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# Varietal Differences in Photosynthetic Rates in Rice Plants, with Special Reference to the Nitrogen Content of Leaves

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**Abstract:** The photosynthetic rate in the flag leaf of rice at the full heading stage was examined in three japonica varieties, Koshihikari, Aikoku and Asanohikari, and the indica high-yielding variety Takanari at the same level of leaf nitrogen. At an ambient $CO_2$ concentration of 350 μL $L^{-1}$, Takanari had a higher photosynthetic rate and stomatal conductance than the japonica varieties when plants were compared at a leaf nitrogen content of approximately 1.5 g $m^{-2}$. Stomatal conductance increased considerably with increases in leaf nitrogen content in the japonica varieties. As a result, at a leaf nitrogen content of approximately 2.0 g $m^{-2}$, differences in terms of the photosynthetic rate among varieties were small. By contrast, there were no clear varietal differences in Rubisco content at any identical nitrogen content of leaves. We conclude that stomatal conductance is responsible for the varietal differences in photosynthetic rate examined at the same leaf nitrogen content.

**Keywords:** Nitrogen content, Photosynthetic rate, Rice variety, Rubisco content, Stomatal conductance

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