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Bioaccessibility of phenolic compounds from grape pomace extracts

Josipa Martinović, Mirela Planinić, Ana Bucić-Kojić

Faculty of Food Technology Osijek, Josip Juraj Strossmayer University of Osijek, Osijek, Croatia

Grape pomace is the solid residue of the winery, rich in phenolic compounds. Phenolic compounds have great potential to exert multiple pharmacological effects when they reach the target site (intestine) in the body where they can be absorbed. Since the bioavailability of phenolic compounds in the body is relatively low, their encapsulation can increase their bioaccessibility in the digestive system and eventually improve the bioavailability. In this work, a phenolic rich-extract from pomace of Cabernet Franc variety was encapsulated by ionic gelation with 3 % sodium alginate as excipient and 0.25 M calcium chloride as curing agent. Also, 5 % gelatin and 1.5 % chitosan were used as additional excipients in combination with sodium alginate. The freeze-dried hydrogels were subjected to simulated digestion *in vitro* during the oral, gastric and intestinal phases to evaluate the bioaccessibility index of individual phenolic compounds from grape pomace extracts.

Encapsulation efficiency was improved by 31.3 % and 40.4 % with the addition of gelatin and chitosan to sodium alginate, respectively. The highest release of was observed in the intestinal phase. Ten individual phenolic compounds were identified by UHPLC analysis, of which five were phenolic acids (gallic, 3,4-dihydroxybenzoic, syringic, ellagic, and o-coumaric acid) and the other five were flavan-3-ols (epicatechin, catechin, epicatechin gallate, gallocatechin gallate, and procyanidin B2). The highest bioaccessibility index is observed at the end of the intestinal phase for o-coumaric acid in all samples (386.5 - 766.3 %).