

Abstract

Pharmaceutical oils (bio-oils) are vegetable oils obtained by conservative extraction and refining methods (e.g., cold pressing, supercritical CO₂ extraction, physical refining), extracted from vegetable raw materials characterized by a unique composition of bioactive compounds and/or fatty acids. Fatty acids, especially unsaturated ones, play an important role in ensuring the proper functioning of the human body, but their relatively high proportion in vegetable oils is a direct cause of the low shelf life of these products.

Recently, special attention has been paid to phenolic compounds as antioxidant additives, with current literature suggesting that not only phenolic acids, but also their derivatives can be effective antioxidants used in the food industry, including the oil industry. Some researchers suggest that phenolic compounds as polar antioxidants can better protect hydrophobic matrices than typical non-polar antioxidants, such as tocopherols (the "polar paradox" theory).

The research planned in this dissertation is based on the latest knowledge of the content and antioxidant activity of phenolic compounds in oils, as described in the review paper. The experimental part investigated the content of naturally occurring phenolic compounds in vegetable bio-oils available on the Polish market (from different raw materials and from a single raw material differing in water content) and the effectiveness of the addition of two phenolic acid derivatives (4-vinylguaiacol and 4-vinylsyringol) in inhibiting lipid oxidation and reducing the degradation of bioactive compounds in bio-oils during storage.

Research carried out within the framework of the dissertation confirmed that phenolic compounds, including phenolic acid derivatives, affect the oxidative stability of vegetable bio-oils and can be used as additives to significantly increase their shelf life, but also have a protective effect on the bioactive compounds they contain. Studies have shown that the effectiveness of the stabilizing effect of phenolic acid derivatives depends on their type and concentration, and also on the type of bio-oil.

Keywords: vegetable bio-oils; phenolic compounds; 4-vinylsyringol; 4-vinylguaiacol; oxidative stability; bioactive compounds