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| Table S1. Summary of transcriptome sequencing and assembly.  |
| Sample | Sequencing |  | Assembly |
| Total Bases | Read Count | N (%) | GC (%) | Q20 (%) | Q30 (%) |  | Number of contigs | Length of N50 | Number of complete genes |
| Leaf | 4,021,129,160 | 39,813,160 | 0.0051 | 45.16 | 90.26 | 82.01 |  | 86,353 | 1,905 | 49,509 |
| Root | 4,312,438,006 | 42,697,406 | 0.005 | 45.58 | 89.6 | 81.33 |  | 103,596 | 2,048 | 62,922 |
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| Table S2. Top BLAST hits of nodulation-related genes against *V. angularis* leaf- and root-derived peptides. |  |  |  |  |  |  |
| Function | Nodulation-related gene | Root |  | Leaf |
| Genes | Identity | Alignment length | Score |  | Genes | Identity | Alignment length | Score |
| Nod factor perception | LjNFR1 | m.85142\_root\_complete\_1 | 63.14 | 605 | 738 |  | m.11274\_leaf\_5prime\_partial\_1 | 63.14 | 605 | 737 |
| LjNFR5 | m.51279\_root\_complete\_1 | 71.33 | 600 | 867 |  | m.92258\_leaf\_3prime\_partial\_1 | 74.13 | 375 | 575 |
| PsSYM10 | m.51279\_root\_complete\_1 | 72.83 | 600 | 872 |  | m.92258\_leaf\_3prime\_partial\_1 | 74.47 | 376 | 571 |
| MtLYK4 | m.85142\_root\_complete\_1 | 52.83 | 600 | 593 |  | m.11274\_leaf\_5prime\_partial\_1 | 52.83 | 600 | 592 |
| MtLYK3 | m.17616\_root\_3prime\_partial\_1 | 62.03 | 158 | 194 |  | m.11274\_leaf\_5prime\_partial\_1 | 46.5 | 157 | 127 |
| MtNFP | m.51279\_root\_complete\_1 | 70.78 | 599 | 852 |  | m.92258\_leaf\_3prime\_partial\_1 | 73.21 | 377 | 561 |
| GmNFR5 | m.51279\_root\_complete\_1 | 88.31 | 599 | 1081 |  | m.92258\_leaf\_3prime\_partial\_1 | 89.66 | 377 | 704 |
| Nod factor signaling cascade | MtDMI3 | m.46930\_root\_complete\_1 | 85.63 | 529 | 912 |  | m.76533\_leaf\_complete\_1 | 36.78 | 416 | 266 |
| MtDMI2 | m.58036\_root\_complete\_1 | 78.26 | 929 | 1456 |  | m.36250\_leaf\_3prime\_partial\_1 | 33.96 | 910 | 429 |
| MtDMI1 | m.76388\_root\_complete\_1 | 95.92 | 147 | 257 |  | m.35127\_leaf\_3prime\_partial\_1 | 95.92 | 147 | 259 |
| LjCASTOR | m.65611\_root\_5prime\_partial\_1 | 86.48 | 858 | 1397 |  | m.117758\_leaf\_complete\_1 | 86.48 | 858 | 1397 |
| LjPOLLUX | m.76386\_root\_complete\_1 | 79.78 | 905 | 1350 |  | m.34806\_leaf\_complete\_1 | 79.78 | 905 | 1350 |
| LjNup133 | m.3596\_root\_complete\_1 | 78.77 | 1319 | 2126 |  | m.24791\_leaf\_complete\_1 | 78.77 | 1319 | 2126 |
| LjNup85 | m.3826\_root\_complete\_1 | 81.29 | 711 | 1194 |  | m.122687\_leaf\_complete\_1 | 81.29 | 711 | 1194 |
| PsSYM9 | m.46930\_root\_complete\_1 | 83.11 | 533 | 897 |  | m.33991\_leaf\_complete\_1 | 37.41 | 417 | 262 |
