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ADSORPTION OF PHENOLIC ACIDS ONTO β -GLUCAN

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Introduction: Phenolic acids belongs to the group of polyphenols. Polyphenols showed that it can interact with food constituents like dietary fiber. Mechanism of their interactions are not completely investigated. To obtain the information about this interaction, the adsorption models can be applied.

Materials & Methods: Adsorption of phenolic acids (caffeic acid and chlorogenic acid) and dietary fiber (β -glucan) was carried out at different temperatures: 25, 37, and 45 °C. The model solutions consisted of β -glucan, phenolic acid, and phosphate buffer (pH 5.5). After adsorption equilibrium, the concentration of unadsorbed phenolic acid was determined by the Folin-Ciocalteu method. The non-linear Langmuir and Freundlich model were applied.

Results: The results showed that β -glucan has limited adsorption capacity for phenolic acids on all temperatures. Furthermore, fitted non-linear Langmuir and Freundlich model matched well with experimental data. Due to the constants of these models adsorption process was described.

Conclusion: During the adsorption process, phenolic acid adsorbed onto the surface of β -glucan. Adsorption was favourable process. The adsorption capacity for both phenolic acid was the highest at 37 °C. Between phenolic acids, caffeic acid showed higher maximum adsorption capacity than chlorogenic acid.

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