

## Effects of Medium Compositions on Potential Organogenesis in Diploid and Tetraploid *Codonopsis lanceolata*

Soo-Jeong Kwon<sup>1</sup>, Swapan Kumar Roy<sup>2</sup>, Young-Ja Moon<sup>1</sup>, Moon-Soon Lee<sup>3</sup>, Hee-Ock Boo<sup>4</sup>, Hag-Hyun Kim<sup>1\*</sup>

<sup>1</sup>Dept. of Food Nutrition and Cookery, Woosong College, Daejeon 34606, Korea

<sup>2</sup>Dept. of Crop Science, Chungbuk National University, Cheong-ju 28644, Korea

<sup>3</sup>Dept. of Industrial Plant Science & Technology, Chungbuk National University, Cheong-ju 28644, Korea

<sup>4</sup>WELLPHYTO Co, Ltd., BI Center, GIST, Gwangju 61005, Korea

### [Introduction]

The root of *Codonopsis lanceolata* contains substances such as saponin, vitamin, B1, B2, and inulin, which are reported to reduce cough, blood pressure and also used as a crude drug substitute for ginseng. Recently, functional substances of medicinal plants have been attained increasing attention, but research on breeding and cultivation method to increase yields is still limited.

### [Materials and Methods]

The seeds of Diploid and tetraploid *C. lanceolata* were selected as testing materials that were grown in-vitro aseptically. In regards to optimum concentration experiment (2 MS, MS, 1/2 MS, and 1/4 MS culture medium) of MS medium composition among culture medium compositions, agar 0.8% was added after controlling sucrose and pH as 3% and 5.8 respectively. For the sucrose experiment (1, 3, 5, 7%), agar (0.8%) was added after adjusting the pH of MS culture medium at 5.8. For pH (3.8, 4.8, 5.8, 6.8, 7.8) and agar concentration experiment (0.4, 0.6, 0.8, 1.0 1.2%), 1/2 MS culture medium with added sucrose 5% and 3% respectively to leaf explant and stem segment of diploid and tetraploid *C. lanceolata* was selected as reference culture medium.

### [Results and Discussions]

The growth of Diploid *C. lanceolata* was concentration-dependant regarding MS medium composition. The shoot and adventitious root formation were suppressed with increasing mineral salt concentration, and active growth of shoot and adventitious root was exhibited as 4.9 cm and 3.2 cm respectively in 1/2 MS medium. On the contrary, the tetraploid *C. lanceolata* showed 2.9 cm and 3.2 cm respectively in 1/4 MS medium. For sucrose study, no consistent decrease was exhibited for growth of shoot and the adventitious root of diploid both at high and low concentration. The growth of shoot (at 3% concentration) and adventitious root (at 7% concentration) was 2.3 cm and 2.0 cm respectively. Results revealed that the adventitious root formation was suppressed at high concentration. No significant difference was observed at the agar concentration in shoot formation of diploid *C. lanceolata* at all concentrations. The highest adventitious growth (4.1 cm) was observed at 0.8% concentration. Minor inhibition of shoot formation and root formation of tetraploid *C. lanceolata* was observed at higher concentration. Shoot formation of diploid *C. lanceolata* also exhibited inhibition at higher concentration. Shoot formation of diploid *C. lanceolata* was increased at lower pH and shoot growth was the highest (2.3 cm) at pH 3.8. The results suggest that the levels of pH had an effect on shoot and root formation in diploid and tetraploid of *C. lanceolata*.

### [Acknowledgements]

This work was supported by Korea Institute of Planning and Evaluation for Technology in Food, Agriculture, Forestry (IPET) through High Value-added Food Technology Development Program, funded by Ministry of Agriculture, Food and Rural Affairs (MAFRA) (114036-04-3-HD030)

\*Corresponding author: Tel. +82-42-629-6988, E-mail. hkyushu@hanmail.net