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| **Table S3 Annotation of long-day-treatment-induced differentially expressed genes (DEGs).** |
| Gene ID | A/B1 | E2 | P3 | Annotation (nr blast, Smart Blast) |
| Csa3M026660.1 | LL/LS | 2.651 | 0.870 | 14 kDa proline-rich protein DC2.15-like (HSP-like) |
| Csa4M646340.1 | HL/HS | -1.438 | 0.909 | 17.9 kDa class II heat shock protein-like (HSP20)  |
| Csa5M197620.1 | HL/HS | -1.902 | 0.926 | 18.1 kDa class I heat shock protein-like (ACD ScHsp26-like) |
| Csa7M073680.1 | LL/LS | -1.475 | 0.819 | abscisic acid 8'-hydroxylase 4-like (P450) |
| Csa6M511860.1 | HL/HS | -2.229 | 0.926 | ACC oxidase 2 (DIOX\_N; 2OG-FeII\_Oxy) |
| Csa6M076710.1 | HL/HS | -1.489 | 0.885 | agamous-like MADS-box protein AGL6 (MADS\_MEF2\_like; K-box) |
| Csa6M095270.1 | HL/HS | -2.906 | 0.873 | agamous-like MADS-box protein AGL9 homolog isoform X1 (K-box) |
| Csa1M598330.1 | HL/HS | -1.036 | 0.833 | alpha-aminoadipic semialdehyde synthase isoform X1 (LKR\_SDH\_like; SDH\_N\_domain) |
| Csa3M894480.1 | HL/HS | -1.419 | 0.874 | amino acid permease 6-like (SLC5-6-like\_sbd) |
| Csa4M618500.1 | HL/HS | -1.023 | 0.815 | anthocyanidin 3-O-glucosyltransferase 2-like (Glycosyltransferase\_GTB\_type) |
| Csa1M268280.1 | HL/HS | -1.640 | 0.903 | apolipoprotein D; temperature-induced lipocalin  |
| Csa5M044510.1 | HL/HS | -1.015 | 0.829 | aquaporin PIP2-2-like (MIP) |
| Csa3M646010.1 | HL/HS | -1.516 | 0.835 | auxin-repressed 12.5 kDa protein-like (Auxin\_repressed:) |
| Csa6M006890.1 | HL/HS | -1.217 | 0.887 | BAG family molecular chaperone regulator 6 (BAG) |
| Csa3M912950.1 | HL/HS | -1.897 | 0.894 | bax inhibitor 1-like |
| Csa2M370570.1 | HL/HS | -1.603 | 0.893 | beta carbonic anhydrase 5, chloroplastic-like isoform X2 (beta\_CA\_cladeB) |
| Csa1M049460.1 | HL/HS | -1.344 | 0.897 | BTB/POZ and TAZ domain-containing protein 1 (SPOP\_C; zf-TAZ) |
| Csa3M081900.1 | HL/HS | -1.249 | 0.819 | calcium-binding protein PBP1-like  |
| Csa2M357340.1 | HL/HS | -1.092 | 0.848 | calmodulin-like protein (EFh) |
| Csa2M357860.1 | LL/LS | -1.211 | 0.841 | calmodulin-like protein (EFh) |
| Csa4M003670.1 | HL/HS | -1.822 | 0.878 | calvin cycle protein CP12-2, chloroplastic (CP12) |
| Csa1M039100.1 | HL/HS | -1.571 | 0.864 | chaperone protein ClpB1; Heat shock protein 101 |
| Csa4M625060.1 | HL/HS | 1.064 | 0.861 | ctenidin-3-like; cold and drought-regulated protein CORA-like; glycine-rich cell wall structural protein  |
| Csa2M363570.1 | HL/HS | -1.324 | 0.890 | cysteine protease  |
| Csa5M224130.1 | HL/HS | -1.148 | 0.864 | cytochrome P450 714A1-like (P450) |
| Csa3M852640.1 | HL/HS | -1.820 | 0.823 | cytochrome P450 CYP82D47-like (P450) |
| Csa6M141420.1 | HL/HS | -1.062 | 0.843 | cytokinin riboside 5'-monophosphate phosphoribohydrolase LOG1-like isoform X1 (DNA processing A) |
| Csa4M045040.1 | HL/HS | -1.464 | 0.884 | dehydrin DHN1 (dehydrin) |
| Csa7M396330.1 | HL/HS | 1.777 | 0.876 | desiccation-related protein PCC13-62 (Ferritin\_2) |
| Csa4M126990.1 | HL/HS | -1.371 | 0.872 | developmental protein SEPALLATA 2-like (K-box) |
