# Supplementary Materials

**Supplementary Figure S1**

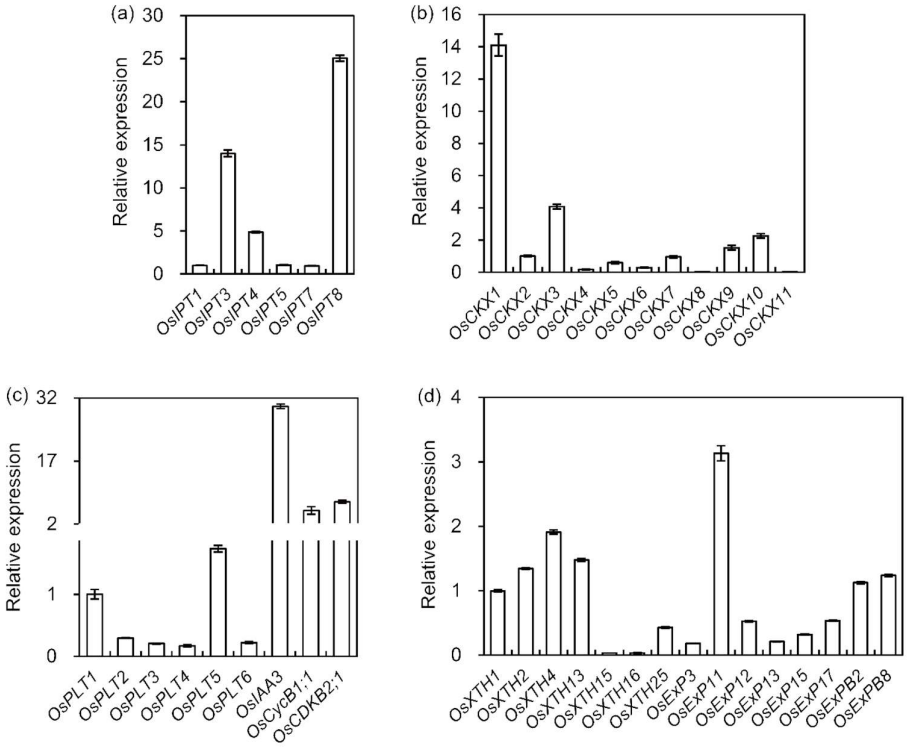


**Figure 1.** The relative expression levels of CK metabolism genes, root meristem size-related genes, and root cell elongation-related genes in rice seminal root. (a) Relative expression levels of CK biosynthesis genes. The relative expression level of *OsIPT1* was set as 1. (b) Relative expression levels of CK degradation genes. The relative expression level of *OsCKX2* was set as 1. (c) Relative expression levels of root meristem size-related genes. The relative expression level of *OsPLT1* was set as 1. (d) Relative expression levels of cell elongation-related genes. The relative expression level of *OsXTH1* was set as 1. Germinated rice seeds were incubated with a solution containing 1 mM N. After one day of treatment, the seminal roots of rice seedlings were sampled for qRT-PCR analyses. N, nitrogen.

