

Accessory Publication

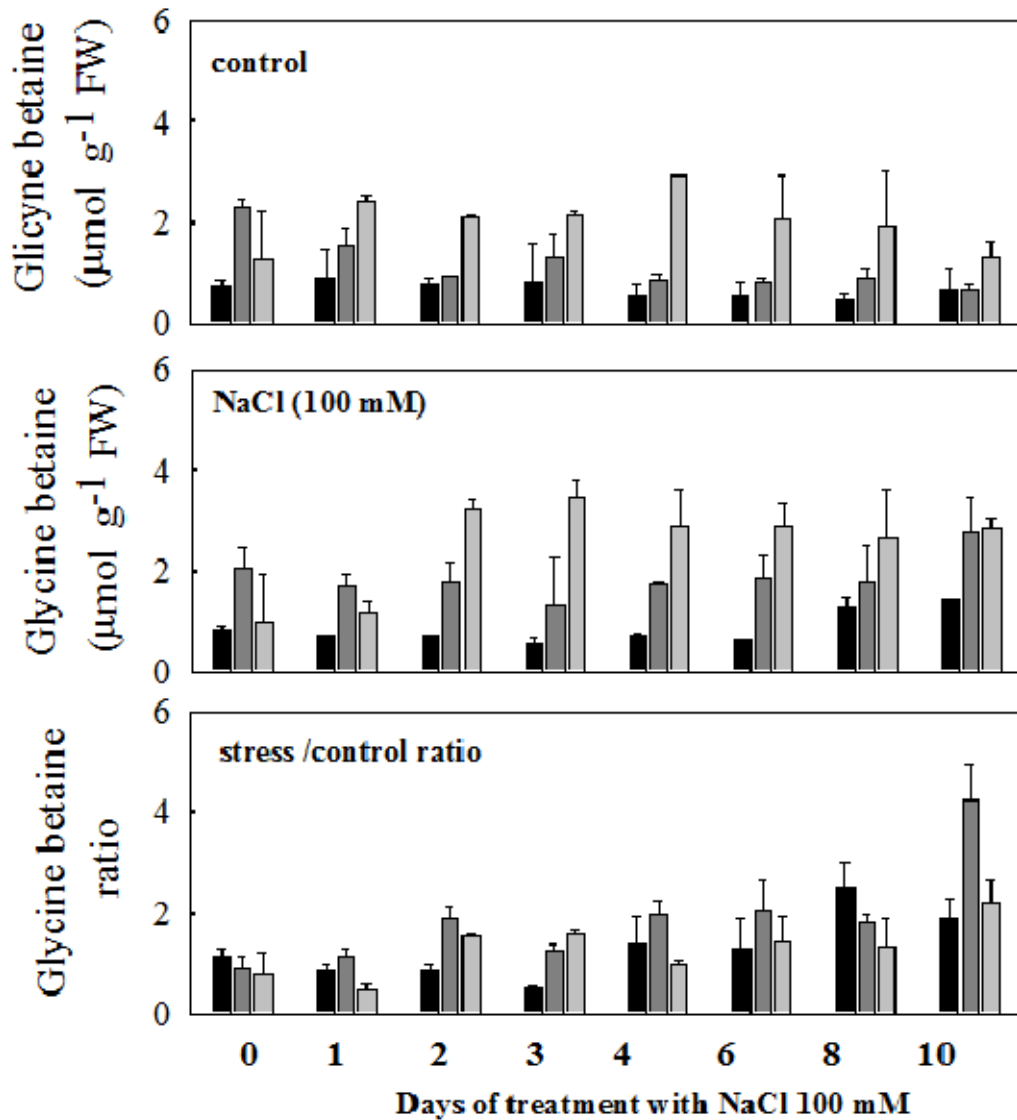


Fig. S1. Glycine betaine accumulation in leaves of durum wheat seedlings at different ontogenetic ages after 10 days of hydroponic culture (0 d) and after 1, 2, 3, 4, 6, 8 and 10 days of salt treatment under continuous high light (900 μE) since the beginning of hydroculture. Control was without 100 mM NaCl. Nitrate was added on day 6 of hydroponic culture. Leaf 1 (black bars), leaf 2 (grey bars) and leaf 3 (light grey bars). The values are mean ± s.d. ($n = 4$).