| Csa1M153560.1 | HL/HS; LL/LS | 1.834; 1.128 | 0.922; 0.882 | fibril-forming collagen alpha chain-like |
| Csa3M002800.1 | HL/HS | 1.284 | 0.844 | flavanone 3-hydroxylase (DIOX\_N; 2OG-FeII\_Oxy) |
| Csa4M358770.1 | HL/HS | -2.592 | 0.866 | floral homeotic protein PMADS 2 isoform X2 (K-box) |
| Csa7M195260.1 | HL/HS | -1.359 | 0.809 | fructose-bisphosphate aldolase, cytoplasmic isozyme 1 (FBP\_aldolase\_I\_a) |
| Csa5M172270.1 | HL/HS | 1.049 | 0.833 | gibberellin 20 oxidase 1-like (DIOX N; 2OG-Fell Oxy) |
| Csa1M278500.1 | HL/HS | -1.593 | 0.898 | glycine-rich cell wall structural protein 2 |
| Csa4M025120.1 | HL/HS | -1.303 | 0.845 | glycine-rich cell wall structural protein 2  |
| Csa3M009550.1 | HL/HS | -1.755 | 0.866 | glycine-rich cell wall structural protein 2-like  |
| Csa2M070310.1 | HL/HS | -3.051 | 0.884 | heat shock 70 kDa protein |
| Csa5M514500.1 | HL/HS | -1.104 | 0.878 | heat shock cognate 70 kDa protein (HSPA1-2 6-8-like NBD) |
| Csa2M351640.1 | HL/HS | -1.770 | 0.874 | heat shock factor protein HSF30-like  |
| Csa3M183950.1 | HL/HS | -1.886 | 0.896 | heat shock protein 83-like  |
| Csa7M387720.1 | HL/HS | -1.621 | 0.883 | heat stress transcription factor A-6b-like isoform X2 (HSF DNA-bind) |
| Csa2M004690.1 | HL/HS | 1.040 | 0.852 | heat stress transcription factor C-1 (HSF\_DNA-bind) |
| Csa1M572420.1 | LL/LS | -1.668 | 0.882 | histidine-containing phosphotransfer protein 1 |
| Csa3M119240.1 | HL/HS | -1.209 | 0.865 | homeobox-leucine zipper protein ATHB-12 (homeodomain) |
| Csa6M501990.1 | HL/HS | -1.213 | 0.880 | homeobox-leucine zipper protein ATHB-40 (homeodomain) |
| Csa1M063560.1 | HL/HS | -1.719 | 0.879 | HSP20 family protein |
| Csa1M527870.1 | HL/HS | -1.877 | 0.914 | HSP20 family protein |
| Csa1M527875.1 | HL/HS | -1.427 | 0.887 | HSP20 family protein |
| Csa1M560745.1 | HL/HS | -1.915 | 0.809 | hydrophobic protein LTI6B-like (Pmp3) |
| Csa2M420990.1 | HL/HS | -1.881 | 0.875 | isocitrate lyase (ICL\_PEPM) |
| Csa2M009550.1 | HL/HS | 1.196 | 0.862 | LIGHT-DEPENDENT SHORT HYPOCOTYLS 2 |
| Csa2M028490.1 | HL/HS; LL/LS | 1.108; 1.393 | 0.880; 0.861 | linoleate 9S-lipoxygenase 6-like |
| Csa2M028500.1 | HL/HS | 1.140 | 0.887 | linoleate 9S-lipoxygenase 6-like |
| Csa1M051580.1 | LL/LS | -1.160 | 0.872 | MADS-box protein |
| Csa6M367080.1 | HL/HS | -1.359 | 0.878 | MADS-box protein CMB1 (K-box) |
| Csa1M039900.1 | HL/HS | -1.384 | 0.853 | MADS-box protein CMB1-like isoform X4 (K-box) |
| Csa3M179130.1 | HL/HS | -1.135 | 0.805 | MADS-box transcription factor 6-like |
| Csa6M095280.1 | HL/HS; LL/LS | -2.151; -1.228 | 0.886; 0.831 | MADS-box transcription factor 8-like |
| Csa1M050360.1 | HL/HS | -1.152 | 0.878 | malate synthase, glyoxysomal (malate\_synt\_A) |
| Csa3M020080.1 | HL/HS | -1.628 | 0.919 | mitochondrial small heat shock protein  |
| Csa3M020090.1 | HL/HS | -1.803 | 0.920 | mitochondrial small heat shock protein  |
| Csa1M532310.1 | HL/HS | -2.718 | 0.815 | mitogen-activated protein kinase kinase kinase NPK1  |
| CsaUNM014620.1 | HL/HS | 1.557 | 0.835 | MLP-like protein 31 (Bet v1-like) |
| Csa5M037437.1 | HL/HS; LL/LS | 1.564; 1.660 | 0.914; 0.869 | MLP-like protein 328 (Bet v1-like) |
