

Antioxidant activity of oxygenated normal and retro-carotenoids in vegetal oils

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Rhodoxanthin belongs to the xanthophylls group, along with the canthaxanthin and asthaxanthin, but it has a retro type polyenic system. The antioxidant function of canthaxanthin was certified by different studies, but the biological functions of rhodoxanthin haven't been studied before. The objectives of this work consist in a comparative study regarding the antioxidant activity of oxygenated carotenoids, with normal (canthaxanthin) and retro type structure (rhodoxanthin purified by thin layer chromatography from *Taxus Baccata* arils), in two different types of vegetal oils (sunflower and pumpkin oils).

In order to evaluate the antioxidant effect of carotenoids, a chemical model which followed two stages was chosen: induction of peroxidation processes in crude oil (obtained by cold pressing) and determining the level of peroxidation in the presence and absence of carotenoids by quantifying the concentration of malonyldialdehyde (via TBA method). Oils were treated with two solutions of 0.1 M CuSO₄ and 1M CuSO₄. Processed samples were homogenized and then kept for one hour at 50°C and 24 hours at 50°C. To study the antioxidant effects, the oil samples were treated with carotenoids dissolved in ethyl acetate (concentration of carotenoid pigments was 200 micromoles).

If in the case of sunflower oil, the peroxidation level was not dependent on the concentration of CuSO₄ solution, for pumpkin seed oil the results showed that there is a direct relationship between cupric ion concentration and the concentration of MDA.. Peroxidation level increased significantly for oil treated with 1M CuSO₄ (50.03 ± 5.07 nmoles/ml) compared to 0.1 M solution concentration (14.96 ± 2.64 nmoles/ml). The protective effect of carotenoids is more obvious in the case of pumpkin seeds oil. MDA concentration decreased more pronounced in samples treated with rhodoxanthin (10.63 ± 1.05 nmoles/ml) compared to oil treated with canthaxanthin (20.31 ± 5.93 nmoles/ml). Also, for both types of oil, in all of the oxidation induction systems, it was observed that rhodoxanthin's protective action was greater or equal than that of canthaxanthin.

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