Table S1. Ions and major metabolites content of leaves 1 and 3 of durum wheat

Plants were harvested after 20 d of hydroponic culture, 10 d after the beginning of salt treatment and 5 d after the high light treatment, 4 h into the light period. Ions, amino acids, glycine betaine and sugars are expressed as $\mu\text{mol g}^{-1}$ FW, proteins and pigments as mg g^{-1} FW. Values are mean \pm s.d. ($n = 4$)

	350 μE		900 μE	
	0 mM NaCl	100 mM NaCl	0 mM NaCl	100 mM NaCl
Leaf 1				
Cl ⁻	2.4 \pm 0.5	317 \pm 45	14.0 \pm 1.3	322 \pm 23
Na ⁺	3.1 \pm 1.0	315 \pm 11	1.3 \pm 0.3	254 \pm 35
K ⁺	93.6 \pm 9.8	158 \pm 6.0	50.5 \pm 12.4	103 \pm 15
K ⁺ /Na ⁺	29.8 \pm 6.2	0.5 \pm 0.2	40.9 \pm 13.8	0.4 \pm 0.0
Free amino acids	15.2 \pm 1.5	43.4 \pm 4.4	9.0 \pm 0.4	46.4 \pm 2.4
Proline	0.8 \pm 0.1	19.3 \pm 0.7	0.2 \pm 0.0	12.1 \pm 0.9
Glycine betaine	1.2 \pm 0.1	4.0 \pm 0.3	0.4 \pm 0.0	0.2 \pm 0.0
GB/tot AA	0.08 \pm 0.05	0.10 \pm 0.04	0.05 \pm 0.00	0.004 \pm 0.000
Hexoses	3.9 \pm 0.5	4.7 \pm 1.1	2.8 \pm 0.2	23.3 \pm 1.6
Sucrose	10.7 \pm 0.8	14.3 \pm 1.3	15.2 \pm 2.1	11.7 \pm 0.5
Starch	16.1 \pm 1.4	12.5 \pm 1.4	15.5 \pm 2.9	12.3 \pm 1.4
Total proteins	12.3 \pm 2.4	12.1 \pm 1.3	9.4 \pm 0.7	7.4 \pm 0.3
Soluble proteins	8.1 \pm 0.2	6.9 \pm 0.3	6.0 \pm 0.9	4.4 \pm 0.7
Total chlorophylls	1.7 \pm 0.1	0.8 \pm 0.0	1.5 \pm 0.1	1.0 \pm 0.0
Carotenoids	0.5 \pm 0.1	0.3 \pm 0.1	0.5 \pm 0.0	0.3 \pm 0.0
Leaf 3				
Cl ⁻	3.7 \pm 0.7	69 \pm 8	15.0 \pm 1.7	69.0 \pm 10.8
Na ⁺	4.5 \pm 1.8	207 \pm 22	2.4 \pm 0.7	196 \pm 39
K ⁺	98.9 \pm 3.0	139 \pm 14	77.9 \pm 9.9	124 \pm 18
K ⁺ /Na ⁺	22.2 \pm 2.6	0.7 \pm 0.3	33.1 \pm 5.0	0.6 \pm 0.0
Free amino acids	20.4 \pm 2.2	24.1 \pm 2.1	14.6 \pm 0.9	27.8 \pm 0.9
Proline	0.7 \pm 0.1	6.5 \pm 0.4	0.4 \pm 0.1	4.6 \pm 0.5
Glycine betaine	5.9 \pm 0.7	13.1 \pm 1.7	0.8 \pm 0.3	1.6 \pm 0.0
GB/tot AA	0.29 \pm 0.02	0.53 \pm 0.04	0.06 \pm 0.02	0.06 \pm 0.00
Hexoses	11.2 \pm 0.7	6.8 \pm 0.5	6.4 \pm 0.3	3.7 \pm 0.5
Sucrose	13.5 \pm 0.9	15.1 \pm 0.7	14.7 \pm 1.8	15.3 \pm 0.7
Starch	24.2 \pm 3.1	21.2 \pm 1.7	11.2 \pm 0.9	11.6 \pm 0.7
Total proteins	14.3 \pm 1.2	14.8 \pm 0.7	13.0 \pm 0.6	9.9 \pm 0.3
Soluble proteins	9.1 \pm 0.2	9.9 \pm 1.2	8.6 \pm 1.4	6.9 \pm 1.5
Total chlorophylls	1.8 \pm 0.1	0.8 \pm 0.0	1.8 \pm 0.3	1.1 \pm 0.0
Carotenoids	0.6 \pm 0.1	0.5 \pm 0.1	0.7 \pm 0.2	0.3 \pm 0.0