| Csa3M171860.1 | HL/HS | 1.206 | 0.880 | MLP-like protein 34-like  |
| Csa3M171870.1 | HL/HS | 1.171 | 0.891 | MLP-like protein 34-like  |
| Csa5M266880.1 | HL/HS | 1.393 | 0.896 | MLP-like protein 43 (Bet v1-like) |
| Csa2M004720.1 | HL/HS | -1.901 | 0.867 | multiprotein-bridging factor 1c |
| Csa3M852470.1 | HL/HS | -1.921 | 0.875 | NAC domain-containing protein 72-like isoform X2 (NAM) |
| Csa5M606310.1 | HL/HS | -1.835 | 0.834 | NAC transcription factor 29-like (NAM) |
| Csa2M009470.1 | HL/HS | 1.162 | 0.883 | NADP-dependent glyceraldehyde-3-phosphate dehydrogenase isoform X2 (ALDH\_F11\_NP-GAPDH) |
| Csa2M060500.1 | LL/LS | -1.229 | 0.807 | oxysterol-binding protein-related protein 4B-like  |
| Csa4M082440.1 | HL/HS | 1.418 | 0.880 | pathogen-related protein-like  |
| Csa1M002810.1 | HL/HS | -1.233 | 0.856 | peptide methionine sulfoxide reductase-like (MsrA) |
| Csa1M542510.1 | HL/HS; LL/LS | -2.124; -2.489 | 0.899; 0.924 | phloem protein  |
| Csa7M056500.1 | HL/HS; LL/LS | -1.381; -1.718 | 0.893; 0.911 | phloem protein 2 (PP2) |
| Csa6M000120.1 | HL/HS | 2.167 | 0.911 | polygalacturonase At1g48100 (Pectate\_lyase\_3) |
| Csa6M526410.1 | HL/HS | 1.507 | 0.818 | polygalacturonase QRT3-like (Pectate\_lyase\_3) |
| Csa6M500540.1 | LL/LS | -1.064 | 0.843 | probable trehalose-phosphate phosphatase J (Trehalose PPase) |
| Csa4M028470.1 | LL/LS | -1.280 | 0.882 | probable trehalose-phosphate phosphatase J-like (trehalose ppase) |
| Csa3M710870.1 | LL/LS | 1.459 | 0.880 | probable WRKY transcription factor 40-like  |
| Csa5M643300.1 | HL/HS | -1.836 | 0.827 | proline dehydrogenase 2, mitochondrial-like (Pro\_dh) |
| Csa7M009730.1 | LL/LS | 1.005 | 0.832 | proline-rich protein 4 isoform X1 (pollen ole e I) |
| Csa4M500830.1 | HL/HS | -1.015 | 0.840 | protein PHLOEM PROTEIN 2-LIKE A1-like (PP2) |
| Csa4M501830.1 | HL/HS | -1.769 | 0.870 | protein PHLOEM PROTEIN 2-LIKE A4-like (PP2) |
| Csa3M736740.1 | HL/HS | 1.154 | 0.828 | protein REVEILLE 8-like isoform X2 (SANT) |
| Csa7M262890.1 | HL/HS | 1.178 | 0.891 | proteoglycan 4-like isoform X1 |
| Csa7M262900.1 | HL/HS | 1.238 | 0.893 | proteoglycan 4-like isoform X1 (DUF2775) |
| Csa3M512980.1 | LL/LS | 1.469 | 0.902 | rRNA intron-encoded homing endonuclease |
| Csa1M168880.1 | HL/HS; LL/LS | -1.165; -1.044 | 0.873; 0.868 | secoisolariciresinol dehydrogenase (NADB\_Rossmann) |
| Csa2M418950.1 | LL/LS | -1.218 | 0.805 | septum-promoting GTP-binding protein 1 (P-loop\_NTPase) |
| Csa4M644120.1 | HL/HS | -1.441 | 0.838 | serine carboxypeptidase-like 1 isoform X1 (Peptidase\_S10) |
| Csa7M414480.1 | HL/HS | -1.047 | 0.876 | short-chain dehydrogenase reductase 3b-like isoform X1 (NADB\_Rossmann) |
| Csa7M414490.1 | HL/HS | -1.054 | 0.808 | short-chain dehydrogenase reductase 3b-like isoform X1 (NADB\_Rossmann) |
| Csa3M041380.1 | HL/HS | 1.024 | 0.834 | terpene synthase |
| Csa3M743950.1 | HL/HS | -1.212 | 0.883 | thaumatin-like protein 1-like  |
| Csa3M078800.1 | HL/HS | -2.107 | 0.907 | thiamine thiazole synthase, chloroplastic-like  |
| Csa1M020890.1 | HL/HS | -1.457 | 0.852 | transcription factor DICHOTOMA-like (TCP) |
