Supplementary Table 1. Co-occurrence network analysis to explore relationships among genes and exudates for *P. fallax* grown in symbiosis with Scots pine, with either alanine or ammonium as the nitrogen source. Modules are shown for all LMWOAs, gene identification with differentially expressed genes marked in bold.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Module | |  |
| LMWOAs | Genes | LMWOA | Gene ID (**differentially expressed**, annotation) |
| Pyruvate | P15967, P17531 |  | 826768|fgenesh1\_kg.00070\_#\_6\_#\_Locus5764v1rpkm33.13 (not differentially expressed, not annotated)  **822025|fgenesh1\_kg.00032\_#\_141\_#\_Locus3496v1rpkm60.57 (differentially expressed in AlaMycNH4ClTip; annotation: KEGG definition Plus-end-directed kinesin ATPase)** |
| Lactate | P14361 |  | 64384|e\_gw1.00011.568.1 (not differentially expressed, not annotated) |
| Oxalate | P18704, P17282, P11466 | 2-ketoglutarate, tartrate, isocitrate, total LMWOAs | 68967|e\_gw1.00020.80.1 (not differentially expressed, not annotated)  **811861|fgenesh1\_kg.00003\_#\_703\_#\_Locus3957v1rpkm52.89 (differentially expressed in AlaMycNH4ClTip, not annotated)**  **819119|fgenesh1\_kg.00020\_#\_248\_#\_Locus4977v1rpkm40.29 (differentially expressed in AlaMycNH4ClTip, not annotated)** |
| Malonate | P11153 |  | **73963|e\_gw1.00038.84.1 (differentially expressed in AlaMycNH4ClTip, not annotated)** |
| Succinate | P4415 |  | 813026|fgenesh1\_kg.00006\_\_\_59\_\_\_Locus2331v1rpkm87.90 (not differentially expressed, not annotated) |
| Citraconate | P3145, P7156, P7395 | citrate | 810061|fgenesh1\_kg.00001\_\_\_194\_\_\_Locus3699v1rpkm57.45 (not differentially expressed; annotation: KEGG definition Glucan 1,4-alpha-glucosidase)  **60271|e\_gw1.00004.787.1 (differentially expressed in AlaTipNH4ClTip, AlaMycNH4ClTip, not annotated)**  816303|fgenesh1\_kg.00013\_\_\_114\_\_\_Locus2558v1rpkm81.28 (not differentially expressed, not annotated) |
| Glutarate | P13510 | malate, maleate, cis-aconitate, isocitrate II | 526370|CE426781\_404 (not differentially expressed, not annotated) |
| Malate | See glutarate |  |  |
| 2-ketoglutarate | See oxalate |  |  |
| Tartrate | See oxalate |  |  |
| Shikimate | P15333, P12784, P15800, P5821, P9695, P7619, P13663, P5339 |  | **7630|gm1.7541\_g (differentially expressed in AlaMycNH4ClTip, not annotated)**  **821964|fgenesh1\_kg.00032\_\_\_80\_\_\_Locus661v1rpkm265.20**  **3247|gm1.3158\_g (differentially expressed in AlaTipNH4ClTip, AlaMycNH4ClTip, not annotated)**  **830482|fgenesh1\_kg.00377\_\_\_6\_\_\_Locus1994v1rpkm101.27 (differentially expressed in AlaTipNH4ClTip, AlaMycNH4ClTip, not annotated)**  **343532|CE243943\_3687 (differentially expressed in AlaMycNH4ClTip, not annotated)**  **828900|fgenesh1\_kg.00105\_\_\_19\_\_\_Locus29605v3rpkm0.36 (differentially expressed in AlaMycNH4ClTip, not annotated)**  **827962|fgenesh1\_kg.00086\_\_\_41\_\_\_Locus258v1rpkm557.62 (differentially expressed in AlaTipNH4ClTip, AlaMycNH4ClTip, not annotated)**  **301827|CE202238\_14819 (differentially expressed in AlaTipNH4ClTip, AlaMycNH4ClTip, not annotated)** |
| Isocitrate | See oxalate |  |  |
| Maleate | See glutarate |  |  |
| Cis-Aconitate | See glutarate |  |  |
| Citrate | See citraconate |  |  |
| Isocitrate II | See glutarate |  |  |
| Fumarate | P18369, P7528, P7691, P223, P11006, P2050, P2529 |  | 817995|fgenesh1\_kg.00017\_\_\_353\_\_\_Locus2049v1rpkm99.20 (not differentially expressed, not annotated)  **292476|CE192887\_5431 (differentially expressed in AlaTipNH4ClTip, not annotated)**  **815462|fgenesh1\_kg.00011\_\_\_98\_\_\_Locus278v1rpkm529.98 (differentially expressed in AlaTipNH4ClTip, AlaMycNH4ClTip, not annotated)**  **773636|MIX12585\_4694\_23 (differentially expressed in AlaTipNH4ClTip, AlaMycNH4ClTip, not annotated)**  **830540|fgenesh1\_kg.00404\_\_\_1\_\_\_Locus1399v1rpkm136.98 (differentially expressed in AlaTipNH4ClTip, AlaMycNH4ClTip; annotation: GO transporter activity)**  **308901|CE209312\_3006 (differentially expressed in AlaTipNH4ClTip, AlaMycNH4ClTip, not annotated)**  **828940|fgenesh1\_kg.00106\_\_\_11\_\_\_Locus7405v1rpkm21.46 (differentially expressed in AlaTipNH4ClTip, AlaMycNH4ClTip, AlaMycNH4ClTip; annotation: GO nucleobase transmembrane transporter activity/nucleobase-containing compound transport** |
| Trans-Aconitate | No correlation |  |  |
|  |  |  |  |
| Total LMWOAs | See oxalate |  |  |
|  |  |  |  |