| MtNSP1 | m.4659\_root\_internal\_1 | 74.91 | 554 | 803 |  |  |  |  |  |
| MtNSP2 | m.52658\_root\_complete\_1 | 36.24 | 425 | 187 |  | m.86171\_leaf\_complete\_1 | 36.24 | 425 | 187 |
| MtERN1 | m.21590\_root\_internal\_1 | 65.9 | 217 | 260 |  | m.36662\_leaf\_complete\_1 | 45.71 | 105 | 86.3 |
| MtNIN | m.121650\_root\_complete\_1 | 39.01 | 487 | 290 |  | m.107879\_leaf\_3prime\_partial\_1 | 36.63 | 617 | 322 |
| MtENOD11 | m.93682\_root\_complete\_1 | 41.94 | 124 | 50.8 |  | m.123975\_leaf\_5prime\_partial\_1 | 43.08 | 130 | 55.5 |
| MtIPD3 | m.45696\_root\_complete\_1 | 74.88 | 430 | 619 |  |  |  |  |  |
| LjCYCLOPS | m.45696\_root\_complete\_1 | 74.59 | 429 | 628 |  |  |  |  |  |
| LjSIP1 | m.133871\_root\_complete\_1 | 85.48 | 310 | 521 |  | m.111400\_leaf\_complete\_1 | 76 | 425 | 617 |
| MtRPG | m.1455\_root\_5prime\_partial\_1 | 29.4 | 1119 | 323 |  | m.125297\_leaf\_internal\_1 | 66.67 | 366 | 465 |
| LjCERBERUS | m.19088\_root\_complete\_1 | 83.02 | 1490 | 2513 |  | m.115755\_leaf\_complete\_1 | 28.3 | 834 | 304 |
| LjERF1 | m.25373\_root\_complete\_1 | 88.54 | 742 | 1364 |  | m.43247\_leaf\_complete\_1 | 88.54 | 742 | 1364 |
| MtHMGR1 | m.79491\_root\_5prime\_partial\_1 | 87.59 | 274 | 503 |  | m.98997\_leaf\_5prime\_partial\_1 | 79.86 | 432 | 714 |
| MtEFD | m.150330\_root\_5prime\_partial\_1 | 68.85 | 183 | 235 |  | m.1539\_leaf\_internal\_1 | 75.97 | 129 | 177 |
| Auto-regulation of nodulation | GmNARK | m.135721\_root\_complete\_1 | 51.37 | 952 | 930 |  | m.117765\_leaf\_complete\_1 | 51.12 | 941 | 954 |
| LjHAR1 | m.135721\_root\_complete\_1 | 51.55 | 966 | 953 |  | m.117765\_leaf\_complete\_1 | 50.05 | 967 | 961 |
| MtSUNN | m.135721\_root\_complete\_1 | 52.01 | 944 | 948 |  | m.117765\_leaf\_complete\_1 | 50.99 | 959 | 970 |
| GmKAPP1 | m.88667\_root\_complete\_1 | 89.98 | 409 | 771 |  | m.10672\_leaf\_3prime\_partial\_1 | 90.45 | 398 | 754 |
| GmKAPP2 | m.88667\_root\_complete\_1 | 89.24 | 409 | 772 |  | m.10672\_leaf\_3prime\_partial\_1 | 89.45 | 398 | 751 |
| PsNOD3 | m.142256\_root\_complete\_1 | 76.35 | 334 | 543 |  | m.25029\_leaf\_complete\_1 | 71.55 | 348 | 493 |
| LjKLAVIER | m.125990\_root\_internal\_1 | 75.61 | 619 | 934 |  | m.69057\_leaf\_internal\_1 | 64.54 | 502 | 635 |
| LjASTRAY | m.37635\_root\_5prime\_partial\_1 | 74.61 | 323 | 456 |  | m.51810\_leaf\_5prime\_partial\_1 | 74.61 | 323 | 456 |
| LjETR1 | m.25373\_root\_complete\_1 | 88.54 | 742 | 1364 |  | m.43247\_leaf\_complete\_1 | 88.54 | 742 | 1364 |
| LjEIN2a | m.48233\_root\_complete\_1 | 68.03 | 1320 | 1795 |  | m.93549\_leaf\_complete\_1 | 72.13 | 1306 | 1844 |
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