**Supplementary Figure S2**

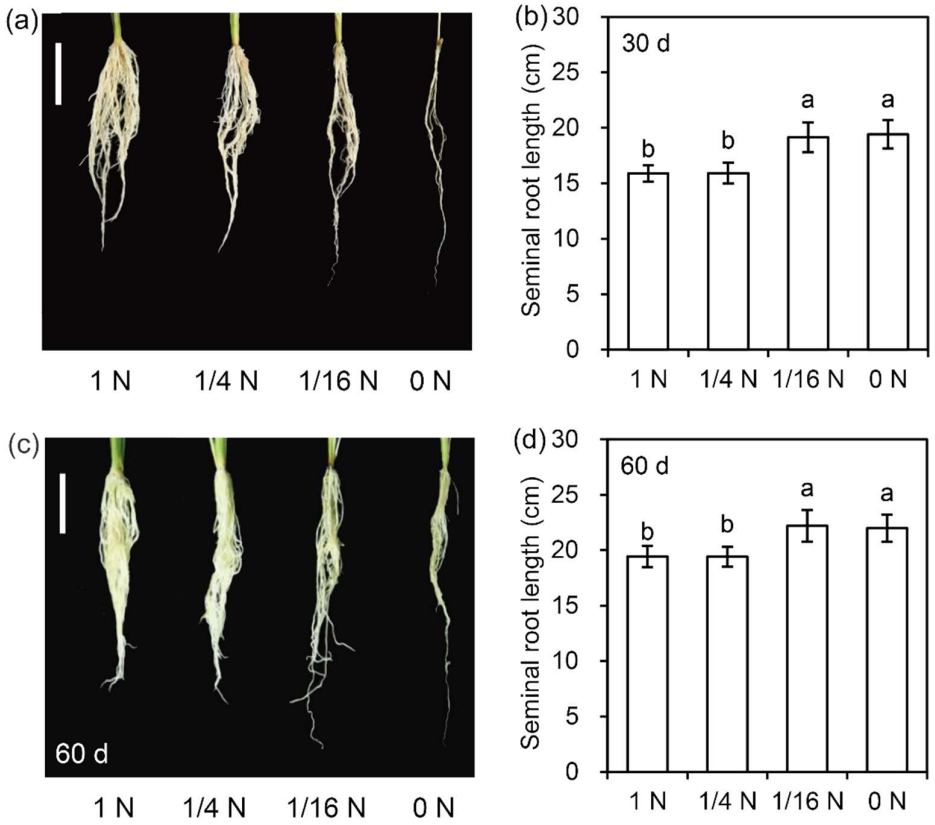


**Figure 2.** Effects of long-term treatment with N deficiency on rice seminal root growth. (a, b) Comparison of root phenotype and seminal root length after 30 days of different treatments. (c, d) Comparison of root phenotype and seminal root length after 60 days of different treatments. Scale bar is 5 cm for (a) and (c). In this experiment, germinated rice seeds were incubated in different solutions for 30 days or 60 days, then photographs were taken, and the lengths of the seminal roots were measured. The data are the means ± SD calculated from ten biological replicates. Significant differences ($P < 0.05$) are indicated by different letters. N, nitrogen; 1 N, 1 mM N; 1/4 N, 1/4 mM N; 1/16 N, 1/16 mM N; 0 N, 0 mM N.

**Supplementary Table S1**

**Table 1.** List of primers used in this research.

| Gene name | Forward primer 5' → 3' | Reverse primer 5' → 3' |
|---|---|---|
| *OsIPT1* | AAGTCCAAGCTCGCCATCC | TCCTCGTCGGTGACCTTGTT |
| *OsIPT3* | GACAAGGGCAAGGTAGTGGT | GTCGTGCACCTGGATCTTGT |
| *OsIPT4* | CGGCGTCAAGCACAAGG | TCGTCACCACATCCAACCC |
| *OsIPT5* | CATCCCGAGGCTTGTTCC | TGCTCCTGCTGACGCTGA |
| *OsIPT7* | AGCGTTGCCACCAGGATTG | GCTGAATCTTGTCGGCGTTG |
| *OsIPT8* | CGGGTCCAACTCGCTCATC | AGGAGGCAGCACGGGAAC |
| *OsCKX1* | CAAATCCAAGTGGGATGCGG | CGACACCACGTAGAACACCTC |
| *OsCKX2* | GAACCGCAACAAGTGGGACA | TGTAGAACACCTCGTCACCG |
| *OsCKX3* | TTGGCACCAAGAACAACCCT | TGTGGCTCATCTGCCTTGAG |
| *OsCKX4* | CAAGCCAGTTCCAGTCGGAT | TGATGTCAGCCTCATCGTGG |
| *OsCKX5* | CGTCACTCGCGAGCAAATAC | CACCATGAACACCAAGCACC |
| *OsCKX6* | CAAGGAGCCGGACTTGTTCT | GTCACCACATCCGAGTAGGC |
| *OsCKX7* | ATGAGGACATCGGGTGCAAG | TGTGTGGGTCATACTTCGCC |
| *OsCKX8* | CGACAGCTTCGAGACCTTCA | TGAAGTTGAGCTGAGCAGGG |
| *OsCKX9* | CCTGGTGGCATTCCTATCCTC | GACTGCCACTCCTGTTCTGT |
| *OsCKX10* | TGTGGTGACAGGAATGGGTG | CAAACTGACCCAACCCACCT |