Table S2. Free amino acid content of leaves of durum wheat

Plants were harvested after 20 d of hydroponic culture, 10 d after the beginning of salt treatment and 5 d after the high light treatment, 4 h into the light period. Amino acids are expressed as $\mu\text{mol g}^{-1}$ FW. Values are mean \pm s.d. ($n = 4$)

	350 μE		900 μE	
	0 mM NaCl	100 mM NaCl	0 mM NaCl	100 mM NaCl
Leaf 1				
Alanine	1.12 \pm 0.02	2.95 \pm 0.30	0.79 \pm 0.05	3.86 \pm 0.19
Arginine	0.10 \pm 0.01	0.12 \pm 0.01	0.09 \pm 0.01	0.30 \pm 0.01
Asparagine	0.16 \pm 0.01	1.34 \pm 0.09	0.07 \pm 0.01	2.27 \pm 0.10
Aspartate	2.98 \pm 0.03	1.84 \pm 0.23	1.50 \pm 0.06	2.19 \pm 0.04
Glutamate	6.45 \pm 0.24	7.17 \pm 0.66	3.21 \pm 0.23	2.88 \pm 0.15
Glutamine	0.57 \pm 0.01	3.18 \pm 0.22	0.45 \pm 0.11	5.85 \pm 0.30
Glycine	0.09 \pm 0.01	0.25 \pm 0.02	0.30 \pm 0.02	0.48 \pm 0.02
Histidine	0.10 \pm 0.00	1.02 \pm 0.08	0.02 \pm 0.00	0.59 \pm 0.15
Isoleucine	0.09 \pm 0.01	0.52 \pm 0.05	0.07 \pm 0.00	1.56 \pm 0.06
Leucine	0.15 \pm 0.02	0.61 \pm 0.06	0.13 \pm 0.01	1.38 \pm 0.05
Lysine	0.18 \pm 0.04	0.23 \pm 0.03	0.23 \pm 0.01	0.49 \pm 0.01
Methionine	0.10 \pm 0.04	0.13 \pm 0.02	0.05 \pm 0.00	0.16 \pm 0.01
Phenylalanine	0.13 \pm 0.01	0.62 \pm 0.05	0.08 \pm 0.00	1.65 \pm 0.07
Proline	0.77 \pm 0.07	19.3 \pm 0.72	0.25 \pm 0.01	12.1 \pm 0.95
Serine	1.49 \pm 0.06	2.04 \pm 0.23	1.04 \pm 0.10	3.07 \pm 0.52
Threonine	0.49 \pm 0.02	0.73 \pm 0.08	0.25 \pm 0.02	0.83 \pm 0.01
Tryptophan	0.04 \pm 0.00	0.19 \pm 0.02	0.04 \pm 0.01	0.33 \pm 0.00
Tyrosine	0.07 \pm 0.01	0.19 \pm 0.03	0.28 \pm 0.03	3.72 \pm 0.04
Valine	0.16 \pm 0.01	0.99 \pm 0.07	0.11 \pm 0.00	2.48 \pm 0.13
Leaf 2				
Alanine	1.11 \pm 0.09	2.18 \pm 0.17	1.09 \pm 0.08	2.23 \pm 0.09
Arginine	0.09 \pm 0.01	0.09 \pm 0.01	0.07 \pm 0.01	0.24 \pm 0.04
Asparagine	0.20 \pm 0.01	1.08 \pm 0.10	0.10 \pm 0.01	1.76 \pm 0.16
Aspartate	3.10 \pm 0.24	3.10 \pm 0.40	1.13 \pm 0.14	1.54 \pm 0.08
Glutamate	7.08 \pm 0.65	9.60 \pm 0.66	3.40 \pm 0.35	3.60 \pm 0.17
Glutamine	0.74 \pm 0.08	1.10 \pm 0.04	0.38 \pm 0.06	3.41 \pm 0.24
Glycine	0.11 \pm 0.01	0.41 \pm 0.03	0.20 \pm 0.02	0.48 \pm 0.04
Histidine	0.10 \pm 0.01	0.52 \pm 0.04	0.02 \pm 0.01	0.49 \pm 0.05
Isoleucine	0.08 \pm 0.01	0.33 \pm 0.03	0.07 \pm 0.01	0.99 \pm 0.08
Leucine	0.12 \pm 0.02	0.32 \pm 0.04	0.14 \pm 0.05	0.96 \pm 0.07
Lysine	0.18 \pm 0.03	0.17 \pm 0.04	0.24 \pm 0.06	0.29 \pm 0.06
Methionine	0.11 \pm 0.01	0.11 \pm 0.01	0.07 \pm 0.04	0.12 \pm 0.01
Phenylalanine	0.13 \pm 0.02	0.38 \pm 0.03	0.10 \pm 0.01	1.01 \pm 0.10
Proline	0.60 \pm 0.05	12.4 \pm 0.60	0.26 \pm 0.08	6.02 \pm 0.70
Serine	1.72 \pm 0.14	2.05 \pm 0.20	1.61 \pm 0.15	2.57 \pm 0.14
Threonine	0.60 \pm 0.05	0.82 \pm 0.08	0.28 \pm 0.03	0.77 \pm 0.05
Tryptophan	0.03 \pm 0.01	0.12 \pm 0.01	0.11 \pm 0.03	0.38 \pm 0.03
Tyrosine	0.07 \pm 0.01	0.12 \pm 0.00	0.48 \pm 0.08	1.68 \pm 0.16
Valine	0.17 \pm 0.02	0.64 \pm 0.06	0.13 \pm 0.00	1.50 \pm 0.09

