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Faculty of Agrobiotechnical Sciences Osijek

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Inhibition of α-amylase by polyphenols present in the peel of traditional, indigenous apple varieties

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Summary

The aim of this work was to evaluate polyphenols from the peel of two traditional apple varieties as α-amylase inhibitors. The extraction of polyphenols from the peel of two traditional apple varieties (Citronka and Kolačara) was conducted using 80% methanol as a solvent with the help of an ultrasonic bath. The main polyphenol subgroups (dihydrochalcones, flavanols, flavonols, and phenolic acids) found in extracts were separated using gel chromatography. Three fractions were collected for each apple variety and analyzed using reversed-phase high-performance liquid chromatography (RP-HPLC). The α-amylase activity was evaluated based on the spectrophotometric determination of maltose released from starch by the action of the enzyme. To inhibit enzyme activity, various concentrations of fractions were added to the reaction mixture. IC_{50} values were calculated (concentration of polyphenols that gives 50% inhibition). Fraction 1 was mainly composed of flavanols (94% and 100%), fraction 2 was rich in dihydrochalcones and phenolic acids (69% and 54%) while fraction 3 was predominantly made of flavonols (92% and 64%) for Citronka and Kolačara, respectively. All the fractions showed inhibition capacity with IC_{50} values ranging from 0.54 μg/mL (fraction 1 of Citronka) to 40.01 μg/mL (fraction 3 of Citronka). The results suggest that polyphenols from the peel of traditional, indigenous apple varieties are potent inhibitors of α-amylase activity.

Key words: apple varieties, traditional, inhibition, α-amylase