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Simultaneous determination of artificial sweeteners in possible counterfeited wines, using high performance liquid chromatography with DAD detection

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Abstract Increased use of food, beverages or drugs containing synthetic sweeteners presents a real danger to health, which is why the EU Member States had to establish a system of regular surveys to monitor sweetener consumption. In case of wine industry, according to law no. 244/2002, Romania prohibits the addition of synthetic sweeteners in wine in order to obtain sweet wine. The official method for detection of adulterated sweet wines with synthetic sweeteners is TLC-Thin Layer Chromatography. However, quantitative methods of analysis are needed to measure levels of sweeteners in different food matrices and high performance liquid chromatography has proved to be a powerful tool for quantitative analysis of compounds at traces levels. In this paper, a high performance liquid chromatographic (HPLC) method for the simultaneous separation and determination of three of the most popular artificial sweeteners (acesulfame potassium, saccharine and aspartame) in a single injection was developed. The described method is rapid, accurate and highly sensitive. Detection limit were 4 mg/L for acesulfame K, 1 mg/L for saccharine and 9 mg/L for aspartame respectively. The precision of the method was about 2% and recovery ranged between 92.6% and 103.3%. There were analyzed commercial wine samples, in order to detect possible counterfeits-sweet and medium sweet wines. Therefore, of the 20 analyzed wine samples, only two samples consisting in wine sweet table, were counterfeited by adding saccharin.

Keywords: artificial sweeteners, adulterated wine, HPLC

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