

OPTIMIZATION OF THE TOTAL POLYPHENOLS EXTRACTION FROM HIPPOPHAE RHAMNOIDES USING CENTRAL COMPOSITE DESIGN*

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Abstract: Polyphenolic compounds provide health benefits by removing free radicals, protecting and regenerating other antioxidants from food. Therefore, in recent years, interest in polyphenols has increased among scientists, those in the agricultural and food industries, nutritionists etc. [1]. Also, the polyphenols from plants which can effectively absorb photons and rapidly return to ground state, exactly as UV filters have been recently considered as potential sunscreen resources [2].

The aim of this study was the optimization of the extraction processes (extraction by sonication and reflux) of polyphenols from sea buckthorn (*Hippophae rhamnoides*), depending on the water: ethanol ratio, solvent: vegetable material, temperature and extraction time. Before the extraction, it was established the sea buckthorn weighing mass, respectively the volume of the solvent according to the optimum hydromodule. For optimization of polyphenols extraction from sea buckthorn the Central Composite design was used, from the software Minitab 17, resulting 20 experimental variants. The obtained extracts were characterized in terms of the total content of polyphenols by the Folin-Ciocalteu method.

From the results obtained by spectrophotometric analysis of the extracts obtained by sonication, it was found that the largest amount of polyphenols (7.47 ± 0.10 mg / g dry vegetable material) extracted from the sea buckthorn was obtained under the following conditions: extraction solvent: 50% ethanol; extraction temperature: 56.8 °C; extraction time: 20 min. In the case of the reflux extraction, the largest amount of polyphenols (14.29 ± 0.57 mg / g dry vegetable material) was obtained by refluxing with 40% ethanol as the extraction solvent for 90 minutes.

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References

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