

Supplemental Table II. Summary of the rice acyltransferase mutant screen. Primers for genotyping and gene expression analysis are listed in Supplemental Table I.

| Gene Name ^a | Locus ID (LOC_) ^b | EST Count ^c | Mutant Line ID (PFG_) | cv ^d | Line Class (Insert Position) | # Plants Genotyped | Insert Detected | Gene Expression (primer position) | Immature leaf and sheath cell wall hydroxycinnamic acid phenotype ^e |
|------------------------|------------------------------|------------------------|-----------------------|-----------------|---|--------------------|---------------------|---|--|
| <i>OsAt1</i> | <i>Os01g42880</i> | 87 | 3A-13924 | DJ | AT ⁱ | 14 | No | ND ^g | ND |
| <i>OsAt2</i> | <i>Os01g42870</i> | 27 | NA ^h | | | | | | |
| <i>OsAt3</i> | <i>Os05g04584</i> | 49 | 3A-02783 | DJ | AT | | No | ND | ND |
| <i>OsAt4</i> | <i>Os01g18744</i> | 51 | 3A-02300 | DJ | Insert/AT ⁱ | 20 | Yes, no homozygotes | ND | ND |
| | | | 3A-09297 | DJ | Insert/AT | | No | ND | ND |
| <i>OsAt5</i> | <i>Os05g19910</i> | 17 | 2A-20021 | DJ | AT (~4 kb 5' of start) | 20 | Yes | ~3000-fold increase (2 nd exon) | Leaf and sheath: increase in FA:p-CA ratio |
| | | | 1C-03624 | HY | Insert ^j | | No | ND | ND |
| <i>OsAt6</i> | <i>Os01g08380</i> | 80 | 1C-06931 | HY | Insert | | No | ND | ND |
| | | | 3A-08459 | DJ | AT | | No | ND | ND |
| | | | 2D-40810 | HY | AT | 20 | Yes | ND | None |
| <i>OsAt7</i> | <i>Os05g08640</i> | 19 | 2A-40095 | HY | Insert/AT (near 3' end of last exon) | 19 | Yes | ~4-fold reduction (1 st exon) ~5000-fold reduction (2 nd exon) | Sheath: decrease FA |
| <i>OsAt8</i> | <i>Os06g39470</i> | 6 | NA | | | | | | |
| <i>OsAt9</i> | <i>Os01g09010</i> | 211 | NA | | | | | | |
| <i>OsAt10</i> | <i>Os06g39390</i> | 38 | 4A-03423 ^k | DJ | AT (~8.5 kb 5' of start) | 16 | Yes | ~200-fold increase (2 nd exon) | Leaf and Sheath: decrease FA, possible increase in p-CA ^l |
| <i>OsAt11</i> | <i>Os04g11810</i> | 0 | NA | | | | | | |
| <i>OsAt12</i> | <i>Os04g09590</i> | 0 | 3A-16373 | DJ | AT | 20 | Yes | ND | None |
| | | | 2D-41616 | HY | AT | 20 | Yes | ND | None |
| <i>OsAt13</i> | <i>Os10g01930</i> | 3 | 2D-10182 | DJ | Insert/AT | 20 | Yes, no homozygotes | ND | ND |

| | | | | | | | | | |
|---------------|-------------------|----|-------------------------|----|------------------------------|----|---|-----------------------|-------------------|
| <i>OsAt14</i> | <i>Os10g02000</i> | 0 | NA | | | | | | |
| <i>OsAt15</i> | <i>Os10g01920</i> | 11 | 1B-00523 | DJ | AT (~7 kb 3' of start) | 20 | Yes | ~100-fold increase | Leaf: decrease FA |
| <i>OsAt16</i> | <i>Os10g01800</i> | 0 | 2D-40243 | DJ | AT | | No | ND | None |
| <i>OsAt17</i> | <i>Os10g03360</i> | 0 | NA | | | | | | |
| <i>OsAt18</i> | <i>Os10g03390</i> | 2 | 4A-04176 | DJ | AT | 20 | Yes | ND | None |
| <i>OsAt19</i> | <i>Os04g09260</i> | 8 | NA | | | | | | |
| <i>OsAt20</i> | <i>Os06g48560</i> | 0 | NA | | | | | | |
| Totals | 20 | | 17 (for 12 genes) | | | | 11 confirmed, 2 no homozyg. for insert | | 4 phenotypes |

^a *Oryza sativa* (Os) acyltransferase (At) gene names were assigned based on an early phylogenetic analysis, that has since been revised.

^b Annotation MSUv6.

^c Sum of ESTs from all organs/stages from rice Sanger EST data available through 2009.

^d DJ and HY indicate *O. sativa* var. *japonica* cv. Dongjin and cv. Hwayoung, respectively.

^e For homozygous mutants relative to wild-type segregant siblings. CA signifies *p*-coumaric acid. FA signifies ferulic acid. A change in FA:*p*-CA ratio is only mentioned when a phenotype in neither FA nor CA alone appear to change.

^f AT signifies a putative activation tagged line in which the T-DNA insert possesses transcription activation elements.

^g ND signifies not determined.

^h NA signifies that no rice activation lines were available at the inception of the study.

ⁱ Insert/AT signifies that the T-DNA possesses transcription activation sequences but is inserted within, or <300 base pairs away from, the gene.

^j Insert signifies that the T-DNA is inserted within, or <300 base pairs away from, the gene.

^k *OsAT10-D1*

^l Variation in *p*-CA among replicates reduced the significance of the possible increase in *p*-CA in the first generation of mutants characterized.

