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Environmental Factors Affecting the Acclimatization Potentiality of In-vivo Cultured Seedlings of Two Species of *Platycodon grandiflorum*

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[Introduction]

The bellflower is known as perennial herbaceous plant with its diverse flowers color as white, purple, and pink. The flower shape is blooming with single flowers and double flowers. The present study aims to explore the environmental factors such as soil, temperature, and light conditions necessary for the acclimatization of the tetraploid *Platycodon grandiflorum* with green petal and the *P. grandiflorum* for. *duplex*, which are capable of horticultural cultivation due to their high tubular value and to obtain the basic data for establishing the system.

[Material and Method]

Nine kinds of cultivated soil with different mixing ratios were cultured in the growth chamber, such as Horticultural bed soil (S), peatmoss (Pm), cocopeat (C), vermiculite (V) and perlite (P) to determine suitable soil for acclimation. Temperature (15, 20, 25, 30 °C), light intensity (10, 15, 30 and 60 $\mu\text{mol} \cdot \text{m}^{-2} \cdot \text{s}^{-1}$), and the appropriate LED light source (fluorescent lamp, Blue, Red, White and Blue+Red) were investigated. Eight weeks after transplantation, growth characteristics, leaf width, leaf length, and branching were investigated.

[Result and Discussion]

In the case of tetraploid *Platycodon grandiflorum* with green petal, the highest plant height (24.3 cm) was obtained from the soil, vermiculite and perlite (SVP=2:1:1) mixture followed by the soil and vermiculite (SV=2:1) mixture with 21.6 cm, respectively. The leaf characteristics also showed the potentials results from the SVP and SV soil properties. The optimum temperature at the time of acclimatization showed the most vigorous growth at 20 °C, and the plant height (24.0 cm and 23.0 cm) increased with the light intensity increased at 30 and 60 $\mu\text{mol} \cdot \text{m}^{-2} \cdot \text{s}^{-1}$, respectively. The growth characteristics were influenced significantly in the red light, whereas the stem diameter was the lowest (1.2 mm), and the number of branches (2.8) was significantly greater than that of other treatments. The tetraploid *P. grandiflorum* for. *duplex* showed the most vigorous growth in the range of 27.8 ~ 30.8 cm in the single-use and mixed-use cultured Horticultural bed soil (S), whereas growth was significantly suppressed in the cultured soil mixed with cocopeat and peatmoss. The light intensity showed higher results than other treatments at 60 $\mu\text{mol} \cdot \text{m}^{-2} \cdot \text{s}^{-1}$, and no significant changes was observed under LED light condition in the range of 23.4 ~ 30.7 cm towards all light sources except the mixed light (Blue+Red).

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