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Development of Kenaf (*Hibiscus cannabinus* L.) Genotypes with Superior Characteristics through Backcross

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[Introduction]

Kenaf(*Hibiscus cannabinus* L. 2n=36) is an annual herbaceous crop of the Malvaceae family, which is known for its economic importance. Biological yield of kenaf is about 3-4 times that of forest and CO₂ assimilation capacity is about 4-5 times that of trees. 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 backcross breeding. Also, it aimed to describe pedigrees in regards to their morphological, genetic and histological traits in comparison to the Control varieties, Jangdae and Hongma, in BC1F2 generation.

[Materials and Methods]

The parental two materials used in this study are Jangdae and Hongma 300 varieties. F1 lines were established in 2017 using Jangdae as female and Hongma as male resource. In 2018, backcross was implemented with Jangdae used as recurrent parent and harvested BC1F1 seeds. The seeds of previous year were planted, harvested BC1F2 seeds, and since then assigned numbers for 22 lines in 2019. 20 seedlings per each pedigree of BC1F2 generation were grown to maturity in an upland field in 2020. All lines were used to record data on days to 1st flowering, plant height, stem diameter and branch number.

[Results and Discussions]

A multipurpose utilization such as rope, pulping, and filtration media is what makes kenaf (*Hibiscus cannabinus* L.) special. The experiment was conducted to select the elite pedigrees with higher biomass production through backcross. The agronomic performances, fuel characteristics, and histological analysis of the elite lines were investigated at BC1F2 generation in comparison with the Control. Significant differences were observed from 12 evaluations of the variety and pedigrees. Five plants, including the two Controls (Jangdae and Hongma) and 3 pedigrees, had a big difference in the number of flowering days from July 5 to Sept. 30. The plant height of BC100-10 with 447 cm was the highest of the genotypes. As to branch number, BC100-15 showed 29 being the best performance. The stem dry weight was founded to be the lowest in the Jangdae variety as 792 g, whereas BC100-17 showed the highest record. For seed weight, Hongma didn't set seeds owing to late flowering. However, three elite lines with 34 g/plant on average had more seeds than Jangdae (16g/plant) vulnerable to decay due to viviparous germination. In the fuel characteristics analysis, a heating value of three elite lines ranged from 4,510 to 4,930 kcal/kg which was much higher than that of the two Controls with 4,320 kcal/kg. The ash content analysis produced that the line BC100-10 showed the lowest value with 3.2% which was approximate to the Korea's 3rd-grade. Based on the histological analysis of stem, the pedigrees were close to Hongma. Taken together, three elite lines would be useful as the genetic resources for high biomass production. This work is supported by a fund of project designated as No. PJ014779012020, Rural Development Administration (RDA), Republic of Korea.

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