Tolerance of transplastomic tobacco plants overexpressing a theta class glutathione transferase to abiotic and oxidative stresses

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**Figure S1.** Effect of Diquat (100 and 200 ml per 30 L-1 1000 m-2) on growth of transplastomic lines and WT tobacco plants after 1-day exposure to herbicide-induced oxidative stress and control (C) conditions.



**Figure S2.** Effect of Diquat (100 and 200 ml per 30 L-1 1000 m-2) on growth of transplastomic lines and WT tobacco plants after 2-days exposure to herbicide-induced oxidative stress and control (C) conditions.



**Figure S3.** Effect of NaCl (150 and 300 mM) on growth of transplastomic lines and WT tobacco plants after 20 days under NaCl and control (C) conditions *in vitro*.

**Table S3.** Growth (fresh-MF and dry-MD matter; g) and photophysiological parameters (relative chlorophyll content- Chl and Maximum quantum yield of PSII-*F*v/*F*m) of *GST transplastomic* lines and WT tobacco plants grown for 2 days in low (Diq\_L) and high (Diq\_H) Diquat dose and control conditions (C). Data are mean ± SE (n=6) at p<0.05.

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| **Genotype** | **Treatment** | **MF (g)** | **HSD** | **MD (g)** | **HSD** | **Chl** | **HSD** | ***F*v*/F*m** | **HSD** |
| pt*At*GSTT6.1 | Control | 10.7±2.11 | a | 0.81±0.15 | a | 6±0.203 | b | 0.8±0.003 | a |
| pt*At*GSTT6.1 | Diq\_L | 5.9±0.99 | a | 0.75±0.15 | a | 7.48±0.386 | a | 0.47±0.078 | b |
| pt*At*GSTT6.1 | Diq\_H | 5.2±0.29 | a | 0.62±0.064 | a | 8.11±0.523 | a | 0.44±0.079 | b |
| pt*At*GSTT2a | Control | 9.53±0.72 | a | 0.59±0.063 | a | 7.04±0.24 | a | 0.79±0.005 | a |
| pt*At*GSTT2a | Diq\_L | 4.78±0.6 | b | 0.73±0.12 | a | 7.02±0.323 | a | 0.45±0.069 | b |
| pt*At*GSTT2a | Diq\_H | 6.66±0.29 | a | 0.96±0.08 | a | 7.64±0.258 | a | 0.4±0.084 | b |
| ptEFD6-115A | Control | 14.26±1.17 | a | 0.85±0.095 | a | 7.47±0.458 | a | 0.8±0.003 | a |
| ptEFD6-115A | Diq\_L | 4±0.096 | b | 0.61±0.037 | a | 6.06±0.256 | ab | 0.41±0.079 | b |
| ptEFD6-115A | Diq\_H | 4.63±0.81 | b | 0.6±0.077 | a | 5.64±0.329 | b | 0.39±0.085 | b |
| WT | Control | 13.96±1.84 | a | 1.06±0.13 | a | 8.56±0.286 | a | 0.81±0.0035 | a |
| WT | Diq\_L | 7.4±0.78 | b | 0.98±0.14 | a | 7.22±0.439 | b | 0.45±0.08 | b |
| WT | Diq\_H | 6.46±0.36 | b | 0.83±0.096 | a | 7.76±0.473 | ab | 0.47±0.082 | b |

**Table S4.** Percent of change difference in morphological traits (shoot and root length; cm and MF; g)and maximum quantum yield of PSII (*F*v/*F*m) of GST transplastomic lines and WT tobacco plants grown for 20 days in salinity stress (150 and 300 mM NaCl) *in vitro*. Data are the mean ± SE. Different letters indicate significant differences between treatments for each genotype at p<0.05.

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| **Genotype** | **Treatment** | **shoot length%** | **HSD** | **root length%** | **HSD** | **MF%** | **HSD** | ***F*v/*F*m%** | **HSD** |
| pt*At*GSTT6.1 | NaCl\_L | -21.13 | a | -2.75 | a | -34.08 | ab | 1.22 | a |
| pt*At*GSTT6.1 | NaCl\_H | -61.50 | b | -65.07 | b | -71.75 | b | -4.88 | b |
| pt*At*GSTT2a | NaCl\_L | -15.79 | a | -15.85 | a | -39.61 | ab | -1.22 | a |
| pt*At*GSTT2a | NaCl\_H | -42.72 | a | -72.44 | b | -73.07 | b | -4.87 | b |
| ptEFD6-115A | NaCl\_L | -55.88 | b | 8.05 | a | -36.25 | b | 1.22 | a |
| ptEFD6-115A | NaCl\_H | -67.06 | b | -59.29 | b | -67.33 | c | -4.87 | b |
| WT | NaCl\_L | -30.03 | b | -6.61 | a | -20.93 | a | 1.22 | a |
| WT | NaCl\_H | -52.90 | b | -74.38 | b | -72.67 | b | -7.32 | b |

**Table S5.** Percent of change difference in morphological traits (shoot and root length; cm and MF; g)and maximum quantum yield of PSII (*F*v/*F*m) of GST transplastomic lines and WT tobacco plants grown for 35 days in osmotic stress (100 and 200 mM mannitol stress) *in vitro*. Data are the % change of the mean ± SE. Different letters indicate significant differences between treatments with the control for each genotype at p<0.05.

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| **Genotype** | **Treatment** | **shoot length%** | **HSD** | **root length%** | **HSD** | **MF%** | **HSD** | ***F*v/*F*m%** | **HSD** |
| pt*At*GSTT6.1 | Man\_L | 17.17 | a | -9.79 | a | -20.37 | a | 7.79 | a |
| pt*At*GSTT6.1 | Man\_H | -14.16 | b | -16.08 | a | -64.44 | b | 5.19 | a |
| pt*At*GSTT2a | Man\_L | -82.76 | b | -75 | b | -86.21 | b | 0 | a |
| pt*At*GSTT2a | Man\_H | 16.55 | a | 22.92 | a | -70.93 | b | -5.06 | a |
| ptEFD6-115A | Man\_L | -52.46 | b | -5.68 | a | -63.71 | b | 3.79 | a |
| ptEFD6-115A | Man\_H | -63.44 | b | -1.14 | a | -76.03 | b | 1.26 | b |
| WT | Man\_L | -53.4 | b | 2.44 | a | -51.07 | b | 1.23 | a |
| WT | Man\_H | -53.6 | b | 7.9 | a | -71.82 | c | -2.47 | b |