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Abstract

The Value of Food Waste: *Citrus reticulata* (Mandarin) Peel as a Potent Biological Agent †

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Abstract: *Citrus reticulata* (mandarin) is used in the food industry mainly for juice production, while its peel represents a byproduct with a high content of miscellaneous biologically active compounds. This research aimed to assess the antioxidant and enzyme-inhibitory activities of different peel extracts of mandarin cultivated under natural conditions in the Montenegrin coastal region (Lastva Grbaljska). Mandarin fruits were collected in November 2017, and their extracts were prepared using acetone, methanol, and boiling distilled water as solvents. Total phenolic (TPC) and flavonoid (TFC) contents were determined at the concentration of 0.5 mg/mL, as well as the extracts' antioxidant (using DPPH and total reducing power assays) and enzyme-inhibitory activities (using acetylcholinesterase (AChE) and α-glucosidase inhibition assays). The results indicated that the acetonic extract exhibited the highest radical scavenging activity (12.70%) while also showing the highest TPC (52.40 mg GAE/g) and TFC (13.05 mg QE/g), which is not surprising since acetone is known to extract highly biologically active flavonoid aglycones from plants. Although the aqueous extract had the lowest TPC and TFC, it exerted the highest reducing power (199.06 μmol AAE/g), as well as AChE inhibition activity (22.44%), indicating that other groups of phytochemicals besides phenolics, such as various classes of glycosides, are responsible for the displayed bioactivity. Moreover, none of the extracts inhibited the activity of α-glucosidase. Finally, this study suggests that mandarin peel should not be dismissed in food processing since it possesses a valuable medicinal potential that has yet to be further investigated.

Keywords: citrus reticulata; extracts; phenolics; biological activities

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