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Selection of Kenaf (*Hibiscus cannabinus* L.) Genotype Showing Excellent Properties in Reclaimed Land

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[Introduction]

Kenaf (*Hibiscus cannabinus* L.), which belongs to the family of Malvaceae, is an annual C3 and a common warm season fiber plant native to India and Africa. It has been cultivated and used twine, rope, gunny bag, sackcloth, pulping and paper making, oil absorption, potting media, board making, filtration media, animal feed and bioplastic material. Also, the 'green tag' is further associated with kenaf because of its promising growth, and scavenges extensive amounts of Carbon dioxide (CO₂) from the atmosphere. To successfully cultivate kenaf in Korea, the development of its new varieties producing high biomass in reclaimed land is essential. It aimed to describe pedigree in regards to their morphological, and physiological traits in comparison to the Control varieties, Jangdae and Hongma, in F₃ generation.

[Materials and Methods]

The parental two materials used in this study are Jangdae and Hongma 300 varieties. F₁ lines were established in 2018 using Jangdae as female and Hongma as male resource. In 2019, the seeds of previous year were planted, harvested F₂ seeds, and since then assigned numbers for 22 lines in 2019. 25 seedlings per each pedigree of F₂ generation were grown to maturity in an upland field in 2020. The seeds of F₃ generation were sown in the plastic tray with 162 holes, and 25 seedlings per each pedigree were planted at the distance of 80cm between rows x 40cm between plants in 2021. All lines were used to record data on days to 10% flowering, stem diameter and branch number, and so forth. The chlorophyll fluorescence analysis was done using FlourPen. The record data was average of 10 repetitions.

[Results and Discussions]

Various multipurpose utilizations are what makes kenaf (*Hibiscus cannabinus* L.) special. The experiment was conducted to select the elite pedigrees with higher biomass production in the reclaimed land, Samangeum. The agronomic performances, and chlorophyll fluorescence analysis of the elite line was investigated at F₃ generation in comparison with the Control. Significant differences were observed from JBK4-13. Three plants, including the two Controls (Jangdae and Hongma) and 1 pedigree, had a big difference in the number of flowering days from July 7 to Oct. 1. The stem diameter of JBK4-13 with 32.5cm was higher than that of the Jangdae, showing the same score with the Hongma. This trait is the high correlation with biomass productivity. As to stem color, JBK4-13 showed 5 scale higher than that of the two Controls. The leaf length, width, green degree, and flower size were founded to be different among lines. For OJIP analysis, F_m/F_v score of JBK4-13, being a parameter presenting the photo system II activity degree, is 0.65 which was much higher than that of the two Controls with 0.61. As the result, F_v/F_m parameter would be selected as potent indicator of plant growth in reclaimed land. Based on various scores, the JBK4-13 would be useful as the genetic resources for high biomass production in reclaimed land.

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