

TRENDS ON ANALYTICAL METHODS FOR RESVERATROL, A MAJOR BIOACTIVE COMPOUND IN WINES

Maria João Cabrita^{}, Nuno Martins, Bruno Soares, Ana Maria Costa
Freitas and Raquel Garcia*

ICAAM - Instituto de Ciências Agrárias e Ambientais Mediterrânicas, Universidade de Évora,
Núcleo da Mitra, Ap. 94, 7002-554 Évora, Portugal

ABSTRACT

Resveratrol (3,5,4-*trans*-trihydroxystilbene) is a member of the stilbene group of phenolic compounds, comprising two aromatic rings linked by an ethylene bridge and is considered one of the most promising bioactive compounds due to its bioactivity. Wine is one of the main source of this bioactive compound in Mediterranean diet. Several authors have dedicated their research to the relationship between diet and health, and concerning wine and health studies, “French Paradox” was the starting point.

Resveratrol is found in seeds and skins of grapes and in wines. The red wines are richer than the white ones due to differences in winemaking technology. The amount of resveratrol found in wines varies widely, since a huge number of factors affect its biosynthesis (grape variety, geographic region, climatic conditions, agronomic factors) and its extraction from the solid part of the grapes into the wines (technological practices).

Numerous analytical methods are described in literature to determine resveratrol content in wines, but apart few methods reporting direct injection, a previous sample preparation step is required before the injection into a chromatographic system. Liquid chromatography coupled with a fluorescence detector, a diode array detector or a mass spectrometry detector are the most used separation and identification tools, since the use of gas chromatography also requires a derivative step. Recently, the development of molecular imprinting technology based on a mechanism of molecular recognition, and the further applications of the generated molecularly imprinted polymers (MIPs) as selective sorbents in Solid Phase Extraction (MISPE) or magnetic MIPs (MMIPs) have provided a new versatile tool for the highly selective quantification of resveratrol in wines.

In this chapter, the biosynthesis of resveratrol in grapes, the factors affecting resveratrol content in wines and the current analytical methods for resveratrol determination in wines, will be revisited.

However, the focus of this review will be on the new trends in analytical methods for resveratrol in wines, namely the use of molecularly imprinted polymers (MIP) as a recent and innovative sample preparation methodology.

Keywords: resveratrol, analytical methods, molecularly imprinted polymers

^{*} Corresponding author: ICAAM - Instituto de Ciências Agrárias e Ambientais Mediterrânicas, Universidade de Évora, Núcleo da Mitra, Ap. 94, 7002-554 Évora, Portugal. Email: mjbc@uevora.pt.