
CONTINUOUS EXTRACTION OF OLIVE TREE LEAVES IN A FIXED BED APPARATUS

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ABSTRACT

This study focuses on the continuous extraction of olive tree leaves for the recovery of phenolics and other bioactive compounds. Our previous work on that subject only used batch extraction methods and varied parameters like temperature, time of contact, type of solvent and solid particle size [1-3]. Batch extraction is fairly convenient on the laboratory scale, but has efficiency issues at bigger scale with a lot of operational time spent on loading, unloading, cleaning and achieving operational temperatures. Another disadvantage is the liquid retention of the solid. Also, the solid must be brought into contact more than one time with fresh solvent to leach out most of the extractives. Continuous extraction on the other hand can be performed at steady state with fixed conditions. There are various methods and equipment for continuous extraction, but the most common ones bring the solid, which sits in beds that hold it in place, in contact with pure solvent streams, which are able to pass through the solid-beds, until the substances have leached through the solid. This minimizes the solvent and time spent to leach out the substances. In the industry, there are many specialized equipment to perform continuous extraction (e.g. Rotocel), but they are more complex than stirred vessels that would be used in batch extractions and therefore more costly. In this study, an effort was made to test the efficiency of continuous extraction compared to the batch methods in our previous studies. The experimental apparatus consisted of a fixed bed in which the dry pulverized material was loaded and fresh solvent was passed through it with the help of a dosimetric pump for accurate flow rates. Three types of solvent were used: plain water, a hydroethanolic mixture of 70% v/v ethanol, and 85% ethanol. The method was compared to typical batch extractions in terms of solvent used and the amount of extractable material measured with colorimetric methods for phenolic and reducing sugars concentration. Continuous extraction was found to greatly reduce the use of solvent and increase the amount of extractable material in the leachate.

KEYWORDS: olive tree leaves, hydroxytyrosol, solvent extraction, continuous

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