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In Vitro selection and rapid screening of high-lysine mutants in rice

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Lysine is the first limiting essential amino acid for optimal nutritional quality in rice grain. However, the rice has a low level of lysine content in the endosperm and poor genetic resources compared to the other cereals. Recently, Dr. Schaeffer, in USDA, released five high-lysine rice germplasms but no further systematic approaches were made into the rice breeding field. The objective of this study is to define a breeding scheme of high-lysine rice. For the narrow genetic diversities, somaclonal variation was adopted as a mutation source in our breeding program. The biochemical selection was conducted to one passage of 1mM S-(2-aminoethyl) cystein followed by two passage of 5 mM lysine, plus threonine in the callus subculture medium. The lysine composition in endosperm of all progenies regenerated from the survived calli was higher than that of their donor cultivar. These elevated lysine traits of mutants were successfully transmitted to M4 generation. The absorbance at 570nm in Ninhydrin color test was highly significantly correlated with lysine content(0.461**) and composition(0.420**) in the endosperm of rice. We assumed that Ninhydrin color test could be used for rapid and mass screening of lysine contents in rice endosperm and that high-lysine rice can be bred with little effort by the aid of *in vitro* selection and Ninhydrin color test.