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Title

High-affinity nitrate uptake by rice (*Oryza sativa*) coleoptiles.

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Abstract

Nitrate uptake by rice coleoptiles was evaluated using ¹⁵N-nitrate in relation to the expression of high-affinity nitrate uptake-related genes, *OsNRT2s* (*OsNRT2.1–2.4*) and *OsNAR2s* (*OsNAR2.1* and *2.2*). Apparent nitrate uptake by coleoptiles was about one-sixth of that by hydroponically cultured seedling roots. Real-time RT-PCR analysis revealed that *OsNRT2.1*, a root-specific key gene of inducible high-affinity transport system for nitrate, was most strongly induced in coleoptiles following nitrate supply initiation, while other *OsNRT2s* and *OsNAR2s* showed modest induction. These results suggest that rice coleoptiles may have high-affinity transport systems for nitrate similar to roots, and can be model organs for nutrient uptake by submerged plant shoots.