

Comparison of Bioactive Compounds and Antioxidant Activity according to Culture Systems in *Artemisia fukudo*

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Artemisia fukudo is a biennial plant and has been reported to have anticancer, anti-melanogenesis, and anti-inflammatory effects. However, it is difficult to produce biomass from *A. fukudo*, so it is not used as a material for cosmetics or pharmaceuticals. In vitro culture can stably produce biomass throughout the year. In this study, the culture system for producing the highest biomass and bioactive substances was compared. Ex vitro plants were collected in Pyoseon-eup, Jeju island in May 2021, and in vitro culture was harvested after culturing for 8 weeks (plantlet) and 4 weeks (adventitious roots), respectively. After harvest, total polyphenol content (TPC), total flavonoid content (TFC), and DPPH scavenging activity were analyzed. In biomass production, adventitious roots (FW: 5.1 g·100 ml⁻¹, DW: 0.6 g·100 ml⁻¹) were about 4 times higher than that of plantlets (FW: 1.8 g·200 ml⁻¹, DW: 0.3 g·200 ml⁻¹). Both TPC and TFC were highest in ex vitro plants (9.2 µg·mL⁻¹, 31.6 µg·mL⁻¹), and were 3.0 times and 1.8 times higher than those of plantlets (3.0 µg·mL⁻¹, 17.8 µg·mL⁻¹), respectively. The IC₅₀ value of DPPH scavenging activity was also the best in ex vitro plants (69.8 µg·mL⁻¹), followed by root root (184.4 µg·mL⁻¹) and plants (325.3 µg·mL⁻¹) in that order. Through additional elicitor treatment, scale-up, and advanced compounds analysis such as HPLC, it can be used as an industrial material.

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