**Table S1.** Gradient elution program in the HPLC analysis for amino acids.

|  |  |  |
| --- | --- | --- |
| Time / min | A / % | B / % |
| 0 | 100 | 0 |
| 3.0 | 100 | 0 |
| 3.50 | 95 | 5 |
| 4.50 | 95 | 5 |
| 5.00 | 70 | 30 |
| 6.00 | 70 | 30 |
| 6.50 | 30 | 70 |
| 7.5 | 30 | 70 |
| 8.00 | 100 | 0 |
| 12.0 | 100 | 0 |

**Table S2.** RT-qPCR primers for genes involved in JA and SA defense responses.

|  |  |  |
| --- | --- | --- |
| Primer | Primer sequences | E value |
| *AOS*-F | ACTTCAACACGCTCAACGACT | 0.92 |
| *AOS*-R | TCACCGCTGACAAAGATGG |
| *LOX*-F | GACCAGCGAAACAACAACC | 0.96 |
| *LOX*-R | GCATACAATAGCGGGAACAC |
| *PAL*-F | CCACCCTGGACAGATTGAA | 0.98 |
| *PAL*-R | ATGAGCGGGTTGTCGTTG |
| *PR-1*-F | ATAACCTCGGCGTCTTCAT | 1.01 |
| *PR-1*-R | TACTCGCTCGGTCCCTCT |
| *Actin*-F | GGAAAATCAGTCTCGGTTCAG | 0.96 |
| *Actin*-R | TCATACAGCAGGCAAGCAC |

**Table S3.** Summary of ANOVA results for effects of elevated CO2 and drought on relative water content.

|  |  |  |  |
| --- | --- | --- | --- |
| Treatment | *df* | *F* | *P* |
| CO2 | 1 | 10.13 | 0.01 |
| Drought | 1 | 26.12 | < 0.01 |
| CO2\*drought | 1 | 2.48 | 0.15 |

**Table S4.** Summary of ANOVA results for effects of elevated CO2 and drought on soluble sugar contents.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Measurement | Treatment | *df* | *F* | *P* |
|  | CO2 | 1 | 0.93 | 0.36 |
| Fructose | Drought | 1 | 6.12 | 0.04 |
|  | CO2\*drought | 1 | 0.01 | 0.95 |
|  | CO2 | 1 | 5.93 | 0.05 |
| Glucose | Drought | 1 | 11.76 | <0.01 |
|  | CO2\*drought | 1 | 0.61 | 0.46 |
|  | CO2 | 1 | 2.25 | 0.17 |
| Sucrose | Drought | 1 | 9.27 | 0.02 |
|  | CO2\*drought | 1 | 0.04 | 0.85 |
|  | CO2 | 1 | 5.31 | 0.05 |
| Total sugars | Drought | 1 | 22.73 | <0.01 |
|  | CO2\*drought | 1 | 0.01 | 0.94 |

