Grape seed powders as a source of phenolic compounds: UHPLC Orbitrap MS^4 characterization

FUNPRO For healthy food products

Danijel D. Milinčić[1], Uroš Gašić[2], Aleksandar Ž. Kostić [1], Slađana P. Stanojević [1], Živoslav, Lj. Tešić[3], Mirjana B. Pešić [1]

[1]University of Belgrade, Faculty of Agriculture, Chair of Chemistry and Biochemistry, Belgrade, Serbia, [2]Institute for Biological Research "Siniša Stanković", National Institute of the Republic of Serbia, University of Belgrade, Belgrade, Serbia, [3]University of Belgrade, Faculty of Chemistry, Belgrade, Serbia

Introduction

Grape seeds represent a rich source of phenolic compounds that exhibit varying health benefits. Therefore, grape seed powders can be a potential functional ingredient in the formulation of different nutritionally valuable food products.

Aim

The aim of this study was UHPLC Orbitrap MS4 characterization of phenolic compounds and their derivatives of indigenous (Smederevka, Tamjanika and Prokupac) and international (Italien Riesling, Muscat Hamburg, Merlot and Cabernet Sauvignon) grape seed powders.

Material and methods

Phenolic compounds from grape seed powders were extracted with 80% methanol containing 0.1% HCl and analyzed by UHPLC Orbitrap MS. Identification of phenolic compounds was conducted based on their monoisotopic mass, MS fragmentation (MS^4, MS^3, MS^2), available standards and literature data.

Conclusions

Grape seed powders of indigenous and international varieties contain a different class of phenolic compounds, primarily flavan-3-ols, procyanidins and phenolic acids, which increase and favor their future application in the food industry.

Contact email: milincic93@gmail.com, mpesic@agrif.bg.ac.rs

Results


GRAPE SEED

SMEDEREVKA

ITALIEN RIESLING

TAMJANIKA

MUSCAT HAMBURG

PROKUPAC

MERLOT

CABERNET SAUVIGNON

Compounds	Grape varieties						
	Smederevka	Italien Riesling	Tamjanika	Muscat Hamburg	Prokupac	Merlot	Cabernet Sauvignon
Hydroxybensoic acids and derivatives							
Galic acid*	+	+	+	+	+	+	+
✓ gallic acid hexoside	+	+	+	+	+	+	+
✓ dihydroxybenzoic acid hexoside	+	+	+	+	+	+	+
protocatechinic*	+	+	+	+	+	+	+
p-hydroxybenzoic *	+	+	+	+	+	+	+
gentisic acid *	-	+	+	+	+	-	+
ellagic acid	+	+	+	+	+	+	+
vanillic acids *	+	+	+	+	+	+	+
Flavan-3-ols and procyanidins							
✓ B typ procyanidin dimer isomer 1	+	+	+	+	+	+	+
✓ B typ procyanidin dimer isomer 2	+	+	+	+	+	+	+
✓ B typ procyanidin trimer isomer 1	+	+	+	+	+	+	+
Catechin	+	+	+	+	+	+	+
Epicatechin	+	+	+	+	+	+	+
✓ B typ procyanidin dimer isomer 3	+	+	+	+	+	+	+
✓ B typ procyanidin dimer gallate isomer 1	+	+	+	+	+	+	+
✓ B typ procyanidin trimer isomer 2	+	+	+	+	+	+	+
✓ B typ procyanidin dimer gallate isomer 2	+	+	+	+	+	+	+
✓ B typ Procyanidin dimer digallate	+	+	+	+	+	+	+
✓ Catechin gallate	+	+	+	+	+	+	+

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