THE OXIDATIVE STABILITY OF VEGETABLE OILS ENRICHED WITH CAROTENOIDS

Violina POPOVICI

Technical University of Moldova

***Keywords**: sunflower oil, edible oils, antioxidants, carotenoids, lipid oxidation.*

A permanent concern of the modern food industry is to ensure an optimal storage term for food. Sunflower oil has an important place in human nutrition. It is mostly consumed as salads dressing, in cooking or frying. According to (Gertz et al., 2000) [1] edible oils are supposed to oxidative reactions during frying. Lipid oxidation leads to the production of compounds that reduce the quality [2], leads to undesirable changes in sensory, chemical and nutritional properties of oils. [3]. One of the easiest ways to reduce vegetable oil and lipid oxidation is the application of antioxidants. Vegetables, berries, herbs and spices are among the numerous sources of natural antioxidants.

There is an increased interest for sources of natural antioxidants in order to enrich oils towards reducing lipid oxidation [4,5]. The sea buckthorn and rosehip berries are natural concentrate of vitamins (C, P, B1, B2, E, K), carotenoids, folic acid, volatile oil, etc. [6]. Studies on sea buckthorn and rosehip fruits and lipophilic extraction are increasing such as they become potential ingridients rich in biologically active compounds for functional food products.

Carotenoids represent a class of biologically active compounds that have colouring power, health benefit, antioxidant capacity, and antiobesity effect. Also are known multiple domains where carotenoids are used such as food industry, pharmaceutical industry, cosmetics and animal food industries. Sea buckthorn and rosehip berries are widely spread in Moldova which fact can motivate its use mainly in food industry.

According to bibliographic sources, the carotenoids content may vary between 1 and 20 mg/l [7]. Usually the content of total carotenoids may vary according to cultivating region, season or weather conditions.

The aim of this study is to optimize the extraction process of liposoluble compounds and to evaluate the oxidative stability of sunflower oils enriched with rosehip and sea buckthorn extracts. For this purpose, it is intended to analyze the total carotenoid content of the studied extracts and to investigate their oxidative stability.

In order to analyze the carotenoid content of local berries were performed extractions in sunflower oil at a preset temperature of 45°C and period of time – 3h. Using spectrophotometric methods were determined the content of lycopene (λ=470 nm) , β-carotene (λ=448 nm) and zeaxanthin (λ=452 nm).

Table 1

Total carotenoid content of lipophilic extracts.

Carotenoids	**Sea buckthorn extract,** $mg \cdot L^{-1}$	**Rosehip extract,** $mg \cdot L^{-1}$
lycopene	6,41±0,15	17,11±0,22
β-carotene	7,33±0,14	18,52±0,25
Zeaxanthin	8,30±0,14	19,10±0,17

The results obtained demonstrate that the analyzed lipophilic extracts are rich in carotenoids, especially the rosehip extract (Table 1).

In order to evaluate the oxidative stability of vegetable oils were studied the impact of sea buckthorn and rosehip extract on the peroxidation degree of sunflower oil.

For this, the examined oils (0.2g) were solubilized in a 0.01M phosphate buffer (pH 7.4, 37 ° C) with the tween 20 emulsifier [8]. At the same time, the content of lipidic hydroperoxides (conjugated dienes) was measured spectrophotometrically at 234 nm. After determining the constant rate of peroxidation (60 min), oily extracts of sea buckthorn and rosehip (0.1-0.5 mL) were added and measured the evolution of the conjugated diene content (λ=480 min).

It has been established that the reduction of the degree of lipid peroxidation is direct proportional to the content of the oily extracts added. The ratio of inhibited peroxidation rate to uninhibited peroxidation rate varies between 0.37-0.56 for sea buckthorn extract and 0.28-0.46 for rosehip extract.

This study has shown the inhibitory effect of sea buckthorn and rosehip extracts on lipid peroxidation in food. Addition of such extracts to vegetable oils may contribute to the increase of their oxidative stability.

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