

Role of Plant Growth Regulators on *in vitro* Organogenesis in *Platycodon grandiflorum*

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[Introduction]

Platycodon grandiflorum is an important traditional medicinal plant found in North East Asia (including China, Japan, and Korea.) that mainly used to mitigate cough, phlegm, sore throat, lung abscess, chest pain, dysuria, and dysentery. The current investigation was carried out to explore the potentiality of shoot and root organogenesis of *P. grandiflorum* with multiple types of petals in response to various plant growth regulators.

[Materials and Methods]

The nodes from the three types of *P. grandiflorum* (with wild, green and duplex petals) were used as materials to execute the study with a variety of supplemented with different levels of plant growth regulators. The effects of 6-benzylaminopurine (BA), Thidiazuron (TDZ), Kinetin (Kn), and auxins; α -naphthalene acetic acid (NAA), 3-indole butyric acid (IBA) and Indoleacetic acid (IAA) were investigated separately. However, 1/4 MS and 1/8 MS culture medium supplemented with sucrose (5%) and agar (0.6%) was selected as reference culture medium. The concentrations of growth regulators were maintained at 0, 0.1, 0.5, 1, 5, 10 mg L⁻¹.

[Results and Discussions]

This study was performed to enhance the mass propagation for *P. grandiflorum* containing wild, green, duplex petals via the growth regulators. BA at 1 mg·L⁻¹ showed the maximum number of shoots (6 shoots) with shoot length (2.1 cm), whereas BA at 0.1 mg·L⁻¹ produced the highest shoot length (4.5 cm). Shoot proliferation occurred notably only when the medium was supplemented with 0.5 and 1 mg·L⁻¹ TDZ. However, TDZ at 0.5 mg·L⁻¹ induced the greatest number of shoots per explant from the *P. grandiflorum* for. *duplex*. The highest number of root (10 roots per explant) was obtained on the control medium from *P. grandiflorum* for. *duplex*. For the root length, the effects of TDZ showed the similar trend with the root number. However, the medium supplemented with 10 mg·L⁻¹ Kn resulted in the best shoot number (6 shoots per explants) and Kn at 0.1 mg·L⁻¹ showed the highest (5.3 cm) shoot length. For NAA experiment, the highest number of shoots and shoot length was achieved at 0.1 mg·L⁻¹ from the explants of *P. grandiflorum* with green and wild petal respectively. The medium supplemented with 0.5 and 0.1 mg·L⁻¹ showed the best results (13 roots per explant and 5.1 cm) for root proliferation and root elongation respectively. For IAA experiment, the highest number of regenerated shoots (7 shoots per explant) was observed at 0.5 mg·L⁻¹ IAA from the explant of *P. grandiflorum* for. *duplex*. However, MS medium supplemented with 0.1 mg·L⁻¹ showed the highest number of roots (17 roots per explants). The highest number of regenerated shoots (7 shoots per explant) was achieved on 0.5 mg·L⁻¹ IBA from explant of *P. grandiflorum* for. *duplex*. IBA at 10 mg·L⁻¹ from explant of *P. grandiflorum* showed the highest number (17 roots per explant) of regenerated roots.

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