

제주지역 갯메꽃(*Calystegia soldanella* L.) 유래 부정근 재분화 및 생물반응기 시스템 이용 대량증식법

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Regeneration of adventitious root from *Calystegia soldanella* L. in Jeju island and mass proliferation method using bioreactor system

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Calystegia soldanella L. is a perennial herbaceous halophyte belonging to the convolvulaceae family, which mainly grows in coastal sand dunes in Korea. Shoots and rhizomes are edible, and roots called 'Hyoseon Chogeun' are known to have medicinal effects such as antipyretic, sterilization, and diuretic. In addition, physiological activities of antioxidant, anti-inflammatory, antiviral, antifungal and PTP-1B (protein tyrosine phosphate-1B) inhibition have been reported. In this study, in vitro induction cell lines of *C. soldanella* L. collected from the coastal sand dunes in Jeju island was redifferentiated into adventitious roots that can be used as medicinal resources. Also the biomass of mass-proliferated adventitious roots using a bioreactor were evaluated. Plants of *C. soldanella* L. were collected from the crevice of the seashore in the coastal area of Taeheung 2-ri, Namwon-eup, Seogwipo-si. Then, it was separated into leaves, stems, rhizomes, and roots, and surface sterilized with 70% ethyl alcohol and 2% NaOCl (sodium hypochlorite). After washing with sterilized water, each organ section was cultured in Hormone-free MS medium (Murashige & Skoog Medium). As a result, the induction response rates were evaluated at 85% and 55%, respectively, in terms of callus formation and shoot generation in the rhizome segment. In the case of the adventitious roots morphological characteristics induced by single-use treatment of auxin-based plant growth regulators IBA and NAA from redifferentiated shoots were compared. Most efficient adventitious root culture method as a rooting rate, number, length, and biomass proliferation in the bioreactor system was confirmed when treated by culturing in MS salts, Sucrose 30 g•L⁻¹, and IBA 1mg•L⁻¹ for 4 weeks. In this study, the medium composition and culture period were confirmed using a bioreactor system to mass-proliferate adventitious roots derived from *C. soldanella* L. in Jeju island. Also this adventitious root line developed a new medicinal material could increase value of the bio-industry ingredient through quantitative and qualitative screening of phyto-bioactive compounds.

Key words: *Calystegia soldanella*, Adventitious root, Bioreactor system, Plant cell line, Mass proliferation

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