

E231**Epoxidation of Zeaxanthin and Recovery from Low Temperature
Photoinhibition in Rice Leaves: Effects of Phosphatase Inhibitors**Chang-Cheng Xu, Hong Jin Hwang and Choon-Hwan Lee
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Previous investigations with two rice varieties, a chilling-resistant Dongjin-byeo and a chilling-sensitive IR841, revealed that the dark recovery at 25 °C following 6h light-chilling was biphasic. The initial rapid phase could be blocked by phosphatase inhibitors (Kim et al., Plant Sci., in press). In this study, we observed that chilling in the light caused a deepoxidation of violaxanthin to zeaxanthin up to 50% of total xanthophyll pool. The epoxidation of zeaxanthin during dark recovery at 25 °C also exhibited two distinct phases. The initial rapid phase usually was completed within 1h and was more pronounced in Dongjin-byeo than in IR841. The kinetics of PS II reactivation and epoxidation of zeaxanthin were closely correlated in both the two varieties. However, recovery following light-chilling in the presence of dithiothreitol, which prevented formation of zeaxanthin, exhibited only slow phase, suggesting that the rapid phase of PS II reactivation is related to zeaxanthin epoxidation. Pretreatment with phosphatase inhibitors (NaF and Na₂MoO₄) in darkness blocked the epoxidation of zeaxanthin. Under illumination of 60 μmol/m² · s at 25 °C, moderate level of NaF caused almost completely deepoxidation of available violaxanthin. We speculate that phosphorylation and dephosphorylation of thylakoid proteins may be involved in the regulation of xanthophyll cycle.

E232**Growth and Tropane Alkaloid Production of Tumor-Derived
Calli in *Datura metel* Transformed with *Agrobacterium tumefaciens***Deok Cho Yang, Hyun Mi Kang, Kang Seop Lee*, Yong Hae Kim
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Tumor-derived calli cultures of *Datura metel* were established after tumors induced on plants following infection with *Agrobacterium tumefaciens* Ery 101. The growth and tropane alkaloids (scopolamine and hyoscyamine) content of tumor-derived calli were investigated under various conditions. SH, MS and White media were tested. The optimum medium for the growth and tropane alkaloid production was SH medium and MS medium under light condition, respectively. The influence of 4 different carbon sources (sucrose, mannitol, glucose and lactose) was examined and a 4% concentration of sucrose was found to be the most appropriate for growth and for alkaloid production. Also, the effect of 4 different vitamins (0.1 mg/L D-pantothenate, 5 mg/L nicotinic acid, 0.5 mg/L pyridoxine-HCl and 5.0 mg/L thiamine-HCl) was examined. When nicotinic acid + D-pantothenate and D-pantothenate + nicotinic acid + thiamine-HCl were treated into SH basal medium, the growth and tropane alkaloid production were higher than those of the SH medium (original medium), respectively.