INTRODUCTION

• Beneficial effects of polyphenols are often connected to their bioaccessibility which can be influenced by interactions with dietary fibers.
• Those interactions can be studied through the adsorption process.
• In this work we studied interactions of individual polyphenols from flesh and peel of two traditional varieties of apples and dietary fiber β-glucan by studying adsorption process.

MATERIALS AND METHODS

Polyphenols from flesh and peel of apples (Božićnica and Batulenka) were
• extracted (ultrasonic assisted extraction), quantified (RP-HPLC), separated into two fractions by using Sephadex LH-20.
• adsorbed onto β-glucan for 5 h, at pH 5.5. The amount of adsorbed polyphenols was calculated (q). Data were modeled with adsorption isotherms

RESULTS AND DISCUSSION

• Phenolic acids and anthocyanins were present in the first, and flavonols and dihydrochalcones in the second fractions (Figure 1).
• Polyphenols from the peel adsorbed in higher amount onto β-glucan (0.7 to 82 mg g⁻¹) than polyphenols from the flesh (3.3 to 12.4 mg g⁻¹) (Figure 1).

Adsorption isotherms can give apparent, theoretical maximum adsorption capacities (qₑₐ) from Langmuir and Hill, qₑₐ from Dubinin-Radushkevich. Due to E lower than 8000 J/mol, it can be suggested that bonds between polyphenols and β-glucan can be Van der Waals forces or H bonds (Table 1 and 2).

CONCLUSION

Adsorption isotherms might be a useful tool for studying interactions between polyphenols and β-glucan. They can give an insight into the adsorption (interaction) process. But those results need to be confirmed with additional analysis.

Table 1. Parameters of Langmuirov, Freundlichov, Hill and Temkini adsorption isotherms obtained by non-linear modeling of polyphenols from ‘Božićnica’ and ‘Batulenka’ peel

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<th>K₁</th>
<th>K₂</th>
<th>n</th>
<th>b</th>
<th>a</th>
<th>m</th>
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</table>

Table 2. Parameters of Langmuirov, Freundlichov, Hill and Temkini adsorption isotherms obtained by non-linear modeling of polyphenols from ‘Božićnica’ and ‘Batulenka’ flesh

<table>
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<th>b</th>
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