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A Kenaf Mutant Showing Superior Performances in Reclaimed land and Upland

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[Introduction]

Kenaf(*Hibiscus cannabinus* L. 2n=36) is an unfamiliar plant to Korean. However, it is well-known for its economic importance. Its aerial part yield and CO_2 assimilation capacity are about 3-5 times higher than that of other plants. So, the 'green tag' is further associated with kenaf. Thus, the main objective of this study was to generate new kenaf varieties with high biomass through mutation breeding in reclaimed land and upland, describing genotypes in regards to their morphological traits in comparison to the Control varieties, Jangdae.

[Materials and Methods]

The kenaf seed variety used for the Control was 'Hongma 300', being originally from China.

Approximately 100g of kenaf seeds were irradiated with 250 Gy from ^{60}Co sources located in Korea Atomic Energy Research Institute (KAERI). Each of the 500 plants (1st generation, M_1) were planted in 2017, grown to maturity in an upland field, and assigned numbers at harvest time. In 2018, the 250 plants of 2nd generation (M_2) were planted and the mutants showing normal seed fertility were investigated on an individual plant basis. An acceleration of generation was processed from Oct. 2019 to Apr. 2020, and from Oct. 2020 to Apr. 2022. After planting in reclamed land and upland on 1st May, various characteristics including flowering date were recorded, compared to Control plants.

[Results and Discussions]

Kenaf has been used in many different fields worldwide. The elite mutant with superior performances was selected through mutation breeding. Seeds of the original resource named Hongma 300 (Control) were irradiated with 250 Gy gamma-ray. The agronomic performances of the elite mutant line (JBK3169) were investigated at M10 generation in comparison with the variety, Jangdae. The leaf shape of the Control and the JBK3169 mutant was palmate. The stem color was the same as a green between JBK4-713 and Jangdae. The JBK3169 was blooming on September 10 and 13 in reclaimed land and upland, respectively. However, Jangdae was flowering on July 4 and 23, respectively. The leaf and flower size of the JBK4-713 was larger than those of Jangdae in both test fields. At the flowering period, the stem diameter of JBK3169 in upland and reclaimed filed was 15.7cm and 20.3cm, which was much higher ($p \leq 0.05$) than that of Jangdae with 11.2cm and 10.3cm, respectively. It demonstrated differentiation between the variety and mutant. Taken together, the JBK3169 would be useful as a resource for high biomass production in Korea. This work is supported by a fund of project designated as No. 20016795, Minisrty of Trade, Industry and Energy (MOTIE), Republic of Korea.

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