Production of some volatile components in *Daucus carota* L. callus cultures

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**Background and Aims:** *Daucus carota* L. or carrot from Apiaceae family is a herbaceous and biennial plant that produces an edible root. The aromatic substances and beta-carotene, as an orange and abundant pigment of the fruits and roots are the main components of the plant. Callus cultures of *D. carota* fruits may produce the similar compounds. The aim of this work was to initiate and establishment of callus culture of *D. carota* fruits for volatiles and beta-carotene production as well as determination of the essential oil of *D. carota* fruits for comparing.

**Methods:** A sterile in vitro *D. carota* fruit was prepared by sterilization with ethanol 70% and hydrogen proxide 30% and subculture of buds, excised aseptically and inoculated into sterile culture jars containing Murashige and Skoog’s medium and were incubated at 25 °C. Production of calluses main compounds was evaluated by TLC and GC-MS techniques. The same processes were done on *D. carota* fruits as well. For this purpose the fruits of *D. carota* were powdered and the volatile fraction was isolated by both of BP hydrodistillation method and dichloromethane solvent. The collected oils were analyzed by GC-MS analysis.

**Results:** No beta-carotene was detected on cultures and six compounds were found in the essential oil of *D. carota* fruits including apiol (44.6%). Apiol and myristicin were detected in DCM extract of cultures.

**Conclusions:** According to our results the call cultures of *D. carota* fruits like as intact plant are able to produce secondary metabolites but it looks different in number of compounds.

**Keywords:** Daucus carota; Apiaceae; Callus culture; Essential oil; GC-MS; Apiol