**Table S1.** Primer sequences used in this work.

| Gene | Forward Primers (5'–3') | Reverse Primers (5'–3') | Amplicon (bp) | EFF%[1] | Concentration[2] (μmol/L) |
|---|---|---|---|---|---|
| *AMT1;1* | ATCCGACGCCAACTACACTTCTAC | CGATTTGGTCACAGATGAAGTGAG | 171 | 96.312 | 0.2 |
| *AMT1;2* | AAGCGAGGATGAGACTCAAGGG | GCAGGACTGGCATCATTAACAGG | 138 | 99.406 | 0.2 |
| *AMT1;5* | ACAGATAGTGGTAATTATAGGGTG | CGTGGTCATGGTACACGTAAGC | 158 | 102.381 | 0.2 |
| *AMT1;6* | GTAACTTATTGTTCACCTCTGGGGC | CGTTCCTGAACGCGTCGAAT | 135 | 107.913 | 0.2 |
| *AMT1;8* | GTTGTTAGGCTCTGGAGCCATTG | GCCTTCCCAAACGTGTCAAAC | 129 | 97.639 | 0.4 |
| *AMT2;1* | GTGACGATGGATCGATTGAGACTC | CGCTAACAAAATAAGAGTAATAGCT | 109 | 94.450 | 0.4 |
| *AMT2;2* | ATATCGGAGATGACGCGGTTC | CGTACGCTGCTGTATTCCGAC | 102 | 92.635 | 0.2 |
| *AMT3;1* | TCACTGGCCTCGTCTGCATTAC | GGTGTCGTCAACTGCGGATAAC | 149 | 100.357 | 0.2 |
| *AMT4;2* | GGAGGTCCCAACGTGCACAC | CACGATGAACCGAATCAGAAAAC | 123 | 90.869 | 0.4 |
| *AMT4;3* | ATCACTGGCTTAGTTTGCATTACTC | GACTTGCTTTAGGATGCCGATT | 141 | 108.174 | 0.2 |
| *EF-1α*[3] | ATTCAAGTATGCCTGGGTGC | CAGTCAGCCTGTGATGTTCC | 179 | 104.245 | 0.2 |
| *AMT1;2C*[4] | ATGGCCACTCTGACCTGCAC | TTATGCAGGACTGGCATCATTAAC | 1515 | | |

[1] Eff% indicated the efficiency of primers.

[2] Concentration indicated primer concentration used to obtain the corresponding PCR efficiency.

[3] Served as reference gene.

[4] Primers used for cloning of *AMT1;2*.

**Table S2.** Correlation analysis of *AMT2;1* and *AMT2;2* expression levels during diurnal cycles.

| | | AMT2;1 | AMT2;2 |
|---|---|---|---|
| AMT2;1 | Pearson correlation | 1 | 0.982** |
| | Sig. (2-tailed) | | 0.003 |
| | N | 5 | 5 |
| AMT2;2 | Pearson correlation | 0.982** | 1 |
| | Sig. (2-tailed) | 0.003 | |
| | N | 5 | 5 |

