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Mechanical Stimulus-Sensitive Mutation, *rrl3*, Affects the Cell Production Process in the Root Meristematic Zone in Rice

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Abstract: Genetic studies on the response of plant root to environmental stimuli are important for elucidating the mechanism of the stress tolerance of plants. We isolated and characterized a recessive rice mutant, *rrl3*, which was highly sensitive to mechanical stimulus and has short roots. No significant difference was observed between the seminal roots of *rrl3* mutant and wild type in the mean axial and radial length of mature cortical cells. On the other hand, meristematic zone of the root was smaller and the cortical cell flux in the growing zone of the root was significantly lower in the mutant than in the wild type. In addition, the *rrl3* mutant and the wild type did not differ in sensitivity to ethylene, IAA or ABA. These results suggest that the *RRL3* gene specifically regulates the cell production process in the root meristematic zone under a mechanically impeded condition and does not regulate the sensitivities to ethylene, IAA and ABA.

Keywords: Cell flux, Mechanical stimulus, Mutation, *Oryza sativa*, Root apical meristem, Root elongation

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