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Relationships between kernel quality of appearance and yield characters in *japonica* and *Indica* rice cultivars

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Abstract

Subspecific difference of the percentage of white immature kernels (WIK) between *japonica* and *indica* rice cultivars was analyzed in relation to ripening temperature and yield characters. Thirty-three Chinese and 10 Japanese rice cultivars, including 32 *japonica* and 11 *indica*, were cultivated with three different cropping seasons for three years. The results were as follows: (1) *Indica* had less number of panicles, larger number of spikelets per panicle with higher yield, and longer and narrower kernels than *japonica*. In *japonica*, Chinese cultivars had less number of panicles and larger number of spikelets per panicle than Japanese cultivars. In addition, WIK was significantly higher in Chinese cultivars than in Japanese cultivars, because of the higher percentage of milky white kernels, even at similar temperature conditions during ripening. On the other hand, WIK in *indica* was not significantly different between the production areas and between the cropping seasons. (2) Regardless of subspecies, WIK in a large number of Chinese cultivars increased with increasing temperature during ripening within 20 days after heading, while this relation was uncommon in Japanese cultivars, showing the low temperature response. However, some Chinese cultivars had the low WIK with the low temperature response. (3) WIK in *japonica* was positively correlated with 1000-kernel weight, spikelet density, kernel width and thickness, but negatively correlated with panicle length and grain filling percentage, while in *indica* it was positively correlated with panicle number per area, grain filling percentage, brown rice yield and kernel width, but negatively correlated with kernel length. These results indicated that WIK in both subspecies had a close relation to kernel size, and that WIK was high in *japonica* cultivars with wide and thick kernels and in *indica* cultivars with short and wide kernels.

Keywords: *indica*, *japonica*, kernel size, rice cultivar, white immature kernel.

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