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In vitro plant regeneration and micropropagation of *Liriope platyphylla* Wang et Tang

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Objectives

Liriope platyphylla is a medicinal plant that has been used for treating cough and sputum in Korea. With regards to the pharmacological effect of *Liriope platyphylla*, antibacterial and anticancer effects have been reported.

A reliable and highly efficient method for the regeneration of intact plants from *in vitro* culture is essential for establishing a multiple micropropagation and genetic transformation protocol for plants. In this paper, we describe the first development of a method for high-frequency shoot organogenesis and plant regeneration of *Liriope platyphylla.*

Materials and Methods

Seed sterilization and germination

For preparing plant materials, seeds of Liriope platyphylla were surface-sterilized with 70% (v/v) ethanol for 30 s and 2% (v/v) sodium hypochlorite solution for 10 min, then rinsed three times in sterilized water. Seven seeds were placed on 25 mL of agar-solidified culture medium in Petri dishes (100 × 15 mm).

Shoot induction from meristem cultures

Shoot meristem of Liriope platyphylla was cut into four pieces approximately 0.5 × 0.5cm in size, respectively, from plants grown in vitro that had been cut aseptically at the ends. Explants were placed on medium (approximately 25 mL) in 100 ×25 mm Petri dishes. Seven explants were cultured in each Petri dish on basal medium consisting of MS medium solidified with 0.7% (w/v) Phytagar (Gibco, Carlsbad, CA) that had been sterilized by autoclaving at 1.1 kg cm^{-2} (121 ° C) for 20 min.

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Results

We succeeded the protocol for regeneration and micropropagation of *Liriope platyphylla.* meristem explants were cultured with different concentration of cytokinins and later 1 mg/l of each cytokinins supplemented with various concentrations of different auxins to find out the potential regeneration capacity and growth of shoots from excised meristem culture. Among the cytokinins BAP and TDZ showed the highest efficiency for shoot initiation whereas kinetin and zeatin showed higher efficacy for shoot growth after 6 weeks in culture. Here zeatin along with any auxins
performed better for the initiation of shoot. Among the cytokinins and auxins combinations, zeatin along with IAA 0.1 performed the best for the initiation of the highest number of shoot (4.2/explants) followed by zeatin and IBA 1 and NAA 0.1 treatments, respectively. Combined application of zeatin and auxins might play a vital role for the regeneration and micropropagation of *Liriope platyphylla*.

Figure 1. Shoot organogenesis of *Liriope platyphylla*.