



SRAP analysis of DNA base sequence changes in lotus mutants induced by Fe⁺ implantation

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ABSTRACT. Ion implantation, a new biophysically mutagenic technique, has shown great potential for crop breeding. To reveal the mutation effect of low-energy ion implantation on Baiyangdian red lotus, sequence-related amplified polymorphism markers were used to amplify and detect the DNA sequence differences in mutants induced by Fe⁺ ion implantation. A total of 121 primer combinations were tested in 6 mutants and a control. Seven primer combinations (me1 + em3, me1 + em14, me9 + em3, me8 + em2, me6 + em1, me11 + em5, and me6 + em5) generated clear bands with high polymorphism and good repeatability. The results showed that among 15,317 bases cloned, 146 bases in 6 mutants were different from those of the wild type, showing a variation frequency of 0.95%. The types of base changes included deletion, insertion, transversion, and transition. Adenine was more sensitive to the irradiation than were the other bases. The results suggested that mutational “hotspots” probably exists in lotus and are induced by low-energy ion implantation.

Key words: Baiyangdian red lotus; Ion implantation; SRAP marker; Specific fragment; Sequence analysis