

Abstract

Wxl^v, the Ancestral Allele of Rice Waxy Gene [†]

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Abstract: In rice endosperms, the *Waxy* (*Wx*) gene is important for amylose synthesis, and various *Wx* alleles control the amylose content and affect the taste of cooked rice. Herein, we report the cloning of the ancestral allele *Wx^{lv}* of the *Wx* locus, which affects the mouthfeel of rice grains by modulating the size of amylose molecules. Using evolutionary analysis, we demonstrated that *Wx^{lv}* originated directly from wild rice, and the three major *Wx* alleles in cultivated rice (*Wx^b*, *Wx^a*, and *Wxⁱⁿ*) differentiated after the substitution of one base pair at the functional sites. These data indicate that the *Wx^{lv}* allele played an important role in artificial selection and domestication. The findings also shed light on the evolution of various *Wx* alleles, which have greatly contributed to improving the eating and cooking quality of rice.

Keywords: *Oryza sativa*; Waxy; eating and cooking quality; allelic variation

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