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[\[Full-text PDF \(792K\) \]](#) [\[References \]](#)**Relationships between Photosynthetic Activity and the Amounts of Rubisco Activase and Rubisco in Rice Leaves from Emergence through Senescence**

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Abstract:

Photosynthetic activity determined as O₂ evolution (OER) and the amounts of Rubisco activase, Rubisco, total soluble protein and chlorophyll were investigated in the 10th leaf of rice, *Oryza sativa* L. cv. Nipponbare, in relation to its aging. The Rubisco activase content increased until the 17th day after leaf emergence, at which time it attained its maximum and accounted for 1.43% of total soluble protein; thereafter, it decreased rapidly. This change was most remarkable compared to the other leaf constituents examined. The Rubisco content had already reached its maximum 3 days after leaf emergence and had begun to decrease earliest among the leaf constituents. The OER depended linearly on the leaf Rubisco content below the value of 3 g m⁻², but tended to saturate above this value. On the contrary, the amount of Rubisco activase and OER were linearly correlated during the life span of the leaf. The in vivo Rubisco activity, as the OER per unit Rubisco content, increased exponentially with the increased Rubisco activase/Rubisco ratio. These results show that the amount of Rubisco activase is closely related to the photosynthetic rates in rice leaf from its emergence through senescence, and suggest that in vivo Rubisco activity can be restricted by Rubisco activase content, particularly when the leaf is young and accumulates excess Rubisco.

Keywords:Aging, *Oryza sativa* L., Photosynthesis, Rice, Rubisco, Rubisco activase, Senescence[\[Full-text PDF \(792K\) \]](#) [\[References \]](#)

