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Characteristics of Kenaf (*Hibiscus cannabinus* L.) Mutants Induced by Gamma-Ray

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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 a elite mutant with higher biomass through induced mutagenesis.

[Materials and Methods]

The kenaf used in this study was obtained from National Agricultural Genetic Resources Center (NAGRC) 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 in 2018. RAPD and histological analysis were performed.

[Results and Discussions]

Kenaf (*Hibiscus cannabinus* L.) is known as a multipurpose crop producing biomass for energy thus, the study was conducted to select the elite mutants with higher biomass produced through mutation. Obtained from the National Agricultural Genetic Resources Center (NAGRC) in Korea, the seeds of the original natural resource named IT202801 (Control) were irradiated with 250 Gy gamma-ray. The agronomic performances, genetic variation and histological analysis of the elite mutant lines were investigated at M2 generation in comparison with to the Control. Significant differences were observed from the previous three evaluations of the eight mutants. Nine plants, including the Control and 8 mutants, had little difference in the number of flowering days from July 23 to 25. The leaf shape of the Control was entire, while the leaf shape of the mutant was palmate. Of the eight lines, M2 IT20-5 showed better performance in regard to diameter, dry weight and seed weight per plant. The RDPA analysis produced a genetic diversity of 72.7% within the genotypes used. A dendrogram was constructed based on the RAPD fragments. In M3 generation, T20-5 presented tolerance for Fusarium. It demonstrated differentiation between the Control and kenaf mutants. Taken together, the mutant line, M2 T20-5, can be useful as a resource for high biomass production.

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