A Kinetic Study On The Antioxidant Activities Of Supercritical Extracts From Rhododendron And Laurocerasus Species’ Leaves

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Within the last two decades, considerable effort has been devoted to the extractions and applications of natural antioxidant active compounds such as flavonoids and phenolic acids since the synthetic antioxidant compounds had been shown to have some carcinogenic effects [1-4]. But, most of these studies did not deal with the extraction of antioxidant active compounds under violent conditions (except supercritical carbon dioxide), and thus, there was not so much data about the kinetic parameters for such type extractions. Kinetic parameters have importance in optimizing the extraction conditions.

In this study, the leaves of two different plants, Rhododendron ponticum L. and Laurocerasus officinalis Roem, from Eastern Black Sea Region of Turkey, were subjected to supercritical extractions by using methanol, ethyl acetate, and n-hexan as solvents. In these experiments, the effects of sample particle size, extraction time interval, and solvent polarity on the total phenolic contents and antioxidant activities of the extracts were investigated.

As a result, it was found out that, for Laurocerasus officinalis Roem. leaves, while the particulate size of the sample was getting increase, the total phenolic contents, and in parallel, antioxidant activities of the extracts were getting decrease. For Rhododendron ponticum L. leaves, significant variation was not detected between particulate size of the sample and total phenolic contents or antioxidant activities of the extracts. In extended extraction time intervals, while the total phenolic contents of the extracts were getting increase, their antioxidant activities were getting decrease for both plants. Methanol was found to be the best choice among the solvents used in supercritical extractions. Optimum extraction conditions were obtained as sample particle size was 125-250 μm, extraction time interval was max 30 min, and extraction solvent was methanol.

References


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