**Table S5.** Summary of ANOVA results for effects of elevated CO2 and drought on amino acid contents.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Measurement | Treatment | *df* | *F* | *P* |
|  | CO2 | 1 | 3.98 | 0.08 |
| Leucine | Drought | 1 | 0.43 | 0.53 |
|  | CO2\*drought | 1 | 0.14 | 0.72 |
|  | CO2 | 1 | 0.01 | 0.98 |
| Phenylalanine | Drought | 1 | 12.09 | <0.01 |
|  | CO2\*drought | 1 | 0.53 | 0.49 |
|  | CO2 | 1 | 0.28 | 0.61 |
| Alanine | Drought | 1 | 2.72 | 0.14 |
|  | CO2\*drought | 1 | 28.42 | <0.01 |
|  | CO2 | 1 | 8.11 | 0.02 |
| Methionine | Drought | 1 | 3.93 | 0.08 |
|  | CO2\*drought | 1 | 0.37 | 0.56 |
|  | CO2 | 1 | 5.17 | 0.05 |
| Glycine | Drought | 1 | 1.21 | 0.3 |
|  | CO2\*drought | 1 | 0.06 | 0.81 |
|  | CO2 | 1 | 1.18 | 0.31 |
| Glutamate | Drought | 1 | 7.72 | 0.02 |
|  | CO2\*drought | 1 | 0.01 | 0.94 |
|  | CO2 | 1 | 0.01 | 0.92 |
| Glutamine | Drought | 1 | 0.25 | 0.63 |
|  | CO2\*drought | 1 | 0.92 | 0.37 |
|  | CO2 | 1 | 0.01 | 0.95 |
| Valine | Drought | 1 | 5.0 | 0.06 |
|  | CO2\*drought | 1 | 0.29 | 0.6 |
|  | CO2 | 1 | 1.28 | 0.29 |
| Arginine | Drought | 1 | 0.64 | 0.45 |
|  | CO2\*drought | 1 | 4.21 | 0.07 |
|  | CO2 | 1 | 5.83 | 0.04 |
| Lysine | Drought | 1 | 0.22 | 0.65 |
|  | CO2\*drought | 1 | 1.14 | 0.32 |
|  | CO2 | 1 | 0.13 | 0.72 |
| Tyrosine | Drought | 1 | 6.93 | 0.03 |
|  | CO2\*drought | 1 | 0.79 | 0.4 |
|  | CO2 | 1 | 0.37 | 0.56 |
| Proline | Drought | 1 | 14.87 | <0.01 |
|  | CO2\*drought | 1 | 4.33 | 0.07 |
|  | CO2 | 1 | 10.4 | 0.01 |
| Tryptophan | Drought | 1 | 99.59 | <0.01 |
|  | CO2\*drought | 1 | 6.67 | 0.03 |
|  | CO2 | 1 | 0.01 | 0.75 |
| Serine | Drought | 1 | 3.17 | 0.11 |
|  | CO2\*drought | 1 | 0.56 | 0.47 |
|  | CO2 | 1 | 34.46 | <0.01 |
| Threonine | Drought | 1 | 2.6 | 0.15 |
|  | CO2\*drought | 1 | 3.91 | 0.08 |
|  | CO2 | 1 | 5.19 | 0.05 |
| Aspartic acid | Drought | 1 | 7.56 | 0.02 |
|  | CO2\*drought | 1 | 0.8 | 0.4 |
|  | CO2 | 1 | 4.24 | 0.07 |
| Asparagine | Drought | 1 | 9.03 | 0.02 |
|  | CO2\*drought | 1 | 0.21 | 0.66 |
|  | CO2 | 1 | 2.09 | 0.19 |
| Isoleucine | Drought | 1 | 1.04 | 0.34 |
|  | CO2\*drought | 1 | 0.03 | 0.86 |
|  | CO2 | 1 | 5.52 | 0.05 |
| Serine | Drought | 1 | 0.97 | 0.35 |
|  | CO2\*drought | 1 | 0.74 | 0.41 |
|  | CO2 | 1 | 5.7 | 0.04 |
| Total | Drought | 1 | 10.13 | 0.01 |
|  | CO2\*drought | 1 | 0.03 | 0.87 |

**Table S6.** Summary of ANOVA results for effects of elevated CO2, drought, and aphid infestation on phytohormone contents.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Measurement | Treatment | *df* | *F* | *P* |
|  | CO2 | 1 | 2.10 | 0.17 |
|  | Drought | 1 | 141.75 | <0.01 |
|  | Infestation | 1 | 18.19 | <0.01 |
| ABA | CO2\*drought | 1 | 0.17 | 0.68 |
|  | CO2\*infestation | 1 | 0.07 | 0.79 |
|  | drought\*infestation | 1 | 0.03 | 0.87 |
|  | CO2\*drought\*infestation | 1 | 0.91 | 0.35 |
|  | CO2 | 1 | 4.82 | 0.04 |
|  | Drought | 1 | 53.99 | <0.01 |
|  | Infestation | 1 | 6.31 | 0.02 |
| JA | CO2\*drought | 1 | 3.27 | 0.09 |
|  | CO2\*infestation | 1 | 0.61 | 0.45 |
|  | drought\*infestation | 1 | 0.77 | 0.39 |
|  | CO2\*drought\*infestation | 1 | 0.33 | 0.58 |
|  | CO2 | 1 | 35.77 | <0.01 |
|  | Drought | 1 | 0.01 | 0.91 |
|  | Infestation | 1 | 6.87 | 0.02 |
| SA | CO2\*drought | 1 | 4.6 | 0.05 |
|  | CO2\*infestation | 1 | 0.7 | 0.42 |
|  | drought\*infestation | 1 | 0.85 | 0.37 |
|  | CO2\*drought\*infestation | 1 | 0.01 | 0.99 |

