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Expression of Photosynthesis-Related Genes during the Leaf Development of a C₃ Plant Rice as Visualized by *In Situ* Hybridization

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Abstract: The expression of photosynthesis-related genes, *rbcS* (small subunit of ribulose 1,5-bisphosphate carboxylase/oxygenase) and *cab* (light-harvesting chlorophyll a/b-binding protein), in emerging rice leaves was examined. We performed *in situ* hybridization to visualize the spatial expression pattern of the photosynthesis-related genes. In the basal region of the leaf blade, which is the youngest region in a leaf blade of monocotyledonous plants, the expression of the genes was observed in both bundle sheath and mesophyll cells, while in the older middle and the oldest tip regions, the expression was only observed in mesophyll cells and not in bundle sheath cells. These results indicate that the expression of these photosynthesis-related genes is developmentally regulated and becomes mesophyll-specific in mature leaves. The expression of the photosynthesis-related genes in the lamina joint was also examined. These genes were not expressed in the lamina joint of immature leaves nor in the mature leaves. Therefore, the lamina joint was considered to be a photosynthetically inactive region.

Keywords: [Bundle sheath](#), [Chlorophyll a/b-binding protein](#), [in situ hybridization](#), [Lamina joint](#), [Leaf development](#), [Mesophyll](#), [Rice](#), [Rubisco small subunit](#)

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