Bioactive Compounds and radical scavenging properties of grape pomace

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INTRODUCTION

Natural products and preparations for food and nutritional supplementation or dietary purposes have gained increased attention in recent years. Among them, considerable interest is focused on the development and evaluation of natural antioxidants and radical scavengers from plant materials which are rich in polyphenol compounds. It is well-known that plant-derived polyphenols have remarkable antioxidant and radical scavenging activity resulting in multiple beneficial nutritional-physiological effects in the human organism. Grape seeds are well studied in regard to their antioxidant activity due to their significant content of polyphenol substances. Based on this evidence the evaluation of the antioxidant properties of grape pomace might be of great evidence.

The objective of this study was to quantify the content of total polyphenols and to evaluate the antioxidant and free radical scavenging properties of grape pomace of especially in certain regions of Austria cultivated grape varieties for the production of the unique Austrian wine called “Uhudler”.

METHODOLOGY

Dried grape pomace (grape seeds, grape skin, stalks) from the production of the Austrian wine variety “Uhudler” was finely crushed and extracted individually with ethanol, 50% ethanol in water and water. The obtained solid pomace extracts were analyzed for their content of total polyphenols according to the Folin-Ciocalteu method. The radical scavenging capacity of the pomace extracts was evaluated by the DPPH radical scavenging method in terms of their Efficient Concentration EC_{50} (mg antioxidant / mg DPPH*) representing the amount of antioxidant necessary to decrease the initial DPPH* (2,2-diphenyl-1-picrylhydrazyl) concentration by 50%. Low EC_{50}-values are indicating high radical scavenging activity.

RESULTS & DISCUSSION

- Above all the ethanolic grape pomace extracts showed remarkable amounts of total polyphenols and considerable free radical scavenging activity
- The highest amounts of total polyphenols (mg/g) were found in the ethanol/water extract (41.2) and the ethanol extract (35.4) compared to the water extract (14.6)
- The highest antioxidant and radical scavenging capacity was observed in the ethanol/water extract of the grape pomace (EC_{50}: 1.15), followed by the ethanol extract (EC_{50}: 1.57), whilst the water extract showed relatively minor inhibitory effectiveness (EC_{50}: 4.09)
- There is a high correlation of the antioxidant and radical scavenging activity with the content of total polyphenols

CONCLUSION

The results indicate that ethanol extracts from grape pomace, which is derived from the production of the unique Austrian wine called “Uhudler”, have remarkable antioxidative and radical scavenging properties in correlation with their content of total polyphenol substances. An application of grape pomace extracts as potent natural antioxidant additive for food products and as dietary supplement seems to be worth considering, particularly in regard to their beneficial impact to physiological degenerative processes, and would be helpful in maintaining and promoting health.

Total polyphenols and radical scavenging capacity of grape pomace extracts