

# Plant Science

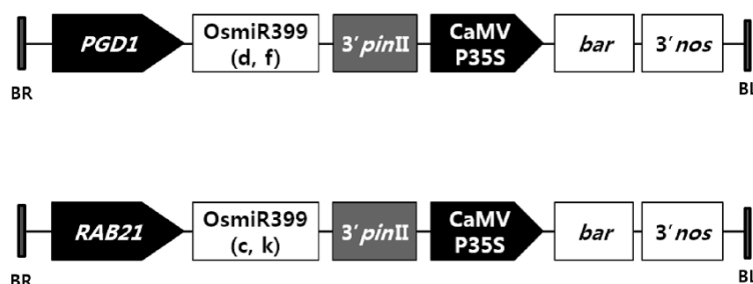
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## Analysis of *OsmiR399* expression and down-regulation of LTN1 in rice

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Among the many miRNAs involved in plant stress responses, miR399 is well known to be involved in controlling phosphate homeostasis by down-regulating the expression of  $PHO_2$ , which encodes the ubiquitin-conjugating E2 enzyme, UBC24, in *Arabidopsis*. In this study, to understand the expression of the rice *OsmiR399* genes under abiotic stress conditions, the expression of the eleven *OsmiR399* (a-k) genes was studied by analyzing the levels of their precursor transcripts (pre-miRNAs) in the roots and shoots of rice seedlings subjected to the stress-responsive phytohormone abscisic acid (ABA). We found that the *OsmiR399* genes showed different patterns in pre-miRNA accumulation. In particular, *OsmiR399b*, *OsmiR399d*, *OsmiR399e*, and *OsmiR399f* showed high and steady accumulation in both the roots and shoots regardless of ABA treatments. However, *OsmiR399c* and *OsmiR399k* showed ABA-induced expression in the whole plant body or aerial part of the rice seedlings. In addition, to test the possibility that the putative rice  $PHO_2$  ortholog of *Arabidopsis*, also known as LEAF TIP NECROSIS 1 (LTN1), might be down-regulated by the multiple *OsmiR399s* with certain sequence divergences, four different lines of transgenic rice plants that overexpress either the constitutively expressed *OsmiR399s* (*OsmiR399d* and *OsmiR399f*) or the ABA-inducible *OsmiR399s* (*OsmiR399c* and *OsmiR399k*) were produced and the levels of *OsmiR399* pre-miRNAs and LTN1 transcripts were analyzed. A significant decrease in the accumulation of LTN1 transcripts and an increase in the *OsmiR399* pre-miRNAs levels were found in all of the transgenic plants. Based on these results, we concluded that LTN1 is down-regulated by multiple *OsmiR399* genes in rice.



**Figure 1:** The recombinant plasmids used for rice transformation. All of the four recombinant plasmids used for transformation contain the *bar* gene fused with the cauliflower mosaic virus 35S promoter (CaMV P35S) for herbicide selection of the transgenic rice.

### Biography

Minkyun Kim is an Professor in the Department of Plant Physiology and Biochemistry at Seoul National University. He has published numerous research papers and articles in reputed journals and has various other achievements in the related studies. He has extended his valuable service towards the scientific community with his extensive research work

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