

Effects of Plant Growth Regulators on Callus and Adventitious Root Induction of *Rhodiola sachalinensis* A.Bor

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Objectives

Rhodiola sachalinensis A.Bor grows at high mountain area of China, Korea and Japan. As a drug of chinese traditional medicine, it can effectively enhance the body's ability to resist anoxia, microwave radiation, and fatigue and to delay aging. Field cultivation of *R. sachalinensis* has made little progress due to the temperature-sensitive nature and frequently occurring root-rotting diseases.

Here, we report the effects of plant growth regulators on callus and adventitious root induction with one step for the mass production/culture *in vitro* culture system.

Materials and Methods

1. Plant materials: Seeds of *Rhodiola sachalinensis* A.Bor that was purchased in China were immersed in 70% EtOH for 3 min, then sterilized in 5% NaOCl for 5 min, and the rinsed 3 times with sterile distilled water. The seedlings were grown under white fluorescent light ($50 \mu\text{mol} \cdot \text{m}^{-2} \cdot \text{s}^{-1}$) with a photo irradiation period of 16h/d at $25 \pm 1^\circ\text{C}$
2. Callus and Adventitious Root Induction: To test the effects of

growth regulators on callus induction, leaf and stem segments was cultured on $\frac{1}{2}$ MS solid medium combined treatments of auxin (2,4-D, NAA: 0.1-2 mg/L) and cytokinin (BA: 0.1-0.2 mg/L). For adventitious root induction it was examined the sole treatment of various kind of auxins (NAA, IAA, IBA at 0.1, 0.5 mg/L). MS, WPM, B5 medium and each diluted/concentrated media ($\frac{1}{2}^x$, 2^x , 3^x) were used to investigate the growth of callus on each medium. All the cultures were incubated under complete darkness, at $25 \pm 1^\circ\text{C}$.

Results and Discussion

1. Callus induction: When supplemented with 0.5 mg/L NAA and 1 mg/L BA, callus induction were highest among the other test. Among media tested, 2B5 showed the best growth of callus and then maintained.
2. Adventitious Root Induction: Adventitious roots were formed from $\frac{1}{2}$ MS medium supplemented with various concentrations of IBA and IAA. The optimal concentration of IBA for adventitious roots induction was 0.1 mg/L, but NAA treatment did not show any response.