39$	$P = 0.56$	$P = 0.52$
<b>C<sub>3</sub> metabolites</b>							
RuBP ( $\mu\text{mol m}^{-2}$ )	82 $\pm$ 4 a	66 $\pm$ 3 a	243 $\pm$ 49 b	276 $\pm$ 47 b	$P < 0.001$	$P = 0.78$	$P = 0.45$
PGA ( $\mu\text{mol m}^{-2}$ )	349 $\pm$ 16 b	270 $\pm$ 15 a	43 $\pm$ 8 c	59 $\pm$ 11 c	$P < 0.0001$	$P = 0.05$	$P = 0.007$
Triose-P ( $\mu\text{mol m}^{-2}$ )	154 $\pm$ 25 a	128 $\pm$ 11 a	60 $\pm$ 16 b	64 $\pm$ 10 b	$P < 0.001$	$P = 0.49$	$P = 0.37$
RuBP/PGA	0.24 $\pm$ 0.02 a	0.25 $\pm$ 0.00 a	5.74 $\pm$ 0.86 b	5.19 $\pm$ 1.61 b	$P < 0.001$	$P = 0.75$	$P = 0.75$
Triose-P/PGA	0.45 $\pm$ 0.09 a	0.47 $\pm$ 0.02 a	1.50 $\pm$ 0.53 a	1.20 $\pm$ 0.32 a	$P < 0.05$	$P = 0.64$	$P = 0.58$
Total C <sub>3</sub> (2 $\times$ RuBP+PGA+Triose-P) ( $\mu\text{mol m}^{-2}$ )	666 $\pm$ 16 a	530 $\pm$ 31 a	589 $\pm$ 116 a	675 $\pm$ 89 a	$P = 0.64$	$P = 0.73$	$P = 0.15$