
Comparative Studies of Genetic Diversity in Kenaf Mutants Based on Analysis of Morphological and RAPD Data

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[Introduction]

Kenaf (*Hibiscus cannabinus* L. 2n=36) is an annual herbaceous crop of the Malvaceae family, which is known for both its economic and horticultural importance. Recently, rapid development of kenaf production is of important significance to protect forest resources. So, it has been called 21st century. Biological yield of kenaf is about 3-4 times that of forest and CO₂ assimilation capacity is about 4-5 times that of trees. Therefore, this study was conducted to select an elite mutant with higher biomass through induced mutagenesis.

[Materials and Methods]

The kenaf (IT202801) used in this study was obtained from National Agricultural Genetic Resources in 2017. In the same year, its seeds were irradiated with 250Gy of gamma-ray. M₂ mutants were planted at the field, and its agricultural characteristics were evaluated from May to October. PCR reactions for RAPD analysis were performed with 25 Operon 10-mers, and a dendrogram was generated based on the cluster analysis.

[Results and Discussions]

This study was conducted to select elite mutants of kenaf with higher biomass. The morphological variation of the kenaf mutants is summarized as follows. The flowering time was similar to each other as difference of 2 days, from 23 to 25 July. In terms of a qualitative assessment of seed development before harvesting, all lines containing the Control set enough seeds. The stem color is green in the Control, red from M-1 to M-6, and light red in M-7 and M-8. For plant height, M-3 turned to be the highest as 295cm, followed by M-2 and M-4. The stem diameter, above 20 cm from soil surface, was the thickest in M-5 as 42 mm, and thinnest in M-7 as 29.7 mm. As to branch number, there is a huge significance in M-5(23) compared to the others that ranged 9~16. In regard of RAPD analysis, primers were screened using the Operon 10-mer (25 primers). It was shown that 76% of the primers could produce distinguishable polymorphic DNA bands. The RDPA analysis showed some genetic diversity among the mutants compared to the Control. On average, 3.3 polymorphic bands were produced per primer among the lines. A total number of 66 fragments was unambiguously identified and used for the computation of relative genetics similarities. A dendrogram was constructed based on the RAPD fragment in different kenaf mutants. The dendrogram demonstrated differentiation of the kenaf mutants. Based on the morphological and genetic variation, M-4 and -5 lines could be recommendable for high biomass production. After this, however, the elite line with high biomass will be decided through dry weight analysis.

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