Abstract

Nepeta binaludensis Jamzad is an important medicinal species of Lamiaceae family. It is an endemic species with limited habitat in the highlands of northeastern Binalude mountains, Iran. The main Essential oils components the plant is secondary metabolites nepetalactone and 1,8 Cineole. This study was conducted to investigate the effect of *in vitro* conditions on *N. binadulens* nepetalactone content and cis-trans type. The experiment was conducted as a factorial experiment based on a completely randomized design with four replications. Callus induction was performed using gradient levels of 2,4-D (0, 0.5, 1, 1.5, 2, and 2.5 $mg.l^{-1}$) and BAP (0, 0.5, 1 and 1.5 $mg.l^{-1}$). GC/MS analysis was done to compare the nepetalactone content among *in vitro* and *in vivo* conditions. The results suggest that nepatalactone synthesis showed an increase in 16 growth regulator combinations compared to hormone-free medium and *in vivo* conditions. The highest callus induction was obtained in 2mg/l 2,4-D+1mg/l BAP. The results show that *in vitro* techniques are feasible method for nepetalactone synthesis.

Key words: *Nepeta binaludensis* Jamzad, Tissue culture, Essential oils, Trans-cis Nepetalactone, 2,4-D, BAP.

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Medicinal plant (*Nepeta binaludensis* Jamzad) tissue culture and nepetalactone variations of essential oil *in vivo* and *in vitro*

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