

## **Light differentially regulates cell division and endoreduplication in PLB regeneration of *Phalaenopsis* ‘Spring Dancer’**

A-Reum Kwon<sup>1</sup>, Hye-Rim Jang<sup>1</sup>, Niranjana H. Murthy<sup>2</sup>, Kyeong-Ju Lee<sup>1</sup>, So-Young Park<sup>1\*</sup>

<sup>1</sup>Depart. of Hort. Sci., Chungbuk Nat. Univ. Cheongju 361-763, Republic of Korea,

<sup>2</sup>Depart. of Plant Sci., Kanatak Univ. MB, India,

\*soypark7@cbnu.ac.kr

Species belonging to *Phalaenopsis*, one of the most important ornamental orchids, have been extensively studied over the last decade. This study aimed to investigate the effect of light quality on embryogenic cell division and endoreduplication level during the regeneration of *Phalaenopsis* PLBs. For induction and proliferation, thin-sectioned stems and PLBs of *Phalaenopsis* cv. ‘Spring Dancer’ were cultured under six kinds of monochrome or combinations of lights; red (R60), red1:blue1 (R30B30), red2:blue1 (R40B20), red2:blue1:green1 (R30B15G15), and fluorescent lamp (FL, control). After 4 weeks of culture, the highest numbers of PLB were induced after exposure to R30B15G15. The explants exposed to R60 and R30B15G15 showed higher percentage of cells in the S and G2M phase compared to those found under other light conditions. The content of oxidized phenol in the medium was also lesser after exposure to R60 and R30B15G15 than after exposure to FL and R30B30. The proliferation of PLBs was also high after exposure to R30B15G15 and R60. In morphology, however, PLBs proliferated under R60 were elongated in shape. Flow cytometric analysis revealed the presence of high numbers of endoreduplicated cells (2~32C), which might have resulted in the expansion of PLB size in red light. This finding indicated that red and green light stimulates embryogenic cell division and especially red light might increase cell expansion by regulation of endoreduplication level. Further studies will focusing to investigate the expression levels of genes associated with the endocycle of cells.

**Keywords:** *Phalaenopsis*, endoreduplication, cell cycle, light wavelength