

## Evaluation of antioxidant activity of the essential oils of different parts of *Juniperus polycarpus* (Cupressaceae) by TBARS method in comparison with vitamin E

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**Background and Aims:** In this study, thiobarbituric acid reactive species (TBARS) method was used to evaluate antioxidant activity of different parts of *Juniperus polycarpus* and its pure components at different concentrations in comparison with vit E.

**Methods:** Essential oils of fruits and male and female leaves of *J. polycarpus* were obtained and different concentrations of the oils (0.1, 0.5, 1.4, 20 and 40 mg/mL) in methanol were prepared. In TBARS method, egg yolk was used as an oxidable substrate, 2, 2'-azobis (2-amidinopropane) dihydrochloride (ABAP) as a radical initiator, and  $\alpha$ -tocopherol as reference. Major components of these oils such as sabinene,  $\alpha$ -pinene,  $\beta$ -pinene, limonene,  $\alpha$ -thujene,  $\gamma$ -terpinene were also tested for their anti-oxidative activity in comparison to vit E at different concentrations of 4, 20 and 40 mg/mL.

**Results:** Various parts of *J. polycarpus* essential oils showed different antioxidant activity but significantly lower than the activity of vit E ( $P < 0.001$ ). Among different parts of this plant, the oil of fruits showed the highest and the oil of male leaves showed the lowest antioxidant effect. Antioxidant activity increased at higher concentrations. At concentrations of 20 and 40 mg/mL, antioxidative activity was significantly higher compare to other used concentrations. Among the pure components,  $\gamma$ -terpinene showed the highest activity with no significant difference when compared with vit E. The lowest activity was related to  $\alpha$ -pinene. ANOVA and Tukey-Kramer statistical tests were used to analyze the data. The EC<sub>50</sub> was calculated for each essential oil. The lowest one was related to *J. polycarpus* fruit (23.375 mg/mL) and the *J. polycarpus* fruit showed the highest one (162.666mg/ml).

**Conclusions:** According to the findings, essential oils of *J. polycarpus* fruit potentially have highest antioxidant effects especially at higher concentrations. This activity can be related to the components of this oil, particularly  $\gamma$ -Terpinene.

**Keywords:** *Juniperus polycarpus*; Cupressaceae; Antioxidative activity; TBARS method; vitamin E