Supplemental Table III. Average \pm standard deviation of sugar composition of the media during the course of *Penicillium* sp. YT02 incubation with straw from *OsAT10-D1* (Mut) plants and the wild-type segregant (WT) plants. N = 5.

| Time (hrs) | Glucose | | | Xylose | | | Arabinose | | |
|------------|-----------------|-----------------|------------|-----------------|-----------------|------------|-----------------|-----------------|------------|
| | WT (mg/mL) | Mut (mg/mL) | Δ % | WT (mg/mL) | Mut (mg/mL) | Δ % | WT (mg/mL) | Mut (mg/mL) | Δ % |
| 12 | 0.42 \pm 0.01 | 0.42 \pm 0.02 | 0 | 0.17 \pm 0.03 | 0.32 \pm 0.04 | 88 | 0.05 \pm 0.02 | 0.05 \pm 0.01 | 0 |
| 24 | 1.4 \pm 0.1 | 1.5 \pm 0.4 | 3 | 0.7 \pm 0.3 | 1.4 \pm 0.5 | 106 | 0.14 \pm 0.05 | 0.24 \pm 0.01 | 71 |
| 36 | 2.1 \pm 0.1 | 2.3 \pm 0.2 | 9 | 0.8 \pm 0.2 | 1.8 \pm 0.4 | 116 | 0.27 \pm 0.03 | 0.40 \pm 0.01 | 48 |
| 48 | 2.7 \pm 0.1 | 4.4 \pm 0.3 | 65 | 1.2 \pm 0.5 | 2.3 \pm 0.2 | 95 | 0.5 \pm 0.2 | 0.39 \pm 0.02 | -19 |
| 60 | 3.5 \pm 0.1 | 4.7 \pm 0.3 | 35 | 1.7 \pm 0.3 | 2.7 \pm 0.2 | 64 | 0.6 \pm 0.2 | 0.63 \pm 0.02 | 5 |
| 72 | 3.4 \pm 0.1 | 6.1 \pm 0.2 | 82 | 1.8 \pm 0.1 | 3.7 \pm 0.4 | 102 | 0.5 \pm 0.5 | 0.60 \pm 0.03 | 25 |
| 84 | 3.3 \pm 0.1 | 4.8 \pm 0.1 | 47 | 2.0 \pm 0.2 | 2.9 \pm 0.2 | 45 | 0.6 \pm 0.3 | 0.80 \pm 0.05 | 35 |
| 96 | 1.8 \pm 0.1 | 3.4 \pm 0.2 | 97 | 1.4 \pm 0.1 | 2.5 \pm 0.2 | 84 | 0.5 \pm 0.2 | 0.64 \pm 0.03 | 28 |
| 120 | 1.1 \pm 0.1 | 1.4 \pm 0.1 | 28 | 1.6 \pm 0.1 | 2.4 \pm 0.2 | 48 | 0.5 \pm 0.2 | 0.48 \pm 0.03 | 7 |
| Avg | | | 46 | | | 82 | | | 25 |

| Time (hrs) | Galactose | | | Mannose | | | Cellobiose | | |
|------------|-----------------|-----------------|------------|-----------------|-----------------|------------|-----------------|-----------------|------------|
| | WT (mg/mL) | Mut (mg/mL) | Δ % | WT (mg/mL) | Mut (mg/mL) | Δ % | WT (mg/mL) | Mut (mg/mL) | Δ % |
| 12 | 0.02 \pm 0.01 | 0.02 \pm 0.01 | 0 | 0.04 \pm 0.01 | 0.04 \pm 0.01 | 0 | 0.20 \pm 0.01 | 0.09 \pm 0.01 | -55 |
| 24 | 0.11 \pm 0.02 | 0.04 \pm 0.01 | -62 | 0.18 \pm 0.02 | 0.16 \pm 0.01 | -9 | 0.38 \pm 0.01 | 0.36 \pm 0.02 | -4 |
| 36 | 0.09 \pm 0.03 | 0.10 \pm 0.01 | 11 | 0.14 \pm 0.06 | 0.20 \pm 0.03 | 48 | 0.54 \pm 0.01 | 0.35 \pm 0.02 | -35 |
| 48 | 0.18 \pm 0.06 | 0.16 \pm 0.01 | -13 | 0.42 \pm 0.04 | 0.23 \pm 0.04 | -44 | 0.70 \pm 0.01 | 0.55 \pm 0.04 | -22 |
| 60 | 0.15 \pm 0.02 | 0.27 \pm 0.03 | 80 | 0.38 \pm 0.03 | 0.45 \pm 0.03 | 20 | 0.85 \pm 0.02 | 0.81 \pm 0.05 | -5 |
| 72 | 0.16 \pm 0.04 | 0.12 \pm 0.02 | -25 | 0.24 \pm 0.04 | 0.48 \pm 0.02 | 100 | 0.95 \pm 0.01 | 1.2 \pm 0.2 | 27 |
| 84 | 0.15 \pm 0.02 | 0.40 \pm 0.03 | 170 | 0.15 \pm 0.03 | 0.30 \pm 0.02 | 103 | 0.73 \pm 0.03 | 0.80 \pm 0.05 | 10 |
| 96 | 0.65 \pm 0.01 | 0.24 \pm 0.01 | -63 | 0.10 \pm 0.02 | 0.40 \pm 0.02 | 300 | 0.60 \pm 0.02 | 0.80 \pm 0.04 | 34 |
| 120 | 0.36 \pm 0.01 | 0.03 \pm 0.02 | -17 | 0.36 \pm 0.05 | 0.30 \pm 0.01 | -17 | 0.37 \pm 0.03 | 0.78 \pm 0.02 | 110 |
| Avg | | | 10 | | | 63 | | | 14 |