**Table S7.** Summary of ANOVA results for effects of elevated CO2, drought, and aphid infestation on JA- and SA-related gene expression.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Measurement | Treatment | *df* | *F* | | *P* | |
|  | CO2 | 1 | 2.37 | | 0.14 | |
|  | Drought | 1 | 46.06 | | <0.01 | |
|  | Infestation | 1 | 13.17 | | <0.01 | |
| *AOS* | CO2\*drought | 1 | 2.02 | | 0.17 | |
|  | CO2\*infestation | 1 | 0.39 | | 0.54 | |
|  | drought\*infestation | 1 | 1.31 | | 0.27 | |
|  | CO2\*drought\*infestation | 1 | 3.62 | | 0.08 | |
|  | CO2 | 1 | 5.42 | | 0.03 | |
|  | Drought | 1 | 22.81 | | <0.01 | |
| *LOX* | Infestation | 1 | 61.77 | | <0.01 | |
|  | CO2\*drought | 1 | 1.78 | | 0.20 | |
|  | CO2\*infestation | 1 | 0.11 | | 0.74 | |
|  | drought\*infestation | 1 | 8.84 | | <0.01 | |
|  | CO2\*drought\*infestation | 1 | 0.39 | | 0.54 | |
|  | CO2 | 1 | 62.44 | | <0.01 | |
|  | Drought | 1 | 0.66 | | 0.43 | |
| *PR-1* | Infestation | 1 | 5.49 | 0.03 | |
|  | CO2\*drought | 1 | 0.01 | | 0.95 | |
|  | CO2\*infestation | 1 | 0.01 | | 0.96 | |
|  | drought\*infestation | 1 | 0.32 | | 0.58 | |
|  | CO2\*drought\*infestation | 1 | 0.01 | | 0.92 | |
|  | CO2 | 1 | 16.1 | | <0.01 | |
|  | Drought | 1 | 2.98 | | 0.10 | |
| *PAL* | Infestation | 1 | 6.83 | | 0.02 | |
|  | CO2\*drought | 1 | 0.15 | | 0.70 | |
|  | CO**2**\*infestation | 1 | 0.02 | | 0.88 | |
|  | drought\*infestation | 1 | 0.24 | | 0.63 | |
|  | CO2\*drought\*infestation | 1 | 0.63 | | 0.44 | |

**Table S8.** Summary of ANOVA results for effects of elevated CO2 and drought on aphid life table parameters.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Measurement | Treatment | *df* | *F* | *P* |
|  | CO2 | 1 | 5.97 | 0.04 |
| *R*0 | Drought | 1 | 6.62 | 0.03 |
|  | CO2\*drought | 1 | 0.01 | 0.95 |
|  | CO2 | 1 | 3.91 | 0.08 |
| *T* | Drought | 1 | 0.64 | 0.45 |
|  | CO2\*drought | 1 | 0.02 | 0.90 |
|  | CO2 | 1 | 10.19 | 0.01 |
| *r*m | Drought | 1 | 3.75 | 0.09 |
|  | CO2\*drought | 1 | 0.02 | 0.90 |
|  | CO2 | 1 | 10.1 | 0.01 |
| *λ* | Drought | 1 | 3.75 | 0.09 |
|  | CO2\*drought | 1 | 0.01 | 0.92 |