

Author: [ADVANCED](#)Volume Page Keyword: 

[TOP](#) > [Available Issues](#) > [Table of Contents](#) > [Abstract](#)

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Effect of Brassinolide Applied at the Meiosis and Flowering Stages on the Levels of Endogenous Plant Hormones during Grain-Filling in Rice Plant (*Oryza sativa* L.)

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Abstract: Brassinolide (BL), a brassinosteroid, applied to rice plants in pots promotes panicle ripening. In this study, we examined the effect of BL applied at the meiosis and flowering stages on endogenous levels of various plant hormones in the panicles of the rice plant (cv. Nipponbare) grown in a field-temperature(F-temp; 25°C on average ranging from 22 to 33°C during ripening periods) condition and low-temperature(L-temp; in phytotron kept at 22°C/17°C) condition in rice cultivation season in Japan. The content of either free- or bound-IAA in the rice spikelet at the milk-ripe stage (10 - 15 days after heading) was higher in the F-temp condition than in the L-temp condition. BL applied twice, 10 days before and on the day of heading, slightly increased the free-IAA content and greatly increased the bound-IAA content at the milk-ripe stage in both condition. BL slightly decreased the ABA content of the spikelet at the milk-ripe stage in the F-temp condition, and slightly increased it in the L-temp condition. The rate of ethylene production was measured only in the F-temp condition. It was markedly high at the milk-ripe stage and low at the dough-ripe stage (21 days after heading). BL treatment clearly increased the rate of ethylene production from the panicles under both light and dark conditions at the milk-ripe stage. These results suggest that BL, which promotes rice ripening, influences in the levels of endogenous plant hormones to play an important role in controlling the sink function during grain-filling.

Keywords: [Abscisic acid\(ABA\)](#), [Brassinolide\(BL\)](#), [Ethylene](#), [Indoleacetic acid\(IAA\)](#), [Low temperature\(L-temp\)](#), [Milk-ripe stage](#), [Panicle](#), [Rice](#)

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