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Differential expression of OsPT2, a high-affinity phosphate transporter of rice induced phosphate deficient condition

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Our ultimate goal is to develop new transgenic plants able to adapt to phosphate deficient condition by understanding the mechanisms that underlie phosphorous homeostasis in plant. First of all, we isolated the putative phosphate transporter gene (*OsPT2*) from rice (*Oryza sativa*). The encoded polypeptides are 89% identical to other plants and show high degree of amino acid sequence similarity with phosphate transporter of Zea mays. There is signal peptide in *OsPT2* polypeptides. *OsPT2* is 1626bp long and contains an open reading frame encoding a 541 amino acid polypeptide. *OsPT2* contains 12 putative membrane-spanning domains, hydrophilic amino and carboxy termini, and a hydrophilic loop between transmembrane segments six and seven. An unrooted phylogenetic tree diagram demonstrates that monocotyledonous *OsPTs* evolutionally are different from those of dicotyledonous plants and *OsPTs* also have evolved in three distinct groups. The RNA blot analysis showed that expression of *OsPT2* are various in response to phosphate deficiency. In particular expression of *OsPT2* was up-regulated in phosphate deficiency condition. *OsPT2* was tightly regulated by phosphate concentration. We are generating transgenic rice plants overexpressing *OsPT2* gene.

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Transcripts of MYB-like genes respond to phosphorous deprivation in rice

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We isolated the 3 different MYB-like genes (OsMYB2-4) respond to phosphorus deprivation in rice (Oryza sativa). The encoded polypeptides are 30% identical to other plants and show high degree of amino acid sequence similarity with MYB-like gene of Arabidopsis thaliana. OsMYB2 is 776-bp long and encodes a 258 amino acid polypeptide. OsMYB3 is 935-bp long and contains an open reading frame encoding a 311 amino acid polypeptide. And OsMYB4 is 992-bp long and encodes a 330 amino acid polypeptide. Whereas the three clones are 50% similar in their nucleotide sequence within the coding region. The RNA blot analysis showed that expression of OsMYBs are various in response to phosphate deficiency. In particular expression of OsMYB2, OsMYB3, and OsMYB4 were up-regulated in phosphate deficiency condition. Now we are generating transgenic rice plants overexpressing OsMYB genes.