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Pre-harvest Sprouting Tolerance Test in Rice with Floury Endosperm

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[Abstract]
Pre-harvest sprouting(PHS) refers to germinating seeds in the mother plant before harvesting under low dormancy and humid climate, deteriorating grain quality, and rice yield. Rice varieties with floury endosperm(RFE) have been developed to boost domestic rice consumption by invigorating the processed rice industry, reducing milling and environmental cost. However, the PHS tolerance of RFE is relatively low in the rice varieties with transparent endosperm(RTE) since they soak moisture rapidly due to soft endosperm. In this study, Baromi2(BR2), floury endosperm, and Jomyeong1(JM1), PHS tolerance donor, were crossed to improve PHS tolerance. Major agronomic traits and PHS tolerance test of ten F_7(BR2/JM1) lines were conducted in NICS, 2022. The evaluations of PHS were carried out according to the method of RDA(2012) with slight modifications. Briefly, three panicles were treated and incubated 25°C in a growth chamber 35 days after the heading date. Ten PHS tolerance promising lines demonstrated floury endosperm. The heading date of BR2 and JM1 was 7/27 and 8/5, respectively. The heading date of promising lines was 7/23~8/10. The PHS rate of BR2 and JM1 exhibited 56.3% and 10.7%, respectively. However, the PHS rate of ten promising lines demonstrated 2.4%~52.4%, 3 lines significantly lower than BR2. Further studies such as ABA contents are necessary to elucidate the mechanism of PHS tolerance in BR2/JM1. These results may contribute to developing elite RFE lines with improved PHS tolerance.

[Acknowledgement]
This research was funded by the Rural Development Administration(RDA) of South Korea (Grant number: PJ016831012022)

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