

Polyphenolic Profile and Biopharmaceutical Potential of Istrian Malvasia Grape Skin Extract

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Abstract

Grape pomace consisting of fragmented skin, pulp remaining, seeds and stalks is the main by-product in the wine industry that has attracted considerable attention as a source of bioactive compounds, especially polyphenols. The pomace from white grape is particularly attractive for further exploitation as it usually does not pass the maceration process. Accordingly, it preserves nearly all phenolic compounds originating from the grape cluster. The aim of the presented research was to determine the potential of the grape skin originating from the autochthonous Croatian white grape variety Istrian Malvasia, the leading viticultural and wine making variety in the region of Istria. Extracts from grape skin were obtained by extraction with 70% ethanol and ultrasound treatment. The polyphenolic profile of skin extracts was determined by direct infusion mass spectrometry, while contents of total phenols and flavonoids were determined spectrophotometrically. The biopharmaceutical potential was explored by antioxidant, antiproliferative and enzyme inhibitory activity assays of the extracts. Obtained results showed that the Istrian Malvasia grape skin has a specific polyphenolic profile characterized by the presence of catechin, procyanidins type -B, procyanidin trimers and quercetin and kaempferol glycosides. The extracts showed antioxidant activity as well, reaching values up to 6.85 ± 0.48 , 18.45 ± 0.60 , 32.90 ± 0.20 and 20.43 ± 0.13 mg TE/g for DPPH, ABTS, CUPRAC and FRAP assays, respectively. Grape skin extracts were better glucosidase inhibitors than the amylase inhibitors. In addition, extracts showed antiaging potential by inhibiting tyrosinase. At last, the extracts exerted the most potent antiproliferative activity on the growth colorectal carcinoma cell line HCT116 at the same time exerting antiproliferative activity towards HFF-1 normal fibroblasts as well. Grape skin has a prominent biological potential and can be therefore, exploited along with other

parts of grape pomace as a functional ingredient in pharmaceutical, cosmetic and food industries.

Keywords: grape pomace, polyphenols, mass spectrometry, antioxidant activity, enzyme inhibition

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