| | | |
|---|---|---|
| *OsCKX11* | TGAGCGGGCAATCCTTC | GTGATGACGCCGAACTGG |
| *OsPLT1* | AACATTCGGCACTGAGGAGG | CTCCCGATTGGAAGGTTGCT |
| *OsPLT2* | CCGCTTGACTTCCCGTACAT | ATCAGATCCTCGCATGCCTT |
| *OsPLT3* | TGTTGCAACTCGTTTGGTCG | CCTGCCATTACCCAGCTTCC |
| *OsPLT4* | AAGAAGATAAGGCGGCTCGG | TGCAATGTACTCCTGCCTGG |
| *OsPLT5* | AGCAGTGGTTTCTCCAGAGG | GCTGAAGGTGCCCAAGTAGA |
| *OsPLT6* | TCCAGACGTCACAGGTTTCG | CGGGAGACCATGAAAGCCAT |
| *OsCycB1;1* | CAGGAACGCAAGGGAGGTAAG | GTATCGCAGCAAGAAAACCCC |
| *OsCDKB2;1* | CGCTCGTTCACTGTCCCTCT | CCACAGACCAGATGTCAACCG |
| *OsIAA3* | GCCATGTTCCTCTGCTTCTCC | CGCCGTCCTTGTCCTCGTAG |
| *OsXTH1* | ACCGCCTACTACATGTGCTC | ATGATGTAGGGCTCACCCGT |
| *OsXTH2* | TGATCGCGTTCTTCGTGGAC | TCCACAGGCTGGAGTAGAGC |
| *OsXTH4* | TCTGGAATGCCGATGACTGG | GCAAGCGATAGCCCTGTAGT |
| *OsXTH13* | GGTGTTCCGCAACTACCAGA | CCCATATGCTCGAGTAGGCG |
| *OsXTH15* | CAGTGTGACATCACGTGGGA | TTGGTCCGGAGCATACAACC |
| *OsXTH16* | TGATATGGGGCGAAGACCAC | ACTGGTCCTTGGACTGGAAC |
| *OsXTH25* | CGAGTCGGAGCAAGACAACT | CCTGAACCAGTGGCGTATGT |
| *OsEXP3* | ACATCGCCGTCTATCAAGCC | GTAGTCGTGACCGCTGATCG |
| *OsEXP11* | ACCATCACCGGCCACTCCT | CGACCCCTTCACCGACACC |
| *OsEXP12* | CCTCAACAACCAGGCCATCT | GGTGAATGTCTGGCCGAACT |
| *OsEXP13* | ACCAAAGGGTTCCTTGCATGA | ACTTGGAGCCCTTCACGTCC |
| *OsEXP15* | GGCTCCAGATCGGCATCTAC | GATCAGCACCAGCTCGAAGT |
| *OsEXP17* | TACAAGACATCGGACTGGCAC | GTCTTCGTCGAGTAGAGCGAC |
| *OsEXPB2* | TCGTCTACACCAACGACTGG | CGGGTACTGGTTGGTGTTCT |
| *OsEXPB8* | TACCCGTTCATGGGGATGAC | GGTTTCGATTGCACCTGACG |
| *OsACTIN* | CTGACGGAGCGTGGTTACTCAT | TCATAGTCCAGGGCGATGTAGG |