



Optimization of callus induction of *Zataria multiflora* under the effect of different plant growth regulators and explant source

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Background and objectives: The *Lamiaceae* family is rich in favorable secondary metabolites which have different medicinal properties and also use in food, cosmetic and sanitary industry. *Zataria multiflora* Boiss. is an aromatic and bushy plant containing specific pharmaceutical components which is only distributed in certain regions of Iran. Tissue culture technologies could be suitable for *in vitro* production of *Zataria*. **Methods:** In this study, callus production and callus related traits of *Zataria* was evaluated at *in vitro* condition. Callus induction was performed on Murashige and Skoog (MS) medium containing different levels of plant growth regulators including different cytokinins (Kinetin, benzyl amino purine) and auxins (2,4 dichlorophenoxyacetic acid and naphthalen acetic acid) and two different explant (hypocotyl and leaf). **Results:** The friable calli with yellow-green color only appeared from leaf explants on three different treatments including: 1: 2.5 (mg/L 2,4-D); 2: 2 (mg/L 2,4-D); 3: [2 (mg/L) 2,4-D+ 1 (mg/L Kin]. The best callus induction (75%) was obtained at 2,4-D (2 mg/L) + Kin (1 mg/L) after 2 month of incubation under the photoperiod of 16/8 (light/dark). The highest callus growth rate (CGR) (0.072 mm/day) and callus fresh weight (0.135 g) were denoted to the treatment of 2 mg/L (2,4-D). **Conclusion:** The benefits of the protocol described here include the possibility of its use throughout the callus culture for commercial production of suitable secondary metabolites of *Zataria* in rapid time and huge scale.

Keywords: callus induction, plant growth regulators, secondary metabolites, *Zataria multiflora*