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Supplementary Material

Nitrate increases ethylene production and aerenchyma formation in roots of lowland rice plants under water stress

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Table S1. Gene numbers and primers of actin, OsLSD1.1, OsLSD2, OsEDS,OsPAD4 and OsACS5 for q-RT-PCR

Gene	Number	Primers
actin	Os03g0718100	F: CAACACCCCTGCTATGTACG R: CATCACCAGAGTCCAACACAA
OsLSD1.1	Os08g0159500	F: CGAGATGGCGCAGTTAGTTTG R: TCGCACCGCGTATATACATCA
OsLSD2	Os03g0639600	F: CCCCCCCACCAACTTCAG R: TCTCGACAACAACGGTTACATTCT
OsEDS	Os09g0392100	F: CCGCCGGTTGGTTGAG R: TCCTCGTTCTTGGAATGCCTAT
OsPAD4	Os11g0195500	F: GCCGACTACCACCGAAACAA R: CGGCCATGGGTGATGTAAG
OsACS5	Os01g0192900	F: GATTACCATGGCCTCAAGAGCTT R: CGCGTATCTTCCCCATGAAG

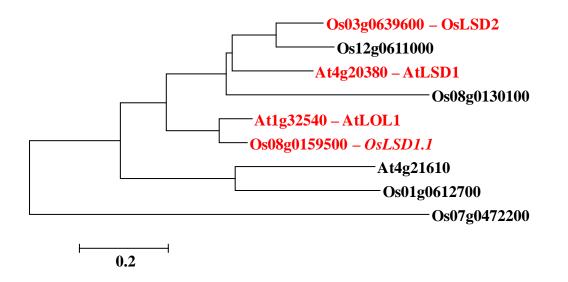


Fig. S1. Phylogenetic analysis tree of *LSD* proteins in rice and *Arabidopsis* plant. Genetic distance calculated by MEGA 5.2 (<u>http://www.megasoftware.net</u>). The *LSD* family members was searched according to 'http://planttfdb.cbi.pku.edu.cn/'. Six *LSD* members (Os01g0612700, Os03g0639600 (*OsLSD2*), Os07g0472200, Os08g0130100, Os08g0159500 (*OsLSD1*), Os12g0611000) and three members (At1g32540 (*AtLOL1*), At4g20380 (*AtLSD1*) and At4g21610) were selected in rice plant and in *Arabidopsis*.

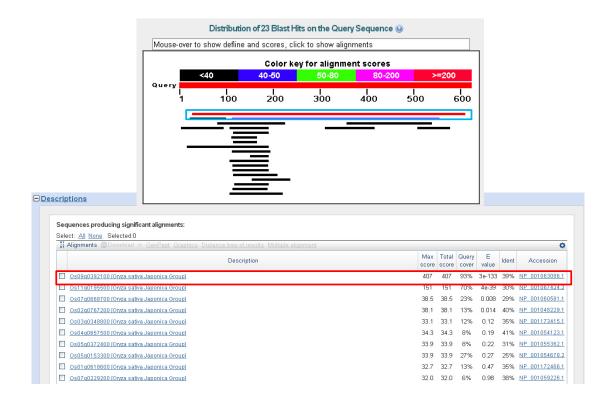


Fig. S2. The homologous genes of *AtEDS* in rice by searching in the Gene-bank of National Center for Biotechnology Information (NCBI). The gene of marked with rectangles was *OsEDS*, which we selected in our study.

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Fig. S3. The homologous genes of *AtPAD4* in rice by searching in the Gene-bank of National Center for Biotechnology Information (NCBI). The gene of marked with rectangle was *OsPAD4*, which we selected in our study.

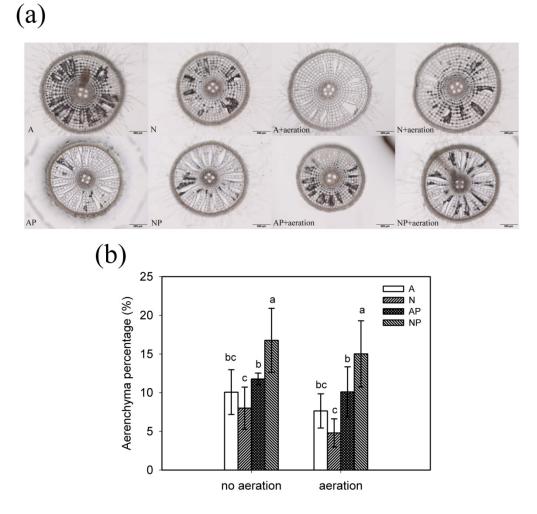


Fig. S4. The comparison of root cortical aerenchyma formation between aeration and non-aeration hydroponic culture in Shanyou 63 plant. (a) aerenchyma images of root transverse sections, which were cut from the middle of 7–8 cm long, newly formed adventitious roots. Bars = 200 μ m. (b) The percentage of aerenchyma in the root cross-section. Aeration hydroponic culture was conducted with aerating air to the nutrient solution by the same method used for exogenous ethylene treatment (The flow rate was 75 L h⁻¹), and the dissolved oxygen concentration (mg L⁻¹) was measured (A, 7.7 ± 0.8; N, 7.7 ± 1.0; AP, 6.6 ± 1.4; NP, 6.0 ± 1.2). The data represent the mean ± s.d. Significant differences (*P* < 0.05) between treatments are indicated by different letters.