Fire and Brimstone: Molecular Interactions between Sulfur and Glucosinolate Biosynthesis in Model and Crop Brassicaceae

Priyakshee Borpatragohain[1], Terry J. Rose [1,2], Graham J. King [1*]

[1]Southern Cross Plant Science, Southern Cross University, Lismore, NSW, Australia.

[2]Southern Cross GeoScience, Southern Cross University, Lismore, NSW, Australia.

Correspondence:

Southern Cross Plant Science, Southern Cross University, Lismore, NSW, 2480, Australia; Tel: (61) 02-6620-3410 Fax: (61) 02-6622-3459

E-mail: graham.king@scu.edu.au

Supplementary Table 1

Effect of S on seed yield, GSL and Met Content. Modified from Falk et al. (2007).

Plant	Organ	Low S treatment	High S treatment	Total GSL at low S	Total GSL at high S	Yield/methionine content at low S	Yield/ methionine content at high S	% change in total GSL	% change in yield	References
A. Field experiments										
Brassica oleracea L. *capitata*		0 kg S ha–1	110 kg S ha–1	2.26 µmol gfw–1	2.85 µmol gfw–1	36.1 Mgha-1	39.2 Mgha-1	+ 26	(+) 9	(Rosen et al., 2005)
Brassica oleracea L. *italica*		0 kg S ha–1	23 kg S ha–1	32.1 mg per leaf, 63.6 mg per head	38.0 mg per leaf, 88.3 mg per head	363.4 µg S per mL in leaf 308.6 µg S per mL in head	529.2 µg S per mL in leaf 419.3 µg S per mL in head	+18 leaf (+) 39 head	(+)46 leaf (+) 39 head	(Rangkadilok et al., 2004)
Brassica oleracea L. *italica* var. Marathon		15 kg S ha–1	150 kg S ha–1	51.8 µmol gdw–1 (head, early season), 30.6 µmol gdw–1 (late season)	36.2 µmol gdw–1 (head, early season), 52.5 µmol gdw–1(head, late season)			(–) 30		(Vallejo et al., 2003)

							(+) 72		
Brassica oleracea L. *italica* var. Monterrey	15 kg S ha–1	150 kg S ha–1	32.2 µmol gdw–1(head, early season), 84.9 µmol gdw–1(head, late season)	78.4 µmol gdw–1 (head, early season), 69.6 µmol gdw–1 (head, late season)			(+) 144		(Vallejo et al., 2003)
							(–) 18		
Brassica napus L. cv. Bulbul-98	0 kg S ha–1	30 kg S ha–1	13.6 µmol/g	24.6 µmol/g			(+) 11		(Ahmad et al., 2007)
Brassica napus	0 kg S ha–1	80 kg S ha–1	15.8 µmol g–1 seed	41.2 µmol g–1 seed			(+) 161		(Withers and O'Donnell, 1994)
Brassica napus	0 kg S ha–1	100 kg S ha–1	2.59 µmol g–1	4.2 µmol g–1			(+) 62		(Salac et al., 2006)
Brassica napus cv. Dunkeld	0 kg S ha–1	40 kg S ha–1	51.0 µmol g–1	61.67 µmol g–1	1.52 Mg seed ha-1	1.67 Mg seed ha-1	(+) 10.67	(+) 10	(Rehman et al., 2012)

Brassica napus cv. Shiralee	0 kg S ha–1	40 kg S ha–1	56.0 µmol g–1	68.67 µmol g–1	1.54 Mg seed ha-1	1.68 Mg seed ha-1	(+) 12.67	(+) 9	(Rehman et al., 2012)
Brassica juncea canola cv. Arid	0 kg S ha–1	40 kg S ha–1	4.0 µmol g–1 in seed	11.9 µmol g–1 in seed	366 Kg ha-1	1795 Kg ha-1	(+) 198	(+) 390	(Malhi et al., 2007)
Brassica juncea canola cv. Amulet	0 kg S ha–1	40 kg S ha–1	12.6 µmol g–1 in seed	20.7 µmol g–1 in seed	1045 Kg ha-1	1870 Kg ha-1	(+) 64	(+) 79	(Malhi et al., 2007)
Brassica juncea mustard cv. Cutlass	0 kg S ha–1	40 kg S ha–1	61.0 µmol g–1 in seed	98.6 µmol g–1 in seed	1090 Kg ha-1	2325 Kg ha-1	(+) 62	(+) 113	(Malhi et al., 2007)
Brassica napus cv InVigor 2663 hybrid canola	0 kg S ha–1	40 kg S ha–1	2.4 µmol g–1 in seed	7.9 µmol g–1 in seed	874 Kg ha-1	3093 Kg ha-1	(+) 229	(+) 254	(Malhi et al., 2007)
Brassica napus cv Lisek	0 kg S ha–1	90 kg S ha–1	9.29 µmol g–1 in seed	11.55 µmol g–1 in seed					(Jankowski et al., 2008)
B. Greenhouse experiments									

Brassica napus	0.9 mM SO_4^{2-}	18.3 mM	11.3 µmol gdw–1	153.8 µmol gdw–1	32 g plant-1 (seed yield) 6.93 mg gdw-1 methionine	48 g plant-1 (seed yield) 8.47 mg gdw-1 methionine	(+) 1261	(+) 50 yield (+) 22 methionine	(Davik and Bakken, 1999)
Brassica rapa	0.5 mM SO_4^{2-}	1.0 mM	28.4 µmol gdw–1	80 µmol gdw–1			(+) 182		(Kim et al., 2002)
C. Hydroponics/ tissue culture experiments									
Brassica oleracea L. Acephala	0.125 mM SO_4^{2-}	2.0 mM SO_4^{2-}	0.59 µg gdw–1	3.97 µg gdw–1			(+) 573		(Kopsell et al., 2003)
Brassica napus	0 mM SO_4^{2-}	1.0 mM SO_4^{2-}	8.14 µmol gdw–1	122.1 µmol gdw–1			(+) 1400		(Blake-Kalff et al., 1998)
Brassica oleracea L. *italica*	0 mg L–1 SO_4^{2-}	29.2 mg L–1 SO_4^{2-}	56.1 µmol gdw–1	33.8 µmol gdw–1			(–) 40		(Aires et al., 2006)
Brassica napus var. Bienvenu	0 mM SO_4^{2-}	0.5 mM SO_4^{2-}	100 µg kg fresh wt–1	4669 µg kg fresh wt–1			(+) 4569		(Dubuis et al., 2005)

Brassica oleracea L. *gemmifera*	0 ppm SO_4^{2-}	15.0ppm SO_4^{2-}	110 µmol gdw–1	168 µmol gdw–1 (not infested with aphids)	(+) 53	(Yusuf and Collins, 1998)
			90 µmol gdw–1	66 µmol gdw–1 (infested with aphids)	(–) 27	

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