



## **An efficient method to induce regeneration and callogenesis in *Crataegus microphylla* L.**

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**Background and objectives:** Hawthorn as an ethno-pharmaceutical plant has been consumed for 2,500 years. Flowers, leaves and fruits of hawthorn are rich in antioxidant and polyphenols and are popular in the treatment of congestive heart failure. **Methods:** In the present study, by using various media and plant hormones the regeneration and callogenesis capacity of *Crataegus microphylla* L. was investigated. The one-year-old branches and lateral buds were selected for explant supply. Single nodes were sterilized in two different methods: either with 'long-term sterilization' (ethanol 60 s, NaClO 10% v/v 10 min) or with 'shorter-term sterilization' (ethanol 30 s, NaClO 10% v/v 15 min). Single nodes were then cultured in MS or DKW media with different concentrations of BA and 2,4-D. **Results:** After 10 days, cultured Hawthorn nodes regenerated up to 66% in DKW (supplemented with BA 9.06  $\mu$ M) and to 50% in MS medium (supplemented with BA 13.32  $\mu$ M and 2,4-D 2.26  $\mu$ M). In shorter-term sterilization dark green leaves appeared on small sprouts. A callogenesis of 100% in MS (supplemented with 2,4-D 13.59  $\mu$ M) was observed at the ends of all explants after one week when nodes were treated with long-term sterilization. **Conclusion:** This data suggests efficient and novel methods on induction of callogenesis and regeneration in *Crataegus microphylla* L. with the idea of supporting higher yields of therapeutically important secondary metabolites of hawthorn.

**Keywords:** BA, callogenesis, 2,4-D, regeneration, single node

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