** Correlation is significant at the 0.01 level (2-tailed).

**Table S3.** Analysis of cis-acting elements that existed in the promoters of *MdAMT* genes.

| Cis element | Sequence | Number of Cis-elements (*MdAMTs*) | | | | | | | | Function |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 1;2 | 1;4 | 1;6 | 1;8 | 2;1 | 3;1 | 4;1 | 4;3 | |
| ABRE | TACGGTC | 3 | 2 | 0 | 3 | 0 | 1 | 1 | 0 | abscisic acid responsiveness |
| ACE | CTAACGTATT | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | light responsiveness |
| AE-box | AGAAACAT | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | part of a module for light response |
| ARE | TGGTTT | 2 | 1 | 1 | 1 | 2 | | 1 | 6 | anaerobic induction |
| ATC-motif | AGTAATCT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | part of a conserved DNA module involved in light responsiveness |
| AT-rich element | ATAGAAATCAA | 1 | 0 | 0 | 0 | 1 | 0 | 2 | 0 | binding site of AT-rich DNA binding protein |
| ATCT-motif | AATCTAATCC | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 1 | part of a conserved DNA module involved in light responsiveness |
| Box 4 | ATTAAT | 3 | 0 | 1 | 1 | 8 | 4 | 1 | 3 | part of a conserved DNA module involved in light responsiveness |
| Box III | CATTTACACT | 1 | 0 | 0 | 0 | 0 | 0 | 2 | 0 | protein binding site |
| Box-W1 | TTGACC | 1 | 1 | 3 | 1 | 1 | 1 | 0 | 1 | Fungal elicitor responsive element |
| CAAT-box | CAAAT | 33 | 0 | 0 | 0 | 0 | 0 | 27 | 0 | common cis-acting element in promoter and enhancer regions |
| CATT-motif | GCATTC | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | part of a light responsive element |
| CCAAT-box | CAACGG | 1 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | MYBHv1 binding site |
| CGTCA-motif | CGTCA | 0 | 3 | 0 | 0 | 1 | 1 | 0 | 2 | involved in the MeJA-responsiveness |
| EIRE | TTCGACC | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | elicitor-responsive element |
| ELI-box3 | AAACCAATT | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | elicitor-responsive element |
| ERE | ATTTCAAA | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | ethylene-responsive element |
| G-Box | CACGTA | 2 | 2 | 0 | 1 | 1 | 1 | 1 | 2 | involved in light responsiveness |
| G-box | CACGAC | 5 | 3 | 0 | 4 | 0 | 1 | 1 | 4 | involved in light responsiveness |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| GA-motif | AAGGAAGA | 0 | 0 | 1 | 0 | 0 | 0 | 1 | 0 | part of a light responsive element |
| GAG-motif | AGAGATG | 0 | 1 | 3 | 0 | 1 | 1 | 3 | 1 | part of a light responsive element |
| GARE-motif | AAACAGA | 1 | 3 | 0 | 0 | 0 | 0 | 1 | 0 | gibberellin-responsive element |
| GC-motif | CCCCCG | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | enhancer-like element involved in anoxic specific inducibility |
| GCN4_motif | TGTGTCA | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | involved in endosperm expression |
| GT1-motif | GGTTAAT | 0 | 0 | 0 | 0 | 1 | 1 | 5 | 2 | light responsive element |
| H-box | ACCATTTTCACTC | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | involved in light responsiveness |
| HD-Zip 3 | GTAAT(G/C)ATTAC | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | protein binding site |
| HSE | AAAAAATTTC | 3 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | involved in heat stress responsiveness |
| I-box | TATTATCTAGA | 0 | 0 | 0 | 2 | 0 | 0 | 1 | 0 | part of a light responsive element |
| LAMP-element | CCAAAACCA | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | part of a light responsive element |
| LTR | CCGAAA | 0 | 0 | 0 | 0 | 2 | 0 | 1 | 0 | low-temperature responsiveness |
| MBS | CAACTG | 2 | 1 | 1 | 0 | 0 | 3 | 1 | 1 | MYB binding site involved in drought-inducibility |
| MNF1 | GTGCCC(A/T) | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | light responsive element |
| MRE | AACCTAA | 0 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | MYB binding site involved in light responsiveness |
| O2-site | GATGACATGG | 0 | 1 | 0 | 2 | 1 | 0 | 1 | 3 | zein metabolism regulation |
| Skn-1_motif | GTCAT | 1 | 3 | 3 | 3 | 4 | 1 | 0 | 1 | required for endosperm expression |
| Sp1 | CC(G/A)CCC | 0 | 2 | 4 | 4 | 1 | 5 | 2 | 0 | light responsive element |
| RY-element | CATGCATG | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | involved in seed-specific regulation |
| TA-rich region | TATATATATATATATATATA | 0 | 0 | 0 | 0 | 1 | 23 | 0 | 0 | enhancer |
| TC-rich repeats | ATTTTCTTCA | 1 | 1 | 0 | 0 | 2 | 0 | 1 | 0 | defense and stress responsiveness |
| TCCC-motif | TCTCCCT | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | part of a light responsive element |
| TCT-motif | TCTTAC | 1 | 2 | 0 | 0 | 0 | 1 | 0 | 0 | part of a light responsive element |
| TGA-element | AACGAC | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 2 | auxin-responsive element |
| TGACG-motif | TGACG | 0 | 3 | 0 | 0 | 1 | 1 | 0 | 2 | involved in the MeJA-responsiveness |
| WUN-motif | TCATTACGAA | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 2 | wound-responsive element |
| as-2-box | GATAatGATG | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | involved in shoot-specific expression and light responsiveness |
| chs-CMA1a | TTACTTAA | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | part of a light responsive element |
| circadian | CAAAGATATC | 0 | 2 | 2 | 0 | 0 | 1 | 3 | 2 | involved in circadian control |
| rbcS-CMA7a | GTCGATAAGG | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | part of a light responsive element |

