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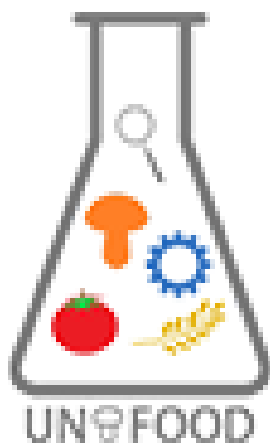
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HRANA I ZDRAVLJE / FOOD AND HEALTH



HZ12 / FH12 U/O

Predloženi mehanizam uticaja oligosaharida dobijenih iz pektina na intestinalnu mikrobiotu

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Intestinalni trakt je najvažnije mesto za delovanje pektina i derivata pektina iz hrane. Veliki značaj ima u odbrani od patogenih organizama i ćelija kancera. Pektin je najvažnije rastvorno dijetetsko vlakno u jabukama i citrusima. Alkalnom hidrolizom sa vodonik-peroksidom smo dobili oligosaharide iz pektina (jabuka i citrusi) i poligalakturonske oligosaharide, koje smo analizirali infracrvenom spektrometrijom sa Furijeovom transformacijom. Pored toga, elektron paramagnetnom rezonantnom spin-trapng spektroskopijom smo analizirali efekat oligosaharida iz pektina na hidroksil-radikal (HO \cdot)-generisanu Fentonovu reakciju i na rast *Escherichia coli* i *Staphylococcus aureus* u prisustvu sistema koji generiše HO \cdot - (gvožđe + askorbat). Oligosaharidi reaguju sa HO \cdot radikalom i proizvode ugljen-dioksid anjon radikal (CO $_2^{\cdot-}$). Komparativna analiza je pokazala da oligosaharidi koji potiču od pektina jabuke ima najjači bakteriostatski efekat. Radikal CO $_2^{\cdot-}$, koji je dobijen iz pektina jabuke generiše se 65% više u poređenju sa poligalakturonskom kiselinom i pektinom dobijenim iz citrusa, i može se smatrati da je glavni nosilac antimikrobne aktivnosti pektina iz jabuke.

Possible Mechanism of Pectin-Derived Oligosaccharides Influence on Gut Microbiota

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Intestinal tract appears to be the main site of beneficial actions of dietary pectin and pectin derivatives. It seems that this is especially important in the fight against the potentially *pathogenic* organisms and cancer cells. Pectin is the main soluble fiber in apples or citruses. We prepared pectin-derived oligosaccharides (apple and citrus) and polygalacturonic acid-derived oligosaccharides, using alkaline hydrolysis by hydrogen peroxide, and analyzed them by Fourier Transform Infrared spectrometry. Furthermore, we analyzed the effects of pectin-derived oligosaccharides on hydroxyl radical (HO \cdot)-generating Fenton reaction using electron paramagnetic resonance spin-trapping spectroscopy, and the effects on the growth of *Escherichia coli* and *Staphylococcus aureus* in the presence of dietary-relevant HO \cdot -generating system (iron + ascorbate). The oligosaccharides react with HO \cdot radical to produce carbon dioxide radical anion (CO $_2^{\cdot-}$). A comparative analysis showed that apple pectin-derived oligosaccharides has the most prominent bacteriostatic effect. The production of CO $_2^{\cdot-}$, which was promoted by chemically processed pectin from apple by approximately 65% in comparison to processed polygalacturonic acid and citrus pectin, might be the main cause of the antimicrobial activity of the apple pectin derivative.