

## Induction of Different Types of Callus and Somatic Embryogenesis in Various Explants of *Taraxacum Kok-Saghyz Rodin*

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**Abstract :** To explore the potential for in vitro rapid regeneration of Russian dandelion (*Taraxacum kok-saghyz Rodin*), different concentrations of 6-Benzylaminopurine (BAP), 2,4-Dichlorophenoxyacetic acid (2.4-D) and BAP combined with Indole-3-acetic acid (IAA) were evaluated for their effects on the induction of somatic embryos from leaf, seed stem and root explants. Different explants were cultured on MS medium supplemented with various concentrations (0, 0.5, 1, 1.5, 2, 2.5 and 3 mg/l) of each kind of hormone. Callus induction percentage, fresh weight, color and texture of the callus were assessed after 14 and 28 days of culture. The optimum medium for the proliferation of embryogenic calli from leaf and root explants was MS supplemented with 2.5 mg/L BAP and 0.5 mg/L 2.4-D. Concentrations of 2.5 mg/L BAP and 1.5 mg/L IAA also had a remarkable effect on root and stem explants. The best concentration to produce callus from stem explants was 0.5 mg/L BAP and 1 mg/L IAA. Results of mean comparison showed that BAP and 2.4-D were more effective on different explants than BAP and IAA. Results of the double staining method proved that somatic embryogenesis occurred in the most concentrations of BAP and 2.4-D. Under microscopic observations, the different developmental stages of the embryos (globular, heart, torpedo and cotyledonary) were revealed together in callus cells, indicating that the most tested hormone combinations were effective for somatic embryogenesis formation in this species. Seed explants formed torpedo and cotyledonary stages faster than leaf and root explants in the most combinations. Most calli from seed explants were cream colored and friable, while calli were compact and light green from leaf and root explants. Some combinations gave direct regeneration and (3 mg/L BAP and 2 mg/L IAA) in seed explants and (0.5 mg/L BAP and 2.5 mg/L IAA) in leaf explants had the highest number of shoots with average of 21 and 27 shoots per callus. The developed protocol established the production of different callus types from seed, leaf, and root explants and plant regeneration through somatic embryogenesis.

**Keywords :** taraxacum kok-saghyz Rodin, callus, somatic embryogenesis

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