| Csa1M039910.1 | HL/HS | -1.128 | 0.874 | truncated transcription factor CAULIFLOWER A isoform X1; agamous-like MADS-box protein AGL8; (K-box) |
| Csa6M367090.1 | HL/HS | -1.126 | 0.869 | truncated transcription factor CAULIFLOWER A-like (K-box) |
| Csa4M126480.1 | HL/HS | -1.232 | 0.872 | truncated transcription factor CAULIFLOWER D isoform X2 (K-box) |
| Csa6M010000.1 | LL/LS | -2.040 | 0.917 | uncharacterized acetyltransferase At3g50280 (condensation) |
| Csa1M050230.1 | HL/HS | -3.799 | 0.843 | uncharacterized protein |
| Csa1M527880.1 | HL/HS | -1.338 | 0.888 | uncharacterized protein |
| Csa2M000790.1 | HL/HS | -1.822 | 0.847 | uncharacterized protein |
| Csa2M047780.1 | LL/LS | -1.121 | 0.843 | uncharacterized protein |
| Csa2M047785.1 | LL/LS | -1.548 | 0.824 | uncharacterized protein |
| Csa2M252100.1 | HL/HS; LL/LS | 1.062; 1.972 | 0.864; 0.921 | uncharacterized protein |
| Csa3M695850.1 | HL/HS; LL/LS | -1.215; -1.136 | 0.869; 0.857 | uncharacterized protein |
| Csa3M748780.1 | HL/HS | -1.651 | 0.801 | uncharacterized protein |
| Csa3M848246.1 | LL/LS | 2.568 | 0.932 | uncharacterized protein |
| Csa3M848247.1 | HL/HS; LL/LS | 1.825; 2.281 | 0.891; 0.926 | uncharacterized protein |
| Csa3M859670.1 | HL/HS | -1.430 | 0.892 | uncharacterized protein |
| Csa3M880025.1 | HL/HS | -1.667 | 0.846 | uncharacterized protein |
| Csa3M880040.1 | HL/HS | -1.182 | 0.851 | uncharacterized protein |
| Csa4M243140.1 | LL/LS | 2.355 | 0.931 | uncharacterized protein |
| Csa4M652690.1 | LL/LS | 3.061 | 0.914 | uncharacterized protein |
| Csa5M168910.1 | HL/HS | -2.145 | 0.801 | uncharacterized protein |
| Csa5M197120.1 | HL/HS | -1.867 | 0.924 | uncharacterized protein |
| Csa6M006900.1 | HL/HS | -1.363 | 0.881 | uncharacterized protein |
| Csa6M150560.1 | HL/HS | -1.092 | 0.853 | uncharacterized protein |
| Csa6M239680.1 | LL/LS | 2.227 | 0.930 | uncharacterized protein |
| Csa6M239685.1 | LL/LS | 2.521 | 0.933 | uncharacterized protein |
| Csa6M517000.1 | HL/HS | -2.495 | 0.818 | uncharacterized protein |
| Csa7M067370.1 | LL/LS | -1.102 | 0.843 | uncharacterized protein |
| CsaUNM030420.1 | LL/LS | 2.411 | 0.932 | uncharacterized protein |
| CsaUNM030425.1 | LL/LS | 2.448 | 0.932 | uncharacterized protein |
| CsaUNM030435.1 | HL/HS; LL/LS | 1.152; 2.847 | 0.895; 0.935 | uncharacterized protein |
| Csa6M085110.1 | HL/HS | -2.189 | 0.890 | uncharacterized protein (agglutinin) |
| Csa5M638340.1 | HL/HS | 1.850 | 0.911 | uncharacterized protein (DUF179) |
| Csa4M141240.1 | HL/HS | 1.816 | 0.809 | uncharacterized protein (nsLTP2) |
| Csa6M052700.1 | HL/HS | -1.136 | 0.803 | uncharacterized protein (p23\_hB-ind1\_like) |
| Csa4M003620.1 | HL/HS | -2.090 | 0.875 | universal stress protein A-like protein (USP\_Like) |
| Csa5M550240.1 | HL/HS | 1.073 | 0.865 | vacuolar iron transporter 1-like (CCC1) |
| Csa1M422990.1 | LL/LS | 1.167 | 0.831 | xyloglucan endotransglucosylase/hydrolase protein 23 |
| Csa4M642460.1 | HL/HS | -1.197 | 0.879 | Zinc-finger protein 10 (zf-C2H2 6) |

1A/B, A is compared with B; 2E, the log2(A-FPKM/B-FPKM) value of the DEGs; 3P, probability.