Leaf 3				
Alanine	1.24 ± 0.10	1.37 ± 0.12	1.64 ± 0.11	2.10 ± 0.09
Arginine	0.09 ± 0.01	0.06 ± 0.00	0.11 ± 0.04	0.39 ± 0.13
Asparagine	1.12 ± 0.08	2.55 ± 0.34	0.89 ± 0.09	4.07 ± 0.59
Aspartate	3.46 ± 0.22	2.07 ± 0.10	1.32 ± 0.18	1.53 ± 0.01
Glutamate	9.38 ± 0.67	7.14 ± 0.39	4.51 ± 0.05	4.11 ± 0.16
Glutamine	0.97 ± 0.15	0.65 ± 0.07	0.74 ± 0.09	1.83 ± 0.44
Glycine	0.11 ± 0.01	0.25 ± 0.03	0.31 ± 0.05	0.51 ± 0.11
Histidine	0.13 ± 0.02	0.29 ± 0.04	0.13 ± 0.01	0.50 ± 0.00
Isoleucine	0.10 ± 0.01	0.13 ± 0.01	0.11 ± 0.02	0.54 ± 0.04
Leucine	0.13 ± 0.01	0.13 ± 0.01	0.14 ± 0.04	0.54 ± 0.09
Lysine	0.21 ± 0.01	0.16 ± 0.01	0.23 ± 0.06	0.24 ± 0.02
Methionine	0.09 ± 0.01	0.09 ± 0.01	0.08 ± 0.01	0.12 ± 0.03
Phenylalanine	0.18 ± 0.01	0.19 ± 0.02	0.12 ± 0.03	0.58 ± 0.06
Proline	0.75 ± 0.06	6.50 ± 0.44	0.45 ± 0.09	4.57 ± 0.49
Serine	1.46 ± 0.12	1.35 ± 0.14	2.08 ± 0.07	2.90 ± 0.07
Threonine	0.69 ± 0.07	0.54 ± 0.05	0.51 ± 0.03	0.72 ± 0.02
Tryptophan	0.03 ± 0.00	0.05 ± 0.00	0.07 ± 0.01	0.25 ± 0.03
Tyrosine	0.07 ± 0.01	0.28 ± 0.00	0.81 ± 0.18	1.05 ± 0.05
Valine	0.21 ± 0.02	0.28 ± 0.02	0.22 ± 0.04	0.96 ± 0.03