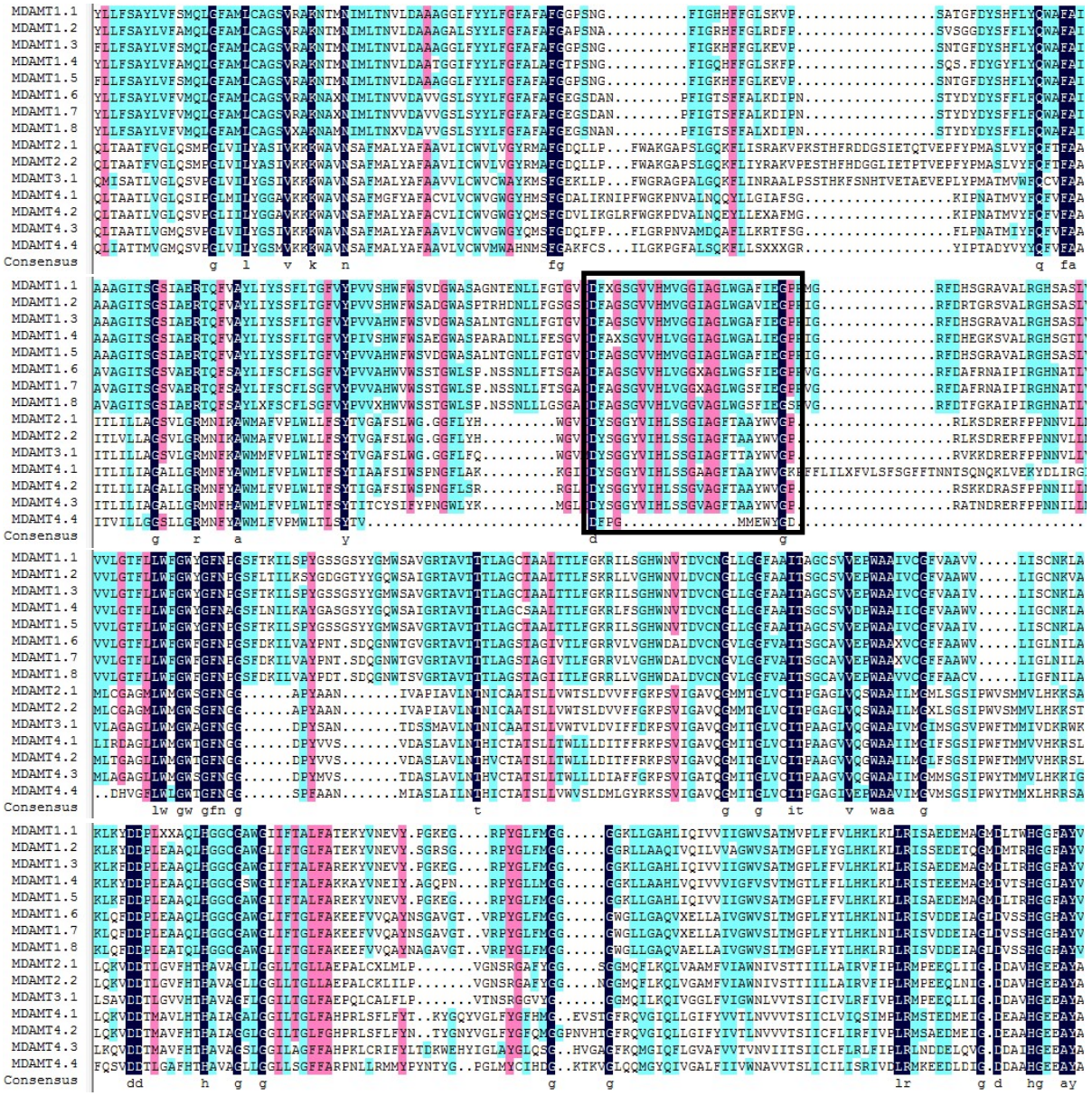

**Figure S1.** Multiple sequence alignment of MdAMTs. The conserved AMT-specific domain is enclosed by rectangle.